

CardioSic

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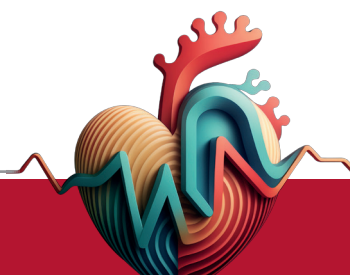
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CardioSic

A stylized graphic of a heart and an ECG line, with the heart in red and the ECG line in black, positioned below the 'Cardio' part of the title.

85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

ARITMIE

ARITMIE 269

ARITMIE VENTRICOLARI (ARITMIE)

MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) ASPETTI GENETICI DELLE ARITMIE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

LONG-TERM CLINICAL OUTCOMES OF PATIENTS WITH DRUG-INDUCED TYPE 1 BRUGADA ELECTROCARDIOGRAPHIC PATTERN: A NATIONWIDE COHORT REGISTRY STUDY

Alfredo Caturano (a), Federico Migliore (b), Federico Guerra (c), Pietro Francia (d), Martina Nesti (e), Giulio Conte (f), Alessandro Paoletti Perini (g), Giuseppe Mascia (h), Stefano Albani (i), Procolo Marchese (j), Vincenzo Ezio Santobuono (k), Gregory Dendramis (l), Andrea Rossi (m), Emilio Attena (v), Andrea Ghidini Ottonelli (n), Luigi Sciarra (o), Zefferino Palamà (w), Enrico Baldi (p), Emanuele Romeo (q), Pasquale Notarstefano (e), Carmen Adducci (d), Livia Pardo Franchetti (f), Nicola Berlier (i), Berardo Sarubbi (r), Ferdinando Carlo Sasso (a), Paolo Golino (q), Alessandro Vicentini (p), Italo Porto (h), Luca Barca (h), Nicolò Martini (b), Chiara Carrozzi (p), Gianfranco Tola (t), Roberto Floris (u), Antonio D'onofrio (r), Gerardo Nigro (s), Vincenzo Russo (s)

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Background: There are limited real-world data on the extended prognosis of patients with drug-induced type 1 Brugada electrocardiogram (ECG).

Objective: We assessed the clinical outcomes and predictors of life-threatening arrhythmias in patients with drug-induced type 1 Brugada ECG.

Methods: This multicenter retrospective study, conducted at 21 Italian and Swiss hospitals from July 1997 to May 2021, included consecutive patients with drug-induced type 1 ECG. The primary outcome, a composite of appropriate ICD therapies and sudden cardiac death, was assessed along with the clinical predictors of these events.

Results: A total of 606 patients (mean age 49.7 ± 14.7 years; 423 [69.8%] men) were followed for a median of 60.3 months (interquartile range 23.0-122.4 months). Nineteen patients (3.1%) experienced life-threatening arrhythmias, with a median annual event rate of 0.5% over 5 years and 0.25% over 10 years. The SCN5A mutation was the only predictor of the primary outcome (hazard ratio 4.54; $P = .002$), whereas a trend was observed for unexplained syncope (hazard ratio 3.85; $P = .05$). In patients who were asymptomatic at presentation, the median annual rate of life-threatening arrhythmias is 0.24% over 5 years and increases to 1.2% if they have inducible ventricular fibrillation during programmed ventricular stimulation.



Conclusion: In patients with drug-induced type 1 Brugada ECG, the annual risk of life-threatening arrhythmias is low, with the SCN5A mutation as the only independent predictor. Unexplained syncope correlated with worse clinical outcomes. Ventricular

fibrillation inducibility at programmed ventricular stimulation significantly increases the median annual rate of life-threatening arrhythmias from 0.24% to 1.2% over 5 years.

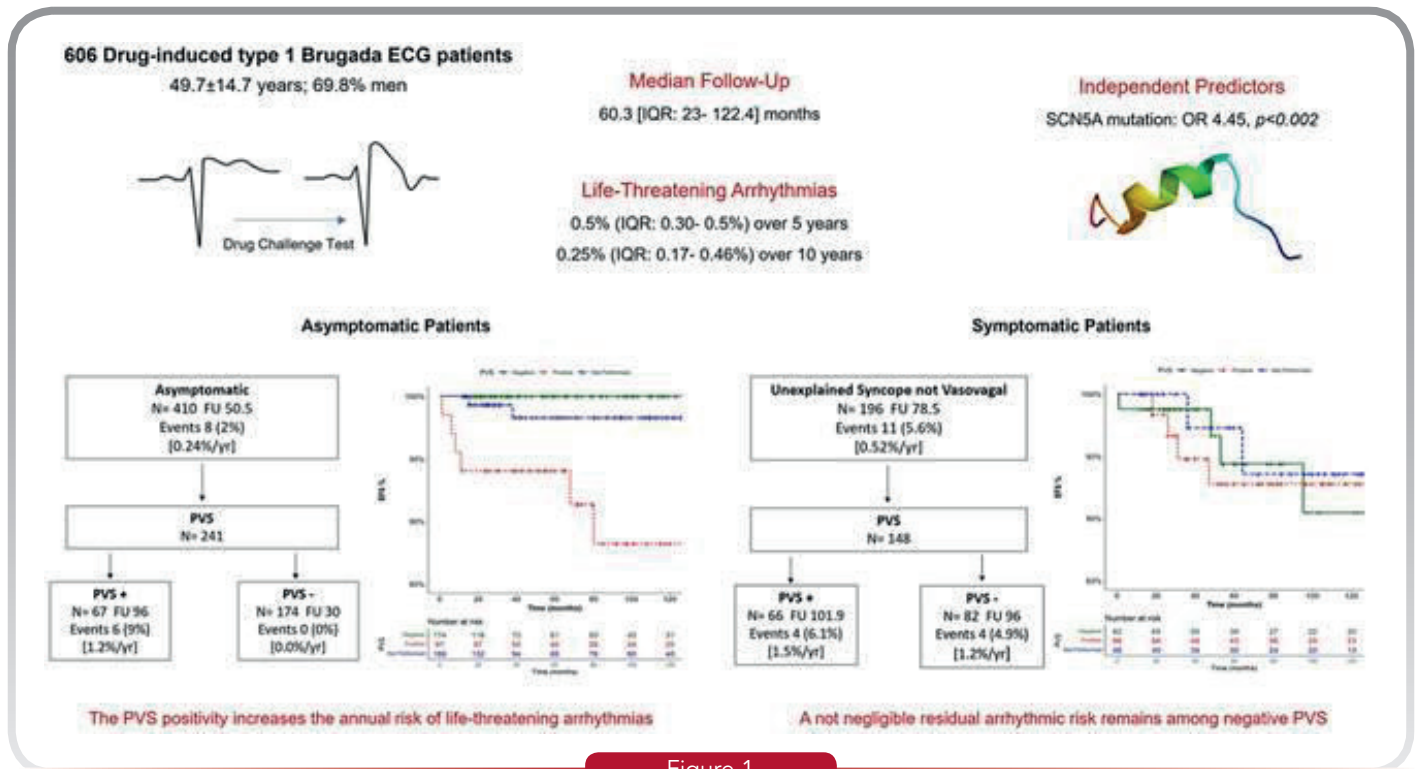


Figure 1

ARITMIE 144

ELETTROSTIMOLAZIONE (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)

ULTRASOUND-GUIDED AXILLARY VEIN PUNCTURE VS LAND-MARK GUIDED APPROACH FOR CARDIAC IMPLANTABLE ELECTRONIC DEVICE PLACEMENT

Francesco Flore (a), Francesco Perna (a), Alessandro Telesca (a), Roberto Scacciavillani (a), Eleonora Ruscio (a), Gianluigi Bencardino (a), Gaetano Pinnacchio (a), Maria Lucia Narducci (a), Gemma Pelargonio (a)
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A. GEMELLI IRCCS, ROMA

Introduction: Ultrasound (US)-guided axillary vein puncture is a safe and effective approach for cardiac implantable electronic device (CIED) implantation and it is highly recommended by the current consensus document. However, only reports on small populations are available in the current literature regarding comparison of this technique with other traditional approaches (subclavian vein blind puncture and cephalic vein surgical cutdown).

Purpose: We aimed to assess the effectiveness and safety of US-guided axillary vein puncture using a micro introducer kit for CIED implantation as compared to the traditional approaches.

Methods: All consecutive patients with an indication to CIED implantation were prospectively enrolled in our observational study from March 2021 to July 2023. Patients were divided into three groups based on venous access route, according to the operator's preference: cephalic vein surgical cutdown (G1), US-guided axillary vein puncture (G2) and subclavian vein blind puncture (G3). Clinical and procedural characteristics, success and complication rates were considered for analysis.

Results: A total of 1000 patients (65.2% male, mean age 75.5 ± 10.8 years) were enrolled. Cephalic vein surgical cutdown was chosen in 172 (G3, 17.2%), US-guided axillary access in 433 patients (G2, 43.3%), subclavian vein in 395 (G3, 39.5%). Success rate was 77.6% in G1,

96.3% in G2 and 97.2% in G3 (G2 vs G3, $p=.5$; G1 vs G2, $p<.0001$; G1vsG2vsG3, $p<.0001$). Compared to subclavian and cephalic groups, in the US-guided axillary group a successful access was obtained with a reduced mean number of puncture attempts (G2 vs G3: 1.3 ± 0.9 vs 1.8 ± 1 , $p<.0001$) and needed reduced times to get access (G2 vs G3: $35.4 \text{ sec} \pm 65.8$ vs $67.9 \pm 96.2 \text{ sec}$; $p<.0001$, G1 vs G2: 216.4 ± 96.7 vs $35.4 \pm 65.8 \text{ sec}$; $p<.0001$) and to reach the superior vena cava, without differences in total procedural times ($72.9 \pm 30.4 \text{ min}$ vs $75.7 \pm 34.8 \text{ min}$, $p=0.24$). Fluoroscopy times ($10.7 \pm 30.7 \text{ sec}$ vs $46.2 \pm 61 \text{ sec}$, $p<.0001$) and usage of vein angiography (11.9% vs 51.3%, $p<.0001$) were lower in G2 as compared to G3. Complication rate did not differ among the three study groups (early complications: 1.8% in G3, 2.3% in G2, 2.9% in G3, $p=.7$; late complications at a mean follow up of 6 months: 0.3% in G1, 1.6% in G2, 1% in G3, $p=.3$).

Conclusions: US-guided axillary vein puncture for CIED implantation using a micro introducer kit is a safe technique with a very high success rate. Compared to other traditional approaches, it allows to get access with a lower number of puncture attempts and with reduced times, without prolonging the total procedural time. Moreover, X-ray use and need for contrast medium are very rare in US-guided axillary approach. Hence, it should be considered the strategy of choice for most patients undergoing CIED implantation.



ARITMIE 202

FARMACI ANTIARITMICI (ARITMIE) ELETTROSTIMOLAZIONE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE)

ORAL FLECAINIDE THERAPY IN PATIENTS WITH PACEMAKER DEVICES: RESULTS FROM A MULTICENTER STUDY

Francesco Niglio (a), Francesco Santoro (a), Damiano D'alejandro (a), Ilaria Ragnatela (a), Alessandra Margaglione (a),
Girolamo D'ariento (a), Pierluigi Pellegrino (a), Natale Daniele Brunetti (a)

(a) CARDIOLOGY UNIT, DEPARTMENT OF MEDICAL AND SURGERY SCIENCES, UNIVERSITY OF FOGGIA, ITALY

Background and aim of the study: Antiarrhythmic drugs, class I are widely used for prevention of atrial fibrillation recurrence. However, previous studies found that these drugs could affect pacing thresholds among pacemaker recipients.

Aim of the study: evaluate short-term effect on myocardial pacing following therapy with oral flecainide (200 mg/daily).

Methods: 45 consecutive pacemaker recipients were prospectively enrolled in a multicenter registry. These patients had preserved left ventricular ejection fraction, a dual chamber pacemaker with symptomatic sustained high-rate atrial fibrillation episodes and stable output atrial and ventricular thresholds. Patients were followed with ambulatory and/or remote monitoring.

Results: mean age was 74 ± 1 years, 48% pts were male and AF burden was $8 \pm 16\%$. Pacemaker implantation was performed 3.9 ± 0.3 year before study enrollment. Three (6%) out of 45

patients were excluded due to drug sided effects including dyspnea (n=1), diplopia (n=1) and toxicity during acute renal insufficiency (n=1). Flecainide treatment was associated with a significant reduction of atrial fibrillation burden (from $8 \pm 16\%$ to $5 \pm 12\%$, $p < 0.01$).

At 30 days follow-up since Flecainide starting therapy both atrial and ventricular sensing significantly decreased (3.6 ± 2.2 vs 3.4 ± 2.1 mV $p=0.01$; 12.5 ± 6.6 vs 11.8 ± 6.3 mV $p=0.01$), while there was a slight increase of both atrial and ventricular capture thresholds (0.77 ± 0.61 V @ 0.4ms vs 0.80 ± 0.42 V @ 0.4ms $p=0.01$; 0.80 ± 0.53 V @ 0.4ms vs 0.83 ± 0.33 V @ 0.4ms $p=0.01$). No patient required pacemaker parameters reprogramming.

Conclusions: oral flecainide therapy among pacemaker recipients at 30 days follow-up seems to be safe and do not affect device function. Further studies with additional follow-up data are warranted.

ARITMIE 685

ABLAZIONE TRANSCATETERE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)**REPEAT ABLATION FOR ARRHYTHMIA RECURRENCE AFTER ULTRA-LOW TEMPERATURE CRYOABLATION FOR ATRIAL FIBRILLATION**

Lucio Addeo (a), Bob Abeln (d), Vincenza Abbate (a), Federico Vannini (b), Tom De Potter (c)

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Background: Ultra-low temperature cryoablation (ULTC) is an ablation modality that uses near-critical nitrogen to pursue the creation of durable, transmural, contiguous ablation lesions. No studies have reported on the durability of ablation lesions in patients with arrhythmia recurrence after ULTC to treat atrial fibrillation.

Methods: Patients that were treated using the AF4 ULTC catheter and had a repeat ablation to treat atrial arrhythmia recurrence after ULTC were included in the cohort. Baseline and procedural characteristics of the two strata are presented. Procedural characteristics, findings and outcomes of the repeat ablation procedures are presented. Gaps in the pulmonary vein (PV) ablation lesions were evaluated per PV segment.

Results: The cohort included 25 patients that were treated with ULTC. Gaps in one or more PV ablation lesion were present in 21 out of 25 patients (84%) undergoing a repeat ablation (median 2 [IQR 2-4] PV's per patient) while reconnection of the posterior wall ablation was present in only 27 % (4/15 patients). Gaps

in cavo-tricuspid isthmus and lateral mitral isthmus lesions were found in 1/2 patients (50%) and in 3/5 patients (60%), respectively. Assessing PV isolation, there was a significant difference between the number of gaps when comparing the anterior and posterior halves of the left and right PV's ($\chi^2 (3, N = 616) = 7.9, p = .047$), with most reconnected segments in the anterior side of the left PV's (35% of segments). The highest proportion of gaps were found in the anterior part of the carina of the left PVs (45% of patients). After a follow up of 1.6 ± 1.3 years, 10/25 patients had recurrence of atrial tachyarrhythmia after repeat ablation.

Conclusion: Patients that had repeat ablation to treat arrhythmia recurrence after ULTC had a reconnection of one or more PVs in 84%. The anterior side of the left PVs has been found out to be a crucial spot, being reconnected most often. Reconnections in other sites have been found in 27% of cases after posterior wall isolation, 50% after cavo-tricuspid isthmus ablation and 60% after mitral isthmus ablation.



ARITMIE 709
GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)
ELETTROSTIMOLAZIONE (ARITMIE)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

LONG TERM PROGNOSIS FOLLOWING TRANSVENOUS LEAD EXTRACTION: INSIGHTS FROM A SINGLE CENTER REGISTRY

Emiliano Calvi (a), Gianmarco Arabia (a), Gianfranco Mitacchione (a), Maria Giulia Bellicini (a), Antonino Mesi (a), Paolo Fornaro (a), Lorenzo Veronelli (a), Manuel Cerini (a), Antonio Curnis (a)
 (a) UNIVERSITÀ DEGLI STUDI DI BRESCIA

Objective: The purpose of our study was to investigate long-term prognosis of transvenous lead extraction (TLE) of cardiac implantable electric device (CIED).

Materials and Methods: We retrospectively studied all consecutive patients who underwent TLE between January 2014 and January 2016 in our Institution and stratified them by the presence or absence of CIED infection. The primary outcome considered was the composite endpoint of time to death or repeated TLE; secondary outcomes included the single above outcomes.

Results: 191 patients (85% male, median age 70 years) who underwent TLE in our Institution were considered. 96 patients (50%) were extracted because of CIED infection and remaining 95 (50%) were extracted for other reasons. Complete procedural success was achieved in 189 patients (99%) with no

major complications. During a follow-up of 6.5 (5.4-7.1) years, CIED infection indication to extraction was associated with a significantly lower composite outcome (67% vs 83%; adjusted hazard ratio [aHR] 1.97, 95% confidence interval [CI] 1.02-3.81, P=0.04), with lower time to death (30% vs 10%, log-rank P<0.01), but similar time to repeated TLE rate (4% vs 7%, P=0.62). In case of TLE of infected device, the presence of vegetations (aHR 2.56; 95%CI 1.17-5.63, P=0.02) and positive blood cultures (aHR 2.64; 95% CI 1.04-6.70, P=0.04) were independently associated with the primary outcome.

Conclusion: Patients who underwent TLE because of CIED infection showed precocious death or repeated TLE compared to those with a different extraction indication. In presence of vegetations or positive blood cultures prognosis were poorer despite an uncomplicated extraction and appropriate therapy.



ARITMIE 708

ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ARITMIE VENTRICOLARI (ARITMIE) FARMACI ANTIARITMICI (ARITMIE) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

RANOLAZINE FOR ANTIARRHYTHMIC PURPOSE: SINGLE CENTER EXPERIENCE

Valentina Braia (a, b), Filippo Angelini (a), Pier Paolo Bocchino (a), Stefano Pidello (a), Giulia De Lio (a), Carola Griffith Brookles (a, b), Giuseppe Giannino (a, b), Claudia Raineri (a), Gaetano Maria De Ferrari (a, b), Veronica Dusi (a, b)
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Introduction: Ranolazine is a multichannel blocker (mostly inhibitor of the late inward sodium current) and induces a reduction of intracellular calcium overload. Although the drug was originally developed and it is still primarily used as an antianginal agent, preliminary pre-clinical as well as clinical data on its antiarrhythmic efficacy are promising. The dose-response relationship seems to be different for arrhythmias compared to angina, with higher dosages required for the latest.

Objective and methods: The aim of this observational study was to assess the antiarrhythmic efficacy of ranolazine on atrial and/or ventricular arrhythmias. Adult patients starting ranolazine for antiarrhythmic purposes at one single tertiary center from January 2022 to April 2024 were consecutively enrolled. Patients were considered eligible for treatment with ranolazine if, in the last 6 months, they had (1) atrial arrhythmias, including atrial fibrillation (AF), atrial flutter and/or frequent (> 500/day) premature atrial contractions, and/or (2) ventricular arrhythmias, defined as frequent (> 500/day) premature ventricular contractions (PVC), non-sustained ventricular tachycardias (VTs) or sustained VTs (arrhythmias lasting > 30 seconds or requiring interruption interrupted by implantable cardioverter-defibrillator [ICD] therapies). Patients receiving ranolazine for isolated angina were excluded. All patients underwent periodic Holter monitoring and implantable device interrogations for those

implanted; most also had remote monitoring. The primary efficacy outcome was the incidence of atrial and ventricular arrhythmias. The safety of ranolazine was also evaluated.

Results: 151 patients were enrolled (65±12 years). Twenty-six (17%) patients were female, 91 (60%) had arterial hypertension, 62 (41%) had coronary artery disease (CAD) and 55 (36%) had a primary cardiomyopathy (CMP) (4 [3%] hypertrophic CMP). LMNA-related CMP was found in 6 (4%) subjects. Thirteen (9%) patients carried a pacemaker (PM) and 67 (44%) an implantable cardioverted defibrillator (ICD). Mean creatinine levels were 1.1±0.3 mg/dL, mean left ventricular ejection fraction 42±15%. Half of the patients suffered atrial arrhythmias (33 [44%] with paroxysmal AF) and 114 (75%) patients had ventricular arrhythmias (85 [56%] with isolated ventricular extrasystoles or non-sustained VTs, 29 [19%] with sustained VTs or ICD-treated ventricular arrhythmias). Twenty-six (17%) patients had previously undergone AF ablation, 15 (10%) VT ablation, 5 (3%) cardiac sympathetic denervation. Most patients (89%) patients were on beta-blocker therapy and 42 (28%) on amiodarone. Ranolazine was prescribed at an average initial dose of 523±148 mg and was titrated up to an average dose of 633±161 mg. At a mean follow-up of 7 ± 6 months, significantly fewer patients had atrial arrhythmias compared to baseline (17 [11%] vs 75 [50%], p-value < 0.001), requiring



ablation in 1 (6%) case; also, significantly fewer patients showed ventricular arrhythmias at follow-up compared to baseline (12 [8%] vs 114 [75%], p -value < 0.001), requiring ablation in 4 cases. Among patients with CAD, 2 patients had ventricular arrhythmias at follow-up. Ranolazine was interrupted in 5 (3%) patients due to intolerance.

Conclusion: This observational study on the use of ranolazine for antiarrhythmic purposes demonstrates encouraging antiarrhythmic efficacy in the mid-term follow-up with good safety data. The dose response is a critical point also considering the lack of the 1000 bid formulation in Italy (approved in other countries) Larger observational and randomized studies are warranted.



ARITMIE 17

GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) ELETTROSTIMOLAZIONE (ARITMIE) ENDOCARDITI (VALVULOPATIE)

OTTIMIZZAZIONE DELLE SOSTITUZIONE CIED: FATTIBILITÀ, SICUREZZA ED ACCETTABILITÀ DEL REGIME DI DAY SURGERY PER LE SOSTITUZIONI CIED

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Introduzione: La sostituzione dei dispositivi elettronici impiantabili cardiaci (CIED), principalmente a causa dell'esaurimento della batteria, è diventata un aspetto fondamentale dell'attività nei centri leader per l'impiantistica di CIED. Il tasso di complicanze supera significativamente quello dell'impianto iniziale. Il regime di day Surgery (DS) rappresenta un'opzione emergente in cardiologia interventistica rispetto al ricovero ordinario standard (OS), ma la mancanza di studi riguardanti il regime di Day Hospital rappresenta un importante gap in letteratura.

Metodi: Si tratta di uno studio osservazionale retrospettivo, monocentrico, di coorte su pazienti sottoposti a sostituzione di CIED tra il 2017 e il 2024, che ha arruolato 201 pazienti. La coorte è stata divisa in due gruppi: uno è stato sottoposto a sostituzione in regime di DS (125 pazienti) e uno in ricovero ordinario (83 pazienti). Abbiamo analizzato la sicurezza dell'approccio DS con modelli di Kaplan-Meier per il tasso annuale di infezioni fino a 365 giorni dopo l'intervento. Abbiamo valutato la soddisfazione dei pazienti con un questionario

sviluppato dal nostro Dipartimento e con il questionario The Amsterdam Preoperative Anxiety and Information Scale (APAIS) e The Anesthesia and Surgery dependent Preoperative Anxiety (ASPA).

Risultati: Il tasso di infezione è stato dell'1,6% (n=2) nei pazienti sottoposti a sostituzione in DS e del 2,4% (n=2) nei pazienti sottoposti all'intervento in ricovero ordinario (p=0,677). L'analisi riguardante la preferenza dei pazienti ha mostrato che, nel gruppo DS, l'88,8% (n=111) ha preferito il regime di DS e il 5,6% (n=7) avrebbe preferito il ricovero ordinario mentre, nel gruppo OS, il 65,1% (n=54) avrebbe preferito il DS e 28,9% (n=24) ha preferito il ricovero ordinario (p= <0,001)

Conclusioni: Il regime di day Surgery è sicuro per i pazienti sottoposti a qualsiasi tipo di sostituzione del generatore. I nostri dati suggeriscono che la dimissione in giornata comporta livelli più elevati di soddisfazione e a minori livelli di ansia e stress preoperatorio, con una riduzione del numero di giorni di ricovero ospedaliero e benefici economici per il sistema sanitario.



POPULATION AND STUDY DESIGN

138 Men, 70 Women



Adults with CIED implantation in need of generator replacement (3 months from ERI).

Observational retrospective study

Two groups, one undergoing generator replacement in Day Surgery setting and one in Ordinary setting to assess the safety in DS group.

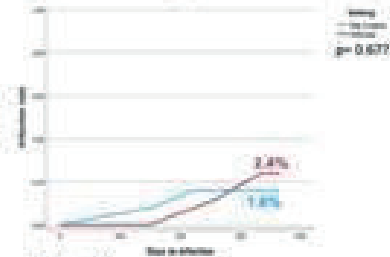


DAY SURGERY 125 patients

ORDINARY SETTING 83 patients

RESULTS

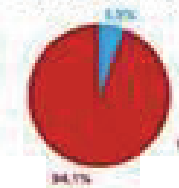
An estimated annual infection rate for both DS and OS group, generated using Kaplan-Meier models.



Patients' preferences

■ Patients who prefer DS
■ Patients who prefer OS

Day surgery setting



Ordinary setting

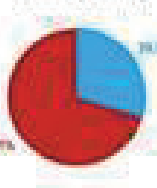


Figura 1

ARITMIE 833

MECCANISMI DELLE ARITMIE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

INTEGRATION OF CMR AND EAM FOR SCAR CHARACTERIZATION IN NON ISCHEMIC CARDIOMYOPATHY: INSIGHTS FROM ADAS 3D SOFTWARE

Leonardo D'angelo (a), Paolo Compagnucci (a), Giovanni Volpato (a), Yari Valeri (a), Francesca Campanelli (a), Laura Cipolletta (a), Quintino Parisi (a), Agostino Misiani (a), Silvano Molini (a), Federico Guerra (a), Antonio Dello Russo (a), Michela Casella (a)

(a) AZIENDA OSPEDALIERO UNIVERSITARIA DI ANCONA, CLINICA DI CARDIOLOGIA E ARITMOLOGIA, ANCONA

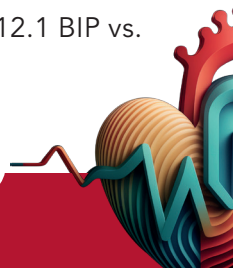
Introduction: Patients with non-ischemic cardiomyopathy (NICM) face a heightened risk of ventricular arrhythmias (VA), which typically originate in scar areas and adjacent border zones. These areas can be detected on cardiac magnetic resonance (CMR) through late gadolinium enhancement (LGE). The strong correlation between scar regions and the electrophysiological substrate—characterized during electroanatomical mapping (EAM) by late potentials and local abnormal ventricular activation—has led to the development of ablation strategies guided by CMR, focusing on anatomical substrates alone. In this context, the ADAS 3D software (GALGO) emerges as a valuable tool, capable of creating color-coded maps that depict scar areas based on LGE-CMR sequences. These maps can be integrated with EAM, combining the electrophysiological data obtained from EAM with the tissue characterization provided by LGE-CMR.

Objective: This study seeks to validate the diagnostic accuracy of the ADAS 3D software in identifying and localizing scar and border zone areas by comparing its performance to the gold standard in cardiac tissue characterization: EAM.

Materials and Methods: This retrospective study was conducted at two hospitals: the University Hospital of Ancona and the A. Gemelli University Hospital in Rome. The study included patients who were candidates for an electrophysiological study

(EPS) involving programmed ventricular stimulation and EAM to assess their risk of sudden cardiac death (SCD). Before undergoing EPS, each patient underwent LGE-CMR. EAM was performed using the Ensite X navigation system and a high-density multipolar HD Grid catheter (ABBOT, USA) in its three configurations: unipolar (UNI), bipolar (BIP), and omnipolar (OT). To validate its diagnostic accuracy, the multilayer shells generated by the GALGO software from LGE-CMR sequences were compared with the 3D reconstructions produced by the EnsiteX navigation system.

Results: The agreement analysis, showed that the EAM in OT and UNI configurations have the highest correlation with the GALGO software (Cohen's Kappa: OT 0.72, UNI 0.71, BIP 0.54). The OT configuration demonstrated the strongest correlation with the endocardial shells generated by the ADAS 3D software (Cohen's Kappa 0.97; PPV 96%; NPV 100%), while the UNI configuration had the strongest correlation with epicardial shells (Cohen's Kappa 0.93; PPV 97.2%; NPV 86.5%). The reliability analysis indicated that the OT configuration provides the most reliable and consistent measurements for both the BZ and scar areas. Specifically, the OT had the lowest absolute percentage error (APE) (BZ 39% OT vs. 64% BIP vs. 60% UNI; SCAR 23% OT vs. 70% BIP vs. 100% UNI) and the narrowest limits of agreement (LoA) (BZ -22.5 to 12.9 OT vs. -24.7 to 12.9 BIP vs. -28.3 to 17.3 UNI; SCAR -8.2 to 7.8 OT vs. -7.5 to 12.1 BIP vs.



-12.8 to 19.1 UNI). In contrast, the UNI exhibited the greatest variability and the least reliability.

Conclusions: The concordance analysis shows that both methods are equally effective in identifying scarred cardiac tissue, especially when EAM is performed using high-density mapping catheters

with an omnipolar configuration, which can overcome the issue of 'bipolar blindness'. Despite its invasive nature, these findings suggest that EAM could serve as a substitute for CMR in tissue characterization for patients who cannot undergo CMR, while also allowing the study of the electrophysiological properties of cardiac tissue.



ARITMIE 507

ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) ABLAZIONE TRANSCATETERE (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE)

THE HIDDEN THREAT: DUAL AV NODAL NON-RE-ENTRANT TACHYCARDIA- INDUCED CARDIOMYOPATHY

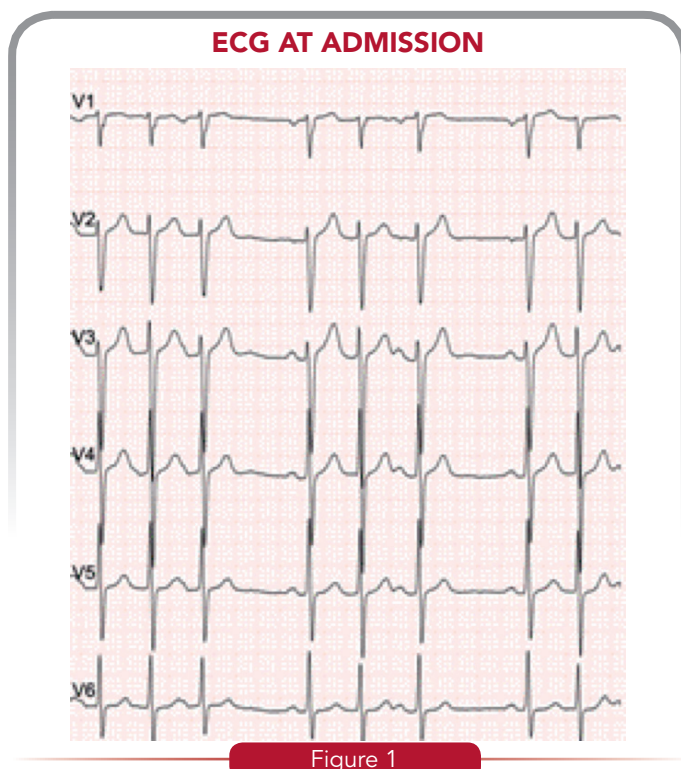
Gaia Filiberti (a, b), Antonio Taormina (b), Diego Penela Maceda (a, b), Giulio Falasconi (b), Alessia Chiara Latini (a, b), Mattia Penna (a, b), Paola Galimberti (b), Carlo Ceriotti (b), Massimo Vito Tritto (b), Gianluigi Condorelli (a, b)
(a) HUMANITAS UNIVERSITY, DEPARTMENT OF BIOMEDICAL SCIENCES - VIA RITA LEVI MONTALCINI 4, 20090 PIEVE EMANUELE (MI); (b) IRCCS HUMANITAS RESEARCH HOSPITAL - VIA MANZONI 56, 20089 ROZZANO (MI)

Introduction: Dual atrioventricular nodal non-re-entrant or “double firing” tachycardia (DAVNNT) is a rare, often misdiagnosed, supraventricular tachycardia. It involves a single sinus beat conducting through both the fast and slow AV nodal pathways, causing two consecutive ventricular depolarizations on the ECG. This requires a retrograde block in the slow pathway. DAVNNT can mimic atrial

premature beats or atrial fibrillation (AF), leading to inappropriate treatments. The preferred treatment is radiofrequency catheter ablation of the slow pathway. We present a case of a 51-year-old patient with DAVNNT-induced cardiomyopathy mistakenly referred for AF ablation.

Clinical history: The patient had a history of palpitations, with cardiological evaluations showing phases of sinus tachycardia, frequent supraventricular extrasystoles, and brief AF episodes. He was on anticoagulant therapy with a NOAC. Holter ECG revealed AF at a high ventricular rate throughout the recording duration. An echocardiogram showed moderate left ventricular dysfunction (EF 43%). Therefore, he was referred to our center for transcatheter AF ablation.

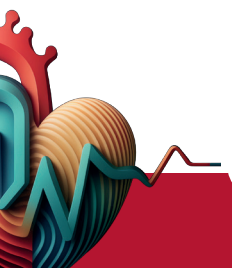
Management: At admission, the ECG showed irregular RR intervals and P waves followed by two narrow QRS complexes (Figure 1). Electrophysiological study (EPS) was performed, with a decapolar catheter in the proximal coronary sinus, a tetrapolar catheter in the His region, and a quadripolar catheter at the right ventricle (RV) apex. Intracardiac EGM confirmed sinus rhythm with conduction through both fast and slow AV nodal pathways. There was no retrograde conduction during RV pacing, and AVNRT was not inducible with programmed atrial pacing. The slow pathway region was mapped, and ablation was performed



using a 4-mm non-irrigated radiofrequency ablation catheter (45W).

echocardiogram showed a recovery of ejection fraction (EF 52%) and the disappearance of AVNRT on the Holter ECG.

Conclusion: At the 1-month follow-up,



ARITMIE 131

ABLAZIONE TRANSCATETERE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE) CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

TRANS-JUGULAR APPROACH FOR SAFE AND SUCCESSFUL CRYOABLATION OF PARA-HISIAN/ANTERIOR-SEPTAL, ANTERIOR, ANTERIOR-LATERAL ACCESSORY PATHWAYS IN CHILDREN

Francesco Flore (a), Stella Maiolo (a), Pietro Paolo Tamborrino (a), Massimo Stefano Silveti (a), Fabrizio Drago (a)
(a) PAEDIATRIC CARDIOLOGY AND CARDIAC ARRHYTHMIAS UNIT,
BAMBINO GESU' CHILDREN HOSPITAL IRCCS, ROME

Background: Cryoablation of APs localized near the atrioventricular (AV) junction is a well-established ablation strategy in children, and it has proved to be very safe. However, recurrence rates remain considerable for specific accessory pathway (AP) localizations. The aim of this retrospective study was to evaluate the efficacy and safety of a trans-jugular approach for cryoablation of right anterior, anterior-lateral, and anterior-septal APs in children, as compared to the conventional femoral approach.

Methods: From June 2019 to November 2023, 24 consecutive patients (mean age 13.2 ± 4.6 , 12 males (50% of total cohort)) with right anterior-lateral, anterior, and anterior-septal/para-Hisian APs underwent 3D non-fluoroscopic transcatheter cryoablation through the right jugular vein at our Institution. Ablation results were

compared with 24 patients for whom a conventional trans-femoral approach was used.

Results: Acute procedural success rate was 100% ($n = 24/24$), with a non-statistically significant difference as compared to the control group (100% vs. 83%, $p = 0.1$). During follow-up (1.1 years, interquartile range 0.6–1.3), one patient (4%) had a recurrence in the trans-jugular group, as opposed to eight (38%) in the control group ($p = 0.006$). No permanent complications occurred.

Conclusions: 3D cryoablation of right anterior-lateral, anterior, and anterior-septal/para-Hisian APs in children using a trans-jugular approach is extremely effective and safe, resulting in higher chronic success rate compared to the conventional femoral approach.



ARITMIE 133
ABLAZIONE TRANSCATETERE (ARITMIE)
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)
CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E
MALATTIE DEL CIRCOLO POLMONARE)

CT-SCAN GUIDED IRRIGATED CATHETER ABLATION OF EPICARDIAL ACCESSORY PATHWAYS IN THE CORONARY SINUS: SAFETY AND FEASIBILITY IN PAEDIATRIC PATIENTS

Francesco Flore (a), Rita Blandino (a), Aurelio Secinaro (a), Ilaria Cazzoli (a), Cristina Raimondo (a), Corrado Di Mambro (a), Fabrizio Drago (a)

(a) PAEDIATRIC CARDIOLOGY AND CARDIAC ARRHYTHMIAS UNIT,
 BAMBINO GESU' CHILDREN'S HOSPITAL IRCCS, ROME

Background: The most common site of epicardial APs is left posterior-septal, and ablation from the coronary sinus (CS) or its main tributaries is needed. However, particularly in children, it can carry a considerable risk of complications, such as coronary artery (CA) injury, CS damage, and perforation. This study aims to assess the efficacy and safety of computed tomography (CT)-scan-guided irrigated trans-catheter (TC) ablation of epicardial APs through the CS in children.

Methods: Twenty-four consecutive children (19 males; mean age $13,8 \pm 2,6$) with ventricular pre-excitation (VP) underwent an endocavitary electrophysiological study (EPS) and subsequent TC ablation of epicardial APs localized into the CS. All patients underwent a CT scan to visualize the CS and its branches and their proximity to the CAs before the ablation. Clinical,

electrophysiological and follow-up data were collected.

Results: Acute success rate was 87.5% (21 out of 24 procedures). No complications occurred. In 16 (66.7%) patients, the ablation site was detected at the proximal CS, in 2 (8.3%) patients in the mid-proximal CS and in 6 (25%) in the middle cardiac vein (MCV). Ablation was achieved using an irrigated radiofrequency (RF) catheter in all patients and without the use of fluoroscopy in 20 patients (83.3%). Over a median follow-up of 15.1 months (IQR 2.5-32.3), no recurrences or complications occurred.

Conclusions: Epicardial posterior-septal APs, in the area of CS or MCV, can be definitively eliminated in most children using CT scan-guided electro-anatomical mapping and transvenous irrigated RF ablation.

ARITMIE 903
ARITMIE VENTRICOLARI (ARITMIE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

**SUBCLINICAL EDEMA DETECTED BY T2 MAPPING AND VENTRICULAR ARRHYTHMIAS
 IN MITRAL VALVE PROLAPSE**

Fabrizio Fortunato (a), Michele Dadamo (b), Francesco Mangini (c), Grazia Casavecchia (d), Matteo Gravina (d), Natale Daniele Brunetti (e), Francesco Spinelli (f), Roberto Calbi (f), Ilaria Dentamaro (b), Andrea Igoren Guaricci (b), Robert W.w. Biederman (g), Massimo Grimaldi (c)

(a) DEPARTMENT OF CARDIOLOGY, UNIVERSITY OF PALERMO, ITALY; (b) DEPARTMENT OF CARDIOLOGY, UNIVERSITY OF BARI, ITALY; (c) DEPARTMENT OF CARDIOLOGY, MIULLI GENERAL HOSPITAL, ACQUAVIVA DELLE FONTI, ITALY; (d) DEPARTMENT OF RADIOLOGY, UNIVERSITY OF FOGGIA, ITALY; (e) DEPARTMENT OF RADIOLOGY, UNIVERSITY OF FOGGIA, ITALY; (f) DEPARTMENT OF RADIOLOGY, MIULLI GENERAL HOSPITAL, ACQUAVIVA DELLE FONTI, ITALY; (g) RADIOLOGY DEPARTMENT, ROPER ST. FRANCIS, CHARLESTON, USA

Background: The arrhythmogenicity of mitral valve prolapse has been widely demonstrated; factors such as mitral annulus disjunction and myocardial fibrosis, thought to be related to altered wall stress, have been shown to correlate with arrhythmogenicity in this disease.

Hypothesis: Evidence indicates that altered wall stress can lead to myocardial edema, which often precedes fibrosis in several conditions. In cardiac magnetic resonance, edema is identified by visual estimation in T2-weighted sequences; in non-acute settings it may be subclinical requiring T2 mapping sequences for detection. AIMS: Evaluate whether native T2 times correlate with the left ventricular arrhythmic burden defined by the Lown class in patients with mitral valve prolapse.

Methods: 34 patients with mitral valve prolapse and ventricular arrhythmias, grouped based on the Lown class, 17 with low Lown class (0-1), 17 with high Lown class (2-3-4), were evaluated by 1.5 T magnetic resonance for volumes, function and morphological study, traditional T2-weighted sequences, native T2 mapping and LGE sequences; the inclusion criteria

were the presence of mitral annulus disjunction, the absence of LGE and the normal myocardial signal in T2-weighted sequences. First, the T2 times of each corresponding segment were compared between the two groups. Based on the results, we compared the T2 times of the basal antero-lateral and basal postero-lateral segments with those of the remaining segments of the left ventricle (remote myocardium) within the same group in both groups.

Results: in the Lown class 2-3-4 group, native T2 times were found to be significantly higher in the basal segments of the antero-lateral (respectively 54.1 vs 51.1, $p = 0.027$) and postero-lateral (respectively 54.5 vs 51.3, $p = 0.001$) walls compared to the corresponding segments of the Lown class 0-1 and to the remote myocardium areas.

Conclusions: patients with mitral valve prolapse and higher arrhythmic burden show, at segments typically subjected to wall stress, higher native T2 time suggesting 'subclinical edema', which could play a role in arrhythmogenicity and predict fibrosis development in this disease. Further studies with a larger population are needed to validate this hypothesis.



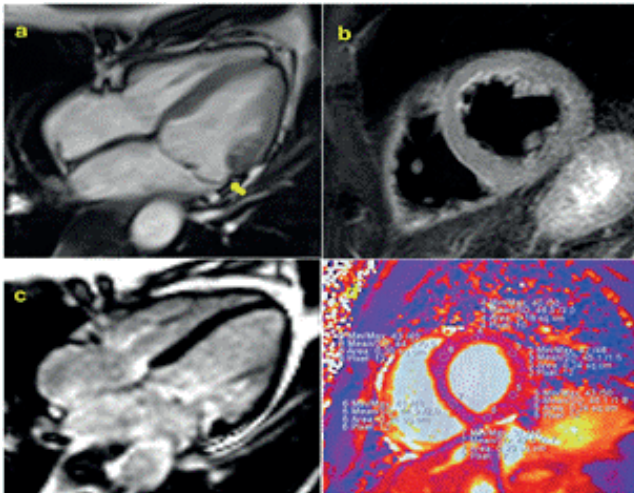


Figure 1. Patients were evaluated by 1.5 T magnetic resonance for volumes, function and morphological study (a), traditional T2-weighted sequences (b), native T2 mapping (d) and LGE sequences (c); the inclusion criteria were the presence of mitral annulus disjunction (a, yellow arrow), the absence of LGE (c) and the normal myocardial signal in T2-weighted sequences (b)

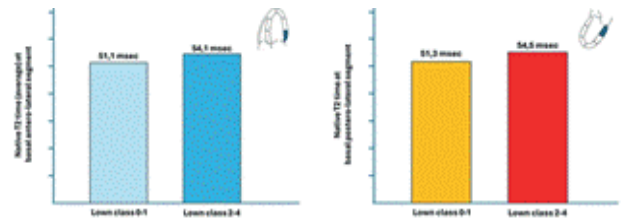


Figure 2. Native T2 times (average) at basal antero-lateral segment (left) and at postero-lateral segment (right) in the two groups.

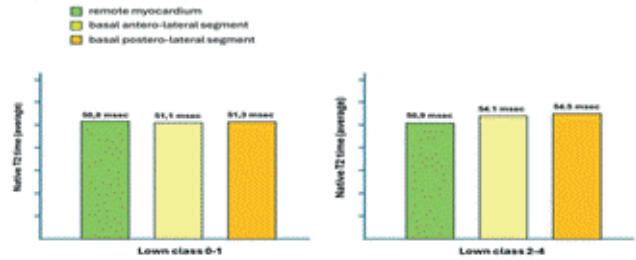


Figure 3. Native T2 times (average) at basal segment of antero-lateral and postero-lateral walls and remote myocardium in the two groups.

Figure 1

ARITMIE 183

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

LEFT ATRIAL APPENDAGE OCCLUSION VERSUS DIRECT ORAL ANTICOAGULATION FOR STROKE PREVENTION IN ATRIAL FIBRILLATION: A BUDGET IMPACT ANALYSIS IN ITALY

Michele Magnocavallo (a), Guccio Vagnarelli (b), Giampaolo Vetta (d), Ilaria Giabbani (b), Pietro Rossi (a), Elisa Vireca (b), Gian Battista Chierchia (d), Stefano Bianchi (a), Carlo De Asmundis (d), Andrea Natale (c), Domenico Giovanni Della Rocca (d)

(a) ISOLA TIBERINA- GEMELLI ISOLA, ROME, ITALY; (b) BOSTON SCIENTIFIC, MILAN, ITALY; (c) TEXAS CARDIAC ARRHYTHMIA INSTITUTE, AUSTIN, TEXAS, USA; (d) HEART RHYTHM MANAGEMENT CENTRE, UNIVERSITAIR ZIEKENHUIS BRUSSEL - VRIJE UNIVERSITEIT BRUSSEL, BRUSSELS, BELGIUM

Introduction: Atrial fibrillation (AF)-related stroke has a substantial impact on healthcare costs. Therefore, it is pivotal to assess the clinical and economic value of different prevention strategies to ensure access to therapies that are safe, effective, and economically sustainable. Herein, we performed a budget impact analysis to quantify the financial impact of increasing the adoption of left atrial appendage occlusion (LAAO) compared to pharmacological treatment with direct oral anticoagulants (DOACs) in Italy.

Methods: Two scenarios were modelled to simulate an increased uptake of LAAO from the baseline scenario of 2,256 LAAO procedures (current LAAO volume according to the 2023 GISE Registry). Scenario I assumed 5,947 procedures (10 LAAO per 100,000 inhabitants, currently observed in Sicily, the region performing the highest number of procedures per inhabitant); scenario II assumed 24,431 LAAO procedures, which corresponds to 5% of the estimated target population at risk of stroke. Clinical event rates were derived from two propensity score matched (ratio 1:2) cohorts of consecutive AF patients undergoing LAAO via a Watchman FLXTM device or prescribed DOACs (286 LAAO vs 572 DOACs patients). Unit costs sourced from the literature were assigned to the clinical outcomes and modelled over a 10-year horizon from the perspective of Italian healthcare providers.

Results: The annualized rate of ischemic stroke in the matched population was 1.5% (95% CI: 0.6- 3.3%) with LAAO and 3.4% (95% CI: 2.6-4.5%) with DOACs. Severe or fatal stroke was documented in 5 (0.87%) DOACs patients versus none in the LAAO group. The annualized rate of major bleeding was 0.3% (95% CI: 0.006-1.4%) with LAAO and 1.5% (95% CI: 0.9-2.2%) with DOACs.

The model yielded significantly better clinical and economic outcomes in both Scenario I and II compared to baseline, resulting in the avoidance of 324 and 1,944 strokes respectively. Increased LAAO therapy resulted in cost savings of €16 and €99 million over ten years, mainly driven by reduced incidence of major bleedings, stroke, and post-stroke disability (Table). The break-even point occurred between the fifth and sixth year (Figure), when cost savings offset the initial investments required to sustain LAAO therapy expansion.

Conclusions: Simulating an increased uptake of LAAO among non-valvular AF patients at risk of stroke in Italy yielded substantial long-term clinical and economic benefits. Expanding LAAO therapy may contribute to superior clinical outcomes in terms of major bleedings and ischemic strokes. Consequently, the initial investment in the LAAO procedure can be recouped after 5 years.



Cost category	Cumulative 10-year costs, thousands of €		
	Baseline scenario	Δ Scenario 1 vs. Baseline	Δ Scenario 2 vs. Baseline
LAAC Procedure	15,407	25,208	151,443
Adverse Events	2,858,282	-15,449	-92,814
Long-term Stroke Management	739,910	-5,357	-32,186
Pharmacological Treatment	2,940,637	-20,856	-125,301
Total	6,554,237	-16,455	-98,858

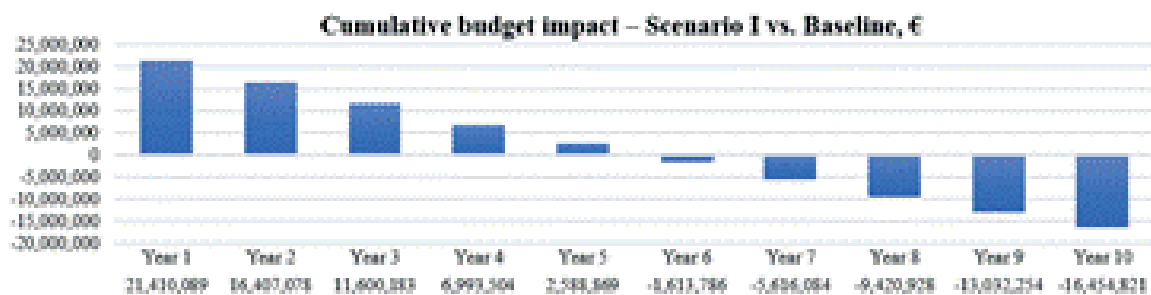


Figure 1

ARITMIE 770

ASPETTI GENETICI DELLE ARITMIE (ARITMIE) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) ARITMIE VENTRICOLARI (ARITMIE)

A NOVEL VARIANT OF SLC4A3 GENE MUTATION ASSOCIATED WITH FAMILIAR SHORT-QT SYNDROME, SUDDEN DEATH AND EPILEPSY

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Antonio Micari (a), Giuseppe Dattilo (a), Pasquale Crea (a)

(a) UNIVERSITÀ DEGLI STUDI DI MESSINA, DIPARTIMENTO DI MEDICINA CLINICA E SPERIMENTALE,
POLICLINICO "G. MARTINO", UOC CARDIOLOGIA; (b) UNIVERSITÀ DEGLI STUDI DI MESSINA, DIPARTIMENTO
DI MEDICINA CLINICA E SPERIMENTALE, POLICLINICO "G. MARTINO", UOSD CARDIOLOGIA PEDIATRICA

Short QT syndrome (SQTS) is a rare, genetically determined, heart rhythm disorder with a high risk of ventricular fibrillation (VF) and sudden cardiac death (SCD). Nine genes have been implicated as a potential cause of SQTS, however not all have a proven relationship with the syndrome. SCL4A3, encoding for a sodium bicarbonate exchanger, is one of the genes which can be responsible for SQTS.

We describe a family with a history of SCD and short QT interval. The proband is a 13-year-old girl who came to our attention after a routine ECG (Figure 1A) with a QT corrected according to Bazzett formula of about 330 ms. Following family screening, we found a short QT interval also in the mother with a QTc of about 350 ms (Figure 1B), who is also affected from an epileptic syndrome, kept under control by medical

therapy, and apparently never had syncopal episodes of cardiac origin.

We collected her family history (Figure 2) and we discovered four cases of sudden death. Moreover, we discovered that another brother of the woman, still alive, also suffered from epilepsy and had a shortened QT interval on a recent ECG, recorded after a syncopal episode.

Genetic testing identified a novel missense mutation of the gene SLC4A3 in heterozygosity in both the patients. This mutation (c.1157G>T p.Gly386Val) has not yet been described in literature and according to three prediction tools (Align-GVGD, SIFT, PolyPhen-2) it is probably responsible of a loss-of-function effect on the protein which causes shortening of the action potential.

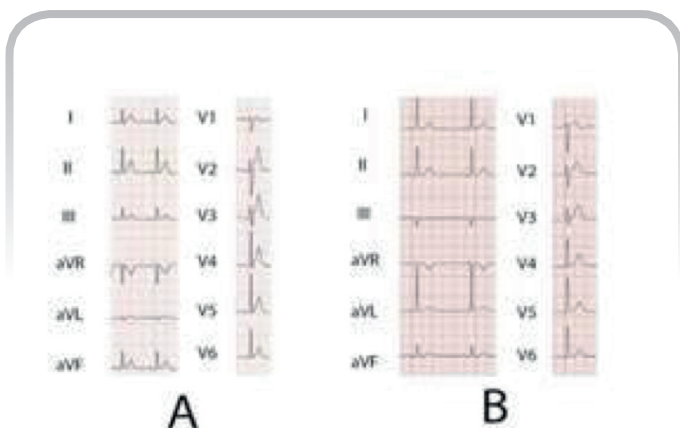


Figure 1

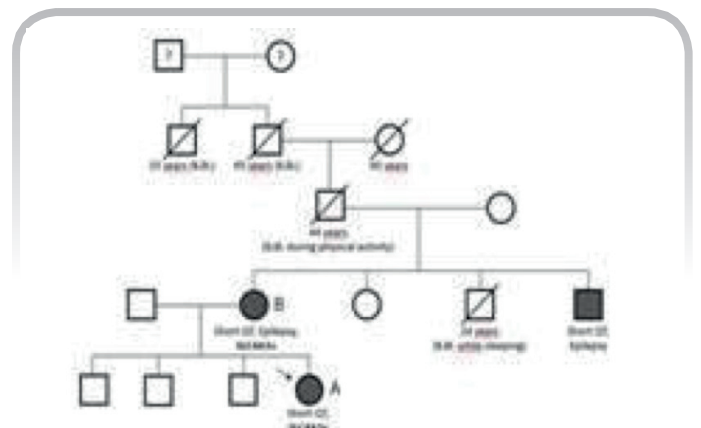


Figure 2

First, we attempted to prolong the repolarization by giving hydroquinidine to mother and daughter, which was well tolerated but without a significant change in QTc interval. A loop recorder was implanted in both the patients, which did not record any significant event after one-year follow-up. During this period of time, we attempted to prolong the QT interval in mother's ECG using flecainide and sotalol, without significant changes. Amiodarone was not considered due to well-known side effects

of this drug, especially in young patients. According to the history of familiar sudden death, unclear history of epileptic disorder, unknown effects of a new mutation and ineffective drug therapy, we proposed to the mother subcutaneous implantable cardioverter defibrillator implantation and the patient agreed. The daughter is, by now, under strict clinical follow-up, with loop recorder monitoring and hydroquinidine therapy.



ARITMIE 538

ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ARITMIE VENTRICOLARI (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE)

EXPANDING THE ROLE OF ULTRASOUND-GUIDED PERCUTANEOUS STELLATE GANGLION BLOCK BEYOND ELECTRICAL STORM: A SINGLE-CENTER EXPERIENCE

Arianna Morena (a, b), Simone Frea (a), Filippo Angelini (a), Carol Gravinese (a), Giulia De Lio (a), Paolo Boretto (a), Andrea Saglietto (a), Matteo Anselmino (a, b), Gaetano Maria De Ferrari (a, b), Veronica Dusi (a, b)
(a) DIVISION OF CARDIOLOGY, CARDIOVASCULAR AND THORACIC DEPARTMENT, AOU CITTA DELLA SALUTE E DELLA SCIENZA, TURIN; (b) DEPARTMENT OF MEDICAL SCIENCES, UNIVERSITY OF TURIN

Background: Percutaneous stellate ganglion block (PSGB) is recommended by the latest European guidelines and EHRA consensus for the acute management of refractory electrical storm (ES). Instead, its beneficial effect on supraventricular arrhythmias (SVAs) susceptibility is supported in literature by little clinical studies on humans; therefore, due to the strong antiarrhythmic rationale, combined with the good safety profile, our center has recently used this technique for the prophylaxis/treatment of SVAs and prophylaxis of ventricular arrhythmias (VAs) in high-risk patients and in patients with acute heart failure (HF).

Purpose: to describe our single-center experience with PSGB usage for drugs refractory SVAs and for the prevention of VAs outside the conventional indication of ES.

Methods: We describe our single center experience with PSGB from 2/2021 to 7/2024.

Results: 71 patients (87% male, mean age 65 ± 12 years) received a total of 117 PSGB performed with the lateral, ultrasound (US) guided technique. Most of the procedures consisted of a single bolus anesthetic injection of lidocaine plus ropivacaine, 22% in an additional continuous infusion, mainly with ropivacaine. All the procedures except for 3 in a single patient who had previously received left cardiac sympathetic denervation, were performed on the left side. Thirty one (44%) patients suffered non ischemic cardiomyopathy

(CMP), the rest had ischemic cardiopathy with 14 acute coronary syndrome and 3 Takotsubo syndrome; mean LVEF was $26 \pm 13\%$. Most of the procedures ($n=92$, 79%) were performed due to ongoing refractory VAs, yet 17 (14%) aimed to prevent major VAs in high-risk patients, mostly in the setting of recent ES (within 1 month) and need for inotropes (as Levosimendan) to support cardiac output, in two cases due to recent stereotactic VT ablation to prevent early VAs in the phase of acute radiation induced microvascular damage. All PSGBs were effective in preventing clinically significant VAs or reduce the burden of premature ventricular complexes and non-sustained ventricular tachycardias. Additionally, 8 single bolus PSGBs (7%) were performed due to atrial arrhythmias with high ventricular rate despite intravenous drugs in the setting of acute HF. Specifically, 6 patients had atrial fibrillation (AF), 1 patient incessant runs of ectopic atrial tachycardia (AT) and 1 patient 2:1 atrial flutter. In 4/6 refractory-AF cases a cardioversion into sinus rhythm occurred within 1 hour from PSGB leading to hemodynamic improvement during acute HF. In the other 3 cases (2 AF patients and 1 AT patient) left-sided PSGB significantly reduced ($\geq 46\%$ reduction) ventricular rate during AF and AT but not during the single case of 2:1 atrial flutter. Throughout our population only 1 (0,8%) major complication occurred (respiratory arrest), that was quickly and effectively treated with lipid emulsion, while minor complications were observed in 22% of PSGBs (mostly transient left arm weakness).



Conclusions: Our data suggest that US-guided PSGB usage, thanks to its feasibility at bed-side and its good safety profile, may expand, beyond ES, to not only to VAs prevention in high-risk settings, but also to

prophylaxis/treatment of atrial arrhythmias in critically ill patients with acute HF refractory to conventional antiarrhythmic therapy and requiring concomitant inotropic support.



ARITMIE 892

ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) GRAVIDANZA E CARDIOPATIA (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

FATTORI ENDOGENI IMMUNOREATTIVI DIGOSSINO-SIMILI IN GRAVIDANZA

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Introduzione: i fattori endogeni immunoreattivi digossino-simili (DLIF) sono molecole con struttura steroidea che inibiscono il funzionamento della pompa sodio/potassio ATPase. Le conseguenze biologiche di questa inibizione sono primariamente un accumulo di sodio e secondariamente di calcio nel citosol. Gli esseri umani secernono alte quantità di DLIF in tre condizioni cliniche caratterizzate da ipervolemia, di cui due sono patologiche (lo scompenso cardiaco e renale) e una è fisiologica (la gravidanza). L'obiettivo sembra essere la stimolazione della diuresi ad opera delle DLIF per contrastare l'eccesso di volume, ma l'accumulo di calcio intracellulare possiede un ruolo pro-aritmico dovuto all'incremento dell'eccitabilità cellulare.

Descrizione del caso clinico: in una donna di quarantadue anni alla trentatreesima settimana di gravidanza è stata documentata la presenza di una tachicardia ectopica atriale sintomatica per cardiopalmo, non responsiva al beta-bloccante, causante un rapido deterioramento della funzione

cardiaca (la frazione di eiezione si era ridotta dal 55% al 39% in 3 settimane). La digossinemia nel sangue era di 0.16 µg/L (range terapeutico 0.80-2.00) nonostante la paziente non fosse in terapia con la digitale. Il dato ha permesso di ipotizzare che nel sangue fosse presente la DLIF di tipo marinobufagene (prodotto dal surrene e dalla placenta) e/o ouabaina (secreta dal surrene e dall'ipotalamo). La somministrazione di flecainide, farmaco antiaritmico di classe I bloccante del canale del sodio, e di propranololo, un beta bloccante con effetto anche bloccante del canale del sodio, ha interrotto l'aritmia quando la loro concentrazione sierica ha raggiunto i livelli di range terapeutico (rispettivamente 550 ng/L e 135 ng/L, ovvero entro i range 200-800 ng/L e 20-300 ng/L). Grazie al ritorno del ritmo sinusale, la paziente ha recuperato una normale funzione cardiaca (frazione di eiezione 53%) alla trentottesima settimana di gestazione. La paziente ha potuto così arrivare al termine della gravidanza in eccellente compenso emodinamico e partorire una bimba sana e normo peso.



ARITMIE 710 ELETTROSTIMOLAZIONE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)

EFFECTS OF DIRECT IRRADIATION ON CARDIAC IMPLANTABLE ELECTRONIC DEVICES

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Background. Implantable cardiac electronic devices (CIEDs) can be damaged during a radiotherapy cycle. Recent expert consensus, and all CIED manufacturers, recommend avoiding irradiation of devices with a cumulative dose that exceed 5 grays (Gy). In case of major doses, the eventualities expected by the device manufacturing companies are setup reset and/or sudden battery failure.

Aim of the study. In our prospective study we tested the effects of direct irradiation on CIEDs with different radiation doses 5-10Gy.

Methods. 124 CIEDs of Medtronic, Abbott, Biotronik, Boston Scientific, Sorin were collected during system upgrading or lead extraction procedures and considered for the study in case of residual battery capacity of at least 80%. Depending by CIED type, pacing mode was configured in VIR, VDDR or DDDR, and biventricular stimulation was activated,

if present. Electrical therapies were setup with a pre-determined configuration. All devices were singularly placed in a 30 cm × 30cm plastic bowl containing 2 Lt of deionized water that was placed over 5cm Rockwool to simulate the backscatter and irradiated by a linear accelerator (Elekta Synergy®) with a dose of 5 Gy or 10 Gy.

Results. No significant differences in battery drainage were observed after irradiation respect to baseline in 5 Gy or in 10 Gy group (7.8 ± 3.1 vs. 7.4 ± 2.1 [years] battery longevity, $p=0.693$; 7.6 ± 3.1 vs. 7.3 ± 2.1 [years] battery longevity, $p=0.677$, respectively). All CIEDs saved the baseline program setting, without device reset events.

Conclusions. Our data confirm that direct irradiation of CIEDs at 5Gy is safe. Direct irradiation up to 10Gy appears to be equally safe with regard to the risk of electrical reset of CIEDs and battery depletion.

ARITMIE 173

TERAPIA DI RESINCRONIZZAZIONE (ARITMIE) PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE) ELETTROSTIMOLAZIONE (ARITMIE) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

LEFT BUNDLE BRANCH PACING AND IMPROVEMENT OF AORTIC STENOSIS: A SUCCESSFUL AND UNUSUAL CLINICAL CASE

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Introduction: The dyssynchronous electrical activation of the ventricles may worsen an underlying aortic stenosis. Left bundle branch pacing (LBBP) via a transventricular septal approach could be an alternative physiological pacing modality for patients with atrioventricular block (AVB), allowing the preservation of left ventricle synchronization and a decrease in left ventricular end-systolic volume.

Case report: We report the case of a 77-year-old woman admitted for lower limb edema, easy fatigue and orthopnea. Her cardiological history included chronic heart failure with preserved ejection fraction, chronic coronary syndrome and severe aortic stenosis treated with coronary artery bypass grafting (CABG) and surgical aortic valve

replacement (SAVR). Subsequently, transcatheter valve-in-valve aortic valve implantation (TAVI) was performed due to prosthetic aortic valve stenosis. The admission EKG revealed bigeminal sinus rhythm, first-degree AVB and left bundle branch block (LBBB). Close EKG monitoring during hospitalization revealed 2:1 AVB. At the echocardiographic examination, findings included valve-in-valve outcomes with a normally positioned prosthetic valve but increased transprosthetic gradients, suggestive of possible valve stenosis. However, considering the conduction disorder and the history of left bundle branch block, it was decided to perform cardiac resynchronization therapy using left bundle branch pacing (LBBP) with a dual-chamber pacemaker (Biotronik Edora 8 DR). After device implantation,

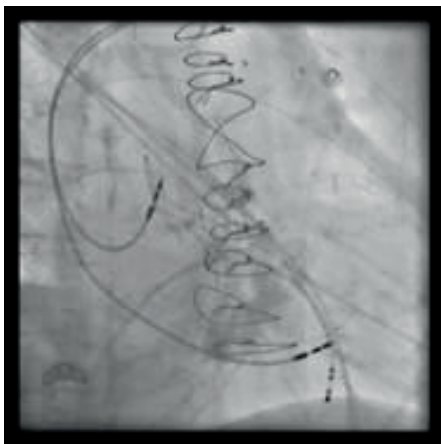


Figure 1

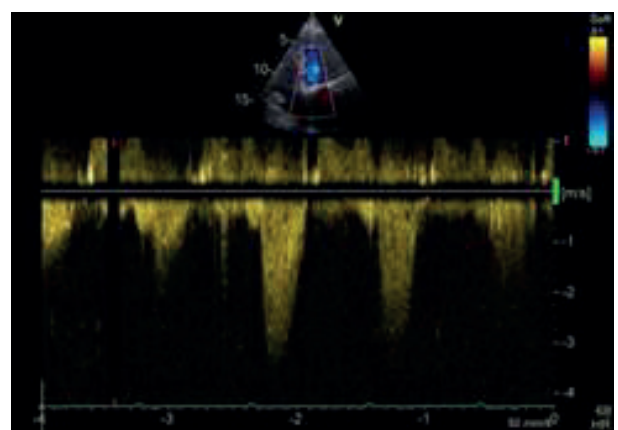


Figure 2



the EKG revealed an electrically induced rhythm with left anterior hemiblock-like (LAHB) morphology. The patient's clinical course was uneventful, and she was discharged with significant symptomatic improvement. One month later, a follow-up cardiology visit confirmed clinical stability, and a Doppler echocardiogram demonstrated parameters suggestive of improvement of transprosthetic gradients. Approximately six months after discharge, the patient was called to our Unit for a follow-up visit. During the check-up, the patient reported subjective clinical well-being. Additionally, the echocardiographic examination confirmed the parameters observed at discharge, suggestive of normal prosthetic function.

Conclusion: In atrioventricular block, anomalous electrical conduction causes an increase in left ventricular end-diastolic volume, resulting in a condition of hyperflow through the ventricular outflow tract. Left bundle branch pacing, by resynchronizing atrioventricular and biventricular activity, ensures adequate diastolic filling and reduces the aortic transvalvular gradient, thereby improving aortic stenosis and clinical conditions. These findings suggest that LBBP may represent a promising alternative to traditional right ventricular apical pacing, particularly in patients with aortic stenosis and dysfunction of the sinoatrial node or atrioventricular blocks.

ARITMIE 431
ABLAZIONE TRANSCATETERE (ARITMIE)
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

TROMBOSI ACUTA DEL RAMO CIRCONFLESSO DURANTE ABLAZIONE TRANSCATETERE DI VIA ACCESSORIA LATERALE SINISTRA

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(a) AZIENDA OSPEDALIERO UNIVERSITARIA DI FERRARA; (b) OSPEDALE MAGGIORE DI BOLOGNA

Introduzione: L'ablazione transcaterere rappresenta il trattamento d'elezione per i pazienti sintomatici affetti da aritmia da rientro atrio-ventricolare, vantando un alto tasso di successo e rare complicanze. Tuttavia, seppur rara, l'occlusione coronarica acuta con infarto miocardico acuto (IMA) rappresenta una complicanza potenzialmente seria di questa procedura.

Case Report: Presentiamo il caso di una giovane donna con storia di cardiopalmo fin dall'età di quattro anni. All'età di 16 anni, a causa dell'inefficace controllo farmacologico dell'aritmia, si è sottoposta a studio elettrofisiologico che ha evidenziato la presenza di una via accessoria laterale sinistra. La paziente è stata quindi sottoposta ad ablazione transcaterere con radiofrequenza con esito positivo. Tuttavia, dopo pochi mesi, si sono verificate recidive plurime dell'aritmia da rientro atrio-ventricolare, persistenti nonostante la terapia antiaritmica. Per tale motivo, la paziente è giunta alla nostra attenzione con l'indicazione di un ulteriore tentativo di ablazione. Durante il nuovo studio elettrofisiologico, è stata documentata una via accessoria laterale sinistra occulta e indotta l'aritmia da rientro atrio-ventricolare clinica. Si è quindi eseguita l'ablazione con radiofrequenza mediante catetere irrigato. A seguito della quarta erogazione, eseguita a 40 watt, la via accessoria non è risultata più documentabile e l'aritmia non più inducibile. Al termine della procedura, la paziente

ha riferito dolore toracico oppressivo e sudorazione algida. L'elettrocardiogramma ha mostrato un lieve sottoslivellamento del tratto ST nelle derivazioni anteriori e un soprasslivellamento in V6. L'ecocardiografia ha escluso la presenza di versamento pericardico, ma ha evidenziato un'acinesia della parete posteriore con frazione d'eiezione ventricolare sinistra lievemente ridotta. La paziente è stata quindi trasferita in sala di emodinamica per coronarografia urgente, che ha documentato un'occlusione trombotica acuta totale del ramo circonflesso alla biforcazione con un ramo marginale. L'utilizzo dell'IVUS ha escluso la presenza di placca aterosclerotica sottostante e di dissezione coronarica. Alla luce dell'elevato burden trombotico, è stato utilizzato un tromboaspiratore e iniziata la terapia con Tirofiban ev. Successivamente è stata eseguita un'angioplastica con solo pallone medicato su entrambi i rami coinvolti, ottenendo un buon risultato finale, confermato angiograficamente e con l'IVUS. La paziente è stata quindi caricata con cardioaspirina e trasferita in terapia intensiva. Nelle successive 24 ore si sono verificati frequenti episodi di recidiva aritmica, trattati con flecainide e metoprololo. Alla dimissione, il burden aritmico era notevolmente ridotto, tuttavia la paziente è stata dimessa con terapia cronica con flecainide.

Conclusioni: L'infarto miocardico acuto è una rara complicanza dell'ablazione transcaterere con radio-



frequenza. I meccanismi fisiopatologici ipotizzati includono lo spasmo coronarico, il danno termico, la dissezione coronarica e il tromboembolismo. Nel caso qui presentato, l'ipotesi più probabile è quella della trombosi indotta da danno termico, conseguente alla denaturazione delle proteine sieriche e

la conseguente formazione di un coagulo. Le erogazioni di radiofrequenza erano state eseguite a livello endocardico proprio nel punto in cui, a livello epicardico, scorreva il ramo circonflesso con la diramazione con il ramo marginale coinvolti dal processo trombotico.



ARITMIE 15

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) SINCOPE (ARITMIE)

ELETTROCARDIOGRAFIA/ CARADIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

REVISIONE DEL PROTOCOLLO PER L'IMPIANTO DEI LOOP RECORDER: MASSIMIZZARE IL VOLTAGGIO DELL'ONDA R E MINIMIZZARE IL NUMERO DI FALSI POSITIVI

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Introduzione: I loop recorder impiantabili (ILR) sono uno strumento efficace per la gestione di diversi contesti clinici. Convenzionalmente l'ILR viene impiantato in posizione standardizzata suggerita dai produttori (quarto spazio intercostale, angolo di 30°). Tuttavia, per massimizzare l'accuratezza diagnostica, dovrebbe essere impiantato nella zona in cui l'ampiezza della R sentita dall'ILR è maggiore.

Obiettivi: Dimostrare la superiorità del nostro protocollo di impianto, basato sulla mappatura

elettro-anatomica della zona precordiale per ottenere un miglior rilevamento dell'onda R e un minor numero di falsi allarmi positivi, che rappresentano il 57% delle trasmissioni remote, come riportato in letteratura.

Metodi: Si tratta di uno studio retrospettivo osservazionale, monocentrico, su pazienti sottoposti a impianto di ILR. Sono stati arruolati 104 pazienti. La coorte è stata divisa in due gruppi: uno sottoposto a impianto ILR con mappaggio elettro-anatomica

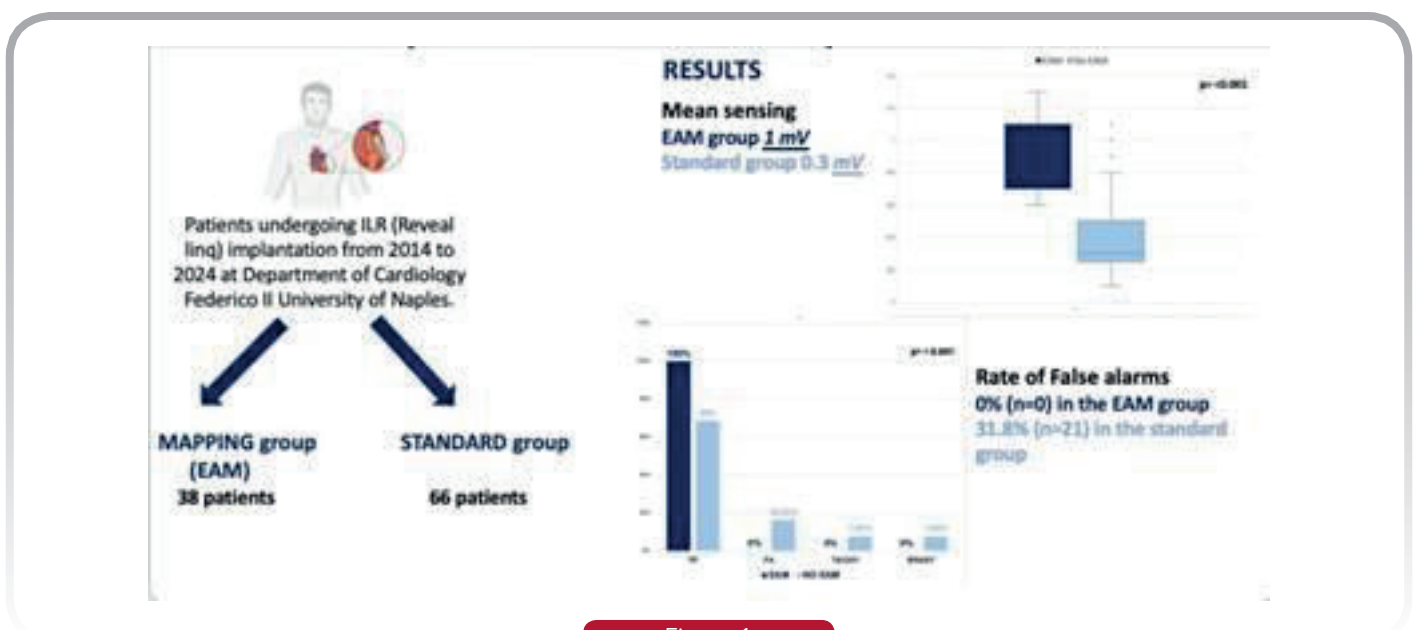


Figure 1

(EAM) sopra ed attorno alla zona precordiale (38 pazienti) e l'altro è stato sottoposto a impianto ILR utilizzando posizione standard (66 pazienti). Abbiamo analizzato l'efficacia di entrambi i protocolli misurando l'ampiezza dell'onda R sentita dagli ILR e analizzando il numero, la quantità e la tipologia di falsi allarmi registrati dal dispositivo.

Risultati: Il sensing medio è stato di 1 mV [0,6-1,3] nei pazienti sottoposti ad impianto di ILR utilizzando il mappaggio elettro-anatomico e 0,3 mV [0,1-1,1] nei pazienti sottoposti ad impianto standard

($p < 0,001$). Il tasso di falsi allarmi è stato dello 0% ($n=0$) nel gruppo EAM e del 31,8% ($n=21$) nel gruppo con impianto standard. ($p = < 0,001$)

Conclusioni: Il vantaggio della mappaggio del torace appare evidente, determinando un sensing dell'onda R significativamente migliore e una frequenza di allarmi falsi positivi significativamente più bassa. L'esecuzione dell'EAM è molto veloce, facile, efficace e riproducibile, imprescindibile dal nostro punto di vista, soprattutto dinanzi ad anatomie complesse del torace.



ARITMIE 137

SINCOPE (ARITMIE)

MECCANISMI DELLE ARITMIE (ARITMIE)

TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

THE TRIGGERS OF SITUATIONAL SYNCOPE DO NOT INFLUENCE THE HUTT RESPONSE AND PROGNOSIS - LA RISPOSTA A HEAD UP TILT TEST E LA PROGNOSE NON E' INFLUENZATA DAL TRIGGER DELLA SINCOPE SITUAZIONALE

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Background: Situational syncope (SS) is a form of reflex syncope following specific triggers/circumstances (micturition, swallow/defecation, cough/sneeze, post-exercise, laughing, brass instrument playing). The head-up tilt test (HUTT) has high sensitivity, about 71.1%, among patients with SS; moreover, it is useful for detection of hypotensive susceptibility or cardioinhibitory component of syncope. The type of response and positivity rate of HUTT of SS is similar to that observed in patients with vasovagal syncope. The HUTT responses of the different SS triggers are poorly investigated and no data are yet available about the syncope recurrence stratified according to the underlying situational triggers.

Methods: We aimed to evaluate the HUTT positivity rate, haemodynamic responses and prognosis among 236 consecutive patients with SS who underwent nitroglycerin (NTG)-potentiated HUTT from March 1st, 2017, to May 1st, 2023; followed for at least one-year.

Results: 236 SS patients (mean age 50 ± 19.3 years; male 63.1%); among them, the situational trigger was micturition in 109 patients (46.2%); swallow in 32 (13.6%) patients; defecation in 35 (14.8%) patients; post-exercise in 41 (17.4%) patients and cough/sneeze in 17 (7.2%) patients. There were no significant differences in baseline clinical characteristics between different situational triggers. The time between the last spontaneous syncope and the HUTT was 54 ± 15 days. All SS patients received education and lifestyle modifications, and reassurance regarding the benign nature of their condition. In 55 patients (23.3%) the

hypotensive therapy was reduced or discontinued; 15 patients (6.4%) received permanent pacemaker therapy; 11 patients (47.7%) received implanted loop recorder. During a mean follow-up, 42 patients (17.8%) experienced a syncopal recurrence due to situational (6.4%) or vasovagal (11.4%) trigger. Among patients with recurrence of situational syncope, the trigger was micturition in 9 patients (60%), swallow in 2 patients (13.3%); defecation in 1 patient (6.7%), post-exercise in 2 patients (13.3%) and cough/sneeze in one patient (6.7%). In 3 patients the trigger of recurrent syncope was different from the initial trigger. The Kaplan–Meier analysis did not show a statistically different rate of syncope recurrence across different subgroups (log-rank $p = 0.21$).

Conclusion: SS is a homogeneous syndrome with different triggers. In this paper we showed that there was no difference among the different types of SS. Putting together the results of our previous and of the present studies, we suggest that, despite triggers and afferent pathways involved in the various forms of neurally-mediated syncope are greatly different, all forms of neurally-mediated syncope, either VVS or SS, have a similar response to HUTT. The orthostatic stress caused by HUTT can induce a similar positive response even when the spontaneous triggers are quite different. This finding is novel. We can infer that, in patients with neurally-mediated syncope, the integration at the level of the central nervous system and its effect on the final efferent pathways are similar irrespective of the triggers and the afferent limb.



**ARITMIE 142
SINCOPE (ARITMIE)
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)
FARMACI ANTIARITMICI (ARITMIE)**

ASYSTOLE ON LOOP RECORDER IN PATIENTS WITH UNEXPLAINED SYNCOPE AND NEGATIVE TILT TESTING: AGE DISTRIBUTION AND CLINICAL PREDICTORS - ASISTOLIE AL LOOP RECORDER NEI PAZIENTI CON SINCOPE INSPIEGATA E TILT TEST NEGATIVO

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Background: Approximately 50% of patients with unexplained syncope and negative head-up tilt test (HUTT) who have an electrocardiogram (ECG) documentation of spontaneous syncope during

implantable loop recorder (ILR) show an asystolic pause at the time of the event.

Objective: The aim of the study was to evaluate the age distribution and clinical predictors of asystolic syncope detected by ILR in patients with unexplained syncope and negative HUTT.

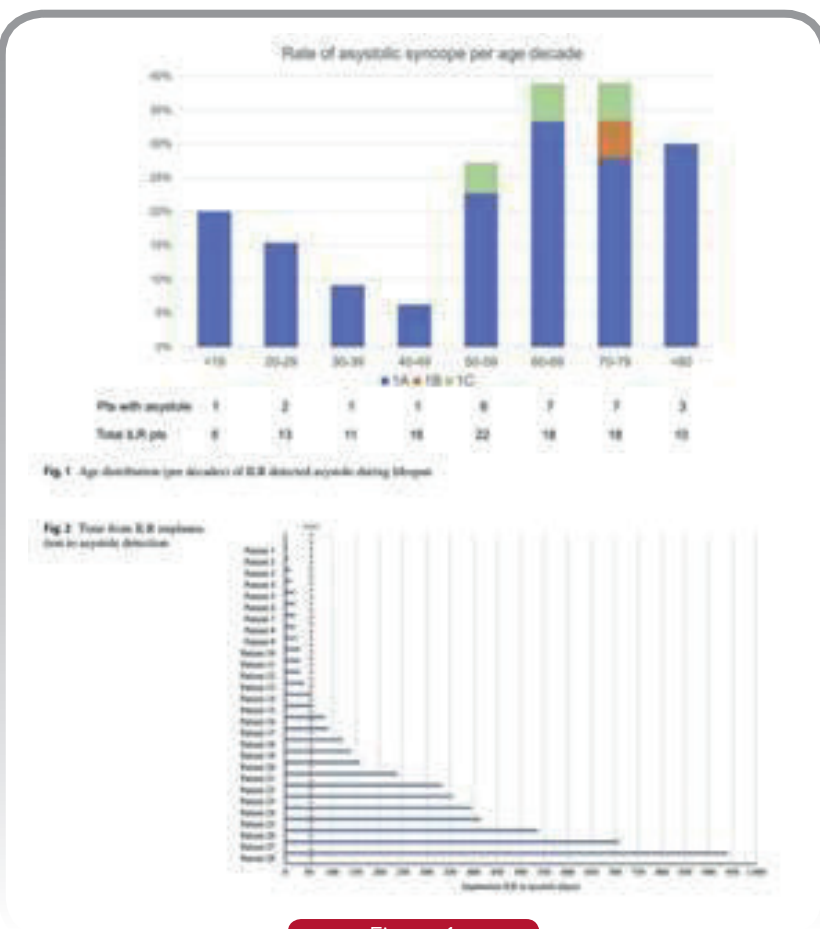


Figure 1

Methods: This research employed a retrospective, single-center study of consecutive patients. The ILR-documented spontaneous syncope was classified according to the International Study on Syncope of Uncertain Etiology (ISSUE) classification.

Results: Among 113 patients (54.0±19.6 years; 46% male), 49 had an ECG-documented recurrence of syncope during the observation period and 28 of these later (24.8%, corresponding to 57.1% of the patients with a diagnostic event) had a diagnosis of asystolic syncope at ILR: type 1A was present in 24 (85.7%), type 1B in 1 (3.6%), and type 1C in 3 (10.7%) patients. The age distribution of asystolic syncope was bimodal, with a peak at age<19 years and a second peak at the age of 60– 79 years. At Cox multivariable analysis,



syncope without prodromes (OR 3.7; $p=0.0008$) and use of beta blockers (OR 3.2; $p=0.002$) were independently associated to ILR-detected asystole.

Conclusions: In patients with unexplained syncope and negative HUTT, the age distribution of asystolic syncope

detected by ILR is bimodal, suggesting a different mechanism responsible for asystole in both younger and older patients. The absence of prodromes and the use of beta blockers are independent predictors of ILR-detected asystole



ARITMIE 503
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

PROGNOSTIC IMPACT OF NEW-ONSET LEFT BUNDLE BRANCH BLOCK AFTER TRANSCATHETER AORTIC VALVE REPLACEMENT

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 (a) UNIVERSITA' CATTOLICA DEL SACRO CUORE - ROMA

Background: Left bundle branch block (LBBB) is one of the most frequent complications of transcatheter aortic valve replacement (TAVR) and is associated with a higher rate of high-grade atrioventricular block and pacemaker implant. However, the relation of TAVR-induced LBBB with clinical outcome is unclear. Thus, the aim of this study is to assess the prognostic impact of new-onset LBBB after TAVR.

Methods: From 2013 to 2024, we performed 24-hour electrocardiogram (ECG) Holter monitoring (ECG-HM) during hospital staying in 325 patients who had undergone a successful TAVR procedure for severe aortic stenosis. Patients with failed procedure or indication to pacemaker implant due to advanced atrio-ventricular block were excluded. Baseline clinical features and ECG were collected for all patients. Clinical follow-up was done by telephone interview with patients or their relatives. In case of death, its cause was carefully ascertained. Clinical end-points included total and cardiovascular death. Death was attributed to a cardiovascular cause in case of sudden death, progressive heart failure, acute myocardial infarction

or stroke. Cox regression analysis was applied to assess the association of new-onset LBBB with clinical outcomes.

Results: Overall, 106 patients (32.7%) showed a new-onset persistent or intermittent LBBB at ECG-HM. A clinical follow-up could be obtained in 295 patients (90.8%), 95 of whom (32.2%) showed new-onset LBBB. During a median follow-up period of 31.6 months (IQ range 13.5-58.2), death occurred in 97 patients, 27 (28%) in new-onset LBBB patients and 72 (36%) in those without new-onset LBBB (HR 0.93; 95 CI, 0.59-1.45; $p=0.93$). Death could be attributed to cardiac causes in 24 patients (24.7% of deaths; 8.1% of the population). Cardiac death occurred in 7 (7.4%) in new-onset LBBB patients and 17 (8.5%) in those without new-onset LBBB (HR 1.09; 95 CI, 0.45-2.66; $p=0.85$).

Conclusions: In this study, we found no significant association, among patients undergoing TAVR, between TAVR-induced LBBB and both total and cardiovascular mortality.

ARITMIE 726

ARITMIE VENTRICOLARI (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE) MORTE IMPROVISA / RIANIMAZIONE (ARITMIE)

BEYOND CONVENTIONAL NEUROMODULATION: FIRST EUROPEAN CASE REPORT OF BILATERAL PERCUTANEOUS STELLATE GANGLION ABLATION USING CONTINUOUS RADIOFREQUENCY FOR REFRACTORY VENTRICULAR ARRHYTHMIAS

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Introduction: Cardiac sympathetic denervation consists in the resection of the thoracic sympathetic chain from T1 (lower half of the stellate ganglion) to T4 and is performed under general anesthesia and single-lung ventilation. The procedure is currently recommended for the prevention of refractory ventricular tachycardias (VT), especially if fast, polymorphic or pleomorphic, in patients with structural heart disease. In some cases, however, especially due to pulmonary comorbidities, the anesthetic risk can be prohibitive. For these patients, in addition to the well-established possibility of performing percutaneous pharmacological stellate ganglion block (PSGB) in the acute/emergency setting, percutaneous ablation of the stellate ganglion can be performed.

Clinical case: we present a 57-year-old woman, with positive family history (sudden death), previous smoker, suffering from advanced multi-organ involvement of systemic sclerosis (Scl70+), that was diagnosed in 2016 and currently includes: lung (progressive bilateral interstitial disease, DLCO 40%), esophageal, skin and muscular damage, on chronic macitentan and iloprost. The patient has a concomitant arrhythmogenic cardiomyopathy with prevalent right ventricle (RV) involvement (severe dilation, FAC 20%, massive tricuspid regurgitation), without significant

pulmonary hypertension; a double-leaflets mitral valve prolapse associated with severe mitral regurgitation is also present, with a LVEF of 53%. Cardiac genetic test showed a VUS in the dystrophin gene. Since the onset, frequent polymorphic premature ventricular beats and runs of non-sustained VT occurred, poorly responsive to drugs. The electrophysiological study with RV mapping performed at another center in 2019 showed an extensive scar with multiple inducible VT morphology, therefore no ablation was performed, and a subcutaneous ICD was implanted (sICD). In the following years there was a progressing, multifactorial, clinical worsening (NYHA III). On March 2024, she was hospitalized for a severe electrical storm with 12 episodes of rapid (resulting in syncope) monomorphic VT of different morphologies (200-300 bpm) treated by the sICD. Due to the persistence of subthreshold NSVT despite lidocaine and amiodarone drip, PLSGB was performed, that was very effective. The patient was discharged on BB, amiodarone and mexiletine. Two months later, two relapses of rapid VT at 250 bpm requiring sICD shocks occurred. Upgrading to a dual-chamber transvenous ICD was performed and stellate ganglion radioablation was planned.

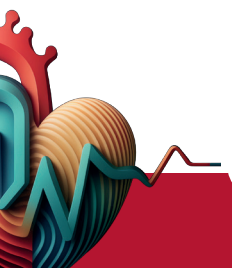
The procedure was performed first on the left and then on the right side in 2 different sessions. For each side, 3 lesions of 90 seconds each were delivered



using continuous RF and increasing temperatures (50, 55 and 60 degrees). Ablation was performed under ultrasound and radiological guidance (landmark: C7 transverse process) and preceded by sensory and motor stimulation to avoid off-target neuronal damage. A mild ipsilateral miosis and ptosis occurred immediately after, which subsequently improved. No arrhythmic relapses have occurred so far in a 2-month follow-up.

Conclusions: Our clinical case is the first reported in

Europe and among the few in the world of bilateral RF ablation of the stellate ganglion. Our data suggest that in selected patients with recurrent VT, especially if rapid/polymorphic, and a prohibitive anesthetic risk, the procedure, albeit incomplete compared to the conventional invasive denervation (gold standard), can be taken into consideration as a bailout therapy to reduce the risk of life-threatening arrhythmias. A local expertise in both cardiac neuromodulation and pain therapy is essential.



ARITMIE 761

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) ABLAZIONE TRANSCATETERE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE) FARMACI ANTIARITMICI (ARITMIE)

COMORBILITÀ MULTIPLE ED ELETTROPORAZIONE PER L'ABLAZIONE DI FIBRILLAZIONE ATRIALE: OSSERVAZIONI SU SICUREZZA IN ACUTO ED EFFICACIA

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Background: I pazienti con multiple comorbilità cardiovascolari (CV) sono utilizzatori crescenti di servizi sanitari a livello globale. La decisione di eseguire un'ablazione della fibrillazione atriale (FA) può essere complessa in questa popolazione, a causa della difficoltà nel valutare la loro aspettativa di vita e il rischio procedurale associato. Inoltre, non sono stati riportati dati sull'efficienza, l'efficacia e gli esiti di sicurezza per l'ablazione non termica, come l'elettroporazione con ablazione a campo pulsato (PFA).

Scopo: Valutare l'entità di lavoro procedurale e la sicurezza per l'ablazione della FA in questi pazienti attraverso una nuova tecnologia PFA (Farapulse).

Metodi: Sono stati inclusi pazienti consecutivi che avevano subito una PFA della FA nel nostro centro. I pazienti sono stati stratificati in base al numero di varie comorbilità, assegnando 1 punto ciascuna, tra cui: età avanzata (≥ 80 anni), FEVS $\leq 35\%$, cardiopatia strutturale, cardiopatia ischemica, malattia renale cronica, broncopneumopatia cronica ostruttiva, pregresso ictus/TIA, ipertiroidismo, storia di cancro, cancro in corso, apnea notturna grave, diabete, ipertensione, dislipidemia.

Risultati: Abbiamo incluso pazienti (età 63.6 ± 4.4 anni, 72.6% maschi, 75.4% FA parossistica, 97% procedura di ablazione de novo, FEVS $59 \pm 6\%$). Quarantatré (17%) pazienti non avevano fattori di ri-

schio, 55 (21%) pazienti avevano uno, 74 (29.4%) due, 33 (13.1%) pazienti 3 fattori di rischio e 47 (18.7%) pazienti più di 4 comorbilità.

I pazienti con fattori di rischio accumulati (≥ 4) avevano una percentuale più alta di FA di lunga durata (40.5% vs 21%, $p=0,005$) e venivano sottoposti ad un set di lesioni più esteso oltre alla PVI (ad es. area della parete posteriore dell'atrio sinistro, 36.2% vs 20.5%, $p=0,02$).

In questi casi, gli operatori hanno deciso di adottare più frequentemente, anche se non in modo significativo, diagnostiche avanzate come il sistema di mappatura 3D (25.5% vs 15.6%, $p=0,08$) o l'ecocardiografia intracardiaca (91,5% vs 87,8%, $p=0,47$).

Le procedure in cui erano coinvolti pazienti con fattori di rischio accumulati richiedevano un tempo dalla pelle alla pelle più lungo (84.6 min vs 75.1 min, $p=0,03$) rispetto ai pazienti con < 4 fattori di rischio, mentre il tempo di scopia (21.5 min vs 18.6 min, $p=0,81$) era simile.

La PVI è stata raggiunta in tutti i pazienti.

Non sono stati riportati eventi avversi maggiori correlati alla procedura.

Conclusioni: In questa esperienza preliminare, l'uso del sistema Farapulse PFA per l'ablazione della FA nei pazienti con fattori di rischio accumulati è risultato sicuro ed efficace e ha portato a tempi simili e rapidi per la PVI.



ARITMIE 562

ELETTROSTIMOLAZIONE (ARITMIE) SINCOPE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)

LEADLESS PACEMAKER IMPLANTATION THROUGH INTERNAL JUGULAR VEIN: A CASE REPORT

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Introduction: Leadless pacemaker implantation (LPI) offers fewer device-related complications, and a reduced risk of infection compared to traditional transvenous pacemakers (PM). The standard access for LPI is typically through the femoral vein. However, the use of the internal jugular vein (IJV) is emerging as a novel alternative. Here, we report a case where LPI was performed through the IJV.

Case description: An 84-year-old male was admitted due to recurrent syncope and pathological pauses detected during ECG monitoring. His medical history included permanent atrial fibrillation, type 2 diabetes, stage 4 chronic kidney disease, and previous surgeries for ascending aorta replacement and mitral valvuloplasty. Given his unsuitable bilateral femoral venous access, the patient was deemed a candidate for LPI via the IJV approach. Venous access was obtained under ultrasound guidance, and an 8-Fr sheath was placed in the right IJV. A stiff guide wire (Amplatz Super Stiff guide wire, Boston Scientific) was guided down into the inferior vena cava (IVC). The entry site was then dilated using progressively larger dilators (12-Fr and 18-Fr). Under fluoroscopic guidance, the 27-Fr introducer system was advanced through the IJV into the right atrium (RA). The Micra Delivery Catheter (Medtronic Inc., Minneapolis, Minnesota, USA) was advanced through the introducer. The introducer system was then retracted into the superior vena cava (SVC) while the delivery system remained in the RA. The delivery system was

curved using the deflection button on its handle to cross the tricuspid valve (TV) into the right ventricle. The Micra pacemaker was successfully deployed in the mid-interventricular septum on the first attempt. Following the procedure, the pacing threshold was 0.25 V at 0.24 ms pulse width with a sensed amplitude of 6.2 mV. The patient reported no pain or discomfort during the implantation procedure, and accessing the interventricular septum was straightforward for the operator. Immediately post-implantation, the patient was able to ambulate.

Discussion: The IJV approach for LPI is typically considered a bailout strategy when femoral access is not feasible. Observational studies provide encouraging data on the safety of this approach, demonstrating a high procedural success rate and indicating several potential advantages, including the absence of vascular complications, simpler non-apical positioning, immediate post-procedural ambulation (which reduces back pain), and the avoidance of deep venous thrombosis.

For these reasons, same-day discharge may be possible, resulting in a reduction of costs associated with the length of hospital stay.

Conclusions: The jugular approach may ensure a faster recovery for the patient. In the future, it could potentially become the first-line strategy, although further studies are needed to confirm these promising findings.



ARITMIE 398

ABLAZIONE TRANSCATETERE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

ABLATION WITH ELECTROPORATION FOR PAROXYSMAL OR PERSISTENT ATRIAL FIBRILLATION: PILOT EXPERIENCE ON PULSESELECT AND FARAPULSE TECHNOLOGIES

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Background. In recent years, pulsed field ablation (PFA) has emerged as an alternative to thermal ablation energy sources for pulmonary vein isolation (PVI) in patients with atrial fibrillation (AF). At present, only two single-shot PFA catheters have been commercialized (FARAPULSE, Boston Scientific, 2021, and PulseSelect, Medtronic, 2023). Their comparative performance has not been investigated yet.

Purpose: To describe the clinical characteristics of patients undergoing PFA and to describe potential differences in the procedural aspects and procedure-related complications between two PFA technologies.

Methods: This is a single-center, prospective, observational registry enrolling consecutive patients undergoing PFA for AF treatment. Data were collected during the hospital stay for the index ablation procedure. Data included patient demographics, AF type, CHA2DS2-VASc, HAS-BLED, and EHRA scores, 3D-echocardiographic parameters, peri-procedural information (total procedure duration, left atrial [LA] dwell time, electrical cardioversion after the procedure, and total number of lesions), and peri-procedural complications. LA dilation was defined as LA volume indexed > 44 ml/m² and reduced LA performance was defined as peak atrial longitudinal strain $< 24\%$. Results are reported as count and percentages or as median and interquartile range (IQR). Comparisons were conducted by chi-square test and the Mann-Whitney U test. A p -value < 0.05 was considered statistically significant.

Results: Between November 2023 and July 2024, 49 patients were enrolled, of whom 12 underwent PFA using the PulseSelect technology and 37 using FARAPULSE. Baseline patient characteristics were similar between the groups. Median age was 62.5 (54.7-64.2) vs 60.0 (53.0-67.0) years, median CHA2DS2-VASc score was 1.5 (1.0-2.0) vs 1.0 (1.0-2.0), 33.3% vs 21.6% of patients were female and 50% vs 35.1% had persistent AF, respectively (Table 1). Both groups presented a similar proportion of patients with LA dilation (75% vs 50%) and reduced LA performance (66.7% vs 47.1%). All P -values > 0.05 (Table 1).

Total procedure duration was 60.0 (53.2-70.0) minutes in the PulseSelect group and 55.0 (50.0-65.0) minutes in the FARAPULSE group ($p=0.527$). LA dwell time was slightly higher in the PulseSelect group [(30.0 (25.0-31.2) minutes vs 20.0 (18.5-25.0) minutes respectively, $p=0.003$]. Total lesion number was similar 32 (32-32) vs 32 (32-32) ($p=0.619$) (Table 1). Overall, 16 (32.6%) patients underwent electrical cardioversion at the end of the procedure. We observed a total of 4 (8.5%) peri-procedural complications, including 1 pericardial tamponade, 1 groin hematoma, and 2 asystole during electroporation, with no difference between groups ($p=0.561$) (Table 1).

Conclusions. In a contemporary pilot experience including paroxysmal and persistent AF patients undergoing PVI isolation with electroporation, PulseSelect and FARAPULSE showed similar procedural characteristics and safety.



DEMOGRAPHIC, ECHOCARDIOGRAPHIC AND PROCEDURAL PATIENT CHARACTERISTICS

	PulseSelect (n=12)	FARAPULSE (n=37)	P-value
Demographic characteristics			
Age, years	62.50 (54.75-64.25)	60.00 (53.00-67.00)	0.675
Female, N (%)	4 (33.3)	8 (21.6)	0.665
BMI, kg/m ²	27.30 (24.92-30.12)	25.80 (23.95-30.65)	0.464
Previous ablation, N (%)	2 (16.7)	5 (13.5)	1.000
Echocardiographic parameters			
3D-LVEF, %	57.50 (54.00-63.50)	59.00 (55.00-62.00)	0.916
3D-End-systolic LAVi, ml/m ²	51.30 (44.15-58.90)	43.75 (33.62-59.38)	0.198
LA dilation, N (%)	9 (75.0)	17 (50.0)	0.245
LAEF, %	52.00 (49.25-55.00)	48.00 (37.75-56.25)	0.234
PALS, %	30.15 (21.75-35.78)	23.25 (20.00-28.73)	0.098
LA reduced performance, N (%)	8 (66.7)	16 (47.1)	0.405
Procedural characteristics			
Procedure duration, minutes	60.00 (53.25-70.00)	55.00 (50.00-65.00)	0.527
LA catheter dwell time, minutes	30.00 (25.00-31.25)	20.00 (18.50-25.00)	0.003
Electrical cardioversion after the procedure, N (%)	4 (33.3)	12 (32.4)	1.000
Total lesions	32.00 (32.00-32.00)	32.00 (32.00-32.00)	0.619
Peri-procedural complications, N (%)	0 (0.0)	4 (10.8)	0.561

AADs, antiarrhythmic drugs; AF, atrial fibrillation; BMI, body mass index; LA, left atrial; LAEF, left atrial ejection fraction; LAVi, left atrial volume indexed; LVEF, left ventricular ejection fraction; PALS peak atrial longitudinal strain. Continuous data are presented as median (IQR) unless otherwise specified

Table 1

ARITMIE 765

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ABLAZIONE TRANSCATETERE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

HYDRATION STRATEGY TO PREVENT ACUTE KIDNEY INJURY IN PATIENTS UNDERGOING PULSED FIELD ABLATION

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(a) *POLICLINICO TOR VERGATA*; (b) *TEXAS CARDIAC ARRHYTHMIA INSTITUTE*

Introduction: Previous studies have highlighted the risk of acute kidney injury (AKI) development, underlining the need for strategies to mitigate this complication.

Aim: The aim of our study was to evaluate the impact of hydration timing and the amount of fluids on incidence of AKI in patients undergoing PFA.

Methods: We analyzed 208 consecutive patients who underwent pulsed field ablation (PFA) for post-FDA approval. All patients received pulmonary vein isolation. Ablation of extra-PV sites was performed per the operator's choice, with no contrast agents. Serum creatinine was measured in all patients at baseline and 24 after ablation. Group means for continuous variables were compared using the Student t-test. Categorical variables were compared using the Chi-square test. A ROC analysis was done to evaluate the predictive model of PFA applications to evaluate AKI. All tests were two-tailed and conducted at an α level of 0.05.

Results: We divided patients into two groups: Group 1 (n=102) received either one liter of saline pre-procedure or one liter pre-procedure followed by a liter post-procedure; Group 2 (n=106) was

preemptively hydrated with two liters of saline before the procedure, followed by additional 500cc if the patient had received more than 100 PF applications. In the comparative analysis of the two groups, there was no significant difference regarding the number of PFA applications administered. None of the patients in Group 2 experienced AKI, while Group 1 AKI occurred in 9 patients. (0/106 vs 9/102, p-value=0.0034). The ROC analysis yielded an area under the curve of 0.709 ± 0.107 with a 95% confidence interval ranging from 0.498 to 0.919 (p-value=0.035). An optimal PF application cutoff point of 105.50 was determined, associating a higher probability of AKI with PFA applications exceeding this threshold (sensitivity:0.667, specificity:0.735, Youden's index:0.402). Among the 9 patients who developed AKI, we observed that 7 received more than 100PF applications; the remaining 2 patients, each with baseline stage 3 chronic kidney disease and prior episodes of AKI following surgeries, received 54 and 50PF applications, respectively.

Conclusion: In this series of patients, pre-procedural hydration with two liters of fluids eliminated the risk of AKI even in patients who received a high number of PFA applications.



ARITMIE 271

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE)

EFFETTI DELLA CARDIOVERSIONE ELETTRICA DELLA FIBRILLAZIONE ATRIALE NEI PAZIENTI CON DISFUNZIONE ERETTILE

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Background e obiettivi dello studio: Le disfunzioni sessuali, in particolare la disfunzione erettile, rappresentano un problema significativo nei pazienti affetti da patologie cardiovascolari. Nella popolazione generale maschile di età superiore ai 20 anni, la prevalenza di DE si attesta tra il 18 e 40%.

In pazienti affetti da fibrillazione atriale, la prevalenza di disfunzione erettile risulta elevata, ma non è ancora ampiamente chiaro se e come il ripristino del ritmo sinusale possa influire sul miglioramento delle funzioni sessuali. Obiettivo del nostro studio è stato quindi quello di valutare, in pazienti con fibrillazione atriale, gli effetti della cardioversione elettrica e il conseguente ripristino del ritmo sinusale nei pazienti con disfunzione erettile.

Materiali e Metodi: Nel nostro studio prospettico, sono stati arruolati 487 pazienti sottoposti a cardioversione elettrica per fibrillazione atriale parossistica o persistente presso il Policlinico Umberto I. Sono stati esclusi pazienti di età inferiore a 18 anni e superiore a 65 anni, con precedenti tentativi di cardioversione o ablazione, altre cause organiche di disfunzione erettile e in terapia farmacologica cronica per disfunzione erettile. La funzione erettile è stata valutata utilizzando il questionario IIEF-5. I dati clinici, ecocardiografici e relativi alle strategie di cardioversione sono stati raccolti e analizzati.

Risultati: A 3 mesi dalla cardioversione, 436 pazienti (89,53%) hanno mantenuto il ritmo sinusale, con un miglioramento significativo della funzione erettile (punteggio medio IIEF-5 pre-CVE 1415, post-CVE 2013, $p < 0.001$). È stata riscontrata un'associazione statisticamente significativa tra ipertensione, diabete, fumo, dislipidemia, insufficienza renale cronica, FE > 50%, BMI 18-25, BMI > 25, BPCO, fibrillazione parossistica e persistente e miglioramento della funzione erettile nell'analisi univariata. All'analisi multivariata il mantenimento del ritmo sinusale si è dimostrato la sola variabile associata in maniera statisticamente significativa al miglioramento del punteggio IIEF-5.

Conclusioni: La cardioversione elettrica e il conseguente mantenimento del ritmo sinusale migliorano significativamente la funzione erettile nei pazienti con fibrillazione atriale. Il miglioramento dell'emodinamica del paziente e di conseguenza della perfusione tissutale potrebbe spiegare questo miglioramento. Studi futuri su una popolazione più ampia e diversificata sono necessari per valutare l'effetto a lungo termine del mantenimento del ritmo sinusale sul miglioramento della disfunzione erettile.

ARITMIE 93 ARITMIE VENTRICOLARI (ARITMIE) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) ASSISTENZA CARDIACA PRE-OSPEDALIERA (ASSISTENZA CARDIACA IN ACUTO)

POST-ROSC ECG PREDICTS SURVIVAL AFTER OUT-OF HOSPITAL CARDIAC ARREST: THE VALIDATION OF THE PROGRESS SCORE

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(a) IRCCS POLICLINICO SAN MATTEO

Purpose: The aim of the present study is to validate the PROGRESS score on a larger and international cohort of post-out of hospital cardiac arrest (OHCA) patients, as well as to evaluate the performance of the score following its correction for patients' and events' characteristics contained in the UB-ROSC score.

Materials and methods: This is a multicentre study based on a retrospective analysis of prospectively collected data. Cardiac arrest cases, occurred between January 2015 and December 2023, were re-

trieved by the Lombardy Cardiac Arrest Registry and from the Saint-Pierre Hospital in Brussels. Only patients in whom a post-ROSC 12-lead ECG was performed and for whom all the variables contained in the UB-ROSC score were available were included. The performance of the PROGRESS score was tested both alone and after correction for UB-ROSC score.

Results: We considered 1075 OHCA of whom 63.6% were males with a median age of 70. 16.3% were classified as low risk, 27.9% as intermediate risk and 55.8% as high risk. 30-day survival was 33.2%, 43.7% and 57.7% in high, intermediate, and low risk groups respectively. PROGRESS score was shown to discriminate (Harrel-C= 0.57) 30-day survival of pa-

PROGRESS SCORE			
Variable	HR (95% CI)	P value	Score calculation: sum the coefficients in the table
Median age, y			
≤62	1	0.003	0
>62	1.78 (1.21-2.61)		6
Sex			
Male	1	0.025	0
Female	1.50 (1.05-2.13)		4
ROSC ECG time, min			
≥8	1	0.495	0
<8	1.18 (0.74-1.87)		1
Number segment			
≤1	1	<0.001	0
>1	1.75 (1.59-1.93)		6
QRS width, ms			
≤120	1	<0.001	0
>120	1.64 (1.43-1.87)		5
Brugada pattern			
No	1	<0.001	0
Yes	1.49 (1.39-1.59)		4

Figure 1

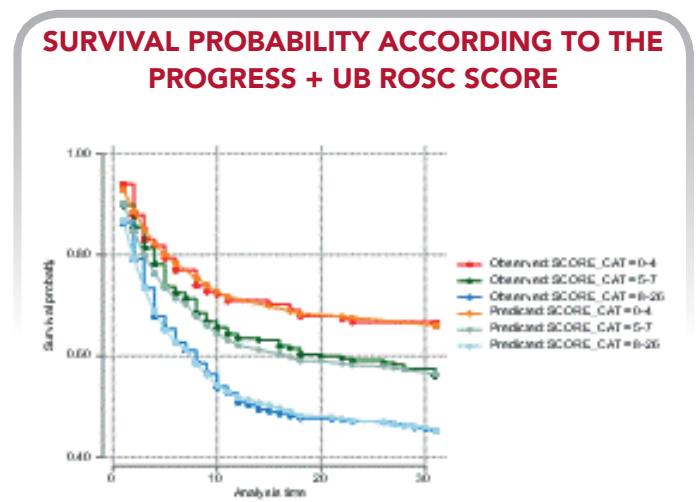
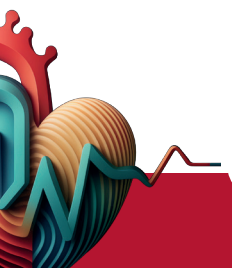


Figure 2

tients at high-risk (HR: 1.91; p-value < 0.001) and intermediate-risk (HR:1.38; p-value: 0.05) from low-risk ones. After correction for the UB-ROSC score both calibration and discrimination improved (Harrel-C = 0.64).

Conclusions: This study confirms the prognostic role of post-ROSC ECGs responding to the current lack of

early prognostic indicators in the post-resuscitation phase. Both the PROGRESS score alone and adjusted for the UB-ROSC score have shown the ability to predict the risk of death at 30 days. The combined use of the two scores on the field would provide a possibility for risk stratification during resuscitation manoeuvres and in post-ROSC care, which is essential to guide resource allocation.



ARITMIE 422

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

IMPACT OF ANAEMIA IN PATIENTS WITH ATRIAL FIBRILLATION: RESULTS FROM A CONTEMPORARY COHORT

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Davide A. Mei (a, b), Niccolò Bonini (a), Benedetta Cherubini (a), Enrico Tartaglia (a), Luigi Gerra (a), Francesco
Tritto (a), Francesco Chiriaco (a), Ilaria Righelli (a), Gianluca Bertolini (a),
Bernadette Corica (a), Emilia Caliano (a), Chiara Birtolo (a), Giuseppe Boriani (a)
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OF MODENA AND REGGIO EMILIA, POLICLINICO DI MODENA, MODENA, ITALY;* (b) *CLINICAL AND
EXPERIMENTAL MEDICINE PHD PROGRAMME, UNIVERSITY OF MODENA AND REGGIO EMILIA, MODENA, ITALY*

Background and aim of the study: Anaemia is a frequent condition that poses significant challenges in patients with atrial fibrillation (AF), especially concerning stroke prevention and bleeding risk. Thus, the aim of this analysis was to assess the impact of anaemia in terms of oral anticoagulant (OAC) prescription and outcomes in patients with atrial fibrillation.

Methods: Both in- and out-patients with AF enrolled in a prospective registry were analysed. For the purpose of this analysis, we divided the population based on the presence of anaemia (defined as Hb <12 g/dl for women and Hb <13 g/dl for men). Differences in terms of OAC prescription and outcomes were assessed using logistic and Cox regression analysis. The primary outcome was all-cause death, while the secondary exploratory outcomes were thromboembolic events and haemorrhagic events.

Results: We prospectively enrolled 928 patients (median age 75 years, IQR 67-82 years; females 355, 38.3%). The median CHA₂DS₂-VASc score was 4 (IQR 2-5), and the median HAS-BLED score was 1 (IQR 1-2). Among these patients, 244 (26.3%) suffered from anaemia. These patients were older (median age 79.5 years, IQR 73-85), suffered more from

coronary artery disease (20.9% vs. 40.6%), valvular heart disease (44% vs. 66%), heart failure (22.7% vs. 36.9%), diabetes (17.1% vs. 28.7%), and CKD (25.6% vs. 48.8%) (all $p < 0.001$). Both CHA₂DS₂-VASc and HAS-BLED scores were higher in patients with anaemia (both $p < 0.001$). Almost half of the individuals in this group had permanent AF (48.8% vs. 38% in non-anaemic patients, $p < 0.001$). No differences were observed in terms of previous thromboembolic and haemorrhagic events. The overall use of OAC was high (92.4%), but at logistic regression (adjusted for CHA₂DS₂-VASc score, type of AF and CKD) patients with anaemia had lower odds of being prescribed with OAC (OR 0.46, 95% CI 0.25- 0.84), and higher odds of receiving the reduced dosage (OR 2.41, 95% CI 1.66-3.51). During a median follow-up of 702 days (IQR 230-2220), 187 (20.2%) events of the primary outcome occurred. Kaplan-Meier curves for all-cause death is reported in the Figure (panel A). At multivariable Cox regression adjusted for CHA₂DS₂-VASc score, type of AF, CKD, and OAC use, patients with anaemia had a higher risk of all-cause death (HR 2.20, 95% CI 1.63-2.98), while no differences were observed for both thromboembolic and haemorrhagic events. When considering haemoglobin (Hb) as a continuous variable, there was a 20% reduction of the risk of all-cause death



for every 1-point increase (g/dl) in the Hb values (HR 0.80, 95% CI 0.73-0.87). The restricted cubic spline curve (panel B of the Figure) is the graphical representation of Hb as a continuous variable.

Conclusions: Anaemia is commonly encountered in patients with AF, affecting about one every four patients. It is associated with a lower prescription of OAC, and with a higher risk of all-cause death.

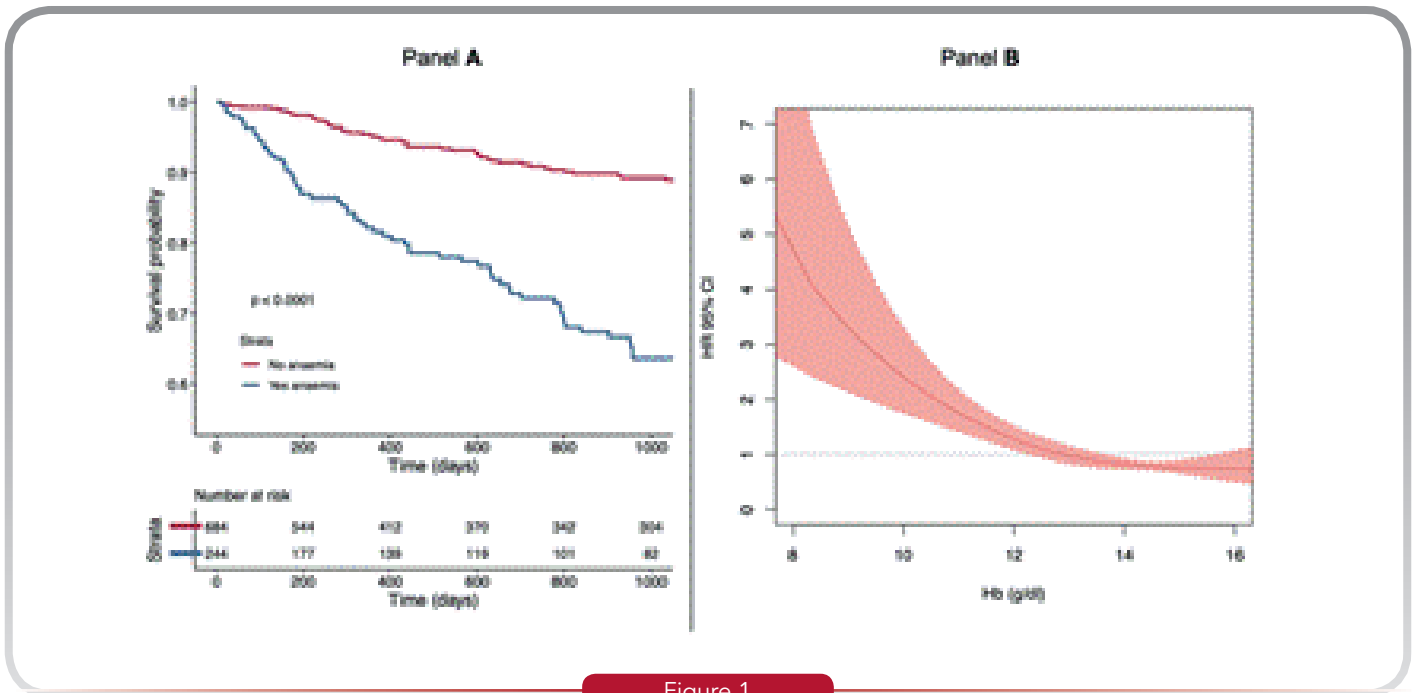


Figure 1

ARITMIE 433

ELETTROSTIMOLAZIONE (ARITMIE) SINCOPE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)

SYSTEMATIC REVIEW AND META-ANALYSIS ON THE IMPACT ON OUTCOMES OF DEVICE ALGORITHMS FOR MINIMIZING RIGHT VENTRICULAR PACING

Davide Antonio Mei (a), Margherita Leoni (a), Kevin Serafini (a), Marta Mantovani (a), Luigi Gerra (a),
Andrea Gollè (a), Federica Pollicino (a), Niccolò Bonini (a), Marco Vitolo (a),
Jacopo Francesco Imberti (a), Giuseppe Boriani (a)
UNIVERSITÀ DI MODENA E REGGIO EMILIA - U.O. CARDIOLOGIA - POLICLINICO

Background: Physiological activation of the heart using algorithms to minimize right ventricular pacing (RVPm) may be an effective strategy to reduce adverse events in patients requiring anti-bradycardia therapies. We conducted this systematic review and meta-analysis to assess the efficacy and safety of the use of RVPm algorithms.

Methods: We conducted a systematic search of the PubMed database. Our pre-defined endpoints were: i) Persistent/Permanent atrial fibrillation (PerAF); ii) cardiovascular (CV) hospitalization; iii) heart failure (HF) hospitalization; iv) all-cause death; v) adverse symptoms; vi) syncope.

For direct comparison of outcomes, we utilized the Mantel-Haenszel random-effects model to determine pooled estimates reported as odds ratios (OR) with 95% confidence intervals (CI). Heterogeneity was assessed using the inconsistency index (I^2).

Results: The literature search initially identified 3156 studies. After removing duplicates and screening titles and abstracts, 61 full texts were assessed for eligibility, resulting in 8 studies included for quantitative synthesis, for a total of 7229 patients. Of these, 7 studies were randomized

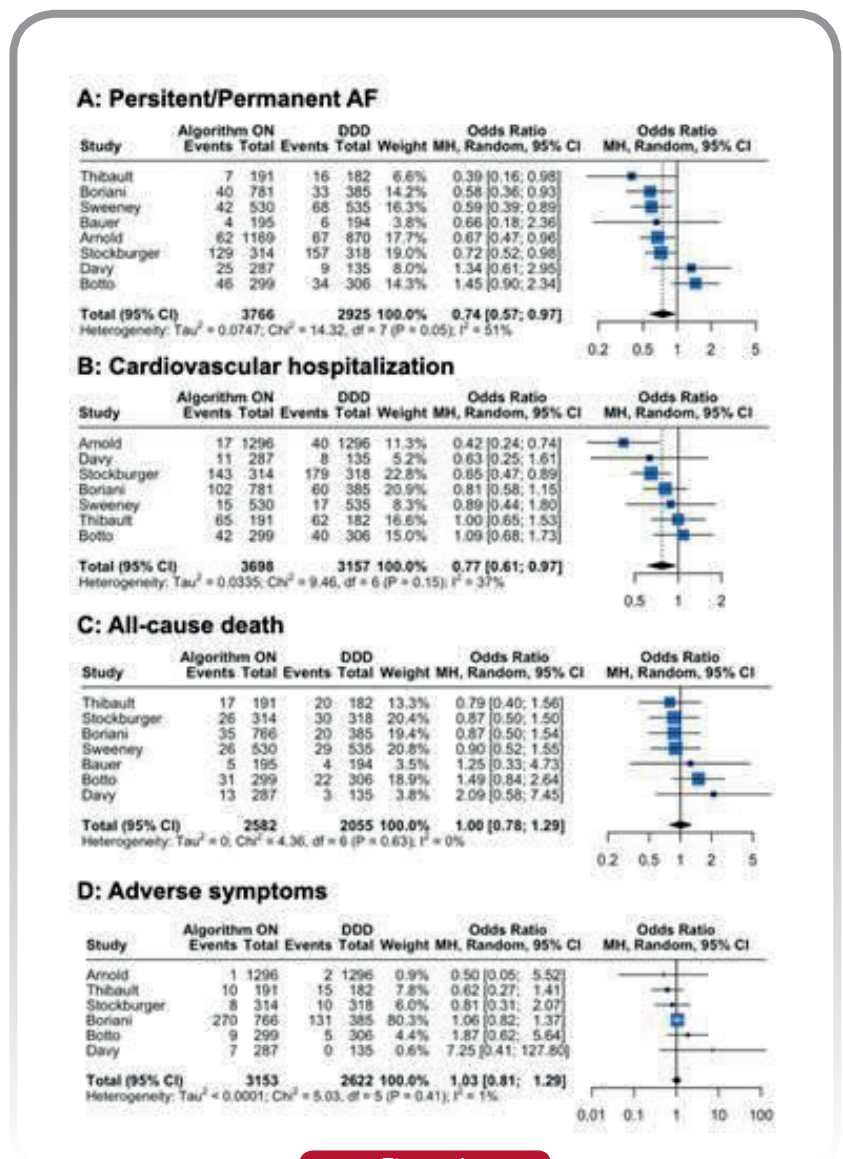


Figure 1

trials, while one study was based on observational multicenter data.

Compared to DDD-pacing, patients using RVPm algorithms showed a lower risk of PerAF (OR 0.74, 95% CI 0.57-0.97, I^2 : 51%), CV hospitalization (OR 0.77, 95% CI 0.61-0.97, I^2 : 37%) and HF hospitalization (OR: 0.65, 95% CI 0.47-0.89, I^2 : 47%). No significant difference was found for all-cause death (OR 1.01, 95% CI

0.78-1.30, I^2 : 0%), adverse symptoms (OR 1.03, 95% CI 0.81-1.29, I^2 : 1%) or syncope (OR: 0.78, 95% CI 0.20-2.14, I^2 : 47%).

Conclusion: Algorithms for RVPm may be effective in reducing the risk of PerAF, CV and HF hospitalization in patients requiring anti-bradycardia therapies, without an increased risk of adverse symptoms.



ARITMIE 439

ELETTROSTIMOLAZIONE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) SINCOPE (ARITMIE)

EFFICACY OF PACEMAKER ALGORITHMS IN THE REDUCTION OF UNNECESSARY RIGHT VENTRICULAR PACING: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Vincenzo Turco (a), Edoardo Casali (a), Niccolò Bonini (a), Marco Vitolo (a),
Jacopo Francesco Imberti (a), Giuseppe Boriani (a)
(a) UNIVERSITÀ DI MODENA E REGGIO EMILIA - U.O. CARDIOLOGIA - POLICLINICO

Background: Guidelines on cardiac pacing recommend keeping right ventricular pacing (RVP) percentage below 20% to reduce the risk of developing pacing induced cardiomyopathy. Physiological activation of the heart using algorithms to minimize RVP (RVPm) may be one of the possible strategies to achieve this cut-off in patients requiring anti-bradycardia therapies. We conducted this systematic review and meta-analysis to assess the efficacy of RVPm to reduce RVP percentage below the recommended cut-off of 20%.

Methods: We conducted a systematic search of the PubMed database. According to our primary aim, the main inclusion criteria were: (i) studies that compared algorithms for RVPm to standard dual chamber (DDD), irrespective of study design; ii) included adult population > 18 years old; and iii) provided data on outcomes of interest. We collected data regarding the percentages of RVP in the RVPm and DDD group. The means of RVP percentages were pooled using the random-effects model with inverse variance weighting. For studies reporting median and interquartile range, we applied the method described by Wan et al. to estimate mean and standard deviation.

Results: The literature search initially identified 3156 studies. After removing

duplicates and screening titles and abstracts, 61 full texts were assessed for eligibility, resulting in 6 studies included for quantitative synthesis that provided data on the percentage of RVP. The pooled mean RVP percentage for patients with RVPm algorithms activated was 7.96% (95% CI 3.13-20.25, I²=99%).

In contrast, patients in the DDD pacing mode had a pooled mean RVP percentage of 45.11% (95% CI 26.64-76.38, I²=99%). Two studies showed only a modest reduction in the overall DDD pacing percentage.

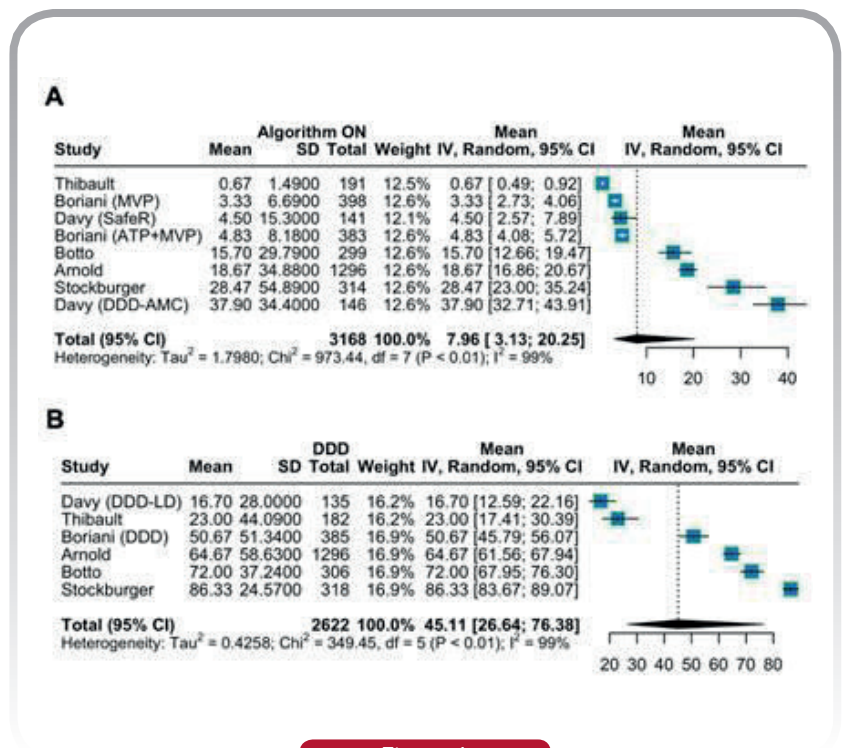


Figure 1

In both cases, the DDD control group was programmed with a long AV delay, thus reducing the overall RV pacing burden, albeit with an expected prolongation of the PR interval.

Conclusions: algorithms for RVPm successfully reduced RVP below the recommended threshold of 20%, which is critical for minimizing pacing-induced adverse effects.



ARITMIE 167

ABLAZIONE TRANSCATETERE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

OPEN WINDOW MAPPING WITH EXTENDED EARLY MEETS LATE: A NEW WEAPON AGAINST ACCESSORY PATHWAY

Marco Micillo (a), Sara Poggi (a), Assunta Iuliano (a), Giorgio Spiniello (a), Giuseppe Stabile (a)
(a) CARDIOCENTRO MEDITERRANEA

A 22-year-old female patient presented to our electrophysiology unit with a history of palpitations since childhood. A 12-lead surface electrocardiogram (ECG) revealed ventricular pre-excitation, with a positive delta wave in the inferior leads and a negative delta wave in V1, suggestive of a right antero-septal accessory pathway (AP). Given the indication for an electrophysiological study and ablation of the arrhythmic substrate, the procedure was performed using the CARTO® 3 mapping system with a zero-fluoroscopy approach. Three diagnostic catheters were inserted via right femoral venous accesses: two standard quadripolar catheters were placed at the apical site of the right ventricle and at the level of the His bundle, while a decapolar catheter was placed in the coronary sinus. An electroanatomical reconstruction of the right atrium and ventricle was performed with a high-density multipolar catheter Octaray™ (Biosense Webster, Irvine, CA). During mapping, orthodromic atrio-ventricular tachycardia was spontaneously induced.

To optimize direct visualization of the position and width of the accessory pathway, the open window mapping (OWM) technique with the extended early-meets-late (EEML) algorithm was used. The OWM represents a novel mapping strategy that enables precise localization of the AP by direct visualization of the ventricular and atrial insertion of the AP. In particular, the local signal is annotated with a window of interest that includes both atrial and ventricular signals, with the surface QRS serving as an automatic reference. Furthermore, the EEML algorithm

has been shown to facilitate the identification of the atrio-ventricular by-pass tract by allowing the visualization of a block line in the transition between the two cardiac chambers.

In our case, with more than 11,000 rapidly acquired points, the system accurately identified the AP insertion at the tricuspid valve annulus (5.9 mm from the recording site of the His bundle potential) and analyzed the signal activation time, allowing the creation of a propagation map in sinus rhythm with EEML at its lower threshold. This tool revealed the AP insertion as a break site in the TV annulus (Fig.1). A further verification of this AP was then performed by acquiring a propagation map with OWM during orthodromic tachycardia. During the first radiofrequency energy delivery (50°C, 50 Watts with a 4-mm non-irrigated ablation catheter in temperature-controlled mode) at this site, a prompt normalization of

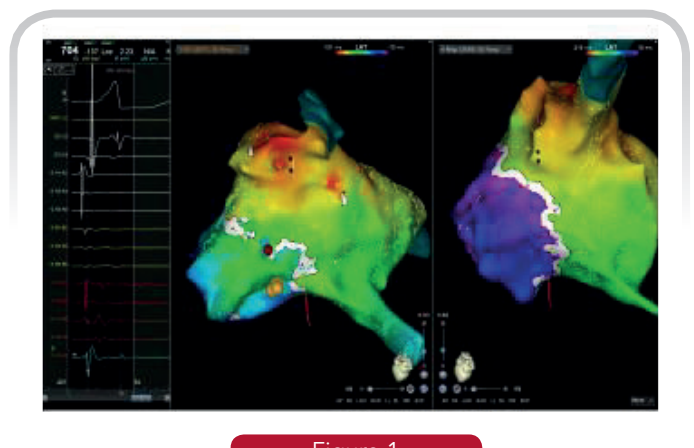
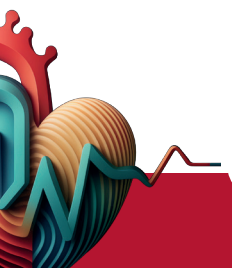


Figure 1

AV conduction was observed. The procedure was successfully completed without any complications or the use of fluoroscopy.

The presented case study exemplifies the utility of OWM in rapidly and effectively mapping and ablating APs, facilitating visualization of their location

and width. This method is particularly advantageous for more complex APs (such as anteroseptal in our case), offering an additional safety parameter and the opportunity to reduce or eliminate the use of fluoroscopy.



ARITMIE 454

MECCANISMI DELLE ARITMIE (ARITMIE) SINCOPE (ARITMIE)

TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

QUANDO IL PACEMAKER PUÒ ATTENDERE: MALATTIA DI LYME E BLOCCO ATRIOVENTRICOLARE TOTALE

Gianfranco Notarianni (a), Federico Bernardini (b), Davide Gallo (b), Michelangelo Luciani (b), Mattia Petrunaro (a), Mario Malavasi (a), Edoardo Nobile (b), Daniele Pontillo (b), Pietro Scrimieri (b)
(a) OSPEDALE BELCOLLE DI VITERBO, UOC DI CARDIOLOGIA PER LO STUDIO FUNZIONALE DELL'ELETTROFISIOLOGIA ; (b) OSPEDALE BELCOLLE DI VITERBO, UOC DI CARDIOLOGIA, UTIC, EMODINAMICA

Presentazione del Caso: Un paziente di 58 anni, senza precedenti cardiologici di rilievo o fattori di rischio cardiovascolare, è stato ricoverato presso il nostro centro a causa di episodi sincopali recidivanti.

L'elettrocardiogramma all'ingresso (immagine allegata in fondo) mostrava una tachicardia sinusale con blocco atrioventricolare completo e ritmo di scappamento giunzionale con frequenza cardiaca di 42/min. Gli esami di laboratorio (emocromo, funzionalità epatica, renale ed elettroliti) sono risultati normali. Un'anamnesi approfondita ha rivelato artralgie diffuse a spalla, caviglia e polso. Inoltre, il paziente ha riferito di aver subito almeno tre punture da zecca negli ultimi tre mesi. Nonostante le IgG anti-Borrelia fossero negative e il Western Blot risultasse dubbio, dato il forte sospetto clinico di malattia di Lyme, è stato deciso di prorogare l'impianto del pacemaker, avviare una terapia antibiotica specifica e mantenere il paziente in osservazione.

Nei giorni successivi al ricovero, si è osservata una rapida regressione del blocco atrioventricolare totale, con una transizione iniziale verso un blocco atrioventricolare di primo grado che successivamente è regredito completamente. Alla luce di questi risultati e del persistente sospetto clinico di malattia di Lyme, il paziente è stato dimesso dopo l'impianto di un loop recorder con monitoraggio remoto e l'indicazione a ripetere il dosaggio delle

IgG anti-Borrelia dopo tre mesi. A quel punto, le IgG anti-Borrelia sono risultate positive.

A sei mesi di follow-up, il paziente risulta asintomatico e con un ECG normale.

Conclusioni: Questo caso evidenzia l'importanza di una valutazione dettagliata e approfondita nei pazienti con blocco atrioventricolare totale, per escludere cause secondarie reversibili. È cruciale considerare la possibilità di una malattia di Lyme anche in presenza di test sierologici inizialmente negativi, avviando precocemente una terapia antibiotica e ripetendo i test a distanza per confermare la diagnosi. La positivizzazione tardiva degli anticorpi anti-Borrelia, come osservato in questo caso, può fuorviare il processo diagnostico.

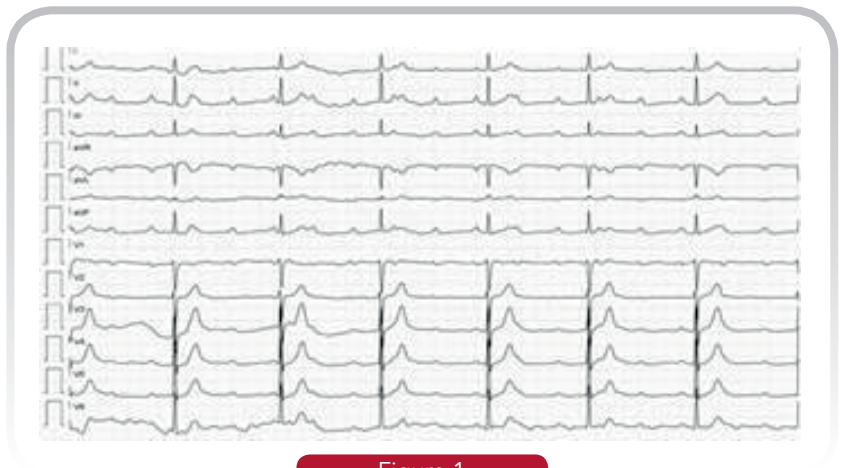


Figure 1



ARITMIE 7

ARITMIE VENTRICOLARI (ARITMIE) ELETTROSTIMOLAZIONE (ARITMIE) TERAPIA DI RESINCRONIZZAZIONE (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE)

TEMPESTA ARITMICA, QUANDO IL PROBLEMA È IL CATETERE SINISTRO

Federico Paolini (a), Simone Maffei (a), Giovanni Bersigotti (a), Lorena Scappini (a), Gianmarco Bastianoni (a), Michela Cottini (a), Giovanni Tarsi (a)
(a) CARDIOLOGIA-UTIC PESARO

Introduzione: La terapia di resincronizzazione cardiaca (CRT) è un trattamento efficace per i pazienti con cardiomiopatia ipocinetica dilatativa. Questa terapia migliora la funzione cardiaca, aumenta la sopravvivenza e la qualità della vita dei pazienti affetti da tale patologia. Tuttavia, in rari casi la CRT può determinare un aumento dell'incidenza di aritmie ventricolari.

Presentazione del caso: il paziente era affetto da cardiomiopatia ipocinetica dilatativa con severa disfunzione sistolica biventricolare complicata da sindrome coronarica cronica e portatore della mutazione del gene della Lamina. Nonostante l'introduzione di una terapia medica ottimizzata e l'impianto di una CRT-D, il paziente presentava un'importante instabilità elettrica per cui è stato sottoposto ad ablazione transcateretere sia endocardica che epicardica e successivamente inserito in lista per trapianto cardiaco, per l'insorgenza di ulteriori episodi di tempesta aritmica difficilmente controllabili, vista anche l'intolleranza ad un'adeguata terapia antiaritmica. Ricoverato per l'ennesima recidiva di tempesta aritmica, dopo una temporanea stabilizzazione clinica ottenuta mediante la somministrazione di terapia an-

tiaritmica endovena, si assisteva all'insorgenza di tachicardie ventricolari subentranti a bassa frequenza. Interrotte solo temporaneamente da terapie anti-tachicardiche ma con rapida recidiva, il controllo delle aritmie si otteneva con la disattivazione della stimolazione epicardica sinistra. Questo permetteva di trasferire in sicurezza il paziente per essere poi sottoposto a trapianto cardiaco.

Conclusioni: la disattivazione della stimolazione sinistra epicardica ha portato alla rapida interruzione delle aritmie ventricolari refrattarie, confermando un suo possibile ruolo critico nella generazione e mantenimento delle aritmie ventricolari in alcuni contesti clinici. L'ipotesi più probabile all'origine delle tachicardie ventricolari in questo contesto è la presenza di una cicatrice epicardica del ventricolo sinistro che conferisca una predisposizione a circuiti di rientro anatomici macroscopici o microscopici, confermato dal tracciato elettrocardiografico a 12 derivazioni che mostra una chiara origine dell'aritmia dal ventricolo sinistro in prossimità del catetere sinistro.

ARITMIE 253

ABLAZIONE TRANSCATETERE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

UTILIZATION OF IMPROVED LESION VISUALIZATION DURING PULMONARY VEIN ISOLATION

Alessandro Parlato (a, b), Thomas Fink (a), Vanessa Sciacca (a), Denise Guckel (a), Moneeb Khalaph (a), Martin Braun (a), Mustapha El Hamriti (a), Guram Imnadze (a), Maxim Didenko (a), Maximilian Mörsdorf (a), Christian Sohns (a), Philipp Sommer (a)

(a) CLINIC FOR ELECTROPHYSIOLOGY, HERZ- UND DIABETESZENTRUM NRW, BAD OEYNHAUSEN, GERMANY;

(b) CARDIOVASCULAR DIVISION, UNIVERSITY OF PISA, PISA, ITALY

Background and aims: Pulmonary vein isolation (PVI) is the cornerstone of atrial fibrillation (AF) ablation. Recently, High-power short-duration (HPSD) ablation protocols have been introduced into clinical practice. Effectiveness of catheter ablation relies on transmural-ity and contiguity of ablation lesions and ablation points acquisition and visualization results in having a crucial role in the process of delivering consistent lesions. Two novel algorithms have recently been incorporated into a commercially available electroanatomic 3D mapping system facilitating continuous analysis of catheter movement during ablation and offering automated display of interlesion gaps to enable optimized lesion creation. We investigated the impact of this novel algorithms on procedural parameters in patients undergoing first-time PVI with HPSD ablation.

Methods: Consecutive patients undergoing first-time PVI in a high volume center with two different mapping setups were evaluated. In the study group the novel algorithm was utilized. In case of automated interlesion gap display, additional touch-up ablation was performed. A patient cohort ablated without the help of the new algorithm and in which interlesion distance was manually assessed by the operator served as control group. Parameters including procedural time, number of radiofrequency applications and rates of first-pass isolation were assessed. Ablation was performed in all patients with HPSD ablation (90 Watt applications over 4 seconds time) with the help of high-density mapping utilizing an 8-splines mapping catheter.

Results: A total of 86 patients were analyzed (28 in the study group and 58 in the control group). Procedural duration (83 ± 19 minutes in the study group and 75 ± 19 minutes in the control group, $p=0.11$), and fluoroscopy duration (314 ± 149 seconds in the study group and 315 ± 147 seconds in the control group, $p=0.98$), RF ablation times for isolation of right and left pulmonary veins (376 ± 171 seconds in the study group versus 357 ± 102 seconds in the control group, $p=0.55$) and numbers of RF applications (93.9 ± 42.8 applications in the study group and 89.4 ± 25.5 applications in the control group, $p=0.55$) were comparable between patient cohorts. First-pass isolation was significantly more often achieved in the study group as compared to the control group (22/28 patients (78.6 %) versus 28/58 patients (48.3 %), $p=0.008$). There was no significant difference among first-pass isolation rates for RPVs (24/28 patients (85.7%) versus 43/58 patients (74.1%), $p=0.23$) and for LPVs (24/28 patients (85.7%) versus 36/58 patients (62.1%), $p=0.25$). No major periprocedural complications occurred in both groups.

Conclusion: The integration of a novel tool for improved ablation points acquisition and automatic interlesion gap visualization can lead to higher first-pass isolation rates without any increase in the number of RF applications. The impact of this tool on long-term effectiveness of AF ablation still has to be evaluated in further studies.



ARITMIE 223
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

LEFT ATRIAL STRAIN AS A PREDICTOR OF LONG-TERM POSTOPERATIVE ATRIAL FIBRILLATION IN PATIENTS UNDERGOING MITRAL VALVE SURGERY

Maria Concetta Pastore (a), Maria Alma Iuliano (a), Federica Marrese (a), Giulia Elena Mandoli (a), Lorenzo Tanzi (a), Alessia Culcasi (a), Martina Rizzo (b), Veronica Lorenz (b), Giuseppe Alba (b), Gianfranco Montesi (b), Luna Cavigli (a), Marta Focardi (a), Flavio D'ascenzi (a), Serafina Valente (a), Matteo Cameli (a)
 (a) DEPARTMENT OF MEDICAL BIOTECHNOLOGIES, DIVISION OF CARDIOLOGY, UNIVERSITY OF SIENA, SIENA, ITALY; (b) UNIVERSITY OF SIENA, ITALY

Background: Severe mitral regurgitation (MR) resolute treatment is surgical intervention. However, mitral valve surgery carries a considerable risk of postoperative atrial fibrillation (POAF), due to surgical stress and underlying atrial myopathy. Therefore, the identification of patients most prone to develop POAF after mitral surgery may be useful to optimize the follow up program of these patients. The aim of this study was to find potential predictors of long-term POAF, among basic and speckle tracking echocardiography (STE), in patients undergoing surgical treatment for MR.

Methods: We prospectively enrolled patients with severe MR who underwent preoperative clinical, biohumoral and echocardiographic evaluation, completed by STE, before mitral valve surgical repair or replacement. Patients with atrial fibrillation at the time of enrolment, previous cardiac surgery or other severe VHD were excluded. After surgery, patients were followed by on-site visits or phone calls to investigate clinical outcome. The primary endpoint was the occurrence of POAF, the secondary endpoint was heart failure hospitalization and/or cardiovascular mortality.

Results: overall, 60 patients were enrolled (mean age 64±13 years). Mean follow up was 34±10 months, over which 18 patients (30%) developed POAF, 2 patients were hospitalized for heart failure, 4 patients died for cardiovascular causes. Among clinical and echocardiographic parameters in patients with POAF,

only tricuspid annular plane systolic excursion (TAPSE) and global PALS showed statistically significant differences compared to patients without POAF (21±4 vs. 24±4 for TAPSE and 18±8 vs. 24±7 for global PALS). With ROC curves, global PALS had the highest accuracy for the prediction of POAF (AUC 0.7, p=0.02) with an optimal cut-off value ≤ 19.5%. Multivariate analysis by Cox Proportional Hazard model including age, left atrial volume index (LAVI), TAPSE, only global PALS was independently associated with the primary endpoint (HR = 0.91 [CI 0.86-0.98] each unit decrease, p =0.01). With Kaplan Meier curves, global PALS ≤ 19.5% confirmed to provide a good risk stratification of long-term POAF (Log-rank p = 0.006) with a late but sustained divergence of the curves after month 20 (Fig.1).

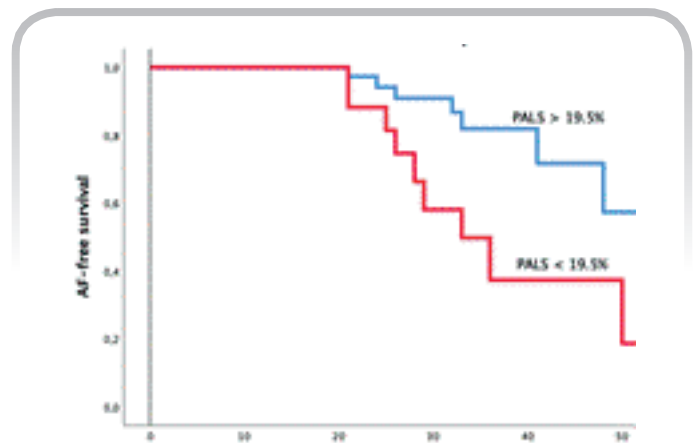


Figure 1

Conclusions: the pre-operative assessment of global PALS may aid identifying patients at higher risk of long-term POAF in patients undergoing mitral valve

surgery, in order to provide a strict follow up and rhythm monitoring to these patients.



ARITMIE 881

ARITMIE VENTRICOLARI (ARITMIE) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE)

DIFFERENZE DI GENERE NEI PREDITTORI DI FIBRILLAZIONE VENTRICOLARE PRIMARIA: RISULTATI DELLO STUDIO PREDESTINATION

Vanessa Peano (b), Filippo Angelini (b), Veronica Dusi (b), Gaetano Maria De Ferrari (b)

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Introduzione: Pochi studi hanno valutato i fattori di rischio di fibrillazione ventricolare (FV) prima della riperfusione durante un primo infarto miocardico acuto (IMA). Importanti parametri quali kaliemia, pressione arteriosa (PA) e frequenza cardiaca (FC) alla presentazione non sempre sono stati considerati. Inoltre, non sono mai state indagate eventuali differenze di genere.

Obiettivi: valutare la presenza di differenze di genere nei predittori di sviluppo di FV primaria nella popolazione PREDESTINATION (PRimary Entricular fibrillation and suDden dEath during a firST myocardial iNfArcTION).

Pazienti e metodi: PREDESTINATION è uno studio caso-controllo (appaiamento 1:2 per sesso ed età), prospettico, multicentrico, che arruola pazienti tra 18 ed 80 anni con un primo IMA, complicato (casi) o meno (controlli) da FV primaria.

Risultati: Sono stati analizzati 1622 pazienti (media 59 anni, 83% maschi, 35% casi). Confrontando i casi maschi vs femmine, le donne sono meno giovani, con BMI più basso, kaliemia alla presentazione più bassa (3.6 ± 0.6 vs 3.8 ± 0.6 mEq/L, $p=0.02$); hanno inoltre maggior familiarità per MCI, maggior prevalenza di depressione, di inattività fisica, di flusso TIMI 2-3 nell'arte-

ria culprit pre-riperfusione e di FV come primo sintomo (27% vs 15%, $p=0.03$). L'analisi multivariata (regressione logistica) condotta su tutta la popolazione e poi soltanto nei maschi ha identificato 9 predittori indipendenti di FV, di cui 7 fattori di rischio (fibrillazione atriale, prima kaliemia ≤ 3.5 mEq/L, $FC \geq 90$ bpm, familiarità di I grado per morte cardiaca improvvisa, sede anteriore dell'IMA, ipercolesterolemia nota, inattività fisica) e due protettivi (diabete mellito noto e PA sistolica alla presentazione più alta). Soltanto 2 variabili sono state confermate nelle donne: prima kaliemia ≤ 3.5 (OR 3, IC 95% 1.6-5.8, $p<0.001$) e PA (OR 0.98 per mmHg, IC 95% 0.97-0.99, $p=0.02$). Il coefficiente di correlazione dose-risposta tra kaliemia e probabilità di FV è risultato molto più negativo nelle donne.

Conclusioni: la presente analisi ha identificato differenze di genere tra i casi di FV primaria e ha individuato soltanto 2 predittori indipendenti di FV nella popolazione femminile, con forte valenza nell'ipokaliemia nella sua accezione dose-risposta. Questi riscontri mirano a colmare il gap nelle conoscenze dei fattori di rischio specifici della popolazione femminile, persistentemente sottorappresentata negli studi cardiovascolari.

ARITMIE 722
ABLAZIONE TRANSCATETERE (ARITMIE)
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

RIGHT ATRIAL DIVERTICULUM IN A PATIENT WITH WOLFF-PARKINSON-WHITE SYNDROME

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A 33-year-old man with a 15-years history of an accessory pathway presented with two isolated, self-limited episodes of palpitations. A twelve-lead ECG during normal sinus rhythm showed preexcitation consistent with a right postero-septal accessory pathway. Routine transthoracic echocardiography revealed no structural heart disease or valvulopathies. The electrophysiological study identified an inducible antidromic atrioventricular tachycardia (tachycardia cycle length = 220 ms) due to a high-risk accessory pathway with robust conduction in both antegrade and retrograde directions. The accessory pathway was localized inside a right atrial diverticulum near the tricuspid annulus, confirmed through angiography (Figure 1A) and 3D high-density mapping (Figure 1B). Radiofrequency ablation was successfully performed at the top of the diverticulum at a site recording an accessory pathway potential (Figures 1D and 1E, red arrows). "Anatomical"

accessory pathways are rare, often described in the literature as diverticula of the coronary sinus. However, right atrial diverticula associated with atrioventricular accessory pathways are exceedingly uncommon, with only a few cases reported. To further characterize the diverticulum, we performed a multiplane, ECG-gated magnetic resonance imaging, which showed a maximum dimension of 20x16 mm (Figure 1C). Since the diverticulum did not cause any hemodynamic impact, surgical intervention was deemed unnecessary.



Figure 1

ARITMIE 536
ARITMIE VENTRICOLARI (ARITMIE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
PROGNOSI (SCOMPENSO CARDIACO)

CORRELATION BETWEEN STANDARD ECG ALTERATIONS AND VENTRICULAR TACHYCARDIA OR CARDIAC ARREST IN A MONOCENTRIC RETROSPECTIVE COHORT OF PATIENTS AFFECTED BY ARRHYTHMOGENIC MITRAL VALVE PROLAPSE

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Background: although mitral valve prolapse (MVP) is often considered a benign condition, arrhythmic risk of these patients is still uncertain and frequently an exhaustive arrhythmic risk stratification is not completed.

Objectives: this study aims to identify a statistical correlation between standard ECG alterations frequently found in arrhythmogenic mitral valve prolapse (AMVP) (as defined in EHRA 2022 consensus on AMVP) and NSVT / SVT / CA risk.

Patients and Methods: our monocentric retrospective cohort study has included consecutive patients hospitalized from 01/01/2019 to 25/06/2024 in the Cardiology and Arrhythmology Clinic of the A.O.U. "Ospedali Riuniti", Ancona, Italy and affected by AMVP, according to EHRA 2022 consensus on AMVP, of whom a standard ECG was available. The sample was then divided into 2 cohorts: patients with NSVT and/or SVT and/or CA in anamnesis and 15 patients with PVC \geq 5% without VT history. Finally, we subdivided each cohort between patients with and without altered basal ECG and we analyzed clinical outcomes.

Results: 46 consecutive patients were enrolled, of which mean age was 58,1 [20-95] years, without sex prevalence (males-females: 1:1). 31 patients experienced NSVT and/or SVT and/or CA (mean age: 58,3 [20-95] years, M/F: 1:1,1) and 15 patients with PVC \geq 5% without VT history (mean age: 57,7 [26-77] years, M/F: 1,1:1). AMVP's typical

ECG alteration were found in 19 patients of the all sample (13 had T wave inversion at basal ECG, 8 had a fragmented QRS and 6 had a Long QTc). While inverted T waves were present in both cohorts (8 in VT cohort and 5 in the PVC cohort), fragmented QRS and long QTc seemed to be more frequent in the VT cohort (7 fragmented QRS and 6 long QTc in the VT cohort; 1 fragmented QRS and 0 long QTc in the PVC cohort). A basal altered ECG was found in 5 patients of the PVC \geq 5% without VT history cohort (33,3% of the cohort) and in 14 patients of the NSVT and/or SVT and/or CA cohort (45,2% of the cohort). Thus, ECG alterations resulted more frequent in the cohort with VT and/or CA (Figure 1).

Conclusions: despite the small sample of the study, ECG alterations seem to relate with augmented complex ventricular arrhythmias risk, suggesting the necessity of a complete risk stratification in this clinical context.

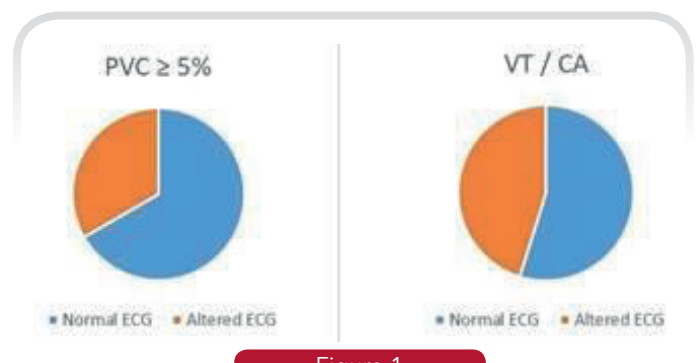


Figure 1

ARITMIE 297

ABLAZIONE TRANSCATETERE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) FARMACI ANTIARITMICI (ARITMIE)

OPTIMIZED WORKFLOW FOR PAROXYSMAL ATRIAL FIBRILLATION ABLATION USING BIDIRECTIONAL STEERABLE VISUALIZABLE SHEATH CATHETER, HIGH DENSITY MAPPING AND VERY HIGH POWER SHORT DURATION

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Background: wide antral pulmonary vein isolation (PVI) is effective for treating paroxysmal atrial fibrillation (PAF), although time-demanding. We investigated the impact of a standardized high-density mapping and very high-power-short-duration (vHPSD) ablation protocol on procedural timing, efficacy, and safety.

Methods: consecutive PAF patients free from previous ablations undergoing PVI alone between January 2022 and March 2023 were prospectively enrolled. Our standardized workflow included a single transeptal puncture (TSP) through which a bidirectional, steerable visualizable sheath was introduced into the left atrium to accommodate an high density, penta-spline mapping catheter and an ablation catheter enabled to deliver vHPSD. Procedural data as well as electrophysiology laboratory times were systematically analyzed.

Results: the study cohort was composed by 138 patients (mean age was 59 ± 11 years, 38% female) and successful PVI was achieved in 100% of cases. Skin-to-skin time and total laboratory time were 58 ± 5 min and 85 ± 7 min. Overall PVI first pass was 95%. Four (3%) complications were reported. Arrhythmia-free survival after 12 months was 90%, with a 8% per year incidence of atrial tachycardias or AF recurrence at a mean follow up of 17 ± 5 months. Upper limit skin-to-skin times, AF at the beginning of the procedure and AAD withdrawal within 1-year resulted predictors of arrhythmia recurrences.

Conclusion: This standardized workflow resulted in low procedural times and arrhythmias recurrence without compromising the safety.



ARITMIE 651

DEFIBRILLATORE IMPIANTABILE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

DEFIBRILLATORE EXTRAVASCOLARE (EV-ICD): ESPERIENZA MONOCENTRICA

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Background: Le patologie cardiache, strutturali ed aritmogeniche, rappresentano, ad oggi, la principale causa di morte improvvisa. Il defibrillatore impiantabile (ICD) rappresenta il trattamento più efficace nella prevenzione della morte cardiaca improvvisa (MCI). I defibrillatori transvenosi (TV-ICD) sono gravati da un tasso crescente di complicanze quali infezioni/malfunzionamenti, secondarie alla presenza degli elettrocateri impiantati all'interno delle camere cardiache. Lo sviluppo di un defibrillatore sottosternale extravascolare (EV-ICD) rappresenta la più recente innovazione tecnologica in grado di superare tali complicanze, specialmente nei pazienti di giovane età.

Esperienza del nostro centro: Abbiamo eseguito c/o il nostro centro di Bari, i primi quattro impianti di EV-ICD, su una popolazione maschile (100%) e con età media di 46,7 anni.

Il primo paziente sottoposto a questa procedura presso il nostro centro è stato un maschio di 68 anni affetto da cardiopatia dilatativa non ischemica e severa disfunzione ventricolare sinistra (FE 25%), già portatore di TV-ICD, espantato nel 2023 per evidenza di endocardite su elettrocateri e trombosi completa a livello di vena cava superiore ed inferiore. Stante l'elevato rischio infettivo e l'assenza di accessi vascolari idonei e necessità di terapia pacing antitachicardico (ATP), per pregressi interventi appropriati, si è optato per impianto di EV-ICD.

Il secondo paziente, 44 anni, con evidenza all'ECG di pattern di Brugada tipo 1 spontaneo, familiarità per Sindrome di Brugada e pe MCI, già portatore di ICD bicamerale, espantato per frattura di elettrocateri. Il paziente è stato quindi sottoposto ad impianto di EV-ICD. Al con-

trollo ambulatoriale a 7 giorni, evidenza di deiezione a livello della ferita della tasca del defibrillatore, pertanto è stato nuovamente ricoverato a Maggio 2024 e sottoposto a revisione di tasca con invio di lembo cutaneo per l'esecuzione di esame colturale risultato negativo.

Il terzo paziente, 56 anni, senza storia di sincopi o di familiarità per patologie cardiovascolari o morte cardiaca improvvisa. Giunto per dispnea ed iperpiressia in pronto soccorso con quadro radiografico suggestivo per polmonite acuta. All'ECG evidenza di pattern spontaneo di tipo I di Brugada durante febbre, e di tachicardie ventricolari sostenute monomorfe (TVSm). Alla luce dei reperti elettrocardiografici si poneva indicazione a impianto di ICD, in prevenzione secondaria. Visto il recente quadro infettivo e il riscontro di TVSm, abbiamo preferito impiantare un EV-ICD, dopo risoluzione del quadro polmonare.

Il quarto paziente, di 19 anni, con familiarità per MCI, sintomatico per episodi lipotimici, con evidenza di pattern di Brugada di tipo I farmaco indotto e spontaneo (intermittente). Stante la giovanissima età e la esile conformazione toracica è stato quindi sottoposto a impianto di EV-ICD.

Discussione: L'EV-ICD rappresenta una delle più importanti novità nel mondo dei dispositivi cardiaci impiantabili (CIED) per la prevenzione della MCI. Alcune delle sue caratteristiche peculiari (dimensioni, longevità, ATP e stimolazione antibradicardica) lo rendono una validissima alternativa ai dispositivi cardiaci tradizionali (TV-ICD) e sottocutanei (S-ICD), e probabilmente rappresenta la migliore opzione terapeutica per una popolazione selezionata di pazienti a rischio di MCI.

ARITMIE 567

MECCANISMI DELLE ARITMIE (ARITMIE)

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

ELETTROSTIMOLAZIONE (ARITMIE)

HIDDEN CULPRITS: HYPERKALEMIA AND HYPERCALCEMIA LEADING TO HEART FAILURE AND ATYPICAL ATRIOVENTRICULAR BLOCK

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Case Report: A 90-year-old woman presented to ED with dizziness, dyspnea and signs of ADHF. The ECG showed sinus rhythm, 80 bpm, conducted with second-degree atrio-ventricular block Mobitz I type with non typical L-W phenomenon, diffuse negative T-waves, and QTc prolongation (560 ms) (F.1).

Echo revealed diffuse hypokinesia (LVEF 50%); moderate signs of central congestion (VeXUS 2) and widespread B- Lines. Laboratory tests revealed acute kidney injury with severe electrolytes imbalances (Ca 4,35 mg/dl; K 6.7 mmol/L; Creat 3.9 mg/mL with eGFR 12 ml/min), and ADHF (BNP 1161 pg/ml, Tnl 30 pg/ml). Correction of electrolytes was performed with calcium gluconate, and a secondary hypoparathyroidism due to CKD was found and treated with high oral dose of colecalcidiol. After 4 days and electrolytes' return within normal ranges, ECG showed normal atrio-ventricular

conduction and QTc 420 ms (F.2). Considering the resolution of the AVB there was no indication for a pacemaker implantation. Additionally, there was an improvement of ADHF-signs and LVEF (60%) at 30 days follow-up.

Discussion: We are faced with an atypical second-degree AVB type I. The maximum prolongation of the P-R interval does not occur in the second beat of the cycle but in the last beat preceding the blocked impulse, and R-R interval does not progressively shorten (F.3). This type of block is also known as Kinoshita variant IIA. Type I has an R-R interval longer than the previous one; type III has irregularly variable P-R intervals. Type II and III can be explained by admitting the longitudinal dissociation of the AV node through the presence of two pathways with different conduction characteristics.

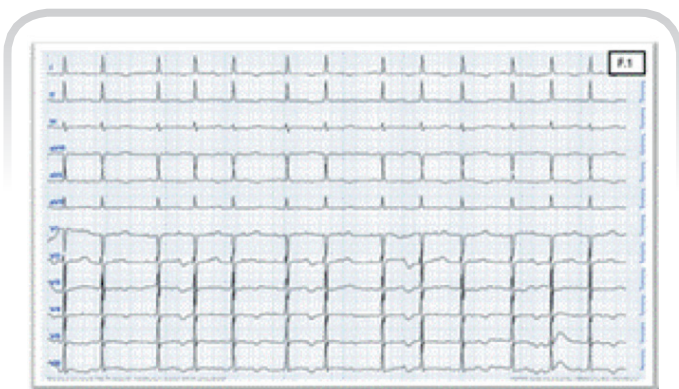


Figure 1



Figure 2



This phenomenon is very rare in literature and it is often described in the context of electrolytes imbalance. In this scenario the AVB is probably due to hyperkalemia, although hypocalcemia could also have played a role, such as some cases of newborns documented. Hypocalcaemia, furthermore, is a recognised cause of secondary QT prolongation, via prolongation of the phase 2. In literature, cases of HF induced by hypocalcemia secondary to hypoparathyroidism have been reported, and calcium + vitD showed reversion of signs and LVEF improvement, like in our patient. This study highlights that hypocalcemic cardiomyopathy should be taken into account in the presence of ADHF

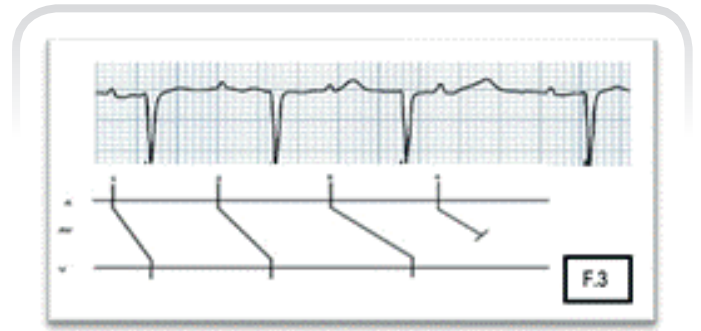


Figure 3

and electrical instability, though further research is needed to clarify the electrophysiological mechanisms.

ARITMIE 239
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
ABLAZIONE TRANSCATETERE (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)
FARMACI ANTIARITMICI (ARITMIE)

UTILIZZO DELLA VERY HIGH POWER SHORT DURATION NELL'ABLAZIONE DI FIBRILLAZIONE ATRIALE E FLUTTER ATRIALE ATIPICO: STUDIO PROSPETTICO MONOCENTRICO

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Background: Pulmonary vein isolation (PVI) is the cornerstone of atrial fibrillation (AFib) transcatheter ablation. Very high-power short-duration (vHP-SD) radiofrequency (RF) ablation has been latterly introduced. Aim of the present study is the analysis of efficacy and safety of vHP-SD with QDOT Micro Catheter (Biosense Webster) in AFib and AtypicalFL.

Materials and Methods: We present a prospective observational study including patients undergoing transcatheter RF ablation of AFib and AtypicalFL in a 18 months period (from 2022 to 2023) at Our Institution. Electroanatomical mapping (EAM) of the left atrium was performed with CARTO3 EAM system (Biosense Webster) using a mapping catheter (Pentaray, Biosense Webster). Ablation was performed according to the physician choice and the patient profile, with the choice between QMOD+ for PVI on the whole procedure or for the posterior PV regions (hybrid approach). Data on efficacy procedural outcomes (complete PVI and isolation of the target lesions at the end of the procedure) and safety were prospectively collected and analyzed by Our EP Team. **RESULTS:** 264 patients underwent AFib and AtypicalFL RF ablation in our EP Laboratory using EAM system CARTO3, of which 79 (31.1%) undergo vHP-SD ablation and were consecutively enrolled. Mean age was 61.6 years (± 12.2). 57 patients (72.1%) had history of Paroxysmal AFib, 18 (22.8%) patients of Persistent AFib and 5 (5.1%) of Atypical Flutter. The most common comorbidity was hypertension (41 patients, 52.6%). Mean ejection

Fraction was 60.4% (± 9.0) and mean LA volume was 80 mL (± 24.4). The procedure was performed in deep sedation in 11 (13.9%) patients, in conscious sedation in 54 (74.7%) patients and under general anesthesia in 9 (11.4%) patients, of whom 8 by the patient choice pre-procedure. At the end of the procedure, successful PVI isolation was achieved in all the patients. 5 patients underwent Atypical Left Atrial Flutter ablation and 14 (17.7%) patients underwent adjunctive cavo-tricuspid isthmus ablation. Mean procedure time was 85 ± 17 minutes, without significant difference between patients with Paroxysmal and Persistent AFib ($p=0.22$). Mean procedure time was significantly increased in patients undergoing re do procedure (mean 109 ± 12 vs 82 ± 3.4 , $p=0.01$). Mean fluoroscopy time was 2.2 ± 1.0 minutes. The procedure was carried out without the use of fluoroscopy in 9 (11.5%) patients, for the present of patent foramen ovale. No major procedural adverse events were recorded. Two (0.03%) minor procedural adverse events were recorded (pericarditis without pericardial effusion), with complete resolution after 5 days from the procedure with standard pharmacological therapy.

Conclusion: In our single center experience, atrial fibrillation and atypical flutter ablation using vHP-SD technology showed high procedural success rate (100% of PVI), short procedural time (mean skin to skin procedure time 85 minutes) and high safety profile (no major adverse events, 2 minor adverse event).



ARITMIE 744

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ABLAZIONE TRANSCATETERE (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

IMPACT OF LOW-VOLTAGE AREA ABLATION IN ADDITION TO PULMONARY VEIN ISOLATION ON ATRIAL FIBRILLATION RECURRENCE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Atrial fibrillation (AF) is the most common arrhythmia worldwide and is associated with a high risk of mortality and morbidity. Pulmonary vein isolation (PVI) ablation is one of the cornerstones of AF treatment. Nevertheless, in certain patients, particularly those with persistent AF, the recurrence rate of arrhythmia remains notably high. Low-voltage areas (LVA) ablation, in addition to PVI, has been proposed as a new strategy in patients with AF, but clinical trials have shown conflicting results. We conducted a systematic review and meta-analysis to assess the impact of LVA ablation in patients undergoing AF ablation.

Methods: A comprehensive search was conducted on PubMed, Embase, and the Cochrane Library up until April 22nd, 2024, to identify all randomized trials examining the role of LVA ablation in addition to PVI in patients with AF. The primary outcome was the recurrence of atrial arrhythmias following the first AF ablation procedure. Secondary outcomes included procedure time, fluoroscopy time, and procedural complications. Sensitivity analyses were conducted, focusing only on patients who had LVA confirmed through mapping. Subgroup analyses were conducted based on study design (multicentric vs. monocentric), AF type, and the ablation strategy used in the control group (PVI only or PVI plus lines and boxes). Meta-regression analyses were also performed to determine if there was any interaction between the primary outcome and potential effect modifiers such as sex, age, left ventricular ejection fraction, left atrium diameter, CHA

DS - VASc score, and AF duration prior to ablation.

Results: A total of 625 results were identified through the database search. After removing duplicates and screening studies, seven randomized clinical trials, comprising a total of 1547 patients, were included in the meta-analysis. The addition of LVA ablation to PVI was found to reduce atrial arrhythmia recurrence (odds ratio [OR] 0.65, 95% confidence interval [CI] 0.52-0.81, $p < 0.001$), with a number needed to treat of 10 to prevent one recurrence. There were no significant differences observed in procedure time (mean difference [MD] -5.32 minutes, 95% CI -19.01 to 8.46 minutes, $p = 0.45$), fluoroscopy time (MD -1.10 minutes, 95% CI -2.48 to 0.28 minutes, $p = 0.12$), or complications (OR 0.81, 95% CI 0.40 to 1.61, $p = 0.54$). The sensitivity analyses confirmed consistent findings when focusing on patients with LVA identified during mapping and in predefined subgroups based on AF type (paroxysmal vs persistent), multicenter vs single-center trials, and the ablation strategy in the control group. Meta-regression analyses indicated that none of the potential effect modifiers had a significant impact on the primary outcome, except for AF duration before ablation (coefficient -0.02, 95% CI -0.32 to -0.001, $p = 0.043$).

Conclusions: In patients with atrial fibrillation, adding low-voltage areas ablation to pulmonary vein isolation decreases atrial arrhythmia recurrence without significantly increasing procedure time, fluoroscopy duration, or the risk of complications.

ARITMIE 563

ELETTROSTIMOLAZIONE (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)

ULTRASOUND-GUIDED VENOUS AXILLARY ACCESS VS STANDARD FLUOROSCOPIC TECHNIQUE FOR CARDIAC LEAD IMPLANTATION: ZEROFLUOROAXI RANDOMIZED TRIAL

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(a) UNIVERSITA' DEGLI STUDI DI FERRARA

Background: Axillary vein puncture (AVP) and cephalic vein surgical cutdown (CVC) are recommended in international guidelines due to their low risk of pneumothorax and chronic lead complications. Directly visualizing and puncturing the axillary vein under ultrasound guidance reduces radiation exposure, provides direct needle visualization, and lowers periprocedural complications. Our hypothesis is that ultrasound-guided axillary access is safer and more feasible than the standard fluoroscopic technique.

Objectives: To assess the efficacy and safety of ultrasound-guided axillary venous access during cardiac lead implantation for pacemakers (PM) and implantable cardioverter-defibrillator (ICD) implantations.

Methods: Patients were randomized in a 1:1 fashion to either axillary venous access under fluoroscopic guidance or ultrasound-guided axillary venous access. The composite outcome, including pneumothorax, hemothorax, inadvertent arterial puncture, pocket hematoma, pocket infection, lead dislodgement, and death, was evaluated 30 days after implantation.

Results: We randomized 270 patients into two groups: the standard group for fluoroguided AVP (n=134), and the experimental group for ultrasound-guided AVP (n=136). No disparities in baseline characteristics were

observed between the two groups. The median age of the patients was 81 years, with females comprising 41% of the population. The majority of patients received single and dual chamber PMs (87% vs. 88%, $p=1.0$), while slightly over 10% in both groups received ICDs (13% vs. 12%, $p=0.85$). In total, we placed 357 leads in pacemakers and 48 leads in ICDs. Among these, 295 leads were inserted via axillary vein access and 110 via cephalic vein access. Notably, the subclavian vein was never utilized as a vascular access. The composite outcome at 30 days was lower in the ultrasound group according to intention-to-treat analysis (odds ratio 0.55; 95% CI 0.31-0.99; $p = 0.034$). The main difference within the composite outcome was the lower incidence of inadvertent axillary arterial puncture in the experimental group (17% vs. 6%; $p = 0.004$). The ultrasound group also exhibited lower total procedural X-ray exposure (10344 $\mu\text{Gy} \times \text{cm}^2$ vs 7119 $\mu\text{Gy} \times \text{cm}^2$; $p = 0.002$), while achieving the same rate of success at the first attempt (61% vs 69%; $p = 0.375$).

Conclusions: ultrasound-guided axillary vein puncture is safer than the fluoroscopy-guided approach, as it achieves the same rate of acute success while maintaining low total procedural radiation exposure. Ultrasound AVP should be considered the optimal venous access method for cardiac lead implantation.



ARITMIE 553

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ABLAZIONE TRANSCATETERE (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE)

PROGNOSTIC EFFECT OF EPICARDIAL ADIPOSE TISSUE AFTER ATRIAL FIBRILLATION CATHETER ABLATION: A METANALYSIS AND SYSTEMATIC REVIEW

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Introduction and aims: The impact of epicardial adipose tissue (EAT) on the development and progression of atrial fibrillation (AF) has been extensively studied, including from a pathophysiological perspective. Although AF catheter ablation (AFCA) has been shown to be more effective than anti-arrhythmic drugs in maintaining sinus rhythm, recurrences are still common. EAT is a significant and available predictor of AFCA failure. This anatomical feature can be assessed by computed tomography (CT), magnetic resonance imaging (MRI), and, to a lesser extent, echocardiography. Most published data are from CT due to its widespread availability; it is a faster and more cost-effective method compared to MRI. The aim of this study was to gather all available research evaluating the effect of total and left atrium (LA) EAT on AFCA and to perform a meta-

analysis to determine the association between EAT and AFCA failure.

Methods and results: The PubMed/ME DLINE databases were searched up to July 11, 2024, for articles reporting late recurrences of AF (LRAF) in patients whose EAT and LA-EAT were evaluated by CT. Twelve studies with LA-EAT data and sixteen with total EAT data were included in the analysis, encompassing 3,965 AF patients (66.4% male, 27.5% persistent AF, mean age 58.92 ± 10.51 years). After an average follow-up of 18.4 months, AF recurrences occurred in 654 patients in the LA-EAT group and in 1,323 patients in the EAT group. The mean LA-EAT among patients with recurrence was 26.03 ± 12.60 mL, while among those free from recurrence it was 23.45 ± 10.81 mL.

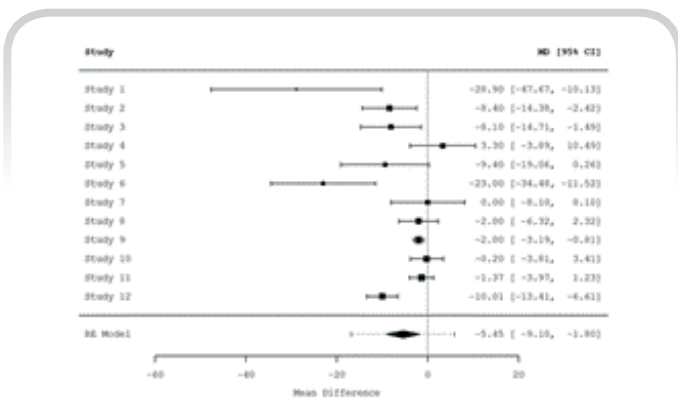


Figure 1

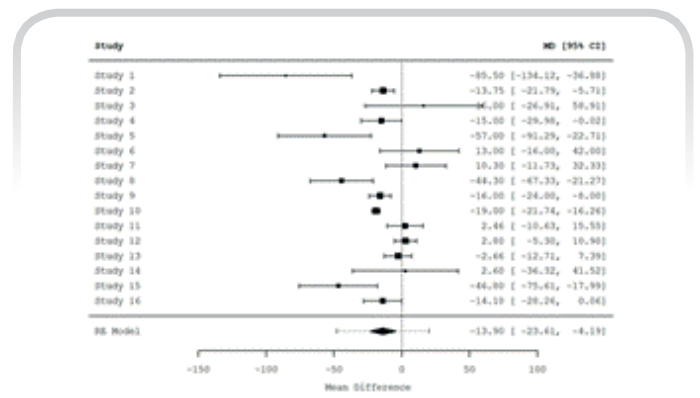


Figure 2

The mean EAT among patients with recurrence was 125.19 ± 46.72 mL, while among those free from recurrence it was 114.39 ± 47.65 mL. Based on the random-effects model, the average mean difference in LA-EAT and total EAT volumes between patients free from AF recurrence and those with recurrence was statistically significant (-5.45 ; 95% CI: -9.10 to -1.81 ; $p = 0.0034$ and -13.90 ; 95% CI: -23.60 to -4.19 ; $p = 0.005$, respectively).

Conclusions: This meta-analysis indicates that both EAT and LA-EAT are valid predictors of AF recurrences following AFCA. CT evaluation of EAT could become routine in the AFCA workflow, as all patients require an assessment of the heart's anatomy, particularly the atria and pulmonary veins. This study highlights the importance of standardizing EAT evaluation for further comparisons among studies.



ARITMIE 694
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)
FARMACI ANTIARITMICI (ARITMIE)

BILATERAL ATRIAL FUNCTION IMMEDIATELY AFTER ECV PREDICTS AF RECURRENCE

Fabio Anastasio (a), Guido Pastorini (a), Mauro Feola (a), Valentina Tardivo (c), Giacomo Pucci (b)

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Rhythm control therapy with electrical (ECV) or pharmacological cardioversion are recommended to improve the quality of life of patients with AF. However, the recurrence rate of AF in the first year after electrical cardioversion (ECV) ranges from 63 to 84%. Morpho-functional changes of both left (LA) and right atria (RA) have emerged as important factors associated with the development, progression, and recurrence of AF, by altering electrophysiological and structural remodelling.

The present study investigated the value of immediately post-procedural cardiovascular assessment to predict AF recurrence after ECV in patients with restored SR. We included 61 clinically stable patients underwent on elective ECV with a successful conversion to sinus rhythm. The primary end point was the evidence of new episodes of AF after the index ECV. We collected medical history, therapy, lifestyle, physical activity, eating habits and alcohol intake, and blood sample. A complete instrumental and clinical evaluation were done 2 hours after ECV, including 12-lead electrocardiograms, an echocardiography with atrial and ventricular strain, and an evaluation of arterial stiffness.

Over a period of 6 months, 24 (39.3%) patients had an AF recurrence. Of these, 16 patients (26.2%) had AF

recurrence over the first month, and 8 (13.1%) between 1 and 6 months. Among anamnestic, anthropometric factors, and laboratory tests, there were no differences among patients with or without AF recurrence at 6 months (Table 1). The prevalence of physical activity appeared to be the only difference between the two groups ($p=0.02$). Among the echocardiographic factor, patients without AF recurrence showed a lower RAVI (Right Atrial Valvular Index) (32 ± 8 vs 40 ± 10 , $p=0.02$), an higher LA strain S-R (15.8 ± 7.7 vs 9.0 ± 4.2 , $p=0.01$), a lower LA strain S-CT (-8.6 ± 5.3 vs -4.7 ± 3.4 , $p=0.04$) and more pronounced lateral a' wave (5 ± 3 vs 3 ± 1 , $p=0.008$), tricuspidal a' wave (7 ± 3 vs 4 ± 2 , $p=0.009$), and media of the three a' wave (6 ± 2 vs 3 ± 1 , $p=0.004$). Transmission times from p wave to different a or a' wave didn't appear to be correlated with recurrence of AF, nor did the p wave duration or p wave dispersion. Among hemodynamic parameters, AF recurrence appear to be consistent with Augmentation Index corrected for 75 beats for minute (AI75) (26 ± 13 vs. 37 ± 12 , $p=0.02$).

The main finding was that left atrial strain, biatrial function evaluated through TDI Doppler, RAVI and augmentation index acquired immediately post-CVE were independent predictor of AF recurrence after ECV.

ARITMIE 698

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) ELETTROSTIMOLAZIONE (ARITMIE) TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)

HYBRID TRANSVENOUS AND SURGICAL APPROACH FOR THE EXTRACTION OF CORONARY SYNUS LEADS: A CASE SERIES

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(a) UNIVERSITÀ DEGLI STUDI DI BRESCIA; (b) BOLOGNINI HOSPITAL - SERIATE;
(c) ASSIUT UNIVERSITY HEART HOSPITAL

Background: Cardiac device-related infection rate has increased substantially over the past years. Transvenous lead extraction is the standard therapy for this complication. In some patients, however, the extraction procedure cannot be completed through the transvenous route alone, in particular in case of coronary sinus lead extraction procedure could be difficult. In such cases hybrid surgical and transvenous approach may be useful.

Methods: We present three cases of patients who underwent hybrid transvenous and surgical extraction CRT-D system because of infection. One patient had an Attain Starfix lead implanted in the coronary sinus. The procedures were performed under local anesthesia with continuous hemodynamic and transthoracic echocardiographic monitoring. We highlight the characteristics of the patients, the features of the devices, the technical difficulties and the outcomes of the procedures.

Results: In all cases, the right atrial and right ventricular leads were extracted through the transvenous route. In one patient, they were extracted using regular stylets and manual traction, while in the other two patients, telescoping dilator sheaths (Cook), Tight rail hand-

powered mechanical sheaths (Spectranetics) and/ or Glide light Excimer Laser sheaths (Spectranetics) were used. The coronary sinus lead could not be retrieved due to extensive fibrosis nor with locking stylets and mechanical dilator sheaths in all 3 cases, in addition to rotational mechanical sheaths and Laser were not completely useful. So two patients underwent to extraction mean left mini- thoracotomy and one patient mean midline sternotomy. During surgical procedure target vein was ligated, and lead fibrosis was dissected, then lead could be extracted through surgical wound. There were no complications in the two minithoracotomy procedures, instead the patient who underwent to sternotomy developed mediastinitis and required reoperation. All three patients were re-implanted with a contralateral CRT-D device after the resolution of infection.

Conclusion: Hybrid surgical and transvenous CIED extraction approach can be useful when transvenous extraction route fails, in particular in case of need of coronary sinus lead extraction. Transvenous approach can be used to dissect adhesion of the proximal part of the lead, while the distal adhesions can be removed surgically, preferably though a limited thoracic incision.



ARITMIE 9
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
ABLAZIONE TRANSCATETERE (ARITMIE)

CLINICAL IMPACT OF SMOKING ON ATRIAL FIBRILLATION RECURRENCES AFTER PULMUNARY VEIN ABLATION

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(a) U.O. CARDIOLOGIA ED ELETTROFISIOLOGIA, OSPEDALE SANTA MARIA NUOVA, FIRENZE

Background: The clinical impact of smoke on atrial fibrillation (AF) recurrences after pulmonary vein isolation (PVI) have contradictory results in previous studies, performed only on Asian populations.

Methods and aim: Smoking habit and other cardiovascular risk-factors were assessed in patients who underwent their first radiofrequency PVI for symptomatic AF. The study aims to assess the clinical impact of smoke on AF recurrences after PVI in a contemporary European cohort of patients.

Results: The study included 186 consecutive patients (135 males [72.6%]) with a mean age of 63.4±9.7 years. Current smokers resulted 29 (15.7%). No statistically significant baseline differences were detected between current smokers and non-current smokers. After a follow-up of 418 ± 246 days, AF recurrence was higher in currently smoking patients vs. non-currently smoker patients, the latter intended as a combination between previous smokers and never smokers (34.5% vs. 14% p=0.01). A previous smoking habit was not associated with increased risk of AF recurrence when compared with patients who never smoked (13.2% vs. 14.6%, p=0.23), while a current smoking habit impacted on AF

recurrence in comparison with previous smokers (p=0.01) and never smokers (p=0.04). The increased incidence of AF recurrence in current smokers was consistent also considering only paroxysmal AF (31.4% vs 9.6%, p=0.012) or persistent AF (50% vs 31.2%, p=0.03). Smoking (HR =2.96 95% CI 1.32–6.64) and persistent AF (HR =2.64 95% CI 1.22-5.7) resulted independent predictors of AF recurrence.

Conclusion: cigarette smoke increases the risk of AF recurrences after PVI, both in paroxysmal and in persistent AF.

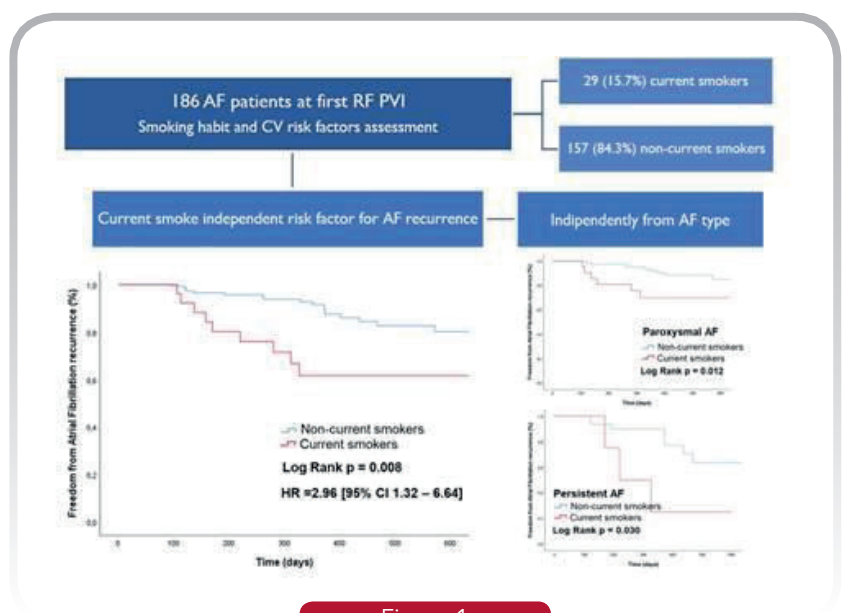


Figure 1

ARITMIE 333

ABLAZIONE TRANSCATETERE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) ARITMIE VENTRICOLARI (ARITMIE) CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

INDICAZIONI ED UTILITA' DELL'ABLAZIONE TRANSCATETERE DELLE ARITMIE IN UNA POPOLAZIONE PEDIATRICA: RISULTATI DI UNO STUDIO MONOCENTRICO

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(a) DIPARTIMENTO DI SCIENZE CARDIOVASCOLARI, AOU DELLE MARCHE, ANCONA

Indicazioni ed utilità dell'ablazione transcateretere delle aritmie in una popolazione pediatrica: risultati di uno studio monocentrico.

Introduzione: L'ablazione transcateretere rappresenta la terapia di prima linea per eliminare i substrati delle tachicardie sopraventricolari e ventricolari nei bambini e negli adolescenti con e senza cardiopatia strutturale. Lo scopo del presente studio è stato quello di valutare la sicurezza, l'efficacia in acuto e a lungo termine e l'uso di fluoroscopia in una popolazione di pazienti inferiore o paria a 18 anni sottoposti a studio elettrofisiologia endocavitario e/o ablazione trans- catetere di aritmie.

Materiali e metodi: Sono stati reclutati 149 pazienti (97 maschi) di età media di 15,4 anni (range: 7-18 anni) e peso corporeo medio di 62,8 anni afferenti % il nostro Centro dal 06/2019 al 02/2024.

Per ogni paziente sono stati rilevati dal nostro archivio elettronico dati relativi a:

- caratteri generali ed antropometrici (razza, etnia e attività sportiva, peso, altezza)
- anamnesi patologica (principali patologie extracardiache, terapie non cardiologiche, ritardo mentale, sindrome genetica, presenza di cardiopatia, scompenso cardiaco o disfunzione ventricolare);
- aspetti ECGgrafici (ritmo, frequenza cardiaca, PR, QRS, QTc)
- aspetti dell'aritmia (età insorgenza, sintomi, tipo, QRS, terapia antiaritmica in acuto e in cronico, even-

tuale studio elettrofisiologico trans-esofageo);

- lo SEF (indicazione clinica, data, età del paziente, modalità di esecuzione, accesso vascolare, sedazione, intubazione, puntura transettale, mappaggio elettroanatomico, sito dell'ablazione, energia impiegata, tempi di scopia, complicanze);
- aspetti del follow-up (ricidiva, sintomatologia della ricidiva, terapia aritmologica in atto)
- eventuale impianto di dispositivi.

I dati sul follow up sono stati raccolti mediante consultazione dell'archivio elettronico sulla base dell'ultima visita registrata o mediante intervista telefonica.

Risultati: Oltre la metà (54%) dei pazienti praticava attività sportiva. L'asma era la patologia extracardiaca più rappresentata (9 pazienti), mentre le cardiopatie congenite erano presenti nel 6,7% del campione.

Nel 57,7% dei casi il sintomo di presentazione della aritmia era il cardiopalmo. Il 31% dei pazienti era in terapia con betabloccante. L'ECG basale documentava nel 14% dei casi una pre-eccitazione ventricolare mentre nel 6% un BBDx completo. Lo SEF è risultato induttivo nel 71,4% dei casi di una tachicardia da rientro AV di tipo ortodromico.

Tutte le procedure elettrofisiologiche sono state effettuate in presenza di anestesista pediatrico dedicato ed in particolare nel 27% dei casi si è impiegata una sedazione mentre nel 7% dei casi si è resa necessaria una anestesia generale.

Il mappaggio elettro-anatomico è stato impiegato in



oltre l'85% delle procedure. Per l'ablazione trans-catetere è stata impiegata la radiofrequenza nella quasi totalità delle procedure.

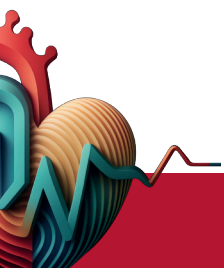
Nel 35% dei casi l'ablazione è stata effettuata mediante puntura transettale.

La durata media della fluoroscopia è risultata di 279,4 secondi con massimo impiego nella ablazione di aritmie ventricolari. Nel 40,5% dei casi le procedure sono state effettuate a raggi zero.

Per quanto riguarda le complicanze queste sono occorse nello 0,7% delle procedure (pseudoaneurisma femorale richiedente intervento chirurgico in una paziente obesa di 12 anni sottoposta ad ablazione di tachicardia ventricolare).

L'efficacia in acuto delle procedure ablativie è risultata del 99% mentre quella a lungo termine (follow up di 3 anni) è stata complessivamente del 85%.

Conclusioni: In una popolazione di 149 pazienti ≤ 18 anni, sottoposta a studio elettrofisiologico endocavitario e/o ablazione trans-catetere di aritmie presso la Clinica Aritmologica di Ancona dal 06/2019 al 02/2024 è stata dimostrata un'elevata efficacia dell'ablazione delle tachiaritmie a fronte di un significativo impiego della fluoroscopia, seppur ridotto rispetto ai principali registri e di un basso tasso di complicanze.



ARITMIE 598

ARITMIE VENTRICOLARI (ARITMIE)

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

FARMACI ANTIARITMICI (ARITMIE)

MECCANISMI DELLE ARITMIE (ARITMIE)

A RARE AND POTENTIALLY LIFE-THREATENING COMPLICATION FOLLOWING PERCUTANEOUS STELLATE GANGLION BLOCK: A CASE REPORT

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Introduction: Percutaneous stellate ganglion block (PSGB) is an emerging therapeutic option for the treatment of electrical storm (ES). Several case reports suggest its effectiveness and safety. However, due to the rarity of ES and the limited current use of SGB, the true incidence of rare complications may be underestimated. We present a case of local anaesthetic systemic toxicity (LAST) following SGB.

Case description: A 72-year-old male presented with palpitations. His medical history included poliomyelitis, hypertension, bifascicular block, and ischemic heart disease. The initial ECG revealed monomorphic ventricular tachycardia (VT) at a rate of 180 beats per minute. The patient was hemodynamically stable, and pharmacological cardioversion with amiodarone was attempted without success. Subsequently, electrical cardioversion was performed, successfully restoring sinus rhythm. On the third of hospitalization, the patient experienced an ES, requiring multiple shocks and intravenous lidocaine. Propranolol was initiated under close monitoring. Following the fourth VT episode, a PSGB was performed under ultrasound guidance. A total of 200 mg of lidocaine and 50 mg of bupivacaine were administered in the region of the longus colli muscle and below the carotid artery. The arrhythmia ceased approximately 5 minutes post-procedure. However, the patient developed delirium, seizures, and vomiting, raising suspicion of LAST. A bolus of 100 ml of 20% lipid emulsion was administered,

followed by continuous infusion. The patient exhibited progressive improvement with complete resolution of neurological symptoms over the subsequent hours. No further arrhythmic episodes were recorded during the remainder of the hospitalization.

Discussion: The most accepted definition of ES is the occurrence of three or more separate episodes of VT or ventricular fibrillation (VF) within a 24-hour period. This condition has a considerable prognostic impact, as patients who develop ES have a mortality rate 2.5 times higher than those with isolated VT. Management of ES can be challenging, with limited therapeutic options available. PSGB is a relatively simple technique that can be applied in most centers. Several case reports suggest a significant reduction in arrhythmic events following PSGB. The STAR study, a recent multicentre observational study involving 133 patients, confirmed the antiarrhythmic effect of PSGB. In this study, over 92% of patients undergoing PSGB experienced a reduction in ventricular arrhythmic events by at least 50% post-procedure. Although the incidence of complications related to PSGB appears low, various adverse events have been reported in the literature, including hematomas, symptoms due to anaesthetic absorption, intravascular injection, brachial plexus injury, and vascular damage requiring intervention. In the STAR study, which represents the largest reported experience to date, only one major complication (0.5%) was observed, most likely due to LAST. In our case,



the initial symptoms were neurological, as typically described in LAST.

However, in the STAR study, the reported patient experienced respiratory depression, which resolved after the administration of a lipid emulsion.

Conclusions: We reported a case of LAST following a PSGB, a complication considered rare according

to current literature but can be potentially fatal if not treated promptly. Given the limited number of reported PSGB cases, the actual incidence of this complication may be underestimated. Further studies are needed to identify rare adverse reactions and their predisposing conditions.



ARITMIE 445

FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

ARITMIE VENTRICOLARI (ARITMIE)

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

THE BENEFICIAL PROPERTIES OF SGLT2 INHIBITORS IN CHRONIC HEART FAILURE PATIENTS WITH ARRHYTHMIC PHENOTYPE

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(a) UOC CARDIOLOGIA UNIVERSITARIA, DIPARTIMENTO INTERDISCIPLINARE DI MEDICINA (DIM), UNIVERSITA' DEGLI STUDI DI BARI ALDO MORO, AOUC POLICLINICO DI BARI

Background: Sodium-glucose cotransporter 2 inhibitors (SGLT2-i) have revolutionized the heart failure treatment scenario, demonstrating an improvement in mortality rate and quality of life. Despite this, life-threatening arrhythmias remain a leading cause of death in these patients. Actually, the impact of these drugs on arrhythmic burden has not been completely understood and is still a topic of debate. The aim of this study was to evaluate the antiarrhythmic effects after 6 months of SGLT2-i treatment in patients with chronic heart failure (CHF) and an arrhythmic phenotype at baseline.

Methods: A non-profit, observational, prospective single-center study was conducted enrolling 82 patients with CHF and carriers of a cardiac implantable electronic device (CIED) with indication for SGLT2-i prescription according to the latest European Guidelines. Major arrhythmic adverse cardiovascular event (MAACE) was evaluated using CIED continuous monitoring at baseline considering the 6 months prior the initiation of gliflozin therapy and at follow-up, after 6 months of treatment. MAACE was defined as the occurrence of sustained ventricular tachycardia, ventricular fibrillation, CIED shock or anti-tachycardia pacing. Moreover, minor arrhythmic events such

as non-sustained ventricular tachycardias (NSVTs) were also considered. Among the 82 patients enrolled, 25 had an arrhythmic phenotype due to the presence of minor and/or major arrhythmic events occurred in the 6 months prior the initiation of gliflozin therapy.

Results: The median age of the population was 63 years (IQR 15). The male sex was prevalent (87%). All patients were carriers of a CIED, and the majority of them (98%) had an implantable cardioverter defibrillator (ICD) or a cardiac resynchronization therapy (CRT). A dilated phenotype was observed in 79% of cases. In about one third of patients an ischemic etiology for CHF was

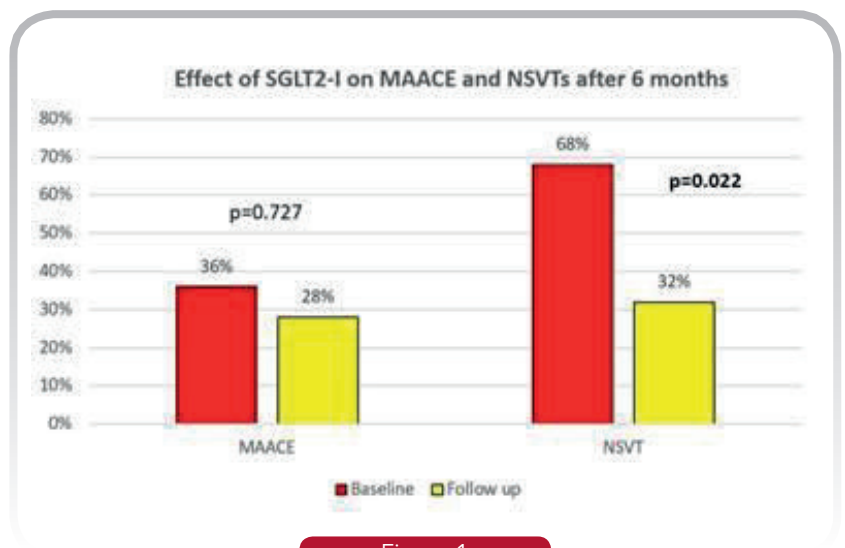


Figure 1

found. In the subgroup of patients with an arrhythmic phenotype a non-statistically significant reduction of MAACE was observed (36% at baseline versus 28% during the follow-up, $p=0.727$). Notably, among the 9 patients with MAACE at baseline, a significant proportion (55%, $p=0.004$) showed no further arrhythmic events. The presence of NSVTs was documented in approximately 68% of cases at baseline, demonstrating a remarkable and statistically significant reduction to 32% during the follow-up period ($p=0.022$). In particular, the median value of

NSVTs per patient at baseline was 1 (IQR 9), significantly decreasing to 0 (IQR 1) in the follow-up ($p=0.005$).

Conclusions: Our preliminary results suggest potential antiarrhythmic properties of SGLT2-i in patient with CHF and arrhythmic phenotype. Further studies including larger cohorts of patients are needed to confirm these findings.



ARITMIE 522

ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) ABLAZIONE TRANSCATETERE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

UN CURIOSO CASO DI TACHICARDIA A QRS LARGHI

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OSPEDALIERO-UNIVERSITARIA MAGGIORE DELLA CARITÀ; (c) STRUTTURA SEMPLICE DI ELETTROFISIOLOGIA,
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Le tachicardie a QRS largo sono da sempre una sfida per il cardiologo. La difficoltà risiede nel distinguere una vera aritmia ventricolare da una forma sopraventricolare condotta con aberranza o da un preesistente blocco di branca. Presentiamo il caso di un uomo di 53 anni che giunge in pronto soccorso per angore e cardiopalmo insorto improvvisamente dopo aver pagato al ristorante, in assenza di comorbidità o precedenti cardiologici ad eccezione di ipertensione in terapia con Doxazosina 2 mg. L'ECG mostrava tachicardia a QRS larghi a 220 bpm emodinamicamente stabile (figura). In pochi minuti si assisteva a ripristino spontaneo del ritmo sinusale, in assenza di anomalie della ripolarizzazione, di preeccitazione o di aberranza di conduzione intraventricolare. Si eseguiva ecoscopia: aorta ascendente ed arco lievemente dilatati, discinesia del SIV, FEVS ai limiti inferiori, non valvulopatie severe, lieve versamento pericardico non emodinamicamente significativo. Non vi erano alterazioni ematochimiche oltre a un lieve rialzo di troponina non significativo, in assenza di stenosi coronariche critiche (riscontro di bridge miocardico su IVA tratto medio) alla successiva coronarografia. La valutazione dell'ECG deponeva per tachicardia sopraventricolare aberrante, tuttavia si cercava conferma diagnostica con studio elettrofisiologico endocavitario: la conduzione basale risultava normale

(AH 92ms, HV 35ms), la stimolazione ventricolare programmata evidenziava tuttavia retroconduzione concentrica non decrementale. Non si evidenziava invece dissociazione longitudinale del nodo atrio-ventricolare (assenza di "jump" alla stimolazione programmata atriale). Si induceva facilmente la tachicardia clinica (con blocco di branca sinistra anche in questo caso) con stimolazione atriale incrementale; prima attivazione ventricolare su catetere Hisiano, fusione VA con prima attivazione atriale in regione di seno coronarico prossimale. Si concludeva pertanto per AVRT ortodromica su fascio accessorio occulto posteriore sinistro, condotta con BBS. Si procedeva a puntura transettale, conferma di potenziale di Kent a livello dell'anello mitralico posteriore ed erogazione di radiofrequenza in tale

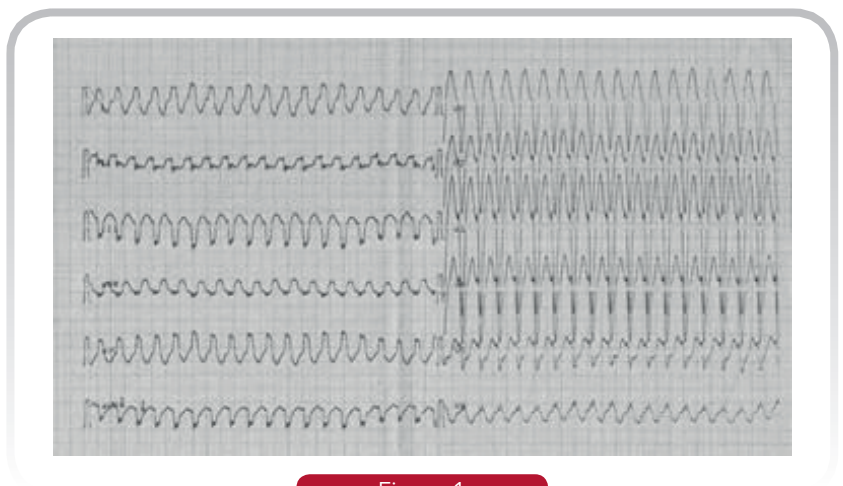


Figure 1



sede, con immediata e stabile interruzione della tachicardia e ripristino di normale retroconduzione concentrica decrementale alla successiva stimolazione ventricolare programmata.

Discussione: la corretta diagnosi ECG delle tachicardie a QRS largo consente il miglior approccio terapeutico; sebbene in caso di dubbio, e special-

mente di instabilità emodinamica, sia sempre bene trattarle come tachicardie ventricolari; quando consentito dalla situazione clinica l'analisi approfondita dell'ECG e le manovre diagnostiche cliniche e farmacologiche possono indirizzare verso il trattamento più corretto.



ARITMIE 766

ABLAZIONE TRANSCATETERE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

FLUTTER ORGANIZATION DURING PULSED FIELD ABLATION FOR ATRIAL FIBRILLATION

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(a) POLICLINICO TOR VERGATA; (b) TEXAS CARDIAC ARRHYTHMIA INSTITUTE

Introduction: Pulse Field Ablation (PFA) has been acknowledged as an effective and safe tool for ablation of Atrial Fibrillation (AF). It is known that during AF ablation, the arrhythmia may organize into atrial flutter. The left atrial posterior wall is identified as a critical source of non-Pulmonary Vein (PV) triggers that facilitate maintenance of atrial fibrillation.

Aim: The purpose of this study is to investigate the phenomenon of atrial flutter organization from AF during the application of PFA.

Methods: This prospective multicentric study encompasses 117 consecutive patients with persistent AF across American and European institutions, undergoing first time catheter ablation.

All receive isolation of the Pulmonary Veins (PV) plus Posterior Wall (PW) isolation.

The PW isolation procedure targeted the standard area between the PVs and extended to the area demarcated by the line connecting the inferior borders of the inferior PV-encircling lesions to the coronary

sinus defined lower part of PW.

We prospectively report the specific locations where AF organized into atrial flutter with a stable cycle length during PFA.

Results: Organization of AF to atrial flutter during PFA was observed in 72 (61.5%) patients.

Analysis of the organization of flutter revealed that in 41 (56.9%) of these cases, flutter began while ablating the lower part of the PW.

Moreover, 9 (12.5%) initiated at one of the PVs, and 22 (30.5%) during the ablation of the posterior wall.

Notably, the flutter was described as perimitral flutter in 33 (45.8%), as typical flutter in 24 (33.3%), and as roof-dependent flutter in 15 (20.8%) of cases.

Conclusion: The findings underscore that during PFA for AF, there is a pronounced tendency for the arrhythmia to organize into atrial flutter, particularly during the ablation of the lower posterior wall.

Of note, ablation in the left atrium organized AF in typical atrial flutter at a considerable rate.



ARITMIE 188
ABLAZIONE TRANSCATETERE (ARITMIE)
ARITMIE VENTRICOLARI (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

VENTRICULAR TACHYCARDIA SUBSTRATE ABLATION IN PATIENTS WITH PRESERVED OR SLIGHTLY DEPRESSED LEFT VENTRICULAR EJECTION FRACTION: PREDICTORS OF VT-FREE SURVIVAL IN A PROSPECTIVE MULTICENTER REGISTRY

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(a) IRCCS HUMANITAS RESEARCH HOSPITAL, ROZZANO; (b) CENTRO MEDICO TEKNON, BARCELLONA

Aims: there is no consensus about the need for an implantable cardioverter-defibrillator (ICD) after catheter ablation of ventricular tachycardia (VT) in patients with preserved or slightly depressed left ventricular ejection fraction (LVEF). This study aims to investigate predictors of VT-free survival in this population.

Methods: we retrospectively analyzed data from a prospective multicenter observational study of substrate-guided VT ablation in patients with a first episode of sustained scar-related VT and LVEF >40%. The ablation procedure was focused on the identification and elimination of the arrhythmogenic substrate during sinus rhythm. Epicardial mapping and ablation was performed if (1) underlying disease, (2) late enhancement at CMR or (3) ECG of clinical or induced VT suggested an epicardial origin, (4) if endocardial mapping did not identify endocardial scar, or (5) if endocardial ablation failed. Identification of entrance and inner conducting channel points (CC) was performed in all patients. At sites where hidden slow conduction (HSC-EGM) was suspected, a double extrastimuli from the right ventricle was delivered. All entrance CC (scar dechanneling) and confirmed sites of HSC were targeted for ablation.

Acute procedural success was defined as absence of any sustained monomorphic VT at the end of the procedure. Ventricular arrhythmia-free survival, defined as absence of any episode of sustained VT (> 30 s) or appropriate ICD therapy, was the primary endpoint.

Results: one-hundred thirty-two patients [67±13 years old, 120 (91%) men, mean LVEF 50±8%] satisfied inclusion criteria. Ablation was acutely successful in 98 (74%) patients. After a mean follow-up of 26±23 months, 32 (24%) patients had VT recurrences. A complete arrhythmogenic substrate elimination [HR: 0.34 (0.16-0.7), p<0.01] and the use of multiple ventricular extrastimuli for HSC identification and ablation [HR: 0.51 (0.27-1.1), p=0.09] were related to VT-free survival. 53 (40%) patients fulfilled both criteria, having an 8% recurrence rate during the follow-up.

Conclusions: VT recurrence after VT substrate ablation in patients with preserved or slightly depressed LVEF remains high. However, complete substrate elimination, also including hidden slow conduction, was related to higher VT-free survival in our cohort and potentially identifies a subgroup of patients at lower risk of recurrences.



ARITMIE 420

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

RED CELLS DISTRIBUTION WIDTH AND OUTCOMES IN PATIENTS WITH ATRIAL FIBRILLATION: A REPORT FROM A PROSPECTIVE REGISTRY

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(a) *CARDIOLOGY DIVISION, DEPARTMENT OF BIOMEDICAL, METABOLIC AND NEURAL SCIENCES, UNIVERSITY OF MODENA AND REGGIO EMILIA, POLICLINICO DI MODENA, MODENA, ITALY*; (b) *CLINICAL AND EXPERIMENTAL MEDICINE PHD PROGRAMME, UNIVERSITY OF MODENA AND REGGIO EMILIA, MODENA, ITALY*

Background and aim of the study: Red cells distribution width (RDW) is a measure of red cell size variability widely available with the routine blood exams. However, there are limited data about its prognostic role in real-world atrial fibrillation (AF) patients. Therefore, the aim of this study was to evaluate the association between RDW values and the outcome.

Methods: We analysed both in-and out-patients with AF enrolled in a prospective registry. For the purpose of this analysis, patients were divided into tertiles according to RDW, as follows: (i) lowest tertile (RDW<13.6%); (ii) middle tertile (RDW 13.6%-14.7%); and (iii) highest tertile (RDW> 14.7%). Differences in terms of outcome was assessed using Cox regression analysis [Model 1: adjusted for age and sex; Model 2: adjusted for the CHA2DS2-VASc score, use of oral anticoagulants (OAC), anaemia, chronic kidney disease (CKD), and type of AF]. The outcome was all-cause death.

Results: A total of 859 patients were included (median age 75 years, IQR 66-81; females 329, 38.8%). The median CHA2DS2-VASc score was 3 [IQR 2-5], and the median HAS-BLED score was 1 [IQR 1-2]. Patients within the highest RDW tertile were older (median age 78 years, IQR 71-84), with a higher prevalence of coronary artery disease (32.5%), heart failure (39.4%),

valvular heart disease (58.0%), hypertension (76.9%), diabetes (28.9%), and CKD (46.6%) (all $p<0.05$). Permanent AF was more frequent in the highest tertile (52.7%), while paroxysmal and persistent AF were both more frequent in the lowest tertile (22.4% and 35.8%, respectively) ($p<0.001$). No differences were observed in terms of OAC prescription among the groups (90.7%, 93.7%, and 92.8%, respectively, $p=0.388$). During a median follow-up of 792 days [IQR 246-2260], 182 (21.2%) events of all-cause death were reported. Kaplan-Meier curves for the primary endpoint according to the different RDW tertiles are reported in the Figure (panel A). At multivariable Cox regression analysis, patients with the highest RDW tertile were independently associated with a higher risk of all-cause death, after adjusting for covariates (Model 1: HR 2.22, 95% CI 1.53-3.20; Model 2: HR 2.14, 95% CI 1.48-3.10). Moreover, panel B of Figure shows the restricted cubic spline curve, built using RDW as a continuous variable: there is a progressive increase in the risk of death for higher values of RDW, after adjusting for the same variables included in Model 2.

Conclusion: In a contemporary cohort of real-world AF patients, higher values of RDW are associated with a worse clinical profile, burdened by more comorbidities and risk factors, and are independently associated with increased risk of all-cause death.



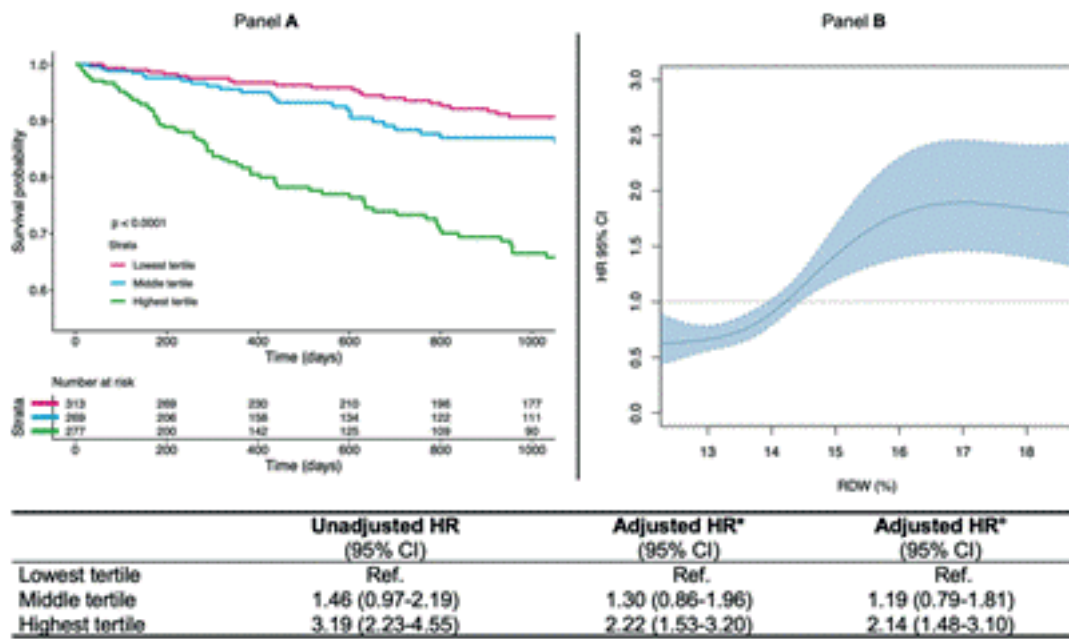


Figure 1

ARITMIE 437

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ELETTROSTIMOLAZIONE (ARITMIE) SINCOPE (ARITMIE)

EFFICACY AND SAFETY OF ALGORITHMS TO MINIMIZE RIGHT VENTRICULAR PACING AMONG PATIENTS WITH ATRIOVENTRICULAR BLOCK

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(a) UNIVERSITÀ DI MODENA E REGGIO EMILIA - U.O. CARDIOLOGIA - POLICLINICO

Background: In literature, there are few studies that examine the efficacy of algorithms designed to minimize right ventricular stimulation (RVPm) in patients with paroxysmal atrioventricular blocks (AVB). The aim of this systematic review and meta-analysis is to assess whether there are differences in clinical outcomes with the use of RVPm algorithms in this group of patients.

Methods: We conducted a systematic search of the PubMed database. Our pre-defined endpoints were: i) Persistent/Permanent atrial fibrillation (PerAF); ii) cardiovascular (CV) hospitalization; iii) all-cause death;

iv) adverse symptoms. We categorized included studies according to the percentage of AVB patients enrolled (< or ≥30%). For direct comparison of outcomes, we utilized the Mantel-Haenszel random-effects model to determine pooled estimates reported as odds ratios (OR) with 95% confidence intervals.

Results: The literature search initially identified 3156 studies. After removing duplicates and screening titles and abstracts, 61 full texts were assessed for eligibility. Finally, 7 studies were included in the analysis. 4 of them enrolled 30% or more of AVB patients (≥30%) and

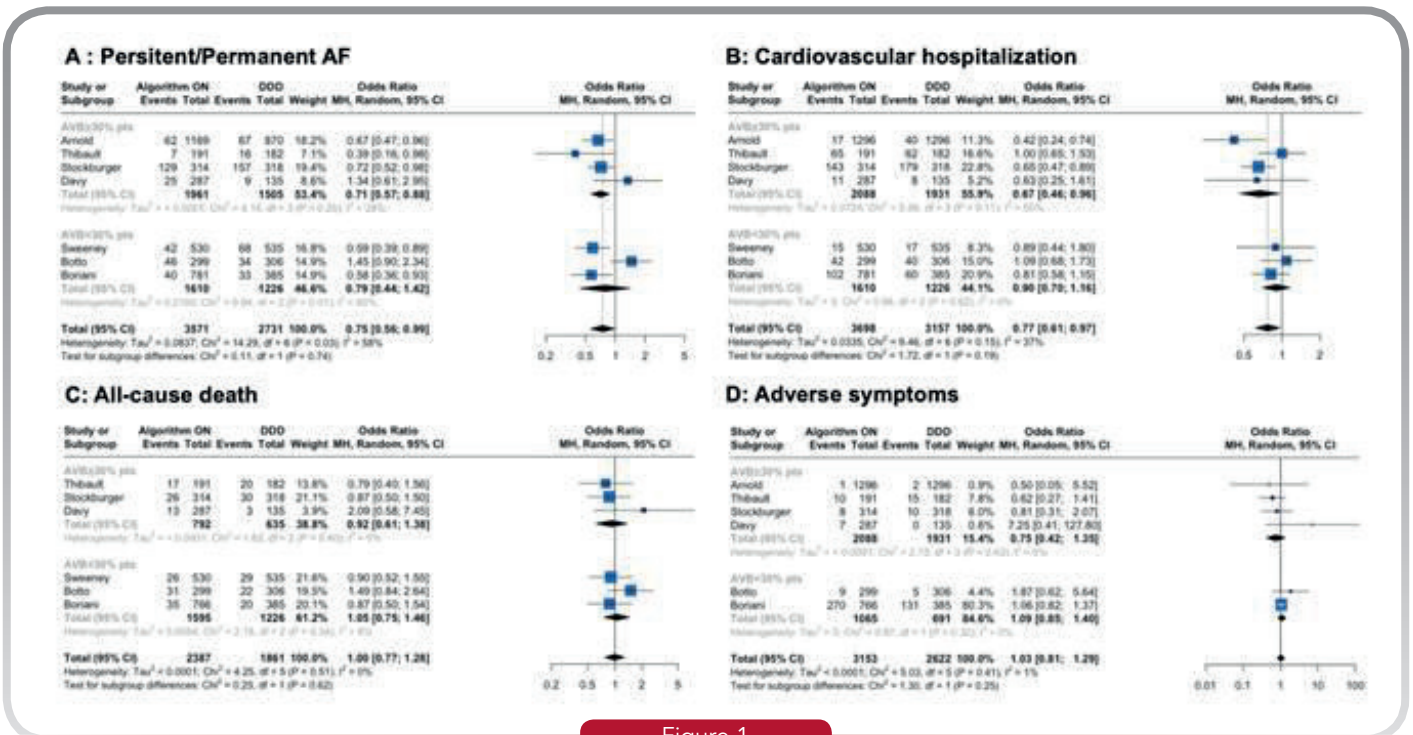


Figure 1

were compared to 3 studies enrolling <30% of AVB.

We did not observe a significant interaction effect between the use of RVPm algorithms and the percentage of AVB patients enrolled for all the outcomes considered in the study: i) perAF ($\geq 30\%$ AVB OR 0.71, 95% CI 0.57-0.88 vs <30% AVB OR 0.79, 95% CI 0.44-1.42, Pint=0.74); ii) CV Hospitalization ($\geq 30\%$ AVB OR 0.67, 95% CI 0.0.46-0.96 vs <30% AVB OR 0.90, 95% CI 0.70-1.16, Pint=0.19); iii) all-cause death

($\geq 30\%$ AVB OR 0.92, 95% CI 0.61-1.38 vs <30% AVB OR 1.05, 95% CI 0.75-1.46, Pint=0.62); iv) adverse symptoms ($\geq 30\%$ AVB OR 0.75, 95% CI 0.42-1.35 vs <30% AVB OR 1.09, 95% CI 0.85-1.40, Pint=0.25).

Conclusion: algorithms for RVPm can improve clinical outcomes and are safe among patients requiring anti-bradycardia therapies with similar efficacy among those with AVB.

ARITMIE 900

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

ARRHYTHMIA-INDUCED CARDIOMYOPATHY: CLINICAL CHARACTERISTICS AND OUTCOMES COMPARED TO IDIOPATHIC DILATED CARDIOMYOPATHY

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Background: Supraventricular tachyarrhythmias (SVT), frequent premature ventricular complexes (PVCs), and left bundle branch block (LBBB) have been associated with the development of a reversible form of left ventricular systolic dysfunction (LVSD), known as Arrhythmia-induced Cardiomyopathy (AiCM). Diagnosing AiCM is challenging due to the absence of specific diagnostic criteria and the broad differential diagnosis of other causes of LVSD, especially when first manifesting as dilated cardiomyopathy (DCM).

Aim of the study: We sought to explore differences in clinical presentation, laboratory parameters, instrumental characteristics and clinical outcomes of patients with AiCM as compared with those of patients with idiopathic DCM.

Methods: We retrospectively collected clinical, laboratory and instrumental characteristics of patients with AiCM who have been followed up for at least 1 year at the Heart Failure outpatient clinic of our institution since January 1st, 2017. We defined AiCM as new onset of LVSD (LVEF <50%) associated with atrial fibrillation, atrial flutter, LBBB, or a PVCs burden of $\geq 10\%$ followed by complete (i.e. LVEF $\geq 50\%$) or partial (i.e. an increase of LVEF $\geq 10\%$ from baseline, and LVEF $\geq 40\%$) recovery of LV systolic function within 6 months from arrhythmia resolution, rate control, or resynchronization therapy. We compared characteristics of AiCM patients with

those of DCM patients (defined according to the 2023 ESC guidelines on cardiomyopathies) followed up at our institution. Baseline characteristics were compared using Chi-square test, t-test, or Mann-Whitney test, as appropriate.

Results: Forty-eight patients with AiCM and 119 patients with DCM were included. Twenty-one (43.7%) patients presenting with LV dilatation subsequently recovered LVEF and were therefore classified as having AiCM. Patients with AiCM were more often male (M:F ratio 2:1) and were older at diagnosis compared with DCM patients [61.5 years (IQR 56-70) vs 51 years (44-57), $p < 0.001$]. At first follow up evaluation, patients with AiCM were less frequently asymptomatic (NYHA I) than those with DCM [47.3% vs 68%, $p = 0.015$] despite exhibiting higher LVEF [$32 \pm 8.32\%$ vs $29.6 \pm 8.71\%$, $p = 0.056$] and lower indexed left ventricular end-diastolic diameter (LVEDDi) [30.3 ± 4.87 mm/m² vs 33.3 ± 5.27 mm/m², $p = 0.005$]. AiCM was associated with a higher indexed left atrial diameter (LADi) [22.9 ± 4.94 mm/m² vs 22.5 ± 5.84 mm/m², $p = 0.005$] than DCM. The median follow-up duration was shorter for AiCM than DCM patients [2.68 (IQR 1.57-4.48) years vs 3.65 (IQR 1.14-8.99) years, $p = 0.02$]. During follow-up, LVEF improved by $19.9 \pm 9.04\%$ in AiCM patients and by $6.86 \pm 12.3\%$ in DCM patients ($p < 0.001$), to $51.7 \pm 5.59\%$ and $36.4 \pm 11\%$, respectively. During follow-up, LVEDDi decreased by 2.99 ± 3.03 mm/m² in AiCM patients and



by 2.44 ± 4.13 mm/m² in DCM patients ($p < 0.487$), to 26.7 ± 3.5 mm/m² and 31.4 ± 4.62 mm/m², respectively ($p < 0.001$).

Conclusions: AiCM is a reversible cause of

cardiomyopathy, that can sometimes mimic idiopathic DCM by presenting with LV dilatation. The identification of predictors of recovery left ventricular function is crucial for optimizing patient management and improving outcomes.



ARITMIE 170

ELETTROSTIMOLAZIONE (ARITMIE)

GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)

DEFIBRILLATORE IMPIANTABILE (ARITMIE)

DIAMOCI UN TAGLIO: STRATEGIE ALTERNATIVE ALLA STIMOLAZIONE TRANSVENOSA

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Introduzione: L'incremento del numero di portatori di dispositivi cardiaci impiantabili (CIED) cui si è assistito negli ultimi anni si è associato ad un parallelo aumento di incidenza di infezioni e malfunzionamenti degli elettrocatereteri (EC), con conseguente necessità di sottoporre tali pazienti a procedura di estrazione transvenosa degli elettrocatereteri (TLE). Quest'ultima procedura non è scevra da complicanze, e presenta un tasso di mortalità non trascurabile. È dunque emersa la necessità di avvalersi di strategie alternative alla stimolazione transvenosa.

Caso Clinico: Si riporta il caso di un paziente di 56 anni, con storia di bicuspidia aortica complicata da molteplici episodi di endocardite infettiva più volte trattati chirurgicamente. Portatore di pacemaker (PM) per BAV di III grado, poi upgrading a terapia di re-sincronizzazione con CRT-D per severa disfunzione bi-ventricolare. Sottoposto a multiple procedure di TLE degli EC e re-intervento su protesi valvolare aortica e aorta ascendente sec. Bentall per complicanze meccaniche ed infettive. Accedeva presso il nostro centro per disfunzione dell'EC atriale, con riscontro di frattura dei monconi, e multiple interruzioni della guaina isolante dell'EC ventricolare al controllo radiologico. Alla venografia evidenza di occlusione degli accessi vascolari venosi a sinistra e dubbia pervietà di quelli a destra. Pertanto, dopo discussione collegiale in Heart Team, considerato il quadro clini-

co-anamnestico del paziente, si optava per impianto di leadless pacemaker (LLPM), successivo espianto del generatore con abbandono degli EC ed infine, impianto di defibrillatore sottocutaneo (S-ICD).

Discussione: Dal registro ELECTRa (European Lead Extraction ConTRolled) si evince che le complicanze più frequenti che si verificano durante la TLE sono l'avulsione cardiaca e la lacerazione dei vasi, ed inoltre la mortalità correlata alla procedura sembra essere più elevata soprattutto nei pazienti con diabete, insufficienza renale, EC impiantati da diversi anni, BMI elevato. Questi pazienti meritano una particolare attenzione anche nel momento in cui si propone un re-impianto del dispositivo. Nel caso clinico riportato, l'elevato profilo di rischio infettivo e di ulteriori complicanze peri-procedurali correlate all'esecuzione di una nuova TLE, ha reso necessario optare per una strategia alternativa. La decisione di

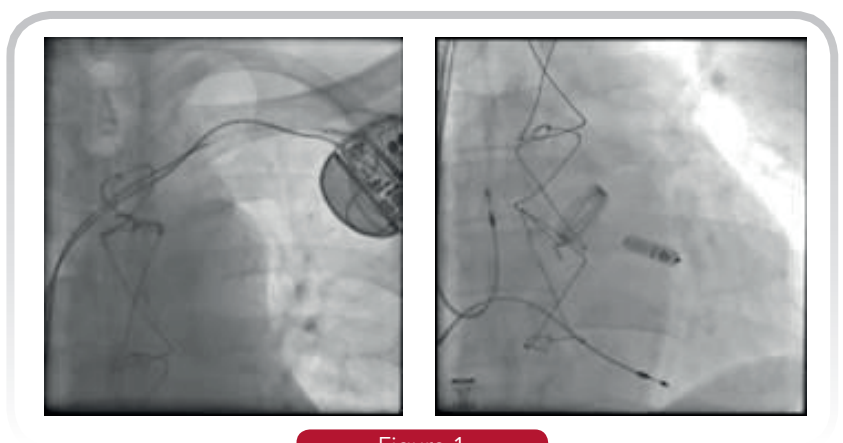
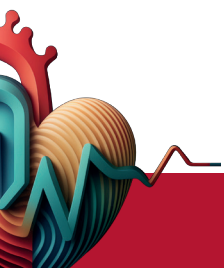


Figure 1

abbandonare gli EC disfunzionanti e di procedere ad impianto di LLPM, infatti, è avvalorata da evidenze a supporto di questi dispositivi che, nell'ultimo decennio, sono sempre più usati. L'associazione combinata con l'S-ICD, potrebbe portare ad un

aumento delle indicazioni di impianto di entrambi i dispositivi, soprattutto laddove si preveda che la stimolazione transvenosa sia correlata ad un maggior rischio di complicanze.



ARITMIE 870

ABLAZIONE TRANSCATETERE (ARITMIE) ARITMIE VENTRICOLARI (ARITMIE) ELETTROSTIMOLAZIONE (ARITMIE)

UN PICCOLO RAMO TAMPONANTE: COMPLICANZA DI ABLAZIONE ENDO- EPICARDICA DI TACHICARDIA VENTRICOLARE SOSTENUTA IN CORSO DI STORM ARITMICO

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Introduzione: La tachicardia ventricolare (TV) è un'aritmia ventricolare complessa ad alto rischio di morte cardiaca improvvisa e si suddivide in sostenuta o non sostenuta ed in monomorfa o polimorfa. La cardiopatia ischemica è la causa principale e si osserva nel 5-10% dei pazienti con SCA (solitamente polimorfe) mentre nella cicatrice miocardica si osserva solitamente una TV monomorfa. Le altre cause includono: cardiomiopatie congenite, canalopatie, cardiomiopatia infiltrativa, distonie, miocardite, HCM, tachicardia ventricolare idiopatica.

Caso clinico: Paziente di 35 anni, uomo. Nel 05/2021 episodio di TVS con contestuale riduzione di FE (38%) e dimostrazione RM di esiti di miocardite in sede laterale medio-basale. Nel 11/2021 ricovero per TV sincopale con successiva comparsa di fasi di asistolia per cui impiantato ICD bicamerale. Al monitoraggio remoto TVS trattate con ATP per cui eseguito tentativo di ablazione endocardica senza inducibilità e senza riscontro di substrato mappabile. Nel 12/2022 ennesimo episodio di TV trattata con ATP e DC Shock. Successivo ricovero per storm aritmico; all'ecoTT: FE > 55%, non valvulopatie significative. Nel 01/2023 il paziente veniva trasferito presso la nostra divisione per ablazione del substrato aritmico. Al mappaggio endocardico: assenza di potenziali tardivi e significative aree di scar. Al mappaggio epicardico: due aree confinanti di potenziali estremamente tardivi e frammentati in regione posterolaterale basale (coerente con RMN). Durante mappaggio induzione spontanea di TV clinica, risoltasi prima di mappaggio di attivazione completo. Eseguita coronarografia: esclu-

sa prossimità di rami coronarici epicardici in regione di interesse. Pertanto, eseguita ablazione mediante radiofrequenze ottenendo progressiva scomparsa di tardivi anche al remap. Non reinducibilità di aritmie ventricolari con singolo, doppio e triplo extrastimolo da apice RV. Al termine della procedura, dopo scambio Agilis Epi con pigtail, comparsa di versamento pericardico tamponante per cui veniva eseguita sternotomia mediana in emergenza con successiva emostasi (non sanguinamento cardiaco, gemizio intrapericardico da piccolo vaso di parete toracica). Ad ecoTT pre-dimissione: FE 58%. IT+. Minimo scollamento pericardico senza falde di versamento. Non più aritmie ventricolari fino a perdita del paziente al follow-up.

Discussione e Conclusioni: La tachicardia ventricolare è un'aritmia minacciosa per la vita. L'ablazione può ridurre il burden di aritmia fino ad evitarne la recidiva. Le ablazioni epicardiche sono tra le procedure più frequentemente associate a tamponamento cardiaco come complicanza, solitamente correlata ad una rottura di parete cardiaca. In questo caso, la frequenza di recidive insieme con la dimostrazione di substrato aritmico coerente con la RM, ha sostenuto l'indicazione alla procedura. Il versamento pericardico è stato drenato chirurgicamente ed è stato riscontrato un sanguinamento da piccolo vaso arterioso della parete toracica. La combinazione di mappaggio e risonanza sono degli strumenti che ci permettono di individuare la regione target per l'ablazione di TV e la conoscenza delle complicanze è fondamentale per poterle gestire durante la procedura.



ARITMIE 86
MECCANISMI DELLE ARITMIE (ARITMIE)
FARMACI ANTIARITMICI (ARITMIE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)

UN CASO DI ANGINA VASOSPASTICA IN PRESENZA DI PATTERN DI BRUGADA TIPO I

Beatrice Marongiu (a), Maria Laura Serra (a), Andrea Spano (a), Gian Francesco Cucculliu (a),
 Maria Elena Lucia Picoi (b), Silvia Denti (b), Filomena Sechi (b), Piero Caddeo (b), Giuseppe Sabino (b), Gavino Casu (a)
 (a) UNIVERSITÀ DEGLI STUDI DI SASSARI; (b) ASL GALLURA UN CASO DI ANGINA VASOSPASTICA IN
 PRESENZA DI PATTERN DI BRUGADA TIPO I.

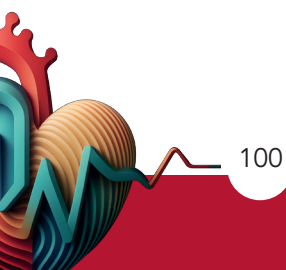
L'angina vasospastica consiste nella vasocostrizione di un'arteria epicardica con transitorio sopraslivellamento del tratto ST all'elettrocardiogramma. La sindrome di Brugada è invece una canalopatia ereditaria che predispone ad aritmie ventricolari maligne. Si tratta di due condizioni fisiopatologicamente distinte che tuttavia in rari casi possono coesistere.

Un uomo di 63 anni iperteso ed ex fumatore giungeva a ricovero presso la nostra UO a seguito di epigastralgia e successivo episodio di vomito seguito da breve episodio sincopale, di versomile natura situazionale. All'ECG a 12 derivazioni riscontro di pattern di Brugada tipo I spontaneo in assenza di ulteriori alterazioni, con regressione spontanea dopo poche ore. All'ecocardiogramma transtoracico non alterazioni della cinesi regionale ventricolare sinistra, dati morfofunzionali nei limiti. Agli esami ematici evidenza di necrosi miocardica con Tnlhs 517 pg/mL. Veniva quindi eseguita coronarografia che evidenziava ateromasia non critica e vasospasmo del segmento medio della coronaria destra, con sopraslivellamento del tratto ST all'ECG in sede laterale,

regredito dopo infusione di nitrati intracoronarici.

La coesistenza di angina vasospastica e pattern di Brugada nello stesso paziente pone un problema nella scelta terapeutica poichè sono presenti in letteratura studi che evidenziano come i calcio antagonisti centrali ed i nitrati, farmaci di prima scelta nel trattamento dell'angina vasospastica, possano peggiorare il pattern ECG e favorire eventi aritmici nei pazienti con sindrome di Brugada. Questi farmaci andrebbero perciò utilizzati con cautela.

Abbiamo quindi introdotto terapia con diltiazem, isosorbide dinitrato RP, cardioaspirina ed atorvastatina. Al monitoraggio telemetrico (72 ore) non ulteriore evidenza di pattern di Brugada tipo I né comparsa aritmie. E' stato inoltre impiantato dispositivo loop recorder per migliore monitoraggio post dimissione. Al controllo da remoto ad oggi non evidenza di aritmie. Negativi anche i tracciati registrati ai successivi controlli ambulatoriali (1, 3 e 6 mesi) ai quali il paziente riferiva benessere soggettivo.



ARITMIE 45

ABLAZIONE TRANSCATETERE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE)

LEFT ATRIAL SPATIAL ENTROPY: A NOVEL TOOL FOR ELECTROPHYSIOLOGICAL SUBSTRATE CHARACTERIZATION IN ATRIAL FIBRILLATION

Lorenzo Gigli (a), Alberto Preda (a), Patrizio Mazzone (a), Roberto Sassi (b)

(a) ASST NIGUARDA CA' GRANDA; (b) DIPARTIMENTO DI INFORMATICA, UNIVERSITÀ DEGLI STUDI DI MILANO

Background: Electrical remodeling has been linked to atrial fibrillation (AF) progression and recurrence after catheter ablation (CA). Substrate mapping based solely on voltage amplitude electrogram does not provide a comprehensive understanding of the left atrial (LA) disease. The aim of this study is to assess left atrial spatial entropy (LASE) from voltage maps routinely obtained during AF ablation to further characterize atrial tissue.

Materials and methods: High-density electroanatomic maps of 27 patients with paroxysmal or persistent AF undergoing routine CA were prospectively collected. From voltage maps, a computational postprocessing was performed to quantify LASE by using Shannon Entropy method. Downsampling of the original meshes was performed to make the results more homogeneous and comparable. Finally, correlations

between LASE and AF clinical and electrophysiological characteristics were explored.

Results: LASE differentiated patients with paroxysmal and persistent AF (6.45 ± 0.41 vs. 5.87 ± 0.53 , $p=0.028$) as well as patients with normal and abnormal LA substrate (6.42 ± 0.42 vs. 5.87 ± 0.56 , $p=0.043$) independently from the basal rhythm during EM acquisition (6.33 ± 0.41 vs. 6.11 ± 0.63 , $p=0.619$). The capability of LASE in predicting LA abnormal substrate was assessed by ROC analysis (AUC 0.81, C.I.: 0.62 – 0.99, Youden index 6.06, sensitivity 80%, specificity 80%). The two patients with the lowest LASE reported AF recurrence at follow up.

Conclusion: LASE may have a role in further characterization of LA substrate and the type of AF independently from basal rhythm.



ARITMIE 207
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

EVALUATION OF BRUGADA ECG PATTERN IN A LARGE COHORT OF 550 PATIENTS ADMITTED IN PSYCHIATRIC UNIT: A LONGITUDINAL PROSPECTIVE STUDY

Alessandra Margaglione (a), Francesco Santoro (a), Ilaria Ragnatela (a), Francesco Niglio (a), Damiano D'alexandro (a),
 Girolamo D'ariento (a), Pierluigi Pellegrino (a), Natale Daniele Brunetti (a)

(a) *CARDIOLOGY UNIT, DEPARTMENT OF MEDICAL AND SURGERY SCIENCES, UNIVERSITY OF FOGGIA, ITALY*

Background: Brugada syndrome (BrS) is an inherited disorder with autosomal dominant transmission, which occurs predominantly in males in the third to fourth decade of life with resting syncope, nocturnal agonic breathing, major ventricular arrhythmias and sudden death. Arrhythmic complications can occur spontaneously or following exposure to triggers such as fever, or certain categories of medications, including psychiatric drugs.

Aim of the study: to evaluate the prevalence of Brugada ECG pattern in psychiatric patients.

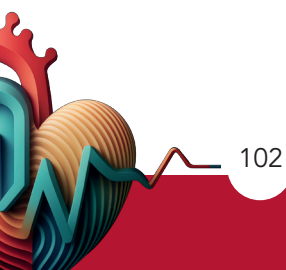
Methods: from January 2023 to December 2023, 550 consecutive patients who were admitted to the psychiatric department of the university hospital of Foggia were enrolled. For each patient, electrocardiographic and anamnestic data including psychiatric diagnosis, current drug therapy and family history were collected.

Results: Twenty-one out of five-hundred and fifty patients (3.8%) presented with a Brugada ECG pattern.

Mean age was 42 ± 6 years and seventeen out of twenty-one patients (81%) were male. Two patients exhibited a Spontaneous type 1 Brugada ECG pattern meanwhile nineteen patients had a Brugada type 2 or 3 ECG pattern. When compared to the general population, those with Brugada ECG had longer P wave duration (110 ± 7 vs 103 ± 13 msec $p < 0.01$) and longer QRS duration (97 ± 14 vs 89 ± 12 msec $p = 0.04$).

Evaluating psychiatric disorders, patients with Brugada ECG had high prevalence of mood disorders (10 out of 21, 47%). Other disorders were schizophrenia (3 out of 21, 14%), cognitive retardation (5 out of 21, 23%), and attention disorder (1 out of 21, 5%). Moreover 4 patients were drug addicted. Only 5 out of 21 (24%) patients had a family history of psychiatric and neurological disorders.

Conclusions: Brugada ECG pattern has a prevalence of 3.8% in a large cohort of psychiatric patients. Mood disorders was the most common diagnosis in this cohort. Large prospective registries are needed to evaluate the clinical feature and potential clinical implication of this findings.



ARITMIE 953

ABLAZIONE TRANSCATETERE (ARITMIE) ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE)

GENDER GAP IN ELECTROPHYSIOLOGY: A PATIENT PROSPECTIVE

Francesco Schiavone (a), Gennaro Ciliberti (a), Anahita Fazeli (a), Martina Apicella (a), Benedetta Anselmi (a), Yari Valeri (a), Francesca Campanelli (a), Leonardo D'angelo (a), Laura Cipolletta (a), Paolo Compagnucci (a), Loredana Messano (a), Federico Guerra (a), Antonio Dello Russo (a), Michela Casella (b)

(a) CARDIOLOGY AND ARRHYTHMOLOGY CLINIC, UNIVERSITY HOSPITAL "OSPEDALI RIUNITI", MARCHE POLYTECHNIC UNIVERSITY, ANCONA; (b) DEPARTMENT OF BIOMEDICAL SCIENCES AND PUBLIC HEALTH, MARCHE POLYTECHNIC UNIVERSITY, ANCONA

Gender disparities continue to be a significant issue across medical specialties, including interventional cardiology. Recent trends indicate an increasing number of female physicians in Italy, however societal perceptions of gender remain problematic. This study aims to explore the "gender perception" of healthcare personnel by the patient undergoing electrophysiology procedures.

We analyzed 66 patient questionnaires from our ward. Of these patients, 34.8% were female (23) and 65.2% were male (43), with a mean age of 60.35 ± 14.24 years for females and 55.19 ± 17.27 years for males. Notably, a higher proportion of female patients held a university degree compared to their male counterparts: 39.1% versus 23.3%, respectively (figure 1).

Patient origin data showed that 63.6% were from the Marche region, with 22 patients from outside

the region (figure 2). Regarding gender preference for healthcare personnel, 88.3% of patients had no gender preference for the first operator (84.8%), second operator (92.4%), anesthesiologist (89.4%), or nursing staff (86.4%). Among those with preferences, 89% preferred a male first operator, 75% preferred a male second operator, 60% preferred a male anesthesiologist, and 89% preferred a female nurse (figure 3).

These preliminary data highlight significant gender-based perceptions among patients and suggest potential biases in healthcare delivery. A limitation of the study is the sample size. An higher number of patient will allow more significant findings. Further research is needed to explore these perceptions more deeply and to address any underlying factors contributing to these preferences and biases.

DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

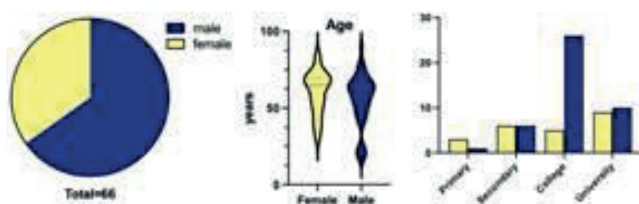


Figure 1

PATIENT ORIGIN

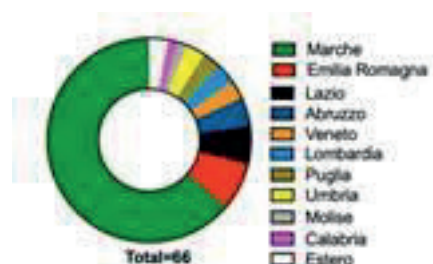
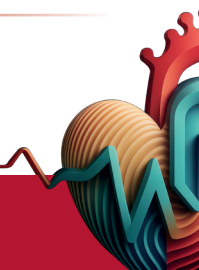


Figure 2



GENDER PERCEPTION

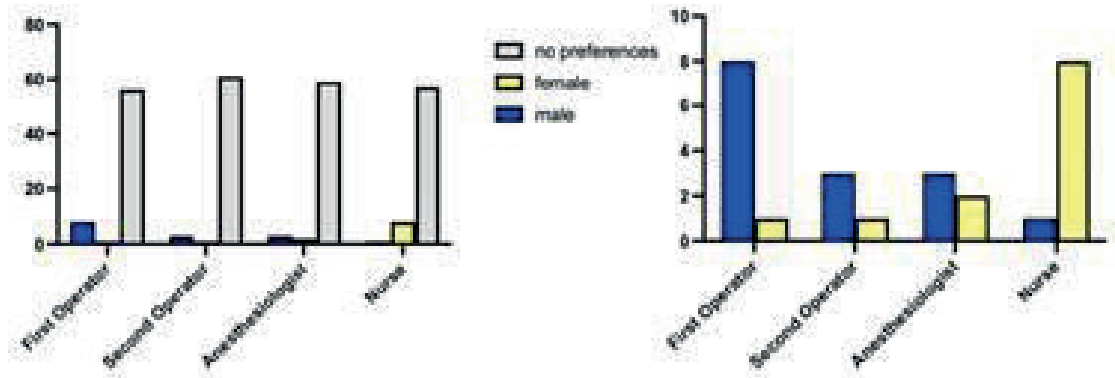


Figure 3



ARITMIE 151

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA (ASSISTENZA CARDIACA IN ACUTO)

CARDIAC MEMORY PRESENTING AS ST ELEVATIONS FOLLOWING REENTRANT SUPRAVENTRICULAR TACHYCARDIAS

Andrea Tacchetto (a, b), Caterina Chiara De Carlini (b), Ester Meles (b), Antonio Pani (c), Stefano Maggiolini (b)
(a) UNIVERSITA DEGLI STUDI MILANO-BICOCCA; (b) SC CARDIOLOGIA OSPEDALE SL MANDIC,
MERATE ASST LECCO; (c) SC CARDIOLOGIA OSPEDALE A MANZONI, LECCO ASST LECCO

Changes in repolarization resulting from atypical ventricular activation are known as cardiac memory (CM). After abnormal activation stops, the T wave aligns with the previously "abnormal" QRS complex. CM is associated with various cardiac conditions like ventricular paced rhythm, premature ventricular contractions (PVC), intermittent left bundle branch block, ventricular tachycardia, and Wolff-Parkinson-White syndrome. Previous literature has reported instances of CM presenting as ST elevation in a patient with a paced rhythm. In this case, the authors noted the presence of biphasic T waves in the inferior leads and ST elevation following an abnormal right ventricular paced rhythm. Similarly, another report described ST elevation in a patient who underwent premature ventricular complexes (PVC) ablation.

There are limited documented cases of ST-segment elevation in the context of CM. Hence, this may be the first documented case of CM presenting as ST elevation following reentrant supraventricular tachycardias. Through this clinical case, we aim to underscore the possibility of an ST-segment memory, similar to a T-wave memory.

Upon arrival at the emergency department, a 47-year-old patient presented himself with symptoms of rapid heart rate and retrosternal chest discomfort. The patient had been undergoing antibiotic treatment for pharyngitis for approximately one week. The only reported cardiovascular risk factor

was a family history of cardiovascular disease, with no other significant medical history noted. Blood tests indicated no significant abnormalities (TN I at 37 ng/l Vn <10 ng/l, stable during observation). An initial ECG upon admission revealed wide QRS tachycardia with a heart rate of 205 beats per minute. The tachycardia spontaneously regressed during the evaluation; however, a subsequent ECG exhibited diffuse ST-segment depression with a supra-sloped ST at AVr, which resolved within the following hour. Considering the uncertain clinical circumstances, the patient was admitted to the cardiology department for a comprehensive evaluation to exclude potential ischemic etiologies. Subsequent coronary angiography revealed no thrombus, dissection, stenosis, or vasospasm in the coronary arteries. During the patient's hospital stay, an electrophysiological study was conducted, which revealed evidence of orthodromic atrioventricular re-entry tachycardia being conducted with aberrancy to the left bundle branch block through a posteroseptal accessory pathway. This pathway was later ablated. We believe these irregularities were a form of ST-segment cardiac memory, as there was no other logical explanation for the ST elevation. Furthermore, the anomalies disappeared within an hour, and the tests' results support the possibility that CM is responsible for the ST-segment elevation in our patient.



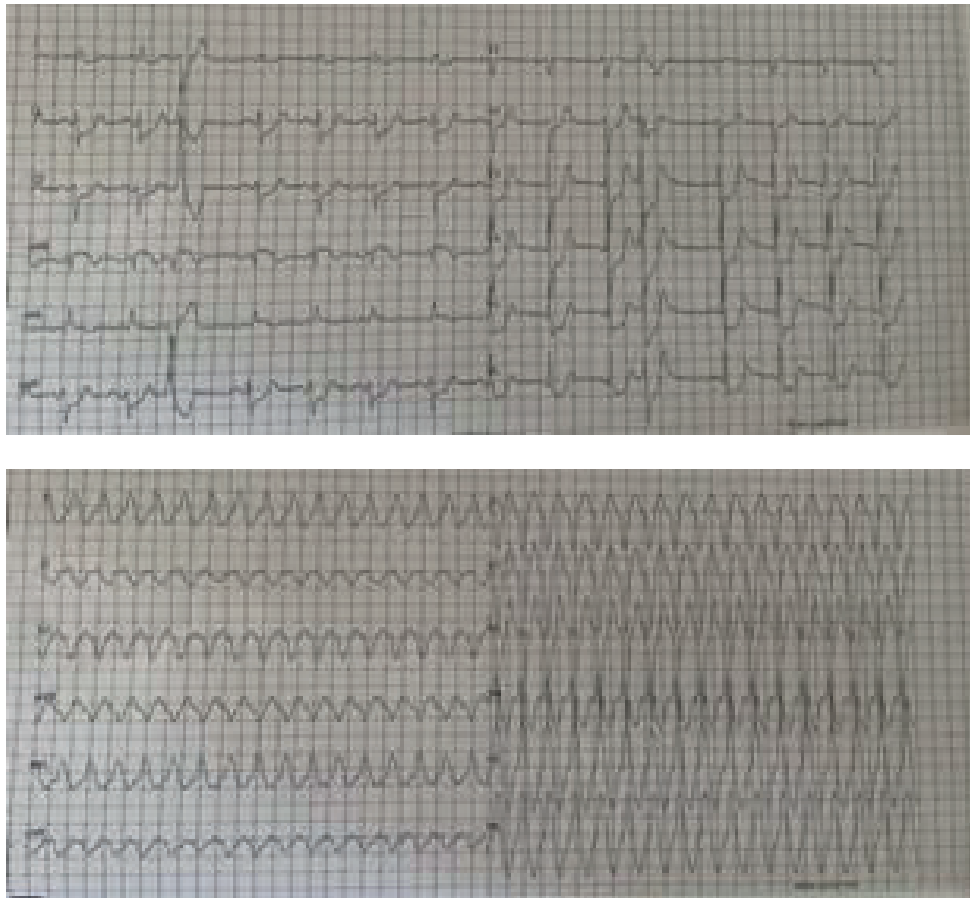


Figure 1

ARITMIE 807

FIBRILLAZIONE ATRIALE (FA) (ARITMIE)

MECCANISMI DELLE ARITMIE (ARITMIE)

ABLAZIONE TRANSCATETERE (ARITMIE)

INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)

FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA)

RUOLO DELL'INTERLEUCHINA 6 NELL'EZIOPATOGENESI DELLA FIBRILLAZIONE ATRIALE E DELLE PRINCIPALI COMPLICANZE TROMBOEMBOLICHE

Filippo Toriello (a), Massimo Saviano (a), Federica Valli (a), Alberto Vincenzo Pollina (a), Giulio Mallardi (c), Massimiliano Ruscica (b), Valeria Borrelli (a), Stefano Carugo (c)

(a) DIPARTIMENTO DI MALATTIE CARDIO-TORACO-VASCOLARI, FONDAZIONE IRCCS CA' GRANDA OSPEDALE MAGGIORE POLICLINICO MILANO, ITALIA; (b) DIPARTIMENTO DI SCIENZE FARMACOLOGICHE E BIOMOLECOLARI, UNIVERSITÀ DEGLI STUDI DI MILANO, ITALIA; (c) DIPARTIMENTO DI SCIENZE CLINICHE E DI COMUNITÀ, UNIVERSITÀ DEGLI STUDI DI MILANO, ITALIA

Introduzione: Come per altre patologie cardiovascolari, è ormai consolidato che l'infiammazione, sia a livello sistemico che locale, rivesta un ruolo rilevante nell'eziopatogenesi e nella storia naturale della fibrillazione atriale (FA). Diversi mediatori infiammatori, tra cui l'interleuchina 6 (IL-6), agiscono favorendo il rimodellamento elettrico e strutturale delle camere atriali, oltre ad alterare l'equilibrio del sistema nervoso autonomo. L'IL-6, nello specifico, ridurrebbe l'espressione delle connesine 40 e 43, andando ad alterare l'accoppiamento elettrico dei miocardiociti. L'infiammazione è implicata, inoltre, anche nella genesi delle complicanze tromboemboliche correlate alla FA, contribuendo al danno endoteliale.

Obiettivo: Analizzare la correlazione tra livelli di IL-6 e fattori di rischio clinici in una coorte di pazienti affetti da FA candidati, secondo la normale pratica clinica e le indicazioni delle principali linee guida internazionali, ad una strategia di controllo del ritmo cardiaco mediante ablazione transcateretere.

Metodi: Abbiamo condotto un'analisi preliminare dei dati basali ottenuti da uno studio monocentrico osservazionale volto a valutare le modifiche dei principali marker infiammatori coinvolti nei meccanismi di

innesco e mantenimento della FA a seguito di ablazione transcateretere.

Risultati: Sono stati analizzati i dati dei primi 38 pazienti arruolati. Di questi, 27 presentavano FA parossistica, 10 FA persistente, 1 FA persistente di lunga durata. L'età media è stata di 62,2 anni ($\pm 11,49$). Il livello basale medio di IL-6 (pg/ml), misurato al momento della procedura (prima della somministrazione di farmaci anestetico-sedativi), è stato di 3,419 ($\pm 2,31$). Relativamente al CHA2DS2-VASc score, 25 pazienti (il 65,8%) avevano uno score inferiore a 3, i restanti 13 pazienti (il 34,2%) avevano uno score uguale o superiore a 3. Il 59,5% (22 soggetti) era affetto da ipertensione arteriosa.

È stata osservata un'associazione statisticamente significativa tra elevati valori di IL-6 e la presenza di ipertensione arteriosa ($4,218 \pm 2,749$ vs $2,374 \pm 0,858$, $p=0,017$) e, allo stesso modo, i soggetti con CHA2DS2-VASc score superiore o uguale a 3 hanno mostrato livelli di IL-6 significativamente maggiori ($5,039 \pm 2,992$ vs $2,609 \pm 1,354$, $p=0,033$).

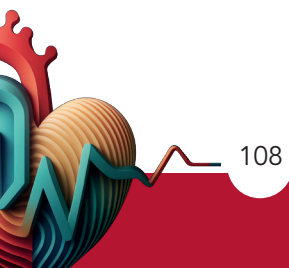
I pazienti, infine, che erano stati sottoposti in precedenza ad una strategia di controllo del ritmo cardiaco (farmaci antiaritmici, cardioversione o pregressa ablazione) hanno mostrato una tendenza ad avere valori



di IL-6 più bassi, tuttavia non ancora significativa dal punto di vista statistico ($p=0,06$).

Conclusioni: I nostri risultati avvalorano l'ipotesi secondo cui l'infiammazione rappresenta un driver rilevante nella fisiopatologia della FA, delle comorbidità e delle complicanze ad essa associate. Essa giocherebbe un ruolo importante non solo nel

meccanismo eziopatogenetico e nel favorire i principali fattori di rischio modificabili, ma si confermerebbe coinvolta anche nella genesi delle complicanze tromboemboliche. Diversi studi hanno già suggerito l'implementazione dei marker infiammatori, tra cui l'IL-6, negli score di rischio, quali il CHA2DS2-VASc, per stratificare con più precisione il rischio tromboembolico.



ARITMIE 594

INTELLIGENZA ARTIFICIALE (TELECARDIOLOGIA ED E-HEALTH) ARITMIE VENTRICOLARI (ARITMIE) ASPETTI GENETICI DELLE ARITMIE (ARITMIE)

UTILIZZO DELL'INTELLIGENZA ARTIFICIALE NELLA PREVISIONE DI EVENTI ARITMICI MAGGIORI SULLA BASE DI DATI CLINICI E DI MAPPAGGIO ELETTROANATOMICO DEL VENTRICOLO SINISTRO

Yari Valeri (a, b), Paolo Compagnucci (b), Giovanni Volpato (a, b), Laura Cipolletta (a, b), Quintino Parisi (a, b), Francesca Campanelli (a, b), Leonardo D'angelo (a, b), Antonio Dello Russo (a, b), Michela Casella (b)
(a) UNIVERSITÀ POLITECNICA DELLE MARCHE, ITALIA, ANCONA; (b) CLINICA DI CARDIOLOGIA E ARITMOLOGIA, "OSPEDALI RIUNITI", ANOCNA, ITALIA

Introduzione: L'intelligenza artificiale (IA) rappresenta una frontiera rivoluzionaria nell'analisi di dati complessi ed ampi, anche nel campo medico. L'IA può essere utilizzata per analizzare sistematicamente i dati numerici del mappaggio elettro-anatomico (EAM), ottenuti dall'estrazione degli stessi dai software dei sistemi di mappaggio.

Scopo: L'obiettivo principale dello studio è utilizzare metodi di machine learning per identificare potenziali correlazioni tra variabili cliniche, procedurali e di EAM con gli eventi cardiaci aritmici maggiori (MaCE).

Metodi: Gli algoritmi di machine learning sono stati applicati ad un database di 220 pazienti sottoposti a EAM endocardico del ventricolo sinistro. Sono state raccolte un totale di 223 variabili clinico-procedurali (analisi condotta per le 61 variabili più interessanti) e i dati numerici relativi al EAM sono stati estrapolati direttamente dai software ingegneristici. Sono state esplorate combinazioni di 4 e 5 variabili, ottenendo rispettivamente 487.635 e 5.461.512 combinazioni. Per ciascun paziente, sono stati valutati i dati numerici estratti dai file di EAM, concentrandosi specificamente su: (1) l'estensione e la dispersione dei potenziali tardivi (%LatArea); (2) differenza punto-punto del potenziale bipolare rispetto al potenziale unipolare, con potenziale identificazione di regioni dove sono raggruppati più punti con alte differenze (%UniBip); (3) aree di decelerazione, caratterizzate da potenziali molto precoci e molto tardivi in un breve intervallo,

indicando una sostanziale differenza nei tempi di attivazione (GradVal).

Risultati: Analizzando i migliori sei modelli di regressione logistica a 4 variabili, notiamo che le variabili più frequentemente correlate con un MaCE durante il follow-up sono "classe NYHA", "PAPs" e "GradVal" (l'AUC dei migliori modelli era: 0,96; 0,94; 0,91; 0,90; 0,90; 0,90). Analizzando i migliori sei modelli di regressione logistica a 5 variabili, emergono che le variabili più frequentemente correlate con un MaCE durante il follow-up sono "classe NYHA", "PAPs", "GradVal", "Storm aritmico", "TAPSE" e "%UniBip" (l'AUC dei migliori modelli era: 0,97; 0,93; 0,92; 0,92; 0,92; 0,92). I dati di EAM, aggiunti ai dati clinici, aumentano il numero di variabili di regressione e la complessità del modello ma allo stesso tempo permettono una miglior stratificazione del paziente. "GradVal" e "%UniBip" sembrano avere una maggior rilevanza e una maggior correlazione con i MaCE.

Conclusioni: Lo studio utilizza con successo algoritmi di machine learning per identificare le variabili che influenzano la previsione dei MaCE. L'applicazione dell'IA consente di analizzare una grande quantità di dati informatici, che non sarebbero analizzabili con le sole capacità umane. L'analisi dei dati numerici estratti dai file di EAM tramite IA permette una migliore stratificazione del rischio di MaCE e consentire un'analisi più approfondita dei dati di EAM.



ARITMIE 832
ABLAZIONE TRANSCATETERE (ARITMIE)
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)

CATHETER ABLATION OF ATRIAL FIBRILLATION IN PATIENTS WITH PSORIASIS

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Background: Psoriasis is linked to an increased risk of atrial fibrillation (AF). However, data on the electrophysiological substrate and outcomes of AF ablation in patients with psoriasis are lacking.

Methods: We conducted a retrospective, multicenter study involving 48 patients with psoriasis (median age, 66 [56-72] years, 79% male) and paroxysmal (n=25, 52%) or persistent AF (n=23, 48%) who underwent ablation at four high-volume institutions between 2018 and 2023. Propensity score-matching identified 96 controls patients without psoriasis undergoing AF ablation at the same institutions. The primary endpoint was survival free from atrial tachyarrhythmia recurrence (AT) after an 8-week blanking period. Secondary endpoints included acute coronary syndromes, stroke, death, and procedural complications.

Results: Baseline clinical characteristics were well balanced between groups. However, psoriasis patients had higher C-reactive protein (CRP) than controls (0.85 [0.45-1.2] mg/dl vs. 0.3 [0.3- 0.4] mg/dl,

$p < 0.001$) and a greater burden of left atrial low-voltage regions at electroanatomical mapping (20 [11-20]% vs. 5 [5-10]%; $p = 0.013$). Over a median follow-up of 20 (13-32) months, AT recurrence occurred in a higher proportion of psoriasis patients (40% vs 24%, log-rank $p = 0.023$). Patients with psoriasis also had a slightly higher risk of acute coronary syndrome (log-rank $p = 0.045$), with similar risks of death (log-rank $p = 0.517$) and procedural complications (2% vs. 2%, $p = 1.000$), while no stroke occurred. Multivariable analysis identified early recurrence within blanking period (aHR=5.88, $p < 0.001$), pre-ablation CRP levels (aHR=1.17, $p = 0.016$), and psoriasis history (aHR=2.20, $p = 0.046$) as predictors of AT recurrence.

Conclusion: Psoriasis is associated with low-grade systemic inflammation, more severe electroanatomical markers of atrial cardiomyopathy, and worse post-ablation outcomes. The association between CRP levels and rhythm outcomes suggests that inflammation may drive recurrences among psoriasis patients undergoing AF ablation.



ARITMIE 682
ARITMIE VENTRICOLARI (ARITMIE)
ABLAZIONE TRANSCATETERE (ARITMIE)
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

VENTRICULAR FIBRILLATION RISK DURING LEFT ATRIAL PULSED FIELD ABLATION: A CASE REPORT

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Patient Presentation: A 71-year-old female patient with a history of symptomatic persistent atrial fibrillation (AF) was referred for pulsed field ablation (PFA). She had previously been treated with antiarrhythmic drugs, which were discontinued due to adverse effects, leading to a switch to beta-blockers.

Initial Work-Up and Procedure: The PFA procedure was conducted with the aim of isolating the pulmonary veins and addressing the left atrial posterior wall. The procedure was performed under general anesthesia, and during the ablation, ventricular fibrillation (VF) was unexpectedly triggered.

Complication and Immediate Response: The VF occurred after the third PFA application to the left atrial posterior wall, despite no signs of coronary spasm. The VF was successfully treated with a single 200J DC shock, which restored sinus rhythm without

any ST-segment elevation or other immediate complications.

Follow-Up and Diagnosis: Post-procedure imaging revealed reduced left ventricular function. Follow-up examinations indicated moderate left ventricular dysfunction with persistent premature ventricular contractions (PVCs). A cardiac MRI confirmed these findings, showing global hypokinesis and signs of dilated cardiomyopathy.

Conclusion: This case underscores the potential proarrhythmic risks of PFA, particularly the induction of VF, even when the ablation is conducted away from ventricular tissue. The exact mechanisms of this arrhythmogenic response remain unclear, highlighting the need for further research as PFA becomes more commonly used for ventricular tachycardia (VT) and PVC ablations.



ARITMIE 825
ABLAZIONE TRANSCATETERE (ARITMIE)
ARITMIE VENTRICOLARI (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)
FARMACI ANTIARITMICI (ARITMIE)

CLINICAL PROFILES AND OUTCOMES OF IDIOPATHIC FASCICULAR VENTRICULAR TACHYCARDIAS IN PEDIATRICS: INSIGHTS FROM A SINGLE CENTER EXPERIENCE

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Background: Idiopathic fascicular left ventricular tachycardia (IFLVT) is the most common idiopathic ventricular tachycardia (IVT) of the left ventricle (LV) and represents 10-15% of all IVT. Several types have been reported according to their clinical presentation, such as ventricular origin, response to drugs, and electrocardiographic pattern, among other parameters. In children with structurally normal hearts, it is generally irrelevant to the risk of sudden arrhythmic death, but it may be associated with deterioration in the quality of life. Tachycardiomyopathy has been described in 6% of cases because of persistent tachycardia, and it is usually reversible after successful ablation. Although most episodes may occur at rest, exercise, emotional stress, and catecholamine excretion can also trigger the arrhythmia.

Purpose: to describe the clinical profiles and outcomes of symptomatic IFLVT in a pediatric cohort of patients (N=3; age 7, 11, and 16 years old, respectively; 1 male – 2 females) afferent to our tertiary center for the electrophysiological study and transcatheter ablation of the arrhythmias.

Methods: Three consecutively enrolled patients presenting with IFLVT at the 12-leads ECG and symptomatic for palpitations and/or dizziness with/without signs and symptoms of heart failure were

enrolled. Echocardiography, first, and cardiac magnetic resonance imaging, subsequently, excluded the presence of false tendon or fibromuscular band extensions from the posteroinferior LV to the basal septum in all patients and the presence of late gadolinium enhancement (LGE). Follow-up was conducted cooperatively by interventional electrophysiologists and congenital heart disease expert cardiologists.

Results: In our cohort, the most frequent symptoms were palpitations (N=3/3, 100%), associated with fatigue and asthenia. The mean age at the time of catheter ablation was 12±5 years. The mean weight was 44±22 kg. Intravenous verapamil administration was effective for acute IFLVT interruption but not for recurrence prevention, which needed flecainide and metoprolol/nadolol treatment. At the CMR exams, two patients demonstrated altered exams: 1) pericardial LGE (following COVID-19 infection); 2) inferolateral myocardial edema and LGE, with LV severe dysfunction (after myocarditis). A 100% success rate was observed with the catheter ablation without major complications. At the follow-up, lasting approximately 6 months, only one patient experienced permanent success without antiarrhythmic drug administration; n=2/3 (those with altered CMR exams) experienced monomorphic ventricular extrasystole and only one further VT recurrence; both conditions



were pharmacologically treated with beta-blockers.

Conclusions: If not promptly recognized, IFLVT may have an adverse clinical course in children.

In most cases, this condition is drug refractory. Catheter ablation is a successful and safe treatment and should represent the first-line approach in symptomatic children.



ARITMIE 865

FIBRILLAZIONE ATRIALE (FA) (ARITMIE)

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

FARMACI ANTIARITMICI (ARITMIE)

THE "ATRIAL FIBRILLATION PATH": REAL WORLD EXPERIENCE FROM ONE OF THE BIGGEST HOSPITAL OF SOUTHERN ITALY

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Atrial fibrillation (AF) represents the widest supraventricular arrhythmia worldwide with an increasing global prevalence over the past three decades and is currently of approximately 60 million cases.

In our center AF represents about 2% of admittance to the Emergency Department and a patient admitted for paroxysmal AF undergoes the so called "AF path" (percorso FA): after an online cardiological consultation request the patient is brought to cardiological intensive care where a prompt anamnesis, physical examination, lab test analysis, ECG study and echocardiogram is performed.

Our stepwise approach consists of: (1) identifying the degree of clinical decompensation related to the presence of AF, (2) diagnosing clinical conditions which might explain the occurrence of AF; (3) estimating the thrombotic and hemorrhagic risks of the patient in order to manage the correct antithrombotic strategy; and (4) identifying the arrhythmic episode onset time. Patient with unstable AF defined by chest pain, pulmonary edema, persistent hypotension, shock, and altered state of consciousness are managed with immediate synchronized electric cardioversion (ECV) with biphasic defibrillator (both anterolateral or anteroposterior positions of the pads) in association with anticoagulants administration and sedation with midazolam (0.15mg/kg i.v.).

In all the patients identification and treatment of the reversible cause is performed—such as acute coronary syndrome, pulmonary embolism, thyrotoxicosis, electrolytes imbalance, poisoning, valvular heart diseases, anemia. Rate control is an integral part of our

AF management and is often sufficient to improve AF-related symptoms with a target rate of <110 bpm.

In hemodynamically stable patients, an approach intended to control cardiac rhythm—i.e. to restore sinus rhythm—may be considered when, according to medical history, AF onset turns out to be < 48 h and/or patient persist symptomatic after rate control. In this case, the stability of the clinical picture allows to choose between a pharmacological treatment, and one based on an internal (in case of a patient with an ICD device) or external ECV.

In principle, when AF onset is < 48 h pharmacological cardioversion can be carried out by using i.v. drugs such as flecainide and propafenone if no contraindication are present or amiodarone in patients with heart failure or structural cardiac diseases.

The patient who arrives at the Emergency Department for an episode of AF arisen for > 48 h deserves an integrated approach in order to optimize the situation by deciding for rhythm or rate control. A direct cardioversion can be performed only after transesophageal echocardiogram in order to exclude the presence of blood clots in the left atrium appendage. After stabilization the patient is either sent to observation unit in emergency department with a planned follow up in our Arrhythmology Unit or admitted in Cardiology Intensive Care Unit if several cardiovascular risk factors are present and a continuous ecg monitoring is applied.

In numbers in the last year (2023) we performed around 600 atrial fibrillation consultations and 42% of patients underwent ECV, 31% pharmacological cardioversion, and 27% either rate control or observation.

ARITMIE 16

ELETTROSTIMOLAZIONE (ARITMIE)

GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

CASE REPORT: QUANDO TRATTARE LA SINDROME DA APNEE OSTRUTTIVE DEL SONNO VUOL DIRE TRATTARE LE BRADIARITMIE

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Introduzione: La relazione tra sindrome da apnee ostruttive nel sonno ed alterazioni del ritmo cardiaco è ampiamente discussa in letteratura.

Caso Clinico: Presentiamo il caso di un uomo di 56 anni, con abitudine tabagica, obeso, dislipidemico e con diabete mellito di tipo II.

In anamnesi presentava sindrome coronarica cronica già sottoposta a rivascolarizzazione per via percutanea. Nel 2022 impianto di pacemaker bicamerale per malattia del nodo del seno diagnosticata durante monitoraggio in telemetria post rivascolarizzazione, paziente asintomatico per sincope o lipotimie. Nello stesso anno per insorgenza di cervicotalgia si sottoponeva a RMN cervicale con evidenza di spondilodiscite. Nel 2023 effettuava PET total body che evidenziava accumulo di tracciante a livello della regione pettorale sinistra (tasca d' impianto PKM e parte prossimale dei cateteri).

Si procedeva ad estrazione transvenosa completa del sistema di stimolazione, mediante semplice trazione manuale. All'interrogazione pre-espianto Ventricular pacing 0%, Atrial pacing 0%.

Discusso il caso collegialmente si decideva di soprassedere al reimpianto di pacemaker e si poneva indicazione ad impianto di loop recorder. Il paziente veniva dimesso al domicilio.

Ad 1 mese giungeva al remote monito-

ring alert per pausa di 4 secondi alle 00:04 di notte, per cui veniva contattato il paziente che confermava l'asintomaticità dell'evento.

Veniva quindi consigliata polisomnografia notturna, la quale evidenziava "Insufficienza respiratoria cronica notturna secondaria a Sindrome delle apnee ostruttive durante il sonno di grado severo". Dopo ricovero per ottimizzare CPAP il paziente veniva dimesso al domicilio.

All'attuale follow-up da remote monitoring non si registrano pause significative.

Conclusioni: La rivalutazione delle indicazioni di impianto post-espianto di un device infetto è raccomandata in classe IA. Questo caso evidenzia

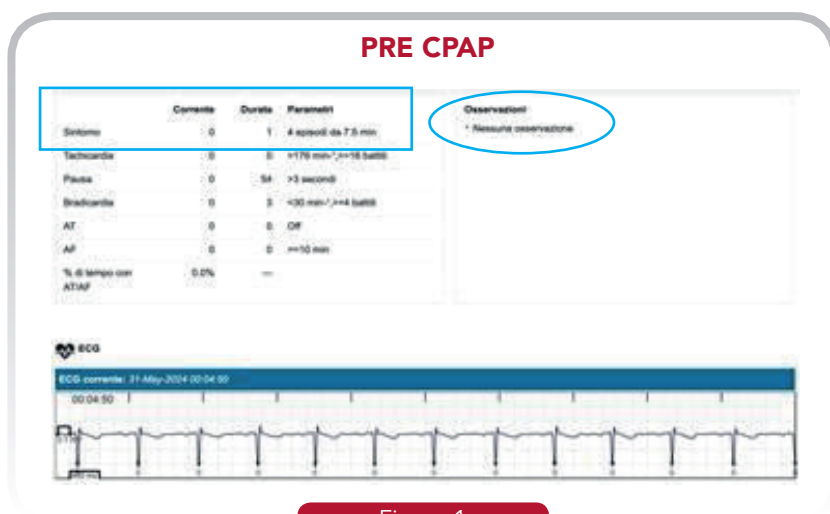


Figure 1

l'importanza di discutere collegialmente ogni caso di espianto. Nel caso specifico, sottolinea come la Sindrome da apnee ostruttive nel sonno possa essere un fattore confondente nella valutazione di un paziente candidato all'impianto di un pacemaker.

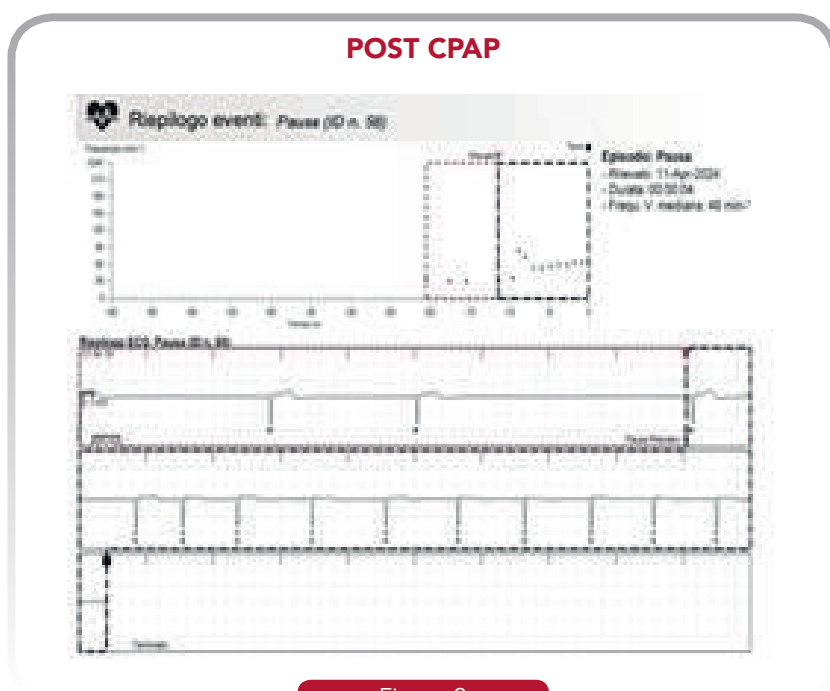
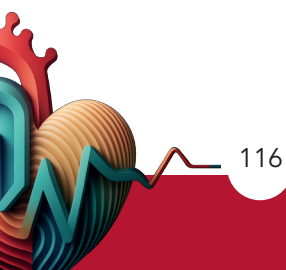


Figure 2



ARITMIE 25
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)
TOMOGRAFIA AD EMISSIONE DI POSITRONI (PET)
(IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
SINCOPE (ARITMIE)

**TECNICA SHIFT AND COVER PER IL MANAGEMENT DELLE INFEZIONI DI S-ICD:
 COSA FARE IN CASO DI TASCA INTERMUSCOLARE INFETTA?**

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 (a) AOU FEDERICO II

Introduzione: La gestione delle infezioni CIED è un punto chiave della pratica clinica dei cardiologi. Recenti evidenze scientifiche hanno dimostrato come il management delle infezioni dei defibrillatori sottocutanei possa essere differente dai convenzionali optando per una strategia conservativa.

Caso Clinico: Presentiamo il caso di un uomo di 50 anni, sportivo (ciclismo agonistico), in assenza di fattori di rischio cardio-vascolari. In anamnesi presentava singolo episodio sincopale

traumatico durante sforzo nel 2017. Ai successivi accertamenti evidenza alla RM di cardiomiopatia ipertrofica con test genetici negativi (SCD score 4,5%). Seguiva impianto di S-ICD presso la nostra struttura mediante tecnica con tasca intermuscolare, con ottimi vettori di sensing e di impedenza (Shock: 65 Ohm). Nel 2024 giungeva a controllo per evidenza di lesione cutanea pseudo-nodulare in corrispondenza della sleeve del catetere. Al controllo del device evidenza di ERI.

Effettuava, quindi, PET-TC total body che eviden-

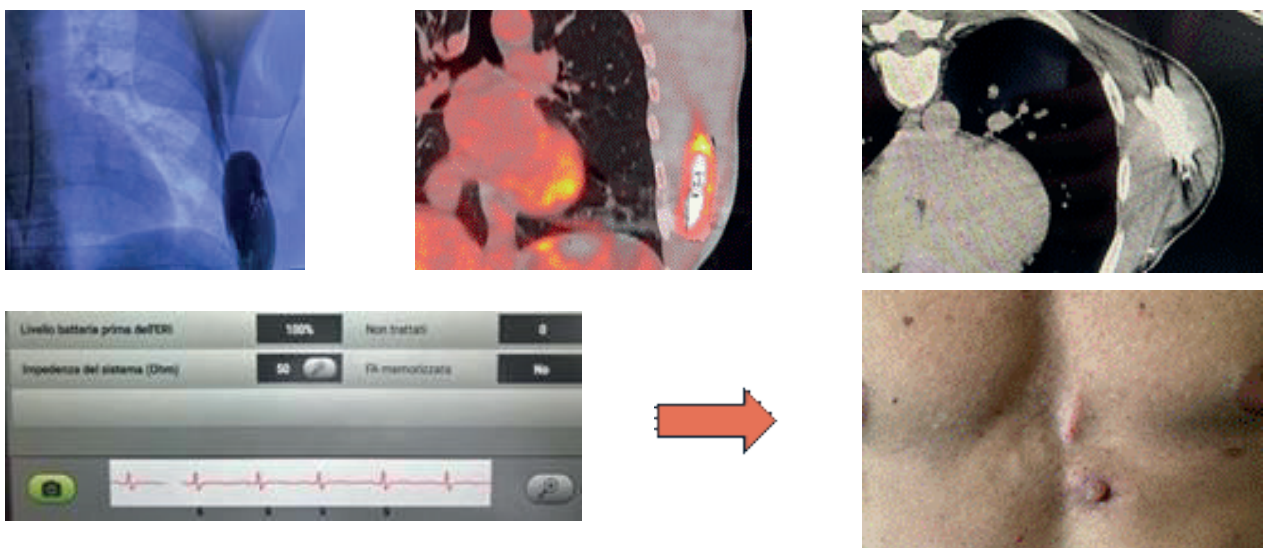


Figure 1

ziava accumulo di radiocomposto (SUV mx 6.1) alla periferia dell'S-ICD con estensione al decorso dell'elettrocattetero (SUV max 3) fino alla regione sottotifoidea.

Dalle recenti evidenze scientifiche a supporto della tecnica "shift and cover" (Droghetti et al.) si optava per un'estrazione del device in toto con contestuale reimpianto e "shift" della tasca da intermuscolare a sottomuscolare. Dato il coinvolgimento dell'elettrocattetero, si rimuoveva il precedente e, dopo appropriato screening, si tunnellizzava nuovo catetere

in sede medio-sternale applicando la tecnica "shift and cover" alla sleeve. La procedura si concludeva in assenza di complicanze e con ottimi vettori di sensing ed ottima impedenza di Shock (50 Ohm).

All'attuale follow-up paziente asintomatico e tasca in ordine.

Conclusioni: La tecnica "shift and cover" è praticabile anche in pazienti con infezione di tasca intermuscolare, mediante confezionamento di una tasca sottomuscolare.



ARITMIE 679

ELETTROSTIMOLAZIONE (ARITMIE)

TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

EFFICACIA E SICUREZZA DELLA STIMOLAZIONE NELL'AREA DELLA BRANCA SINISTRA

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Premessa: La stimolazione ventricolare apicale determina dissincronia elettromeccanica, associata a un aumento del rischio di insufficienza cardiaca e fibrillazione atriale. La terapia di resincronizzazione cardiaca con stimolazione biventricolare riduce la dissincronia ventricolare e offre benefici clinici nei pazienti con prolungamento della durata del QRS, restando tuttavia raccomandata solo nei pazienti con insufficienza cardiaca. La stimolazione nell'area della branca sinistra (LBBAP) genera una ridotta durata del QRS stimolato, un'attivazione ventricolare sinistra sincronizzata rapida e la correzione del blocco di branca sinistro.

Metodi: Questo registro retrospettivo a centro singolo ha incluso pazienti sottoposti a impianto del catetere da pacemaker nell'area della branca sinistra. LBBAP è stata eseguita impiantando l'elettrocattetero a fissaggio attivo circa 2 cm distalmente al fascio di His e profondamente nel setto, mediante un catetere di rilascio dedicato. Il principale endpoint di sicurezza è stato l'incidenza di eventi avversi peri-procedurali seri legati al catetere da LBBAP. Le durate medie del QRS (QRSd) basale e del QRS stimolato sono state misurate nella popolazione generale e nei pazienti con dissincronia (QRSd ≥ 130 ms) per valutare l'efficacia.

Risultati: Tra Ottobre 2022 e Luglio 2024, 50 pazienti sono stati sottoposti a impianto di elettrocattetero nell'area della branca sinistra. Il 22% presentava una QRSd ≥ 130 ms, il 20% blocco di branca destra, il 18%

blocco di branca sinistra e il 24% un difetto di conduzione intraventricolare. Le indicazioni alla stimolazione sono state disfunzione del nodo del seno nel 14%, blocco atrioventricolare di vario grado nel 58%, terapia di resincronizzazione cardiaca nel 14% e fibrillazione atriale a bassa risposta ventricolare nel 16% dei pazienti. In tutti i pazienti l'impianto è stato eseguito con successo (100%). In 3 pazienti è stato necessario riposizionare l'elettrocattetero ventricolare per dislocamento (2) e perforazione del setto con avanzamento dell'elettrodo nella cavità ventricolare sinistra (1) entro le prime 24 ore dalla procedura; in 1 altro paziente è stato effettuato espianto del device per decubito di tasca dopo un mese dall'impianto; in nessun paziente (0%) sono stati registrati effetti avversi seri legati all'elettrocattetero o al catetere di rilascio utilizzati. LBBAP non ha determinato dissincronia de novo e non ha modificato significativamente la QRSd media (basale 109 ± 26 ms vs stimolato 115 ± 17 ms; $p=0.12$) nella popolazione generale. Nei pazienti con QRSd ≥ 130 ms al basale si è assistito invece a una riduzione significativa della durata media (basale 149 ± 15 ms vs stimolato 125 ± 13 ms; $p < 0.01$).

Conclusioni: Questo registro retrospettivo monocentrico dimostra che LBBAP è una metodica sicura, caratterizzata da alte percentuali di successo e basse percentuali di complicanze. LBBAP si è dimostrata efficace nel non determinare dissincronia da stimolazione, riducendo significativamente la durata del QRS stimolato nei pazienti con QRSd ≥ 130 ms.



ARITMIE 727

ABLAZIONE TRANSCATETERE (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) SINCOPE (ARITMIE)

A CASE REPORT OF TAILORED CARDIONEUROABLATION: ONE SIZE MAY NOT FIT ALL

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Introduction: Cardioneuroablation, despite the still limited knowledge on the anatomy and functioning of the intrinsic cardiac nervous system, as well as on the long-term effects of its modulation/destruction, is emerging as an alternative method to pacing in young patients with symptomatic functional bradyarrhythmias. The extent of the procedure, therefore the number of parasympathetic ganglia that needs to be targeted to maximize the risk/benefit ratio, is a matter of great debate, and many centers prefer an extended, very destructive biatrial approach. We describe a case in which a limited approach aimed at tailored cardiac neuromodulation was used.

Clinical case: 28-year-old girl, 55 kg, 167 cm, BP 115/75 mmHg, multiple comorbidities: dysmenorrhea, allergic asthma, long history of psychiatric (borderline personality disorder with multiple self-harming attempts) and eating behavior disorders (first anorexia nervosa, then bulimia), on polytherapy with psychoactive drugs since 2013. Since 2019 on sertraline (max dose 200 mg/day, min 75 mg/day, current 100 mg), which cannot be weaned. Since 2016, onset of syncopal episodes, sometimes related to painful menstrual cycles, sometimes without clear trigger, associated with hypotension, without reported bradycardia. Starting from April 2023, the girl complained about an intensification of the syncopal and pre-syncopal episodes, mostly not preceded by classic vagal triggers, resulting in frequent visits to the ED. Upon arrival, BP was 100/60 mmHg, with marked sinus bradycardia

(30-35 bpm), sometimes alternating with low atrial rhythm, without sinus pauses >2 seconds and with excellent response to atropine (HR up to 100 bpm). At subsequent cardiological tests, normal chronotropic competence was documented on the exercise test (max HR 89% of the expected) and on the 24-hour Holter ECG outside of these episodes (med/min/max HR 86/43/143 bpm), in a structurally normal heart. Autonomic parameters suggested a slight underlying tonic sympathetic predominance, as expected with the psychiatric disorder (pNN50:1%, RMSSD:21 ms, SDNN:105 ms, SDNN Index:44 ms, SDANN:91 ms). A Loop Recorder was implanted and prolonged release theophylline 200 mg was tested, that was poorly tolerated from a gastrointestinal point of view but resulted in an increase of resting HR of approximately 20 bpm. Nonetheless, symptomatic hypervagotonia crises persisted, responsive to atropine. A limited RF ablation of the superior paraseptal ganglion was therefore performed (zero fluoroscopy approach), targeting the conventional areas of fractionated potentials identified on the posterior aspect of the atrio-caval junction using endocardial electroanatomical mapping. A total of 6 lesions were delivered (protocol 35 W, 60 and 90 seconds) using a unifocal right atrial approach, resulting in the gradual and progressive increase in HR up to a peak of 101 bpm reached during ablation, and a subsequent stabilization at 90 bpm at the end of the procedure. At the subsequent telemetric monitoring, HR was stable around 90 bpm, and Holter ECG at 48 hours showed an HR med/min/max of 92/75/133

bpm, with no atrioventricular conduction disorders (PR interval was between 100 and 160 msec). In the following months, no more episodes of bradycardia nor ED visits occurred.

Conclusions: Our clinical case suggests the possibility

of treating disabling hypervagotonia crises with a prevalent cardioinhibitory component with a very limited, tailored, approach of cardiac neuromodulation, aimed at limiting the parasympathetic damage and its possible deleterious effects in the middle and long term, while hopefully preserving the healing possibilities.



ARITMIE 902
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)
TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

LARGER QRS BUT BETTER HEMODYNAMIC EFFECT OF HIGH OUTPUT HIS BUNDLE PACING IN PATIENT WITH DILATED CARDIOMYOPATHY

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Background: QRS duration is an important factor in determining Cardiac Resynchronisation Therapy (CRT) response and a useful surrogate for electromechanical dyssynchrony. However, we don't have studies confirming this concept in conduction system pacing. We present a case report suggesting that this theory is not probably valid in conduction system pacing. **METHODS:** A 56- year-old diabetic patient with primary dilated cardiomyopathy with reduced EF (EF 30%) and a QRS width 140 msec. In 2014 he underwent optimized medical therapy and ICD implantation. Despite pharmacological therapy, he experienced numerous hospitalizations for heart failure. In the last hospitalization he underwent ICD extraction for CIED endocarditis and subsequent S-ICD implantation. Then, the patient came to our attention in NYHA class III and with typical atrial flutter, NT-pro BNP 758 ng/l, severe

left ventricular dilatation with EF 30%. Subsequently, the patient underwent ablation of typical atrial flutter. We performed an echocardiogram the next day that confirmed the persistence of the previous EF. In consideration of the persistence of the depressed EF despite OMT, the patient underwent implantation of a biventricular pacemaker. After mapping the His bundle area, a bipolar screw electrode was introduced using the SSPC1 delivery sheath until non-selective His bundle stimulation was obtained. Subsequently, a bipolar screw electrode was introduced through a SSPC3 delivery sheath deep into the interventricular septum, obtaining stimulation of the left bundle branch. His bundle pacing electrode was introduced in the LV channel of the PM while left bundle branch pacing electrode was introduced in the RV channel. The device was programmed in DDDR CRT pacing (LV offset pacing

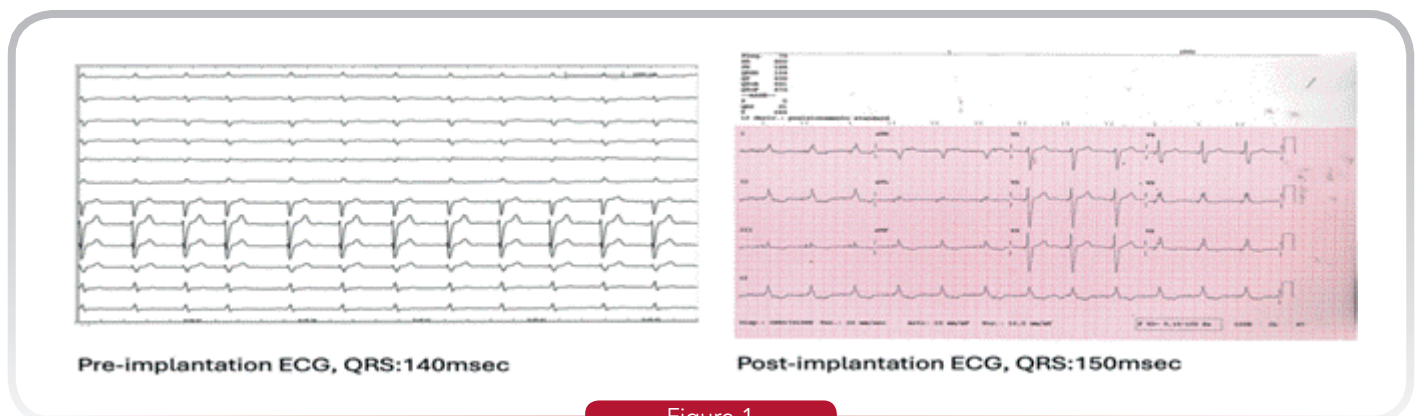


Figure 1

chamber -40 msec) with output 3,5V @ 1msec ("High Output Pacing"), bipolar lead configuration. The next day ECG presented morphological features indicating NS-HBP, combining the absence of plateaus, notching, and/or slurring in leads I, V1, and RWPT < 100 ms, with a paced-QRS duration of 150 msec. We performed an echocardiogram showing a sudden improvement in ejection fraction to 40% and a reduction in mitral insufficiency from moderate-severe to mild-moderate.

Conclusion: This case is paradigmatic of how in everyday clinical practice we come across the limits of medical therapy and conventional heart failure stimulation techniques. CSP appears to bridge the pathophysiological limitations of right ventricular stimulation and CRT. High Output His Bundle Pacing increases acutely the EF with a homogeneous biventricular excitation, whereas the larger QRS width does not appear to have a negative impact.



ARITMIE 22
ARITMIE VENTRICOLARI (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
ABLAZIONE TRANSCATETERE (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)

TACHICARDIA VENTRICOLARE SOSTENUTA E SINDROME CORONARICA: A CASE REPORT

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 (a) POLICLINICO UNIVERSITARIO CAMPUS BIO-MEDICO DI ROMA

Paziente maschio di 71 anni iperteso, con familiarità per cardiopatia ischemica e in assenza di precedenti cardiaci di rilievo accedeva al Dipartimento di emergenza e accettazione per episodi di palpitazioni da circa due giorni. Al monitoraggio telemetrico al DEA si evidenziavano frequenti episodi di tachicardia a QRS largo, emodinamicamente tollerati, a regressione spontanea. All'ECG standard di superficie, eseguito durante l'aritmia, si riscontrava una tachicardia ventricolare monomorfa (FC 160 bpm) (Fig 1), con asse inferiore, morfologia a blocco di branca sinistra e transizione in V4. Veniva ricoverato in UTIC e sottoposto a coronarografia che mostrava malattia significativa a carico dell'arteria discendente anteriore. Veniva eseguita contestualmente angioplastica coronarica con impianto di stent medicati su tronco comune ed arteria discendente anteriore. Nei successivi giorni il paziente manteneva buoni parametri emodinamici; al monitoraggio telemetrico si riscontrava tuttavia alternanza tra ritmo sinusale e ritmo ventricolare con FC 80-90 bpm, con medesima morfologia dell'aritmia ventricolare riscontrata al momento del ricovero, persistente nonostante introduzione di terapia con Metoprololo 50 mg bid ed a distanza di oltre 72 h dalla procedura di rivascolarizzazione coronarica. All'ecocardiogramma, in corso di aritmia ventricolare, si evidenziava marcata dissincronia di contrazione ventricolare, determinante moderata riduzione della funzione sistolica globale (FE 42%). Dopo circa una settimana dalla rivascolarizzazione si eseguiva cardio RMN con evidenza nelle sequenze Delayed Enhancement di iperintensità subendocardica a livello della parete antero-settale al passaggio medio-apicale. In relazio-

ne alla persistenza dell'aritmia ventricolare sostenuta e non sostenuta, alla modificazione emodinamica in corso di ritmo ventricolare, pur in condizioni di stabilità emodinamica ed asintomaticità del paziente, si decideva per mappaggio del substrato aritmico. È stato, quindi, eseguito mappaggio elettro-anatomico del ventricolo destro, che non ha mostrato anticipi rilevanti rispetto al QRS durante tachi-aritmia, e successivamente del ventricolo sinistro che ha mostrato EGM con anticipo di 40 ms in zona antero-settale medio-basale (sede di scar alla cardio RMN) (Fig 3). Il focolaio aritmogeno è stato sottoposto ad ablazione, al monitoraggio successivo assenza di induzione di aritmie ventricolari. Da notare che in corso di aritmia ventricolare si riscontrava un drop di circa 40 mmHg di pressione arteriosa sistolica al monitoraggio cruento (Fig 3). In considerazione della storia clinica del paziente e della presenza di una estesa zona di scar subendocardica alla RMN, in sesta giornata post ablazione si sottoponeva il paziente ad impianto di ICD in prevenzione secondaria. Come evidenziato dalle linee guida ESC 2022 per la gestione delle aritmie ventricolari, nei pazienti con sindrome coronarica cronica, LEFV >40% e tachicardie ventricolari sostenute monomorfe, emodinamicamente tollerate, deve essere preso in considerazione l'intervento di ablazione presso centri specializzati o l'impianto di ICD (Classe IIa). Inoltre, in pazienti candidati a impianto di ICD può essere preso in considerazione l'intervento di ablazione presso centri specializzati subito prima o subito dopo l'impianto di ICD per ridurre il burden di TV e prevenire l'erogazione di shock da parte dell'ICD (Classe IIb).

ARITMIE 805
ABLAZIONE TRANSCATETERE (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)

A PARTICULAR CASE OF TYPICAL ATRIAL FLUTTER: WHEN HIGH-DENSITY MAPPING IS NECESSARY FOR THE CORRECT DIAGNOSIS

Andrea Galli (a, b), Giuseppina Guida (a, b), Stefano Marzorati (a, b), Lorenzo Adriano Doni (b),
 Raffaella Marazzi (b), Roberto De Ponti (a, b)

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Typical atrial flutter (AFL) can be successfully treated by radiofrequency catheter ablation (RFCA) in the vast majority of the case. In the absence of the arrhythmia the procedure can be performed using pacing maneuvers. We present a case of a 73 yo male patient with history of atrial fibrillation (AF) who presented at emergency room for palpitation with a surface ECG of typical AFL (figure 1), while on antiarrhythmic drug (AAD). Transthoracic echocardiography showed absence of significant structural heart disease (SHD). The patient was then referred for ablation while the arrhythmia persisted. At electrophysiologic study, however, the intracavitary activation sequence was not consistent with typical AFL with a distal to proximal activation of the coronary sinus and entrainment mapping excluded a peritricuspid reentry and suggested a left atrial origin. Therefore, the patient was electrically cardioverted and a left-sided procedure was rescheduled. At the time of the second admittance, a persistent recurrence of the arrhythmia with the same cycle length (235 msec) and P wave morphology was observed. Multielectrode electroanatomic mapping (Octaray and Carto 3, Biosense Webster) of the left atrium (LA) during tachycardia was performed. A multi-loop reentry in the LA with a clockwise perimitral reentry, a second clockwise loop around the right pulmonary veins and a third incomplete loop around the left pulmonary veins were present (figure 2), while the pulmonary veins were passively activated. Interesting enough, the loop around the right pulmonary veins showed an early transition to the right atrium resulting in a caudocranial

activation of the atrial septum which justified the surface P wave morphology. After pulmonary vein isolation by high-power short-duration radiofrequency energy ablation (Q-dot catheter, Biosense Webster) to treat coexistent AF, the activation map was further evaluated to plan an appropriate ablation strategy: the two

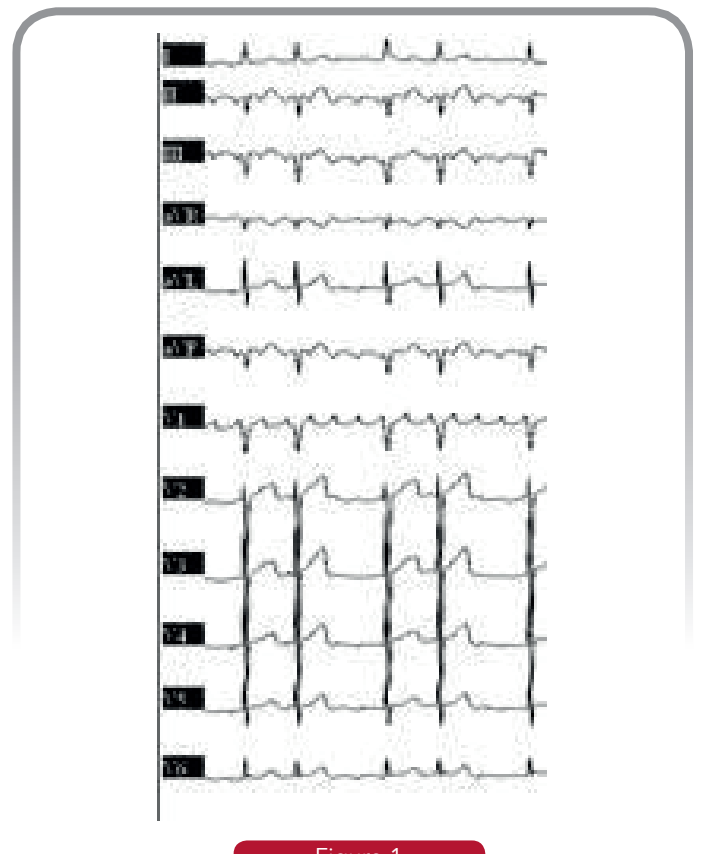


Figure 1



independent dominant loops shared an isthmus (figure 2, black arrow) between the anterior mitral annulus and an area of conduction block in the supero-medial LA close to the os of the right superior pulmonary vein. A linear ablation from the anterior mitral annulus to the area of conduction block terminated the arrhythmia and achieved conduction block. Notably, during ablation in the superior part of this line, once the tachycardia had been terminated, a focal atrial activity responsible for focal atrial tachycardia with a cycle length of 390 ms was evident and abolished by further focal ablation. No other arrhythmia was inducible and therefore the procedure was terminated with an indication to continue the previously ineffective AAD for the presence of diffuse low voltage in the LA. In conclusion, although cavo-tricuspid isthmus ablation is routinely performed to treat typical AFL even in the

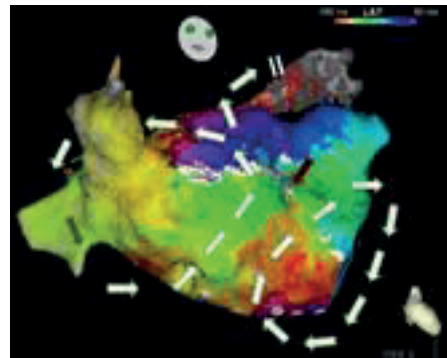
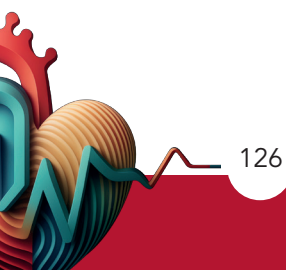


Figure 2

absence of the arrhythmia, in some case with no SHD and/or prior surgery, other forms of reentrant circuit can mimic typical AFL on surface ECG and be responsible for arrhythmia recurrence if the cavo-tricuspid isthmus is ablated empirically.



ARITMIE 712

DEFIBRILLATORE IMPIANTABILE (ARITMIE)

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)

TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

MALPOSIZIONAMENTO TARDIVO TWIDDLER-LIKE IN DEFIBRILLATORE SOTTOCUTANEO

Stefano Pardi (a), Vespasiano Di Spirito (a), Tiziana Tommasone (a), Flavia Tersigni (a), Roberta Teoli (a),
Raffaele Fraioli (a), Agata Masia (a), Giuseppe Giuffrè (a)
(a) OSPEDALE DI CASSINO

Introduzione: Il defibrillatore sottocutaneo rappresenta uno strumento terapeutico efficace nel trattamento dei pazienti con indicazione ad ICD (implantable cardioverter defibrillator) nei quali non vi sia necessità di pacing. Le complicanze conseguenti all'impianto di un defibrillatore sottocutaneo comprendono la migrazione precoce dell'elettrocattetero in un sito differente da quello dell'impianto (1.93%) dei pazienti sottoposti ad estrazione di elettrocattetero di S-ICD in una recente review, la sostituzione precoce della batteria (2.2%), la frattura dell'elettrocattetero (0.3%). Rarissime sono le esperienze riportate di un malposizionamento tardivo dell'elettrocattetero.

Caso clinico: Riportiamo il caso di un paziente di 61 anni che presentava in anamnesi: obesità (peso 130Kg), diabete mellito tipo II, cardiopatia dilatativa post-ischemica, scompenso cardiaco a frazione di eiezione ridotta, sottoposto ad Aprile 2021 ad impianto di defibrillatore sottocutaneo in prevenzione primaria. Il paziente aveva eseguito i controlli del defibrillatore regolarmente in assenza di evidenza di anomalie del dispositivo. In occasione di un controllo di routine effettuato a Settembre 2023 il dispositivo risultava non interrogabile ed il paziente veniva trasferito presso il nostro centro.

All'ingresso presso il nostro reparto di UTIC il paziente, asintomatico, veniva sottoposto ad una radiografia del torace (Figura 1) che evidenziava una posizione anomala dell'elettrocattetero di shock che appariva retratto in

corrispondenza della cassa del defibrillatore ed avvolto intorno alla medesima in modo simile a quanto si può osservare nei pazienti con sindrome di Twiddler. Si decideva, quindi, di procedere a rimozione del dispositivo ed a un nuovo impianto.

L'intervento veniva effettuato con incisione in corrispondenza della linea ascellare anteriore. Si reperiva il defibrillatore sottocutaneo precedentemente impiantato in tasca intermuscolare con evidenza di dislocazione dell'elettrocattetero di defibrillazione che appariva circondare nella sua interezza il dispositivo in assenza di residui di filo avvolti attorno ad esso. Si procedeva a rimozione del dispositivo e dell'elettrocattetero e conseguente posizionamento di nuovo elettrocattetero mediante tecnica a tre incisioni. La radiografia di controllo mostrava un adeguato posizionamento del sistema di defibrillazione sottocutaneo.

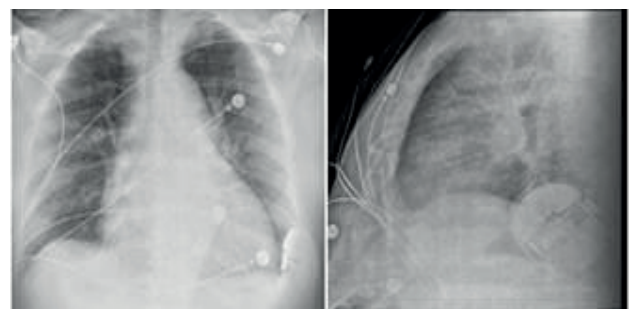
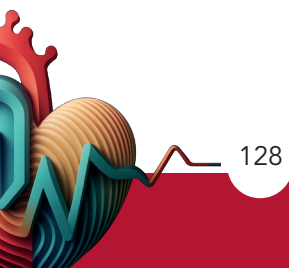


Figure 1



Conclusioni: L'S-ICD ha dimostrato di comportare un minor numero di complicanze rispetto al ICD transvenoso soprattutto in relazione al minor rischio di infezione. Tuttavia, alcune categorie di pazienti quali i pazienti obesi appaiono maggiormente a rischio di dislocazione

dell'elettrocatteter. Il nostro caso riporta tra i primi una dislocazione tardiva con riscontro di malposizionamento dell'elettrocatteter Twiddler-like in un paziente obeso sottoposto ad impianto di S-ICD. Figura 1.



ARITMIE 533
GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)
ELETTROSTIMOLAZIONE (ARITMIE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

**MANAGEMENT OF CARDIAC PERFORATION AND PNEUMOTHORAX FOLLOWING PACEMAKER
 IMPLANTATION: A CASE REPORT**

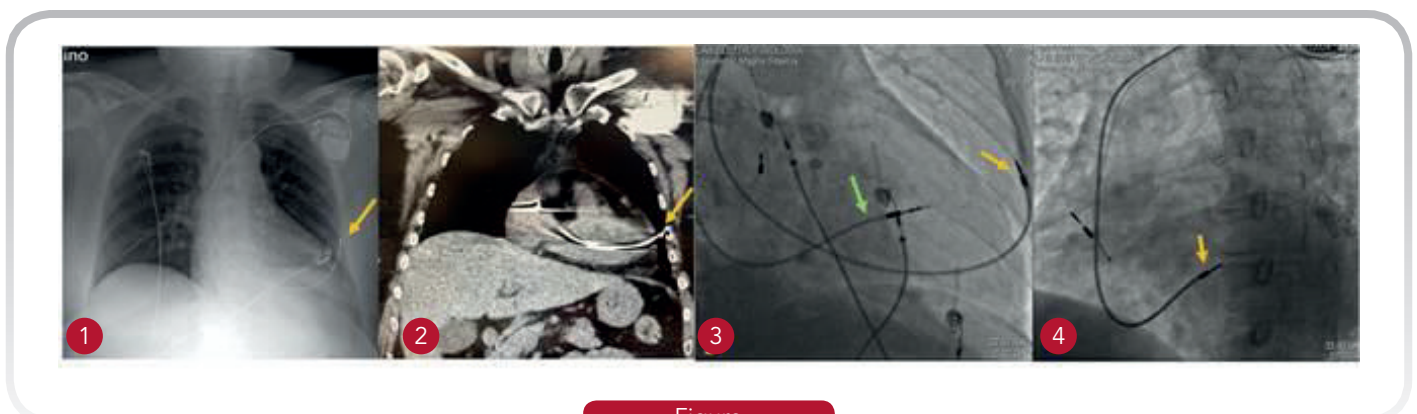
Giovanni Martino (a, b), Antonio Strangio (a, b), Giuseppe Santarpia (b), Francesco Passafaro (b),
 Alessandro Laschera (a, b), Jessica Ielapi (c), Isabella Leo (c), Jolanda Sabatino (c), Sabato Sorrentino (a, b),
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Introduction: Cardiac perforation is a rare complication following pacemaker implantation, occurring in 0.1–0.8% of patients. It can range from being asymptomatic to a potentially fatal complication. We report the case of a 72-year-old woman who was transferred to our department due to subacute cardiac perforation and pneumothorax.

Case Description: Two days after dual chamber pacemaker implantation for paroxysmal third-degree atrioventricular (AV) block, a 72-year-old woman presented with loss of ventricular capture and dyspnea. A chest X-ray (Fig. 1) followed by a chest CT scan (Fig. 2) revealed cardiac perforation caused

by the migration of the active right ventricular (RV) lead through the RV apex into the pleural cavity, resulting in a left pneumothorax (PNX) with a maximum thickness of 32 mm. The patient was referred to our hospital for further management. Given the recent implantation, the presence of symptoms, and the potential involvement of other structures, we opted for transvenous lead removal. Initially, a new transvenous active RV lead was implanted in the mid-septal position (Fig. 3). Subsequently, the original RV lead was removed. A standard stylet was inserted, and simple traction successfully removed the lead (Fig. 4). Device interrogation post-procedure showed appropriate capture, sensing, and lead impedance.



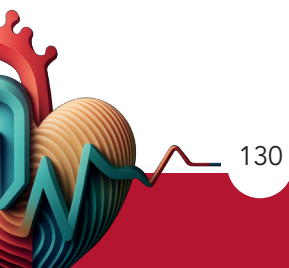
Figure



She remained hemodynamically stable with no increase in pericardial effusion. The pneumothorax was managed conservatively, considering the improvement in dyspnea and the absence of respiratory failure.

Discussion and Conclusions: Cardiac perforation due to pacemaker lead dislodgement is a rare but significant complication, categorized into three distinct types: acute (within 24 hours), subacute (within 30 days), and chronic/delayed (beyond 30 days). Subacute and delayed perforations are less common and more challenging to diagnose than acute ones. Clinical presentations can range from asymptomatic cases to potentially life-threatening conditions. The prevalence of asymptomatic cases may be underestimated and

could be significantly higher when assessed using CT scans. The treatment of pacemaker lead perforation involves two main approaches: conservative (observation or transvenous removal) and surgical (conventional median full-sternotomy or left mini-thoracotomy). The management strategy typically depends on the presence or absence of symptoms, the current and future risks associated with leaving the lead in place, and the risks associated with its removal. The optimal therapeutic approach is not always clear due to the rarity of this complication. Further studies are required to determine the most effective therapeutic strategies more accurately among the various possible scenarios.



ARITMIE 217
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
ARITMIE VENTRICOLARI (ARITMIE)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)
ABLAZIONE TRANSCATETERE (ARITMIE)

DIAGNOSI DIFFERENZIALE DI UN PARTICOLARE CASO DI TACHICARDIA A QRS LARGO

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 (a) U.O. CARDIOLOGIA, AZIENDA OSPEDALIERO-UNIVERSITARIA DI FERRARA

Uomo di 53 anni, iperteso, con storia di pregresso infarto miocardico acuto con FE moderatamente ridotta (40%), si presenta in visita ambulatoriale con richiesta di valutazione urgente per cardiopalmo, associato a dispnea. Si eseguiva ECG con riscontro di tachicardia a QRS largo a morfologia a blocco di branca destra, positivo nelle derivazioni inferiori e isodifasico in aVR. Si eseguiva adenosina (6 mg + 12 mg) con successivo riscontro di flutter atriale istmo cavo- tricuspidalico (ICT) dipendente, condotto con QRS stretto, e successiva rapida ripresa della tachiaritmia (240 bpm); veniva pertanto eseguita, con assistenza anestesologica, efficace cardioversione elettrica sincronizzata (200 J) con ripristino del ritmo sinusale e risoluzione della sintomatologia, seguiva ricovero in UTIC.

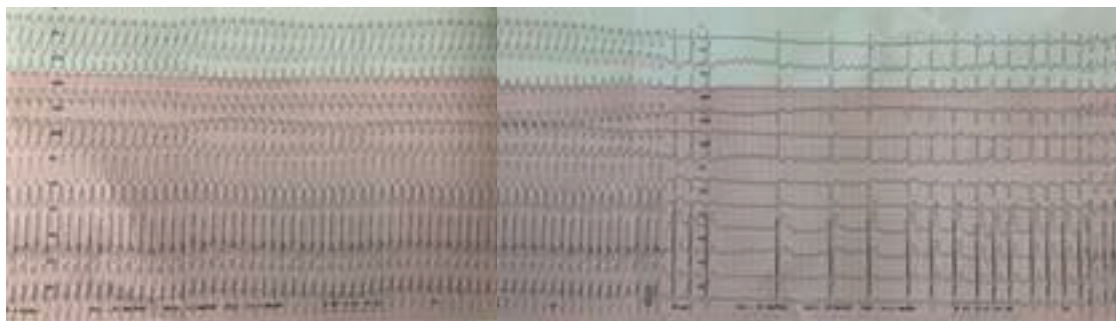
Veniva eseguito ecocardiogramma con evidenza di FE del ventricolo sinistro moderatamente ridotta (40%), in assenza di valvulopatie di rilievo.

Veniva eseguito studio elettrofisiologico (SEF) con fa-

cile inducibilità di flutter atriale ICT dipendente talora condotto con aberranza con morfologia del QRS simile all'aritmia clinica, al SEF ventricolare non inducibili aritmie ventricolari fino alla refrattarietà ventricolare; lo studio deponeva in favore della diagnosi di flutter ICT dipendente condotto con aberranza e pertanto si procedeva ad ablazione mediante radiofrequenza dell'ICT con successiva conferma del blocco biderazionale.

Il caso presentato mette in luce la difficoltà della diagnosi differenziale tra tachiaritmia atriale condotta con aberranza e tachicardia ventricolare fascicolare da overdrive atriale in corso di tachiaritmia atriale.

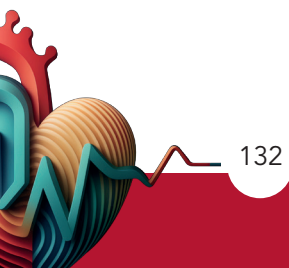
In particolare, le due aritmie presentano caratteristiche simili all'ECG di superficie con elevata frequenza ventricolare con QRS largo, iniziale rapida attivazione ventricolare con R-wave activation time (RWAT) in DII e aVR inferiore ai 40 ms e morfologia tipica da aberranza. Nel tracciato proposto, inoltre, sono assenti le tipiche caratteristiche che permettono la diagnosi di tachicar-



Figure

dia ventricolare, inclusa quella fasciolare, come battiti di fusione, battiti di cattura e/o dissociazione atrio-ventricolare, ma sono anche assenti caratteristiche suggestive di tachicardia ventricolare, come un'elevata durata del QRS e l'assoluta positività dei complessi ventricolari in aVR. Entrambe le aritmie inoltre possono risultare, come nel caso proposto, responsive alla somministrazione di adenosina, utile nel setting dell'emergenza per interrompere tachicardie parossistiche so-

praventricolari in cui il nodo AV prenda parte al circuito dell'aritmia, per rallentare la frequenza ventricolare in corso di fibrillazione e flutter atriale ad elevata risposta ventricolare e per confermare la diagnosi di tachicardia sopraventricolare condotta con aberranza. Nonostante la difficoltà nella diagnosi differenziale, porre la diagnosi corretta diventa fondamentale per via delle diverse strategie terapeutiche.



ARITMIE 757

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE)

RISCHIO TROMBOEMBOLICO DELLA CARDIOVERSIONE ELETTRICA NEI PAZIENTI AFFETTI DA FIBRILLAZIONE ATRIALE IN TERAPIA ANTICOAGULANTE

Salvatore Pagano (a), Marco Lo Presti (b), Daniela Dugo (a), Paolo Zappulla (a), Paola Pruiti (a), Marco Marsala (a), Francesco Barreca (a), Josef Milazzo (a), Veronica Trovato (a), Alessandra Tasca (a), Umberto Romeo (a), Riccardo Prezzavento (a), Giuseppe Valadà (a), Francesco Platania (a), Angelo Antonio Di Grazia (a), Davide Francesco Maria Capodanno (a)

(a) AOU POLICLINICO G. RODOLICO - SAN MARCO; (b) PO UMBERTO I DI ENNA

Premessa: L'utilizzo della cardioversione elettrica (CVE) nei pazienti affetti da fibrillazione atriale (FA) di nuova insorgenza è raccomandato sia in condizioni di instabilità emodinamica sia in elezione. In quest'ultimo setting in particolare è strettamente raccomandata un'attenta valutazione del rischio tromboembolico mediante il calcolo del CHA2DS2VASc Score. Nei casi in cui il rischio sia elevato, qualora l'aritmia sia insorta da più di 48 h o non sia "databile", è mandatoria l'esecuzione di un'ecocardiogramma transesofageo (ETE) prima di procedere alla cardioversione, per escludere la presenza di formazioni trombotiche in atrio sinistro o auricola, scongiurando così il rischio di embolizzazione al ripristino del ritmo sinusale.

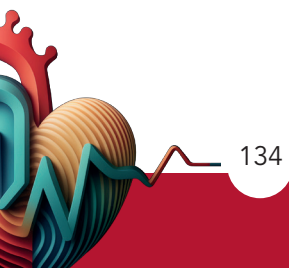
Materiali e metodi: In questo studio retrospettivo di coorte a singolo centro abbiamo analizzato i dati relativi ai pazienti sottoposti a cardioversione elettrica presso il nostro Istituto. Tutti i pazienti prima della CVE venivano sottoposti a ETE. I pazienti che non presentavano trombosi in atrio sinistro o auricola, previo monitoraggio ECG, saturimetrico e pressorio non invasivo, venivano sottoposti, in presenza di un anestesista, a sedazione e a erogazione di DC Shock partendo da un'energia minima di 100-150J. In caso di insuccesso, l'erogazione veniva ripetuta a voltaggio crescente fino a un massimo di 3 DC-Shock erogati. La registrazione di un nuovo ECG a 12 derivazioni confermava l'eventuale ripristino del ritmo sinusale.

Risultati: Da giugno 2018 a giugno 2024 497 pazienti sono stati sottoposti a CVE presso il nostro centro. Di questi, l'11% era affetto da FA di nuova insorgenza, il 6% da FA parossistica, il 71% da FA persistente e il 12% da flutter atriale o tachicardia atriale. Il ripristino del ritmo sinusale è stato ottenuto nel 91,3% dei pazienti. Sono stati inoltre analizzati i dati relativi alla valutazione ecocardiografica eseguita su 344 pazienti: il 68% presentava un atrio sinistro di normali dimensioni, nel 23% dei casi era presente una lieve dilatazione, nel 5% e 4% la dilatazione riscontrata era rispettivamente di grado moderato e severo. Sul totale dei 344 ETE effettuati, 60 (17,4%) hanno mostrato la presenza di trombo in atrio o auricola sinistra. Il 97% dei pazienti in cui è stata riscontrata trombosi all'ETE praticava terapia anticoagulante da almeno un mese (80% nuovi anticoagulanti orali, NAO; 10% anticoagulanti dicumarolici; 10% terapia eparinica a basso peso molecolare). Da un'analisi di questo sottogruppo di pazienti è emerso che il CHA2D2VASc Score era mediamente più alto rispetto alla popolazione generale dello studio (2,91 nei pazienti con trombi all'ETE vs 2,4 nella popolazione generale; mediana 3 nei pazienti con trombi all'ETE vs 2 nella popolazione generale). Tali pazienti presentavano insufficienza mitralica moderato-severa nel 74% dei casi; il 25% era inoltre affetto da scompenso cardiaco, con una FE < 40% nel 19% dei casi.



Conclusioni: L'analisi retrospettiva dei dati del nostro centro conferma che la CVE è una procedura altamente efficace nel ripristino del ritmo sinusale. L'elevato tasso di trombosi intracavitaria riscontrato nella nostra casistica nonostante adeguata terapia anticoagulante suggerisce l'esecuzione di ETE

pre-procedurale in tutti i pazienti, indipendentemente dall'epoca di insorgenza dell'aritmia e della durata della terapia anticoagulante praticata, in particolare nei pazienti con elevato rischio tromboembolico, valvulopatia mitralica o insufficienza cardiaca.



ARITMIE 489

ABLAZIONE TRANSCATETERE (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

SINDROME DI WOLFF-PARKINSON-WHITE E VIE DI CONDUZIONE ATRIOVENTRICOLARE ACCESSORIE MULTIPLE

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Introduzione: Si definisce pre-eccitazione ventricolare la depolarizzazione ventricolare anticipata di una parte più o meno estesa di muscolatura ventricolare ad opera di una via di conduzione accessoria. Il termine sindrome si collega a quello di pre-eccitazione quando, oltre alla presenza di eccitazione prematura della muscolatura ventricolare durante il ritmo sinusale, si verificano disturbi del ritmo cardiaco in cui è coinvolta la via accessoria. Di seguito la diagnosi e il trattamento della sindrome da pre-eccitazione attraverso l'esposizione di un caso clinico.

Caso Clinico: Paziente di 19 anni con in anamnesi ADHD e con familiarità positiva per MCI. Noto dall'età di 8 anni per pre-eccitazione ventricolare, persistente durante lo sforzo, in assenza di cardiopatia strutturale. Sottoposto nell'Aprile del 2013 c/o altro Centro a studio elettrofisiologico endocavitario con documentazione di singola via accessoria postero-settale destra con discrete capacità conduttive (conduzione AV 1:1 anterograda fino a ciclo di 280 ms e conduzione AV 1:1 retrograda fino a ciclo di 210 ms) in presenza di inducibilità con doppio extra-stimolo atriale, durante infusione di Isoproterenolo, di tachicardia reciprocante atrioventricolare ortodromica a ciclo di 240 ms. Non inducibilità di fibrillazione atriale, ma di fasi autolimitanti di FLA con RR minimo >400 ms. Da Gennaio 2023 comparsa di episodi di cardiopalmo della durata di circa 5-10 minuti a regressione spontanea; mai lipotimie/sincope. A Settembre 2023 episodio di cardiopalmo prolungato condizionante accesso in PS con riscontro all'ECG di tachicardia a QRS stretto a 207 bpm, regredita con manovre di stimolazione vagale. Da allora in terapia antiaritmica con Flecainide 50 mg ogni 12 ore, con beneficio clinico.

Ricoverato a Gennaio 2024 c/o il Nostro Centro per esecuzione in regime di elezione di studio elettrofisiologico endocavitario, previo adeguato periodo di sospensione della terapia antiaritmica. Allo studio elettrofisiologico veniva confermata inducibilità di tachicardia da rientro atrioventricolare ortodromica lungo via accessoria postero-mediale destra durante infusione di Isoprenalina, che risultava al mappaggio estesa dalla regione posteriore a quella postero-laterale dell'anello tricuspidalico. Sottoposto quindi ad ablazione transcatterete mediante energia di radiofrequenza, efficace nell'abolizione completa della conduzione lungo la via accessoria. Successivamente ed in modo inaspettato si osservava facile inducibilità di una seconda tachicardia reciprocante atrioventricolare ortodromica lungo via accessoria occulta postero-laterale sinistra. Si procedeva pertanto, previo cateterismo transtettale, ad efficace ablazione transcatterete anche di tale fascio anomalo. La degenza decorreva regolarmente e il Paziente si manteneva asintomatico. Veniva dimesso senza terapia antiaritmica. Successivo follow-up regolare, negativo per documentazione di recidiva di pre-eccitazione ventricolare o di tachiaritmie.

Conclusioni: In una percentuale ridotta di casi è possibile osservare vie di conduzione atrioventricolare accessorie multiple, ciascuna in grado di provocare aritmie. Nel caso specifico dopo l'abolizione completa della conduzione lungo la via accessoria manifesta, si osservava facile inducibilità di tachicardia reciprocante atrioventricolare ortodromica attraverso via accessoria occulta, necessitante anche essa di trattamento per il raggiungimento del successo clinico.



ARITMIE 44

ELETTROSTIMOLAZIONE (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)

MULTICENTRIC EXPERIENCE WITH THE USE OF SHORT 13 FR BIDIRECTIONAL MECHANICAL ROTATING DILATOR SHEATH FOR TRANSVENOUS LEAD EXTRACTION IN HIGH-VOLUME ITALIAN CENTRES

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(a) ASST NIGUARDA CA' GRANDA

Background: The need for transvenous lead extraction (TLE) is increasing worldwide and the course of the subclavian vein until the junction with the superior vena cava is a frequent place of lead adherences. Here we aim to assess the safety and efficacy of a short bidirectional rotational mechanical sheath in high-volumes centres.

Methods and results: in this multicentric study, 202 carriers of a cardiac implantable electronic device (CIED) undergoing TLE using a short 13 Fr bidirectional rotational mechanical sheath were prospectively enrolled. All procedures were performed by using the stepwise approach. The indication to TLE were infection (62%), lead malfunction (32%) and device upgrade (6%). Of the 471 total leads, 20% were defibrillator leads, 9% were left ventricle leads and 6% were abandoned leads. Clinical success and lead complete extraction

have been achieved in 97% and 95% of cases, respectively. The short sheath was always effective in gaining venous access at the start of the procedure and was sufficient for complete TLE in 72% of cases. Lead's dwell time, defibrillator lead, number of leads per patient and lead malfunction were predicting factors of long bidirectional rotational mechanical sheath use. There were no cases of intraprocedural death and major complication occurred in 2% of patients. Overall survival was 97% at 1-year follow up.

Conclusion: This multicentric experience using a short bidirectional rotational mechanical sheath reported a high safety and efficacy profile for TLE when performed in high volume centres, proving the utility of routine use of short extraction sheaths.

ARITMIE 852
ARITMIE VENTRICOLARI (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

**CARDIOMIOPATIA IPERTROFICA ED ELEGGIBILITÀ A IMPIANTO DI DEFIBRILLATORE SOTTOCUTANEO:
A VOLTE NON È PER SEMPRE. CASO CLINICO, RIFLESSIONI E PROSPETTIVE FUTURE**

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Josef Milazzo (a), Veronica Trovato (a), Alessandra Tasca (a), Umberto Romeo (a), Salvatore Pagano (a),
Giuseppe Valadà (a), Daniela Dugo (a), Paola Pruiti (a), Francesco Platania (a), Angelo Antonio Di Grazia (a),
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(a) AOU POLICLINICO "GASPARE RODOLICO - SAN MARCO", CATANIA

In pazienti affetti da cardiomiopatia ipertrofica, il tasso di superamento dello screening preimpianto di un defibrillatore sottocutaneo risulta inferiore rispetto a quello della popolazione generale. Ciò è dovuto alle alterazioni strutturali della patologia che, ripercuotendosi sull'attività elettrica del cuore, alterano sia i segnali sia dell'ECG di superficie, sia dei vettori di sensing analizzati in fase di screening.

Il nostro caso clinico riguarda un giovane uomo affetto da HCM ad alto rischio di SCD che nel 2015, all'età di 27 anni, ha impiantato un S-ICD in prevenzione primaria. Da allora è stato sottoposto a periodici controlli del device, risultati nei primi cinque anni nella norma. Nel 2020 e nel 2021 sono stati registrati due episodi di oversensing, di cui uno con erogazione di shock inappropriato. Per malfunzionamento dell'elettrocatteter, l'S-ICD è stato espantato a fine 2022 con indicazione a reimpianto di nuovo dispositivo. Il paziente è stato quindi sottoposto a test di screening, questa volta fallito per basso rapporto R/T e insufficiente ampiezza dell'onda R.

Ci siamo interrogati sui motivi che hanno portato nel tempo alla perdita di eleggibilità verso l'impianto di un S-ICD, formulando due ipotesi.

La prima ipotesi riguardava la differente modalità con cui il test di screening è stato effettuato nelle due occasioni (manuale nel 2015, automatico nel 2017) ed è stata scartata una volta eseguito il test manua-

le sui vettori rilevati nel 2022 con esito negativo. La seconda ipotesi nasceva dall'idea che l'evoluzione della patologia, provocando un ulteriore sovrimento della struttura miocardica e della sua attività elettrica, ha compromesso la qualità dei vettori di sensing analizzati.

Nel 2015 la RMN cardiaca descriveva un quadro di severa ipertrofia asimmetrica settale con associata degenerazione fibrotica delle pareti libere, soprattutto laterale ed inferiore. Nel 2022 l'esame attestava un ulteriore ispessimento del setto (32mm vs 28mm) che appariva maggiormente fibrotico, un ulteriore calo della frazione di eiezione (dal 41% al 27%) e un'ulteriore evoluzione fibrotica delle pareti laterali e inferiori, più assottigliate e con quota di metaplasia adiposa di nuova insorgenza.

Dai dati di correlazione disponibili in letteratura, le alterazioni strutturali hanno spiegato le nuove modifiche elettrocardiografiche, soprattutto in termini di frammentazione e di decremento del picco del QRS (con conseguente decremento del rapporto QRS/T), della morfologia delle onde T e della maggiore dispersione del tratto QT. Tali modifiche, interessando quasi tutte le derivazioni, sono espressione di un peggioramento generalizzato dell'attività elettrica e quindi non possono non manifestarsi anche a livello dei vettori del test di screening. D'altra parte, le osservazioni scaturite dal confronto degli ECG coin-



cidono con i motivi del fallimento del secondo screening.

Per concludere, il fallimento del secondo screening è stato dovuto all'evoluzione della patologia.

Soprattutto in assenza di dati in letteratura, è difficile predire il mantenimento di buoni vettori di sensing

nel tempo. Tuttavia, sulla base della nostra esperienza, crediamo che tale eventualità debba essere considerata in fase di screening, soprattutto in pazienti con severe alterazioni strutturali, indicative di forme con fenotipi più aggressivi e a rischio di una più rapida evoluzione.



ARITMIE 120

ELETTROSTIMOLAZIONE (ARITMIE)

MECCANISMI DELLE ARITMIE (ARITMIE)

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

STIMOLAZIONE DELL'AREA DELLA BRANCA SINISTRA DOPO SOSTITUZIONE TRANSCATETERE DI VALVOLA AORTICA: FATTIBILITÀ E SICUREZZA

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Introduzione: Una delle principali complicanze dell'impianto transcateretere della valvola aortica (TAVI) è il blocco atrioventricolare (BAV). Le attuali linee guida europee raccomandano l'osservazione per 1-2 giorni prima di impiantare un pacemaker permanente, ma non vengono fornite raccomandazioni specifiche sulle modalità o sui dispositivi di stimolazione preferiti. In questi pazienti solitamente viene eseguita la stimolazione ventricolare convenzionale dell'apice del ventricolo destro (RVP), ma questa potrebbe determinare una cardiomiopatia pacing-correlata nel follow-up a lungo termine. La stimolazione dell'area della branca sinistra (LBBAP) si sta affermando come un metodo alternativo per la stimolazione, in particolare sulla base delle recenti evidenze scientifiche che affermano come quest'ultima determini una propagazione più fisiologica dell'impulso elettrico e una minore dissincronia ventricolare. Tuttavia, l'esperienza di LBBAP dopo TAVI è limitata.

Obiettivo: L'obiettivo dello studio è quello di valutare la fattibilità e la sicurezza della LBBAP nei pazienti con BAV completo post-TAVI.

Materiali e metodi: In questo studio osservazionale monocentrico sono stati arruolati 17 pazienti, ricoverati presso l'AOU Maggiore Della Carità di Novara tra il 5 febbraio 2022 e il 1° marzo 2024, i quali hanno sviluppato BAV completo post-TAVI. In tutti i pazienti è stato tentato l'impianto di un pacemaker definitivo

con LBBAP. Sono stati raccolti i dati procedurali e del follow-up a breve termine (minimo tre mesi).

Risultati: Il successo procedurale acuto è stato raggiunto nel 100% dei pazienti, in base ai criteri del recente consensus EHRA (European Heart Rhythm Association) sulla stimolazione del sistema di conduzione. La performance di stimolazione elettrica è risultata clinicamente ottimale (LVAT medio 70.6 ± 17.1 msec e Rr1 medio 48.7 ± 11.4 msec), con una riduzione al follow-up (6 \pm 3.7 mesi) sia della soglia di cattura (0.9 ± 0.4 vs 0.5 ± 0.1 V x 0.5 msec, $p=0.001$), sia dell'impedenza (681.8 ± 245.9 vs 415.9 ± 64.7 Ohm, $p<0.001$). Il QRS è stato accorciato dalla stimolazione (152 ± 23 vs 116 ± 25 msec, $p<0.001$ all'impianto; 152 ± 23 vs 116 ± 23 msec, $p<0.001$ al follow-up). È stata osservata una sola complicanza peri-procedurale.

Conclusioni: La LBBAP si è rivelata essere una tecnica di stimolazione fattibile e sicura nei pazienti che sviluppano BAV completo post-TAVI, con una rilevante riduzione della durata del QRS sia in acuto e che al follow-up. Un follow-up esteso potrebbe chiarire se il beneficio osservato nella durata del QRS possa tradursi in una riduzione clinicamente rilevante della cardiomiopatia indotta da pacemaker (PICM). Studi di confronto con altre strategie di pacing saranno utili per individuare il miglior approccio anti-bradicardico.



ARITMIE 719 SINCOPE (ARITMIE) ABLAZIONE TRANSCATETERE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

CARDIONEUROABLAZIONE PER IL TRATTAMENTO DELLA SINCOPE VASO VAGALE- CASE REPORT

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(a) ELETTROFISIOLOGIA

Introduzione: La sincope vasovagale (VVS) è la forma più comune di sincope ed è fortemente associata a ipervagotonia; sebbene gli outcome siano generalmente benigni, la VVS può determinare lesioni da trauma e influenzare negativamente la qualità di vita. Recentemente, la cardioneuroablazione (CNA) è emersa come opzione terapeutica alternativa all'impianto di pacemaker per il trattamento dei pazienti di età inferiore ai 40 anni con sincope vasovagale di tipo cardioinibitorio.

Caso clinico: Un ragazzo di 17 anni, senza fattori di rischio cardiovascolare né familiarità per morte improvvisa, atleta a livello agonistico, è giunto alla nostra attenzione dopo diversi episodi sincopali preceduti da prodromi, verificatisi in seguito a stimolo doloroso o a prolungato ortostatismo. Sono state escluse anomalie di conduzione e alterazioni strutturali a livello cardiaco mediante elettrocardiogramma, ECG secondo Holter, ecocardiogramma transtoracico e risonanza magnetica nucleare (RMN) cardiaca; sono state inoltre escluse cause neurogene mediante l'esecuzione di elettroencefalogramma e RMN encefalo. È stato eseguito TILT Test, con riproducibilità della sincope e risposta VASIS di tipo 2B con asistolia prolungata (Fig.1). Il test all'Atropina (2 mg in bolo) ha avuto esito positivo con un incremento della frequenza cardiaca (FC) >25% rispetto alla FC basale (60 bpm basale, 120 bpm dopo 2 minuti dalla somministrazione). In considerazione della giovane

età e della ricorrenza degli episodi sincopali, il paziente è stato sottoposto a cardioneuroablazione. La procedura è stata eseguita presso la nostra sala di elettrofisiologia con il paziente non sedato. Dopo aver creato una mappa elettroanatomica di entrambe le cavità atriali mediante sistema di mappaggio 3D (Fig.2), sono stati individuati ed ablati mediante applicazione di radiofrequenza (Fig. 3) i potenziali frazionati correlati alla presenza dei plessi ganglionari (GP) a livello delle vene polmonari superiore e inferiore di sinistra (Left Superior GP, LSGP; Left Inferior GP, LIGP) e di destra (Right Superior GP, RSGP; Right Inferior GP, RIGP), a livello del tratto di Marshall (MTGP), nonché a livello della vena cava superiore (SVC GP). Durante l'ablazione di LSGP è stata osservata una risposta vagale con asistolia di 6.8 secondi; a fine procedura la FC a riposo è aumentata da 60 a 90 bpm. Al follow-up di un mese il paziente non ha avuto recidive e la FC registrata all'ECG è stata di 98 bpm.

Conclusioni: La CNA può essere considerata un'opzione terapeutica per le sincopi ricorrenti in pazienti con documentate pause prolungate. I rischi della procedura possono essere accettabili in pazienti opportunamente selezionati, in particolare nei più giovani dove l'impianto di pacemaker rimane l'unica alternativa. Sono necessari tuttavia trial randomizzati per valutare l'efficacia a lungo termine e standardizzare la procedura.

ARITMIE 177

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) BIOLOGIA MOLECOLARE CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

ARRHYTHMIC RISK ASSESSMENT IN PATIENTS WITH IDIOPATHIC INFLAMMATORY MYOPATHIES AND ANTI-RO/SSA 52 KD ANTIBODIES POSITIVITY

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Anti-Ro/SSA 52KD antibodies are known for their ability to cause congenital heart block in children born to mothers positive for such autoantibodies and, more recently, a possible effect of such autoantibodies in causing reversible heart block has been demonstrated in adults. The underlying mechanism appears to be linked to the structural homology between the Ro 52 antigen and a subunit of the hERG-K⁺ potassium channel, resulting in lengthening of the duration of the action potential and a corresponding lengthening of the electrocardiographic QT interval. In patients suffering from idiopathic inflammatory myopathies (IIM), cardiovascular involvement appears to be quite frequent, with electrocardiographic alterations found in 30-80% of cases. Positivity for anti-Ro52 KD antibodies is found in 10-40% of cases. In the following study we tried to evaluate whether positivity for anti-Ro52 antibodies in patients suffering from IIM could be associated with electrocardiographic alterations, in term of lengthening of the QTc interval and changes in heart rate variability (HRV). Forty patients suffering from different types of IIM were enrolled in the present study (26 females, 65%, 14 males, 35%); all patients were positive for myositis specific antibodies (MSA) and myositis associated antibodies (MAA); in particular, 25 (63%) were anti-Ro52 positive and 15 (37%) negative. All patients underwent electrocardiographic recording over 24 hours using the "Cardioline Clickholter ECG"

device. The calculation of the QTc interval was carried out according to Bazett's formula and considered pathological when > 480 ms; lengthened if > 440 ms in males and > 460 ms in females. Regarding HRV, only the time domain was analyzed; in particular, the values of SDNN (standard deviation of NN intervals) and triangular index. The SDNN was considered pathological if < 50 ms, borderline when between 50-100 ms; the triangular index was considered moderately reduced if < 20 and severely reduced if < 15. All tracings showed sinus rhythm. The median QTc of the entire cohort was 428 ms (IQR = 415-444); 431 ms (IQR = 420-451) respectively in anti-Ro52 positive patients, 418 ms (IQR = 407-436) in negative ones; no statistically significant difference emerged from the comparison of the two subgroups (p 0.075). As regards HRV, the median value of SDNN recorded in the whole cohort was 116 ms (IQR = 97-140 ms); 124 ms (IQR = 98-141 ms) in anti-Ro52 positive patients, 105 ms (IQR = 97-124 ms) in negative ones; the comparison between the two groups did not reveal a statistically significant difference (p = 0.829). The median value of the triangular index of the entire cohort was 28.5 (IQR = 25-36.5); 33 (IQR = 27-40) in anti-Ro52 positive patients, 25 (IQR = 23-30.5) in negative ones. The comparison between the two groups did not reveal a statistically significant difference (p = 0.991). Two patients (one positive and one negative for anti-



Ro52 antibodies) had a triangular index < 20 but ≥ 15 . 14 patients (8 positive and 6 negative) showed a SDNN between 50 and 99. In our cohort, no statistically significant electrocardiographic differences were found in term of QTc prolongation or HRV alterations, comparing IIM patients based on anti-Ro52

antibody positivity. However, a greater frequency of electrocardiographic alterations was found in anti-Ro52 antibody positive patients. Therefore, further studies with a larger number of patients will be necessary to better clarify the pro-arrhythmic role of anti-Ro/SSA 52 KD antibodies in this category of patients.



ARITMIE 859
ELETTROSTIMOLAZIONE (ARITMIE)
GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)

**REFRACTORY AXILLARY VENOUS SPASM DURING TRANSVENOUS DEFIBRILLATOR IMPLANTATION:
WHEN A CHANGE OF APPROACH IS NECESSARY**

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Background: Vascular spasm is well known to occur in the arterial system. However, central venous spasm during device implantation is uncommon with only few cases reported in literature.

Case report: We report the case of a 52 years old male smoker with a late anterior ST-elevated myocardial infarction (STEMI) treated with angioplasty and stent implantation in the left anterior descending artery. After four weeks, despite optimal medical therapy left ventricular ejection fraction at cardiac echography was 30% and cardiac magnetic resonance showed a large scar with transmural late gadolinium enhancement in mid and apical anterior and anteroseptal segments and apical cup. Therefore, a single lead implantable cardiac defibrillator (ICD) was recommended for primary prevention of sudden death and the procedure was planned. Once in the operating room, after local anaesthesia we performed an echo-guided axillary vein puncture, positioning the guidewire after fluoroscopic check in the inferior vena cava and subsequently positioning a sheath according to the Seldinger technique without any difficulty. However, while moving forward the catheter we encountered an unexpected resistance making advancement impossible (Figure A). Therefore, we removed the lead and performed a venography that showed that the contrast medium stopped at the level of the axillary vein (Figure B). The patient was asymptomatic with normal vital signs. Therefore, we suspected an axillary and subclavian venous spasm, we waited 30 minutes and repeated the

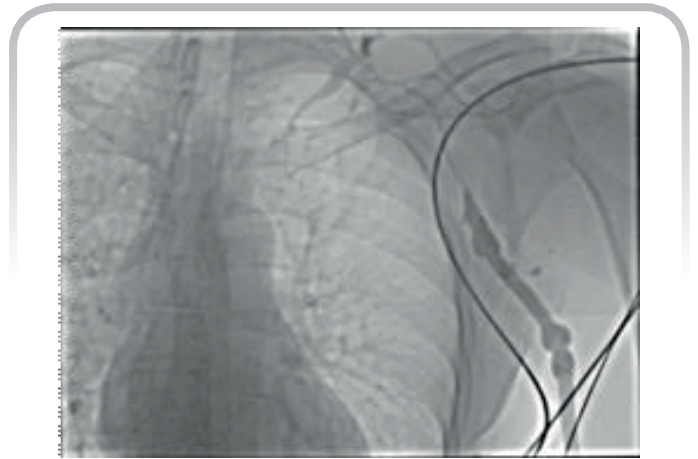


Figure A

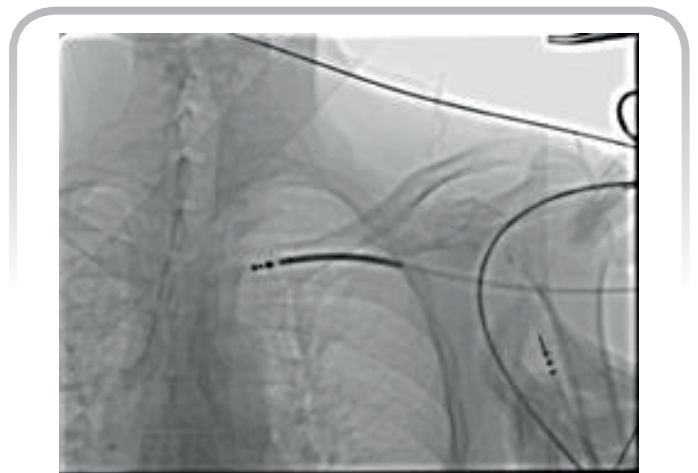
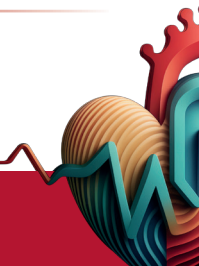


Figure B



venography that did not show any change. Thus, we suspended the procedure.

The day after we requested a chest CT angiography which showed normal venous anatomy and flow, confirming that the phenomenon observed was a severe vasospasm. Two days later we came back to the operating room repeating the procedure under sedation and intravenous nitrates administration to reduce the risk of vasospasm. Nonetheless, even during this attempt a severe spasm confirmed by angiography

occurred and even venous puncture was not possible. Therefore, since the patient did not require pacing therapy, we opted for a subcutaneous ICD (SICD) and the procedure was successfully performed without any complication.

Conclusion: Central venous spasm can occur during device implantation and sometimes may not respond to nitroglycerine injection, requiring a change of access site or a different approach.



ARITMIE 391

ARITMIE VENTRICOLARI (ARITMIE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) DEFIBRILLATORE IMPIANTABILE (ARITMIE)

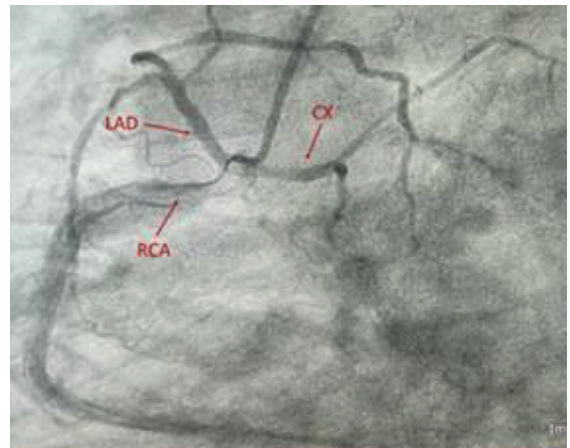
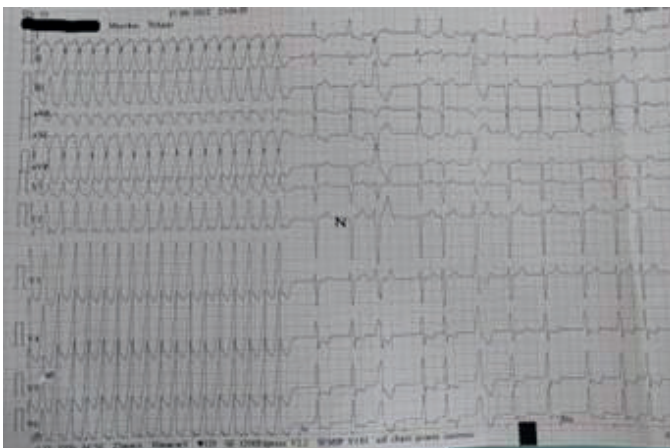
A SURPRISING CORONARY ANATOMY

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Congenital anomalies of the coronary artery are uncommon, with a reported incidence of 0.3% to 1.3% in the coronary angiography studies routinely performed for suspected atherosclerotic coronary disease. An aberrant origin of the left anterior descending coronary artery (LAD) from the right sinus of Valsalva is a rare anomaly that has been associated with myocardial ischemia and sudden cardiac death. An interarterial course of the LAD can be seen in more than 75% of patients with an LAD originating from the right sinus (as a separate vessel or as a branch of a single coronary artery). The high risk of sudden death is due to the acute angle of the ostium, the "stretching" of the intramural segment, and compression between the commissures of the right and left coronary cusps. Sudden death can result from transient compression of the anomalous LAD course, caused by dilation of the

aorta and pulmonary artery, which is in turn caused by the increase in blood flow during intense exercise, thus creating torsion or compression of the coronary artery between the aorta and the right ventricular outflow tract.

A 80 years Caucasian man was admitted to the Intensive Care Unit for acute decompensated heart failure in dilated-hypokinetic cardiomyopathy (EF 25%) precipitated by several runs of non-sustained ventricular tachycardia, symptomatic for fatigue and dizziness. His past medical history included: bioprosthetic aortic valve for severe aortic stenosis; diabetes mellitus; dyslipidemia; CKD; COPD. A 12-leads EKG showed: ventricular tachycardia with RBBB morphology, right inferior quadrant axis, positive concordance in precordial leads. Coronary angiography revealed: appearance of both coronary

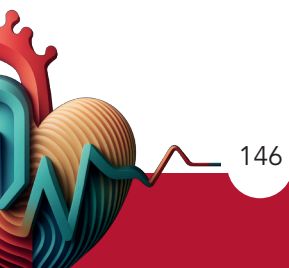


Figure



arteries originating from the right sinus of Valsalva. LAD passed between the aorta and the pulmonary artery, representing potentially a serious anomaly associated with sudden cardiac death. The arrhythmia probably originated from basal segments of left ventricle, likely corresponding to the areas of LGE (ischemic pattern) related to the abnormal coronary origin as showed in

the cardiac MRI performed during the hospitalization. This case was evaluated in heart team without giving any surgical indication for the coronary anatomy anomaly. The patient was treated with medical therapy for HFrEF and antiarrhythmic drugs. After reaching a hemodynamic stability, an ICD was implanted for secondary prevention.



ARITMIE 363

ASPETTI GENETICI DELLE ARITMIE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

VIA ACCESSORIA FASCICOLO-VENTRICOLARE IN CARDIOPATIA A FENOTIPO IPERTROFICO SOSPETTA PER MUTAZIONE PRKAG2

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Le cardiomiopatie PRKAG2 mutate sono una rara forma non sarcomerica di cardiomiopatia a fenotipo ipertrofico caratterizzata da un accumulo patologico di glicogeno all'interno dei miocardiociti.

Lo spettro clinico della cardiomiopatia PRKAG2 mutata comprende importanti disturbi della genesi e conduzione dell'impulso cardiaco tra cui blocchi AV totali, FA ed altre aritmie sopraventricolari. In tali cardiomiopatie è nota la correlazione con la presenza di vie accessorie a conduzione decrementale (F. Mahaim, vie fascicolo-ventricolari e nodo-fascicolari). Un paziente di 58 accede nella nostra UTIC in seguito a ricovero per insufficienza respiratoria e riscontro al monitoraggio ECG di fasi di bradicardia sospetta per FA bloccata.

All'ECG riscontro di FA a lenta risposta condotta con preccitazione ventricolare e onde Delta a bassa ampiezza.

All'ecocardiogramma primo riscontro di cardiopatia a fenotipo ipertrofico con funzione biventricolare conservata.

Alla RMN cardiaca riscontro di ipertrofia asimmetria localizzata principalmente a livello del SIV (19mm) con assenza di LGE.

È stato indicato SEF per lo studio della conduzione AV e della via accessoria in ottica di eventuale impianto di PM definitivo.

Metodi: Il SEF ha determinato la presenza di un significativo disturbo di conduzione sovrahissiano e

sottohissiano (AH 251ms HV 101ms).

È stata identificata un via accessoria a conduzione decrementale sensibile all'adenosina; la stimolazione multisito programmata ha permesso di localizzare la via accessoria in posizione settale.

L'infusione intraoperatoria di bolo di Ajmalina ha determinato un blocco selettivo della via accessoria permettendo la diagnosi elettrofisiologica di via fascicolo-ventricolare.

Vista l'alto sospetto di cardiomiopatia PRKAG2 mutata è stata eseguita biopsia endomiocardica (BEM) del SIV destro guidata da sistema di mappaggio ad alta densità e successiva indagine istopatologica rivolta a ricercare accumuli patologici di glicogeno all'interno dei miocardiociti.

È stata infine impiantato PM bicamerale ed eseguita indagine genetica (attualmente in corso) per ricercare mutazioni di PRKAG2.

Risultati: Il SEF ha mostrato la presenza di una significativa malattia del tessuto di conduzione cardiaco e la presenza di una via fascicolo-ventricolare in posizione settale.

La biopsia endomiocardica ha mostrato diverse aree di miocardiociti patologicamente ricchi di glicogeno.

Conclusioni: Nei pazienti con cardiopatia a fenotipo ipertrofico e presenza di preccitazione ventricolare da vie a conduzione decrementale è necessario porre il sospetto di cardiomiopatia da mutazione PRKAG2.



ARITMIE 130
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)
ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

ADVANCED INTERATRIAL BLOCKS ACROSS THE SPECTRUM OF RENAL FUNCTION - IL BLOCCO INTERATRIALE AVANZATO ATTRAVERSO GLI STADI DELLA FUNZIONALITÀ RENALE

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Background and Objective: Interatrial block (IAB) was defined as a conduction delay between the right and left atria. The pathological substrate of IAB is characterized by the fibrotic substitution of normal atrial musculature due to intracellular destruction and replacement with glycogen and collagen deposition in-between the cells; the collagen deposition disrupting the normal atrial current flow. It has also been suggested that IAB is an independent risk factor for stroke, cognitive impairment, dementia, atrial cardiomyopathy, thrombotic events, ARDS in need of intubation and cardiovascular mortality in several clinical settings. Advanced-IAB has been described as a sign of uremic cardiomyopathy among patients with chronic kidney disease (CKD) in haemodialysis. No data are available about the prevalence of both partial-IAB and advanced-IAB among different stages of chronic kidney disease. The aim of this study was to describe the prevalence and type of advanced-IAB across the spectrum of renal function, including patients on dialysis and the clinical characteristics associated to advanced-IAB.

Materials and Methods: Retrospective, single center study of 151 patients. The study population was divided into three groups according to stages of chronic kidney disease. We evaluated the prevalence and pattern of

IAB among the groups and the clinical characteristics associated to advanced-IAB.

Results: The prevalence of partial-IAB was significantly lower in ESKD group compared to control group (36.7% vs 59.6%; $p=0.02$); in contrast the prevalence of advanced-IAB was significantly higher in both CDK (17.8% vs 5.3%, $p=0.04$) and ESKD group (24.5% vs 5.3%, $p=0.005$) compared to control group. The atypical pattern of advanced-IAB was more frequent in both ESKD and CKD group than in control group (100% and 75% vs 33.3%; $p=0.02$). Among patients that showed advanced-IAB, 17 (73.9%) showed atypical pattern by morphology and 2 (8.7%) showed atypical pattern by duration of advanced-IAB. ESKD group was younger than control group (65.7 ± 12.3 vs 71.3 ± 9.9 ; $p=0.01$) and showed more prevalence of beta blockers (42.9% vs 19.3%; $p=0.009$), as in CKD group (37.8% vs 19.3%; $p=0.04$).

Conclusions: The progressive worsening of renal function was associated to an increasing prevalence of advanced-IAB. Advanced-IAB may be a sign of the uremic cardiomyopathy and suggest further evaluation with long-term follow-up to investigate its prognostic significance in chronic kidney disease.

ARITMIE 400

ABLAZIONE TRANSCATETERE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE)

TRANSOESOPHAGEAL ECHOCARDIOGRAPHY FOR SCREENING FOR LEFT ATRIAL THROMBI IN PATIENTS UNDERGOING ATRIAL FLUTTER OR ATRIAL FIBRILLATION ABLATION

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(b) UNIVERSITÀ POLITECNICA DELLE MARCHE

Introduction: Atrial Fibrillation (AF) is the most frequent arrhythmia in adults and is associated with an increased risk of stroke that can be prevented with oral anticoagulant therapy (OAT).

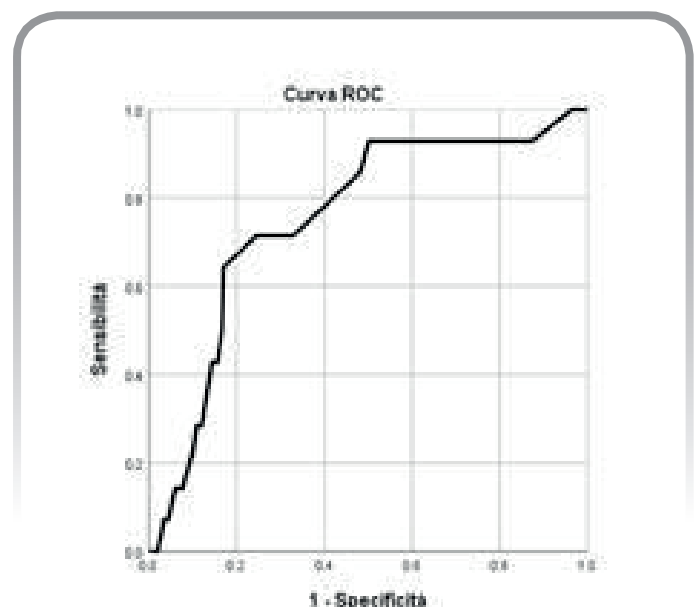
Catheter ablation (CA) with pulmonary vein isolation (PVI) is a first-line therapy but the presence of a left atrial thrombus (LAT) or left atrial appendage thrombus (LAAT) thrombus is a contraindication to CA due to increased risk of periprocedural ischemic complication. For this reason, patients undergoing CA should be screened to exclude LAT or LAAT.

Transesophageal Echocardiography (TOE) is the main imaging options for the exclusion of atrial thrombus.

Methods: Between January 2019 and April 2024, all consecutive patients undergoing TOE evaluation before AF/atrial flutter (AFL) ablation at our institution were screened and enrolled in the present study. For each patient we collected demographic data, past medical history, laboratory exams, medical therapy (including OAT therapy and adherence), transthoracic echocardiography parameters and evidence of LAT/LAAT at TOE.

Results: 586 consecutive patients underwent TOE before AF/AFL ablation. The mean age was 66 (\pm 6 years), and 422 (72%) pts were males. 236 (40%) had paroxysmal AF, 257 (44%) had persistent AF, 93 (16%) had AFL. At the time of the procedure 530 (89%) of

patients were in OAT (86% in DOAC, 3% in VKA). Patients in optimal OAT for more than 3 weeks before the procedure were 464 (80%). In our population we found 14 LAAT, all in the LAA. Patients with LAAT, compared to patients without thrombus, had a higher prevalence of coronary artery disease (CAD) (36% vs 13%; $p = 0,017$), heart failure (HF) (50% vs 23%; $p = 0,017$), lower EF (56% vs 49%, $p = 0,001$) and higher



LVEF ROC curve: area under the curve (AUC) 0,752 (IC 95%: 0,629-0,875 p value= 0,001).

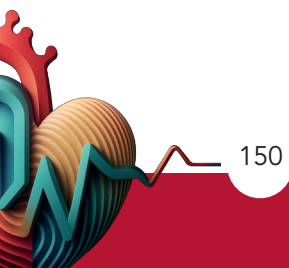
Figure 1



systolic pulmonary artery pressure (sPAP) (34 mmHg vs 29 mmHg, $p = 0,028$).

Among patients with thrombus there was a higher prevalence of persistent AF (10 patients) vs paroxysmal AF (3 patients, $p = 0,003$). At the univariate analysis history of CAD, HF, lower LVEF and higher sPAP showed to be predictors of LAAT. LVEF was analyzed with receiving operator characteristic curve (ROC) with an area under the curve (AUC) of 0,752 (IC 95%: 0,629-0,875 p value= 0,001) with LVEF of <50% as best cut-off.

Conclusion: our study suggests that patients with persistent AF, lower ejection fraction (< 50%), history of heart failure and higher sPAP are at increased risk of LAAT when pre-procedural CA imaging screening is performed. No other traditional risk factor (such as CHADSVASC or non-optimal anticoagulant therapy during 3 weeks before the procedure) showed to be significant.



ARITMIE 809
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE
(ARITMIE) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

ECG BEFORE NON-CARDIAC SURGERY: SUPERFLUOUS OR ESSENTIAL?

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Andreina Carbone (a), Pasquale Castaldo (a), Tiziana Formisano (a), Daniele Molinari (a), Massimiliano Orlandi (a),
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Introduction: Cardiovascular (CV) complications in the first month following non-cardiac surgery (NCS) represent a problem of clinical relevance, considering the high annual global volume of interventions worldwide. Performing an accurate CV evaluation and setting an adequate peri-operative management in patients scheduled for NCS is of primary importance. The aim of the present study was to assess the prevalence of abnormal ECG findings among patients scheduled for elective low- and intermediate-risk surgery, in whom ECG is not recommended by the latest European guidelines, and to establish if performing this exam may provide additional prognostic information and modify the peri-operative management of these groups of patients.

Methods: An observational cross-sectional study was performed. Included patients were the following: individuals scheduled for low-risk NCS; individuals scheduled for intermediate-risk NCS, under 65 years of age, and without CV risk factors/CV disease. All the patients underwent CV evaluation including collection

of CV risk factors, physical examination, and ECG performance.

Results: A total of 161 pre-operative evaluations were performed. Previously unknown ECG abnormalities were found in 11 patients, and 9 of them (5.6% of the total population) were corresponding to cardiovascular disease. In particular, atrial fibrillation (1.86%), ischemic disease (1.24%), hypertrophic cardiopathy (1.86%), and mitral prolapse with significant valvular regurgitation (0.62%) were detected. At least one CV risk factor was found in 8 out of 9 patients.

Conclusions: The prevalence of unknown ECG abnormalities in patients undergoing NCS is far from low. Given its low-cost and non-invasive nature, pre-operative ECG need to be performed in all patients as a screening method to diagnose unknown CV disease, optimize therapy before surgery, and guide preventive peri-operative strategies. More attention should be paid in patients with CV risk factors.



ARITMIE 31

FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ABLAZIONE TRANSCATETERE (ARITMIE) MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)

URIC ACID SIGNIFICANTLY CORRELATES WITH THE PRESENCE OF LOW VOLTAGE AREAS AT THE ENDOCARDIAL MAPPING IN PATIENTS WITH NON VALVULAR ATRIAL FIBRILLATION

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(a) CARDIOLOGIA 3, A. DE GASPERIS CARDIO CENTER, ASST GOM NIGUARDA CA' GRANDA, MILANO, ITALIA;
(b) CARDIOLOGIA 4, A. DE GASPERIS CARDIO CENTER, ASST GOM NIGUARDA CA' GRANDA, MILANO, ITALIA;
(c) DIPARTIMENTO DI MEDICINA E CHIRURGIA, UNIVERSITÀ MILANO BICOCCA, MILANO, ITALIA

Background: Interest in the role of atrial substrate in maintaining Atrial Fibrillation (AF) is growing. Fibrosis is the culprit in the electrical derangement of the myocytes. Many cardiovascular risk factors are known to be linked to atrial scarring; among them Uric Acid (UA) is emerging. The purpose of our study is to evaluate whether UA is associated with atrial fibrosis in AF patients.

Methods: 81 patients who underwent radiofrequency transcatheter ablation for nonvalvular AF at the cardiological department of the our hospital were enrolled. UA levels were analysed before the procedure as well as known predictors of atrial fibrosis. High density electroanatomic mapping of the left atrium was performed and patients were divided according to the presence or not of areas of pathological substrate (bipolar voltage < 0.5mV in sinus rhythm).

Results: 19 patients showed a pathological atrial substrate. The population of patients with pathological atrial substrate was older (64.7 ± 1.6 vs 58.2 ± 10.9 years, $p=0.032$) and had more often a persistent phenotype of AF (84.3 vs 35.8%, $p<0.001$). UA levels were significantly higher in the pathological group (6.8 ± 1.9 vs 5.3 ± 1.4 , $p<0.001$) as well as the prevalence of hyperuricemia (26.5 vs 6.5%, $p=0.021$). The association between uric acid and pathological atrial substrate remains significant even after correction for confounding factors (age, left ventricular dysfunction, valvular disease, AF phenotype and furosemide use).

Conclusions: In a population of patients who underwent atrial fibrillation's ablation, higher uric acid's levels were significantly associated with pathological left atrium's substrate at electro-anatomical mapping.

ARITMIE 2

GESTIONE DELLE COMPLICANZE PM / ICD (ARITMIE) SINCOPE (ARITMIE)

COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

MIGRATION OF LONG-SENSING VECTOR IMPLANTABLE LOOP RECORDER UNMASKED BY REMOTE MONITORING IN PATIENT WITH UNEXPLAINED SYNCOPE

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NOCERA INFERIORE

Introduction: Implantable loop recorders (ILRs) are indicated in patients with unexplained syncope in whom the comprehensive non-invasive evaluation has failed to identify the cause of transient loss of consciousness (T-LOC). Remote monitoring is recommended as part of the standard follow-up management strategy of ILRs. We report a case of asymptomatic ILR migration into the pleural cavity, unmasked by remote monitoring, and its multidisciplinary management.

Case presentation: A 75-year-old man with paroxysmal atrial fibrillation was referred to our syncope unit for the evaluation of recurrent episodes of orthostatic T-LOC without prodromes resulting in facial trauma. The result of the comprehensive cardiological evaluation was negative. An ILR with a long-sensing vector (Biomonitor IIIM, Biotronik, Berlin, Germany) was implanted in the left anterior chest wall, according to the standard technique. The procedure was completed with no complications. At implantation, the measured R-wave amplitude was 0.4 mV. The patient was remotely monitored with the Biotronik Home Monitoring® system. Approximately 1 month later, an unstable R-wave amplitude varying from very high (>1.9 mV) to very low (<0.2 mV) values was recorded at remote monitoring. The patient's device was interrogated in the pacemaker clinic. It was not possible to achieve telemetric connection to the ILR at the implantation site. The only area where the ILR could be interrogated was the left posterior axillary site. Chest X-ray and

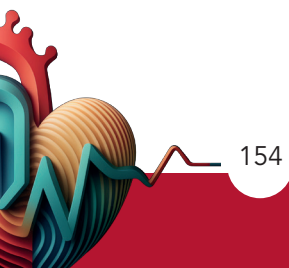
computed tomography (CT) scan confirmed migration of the ILR into the anterior costophrenic recess. The ILR was removed by uniportal video-assisted thoracic surgery, with no post-operative complications. After two days a new ILR implantation was successfully performed and the patient was discharged from the hospital.

Discussion: ILR migration into the pleural cavity is rare. It may be caused by an intraoperative technical mistake. If an excessive angle of penetration (>40°) is applied, the pocket tool might be inadvertently inserted through the intercostal space into the pleural cavity. Moreover, if the tip of the device was initially implanted deeply with angulation toward the intercostal muscle, the thin chest wall structure and the negative pressure of the pleural cavity could result in intrathoracic migration. From the analyses of the previous published cases with Biomonitor II or III and Medtronic LINQ the event occurred from the 5th to the 35th day after the procedure. The left posterior inferior pleural cavity was the more prevalent site of migration. In half of patients, the migration was asymptomatic. The diagnosis was usually achieved by chest CT scan. Uniportal video-assisted thoracic surgery was the first-choice surgical approach to achieve a favorable patient outcome. In all the reported cases, the suspicion of ILR dislocation was suggested by patients' symptomatology or by the impossibility to telemetrically interrogate the ILR at routine clinical visit. In our case, the sudden and



unexpected unstable R-wave amplitude fluctuation with very high values detected at device remote monitoring led us to evaluate the patient before the scheduled in-hospital clinical visit and to detect the ILR migration. A measured R-wave amplitude >1.5 mV should raise suspicion of improper device placement.

Conclusion: ILR migration into pleural cavity is a rare complication of ILR implantation. ILR remote monitoring may be useful to early detect the sudden and unexpected R-wave amplitude fluctuation which may lead to ILR migration diagnosis, even if the patient is asymptomatic.



ARITMIE 3

GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) SINCOPE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

MIGRATION OF IMPLANTABLE LOOP RECORDER: A META-SUMMARY OF CASE REPORTS

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Background: Implantable loop recorder (ILR) is indicated in patients with unexplained syncope in whom a comprehensive non-invasive evaluation has failed to identify the cause of transient loss of consciousness (T-LOC). There are few cases described in the literature of migration or extrusion of the device. This study aimed to perform a meta-summary of case reports to characterize patients who experienced ILR migration.

Methods: We searched for case reports published in Pubmed, Google Scholar, Scopus, and EMBASE from January 2017 to 2024 using the following keywords: "Migration ILR" "Migration Loop Recorder", "Complication Loop Recorder", "Complication ILR". Case reports of migration of ILR were included. Only English original reports were considered, and double papers were ruled out. Finally, 7 eligible case reports/case series were included in our meta-summary. Patients' characteristics, ILR implant technique and diagnostic properties were collected.

Results: A total of 7 patients who experienced migration of ILR were examined. The ILR implanted were Biomonitor II/III (Biotronik, Berlin, Germany) in four patients and Medtronic linq (Medtronic Inc, Minneapolis, Minnesota) in the three ones. All ILRs were implanted according to the standard protocol. Regarding the time to event, all patients experienced migration within 35 days following ILR implantation.

No information about the possible causes of ILR migration was provided. The clinical suspicion arose from chest pain in 5 cases, from signal abnormalities on ILR interrogation by the anterior chest in one case, and from signal abnormalities of home ILR monitoring in one case. The migration of ILR was confirmed in post-operative CXR and CT-scan in all cases. ILRs migrated most commonly into the left inferior part of the pleural cavity (n: 4; 57.14%). The management of ILR migration was based on the device movement by video-assisted thoracic surgery (VATS) (n: 5; 71.4%) and open surgical intervention (n: 2; 28.6%).

Discussion: ILR implantation is a simple procedure burdened by low intraoperative complications. The main complications are represented by short-term local pain, hematomas, and local discomfort. Rarely, episodes of extrusion from the skin may occur. Few cases describe ILR migration. From the results of our analysis, ILR migration is a rare complication that occurred in 50% in the early post-implant period (< 7 days) and always within the following 35 days; therefore, it should be considered an early complication of ILR implantation. ILR migration may be caused by an intra-operative technical mistake. The suspicion of ILR migration is mainly derived from the appearance of symptoms such as local pain, discomfort in the migration area, and dyspnea. The diagnosis of ILR migration occurred mainly with the use of radiological techniques. Device

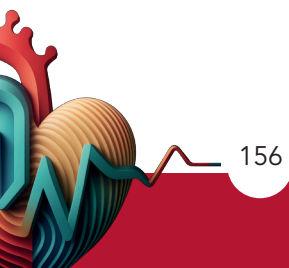


removal was primarily based on the use of the VATS technique. In one case remote ILR monitoring was able to detect ILR migration. However, interrogation of ILR was verified signal alteration.

Limitations: The low number of included cases is certainly a limitation; however, the present

is the first meta-summary regarding this topic.

Conclusion: Intrapleural migration is a rare complication of ILR implantation. Larger studies are needed to increase the knowledge and improve the prevention of ILR migration.



ARITMIE 485
ARITMIE VENTRICOLARI (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
MECCANISMI DELLE ARITMIE (ARITMIE)

ARRESTO CARDIACO DA VASOSPASMO SU PLACCA: UN CASE REPORT

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Le cause di arresto cardiaco possono essere ricondotte ad un ampio spettro di meccanismi. La cardiopatia ischemica, sia acuta sia cronica, ne rappresenta l'eziopatogenesi più comune (65-70% dei casi totali). L'identificazione di una chiara coronaropatia critica è possibile in circa il 70% di questi soggetti, mentre un'occlusione coronarica totale si riscontra solo nel 50% dei casi.

Una paziente di 49 anni, con anamnesi patologica remota muta, veniva trasportata in PS in seguito ad un arresto cardiaco testimoniato, con ROSC dopo singola erogazione di DC shock tramite DAE utilizzato dai soccorritori. All'analisi postuma del DAE è stato riscontrato un ritmo defibrillabile compatibile con FV. L'ECG teletraspresso, negativo per STEMI, ha escluso in un primo momento la necessità di attivare la sala di emodinamica in emergenza, pertanto la paziente veniva centralizzata presso il nostro DEA. L'ecocardio eseguito in acuto mostrava una lieve disfunzione sistolica (FEVs 45%) con franca ipocinesia del SIV anteriore e dell'apice. Veniva pertanto eseguito uno studio coronarografico, con riscontro di ateromasia angiograficamente non ostruttiva dell'IVA prossimale. La paziente, ricoverata in terapia intensiva, si è sempre mantenuta emodinamicamente stabile in assenza di supporto aminico. Al successivo monitoraggio telemetrico venivano registrate numerose TVNS polimorfe e un transitorio soprallivellamento del tratto ST in V1->V5, a risoluzione spontanea, con impossibilità di valutare eventuali sintomi poiché la paziente era sedata. Nel sospetto di un episodio di vasospasmo coronarico, si avviava

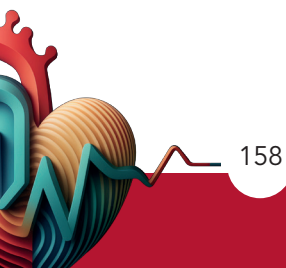
terapia con calcio antagonista e nitrato. Nel successivo decorso clinico non si sono registrate nuove recidive né aritmie ventricolari maligne. Il caso è stato discusso collegialmente in Heart Team: è stata posta indicazione a nuovo studio coronarografico con supporto IVUS, con documentazione di un burden di placca del 58.8% in sede prossimale. Alla luce della presentazione con MINOCA complicato da ACC e del presunto meccanismo eziopatogenico riferibile a spasmo su placca, supportato dalle modifiche dinamiche del tratto ST al monitoraggio ECGrafico seppur in assenza di documentazione angiografica di spasmo epicardico, si decideva di procedere ad angioplastica con impianto IVUS-guidato di stent medicato sull'asse IVA prossimale-media. La RM cuore eseguita a distanza di 12 giorni dall'evento acuto ha identificato una normale cinesi biventricolare con un'estesa area di edema nel territorio di IVA in assenza di LGE. Si è proceduto pertanto a impianto di S-ICD in prevenzione secondaria.

Abbiamo voluto presentare un caso clinico di vasospasmo coronarico su placca non critica verosimilmente responsabile dell'arresto cardiaco, con recidiva intraricovero di vasospasmo e spiccata suscettibilità aritmica. La gestione di tali pazienti rimane ambigua e contraddittoria viste le raccomandazioni internazionali che suggeriscono una gestione esclusivamente medica degli episodi di vasospasmo: tuttavia nella minoranza dei casi in cui la presentazione clinica è l'arresto cardiaco si reputa opportuno valutare l'impianto di ICD in prevenzione secondaria anche nei pazienti con terapia farmaco-



logica già massimale. Nel nostro caso inoltre la placca presente sull'IVA prossimale, pur di per sè non critica, presentava un significativo burden aterosclerotico all'IVUS pertanto si è ritenuto opportuno l'esecuzione dell'angioplastica in modo da "passivare"

la lesione ritenuta vulnerabile e responsabile della condizione clinica di esordio. Visto il gap of evidenze in tali pazienti la terapia medica e l'angioplastica non hanno un'efficacia prevedibile e ciò potrebbe essere da stimolo per ulteriori indagini al riguardo.



ARITMIE 232
FARMACI ANTIARITMICI (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA
CARDIACA IN ACUTO)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
ELETTROSTIMOLAZIONE (ARITMIE)

QUANDO IL CUORE NON E' STIMOLABILE

Donatella Tansella (a), Giorgia Ugolini (a), Luca Licchelli (a), Filippo Donato (a), Luisa Cacciavillani (a)
(a) UNIVERSITÀ DEGLI STUDI DI PADOVA

La flecainide è un farmaco antiaritmico di classe Ic con un ristretto range terapeutico, quindi anche dosaggi di poco superiori a quelli terapeutici, possono causare intossicazioni potenzialmente fatali, tra cui blocchi atrio-ventricolari (BAV) di alto grado, tachicardia ventricolare/fibrillazione, bradiaritmie e asistolia. Si presenta il caso di una donna di 83 anni affetta da fibrillazione atriale parossistica già trattata in passato con flecainide con strategia "pill in the pocket". Richiama l'attenzione del curante per un episodio di cardiopalmo per cui le viene consigliata l'assunzione di 100 mg x2v/die di flecainide; per la persistenza della sintomatologia, la paziente decide autonomamente di assumere 5 compresse nell'arco di 24 ore, giunge quindi in Pronto Soccorso soporosa, ma ancora risvegliabile, con un quadro di tachicardia a complessi larghi e in distress respiratorio (FC 150 bpm, PA 90/60 mmHg, FR 25 atti/min). Alla luce dell'anamnesi, si ipotizza sin da subito un'intossicazione da flecainide, quindi si somministra sodio bicarbonato (bolo 150 mEq e successiva infusione continua) e intralipid per cercare di antagonizzare l'effetto del farmaco, tuttavia il quadro di distress respiratorio peggiora, la paziente diventa incosciente e si decide di procedere con l'intubazione oro-tracheale. Durante la sedazione però si assiste all'insorgenza di BAV avanzato con ritmo di scappamento giunzionale a QRS stretto; si tenta la stimolazione transcutanea, senza però evidenza di cattura elettrica. La paziente, instabile emodinamicamente, in corso di rianimazione cardio-polmona-

re, viene trasportata in sala di emodinamica per il posizionamento di un pacemaker transvenoso temporaneo, anche in questo caso però, senza evidenza di cattura elettrica. Viene quindi posizionato l'ECMO veno-arterioso. Si assiste successivamente a ripristino di ritmo sinusale a QRS stretto. Agli esami ematochimici, il dosaggio di flecainide nel sangue mostra dei livelli più di 6 volte superiori al range di normalità: 6500 ng/mL (v.n. fino a 1000 ng/L). Questo caso mostra come sia difficile sia il ricono-

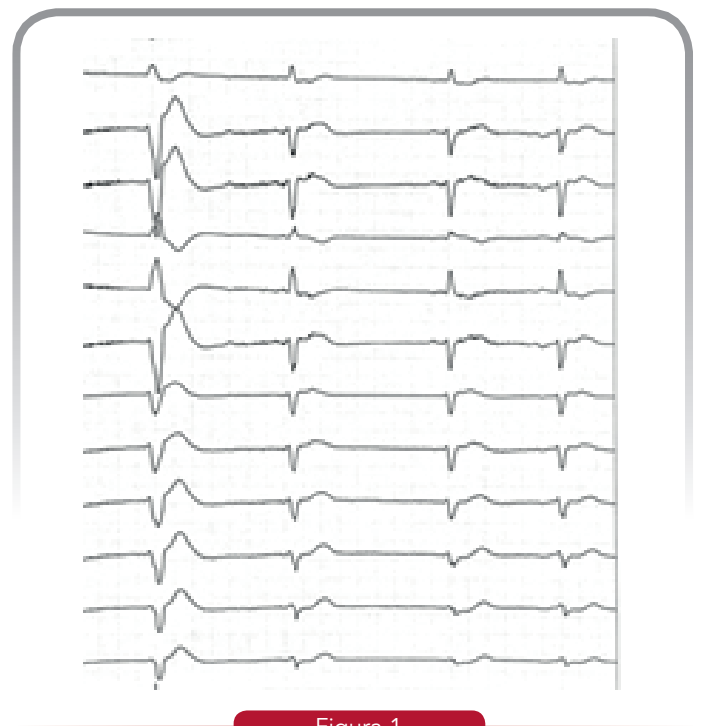


Figura 1



scimento, ma anche il trattamento di un'intossicazione da flecainide, poiché non esiste un antidoto specifico e non è un farmaco dializzabile; non esiste un trattamento standardizzato: in caso di intossicazione le uniche armi a disposizione sono carbone attivo, in caso di recente ingestione, sodio bicarbonato, caposaldo della terapia, per incrementare la concentrazione extracellulare di sodio e spiazzare il farmaco dal recettore. In caso di mancata risposta, è necessario il supporto emodinamico con ECMO, per consentire un'adeguata perfusione d'organo fino a washout completo del farmaco. Anche in letteratura sono descritti casi, in cui l'overdose di flecainide, può causare la mancata cattura elettrica del miocar-

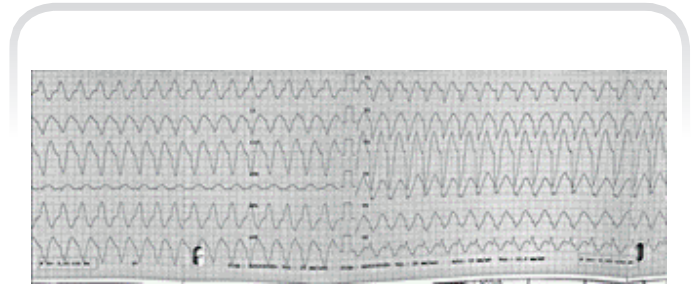


Figura 2

dio durante pacing proprio in virtù dell'impregnazione delle fibre miocardiche al farmaco e l'incremento delle soglie di pacing.

ARITMIE 734

STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)

PR CORTO ED ASPETTO PRE-ECCITATO DEL QRS: MALATTIA DI ANDERSON FABRY O VIA ACCESSORIA?

Eugenio Trovarelli (a), Anna Mengoni (a), Cinzia Zuchi (a), Matteo D'ammando (b), Rosanna Lauciello (a),
Giuliana Bardelli (a), Sandra D'addario (a), Erberto Carluccio (a), Giuseppe Ambrosio (a)

(a) *CARDIOLOGIA E FISIOPATOLOGIA CARDIOVASCOLARE, OSPEDALE SANTA MARIA DELLA MISERICORDIA, UNIVERSITA' DEGLI STUDI DI PERUGIA, ITALIA;* (b) *STRUTTURA COMPLESSA DI CARDIOLOGIA, OSPEDALE SANTA MARIA DELLA MISERICORDIA, PERUGIA, ITALIA*

Caso Clinico: una donna di 68 anni, giunge alla nostra attenzione per brevi episodi di cardiopalmo. In anamnesi malattia di Anderson-Fabry con interessamento cardiaco (fenotipo ipertrofico con funzione ventricolare sinistra conservata), neurologico, cutaneo ed oculare in terapia con agalsidasi-alfa. All'ECG ritmo sinusale, un intervallo PR corto (60 msec) con aspetto pre-eccitato del QRS, blocco di branca destro, onde T negative profonde e diffuse ed (fig. 1).

La nostra attenzione si è focalizzata sul PR corto e l'aspetto da pre-eccitazione del QRS, spesso presenti nei pazienti con malattia di Anderson-Fabry ma elemento caratteristico anche delle vie accessorie, che avrebbero potuto spiegare il cardiopalmo.

Nel sospetto di una tachicardia da rientro atrio-ventricolare, la paziente è stata sottoposta a studio elettrofisiologico che ha mostrato in un intervallo basale A-H 65 ms e H-delta 13 ms. Dopo extrasistole ventricolare si è verificata una retroconduzione su via lenta (VA 113 ms). Dopo stimolazione atriale multifocale (CS 9-10, CS1-2, HRA) e dopo stimolazione atriale decrementale (CS 9-10), non si è assistito a variazione del grado di pre-eccitazione. Il periodo refrattario del nodo atrio-ventricolare e della via accessoria erano di 410 msec.

Durante lo studio sono state inoltre eseguite manovre di pacing para-Hisiano con evidenza di morfologia del QRS elettro-indotto analoga al QRS basale. La somministrazione di adenosina ha indotto un blocco atrio-ventricolare avanzato con alcuni battiti di scappamento giunzionali pre-eccitati con stessa morfologia del QRS in basale (fig.2). Non sono state indotte aritmie sopra-ventricolari da rientro.

L'esame deponeva quindi, per via accessoria manifesta fascicolo ventricolare a basso rischio aritmico.

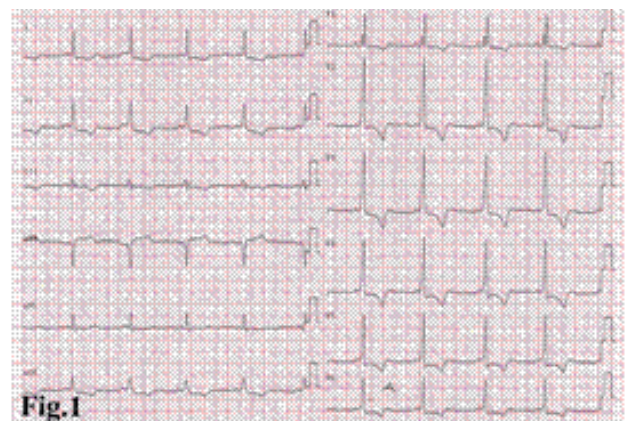


Figura 1

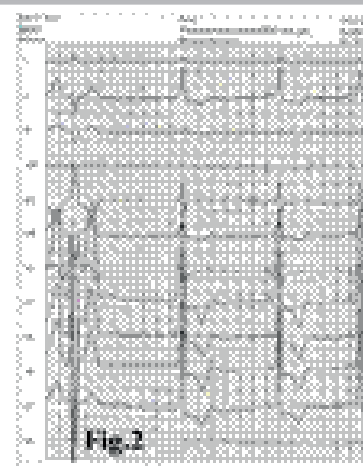


Figura 2

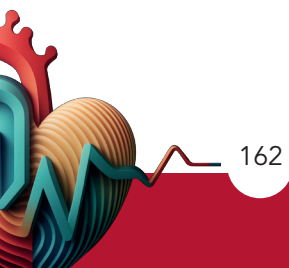


Discussione: l'intervallo PR breve è tipico delle fasi iniziali della malattia di Anderson- Fabry ed è riconducibile all'aumentata velocità di conduzione atrio-ventricolare, causata dall'accumulo di glicosfingolipidi intracellulari. Questa condizione potrebbe portare a non valutare la possibile presenza di vie accessorie concomitanti, che potrebbero essere causa di aritmie.

Il caso clinico presentato è interessante anche perchè

ha mostrato la presenza di una rara forma di via accessoria fascicolo-ventricolare (AVP).

Conclusioni: in presenza di cardiopalmo, potrebbe essere utile eseguire lo studio elettrofisiologico in pazienti affetti da malattia di Anderson- Fabry con PR corto ed aspetto pre- eccitato del QRS.



ARITMIE 814

ELETTROSTIMOLAZIONE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) SINCOPE (ARITMIE) PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)

STIMOLAZIONE DELL'AREA DELLA BRANCA SINISTRA IN PAZIENTE PRECEDENTEMENTE SOTTOPOSTA A RIPARAZIONE DELLA VALVOLA TRICUSPIDE MEDIANTE SISTEMA TRICLIP

Veronica Trovato (a), Giuseppe Sollano (b), Daniela Dugo (a), Paolo Zappulla (a), Paola Pruiti (a), Marco Marsala (a), Francesco Barreca (a), Josef Milazzo (a), Alessandra Tasca (a), Umberto Romeo (a), Salvatore Pagano (a), Riccardo Prezzavento (a), Giuseppe Valada' (a), Francesco Platania (a), Angelo Antonino Di Grazia (a), Davide Francesco Maria Capodanno (a)
(a) U.O.C. CARDIOLOGIA-UTIC, A.O.U.P. G. RODOLICO-SAN MARCO, CATANIA;
(b) U.O.C. CARDIOLOGIA-UTIC, P.O. S. ELIA, CALTANISSETTA

Introduzione: La procedura di impianto di pacemaker prevede il posizionamento dell'elettrocatteter ventricolare mediante l'attraversamento della valvola tricuspide. L'eventuale presenza di sistemi di correzione dell'insufficienza tricuspidalica potrebbe rendere la procedura più difficoltosa. In tale contesto, gli strumenti attualmente disponibili per la stimolazione dell'area della branca sinistra (LBBAP) potrebbero facilitare l'impianto dell'elettrocatteter ventricolare, garantendo una stimolazione più prossima a quella fisiologica e prevenendo il rischio di dissincronia iatrogena.

Caso Clinico: Una donna di 80 anni, ipertesa, dislipidemia, affetta da ipotiroidismo in terapia ormonale sostitutiva e fibrillazione atriale persistente in terapia anti-coagulante orale, giungeva alla nostra osservazione nel 2022 con scompenso cardiaco (NYHA III) e insufficienza tricuspidalica di grado massivo. Per tale motivo veniva sottoposta a riparazione percutanea edge to edge della valvola tricuspide (TEER - tricuspid transcatheter edge to edge repair) mediante sistema TriClip (Abbott Medical), con posizionamento di due clip XTW tra i lembi anteriore e settale della valvola ed insufficienza residua di grado moderato. Successivamente, per la comparsa di bradicardia marcata e sincope, veniva posta indicazione ad impianto di pacemaker definitivo. In considerazione della non trascurabile difficoltà tecnica della procedura di impianto dell'elettrocatteter ventricolare in presenza delle due clip precedentemen-

te posizionate sulla valvola tricuspide, si decideva di procedere con LBBAP. In particolare, veniva utilizzato il delivery dedicato (Selectra 3D, Biotronik), servendosi della peculiare curvatura e del maggior supporto per l'attraversamento del piano valvolare e l'impianto dell'elettrocatteter (Solia S60, Biotronik) nell'area della branca sinistra (Fig. 1). Nei successivi follow-up a uno, tre e quindici mesi veniva rilevata buona stabilità dei parametri elettrici relativamente e sensing, soglia ed impedenza (Tab.1).

LBBAP IN PRESENZA DI SISTEMA DI RIPARAZIONE DELLA VALVOLA TRICUSPIDE TRICLIP

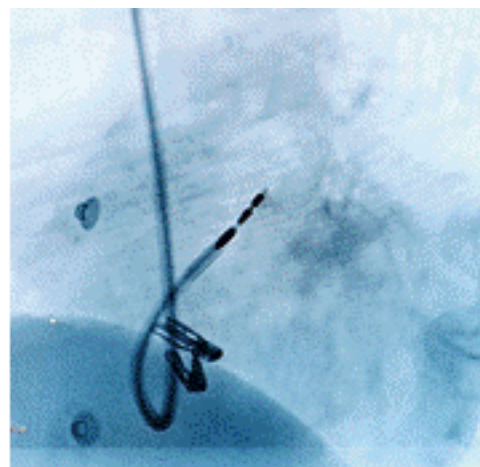


Figura 1

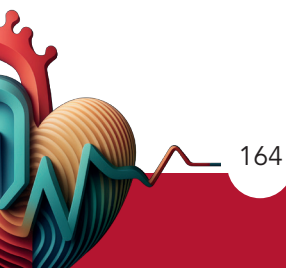
Conclusioni: LBBAP con l'utilizzo del delivery dedicato può facilitare l'impianto di pacemaker nei pazienti precedentemente sottoposti a TEER mediante sistema

Triclip. LBBAP, inoltre, garantisce un'attivazione ventricolare più prossima a quella fisiologica, riducendo il rischio di indurre dissincronia di contrazione.

LBBAP E STABILITÀ DEI PARAMETRI ELETTRICI DURANTE IL FOLLOW UP

Parametri Elettrici	Impianto	1 mese	3 mesi	15 mesi
Sensing unipolare	4,4	11	10,4	0
Sensing bipolare	4	9	9	0
Soglia unipolare	0,5	0,4	0,6	0,8
Soglia bipolare	0,6	0,6	0,6	0,9
Impedenza unipolare	448	409	409	390
Impedenza bipolare	412	663	400	526
% VP		100%	87%	96%

Tabella 1



ARITMIE 221

ARITMIE VENTRICOLARI (ARITMIE) SINCOPE (ARITMIE) FARMACI ANTIARITMICI (ARITMIE)

INSIDE AN ARRHYTHMIC HEART

Margherita Zanoletti (a), Pier Filippo Vianello (b), Rosa Coppoletta (c), Paolo Di Donna (b), Italo Porto (a, b)
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A 72-year-old man, with no previous cardiological history nor family history of cardiomyopathy, channelopathy or sudden cardiac death was admitted to the emergency department due to an episode of loss of consciousness at rest. He has experimented episodes of fatigue with palpitations, especially during night, for about two weeks. He was not on any pharmacotherapy but was taking supplements containing serenoa repens, thuja, sequoia and St. John's wort. The EKG showed frequent short-coupled ventricular ectopic activity with right bundle branch block (RBBB) and left axis deviation morphology (image 1). An echocardiogram showed preserved ejection fraction, no kinetic abnormalities, no significant valvular disease, no dilated right chambers and no pericardial effusion. After few minutes, an episode of polymorphic ventricular tachycardia (VT) (image 2) occurred, degenerating into ventricular fibrillation (VF) treated with DC shock. A venous blood gas showed mild hypokalemia (3.4 mEq/L), for which intravenous (IV) potassium and magnesium sulfate were administered. Ventricular extrasystoles' morphology suggested the hypothesis of idiopathic fascicular left VT so IV verapamil bolus 5 + 5 mg was given without suppression of the ectopic activity. After few minutes, two additional episodes of VF treated with multiple DC shocks occurred. We decided to administer IV isoproterenol with a target heart rate (HR) of 85-90 bpm, followed by a rapid suppression of ectopic activity. An EKG after ROSC showed no acute ischemic changes, QTc within normal limits; the blood tests showed serial negative high-sensitivity

troponin I (TnI hs), no anemia, negative toxicology, no signs of infection and normal electrolytes. A coronary angiography study showed no significant stenoses. After two days of arrhythmic silence, an attempt was made to reduce the isoproterenol infusion which quickly resulted in R-on-T and the onset of polymorphic VT. The day after, despite the absence of electrolyte disturbances, the isoproterenol infusion and mild sedation with midazolam, the patient experienced an arrhythmic storm treated with multiple DC shocks. A left stellate ganglion block attempt was made but was ineffective, with a rapid recurrence of ectopy (image 3: ventricular bigeminy with left bundle branch block morphology and superior axis, incomplete RBBB, S wave in lead I, J point elevation in inferior leads). We decided to implant a catheter in the right atrium with a high-rate pacing (100 bpm) followed by complete

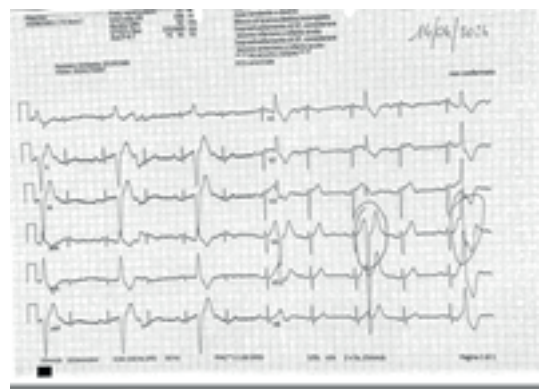
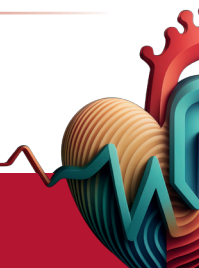
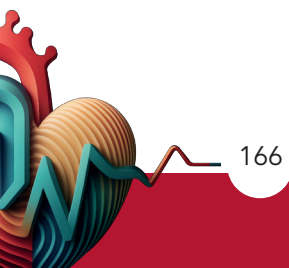


Figure 1



suppression of the arrhythmic burden (image 4), even after discontinuation of IV isoproterenol. After two days of arrhythmic silence, a dual-chamber ICD (DDD mode) was implanted, with pacing at 100 bpm, and hydroquinidine 150 mg three times daily was started.

The pacing rate was then reduced to 80 bpm and the patient was discharged. At one month, the patient was asymptomatic and the ICD monitoring showed no ventricular arrhythmias.



ARITMIE 158

ABLAZIONE TRANSCATETERE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

LOCK PROTOCOL: A NEW ROBUST WORKFLOW FOR A VERY HIGH FIRST PASS PULMONARY VEIN ISOLATION DURING ATRIAL FIBRILLATION ABLATION

Saverio Zarra (a), Andrea Di Cori (a), Giulio Zucchelli (a), Raffaele De Caterina (a)
(a) AOUP

Introduction: Pulmonary vein isolation (PVI) is the gold standard for atrial fibrillation (AF) ablation. First pass PVI is often demanding when a raw geometry reconstruction is used in combination with a non accurate automarks annotation, accounting for discontinuous or non-transmural lesions and related AF recurrences. We hypothesized that a magnetic-post processing of left atrial geometry in combination with an LSI-guided high power short duration (HPSD) automarks annotation could improve procedural efficiency.

Purpose: Aim of the study was to determine the impact on procedural outcomes of the new "Lock PVI protocol" during AF ablation with the new voxel mode EnSite X mapping system.

Methods: We included in the study consecutive patients with PAF scheduled for pulmonary vein isolation (PVI). Patients were divided in two Groups, the Lock-PVI Group and the control No Lock-PVI Group. The "Lock PVI" Group was ablated with the new Ensite X System using the new protocol, which consisted of (1) performing a road map with contact-force annotation at potential PVI sites after High Density reconstruction, (2) shaving the magnetic geometry reconstruction to unearth true 3D location of contact points, (3) Use of

3D-Automarks color-coded with a Lesion Index (LSI) target of 5.5 (anterior) and 4.5 (posterior) (4) Inter-lesion distance ≤ 6 mm (5) High Power Short Duration Approach (50 W). The No-Lock PVI was represented by patients ablated with and HPSD ablation with the previous version of the EnSite Precision mapping suite as per local standard practice. Groups were compared in term of procedural duration, radiological exposure and "first pass" isolation.

Results: Forty-four patients (22 "Lock PVI" and 22 controls mean age $63,3 \pm 8$ years, 65,9% male, 47,7% persistent AF), for a total of 88 PVI circles were enrolled. Procedural duration was similar between approaches ($121,1 \pm 43,6$ vs $125,3 \pm 30,1$ min; $P=0,72$) but RF time was shorter in the "Lock PVI" group ($19,6 \pm 4$ vs $29,55 \pm 9,1$ min; $P<0,001$), even if with a longer fluoroscopy ($19,5 \pm 10,1$ vs $13,4 \pm 4,9$ min; $P=0,01$). Of note, first pass isolation was significantly higher in the "Lock PVI" group: 40/44 (90,9%) vs 28/44 (63,6%) circles ($P=0,002$).

Conclusion: The new "Lock PVI" approach allowed a consistently better first pass isolation (>90%) with less RF time when compared to standard of care PVI.



ARITMIE 74

ELETTROSTIMOLAZIONE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) SINCOPE (ARITMIE)

LEADLESS PACEMAKER COME BACKUP THERAPY

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Background: grazie all'utilizzo dei nuovi device leadless, il mondo della cardiostimolazione sta subendo un cambiamento radicale, in quanto i nuovi dispositivi, rispetto ai tradizionali device transvenosi, aprono la strada ad indicazioni terapeutiche del tutto nuove. Infatti sta aumentando sempre di più la platea di pazienti eleggibili in prima istanza all'impianto di un dispositivo leadless, variando dal paziente anziano, con un maggior rischio infettivo e di complicanze periprocedurali, fino a pazienti di età intermedia, maldisposti ad accettare l'ineluttabile cambiamento di stile di vita conseguente all'impianto di un pacemaker transvenoso.

Caso clinico: donna caucasica di anni 80, in ritmo sinusale e pregresso impianto di pacemaker bicamerale transvenoso nel 2010 per blocco atrioventricolare completo, da allora anamnesi negativa per sincope e/o lipotimia. Al controllo del dispositivo di Giugno 2024, device programmato in modalità DDD 60/130 bpm con buoni parametri di soglia, sensing ed impedenza, AP del 41% e VP del 100 %, tempo approssimativo all'ERI di 5 anni. Nelle memorie del dispositivo numerosi episodi di oversensing da verosimile frattura degli elettrocatteteri con interruzione del pacing ventricolare ed ingresso in autoccumtazione di modalità per cui veniva programmata la revisione del device. All'atto del ricovero ospedaliero, al controllo del dispositivo, persistevano gli episodi di oversensing. In considerazione dell'anamnesi, si optava quindi per impianto di pacemaker leadless Medtronic Micra AV2 in sede ventrico-

lare destra, programmato in modalità VVI con LR di 50 bpm come backup therapy, lasciando in sede il precedente dispositivo, con la medesima programmazione. Si ponevano in home-monitoring entrambi i dispositivi.

Conclusioni: la singolare decisione di impiantare un pacemaker leadless come backup therapy in luogo della revisione o sostituzione del precedente dispositivo presenta vantaggi non trascurabili per il paziente: permette di conservare la stimolazione in modalità DDD, evitando l'aggiunta di ulteriori cateteri, riducendo il rischio di infezioni e di insufficienza tricuspidalica; inoltre aumenta sensibilmente le tempistiche all'ERI del pacemaker leadless e mantiene l'intero sistema MRI compatibile.

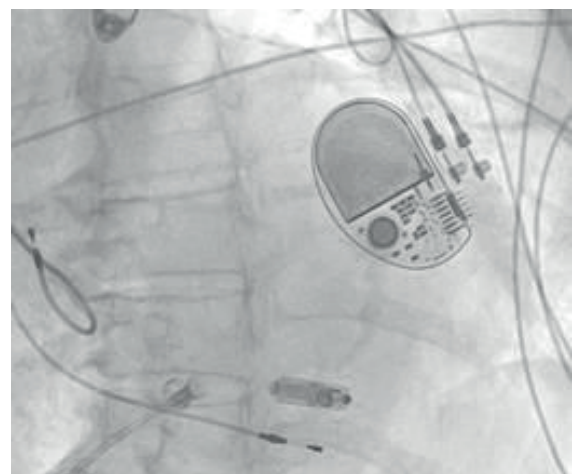


Figura 1

ARITMIE 735

MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

ARITMIE VENTRICOLARI (ARITMIE)

ASPETTI GENETICI DELLE ARITMIE (ARITMIE)

SINDROME QT LUNGO TIPO 3 E FLECAINIDE: EFFETTO MUTAZIONE DIPENDE?

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Introduzione: La sindrome del QT lungo (LQTS) comprende un gruppo distinto di canalopatie caratterizzate da intervallo QT prolungato e aumentato rischio di aritmie ventricolari. Tre geni sono responsabili del 90% dei casi di LQTS: KCNQ1 (LQTS1), KCNH2 (LQTS2), SCN5A (LQTS3). L'identificazione specifica della mutazione genetica risulta fondamentale per diagnosi, prognosi e ottimizzazione terapia farmacologica.

Caso clinico: Donna di 12 anni, ricoverata per episodio di perdita di coscienza. In anamnesi LQTS tipo 3 (mutazione R1623Q gene SCN5A), in terapia con Nadololo, Mexiletina 3cp/die, ICD in prevenzione secondaria, denervazione simpatica cardiaca sinistra e destra. Al controllo del device ripetuti episodi di TdP. Dopo la somministrazione di lidocaina ev è stata tentata introduzione della Flecainide per via orale che però ha dimostrato scarsa efficacia con slargamento del QRS e prolungamento del QT. E' stata dunque reintrodotta Mexiletina con un intervallo di 6 ore fra

le dosi dato che le aritmie si erano verificate alla valle del livello plasmatico.

Discussione: Nella LQTS 3 le terapie con farmaci bloccanti le correnti del sodio sono gene specifiche dal momento che la flecainide ha un effetto anche sulla corrente del sodio in fase 0 e non solo nelle fasi tardive del potenziale d'azione. Vista l'inefficacia della terapia con Mexiletina è stato tentato switch a Flecaidine che però non ha ridotto il QT e ha aumentato la durata del QRS. E' stata dunque ripresa la terapia con Mexiletina intensificando il numero di somministrazioni giornaliere ottenendo un buon controllo del QT.

Conclusioni: Nel LQTS tipo 3 differenti mutazioni nel gene SCN5A hanno mostrato differenti risposte alla Mexiletina. La Flecaidine in alcuni report ha mostrato efficacia ma l'effetto è altamente mutazione-specifico.



ARITMIE 549

ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA (ASSISTENZA CARDIACA IN ACUTO) MECCANISMI DELLE ARITMIE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

UN COMPLESSO QUADRO CARDIOLOGICO DA CARCINOMA PARATIROIDEO

Davide Gallo (a), Gianfranco Notarianni (b), Viviana Costanzi (a), Federico Bernardini (a), Michelangelo Luciani (a),
Mattia Petrunaro (b), Mario Malvasi (b), Giordano Zampi (a), Edoardo Nobile (a), Pietro Scrimieri (a)
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CARDIOLOGIA PER LO STUDIO FUNZIONALE DELL'ELETTROFISIOLOGIA

Caso clinico: Una paziente di 38 aa viene trasferita in urgenza da PS periferico presso il nostro centro per il sospetto di miocardite, basato sulla presenza di emodinamica instabile ed elevati valori di TnI. La donna accedeva per dolore epigastrico, profonda astenia e numerosi episodi di emesi nelle 2 settimane precedenti, associati a stipsi. In anamnesi solo distiroidismo in terapia sostitutiva. All'arrivo si presenta in CG scadute, tachipnoica, sofferente, diaforetica e disidratata. PA 90/60 mmHg, FC 135 bpm, SpO2 98%, apiretica. L'ECG mostra una tachicardia sinusale con BAV I, diffuse anomalie della ripolarizzazione ventricolare, QTc 660 msec. Si riscontrano al laboratorio valori di K⁺ 2.6 mEq/l, Ca⁺⁺ tot 18 mg/dl, Creatinina 4 mg/dl, oltre che TnI di 2700 pg/ml (v.n. <15.6), Hb 12 g/dl, GB 16x1000/mmc. L'ecoscopia cardiaca, eseguita in urgenza, mostra un ventricolo sinistro di ridotti volumi endocavitari e normali spessori, con funzione sistolica globale conservata. Smentito il sospetto di miocardite, ed alla luce della marcata disionia, si richiede videat nefrologico urgente e TC total body. La paziente, nel frattempo, viene reidratata e trattata con integrazione di K⁺ e chelanti del Ca⁺⁺. Emerge succes-

sivamente un quadro radiologico compatibile con carcinoma paratiroideo con conseguente ricovero in nefrologia. La paziente, tuttavia, va incontro al decesso nelle 24h successive per asistolia refrattaria alle manovre di rianimazione cardiopolmonare.

Conclusioni: Le disionie, specie se marcate, sono una frequente causa di anomalie elettrocardiografiche ed aritmie. In questo caso emblematico, il grave squilibrio degli ioni potassio e calcio ha determinato alterazioni del tracciato ECG tipiche delle rispettive

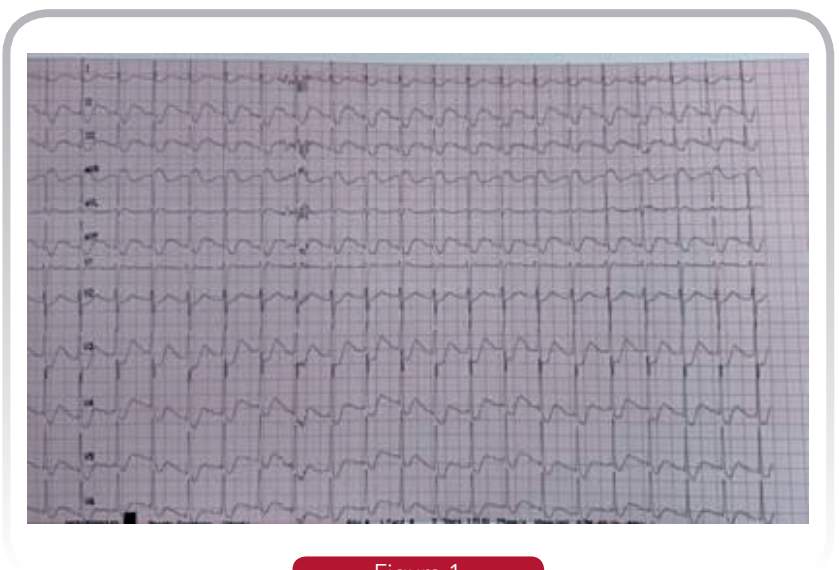


Figura 1

disionie, ma combinate tra loro e di non immediato riconoscimento, tali da condurre rapidamente la paziente ad exitus per aritmia ipocinetica. Emerge, inoltre, come sia fondamentale contestua-

lizzare sempre il valore delle troponine per non incorrere in errori diagnostico-terapeutici che possono ritardare il trattamento di altri stati morbosi.



ARITMIE 575
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
ARITMIE VENTRICOLARI (ARITMIE)
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)

ARITMIE VENTRICOLARI IN UN PAZIENTE GIOVANE: QUANDO IL TEST GENETICO NON TI AIUTA!

Erika Pedio (a), Chiara Cosima Simeone (a), Antonella Muscella (a), Assunta Greco (a), Antonio Marzo (a),
 Maria Rosaria Gualtieri (a)

(a) UO CARDIOLOGIA - P.O. "F. FERRARI" - CASARANO

Paziente di 51 anni noto per ipertensione arteriosa non controllata per scarsa compliance alla terapia medica, potus, cirrosi epatica HCV correlata, pregressa splenectomia, esiti di trauma cranico. In anamnesi erano segnalate varici agli arti inferiori complicate da pregressi episodi di trombosi venosa profonda ed intervento chirurgico sul tratto gastro-intestinale non specificato in età prescolare. Il paziente veniva soccorso dal 118 per dolore toracico in corso di piccolo ipertensivo. Durante il trasporto in ambulanza il quadro emodinamico si complicava a seguito di due episodi di arresto cardiocircolatorio, secondari a fibrillazione ventricolare, efficacemente trattati con DC- shock. L'ECG evidenziava un lieve sovraslivellamento del tratto ST in sede inferiore. Alla coronaro-

grafia eseguita in regime di urgenza si evidenziavano coronarie indenni da stenosi emodinamicamente significative. L'ecocardiogramma risultava nei limiti della norma. Pertanto veniva posta diagnosi di MINOCA e si procedeva ad ottimizzazione della terapia antiaritmica. Dopo circa un mese dall'evento acuto, l'ECG dinamico secondo Holter rilevava numerose extrasistoli ventricolari, polimorfe, ripetitive con presenza di coppie, triplette e diversi episodi di tachicardia ventricolare non sostenuta. La risonanza magnetica cardiaca descriveva normali dimensioni e spessori parietali del ventricolo sinistro, con funzione sistolica globale ai limiti inferiori della norma (FE 54%). Inoltre si segnalavano reperti compatibili con residuo emosiderinico a livello della parete inferiore

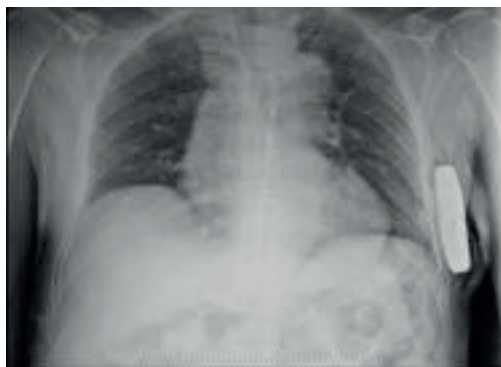


Figura 1

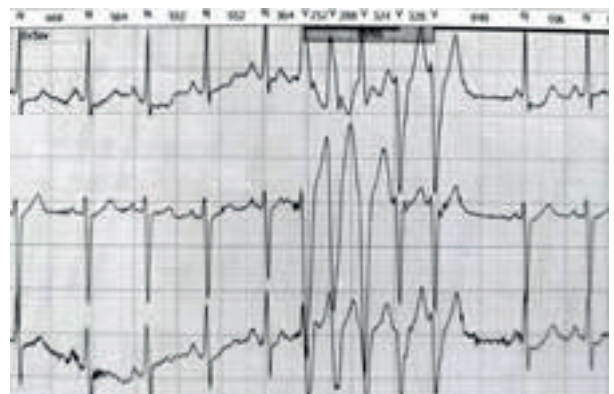


Figura 2

media, in sede subendocardica; valori di T1 e di ECV lievemente aumentati a livello della parete inferiore ed inferolaterale; presenza di LGE a livello della giunzione posteriore.

L'analisi del DNA di geni noti correlati a patologie cardiologiche dimostrava la presenza di varianti di significato incerto sul gene MYH7 (p.V1899A) codificante per la catena pesante della beta- miosina cardiaca e sul gene DSP (p.R2541K) codificante per la Desmoplakina.

Data l'anamnesi del paziente e la persistenza di aritmie ventricolari complesse, prima della dimissione

si procedeva ad impianto di ICD sottocutaneo in prevenzione secondaria.

In conclusione, ad oggi, il potere aritmogeno di alcune varianti genetiche resta una zona grigia meritevole di ulteriori studi. Le linee guida ESC sulle aritmie ventricolari raccomandano l'impianto di ICD nei pazienti con episodi documentati di fibrillazione ventricolare in assenza di cause reversibili. L'utilizzo del defibrillatore sottocutaneo è utile in casi selezionati, soprattutto in soggetti giovani che non necessitano di pacing per bradicardia o di risincronizzazione cardiaca, come il nostro paziente.



ARITMIE 118

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) ARITMIE VENTRICOLARI (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE) SINCOPE (ARITMIE)

PATTERN BRUGADA DI TIPO 1: SPONTANEO O FEBBRE-INDOTTO?

Giorgio Sciaramenti (a, b, c)

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(b) DOTT.SSA CHIARA BIANCHI, MEDICO IN FORMAZIONE;
(c) DOTT. STEFANO PIERACCINI, MEDICO IN FORMAZIONE

Introduzione: La sindrome di Brugada rappresenta una delle cause di morte cardiaca improvvisa e di predisposizione ad aritmie ventricolari maligne, specialmente nel giovane adulto. La sua diagnosi segue all'interpretazione ECG del caratteristico pattern di tipo 1, che ne costituisce il criterio fondamentale, in assenza di cardiopatie strutturali. La slatentizzazione del pattern elettrocardiografico rappresenta una delle questioni critiche per la gestione del quadro dal punto di vista terapeutico. Oltre alla comparsa spontanea del pattern, vari elementi possono essere considerati responsabili della sua induzione "secondaria": farmaci, eventi ischemici o stati febbrili.

Caso clinico: Presentiamo il caso clinico di un paziente di 31 anni, senza alcun precedente cardiologico in anamnesi, che si presenta presso l'unità di Pronto Soccorso a causa di uno stato lipotimico seguito da sintomatologia riferibile ad emesi e sensazione di nausea, in corso di rialzo febbrile, probabilmente dovuto all'assunzione di cibo contaminato nella serata precedente. All'ECG eseguito in Pronto Soccorso viene segnalato un pattern Brugada tipo 1, giudicato inizialmente come indotto dallo stato febbrile concomitante. L'ecocardiogramma non documenta segni di cardiopatia organica. Il paziente esegue, ad un mese di distanza, una visita aritmologica ed un

holter-ECG documentante un ritmo sinusale con franco pattern di Brugada, rivelatosi ad insorgenza spontanea, nelle derivazioni precordiali durante le ore pomeridiane e serali. Viene dunque ricoverato in regime elettivo per esecuzione di SEF: durante la procedura è stata indotta al terzo stimolo un'aritmia di tipo fibrillazione ventricolare. Pertanto, nelle giornate successive, in accordo con il paziente, si è optato per impianto di dispositivo ICD sottocutaneo in prevenzione primaria.

Conclusioni: Il punto critico di nostro interesse non è costituito dalla già dimostrata relazione di interdipendenza tra la manifestazione del pattern tipo 1



Figura 1

di Brugada e la presenza di un evento febbrile che ne assume il ruolo di fattore slatentizzante, quanto piuttosto dall'osservazione che, a primo impatto, il pattern si fosse manifestato secondariamente alla gastroenterite. L'esame holter- ECG, invece, ne ha dimostrato la natura spontanea. In considerazione del fatto che la comparsa di un pattern spontaneo, rispetto ad uno indotto da un fattore trigger, modi-

fica il rischio aritmogenico, il conseguente orizzonte terapeutico dovrà tener conto della modalità di presentazione del pattern documentato, oltre che di altri fattori imprescindibili come l'età del paziente, il quadro clinico- anamnestico ed il rapporto rischio-beneficio dell'eventuale impianto del dispositivo ICD transvenoso o sottocutaneo.



ARITMIE 463
ARITMIE VENTRICOLARI (ARITMIE)
FARMACI ANTIARITMICI (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

LIFE-THREATENING ARRHYTHMIC STORM IN A PATIENT WITH HEPATIC DYSFUNCTION AND METHADONE OVERDOSE: A CASE REPORT

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A 53-year-old Caucasian male with chronic liver disease related to HCV and HBV infection and substance abuse (Child-Pugh score of 12), on methadone therapy, was admitted to the infectious diseases unit for septicemia and acute hepatic insufficiency. During hospitalization, he experienced

multiple episodes of pulseless recurrent ventricular tachycardia requiring defibrillation. Consequently, he was transferred to the cardiac intensive care unit with a diagnosis of arrhythmic storm. Blood tests revealed hypokalemia (3.3 mmol/L) and hyperbilirubinemia (total bilirubin 10 mg/dL). The electrocardiogram

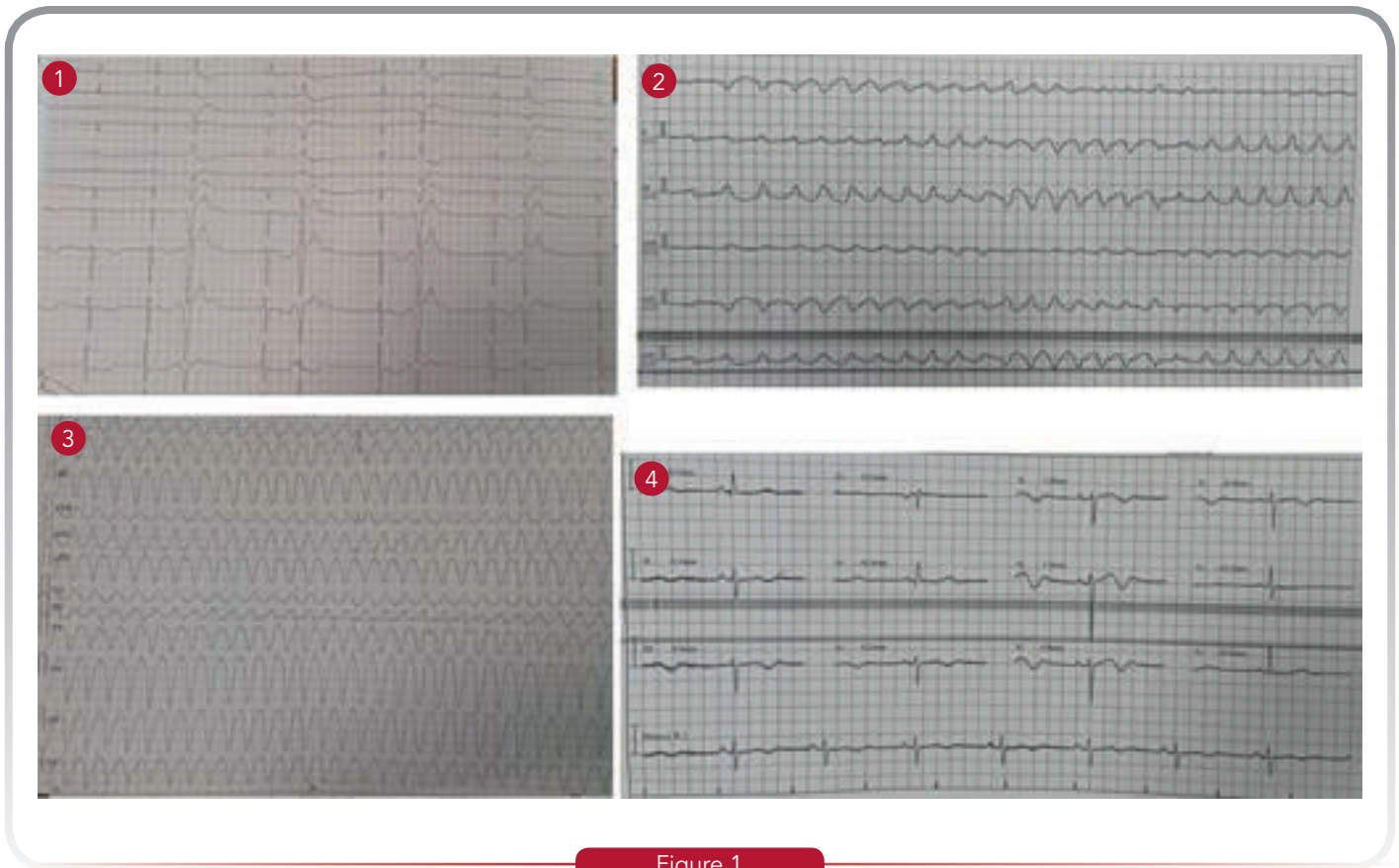


Figure 1



showed a sinus rhythm with a heart rate of 53 bpm, significant QT interval prolongation (Bazett 600 ms, Fridericia 614 ms), and ventricular bigeminy. The patient experienced further episodes of torsades de pointes and sustained ventricular tachycardia, which resolved spontaneously. Due to the instability, a central venous catheter was placed, and potassium and magnesium were rapidly administered, along with the initiation of positive chronotropic therapy via isoprenaline infusion, leading to clinical stabilization. Beta-blocker therapy with propranolol for esophageal varices was discontinued. Additionally, the patient was receiving 105 mg of methadone as prescribed by the Substance Abuse Treatment Service but disclosed that his actual intake at home was much lower than prescribed. This suggested a likely contribution of the

high dosage of opioid agonist therapy to the severe tachyarrhythmic event, prompting a dose reduction. Methadone, like all opioids in overdose, prolongs the QT interval through its action on cardiac rapid-rectifying K⁺ channels, as demonstrated in various studies and reviews. Hyperbilirubinemia also prolongs the QT interval, as evidenced by the National Health and Nutrition Examination Survey, which found higher bilirubin levels associated with longer QT intervals. The tachyarrhythmic events were thus attributed to a combination of electrolyte imbalance, hyperbilirubinemia, and methadone overdose. The treatment was successful, with complete resolution of major arrhythmic events and a progressive and consistent reduction in the QT interval, reaching an acceptable value of 480 ms.



ARITMIE 192
ARITMIE VENTRICOLARI (ARITMIE)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)
RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA IN ACUTO)

ELECTRICAL STORM SECONDARY TO ABIRATERONE-INDUCED SEVERE HYPOKALEMIA: A CASE REPORT

Alessio Falagario (a), Andrea Cosma (a), Vito Caragnano (b), Carlo Lafranceschina (b), Palma Luisa Nestola (b),
 Fabio Tiecco (b), Giovanni Addante (b), Vincenzo Pestrighella (b), Sabino Iliceto (b)
 (a) UNIVERSITA' DEGLI STUDI DI BARI "ALDO MORO"; (b) MATER DEI HOSPITAL, BARI

Introduction: abiraterone, an androgen deprivation therapy, has been used in the treatment of metastatic castration-resistant prostate cancer (mCRPC). It has been associated with increased risks of hypokalemia and, although rarely, life-threatening arrhythmias. We describe a case of severe refractory hypokalemia secondary to abiraterone resulting in polymorphic ventricular tachycardia and cardiac arrest in man with mCRPC.

Case presentation: an 88-year-old man with a history of hypertension, permanent atrial fibrillation and mCRPC presented to the emergency department for generalized weakness. He was seen by his oncologist few weeks prior to his presentation to the ED and was found to have mild hypokalemia on routine laboratory results for which he was prescribed oral potassium supplements. The patient's home medications included ramipril 10 mg, abiraterone 0,5 g, canrenone 50 mg and rivaroxaban 20 mg. Arterial blood gas revealed metabolic alkalosis. Laboratory results reported a potassium level of 1.7 mmol/L (3.5–5.0) and normal kidney and hepatic functions. The patient had multiple episodes of torsades de pointes (TdP) and ventricular fibrillation (VF), became pulseless and underwent advanced cardiac life support, including defibrillation. Despite immediate administration of hydrocortisone and intravenous potassium chloride supplements, his potassium level did not improve significantly. The patient died from the consequences of refractory electrical storm.

Discussion: abiraterone is a selective CYP17A1 inhibitor, widely used in mCRPC since its approval in 2011. Blockade of this enzyme leads to inhibition of androgen and cortisol synthesis, resulting an ACTH over-production. When 17 a-hydroxylase is inhibited, there is an increase in the production of corticosteroid precursors which are shunted towards the uninhibited mineralocorticoid synthesis pathway. The resultant increased mineralocorticoid levels lead to hypokalemia, fluid retention and oedema. In patients treated with abiraterone, cortisol, which feeds back to lower ACTH production, is diminished

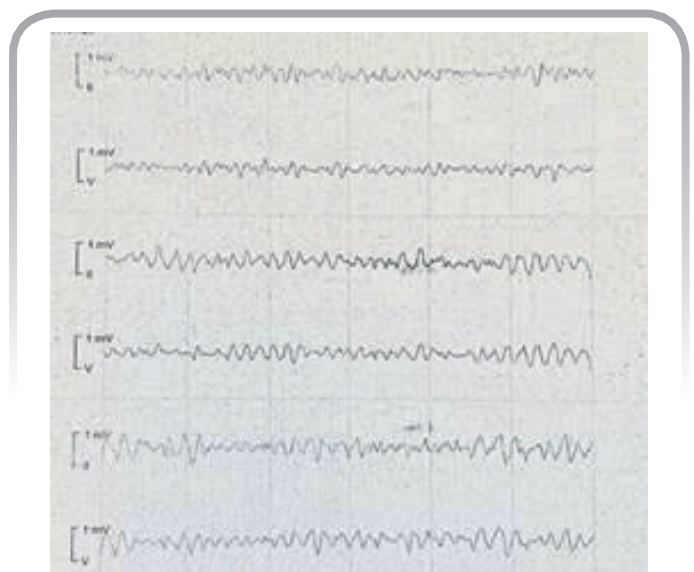


Figure 1

and as such, prednisone should be co-administered to fill this role. Without glucocorticoid co-administration, abiraterone can result in an overproduction of ACTH and patients may experience the adverse effects of mineralocorticoid, such as life-threatening arrhythmias.

Conclusion: currently, there are no regulatory guidelines or monitoring for potential cardiac arrhythmias with the use of abiraterone. Glucocorticoid co-administration, standardized close QTc calculation and electrolyte monitoring in patients may help prevent fatal arrhythmias associated with this anti-androgen drug.



ARITMIE 237

ABLAZIONE TRANSCATETERE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) ARITMIE VENTRICOLARI (ARITMIE) FARMACI ANTIARITMICI (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

NULLA E' CIO' CHE SEMBRA

Enrico Guido Spinoni (a), Alberto Battaglia (a), Natascia Cerrato (a), Marco Gagliardi (a), Francesco Geuna (a),
Andrea Lamanna (a), Domenico Caponi (a), Marco Scaglione (a)
(a) OSPEDALE CARDINAL MASSAIA, ASTI

Introduzione: La corretta diagnosi delle tachicardie a QRS largo è frequentemente complessa e richiede un'attenta analisi dei tracciati elettrocardiografici, utilizzando differenti criteri discriminatori, in associazione a una completa conoscenza della storia anamnestica del paziente. La corretta diagnosi del tracciato ECG permette di guidare il clinico nell'ottimale gestione del paziente, in particolare nelle condizioni di emergenza e urgenza.

Caso clinico: Uomo di 85 anni, si presentava presso il PS del Nostro Nosocomio per episodio di cardiopalmo persistente. In anamnesi riferiva storia di precedenti episodi di tachicardia parossistica sopraventricolare (TPSV) in terapia domiciliare con Propafenone da circa 20 anni. All'arrivo in PS i parametri vitali erano

stabili, con valori di pressione 120/80 mmHg. Al tracciato ECG immediatamente eseguito si documentava aritmia a QRS largo (0.16 sec) a 145 bpm, emodinamicamente stabile (Figura 1). Veniva quindi somministrato Adenosina a bolo ev rapido di 6 mg con interruzione dell'aritmia e successivi battiti di scappamento a QRS largo in transitorio BAV III grado indotto dal farmaco di brevissima durata. Successiva comparsa di ritmo sinusale condotto con BAV I grado e ritardo di conduzione IV (morfologia del QRS sovrapponibile a precedente durante tachiaritmia – Figura 2). Alla revisione dei tracciati si poneva quindi diagnosi di TPSV sospetta per aritmia da rientro nodale (AVNRT) tipica Slow-Fast condotta con blocco di branca indotta da anti-aritmico di classe Ic. Veniva dunque sospeso Propafenone e si avviava terapia betabloccante. Ai

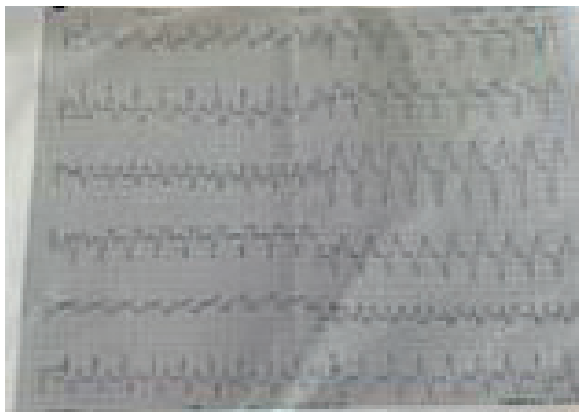


Figura 1

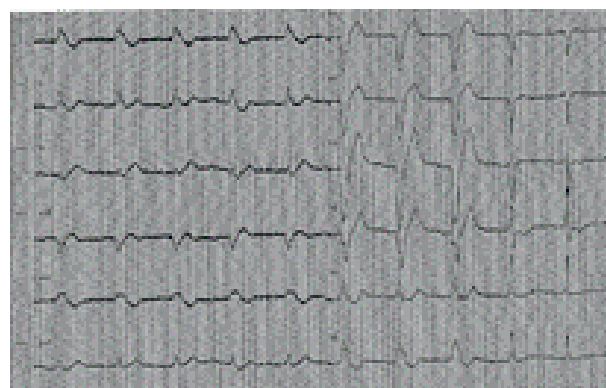


Figura 2

successivi traccati seriati si osservava completa risoluzione del blocco di branca indotto da farmaco. Nei mesi successivi, per recidiva aritmia sintomatica per cardiopalmo, veniva effettuato studio elettrofisiologico a raggi zero mediante mappaggio elettroanatomico con sistema CARTO3 (Biosense Webster) che confermava l'ipotesi diagnostica di AVNRT Slow-Fast. Veniva quindi effettuata ablazione transcatetere con radiofrequenza con erogazione su potenziale di via lenta nodale, con buon risultato della procedura. Al successivo follow-up di circa 6 mesi, non si registra-

rono recidive aritmiche in assenza di terapia farmacologica.

Conclusioni: Un'attenta e corretta analisi dei traccati ECG, in aggiunta all'analisi della storia clinica del paziente e manovre diagnostiche (es manovre vagali), sono fondamentali nella corretta diagnosi delle tachicardie (sia a QRS stretto che QRS largo) e permettono di guidare il clinico nella corretta ottimale gestione del paziente, al fine di guidarne al meglio il processo di cura.



ARITMIE 743

DEFIBRILLATORE IMPIANTABILE (ARITMIE) ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

ANTIARITMICI E DISONIE: UNA COMBINAZIONE (POTENZIALMENTE) LETALE

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Giunge presso il DEA del nostro Policlinico la paziente L.F., di 55 anni, insegnante di spinning, a seguito di arresto cardiocircolatorio (ACC) testimoniato occorso durante lo svolgimento di una lezione in palestra. Al momento dell'ACC i presenti attuano le corrette manovre di rianimazione cardiopolmonare, e, seguendo le indicazioni del DAE, erogano una scarica con successivo ritorno alla circolazione spontanea ed evidenza ECG di una già nota aritmia da fibrillazione atriale (FA).

La storia aritmica della paziente comincia 3 anni prima, con palpitazioni e riscontro all'ECG di FA tachifrequente, che viene trattata con terapia betabloccante e anticoagulante. Al primo episodio di FA fanno seguito 3 cardioversioni elettriche (di cui l'ultima un mese prima del ricovero con ripristino del ritmo sinusale ma precoce recidiva di FA) e l'introduzione in terapia di flecainide 200 mg/die. L'ecocardiografia evidenziava ventricolo sinistro ai limiti superiori, lieve ipertrofia settale, severa dilatazione biatriale, insufficienze mitralica e tricuspoidale di grado moderato.

Al momento dell'ingresso in DEA la paziente si presenta vigile, orientata ed asintomatica, riferisce di non aver accusato alcun tipo di discomfort toracico prima dell'evento. L'ECG mostra FA normofrequente e atipie come da sovraccarico. Non si hanno a disposizione i tracciati registrati dal DAE per mancata disponibilità del software dedicato. All'EGA venoso si riscontra una severa ipokaliemia (2.6 mmol/L), verosimilmente conseguente ad un quadro di gastroenterite acuta manifestatasi con plurimi episodi diarroici nei giorni precedenti. Viene impostata una reintegrazione di K⁺ per via endovenosa

sa e la paziente viene ricoverata in UTIC dove il monitoraggio telemetrico non mostra aritmie significative. Trasferita in degenza ordinaria, l'iter diagnostico volto ad indentificare una possibile eziologia organica dell'evento aritmico prosegue con: -prova da sforzo al cicloergometro, risultata negativa per aritmie da sforzo; -TC coronarica risultata negativa per stenosi coronariche significative; -RM cardiaca, che evidenzia un VS non dilatato, lievemente ipertrofico, globalmente ipocinetico con riduzione della funzione sistolica globale (FE 40%), con LGE intramurale del SIV inferiore basale e "spotty" agli hinge point settali. Dilatazione bi-atriale. Ci si trova quindi davanti ad un bivio: impiantare un ICD in prevenzione secondaria, o attribuire l'evento aritmico alla combinazione di importante disonia e terapia farmacologica con flecainide ad alto dosaggio potenzialmente pro-aritmica in una cardiopatia ipocinetica?

Dopo accurata valutazione collegiale, in accordo con le ultime linee guida ESC 2022 su morte cardiaca improvvisa ed aritmie ventricolari, e non ultimo senza trascurare la volontà della paziente, si è optato per uno stretto follow-up soprassedendo all'impianto di ICD che avrebbe grandemente influenzato la qualità di vita della nostra insegnante di spinning. Alla visita ad un mese dalla dimissione la paziente si è presentata asintomatica ed in buon compenso.

Questo caso ci fa riflettere sull'importanza dell'utilizzo sempre più diffuso del DAE nella gestione dell'ACC sul territorio; non meno importante rimane la possibilità di visualizzare i tracciati registrati al momento dell'ACC; la visualizzazione del ritmo può facilitare, guidare, e a volte spostare, la decisione finale.

ARITMIE 213

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) FARMACI ANTIARITMICI (ARITMIE) SINCOPE (ARITMIE)

RUOLO DEI DISPOSITIVI WEARABLE NELLA DIAGNOSI DELLE ARITMIE

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Uomo di 60 anni con ipertensione arteriosa e familiarità per malattia coronarica, si presenta in Pronto Soccorso per dolore toracico e astenia. All'ECG: blocco atrioventricolare di terzo grado con ST sopraslivellato in sede inferiore, per cui veniva attivato il protocollo di angioplastica primaria. La coronarografia mostrava l'occlusione del ramo discendente anteriore e la subocclusione della coronaria destra (lesione culprit), trattata con angioplastica ed apposizione di stent medicato, con successiva rapida risoluzione del disturbo di conduzione, come anche evidenziato dal monitoraggio telemetrico. Durante la quinta giornata post-infartuale veniva anche eseguita angioplastica staged del ramo discendente anteriore. Durante la degenza si eseguiva ecocardiografia transtoracica, che mostrava una conservata funzione biventricolare in assenza di valvulopatie di rilievo.

Alla prima visita di controllo dopo la dimissione il paziente riferiva sporadica sensazione di cardiopalmo extrasistolico per cui veniva indicata esecuzione di ECG Holter delle 24h che risultava negativo per aritmie di rilievo. In considerazione del risultato dell'Holter e del fatto che il paziente fosse in possesso di uno SmartWatch con possibilità di registrare una traccia elettrocardiografica a singola derivazione, veniva consigliato di effettuare una registrazione in corso di sintomi da inviare alla nostra mail.

Il paziente inviava, dunque, una serie di tracciati, eseguiti in corso di cardiopalmo extrasistolico, che mostravano la presenza di alcuni battiti ectopici sopraventricolari, per cui si iniziava terapia con beta-bloccante, con successiva interruzione della stessa per intolleranza.

Dopo alcune settimane il paziente riferiva una sensazione di cardiopalmo extrasistolico, al mattino, riferito

come differente rispetto ai precedenti, ed inviava contestualmente il tracciato monoderivazione eseguito con SmartWatch, che mostrava un blocco atrioventricolare di 2° grado tipo Wenckebach.

In considerazione della storia di blocco completo per-infartuale ed anche della riferita sintomatologia lipotimica, veniva programmata ulteriore visita cardiologica con riesecuzione di ECG-Holter delle 24h, risultato negativo per pause patologiche e blocchi atrioventricolari di ogni grado; il paziente veniva, inoltre, invitato ad inviare registrazioni eseguite durante gli episodi lipotimici nei quali non si evidenziavano blocchi atrioventricolari. Si soprassedeva, dunque, ad esecuzione di impianto di Pacemaker in quanto i sintomi del paziente non erano associati a blocchi atrioventricolari e/o a pause, che, invece, venivano registrati solo al risveglio, associati a diversa sintomatologia, riferita come 'battito mancante', e mai a sincope e/o presincope.

Questo caso clinico permette di comprendere quanto dispositivi come gli SmartWatch, capaci di registrare monoderivazioni elettrocardiografiche, possano rivelarsi strumenti aggiuntivi utili nel contesto della pratica clinica cardiologica, in quanto permettono la registrazione di tracciati elettrocardiografici a singola derivazione ed alcuni altri parametri clinici esattamente nel momento in cui il paziente manifesta dei sintomi.

In particolare, nel nostro caso, le registrazioni effettuate hanno permesso di evidenziare la presenza di un blocco atrioventricolare di secondo grado tipo Mobitz I, ma anche di escludere che tale reperto fosse associato alla sintomatologia lipotimica riferita dal paziente, consentendoci, dunque, di escludere l'indicazione ad impianto di pacemaker.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

ASSISTENZA CARDIACA IN ACUTO

ASSISTENZA CARDIACA IN ACUTO 492 ELETTROSTIMOLAZIONE (ARITMIE) ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA (ASSISTENZA CARDIACA IN ACUTO) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

VIRTUAL REALITY IMPLEMENTATION IN THE ELECTROPHYSIOLOGY LABORATORY

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Introduction: The presence of pain discomfort in the electrophysiology laboratory extends procedural time and increases surgical duration. Virtual reality-based analgesia (VR-A) has been shown to enhance patient acceptance of clinical settings, particularly in emergency contexts. However, the routine adoption of VR-A in cardiology remains limited as it is still under investigation.

Hypothesis: It was hypothesized that the use of VR-A would improve patient compliance. Consequently, this study aimed to evaluate the potential benefits of VR-A during cardiostimulation procedures.

Methods: From April 2024 to May 2024, patients admitted to our academic hospital for cardiac rhythm disorders requiring a pacemaker (PM) or an implantable cardioverter/defibrillator (ICD) were enrolled in the study. Patients were randomized into two groups with an allocation ratio of 1:1. One group received the standard sedation protocol, while the other group was treated with a VR-A device. Pain levels were assessed using a numeric rating scale, and variations in vital parameters were measured at baseline, and 15, 30, and 60 minutes after the start of the procedure, as well as half an hour after its conclusion, to provide an objective evaluation of pain. Statistical analysis was conducted using SPSS.

Results: The baseline clinical characteristics of the

two cohorts were comparable. Patients underwent PM (N=12) and ICD (N=8) implantations, with both groups having similar allocation and mean procedural durations (69.5 ± 23.4 minutes for the VR-A group versus 69.5 ± 10.9 minutes for the standard group, $p=0.3$). However, there was a significant difference in the numeric rating scale scores, with the VR-A group reporting lower pain scores (4.5 ± 0.8) compared to the standard group (5.9 ± 1.7 , $p=0.02$). Additionally, the standard group experienced significant variations in blood pressure [$F(4, 45)=6.95$; $p<0.001$] and heart rate [$F(4, 45)=12.55$; $p<0.001$] during the interventions, with greater fluctuations between the initial and 60-minute measurements as revealed by post-hoc analysis ($p<0.001$). In contrast, no significant differences were observed in the VR-A group for blood pressure [$F(4, 45)=1.61$; $p=0.19$] and heart rate [$F(4, 45)=0.47$; $p=0.78$]. Notably, leadless PM implantation (2/12, 17%) and subcutaneous ICD (2/8, 25%) - being less invasive and well-tolerated procedures - enabled same-day discharge when combined with VR-A and remote patient monitoring.

Conclusions: VR-A has demonstrated effectiveness as a tool for pain management during cardiostimulation procedures. Patients in VR-A immersive clinical settings reported experiencing less pain, reduced distress, and an overall more pleasant experience, expressing a desire to utilize VR-A for future painful medical procedures.



**ASSISTENZA CARDIACA IN ACUTO 603
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA CARDIACA PRE-OSPEDALIERA (ASSISTENZA CARDIACA IN
ACUTO) RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA
IN ACUTO) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)**

LONG-TERM SURVIVAL FROM OUT-OF-HOSPITAL CARDIAC ARREST - DATA FROM A PROSPECTIVE REGISTRY FOR THE YEARS 2020-2023 IN THE ITALIAN PROVINCE OF VARESE

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Background: Out-of-Hospital Cardiac Arrests (OHCAs) are time-dependent medical emergencies with a considerable socioeconomic impact on the various health systems around the globe. The epidemiology and outcome of OHCA varies greatly among different countries in the world, even between countries of the same geographic area. It is of vital importance to understand the main factors affecting the outcome of OHCA, both in the pre-hospital and in the hospital phase, to put in place the most adequate interventions and improve survival.

Materials and methods: We extracted data regarding OHCAs occurred in the province of Varese in the years 2020, 2021, 2022 and 2023 from the Lombardia Cardiac Arrest Registry (Lombardia

CARe), a prospective registry founded in Pavia in 2014, covering a population of more than 4 million people, as of today. Next, we analyzed the main characteristics of the population and the acute survival rate, described as the obtainment of return of spontaneous circulation (ROSC) in the pre-hospital phase or at the hospital. Moreover, long-term survival of patients arriving at our Center, Ospedale di Circolo of Varese, was analyzed, up to May 1st, 2024.

Results: 4260 OHCAs occurred between January 1st, 2020, and December 31st, 2023, in the province of Varese: the population was predominantly male (59%) with a median age of 78 years [RIQ 66-86]. A ROSC was obtained in 364 cases, therefore the overall acute survival rate was 8.5%. The median time of intervention was

Variables	Univariate		Multivariate	
	OR (95% CI)	p value	OR (95% CI)	p value
Age	1.00 (0.99, 1.02)	0.81	1.01 (0.99, 1.03)	0.29
Female sex	0.74 (0.43, 1.28)	0.36	0.76 (0.41, 1.41)	0.47
Time to intervention	0.97 (0.92, 1.02)	0.32	1.00 (0.94, 1.07)	0.95
OHCA near public places	1.92 (0.90, 4.10)	0.16	1.38 (0.60, 3.19)	0.53
Witnessed OHCA	2.71 (1.25, 5.85)	0.03	2.42 (1.03, 5.70)	0.09
Shockable rhythm at presentation	3.88 (2.29, 6.55)	< 0.001	3.28 (1.86, 5.78)	0.001

Table 1

13.6 minutes [RIQ 10.9-17]. Resuscitation maneuvers were attempted from the Emergency Medical System (EMS) operators in 65% of the cases. A witness was present in 43% of cases. Of the 364 patients who obtained a ROSC, 191 were transferred to our Center, and for 185 of these patients a long-term follow-up was available. 83/185 (45%) patients were alive at 30 days from the event, 67 (36%) were alive at the latest follow-up (May 1st, 2024). Patients who survived at 30 days were more likely to have a witnessed event ($p = 0.049$) and to present with a shockable rhythm ($p < 0.001$). In a multivariate analysis, the presence of a shockable rhythm at presentation was the only independent predictor of 30-days survival (OR 3.28 [95% CI: 1.86-5.78], p -value = 0.001).

Conclusions: Pre-hospital management of OHCA is critical and bystanders' intervention plays a pivotal role. The fact that the presence of a shockable rhythm plays the part of the main factor predicting longer survival highlights the necessity of early detection of these events. Thus, many efforts should be made to further increase the chance of survival of patients suffering OHCA and they include: training the general population in the recognition of cardiac arrests and teaching them to promptly alert the EMS and to immediately start a valid cardiopulmonary resuscitation (CPR), creating a denser network of publicly available automatic external defibrillators (AEDs), encouraging a more extensive use of AEDs from bystanders



ASSISTENZA CARDIACA IN ACUTO 172
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA IN ACUTO)

LA PERSISTENTE ELEVAZIONE DEI LIVELLI DI LATTATI, MA NON L'IPOTENSIONE, È ASSOCIATA ALLA PROGNOSI NEI PAZIENTI AMMESSI IN TERAPIA INTENSIVA DOPO ARRESTO CARDIACO EXTRA-OSPEDALIERO

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La sindrome post-arresto cardiaco è la causa principale di morbidità e mortalità dopo arresto cardiaco extra-ospedaliero (OHCA). Le linee guida attuali dell'European Resuscitation Council (ERC) raccomandano, una volta giunto il paziente in Terapia Intensiva (ICU), di evitare l'ipotensione, mantenendo una pressione arteriosa media (MAP) > 65 mmHg, al fine di ripristinare livelli di lattati normali o ottenere una loro clearance. Lo scopo di questo studio è stato quello di valutare l'impatto dell'ipotensione e della clearance del lattato (LC) sugli esiti nei pazienti ammessi in ICU dopo OHCA.

Metodi: I dati dei pazienti ammessi in ICU dopo OHCA tra novembre 2017 e dicembre 2023 sono stati recuperati dal Registro degli Arresti Cardiaci della Regione Lombardia (LombardiaCARE). La pressione arteriosa media e i livelli di lattati sono stati valutati inizialmente all'ammissione in ICU e successivamente dopo 12 ore di ricovero. La LC è stata definita come livelli di lattati inferiori a 2 mmol/L, mentre l'ipotensione come MAP < 65 mmHg. La sopravvivenza è stata valutata a 30 giorni; l'analisi della sopravvivenza è stata eseguita con regressione multivariabile di Cox.

Risultati: Un totale di 325 pazienti sono stati am-

messi in ICU nel periodo di studio e 265 avevano disponibili i dati di MAP e lattati all'ammissione in ICU e dopo 12 ore (74% maschi, età mediana 63 anni, primo ritmo defibrillabile 50%, arresto testimoniato 91%, rianimazione cardiopolmonare da parte di astanti 55%, tempo medio di arresto 31 minuti, dose media di epinefrina pre-ospedaliera 2 mg, sopravvivenza a 30 giorni 42%).

Alla regressione multivariabile di Cox, includendo sia lo stato di LC che l'ipotensione, dopo correzione per il tempo di arresto, lo stato testimoniato, la RCP da parte di astanti e il ritmo defibrillabile, l'assenza di LC all'ammissione (HR 2,60, 95% CI 1,33-5,07, p=0,005) e a 12 ore (HR 1,84, 95% CI 1,21-2,79, p=0,004) è stata significativamente associata alla mortalità a 30 giorni; l'ipotensione invece, sia al momento del ricovero (HR 1,16, 95% CI 0,76- 1,79, p=0,473) che a 12 ore (HR 1,52, 95% CI 0,87-2,66, p=0,143), non è stata significativamente associata alla mortalità a 30 giorni.

Conclusioni: L'assenza di LC, sia all'ammissione in ICU che a 12 ore, discrimina la sopravvivenza meglio dell'ipotensione, ed è indipendentemente associata alla mortalità a 30 giorni. È necessario quindi concentrare le risorse al fine di ottenere la LC piuttosto che focalizzarci su un valore specifico di MAP.

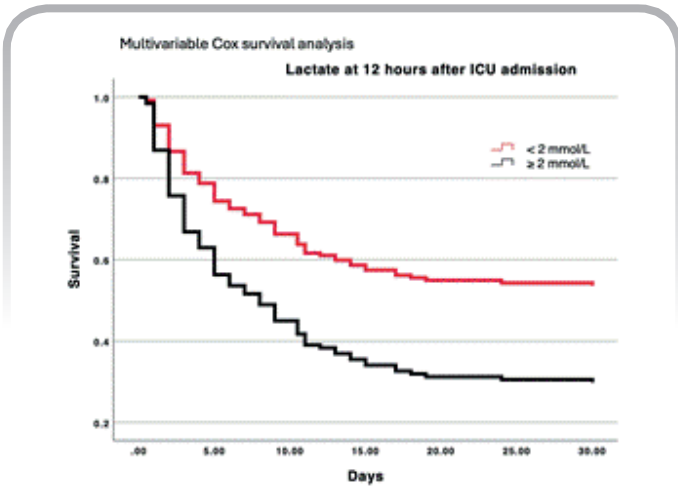


Figura 1

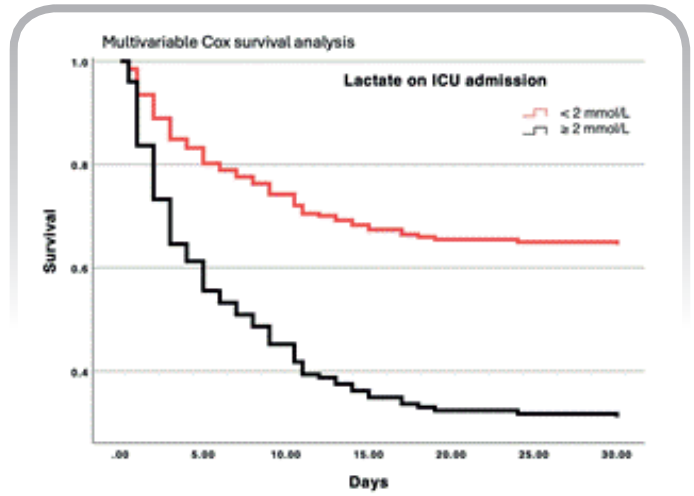


Figura 2



ASSISTENZA CARDIACA IN ACUTO 789
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA
CARDIACA IN ACUTO)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)

**A PRACTICAL FORMULA FOR CARDIAC INDEX ESTIMATION:
 OPTIMIZING ECHOCARDIOGRAPHY IN CRITICAL CARE**

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Background: Cardiac index (CI) estimation is critical for managing patients in the intensive care unit (ICU). CI estimation with transthoracic echocardiography (TTE) requires measuring the left ventricular outflow tract (LVOT), which can be challenging in ICU patients due to practical limitations that often result in poor acoustic windows. Applying simple mathematical adjustments, the CI equation can be simplified to rely solely on two variables: the LVOT velocity time integral (LVOT-VTI) and heart rate (HR), which are combined in the formula: $CI-TTE = 2 * LVOT-VTI * HR$ (in women, the first coefficient is 1.8). This study aimed to assess the accuracy of CI estimation using this new simplified TTE formula in a real-world ICU setting.

Methods: This multicenter prospective study enrolled 142 patients (mean age 62 ± 13 years; 30% women) across three Italian hospitals over two years. CI was measured concurrently using right heart

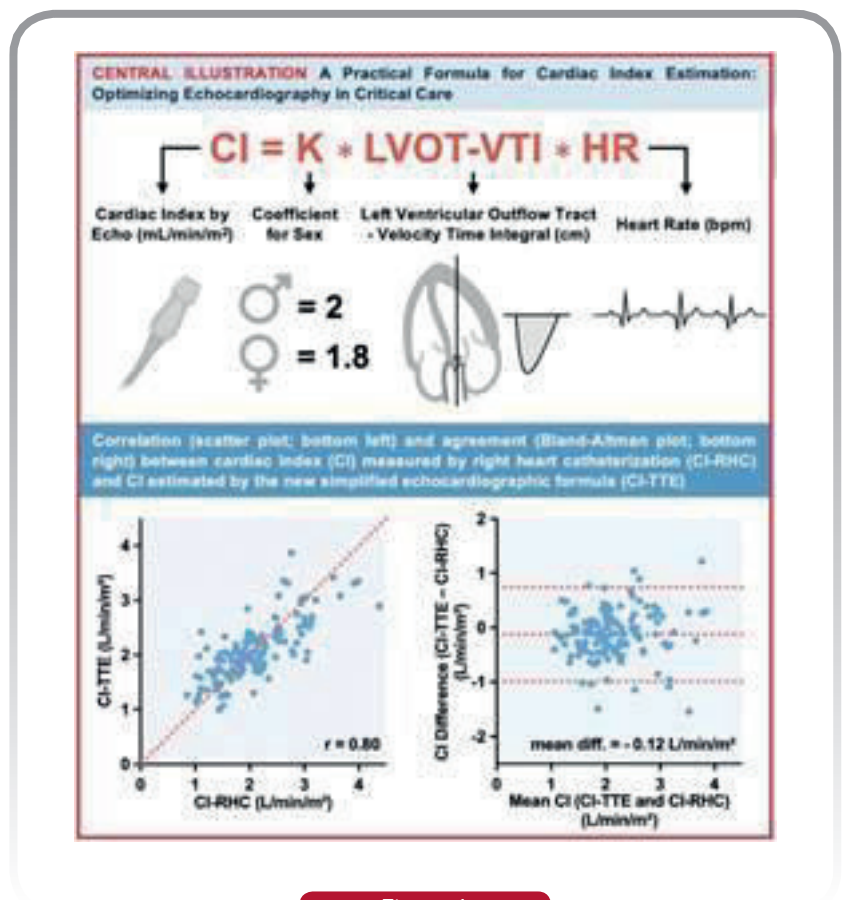


Figure 1

catheterization (CI-RHC) and the new simplified TTE formula (CI-TTE). Accuracy was assessed using Pearson's correlation and the Bland-Altman method.

Results: CI-TTE showed a strong correlation with CI-RHC ($r = 0.80$, $p < 0.001$), with a mean difference of -0.12 L/min/m² (95% CI: -0.20 to -0.05). CI-TTE correctly classified a low-output state ($\text{CI-RHC} \leq 2.2$ L/min/m²) with 89% sensitivity, 69% specificity, and an area

under the curve (AUC) of 0.79 (95% CI: 0.72 to 0.86, $p < 0.001$). Atrial fibrillation and poor TTE windows were significant predictors of misclassification.

Conclusions: The simplified CI-TTE formula offers a practical and reliable alternative for CI estimation in the ICU, especially when traditional TTE measurements are challenging.



**ASSISTENZA CARDIACA IN ACUTO 494
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
PROGNOSI (SCOMPENSO CARDIACO)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)**

**EPIDEMIOLOGY, TEMPORAL TRENDS AND OUTCOMES OF OCTOGENARIANS
IN CARDIAC INTENSIVE CARE UNIT**

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Background: Despite the widespread prevalence and significant impact of cardiovascular diseases among the older individuals, many studies have excluded this age group. The scarcity of scientific data, the complexity of older patients, the frequent presence of comorbidities, and the variable responses to treatments complicate the management of acute cardiac conditions that require highly specialized and intensive care. Understanding the evolution of comorbidities over time, post-discharge mortality, and readmissions, as well as defining patients with a high vs low probability of positive outcomes among older individuals admitted to CICU, are essential for improving the level of care for each patient and optimizing resource allocation in the overall healthcare system.

Aim: The aim of our study is to investigate the presence of predictive factors for all-cause mortality at 12 months and 30 days, as well as for all-cause readmission at 12 months and 30 days, in the population of older patients aged ≥ 80 years admitted to a CICU of a tertiary care hospital in Italy. We also focused on comparing the population with ACS and that with AHF.

Methods and results: In this retrospective longitudinal study, we analyzed patients aged ≥ 80 years (median age 83 years [81; 86]) admitted to the CICU of our Institute from January 1, 2013, to December 31, 2020. The patients were mainly women (51.4%), with the primary admission diagnosis being ACS (45.8%), followed by

AHF (11.6%), and with higher 12-month mortality in the AHF group ($p < 0.001$). The burden of comorbidities did not change over the years, with a median ranging from 2 to 3 comorbidities per patient. We noted an increase in the rate of polypharmacotherapy at discharge (patients with polypharmacotherapy at discharge were 31.5% more compared to admission) and an increase in the median number of medications at discharge (6 medications at admission vs. 8 at discharge). From 2013 to 2020, we observed a reduction in 12-month mortality, both crude ($p < 0.001$) and adjusted for year of admission, age, sex, major comorbidities, and the need for invasive procedures during hospitalization (HR 0.897, $p < 0.001$). We found a significant association between 12-month and 30-day mortality and low Hb levels (HR 0.879, $p 0.033$; OR 0.826, $p 0.019$) upon admission, the need for dialysis (HR 3.339, $p 0.018$; OR 3.379, $p 0.033$), NIV (HR 2.241, $p 0.015$; OR 3.002, $p 0.008$), use of inotropic and vasopressor drugs (HR 2.358, $p < 0.001$; OR 3.668, $p < 0.001$), and the onset of delirium (HR 2.418, $p < 0.001$; OR 2.068, $p 0.020$) during hospitalization.

Conclusions: Our study provides a detailed overview of the demographic characteristics, clinical practices, and prognostic implications in octogenarian patients admitted to a CICU of a tertiary care hospital in Italy. We have demonstrated a progressive reduction in long-term mortality, likely due to improvements in pharmacological and non-pharmacological treatments

implemented in older patients, as no significant variations were observed in the overall burden of comorbidities. The variables identified as significantly associated with short and long-term mortality, as well as readmission risk, frequently pertain to non-cardiac factors. This underscores the importance of a

comprehensive and multidisciplinary assessment of older patients with acute cardiac conditions, which could contribute to accurately stratifying patients upon admission and guiding decisions regarding aggressive vs more conservative care strategies.



ASSISTENZA CARDIACA IN ACUTO 174
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA IN ACUTO)

LO SCORE SAPS-2 È MIGLIORE RISPETTO AGLI SCORE APACHE E SOFA NEL PREDIRRE L'OUTCOME DOPO ARRESTO CARDIACO EXTRA-OSPEDALIERO

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(a) DIPARTIMENTO DI CARDIOLOGIA, IRCCS POLICLINICO SAN MATTEO, PAVIA, PV, ITALIA;
 (b) DIPARTIMENTO DI TERAPIA INTENSIVA, IRCCS POLICLINICO SAN MATTEO, PAVIA, PV, ITALIA;
 (c) DIPARTIMENTO DI EMERGENZA E URGENZA (AREU), PAVIA, PV, ITALIA

Gli score APACHE (Acute Physiology and Chronic Health Evaluation), SAPS II (Simplified Acute Physiology Score) e SOFA (Sequential Organ Failure Assessment) sono sistemi di punteggio utilizzati nelle unità di terapia intensiva (ICU) per predire la mortalità, quantificando la gravità delle patologie in atto. Lo scopo di questo studio è stato valutare l'accuratezza di questi punteggi nel predire gli esiti nei pazienti ammessi in terapia intensiva dopo un arresto cardiaco extraospedaliero (OHCA).

Metodi: Abbiamo analizzato i dati dei pazienti ammessi in ICU del nostro ospedale dopo un OHCA a partire da novembre 2017 fino a dicembre 2023, dopo essere stati raccolti nel Registro degli Arresti Cardiaci della Regione Lombardia (LombardiaCARE). Gli score SAPS-2, APACHE e SOFA sono stati valutati nelle prime 24 ore dopo l'ammissione in ICU. La sopravvivenza è stata valutata al momento della dimissione dall'ICU e a 30 giorni. L'esito neurologico sfavorevole è stato valutato al momento della dimissione dall'ICU e definito come una categoria di performance cerebrale (CPC) >2.

È stata eseguita un'analisi della curva ROC per valutare l'accuratezza delle variabili continue nel predire gli esiti binari.

Risultati: Un totale di 325 pazienti sono stati ammessi in ICU nel periodo di studio e 262 di essi avevano tutti i dati disponibili per ottenere i punteggi tramite gli score SAPS-2, APACHE e SOFA (75% maschi, età mediana 62 anni, primo ritmo scioccabile 51%, arresto testimoniato 90%, rianimazione cardiopolmonare da parte di astanti 56%, tempo mediano di arresto 31 minuti, dose mediana di epinefrina preospedaliera 2 mg, sopravvivenza a 30 giorni 42%). Nell'analisi del-

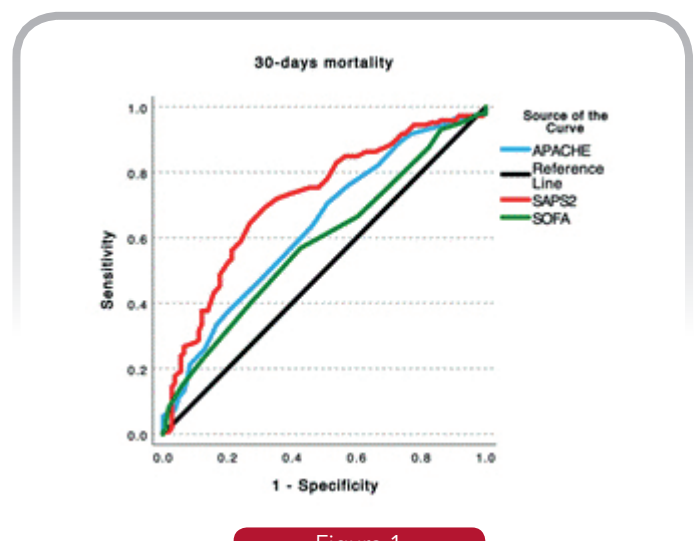


Figura 1

la curva ROC, SAPS-2 ha mostrato un'AUC più alta (0.74, IC 95% 0.68-0.80, $p < 0.001$) rispetto a APACHE (0.63, IC 95% 0.56-0.70, $p < 0.001$) e SOFA (0.60, IC 95% 0.54-0.67, $p = 0.003$) nel predire la mortalità o CPC > 2 . Inoltre, SAPS-2 ha mostrato un'AUC più alta (0.72, IC 95% 0.65-0.78, $p < 0.001$) rispetto a APACHE (0.64, IC 95% 0.56-0.70, $p < 0.001$) e SOFA (0.58, IC 95% 0.51-0.65, $p = 0.018$) nel predire la mortalità a 30 giorni.

Conclusioni: Il punteggio SAPS-2 ha avuto prestazioni significativamente migliori rispetto ai punteggi SOFA e APACHE e ha mostrato una buona accuratezza nel predire la mortalità o la prognosi neurologica negativa dopo OHCA.

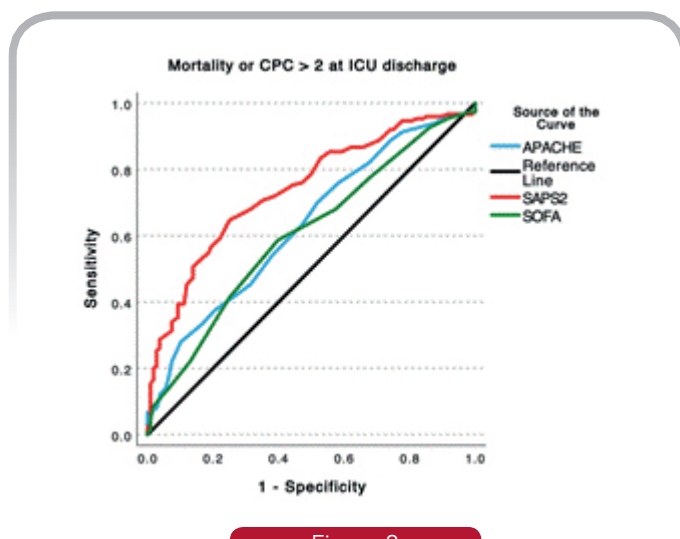


Figura 2

**ASSISTENZA CARDIACA IN ACUTO 724
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
TOMOGRAFIA AD EMISSIONE DI POSITRONI (PET)
(IMAGING CARDIOVASCOLARE)**

**MYOCARDIAL VIABILITY ASSESSMENT DURING IMPELLA SUPPORT
WITH 18- FLUORODESOXYGLUCOSE PET IMAGING**

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(b) NUCLEAR IMAGING UNIT, IRCCS SAN RAFFAELE SCIENTIFIC INSTITUTE, MILAN; (c) CARDIOVASCULAR IMAGING UNIT, IRCCS SAN RAFFAELE SCIENTIFIC INSTITUTE, MILAN; (d) CARDIOVASCULAR RESEARCH UNIT, IRCCS SAN RAFFAELE SCIENTIFIC INSTITUTE, MILAN; (e) SCHOOL OF MEDICINE, VITA-SALUTE SAN RAFFAELE SCIENTIFIC INSTITUTE, MILAN

Background: Myocardial recovery is crucial for weaning patients from temporary mechanical circulatory support (tMCS) in cases of cardiogenic shock (CS). Assessing myocardial viability (MV) is essential as it has been linked to improved left ventricular (LV) systolic function, particularly in coronary artery disease (CAD) patients. Cardiac magnetic resonance (CMR) presents limitations due to the presence of metallic components in mechanical devices. Metabolic myocardial imaging using 18-fluorodesoxyglucose positron emission tomography (18FDG-PET) presents a viable alternative, offering quantitative regional MV information without the limitations posed by CMR. This study investigates the safety and feasibility of 18FDG-PET for MV evaluation in patients supported by percutaneous ventricular assist devices (p-VADs), specifically Impella, during acute myocardial infarction-related CS (AMI-CS).

Methods and Results: Our observational study included six AMI-CS patients receiving Impella support. Four patients had three-vessel disease, and two had two-vessel disease, with proximal LAD involvement in five cases. Five patients presented with STEMI, and primary PCI was performed on

arrival for four patients. PET scans were performed 13 (8-20) days after Impella insertion, with patients exhibiting stable clinical and haemodynamic parameters and Impella flows. PET scans were conducted in accordance with the American Society of Nuclear Cardiology and Society of Nuclear Medicine and Molecular Imaging guidelines. Image analysis involved automated assessment of regional 18FDG uptake using CardIQ Physio software, defining regional viability based on segmental tracer uptake exceeding 50% of the maximal uptake. PET imaging demonstrated high quality despite logistical challenges, revealing a median of 9.0 (7.25-10.75) viable segments per patient and a median LV necrotic area of 44.1% (36.8-51.5%). The imaging results informed clinical management, directing staged revascularization in one patient and indicating the futility of revascularization in two patients due to extensive necrosis. Three patients required bridging to heart replacement therapy. The ICU stay was 44 (35-56) days, with three in-hospital deaths.

Conclusions: The study demonstrates that 18FDG-PET is a safe and feasible method for assessing myocardial viability in AMI-CS patients supported by

Impella devices. The imaging technique successfully identified viable myocardial segments, aiding in therapeutic decision-making. Despite the small sample size, these findings suggest that 18FDG-PET can be an effective tool for evaluating MV during tMCS. Further research with larger patient cohorts

is needed to validate these results and expand the generalizability of this approach. The integration of 18FDG-PET into clinical practice may enhance the management of AMI-CS patients, guiding revascularization and heart replacement strategies.



**ASSISTENZA CARDIACA IN ACUTO 342
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)**

CLINICAL CHARACTERISTICS AND SHORT-TERM OUTCOMES OF PATIENTS ADMITTED FOR CARDIAC TAMPONADE

Marco Giuseppe Del Buono (a), Gianluigi Saponara (a), Daniela Pedicino (a), Rocco Antonio Montone (a), Gaetano Pinnacchio (a), Alessia D’aiello (a), Lorenzo Genuardi (a), Maria Antonietta Di Salvatore (a), Michela Quirino (a), Mattia Brecciaroli (a), Ilaria Poli (a), Francesca Rigoli (a), Simone Filomia (a), Carlo Trani (a, b), Gemma Pelargonio (a, b), Francesco Burzotta (a, b), Tommaso Sanna (a, b)

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Background: Cardiac tamponade is a life-threatening condition.

Methods: We conducted a retrospective review of clinical and laboratory data, therapeutic management, and outcomes of patients with cardiac tamponade admitted to the Cardiac Intensive Care Unit of Policlinico Gemelli, a high-volume cancer center in Rome, Italy, from January 2022 to January 2024.

Results: A total of 87 patients were included (median age 70 years, Interquartile Range (IQR) 59- 79; 43 [49%] females, 44 [51%] males). Percutaneous pericardiocentesis was performed in 82 patients (94%), surgical pericardiostomy in 5 patients (6%), and pleuropericardial window procedure in 6 patients (7%). Recurrent tamponade occurred in 10 patients (11%) with a median of 2 prior procedures (IQR 2-3). The median amount of pericardial fluid drained was 720 ml (IQR 555-900) and bloody pericardial fluid was present in 47 patients (54%). Etiologies included malignant pericardial

effusion (46%), idiopathic (8%), inflammatory (24%), iatrogenic (20%), and congestive heart failure (2%). Among patients with malignant pericardial effusion, 23 (58%) had lung cancer, 5 (12%) blood cancers, 4 (10%) breast cancers, 2 (5%) thymic cancer, and 6 (15%) other types of cancer. Of the 47 patients with malignant effusion, 17 (36%) were undergoing active

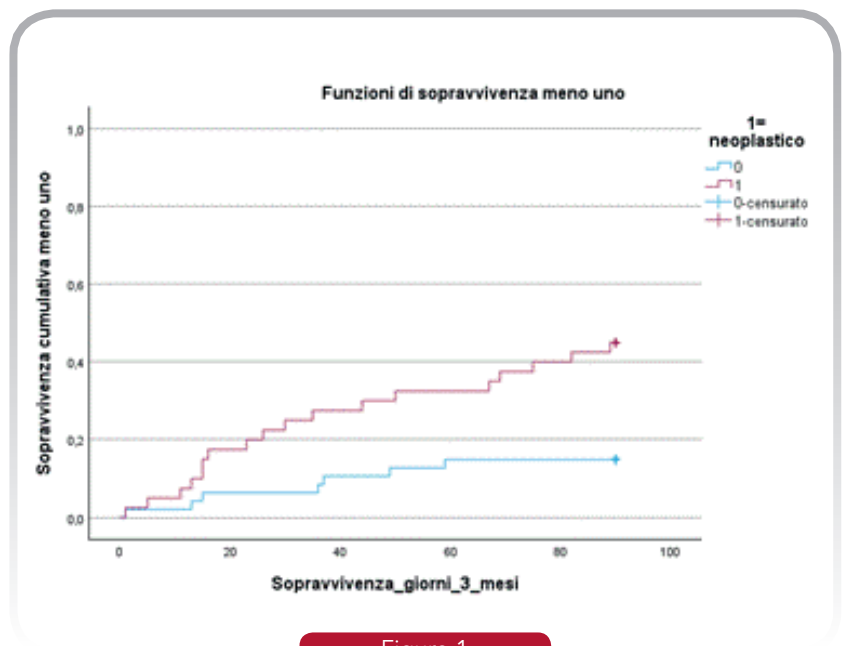


Figure 1

treatment at the time of admission. At 3-month follow-up, 25 out of 87 patients (29%) had died. Mortality was significantly higher among those with malignant effusion (18/40, 45%) compared to those with non-malignant effusion (7/47, 15%) (log-rank $p=0.02$).

Conclusions: This study provides valuable insights into the clinical characteristics, management

approaches, and outcomes of patients with cardiac tamponade at a high-volume cancer center. A significant proportion of patients had malignant pericardial effusions, primarily associated with lung cancer. The higher mortality rate observed among patients with malignant effusions underscores the critical need for early recognition and personalized management strategies.



**ASSISTENZA CARDIACA IN ACUTO 700
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)**

PUÒ IL SISTEMA DI MONITORAGGIO BISPECTRAL INDEX AIUTARE NELLA GESTIONE DEL PAZIENTE COMATOSO POST-ARRESTO CARDIACO IN UTIC?

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(a) UNITA' DI TERAPIA INTENSIVA CARDIOLOGICA - UOC CARDIOLOGIA - OSPEDALE CA' FONCELLO DI TREVISO

La sindrome post-arresto cardiaco è una condizione molto complessa, sempre più presente nelle UCIC. Tra i vari elementi che la caratterizzano, la condizione di coma post-anossico è sicuramente uno degli aspetti che ne condiziona maggiormente la prognosi e conseguentemente le scelte terapeutiche. Al cardiologo intensivista è chiesto di definire la prognosi neurologica e trattare tempestivamente le condizioni che potrebbero peggiorarla ulteriormente come lo stato di male epilettico. A tal fine è necessario un approccio multiparametrico e multidisciplinare, basato sull'esame obiettivo neurologico e sull'esecuzione di indagini laboratoristiche, radiologiche e di neurofisiologia. Tra le tecniche di neurofisiologia l'elettroencefalogramma è sicuramente l'esame più importante in grado di valutare la presenza di attività cerebrale epilettiforme. Le raccomandazioni internazionali raccomandano l'esecuzione dell'EEG non prima di 48 ore dall'ingresso del paziente in Terapia Intensiva. Nella nostra UCIC abbiamo di recente introdotto la monitoraggio del paziente comatoso post-arresto cardiaco con il sistema BIS (bispectral index). Questo strumento analizza il segnale elettroencefalografico rilevato da un set di elettrodi applicato sulla fronte, restituendo una traccia elettroencefalografica semplificata, una traccia spettroscopica che riproduce la tipologia di attività cerebrale, ed un valore numerico, correlato con la profondità della sedazione. La nostra ipotesi è che l'utilizzo di questo tipo di monitoraggio real-time possa fornire elementi utili per

sospettare precocemente una condizione di stato di male epilettico nel paziente comatoso e sedato, al fine di impostare un trattamento adeguato e di iniziare già nelle prime fasi di degenza a comprendere quale potrà essere l'evoluzione del paziente.

Descriviamo il caso di un paziente di 43 anni, ricoverato presso la nostra UCIC per una condizione di coma post-arresto cardiaco. Il paziente, con storia anamnestica di extrasistolia sopraventricolare a genesi non ischemica, risultava vittima di arresto cardiaco extraospedaliero, venendo rinvenuto in gasping dai conviventi; all'arrivo del soccorso avanzato, dopo 15 minuti di RCP di scarsa qualità da parte degli astanti, veniva rilevato un ritmo da fibrillazione ventricolare ad onde fini, con ottenimento del ROSC dopo 5 cicli di rianimazione secondo protocollo ACLS. All'ingresso in UCIC il paziente si presentava in stato comatoso, con GCS 3 (E1VtM1) e presenza dei riflessi corneale e pupillare. Al monitoraggio BIS, in corso di sedazione, già nelle prime ore si rilevava un'attività cerebrale prevalente nella banda di frequenza 4 Hz (a conferma di uno stato di coma profondo) con anomalie puntute alla traccia elettroencefalografica, sospette per stato di male epilettico. Veniva quindi prontamente eseguito l'elettroencefalogramma, che confermava il sospetto clinico; venivano inoltre eseguiti i PESS con riscontro di assenza bilaterale dell'onda N20. Il monitoraggio BIS consentiva di rilevare, nelle successive giornate di degenza, persistenza di anomalie epilettiformi alla

traccia elettroencefalografica, con attività cerebrale prevalente a basse frequenze, e tali reperti venivano confermati con elettroencefalogrammi seriati, nonostante avvio e opportune modifiche della terapia antiepilettica, concordate con i colleghi neurologi. Entro le prime 72 ore veniva completata la valutazione

multiparametrica della prognosi neurologica, con la risonanza magnetica cerebrale che rilevava segni di danno anossico diffuso e i valori di NSE che raggiungevano 134 ng/mL. Vista quindi la prognosi infausta dal punto di vista neurologico, si concordava un atteggiamento di desistenza terapeutica.



**ASSISTENZA CARDIACA IN ACUTO 486
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)**

AGITATION IN THE ICU: WAS IT JUST AN HOLE?

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(a) DEPARTMENT OF INTERNAL MEDICINE, UNIVERSITY OF GENOVA, ITALY; (b) CARDIOVASCULAR UNIT, IRCCS OSPEDALE POLICLINICO SAN MARTINO, GENOVA

We present the case of a 78 years old male admitted to a spoke hospital for acute typical chest pain since the day before. ECG revealed ST segment elevation with Q waves in antero-lateral leads consistent with subacute anterior STEMI, which was treated by angioplasty of left anterior descending coronary artery and placement of a drug eluting stent. Echocardiography after the procedure showed impaired systolic function of the left ventricle with large akinesia of the apex and septum, without significant valvular diseases. Twenty-four hours after coronary revascularization, the patient became anxious and dysphonic. Blood gas analysis demonstrated normal peripheral oxygen saturation, but increased serum lactate concentration. Echocardiography was repeated and allowed the diagnosis of a left-to-right shunt across the distal portion of the interventricular septum (Figure 1A). The patient's status quickly deteriorated with acute hypoxic respiratory failure and cardiogenic shock. An intra-aortic balloon pump (IABP) was placed and the patient was transferred to our hospital for ventricular septal defect (VSD) repair. Pre-operative transesophageal echocardiography confirmed the presence of VSD of 10 mm with a Qp/Qs of 3.1. Surgical VSD repair was done on day 4 and was successful and resulted in normalization of Qp/Qs to 1.1, and the patient was finally discharged to a rehabilitation facility on post-operative day 14.

VSD complicating acute myocardial infarction (AMI) is a rare (0,3%) but life-threatening condition with almost unavoidable mortality if left untreated. The risk of VSD is higher in patients of older age, sex female, with

first AMI, and the absence of hypertension, diabetes and smoking history; this suggests an important role of lack of or insufficient collateral coronary circulation. The clinical presentation of AMI-VSD ranges from an incidental murmur to circulatory collapse; thus, a VSD should be suspected in any post-MI patient with severe hemodynamic instability. Surgical closure is the standard of care for AMI-VSD, but the optimal timing is unclear. Immediate surgical closure is often suboptimal and associated with high mortality due to hemodynamic instability and friable tissue surrounding the VSD in the acute phase of AMI. In order to improve outcomes, surgery is often deferred until patients are more stable and myocardial tissue has started healing. The correct use of mechanical circulatory support (MCS)



Figure 1

is crucial to bridge the patient to surgery, with IABP being the first choice: it reduces LV afterload and wall stress, thereby facilitating contractility and increasing cardiac output, simultaneously decreasing left-to-right shunting. Other MCS, like venoarterial extracorporeal membrane oxygenation and Impella, are gaining importance. The current European guidelines consider

delayed repair for those subjects who respond well to aggressive therapy.

In patients who are not suitable for surgical treatment of VSD repair because of excessive risk, percutaneous closure can be considered as definitive treatment or as bridge to surgery.



ASSISTENZA CARDIACA IN ACUTO 887 ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)

ST-SEGMENT DOWNSLOPE, RECURRENT FEVER AND DAILY INSOMNIA IN A MALE PATIENT ADMITTED TO THE EMERGENCY DEPARTMENT

Giovanni Lopes (a), Letizia Rosa Romano (a), Pierangelo Calvelli (a), Rossella Quarta (a), Gemma Filice (a), Giuseppe Fuscaldo (a), Bruno Nardo (b), Alberto Polimeni (a), Antonio Curcio (a)

(a) DIVISION OF CARDIOLOGY, DEPARTMENT OF PHARMACY, HEALTH AND NUTRITIONAL SCIENCES, UNIVERSITY OF CALABRIA, RENDE, ITALY; (b) DIVISION OF GENERAL SURGERY, DEPARTMENT OF PHARMACY, HEALTH AND NUTRITIONAL SCIENCES, RENDE, ITALY

Background: Electrocardiogram (ECG) evidence of ST-segment depression in the anterior leads is typically associated with acute coronary syndrome (ACS) but could also result from other underlying conditions, especially when accompanied by clinical signs and symptoms suggestive of non-cardiac causes. It is crucial to emphasize the need for a comprehensive patient evaluation involving a multidisciplinary team. Such presentations can obscure the diagnosis and divert attention toward less common conditions, potentially delaying appropriate management. The optimal therapeutic path depends on a multidisciplinary team, and collaborative care in diagnosing and treating complex presentations.

Case Description: A 57-year-old man with a history of hypertension, type 2 diabetes, and obesity presented with epigastric and constant chest pain, prompting him to visit the Emergency Department. Upon admission, the ECG showed bradycardic sinus rhythm with a heart rate of 52 bpm, a supraventricular extrasystole, and ST-segment depression in the anterior precordial leads. Blood tests revealed a modest increase in troponin levels, raising ACS suspicion, therefore the patient was admitted to the Coronary Care Unit. Serial ECGs showed resolution of the ST-segment depression. Follow-up troponin levels did not follow the typical pattern of ACS. During hospitalization, the patient exhibited intermittent fever, hypertensive spikes

refractory to medical therapy, and persistent insomnia characterized by circadian rhythm at midnight. Infectious disease testing was negative, but inflammatory markers were elevated. An echocardiogram revealed normal function, normal chamber volumes, and a slightly hypertrophic left ventricle. Elevated creatinine and pancreatic enzyme levels prompted involvement of a multidisciplinary team, including cardiologists, infectious disease specialists, urologists, anesthesiologists, radiologists, and endocrinologists. A full-body CT scan revealed a heterogeneous adrenal mass suspicious for a complicated pheochromocytoma, confirmed by elevated norepinephrine levels and MRI imaging. Given the systemic clinical manifestations and high risk of complications, multidisciplinary team decided on a right adrenalectomy with resection of the 12 cm mass. The surgery was performed without complications, and the patient successfully passed the first 24 hours in intensive care before being transferred to the surgical ward. Unfortunately, the following day, the patient experienced sudden death at rest in bed while receiving his relatives. The exact cause of death was not definitively determined, but it underscores the complexity and high risk associated with pheochromocytoma and its complications.

Discussion: This case underscores the significant challenges in differential diagnosing and management of ECG ST-segment changes associated with complex

symptoms and chest pain. In our case, diagnostic confirmation through imaging and elevated plasma metanephrines revealed a pheochromocytoma with large adrenal mass. The atypical presentation, which included adrenal mass infection and insomnia, underscores the significance of a multidisciplinary approach.

Additionally, the success of the surgical intervention highlights the essential role of collaborative care.

Conclusion: A thorough diagnostic approach and effectiveness of multidisciplinary team-based management are crucial in handling complex conditions.



ASSISTENZA CARDIACA IN ACUTO 469 SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO) ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO) ECMO (ASSISTENZA CARDIACA IN ACUTO) PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE) PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)

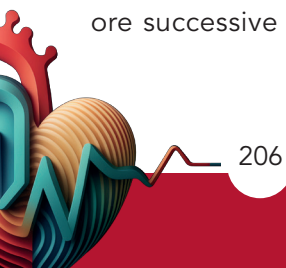
PCCS: DALLA DIAGNOSI ALLA GESTIONE AVANZATA DI UNO SHOCK CARDIOGENO POST-CARDIOTOMICO

Caterina Scapicchi (c), Alessio Arrivi (a), Marco Dell'uomo (a, c), Giulia Ceccotti (c), David Mecali (c),
Marco Mengoni (c), Vincenzo Pace (c), Andrea Scarpignato (c), Alessandro Mostarda (c), Marco Giuranna (c),
Erberto Carluccio (b, c), Giuseppe Ambrosio (a, b, c)

(a) SC CARDIOLGIA, AOSP TERNI; (b) SC CARDIOLOGIA, AOSP PERUGIA; (c) UNIVERSITÀ DEGLI STUDI DI PERUGIA

Pz M di 66 aa trasferito da altro ospedale con diagnosi di SCA ed EPA. Accede in PS per dispnea da sforzo a soglia rapidamente ingravescente fino all'ortopnea obbligata con associato dolore toracico posteriore. Anamnesi: nel 2002 sostituzione (bioprotesi) di v.aortica bicuspid; coronarie normali (2002). TD: ASA. Al torace SS ed olodiastolico 3/6, crepitazioni medio-basali bilaterali. ETT di ingresso: IVS, lieve disfunzione biventricolare, IAO severa con evidente protrusione di una cuspid nel LVOT, IM moderata funzionale, PAPS 70. ETE: rottura di cuspid di bioprotesi aortica con secondaria IAO severa con immagini in plus riferibili a frammenti della cuspid o esiti di endocardite. IM moderata funzionale, non immagini in plus. Eseguito intervento CCH urgente di SVAO+SVM (REDO) con bioprotesi. Al termine dell'intervento posizionati PMK temporaneo e IABP. Dopo l'intervento pz emodinamicamente instabile, ipoteso, oligoanurico. All'ETE: Vsn ipomobile, Vdx nei limiti. In TIPO veniva iniziato fluid challenge con colloidi e cristalloidi, trasfusi GRC, iniziati alti dosaggi di amine e successivamente iniziata infusione di levosimendan. Dopo sole 3 ore dall'intervento, per la persistenza di sindrome da bassa portata post-CCH, posizionato IMPELLA CP in sala di Emodinamica ed eseguita coronarografia selettiva (malattia coronarica ectasianta senza stenosi significative). Nelle ore successive nonostante – e a causa – dell'utilizzo

di IMPELLA si è assistito ad un peggioramento della funzione Vdx per cui è stato necessario upgrading al supporto completo di circolo con posizionamento di ECMO V-A. Veniva inoltre iniziata CVVHDF in calcio citrato e antibiotico terapia profilattica. Iniziali segni di sofferenza epatica e comparsa di piastrinopenia. Al controllo eco eseguito dopo circa 12h, persistenza di severa disfunzione biventricolare. In 5° GPO evidenza ecocardiografica di lieve miglioramento della contrattilità del VS pur persistendo una severa disfunzione biventricolare. Veniva iniziato un II ciclo di Levosimendan. In 6° GPO comparsa di febbre: prelevate emocolture e potenziata terapia antibiotica. Nelle ore successive si è assistito ad una rapida instabilizzazione dell'emodinamica necessitante un ulteriore aumento del supporto aminico con successiva comparsa di FV subentranti trattate con CVE seguite dall'instaurarsi di FA a elevata rvm. Questa, in associazione al grave quadro di MOF non responsivo a trattamento massimale, hanno condotto ad exitus il paziente. Nell'ultimo decennio si è assistito a un calo significativo della mortalità associata alla chirurgia cardiaca nonostante l'aumento della complessità procedurale. La sindrome da bassa gittata cardiaca (LCOS) è la più comune e la più grave delle complicanze cardiovascolari ed è associata a un aumento della morbilità e della mortalità a breve e lungo termine. Questa sindrome è caratterizzata



da riduzione della FE con conseguente riduzione dell'apporto di ossigeno (DO₂) – e quindi ipossia tissutale-, diminuzione dell'indice cardiaco (CI) < 2,0 L/min/m², diminuzione della PAS <90 mmHg, e segni di ipoperfusione tissutale. Obiettivo dell'intervento terapeutico è quello di migliorare la GC ottimizzando il precarico, minimizzando il postcarico, aumen-

tando la contrattilità e garantendo una frequenza cardiaca adeguata. La terapia medica - come il raggiungimento dell'euvolemia, un adeguato supporto aminico e l'utilizzo di Levosimendan-, è la strategia di prima scelta. Tuttavia, le terapie conservative non sono sempre sufficienti per cui si rende necessario il ricorso a dei supporti meccanici al circolo (MCS).



**ASSISTENZA CARDIACA IN ACUTO 345
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)**

THE DISTAL RADIAL ARTERY APPROACH FOR INVASIVE BLOOD PRESSURE MONITORING IN THE INTENSIVE CARDIAC CARE UNIT: PRELIMINARY RESULTS OF A RANDOMIZED NON-INFERIORITY TRIAL

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(b) DIVISION OF CARDIOLOGY, DEPARTMENT OF THORACIC AND CARDIOVASCULAR DISEASES, MAGGIORE DELLA CARITA' HOSPITAL, NOVARA

Background: Arterial catheterization is routinely used for arterial blood gas sampling and hemodynamic monitoring in patients admitted in the intensive care unit (ICCU). The distal radial artery (dRA) is a novel arterial access site for interventional cardiology. We investigated the dRA (Figure 1) as an alternative approach to the classic forearm radial artery (fRA) for invasive blood pressure monitoring in the ICCU. We hypothesized that invasive dRA catheterization is non-inferior to fRA in terms of catheterization success rate and access site complications.

Methods: This is a single-center, randomized, non-inferiority trial. Patients admitted in the ICCU requiring invasive blood pressure monitoring were enrolled and randomly allocated to the fRA or dRA group (1:1 ratio). The primary endpoint was to demonstrate whether dRA was non-inferior to fRA in the success rate of arterial catheterization, using either the anatomical or the ultrasound-guided puncture. The secondary endpoint included the incidence of complications (puncture site hematoma, puncture site infection, vascular occlusion and catheter kinking), the first attempt success rate, catheterization-related quality of pain and the arterial catheterization time.

Results: A total of 190 patients who received either

fRA (n=98) or dRA (n=92) catheterization were enrolled. The success rates were respectively 96.9% and 95.6% in the fRA and dRA groups, with a mean difference of 1.3% (95%CI -4.1 to 6.7%, P value for non-inferiority <0.01). Since the non-inferiority margin was defined as -15%, the dRA group demonstrated a non-inferior

DISTAL RADIAL ARTERY CATHETERIZATION



Figure 1

catheterization success rate compared to the fRA group (Figure 2). No difference was observed in the incidence of complications ($P=0.82$), in the first attempt success rate ($P=0.21$) and in catheterization-related quality of pain ($P=0.50$) in the two groups. The arterial catheterization time was 82 (55-149) seconds in the fRA group and 103 (57-199) seconds in the dRA group ($P=0.35$).

Conclusion: The dRA can be an alternative approach to the fRA for invasive blood pressure monitoring in the ICCU and provides a non-inferior catheterization success rate.

THE DRA GROUP DEMONSTRATED A NON-INFERIOR CATHETERIZATION RATE TO THE FRA GROUP

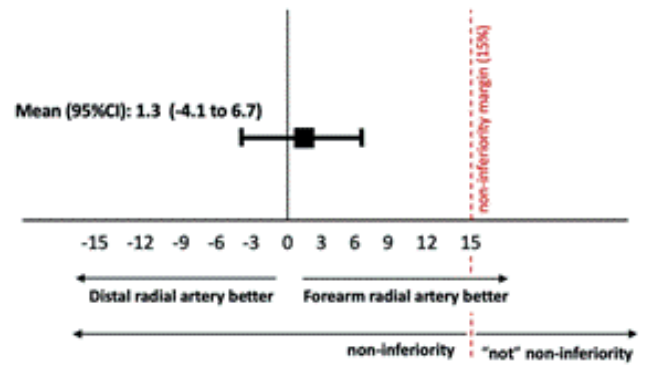


Figure 2

**ASSISTENZA CARDIACA IN ACUTO 822
ECMO (ASSISTENZA CARDIACA IN ACUTO)
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA IN ACUTO)**

**LEFT MAIN CORONARY ARTERY THROMBOTIC OCCLUSION AS A COMPLICATION OF VA-ECMO ASSISTED
OUT-OF-HOSPITAL CARDIAC ARREST**

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A 47-year-old woman with a one-week history of gastrointestinal symptoms and fever was admitted to our department after experiencing an out-of-hospital cardiac arrest. Due to refractory ventricular fibrillation, the patient required the use of veno-arterial extracorporeal membrane oxygenation (V-A ECMO) during cardiac arrest, achieving ROSC after 65 minutes. An emergency coronary angiography was performed, revealing a mobile image at the level of the proximal

aorta, which was intermittently occluding the left main coronary artery (panel A).

Additionally, given the preceding viral symptoms, a cardiac biopsy was performed, which was compatible with lymphocytic myocarditis. Transesophageal echocardiography identified a mass adhered to the aortic root on the left sinus of Valsalva (Panel B). The patient was urgently operated, and the mass surgically removed. Pathology of the mass was consistent with



Figure

thrombus (panel C).

Clinically, the patient experienced a full neurological recovery and a slight improvement in ventricular function, allowing for the withdrawal of ECMO. However, she remained dependent on inotropic support due to heart failure, ultimately requiring a heart transplant.

This case emphasizes the critical role of imaging techniques such as transesophageal echocardiography

in monitoring VA-ECMO patients and identifying complications. The thrombus likely formed in the aortic root due to the prolonged cardiac arrest and reduced aortic valve opening caused by the elevated left ventricular afterload induced by ECMO flow. The increased pressure in the aorta relative to the coronary arteries allowed intermittent blood flow into the coronary arteries during part of the cardiac cycle.



ASSISTENZA CARDIACA IN ACUTO 341 ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO) SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO) INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)

EPIDEMIOLOGY AND PREDICTORS OF OUTCOME IN CARDIOGENIC SHOCK

Marco Giuseppe Del Buono (a), Alessia D’aiello (a), Daniela Pedicino (a), Gaetano Pinnacchio (a), Lorenzo Genuardi (a), Rocco Antonio Montone (a), Gianluigi Saponara (a), Francesco Moroni (a), Simone Filomia (a), Mattia Brecciaroli (a), Cristina Aurigemma (a), Giovanna Liuzzo (a, b), Carlo Trani (a, b), Francesco Burzotta (a, b), Tommaso Sanna (a, b)
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(b) UNIVERSITA CATTOLICA DEL SACRO CUORE, ROME, ITALY

Background: Cardiogenic shock (CS) is a critical condition with a high risk of mortality. This study aims to assess in-hospital mortality, complication rates, and prognostic factors in patients admitted with CS at a high-volume hospital in Italy.

Methods: We conducted a retrospective analysis of patients diagnosed with CS (stage C or higher according to the Society for Cardiovascular Angiography and Interventions [SCAI] shock classification). Data on clinical presentation, echocardiography, laboratory results, demographics were collected.

Results: The study included 96 patients (median age 71 years, IQR 60-79; 65 [68%] males), with 49 patients (52%) experiencing acute myocardial infarction-related CS and 60 (63%) presenting with de novo CS. During hospitalization, 45 patients (47%) died. Non-survivors were older and had higher inflammatory markers at admission, elevated lactate levels, a more rapid rise in lactate levels, increased left ventricular filling pressures, and worse right ventricular function. Multivariate analysis identified

C-Reactive Protein (CRP) levels [odds ratio (OR) 1.03, 95% confidence interval (CI) [1.00-1.04], p=0.027),

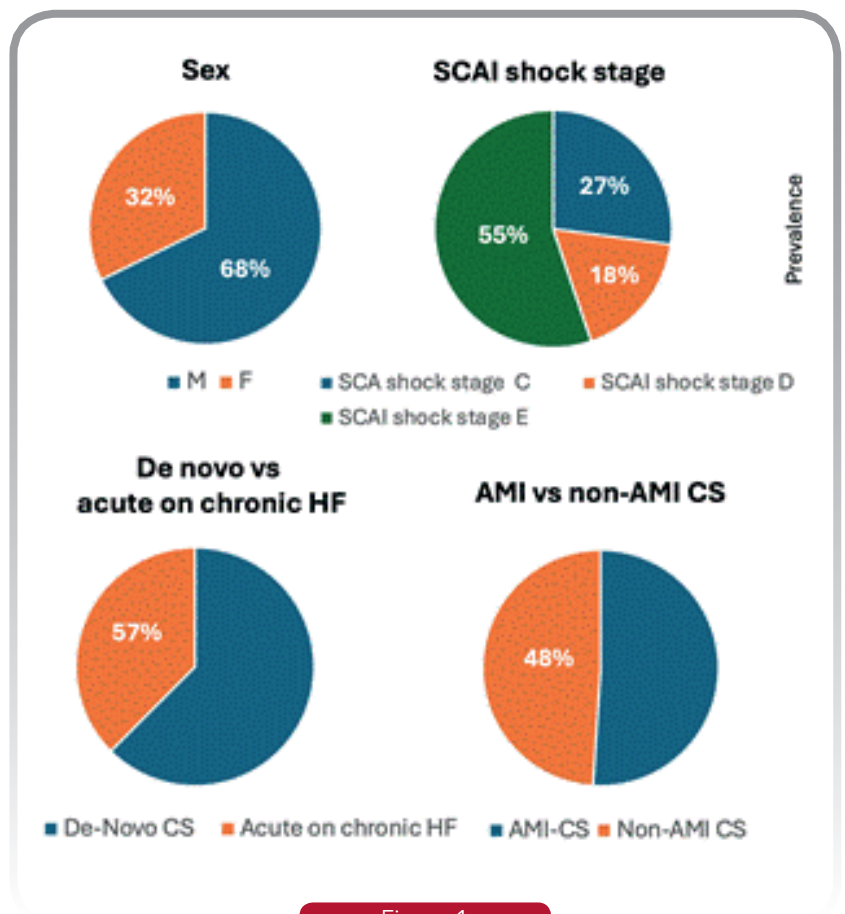


Figure 1

lactate levels at admission (OR 3.49, 95% CI [1.59-7.63], $p=0.02$), and the increase in lactate levels (OR 2.8, 95% CI [1.37-5.75], $p=0.005$) as independent predictors of in-hospital mortality.

Conclusions: CS is associated with high mortality and complication rates. Elevated lactate levels, indicating tissue hypoperfusion, and CRP levels at admission, reflecting the inflammatory response, can help identify patients at higher risk for adverse in-hospital outcomes.



**ASSISTENZA CARDIACA IN ACUTO 150
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA CARDIACA PRE-OSPEDALIERA
(ASSISTENZA CARDIACA IN ACUTO)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA IN ACUTO)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)**

ROLE OF EXTRACORPOREAL CARBONE DIOXIDE REMOVAL (ECCO2R) IN PATIENT RESUSCITATED FROM OUT-OF-HOSPITAL CARDIAC ARREST

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(a) UNIVERSITÀ DEGLI STUDI DELL'AQUILA; (b) AZIENDA OSPEDALIERA UNIVERSITARIA CAREGGI

Background: Non-invasive (NIV) and invasive mechanical ventilation (IMV) are standard therapies for treating acute respiratory failure. In severe COPD patients, a hypercapnia refractory to common ventilation methods may persist and the increase in fan supports can lead to Ventilator Induced Lung Injury (VILI), resulting in worsened outcomes. Extracorporeal CO₂ removal (ECCO₂R) may be a promising adjunctive therapeutic strategy for management patients with severe hypercapnia in selected cases.

Case summary: A 60-year-old male with type II diabetes mellitus, history of ischemic heart disease and COPD (heavy smoker, 30 pack/years), was admitted to our hospital after experiencing cardiac arrest due to ventricular fibrillation during chess game treated immediately with cardiac pulmonary resuscitation with two defibrillator-delivered electrical shocks obtaining return of spontaneous circulation (ROSC). Endotracheal intubation was required. A 12-lead electrocardiogram (ECG), performed after ROSC, showed signs of acute anterior ST myocardial infarction. The patient underwent urgent coronary angiography that showed acute occlusion of the proximal left coronary artery (LAD). Due to hemodynamic instability, intra-aortic balloon pump (IABP) was implanted. A transthoracic echocardiogram (TTE) underlined a depressed ventricular function (Ejection Fraction E.F. 25%). At

Intensive Cardiac Care Unit (ICCU) admission the patient was supported by IABP 1:1 and vasopressors with Mean Arterial Pressure (MAP) 65 mmHg and lactates 2.8 mmol/L. An Arterial Blood Gas (ABG) highlighted type two respiratory failure (pCO₂ 100 mmHg) causing severe respiratory acidosis (pH 7.06). Therefore, it was necessary to ventilate the patient with high ventilatory supports and inhalation therapy with Nitric Oxide (iNO). At ABG, pCO₂ remained high so ECCO₂R therapy was implemented and in the following day CO₂ progressively decreased. Due to improvement in gas exchange and lactates, iNO and IABP have

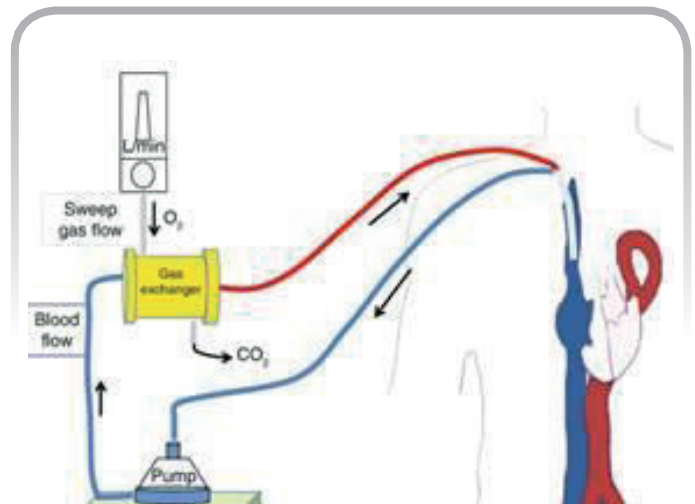


Figure 1

been removed on 4th day. Progressively neurological and respiratory improvement allowed transition to spontaneous breathing and weaning from MV and ECCO2R. A cardiac MRI was performed (E.F. 28% with LGE located in anterior and apical wall). Therefore, a transvenous ICD was implanted for primary prevention on 13th day. He was discharged from the cardiology department after a total length of stay of twenty days, with normal neurological status.

Discussion and conclusion: Case series studies have reported successful use of ECCO2R in patients with severe refractory hypercapnia in acute respiratory failure who are receiving mechanical ventilation. Extracorporeal membrane oxygenation (ECMO) could be an alternative option but is complex, costly, with high risk of complications, and limited to specialized hospital with trained ECMO teams.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA

**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 166
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E MALATTIE DEL
CIRCOLO POLMONARE)**

**MULTIPARAMETRIC AND ANESTHESIOLOGICAL MONITORING IN A PEDIATRIC SURGICAL HUMANITARIAN
MISSION IN BENIN: A NURSE'S EXPERIENCE**

Simone Amato (a)

(a) AZIENDA OSPEDALIERA SAN CAMILLO FORLANINI, CARDIAC INTENSIVE CARE UNIT,
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Introduction: In Benin, as in many African countries, access to health care is not universally guaranteed. Even in public health facilities services are fee-for-service, making access to care difficult for many people, especially in rural areas. In the Cotonou area, for many families even the journey to the hospital represents an unaffordable cost. In Benin, the Ministry of Health outlines the destination of pediatric surgeries to Emergenza Sorrisi, an Italian nonprofit volunteer organization, within the Abomey Calavi Area Hospital. During the mission, many mothers bravely sought help, defying social norms to give their children hope for the future and break the cycle of isolation and despair. The mission not only saved lives, but also demonstrated how modern medicine can challenge and transform harmful cultural beliefs, bringing positive change to local communities. In addition, the goal was to treat selected complex surgical cases and train local staff in specialized surgery and management of the post-operative period.

Methods: This article reports a retrospective analysis of an 8-day experience of pre-intra and postoperative nursing care of pediatric surgeries in remote areas of Benin under extremely adverse conditions. Teams of expatriate volunteers (surgeons, anesthesiologists, instrumentalists, operating room nurses, and general practitioners) performed pediatric surgeries. A total of 87 patients were seen during the humanitarian mission. The team mainly focused on medical and

surgical care of patients with cleft lip and palate, neoplasms, facial malformations, as well as debilitating outcomes of severe burns, which often required grafts in various areas of the body and face.

Results: 59 patients were operated on (60% male, 90% under 16 years old). 53 elective surgeries (90%) and 6 emergency surgeries (10%) were performed. Most of the surgeries were performed under general anesthesia. (n=50, 85%). In other cases, ketamine was required (n=6, 10%), and a small number of patients received local anesthesia.(n=3, 5%) No postoperative complications occurred. During the surgical procedures, the Italian team conducted intensive training courses in surgery, anesthesiology, and nursing (training on the job). In nursing, staff in the operating room and on the wards received training that focused particularly on postoperative care, especially regarding skin grafts used in the treatment of burn sequelae, particularly those involving the genital area. This training is increasingly crucial to continuously improve the performance of local staff.

Conclusions: This report shows that it is possible to operate in rural areas of developing countries using simple facilities, equipping them with basic equipment, and employing local staff selected and trained locally by expatriate volunteers. This currently appears to be the only realistic option for providing surgical care to rural populations in less developed countries.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 649
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)

**L'ASSISTENZA INFERMIERISTICA AL NEONATO AFFETTO DA TRASPOSIZIONE DELLE GRANDI ARTERIE:
 DALLA SALA PARTO ALLA SALA DI CARDIOCHIRURGIA PEDIATRICA**

Anna Bellingrath (a)
 (a) A.O. DEI COLLI - V. MONALDI

Introduction: Transposition of the Great Arteries is one of the most frequent diagnoses of neonatal heart disease, due to an anomaly in the embryonic development of the heart during the very first weeks of gestation; it can be compensated if there is a large interventricular defect that ensures the mixing of arterial and venous blood or it becomes an emergency when this defect is not present or is reduced. For this reason it is important to underline the nursing responsibilities from the moment of birth, to emergency neonatal transport, to hospitalization in a level III neonatal intensive care unit, up to hospitalization in pediatric cardiac surgery and the operation.

Presentation of the case: Male patient born at 36 weeks of gestational age with in utero diagnosis of Transposition of the Great Arteries, is monitored closely at the birth point by performing cord blood gas analysis and positioning the oximeter in pre- and post-ductal position showing a saturation equal to 65% at 10 minutes of life; Neonatal Emergency Transport (STEN) is called urgently to transport the patient to a Level III Neonatal Intensive Care Unit, after alerting the cardiologist, the neonatologist and the haemodynamicist of the transferring hospital. In the meantime, an umbilical

venous access is positioned in which the prostaglandin infusion is started. Upon arrival of the neonatal emergency transport, the baby is placed in an incubator with continuous infusion of prostaglandins. Due to the onset of respiratory distress and persistence of the low saturation value, he is intubated and transported to the Neonatal Intensive Care Unit. Upon admission, close monitoring begins, arterial blood gas analysis is performed where metabolic acidosis is highlighted, despite intubation and prostaglandin infusion the patient continues to have a saturation of approximately 65%, for this reason the hemodynamics emergency room is alerted in preparation for Rashkind's operation which is successfully performed within 3 hours of birth showing an improvement in saturation. The patient is subsequently returned to the Neonatal Intensive Care Unit for the continuation of treatment until the definitive cardiac surgery.

Conclusions: The patient with transposition of the great arteries is a complex patient but the neonatal and cardiological team becomes fundamental in all its parts, as the timing of the assistance is fundamental in its precision for the best possible management of the patient until the resolution intervention.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 397 CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA) TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

INTERVENTI INFERMIERISTICI DI EDUCAZIONE TERAPEUTICA E DI PROMOZIONE DEL SELF-CARE NEL PROCESSO DI DIMISSIONE DI PAZIENTI CON PATOLOGIA CARDIOVASCOLARE: UNA SCOPING REVIEW

Cinzia Bona (a), Giulia Locatelli (b), Marzia Ferrario (a), Alessia Martin Trenta (a),
Michela Luciani (b), Davide Luigino Lino Ausili (b)
(a) CENTRO CARDIOLOGICO MONZINO; (b) UNIVERSITÀ DEGLI STUDI DI MILANO- BICOCCA

Introduzione: I pazienti con patologia cardiovascolare (CVD) sono spesso caratterizzati da una health literacy e da un self-care insufficienti e le loro esigenze educative sono sottovalutate e non soddisfatte dal personale sanitario durante la degenza e nel processo di dimissione. Nonostante i progressi degli ultimi anni, infatti, la gestione della dimissione infermieristica di questi pazienti non è ancora ottimale. Gli interventi infermieristici di educazione terapeutica e promozione del self-care permettono ai pazienti con CVD di apprendere comportamenti utili per la modifica del loro stile di vita, nonché di sperimentare un maggiore controllo sulla malattia così da migliorare la readiness for hospital discharge, rallentare la progressione della malattia e prevenire l'insorgere di complicanze, permettendo un aumento della qualità della vita e una diminuzione delle riospedalizzazioni e dei costi sanitari. Il processo di dimissione dei pazienti con CVD, quindi, è di fondamentale importanza per permettere loro una sicura prosecuzione delle cure.

Obiettivi: L'obiettivo del presente studio è stato quello di mappare le evidenze presenti in letteratura in merito agli interventi infermieristici di educazione terapeutica e di promozione del self-care all'interno del processo di dimissione di pazienti con CVD al fine di capire quali risultano essere maggiormente efficaci. Gli obiettivi secondari sono stati quelli di analizzare gli strumenti utilizzati per implementare

gli interventi in oggetto e capire su quali outcome agiscono.

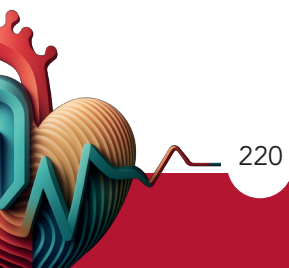
Metodi: La metodologia scelta è stata la scoping review redatta seguendo le linee guida del Johanna Briggs Institute e della JBI Collaboration. I Database consultati sono stati PubMed, Cinahl e Scopus. Lo screening dei 1629 risultati trovati è stato fatto mediante Rayyan e la selezione degli studi è avvenuta seguendo il PRISMA, arrivando ad includere nella revisione 38 articoli.

Risultati: La presente scoping review ha rilevato l'importanza di portare avanti gli interventi in oggetto in un'ottica di continuità assistenziale. Sottolinea, inoltre, l'importanza di iniziare precocemente l'educazione dopo aver valutato le caratteristiche dei pazienti, così da fornire un intervento personalizzato coinvolgendo attivamente sia i pazienti che i familiari. L'utilizzo di modelli, teorie e linee guida su cui costruire gli interventi è risultato facilitante e potrebbe aiutare nello sviluppo di un gold standard. In particolare, il metodo teach-back è risultato avere un buon impatto sulla popolazione indagata, soprattutto se usato in associazione a strumenti di educazione multimediale. L'educazione è risultata essere efficace quando svolta mediante incontri face to face con l'infermiere e seguita da un follow-up. Gli interventi hanno mostrato effetti positivi sull'aumento del self-care, della qualità di vita, dell'aderenza



alla terapia e della conoscenza fino a 12 mesi dall'intervento. È stato rilevato anche un miglioramento degli indicatori clinici, dello stato funzionale percepito, dell'adattamento al coping, del follow-up e della partecipazione ai programmi di riabilitazione nonché un miglioramento della preparazione alla dimissione. È stata inoltre notata una diminuzione delle riammissioni fino a 30 giorni dalla dimissio-

ne, rendendo quindi l'intervento economicamente vantaggioso. Concludendo, risulta importante fare ulteriori studi al fine di creare un gold standard che possa guidare gli infermieri nella strutturazione di interventi efficienti ed efficaci per garantire ai pazienti con CVD l'accesso a programmi educativi completi, personalizzati e basati su prove di efficacia così da ottimizzare i benefici già osservati in questo lavoro.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 380 FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)

LA CARDIOVERSIONE ELETTRICA ESTERNA NELLA PERSONA CON FIBRILLAZIONE ATRIALE E IL RUOLO DEL PROFESSIONISTA SANITARIO INFERMIERE: UPDATE DI UNA REVISIONE SISTEMATICA

Dalia Caleffi (a, b), Sergio Rovesti (c), Domenico Cannizzaro (d), Luca Pingani (c), Stefano Sorrentino (b), Paola Ferri (c)
(a) DOTTORATO DI RICERCA IN CLINICAL AND EXPERIMENTAL MEDICINE, DIPARTIMENTO DI SCIENZE BIOMEDICHE, METABOLICHE E NEUROSCIENZE, UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA;
(b) AZIENDA OSPEDALIERA UNIVERSITARIA DI MODENA, UNITÀ OPERATIVA DI CARDIOLOGIA, NUOVO OSPEDALE CIVILE SANT'AGOSTINO ESTENSE; (c) DIPARTIMENTO DI SCIENZE BIOMEDICHE, METABOLICHE E NEUROSCIENZE, UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA; (d) AZIENDA UNITÀ SANITARIA LOCALE DI PARMA, DIPARTIMENTO DI CURE PRIMARIE

Background: La fibrillazione atriale rappresenta l'aritmia cardiaca con il più elevato grado di prevalenza ed incidenza. È spesso necessario ricorrere ad intervento di cardioversione elettrica esterna al fine di ottenere il ripristino del normale ritmo di conduzione cardiaco. L'infermiere, come professionista sanitario, può avere un ruolo determinante nell'implementazione di tale procedura. L'obiettivo è sintetizzare, aggiornare ed evidenziare le evidenze disponibili sull'efficacia della cardioversione elettrica esterna condotta dall'infermiere nella fibrillazione atriale, valutando opportunità e possibili implicazioni dello svolgimento in autonomia.

Metodi: Una revisione sistematica di studi primari condotti in lingua italiana ed inglese, senza limiti temporali è in corso di elaborazione. Le banche dati incluse ed analizzate nel processo di ricerca sono: Cochrane library, Pubmed, Cinahl, Psycinfo, Scopus, Embase and Web of science. 9 articoli pertinenti sono stati identificati, inclusi, valutati criticamente e in corso di analisi critica. La revisione è condotta nel rispetto delle linee guida PRISMA statement per la conduzione e il reporting di revisioni sistematiche.

Risultati preliminari: L'analisi preliminare dei dati ha permesso di evidenziare realtà in cui la cardioversione elettrica esterna costituisce una procedura che può essere condotta in autonomia dall'infermiere con un'elevata percentuale di successo in condizioni di sicurezza clinica. È necessario, tuttavia, garantire uno specifico percorso formativo che assicuri l'acquisizione di competenze avanzate. Tra gli studi analizzati non esiste, inoltre, un chiaro consenso sugli aspetti anestesiológicos e il grado di coinvolgimento e collaborazione con l'equipe medica durante l'esecuzione della procedura.

Conclusioni preliminari: L'analisi preliminare dei dati supporta la possibilità di implementazione autonoma da parte dell'infermiere della cardioversione elettrica esterna, in determinati setting, in condizioni di sicurezza, al fine di ottenere il ripristino del ritmo sinusale in pazienti con diagnosi di fibrillazione atriale. È necessario, tuttavia, considerare i requisiti necessari tenendo conto degli aspetti richiesti dalla normativa, del ruolo e delle competenze infermieristiche nello specifico contesto. La definizione di linee di indirizzo condivise potrebbe essere di supporto all'effettiva implementazione.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 149
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
ECMO (ASSISTENZA CARDIACA IN ACUTO)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)**

**ECMO, IMPELLA E CONTROPULSATORE AORTICO NELL'ANGIOPLASTICA CORONARICA AD ALTO RISCHIO:
LE DIFFERENZE TRA I DEVICE DI ASSISTENZA MECCANICA AL CIRCOLO E IL RUOLO DELL'INFERMIERE**

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In un'epoca in cui il progresso tecnologico e l'avanzamento della pratica clinica permettono, all'interno dei laboratori di emodinamica, il posizionamento dei cosiddetti dispositivi percutanei di supporto meccanico al circolo, proveremo a farci strada tra contropulsatore aortico, sistema Impella ed ECMO (extracorporeal membrane oxygenation), descrivendoli nella loro struttura e differenziandoli per effetti terapeutici ed indicazioni cliniche. Nello specifico, verranno illustrati e confrontati i rischi e i benefici nell'utilizzo di ognuna di queste apparecchiature, calandole nella principale realtà critica in cui esse si trovano a ricoprire un ruolo da protagoniste: l'angioplastica coronarica ad alto rischio. Nelle angioplastiche coronariche complesse, i dispositivi di supporto meccanico hanno lo scopo di prevenire il collasso emodinamico e quindi il verificarsi di un possibile shock cardiogeno durante la procedura; proprio per la complessità delle stesse, solitamente si tratta di procedure programmate ed eseguite in regime di elezione (escludendo i casi in cui il paziente proviene in regime di emergenza/urgenza per una problematica acuta, quale lo shock cardiogeno secondario a STEMI, embolia polmonare ecc.), dove è quindi possibile pianificare in precedenza gli interventi da attuare, tra cui la scelta del dispositivo di supporto più adatto. Verrà inoltre presentato e discusso il caso clinico di un paziente di 74 anni con un'anamnesi cardiovascolare di ipertensione arteriosa, diabete mellito insulino-dipendente,

recente evento ischemico cerebrale nel maggio 2023 complicato da infarcimento emorragico, coronaropatia trivasale coinvolgente il tronco comune e disfunzione sistolica del ventricolo sinistro con FE (frazione di eiezione) del 43%. Dopo discussione collegiale si è deciso di sottoporre quest'ultimo ad angioplastica coronarica di tutti e tre i vasi epicardici con supporto meccanico al circolo mediante il sistema ECMO, in regime di elezione, nel luglio dello stesso anno. La procedura, oltre al successo angiografico che ha mostrato il completo ripristino del calibro coronarico nativo, ha permesso il recupero, valutato mediante follow up, della funzione ventricolare sinistra risalita a 53% a 6 mesi dall'intervento, con conseguente miglioramento, oltre che della sintomatologia, della qualità di vita della persona assistita. Tale risultato non è dovuto esclusivamente alla buona riuscita dell'angioplastica, ma è stato raggiunto anche grazie ad una corretta presa in carico assistenziale nell'immediato post operatorio; la gestione di questi assistiti si avvale infatti di un team multidisciplinare al quale appartiene anche l'infermiere, e i cui membri devono essere in possesso di competenze specifiche, sostenute da un programma di formazione ed un aggiornamento continuo. Dall'analisi di questo caso clinico, nonché dalla ricerca bibliografica sulle principali banche dati, è emerso come l'attività assistenziale svolta dall'infermiere ricopre un ruolo fondamentale nella gestione di questi pazienti ad alta

complessità, mediante la capacità di gestire tutti gli aspetti dell'assistenza. Le competenze del professionista infermiere riguardano la somministrazione di farmaci, il possesso delle conoscenze tecniche specifiche per l'utilizzo sicuro del circuito ECMO ed un background di perfusione per la gestione della macchina. La prevenzione e la rilevazione precoce

delle complicanze delle persone assistite, in aggiunta all'aderenza alle linee guida esistenti e alla standardizzazione delle procedure, sono gli elementi chiave per un'assistenza infermieristica di successo, che si è dimostrato essere in grado di ridurre la mortalità e migliorare gli outcomes del paziente.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 631 ECMO (ASSISTENZA CARDIACA IN ACUTO) SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO) ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO)

PRONE POSITION NURSING COMBINATED WITH EXTRACORPOREAL MEMBRANE OXYGENATION(ECMO): WHICH BENEFITS, RISKS AND SIDE EFFECTS?

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(a) PO SANTA MARIA DELLE GRAZIE POZZUOLI (ASL NAPOLI 2 NORD)

Introduzione: L'Extracorporeal Membrane Oxygenation (ECMO) è una tecnica di circolazione extracorporea a membrana volta al supporto circolatorio e polmonare nei pazienti cardiogeni refrattari alle misure di trattamento standard. Ha lo scopo di aumentare l'ossigenazione del sangue, ridurre i valori ematici di anidride carbonica e incrementare la gittata cardiaca. L'obiettivo di questa ricerca è quello di conoscere se il decubito prono nei pazienti in ECMO rappresenti una procedura sicura individuando rischi, benefici e complicanze

Materiali e metodi: È stata eseguita una ricerca bibliografica all'interno delle principali banche dati utilizzando una stringa di ricerca. La popolazione è rappresentata da pazienti supportati da ECMO

in combinazione alla procedura di pronazione.

Risultati: Dai risultati ottenuti dalla ricerca effettuata si evince un miglioramento dell'ossigenazione, del rapporto P/F e della compliance polmonare. Non si sono verificate importanti differenze sullo svezzamento precoce dall'ECMO né della sopravvivenza. Sono emersi complicanze reversibili legati al sanguinamento della cannula, a decubiti di I grado e non particolari turbe emodinamiche.

Conclusioni: I benefici della pronazione nel paziente in ECMO hanno riportato un essenziale miglioramento dell'ossigenazione e della compliance polmonare, rendendo questa procedura sicura ed efficace.

ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 43
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA IN ACUTO)

QUALITY OF LIFE IN CRITICAL CARE NURSES: AN OBSERVATIONAL STUDY - A PRELIMINARY RESULT

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 Roberto Latina (d), Francesco Gravante (e)

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 ANESTESIA E RIANIMAZIONE - U.O.C. ANESTESIA BLOCCO OPERATORIO - AZIENDA SANITARIA LOCALE
 CASERTA, PRESIDIO OSPEDALIERO "SAN GIUSEPPE MOSCATI", AVERSA (CE), ITALIA; (c) INFERMIERE -
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 DI PALERMO, PALERMO, ITALIA; (e) INFERMIERE - DIPARTIMENTO DI ANESTESIA E RIANIMAZIONE - U.O.C.
 RIANIMAZIONE E TERAPIA INTENSIVA - AZIENDA SANITARIA LOCALE CASERTA,
 PRESIDIO OSPEDALIERO "SAN GIUSEPPE MOSCATI", AVERSA (CE), ITALIA

Introduction: The World Health Organization defines the quality of life (QoL) as "the individual's perception of one's position in life in the context of cultural systems, and of the reference values in which it is inserted, and about one's goals, expectations, standards, and interests". Predictors such as anxiety, depression, stress, burnout, and sleep deprivation can worsen nurses' QoL.

Objectives: The study aimed to evaluate the QoL of nurses and their predictors, such as anxiety, depression, stress, burnout, and sleep deprivation.

Materials and Methods: We conducted a cross-sectional study at a single site. We used the Nurses' Quality of Life Assessment Scale to measure the QoL. We assessed nurses' burnout through the Maslach Burnout Inventory and the Depression Anxiety Stress Scales (DASS-21) to detect anxiety, stress, depression, and sleep deprivation using the Pittsburgh Sleep Quality Index. All Coronary Intensive Care Unit nurses were included.

Results: A total of 37 questionnaires were delivered. 86.5% (n=32) of nurses participated in the study and were eligible for the analysis. Nurses report being satisfied with QoL Social [n=27 (84.4%)], Emotional [n=27 (84.4%)], Occupational [n=28 (87.5%)] and Physical [n=19 (59.4%)]. The associations between the following groups are statistically significant: QoL Physics vs reduced personal accomplishment (p=0.04), emotional QoL vs. anxiety (p=0.002) and depression (p=0.007), depersonalisation (p=0.04), work QoL vs. anxiety (p<0.0001), depression (p=0.001), stress (p=0.03) and depersonalisation (p=0.01), social QoL vs. anxiety (p=0.04), depression (p=0.008), stress (p=0.04).

Conclusions: QoL is a phenomenon influenced by several factors. The preliminary analysis returns incomplete data, but the investigated predictors independently impact the different dimensions of the QoL of critical care nurses.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 372
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)**

PERCORSO DI IMPLEMENTAZIONE DEL MODELLO ASSISTENZIALE TAVI COORDINATOR

Maria Pia Chiarolla (a)

(a) AZIENDA OSPEDALIERO UNIVERSIATRIA DI FERRARA

Introduzione: La gestione clinico assistenziale del paziente affetto da AS (stenosi aortica severa), sottoposto a procedura TAVI, si pone l'obiettivo di favorire un decorso regolare e una dimissione rapida. Si tratta di pazienti fragili spesso con comorbidità associate, le quali potrebbero rappresentare elementi di potenziale rischio, limitando i benefici e di conseguenza il miglioramento della qualità della vita, che la procedura TAVI si prefigge di garantire.

Lo scopo dell'articolo, correlato allo studio clinico randomizzato TRACS (TRanscatheterAortic- valve with or without on-site Cardiac Surgery), è quello di condividere l'esperienza dell'Azienda Ospedaliero Universitaria di Ferrara (AOUFE), dove dal 2023, si effettuano le procedure TAVI nell'ambito della cardiologia interventistica in assenza dell'U.O di cardio chirurgia on site.

In questo scenario, per garantire un'assistenza appropriata e di qualità, è emersa la necessità di implementare la figura del TAVI coordinator, ruolo svolto da un professionista specializzato.

Le potenzialità del modello TAVI coordinator si esprimono in tutte le fasi del processo assistenziale, dalla presa in carico del paziente al post dimissione, stimando così un aumento della qualità delle cure ricevute, e

conseguentemente un immediato beneficio per l'assistito. Da tenere inoltre in considerazione gli esiti positivi riscontrati in ambito organizzativo dalla messa in atto del modello.

Metodi: Si ripercorreranno tutti gli step formativi che hanno coinvolto l'intera equipe, in particolar modo il TAVI coordinator, per completare le conoscenze e le competenze specifiche che il ruolo richiede.

Risultati: Il progetto è iniziato nel luglio 2023 e perfezionato nell'anno in corso.

Nella presentazione finale della sperimentazione verranno rappresentati nel dettaglio i benefici assistenziali ed organizzativi del modello TAVI coordinator.

Conclusioni: La presenza del TAVI coordinator, in qualità di professionista con competenze avanzate, ha portato a molteplici benefici sia per gli assistiti che per il modello organizzativo, come illustrato nello studio. La presentazione fornirà i dettagli di implementazione del modello organizzativo con il TAVI coordinator e gli strumenti operativi creati per supportare il percorso del paziente.

ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 383 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) APPS IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

CONSENSO INFORMATO MULTIMEDIALE

Francesca Coppola (a), Angelo Cristofaro (a)
(a) OSPEDALE SANTA MARIA GORETTI LATINA

Introduzione: Il consenso informato rappresenta la manifestazione della volontà del paziente di esprimersi liberamente riguardo alla scelta, all'accettazione o al rifiuto di un trattamento sanitario, dopo essere stato adeguatamente informato sulla diagnosi, sul decorso previsto della malattia, su tutti i possibili rischi correlati e sulle alternative terapeutiche disponibili e le loro conseguenze. Nella pratica clinica quotidiana, il consenso informato viene somministrato dal medico al paziente in forma scritta.

Razionale/Obiettivo: L'obiettivo di questo studio è stato verificare l'acquisizione delle informazioni riguardanti la procedura di coronarografia e i relativi rischi in un gruppo campione, al quale il consenso informato è stato inizialmente somministrato esclusivamente in forma scritta e successivamente con il supporto di un contenuto multimediale.

Materiale e metodi: Il campione è stato selezionato casualmente tra i pazienti dell'unità operativa di Emodinamica dell'Ospedale Santa Maria Goretti di Latina che necessitavano di una coronarografia, escludendo quelli in condizioni critiche. Il consenso informato è stato inizialmente fornito in forma scritta, seguito immediatamente dalla somministrazione di un questionario. Il questionario includeva tre domande a risposta multipla per raccogliere dati anagrafici e nove domande su scala Likert per valutare la chiarezza delle informazioni relative al consenso informato, con risposte che variavano da 1 (minima

chiarezza) a 5 (massima chiarezza). Successivamente, i pazienti hanno visionato un videoconsenso della durata di circa due minuti, contenente le stesse informazioni fornite in forma scritta. Dopo la visione del video, è stato somministrato un secondo questionario, arricchito con due domande aggiuntive per valutare il gradimento e l'utilità del video.

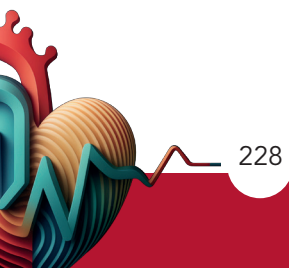
Risultati e discussione: Il campione, sebbene assegnato casualmente al gruppo di studio, si è rivelato statisticamente rappresentativo della popolazione afferente alla ASL Latina. Per la maggioranza del campione in esame, si trattava della prima coronarografia nella loro vita. Il consenso informato scritto chiariva che l'esame serviva ad analizzare le arterie coronarie, ma non spiegava chiaramente il metodo con cui sarebbe stato eseguito. La media delle risposte era intorno a 2,7 per tutte le domande poste prima della visione del video, mentre saliva a 4 per il questionario post-visione, indicando che la maggior parte delle persone ha trovato le informazioni abbastanza chiare. Questo è confermato anche dalle mode delle risposte: 2 o 3 (pre-visione) e 4 o 5 (post-visione), suggerendo una tendenza generale verso una maggiore chiarezza percepita dopo la visione del video. Le varianze non erano molto elevate, suggerendo che le risposte fossero relativamente omogenee.

Conclusioni: La maggior parte delle persone si sente "abbastanza", "molto" o "moltissimo" preparata a



sottoporsi alla procedura dopo aver visto il video, a differenza di quanto emerso dalla somministrazione del consenso informato solo in forma scritta. Il campione dimostra che, in generale, le persone hanno una buona comprensione della procedura medica

descritta e trovano il video informativo utile. Pertanto, si auspica di poter estendere l'uso del videoconsenso a tutte le procedure diagnostico-terapeutiche, includendo diverse lingue per superare anche le barriere linguistiche oltre che quelle culturali.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 59 CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)

CORONARY HEART DISEASE AND DEPRESSION: PROPERTIES EVALUATION OF THE 9-ITEM PATIENT HEALTH QUESTIONNAIRE IN A SAMPLE OF ITALIAN PATIENTS

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Background: Depression is highly prevalent in patients with coronary heart disease (CHD) and a major contributor to cardiovascular morbidity and mortality. The 9-item Patient Health Questionnaire (PHQ-9) is a self-report instrument used to screen and monitor depression. However, data about the psychometric properties of PHQ-9 are limited in CHD populations. Therefore, this study aims to verify the psychometric properties and measurement invariance of the PHQ-9 within a large sample of CHD patients.

Methods: A secondary analysis of baseline data from a multicenter longitudinal study. CHD patients completed a battery of self-report instruments including the PHQ-9 and the Generalized Anxiety Disorder scale-7 (GAD-7). Factorial validity was assessed with Confirmatory factor analysis (CFA). Construct validity was verified by testing the correlations between the PHQ-9 and GAD-7 scores. Internal consistency was investigated with the model-based internal consistency reliability index. Measurement invariance was tested across gender

and age (<65 vs. \geq 65 years) with confirmatory multigroup factor analysis.

Results: We enrolled a total of 427 patients (mean age 64.41 years; 78.9% male; 66.7% married). The CFA supported a bi-dimensional factor structure with the two factors measuring somatic and cognitive symptoms. Construct validity showed a significant positive correlation between GAD-7 and PHQ-9 scores. The model-based internal consistency reliability index was adequate at 0.80. Measurement invariance across age was confirmed at the partial strict level, whereas, for gender, only invariance at the metric level was achieved.

Conclusion: The PHQ-9 showed satisfactory psychometric properties in a sample of CHD patients. This tool also showed acceptable invariance properties across age; hence, PHQ-9 can be used in clinical practice and research to investigate levels of depression in this population and compare its scores confidently between younger and older subsamples.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 327
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

NAVIGATING PEDIATRIC CARDIAC DISCHARGE WITH CONFIENCE: A RETROSPECTIVE STUDY

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Introduction: The pediatric discharge of cardiac surgery patients represents a crucial moment in the treatment pathway, marking the transition from the hospital phase to the home phase. This transition requires special attention to ensure continuity of care and the safety of the child once he or she returns home. Proper discharge planning is critical to prevent postoperative complications, reduce the rate of readmissions, and improve the quality of life for the patient and their family. Although it is not designed for discharge, the use of the Cantarelli model makes possible to promptly identify the needs of the child and the family, plan targeted interventions and provide adequate training to parents for the management of home care. In this way, the optimal recovery of the young patient is promoted, ensuring a safe and efficient transition from hospital to home. The aim of this work is to identify the most frequent problems at the discharge of the cardiac surgery pediatric patient to redesign the time of discharge and re-evaluate the tools to support it.

Methods: Since 2008, a paper discharge card based on the Cantarelli model has been used in a single-specialty pediatric cardiac surgery facility in Tuscany. For this analysis, we took into consideration the 2023 clinical documents and part of those of the current year. Unfortunately, not all the patients received the

letter due to the language barrier, which involves about one-third of the pediatric population belonging to the center.

Results: Of the seventy-seven pediatric discharge letters found, 17 were of patients with interventricular septal defect or atrial septal defect ostium secundum type. Hygiene (n=70), wound management (n=66) and movement (n=64) are the most "open" needs at discharge, followed by the need for urinary elimination (n=47) and nutrition (n=21). Regarding the hygiene, most of the nursing indications refer to how to wash, given the presence of the surgical wound, for which the type of dressing is indicated with the frequency and some instructions for changes. For the movement, it is indicated how to lift the child safely or it is suggested to pay particular attention to accidental blows to the chest in the first post-operative month. Finally, the presence of diuretic support and absorbent device (always compatible with age) is reported and indications regarding nutrition are reported, especially in infants or patients taking oral anticoagulants.

Conclusions: In conclusion, although the limitations of Marisa Cantarelli's model applied to pediatric discharges are recognized, there is no doubt that in-depth knowledge of the patient's needs constitutes a solid starting point for designing effective future

care. Identifying and understanding the specific needs of each child and his or her family makes it possible to organize appropriate, personalized care paths in line with the type of patients belonging to the health facility. The continuous evaluation and

adaptation of care models, based on emerging needs, therefore represent a fundamental strategy to ensure increasingly effective and patient-centered pediatric care.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 104 ANGINA INSTABILE (CARDIOPATIA ISCHEMICA) ARITMIE VENTRICOLARI (ARITMIE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

MULTIDISCIPLINARY APPROACH TO PINCH-OFF SYNDROME: CLINICAL CASE

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Introduction: The "pinch-off syndrome" (POS) first described by Hinke et al. (1990) is a mechanical complication of central venous catheters (CVC) inserted via subclavian venous access; it occurs when the catheter is compressed between the clavicle and the first rib. Compression can cause transient obstruction of the catheter and may result in rupture or even complete resection and embolization of the catheter. Although this is a rare complication, with an estimated incidence of between 1.1 and 5%, it can lead to serious cardiovascular outcomes if not treated promptly. Our experience has been to successfully perform percutaneous transvenous extraction of an embolized port-a-cath fragment in the right cardiac chambers following a rupture, using the 'lasso' technique, and subsequent reimplantation via ultrasound-guided internal jugular venous access in the same session by a multidisciplinary team.

Clinical case: A 55-year-old man with an oncological pathology had a port-a-cath implanted to carry out adjuvant oncological therapy. Two weeks later, he experienced difficulties in the treatment infusion, which was corrected with arm and neck movement. The following day, the patient went to the emergency department with palpitations, chest pain, and dyspnoea. Electrocardiographic tracing and myocardial necrosis biomarkers were negative. A chest X-ray was taken, which showed part of the catheter fractured and embolized in the right-sided heart chambers, followed by a CT scan. The patient was sent urgently to our interventional cardiology

operating unit for extraction of the embolized catheter fragment and subsequent reimplantation. The nurse takes charge of the patient, closely monitoring his vital parameters and assisting him throughout the entire care. He collaborates with the interventional cardiologist by acting as a second operator for the emergency extraction of the embolized catheter fragment a percutaneous endovascular approach from the right femoral vein. He then assists the anesthetist with the reimplantation of the port-a-cath performed from the internal jugular vein. Thanks to teamwork, the patient will avoid having to undergo two surgeries within a few days, reducing the stressful event. The material required for catheter removal is: a 7 French femoral introducer, a pigtail catheter, a 0.035-inch guide wire and a transvenous loop, which reaches into the ventricle via the pigtail and traps the catheter fragment, which is pulled out of the femoral introducer.

Results: POS occurs only in patients with CVC inserted via the subclavian vein approach. This is attributable to the small space between the clavicle and the first rib, which then leads to mechanical compression and shear forces acting on the catheter. Consequently, it may be damaged or fractured. This can be avoided if the insertion of the port through the subclavian vein access is positioned more laterally, as medial positioning is associated with a narrower clavicular cost space. Furthermore, a nurse who is adequately trained in CVC management can play a key role in the prevention and early recognition of POS, preventing

the occurrence of these life-threatening complications.

Conclusions: POS is a rare and life-threatening complication that requires immediate intervention.

Recovery by percutaneous endovascular approach provides excellent results. In cases of embolization, 93.5% are removed percutaneously and only about 2.3% require surgical treatment with thoracotomy.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 804
ARITMIE VENTRICOLARI (ARITMIE)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)**

**NURSING KNOWLEDGE AND SKILLS IN THE INTERPRETATION AND ANALYSIS OF
ELECTROCARDIOGRAPHIC TRACING. MULTICENTER OBSERVATIONAL STUDY**

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Introduction: The electrocardiogram is the most widely used and effective method of detecting possibly fatal heart rhythm disturbances. For nurses, acquiring skills in electrocardiographic interpretation not only enriches their cultural and professional background but is essential to ensure quality and time-dependent health care for patients. The main objective of the study is to conduct a survey of nursing knowledge/skills in the interpretation and reading of electrocardiographic tracing.

Material and methods: A multicentre observational study was conducted by administering a survey, processed via an online platform, to a sample of 100 nurses from different operating units and with varying degrees of seniority and training. The questionnaire was structured by a first part investigating the socio-demographic characteristics of the sample and a second part consisting of eight multiple-choice questions on various cardiac pathologies.

RESULTS: The analysis of the socio-demographic characteristics of the sample of 100 nurses showed that 75% of the sample had a three-year nursing degree, 15% had a master's degree in nursing and midwifery sciences and only 10% had a professional diploma. Of these, 49.5% have more than ten years of work experience, 51% work in a critical care ward and 49% work in an inpatient or outpatient ward. A significant finding is that regarding post-graduate training, only 35% of the participants had attended advanced training courses for reading and analyzing

the electrocardiographic trace, thus increasing their cultural and professional background.

About the practical part of the questionnaire, it emerged that 76% were able to identify the defibrillate rhythms, whereas only 39% answered the question on ventricular tachycardia correctly, indicating wide QRS complexes as the correct answer. As far as ST-segment elevation was concerned, 57% of the sample gave the correct answer, while the identification of the tracing showing an acute myocardial infarction (IMA) was more successful with 83% correct answers. The most significant finding was that only 11% answered all the questions correctly, of whom 9% had attended an advanced training course on electrocardiographic interpretation and analysis.

Conclusions: Based on the results obtained, there is a need to promote training in this area from the university to the postgraduate level, and it would also be necessary to follow training and refresher courses aimed at integrating methods that can facilitate the reading and analysis of electrocardiographic tracing. With the increasing incidence of cardiovascular diseases, a good knowledge of malignant cardiac rhythms is essential to provide quality nursing care that can also include the early recognition of life-threatening conditions and the implementation of useful maneuvers to support basic vital functions, so that everyone can quickly identify the main and most frequent arrhythmias so that they can intervene as quickly as possible in this type of time-dependent pathology.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 713
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA IN ACUTO)

POST INTENSIVE CARE SYNDROME IN AREA CARDIOVASCOLARE: INSIGHT DALLA LETTERATURA

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La Post Intensive Care Syndrome (PICS) è definita in letteratura come una condizione che causa un peggioramento delle condizioni psicofisiche e socioculturali nelle persone che hanno subito una malattia critica che ha richiesto il ricovero in terapia intensiva. Questa sindrome porta quindi a una serie di sintomi fisici, cognitivi e mentali che colpiscono i pazienti dimessi dall'unità di terapia intensiva. Alcuni esempi possono essere astenia, debolezza muscolare, perdita di memoria, ansia, depressione e disturbo post traumatico da stress. Il termine è stato introdotto nel 2010 dalla Society of Critical Care Medicine e negli ultimi anni vi è un crescente interesse da parte della comunità scientifica sul tema, viste le ripercussioni sulla salute generale delle persone e sul loro processo di riabilitazione. La rilevanza del fenomeno è elevata al punto che il 50% delle persone che sopravvivono al ricovero in terapia intensiva sviluppano la PICS durante il follow up ad un anno. A questo va aggiunto che la stessa sindrome si manifesta frequentemente anche nei caregiver familiari delle persone che sono state ricoverate, venendo in questo caso denominata PICS-F (Post Intensive Care Syndrome-Family). Un recente studio

ha esteso il follow up di pazienti sopravvissuti ad arresto cardiaco fino a 24 mesi, evidenziando come un terzo di loro mostrasse sintomi di Post intensive care syndrome a distanza di 2 anni (3). La riabilitazione precoce, indicata come uno degli interventi volti a prevenire la sindrome, ha mostrato un'efficacia limitata all'insorgenza dei sintomi fisici nel breve termine. La letteratura suggerisce che l'approccio alla prevenzione e al trattamento sia multimodale e multidisciplinare, data la complessità della condizione. Sono stati proposti strumenti di screening per identificare il rischio di sviluppo di PICS e PICS-F e fra gli interventi di supporto alla persona si sta studiando anche l'utilizzo di nuove tecnologie, come ad esempio la Virtual Reality. In conclusione, sebbene il già citato crescente interesse nei confronti di questa problematica, vi è la necessità di indagare maggiormente il fenomeno. Alcune aree di indagine potrebbero essere: la prevalenza del fenomeno nelle persone ricoverate nelle UTIC del nostro territorio, l'efficacia degli interventi di prevenzione e trattamento e l'utilizzo delle nuove tecnologie a supporto della persona assistita e dei suoi familiari.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 155
BIG DATA (TELECARDIOLOGIA ED E-HEALTH)
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
ANGINA INSTABILE (CARDIOPATIA ISCHEMICA)**

IPOTIZZARE UN NURSING MINIMUM DATA SET DI AREA CARDIOLOGICA: SCOPING REVIEW

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(a) CENTRO CARDIOLOGICO MONZINO; (b) ISTITUTO EUROPEO DI ONCOLOGIA

Introduzione: Le patologie cardiovascolari rappresentano la prima causa di morte a livello globale e contribuiscono in modo sostanziale al peggioramento dello stato di salute generale. L'assistenza infermieristica influisce positivamente sugli esiti del paziente cardiologico migliorando la sua qualità di vita. Per dare evidenza di questa attività e del suo impatto è necessario dotarsi di un apparato documentale adeguatamente strutturato. Per conoscere, documentare e monitorare il contributo dell'agire infermieristico, negli ultimi anni, l'attenzione si sta indirizzando verso l'implementazione di un Nursing Minimum Data Set, un sistema informativo strutturato, valido e affidabile, sufficientemente sensibile da catturare gli elementi centrali delle cure infermieristiche.

Obiettivo: Individuare i principali bisogni di assistenza infermieristica del paziente affetto da sindrome coronarica acuta, insufficienza cardiaca e fibrillazione atriale come base per la costruzione di un Nursing Minimum Data Set di area cardiologica.

Metodi: È stata condotta una scoping review seguendo la metodologia del Joanna Briggs Institute (JBI) e interrogando le banche dati Pubmed, CINAHL (EBSCOhost), Scopus, EMBASE. Sono stati inclusi

nella ricerca solo studi primari condotti su una popolazione di pazienti adulti (≥ 18 anni) in regime di ricovero ospedaliero e/o ambulatoriale.

Risultati: Dalla scoping review condotta sono stati selezionati 25 articoli. I risultati sono stati organizzati in una tabella di estrazione in cui sono stati inseriti tutti i principali bisogni assistenziali, sintomi ed esiti correlati all'assistenza suddivisi per le patologie prese ad esame. I bisogni sono stati poi raggruppati in 6 domini: autonomia, stato psicologico, outcome clinici, stato nutrizionale e idrico, outcome organizzativi ed eventi avversi/sicurezza. Questi possono rappresentare un punto di partenza per ipotizzare un Nursing Minimum Data Set di area cardiologica.

Conclusioni: Il set di dati rilevati è rappresentativo delle cure minime e di attività indispensabili per il paziente con patologia cardiovascolare e mostra l'impatto a 360° dell'assistenza infermieristica sulla gestione del paziente cardiologico dal punto di vista clinico, psicologico, educativo ed organizzativo. La ricerca mostra quelli che potrebbero diventare i costituenti di un sistema di dati organizzato utile agli infermieri per orientarsi nella gestione del paziente cardiologico e per migliorare l'assistenza al paziente.

**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 243
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING
CARDIOVASCOLARE) INTELLIGENZA ARTIFICIALE
(TELECARDIOLOGIA ED E-HEALTH)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)**

**PROGETTO DI FORMAZIONE IN ANGOLA - MIGLIORAMENTO DELLE CAPACITA' IN CARDIOLOGIA,
CARDIOCHIRURGIA E IMAGING DELL'OSPEDALE "DOM ALEXANDRE DO NASCIMENTO"**

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CENTRO CARDIOLOGICO MONZINO - MILANO

Siamo Partner e attori principali nel Progetto di Capacity Building. Le necessità più cogenti del Governo Angolano e della Amministrazione del Complesso Ospedaliero Cardio-Polmonare Cardinal Dom Alexandre do Nascimento, sia nel breve sia nel medio lungo termine, riguardano il miglioramento quali/quantitativo delle attività erogate in ambito cardiovascolare, con particolare riferimento alle attività di indagini diagnostiche, interventistiche e chirurgiche, ma è altresì molto chiaro, per noi questo obiettivo potrà essere realizzato solo se verranno messi in atto gli strumenti gestionali, tecnologici, organizzativi ed amministrativi che permettono ad un ospedale moderno di essere nello stesso tempo efficace dal punto di vista clinico ed efficiente dal punto di vista gestionale.

L'obiettivo ultimo è migliorare l'accessibilità alle cure per la popolazione Angolana e la qualità delle cure stesse. Sono quindi richieste attività di formazione e supporto sia in ambito clinico (chirurgia, protocolli diagnostici, Imaging) che manageriale, con particolare focus sulla gestione dei processi «core» (es. pianificazione sale operatorie, gestione ambulatori, creazione e gestione liste d'attesa).

Il progetto, partito nell'ottobre del 2022, mira ad ottenere risultati nelle seguenti aree:

- 1) attività di training on the job per i clinici (chirurghi, cardiologi, tecnici, infermieri, amministrativi) sia in Angola che nella Sede Italiana;
- 2) Accesso alle cure per prestazioni di cardiologia, cardiocirurgia ed emodinamica
- 3) Gestione e organizzazione dei servizi di cardiologia, cardiocirurgia ed imaging.

Risultati sino ad ora ottenuti:

- 1) 2833 pazienti trattati
- 2) 550 infermieri e medici formati in Basic ed advanced life support
- 3) 3000 pazienti sottoposti a Screening ecocardiografico nei 4 siti, SPOKE, aperti nella Municipalità di Luanda.
- 4) 340 professionisti (infermieri, medici e tecnici) inseriti nei percorsi di formazione.
- 5) Trasferimento di immagini TAC per Second Opinion dall'Angola all'Italia.
- 6) Creazione di una task force aziendale dedicata al percorso paziente.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 347
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
PROGNOSI (SCOMPENSO CARDIACO)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)**

**SELF-CARE AND QUALITY OF LIFE IN PATIENTS WITH CHRONIC CARDIOVASCULAR DISEASES:
THE ROLE OF ANXIETY, DEPRESSION AND PERCEIVED DISTRESS**

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Background and Aim: the objective of this study is to examine the relationship between psychological status, self-care and quality of life in patients with chronic cardiovascular disease. It is well documented that both psychological status and self-care affect the quality of life of patients with chronic cardiovascular diseases. However, the precise nature of the relationship between these three elements remains unclear.

Methods: a total of 397 patients with chronic cardiovascular disease were included in the study. All participants completed a self-administered test battery comprising the Generalized Anxiety Disorder 7-item scale (GAD-7), the Patient Health Questionnaire 9-item scale (PHQ-9), the Perceived Stress Scale (PSS), the EuroQol 5-dimension (EQ-5D) scale, and the Self-Care Confi-

dence Inventory II (SCCII) scale. A path analysis was performed.

Results: in individuals with chronic cardiovascular disease, self-care and quality of life are indirectly linked via perceived distress, which serves as the mediating factor.

Conclusions: To the best of our knowledge, this is the inaugural study to evaluate the mediating function of distress in the relationship between self-care and quality of life in patients with chronic cardiovascular diseases. The findings suggest that, in this population, self-care affects quality of life with the moderating role of perceived distress, emphasising the significance of fostering collaboration between nurses and psychologists to create tailored interventions.

**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 96
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA CARDIACA PRE-OSPEDALIERA
(ASSISTENZA CARDIACA IN ACUTO)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)**

NURSE COMPETENCE OF FOLLOW-UP SERVICE IN ICU SURVIVORS AFTER CARDIAC SURGERY

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Introduction: Post Intensive Care Syndrome (PICS) is associated with poor quality of life in intensive intensive care unit (ICU) survivors and is explained predominantly by the mental component. There is a lack of knowledge about the competence of a nurse specialist in the follow-up service of ICU survivors after cardiac surgery. The results will outline critical care nurses' competence and knowledge in the early recognition and management of ICU survivors after cardiac surgery.

Objective: This review aims to describe the competence of a critical care nurse in the follow-up service of ICU survivors after cardiac surgery.

Design and Methods: A scoping review was carried out. Pubmed, Scopus, Web of Science, and Cumulative Index to Nursing and Allied Health Literature (CIHNAL) were searched. The search strategy included combinations and synonyms of free text and MESH (Medical Subject Headings) terms such as 'post-intensive care syndrome', 'PICS', 'nurse competence', AND 'cardiac

surgery'. Eligible studies were quantitative (observational, RCT, cohort, and longitudinal study) and qualitative research that reported the nurse competence in the follow-up service of ICU survivors after cardiac surgery.

Results: A total of 232 records were generated from the research question. After duplicate removal (n=190), 42 titles and abstracts were screened. Thirty-nine full texts were evaluated, and 3 studies were included. All studies define the critical care nurse's role in cognitive/mental assessment, consultation, and outpatient adjustment. Nurses often play a central role in PICS follow-up clinics. Conclusion: PICS is a widespread experience among ICU survivors and their family members. Critical care nurses have a crucial role in managing the syndrome in follow-up services through the collaboration of the multidisciplinary team.

Keywords: Post-intensive care syndrome, survivors, cardiac surgery, intensive care unit, nurse competence



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 714 INTELLIGENZA ARTIFICIALE (TELECARDIOLOGIA ED E-HEALTH) TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH) DEFIBRILLATORE IMPIANTABILE (ARITMIE)

SMART ECG: L'INTELLIGENZA ARTIFICIALE PER MIGLIORARE LA QUALITÀ DELL' ASSISTENZA NEL MONITORAGGIO CARDIACO IMPIANTABILE

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(c) UNIVERSITÀ DELLA CALABRIA

Introduzione: Il monitoraggio continuo dell'attività cardiaca e la rilevazione precoce delle aritmie sono essenziali per la diagnosi e la gestione tempestiva dei pazienti cardiologici. Rilevare le anomalie del ritmo cardiaco tempestivamente è fondamentale per prevenire eventi avversi. L'utilizzo dei loop-recorder sottocutanei con all'interno algoritmi di IA, rappresentano un'innovativa soluzione di monitoraggio, permettendo la registrazione continua dell'attività elettrica del cuore ed effettuano analisi in tempo reale dell'elettrocardiogramma, riducendo significativamente i falsi positivi. Questo strumento non solo migliora la precisione nel monitoraggio, ma fornisce anche strumenti avanzati che aiutano gli infermieri, i primi a leggere ed interpretare i dati trasmessi, a gestire meglio il carico di lavoro e a garantire una qualità assistenziale ottimale ai pazienti.

Materiali e Metodi: I dati preliminari sono stati raccolti dai primi 20 pazienti ad oggi sottoposti all'impianto di loop recorder con BioMonitor IV® (Biotronik, inc). La ricerca ha confrontato le diagnosi e le revisioni degli eventi aritmici prima e dopo l'utilizzo dei dispositivi migliorati con IA, dimostrando un minor tempo di lettura degli ECG e quindi un maggiore tempo risparmiato, con conseguente riduzione del carico di lavoro. Particolare attenzione è stata rivolta alle implicazioni per il benessere psicofisico dei pazienti e l'efficienza delle cure infermieristiche. Sono stati valutati l'accuratezza nel rilevamento delle aritmie, l'efficienza operativa e la soddisfazione del personale sanitario.

Risultati: Questo dispositivo ha ridotto notevolmente

i falsi positivi nelle principali aritmie, dimostrando una migliore accuratezza rispetto ai metodi tradizionali. Questo ha contribuito a ridurre il carico di lavoro infermieristico, con una diminuzione del tempo dedicato alla revisione degli episodi di aritmia. Gli infermieri hanno riportato un alto grado di soddisfazione per la facilità d'uso e l'affidabilità del dispositivo, apprezzando in particolare la sua capacità di integrarsi nei sistemi informatici aziendali esistenti, facilitando l'analisi dei dati.

Discussione: L'integrazione dell'IA nei loop-recorder offre vantaggi significativi per la pratica clinica e infermieristica. Una migliore accuratezza diagnostica riduce lo stress del paziente e ottimizza il carico di lavoro infermieristico. Gli infermieri, grazie a queste innovazioni, possono dedicare più tempo all'assistenza diretta dei pazienti, rafforzando così l'efficacia delle cure.

Conclusioni: Nonostante il campione ridotto possa rappresentare un limite alla generalizzabilità dei risultati, l'introduzione dei loop-recorder impiantabili sottocutanei dotati di tecnologia IA può migliorare l'accuratezza diagnostica delle aritmie, riducendo il carico di lavoro infermieristico e migliorando la qualità della vita dei pazienti. L'integrazione tra tecnologia avanzata e assistenza al paziente cardiologico evidenzia il potenziale di queste innovazioni nel migliorare sia l'efficacia delle cure infermieristiche che il benessere psicologico dei pazienti, con un conseguente miglioramento della loro qualità di vita.

Parole Chiave: Implantable cardiac monitor, loop recorder, Artificial Intelligence, Quality of life.

**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 521
INTELLIGENZA ARTIFICIALE (TELECARDIOLOGIA ED E-HEALTH)
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)**

COMPARISON OF RESPONSES BY DIFFERENT LARGE LANGUAGE MODELS IN A CASE STUDY OF ACUTE ANTHRACYCLINES CARDIOTOXICITY

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Introduction: Antineoplastic activity of anthracyclines is well-known for certain haematopoietic and solid neoplasms. Despite clinical success, these agents may cause adverse events such as cardiotoxicity, most commonly presenting as left ventricular dysfunction and/or arrhythmias. The management of cardiotoxicity requires high competences in healthcare teams. The increasing integration of artificial intelligence in healthcare has revolutionised procedures, treatments, and care practices. Due to its capacity to quickly analyse large amounts of data, artificial intelligence can enhance the effectiveness and efficiency of healthcare services.

Objectives: The study aimed to assessing the safety, accuracy, and precision of the bibliographic references provided by Large Language Models, adherence to the Organisation for Economic Co-operation and Development framework, and potential for improvement based on issues emerging from a clinical case of cardio- oncology.

Methods: This research examines how ten advanced Large Language Models, six free and four paid, support nursing clinical decision-making in a

scenario of an acute cardiotoxicity emergency. Their responses were evaluated following the methodology presented in Sblendorio et al., 2024 and based on guidelines established by a Delphi consensus. Clinicians presented to ten LLMs a detailed clinical case regarding an acute cardiotoxicity event due to anthracycline administration, causing severe acute left ventricular failure and hyperglycaemia, appearing after the first cycle of anti-cancer therapy. An expert group employing a Delphi consensus method evaluated the responses provided by the LLMs using a seven-point Likert scale. The responses were evaluated manually by the research team and automatically using the MPNet V2 model, which assesses text coherence and accuracy. Additionally, the scientific references provided by each LLM were verified via Google Scholar to ensure they were genuine and high-quality. The prompts were repeated four times at different intervals to evaluate consistency over time. The responses were then compared to determine variability, ensuring their reliability.

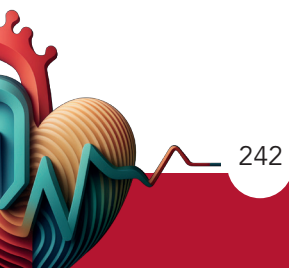
Results: The evaluation of LLMs revealed that Chat GPT 4 Omni excels in "State of the Art Alignment & Safety" and "Ability to Drive Evolution in Healthcare,"



making it the top performer. Copilot Balanced is also strong, particularly in "Focus, Accuracy & Management of Prompt Ambiguity." Claude 3 Opus ranks highly in ethical adherence and data integrity. Conversely, Biomistral 7B and Medichat Llama3 8B show lower performance, needing significant improvements.

Conclusions: This study found that Chat GPT 4 Omni

and Copilot Balanced are recommended for clinical decision-making, while others require enhancements to meet critical healthcare standards. The method uses allowed evaluation not only of the accuracy and safety of the models' responses but also of their ability to provide real references and useful suggestions for improving patient care, healthcare team efficiency, and hospital processes.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 595
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)

CLINICAL NURSE SPECIALIST IN CARDIOLOGY: A SCOPING REVIEW OF CLINICAL ROLES

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 Michela Piredda (d), Maria Grazia De Marinis (e)

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Introduction: The increasing complexity of the healthcare sector necessitates a significant evolution in nursing education and clinical competencies to effectively manage care in complex and interdisciplinary contexts such as cardiology. Cardiovascular nursing involves not only direct patient care but also encompasses a broad range of activities that include patient education, clinical research, and the implementation of evidence-based practices. The integration of these diverse elements requires a sophisticated skill set and knowledge base, enabling nurses to operate autonomously and effectively within multidisciplinary teams. Through these elements, nurses can demonstrate their full spectrum of competencies, contributing to improved patient outcomes and advancing the overall quality of care.

Aim: This scoping review aims to analyze the role of Clinical Nurse Specialists (CNSs) in the cardiology context within hospital settings, detailing their roles, competences and responsibilities. It also provides an overview of the main degrees and postgraduate training programs for specialization in cardiology nursing in the major Western countries.

Methods: This scoping review followed the Arksey & O'Malley framework and JBI methodology. The Preferred Reporting Items for Systematic Reviews

and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) was used. The process of refining the inclusion criteria was carried out through an initial, systematic exploration of multiple and pertinent databases, including but not limited to PubMed, CINAHL, Scopus, the Cochrane Library, and Embase. Bibliographic searches were conducted using the key words "Clinical Nurse Specialist", "Advanced Practice Nurse", "Clinical Nurse Consultant", "Nurse Practitioner", "Cardiology", "Cardiac Procedures" and their variations opportunely combined by Boolean operators. Manual search was conducted scanning the reference lists of relevant articles and Google Scholar to retrieve additional records.

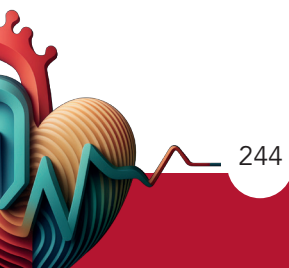
Results: Among the 647 records analyzed, 25 were included in this review. The CNS plays an important role in cardiology clinical care, education, and research. CNSs in cardiology offer direct and indirect patient assistance at every stage of the care process, both as outpatient and inpatient. Thanks to the advanced skills acquired through specific paths, they also act as a link between the healthcare team and patients, improving the provision of personalized and coordinated care and at the same time promoting continuous training and research in cardiology care.

Conclusions: CNSs enhance cardiology care by



offering in-depth clinical assessments, education and support throughout the treatment process. However, the lack of standardized regulatory frameworks in some countries limits the autonomy of cardiology CNSs within the healthcare systems, compromising their ability to address unmet healthcare needs and collaborate internationally.

Implications for Nursing: Standardized educational pathways, roles, responsibilities, and autonomy for CNS in cardiology are needed, able to facilitate international collaboration and contribute to increase scientific research in cardiology nursing.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 4 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES) (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA)

IL RUOLO DELL'IVUS E DELL'OCT NEI PAZIENTI CON L'INFARTO MIOCARDICO SENZA OSTRUZIONE CORONARICA SIGNIFICATIVA (MINOCA)

Aldo Lo Varco (a), Carmelo Severino (a), Maria Palmisano (a), Antonino Riti (a)

(a) UOC DI CARDIOLOGIA - DIPARTIMENTO DI EMERGENZA -URGENZA, AZIENDA OSPEDALIERA UNIVERSITARIA
POLICLINICO PAOLO GIACCONE, PALERMO

Introduzione: Con il termine Myocardial infarction with non-obstructive coronary arteries (MINOCA) si intende una sindrome con cause differenti, responsabile di una necrosi ischemica miocardica e caratterizzata angiograficamente dall'assenza di lesioni coronariche emodinamicamente significative (stenosi <50%). La coronarografia ha dei limiti nella diagnosi dell'aterosclerosi come causa alla base del MINOCA e pertanto l'uso di imaging coronarico invasivo come intravascular ultrasound (IVUS) e optical coherence tomography (OCT), hanno un alto potenziale diagnostico.

Metodi: IVUS e OCT sono due modalità di imaging endovascolare che forniscono in tempo reale sezioni tomografiche delle arterie coronarie.

L'OCT utilizza una luce ad infrarossi che garantisce elevata risoluzione assiale (10-15 μm) e alta frequenza di campionamento invece l'IVUS utilizza ultrasuoni (lunghezza d'onda 40 μm a 40 MHz) e permette di ottenere informazioni in merito alle caratteristiche e alla struttura della placca.

Risultati: Il danno ischemico può essere la conseguenza di una problematica che coinvolge sia le coronarie epicardiche sia

il microcircolo. Le cause epicardiche che determinano l'insorgenza del MINOCA sono la rottura e/o erosione di una placca ateromassica, le dissezioni, il vasospasmo. Le cause microvascolari del MINOCA sono le tromboembolie coronariche, la sindrome di Takotsubo e la disfunzione del microcircolo coronarico.

La sola coronarografia nella maggior parte dei casi non permette di giungere ad una diagnosi eziologica precisa e l'introduzione di imaging intracoronarico come IVUS e OCT ha incrementato l'identificazione dei meccanismi sottostanti specialmente nelle cause epicardiche di MINOCA.

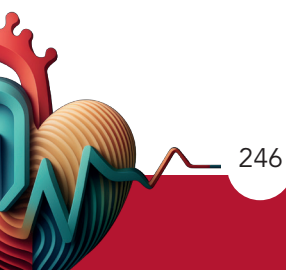
IVUS	OCT
Tecnologia a ultrasuoni	Tecnologia a luce infrarossa
Elevata penetrazione tissutale	Elevata risoluzione spaziale
Migliore valutazione rimodellamento dei vasi	Migliore per la caratterizzazione dei tessuti, rottura di placca e identificazione dei trombi
Bassa quantità di mdc (migliore per i pazienti con insufficienza cronica)	Necessita di di maggiore quantità di mdc
Migliore valutazione delle lesioni aortocostali	Difficoltà nella valutazione delle lesioni ostiali
Ricerche più vaste	Facilità di interpretazione delle immagini

Figura 1



Conclusioni: Con il termine MINOCA si indica un gruppo eterogeneo di patologie che determinano l'insorgenza di IMA e che alla coronarografia non evidenzia la presenza di lesioni significative. Ricopre così un ruolo fondamentale l'imaging intracoronarico

(IVUS o OCT) che ci può dare importanti informazioni in merito alla diagnosi e alla successiva gestione dei pazienti con MINOCA in considerazione del rischio non trascurabile di eventi a breve, medio e lungo termine.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 10
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
DIABETE E MALATTIE CARDIOVASCOLARI
(DIABETE E MALATTIE DEL METABOLISMO)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)**

**GESTIONE INFERMIERISTICA DELL'IPERGLICEMIA ACUTA NEL PAZIENTE CON SCA:
L'ALGORITMO DI YALE MODIFICATO**

Mario Mazza (a), Andrea Crippa (a), Miriana D'andrea (a)
(a) CENTRO CARDIOLOGICO MONZINO

Razionale scientifico: L'iperglicemia acuta si verifica frequentemente nei pazienti in condizioni critiche come, per esempio, quelli affetti da sindrome coronarica acuta (acute coronary syndrome [SCA]) e si associa a una prognosi sfavorevole. Nei pazienti ricoverati in UCC con SCA e iperglicemia acuta è indicato il controllo dei valori glicemici attraverso il trattamento con insulina in infusione. Numerosi studi hanno documentato, in differenti contesti clinici, medici e chirurgici, il vantaggio di un trattamento insulinico in infusione continua rispetto alla correzione con boli di insulina nei pazienti critici. Attualmente, il controllo dell'iperglicemia acuta non prevede l'adozione di protocolli standardizzati e validati ed è completamente a gestione medica. Si ritiene che, come molte esperienze internazionali e nazionali suggeriscono, l'adozione di un protocollo a gestione medico-infermieristica possa contribuire a migliorare il controllo dell'iperglicemia acuta e, di conseguenza, le sue ripercussioni cliniche e prognostiche. Inoltre garantirebbe uno standard condiviso di omogeneità assistenziale e terapeutica e migliorerebbe i percorsi di acquisizione dei dati (glicemia -> prescri-

zione -> terapia) a tutela della salute dei pazienti. Il protocollo di infusione di insulina più comunemente utilizzato nel paziente critico ricoverato in Terapia Intensiva è stato strutturato sulla base del protocollo di Yale, il primo comparso in letteratura a gestione interamente infermieristica. Questo protocollo, tuttavia, mal si adatta alle caratteristiche del paziente con iperglicemia acuta in corso di SCA per il breve decorso della fase acuta e per il fatto che i pazienti con SCA, a differenza dei pazienti ventilati meccanicamente e alimentati con nutrizione artificiale, dopo un breve digiuno si alimentano normalmente con conseguente necessità di variare continuamente la dose di insulina necessaria. Si è pertanto ipotizzato che il protocollo originale di Yale possa essere modificato, adattandolo alle caratteristiche specifiche del paziente con iperglicemia acuta ricoverato per SCA. Il Protocollo Yale-Modificato si basa sulla rilevazione oraria dei valori glicemici e sulla conseguente regolazione della velocità di infusione dell'insulina sulla base di uno schema predefinito che considera la variazione assoluta della glicemia e della velocità di infusione di insulina in atto.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 99
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**L'INFERMIERE CASE MANAGER PER GLI INTERVENTI DI TAVI:
UN PROGETTO BASATO SU EVIDENZE E FORMAZIONE PRATICA**

Mellino Antonio (a), Diego Vannini (a), Claudio Bassi (a)
(a) IRCCS CENTRO CARDIOLOGICO MONZINO

Introduzione: La TAVI (Transcatheter Aortic Valve Implantation) è un'innovazione importante nella cardiologia interventistica per sostituire la valvola aortica in pazienti con stenosi aortica severa, offrendo un'alternativa meno invasiva rispetto alla chirurgia tradizionale, soprattutto per pazienti ad alto rischio. Dalla letteratura emerge che un programma di case management per la TAVI può migliorare significativamente gli esiti ospedalieri, riducendo i tempi di attesa e aumentando la soddisfazione dei pazienti. Ottimizzare i processi clinici è essenziale per ridurre le complicanze e utilizzare al meglio le risorse sanitarie. Un approccio multidisciplinare è cruciale per un trattamento completo e coordinato. Il ruolo dell'infermiere è fondamentale nel processo TAVI, dalla gestione pre-operatoria al supporto intra e post-operatorio continuo. Diversi studi dimostrano che un approccio coordinato e multidisciplinare migliora gli esiti per i pazienti, garantendo un trattamento personalizzato e di alta qualità. All'Ospedale Cardiologico, nel 2023 sono stati eseguiti circa 250 interventi di TAVI, con differenze nella preparazione dei pazienti tra il blocco operatorio e i laboratori interventistici. Con l'obiettivo di ottimizzare le fasi del percorso di cura, migliorare l'efficienza operativa, ridurre le complicanze e garantire un'esperienza ottimale per i pazienti sottoposti a TAVI, dall'ottobre 2023 è stato avviato un progetto per introdurre la figura di un infermiere case manager.

Metodi: Il progetto si fonda sulla corrente letteratura relativa all'ottimizzazione dei percorsi di cura per i pazienti in attesa di TAVI e al ruolo dell'infermiere case manager.

Ha previsto inoltre un periodo formativo presso un altro ospedale milanese, dove la realtà del case management è molto consolidata. Durante il training, sono stati studiati processi e strategie per la gestione integrata dei pazienti. Attualmente, sono in fase di sviluppo documenti condivisi per migliorare la collaborazione tra le unità operative e le sale operatorie, personalizzando i piani assistenziali secondo le esigenze di ogni paziente.

Risultati: Ci aspettiamo che l'introduzione del case manager riduca i tempi di attesa per l'intervento, migliorando la tempestività delle cure. Prevediamo anche un aumento della soddisfazione dei pazienti grazie a un percorso di cura più coordinato e personalizzato. Parallelamente, miriamo a ridurre le complicanze post-operatorie e a migliorare il flusso di informazioni tra le unità operative e le sale operatorie, ottimizzando l'efficienza complessiva e la qualità dell'assistenza.

Conclusioni: L'introduzione di un infermiere case manager dedicato agli interventi TAVI rappresenta un passo significativo verso l'eccellenza nella cura dei pazienti con stenosi aortica. Questo progetto, basato su evidenze consolidate e arricchito dall'esperienza formativa presso un altro ospedale milanese, mira a implementare strategie avanzate per migliorare ulteriormente la pratica clinica e l'assistenza ai pazienti sottoposti a TAVI. L'approccio coordinato e multidisciplinare promuoverà una gestione più efficiente e una migliore qualità delle cure, portando a esiti clinici ottimali e a una maggiore soddisfazione dei pazienti.

**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 55
APPS IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**

EFFECTIVENESS OF VIRTUAL REALITY ON PAIN AND ANXIETY IN PATIENTS UNDERGOING CARDIAC PROCEDURES: A SYSTEMATIC REVIEW AND META- ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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(b) DEPARTMENT OF MEDICINE, SURGERY AND PHARMACY, UNIVERSITY OF SASSARI, ITALY

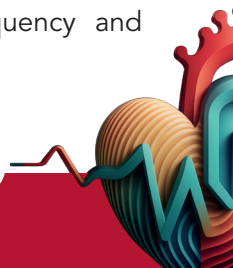
Background: Cardiac procedures encompass diverse endoscopic interventions aimed at addressing various cardiovascular issues. These include procedures for therapeutic purposes of abnormal heart rhythms, such as catheter ablation, those addressing heart disease, such as Percutaneous Coronary Intervention (PCI), as well as interventions designed for valve-related issues, such as Transcatheter Aortic Valve Replacement (TAVR). Cardiac procedures often induce pain and anxiety in patients, adversely impacting recovery. Pharmacological approaches have limitations, prompting exploration of innovative digital solutions like virtual reality (VR). Although early evidence suggests a potential favourable benefit with VR, it remains unclear whether the implementation of this technology can improve pain and anxiety. We aimed to assess by a systematic review and meta-analysis the effectiveness of VR in alleviating anxiety and pain on patients undergoing cardiac procedures.

Methods: Our study adhered to the PRISMA method and was registered in PROSPERO under the code CRD42024504563. The search was carried out in the PubMed, Web of Science, Scopus, and the Cochrane Library databases in January 2024. Four randomized controlled trials were included (a total of 382 patients).

Risk of bias was employed to assess the quality of individual studies, and a random-effects model was utilized to examine the overall effect.

Results: The results showed that VR, when compared to the standard of care, had a statistically significant impact on anxiety (SMD = -0.51, 95 % CI: -0.86 to -0.16, $p = 0.004$), with a heterogeneity $I^2 = 57\%$. VR did not show a significant difference in terms of pain when compared to standard care (SMD = -0.34, 95 % CI: -0.75 to -0.07, $p = 0.10$). The included trials exhibited small sample sizes, substantial heterogeneity, and variations in VR technology types, lengths, and frequencies.

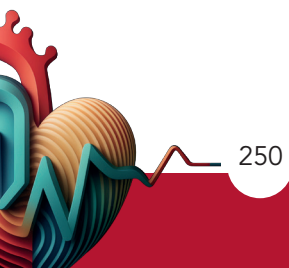
Discussion: This is the most comprehensive study addressing the effect of VR on measurable scales of anxiety and pain. The major findings are as follows: 1) VR had a statistically significant impact on anxiety among patients undergoing cardiac procedures compared to standard of care, 2) no statistically significant differences between VR and standard of care regarding pain were observed. Although all estimates converged directionally our systematic review and meta-analysis did observe significant heterogeneity which was in part at least attributable to variations in trial differences in sample sizes, differences in the frequency and



duration of VR which deserve further investigation. All four studies exhibited significant differences in VR equipment, including display resolution, video and audio quality, weight and dimensions of the device, safety comfort, and ease of use. Another crucial factor was the wide variation in the duration of VR exposure, ranging from 5 min18 to 46 min.

Conclusions: Our systematic review meta-analysis

showed that VR, when compared to standard of care, resulted in a statistically significant reduction in anxiety levels among patients undergoing cardiac procedures. However, for pain, no statistically significant improvements were demonstrated. Future research should focus on determining optimal durations for VR interventions, establishing standardized VR applications, and developing tailored content specifically designed for cardiac procedures.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 665 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

ASEPSI IN CATH LAB

Tiziana Perrotta (a), Maria Filomena Speltri (a), Federica Ceccotti (a), Mariella Tongiani (a), Marco Vaselli (a), Stefania Baratta (a), Marco Ciardetti (a), Angela Durante (a)
(a) FONDAZIONE TOSCANA GABRIELE MONASTERIO

Introduzione: Il laboratorio di cateterismo cardiaco (Cath Lab) è un ambiente complesso in cui operano team multidisciplinari per eseguire procedure ad accesso percutaneo e impianti di dispositivi. Nei Cath Lab le complicazioni infettive sono rare, infatti l'incidenza riportata in letteratura è inferiore all'1%. Tuttavia, la complessità dei casi trattati, l'esecuzione di procedure in emergenza e la costante evoluzione tecnologica sostengono la necessità di tecniche sterili sempre più rigorose, anche alla luce della continua diffusione di laboratori ibridi di cateterizzazione cardiaca/sala operatoria. Il Cath Lab, pertanto, va inteso come un ambiente ad asepsi progressiva ossia un sistema articolato in un insieme di zone a contaminazione microbica decrescente. In un'ottica di miglioramento continuo della qualità assistenziale, il fattore umano costituisce un valore aggiunto e determinante nella gestione del rischio infettivo in Cath Lab. Pertanto si rendono necessari interventi di educazione del personale e di cambiamenti strutturali che possano continuare a contrastare i tassi di infezione.

Obiettivo: Al fine di raggiungere il più basso grado di contaminazione possibile, lo studio si propone di valutare l'adesione alle buone pratiche e norme comportamentali in Cath Lab pre e post-implementazione di formazione attiva rivolta a emodinamisti, elettrofisiologi, infermieri e tecnici di radiologia. L'obiettivo specifico è quello di conservare il livello minimo realizzabile di contaminazione per l'intera durata della sedu-

ta interventistica, nonché ripristinarlo sistematicamente nell'intervallo di tempo che intercorre tra una procedura e l'altra.

Metodi: Studio monocentrico con disegno pre e post, da gennaio 2024 a dicembre 2024(ongoing) condotto in un'azienda monospecialistica Toscana; nella quale si sono avviati interventi di engagement del personale orientati sulle buone pratiche per l'Infection Prevention and Control (IPC), sulle procedure comportamentali per accesso e permanenza nel Cath Lab. Nel periodo pre sono state condotte sessioni di Safety Walk Round, in seguito alle quali è stata strutturata una formazione teorica (webinar) e di training incentrati su igiene mani, dress-code e campo sterile. Nel periodo post sono state eseguite almeno cinque rilevazioni/mese a cadenze trimestrali, condotte da osservatori blind adeguatamente formati via survey informatizzata.

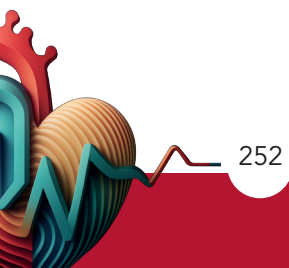
Risultati: Ad oggi sono stati esaminati i dati relativi al I° trimestre post implementazione. Le macroaree indagate riguardano l'igiene mani, il dress code, l'allestimento ed il monitoraggio del campo sterile. Nel periodo pre sono state effettuate 13 osservazioni con 58,46% di aderenza all'igiene mani, 48% di aderenza al dress code, 61,5% di aderenza alla corretta vestizione individuale e assistita, 34,6% di aderenza al corretto allestimento e monitoraggio costante del campo sterile. Nel periodo post sono state effettuate 45 osservazioni con 60,06% di aderenza all'igiene mani, 85,5% di aderenza



al dress code e 91,1% di aderenza alla corretta vestizione individuale e assistita, 97,7% di aderenza al corretto allestimento e monitoraggio costante del campo sterile. Ulteriori dati riguardanti i successivi trimestri verranno presentati in sede congressuale.

Conclusioni: I dati rilevati sostengono i principi della

formazione andragogica in cui gli elementi hands on e on the job, hanno favorito una pratica riflessiva a sostegno dello sradicamento delle abitudini gestuali. Questo studio infine sottolinea l'importanza della formazione continua in ambito sanitario come elemento essenziale per supportare i cambiamenti e la gestione nella complessità del sistema.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 279
ABLAZIONE TRANSCATETERE (ARITMIE)
SINCOPE (ARITMIE)
STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)
TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

**CARDIONEUROABLATION OF SINUS NODE GANGLIA IN TREATING RECURRENT LIPOTIMIA:
A CASE REPORT**

Vincenzo Pettillo (a), Francesco Brandi (b), Gaetano Artiola (a)

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Introduction: Relapsing lipotimias, characterised by frequent episodes of temporary loss of consciousness, represent a significant therapeutic challenge. These episodes can be divided mainly into vaso-vagal and cardioinhibitory lipotimias. Vaso-vagal lipotimias are caused by a sudden drop in heart rate and blood pressure, often triggered by emotional or physical factors, while cardioinhibitory lipotimias result from a significant reduction or cessation of cardiac activity. Treatments to prevent these episodes include tilt-training, which focuses on muscle contraction techniques to maintain blood pressure and breathing techniques to stabilise heart rhythm. However, these strategies may be ineffective in some patients with severe recurrent lipotimia. Nodal neurocardioablation has emerged as a potential therapeutic solution for these cases, particularly in vaso-vagal lipotimias resistant to conventional therapies.

Objectives: The main objective of this case report is to describe the efficacy and safety of nodal neurocardioablation in the treatment of recurrent lipotimia in a specific patient.

Materials and Methods: The 25-year-old patient with a clinical history of relapsing lipothymias unresponsive to conventional therapies was evaluated with a series of diagnostic tests. These included ECG, telemetric device monitoring (loop recorder), echocardiogram, and cardiac MRI. After excluding other structural and functional causes, an atropine test procedure was performed followed by an electrophysiological study (SEF) and cardioneuroablation of the sinus nerve ganglia.

The procedure was preceded by an Atropine test that served as a comparison to confirm the success of the treatment. With bilateral brachial venous accesses, 2 vials of atropine were administered followed by a bolus of 25 ml saline. The basal heart rate (HR) of 74 bpm increased to 130 bpm, with a response of 87%. The subsequent electrophysiological study, under sedation with midazolam and fentanest, identified HIS signals and measurements of the sinoatrial node (NSA), mapping the sinus node activation point and a map of right and left atrial activation. HAFE (High-Frequency Atrial Electrograms) and LAPE (Low-Frequency Atrial Electrograms) signals were detected and ablated with 40W radiofrequency energy, leading to the ablation of all abnormal signals. At the end of the procedure, atropine administration showed a <20% response, indicating a successful.

Outcome and Discussion: Post-procedure, the patient showed a significant reduction in episodes of lipotimia. During continuous monitoring, no new episodes of sinus arrest or severe bradycardia were detected. Clinically, the patient reported a significant improvement in quality of life, with no new episodes of loss of consciousness during the six-month follow-up period. Nodal neurocardioablation proved to be a safe procedure with no major complications during and after the procedure.

Conclusion: This case report highlights the effectiveness of nodal neurocardioablation in the treatment of relapsing lipotimia resistant to conventional therapies. The procedure was safe and led to a significant improvement in symptoms.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 282
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOMIOPATIE
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOPATIE CONGENITE NELL' ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

COMPREHENSIVE CARDIAC CARE STRATEGIES FOR DUCHENNE MUSCULAR DYSTROPHY

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Introduction: Duchenne Muscular Dystrophy (DMD) is an X chromosome-related genetic disorder that affects approximately 1 in 3,500-5,000 newborn males. This disease is characterised by the progressive degeneration of skeletal, respiratory and cardiac muscles, leading to severe disability and reduced life expectancy. As the disease progresses, cardiac complications become predominant and are a major cause of morbidity and mortality in patients with DMD. The myocardium, the muscle of the heart, undergoes a process of fibrosis and deterioration leading to dilated cardiomyopathy, heart failure and arrhythmias. It is essential to understand and manage the cardiac implications of DMD to improve quality of life and prolong patient survival.

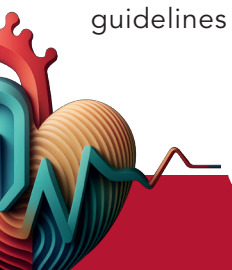
Objectives: This study aims to deepen the knowledge of the cardiac implications of DMD, with a focus on myocardial pathology; Identify early signs of cardiac involvement and associated symptomatology; Outline management and intervention strategies for cardiac complications; Provide in-depth, practical guidance on the role of nurses in the care and monitoring of patients with DMD.

Materials and Methods: The study is based on a systematic review of the scientific literature concerning DMD and its cardiac complications, published in the last ten years. Clinical studies, therapeutic trials and disease management guidelines were included.

Outcome and Discussion: The results indicate that early cardiac monitoring is essential for the management of DMD. Diagnostic tools, such as echocardiogram and cardiac MRI, are essential to detect early signs of cardiomyopathy. Cardiac symptoms in patients with DMD may include fatigue, palpitations, dyspnoea (difficulty breathing) and oedema (swelling). However, many patients may be asymptomatic in the early stages, making regular monitoring even more crucial.

The timely introduction of drug therapies, such as angiotensin-converting enzyme inhibitors (ACE-inhibitors) and beta-blockers, can slow the progression of cardiomyopathy and improve cardiac function. Nurses play a key role in monitoring cardiac signs and symptoms, educating the patient and family about cardiac complications, and ensuring adherence to prescribed treatments. Nursing care also includes support in the daily management of activities, implementation of moderate exercise programmes to maintain muscle and cardiac function, and coordination of multidisciplinary care between cardiologists, neurologists, physiotherapists and other specialists. Nurses need to be alert to changes in the patient's health status and ready to intervene with appropriate actions, such as adjustment of drug therapies and management of cardiac emergencies.

Conclusion: The management of cardiac complications in DMD requires a multidisciplinary and integrated approach involving physicians, nurses and therapists.



Continuing education and support provided by nurses are essential to improve home management of patients and prevent serious complications. Nurses, due to their unique position in the care system, can

facilitate communication between different specialists and ensure that patients receive comprehensive and coordinated care.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 197
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)
TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)**

ADHERENCE TO CPAP IN UNPARTNERED PATIENTS WITH OSAS. A SCOPING REVIEW

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Introduction: Continuous Positive Airway Pressure (CPAP) is considered the most effective treatment for managing Obstructive Sleep Apnea Syndrome (OSAS). Although the benefits of this therapy have been extensively studied and analysed over time, patient compliance and adherence to treatment often decreases due to a number of factors. In the literature published in recent years, there have been a number of articles addressing this phenomenon, with a particular focus on investigating whether adherence to CPAP treatment in OSAS patients can be influenced by the absence of a partner.

Aim: To explore and map the literature on adherence to CPAP therapy in OSAS patients and the absence of a spouse or partner showing a significant correlation.

Method: A scoping review was conducted in MEDLINE, CINAHL, Scopus and Embase. The review followed the Arksey and O'Malley framework.

Results: Seven studies published between 2000

and 2024 were included. The analysis identified five different themes: adherence, the relationship between anxiety and depression scores, sleep quality, work environment, and facilitators and barriers to treatment. Patients living alone were less adherent and used CPAP for significantly less time than those living with a partner. Using the Epworth Sleepiness Scale (ESS) scale to assess an individual's level of daytime sleepiness, patients benefited significantly from CPAP with an average score of 14.4 (+/- 6) at baseline. Studies show a significant correlation between adherence and the employment status of patients. Various barriers such as early reporting of problems, airway dryness, economic and language barriers may influence CPAP treatment. Conversely, patient monitoring, patient education, use of a humidifier and motivation to improve health are facilitators of treatment.

Conclusion: The absence of a partner negatively affects adherence to CPAP therapy, the first-line effective treatment for people with OSAS.

ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 198 TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA)

GENDER DIFFERENCES AND ENGAGEMENT IN CARDIOVASCULAR PATIENTS. A SCOPING REVIEW

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Introduction: Cardiovascular diseases are the leading cause of death worldwide. Prevention and treatment of these diseases are based on education and behavior modification, such as increasing physical activity, eating healthy foods, and controlling weight. Engagement, which involves making individuals and patients active participants in their healthcare, is seen as a key solution for improving therapeutic compliance, adherence, and self-care. Additionally, many cardiovascular diseases have gender-specific symptoms and signs. There is, therefore, a need to investigate these gender differences, alongside efforts to improve patient engagement, in order to develop more effective and personalized approaches to cardiovascular health.

Aim: To explore, map, and examine the extent of the literature about engagement strategies and gender differences in patients with cardiovascular diseases.

Methods: A scoping review was conducted following the Joanna Briggs Institute Manual for Evidence Synthesis guidelines and the PRISMA-ScR checklist. A comprehensive database search was performed in MEDLINE via PubMed, CINAHL, PsycINFO, EMBASE, and Scopus. The selection process was blind and conducted by two independent reviewers, with a third senior reviewer intervening in cases of discrepancies. The web application Rayyan was used to ensure the transparency of the selection process.

Results: The database search identified a total of 43,386 records. After the selection process, 5 articles were included in the review. All articles used quantitative methods and included predominantly women in their samples. Most of the articles were written in the USA (4/5). The most commonly identified engagement strategies involved the use of internet connectivity and web applications. These engagement strategies were often combined with gamification and mobile applications. Sex and gender differences were found in most of the included studies (4/5), with higher levels of engagement among women and transgender women. One study found no differences between women.

Conclusion: The use of engagement strategies in people with cardiovascular diseases appears to be influenced by gender. Most of the strategies involve technology, internet connectivity, and gamification. Women and transgender women demonstrated to be more engaged than men. More studies are needed to better understand gender differences in the use of various engagement strategies among patients with cardiovascular diseases. Future research should aim for greater inclusion of men to evaluate the efficacy of these strategies better in the broader population and should consider larger sample sizes to enhance the generalizability of the findings.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 199
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)
TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)**

ENHANCING PATIENT ENGAGEMENT IN HYPERTENTION, OBESITY, AND OBSTRUCTIVE SLEEP APNOEA MANGEMENT. A SCOPING REVIEW

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Introduction: Healthcare systems have evolved significantly in terms of managing and transforming care pathways, positioning the patient as the primary actor in the healthcare environment, with an increased role in decision making and implementation of care plans. Patients now play a critical role in decision making and implementation of care plans. Nursing interventions should be designed to facilitate patient involvement, collaboration and education, with the aim of empowering patients to manage their symptoms and conditions autonomously. Although there is no widely accepted definition of patient involvement, engagement can be seen as the activation of the patient in their health journey. The perspectives of both patients and healthcare professionals on the factors that support or hinder patient engagement have not been sufficiently explored. As a result, there are currently no clear recommendations on the most effective interventions.

Objectives: To explore and map which nursing strategies support engagement in patients with hypertension, obesity, and obstructive sleep apnoea syndrome.

Methods: A scoping review was conducted according to the PRISMA-ScR checklist. A comprehensive literature search was conducted between January and May 2024. The databases searched were MEDLINE via PubMed, CINAHL, PsycInfo, and Scopus.

Results: A total of 47 articles were included in the review, with 19 articles in patients with hypertension, 20 articles in obese patients and 8 articles in the obstructive sleep apnoea population. Strategies to support engagement included: lifestyle education programmes, counselling to support mental health, adherence, use of technology to support education, shared decision making, communication styles, self-management and follow-up.

Conclusions: The scoping review illustrates how engagement strategies are implemented in the post-acute phase and continued in the home environment. Indeed, follow-up seems to be of great importance, allowing patients to consolidate their knowledge and new learning. Digital tools act as a communication channel, allowing patients to be actively involved even in remote locations, thus facilitating the autonomous management of chronic conditions.

**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 201
TERAPIA NON FARMACOLOGICA
(SCOMPENSO CARDIACO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)**

VALIDATION OF MUTUALITY SCALE IN OSA PATIENT WITH CPAP AND THEIR PARTNER

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(b) IRCCS ISTITUTO AUXOLOGICO, MILAN

Background: Obstructive sleep apnea (OSA) is characterized by the collapse or "obstruction" of the upper airways during sleep. Episodes of apnea (complete collapse) or hypopnea (partial collapse) occur numerous times throughout the night and are associated with sleep fragmentation, excessive daytime sleepiness, impaired cognitive functions, and cardiovascular alterations. The gold standard for OSA treatment is the application of continuous positive airway pressure (CPAP device), a machine that mechanically keeps the airways open by delivering positive pressure to the upper airways, preventing their collapse. It is of fundamental importance to develop multi-approach strategies to improve adherence to CPAP, thereby increasing the percentage of people who use it adequately and gain maximum health benefits. For patients living with a partner, the partner will likely be an integral part of any such intervention.

Aim: The primary objective of the study is to test the psychometric properties (factor structure and reliability) of the Mutuality Scale (MS) in patients with OSA and their partners. Additionally, the study aims to assess the association between mutuality in its four dimensions and adherence to the use of CPAP (Continuous Positive Airway Pressure), as well as the lifestyle and quality of life in patient/partner dyads. Finally, we aim to understand the relationships between the patients' socio-demographic and clinical variables and the degree of mutuality.

Method: The study is observational, non-profit, single-center, and cross-sectional descriptive. The study involves collecting clinical and personal information from the enrolled subjects: socio-demographic aspects, clinical characteristics, CPAP data, mutuality, lifestyle (questionnaires: MDS, IPAQ, PSQI, ESS, SCI), psycho-behavioral aspects, and quality of life (questionnaires: HADS, SF-12) to be administered to both the patient and their partner. To ensure the stability of the scale and the understanding of the questions, the mutuality questionnaire will be re-administered to the first 20 couples 7-14 days after the initial completion.

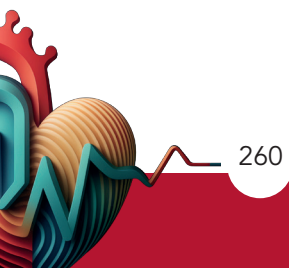
Results: Two hundred subjects with OSA, referred to the Sleep Medicine Center of the Istituto Auxologico Italiano, and their respective partners (another 200 subjects) will be enrolled. To achieve the primary objective of the study, the socio-demographic variables, clinical characteristics, and items of mutuality in patient-partner dyads will be analyzed using descriptive statistics. The reliability, as internal consistency of the factors of the Mutuality Scale and the entire scale (both for the patient version and partner-proxy version), will be evaluated using Cronbach's alpha and a reliability index specific for multidimensional scales, such as Bentler's Global Reliability Index for Multidimensional Scales (2009).

Conclusion: The results of this study could potentially



validate the MS scale, making it a reliable tool for measuring mutuality in patients with OSA and their partners. This validation would support clinical practice and research, aiming to increase levels of care and

mutuality. This, in turn, could have a positive impact on clinical outcomes and adherence to patient therapy, and facilitate the development of targeted educational programs.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 203
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)
APPS IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)
TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

**USABILITY OF MHEALTH APPLICATION FOR PATIENTS WITH HYPERTENTION:
A PATIENT-CENTRED APPROACH. A SCOPING REVIEW**

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Introduction: Hypertension is a common medical condition that requires constant monitoring and careful management to prevent complications. In recent years, mobile health (mHealth) tools, such as smartphone apps and wearable monitoring devices, have become increasingly popular for managing hypertension. However, their effectiveness largely depends on their usability for patients.

Aim: To assess the usability of mHealth tools in reducing blood pressure in patients with hypertension, it is important to examine their effectiveness and user-friendliness. The secondary objective is to analyze the strategies recommended in the literature to improve mHealth usage. These strategies are evaluated based on their impact on quality of life, adherence to treatment, continuous monitoring of blood pressure, and the adoption of a healthy lifestyle.

Methods: A scoping review was conducted following Arksey and o'Malley methods on MEDLINE via PubMed, CINAHL and Scopus.

Results: The included articles (38) show that mHealth tools can significantly help in monitoring and managing hypertension. However, several usability challenges have been identified, including complex user interfaces, unclear instructions, and difficulties in integrating mHealth data with other medical information.

Conclusions: Assessing the usability of mHealth tools for patients with hypertension is essential to improve their effectiveness and acceptability. Recommendations to enhance usability include simplifying user interfaces, adding supportive features, and integrating these tools with other health information management systems.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 67 DEFIBRILLATORE IMPIANTABILE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) ELETTROSTIMOLAZIONE (ARITMIE)

GESTIONE DEL PAZIENTE CON INFEZIONE DEL DEFIBRILLATORE SOTTOCUTANEO: PROCEDURA DI ESTRAZIONE E CONTESTUALE REIMPIANTO DELL'INTERO SISTEMA S-ICD CON TECNICA CONSERVATIVA "SHIFT AND COVER"

Michele Solimene (a)
(a) AOU FEDERICO II

Introduzione: Il rischio di sviluppare complicanze legate ad infezioni di un S-ICD appare di gran lunga inferiore rispetto ad un ICD convenzionale. Il defibrillatore sottocutaneo rappresenta infatti, ad oggi, l'alternativa d'elezione per tutti quei pazienti nei quali un maggior rischio infettivo preclude l'opzione di un ICD transvenoso. Dato il basso tasso di complicanze infettive, l'esperienza legata alla loro gestione è ancora alquanto limitata. Negli ultimi anni è stata proposta una tecnica conservativa che consente di eseguire l'estrazione e il riposizionamento della cassa e dell'elettrocattetero in un'unica seduta operatoria. Attraverso la tecnica "shift and cover" il componente del sistema coinvolto dall'infezione viene spostato in una posizione alternativa e maggiormente protetta: nel caso del generatore si preferisce riposizionarlo in una tasca intermuscolare o, se già presente, sottomuscolare; l'elettrocattetero, se coinvolto, viene invece rimosso, riposizionato e coperto con la fascia muscolare in superficie. Diversi studi hanno dimostrato l'efficacia della tecnica appena descritta, non solo in termini chirurgici ma anche puramente tecnici: è stato infatti osservato un miglioramento dell'impedenza di shock in tali dispositivi, accompagnato da una migliore ottimizzazione del vettore di shock.

Caso clinico: il caso clinico in questione riguarda un paziente di 49 anni affetto da cardiomiopatia ipertrofica e sottoposto ad impianto di S-ICD in prevenzione primaria nell'aprile del 2017, a seguito di RMN cardiaca che ne confermava la diagnosi. Dal momento dell'impianto, il paziente non ha mai manifestato problemi di alcuna natura fino a maggio 2024, quando ha iniziato a notare tumefazione in regione xifoidea con secrezio-

ne di materiale purulento in corrispondenza del sito di inserzione dell'elettrocattetero sottocutaneo. A seguito di follow up ambulatoriale, il paziente veniva subito sottoposto a terapia antibiotica e, nel sospetto di un'infezione del dispositivo, si programmava ricovero per revisione dell'impianto nel giugno 2024. Durante il ricovero, veniva eseguita PET/TC total body che evidenziava captazione del radiocomposto alla periferia del defibrillatore in sede toracica laterale sinistra, estesa lungo il decorso dell'elettrocattetero fino alla zona sottoxifoidea. I tamponi MRSA e KPC risultavano invece negativi. In seguito alla conferma della presenza di infezione, il paziente veniva pertanto sottoposto ad estrazione dell'intero sistema S-ICD, con isolamento di tasca ed elettrocattetero e contestuale reimpianto con tecnica "shift and cover". Si è quindi proceduto prima all'isolamento della vecchia tasca intermuscolare con confezionamento di una nuova tasca sottomuscolare, per poi eseguire la tunnellizzazione del nuovo elettrocattetero di shock in sede medio-sternale con isolamento della vecchia tasca sottocutanea in cui era posizionato l'elettrocattetero infetto. La procedura è decorsa senza complicanze e ha mostrato anche un buon miglioramento dei parametri elettrici del dispositivo.

Conclusioni: La tecnica "shift and cover" si è dimostrata efficace per il trattamento delle infezioni degli S-ICD infetti. La procedura permette infatti di eseguire l'estrazione del dispositivo infetto e il reimpianto nella stessa seduta chirurgica, permettendo di ottimizzare la configurazione dell'intero sistema in termini di impedenza di shock, vettore di defibrillazione e miglior posizionamento del dispositivo.

ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 196 PROGNOSI (SCOMPENSO CARDIACO) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

GLI EFFETTI DI UN INTERVENTO DI BODY SCAN SUGLI OUTCOME DEI PAZIENTI CON SCOMPENSO CARDIACO: PROTOCOLLO DI UNO STUDIO CONTROLLATO RANDOMIZZATO

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(c) UNIVERSITÀ DI ROMA TOR VERGATA - SEZIONE DI SCIENZE INFERMIERISTICHE;
(d) UNIVERSITÀ DEGLI STUDI DI MILANO- BICOCCA - DIPARTIMENTO DI MEDICINA E CHIRURGIA

Introduzione: Nei pazienti con scompenso cardiaco, adeguati livelli di self-care risultano fondamentali per ridurre mortalità e ri-ospedalizzazioni e migliorare la qualità di vita. Il self-care è influenzato dalle abilità cognitive, tra cui l'enterocezione, la capacità dell'individuo di identificare correttamente sensazioni provenienti dal proprio organismo, come i sintomi di una malattia. Migliorare l'enterocezione nei pazienti con scompenso cardiaco potrebbe quindi portare a un aumento della capacità di identificare e gestire i sintomi. Una delle strategie più efficaci per migliorare l'enterocezione è la mindfulness, che tuttavia risulta impegnativa sia per gli assistiti che per i professionisti. Il body scan – una componente dei protocolli di mindfulness – è invece una tecnica più fruibile e sembra essere associato a un miglioramento dell'enterocezione e del benessere psicofisico in diverse popolazioni. Tuttavia, gli effetti del body scan non sono mai stati indagati nella popolazione con scompenso cardiaco e i pochi studi ad oggi disponibili risultano molto eterogenei e di qualità metodologica scarsa.

Obiettivi: Obiettivo primario del presente studio è quello di indagare gli effetti di un intervento di body scan sulla sensibilità enterocettiva dei pazienti con scompenso cardiaco. L'obiettivo secondario è quello di valutare gli effetti del body scan sui seguenti outcome:

accuratezza e consapevolezza enterocettive, self-care, self-care self-efficacy, percezione dei sintomi, qualità di vita generale e specifica per malattia, ansia, depressione, distress emotivo, alessitimia e intelligenza emotiva. Metodi. Verrà condotto uno studio randomizzato controllato. 110 partecipanti saranno suddivisi in due gruppi: il gruppo controllo riceverà le cure standard, mentre il gruppo intervento parteciperà a un programma di body scan con la guida di formatori esperti certificati. Il programma sarà effettuato come segue: gruppi di 10-15 partecipanti effettueranno una sessione di body scan di circa 15 minuti per 21 giorni consecutivi; il primo e l'ultimo giorno sarà effettuata in presenza, i restanti giorni sarà eseguita online. Al termine di ogni sessione, sarà data la possibilità ai partecipanti di discutere col formatore di eventuali riflessioni sorte durante la pratica del body scan. La raccolta dati avverrà in 6 momenti: baseline, al termine dell'intervento, a distanza di 1 mese (outcome primario), dopo 3, 6 e 9 mesi.

Risultati: Lo studio contribuirà a comprendere se il body scan può essere una strategia efficace per migliorare l'enterocezione, la percezione dei sintomi e il self-care monitoring nei pazienti con scompenso cardiaco. Consentirà inoltre di valutare gli effetti del body scan sugli altri outcome rilevanti in questa popolazione, come lo stato psicologico e la qualità di vita.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 378
TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)
APPS IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)**

TELEMEDICINE INTERVENTIONS ON HEART FAILURE DYAD: A SCOPING REVIEW PROTOCOL

Cristian Vairo (a, b), Ines Basso (b), Angela Durante (c, d), Erika Bassi (b), Alberto Dal Molin (b)

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Background: Heart failure (HF) is a serious condition with high morbidity and mortality, affecting over 64 million people worldwide. Patients with HF need daily support from informal caregivers (ICs), who play a crucial role in their care. The patient-caregiver relationship, known as a dyad, is significant as changes in one member affect both. Effective HF management should focus on this dyad, aiming to reduce discrepancies in illness approach, enhance collaboration in disease management, and improve overall health for both (Dyadic Appraisal, Behaviour, and Health). The latest telemedicine interventions designed for HR dyad are moving in this direction, and to overcome various barriers, aiding in better patient management and caregiver support.

Objective: Mapping telemedicine interventions delivered to the HF dyad.

Inclusion criteria: The review focuses on HF dyads, where one member has HR and the other is an IC, regardless of their living arrangements or relationship type. It examines telemedicine interventions for remote healthcare delivery, requiring active participation from both patient and caregiver. The aim is to assess Dyadic Appraisal, Behaviour, and Health outcomes. Studies include interventions conducted at home, with no geographical limitations and ensuring the healthcare provider is not physically co-located with the dyad.

Review question(s): What features characterize

telemedicine interventions delivered to the HF dyad? To fully address this overarching question, the following sub-questions have been identified:

- I) What type of dyads are involved in the intervention?
- II) What type of intervention and for what purpose (prevention, treatment, diagnosis, rehabilitation and monitoring) are telemedicine interventions provided to the HF dyad?
- III) Who are the health professionals providing the interventions?
- IV) What are the outcomes measured for telemedicine interventions administered to the HF dyad?
- V) What is the level of acceptability and satisfaction of the recipients of the intervention?

Methods: The scoping review will adhere to JBI methodology, involving comprehensive searches across databases like MEDLINE, CINHALL, and JBI Evidence Synthesis, alongside gray literature. Two independent reviewers will screen studies based on set criteria. Data extraction will utilize a tool aligned with the JBI System for Unified Management, Assessment, and Review of Information. Findings will be analyzed and presented in tables using charting techniques.

Funding Acknowledgements: This abstract is part of the NODES project that received funding from the MUR - M4C2 1.5 of the EU-funded PNRR - NextGenerationEU (Grant agreement no. ECS000036).

Keywords: Caregiver; Dyad; Heart Failure; Telemedicine.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 736 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

NURSE LED EDUCATION IN CARDIOLOGY PEDIATRIC PALLIATIVE CARE: A SCOPING REVIEW

Arisa Vecchiet (a)

(a) OSPEDALE DI CATTINARA - AZIENDA SANITARIA GIULIANO ISONTINA

Introduction: WHO defines pediatric palliative care (PPC) as the active comprehensive care of the child's body, mind and spirit and including active support to the family (Cancer Pain Relief and Palliative Care in Children, WHO-IASP, 1998).

Pediatric patients, in Italy, acquire the right to PPCs with Law 38 of 2010 very late compared to other European and/or world states. The number of accesses to PPCs is increasing, mainly due to the fact that the advancement of science, knowledge and technology leads to more and more patients surviving but in such a condition that they need palliative care, of which there is an estimated 5% increase every year.

A key aspect in PPCs is the multidisciplinary nature of the health care team, and the nurse has a key role in health education towards the child and towards the family, using specific approaches that differ from those used for the adult.

Because there appears to be little investigation in the literature of the nurse in the role of educator toward the pediatric patient and his or her family, we conducted a scoping review to explore this area in the context of cardiology PPCs.

Materials and Methods: We conducted a scoping review that goes to analyze the figure of the nurse, his or her educational and supportive role toward the pediatric patient, and family, with chronic cardiac terminal illness.

The research was carried out using PUBMED as the reference database. We used the average terms combined with each other in free-field words.

Results and Discussion: Communication assumes a fundamental role especially in progressive diseases and at the end of life and on "what to do" and "what not to do" both with respect to the pediatric patient with terminal cardiologic disease and the family caring for them as investigated by Stevia D. et al.

In the pediatric setting, unfortunately, Italy is still far from the delivery of PPC-related services. Care settings are often inadequate and not uniformly present in the Italian territory. There are only six pediatric hospices in Italy, and the latter should not necessarily be seen as a place of terminality but also as a facility suitable for a period of relief for the family, given the high emotional, economic and social burden. This requires comprehensive, timely and individualized care of all family members.

When we talk about terminal diseases in children, they are often attributable to oncological disease, although this sphere represents a very small part of terminal diseases, while chronic cardiologic, neurological, and degenerative diseases are unfortunately the cause of PPC care in most cases.

In the cardiologic sphere, there is still more emphasis on interventional, surgical or curative procedures, without giving proper attention to end-stage cardiologic diseases. In addition, it emerges, from some studies, the need to carry forward the concept of Family-Centered Care in daily clinical practice, which involves considerable involvement of the patient's family in the care pathway, as their active presence leads to positive health outcome.



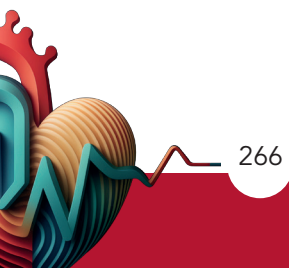
Conclusions

The development of PPCs in the cardiology setting in Italy is still limited. Despite growing recognition of their importance, the integration of PPCs is often delayed or absent altogether, which compares that many patients and their families are not referred to these treatments until the terminal stages of the disease.

Advanced heart disease, such as chronic heart failure in

children, often involves a high level of invasive medical interventions that impact the lives of the patient and family.

Thus, there is a clear need for greater integration between PPCs in pediatric cardiology treatments in a multidisciplinary working logic to improve the overall well-being of patients and their families during the course of the disease.



ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 419

FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)

ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO)

INSTABILITÀ EMODINAMICA DURANTE I CAMBI AUTOMATIZZATI DI NORADRENALINA CON POMPE INFUSIONALI SMART IN TERAPIA INTENSIVA CARDIOLOGICA E CARDIOCHIRURGICA: UNO STUDIO ESPLORATIVO

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Introduzione: Al fine garantire la stabilità emodinamica durante i cambi delle infusioni possono essere utilizzate delle pompe infusionali smart che consentono un cambio automatizzato delle pompe siringa (TOM- Take Over Mode, B.Braun®). L'obiettivo principale è quello di descrivere la frequenza e i fattori di rischio associati agli episodi di alterazioni della pressione arteriosa media ($PAM \geq 15$ mmHg) nei 5 minuti successivi al cambio della noradrenalina con il sistema TOM.

Metodo: Studio osservazionale monocentrico

Risultati: In ICU nel 2022 sono stati osservati 230 cambi di infusioni di noradrenalina in 112 pazienti. La noradrenalina è stata impiegata per instabilità emodinamica post-chirurgica (43%), shock cardiogeno (35.7%), shock settico (6.1%), altro (35.2%).

La riduzione media della PAM è stata 9 ± 8 mmHg. L'incidenza delle variazioni di $PAM \geq 15$ mmHg si è verificata nel 21,7% (IC95% 16.8-27.4) cambi, di cui

76% tra 2°-4° minuto. Per ristabilire i target pressori l'infermiere è intervenuto rapidamente nel 42% (21/50) dei casi con fenilefrina e/o aumento della volemia.

Durante i cambi di noradrenalina con concentrazione elevata (200 mcg/ml vs. 20 mcg/ml) l'ipotensione è stata osservata più frequentemente 30.7% (46/150) rispetto alla concentrazione inferiore 5% (4/80), $p < 0.001$. Il dosaggio mediano di noradrenalina a cui è seguita un'ipotensione era maggiore (0.17 mcg·kg⁻¹·min⁻¹ IQR 0.11-0.24) rispetto a quelli con stabilità emodinamica (0.10 mcg·kg⁻¹·min⁻¹ IQR 0.05-0.23), $p = 0.03$.

Conclusioni: Durante i cambi automatizzati di noradrenalina il rischio di incidente emodinamico è frequente; principalmente legato alla concentrazione del farmaco. Conoscere la frequenza e le caratteristiche delle variazioni emodinamiche durante la sostituzione dei vasoattivi consente all'infermiere di procedere in autonomia e sicurezza alla cura del paziente.



**ASSISTENZA INFERMIERISTICA E TECNICA IN CARDIOLOGIA 47
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)**

L'IMPORTANZA DELL'USO INTEGRATO DI DIVERSE MODALITA' DIAGNOSTICHE PER LA GESTIONE DELLA MALATTIA ATEROSCLEROTICA CORONARICA CRITICA: CASE REPORT

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Background: La malattia aterosclerotica coronarica critica (MACC) è una condizione caratterizzata dalla presenza di placche aterosclerotiche che causano restringimenti significativi delle arterie coronarie, riducendo il flusso sanguigno al miocardio e aumentando il rischio di eventi cardiovascolari maggiori, come infarti miocardici e morte cardiaca improvvisa. La gestione di MACC spesso richiede un approccio multidisciplinare che include modifiche dello stile di vita, terapia farmacologica e interventi invasivi come l'angioplastica coronarica percutanea (PCI) e l'impianto di stent. Secondo i dati del Global Burden of Disease Study, la malattia coronarica rimane una delle principali cause di mortalità a livello mondiale [1]. La scelta della terapia appropriata dipende dalla gravità della stenosi, dalla presenza di sintomi e dalla risposta del paziente alle terapie precedenti [2].

Introduzione: Presentiamo il caso di un paziente con anamnesi di ipertensione arteriosa, dislipidemia con intolleranza statinica e pregressa abitudine tabagica (40/die fino al 2008 per 40 anni). Il paziente ha iniziato a manifestare episodi anginosi nei primi mesi del 2021, portando alla diagnosi di malattia aterosclerotica coronarica critica.

Metodi: Il paziente nei mesi precedenti si era sottoposto a diversi esami tra cui prelievi ematici per il dosaggio

degli enzimi cardiaci, elettrocardiogramma ed ecocolor doppler cardiaco, risultati tutti negativi. Una corotTC ha evidenziato la necessità di una coronarografia, eseguita il 16/03/2021, che ha rilevato stenosi critiche in vari segmenti coronarici, trattate con PCI e impianto di stent medicati. Un'ulteriore scintigrafia miocardica di perfusione eseguita nel 2022 ha mostrato lieve ischemia miocardica, necessitando di un intervento di angioplastica con palloni medicati per una restenosi intrastent. Nei primi mesi del 2024, la ricomparsa della sintomatologia anginosa ha portato il paziente a una nuova valutazione coronarografica.

Risultati: Durante il ricovero nel giugno 2024, sono stati eseguiti esami ematochimici, ecocolor doppler cardiaco, coronarografia e PET miocardica. La coronarografia ha evidenziato una restenosi moderata dello stent all'ostio del ramo circonflesso, mentre gli altri stent erano pervi. La PET miocardica ha mostrato una severa ischemia miocardica inducibile coinvolgente il 15% del ventricolo sinistro.

Discussione: Nonostante la severa ischemia rilevata dalla PET miocardica, la coronarografia non ha mostrato una progressione significativa della malattia nei segmenti trattati precedentemente, portando alla decisione di gestione mediante terapia medica.

Conclusioni: Questo caso evidenzia l'importanza di un follow-up accurato e l'uso integrato di diverse modalità diagnostiche per la gestione complessa della malattia coronarica, sottolineando il ruolo della terapia medica nei pazienti con restenosi moderata e ischemia non specifica.

Parole chiave: malattia aterosclerotica coronarica critica, PCI, stent medicati, restenosi, PET miocardica, ischemia miocardica, terapia medica, follow-up.

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Roma, 12-15 dicembre 2024

ATEROTROMBOSI

ATEROTROMBOSI 646

PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI) INFARTO STEMI (CARDIOPATIA ISCHEMICA) TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

EFFETTI FARMACODINAMICI DEL CANGRELOR IN PAZIENTI STRATIFICATI PER PRESENTAZIONE CLINICA: DATI DAL REGISTRO POMPEII

Lina Manzi (a), Plinio Cirillo (a), Luca Sperandeo (a), Domenico Simone Castiello (a), Imma Forzano (a), Domenico Florimonte (a), Fiorenzo Simonetti (a), Mario Enrico Canonico (a), Marisa Avvedimento (a), Roberta Paolillo (a), Federica Buongiorno (a), Alessandra Spinelli (a), Stefano Cristiano (a), Luigi Di Serafino (a), Carmen Anna Maria Spaccarotella (a), Anna Franzone (a), Raffaele Piccolo (a), Giovanni Esposito (a), Giuseppe Gargiulo (a)

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Introduzione: la terapia antitrombotica è di fondamentale importanza per prevenire le complicanze trombotiche peri e post procedurali legate all'angioplastica coronarica percutanea (PCI) in pazienti con malattia aterosclerotica coronarica (CAD). La terapia antiaggregante prevede la somministrazione di aspirina e inibitori del recettore piastrinico P2Y12. Ad oggi diversi dati hanno ridimensionato l'uso del pretrattamento con inibitori orali del P2Y12 nei pazienti con sindrome coronarica acuta (SCA), sia con soprasslivellamento del tratto ST (STEMI) che senza (NSTEMI). Ciò implica che sempre più pazienti con SCA arriveranno in sala di emodinamica naïve da inibitore orale P2Y12, aprendo quindi maggiore possibilità all'uso del Cangrelor che, essendo somministrato per via endovenosa, ha effetto immediato e particolarmente in questo contesto di pazienti in cui la trombosi acuta è l'attore fisiopatologico principale rappresenta un'importante strategia terapeutica. Tuttavia, recenti dati di farmacodinamica hanno mostrato che in pazienti con STEMI l'effetto del Cangrelor potrebbe presentare alcuni problemi di limitata efficacia. Pertanto, abbiamo condotto uno studio prospettico a singolo centro con l'obiettivo di valutare la farmacodinamica del Cangrelor in tutti i pazienti (sia acuti (SCA) che cronici (SCC)) che ricevevano Cangrelor durante PCI.

Materiali e metodi: sono stati considerati elegibili tutti i pazienti maggiorenni capaci di fornire consen-

so informato per iscritto. Sono stati raccolti ed analizzati campioni ematici prima della somministrazione del bolo di Cangrelor (T0), dopo 30 ± 5 minuti dal bolo (T30), dopo $3h \pm 5$ minuti (T3h, corrispondente a 1h dalla sospensione della infusione di Cangrelor) e dopo $4-6h \pm 5$ minuti (T4-6h). L'aggregazione piastrinica è stata valutata utilizzando 3 diversi test: light transmittance aggregometry (LTA), Multiplate electrode aggregometry (MEA) e VerifyNow P2Y12.

Risultati: Dei 150 pazienti reclutati da Marzo 2021 a Giugno 2024, 86 si presentavano con SCA, di cui 56 STEMI e 30 NSTEMI, mentre 64 pazienti erano stati sottoposti a PCI elettiva. Nel gruppo di pazienti STEMI, 32 erano naïve da inibitori orali del P2Y12 e 24 erano stati pretrattati con Ticagrelor entro 1 ora, pertanto, questi ultimi sono stati esclusi da questa analisi. L'età media della popolazione era 67.8 anni e le donne erano 35 (23%). Il Tirofiban, come strategia di bailout, era stato usato in 2 pazienti (1 paziente STEMI ed 1 elettivo). L'infusione di Cangrelor è stata seguita da Ticagrelor in 61 pazienti, da Clopidogrel in 61 pazienti e da Prasugrel in 3 pazienti. L'inibizione dell'aggregazione piastrinica a 30 minuti (IPA%) in corso di infusione di Cangrelor appariva inferiore nei pazienti STEMI rispetto agli altri pazienti (51.5% versus 59.7%, $p=0.017$), mentre era superiore nei tempi successivi alla interruzione di Cangrelor (3h: 52.7% versus 41.0%, $p=0.029$; 4- 6h: 61.4% versus 53.8%,



$p=0.011$). Gli eventi clinici osservati sono stati: 3 morti (1 paziente con STEMI ed 1 infarto miocardico periprocedurale (PMI) in un paziente elettivo) e 15 episodi di sanguinamento, prevalentemente minori, di cui 3 in pazienti STEMI.

Conclusioni: Cangrelor è sicuro ed efficace nel prevenire le complicanze trombotiche peri e post proce-

durali sia in pazienti con SCA che SCC, sebbene l'entità dell'inibizione piastrinica sia inferiore in pazienti STEMI. Inoltre, la sospensione del farmaco a 2 ore dalla PCI con transizione a inibitore P2Y12 orale può determinare effetto rebound di attivazione piastrinica, che si osserva maggiormente in pazienti SCC che assumono Clopidogrel piuttosto che Ticagrelor. Sono necessari ulteriori studi su questi aspetti.



ATEROTROMBOSI 912
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

CLOPIDOGREL VERSUS TICAGRELOR IN ELDERLY PATIENTS WITH ACUTE CORONARY SYNDROME UNDERGOING PERCUTANEOUS CORONARY INTERVENTION: A RETROSPECTIVE MONOCENTRIC STUDY

Vincenzo Fioretti (a, c), Vincenzo Carfora (b), Pietro Mazzeo (b), Luca Sperandeo (b, c),
Donato Gerardi (b), Eugenio Stabile (b)

(a) AORN CARDARELLI, NAPOLI; (b) AOR SAN CARLO, POTENZA; (c) AOU FEDERICO II

Introduction: Elderly patients with acute coronary syndrome represent a growing population. One of the main issues in the clinical management of these patients is the balancing of ischemic and bleeding risk. There is a scant of data, derived from randomized clinical trials, on the antiplatelet therapy in this population. We aim to analyze the best therapeutic strategy in this population.

Methods: We performed a retrospective study at the Cardiology Department, San Carlo Hospital, Potenza. 135 patients aged ≥ 75 years with STEMI (ST-elevation myocardial infarction) or NSTEMI (non ST-elevation myocardial infarction) undergoing percutaneous coronary angioplasty (PCI) were hospitalized from 1 August 2021 to 31 August 2023. Exclusion criteria were the use of anticoagulant therapy, allergy to antiplatelet drugs, active bleeding, use of prasugrel, planned major surgery, medical or surgery treatment. 133 patients (70.7%) after PCI received DAPT with ticagrelor, while 55 patients (29.3%) received DAPT with clopidogrel. We aimed to evaluate at 12-month follow-up the composite endpoint of ischemic events (death, acute myocardial infarction and stroke) and significant bleeding events (Bleeding Academic Research Consortium BARC 2-5 bleedings) in elderly patients receiving DAPT with clopidogrel or ticagrelor after PCI.

Results: At 12-month follow-up, 35 patients (25.9%) died for all causes: 25 in the ticagrelor group and 10 in the clopidogrel group. 3 patients (2.2%) had a stroke: 2 in the ticagrelor group and 1 in the clopidogrel group. 11 patients (8.1%) had acute myocardial infarction: 7 in the ticagrelor group and 4 in the clopidogrel group. The composite endpoint of ischemic events occurred in 29 patients (30.5%) in the ticagrelor group and in 14 patients (35%) in the clopidogrel group, without statistically significant difference between the two groups of treatment ($p=0.61$). BARC 2-5 bleedings occurred in 15 patients (15.8%) in the ticagrelor group and in 9 patients (22.5%) in the clopidogrel group, without statistically significant difference between the two groups of treatment ($p=0.35$).

Conclusions: Elderly patients with coronary acute syndrome represent a group of patients with high ischemic risk, but also high bleeding risk. The best antiplatelet treatment in this group of patients is debated due to poor randomized trials including elderly patients. Our study suggests the safety of ticagrelor in comparison with clopidogrel in a real-world elderly population with acute coronary syndrome undergoing coronary percutaneous revascularization.



ATEROTROMBOSI 676
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

INTERINDIVIDUAL VARIABILITY IN PLATELET REACTIVITY AMONG INDIVIDUALS WITH OR WITHOUT ANTIPLATELET THERAPY: RESULTS FROM A LARGE TERTIARY CARE HOSPITAL

Mattia Galli (a, b), Sergio Terracina (a), Eleonora Schiera (a), Giacomo Frati (a), Giuseppe Biondi-zoccai (a), Sebastiano Sciarretta (a), Dominick Angiolillo (c), Fabio Pulcinelli (a)

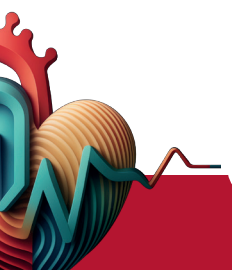
(a) SAPIENZA UNIVERSITY OF ROMA, ITALY; (b) GVM CARE AND RESEARCH, COTIGNOLA, ITALY;
 (c) UNIVERSITY OF FLORIDA COLLEGE OF MEDICINE - JACKSONVILLE, FLORIDA, USA

Background: Antiplatelet therapy is crucial for reducing thrombotic events in patients with atherosclerotic disease, but its response varies widely among individuals. The identification of patients at high (HPR), optimal (OPR) or low platelet reactivity (LPR) is dependent on pre-analytical and analytical variables leading to high interlaboratory variability. We report the results of a large dataset of patients using a standardized methodology to assess platelet aggregation (PA).

Methods and results: A total of 11,913 patients who sequentially underwent PA assessment by the gold standard light transmission aggregometry (LTA) using several stimuli (ADP 2mM, collagen 2mg/ml, arachidonic acid [AA] 0.5 mM, epinephrine 10mM) with a standardized methodology between 2004 and 2022 were screened. After application of inclusion and exclusion criteria, 5,901 patients were included and divided into five groups: 1) healthy volunteers (HV; N=534); controls (CTR; N=1073); aspirin-treated patients (ASA; 75-150 mg/die;

N=3280); clopidogrel-treated patients (CLOP; 75 mg/die; N=495) and patients treated with dual antiplatelet therapy, ASA plus CLOP (DAPT; N=519). The number of patients with OPR at LTA following ADP stimuli was 292 (55%), 511 (48%), 1572 (48%), 380 (77%), and 343 (66%), in the HV, CTR, ASA, CLOP, and DAPT group, respectively. The number of patients with OPR at LTA following collagen stimuli was 354 (67%), 340 (32%), 1579 (49%), 152 (32%), and 332 (74%), in the HV, CTR, ASA, CLOP, and DAPT group, respectively. PA was significantly increased in response to ADP (72.4 ± 33.3 and 62.7 ± 37.1 ; $p < 0.001$) and AA (90.7 ± 15.6 vs 87.6 ± 20.5 ; $p < 0.001$) in CTR compared to HV.

Conclusion: Our findings support the concept that a significant proportion of individuals present a hyper- or hypo-reactive platelet phenotype potentially affecting the safety and efficacy of antiplatelet therapy. These data support ongoing strategies of guided selection of antiplatelet therapy in patients with cardiovascular disease.



ATEROTROMBOSI 37 ENDOCARDITI (VALVULOPATIE) PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE) INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

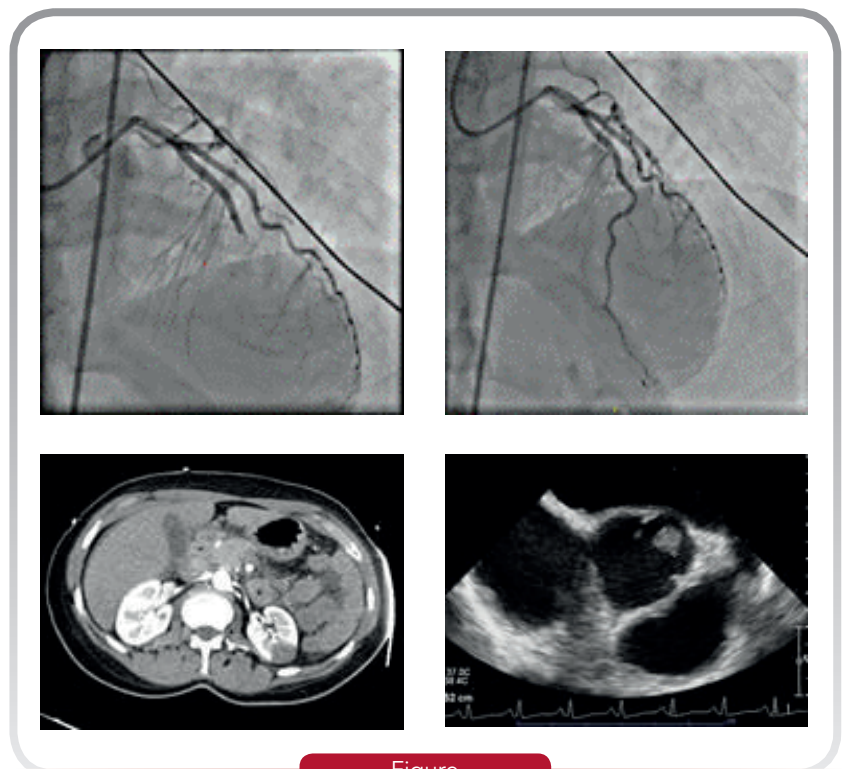
EMBOLISMO SISTEMICO MULTIPLO: UN RARO CASO DI ENDOCARDITE MARANTICA

Chiara Giordano (a), Andrea Pandolfi (a), Alberto Vincenzo Pollina (a), Stefano Carugo (a)
(a) UNIVERSITÀ DI MILANO

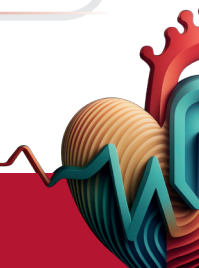
Caso clinico: presentiamo il caso di una donna di 54 anni recatasi in Pronto Soccorso per insorgenza acuta di emiparesi destra e disartria con riscontro alla TC encefalo di ictus emisferico sinistro; contestualmente, si osservava un sovraslivellamento del tratto ST in V1-V2-V3 con un'ipocinesia apicale suggestive di infarto miocardico acuto. Si procedeva dunque a trombectomia meccanica carotidea e successivamente a coronarografia che mostrava un'ostruzione trombotica a livello dell'arteria interventricolare anteriore trattata mediante tromboaspirazione e angioplastica. La TC torace-addome evidenziava inoltre una lesione ischemica a livello del rene sinistro e un espanso annessiale di verosimile natura eteroformativa, confermato poi mediante PET total body e marker tumorali. In considerazione della presenza di lesioni ischemiche multiple (cerebrali, cardiache, renali, emorragie a scheggia ungueali) di verosimile origine embolica, per il rule-out di embolismo orto- e paradosso venivano effettuati un eco-Doppler transcranico ed un'ecocardiografia transesofagea. Il Doppler transcranico escludeva la presenza di shunt destro-sinistro, mentre l'ecocardiografia transesofagea evidenziava una vegetazione ovalare (10 mm x 4 mm) a bordi regolari di aspetto soft a livello della valvola aortica condizionante un'insufficienza multi-jet di grado moderato. Nonostante la paziente non fosse mai risultata piretica e gli indici di flogosi si fossero mantenuti

spenti, si impostava antibiotico terapia nel sospetto di endocardite. Considerato l'alto rischio embolico della massa, si procedeva in urgenza ad intervento cardiocirurgico di sostituzione valvolare. Le emocolture eseguite risultarono tutte negative, così come le sierologie e le indagini molecolari specifiche per batteri atipici. L'esame istologico mostrava fibrina e granulociti neutrofili, in assenza di batteri.

Conclusioni: si poneva diagnosi di endocardite trombotica non batterica (NBTE), nota anche come

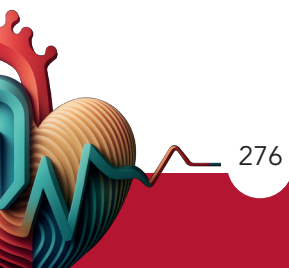


Figure



endocardite marantica, una malattia rara caratterizzata dalla presenza di crescite sterili e depositi di fibrina principalmente sulle valvole cardiache sinistre. Essa è favorita da uno stato infiammatorio e di iper-

coagulabilità tipicamente secondario a patologie neoplastiche, e la manifestazione d'esordio è spesso un embolismo sistemico multiplo, più frequentemente con coinvolgimento neurologico.



ATEROTROMBOSI 529

DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI) PLACCA VULNERABILE (ATEROTROMBOSI)

RIDUZIONE PRECOCE DEL COLESTEROLO LDL IN CORSO DI SINDROME CORONARICA ACUTA: ANALISI PRELIMINARI DI UN REGISTRO PROSPETTICO MONOCENTRICO

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(b) DIVISIONE DI CARDIOLOGIA, DIPARTIMENTO TORACO-CARDIO-VASCOLARE,
OSPEDALE MAGGIORE DELLA CARITÀ, NOVARA

Introduzione: I pazienti con sindrome coronarica acuta (SCA) presentano un rischio elevato di nuova insorgenza di eventi cardiovascolari e la riduzione dei livelli di colesterolo LDL (C-LDL) rimane una terapia di prima linea per migliorarne la prognosi. Nelle ultime linee guida ESC 2023 della SCA viene sottolineata l'importanza dell'inizio precoce di una terapia ipolipemizzante orale e qualora non sufficiente l'utilizzo dei più potenti PCSK9-inibitori (PCSK9-I). Il PCSK9 è una proteina coinvolta nella degradazione dei recettori delle LDL che determina effetti avversi sulle placche coronariche attraverso l'ossidazione del C-LDL e la modifica della composizione della placca con l'attivazione di molecole infiammatorie. Un utilizzo precoce di PCSK9-I in corso di SCA pertanto oltre a ridurre precocemente i livelli di C-LDL potrebbe determinare un effetto precoce sulla stabilizzazione delle placche coronariche.

Metodi: Basandoci su questo razionale è stato disegnato lo studio CATCH (Current Approaches To cut CHolesterol levels after coronary intervention), registro prospettico monocentrico che include pazienti ricoverati per NSTEMI e STEMI sottoposti a rivascolarizzazione percutanea (PCI) e trattati con terapia ipolipemizzante e che ha come obiettivo principale la descrizione delle variazioni dei valori di C-LDL nelle prime 72 ore dalla PCI. Viene eseguita in seguito

una comparazione tra i pazienti che assumono dal momento indice PCSK9-I e quelli trattati con sola statina e/o ezetimibe. Sono stati effettuati i seguenti prelievi: LDL (basale, 24h, 72h). Tutti i dati sono stati analizzati mediante il software Stata 18 (Statacorp, College Station, TX, USA).

Risultati: Lo studio attualmente ha incluso 53 pazienti ricoverati per STEMI e NSTEMI tra settembre 2023 e luglio 2024. Le analisi preliminari dello studio hanno evidenziato una significativa differenza nella riduzione relativa dei livelli di C-LDL nei pazienti trattati con PCSK9i rispetto ai pazienti trattati con sola statina sia a 24 ore ($20,4\pm 13,7\%$ vs $1,2\pm 17,7\%$; $p<0,001$) che a 72 ore ($48,6\pm 11,2\%$ vs $17,4\pm 19,3\%$, $p<0,001$) dalla PCI.

Conclusioni: L'utilizzo precoce di PCSK9-I in corso di SCA determina una riduzione significativa dei livelli di C-LDL già a 24 ore dall'evento acuto. Questo tipo di approccio oltre che ad ottenere un più rapido raggiungimento dei valori target di C-LDL può potenzialmente migliorare la prognosi di questi pazienti riducendo il rischio di nuovi eventi cardiovascolari nelle prime fasi post sindrome coronarica acuta. Il beneficio clinico di questa strategia dovrà tuttavia essere indagato con studi clinici randomizzati controllati.



ATEROTROMBOSI 529

DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI) PLACCA VULNERABILE (ATEROTROMBOSI)

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(b) DIVISIONE DI CARDIOLOGIA, DIPARTIMENTO TORACO-CARDIO-VASCOLARE,
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ATEROTROMBOSI 373

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE) PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

SUCCESSFUL PERIOPERATIVE MANAGEMENT OF TRANSCATHETER AORTIC VALVE IMPLANTATION (TAVI) IN ACQUIRED VON WILLEBRAND DISEASE (AVWS)

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Presentation: Acquired Von Willebrand syndrome (AvWS) is a rare bleeding disorder often associated with hematologic conditions like monoclonal gammopathy of undetermined significance (MGUS), characterized by spontaneous or surgery-induced mucosal bleeding. Monoclonal antibodies bind von Willebrand factor (vWF), thus accelerating the clearance of vWF and factor VIII (FVIII) or interfering with vWF function. In aortic stenosis (AS), increased shear stress exacerbates AvWS by favoring the exposure of the cleavage site of vWF multimers.

Perioperative management of these patients is poorly described. We report the case of an 82-year-old man affected by AvWS secondary to MGUS who underwent TAVI in October 2023 for severe AS.

Diagnosis: AvWS secondary to MGUS (IgG K chain) was diagnosed in 2013 after incidental prolonged aPTT finding. Initial tests showed FVIII activity 22%, vWF activity 7%, VWF antigen 19%.

Management: Upon admission for TAVI, lab tests revealed FVIII 23%, vWF activity 6%, and VWF antigen 24%. Intravenous immunoglobulins (2 g/kg) were administered over two days, leading to values normalization (FVIII 88%, vWF activity 84%, vWF antigen 91%). Given

values normalization, TAVI was performed without specific hemostatic measures beyond vascular closure devices. Unfractionated heparin was administered to achieve an ACT target > 200. A 7-Fr left and 14-Fr right femoral accesses were utilized for Acurate Neo 2L valve implantation. Hemostasis was achieved with two Perclose and one AngioSeal per access. No bleeding complications occurred.

Post-procedural tests showed FVIII 128%, VWF activity 121%, VWF antigen 127%.

The patient was discharged without antiplatelet therapy and no thrombotic or hemorrhagic episodes were reported after 9 months follow-up.

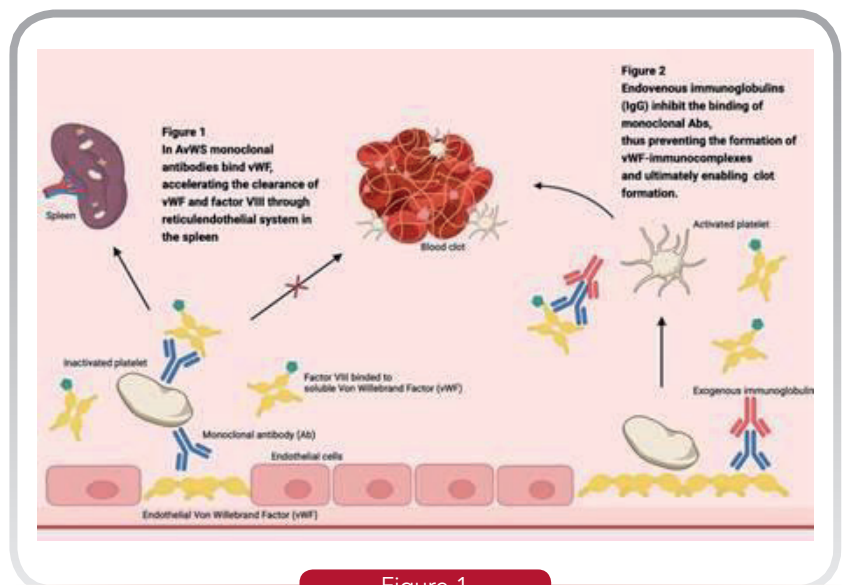


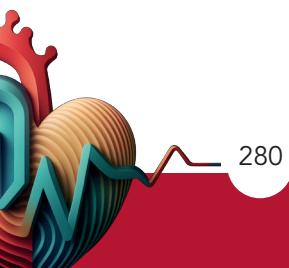
Figure 1

Conclusion: This case highlights the feasibility of performing TAVI in patients with high hemorrhagic risk due to AvWS.

Image. IgG antibodies bind to both endothelial and soluble vWF carried by factor VIII, resulting in the

formation of an immunocomplex degraded by the reticuloendothelial system.

Intravenous immunoglobulins inhibit the binding of IgM antibodies, thus preventing the formation of immunocomplexes and enabling proper clot formation.



**ATEROTROMBOSI 184
INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

CORONARY ARTERY ANEURYSM IN IGG4-RELATED DISEASE

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Vincenzo Sucato (a), Egle Corrado (a), Danilo Puccio (a)

(a) U.O.C. DI CARDIOLOGIA, A.O.U.P. PAOLO GIACCONE - UNIVERSITA' DI PALERMO

Introduction: Coronary artery ectasia is a rare disease defined as a local or diffuse dilatation of the coronary artery more than 1.5 times the diameter of the adjacent normal segment. The etiology is diverse and can be rarely associated with immunoglobulin G4 (IgG4)-related disease. The high levels of serum IgG4 may promote the development of low-density plaques, intimal thickening due to pericoronitis and subsequent coronary ectasia.

Case report: We present the case of a 72-year-old male patient with arterial hypertension, dyslipidemia, chronic renal insufficiency, and a family history of cardiovascular diseases. In the previous year, he suffered a cerebral hemorrhage attributed to an

unspecified cerebral vascular malformation, which was managed with an endovascular approach. The patient was admitted for Non-ST-segment Elevation Myocardial Infarction (NSTEMI). Coronary angiography revealed widespread ectasia of the coronary vessels, a chronically occluded marginal branch, and an aneurysmatic proximal right coronary artery with the presence of a thrombus on the aneurysmal segment, dissolved following administration of intracoronary heparin. Furthermore a critical stenosis at the crux involving the posterior interventricular branch was detected and angioplasty with drug-eluting stent implantation was performed on the affected vessel. Given the coronary artery ectasia, aortic ectasia revealed by echocardiography, renal insufficiency and

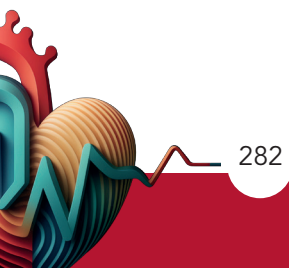


Figure 1



persistently elevated amylase and lipase levels, further diagnostic investigation was conducted suspecting IgG4-related disease. Hematological tests revealed elevated IgG and IgG4 subclass levels (882 mg/dL and 1438 mg/L, respectively), C3 117 mg/dL, C4 30 mg/dL, and total IgE 130 KU/L. The diagnosis of IgG4-related disease was confirmed and the patient was advised to continue cardiological and rheumatological follow-up.

Conclusion: When the coronary arteries are involved in the IgG4-related disease, risk of acute events such as heart attack may increase and the prognosis is poor. Coronary thickening and ectasia, typical imaging features, other aortic involvement and inflammation indicators, like elevated serum IgG4, should be considered as red flags for an early investigation and subsequent early intervention.



ATEROTROMBOSI 941 INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI) TOMOGRAFIA AD EMISSIONE DI POSITRONI (PET) (IMAGING CARDIOVASCOLARE) PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)

SIGNIFICATO PROGNOSTICO DELL'INFIAMMAZIONE DELL' AORTA ASCENDENTE ALLA PET IN PAZIENTI CON ENDOCARDITE

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(a) UNIVERSITÀ DEGLI STUDI DI BRESCIA; (b) CARDIOLOGIA, ASST SPEDALI CIVILI DI BRESCIA,
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Introduzione: L'infiammazione è ormai riconosciuta come un processo patogenetico centrale nell'aterosclerosi e nelle sue complicanze cardiovascolari. Le tecniche di imaging convenzionali (ecografia, TC, RM) sono strumenti preziosi per la visualizzazione delle placche aterosclerotiche macroscopiche e sintomatiche. Tuttavia, presentano limitazioni nell'individuazione precoce delle lesioni aterosclerotiche, caratterizzate da una maggiore instabilità.

Obiettivo: La presente analisi pone la sua attenzione sulla PET (tomografia con emissione di positroni) con 18F-FDG (18F- fluordeossiglucosio), un tracciante che si accumula nelle cellule con aumentato metabolismo, permettendo di indagare fenomeni neoplastici o infiammatori. L'obiettivo è studiare se l'aumento del

SUVMax (Standardized Uptake Value) a livello della parete dell'aorta ascendente possa essere correlato con l'insorgenza di eventi cardiovascolari maggiori (morte cardiovascolare, ictus, infarto miocardico acuto o scompenso cardiaco) e dunque rappresentare un indice prognostico sfavorevole.

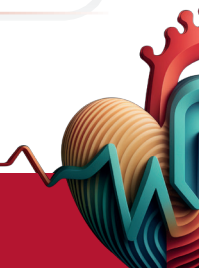
Metodi: È stata condotta un'analisi retrospettiva su una coorte di 207 pazienti ricoverati, sottoposti a PET con 18F-FDG tra il 2016 e il 2021 per la valutazione di una sospetta endocardite. Il follow-up si è concluso al 31 dicembre 2023 (durata media: circa 3 anni).

Risultati: L'analisi univariata ha evidenziato una correlazione statisticamente significativa ($p = 0.05$) tra pazienti con un rapporto SUVmax Aorta/Blood pool superiore

	All (n = 171)	Aorta/Blood Pool \geq 1.04 (n = 65)	SUVMax BloodPool < 1.04 (n = 106)	p-value
Morte, n (%)	78 (46%)	31 (48%)	47 (44%)	0.669
Stroke, n (%)	15 (9%)	6 (9%)	9 (8%)	0.868
SCA, n (%)	10 (6%)	3 (5%)	7 (7%)	0.591
Ospedalizzazioni HF, n (%)	45 (26%)	20 (31%)	25 (24%)	0.300
Ogni evento	122 (71%)	52 (80%)	70 (66%)	0.050

Analisi univariata

Tabella 1

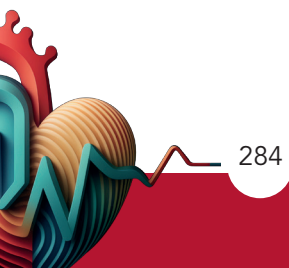


a 1.04 e il verificarsi dell'outcome composito. Tuttavia, tale associazione non è stata confermata all'analisi multivariata.

Limiti dello studio: la natura retrospettiva dello studio e la dimensione ridotta del campione, composta esclusivamente da pazienti sottoposti a PET per endocardite.

Conclusioni: I risultati ottenuti sono in linea con la let-

teratura esistente, che riconosce il ruolo della PET con 18F-FDG nell'identificazione di pazienti ad alto rischio di eventi cardiovascolari maggiori. Tuttavia, l'analisi multivariata non ha confermato l'associazione tra la captazione aortica rilevata alla PET e l'insorgenza degli eventi. Futuri studi sono necessari per chiarire definitivamente il valore prognostico della captazione aortica rilevata alla PET e il ruolo di tale metodica come biomarker surrogato non invasivo dell'infiammazione vascolare.



ATEROTROMBOSI 395 INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI) EMBOLIA POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

SPONTANEOUS CORONARY ARTERY DISSECTION FOLLOWED BY PULMONARY EMBOLISM, A RARE SEQUENCE

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 Francesca Ciliberti (a), Giulia Renda (a, b), Fabrizio Ricci (a, b, c), Sabina Gallina (a, b)

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A 52 years old woman presented to ED with non-cardiac chest pain and mild respiratory failure. She was recently (5 days earlier) discharged from ICU after a spontaneous coronary artery dissection (SCAD II B – Fig. A) involving distal portion of LAD managed conservatively (ASA+statin). At a clinical evaluation she was haemodynamically stable, echo and ECG were unremarkable and cardiac enzymes were negative in multiple determinations. Considering a high d-dimer value (10,14 mg/L) she underwent a CT-angiography that showed pulmonary thromboembolism affecting the lobar and segmental arterial branches bilaterally (Fig. B). Given the lack of scientific evidence and the low bleeding risk she was prescribed a 3-months DAT (aspirin+apixaban) followed by a (N)OAC monotherapy (according to guidelines). She was discharged after a week without bleeding complications or symptomatic recurrences, after being subjected to blood tests for thrombophilia, with negative results.

To our knowledge there are only three case reports in literature of association between SCAD and pulmonary embolism, and in none of these there is such a temporal relationship. There are few etiopathogenetic hypotheses such as fibromuscular dysplasia, mechanical overload of the right ventricle with coronary wall stretching, thromboembolization in the right ventricle as a complication of myocardial infarction or intimal rupture with endothelial activation, but none of

these is plausible in this scenario. Thrombophilia was investigated due to its possible role in both pathologies but gaining negative results. Furthermore, recent findings suggest that SCAD could be related to autoimmune and inflammatory (both systemic and local e.g. vasculitis) disorders, as well as thrombosis. Beyond pathophysiological hypotheses, another key



Figure A



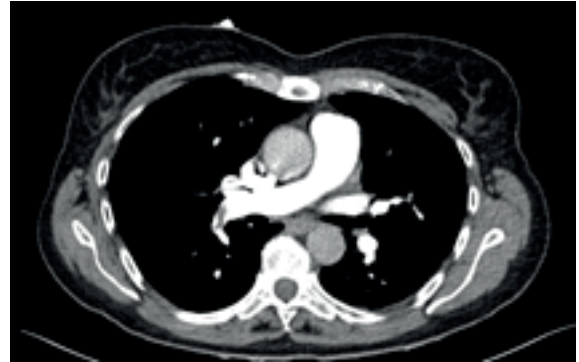
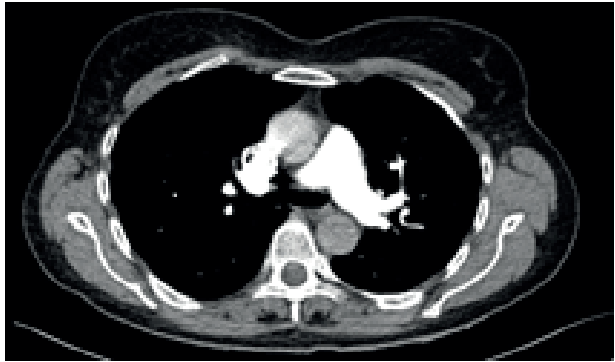
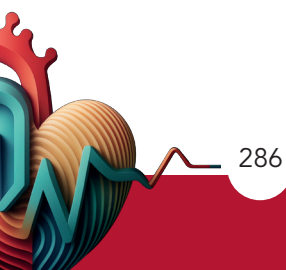


Figure B

issue of this case report is the need of anticoagulation in a recent SCAD, an event known to be related to intramural hematoma. Future research will be necessary

to clarify the pathophysiological mechanisms and the best therapeutic strategies in these patients.



ATEROTROMBOSI 91
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

THE PREVALENCE OF HYPERHOMOCYSTEINAEMIA IS HIGH IN PATIENTS IN SECONDARY CARDIO AND CEREBO VASCULAR PREVENTION

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 Andrea Domenico Ruffolo (d), Francesco La Rosa (e), Mario Balsano (f), Vitaliano Spagnuolo (g)

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 STUDENT, UNIVERSITY OF CATANZARO, CATANZARO, ITALY; (d) GERIATRY UNIT, VENICE HOSPITAL, VENICE,
 ITALY; (e) MEDICAL STUDENT, UNIVERSITY OF ROME, ROME, ITALY; (f) UNIT OF INTERNAL MEDICINE, AO
 OF COSENZA, COSENZA, ITALY; (g) LIPID CENTER COSENZA, COSENZA, ITALY; (h) GRADUATE SCHOOL OF
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Hyperhomocysteinaemia (HHcy) is a pathological condition characterised by elevated plasma homocysteine (PH) levels ($>11.1 \mu\text{mol/L}$ in females and $>13 \mu\text{mol/L}$ in males). HHcy is implicated in the onset of various pathological conditions, including cardiovascular and cerebrovascular diseases (CVD). Although the relationship between HHcy and CVD

is well known, HHcy often remains undetected and untreated. We aimed to assess the prevalence of HHcy in a consecutive series of 130 patients undergoing secondary prevention (one or more CVD events) at a clinic dedicated to cardiovascular prevention. Table 1 presents the characteristics of the patients and their associated risk factors:

Table 1.	All patients # (%)	Woman # (%)	Man # (%)	All HHey # (%)	HHey woman # (%)	HHey man # (%)	All not HHey # (%)
#	130	42	88	112 (86.1)	38 (90.5)	74 (84.1)	18 (13.9)
Age (year)	71.77 \pm 10.34	73.09 \pm 9.71	71.14 \pm 10.68	72.9 \pm 10.28	73.42 \pm 10.04	72.67 \pm 10.53	65.4 \pm 8.59
Smoke	24 (18.5)	4 (9.5)	20 (22.7)	14 (12.5)	2 (5.3)	12 (16.2)	9 (50)
Hypertens.	104 (80)	30 (71)	30 (34.1)	86 (76.8)	28 (73.7)	58 (74.4)	16 (88.9)
Diabetes	48 (36.9)	6 (14.3)	6 (6.8)	38 (33.9)	4 (10.5)	36 (48.6)	9 (50)
Hypercolest.	112 (86)	34 (80.9)	34 (38.6)	86 (76.8)	32 (78.9)	64 (86.5)	15 (83)
Chronic Kidney disease (CKD)	32 (24.6)	8 (19)	8 (9.1)	28 (25)	8 (21)	20 (27)	3 (17)

Table 1

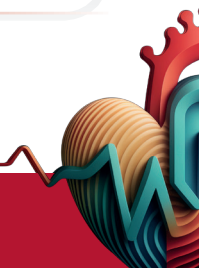


Table 2.	All patients # (%)	Woman # (%)	Man # (%)	All HHey # (%)	HHey woman # (%)	HHey man # (%)	All not HHey # (%)
MI and/or revasc.	104 (80)	20 (47.6)	84 (95.4)	88 (78.6)	18 (47.4)	70 (94.6)	14 (70)
Stroke and/or revasc.	48 (36.9)	26 (61.9)	74 (84.1)	42 (37.5)	22 (57.9)	20 (27)	6 (30)

Table 2

percentage presented with (HHcy) (86.1%); none of them were aware of their condition, and none were receiving therapeutic treatment for HHcy. Patients with HHcy had a higher average age and a lower prevalence of other associated risk factors for VD, except for a higher frequency of chronic kidney disease (CKD). Patients with HHcy exhibited a higher prevalence of myocardial infarction (MI) or revascularisation compared to those without HHcy (78.6% vs. 70%) and a higher prevalence

of stroke or revascularisation (37.5% vs. 30%).

Despite the relatively small sample size, we demonstrated a high and entirely unrecognised prevalence of HHcy among our patients with VD. Patients with HHcy had a lower frequency of association with classic cardiovascular risk factors and a higher prevalence of cardiac and cerebrovascular disease compared to those without HHcy.

CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT

**ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 139
CARDIOLOGIA DELLO SPORT
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
IDONEITÀ SPORTIVA (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)**

ATHLETE'S HEART: A CMR FOCUS ON THE LEFT ATRIUM

Sara Monosilio (a, d), Armando Ferrera (a), Davide Ortolina (a), Giuseppe Di Gioia (a), Silvia Prosperi (a, d), Erika Lemme (a), Lucrezia Netti (a, d), Ruggiero Mango (a), Gianni Tonti (c), Giovanni Pedrizzetti (b), Gianfranco Gualdi (a), Antonio Pelliccia (a), Maria Rosaria Squeo (a), Viviana Maestrini (a, d)
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(c) DEPARTMENT OF CARDIOLOGY, UNIVERSITY OF CHIETI; (d) DEPARTMENT OF CLINICAL, INTERNAL, ANAESTHESIOLOGICAL AND CARDIOVASCULAR SCIENCES, SAPIENZA UNIVERSITY OF ROME

Background: cardiac magnetic resonance (CMR) is the gold standard for evaluating cardiac chambers' dimensions and function, but data on left atrial (LA) dimensions and function among elite athletes are lacking.

Objective: to describe LA size and function among a cohort of elite athletes and evaluate eventual differences based on sports discipline and gender,

Methods: We enrolled 120 Olympic athletes with un-remarkable cardiovascular evaluation (mean age 25 ± 5 years, 50% males, 25% skill, 25% power, 25% mixed, 25% endurance). All the athletes underwent CMR without contrast administration. LA dimensions, in terms of absolute and indexed area and volume, were computed using 4- and 2-chamber steady-state precession cine-sequences. LA ejection fraction (LAEF) and LA coupling index (LACI index, intended as the ratio between LA and LV end-diastolic volumes) were calculated. Cine-images were also used to analyse atrial deformation with dedicated offline software to measure LA global longitudinal strain. LA dimensions and function were compared between males and females and athletes of different sports categories based on European classification.

Results: Among the entire cohort, endurance athletes showed the greatest remodelling in LA and LV dimensions (Table). There were no significant differences in LAEF and LV-EF ($p=0.121$ and $p=0.679$). A trend in increasing LA volumes and decreasing LA strain consistent with a growing cardiovascular demand was observed. Still, the only statistically significant difference was between skill athletes and all the other groups for LA volumes ($p<0.001$), while there were no significant differences in LA strain ($p=0.170$). LACI did not differ between athletes ($p=0.170$). Female athletes showed higher LAEF and LA strain than males (respectively 55 ± 5 vs $52 \pm 6\%$ $p=0.012$ and 35 ± 7 vs $32 \pm 7\%$, $p=0.009$), while LACI did not differ based on gender ($19 \pm 5\%$ for both females and males, $p=0.385$).

Conclusion: LA remodelling was observed in all athletes, being less evident in skill group, as for the LV. Thus, the ratio between LA and LV did not differ between sports categories. LAEF and LA strain were not significantly different among athletes of different sports categories, although LA strain was slightly lower in endurance. Female athletes showed higher LAEF and LA strain than males, while LACI was not different based on gender.

ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 141 CARDIOLOGIA DELLO SPORT (ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT) IDONEITA' SPORTIVA (ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)

CLUSTER ANALYSIS OF CMR PARAMETERS IN A GROUP OF OLYMPIC ATHLETES: IS IT TIME FOR A TAILORED MORPHO-FUNCTIONAL EVALUATION OF CARDIAC REMODELLING?

Sara Monosilio (a, d), Alessandro Spinelli (a), Silvia Prosperi (a, d), Erika Lemme (a), Lucrezia Netti (a, d), Giuseppe Di Gioia (a), Ruggiero Mango (a), Gianni Pedrizzetti (b), Giovanni Tonti (c), Gianfranco Gualdi (a), Maria Rosaria Squeo (a), Antonio Pelliccia (a), Viviana Maestrini (a, d)

(a) INSTITUTE OF SPORTS MEDICINE AND SCIENCE, ITALIAN NATIONAL OLYMPIC COMMITTEE, ROME;

(b) DEPARTMENT OF ENGINEERING, UNIVERSITY OF TRIESTE;

(c) DEPARTMENT OF CARDIOLOGY, UNIVERSITY OF CHIETI; (d) DEPARTMENT OF CLINICAL, INTERNAL, ANAESTHESIOLOGICAL AND CARDIOVASCULAR SCIENCE, SAPIENZA UNIVERSITY OF ROME

Background: Determining the spectrum of physiological adaptation for different sports categories is paramount since the overlap between mixed and endurance athletes' remodelling, which is the highest one, is often found and generates difficulties in differentiating physiology from pathology. Our study aims to explore this overlap entity by CMR to reveal different patterns of cardiac adaptation in mixed and endurance athletes.

Methods: One-hundred and seventy-five Olympic

endurance and mixed athletes (males 58%, mean age 26 ± 5 years, endurance 62%, mixed 38%) with unremarkable cardiovascular evaluation underwent Cardiac Magnetic Resonance (CMR) without contrast. CMR cine-loops were post-processed to obtain left and right ventricular (LV and RV) volumes, mass and ejection fraction (EF), LV and RV global longitudinal (GLS) and LV circumferential strain (GCS) with dedicated offline software. A K-means cluster analysis was performed using CMR LV and RV dimensions specific sports disciplines as input. Differences between the

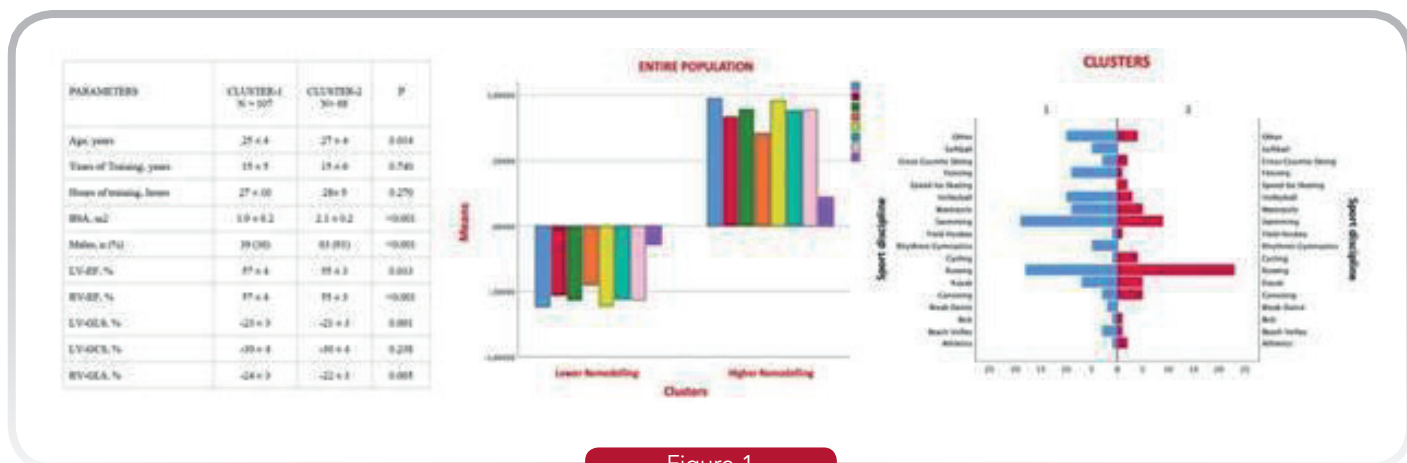


Figure 1

two clusters in variables not used as input for clustering were investigated.

Results: Two main clusters were identified (Figure). The C1 group comprised athletes (107 subjects, 49% mixed and 51% endurance) with a lower level of cardiac remodelling in terms of LV and RV volumes, LV mass indexed and sphericity index compared to athletes of the C2 group (68, 19% mixed and 81% endurance) that demonstrated a higher level of cardiac adaptation (Figure). The C2 group showed lower LV and RV ejection fraction and slightly lower LV and RV GLS (Table). Interestingly, 20% of mixed athletes ended

up in the cluster with higher remodelling, while 49% of endurance athletes had lower remodelling (Figure 1).

Conclusions: CMR cardiac adaptation cluster analysis of endurance and mixed Olympic athletes showed that a non-negligible percentage of endurance athletes belong to the low-remodelling cluster. In contrast, a small percentage of mixed athletes show higher remodelling. CMR allows for a precise definition of cardiac adaptation in elite athletes, confirming the importance of a tailored morpho-functional evaluation for differentiating between athletes' hearts and cardiomyopathies



ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 109
CARDIOLOGIA DELLO SPORT
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

PRESCRIZIONE DI ESERCIZIO FISICO E DI UN PROGRAMMA DI ALLENAMENTO IN SICUREZZA IN PAZIENTI CON CARDIOMIOPATIE

Teresina Vessella (a), Cinzia Pegoraro (a), Laura Merlo (a), Flaviano Giorgiano (a), Barbara Barra (a), Giulia Meneguzzo (a), Alberto Pandolfo (a), Alessandro Nava (a), Maria Vittoria Chiaruttini (b), Giulia Lorenzoni (b), Dario Gregori (b), Patrizio Sarto (a)

(a) UOC MEDICINA DELLO SPORT AULSS2; (b) UNITÀ DI BIOSTATISTICA, EPIDEMIOLOGIA E SANITÀ PUBBLICA - UNIVERSITÀ DI PADOVA

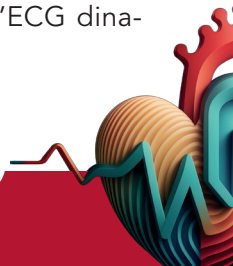
Presupposti dello studio: La prescrizione di esercizio fisico e la determinazione delle appropriate intensità e frequenze di allenamento nel paziente con cardiomiopatia sono state a lungo un argomento di dibattito in cardiologia dello sport, e ancora oggi le evidenze a riguardo sono limitate. Il Centro di Riferimento Regionale per lo sport nei giovani con cardiomiopatia nasce dalla volontà di creare una soluzione a metà strada tra la sedentarietà, fattore di rischio per diverse patologie croniche, e lo sport agonistico, che può esporre il paziente al rischio di eventi aritmici maggiori. Ai pazienti afferenti al Centro viene fornita una presa in carico completa (medica, psicologica e sportiva) che termina con un periodo di training monitorato e il ritorno all'attività sportiva con modalità e intensità compatibili con la patologia del paziente.

Scopo: L'obiettivo dello studio è verificare la sicurezza della prescrizione di un programma di esercizio fisico personalizzato nel paziente ex-atleta con cardiomiopatia in termini di eventi maggiori durante il follow-up. Si vuole inoltre valutare l'impatto di tale modalità di allenamento in termini di capacità funzionale (misurata con il test da sforzo cardiopolmonare) e di progressione di patologia (esaminata

tramite ecocardiografia ed ECG dinamico secondo Holter). Un ulteriore obiettivo dello studio è la valutazione dell'aderenza dei pazienti al programma.

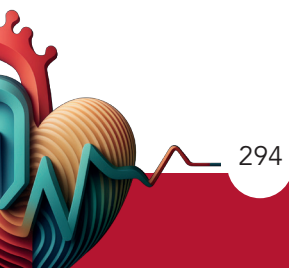
Materiali e metodi: Sono stati arruolati 59 pazienti con cardiomiopatie, (47 uomini e 12 donne), di cui 23 con cardiomiopatia ipertrofica ed età mediana 49 anni (30.5, 56.5), 27 con cardiomiopatia aritmogena ed età mediana 26 anni (17, 54) e 9 con cardiomiopatia dilatativa ed età mediana 19 anni (15, 22). Ogni paziente ha ricevuto una prescrizione di esercizio fisico personalizzata ed è stato seguito con follow-up a cadenza regolare. I dati sono stati raccolti tramite la piattaforma REDCap. Il test dei segni per ranghi di Wilcoxon è stato utilizzato per valutare la differenza dei parametri continui alla prima e seconda visita, rispetto alla baseline.

Risultati. Durante il periodo di allenamento supervisionato e il successivo follow-up della durata mediana di 18 mesi (8.50, 37.00), non sono stati registrati eventi cardiovascolari maggiori. Tra i pazienti che si sono attenuti scrupolosamente alle nostre raccomandazioni, nessuno ha mostrato un peggioramento delle proprie condizioni in termini di burden aritmico (BEV in percentuale rispetto al totale all'ECG dina-



mico secondo Holter) e funzione ventricolare (frazione di eiezione, frazione d'accorciamento del ventricolo destro e TAPSE misurati all'ecocardiogramma). Inoltre, durante il follow-up non si è registrato un peggioramento della capacità funzionale dei pazienti (misurata come consumo d'ossigeno massimo, sia assoluto che percentuale, e alle soglie al test da sforzo cardiopolmonare). 12 pazienti hanno interrotto precocemente il percorso.

Conclusioni: La prescrizione di esercizio fisico e di un programma di allenamento in sicurezza in pazienti con cardiomiopatia sembra non portare a esiti avversi e non determinare un peggioramento statisticamente significativo delle caratteristiche morfo-funzionali cardiache e della capacità funzionale, sebbene questi dati debbano essere confermati da studi con follow-up di maggiore durata e con numerosità campionarie maggiori.



ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 692

MECCANISMI DELLE ARITMIE (ARITMIE)

FIBRILLAZIONE ATRIALE (FA) (ARITMIE)

ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE

(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)

CARATTERISTICHE CLINICHE DI ATLETI MASTER CON FIBRILLAZIONE ATRIALE

Antonio Scarà (a, b), Martina Fusari (b), Alessio Borrelli (a, b), Leonardo Pignalosa (a, b), Federico Zanin (a), Elena Cavarretta (c), Renata Petroni (b, d), Silvio Romano (b), Luigi Sciarra (b)

(a) OSPEDALE SAN CARLO DI NANCY - GVM; (b) DIPARTIMENTO DI MALATTIE CARDIOVASCOLARI - UNIVERSITÀ DEGLI STUDI DELL'AQUILA; (c) UNIVERSITÀ DEGLI STUDI "LA SAPIENZA"; (d) CASA DI CURA DI LORENZO

Introduzione: la pratica di sport di resistenza, quali la corsa, il nuoto, il ciclismo, è diventata molto comune tra le persone intorno ai 40 anni, con notevoli benefici a livello cardiovascolare. Tuttavia, alcuni studi, sebbene confermino i benefici dati dall'attività fisica di intensità lieve moderata, mettono in discussione le conseguenze dell'attività sportiva intensa e praticata per lunghi periodi di tempo: in particolare è emersa l'ipotesi di una associazione tra l'attività sportiva di endurance e l'insorgenza di fibrillazione atriale (FA). Obiettivo dello studio: chiarire l'associazione tra sport di endurance ed insorgenza di FA, evidenziando gli elementi potenzialmente in grado di interferire in tale rapporto.

Metodi e risultati: è stato condotto uno studio osservazionale di tipo caso-controllo. Sono stati selezionati 58 soggetti atleti, reclutati in modo consecutivo, che praticano sport di endurance a livello agonistico o amatoriale. Di questi, 29 soggetti presentavano fibrillazione atriale (gruppo FA+) e 29 soggetti non presentavano FA (gruppo FA-). I due gruppi sono risultati simili per età media (60.2 ± 8.5 anni vs 59.3 ± 10.3 anni), BMI medio (24.8 ± 1.6 kg/m² vs 24.1 ± 1.8 kg/m²) e sesso (100%M vs 96,3%M). È stata valutata la presenza di fattori di rischio per

FA, sia di tipo cardiovascolare (ipertensione, cardiopatia ischemica, cardiopatia valvolare, malattia del nodo del seno, ateromasia dei vasi epiaortici, familiarità per malattie cardiovascolari) ed extra-cardiaco (diabete mellito, dislipidemia, tabagismo, BMI>25, OSAS, distiroidismo, gastrite/ernia iatale/GERD) nei due gruppi: nel gruppo degli sportivi affetti da FA è stato riscontrato un maggior numero di fattori di rischio, rispetto a quelli non affetti da FA (3 vs 1 – $p < 0,05$). Un'associazione statisticamente significativa per singolo fattore di rischio è stato riscontrato soltanto per ipertensione e dislipidemia ($p < 0,05$). È stata inoltre effettuata una comparazione di dati ecocardiografici: il gruppo FA+ ha presentato maggiori valori di volume ventricolare sinistro telediastolico ($64,5 \text{ ml/m}^2$ vs 62 ml/m^2 , $p < 0,05$) ed aumentate dimensioni dell'atrio sinistro (21 cm^2 vs 17 cm^2 – $p < 0,05$) rispetto al gruppo FA-.

Conclusioni: l'insorgenza di fibrillazione atriale in atleti master sembra correlare con la presenza di un maggior numero di fattori di rischio (in particolare ipertensione arteriosa e dislipidemia) piuttosto che con la pratica di sport di endurance. Ulteriori studi, su più ampia scala, saranno necessari per confermare quanto osservato in questa nostra esperienza.



ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 630 IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT) CARDIOLOGIA DELLO SPORT (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)

AN INDEPENDENT MARKER OF MYOCARDIAL FUNCTION IN ATHLETE'S HEART: ROLE OF VORTEX ANALYSIS IN TRIATHLON

Marco Corsi (a), Melissa Orlandi (a), Roberto Palazzo (a), Edoardo Falconi (a), Gabriele Mascherini (a), Laura Stefani (a)
(a) SPORTS MEDICINE CENTER UNIVERSITY OF FLORENCE

Aims: athlete's heart has been extensively studied, particularly regarding global myocardial remodeling in normal systo-diastolic function and supernormal deformation reserve. Based on specific morphological characteristics, it is commonly classified as eccentric and concentric remodeling; however, the recent interest in echocardiography lies in the dynamicity of the vorticity flow inside the LV chamber, primarily correlated with diastolic function. This study aims to verify the potential additional contribution of vortex analysis in characterizing the athlete's heart.

Methods and results: A group of 23 highly trained athletes was studied using 2D standard and deformation echo parameters and vortex examination. A dedicated software (HyperDoppler- ESAOTE) defined geometrical and dynamic vortex parameters (area, length, depth, Energy Dissipation, Vorticity Fluctuation, Kinetic Energy fluctuation). The data obtained were compared with a group of 26 active

non-athletes and a group of 23 normal subjects. BMI differed among the three groups, with higher values in normal subjects (normal=27.2±5.7; active=22.9±2.6; triathletes=22.1±1.8; p=0.01). iLV mass was significantly higher in triathletes (triathletes=96.9±14.9; active=87.6±15; normal=79.5±15.7; p=0.003) as twist (triathletes=12.3±3.9; active=9.8±3.7; normal=8.1±3.1; p=0.001), expressing a supernormal apical reserve. Diastolic function was normal in both groups. In the presence of normal geometrical vortex data, vortex energetic parameters were significantly higher in triathletes (energy dissipation= 1.10±0.41, p<0.001; vorticity fluctuation= 0.89±0.04, p<0.001; kinetic energy fluctuation= 1.01±0.08, p<0.001).

Conclusions: Vortex analysis complements the morphological remodeling of the athlete's heart. It can contribute to defining the effects of training intensity and energy consumption. Future research will focus on potential modifications in different sports.

DEFORMATION AND VORTEX ANALYSIS BY SPECKLE TRACKING AND HYPERDOPPLER MODEL

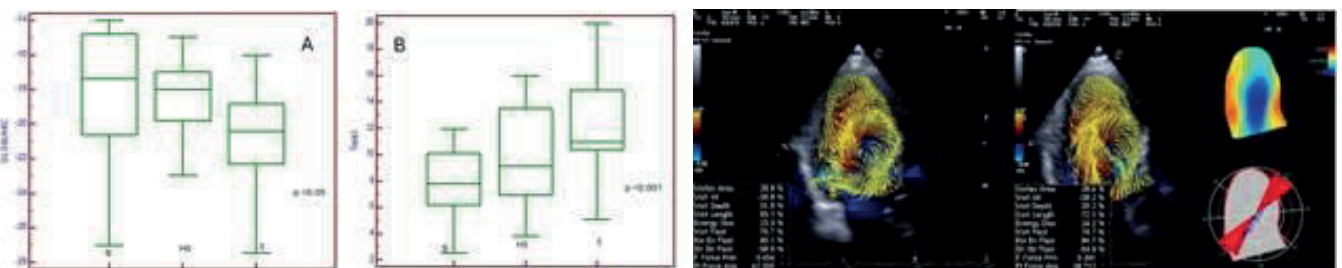


Figure 1

ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 839
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
CARDIOLOGIA DELLO SPORT
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)

EXERCISE PRESCRIPTION IN ADULT WITH LUNG-TRANSPLANTED CYSTIC FIBROSIS

Melissa Orlandi (a), Marco Corsi (a), Pietro Checcucci (a), Beatrice Borchì (b), Annalisa Cavallo (b), Sandra Guarducci (b), Alessandro Bartoloni (b), Martina Donati (c), Cecilia Defraia (c), Leonardo Nesi (c), Stefano Sparacio (c), Claudia Mannini (d), Federico Lavorini (d), Silvia Bresci (b), Laura Stefani (a)

(a) SPORT MEDICINE CENTRE - UNIVERSITÀ DEGLI STUDI DI FIRENZE; (b) CYSTIC FIBROSIS UNIT - AOU CAREGGI - FIRENZE; (c) REHABILITATION CENTRE - AOU CAREGGI - FIRENZE; (d) PNEUMOLOGY AND RESPIRATORY PHYSIOLOGY - AOU CAREGGI - FIRENZE

Introduction: the effects of physical exercise intervention in cystic fibrosis (CF) is of recent interest. Few studies have been, however, specifically addressed to detect the improvement of peripheral muscle strength, body fat-free mass and cardiovascular performance after transplantation. The aim of this study was to compare preliminary data of body composition and cardiorespiratory assessment of CF lung-transplanted patients and solid organ transplanted recipients (OTR) without cystic fibrosis, currently involved in an unsupervised tailored exercise prescription program.

Methods: the two groups (CF and OTR) were evaluated by body composition analysis (BIA 101-BIVA AKERN) and cardiopulmonary test (CPET, Cosmed, Italy). Spontaneous physical activity was assessed with IPAQ questionnaire.

Results: preliminary data were collected in 7 CF (age 42.9 ± 12.1 yo) and 10 OTR (43.5 ± 9.3 yo). BMI was significantly lower in CF group (22.1 ± 2.1 vs 25.6 ± 3.5 , $p = 0.03$), despite similar free-fat mass (FFM) and fat mass (FM) parameters (respectively in CF and OTR: FFM

$78,9 \pm 6,7\%$ vs $72,4 \pm 11\%$; FM $21,0 \pm 6,7\%$ vs $26,1 \pm 7,7\%$; Phase angle of FC: $5,4 \pm 1,1^\circ$ vs $5,7 \pm 0,9^\circ$) and physical activity level, measured by IPAQ. Cardiorespiratory performance evaluated by CPET was significantly different in the two groups, especially for ventilatory response (breathing reserve 42.5 ± 11.2 vs 39.5 ± 12.5 , $p = 0.04$; VE/VCO₂ slope 35.7 ± 8 vs 32.6 ± 5.2 , $p < 0,001$, respectively in CF and OTR) as well for the maximum oxygen pulse ($76.6 \pm 6\%$ vs $101 \pm 18\%$, $p < 0.001$). Peak VO₂ did not show significant differences, although mainly reduced in CF ($64.2 \pm 16.2\%$ vs $82.6 \pm 20,4\%$, $p = 0,06$). A trend for a positive correlation between the Phase Angle and VO₂ max was found in FC group (R: 0.09), but not for OTR.

Conclusions: these preliminary data seem to be suggestive for a peculiar trend in CF group, showing a specific respiratory response to physical exercise and a correlation with phase angle. Peak VO₂, largely used to plan exercise prescription program, should not be considered as exclusive predictive value in terms of cardiovascular fitness among transplanted CF.



**ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 224
 ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
 (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
 CARDIOLOGIA DELLO SPORT
 (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
 IDONEITÀ SPORTIVA (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)**

ASSESSMENT OF EXTRAVASCULAR LUNG WATER IN POWERLIFTERS DURING SIMULATED COMPETITION

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(a) DEPARTMENT OF NEUROSCIENCE, IMAGING AND CLINICAL SCIENCES, "G. D'ANNUNZIO" UNIVERSITY OF CHIETI-PESCARA, VIA DEI VESTINI 33-66100 CHIETI, ITALY

Purpose: Given the significant cardiovascular demands associated with intense weightlifting activities, this study aims to evaluate the prevalence of extravascular lung water (EVLW) in intermediate-level powerlifters.

Methods: Study participants took part in a simulated competition, performing one-repetition maximum (1RM) for the three core elements of powerlifting: bench press, squat, and deadlift. Lung ultrasound (LUS) assessments were conducted using a handheld ultrasound system (Wireless Horus ATL Phased Array+Lineare Color Doppler, ATL, Milan) equipped with a broadband (2.2–3.6 MHz) phased array transducer, before and immediately after each lifting session. B-lines were scored across 12 predefined scanning sites on the anterior, lateral, and posterior chest regions by a trained cardiologist. The overall B-lines score was computed as the sum of signs across all chest sites. LUS was performed both at rest and during peak exertion, with B-lines scores being the aggregate from each of the 12 chest zones, ranging from 0 (no B-lines) to 120 (10 B-lines per zone). LUS was evaluated based on the count of B-lines at rest, peak, and the change between these states. Rest and stress B-lines were categorized as absent (0-4 points), mild (5-9 points), moderate (10-19 points), and severe (≥ 20 points), with a positivity criterion for increased EVLW set at a stress score exceeding the rest by ≥ 2 points.

level powerlifters (33% women), with an average age of 24 years and a body mass index of 25 kg/m². At baseline, all participants showed no signs of pulmonary congestion, with B-lines scores averaging 2±2 across all chest sites. Following a simulated competition involving squat, bench press, and deadlift exercises, B-lines scores were measured immediately post-lift. The squat exercises resulted in a negligible decrease in B-lines scores (-0.2±2.1; p=0.67), with only one participant showing a change meeting the positive criterion. Bench press exercises led to a slight increase in average B-lines scores (0.3±3.2; p=0.93), with two participants experiencing increases meeting the positive criterion. Deadlift exercises also showed a

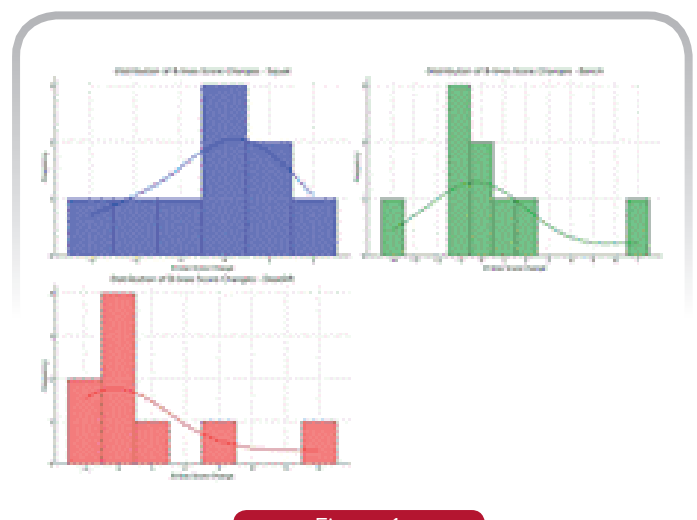


Figure 1

Results: We evaluated nine healthy intermediate-

minimum increase in B-lines scores (0.9 ± 3.3 ; $p=0,34$), with two participants meeting the positive criterion. No significant associations were found between changes in B-lines scores and demographic characteristics.

Conclusions: Our findings suggest that performing three 1RM lifts during a simulated competition did not significantly alter EVLW and seems to be a safe practice as the changes observed were minor and did not consistently exceed established clinical relevance thresholds in this cohort of intermediate-level

powerlifters. Nevertheless, the variability in individual responses highlights the need for personalized assessments to better understand the implications of intense exercises on cardiopulmonary health. Future research should focus on different training settings and athlete experience levels to further elucidate these dynamics.

Figure. Distribution of B-lines score changes for each type of lift (squat, bench press, deadlift) in intermediate-level powerlifters.



ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 344
CARDIOLOGIA DELLO SPORT
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
IDONEITÀ SPORTIVA (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

RETURN-TO-PLAY FOR COMPETITIVE ATHLETES DIAGNOSED WITH ACUTE MYOCARDITIS: COMPARISON BETWEEN COCIS 2017 AND COCIS 2023 GUIDELINES CMR CRITERIA

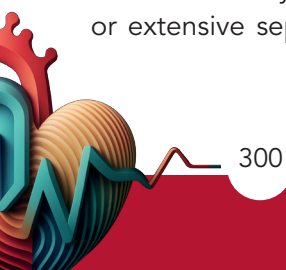
Carlo Maria Gallinoro (a, c), Alessandra Scatteia (c, d), Dario Catapano (b), Franca Di Meglio (a), Santo Dellegrottaglie (c)
 (a) PUBLIC HEALTH DEPARTMENT, UNIVERSITY OF NAPLES FEDERICO II, 80131 NAPLES, ITALY; (b) DIVISION OF CARDIOLOGY, DEPARTMENT OF TRANSLATIONAL MEDICAL SCIENCES, UNIVERSITY OF CAMPANIA "LUIGI VANVITELLI", 80131 NAPLES, ITALY; (c) ADVANCED CARDIOVASCULAR IMAGING UNIT, OSPEDALE MEDICO-CHIRURGICO ACCREDITATO VILLA DEI FIORI, 80011 ACERRA, ITALY; (d) MOVEMENT SCIENCES FOR PREVENTION AND WELLNESS, UNIVERSITY OF NAPLES "PARTHENOPE", 80133 NAPLES, ITALY

Background: Myocarditis has recently become a prominent topic in Sports Cardiology. National and international scientific societies have established return-to-play criteria for competitive athletes diagnosed with myocarditis. In Italy, the COCIS (Committee for Sports Cardiology) guidelines serve as the standard for physicians in determining athletes' eligibility for competitive sports. The latest COCIS 2023 guidelines recommend assessing eligibility using clinical, electrocardiographic (ECG), and cardiac magnetic resonance (CMR) criteria. This study aimed to determine the number of young competitive athletes deemed suitable for competitive sports following acute myocarditis, focusing solely on the CMR criteria and comparing the 2017 and 2023 COCIS guidelines.

Methods: We conducted a retrospective study involving competitive athletes who underwent a CMR scan for acute myocarditis at our laboratory in a 18-month time period. According to the COCIS 2023 guidelines, CMR criteria that must be met for eligibility are the following: no edema, normal left ventricular ejection fraction and no extensive myocardial LGE areas (≥ 3 segments and/or extensive septal involvement). Taking into account

the COCIS 2017 guidelines, CMR criteria differs in LGE extension, defined as "delimited" LGE areas (for the purpose of this analysis defined as a single myocardial segment involved).

Results: The study included 146 athletes (135 men; mean age 26 years) diagnosed with acute myocarditis by CMR performed within 1 month from clinical presentation. In a subset of 53 athletes (36,3%) a second CMR scan performed 3-6 months from clinical onset was available, and 8 patients underwent a third scan performed more than 6 months from the clinical presentation. At the initial CMR scan, 4 patients (2,7%) exhibited a reduced ejection fraction (EF $<55\%$), one of whom required an implantable cardioverter-defibrillator (ICD). Myocardial edema was observed in 123 patients (84,2%) on STIR T2-weighted sequences, and 110 patients (75,3%) displayed extensive LGE (≥ 3 segments), with septal involvement in only 10 patients (6,8%). Based on these findings, 10 patients (6,8%) were eligible according to the COCIS 2023 guidelines, compared to 6 patients (4,1%) taking into account the COCIS 2017 guidelines. Among the 53 athletes who underwent a second CMR scan, 12 additional patients



met the eligibility criteria according to COCIS 2023, whereas only 6 did so according to COCIS 2017. None of the 8 athletes who required a third CMR scan, achieved the eligibility criteria. By the end of the observation period, 22 patients (15%) were eligible for return-to-play according to the COCIS 2023 CMR criteria, in contrast to 12 patients (8,2%) taking into account the COCIS 2017 criteria.

Conclusion: Our findings demonstrate that, based on

CMR criteria outlined in the latest COCIS guidelines, only a small proportion of athletes were cleared to resume competitive sports following acute myocarditis. Considering that in athletes recovering from acute myocarditis the actual prognostic relevance of the observed CMR findings is not completely understood, the reported findings underscore the need for continued research and refinement of return-to-play criteria to ensure athlete safety while optimizing recovery and competitive participation.



ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 829
CARDIOLOGIA DELLO SPORT
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)

THE RELATIONSHIP BETWEEN CARDIOPULMONARY EXERCISE-DERIVED PHYSICAL FITNESS AND TISSUE CHARACTERIZATION THROUGH MAPPING: AN ADDITIONAL ASPECT OF THE ATHLETE'S HEART

Francesca Graziano (a, b, c), Dorottya Balla (b, c), Liliana Szabo (c, d), Vencel Juhasz (b, c), Nora Sydo (b, c), Orsolya Kiss (b, c), Emese Csulak (b, c), Zsafia Dohy (c), Csongor Mesko (b, c), Domenico Corrado (a), Alessandro Zorzi (a), Bela Merkely (b, c), Hajnalka Vago (b, c)

(a) DEPARTMENT OF CARDIAC, THORACIC AND VASCULAR SCIENCES AND PUBLIC HEALTH, UNIVERSITY OF PADOVA, ITALY; (b) DEPARTMENT OF SPORTS MEDICINE, SEMMELWEIS UNIVERSITY, BUDAPEST, HUNGARY; (c) HEART AND VASCULAR CENTRE, SEMMELWEIS UNIVERSITY, BUDAPEST, HUNGARY; (d) BARTS HEART CENTRE, ST BARTHOLOMEW'S HOSPITAL, BARTS HEALTH NHS TRUST, WEST SMITHFIELD LONDON, EC1A7BE, UK

Background: Regular vigorous exercise brings about cardiovascular adaptations, but the relationship between cardiac magnetic resonance derived T1 and T2 mapping and physical activity is not fully understood, with conflicting literature results.

Purpose: This study aims to define the associations between cardiorespiratory fitness (CRF) evaluated using cardiopulmonary exercise test (CPET) and tissue level cardiac remodeling using T1 and T2 mapping.

Methods: We enrolled healthy competitive athletes undergoing pre-participation screening (personal/family history, physical examination, 12-lead ECG), who volunteered for maximal CPET and non-contrast CMR using a 1.5T scanner within 31 days.

Results: The final population was composed of 122 athletes: median age 19.5 [17-25.25] years; 55% males; median hours of training 20 [16-25]; 10%

power, 40% endurance, 50% mixed. Native T1 and T2-mapping were significantly lower in males (935 [918 - 956.5] ms), than females (967.5 [943.25-978.25] ms, $p < 0.001$). T1-mapping was lower in endurance athletes (940 [917.5-957.75] ms). T1- and T2 mapping exhibited significant negative correlations with biventricular end diastolic volumes index and left ventricular mass index, relative VO₂max and VCO₂, anaerobic threshold, and O₂ pulse. Regression analysis revealed that VO₂max was an independent predictor of T1 mapping values ($\beta = -1.14$, $p = .009$), while T2 mapping was minimally affected by CRF results.

Conclusions: Lower T1 mapping values can be considered as part of exercise-induced cardiac remodeling, influenced by sex and type of sport, and associated with CRF assessed with CPET. Understanding this relationship may help in the differential diagnosis between athlete's heart and cardiac disease.



ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 21 ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) IDONEITÀ SPORTIVA (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)

CARDIOVASCULAR PREVENTION USING LONG-TERM ECG SCREENING IN ENDURANCE ATHLETES OVER 40

Paola Liporace (a), Danilo Ricciardi (a), Enrico Crispino (a), Lorenzo Frau (a), Daniele Valente (a), Vincenzo Nafisio (a), Elisabetta Sanasi (b), Luigi Sanasi (a), Maria Chiara D'amore (a), Eliana Laura Italiano (a), Flavio Gioia (a), Francesco Picarelli (a), Vito Calabrese (a), Francesco Grigioni (a), Gian Paolo Ussia (a)
(a) POLICLINICO UNIVERSITARIO CAMPUS BIO-MEDICO DI ROMA; (b) LONDON SCHOOL OF ECONOMICS

Introduction: Cardiovascular diseases (CVD) increase with age. There are many athletes aged over 40 who practise endurance sports which involve high-intensity physical exertion. As CVD are an important cause of death and injuries in athletes during exercise, the use of the conventional annual screening method, based on medical history, spirometry, urine test and exercise test, would be at least questionable. Purpose The aim of the study is to evaluate whether a 5-minute 'Event Recorder ECG', associated with the conventional examination, can be an additional tool for early screening and prevention of CVD in older endurance sport population.

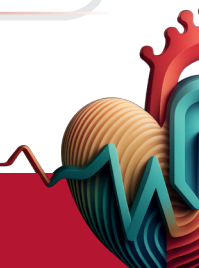
Materials and Methods: The population were selected as part of the larger 'Heart and Run' project, an electrocardiographic collection of endurance athletes of some of the main sports clubs in Rome - Italy. A control group of healthy individuals matched for age was also collected for comparison. The ECG traces were recorded at rest with the Kardia Mobile device 6Lä. HRV indices were analyzed using the software Kubios®. The study group were compared for a morphological analysis and for HRV parameters (time and frequency domain).

Results: A total of 353 subjects (182 athletes and 171 controls) were analyzed. The athletes showed a higher incidence of sinus arrhythmias, LAFB, 1°-degree AV

Block, J-point elevation, ST-segment abnormalities and shorter QTc compared to controls ($p < 0.05$). Differences between the two groups were also found in the time and frequency domain HRV analysis, confirming an increased vagal tone ($p < 0.05$). Due to the absence of normality range in the literature, we considered values lower of the 5th or higher of the 95th percentile range, for the main HRV parameters, as abnormal. We identified HRV or morphological abnormalities in more than one third of our master athlete population. Thirteen patients (7% of population) showed both ECG abnormalities, we scheduled those people for further evaluation or follow-up, the study is on-going.

	ATHLETES (182)	CONTROLS (171)	P-VALUE
PNS INDEX	-0,25 ± 1,38	-1,05 ± 1,03	1,83 × 10 ⁻⁹
SNS INDEX	0,69 ± 1,44	2,38 ± 1,89	2,22 × 10 ⁻¹⁸
MEAN RR (MS)	911,75 ± 151,5	790,64 ± 126,44	6,3 × 10 ⁻⁵
MIN HR (BPM)	60,69 ± 9,85	71 ± 11,07	4,83 × 10 ⁻¹⁸
MAX HR (BPM)	77,34 ± 14,78	86,83 ± 14,41	6,37 × 10 ⁻⁹
MEAN HR (BPM)	67,61 ± 11,63	77,8 ± 12,12	1,73 × 10 ⁻¹⁴
SDNN (MS)	38,72 ± 23,95	26,77 ± 19,22	3,79 × 10 ⁻⁷
RMSSD (MS)	34,98 ± 34,96	24,73 ± 21,18	0,001
NNSD (BPM)	29,14 ± 41,68	20,08 ± 39,43	0,04
pNNSD (%)	12,91 ± 16,74	8,49 ± 16,3	0,01
PEAK FREQUENCY VLF (HZ)	0,04 ± 0,04	0,04 ± 0,03	0,65
VLF POWER (MS ²)	108,12 ± 185,85	59,32 ± 93,44	0,002
PEAK FREQUENCY LF (HZ)	0,14 ± 0,73	0,08 ± 0,03	0,29
LF POWER (MS ²)	1184,42 ± 1639,09	617,12 ± 1238,58	0,0003
PEAK FREQUENCY HF (HZ)	0,19 ± 0,06	0,23 ± 0,08	8,09 × 10 ⁻⁶
HF POWER (MS ²)	654,61 ± 3278,17	330,73 ± 809,35	0,19
TOTAL POWER (MS ²)	1950,56 ± 4671,84	1006,76 ± 1933,64	0,012
LF/HF RATIO	5,27 ± 4,65	3,71 ± 3,97	0,0007

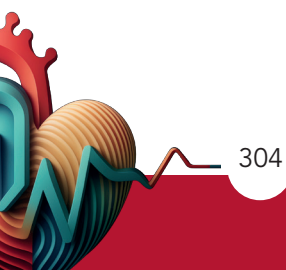
Table 1



Conclusions: Although competitive endurance sports are associated with increased vagal tone, which is deemed protective against cardiovascular disease, the addition of a 5-minute ECG could increase the sensitivity in detecting potential CVD in master athletes, suggesting additional clinical benefits in prevention of Sudden Cardiac Death.

	ATHLETES (182)	CONTROLS (172)	P-VALUE
PR (MS)	165,05 ± 21,13	153,93 ± 22,67	3,25 x 10 ⁻⁵
QRS (MS)	86,84 ± 7,81	86,01 ± 17,02	0,74
QT (MS)	377,24 ± 26,44	364,6 ± 27,8	1,8 x 10 ⁻⁵
QTc BAZETT (MS)	395,95 ± 29,51	411,6 ± 29,01	8,97 x 10 ⁻⁷
QTc FRIDERICIA (MS)	389,22 ± 24,08	395,54 ± 24,1	0,01
SINUS ARRHYTHMIA (N°)	168	101	2,3 x 10 ⁻⁴
SINUSAL RHYTHM (N°)	181	172	0,5
AF (N°)	1	0	0,41
1° (HIGH) AV BLOCK (N°)	9	2	0,007
REBB (N°)	3	6	1
LAF B (N°)	28	9	5,1 x 10 ⁻⁵
INTERMITTENT LAF B (N°)	1	0	0,53
LFFB (N°)	2	0	0,18
PVC (N°)	11	9	0,47
PAC (N°)	7	12	0,73
EARLY REPOLARIZATION (N°)	3	1	0,25
ST ABNORMALITIES (N°)	5	0	0,03
T WAVE INVERSION (N°)	1	0	N/A
EPSILON WAVE	0	0	N/A
PAC-EXCITATION	0	0	N/A

Table 2



ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 868
CARDIOLOGIA DELLO SPORT
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

ASSESSING MAXIMAL EFFORT: THE INEFFICIENCY OF NON-METABOLIC THRESHOLDS

Nikita Baracchini (a), Teresa Maria Capovilla (a), Maddalena Rossi (a), Cosimo Carriere (a), Antonio De Luca (a), Giulia Barbati (b), Gianfranco Sinagra (a, c)

(a) *CARDIOVASCULAR DEPARTMENT, AZIENDA SANITARIA UNIVERSITARIA GIULIANO ISONTINA (ASUGI), UNIVERSITY OF TRIESTE, ITALY*; (b) *BIOSTATISTICS UNIT, DEPARTMENT OF MEDICAL SCIENCES, UNIVERSITY OF TRIESTE, TRIESTE*; (c) *MEMBER OF ERN-GUARD HEART*

Introduction: The maximal effort is crucial for accurately interpreting exercise tests. In cardiopulmonary exercise tests (CPET), maximal effort is indicated by a respiratory exchange ratio (RER) ≥ 1.10 . Standard tests use non-metabolic thresholds, such as peak predicted heart rate (ppHR) $\geq 85\%$, double product (DP) ≥ 20000 rpm*mmHg and peak metabolic equivalent of task (MET) ≥ 5.0 . Our study aimed to compare the ability of non-metabolic thresholds to define a maximal test with the achievement of an RER ≥ 1.10 during CPET.

Methods: We enrolled all stable patients undergoing cardiopulmonary exercise testing (CPET) between 2022 and 2023, irrespective of the indication of the test, their history of HF, or their medication use. All patients also performed transthoracic echocardiography (TTE).

Results: 239 patients enrolled were middle-aged males (53 ± 14 years, 67% male), 86% with RER ≥ 1.10 , with 65% diagnosed with HF, equally represented by ischaemic (45%) and non-ischaemic (55%) causes. Non-metabolic criteria identified RER ≥ 1.10 efforts in 75% of

the cases (AUC < 0.600). Patients incorrectly classified as non-maximal were referred to as “discordant” reported a more likely history of AF, paced rhythm, HF (regardless of etiology or clinical phenotype), and were prescribed beta-blockers or RAASi. This finding was supported by the significant difference in CPET parameters (lower VO₂ peak, higher VE/VCO₂ slope). In the multivariate analysis, the history of HF (OR 4.8, CI 95% 1.6 – 15.6, p: 0.005), low rest DP (≤ 7500 mmHg*rpm), and ramp protocol value had an independent significant predictive role for discordant tests.

Conclusion: According to non-metabolic thresholds, up to 25% of tests with RER ≥ 1.10 were misclassified as non-maximal, resulting in a fallacious interpretation of this valuable data. In the specific presence of HF, poor expected functional capacity and low DP, physicians should refer patients directly to facilities equipped to perform CPET instead of using non-metabolic thresholds.



**ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 423
 ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
 (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
 CARDIOLOGIA DELLO SPORT
 (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT) PREVENZIONE
 CARDIOVASCOLARE: INTERVENTI E RISULTATI
 (PREVENZIONE E RIABILITAZIONE)**

BREATHWISE: EXPLORING NASAL VS. ORAL BREATHING WIN STRATEGIES IN HEALTHY INDIVIDUALS DURING CARDIORESPIRATORY EXERCISE TESTING

Massimo Mapelli (a), Irene Mattavelli (a), Giulia Grilli (a), Elisabetta Salvioni (a), Gabriele Zerboni (a), Alessandro Nava (a), Matteo Biroli (a), Gaia Bellini (a), Mattia Dell’asta (a), Elisabetta Pasini (a), Antonio De Paola (a), Ludovica Terzolini (a), Nicola Mani (a), Sebastiano Turri (a), Jeness Campodonico (a), Piergiuseppe Agostoni (a)
 (a) CENTRO CARDIOLOGICO MONZINO

Background: Nasal and oral exclusive breathing modes have benefits and drawbacks during submaximal exercise. It is less known whether these responses would extend to anaerobic work performed at high intensity. The purpose of this study is to find the most efficient mode of breathing during different phases of a maximal exercise at cardiopulmonary exercise test (CPET).

Methods: Healthy subjects were recruited to perform 4 consecutive maximal CPETs using the same ramp protocol on an electronically braked cycle ergometer. The execution order (standard conditions (STD), exclusively nasal breathing (eNAS), exclusively oral breathing (eOR), partial nasal breathing (pNAS) with just one blocked nostril) were assigned in randomized order. Before the exercise a standard spirometry was executed in the same order.

Results: 12 healthy subjects (28.6±5.2 y, 50% males) performed the 4 CPETs within one month. Variables were analyzed at rest, at anaerobic threshold (AT) and at peak exercise. Compared to STD, eOR, and pNAS conditions, eNAS was associated with a significant lower peakVO₂, peakVCO₂, peak ventilation, respiratory rate, VE/VCO₂slope, respiratory exchange ratio, and workload (Figure and table). Moreover, forced expiratory volume and vital capacity at rest

were significantly lower, while peak inspiration and peak expiration time were significantly augmented. On opposite, no significant difference was detected at rest or AT. eNAS breathing Borg scale was significantly

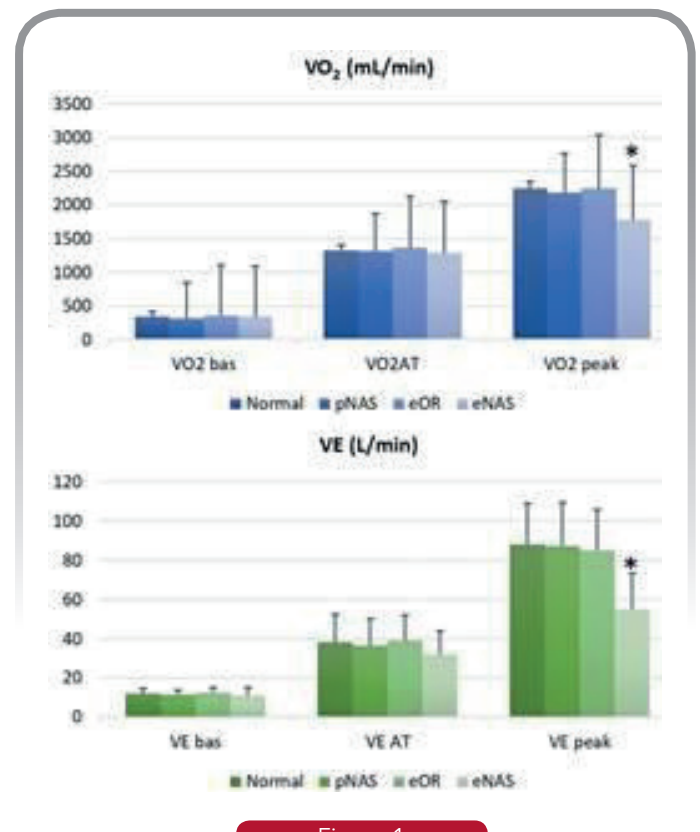


Figure 1

	Normal (N)	pNAS	eOR	eNAS	Rep measure
	mean ± SD	mean ± SD	mean ± SD	mean ± SD	p
Heart rate peak (bpm)	185 ± 10	185 ± 10	184 ± 11	175 ± 13	0.123
PeakVO ₂ (mL/min)	2240 ± 751	2184 ± 765	2241 ± 800	1777 ± 581*	0.021
PeakVO ₂ /kg	33.4 ± 6.3	32.5 ± 6.4	33.3 ± 7.0	28.0 ± 5.8*	0.008
PeakVO ₂ peak%	0.90 ± 0.15	0.88 ± 0.15	0.89 ± 0.16	0.76 ± 0.17*	0.005
VE/VCO ₂ slope	26.79 ± 4.27	28.61 ± 4.01	27.28 ± 4.27	24.89 ± 3.51*	0.021
VO ₂ /work (mL/W)	9.75 ± 0.73	9.55 ± 0.52	9.50 ± 0.72	9.42 ± 1.13	0.562
PeakVCO ₂ (mL/min)	2701 ± 860	2613 ± 967	2688 ± 969	2068 ± 729*	0.008
PeakVE (L/min)	88.2 ± 20.6	86.9 ± 22.4	84.8 ± 20.9	55.2 ± 18.3*	<0.001
Respiratory rate peak	41.3 ± 9.4	42.4 ± 9.0	40.0 ± 9.0	30.4 ± 10.6*	<0.001
Respiratory quotient	1.22 ± 0.08	1.20 ± 0.07	1.21 ± 0.08	1.10 ± 0.10*	0.027
Tidal volume peak (L)	2.21 ± 0.65	2.11 ± 0.59	2.20 ± 0.67	1.94 ± 0.64*	0.012
SatO ₂ peak (%)	96.8 ± 1.3	97.4 ± 1.0	96.8 ± 1.4	97.3 ± 1.8	0.54
PetCO ₂ peak (mmHg)	37.3 ± 5.6	35.9 ± 5.6	36.9 ± 4.9	45.0 ± 7.8*	<0.001
PetO ₂ peak (mmHg)	115.3 ± 5.2	116.0 ± 5.3	115.3 ± 4.8	105.3 ± 9.8*	0.007

Table 1

higher in all phases of the exercise. Spirometry showed a significant reduction in FEV1 in the eNAS condition.

Conclusion: In young healthy subjects, an exclusively nasal respiration is related with a significant impairment

on peak exercise capacity measured at CPET due to a ventilatory limitation, while is not significantly affecting metabolic parameters at rest and in a submaximal exercise.



ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 633
CARDIOLOGIA DELLO SPORT
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)

ATRIAL STRAIN IN SOLID ORGANS TRANSPLANTED SUBJECTS UNDER EXERCISE PRESCRIPTION PROGRAM

Melissa Orlandi (a), Marco Corsi (a), Laura Stefani (a)
 (a) SPORTS MEDICINE CENTER-UNIVERSITY OF FLORENCE

Introduction: atrial strain is an emerging parameter in the evaluation of diastolic dysfunction, particularly in subjects with preserved EF. In solid organ transplant recipients (OTR), cardiovascular mortality remains high even in the post-transplant phase as well the reduced exercise tolerance. Therefore the impact of eventual diastolic failure could play a role. Left atrial (LA) strain parameter by speckle tracking echocardiography (STE) has never been explored in this category. The study aimed to evaluate the contribution of the left atrial strain in the assessment of diastolic function of transplant recipients.

Materials and Methods: 68 solid OTR (liver and kidney transplanted), regularly trained at moderate intensity estimated by cardiopulmonary exercise test, underwent a complete echocardiographic analysis. Measured variables included left ventricle systolic function (ejection fraction: EF), global longitudinal strain (GLS), diastolic function (E/A and E/E'), LA indexed volumes, LA peak atrial longitudinal strain (PALS) and LA peak atrial contraction strain (PACS) measured by 4- and 2-chamber views. This group was compared to 52 healthy trained subjects (HTS).

Results: OTR showed significantly lower systolic function if compared to HTS, despite in the normal range (EF: 63,1±3,5% vs 66,9±6,1; p<0,001; GLS: -18,3±3,3% vs -19,7±2,9; p=0,03).

Diastolic standard parameters were slightly significantly different (E/A: 0,99±0,4 vs 1,8±0,6; p<0,001, E/E': 9,2±2,7 vs 6,7±1,8; p<0,001) although in presence of

normal LA volume (31,1±10 vs 26,1±10,7 ml; p=0,02), while LA strain was significantly lower in OTR vs TS (4C PALS: 33,7±9,7 vs 45,6±15,1; p<0,001 and 4C PACS: 15,9±6,7 vs 11,7±7,6; p=0,006; 2C PALS: 35,3±11,1 vs 47,7±15,5; p<0,001; 2C PALS: 17,4±4,9 vs 13,7±7,5; p=0,001).

Conclusions: LA strain could be useful in the early detection of diastolic dysfunction of OTR, despite normal LA volumes and normal standard diastolic evaluation. LA strain could support the diagnosis in early phase. This approach could be relevant especially in those subjects enrolled in the exercise prescription program.

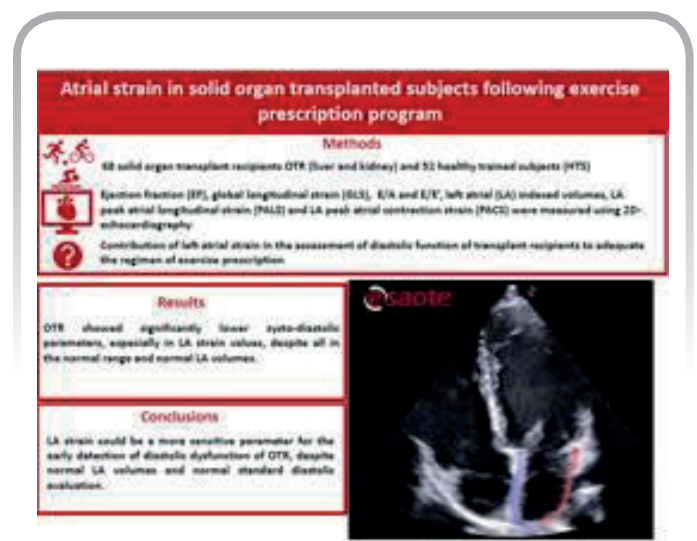


Figure 1

ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT 381 ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE (ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT) FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA) DIABETE E MALATTIE CARDIOVASCOLARI (DIABETE E MALATTIE DEL METABOLISMO)

RISPOSTA CARDIOVASCOLARE ALL'ESPOSIZIONE ACUTA ALL'ALTA QUOTA

Carlo Vignati (a, b), Alessandra Vetrini (a), Irene Mattavelli (a), Elisabetta Salvioni (a), Massimo Mapelli (a, b), Piergiuseppe Agostoni (a, b)

(a) CENTRO CARDIOLOGICO MONZINO, IRCCS; (b) DIPARTIMENTO DI SCIENZE CLINICHE E DI COMUNITA', UNIVERSITA' DEGLI STUDI DI MILANO

Premessa. La medicina d'alta quota è sempre più rilevante a causa dell'incremento del turismo montano di massa. I progressi tecnologici degli impianti di risalita hanno facilitato l'accesso a quote elevate. Questo ha portato ad un aumento del numero di persone esposte ad un ambiente ipossico- ipobarico, comprese quelle con patologie cardio-respiratorie. Poche dati sono presenti in letteratura su queste popolazioni.

Scopo. 1) Valutare le variazioni nei valori di pressione arteriosa, saturazione periferica d'ossigeno e frequenza cardiaca prima e durante l'esposizione all'alta quota. 2) Verificare l'influenza di parametri antropometrici (BMI, genere, età) e stili di vita (livello di attività fisica, fumo) sui cambiamenti osservati.

Materiali e metodi. Sono stati arruolati 136 volontari che hanno utilizzato le stazioni biometriche automatizzate Keito K9 per misurazioni fisiologiche (pressione arteriosa, frequenza cardiaca e SpO₂). valle (Entreves, 1300 m.s.l.m.) e monte (Punta Helbronner, 3466 m.s.l.m.) dopo una salita in funivia (Sky-way Monte Bianco) di circa 20 minuti. I soggetti hanno inoltre compilato un questionario per la raccolta di informazioni demografiche (età, genere) e abitudini di vita (fumo, livello di attività fisica).

Risultati. I livelli medi di saturazione dell'emoglobina si sono ridotti con salita in quota dal 98% all'86%, con una maggior deviazione standard rilevata a monte. Si è riscontrato un aumento statisticamente significativo

nei valori medi della frequenza cardiaca (circa 4 bpm). All'interno di un'ampia variabilità individuale è stato osservato un leggero aumento dei valori di pressione arteriosa diastolica (3 mmHg), mentre per la pressione sistolica la variazione non è risultata statisticamente significativa. Il sottogruppo dei fumatori (11% dei partecipanti) presentava dei valori di pressione in media più elevati già nelle misurazioni effettuate a valle. La desaturazione alla stazione a monte è risultata più marcata in questo sottogruppo rispetto alla media generale (-17% vs -12%) e statisticamente significative. Nessuna differenza tra i due gruppi per quanto riguarda i valori di frequenza cardiaca. I partecipanti più anziani hanno mostrato una maggior variabilità, assieme ad una più significativa riduzione di SPO₂ ed un incremento di FC. I volontari di sesso maschile hanno mostrato una tendenza maggiore all'aumento dei valori di PA e FC rispetto alla controparte femminile. I soggetti con valori più elevati di BMI hanno mostrato una riduzione più marcata di SPO₂ e un aumento maggiore della FC.

Conclusioni: I soggetti più anziani, fumatori e con un BMI più elevato hanno mostrato una maggiore suscettibilità all'ambiente ipossico-ipobarico, suggerendo la necessità di studi in determinate popolazioni con l'implementazione di linee guida apposite. Ulteriori ricerche, con campioni più ampi e diversificati, sono necessarie per affinare la nostra conoscenza delle modificazioni acute dell'organismo all'esposizione acuta all'alta quota.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ

CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 77

CARDIOTOSSICITÀ DA FARMACI (CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)

DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ (CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)

MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)

COMBINATION THERAPY WITH SEMAGLUTIDE AND INCLISIRAN REDUCES SYNERGISTICALLY ANTHRACYCLINE-INDUCED CARDIOTOXICITY UNDER HYPERLIPIDEMIA : IMPLICATIONS IN PREVENTION OF CTRCD IN CANCER PATIENTS

Vincenzo Quagliariello (a), Maria Canale (e), Irma Bisceglia (b), Andrea Paccone (a), Fabrizio Maurea (a), Marino Scherillo (c), Ilaria Giacobbe (a), Vienna Giordano (a), Francesca Izzo (a), Raffaele Arianna (a), Matteo Barbato (a), Massimiliano Berretta (d), Domenico Gabrielli (b), Nicola Maurea (a)

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(b) SAN CAMILLO FORLANINI, ROMA; (c) OSPEDALE SAN PIO BENEVENTO, BENEVENTO, ITALY;
(d) UNIVERSITY OF MESSINA; (e) OSPEDALE DI VERSILIA, LIDO DI CAMAIORE, ITALY;
(f) SACRO CUORE DON CALABRIA, NEGRAR DI VALPOLICELLA

Background: Recent meta analyzes have highlighted the key role of oxLDL in cardiovascular risk in patients with/without cancer through the stimulation of pro-inflammatory signaling. GLP-1 receptor agonists, like semaglutide, have shown cardiorenal benefits in patients with/without diabetes, proposing themselves as a new cardioprotective strategy in a broad patient setting. PCSK9i inclisiran exerts cardiovascular benefits through intrahepatic and extrahepatic functions, involving myocardial tissue. High risk patients with hyperlipidemia and treated with anthracyclines need new pharmacological strategies to reduce the magnitude of CTRCD and reduce overall mortality.

Purpose: We report for the first time the results of the use of combination therapy with a glucagon- like peptide-1 receptor agonist and PCSK9i for the primary prevention of anthracycline-mediated cardiotoxicity.

Methods: Human cardiomyocytes (HFC cell line) were exposed to subclinical concentration of doxorubicin, (200 nM), alone or in combination with inclisiran (100 nM) and or semaglutide (100 nM) for 48h under exposure to 200µg/ml oxLDL (hyperlipidemia). After the incubation period, we performed the following tests: determination of cell viability, through analysis of mitochondrial dehydrogenase activity, study of lipid peroxidation (quantifying cellular

Malondialdehyde and 4- hydroxynonenal), intracellular Ca²⁺ homeostasis. Moreover, pro-inflammatory studied were also performed (activation of NLRP3; expression of TLR4/MyD88; mTORC1 FoxO1/3a; transcriptional activation of p65/NF-κB and expression of cytokines involved in cardiotoxicity (IL-1α, IL-1β, IL-2, IL-4, IL-6, IL-10, IL-12, IL17-α, IFN-γ, TNF-α, G-CSF, GM-CSF).

Results: Inclisiran and semaglutide co-incubated with doxorubicin exert synergistic and significant cardioprotective effects, compared to monotherapy regimens, enhancing cell viability of 74,7-88,4 % compared to doxorubicin-oxLDL treated cells (p<0,01 for all). Significant reductions of oxidative stress, ferroptosis and intracellular levels of NLRP-3, MyD88, p65NF-KB, IL-1α, IL-1β, IL-6, IL-12, IL17-α, TNF-α, G-CSF were seen in semaglutide/inclisiran group vs only doxo groups under oxLDL exposure (p<0.05); contrary, IL-10 was significantly increased.

Conclusion: For the first time, combination therapy with Semaglutide and PCSK9i inclisiran was effective and superior, compared to monotherapy, to reduce anthracycline-mediated cardiotoxicity through different signalling pathways. The overall picture of the study warrant on the use of semaglutide and PCSK9i in primary prevention of CTRCD in cancer patients with hyperlipidemia.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 79
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO)

COMBINATION THERAPY WITH SEMAGLUTIDE AND DAPAGLIFLOZIN REDUCES SYNERGISTICALLY DOXORUBICIN-MEDIATED CARDIOTOXICITY UNDER HYPERGLYCEMIA: IMPLICATIONS IN PRIMARY PREVENTION OF CTRCD IN CANCER PATIENTS WITH DIABETES

Vincenzo Quagliariello (a), Irma Bisceglia (c), Maria Canale (f), Marino Scherillo (d), Alessandro Inno (g),
 Fabrizio Maurea (a), Ilaria Giacobbe (a), Massimiliano Berretta (b), Domenico Gabrielli (c),
 Massimo Trematerra (a), Nicola Maurea (a)

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 (b) UNIVERSITY OF MESSINA; (c) OSPEDALE SAN CAMILLO FORLANINI, ROMA, ITALY; (d) OSPEDALE SAN PIO
 BENEVENTO, ITALY; (e) UNIVERSITY OF SALERNO; (f) OSPEDALE VERSILIA, LIDO DI CAMAIORE, ITALY;
 (g) OSPEDALE SACRO CUORE DON CALABRIA, ITALY

Background: Hyperglycemia and advanced glycation end products (AGES) are key players of heart failure and atherosclerosis in patients with/without cancer through the stimulation of pro-inflammatory signaling. GLP-1 receptor agonists exerts cardiorenal benefits in patients with/without diabetes, proposing themselves as a new cardioprotective strategy in a broad patient setting, including patients with T2DM. Dapagliflozin have beneficial cardiorenal properties, including the improvement of systolic and diastolic functions, increases in calcium homeostasis, reduction of afterload and oxidative stress, improvement of mitochondrial functions in cardiomyocytes. Cancer patients with hyperglycemia are exposed to very high risk of heart failure and need new pharmacological strategies to reduce the magnitude of CTRCD.

Purpose: We report for the first time the results of the use of combination therapy with a glucagon-like peptide-1 receptor agonist and Dapagliflozin for the primary prevention of anthracycline-mediated cardiotoxicity under hyperglycemia.

Methods: Human cardiomyocytes (HFC cell line) were

exposed to subclinical concentration of doxorubicin, (200 nM), alone or in combination with dapagliflozin (50 nM) and/or semaglutide (100 nM) for 48h under hyperglycemia (25mM). After the incubation period, we performed the following tests: determination of cell viability, through analysis of mitochondrial dehydrogenase activity, study of lipid peroxidation (quantifying cellular Malondialdehyde and 4-hydroxynonenal), intracellular Ca²⁺ homeostasis. Moreover, pro-inflammatory studied were also performed (activation of NLRP3; expression of TLR4/MyD88; mTORC1 FoxO1/3a; transcriptional activation of p65/NF-κB and expression of cytokines involved in cardiotoxicity (IL-1α, IL-1β, IL-2, IL-4, IL-6, IL-10, IL-12, IL17-α, IFN-γ, TNF-α, G-CSF, GM-CSF).

Results: Dapagliflozin and semaglutide co-incubated with doxorubicin exerts synergistic and significant cardioprotective effects, compared to monotherapy regimens, enhancing cell viability of 87.9-94.2 % compared to only DOXO treated cells under high glucose (p<0,001 for all). Significant reductions of oxidative stress, ferroptosis and intracellular levels of NLRP-3, MyD88, p65NF-KB, IL-1α, IL-1β, IL-6, IL-



12, IL17- α , TNF- α , G-CSF were seen in semaglutide/dapagliflozin group vs only DOXO groups under hyperglycemia ($p < 0.01$).

Conclusion: For the first time, Combination Therapy With Semaglutide and Dapagliflozin exerts synergistic

anti-inflammatory effects to reduce anthracycline-mediated cardiotoxicity through NLRP-3, Myd-88 and. The overall picture of the study warrant on the use of semaglutide and dapagliflozin in primary prevention of CTRCD in cancer patients with diabetes.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 5
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT)
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)

VALUTAZIONE DELLA CAPACITÀ DI ESERCIZIO MEDIANTE TEST DA SFORZO CARDIOPOLMONARE (CPET) NEI PAZIENTI ONCOLOGICI ANZIANI SOTTOPOSTI A TRATTAMENTI ANTINEOPLASTICI

Umberto Attanasio (a), Antonio Carannante (a), Alessandra Cuomo (a), Paolo Parrella (a), Giacomo Campi (a), Martina Iengo (a), Francesco Fiore (a), Lidia Cicia (a), Ester Topa (a), Remo Poto (a), Giancarlo Marone (b), Luigi Formisano (c, d), Roberto Bianco (c, d), Chiara Carlomagno (c, d), Marco Picardi (c), Carminia Maria Della Corte (e), Morena Fasano (e), Erika Martinelli (e), Stefania Napolitano (e), Teresa Troiani (e), Nicola Ferrara (a), Pasquale Abete (a), Valentina Mercurio (a, d, f), Carlo Gabriele Tocchetti (a, d, f, g)

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Obiettivi dello studio. L'utilizzo del Test da Sforzo Cardiopolmonare (CPET) per misurare la capacità funzionale è stato già ampiamente studiato nei pazienti affetti da malattie cardiovascolari. In questo studio prospettico miriamo ad esplorare il possibile ruolo del CPET in pazienti oncologici ed a valutare la capacità di esercizio e la sua variazione con la somministrazione delle terapie oncologiche in questi pazienti.

Materiali e metodi. Abbiamo analizzato 77 CPET massimali di pazienti oncologici anziani, valutandone la capacità funzionale. I CPET sono stati eseguiti prima dell'inizio (t0), durante (t1) ed alla fine (t2) del trattamento antineoplastico. Il principale outcome era la morte per tutte le cause.

Risultati. I CPET eseguiti al t0 e t1 hanno mostrato una ridotta VO2 di picco se comparate ai CPET eseguiti al t2. Inoltre al t2 è stato in media raggiunto un

maggior carico lavorativo massimo ed un prolungato tempo di esercizio se comparato al t0 ed al t1. E' interessante notare che il massimo carico lavorativo raggiunto e la VO2 raggiunta alla soglia anaerobica risultavano più basse, mentre il quoziente respiratorio (RER) risultava più alto nei CPET eseguiti al t1. Il polso di ossigeno (VO2/HR) risultava più alto dopo le terapie e più basso durante il trattamento oncologico. Queste differenze risultavano ancor più accentuate nei CPET dei pazienti che venivano sottoposti a trattamenti a base di antracicline e quando venivano comparati i test dei pazienti che sarebbero morti durante il follow-up (G1) VS quelli dei pazienti sopravvissuti (G2).

Conclusioni. Il CPET potrebbe rappresentare un utile strumento per la valutazione della capacità di esercizio e l'individuazione di alterazioni muscolari e metaboliche nei pazienti oncologici anziani. L'efficacia



cia di questa metodica nel predire la sopravvivenza o l'aumentata incidenza di eventi cardiovascolari nei pazienti con cancro non è ancora del tutto compresa; sono pertanto necessari ulteriori studi per de-

finire il possibile ruolo del CPET nella valutazione dei benefici dell'esercizio aerobico guidato come potenziale prescrizione "terapeutica" nei pazienti oncologici.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 653
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

CAR-TOX: INFLAMMATION AND ACUTE CARDIOTOXICITY IN ADULT HEMATOLOGICAL PATIENTS TREATED WITH CAR-T CELLS: RESULTS FROM A PILOT PROOF-OF-CONCEPT STUDY

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(a) DEPARTMENT OF CARDIOVASCULAR MEDICINE, POLICLINICO UNIVERSITARIO AGOSTINO GEMELLI, ROMA

Aims: Chimeric Antigen Receptor-T (CAR-T) cell infusion is a rapidly evolving antitumor therapy; however, cardiovascular (CV) complications, likely associated with cytokine release syndrome (CRS) and systemic inflammation, have been reported to occur. The CARdio-Tox study aimed at elucidating incidence and determinants of cardiotoxicity related to CAR-T cell therapy.

Methods: Patients with blood malignancies candidate to CAR-T cells were prospectively evaluated by echocardiography at baseline and 7 and 30 days after infusion. The study endpoints were i) incidence of cancer therapy-related cardiac dysfunction (CTRCD), CTRCD were also balanced for any grade CRS, but CTRCD occurred of Cardiology Guidelines on Cardio-Oncology (decrements of left ventricular ejection

fraction (LVEF) or global longitudinal strain (GLS) and/or elevations of cardiac biomarkers (high sensitivity troponin I, natriuretic peptides) and ii), correlations of echocardiographic metrics with inflammatory biomarkers.

Results: Incidence of CTRCD was high at 7 days (59,3%), particularly in subjects with CRS. The integrated definition of CTRCD allowed the identification of the majority of cases (50%). Moreover, early LVEF and GLS decrements were inversely correlated with fibrinogen and interleukin-2 receptor levels (p always ≤ 0.01).

Conclusions: There is a high incidence of early CTRCD in patients treated with CAR-T cells, and a link between CTRCD and inflammation can be demonstrated. Dedicated patient monitoring protocols are advised.

CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 704
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

SECONDARY CARDIOVASCULAR PREVENTION STRATEGIES IN A REAL-LIFE COHORT OF CANCER PATIENTS UNDERGOING PERCUTANEOUS CORONARY REVASCULARIZATION

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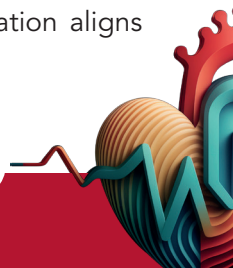
(a) UNIT OF CARDIOVASCULAR SCIENCE, FONDAZIONE POLICLINICO UNIVERSITARIO CAMPUS BIO-MEDICO, ROME, ITALY

Introduction: Patients with cancer undergoing percutaneous coronary intervention (PCI) have both high cardiovascular and hemorrhagic risk. As a result, they less frequently receive aggressive antithrombotic therapies and other secondary prevention strategies compared with patients without neoplasms and receiving coronary stenting. Moreover, due to their poorer prognosis, they are often excluded from trials and registries that investigate long-term PCI outcomes. Therefore, we analyzed real-world data on neoplastic patients after PCI, focusing on differences in cardiovascular drug prescriptions between neoplastic and non-neoplastic patients and comparing clinical practice with current evidence and guidelines.

Methods: This retrospective analysis considered 1,199 patients (379 neoplastic patients vs. 820 controls) with acute or chronic coronary syndrome undergoing PCI from 2009 to 2023. We collected data on discharge therapy from both groups by analyzing differences in antithrombotic prescriptions, lipid-lowering therapies, anticoagulation in atrial fibrillation (AF) and PCI, beta-adrenergic blocking therapy, ARNI, and SGLT2 inhibitors.

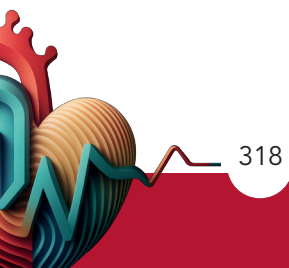
Results: Considering a similar percentage of patients with acute syndromes, the 12-month DAPT prevalence was comparable between the two groups (28% vs. 31%, $p = 0.198$). As expected, a large cohort of neoplastic patients received 1-month DAPT (32% vs. 9%, $p < 0.001$). Most neoplastic patients were prescribed clopidogrel regardless of the clinical syndromes, whereas fewer patients received more aggressive P2Y12 inhibitors (8% vs. 14%, $p = 0.004$). Moreover, despite a higher prevalence of atrial fibrillation in the neoplastic group (20% vs. 13%), only 13% of these patients received triple antithrombotic therapy with anticoagulation. Statin and ezetimibe prescriptions were also significantly lower in neoplastic patients (86% vs. 92%, $p=0.005$ and 12% vs. 36%, $p<0.0001$, respectively). Beta-adrenergic blocking therapy was significantly underrepresented in neoplastic patients (68% vs. 75%, $p = 0.012$), as well as ARNI prescription (0.8% vs. 4%, $p < 0.001$). Furthermore, although both groups had a similar prevalence of diabetes mellitus and heart failure, few neoplastic patients received SGLT2 inhibitors (0.8% vs. 3.1%, $p = 0.069$).

Conclusion: In our population, DAPT duration aligns



with current guidelines for both neoplastic and non-neoplastic patients. However, the higher bleeding risk of these patients strongly impacts antithrombotic management since we observed a significant under-prescription of more aggressive antiplatelet drugs in the acute setting. Moreover, a reduced percentage of neoplastic patients with atrial fibrillation did not receive an appropriate triple strategy after PCI.

Other secondary prevention strategies were also underrepresented in the neoplastic group, potentially exposing these patients to a higher cardiovascular risk. Finally, the cautious use of ARNI and SGLT2 inhibitors in cancer patients after PCI highlights a tendency to not achieve optimal medical therapy in oncologic patients with heart failure.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 358
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

VALUTAZIONE DI POTENZIALI NUOVI PREDITTORI MOLECOLARI DI CARDIOTOSSICITÀ IN PAZIENTI CON CARCINOMA MAMMARIO IN TRATTAMENTO CHEMIOTERAPICO SOTTOPOSTI A MONITORAGGIO MULTIPARAMETRICO CLINICO, BIOUMORALE ED ECOCARDIOGRAFICO

Girolamo Manno (d), Daniela Di Lisi (d), Clarissa Filorizzo (a), Cristina Madaudo (d), Antonino Savarino (c), Dario Savarino (b), Scipione Carerj (b), Salvatore Novo (d), Antonio Russo (a), Giuseppina Novo (d)

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(b) DIVISIONE DI CARDIOLOGIA, DIPARTIMENTO DI MEDICINA SPERIMENTALE E CLINICA, UNIVERSITA DI MESSINA; (c) U.O.C ONCOLOGIA MEDICA - OSPEDALE S. GIOVANNI DI DIO DI AGRIGENTO; (d) DIVISIONE DI CARDIOLOGIA, DIPARTIMENTO DELLA PROMOZIONE DELLA SALUTE MATERNO-INFANTILE, MEDICINA INTERNA E ALTA SPECIALIZZAZIONE E D'ECCELLENZA (PROMISE) G. D'ALESSANDRO - UNIVERSITA DI PALERMO

Background: I farmaci antineoplastici utilizzati nel trattamento del carcinoma mammario possono causare complicanze cardiovascolari talvolta anche severe. L'obiettivo del nostro studio è stato eseguire una valutazione multiparametrica che tenesse conto di nuovi predittori molecolari di cardiotoxicità. In particolare, abbiamo indagato il ruolo delle varianti patogenetiche del gene BRCA, implicato nella patogenesi di tumori ereditari della mammella.

Materiali e Metodi: è uno studio osservazionale, multicentrico, prospettico, condotto in diverse Unità Operative di cardiologia e oncologia in Sicilia, dal febbraio 2021 al febbraio 2024. Sono state arruolate donne asintomatiche con carcinoma mammario di nuova diagnosi, candidate a terapia con antracicline. Tutte le pazienti sono state sottoposte a esame ecocardiografico bidimensionale standard completo e valutazione degli indici di deformazione miocardica mediante speckle tracking echocardiography (STE). Il trattamento che-

mioterapico standard è stato Epirubicina + Ciclofosfamide, seguito da Paclitaxel. È stato eseguito il test genetico per BRCA su sangue periferico e identificazione di varianti patogenetiche (VP) tramite Next Generation Sequencing (NGS). La popolazione dello studio è stata suddivisa in due gruppi in base alla presenza di varianti di BRCA1. Le pazienti sono state valutate al T0, a 3 mesi (T1), 6 mesi (T2), 12 mesi (T3) e 24 mesi (T4).

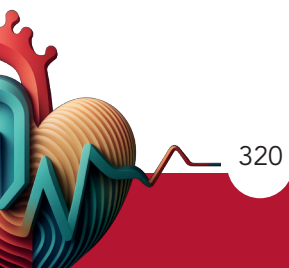
Risultati: sono stati arruolate consecutivamente 96 pazienti di cui 50 hanno completato il follow up (età media 48.6 ± 8.7 anni). L'istotipo più frequente è stato il carcinoma duttale infiltrante (72%). Al test genetico 13 pazienti hanno presentato VP per BRCA1. Sono state riscontrate riduzioni significative nei parametri ecocardiografici standard 2D (frazione di eiezione VSx e TAPSE) solo tardivamente, a partire dal T3. Invece le metodiche STE sono risultate più sensibili come predittori di cardiotoxicità sin dai primi mesi del follow up (T1-T2). Il GLS del VSx e VDx hanno mostrato riduzioni



significative consensuali all'aumento dei valori di NT-proBNP e troponina T Hs. In base alla presenza di varianti BRCA1 abbiamo identificato due sottogruppi: sottogruppo A (BRCA mutato) con 13 pazienti e sottogruppo B (wild type) con 37 pazienti. Non vi erano differenze significative tra i due sottogruppi in termini di fattori di rischio CV, HFA-ICOS score e parametri bioumorali. I parametri di STE e FE invece hanno mostrato variazioni significative solo nel gruppo BRCA mutato. Nel gruppo BRCA mutato, 7 su 13 pazienti sviluppano cardiotoxicità lieve al T3 e 1 paziente cardiotoxici-

tà severa. Nel gruppo cardiotoxicità wild type solo 5 pazienti su 37 hanno sviluppato cardiotoxicità lieve e nessuno severa (p value <0,05).

Conclusioni: il nostro studio ha confermato che il GLS del VS è un predittore sensibile di cardiotoxicità riducendosi significativamente durante il follow-up, prima della comparsa di alterazioni della FE. La presenza di VP di BRCA potrebbe essere utilizzata come predittore indipendente di rischio di sviluppare cardiotoxicità.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 76

CARDIOTOSSICITÀ DA FARMACI (CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)

DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ (CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)

FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO)

COMBINATION THERAPY WITH SEMAGLUTIDE AND VERICIGUAT AS AN EFFECTIVE THERAPY OF 5-FU INDUCED CARDIOTOXICITY IN CANCER PATIENTS: PRELIMINARY EVIDENCES IN CARDIONCOLOGY

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Background: Patients treated with 5-FU are exposed to high risk of acute chest pain, myocardial infarction, heart failure, arrhythmias, and sudden cardiac death. These patients need new cardioprotective strategies to reduce cardiovascular mortality. Vericiguat is a soluble guanylate cyclase (sGC) stimulator. It is used for the treatment of heart failure characterized by reduced ejection fraction. GLP-1 receptor agonists, like semaglutide, have shown cardiorenal benefits in patients with/without diabetes, proposing themselves as a new cardioprotective strategy in a broad patient setting.

Purpose: We report for the first time the results of the use of combination therapy with a glucagon-like peptide-1 receptor agonist and sGCa for the treatment of 5-FU cardiotoxicity through NLRP3 pathways

Methods: Human cardiomyocytes (HFC cell line) were exposed to subclinical concentration of 5-FU (75 μ M) alone or in combination with vericiguat (10 μ M) and/or semaglutide (100 nM) for 48h. After the incubation period, we performed the following tests: determination of cell viability, through analysis of mitochondrial dehydrogenase activity, study of lipid peroxidation (quantifying cellular Malondialdehyde and 4-hydroxynonenal), cyclooxygenase-2 (COX-2) levels intracellular Ca²⁺ homeostasis. Moreover, pro-

inflammatory studied were also performed (activation of NLRP3; expression of TLR4/MyD88; mTORC1 FoxO1/3a; transcriptional activation of p65/NF- κ B and expression of cytokines involved in cardiotoxicity (IL-1 α , IL-1 β , IL-2, IL-4, IL-6, IL-10, IL-12, IL17- α , IFN- γ , TNF- α , G-CSF, GM-CSF).

Results: Vericiguat and semaglutide co-incubated with 5-FU exerts additive cardioprotective effects, compared to monotherapy regimens, enhancing cell viability of 57.2-66.8 % compared to only 5-FU treated cells ($p < 0,001$ for all). A consistent reduction in COX-2 levels in cardiomyocytes were seen (-68.8% vs only 5-FU group); significant reductions of MDA, ferroptosis and intracellular levels of NLRP-3, MyD88, p65NF-KB, IL-1 α , IL-1 β , IL-6, IL-12, IL17- α , TNF- α , G-CSF were seen in semaglutide/vericiguat group vs only 5-FU group ($p < 0.001$).

Conclusion: For the first time, combination therapy with semaglutide and vericiguat was effective and superior, compared to monotherapy, to reduce 5-FU mediated cardiotoxicity through inflammasome and COX-2 pathways. The overall picture of the study warrent on the use of semaglutide and vericiguat in primary prevention of 5-FU induced cardiovascular events in cancer patients.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 601
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

**GESTIONE MULTIDISCIPLINARE DEL PAZIENTE ONCOLOGICO: UN PARTICOLARE CASO DI TOSSICITÀ
 CARDIOVASCOLARE DA TARGET THERAPY**

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Introduzione: I progressi nella terapia oncologica hanno ridotto significativamente i tassi di mortalità per patologie neoplastiche. Tuttavia, l'incremento della sopravvivenza ha reso rilevante la problematica della tossicità cardiovascolare correlata a queste terapie. Il caso in oggetto tratta di una paziente affetta da melanoma metastatico (stadio III b) in trattamento con Dabrafenib e Trametinib, farmaci impiegati come target therapy, inibitori rispettivamente di BRAF e MEK.

Presentazione del caso: paziente di 40 anni di sesso femminile, accede in pronto soccorso per dolore retrosternale trafittivo, non irradiato e non esacerbato dai movimenti, associato a dispnea per sforzi lievi. Agli esami di laboratorio riscontro di anemia lieve, incremento della creatininemia, lieve piastrinopenia (con valori tendenti alla normalità durante la degenza), elevazione degli indici di flogosi, lieve aumento della troponina con andamento a plateau, pro BNP elevato, LDH aumentato. All'ecocardiogramma riscontro di disfunzione ventricolare sinistra moderata (FE 40%) con dilatazione del VSx, atrio sinistro dilatato, IM moderata funzionale, minimo versamento pericardico. All'ECG onde T negative difasiche nelle derivazioni precordiali, in DI e aVL.

Di rilievo in anamnesi patologica remota, circa un

anno prima, intervento di exeresi chirurgica per melanoma con metastasi linfonodali, per cui era stata avviata terapia medica adiuvante con Trametinib e Dabrafenib in associazione; tre mesi dopo ricovero in Cardiologia per sospetta perimiocardite, per cui veniva momentaneamente sospesa la terapia oncologica (ravviata successivamente al miglioramento del quadro clinico cardiologico).

In considerazione del nuovo ricovero e della ripresa della sintomatologia, viene ancora una volta sospesa la terapia adiuvante. Nel sospetto di una recidiva di perimiocardite, è stata impostata terapia antinfiammatoria (ibuprofene e colchicina) mentre, in considerazione del nuovo quadro di scompenso cardiaco, viene impostata terapia cardioprotettiva con ACE inibitore, antialdosteronico, beta-bloccante e diuretico dell'ansa con successivo miglioramento della funzionalità cardiaca (FE 47%) e della sintomatologia della paziente. Nonostante un iniziale incremento della funzionalità cardiaca e renale, sopraggiunge un'insufficienza renale acuta per cui viene sospesa tutta la terapia nefrotossica.

L'evoluzione successiva è stata caratterizzata da un declino inesorabile della funzionalità renale, anemia marcata (6-7 g/dl Hb), lieve piastrinopenia, consumo dell'aptoglobina, peggioramento della funzionalità cardiaca e aumento dei valori di pressione arteriosa.

La complessità del caso ha richiesto una collaborazione multidisciplinare tra cardiologi, nefrologi, ematologi ed oncologi, fino alla diagnosi di sindrome emolitica uremica atipica secondaria a trattamento con target therapy, per cui è stata tempestivamente intrapresa terapia con plasmateresi e corticosteroidi e successivo trasferimento nel reparto di nefrologia per competenza.

Conclusione: A un mese dall'evento acuto, al con-

trollo ECOCG, totale recupero della funzionalità cardiaca (FE 60%); tuttavia è stato necessario intraprendere una terapia dialitica peritoneale.

Il caso rimane aperto con numerosi interrogativi, vista la complessità nella gestione del paziente neoplastico e della fisiopatologia della tossicità cardiovascolare, obbligandoci a trovare un equilibrio tra possibili effetti avversi cardiovascolari e l'aumento della sopravvivenza.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 799
EMBOLIA POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
PATOLOGIA DELLE VENE (MALATTIE DEI VASI)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

INFERIOR VENA CAVA FILTER TO SUCCESSFULLY MANAGE ANTICOAGULANT FAILURE BEFORE OVARIAN CANCER SURGERY IN A PATIENT WITH RECURRENT VEIN THROMBOTIC EVENTS. A SPECIAL CLINICAL CASE

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Introduction: Cancer-associated thrombosis is the second leading cause of death in cancer, leading to anticancer drugs delays or interruptions.

Case report: A 55 y-o woman, with hypertension and severe obesity (120 Kg), was treated with warfarin for lower limbs (LL) recurrent superficial vein thrombosis. She was diagnosed with ovarian cancer complicated by clinical relevant non major bleedings (ISTH criteria), thus her treating clinician replaced warfarin with enoxaparin 8000 IU/die. Admitted to our hospital for surgery, she complained shortness of breath at exertion without further meaningful symptoms. Echocardiogram (EF: 65%) and carotid duplex ultrasound (DU) were normal, Holter Ecg showed rare supraventricular and ventricular ectopic beats treated with bisoprolol. A previous bilateral saphenectomy esited in chronic venous insufficiency CEAP Class 3. Troponin was negative. Ddimers were increased (7000 ng/ml) and a LLDU revealed a right popliteal deep vein thrombosis (DVT). We replaced enoxaparin with fondaparinux 10 mg/die and postponed surgery. After 1 month a follow up LLDU showed DVT regression. Nevertheless, a CT scan detected an incidental pulmonary embolism of the

subsegmentary branches of the right pulmonary artery. Troponin was negative and Ddimers resulted further increased (23102 ng/ml). Accordingly, we placed an inferior vena cava filter (IVCF) in order to prevent venous thrombotic events post surgery without withdrawing anticoagulant therapy, adding compression therapy with elastic stockings. The gynecological tumor was successfully resected. After 1 month we replaced fondaparinux with edoxaban 60 mg 1 cp/die (GFR 72 ml/min). In accordance with the interventional radiologist and the oncologist, we planned the filter removal date but she refused it because she felt more secure with a placed IVCF. After surgery the patient started anticancer agents and during a cardioncological visit for surveillance she was asymptomatic, EF was 60%, LLDU was negative for DVT, troponin was negative and Ddimers were reduced (165 ng/ml).

Conclusions: Vein thrombosis (VT) in cancer is more aggressive compared with non cancer population with a high rate of recurrence. Cancer surgery increases the risk of thrombosis of 4-fold in comparison to non cancer surgery with higher mortality rate. IVCF is a valuable option for mechanical VT prophylaxis if anticoagulant

therapy fails. In this clinical case, a severely obese patient with ovarian cancer presented a DVT relapse despite full anticoagulant therapy and the placement of an IVCF was particularly useful in preventing surgical VT complications. To date, a huge clinical issue still

remains due to the high rate of patients placed with IVCF that are lost at follow up like in this case, since a long indwelling time compromises safety. Studies to test the optimal strategy for mechanical surgical prophylaxis with IVCF are still desperately warranted.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 339
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE) PREVENZIONE CARDIOVASCOLARE:
INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

UTILITÀ DEL GRASSO EPICARDICO E DEL CALCIUM SCORE NELLA PREDIZIONE DEL RISCHIO DI CARDIOTOSSICITÀ IN PAZIENTI CON TUMORI GASTROINTESTINALI

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Background: La stratificazione del rischio di sviluppare cardiotossicità costituisce un momento cruciale prima di iniziare il trattamento antineoplastico nei pazienti con cancro al fine di correggere i fattori di rischio cardiovascolare, ottimizzare la gestione delle patologie cardiache concomitanti e così prevenire l'insorgenza di complicanze.

L'obiettivo del seguente studio è valutare l'utilità del grasso epicardico e del calcium score (CAC score), ad una TC basale di stadiazione del tumore, nel fornire informazioni aggiuntive oltre i tradizionali score di rischio (HFA/ICOS e SCORE2/OP) nella stratificazione del rischio di cardiotossicità.

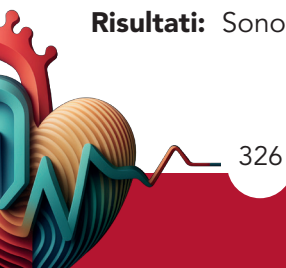
Metodi: È stato condotto uno studio osservazionale in pazienti con tumori gastrointestinali in trattamento con fluoropirimidine e/o VEGF inibitori. Sono stati valutati anamnesi, esami laboratoristici, ECG e ecocardiogramma, al basale e al follow-up e calcolati i punteggi SCORE2 e HFA-ICOS. Sono stati calcolati il volume (EFV) e la densità del grasso epicardico e CAC score. Dopo un periodo medio di 12 mesi è stata valutata l'insorgenza di eventi avversi cardiovascolari.

Risultati: Sono stati arruolati 32 pazienti di cui 21

maschi e 11 femmine con età media di 66 ± 12 anni. Dopo un follow up medio di 12 mesi si sono verificati 23 eventi avversi cardiovascolari. Lo SCORE2 valutato al basale (AUC 0.56) e l'HFA/ICOS (AUC 0.54) non si sono dimostrati accurati predittori di eventi avversi cardiovascolari. La densità del grasso epicardico (AUC 0.68), EFV del grasso epicardico (AUC 0.76) e il CAC (AUC 0.71) si sono dimostrati predittori più accurati. Un EFV > 186 cm³ è stato riscontrato essere il valore che con la maggiore sensibilità (67%) e la maggiore specificità (80%) predice eventi cardiovascolari.

Conclusioni: Lo SCORE2/OP ha dimostrato una maggiore accuratezza predittiva rispetto all'HFA-ICOS score nel predire il rischio di cardiotossicità in pazienti trattati con fluoropirimidine. L'EFV è risultato essere il più significativo parametro predittivo di eventi cardiovascolari e potrebbe implementare la stratificazione del rischio tramite SCORE2/OP. Un valore di EFV > 186cm³ ha dimostrato la migliore sensibilità e specificità nel predire gli eventi.

Il nostro studio retrospettivo indica che l'EFV potrebbe essere un utile predittore del rischio di cardiotossicità nei pazienti oncologici. Sono necessari studi prospettici più ampi per confermare i nostri risultati.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 346
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

EFFECTIVENESS OF CARDIOVASCULAR PREVENTION IN HIGH RISK PATIENTS WITH LYMPHOMA

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Background: Recent progress in cancer therapy improved overall survival rate in patients with lymphoma. Unfortunately cancer therapy-related cardiovascular toxicity (CTRCV) increased in cancer survivors. Thus, oncological and cardiological prevention should be used to prevent late cardiovascular complications in cancer patients. The primary aim of this study was to assess the onset of cancer therapy-related cardiac dysfunction (CTRCD) in patients with lymphoma. Secondary aim was to evaluate the role of cardiovascular risk factors, cardioprotective therapy (the use of ACEI/sartans, beta blockers and/or statins) and other preventive strategies (use of liposomal anthracyclines) in reducing the risk of CTRCD in cancer survivors.

Methods: We prospectively collected data from 60 patients with lymphoma (44 M, 16 F; median age 58 ± 10 years old) treated with anthracyclines. Cardiological examination including electrocardiogram and echocardiogram was performed in all patients. Speckle tracking echocardiography was performed measuring left ventricular global longitudinal strain (GLS). Baseline cardiovascular risk was assessed using HFA-ICOS risk score. Cardiovascular events were assessed after a median time of 3 years: all causes death, arrhythmias, CTRCD development, myocardial ischemia.

Results: We found that 28% of patients were at high risk, 39% at moderate risk, 33% at low risk of cardiotoxicity, based on HFA/ICOS score. Liposomal anthracyclines has been used in 86% of patients at high risk; statin and ACEI/sartans and/or betablockers has been started in high risk patients, according to ESC guidelines on Cardio-Oncology. At follow up, we did not find in general population significant changes in echocardiographic parameters (LVEF and GLS). 8 patients died during follow-up (high risk patients); CTRCD occurred in 3 patients at moderate risk and in 4 patients at high risk (patients untreated with liposomal anthracyclines and that had discontinued cardioprotective drugs); no events occurred in low risk patients. We calculated the correlation between high risk not associated with preventive strategies and high risk associated with preventive strategies: high risk not associated with cardioprotection correlated significantly with the development of CTRCD (odds ratio 1, p value 0.0008).

Conclusions: Our study confirms the importance of a baseline risk stratification of cancer patients and the need of preventive strategies in high risk patients with lymphoma. Liposomal anthracyclines and cardioprotective drugs should be used in high and very high risk cancer patients.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 350
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

MIELOMA MULIPLO: CARDIOTOSSICITÀ DA FARMACI ED EFFICACIA DEI NUOVI SCORE NELLA PREDIZIONE DEGLI EVENTI AVVERSI CARDIOVASCOLARI

Daniela Di Lisi (a), Roberto Giuffrè (b), Francesco Stabile (b), Francesco Damiani (b), Francesca Macaione (a), Cristina Madaudo (b), Giuseppe Puccia (b), Saverio Coppola (b), Alfredo Ruggero Galassi (b), Giuseppina Novo (a, b)
 (a) U.O.C CARDIOLOGIA POLICLINICO "P. GIACCONE" PALERMO; (b) PROMISE- DIPARTIMENTO DELLA PROMOZIONE DELLA SALUTE, MATERNO-INFANTILE, DI MEDICINA INTERNA E SPECIALISTICA D'ECCELLENZA "G. D'ALESSANDRO"

Background: Negli ultimi anni, il trattamento del Mieloma Multiplo (MM) è stato radicalmente rivoluzionato dall'avvento di nuove terapie gravate da minori effetti tossici cardiovascolari (CV). Obiettivi del nostro studio sono stati: valutare la sicurezza dei nuovi farmaci anti-neoplastici utilizzati nel trattamento del MM, valutare l'efficacia di nuovi score nell'identificare i pazienti a maggior rischio di eventi tossici CV.

Materiali e metodi: È stato condotto uno studio osservazionale prospettico arruolando 63 pazienti (34 F, 29 M, età media 68 ± 10) affetti da MM trattati con bortezomib +/- daratumumab e immunomodulatori. I pazienti sono stati sottoposti ad una valutazione cardiologica (ECG ed ecocardiogramma Color-Doppler), prima di iniziare il trattamento antineoplastico. Il rischio CV basale secondo il modello HFA-ICOS e lo score ecocardiografico multiparametrico "AL score" sono stati valutati. Dopo un periodo medio di 12 mesi, sono stati valutati i seguenti eventi avversi cardiovascolari (EAs): morte per cause cardiovascolari, tromboembolismo venoso, fibrillazione atriale, ipertensione arteriosa di nuova insorgenza, ospedalizzazione per scompenso cardiaco, sviluppo di CTRCD (cancer-therapy related cardiac dysfunction). I pazienti sono stati suddivisi in 2 gruppi (rischio alto

e molto alto di cardiotoxicità- gruppo A e rischio basso/intermedio di cardiotoxicità- gruppo B).

Risultati: Solo nel gruppo A (26 pazienti), si è osservata una riduzione significativa del global longitudinal strain del ventricolo sinistro (GLS) al follow-up (p value $< 0,0001$) e non degli altri parametri. Gli EAs si sono registrati in 13 pazienti (maggiormente nel gruppo A e in particolare nei pazienti con concomitante amiloidosi cardiaca AL). Le morti per cause CV sono risultate essere significativamente maggiori nel gruppo A rispetto al gruppo B (p value $0,0061$); così come le ospedalizzazioni per scompenso cardiaco (p value $0,04$) e lo sviluppo di CTR-CD lieve (p value $0,0061$); gli altri eventi non differivano significativamente. Dalla regressione logistica semplice, è emerso che il GLS del ventricolo sinistro e il relative wall thickness -RWT (p value $< 0,0001$), il TAPSE (p value $< 0,0050$) e i valori di NT-pro BNP (p value $< 0,0001$) si associavano significativamente con gli EAs. Dalla regressione multipla, solo il GLS (p value $< 0,011$) e l'NT pro BNP (p value $0,013$) si confermavano predittori indipendenti di EAs. Inoltre, anche l'HFA/ICOS score alto/molto alto e l'AL score > 5 correlavano significativamente con gli EAs (p-value $0,0001$).

Conclusioni: le nuove terapie per il MM sono gravate da minori effetti tossici CV che si presentano soprattutto nei pazienti con concomitante amiloidosi cardiaca e HFA/ICOS alto/molto alto. L'AL score e l'HFA/ICOS si confermano predittori di EAs nei pa-

zienti con MM, così come i valori di GLS e NT-proBNP al basale sono predittori indipendenti di eventi CV. Pertanto tali score devono essere valutati al basale in tutti i pazienti con MM.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 446
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

ROLE OF ECHOCARDIOGRAPHIC PARAMETERS IN PREDICTING CARDIOTOXICITY

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 (a) UNIVERSITÀ DI VERONA

Introduction: breast cancer is the most common cancer among women, and in those undergoing chemotherapy, a potential adverse event is cardiotoxicity. Various clinical scores and echocardiographic parameters have been proposed, yet predicting left ventricular dysfunction remains challenging.

Purpose: this study aims to identify baseline pre-chemotherapy echocardiographic parameters that can predict cardiotoxicity.

Methods: Consecutive patients diagnosed with non-metastatic breast cancer and treated with chemotherapy (including anthracycline, anti-HER2, taxane, or hormonal therapy) were prospectively enrolled and followed for one year with clinical and echocardiographic assessments at baseline and every three months. The diagnosis of cancer therapy-related cardiac dysfunction (CTRCD) was based on the 2021 ESC Guidelines. The case series was therefore divided based on the occurrence of mild CTRCD or not. For descriptive purpose we used mean and confidence intervals; median and interquartile ranges when appropriated. We used Student's T-test or Mann-Whitney U for within-group differences, paired T-test or Wilcoxon-Signed-Rank Test for repeated controls. CTRCD onset over time was evaluated using the Kaplan-Meier method. ROC analysis was used to identify cut-off values able to define at risk patients. Statistical significance was set at $p < 0.05$.

Results: we examined 138 patients with an average age of 53.52 years. 58 patients developed mild CTRCD, (18 within the first trimester, 26 between 3-6 months, 8 between 6-9 months, and 6 between 9-12 months). Parameters like left ventricle global longitudinal strain (GLS), early peak atrial longitudinal strain (PALS), left ventricle ejection fraction (LVEF), peak atrial contraction (PACS) and left atrial volume were evaluated. These parameters showed significant deterioration over time in the overall population; PACS and PALS changed early at 3 months, but nothing was significantly correlated with mild CTRCD diagnosis. A significant difference between the two groups was observed only for PALS at 6 months and PACS at 12 months. At the ROC analysis only GLS showed clinical utility in predicting mild CTRCD with an AUC of 0.83, and the best cut-off value was -21 (sensitivity 0.724, specificity 0.850, positive predictive value 0.778, and negative predictive value 0.810).

Conclusions: echocardiographic parameters worsened over time in chemotherapy patients. Atrial strain showed significant differences between groups. Basal atrial parameters did not predict CTRCD in our study, but literature supports left atrial strain's relevance for predicting CTRCD. A baseline GLS value of ≤ -21 may indicate a higher likelihood of mild cardiotoxicity, probably because chemotherapy effect could cause more easily a reduction $>15\%$ in GLS without reduction in LVEF when the baseline GLS is more negative. These findings require confirmation from larger studies.

CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 289
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)

AN (UN)COMMON CASE OF FULMINANT MYOCARDITIS

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Introduction: Immune checkpoint inhibitors (ICIs) are an emerging tool of current chemotherapy that acts by activating the immune system in order to counteract tumoral growth. Cardiotoxicity is probably the most lethal side effect of this pharmacological class and myocarditis is the most common presentation. We present a case of ICI fulminant myocarditis occurred at our centre with an unexpected clinical evolution.

Case presentation: A 76-year-old female known for a left-sided breast cancer already treated with quadrantectomy and radiotherapy presented to our Cardio-Oncology Department after a loco-regional relapse. Her anamnesis was relevant for hypertension with a hypertrophied left ventricle and a right bundle-

branch block. Biopsy was performed revealing a triple negative (ER 0%, PgR 0%, Ki 67 15%, HER2/neu negative) adenocarcinoma, so an aggressive regimen composed by liposomal anthracyclines, taxanes, carboplatin and pembrolizumab was proposed. After the second cycle of treatment, she referred to our emergency department due to diplopia and heavy breathing. Blood pressure was normal and a brain CT-scan did not display acute neurological lesions, but the electrocardiogram showed a high-rate atrial flutter with alternating bundle branch block. At the echographic evaluation a mild reduction in left ventricular ejection fraction and a dilated vena cava were found. Laboratory tests showed markedly elevated levels of high-sensitivity cardiac troponin and the patient

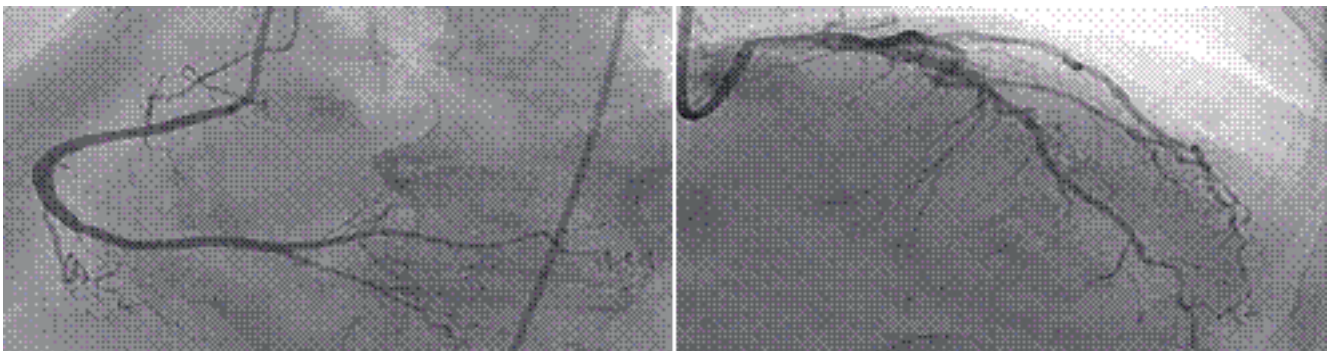


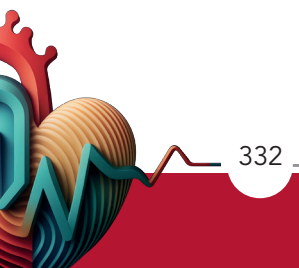
Figure 1



was immediately brought to the cath lab in order to perform a coronary angiography, which excluded an acute coronary obstruction. After some minutes, she developed a severe right ventricular dysfunction, so a CT scan was immediately performed, but it excluded a pulmonary embolism. She was then brought to the intensive cardiac care unit, but, soon after her admission, clinical conditions suddenly declined with a further drop in systolic function and a refractory cardiac arrest leading the patient to death.

Conclusions: ICIs represent an effective therapy in patients affected by different types of cancer and thus

ICI-mediated cardiac events have shown a consistently growing incidence. Myocarditis is probably the most dangerous side effect of these drugs and a deep knowledge of such condition should belong to every clinical cardiologist; in our case, despite the absence of an endomyocardial biopsy or a diagnostic CMR, we believe that the clinical picture clearly reflects the presence of a fulminant form of ICI myocarditis. In this context, the case shows how such condition might present with a subtle and tricky portrait and how, without a quick and aggressive intervention, things can irreversibly deteriorate.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 39
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

ACUTE HEART FAILURE FOLLOWING LENVATINIB TREATMENT

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This case report presents a 54-year-old male admitted to the ICCU with acute heart failure following treatment with Lenvatinib for adenoid cystic carcinoma of the lacrimal glands. The patient's clinical course, management, and outcome are described. The potential relationship between Lenvatinib and acute heart failure is discussed.

Introduction: Lenvatinib is a vascular endothelial growth factor tyrosine kinase inhibitor used in the treatment of various cancers, including thyroid cancer, endometrial carcinoma and adenoid cystic carcinoma (ACC). Lenvatinib is used as treatment of ACC in those cases where other treatments have been ineffective.

Although generally well-tolerated, cardiovascular side effects, including hypertension and heart failure, have been reported. Acute heart failure is a rare but serious complication of Lenvatinib therapy. **Case Presentation:** A 54-year-old male with a history of ACC of the lacrimal glands presented to the ER of our hospital with dyspnea, orthopnea, and lower extremity edema.

Two months prior to his arrival to the ER, he had been receiving Lenvatinib as a second-line therapy for ACC of the lacrimal glands and he reported a discontinuation of this medication after one month because of the initial onset of the aforementioned symptoms.

The patient had no prior history of heart failure, he only had a tobacco smoking history and a long standing persistent Atrial Fibrillation in DOAC.

The initial vital signs taken at the ER were as follows: BP 110/70 mmHg, AF at a mean ventricular response of 110 bpm, RR 20 breaths/min and peripheral O₂

saturation 91% on room air. Cardiomegaly and pleural effusion were observed on chest radiography.

The initial electrocardiogram (ECG) showed AF at mean ventricular response of 110 bpm and a right axis deviation. Physical examination revealed bilateral crackles on lung auscultation. TTE showed a global biventricular dysfunction as indicated by a LVEF of 15% with global hypokinesia and a severe reduction of the RV systolic parameters, associated with a dilatation of the cardiac chambers and a moderate-severe functional MR. The patient was transferred to our ICCU where was treated with diuretics and inotropic support (Levosimendan) to optimize hemodynamics and relieve symptoms of heart failure.

After four days from the admission as the patient had clinically stabilized, the cardiac MRI scan reported a dilated and hypokinetic cardiopathy, (LGE) areas with mid-wall and subepicardial distribution in the mid-basal segments of the anterior wall. The Cardiac CT showed no significant lesions in the coronary arteries.

Once relieved the decompensation phase we started a titration of Sacubitril/Valsartan aiming to complete the four pillars therapy of the HFrEF. After one month of optimal medical therapy (beta blocker, ARNI, MRA and SGLT2i) at his first follow-up visit, the patient reported an important relief from congestion symptoms and the TTE showed an improvement of the global EF and systolic indexes of the left and right ventricle (EF BP 30%, RV S'TDI 12 cm/s). He therefore scheduled a new meeting with his oncologists in order to discuss about the restaging result and the treatment options for the ACC.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 261
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

THE BENEFIT OF SERIAL CARDIOVASCULAR FOLLOW UP IN PATIENTS TREATED BY IMMUNE CHECKPOINT INHIBITORS (ICIS) AND ANTI-VEGF AGENTS: A CASE REPORT OF MULTIPLE CARDIAC TOXICITIES

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Introduction: The Immune Checkpoint Inhibitors (ICIs) and anti-VEGF agents are effective chemotherapy in different type of solid and hematological tumors, but they can present cardiovascular toxicity. Arterial hypertension and arrhythmias are widely known side effects of the anti-VEGFs drugs but they can also promote thrombotic phenomena, especially in the presence of predisposing conditions. The additional and not completely known cardiotoxicity related to the use of ICIs makes the clinical management and the follow-up of these fragile patients more challenging.

Case description: A 76-year-old man with history of surgical right nephrectomy for a clear renal cell carcinoma (1999), was found to have a large retroperitoneal mass histologically defined to be a repetitive lesion of the renal carcinoma. He underwent the surgical excision of the mass and then immunotherapy with Pembrolizumab (ICI) plus Axitinib was planned. The patient suffers from systemic hypertension and dyslipidemia and had multiple coronary percutaneous revascularization procedures due to ischaemic heart disease. Due to the high risk of cardiotoxicity he underwent a comprehensive cardiovascular (CV) evaluation at baseline, including the physical exam, electrocardiogram, and the transthoracic echocardiogram (TTE). The latter showed

a mildly reduced left ventricular ejection fraction (LVEF, 50%) with apical akinesia. Biomarkers were negative. The patient started the cancer therapy and underwent a close follow-up. Firstly, he developed systemic hypertension, requiring the optimization of the anti-hypertensive therapy. One month after starting the immune-chemotherapy a thrombus in the akinetic LV segment was noted. The case was discussed with the oncologists: Axitinib was stopped, anticoagulant therapy with Warfarin was started and antiplatelet therapy was stopped due to the high risk of bleeding. One month later, the LV thrombus was not present. Anticoagulation therapy was prolonged for 6 months and then stopped with reintroduction of antiplatelet therapy. In addition complex and frequent ventricular premature beats were noted and antiarrhythmic therapy commenced. The patient has completed a year of cancer therapy with benefit without additional toxicity.

Conclusions: This case highlights how a comprehensive and serial CV follow-up was essential to early detect and manage the cardiotoxic effect from immunotherapy, before it could cause serious and potentially harmful consequences. The occurrence of LV apical thrombus formation was possibly related with anti-VEGF agents with a possible synergic role of ICIs.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 764
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)

**UN CASO DI ANGINA VASOSPASTICA DOPO SOMMINISTRAZIONE DI PACLITAXEL
 PER ADENOCARCINOMA DEL PANCREAS**

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 (b) S.C. CARDIOLOGIA AZIENDA OSPEDALIERA S.M.M. DI PERUGIA;
 (c) S.C. ONCOLOGIA MEDICA AZIENDA OSPEDALIERA S.M.M DI PERUGIA

Introduzione: La tossicità cardiovascolare associata all'utilizzo dei farmaci antitumorali è tra le più temute e può limitare o condizionare la prosecuzione della terapia. Le sue manifestazioni sono proteiformi, categorizzate in 5 gruppi: disfunzione cardiaca relata a terapia antitumorale, miocarditi da immunoterapia, tossicità vascolare, ipertensione arteriosa, aritmie cardiache. Nell'ambito della tossicità vascolare rientra l'angina vasospastica e tra i farmaci più comunemente implicati vi sono le fluoropirimidine. Raramente è stata descritta tale tossicità nell'utilizzo dei taxani, tanto che nessun warning emerge a tal proposito dalle linee guida.

Caso clinico: S. M. è una donna di 62 anni, senza fattori di rischio CV, affetta da adenocarcinoma del pancreas sottoposto a chirurgia che intraprende chemioterapia adiuvante con paclitaxel e gemcitabina, A distanza di qualche ora dalla fine dell'infusione di paclitaxel la paziente accede in Pronto Soccorso per la comparsa di episodi a riposo di dolore toracico costrittivo della durata di circa 10-15 minuti, a regressione spontanea. Alla valutazione Cardiologia non venivano evidenziate alterazioni elettrocardiografi-

che nè ecocardiografiche, due determinazioni seriali della Troponina ad elevata sensibilità risultavano nella norma. Tuttavia, data la tipicità del sintomo, la paziente veniva ricoverata in cardiologia e nella giornata successiva veniva sottoposta a studio coronarografico che ha mostrato arterie coronarie epicardiche angiograficamente indenni; eseguito test di vaso reattività con Acetilcolina su coronaria sinistra: già al dosaggio più basso (infusione i.c. di 20 mcg di Ach) comparsa di angor, sopraST ed all'angiografia evidenza di diffuso vasospasmo prontamente regredito dopo somministrazione TNT.

Durante la degenza è stata pertanto introdotta terapia con diltiazem 120 mg/die, ben tollerata, e si è concordato con gli oncologi di effettuare rechallenge, in regime di ricovero, della terapia con paclitaxel. La paziente è rimasta asintomatica durante le successive somministrazioni.

Discussione: Tra gli effetti avversi cardiovascolari conosciuti più comuni, seppur rari, della terapia con paclitaxel si annoverano le bradiaritmie e la disfunzione ventricolare sinistra. L'ischemia cardiaca è un evento molto più raro. Il meccanismo attraverso cui il pacli-



taxel induca ischemia miocardica non è chiaramente descritto in letteratura, si ipotizza che il farmaco interferisca con la regolazione del calcio intracellulare e quindi con i meccanismi di vasocostrizione/vasodilatazione. Nei casi presenti in Letteratura, dopo la comparsa di angina vasospastica, inducente per lo più sindrome coronarica acuta con sopraslivellamentoST, , la chemioterapia con paclitaxel veniva sospesa con conseguenze non trascurabili sulla prognosi della patologia tumorale di base. Nel nostro caso,

invece, la “premedicazione” con vasodilatatore (nello specifico calcio-antagonista) ha consentito la prosecuzione della terapia oncologica.

Conclusioni: Questo caso clinico ribadisce come, in un campo come la Cardioncologia, la stretta collaborazione tra diversi specialisti possa garantire un’ottima qualità delle Cure Mediche e la migliore gestione del Paziente



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 234
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

ECOCARDIOGRAFIA SPECKLE TRACKING PER LA DIAGNOSI PRECOCE DI DISFUNZIONE VENTRICOLARE SINISTRA IN PAZIENTI CON CANCRO TRATTATI CON INIBITORI DEL CHECKPOINT IMMUNITARIO

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Background. I farmaci inibitori del checkpoint immunitario (ICI) sono un'innovazione nella terapia del cancro, in particolare per la minore incidenza di effetti collaterali. Nonostante la loro efficacia, sono stati documentati casi di danno miocardico correlati all'uso di ICI, in particolare miocardite e pericardite, che possono avere esiti gravi e potenzialmente fatali. L'ecocardiografia speckle tracking (STE) è raccomandata nella rilevazione della cardiotoxicità indotta da chemioterapia, vista la sua sensibilità, accessibilità e rapidità; al contempo è una metodica utile nella diagnosi di miocardite. Attualmente mancano studi prospettici su larga scala per quanto riguarda l'uso dell'imaging cardiaco nei pazienti trattati con ICI.

Obiettivi. L'obiettivo di questo studio è di determinare il valore diagnostico della STE, in particolare per quanto riguarda la deformazione del ventricolo sinistro e dell'atrio sinistro, per la cardiotoxicità correlata a ICI.

Metodi. In questo studio osservazionale prospettico condotto tra il 2021 e il 2024 sono stati arruolati pazienti affetti da cancro indirizzati dal reparto di Immunoterapia Oncologica presso i nostri ambulatori di ecocardiografia. I criteri di esclusione sono stati: malattie cardiache preesistenti conosciute, precedenti

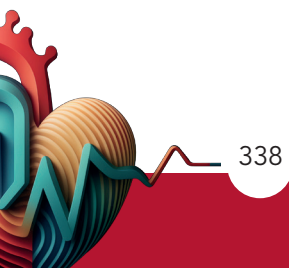
interventi chirurgici cardiaci, portatori di pacemaker cardiaco, precedente immunoterapia, sopravvivenza inferiore a 6 mesi. I pazienti sono stati sottoposti a valutazione clinica, biochimica, elettrocardiografica ed ecocardiografica prima di iniziare l'immunoterapia e successivamente con follow up seriatati durante il trattamento. L'end-point primario dello studio è stato la variazione dei parametri speckle tracking tra il basale e il follow-up. Come end-point secondari sono stati considerati l'insorgenza di eventi cardiaci maggiori, come miocardite e infarto del miocardio, ed eventi extra-cardiaci.

Risultati. Per questo studio sono stati arruolati 58 pazienti (67 ± 12 anni). La durata del follow up è stata di 6 ± 3 mesi. Dall'analisi dei dati è emersa una lieve ma significativa riduzione nel valore del Global Longitudinal Strain (GLS) ($-19,6 \pm 5,2\%$ vs $-17,3 \pm 7\%$, $p=0,002$) e non significativa di Peak Atrial Longitudinal Strain (PALS) ($29,6 \pm 10\%$ vs $28 \pm 10\%$), che denotano un peggioramento della funzionalità miocardica dopo circa sei mesi dall'inizio del trattamento. Ciò restava indipendente dal tipo di terapia oncologica praticata. Inoltre, due pazienti hanno sviluppato una miocardite nel corso del follow up: entrambi avevano valori di GLS considerevolmente ridotti (-9% e -13%).



Conclusioni. Questi risultati, che dovranno essere confermati da ulteriori studi su campioni più numerosi, mostrano come l'uso tempestivo di STE sia utile nella diagnosi precoce di cardiotossicità correlata

ta all'uso di ICI e pertanto permetta di ottimizzare il management dei pazienti oncologici sottoposti a immunoterapia.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 236
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

THINKING OUTSIDE THE BOX: A CASE REPORT OF A RARE PEMBROLIZUMAB- RELATED MYOCARDITIS

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We herein report the case of a 68 year-old man with history of transitional-cell carcinoma (TCC) of the renal pelvis. In April 2022, the patient underwent radical nephrectomy and local lymph nodes dissection, followed by a chemotherapy regimen with Carboplatin and Gemcitabine. In June 2023, a local recurrence of the cancer was documented and immunotherapy with Pembrolizumab (Immune- Checkpoint Inhibitor, ICI) was subsequently initiated. Shortly after having completed the third cycle of therapy, the patient was admitted to the ED of our Hospital because of gradually worsening dyspnea (NYHA III), fever and sharp, non-radiating chest pain. His vital signs were BP 85/50 mmHg, HR 108/min, SaO₂ 94%. The EKG showed elevation of the ST-T tract in the inferior and precordial leads, while the echocardiogram revealed a diffuse and severe pericardial effusion with signs of hemodynamic compromise. Lab tests showed neutrophil leukocytosis (WBC 20.740/mm³), CRP 23 mg/dL, PCT 2.3 ng/mL, hs-TnI 16.4 ng/L. The patient was referred to our Department where he underwent an urgent pericardiocentesis with an overall drainage of 350 cc of serous fluid and improvement of hemodynamic parameters. During the subsequent hospital stay, the follow-up echocardiogram showed a modest and diffuse reduction of the left ventricle ejection fraction (EF 40%), with residual pericardial effusion and wall motion abnormalities with non-coronary distribution. Microbiological, cytological and immunological investigations were performed (i.e. aerobic/anaerobic cultures, polymerase-chain reaction

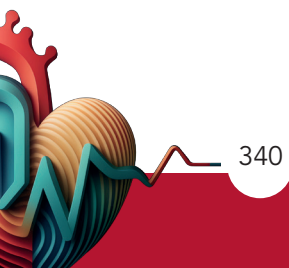
for BK and mycobacteria tests on the pericardial fluid and viral serology tests), all turning negative. After few days of clinical stability, the patient deteriorated with fever, hypotension and chest pain. The EKG showed a persistence of the above-mentioned ST-T alterations, while the echocardiogram did not show any significant difference from the previous one. We decided to perform a coronary angiography, which showed no significant coronary artery disease and a right heart catheterization with endomyocardial biopsy, the latter showing histological signs of intense lymphocytic and macrophage infiltration with multifocal involvement of the lateral wall. We also decided to perform a cardiac-MRI, which confirmed these findings showing extensive transmural edema of the lateral wall (T2-mapping and ECV criteria) and fibrosis (T1-mapping and LGE criteria), consistently with acute myocarditis. Given the clinical presentation, the imaging and histological findings and the absence of any other possible causes, after discussion with the Oncologists, ICI-related myocarditis was diagnosed and Methylprednisolone 1 g was started followed by a gradual tapering to oral Prednisone on discharge; concurrently, the immunotherapy regimen was discontinued. During the out-patient follow-up, he remained asymptomatic (NYHA I) and the serial echocardiographic evaluations showed improvement of the left ventricle contractility with a complete absorption of the pericardial effusion. In June 2024, a cardiac-MRI was repeated, which confirmed the improvement of the left ventricle contractility and



showed mild resolution of both myocardial fibrosis and edema.

With this paper, our aim is to report the case of ICI-related myocarditis presenting as cardiac tamponade confirmed at both histology and MR-imaging and to

raise consciousness among clinicians about this rare but possible entity with a wide range of presentations, from asymptomatic forms to cardiogenic shock. Early recognition and treatment is therefore of paramount importance for the patient.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 438
TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

THE SPECTRUM OF ECG ABNORMALITIES IN A LARGE COHORT OF CARDIAC MASSES

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Background. Cardiac masses represent a heterogeneous clinical scenario. Potential electrocardiographic red flags of malignancy remain to be investigated.

Regarding specific ECG features, a higher heart rate on admission ($p=0.014$), bradyarrhythmias ($p=0.009$), ischemic-like repolarization abnormalities (ST-segment

Objectives. To describe the spectrum of electrocardiographic abnormalities in a large cohort of cardiac masses and to evaluate potential red flags suggestive of malignancy.

Methods. Observational cohort study of 322 consecutive patients with a cardiac mass and available ECG enrolled between January 2000 and March 2023. All masses were diagnosed by histological examination or, in the case of cardiac thrombi, by radiological resolution after proper anticoagulant therapy. Multivariable regression analysis was used to assess potential predictors of malignancy among electrocardiographic abnormalities. All-cause mortality at follow-up was evaluated.

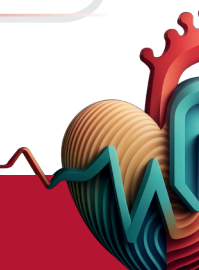
Results. Of 322 patients, 98 (30.4%) had malignant tumors. Compared with patients with benign masses, those with malignant tumors exhibited a higher heart rate, right axis deviation, greater depolarization, repolarization abnormalities and bradyarrhythmia at presentation.



Figure 1

	Univariate analysis				Multivariate Analysis			
	Odds Ratio	Standard Error	95% CI	p value	Odds Ratio	Standard Error	95% CI	p value
Heart rate, bpm	1.04	0.001	1.03-1.05	<0.001	1.03	0.1	1.01-1.05	0.001
Low voltage	37.8	36.2	4.86-289.1	<0.001	20.73	32.3	2.51-170.1	0.006
Right axis deviation	4.33	2.99	1.11-16.7	0.034	--	--	--	--
Bradyarrhythmia	4.01	2.21	1.37-11.79	0.011	0.82	3.99	1.51-22.36	0.01
Q-waves	3.72	2.91	0.94-14.74	0.062	--	--	--	--
Ischemic-like repolarization	12.84	4.54	6.43-25.71	<0.001	9.71	9.7	4.59-20.52	<0.001

Table 1



deviation, both depression and elevation, and negative T-wave; $p < 0.001$), low voltages ($p = 0.001$) and right axial deviation (0.025) were identified as independent predictors of malignancy. Considering these specific ECG alterations, a malignancy-oriented ECG was associated with higher mortality at follow up (median time of 20.7 months).

Conclusion. ECG is frequently abnormal in case of malignant cardiac tumors. Some specific electrocardiographic changes are strongly suggestive for malignancy and type of infiltration.

CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 293
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)

**EFFICACIA DEL CARVEDILOLO NEL TRATTAMENTO DELLA DISFUNZIONE MIOCARDICA DA ANTRACICLINE
NEL PAZIENTE PEDIATRICO CON LEUCEMIA LINFOBLASTICA ACUTA**

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Background: I pazienti pediatrici con leucemia linfoblastica acuta (LLA) sono a rischio di tossicità cardiaca correlata al trattamento con antracicline (AC). L'ecocardiografia seriata è utile nella fase preclinica dello scompenso cardiaco tardivo. La disfunzione miocardica da AC se precocemente riconosciuta e adeguatamente trattata è potenzialmente reversibile.

Scopo dello studio: Validare il GLS per la diagnostica precoce e il monitoraggio della cardiotoxicità da AC, confermandone la maggior accuratezza rispetto ai parametri ecocardiografici tradizionali; dimostrare come una precoce profilassi con carvedilolo in caso di riduzione del GLS consenta un ripristino della funzione cardiaca allo stop della chemioterapia.

Materiali e metodi: Studio retrospettivo monocentrico. 66 pazienti in follow-up longitudinale affetti da LLA (19 alto rischio, HR; 18 basso rischio, SR; 29 rischio intermedio, IR) di cui 24 femmine (età media $9,4 \text{ anni} \pm 5.2$) trattati secondo protocollo AIEOP-BFM LLA 2009 o AIEOP-BFM LLA 2017 con esordio tra il 2018 e il 2021, sottoposti a valutazione ecocardiografica al baseline (T0), prima di ogni nuovo ciclo di terapia con AC e allo stop terapia. Il protocollo ecocardiografico prevedeva report con EF m-mode, EF Simpson Biplano, picco di escursione dell'annulus

tricuspidalico (TAPSE). Il valore GLS era disponibile, invece, in tutti i pazienti al T0 e allo stop terapia. La quantificazione real-time del GLS era considerata opzionale durante il monitoraggio, per cui i dati GLS mancanti sono stati calcolati retrospettivamente rielaborando le immagini off-line (35% delle ecografie durante chemioterapia). Per ogni paziente sono state selezionate tre valutazioni ecocardiografiche: al baseline (T0), ad un nadir (N) identificato come l'ecocardiografia con EF o GLS peggiore registrato, e allo stop terapia. Sono stati considerati patologici valori assoluti di $\text{GLS} < -19\%$ e riduzioni della $\text{EF} > 10\%$ rispetto alla valutazione precedente, o un valore assoluto $< 53\%$. Un GLS nadir $< -19\%$ è stato identificato in 24 pazienti, i quali sono stati trattati con carvedilolo fino allo stop terapia con AC. L'analisi off-line ha identificato ulteriori 12 pazienti con nadir GLS patologico, nei quali non era stata avviata terapia con carvedilolo.

Risultati: Non sono state identificate differenze significative di funzione ventricolare al T0 tra i pazienti HR-SR-IR. I pazienti HR hanno invece mostrato in corso di trattamento con AC valori patologici di GLS in percentuali più alte rispetto agli SR/IR ($63\% \text{ vs } 34\%$, $p < 0,001$), ed un uso maggiore di carvedilolo durante la terapia con AC. Tra i 36 pazienti con Nadir GLS pa-



tologico, i 24 pazienti che hanno assunto tempestivamente carvedilolo hanno mostrato un recupero dei valori di GLS allo stop terapia (T0 $-20,5 \pm 2,4$; Nadir $-17,2 \pm 1,3$; Stop $-20,0 \pm 1,7$; p-value T0 vs Stop non significativo). Nei 12 pazienti non trattati, il GLS è risultato ridotto allo stop terapia rispetto al baseline (T0 $-20,7 \pm 2,3$; Nadir $-17,0 \pm 1,8$; Stop $-18,4 \pm 2,4$; p-value T0 vs Stop $<0,001$).

Conclusioni: Il GLS è più precoce della EF nell'identificazione della tossicità da AC permettendo, nei

pazienti trattati con carvedilolo, di conservare valori nei limiti di norma, senza interferire con il protocollo chemioterapico pianificato. I pazienti LLA-HR in trattamento con AC presentano un rischio maggiore di cardiotossicità e richiedono pertanto un monitoraggio più stringente. La cardiotossicità è tuttavia stata identificata anche in 1/3 dei pazienti LLA-SR. Ulteriori studi sono in corso per valutare l'impatto del carvedilolo dopo 5-10 anni dalla remissione di malattia oncologica.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 564

CARDIOTOSSICITÀ DA FARMACI (CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)

DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ (CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)

BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

SERUM HEMOGLOBIN TO CREATININE RATIO EARLY PREDICTS ANTHRACYCLINES RELATED CARDIOTOXICITY

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Introduction: The quest for reliable prognostic markers to predict adverse cardiovascular outcomes in patients undergoing anthracyclines therapy remains a pivotal challenge. The hemoglobin-to-creatinine ratio (Hb/Cr), a simple and universally accessible index, has never been tested in this clinical setting.

Purpose: Aim of this retrospective analysis was to evaluate the prognostic cardiovascular impact of the Hb/Cr ratio in patients with hematological disorders treated with anthracyclines.

Methods: Out of the 171 patients with hematological disorders enrolled in our registry, 7 were excluded for missing data, 164 were included in this analysis. We evaluated patients before and after the first cycle of chemotherapy, over a median follow-up of 357 days. The primary endpoint was a surrogate of cardiotoxicity, defined as post-chemotherapy cardiac dysfunction (PCCD), a composite of reduced left ventricular ejection fraction, new-onset diastolic dysfunction or increased left ventricular end-diastolic diameter. A cut-point analysis according to Liu's method was run to evaluate the best discriminative value of the Hb/Cr ratio for the prediction of PCCD.

Results: The cut-point analysis showed that a cut-off value of 15.58 represented the most discriminative in predicting PCCD (CI 14.15–17). On the basis of this discriminative value, we divided our population into low

vs. high Hb/Cr groups. The former included 73 (44.5%) patients, while the latter included 91 (55.5%). Patients in the low Hb/Cr group were older and had a higher prevalence of hypertension, smoke, diabetes, and of diagnosis of acute myeloid leukemia. Conversely, patients in the high Hb/Cr group were mostly female and more frequently admitted with non-Hodgkin lymphoma. After the first cycle of chemotherapy, the incidence of PCCD (57.5% vs. 40.7%, $p = 0.032$) was significantly higher in patients with a lower Hb/Cr ratio ($p = 0.035$). Bivariate regression analysis showed that Hb/Cr ratio was marginally inversely associated with PCCD (OR 0.92; CI 0.84 – 1.00; $p < 0.056$) and that this association was mainly driven by new-onset diastolic dysfunction (OR 0.88; CI 0.77 – 0.99; $p = 0.043$). However, after an extensive adjustment for several covariates, including age, sex, cardiovascular risk factors and type of hematological disorder, this association became strongly true: PCCD (OR 0.86; CI 0.77 – 0.97; $p < 0.019$), new-onset diastolic dysfunction (OR 0.8; CI 0.67 – 0.94; $p = 0.008$). These multivariate models were then translated into ROC analyses, which showed an AUC of 0.74 both for PCCD and new-onset diastolic dysfunction.

Conclusions: Our findings suggest that Hb/Cr ratio is inversely associated with cardiotoxicity in hematological patients treated with anthracyclines. Future larger studies are warranted in order to validate the use of the Hb/Cr ratio in this clinical setting.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 566
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

**IMPACT OF DIFFERENT TYPES OF HEMATOLOGIC DISORDERS ON ANTHRACYCLINES-INDUCED
 CARDIOTOXICITY: A RETROSPECTIVE ANALYSIS**

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 OSPEDALE SANTA MARIA GORETTI, LATINA

Introduction: Baseline stratification of cardiovascular risk in patients undergoing anthracycline chemotherapy is of crucial clinical importance. The role of the different types of hematologic disorders has never been considered for this purpose.

Methods: This retrospective observational analysis was based on a population of 152 patients with hematologic disorders, specifically Hodgkin's Lymphoma (LH), Non-Hodgkin's Lymphoma (LNH), and Acute Myeloid Leukemia (LAM), who were treated and/or hospitalized between 2009 and 2023. Patients included underwent at least one baseline echocardiographic evaluation and one post-first cycle of anthracycline chemotherapy. The median follow-up between the two echocardiographic evaluations was of 357.85 days. The primary endpoint was a surrogate of cardiotoxicity, defined as post-chemotherapy cardiac dysfunction (PCCD), a composite of reduced left ventricular ejection fraction (EF), new-onset diastolic dysfunction, or increased left ventricular end-diastolic diameter.

Results: Of the 152 patients included in this analysis, 38 were diagnosed with LH, 92 with LNH, and 22 with LAM. Regarding baseline features of the three groups, no significant differences were found among the collected anamnesis, anthropometric, laboratory, and echocardiographic variables, except for age, which was higher in patients with LNH ($p = 0.0016$) and TAPSE, which was higher in patients with LAM ($p = 0.0107$).

Analyzing the antineoplastic therapies most commonly received, we observed that LNH patients more frequently received CHOP and R-CHOP protocols, LNH patients the ABVD protocol, and LAM patients the 3+7 protocol. At the echocardiographic evaluation after the first cycle of anthracycline chemotherapy, the primary endpoint PCCD was significantly more frequent in LH patients (LH 71.05% vs. LNH 42.39% vs. LAM 45.5%; $p 0.0108$). Additionally, LH patients had a greater reduction in EF (LH 50% vs. LNH 25% vs. LAM 31.82%; $p 0.0213$). Considering these results, we tested the predictive power of LH towards the outcomes of interest through a bivariate logistic regression analysis, which confirmed a statistically significant association between LH and PCCD (OR 3.25; $p = 0.0035$; CI 1.47 - 7.19) and LH and EF reduction (OR 2.8000; $p = 0.0080$; CI 1.30 - 5.98). Subsequently, we conducted two sets of adjustments for possible confounding factors in multivariate analysis, one for age, sex, and cardiovascular risk factors, and another for the most frequent antineoplastic drugs received: in both cases, the association between LH and PCCD and LH and EF reduction remained significant.

Conclusions: LH patients, compared to LNH and LAM patients, appear to be more prone to develop anthracycline-induced cardiotoxicity, particularly in terms of EF reduction. This association appears to be independent of comorbidities and the antineoplastic treatment regimen received.

CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 163 CARDIOTOSSICITÀ DA FARMACI (CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ) DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ (CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ) MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ELETTROSTIMOLAZIONE (ARITMIE)

ATRIOVENTRICULAR BLOCK AND CONDUCTION DISORDERS INDUCED BY IMMUNE CHECKPOINT INHIBITORS: AN INDIVIDUAL PATIENT DATA SYSTEMATIC REVIEW

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Background: Immune checkpoint inhibitors (ICIs) are immunomodulatory monoclonal antibodies that act by removing inhibitory signals that block the T cell-mediated anti-tumor response. While representing a cornerstone in cancer therapy, these drugs can lead to cardiotoxicity and severe adverse effects. Conduction disorders and atrioventricular blocks (AVB) constitute a rare ICI adverse effect and the affected population has never been characterized.

Methods: An individual patient data systematic review was conducted to investigate characteristics of conduction disorders and AVB in cancer patients treated with ICI. Case reports and case series were gathered by searching Medline/Pubmed, SCOPUS, and Cochrane Central. Inclusion criteria were exposure to any ICI for cancer therapy, development of any heart conduction system abnormalities after ICI exposure, in the absence of other causes. The manuscripts need to individually report patient's characteristics to be included.

Results: The initial search yielded 2219 results. Of these, a total of 30 studies were included, comprising 31 patients.

The mean age was 69 ± 10 years, 68% males. 71% of the patients were at the end stage of the disease

	Total (n=31)		
		Labs	
Age (years)	69 ± 10	Positive PCR, n (%), (n=10)	9 (90)
Male gender n (%)	21 (68)	PCR (mg/L), (n=7)	20 (17-63)
Oncology parameters		Positive Troponin IBS, n (%), (n=27)	26 (96)
Lung Cancer, n (%)	12 (39)	Troponin (ng/L), (n=24)	2052 (492-8961)
Urothelial and Kidney Cancer, n (%)	6 (19)	NT-proBNP (pg/mL), (n=8)	2400 (1743-10724)
Melanoma, n (%)	4 (13)		
		ECG	
GI Cancer, n (%)	2 (7)	Normal ECG before ICI, n (%), (n=12)	10 (83)
Cancer stage 3, n (%)	7 (23)	RBBB before ICI, n (%), (n=10)	2 (20)
Cancer stage 4, n (%)	22 (71)	RBBB at presentation, n (%)	9 (29)
Pembrolizumab, n (%)	16 (52)	LBBB at presentation, n (%)	2 (7)
Nivolumab, n (%)	9 (29)	AVB at presentation, n (%)	13 (42)
Comorbidities		Clinical Course	
Hypertension, n (%)	14 (45)	Third-grade AVB, n (%)	28 (90)
Hypercholesterolemia, n (%)	4 (13)	Heart rate during AVB (bpm)	39 ± 10
Diabetes Mellitus, n (%)	6 (19)	Ventricular arrhythmias, n (%)	7 (23)
Clinical Presentation		AVB reversibility, n (%)	13 (42)
Asthenia, n (%)	26 (84)	In-hospital Mortality, n (%)	8 (26)
Dyspnea, n (%)	13 (42)	Investigations	
Chest pain, n (%)	4 (13)	Reduced LVEF, n (%)	8 (26)
Syncope, n (%)	4 (13)	Coronary angiography, n (%)	14 (45)
Palpitation, n (%)	5 (16)	CT coronary, n (%)	7 (23)
SBP (mmHg)	122 ± 25	Management	
Acute Heart Failure, n (%)	16 (52)	Discontinuation chemotherapy, n (%)	24 (74)
Concomitant Myocarditis, n (%)	26 (84)	Steroids, n (%)	25 (81)
Concomitant myasthenia/myositis, n (%)	10 (32)	Temporary pacing, n (%)	22 (71)
Hospitalization due to AVB, n (%)	10 (32)	Permanent pacing, n (%)	19 (61)
Time between ICI and AVB (days)	21 (16-29)	ICD implantation, n (%)	1 (3.2)
		Rechallenge different ICI, n (%)	2 (7)

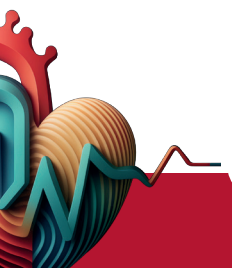
Figure 1



(Stage IV) mainly of Lung and Kidney/Urothelial Cancer. Pembrolizumab was the most reported ICI and AVB block presented after a median of 21 days (IQR 16-29) from the start of the therapy. Most of the patients presented with asthenia and dyspnea. The majority of the population (84%) presented AVB in the context of myocarditis while 32% of the cases were associated with myasthenia/myositis. Third-grade AVB was the most reported conduction disorder (90%) and 74% of the patients required interruption of ICI therapy. 81% were treated with steroids, 71% required temporary pacing, and 61% intracavitary pacemaker implantation. 2 patients were rechallenged with a different ICI. AVB was reversible in less than half

of the patients. 8 patients died during hospitalization.

Conclusion: AVBs in cancer patients treated with ICIs represent a rare adverse effect that approximately occurs three weeks after ICI's first administration concomitantly with myocarditis. Despite being a fragile population, a consistent proportion of patients received a permanent pacemaker. Furthermore, these adverse events determine the interruption of anti-tumor therapy, worsening an already poor prognosis. Whether isolated AVBs have different outcomes compared to myocarditis AVBs requires further research in a larger population.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 730
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)

**MIOCARDITE IN CORSO DI STIMOLAZIONE CON FATTORE DI CRESCITA GRANULOCITARIO IN DONATORE
DI CELLULE STAMINALI: UN CASE REPORT**

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Background: il G-CSF umano è una glicoproteina che stimola la produzione di neutrofili nel midollo osseo, la cui forma ricombinante è impiegata per diminuire l'incidenza di infezioni durante trattamento chemioterapico o per mobilizzazione di cellule staminali per trapianto allogenico. Fra le reazioni avverse più comuni legati al G-CSF ricombinante vi sono dolori muscoloscheletrici e cefalea. Fra quelle non comuni più gravi vi sono rottura splenica, reazioni anafilattiche e sindrome da distress respiratorio acuto. Sono stati riportati alcuni casi di aortite, risoltisi spontaneamente o con terapia steroidea. Ad oggi, è stato riportato un solo caso di miocardite secondaria a G-CSF risultante in shock cardiogeno e richiedente supporto cardiopolmonare. È rilevante dunque nella pratica clinica monitorare la terapia con G-CSF e gli effetti avversi correlati anche a livello cardiaco.

Caso clinico: un giovane uomo di 21 anni veniva selezionato come donatore per trapianto allogenico. Dopo esecuzione di esami ematochimici e strumentali veniva confermata idoneità alla donazione. In particolare, l'esecuzione di ecocardiogramma transtoracico (ETT) evidenziava funzione sistolica

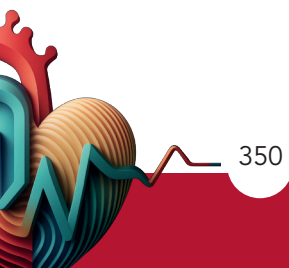
biventricolare conservata, valvola aortica bicuspidale con insufficienza moderata associata ed assenza di versamento pericardico. Il donatore veniva quindi sottoposto a stimolazione con fattore di crescita granulocitario (G-CSF) alla dose di 10 μ g/Kg/die per cinque giorni. Al quinto giorno eseguiva stamioferesi con raccolta di quantitativo adeguato di cellule staminali. Il giorno dopo la raccolta, il paziente accedeva in Pronto Soccorso per dolore precordiale oppressivo presente da alcuni giorni, in assenza di ipertensione o di segni e sintomi gastroenterici o respiratori. Agli esami ematochimici (EEC) si evidenziava aumento degli indici di miocitolisi (TnI=54,5 ng/L) e di flogosi (PCR=7,38 mg/L) in assenza di alterazioni elettrocardiografiche mentre l'ETT mostrava il ventricolo sinistro lievemente dilatato (VTD= 88ml/m²) con conservata frazione di eiezione (FE= 54%), in assenza di alterazioni della cinetica e versamento pericardico. L'AngioTC coronarica risultava nella norma mentre la risonanza magnetica cardiaca eseguita sette giorni dopo la dimissione mostrava lieve dilatazione del ventricolo sinistro (VTD=123 ml/m²), lieve riduzione della funzione sistolica (FE=46 %) senza alterazioni della caratterizzazione tissutale. Discusso il caso con i



Collegli Trsfusionisti ed Ematologi, si ipotizzava un caso di miocardite immunomediata causata da G-CSF, e il paziente veniva dimesso il 7° giorno con EEC ed ECG nei limiti senza provvedimenti farmacologici mentre si programmava visita cardioimmunologica di follow-up a 3 mesi con esecuzione di ETT.

Discussione: questo caso pone l'attenzione su un

possibile effetto avverso raro a livello cardiologico conseguente a terapia con G-CSF e manifestatosi clinicamente come episodio simil miocarditico. Tale eventualità va considerata dopo somministrazione di G-CSF in pazienti con dolore toracico. La collaborazione e la discussione multidisciplinare è essenziale nella gestione dei possibili avventi avversi in donatori sani che si sottopongono a manovre invasive.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 313
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

**THE UNFORGETTABLE CONSEQUENCE: ANTHRACYCLINE-INDUCED
 DILATED CARDIOMYOPATHY A DECADE LATER**

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Case report: A 58-year-old woman presented to the ED with acute decompensated heart failure (ADHF). Her medical history included breast cancer treated ten years ago with neoadjuvant chemotherapy (Docetaxel, Doxorubicin, Cyclophosphamide), mastectomy, and radiotherapy, with a normal echocardiogram at 1-year follow-up. Initial lab tests showed elevated BNP levels (2568 pg/ml), while PCR, PCT, and TnI were negative. ECG indicated sinus tachycardia, incomplete left bundle branch block (LBBB), and flat T-waves in lateral leads (Figure 1). Echocardiography revealed a severely dilated left ventricle (LVEF 20%), moderate secondary mitral regurgitation, a high probability of pulmonary hypertension, and reduced global longitudinal strain (GLS), particularly in the inferior and lateral walls (Figures 2 and 3). During hospitalization, coronary angiography showed no epicardial coronary lesions, and viral tests were negative. Cardiac magnetic resonance (CMR) showed LVEF 14%, no myocardial edema, a diffuse increase in extracellular volume (ECV) and native T1 map values (37% and 1356 ms, respectively), and a non-ischemic pattern of fibrosis with mid-wall late gadolinium enhancement in the interventricular septum, inferior mid-basal ventricular wall, and mid-



Figure 1

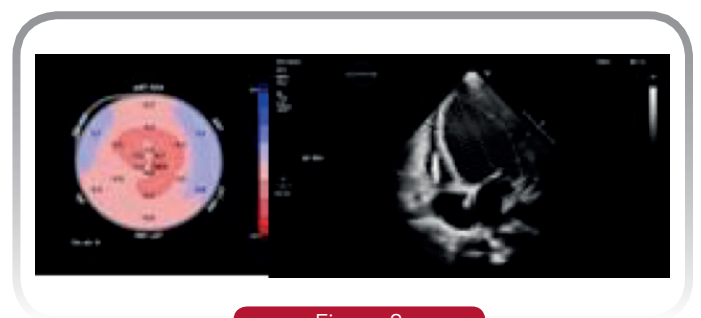


Figure 2



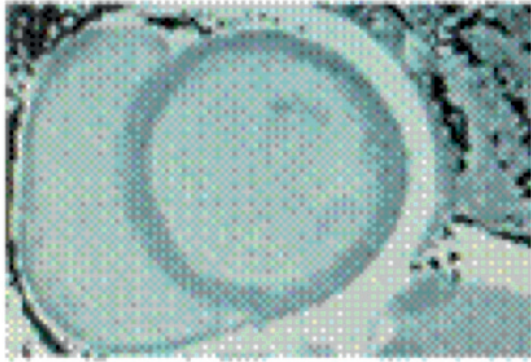


Figure 3

ventricular anterior wall. Genetic testing for dilated cardiomyopathy (DCM)-related genes was negative. An implantable cardioverter-defibrillator was placed for primary prevention after a risk-benefit analysis. After six months of optimal medical therapy, the patient's condition improved, but echocardiographic parameters showed poor recovery, leading to her referral for a heart transplant.

Discussion: The patient was diagnosed with DCM secondary to anthracycline-induced cardiotoxicity, presenting as a late-onset chronic progressive form (>1 year). The exact mechanisms remain unclear, including DNA and RNA alterations (direct or via inhibition of topoisomerase II), free radical generation leading to DNA damage or lipid peroxidation, myocyte apoptosis, and promotion of myocardial fibrosis. This case, the first of adult anthracycline-induced cardiotoxicity reported ten years post-treatment, underscores the need for

extended cardio-oncology screening (>1 year) with a multiparametric and multimodality imaging approach. Furthermore, it highlights the irreversible myocardial damage resistant to standard heart failure with reduced ejection fraction therapy. Future research should focus on understanding the precise molecular mechanisms underlying late-onset anthracycline-induced cardiotoxicity to identify potential therapeutic targets. Investigating genetic and epigenetic factors that may predispose individuals to such long-term effects is crucial. Additionally, there is a need to develop more effective cardio-protective strategies during cancer treatment and explore novel imaging biomarkers for early detection and monitoring of cardiotoxicity. Longitudinal studies with larger cohorts are essential to establish standardized guidelines for extended cardio-oncology surveillance and intervention, ultimately aiming to improve outcomes for cancer survivors at risk of cardiotoxicity.

CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 13
EMBOLIA POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)

HEPARIN-RESISTANCE IN CANCER PATIENTS AND ACUTE VTE: A CASE REPORT

Linda Piras (a), Giumbini Giada (a), Giuliano Tocci (a), Emanuele Barbato (a), Maria Beatrice Musumeci (a), Antonella Romaniello (a), Giacomo Tini Melato (a), Allegra Battistoni (a)
(a) AZIENDA OSPEDALIERA UNIVERSITARIA SANT'ANDREA, ROMA

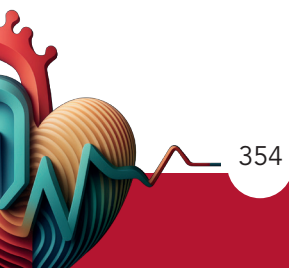
Venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE), continues to be a leading cause of mortality and morbidity in cancer patients. Parenteral anticoagulation is essential in the acute management of VTE, with unfractionated heparin (UFH) being the preferred anticoagulant in intensive care settings due to its short half-life, safety in chronic kidney disease (CKD), and potential reversibility. However, an increasing number of cases documenting heparin resistance are reported in the literature, with mechanisms not yet fully elucidated. We present a case study of a 52-year-old patient, formerly a smoker who was recently diagnosed with advanced non-small-cell lung cancer (NSCLC) accompanied by pulmonary and osseous metastases. Initially, the patient was treated with ICIs, which were quickly discontinued due to the onset of renal toxicity. Subsequently, in March 2024 the patient underwent decompressive laminectomy surgery to address a secondary lesion. After three weeks, the patient began experiencing worsening dyspnoea, marked hypotension, and sinus tachycardia. Arterial blood gas analysis revealed respiratory alkalosis with minimal elevation of lactate levels. D-dimer was 1600 mcg/L. Electrocardiogram findings displayed sinus tachycardia with signs of right ventricular overload and S1Q3T3 pattern. Chest CT angiography revealed disease progression and massive PE affecting both branches of the pulmonary artery, extending to segmental

and subsegmental branches of the upper and lower pulmonary lobes. Echocardiography showed severe right ventricular dilation, McConnell's sign, "60/60 sign", and D-shaped left ventricle. A definitive diagnosis of high risk PE was established and considering the recent neurosurgical intervention, precluding systemic fibrinolysis, the patient received UFH as parenteral anticoagulant therapy. Despite an adequate dose of heparin, achieving the therapeutic activated partial thromboplastin time (aPTT) range within the initial 24 hours proved challenging. The following day, the patient experienced progressive hemodynamic deterioration with significant hypotension and signs of peripheral hypoperfusion, prompting initiation of inotropic and vasopressor therapy with dobutamine and noradrenaline. Subsequently, due to the critical hemodynamic status, the patient underwent right-sided pulmonary endarterectomy (PEA). In the hours following the procedure, despite high-dose UFH infusion (up to 4 ml/h), therapeutic aPTT range was not achieved. Suspecting heparin resistance, blood exams were repeated. However, antithrombin III levels were found to be 96%, excluding it as the cause of resistance. Elevated fibrinogen levels were observed, reaching 642 mg/dL suggesting heparin resistance due to increased levels of heparin-binding proteins. Consequently, UFH was discontinued, and therapy with low molecular weight heparin (LMWH) was initiated. Following days witnessed progressive improvement in clinical and



hemodynamic status. Pre-discharge echocardiogram revealed mild right ventricular dilation with normal longitudinal kinetics and normal pulmonary pressures. This case highlights an important lesson: given the elevated incidence of VTE in cancer patients and

its associated mortality rate, understanding and recognizing heparin resistance and thus determining the optimal parenteral anticoagulant for acute phase management in this patient cohort is of great interest.



CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ 574
CARDIOTOSSICITÀ DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO- ONCOLOGIA E CARDIO-TOSSICITÀ)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

GLIFLOZINE E CARDIOTOSSICITÀ: NUOVE POSSIBILITÀ TERAPEUTICHE?

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Natale Daniele Brunetti (a)

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Le gliflozine, farmaci inibitori di SGLT2, inizialmente sintetizzate come antidiabetici hanno rivoluzionato il trattamento della medicina in diverse specialità inclusa la cardiologia nell'ambito dello scompenso cardiaco. L'indicazione ad empagliflozin e a dapagliflozin in classe IA nello scompenso a FE ridotta nelle LG 2021, è stata estesa con l'update del 2023 anche allo scompenso a FE preservata a fronte dei risultati evidenti di trial clinici che ne dimostravano la capacità di ridurre i MACE.

Panorama ancora inesplorato riguarda il loro utilizzo in pazienti oncologici e sottoposti a terapie cardiотossiche. I pazienti ad alto rischio CV e con segni di scompenso cardiaco ad FE preservata o ridotta per i quali sono necessari stretti schemi chemioterapici potrebbero beneficiare di un trattamento con gliflozine prima di incorrere in episodi di scompenso acuto o progressiva riduzione dell'FE.

Nel nostro centro stiamo per queste ragioni procedendo ad inquadrare gli effetti e le tempistiche con cui tali effetti cardioprotettivi si manifestano in pazienti con scompenso cardiaco a FE preservata.

Iniziali risultati incoraggianti sono stati ottenuti in pazienti con scompenso cardiaco ad FE preservata di cui

3 donne e 1 uomo, sottoposti a terapia CTH per linfoma NH e per K mammario. Al baseline tutti i pazienti presentavano segni di scompenso cardiaco ad FE conservata e GLS ridotti. I farmaci usati negli schemi chemioterapici (schema R-CHOP per i linfoma e EC e taxani per K mammario) avevano determinato un peggioramento del quadro di scompenso nonostante la terapia cardioprotettiva. Per tal motivo alla visita di controllo è stata proposta l'introduzione di empagliflozin. Al follow up dopo soli 3 mesi tutti i pazienti dimostravano un miglioramento nella sintomatologia clinica, miglior profilo nelle curve di GLS e riduzione dei livelli di NT-pro-BNP agli esami ematochimici.

Questo dato è un importante punto di partenza al fine di definire ulteriori applicazioni delle gliflozine soprattutto in classi di pazienti a rischio di sviluppare scompenso cardiaco. Le gliflozine potrebbero rivelarsi, in aggiunta a tutta la OMT, una ulteriore arma a disposizione volta a limitare o ad evitare peggioramenti clinici in pazienti oncologici per i quali eventuali complicanze CV legate ai CTH costerebbe interrompere lo schema terapeutico oncologico.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 841 INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

CORONARY CALCIUM PATTERNS DETECTED WITH COMPUTED TOMOGRAPHY AND THEIR IMPACT ON PROCEDURAL OUTCOMES IN CTO-PCI: INSIGHTS FROM TWO HIGH-VOLUME CENTERS

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Aims: This study aimed to propose a novel classification for chronic total occlusion (CTO) calcifications through computed tomography (CT) imaging and to assess its implications on clinical and procedural outcomes in CTO percutaneous coronary intervention (PCI).

Methods: A total of 217 patients undergoing elective CTO-PCI in two European centers underwent upstream preprocedural coronary computed tomography angiography (CCTA). A specialized CT analysis software was used for image evaluation. A novel classification system for CTO calcifications was devised based on CT findings. The primary endpoint was procedural failure. Secondary endpoints were coronary perforations, fluoroscopic time, procedural time (defined as the amount of time from the administration of local anesthesia to the insertion of the hemostasis device), number of guidewires and balloons, stent length, number and diameter and contrast volume. Student's t-test or the Mann-Whitney U test were used, as appropriate, to compare continuous data. Categorical variables were expressed by percentages and frequencies. Frequency differences were assessed using the Fisher exact test or Pearson's chi square test, and the results were reported as incidence rate ratios (IRR). Cohen's weighted Kappa was used to measure the reproducibility and inter-observer agreement of calcium quantification in a randomly chosen sample

of 20 individuals. Logistic regression analysis was performed to identify the effect size of calcium burden on the primary outcome of procedural success. The effect size was quantified using Odds Ratios (OR) with 95% CI. Linear regression was performed to assess the impact of calcium burden on quantitative procedural secondary endpoints, and the results were expressed as a B coefficient with 95% CI.

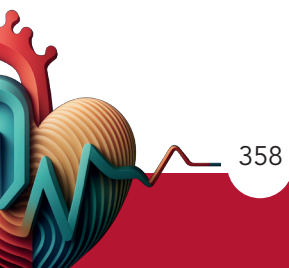
Results: Among the 148 patients with available pre-procedural CT, a novel classification identified seven distinct calcification patterns. According to this classification, patients were categorized based on low and high calcium burden across the cross-sectional area (CSA). Procedural success was achieved in 83.8% of cases. High calcium burden correlated with older age, diabetes, and prior coronary artery bypass grafting. Patients with high calcium burden had significantly higher rates of procedural failure (25.9% vs 10.6%; IRR 2.43; 95% CI 1.0-6.1; $p=0.03$), longer procedural and fluoroscopic times ($p=0.02$ and 0.04 respectively), increased use of balloons ($p=0.03$), and a higher incidence of coronary perforation (13.0 vs 3.2%; IRR 4.0; 95% CI 0.9-24.3; $p=0.03$). Logistic regression analysis showed that calcification burden, according to our classification, predicted the primary outcome (OR 1.24; 95% CI 1.04-1.49; $p=0.01$). Linear regression analysis showed a significant interaction between



calcification burden and procedural time (B coefficient 5.4; 95% CI 1.48-9.33; $p = 0.007$), fluoroscopic time (B coefficient 2.8; 95% CI 0.89-4.79; $p = 0.005$) and number of balloons (0.30; 95% 0.11-0.49; $p = 0.002$)

Conclusions: The study emphasizes the role of CT in characterizing CTO-plaque morphology and

calcification burden. Identification of high calcium burden lesions via CT predicted procedural failure and increased procedural complexity markers. Pre-CTO-PCI CT imaging facilitates the prediction of procedural complexity, enhancing procedural safety and success. It offers valuable insights for precision planning in CTO-PCI procedures.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 189 FIBRILLAZIONE ATRIALE (FA) (ARITMIE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

15-YEARS OF PFO CLOSURE FROM A LARGE NATIONAL COHORT: INSIGHT FROM THE ITALIAN PROLONG REGISTRY

Carlo Gaspardone (a), Daniele Oreste D'atri (a), Paolo Costa (a), Michele Morosato (a), Daniela Trabattoni (b), Massimo Mancone (c), Giuseppe Patti (d), Giuseppe Tarantini (e), Alberto Margonato (a), Matteo Montorfano (a), Antonio Colombo (a), Achille Gaspardone (g), Cosmo Godino (a)

(a) UNIVERSITÀ VITA SALUTE SAN RAFFAELE; (b) CENTRO CARDIOLOGICO MONZINO;
(c) UNIVERSITÀ DI ROMA LA SAPIENZA; (d) OSPEDALE MAGGIORE DELLA CARITÀ NOVARA;
(e) UNIVERSITÀ DI PADOVA; (f) ISTITUTO CLINICO HUMANITAS; (g) OSPEDALE SANT'EUGENIO ROMA

Introduction: Despite the rising employment of transcatheter device closure for Patent Foramen Ovale (PFO) in prevention of cryptogenic stroke or Transient Ischemic Attack (TIA), limited data exist on its long-term outcomes. Given this context, the aim of the present national registry is to shed light on the long-term (>15 years) clinical outcomes of patients who have undergone PFO closure.

Methods: We conducted a multi-center retrospective cohort study, enrolling consecutive adult patients who underwent PFO device closure from 1999 to 2013 from the **PROLONG** (PFO tRanscatheter Occlusion Long-term Outcomes National Group) registry, involving 12 tertiary centers in Italy. We collected demographic,

clinical, procedural, and follow-up data from electronic health records and telephone interviews.

Results: We included 1245 patients (mean age 47 ± 12 years; 56% female) with a mean follow-up (FU) duration of 14.6 ± 2.4 years. The primary indication for PFO closure was cryptogenic embolism (stroke: 36%, TIA: 53%, systemic embolism [SE]: 1.9%), followed by silent lesions at brain MRI (9.7%). Successful device implantation was achieved in 99.1% of cases, with Amplatzer (78.8%) being the most used device. The procedural complication rate was 3%, with atrial fibrillation (AF) being the most common (2.2%). No procedure-related deaths occurred. Residual shunt was

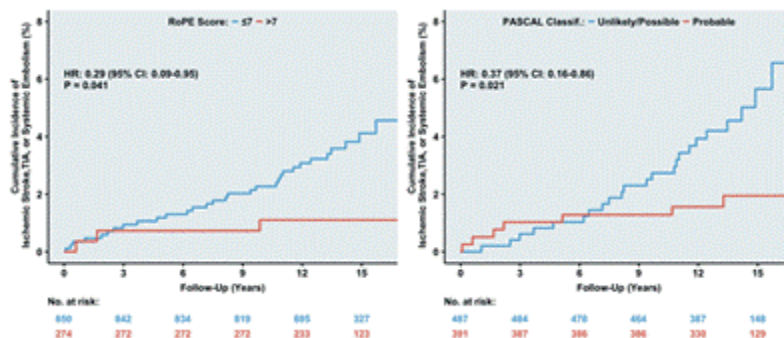


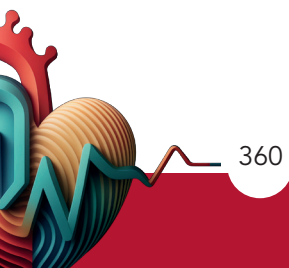
Figure 1



observed in 12.7% of patients, mostly mild (11%). A total of 34 patients (2.7%) had at least 1 recurrent event (stroke, TIA, or SE) (0.19 per 100 person-years). The predictors of recurrent event were the RoPE score (HR 0.78, 95% CI 0.65-0.95), the PASCAL classification (HR 0.3, 95% CI 0.16-0.86) and new-onset AF (HR 4.21 95% CI 1.63-10.9). The presence of a residual shunt did not predict recurrent events. 4.2% of patients developed new-onset AF during follow-up, with 0.7% occurring within six months post-procedure. There were 3 cases

of late device thrombosis and 2 cases of late device dislocation.

Conclusions: Transcatheter PFO closure is an effective strategy with high success rates, low complications, and favorable long-term outcomes for the prevention of recurrent embolic events. Our findings underscore the importance of patient selection using scoring systems that identify a high causal probability between the PFO and the primary event.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 51
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
PLACCA VULNERABILE (ATEROTROMBOSI)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)**

**CHRONIC OBSTRUCTIVE PULMONARY DISEASE PORTENDS VULNERABLE CORONARY PLAQUE
FEATURES IN PATIENTS WITH ACUTE CORONARY SYNDROME**

Francesco Maria Animati (a), Andrea Caffè (a), Vincenzo Scarica (a), Matteo Manzato (a), Michele Russo (a), Riccardo Rinaldi (a), Mattia Basile (a), Gaetano Antonio Lanza (a, b), Tommaso Sanna (a, b), Carlo Trani (a, b), Francesco Burzotta (a, b), Filippo Crea (c), Rocco Antonio Montone (a, b)

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Background: Previous studies reported a robust relationship between chronic obstructive pulmonary disease (COPD) and coronary artery disease (CAD). Systemic inflammation has been proposed as possible pathogenetic mechanism linking these two entities, although data on atherosclerotic coronary features in COPD patients are still lacking.

Objectives: To study atherosclerotic coronary plaque features in COPD patients presenting with acute coronary syndromes (ACS) by using optical coherence tomography (OCT).

Methods: ACS patients undergoing intracoronary OCT imaging of the culprit vessel were retrospectively identified. Coronary plaque characteristics and OCT-defined macrophage infiltration (MØI) were assessed by OCT. ACS patients were divided into 2 groups according to the presence or absence of COPD, and plaque features and MØI at the culprit plaque site and along the culprit vessel were compared between the two groups.

Results: Among 146 ACS patients (mean age: 66.1 ± 12.7 years, 109 males), 47 (32.2%) had COPD. Patients with COPD had significantly higher prevalence of MØI (78.7% vs. 54.5%, $p=0.005$) and thin cap fibroatheroma (TCFA) (48.9% vs. 22.2%, $p=0.001$) at the culprit site than no-COPD patients. In the multivariate logistic regression analysis, COPD was independently associated with MØI (OR: 8.771, CI95%:2.285;33.669, $p=0.002$) and TCFA at the culprit site (OR: 6.553, CI95%:2.330;18.431, $p<0.001$). Similarly, COPD was independently associated with both MØI (OR:1.848, CI95%:1.031;3.314, $p=0.039$) and TCFA (OR: 2.260, CI95%:1.120;4.562, $p=0.023$) along the culprit vessel.

Conclusions: In ACS patients undergoing OCT imaging of the culprit vessel, COPD was an independent predictor of plaque inflammation and vulnerability both at the culprit site and along the culprit vessel. These results suggest that a higher inflammatory milieu in COPD patients might enhance local coronary inflammation, promoting CAD development and plaque vulnerability.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 53
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**

SEX-RELATED DIFFERENCES IN THE PROGNOSTIC ROLE OF ACETYLCHOLINE PROVOCATION TESTING

Vincenzo Scarica (a), Francesco Maria Animati (a), Andrea Caffè (a), Matteo Manzato (a), Riccardo Rinaldi (a), Ilaria Torre (a), Michele Colucci (a), Gaetano Antonio Lanza (a, b), Tommaso Sanna (a, b), Carlo Trani (a, b), Francesco Burzotta (a, b), Filippo Crea (c), Rocco Antonio Montone (a, b)

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Background: Intracoronary provocation testing with acetylcholine (ACh) is helpful to diagnose and risk-stratify patients with ischemia and non-obstructed coronary arteries (INOCA) or myocardial infarction and non-obstructed coronary arteries (MINOCA).

Objectives: The aim of this study is to investigate sex-related differences and their relevance in the prognostic implications of ACh provocation testing.

Methods: A prospective cohort study was conducted. Consecutive INOCA and MINOCA who underwent ACh provocation testing were prospectively enrolled. The primary endpoint was the incidence of major adverse cardiovascular and cerebrovascular events (MACCE) defined as a composite of cardiovascular death, non-fatal MI, hospitalization due to unstable angina, and stroke/transient ischemic attack at follow-up. Co-primary endpoints were angina recurrence and quality of life assessed by 12-month Seattle Angina Questionnaires (SAQ) summary score.

Results: From September 2015 to September 2022, 519 patients (275 [53.0%] women and 244 [47%] men) were enrolled: 346 (66.7%) INOCA and 173 (33.3%)

MINOCA. A positive ACh test occurred in 274 (52.8%) patients, with a lower prevalence of epicardial spasm (82 [56.2%] vs. 106 [82.8%]) and a higher prevalence of microvascular spasm (64 [43.8%] vs. 22 [17.2%]) ($p > 0.001$) in women compared to men. After a median follow-up of 22 months (IQR 13; 30 months), MACCE occurred in 53 (10.2%) patients, without significant sex differences ($p > 0.05$). Men with a positive ACh test had significantly higher rate of MACCE (22 [17.2%] vs. 5 [4.3%], $p = 0.002$) compared to those with a negative test; in contrast no difference was observed in women ($p > 0.05$) (p for interaction = 0.003). Women with a positive ACh test experienced a higher rate of angina recurrence (61 [41.8%] vs. 32 [24.8%], $p = 0.005$) and lower 12-month SAQ summary score (82 [72; 90] vs. 86 [78; 100], $p < 0.001$) compared to those with a negative result, while in men SAQ summary score was similar between those with a positive and negative result ($p > 0.05$).

Conclusions: This study revealed the importance of recognizing sex-specific differences in the prognostic value of ACh testing for personalized management of vasomotor disorders, suggesting the necessity of more aggressive interventions for men and a focus on managing angina and enhancing quality of life in women.

**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 54
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA
E STRUTTURALE)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**

**PROGNOSTIC SIGNIFICANCE OF INDIVIDUAL COVADIS CRITERIA IN PATIENTS UNDERGOING
ACETYLCHOLINE PROVOCATION TESTING**

Andrea Caffè (a), Francesco Maria Animati (a), Vincenzo Scarica (a), Matteo Manzato (a), Riccardo Rinaldi (a), Ilaria Torre (a), Michele Colucci (a), Gaetano Antonio Lanza (a, b), Tommaso Sanna (a, b), Carlo Trani (a, b), Francesco Burzotta (a, b), Filippo Crea (c), Rocco Antonio Montone (a, b)

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Background: The prognostic significance of COVADIS criteria during ACh provocation testing is uncertain.

Objectives: To assess the prognostic impact of COVADIS criteria in patients with myocardial ischemia (INOCA) or myocardial infarction (MINOCA) and non-obstructive coronary arteries undergoing ACh provocation testing.

Methods: We enrolled consecutive INOCA and MINOCA patients undergoing ACh provocation testing. The occurrence of each COVADIS criterion was recorded. The primary outcome was the incidence of major adverse cardiovascular and cerebrovascular events (MACCE) at follow-up.

Results: Among 519 patients (346 [66.7%] INOCA and 173 [33.3%] MINOCA), 274 (52.8%) exhibited a positive ACh test. Over a median 22-month follow-up, the highest incidence of MACCE occurred in patients with 3 positive criteria (15.4%), followed by those with

2 (10.3%) and 1 (9.2%), while the lowest incidence occurred in patients with 0 criteria (3.1%) ($p=0.004$). Patients with ≥ 1 positive criteria had significantly higher MACCE rates than those with 0 criteria (12.5% vs 3.1%; $p=0.003$). MACCE-free survival differed significantly among the four groups, with the best survival for 0 criteria and the worst for 3 criteria ($p=0.004$). Epicardial coronary diameter reduction $\geq 90\%$ and MINOCA were independent MACCE predictors. Among patients with a negative test, epicardial coronary diameter reduction $\geq 90\%$ was the only independent predictor of MACCE and positivity to ≥ 1 criteria was associated in this group with a significantly higher MACCE rates compared to 0 criteria.

Conclusions: Our findings challenge the binary stratification (positive vs negative test) of COVADIS criteria, emphasizing the need for a comprehensive analysis of their components to provide prognostic stratification and personalized treatment.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 195 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

DOSE-REFERENCE-LEVEL (DRL) PER I CATETERISMI CARDIACI IN ETÀ PEDIATRICA, UNO STUDIO MULTICENTRICO NAZIONALE

Biagio Castaldi (a), Francesca De Monte (c), Marta Paiudvo (c), Angelo Giannone (c), Gianfranco Butera (b), Danilo Montefoschi (b), Roberto Formigari (e), Martino Cheli (e), Veronica Rossetti (h), Giuseppe Annoni (h), Gianpiero Gaio (d), Mario Giordano (d), Giovanni Meliota (f), Giuseppe Santoro (g), Chiara Fraccaro (a), Giovanni Di Salvo (a)

(a) AZIENDA OSPEDALE-UNIVERSITÀ DI PADOVA; (b) OSPEDALE PEDIATRICO BAMBINO GESÙ, ROMA; (c) ISTITUTO ONCOLOGICO VENETO; (d) OSPEDALE MONALDI, NAPOLI; (e) ISTITUTO GASLINI, GENOVA; (f) OSPEDALE PEDIATRICO GIOVANNI XXIII, BARI; (g) FONDAZIONE TOSCANA GABRIELE MONASTERIO, MASSA; (h) OSPEDALE REGINA MARGHERITA, TORINO

Background: Le cardiopatie congenite sono riscontrate nell'1% dei nati vivi. Di questi, circa il 70% eseguiranno uno o più cateterismi cardiaci a scopo diagnostico e terapeutico. L'ultima direttiva 2013/59/Euratom del Consiglio europeo rafferma l'obbligo d'uso e la revisione periodica del DRL, comprese le procedure interventistiche. Stabilire i DRL per i bambini è più complesso che per gli adulti, in quanto la quantità di radiazioni assorbite non solo è correlata al problema clinico, ma è fortemente influenzata dalle dimensioni e dal peso del paziente.

Obiettivi dello studio: Scopo dello studio è creare una rete nazionale tra le Cardiologie Pediatriche Italiane e stabilire i valori di DRL Italiani per le procedure di Emodinamica Pediatrica.

Materiali e metodi: Otto Centri hanno accettato di partecipare a questo studio. Di questi, 5 hanno già inviato i dati per complessive 2885 procedure in pazienti tra 0 e 18 anni. Sono stati raccolti i seguenti dati: peso, BSA, tipo di procedura, durata scopia, durata grafia,

minuti scopia, DAP scopia, DAP grafia. È stato, inoltre, somministrato un questionario agli Operatori medici per definire il livello di aderenza alle raccomandazioni europee per il contenimento della dose erogata ed il tipo di attrezzatura disponibile. Tale studio ha ricevuto un supporto economico dal Ministero della Salute (GR-2018-12365477). I dati riportati si riferiscono

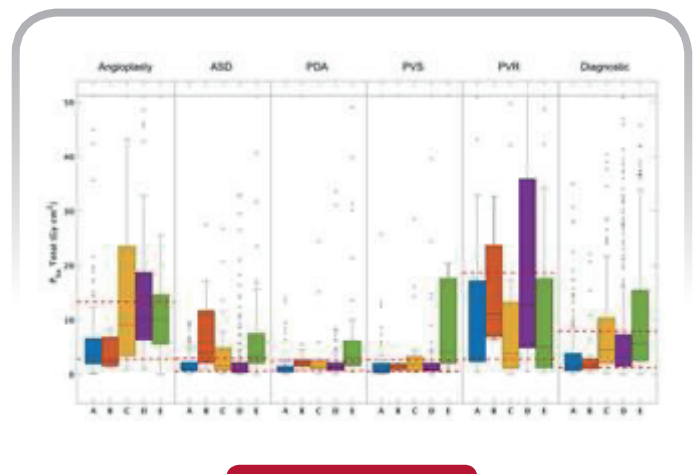


Figure 1

alla valutazione intermedia, milestone 18 mesi. Il termine previsto dello studio (target 5000 pazienti) è il 31/12/2024.

Risultati: Sono state analizzate 2885 procedure. Al questionario hanno risposto tutti e 8 i Centri partecipanti, 5 di questi hanno inviato i dati entro il termine prestabilito. Tutti i Centri hanno un buon livello di rispetto delle raccomandazioni sul contenimento della Dose (mediana 9/12, range 11/12-8/12). La distribuzione del tipo di procedure e dell'età dei pazienti era confrontabile tra i Centri. Le procedure diagnostiche rappresentano il 30% del totale. Tra le procedure interventistiche, sono stati effettuati

confronti tra: difetto interatriale, dotto arterioso pervio, angioplastiche, sostituzione valvolare polmonare, valvuloplastiche. Sono emerse blande differenze tra i Centri, ascrivibili ad un maggior uso della grafia e/o dello zoom. La vetustà delle apparecchiature è la maggiore variabile operatore-indipendente.

Conclusioni: L'uso di radiazioni ionizzanti in medicina è in continuo aumento. La massima riduzione della dose Rx erogata è fondamentale per la tutela della salute del paziente e degli operatori. La presa di coscienza di tale problema, e la creazione di una strategia comune, sono il primo (e fondamentale) passo per ottimizzare il lavoro, e per rendere più omogeneo il servizio erogato.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 38
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**LONG-TERM OUTCOMES FOLLOWING PERCUTANEOUS CORONARY INTERVENTION
IN PATIENTS WITH CANCER: RESULTS FROM THE BALANCE-PCI REGISTRY**

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(a) UNIT OF CARDIOVASCULAR SCIENCE, FONDAZIONE POLICLINICO UNIVERSITARIO
CAMPUS BIO-MEDICO, ROME, ITALY

Introduction: Given the progress in successfully treating many cancer types, attention to the complexity and challenges of managing cardiovascular events in cancer survivors is of critical importance. Percutaneous coronary intervention (PCI) in patients with cancer is particularly challenging as they present a higher risk of bleeding and thrombotic complications. Many studies have tried to evaluate the prognosis of cancer patients undergoing PCI. However, analyses of long-term outcomes, especially in the setting of chronic coronary syndromes, are still lacking.

Methods: The BALANCE-PCI (Balancing risks And Long-term Adverse eveNts in Cancer patiEnts undergoing Percutaneous Coronary Interventions) is a prospected ongoing monocentric registry of cancer patients with acute or chronic coronary syndrome undergoing PCI. We enrolled 295 consecutive patients with neoplastic diseases who underwent PCI between 2009 and 2023, stratified into patients with active cancer, prior cancer, and patients with metastasis. We also included a randomly assigned cohort of 612 patients without cancer (control group) undergoing PCI over the same period. The primary endpoint was the occurrence of major adverse cardio-cerebrovascular events (MACCE) defined as a composite

of cardiac mortality, stroke, myocardial infarction (MI), any revascularization. Secondary endpoints were all-cause mortality, target lesion (TLR), target vessel (TVR) revascularization and major bleeding events.

Results: The 10-year rates of MACCE were significantly higher in the cancer group than in the control group (24.7% vs 17.0%, $p = 0.006$). No significant differences were found in terms of MI and stroke between both cohorts. However, cancer patients showed increased 1-, 5- and 10-year cardiac mortality compared to the control group (26.1 vs 10.8%, $p < 0.001$). The adjusted risk of early and long-term all-cause mortality was increased among patients with cancer [hazard ratio (HR) 2.25, 95% confidence interval (95% CI) 1.62-3.13, $p < 0.001$). Moreover, cancer patients had higher trends of repeat percutaneous or surgical revascularization. After stratifying cancer patients into subgroups, primary endpoint rates were greater among patients with active cancer compared to the control group (25.9% vs 17.0%, $p = 0.017$). According to the overall neoplastic population, patients with active cancer showed a higher incidence of TLR and TVR (7.6% vs 3.4%, $p = 0.027$, and 11.4 vs 5.3%, $p = 0.01$, respectively), as well as in-stent restenosis ($p < 0.001$). However, despite the

high bleeding risk cohort of cancer patients, there were no significant differences in terms of major bleeding events compared to controls (5.4% vs 4.4%, $p = 0.480$).

Conclusions: Patients with cancer, especially in the active state, are associated with higher long-term MACCE incidence, mainly due to the progression of

atherosclerosis that necessitates new revascularization. Management of patients with cancer and coronary artery disease requiring PCI should be tailored and based on a multidisciplinary approach, carefully evaluating the single patient's thrombotic risk, bleeding risk and life expectancy to decide the optimal procedural and medical strategy.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 190
BIG DATA (TELECARDIOLOGIA ED E-HEALTH)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**

CLINICAL FEATURES, MANAGEMENT AND OUTCOMES OF LEFT MAIN SPONTANEOUS CORONARY ARTERY DISSECTION: A PATIENT-LEVEL META-ANALYSIS

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(c) SPEDALI CIVILI DI BRESCIA; (d) CLINIQUE PASTEUR TOULOUSE

Introduction: Spontaneous coronary artery dissection (SCAD) is an uncommon cause of acute myocardial infarction (MI) and is associated with substantial adverse events. SCAD involving the left main coronary artery (LM) is a rare but potentially life-threatening condition. Currently, minimal data on LM-SCAD have been reported. This study aimed to investigate clinical features, contemporary management, and outcomes of LM-SCAD patients.

Methods: We conducted a systematic review and patient-level meta-analysis of literature using “left main” and “dissection” as search keywords. We sought to determine if reported outcomes were associated with initial management strategy.

Results: We screened 492 manuscripts in MEDLINE and EMBASE published between 1990 and 2023. The final analysis included 135 patients (40±11 years, 80% women) diagnosed with LM-SCAD. Remarkably, 36% of cases were associated with pregnancy. Almost all patients (95%) presented with acute coronary syndrome, two-thirds of which were diagnosed with ST-elevation MI. Cardiogenic shock

was documented in 22% of patients at presentation, while serious ventricular arrhythmias occurred in 10%. Among published cases, early revascularization strategy with percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG) was superior to conservative management for the composite endpoint of all-cause death, left ventricular assist device implantation, heart transplant, recurrent MI, and urgent myocardial revascularization (adjusted HR 0.37, 95% CI 0.20-0.69, p<0.001).

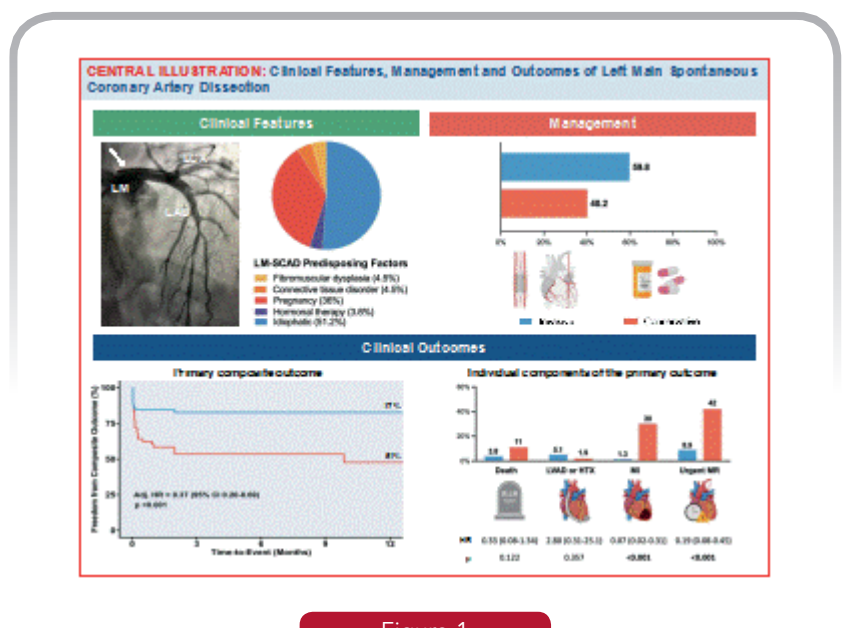


Figure 1

Conclusions: LM-SCAD is associated with significant acute morbidity and mortality. Revascularization (PCI or CABG) was associated with a lower incidence of

early adverse outcomes compared to a conservative strategy, largely driven by the occurrence of recurrent myocardial infarction and urgent revascularization.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 191 PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) PROGNOSE (SCOMPENSO CARDIACO)

CHARACTERISTICS AND OUTCOMES OF PATIENTS WITH SEVERE ISOLATED TRICUSPID REGURGITATION ACROSS DIFFERENT TREATMENT STRATEGIES: SINGLE HEART VALVE CENTRE EXPERIENCE

Michele Morosato (a), Carlo Gaspardone (a), Francesca Braccischi (a), Daniele Oreste D’atri (a), Federica Gramegna (a), Alberto Margonato (a), Eustachio Agricola (a), Paolo Denti (a), Nicola Buzzati (a), Francesco Maisano (a), Cosmo Godino (a)

(a) UNIVERSITÀ VITA SALUTE SAN RAFFAELE

Introduction: Tricuspid regurgitation (TR) has a significant impact on mortality, yet optimal management strategy remains debated. This study aims to compare characteristics and outcomes of patients with isolated severe TR across conservative management and surgical or transcatheter interventions.

Methods: We retrospectively analyzed consecutive patients diagnosed with isolated severe TR from a high-volume tertiary center between 2018 and 2023. Exclusion criteria were defined as: previous tricuspid valve (TV) intervention, concomitant severe valvular disease, and severe left ventricular systolic dysfunction. Baseline and follow-up data were retrieved from electronic health records and telephone interviews.

Results: A total of 481 consecutive patients were enrolled, of which 79 (17%) were treated with transcatheter tricuspid edge-to-edge repair (T-TEER), 74 (15%) underwent TV surgery and 328 (68%) were managed with medical therapy alone. The mean age of the cohort was 74±12 years, with 186 patients (39%) being female.

Patients treated with T-TEER, when compared to medical therapy and TV surgery, had the highest TRI-SCORE (4.8 vs. 4.1 and 3.1 respectively, $p < 0.001$), and were the most symptomatic (NYHA III-IV 52% vs. 33% and 38% respectively, $p < 0.001$). Echocardiographically, their parameters were intermediate between the conservative and surgical groups concerning functional etiology of TR (86%), RV

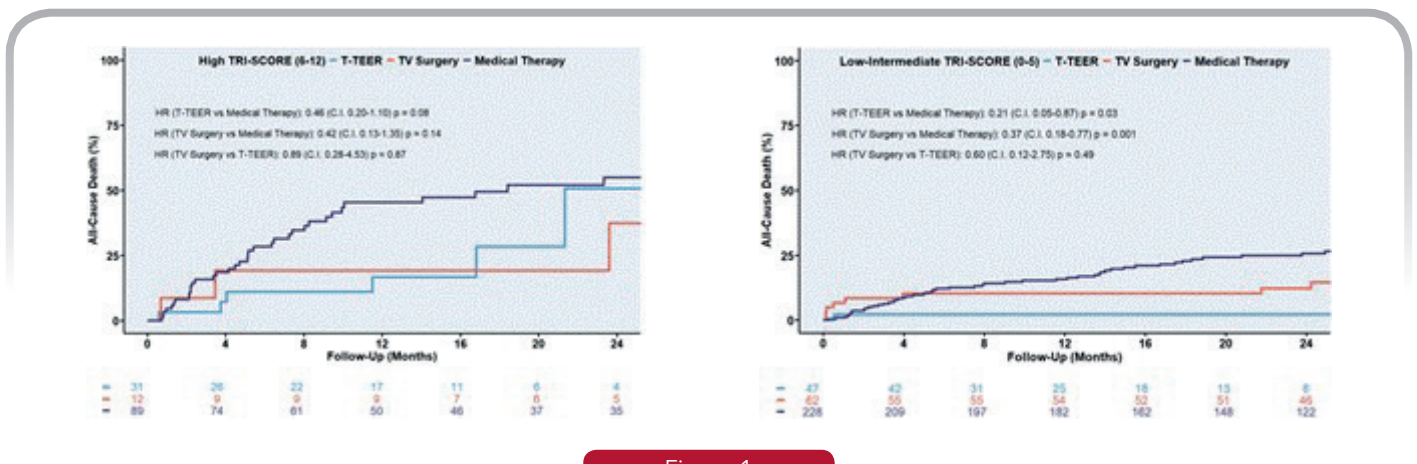


Figure 1

dysfunction (24%) and pulmonary hypertension (mean sPAP 42 ± 9 mmHg).

Intervention was successful in reducing TR grade to \leq moderate in 64 (86%) of patients treated with T-TEER and 74 (100%) of patients treated with TV surgery. In-hospital mortality rate was significantly higher for TV surgery than for T-TEER (9.5% vs. 1.3%, $p=0.03$). At 2-year follow-up, conservative strategy was associated with a higher incidence of all-cause death compared to TV surgery (HR 0.33, 95% CI 0.18-0.63, $p<0.001$) and T-TEER (HR 0.40, 95% CI 0.20-0.83, $p=0.014$). This

result was mainly dragged by low-risk patients (TRIScore 0-5) because the benefit of intervention was lost in high-risk patients (TRIScore 6-12).

Conclusions: Severe isolated tricuspid regurgitation exhibits diverse clinical and echocardiographic characteristics, which influence treatment efficacy. Surgical and transcatheter interventions demonstrate improved outcomes compared to medical therapy in low-risk patients (TRIScore 0-5). However, in advanced stages of the disease (TRIScore 6-12), the benefits of these interventions decline.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 193
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE E
MALATTIE DEL CIRCOLO POLMONARE)
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)**

SUTURE-MEDIATED PFO CLOSURE: LONG-TERM OUTCOMES AND PREDICTORS OF SUCCESS

Achille Gaspardone (a), Antonella De Santins (a), Fabiana Piccioni (a), Emanuela D'ascoli (a), Tommasa Siragusa (a), Maria Iamele (a), Maria Benedetta Giannico (a), Gregory Angelo Squeglia (a), Carlo Gaspardone (b)
(a) OSPEDALE SANT'EUGENIO ROMA; (b) UNIVERSITÀ VITA SALUTE SAN RAFFAELE

Introduction: Percutaneous suture-mediated PFO closure offers a safe and effective alternative to device-based methods, albeit with slightly lower success rates in unselected patients. This study aims to assess the long-term safety and efficacy of suture-mediated PFO closure in the largest and longest-followed patient cohort to date, and to identify predictors of procedural success.

Methods: Between 2016 and 2023, 703 consecutive patients (mean age 47±12 years, 62% women) with PFO-associated stroke or transient ischemic attack (TIA) underwent suture-mediated PFO closure (Heartstitch, Fountain Valley, CA) at our institution. At the 1-year follow-up, all patients were assessed using transthoracic

echocardiography (TTE) with a bubble study to detect significant residual shunt (≥ grade 2 on a scale of 0-3).

Results: The procedure was successfully completed in all patients without any procedural complications. A total of 42 patients (6.0%) required more than one suture. At the 1-year follow-up, the TTE bubble study identified significant residual shunt in 91 patients (12.9%). Independent predictors of significant residual shunt, identified via pre-procedural transoesophageal echocardiography (TEE), included PFO maximum width (HR 1.49; 95% CI 1.30 - 1.71; p < 0.001), PFO minimum length (i.e., extent) (HR 0.89; 95% CI 0.82 - 0.96; p = 0.004), and severe (grade 3) shunt (HR 3.38; 95% CI 1.71 - 7.10; p < 0.001). A new scoring system, the WiSE

PFO Features		Points
A. Maximum Width	≤2 mm	0
	>2 <4 mm	1
	≥4 mm	3
B. Shunt severity grade 3		2
C. Minimum Extent ≤ 6 mm		1

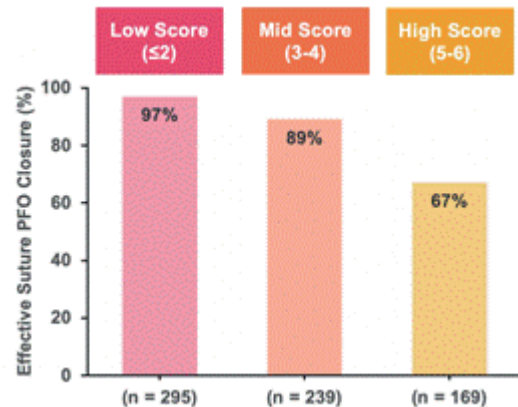


Figure 1

score, was developed and internally validated based on these variables (AUC 0.78; 95% CI 0.73 - 0.83). At a mean clinical follow-up of 4.0 ± 2.2 years, no recurrent embolic events (stroke or TIA) were reported, and only one episode of atrial fibrillation occurred.

Conclusions: Suture-mediated PFO closure demonstrates long-term safety and efficacy. The WiSE score can be a valuable tool for optimally selecting patients for this procedure.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 815
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE)
CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE E MALATTIE
DEL CIRCOLO POLMONARE)**

**ASSOCIATION BETWEEN PERCUTANEOUS CLOSURE OF PATENT FORAMEN OVALE AND MIGRAINE:
A MONOCENTRIC OBSERVATIONAL STUDY**

Mattia De Gregorio (a), Filippo Luca Gurgoglione (a), Luigi Vignali (b), Emilia Solinas (b), Giorgio Benatti (b), Iacopo Tadonio (b), Andrea Denegri (b), Diego Ardissino (a), Giampaolo Niccoli (a)

(a) DIVISION OF CARDIOLOGY, UNIVERSITY OF PARMA, PARMA UNIVERSITY HOSPITAL, PARMA, ITALY; (b) DIVISION OF CARDIOLOGY, PARMA UNIVERSITY HOSPITAL, PARMA, ITALY

Introduction: Patent foramen ovale (PFO) is a common condition found up to three times more frequently in patients with migraines compared to control groups. The prevalence of PFO in migraine patients ranges from 39.8% to 72%, with higher prevalence among those with migraine with aura (40.9%-72%) compared to those without aura (16.2%-33.7%). Previous studies suggest that percutaneous PFO closure may improve migraine symptoms. This study aimed to evaluate the percentage of patients who experienced regression or remission of migraine burden and to identify independent predictors of such improvement.

Methods: This retrospective observational monocentric study included all patients admitted to the Cardiology Department of the University Hospital of Parma who underwent effective percutaneous PFO closure between January 2006 and April 2024, with available follow-up data. The procedure was performed to address clinically significant PFO.

Results: The study population consisted of 193 patients who underwent percutaneous PFO closure at the Hemodynamics Laboratory of the University Hospital of Parma during the study period. At pre-procedural assessment, 63 (32.6%) patients had migraines, of whom 28 (44.4%) had migraine with aura. Compared to the control group, migraine patients had a lower prevalence of male gender (21 [33.3%] vs. 82 [63.1%], $p < 0.001$)

and dyslipidemia (18 [28.6%] vs. 60 [46.2%], $p = 0.020$), with a trend towards a lower prevalence of arterial hypertension (18 [28.6%] vs. 53 [40.2%], $p = 0.099$) and a higher RoPE score (6.3 ± 1.17 vs. 6.2 ± 1.5 , $p = 0.092$).

At a median follow-up of 106 months, 25 (39.7%) migraine patients showed a reduction in migraine episodes, and in 8 (12.7%) patients, no migraine episodes were recorded during follow-up. Univariate logistic regression analysis identified the presence of migraine with aura (OR: 10.204 [3.123-33.338], $p < 0.001$) and interatrial septal aneurysm (OR: 6.090 [1.954-18.974], $p = 0.002$) as positive predictors of migraine regression, while older age was a negative predictor (OR: 0.948 [0.903-0.995], $p = 0.032$). Multivariate logistic regression confirmed that migraine with aura (OR: 7.858 [2.128-29.014], $p = 0.002$) and interatrial septal aneurysm (OR: 5.824 [1.552-21.855], $p = 0.009$) were independent positive predictors of migraine reduction.

Conclusions: Percutaneous PFO closure resulted in a reduction of migraine episodes in 39.7% of patients and complete cessation in 12.7%. The presence of migraine with aura and interatrial septal aneurysm were independent predictors of migraine episode reduction, highlighting the importance of thorough clinical evaluation and anatomical assessment of PFO in migraine patients. These findings suggest that PFO closure may be an effective therapeutic strategy in selected patients.

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 452 INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

PHARMACODYNAMIC EFFECTS OF CANGRELOR IN PATIENTS WITH ACUTE OR CHRONIC CORONARY SYNDROME UNDERGOING PERCUTANEOUS CORONARY INTERVENTION: PRIMARY RESULTS FROM THE POMPEII STUDY

Imma Forzano (a), Domenico Florimonte (a), Luca Sperandeo (a), Domenico Simone Castiello (a), Federica Buongiorno (a), Lina Manzi (a), Fiorenzo Simonetti (a), Mario Enrico Canonico (a), Marisa Avvedimento (a), Roberta Paolillo (a), Alessandra Spinelli (a), Stefano Cristiano (a), Luigi Di Serafino (a), Carmen Annamaria Spaccarotella (a), Anna Franzone (a), Raffaele Piccolo (a), Plinio Cirillo (a), Giovanni Esposito (a), Giuseppe Gargiulo (a)
(a) UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

Introduzione: La terapia antitrombotica nella malattia aterosclerotica coronarica (CAD) è di fondamentale importanza per prevenire le complicanze trombotiche peri e post procedurali legate all'angioplastica. In particolare, gli inibitori del recettore piastrinico P2Y12 sono largamente utilizzati in questo setting. Si suddividono in inibitori somministrabili per via orale, clopidogrel, prasugrel e ticagrelor e per via endovenosa, cangrelor, che presentano proprietà farmacocinetiche differenti. In particolare, gli inibitori orali hanno un periodo di attivazione più lungo in quanto necessitano di tempo per l'assorbimento e la conversione in metaboliti attivi. Il cangrelor presenta il vantaggio di essere somministrato direttamente nel torrente ematico come molecola metabolicamente attiva, raggiungendo la massima efficacia in tempi brevi. Si è dimostrato efficace e sicuro sia nel setting acuto che cronico. Tuttavia mancano studi su ampia scala che ne analizzino la farmacodinamica. Le linee guida attualmente raccomandano il suo utilizzo solo nei pazienti naïve da inibitori di P2Y12. Il nostro studio prospettico a singolo centro si pone l'obiettivo di valutare la farmacodinamica del cangrelor nei pazienti con sindrome coronarica acuta (SCA) o cronica (SCC) che vengono sottoposti ad angioplastica (PCI). Sono stati analizzati sia pazienti naïve da P2Y12 sia pazienti acuti pre-caricati con ticagrelor, in quanto è l'unico

inibitore di P2Y12 orale che non ha dimostrato interazioni farmaco-farmaco con cangrelor.

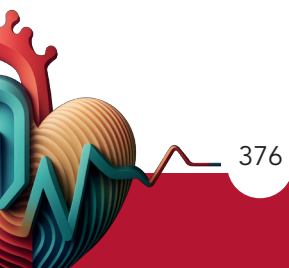
Materiali e metodi: Sono stati considerati eleggibili tutti i pazienti maggiorenni capaci di fornire consenso informato per iscritto. Sono stati raccolti ed analizzati campioni ematici prima della somministrazione del bolo di cangrelor (baseline, T0), dopo 30±5 minuti dal bolo (T30), dopo 3h±5 minuti (T3h) e dopo 4-6h±5 minuti. L'aggregazione piastrinica è stata valutata utilizzando svariati test: light transmittance aggregometry (LTA), Multiplate electrode aggregometry (MEA) e VerifyNow P2Y12.

Risultati: 150 pazienti sono stati reclutati da Marzo 2021 a Giugno 2024. L'età media della popolazione era 67.8 anni e le pazienti donne erano 35 (23%). La presentazione clinica era di PCI elettiva in 64 pazienti e SCA in 86 pazienti, di cui 56 STEMI e 30 NSTEMI. Abbiamo osservato necessità di bailout con tirofiban in 2 pazienti. L'infusione di cangrelor è stata seguita da ticagrelor in 61 pazienti, clopidogrel in 61 e prasugrel in 3 pazienti mentre in 24 pazienti STEMI si era avuto ticagrelor in pretrattamento entro 1 ora. Complessivamente l'inibizione dell'aggregazione piastrinica a 30 minuti (IPA%) era 57.6% con 4 pazienti su 126 (non pretrattati), 3.2% di alta attività piastrinica



residua (HRPR) in corso di terapia con cangrelor, mentre a 3h la HRPR era in 47 su 124 pazienti (37.9%) e a 4-6h era 20 su 124 pazienti (16%) con test di LTA e stimolo di ADP 20 μ molare. Gli eventi clinici osservati sono stati di 3 morti di cui 1 cardiovascolare, 1 infarto miocardico entro 48h e 18 episodi di sanguinamento prevalentemente minori con 3 sanguinamenti maggiori.

Conclusioni: Il cangrelor è sicuro ed efficace nel prevenire le complicanze trombotiche peri e post procedurali sia nel setting acuto (STEMI, NSTEMI, angina instabile) che nella SCC. Tali risultati sono incoraggianti in quanto rinforzano le evidenze ancora scarse in letteratura sull'utilizzo del cangrelor che è risultato essere un valido farmaco da utilizzare per la CAD in studi randomizzati ampi di oltre una decade.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 951
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING
CARDIOVASCOLARE)
ELETTROSTIMOLAZIONE (ARITMIE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)**

**INTERVENTRICULAR SEPTAL THICKNESS ON CARDIAC COMPUTED TOMOGRAPHY AS A NOVEL RISK
FACTOR FOR DEFINITIVE PACEMAKER IMPLANTATION IN PATIENTS UNDERGOING TRANSCATHETER
AORTIC VALVE REPLACEMENT**

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Lucrezia Biagiotti (a, b), Gianluca Corcione (a, b), Antonio Fidanzati (a, b), Matilde Papi (a, b),
Manlio Acquafresca (b), Valentina Scheggi (a, b), Carlo Di Mario (a, b), Niccolò Marchionni (a, b)

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Aims: Conduction system disorder and definitive pacemaker (PM) implantation in patient with severe aortic stenosis undergoing transcatheter aortic valve replacement (TAVR) is a major clinical concern. Recently, muscular interventricular septum (IVS) emerged as a novel risk factor for conduction disturbances in patients undergoing TAVR. Whether the IVS thickness is also related to post-TAVR definitive PM implantation is unknown. Our aim was whether basal IVS thickness, as measured by pre-procedural computed tomography (CT), could be a good predictor of the definitive pacemaker implantation following TAVR.

Methods: We retrospectively analysed 451 consecutive patients admitted to Florence University Hospital between January 2019 and December 2022 for severe aortic stenosis (AS) and approved for TAVR by the local Heart-Team, without a permanent pacemaker on admission. Fully anonymized data retrieved from electronic hospital charts included demographics, comorbidities assessed by Charlson's Comorbidity Index (CCI), NYHA functional class, EuroSCORE II and STS risk score, pre-procedural echocardiographic data,

and procedural details. All patients underwent contrast-enhanced CT using a 256-slice system before TAVR. Only 126 patients had good quality images for the analysis. The thickness of muscular IVS was measured in the coronal view, in systolic phases, at 2, 5, and 10 mm below the membranous septum (MS). Post-procedural pacemaker implantation followed 2021 ESC Guidelines on Cardiac pacing and cardiac resynchronization therapy. The median follow-up duration, calculated from TAVI procedure was 3.3 years (interquartile range [IQR] 3.2-3.4). Decrease in basal IVS thickness, measured at 2 mm, 5 mm and 10 mm below the MS was measured to evaluate its correlation with an increased risk of definitive pacemaker implantation following TAVR.

Results: In accordance with current indications to TAVR, the median age was over eighty for both groups (84.7 ± 0.43 vs 83 ± 1.1 years, no post-TAVR PM implantation vs PM implantation respectively, P-value 0.8). The vast majority of patients (92%) had heart failure symptoms (NYHA class >I), and the burden of chronic comorbidities was rather elevated, as indicated by a median CCI of 6. The SapienTM 3



(Edwards) balloon-expandable prosthesis was the most frequently implanted device (52%), followed by the Evolut self-expandable prosthesis (Medtronic; 36%). Considering only patients with good quality CT images for subsequent analysis of the IVS, PM implantation was needed in 17 patients (13.5%). Those with PM implantation post-TAVR were significantly more likely to have a thinner IVS than those without the need for PM implantation post-TAVR at every measured IVS level (0.33 ± 0.03 vs. 0.44 ± 0.02 cm, 0.54 ± 0.04 vs. 0.69 ± 0.03 cm, and 0.88 ± 0.04 vs. 1.1 ± 0.03 cm for 2, 5 and 10 mm below MS, respectively, $P < 0.05$ for all). In the

multivariate analysis both with RBBB and IVS thickness at 10 mm from the MS were independent predictors of post-TAVR definitive PM implantation (RBBB, $p=0.005$, HR 6.3, 95%CI 1.7-22.7, and IVS at 10 mm, $p=0.026$, HR 0.11, 95%CI 0.017-0.76, AUC 0.77).

Conclusion: Pre-procedural CT assessment of basal IVS thickness is a novel predictive marker for the risk of definitive PM implantation following TAVR. The IVS thickness potentially acts as an anatomical barrier protecting the underlying conduction system from mechanical compression during TAVR.

**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 939
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA
E STRUTTURALE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**

**COMPARISON BETWEEN IMAGING AND PHYSIOLOGY IN GUIDING CORONARY REVASCLARIZATION:
A META-ANALYSIS**

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Massimo Mancone (a, b), Fabrizio D'ascenzo (c, d)

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(c) CITTA DELLA SALUTE E DELLA SCIENZA DI TORINO, LE MOLINETTE, TORINO;

(d) DIPARTIMENTO DI SCIENZE MEDICHE, UNIVERSITÀ DI TORINO

Background: Percutaneous coronary intervention (PCI) is a widely used revascularization strategy for coronary artery disease. The choice between imaging-guided and physiology-guided PCI has been a subject of debate. This meta-analysis aims to systematically compare outcomes between imaging and physiology guided PCI and management of intermediate coronary lesions (ICLs).

Methods: A comprehensive literature search was conducted across major databases for studies published up to December 2023 following PRISMA guidelines. Seven eligible studies comparing imaging-guided and physiology-guided PCI were selected for the final analysis. Relevant outcome measures included major adverse cardiovascular events (MACE), target vessel revascularization (TVR), target vessel failure (TVF) and target lesion revascularization (TLR). Subgroup analysis was performed for ICLs.

Results: A total of 5701 patients were included in the meta-analysis. After a mean follow up of 2.1 years imaging-guided PCI was associated with lower rates of TVR compared to physiology-guided PCI (OR 0.70, 95% CI 0.52-0.95, $p = 0.02$); for what concerns MACE, TVF and TLR no differences were found. When the analysis was restricted to studies considering ICLs management there were no differences between the two techniques. Meta regression analysis did not show any impact of acute coronary syndromes (ACS) presentation on MACE and TVR.

Conclusion: The findings suggest that imaging-guided PCI may reduce the need for future revascularization of the target vessel compared to functional-guided approach and this result was not influenced by ACS presentation.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 940
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
ANGINA INSTABILE (CARDIOPATIA ISCHEMICA)**

MANAGEMENT OF ACS IN THE ELDERLY: UPDATED META-ANALYSIS

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Introduction: In acute coronary syndromes choosing between invasive or conservative management of elderly patients remains a matter of debate. Discordant data coming from randomized trials (RCTs) hinder to draw definitive conclusions on this subset of patients. We performed an updated study-level meta-analysis including the recently published SENIOR-RITA trial.

Methods: Randomized controlled trials and adjusted observational studies evaluating differences in outcomes between invasive and conservative strategy in elderly patients with ACS were searched in different databases. SENIOR-RITA trial data were included in the final analysis. Short-term re-infarction, MACE and bleedings and long-term re-infarction, revascularization and mortality were the considered endpoints.

Results: Five RCTs and fourteen adjusted observational studies were included. The median longer follow-up time was 3 years. Short-term re-IMA and MACE rates were significantly reduced in the invasive group. Bleedings were more frequent in the invasive arm. While RCTs data did not impact on long-term mortality, the invasive strategy was associated with a reduced re-IMA and revascularization risk compared to a conservative strategy according to both RCTs and non-RCTs.

Conclusions: In elderly patients with ACS an initially invasive strategy significantly reduced short-term and long-term ischaemic events while increasing bleeding events.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 811
FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA
E STRUTTURALE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**

**NOVEL NON HYPEREMIC CORONARY PHYSIOLOGY INDEX FOR VESSEL LONGITUDINAL ANALYSIS: THE
IFR PULLBACK PRESSURE GRADIENT (I-PPG)**

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(a) DIVISION OF CARDIOLOGY, DEPARTMENT OF MEDICINE, UNIVERSITY OF VERONA, VERONA, ITALY;
(b) THE LAMBE INSTITUTE FOR TRANSLATIONAL MEDICINE AND CURAM, NATIONAL UNIVERSITY OF IRELAND,
UNIVERSITY ROAD, GALWAY, IRELAND; (c) DEPARTMENT OF CLINICAL AND MOLECULAR MEDICINE,
SAPIENZA UNIVERSITY, ROME, ITALY

Background: The pattern of coronary artery disease, whether focal or diffuse, is an important factor in guiding physicians during the decision-making process for percutaneous coronary interventions. This study introduces a novel non-hyperemic coronary physiology index designed for longitudinal vessel analysis.

Methods: In this prospective observational study, 415 patients underwent pressure-wire functional assessments using iFR pullback traces between March 2015 and November 2023 at Verona University Hospital. After applying exclusion criteria, the final study population included 198 patients with 209 intermediate coronary lesions. Vessels were qualitatively categorized as focal, diffuse, mixed predominantly focal, or mixed predominantly diffuse. The novel Instantaneous Free-ratio Pullback Pressure Gradient (I-PPG) was derived from iFR pullback curves to quantify the atherosclerotic pattern along the vessel. The local severity of lesions was assessed using the iFR gradient per mm (diFR/ds). In parallel, the Murray law-based Quantitative Flow

Ratio (μ QFR) was computed to extract both μ QFR-PPGi and $d\mu$ QFR/ds values, establishing correlations with iFR-derived values.

Results: The optimal I-PPG threshold for defining focal disease was 0.71 (Youden index = 0.456), demonstrating good accuracy in predicting the predominant disease pattern (AUC 0.785, $p < 0.001$), with sensitivity, specificity, positive predictive value, and negative predictive value of 86.5%, 59%, 67.6%, and 81.5%, respectively. The μ QFR-PPGi and $d\mu$ QFR/ds correlated with I-PPG and diFR/ds, respectively ($r = 0.238$, $p < 0.001$; $r = 0.528$, $p < 0.001$). Qualitative vessel analysis using μ QFR showed substantial agreement with iFR pullback-based assessments.

Conclusions: The I-PPG index for longitudinal vessel analysis effectively characterizes the physiological distribution of coronary atherosclerosis, distinguishing between focal and diffuse patterns without the need for hyperemia. Moderate agreement between angiogram-based μ QFR and iFR-based derived indices were found.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 906
 INFARTO STEMI (CARDIOPATIA ISCHEMICA)
 DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)
 TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)**

**INCREASED THROMBOGENICITY IS ASSOCIATED WITH CORONARY MICROVASCULAR
 INJURY IN PATIENTS WITH STEMI**

Denis Leonardi (a), Andrea Bottardi (a), Roberto Scarsini (a), Leonardo Portolan (a), Caterina Butturini (a), Verdiana Galli (a), Francesco Della Mora (a), Anna Piccoli (a), Simone Fezzi (a), Giovanni Benfari (a), Domenico Tavella (a), Gabriele Pesarini (a), Flavio Ribichini (a)

(a) UNIVERSITY OF VERONA, DEPARTMENT OF MEDICINE, SECTION OF CARDIOLOGY

Background: Up to 50% of patients with ST-segment elevation myocardial infarction (STEMI) undergoing primary percutaneous coronary intervention (pPCI) develop coronary microvascular injury (CMI).

Aim: This study aims to assess whether a prothrombotic state of coronary blood, defined by thromboelastography (TEG), is associated with post-pPCI CMI development in STEMI patients.

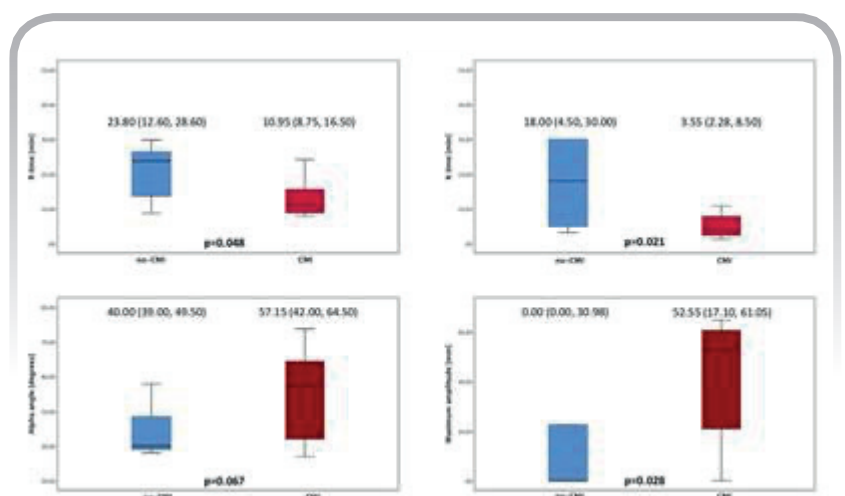
Methods: TEG analysis of infarct-related coronary artery (IRA) blood was performed in 24 consecutive patients with STEMI before and after successful pPCI. CMI was defined as evidence of microvascular obstruction (MVO) at cardiac magnetic resonance (CMR) and/or high values of the non-hyperaemic angiography-derived index of microcirculatory resistance (NH-IMR_{angio} > 40 units).

Results: The median age was 58 (IQR 50-71) years; 20 (83%) of the subjects were male, and 2 (8%) of them had diabetes. CMI was observed in 16 (67%) patients.

Pre-pPCI K time of the coronary blood from the IRA was inversely correlated with NH-IMR_{angio} (rho -0.466, p=0.05). Kinetic (K) time was significantly shorter in patients who developed CMI (3.5 [IQR 2.3-8.5] minutes vs 18 [IQR 4.5-30.0] minutes, p=0.021),

and it provided an overall good diagnostic accuracy in predicting CMI (AUC 0.816, [95% CI 0.613 – 1.000] p=0.021). Reaction (R) time was significantly shorter (10.95 [8.75, 16.50] vs 23.80 [12.60, 28.60], p=0.048), and the clot maximum amplitude (MA) was significantly larger (52.55 [17.10, 61.05] vs 0.00 [0.00, 30.98], p=0.028) in patients with CMI. Coronary post-pPCI TEG parameters did not show a correlation with CMI.

Conclusions: In this proof-of-concept study, a prothrombotic state of coronary blood from the IRA is associated with CMI. Further studies are warranted to evaluate if TEG might help tailor individualized therapies in patients at risk of CMI.



Pre-pPCI TEG parameters in patients with (red) and without (blue) CMI: R time, K time, α angle, MA.

Figure 1

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 944 IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

IMPACT OF INTRAPROCEDURAL GUIDANCE ON PFO CLOSURE OUTCOMES: INSIGHTS FROM THE PROLONG REGISTRY

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Aims: Transcatheter PFO closure is established as the standard treatment for cryptogenic embolism. There is lack of consensus on the choice of intraprocedural guidance. This study aims to compare the safety and efficacy of fluoroscopic guidance alone versus echocardiographic guidance (TEE or ICE) for transcatheter PFO closure.

Methods and results: The retrospective multicenter PROLONG registry included 995 patients from 13 high-volume centers with comprehensive data on intraprocedural guidance who underwent PFO transcatheter closure between 1999 and 2013. Of these, 119 (12%) underwent PFO closure using fluoroscopic guidance only, while for 876 (88%) patients a combined approach of fluoroscopy and echocardiography was utilized—specifically, TEE was used in 483 (48%)

patients and ICE in 394 (40%). There were no significant differences between fluoroscopic and echocardiographic guidance in terms of procedural success (97% versus 99%, $p=0.20$), in-hospital and long-term complications, or residual shunt rates. Echocardiographic guidance was associated with significantly shorter procedural times (29 versus 50 minutes, $p<0.001$), lower radiation exposure (6.8 versus 31 Gy*cm², $p<0.001$) and need for contrast use (16% versus 94%, $p<0.001$) compared to fluoroscopic-only guidance.

Conclusions: Both fluoroscopic and echocardiographic guidance demonstrate comparable effectiveness in transcatheter PFO closure. Tailoring the choice of intraprocedural guidance to each center's expertise and preferences is essential for achieving optimal outcomes.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 470
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
IMAGING DELLE CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE
E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE
E MALATTIE DEL CIRCOLO POLMONARE)**

**A RARE CASE OF CORONARY-PULMONARY FISTULA SUBJECTED TO A PERCUTANEOUS TREATMENT
BY COIL EMBOLIZATION**

Francesca Rampini (a), Ashraf Nassar (a), Giulio Leo (a), Niccolo Bonini (a), Laura Pattumelli (a), Alberto Bagnoli (a), Ilaria Righelli (a), Benedetta Cherubini (a), Salvatore Arrotti (a), Fabio Sgura (a), Daniel Monopoli (a), Giuseppe Boriani (a)

(a) *CARDIOLOGY DIVISION, POLICLINICO DI MODENA, UNIVERSITY OF MODENA E REGGIO EMILIA*

Coronary fistulas are abnormal communications between coronary arteries and an adjacent structure (vessel or cardiac chamber). They can be congenital or acquired and symptoms depends on the entity of shunt and the presence of pulmonary hypertension o myocardial ischemia.

We report the case of a coronary-pulmonary fistula in a symptomatic 66-year-old male, with evidence

of inducible ischemia in the inferolateral and apex and apical mid anterior wall during stress phase, witch recovery during resting phase in myocardial scintigraphy performed in Taiwan, with an indication for coronary angiography study.

No significant morpho-functional abnormalities were detected on the echocardiogram.

Coronary angiography study shows evidence of critical



Figure 1

stenosis in the mid-segment dominant right coronary artery treated with a drug-eluting stent and subsequent post-dilation with NC balloons, achieving a good final angiographic result.

Residual wall irregularity in the proximal segment of the left anterior descending branch, causing 30% stenosis. A large coronary-pulmonary fistula from the left anterior descending artery was noted, with an indication for evaluation by CT angiography and subsequent collegial assessment.

Angio-CT allowed us to appreciate a tortuous vascular structure originating from the proximal segment of the left anterior descending artery merging into the main pulmonary trunk at the left lateral wall approximately 1

cm from the pulmonary valve plane, compatible with a coronary-pulmonary fistula. Cardiopulmonary Exercise Testing showed a marked cardiogenic limitation during exercise (reduced oxygen pulse, peak VO_2), with likely development of exercise-induced pulmonary hypertension (VE/VCO₂ slope 44 ml/kg-min). Surgical correction was deemed necessary for the patient, because of the evidence of induced ischemia in the territory of left anterior descending branch associated with exercise induced pulmonary hypertension, not present at rest.

Therefore, in collaboration with our interventional radiology colleagues, we have scheduled a procedure for closing the fistula using coils.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 711
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA IN ACUTO)
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)**

**CANGRELOR IN PATIENTS WITH PERCUTANEOUS CORONARY INTERVENTION
AFTER OUT-OF-HOSPITAL CARDIAC ARREST**

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(a) DIVISION OF CARDIOLOGY, POLICLINICO IRCCS SAN MATTEO, PAVIA; (b) DEPARTMENT OF MOLECULAR MEDICINE, UNIVERSITY OF PAVIA, PAVIA; (c) CARDIAC ARERST AND RESUSCITATION SCIENCE RESEARCH TEAM (RESTART), FONDAZIONE IRCCS POLICLINICO SAN MATTEO, PAVIA; (d) CARDIOTHORACIC DEPARTMENT, ASST "SPEDALI CIVILI" BRESCIA; (e) DIVISION OF CARDIOLOGY, MAGGIORE HOSPITAL, CREMA; (f) DIVISION OF CARDIOLOGY, SANT'ANNA HOSPITAL, COMO; (g) INTERVENTIONAL CARDIOLOGY UNIT, FONDAZIONE POLIAMBULANZA HOSPITAL INSTITUTE, BRESCIA; (h) DIVISION OF CARDIOLOGY, CLINICAL INSTITUTE HUMANITAS, CASTELLANZA; (i) DIVISION OF CARDIOLOGY, HOSPITAL ASST OVEST MILANESE, LEGNANO

Background: Coronary artery disease (CAD) is the leading cause of out-of-hospital cardiac arrest (OHCA). There is currently no data on the clinical outcomes associated with the use of cangrelor in patients undergoing percutaneous coronary intervention (PCI) after OHCA. This study aims to investigate the in-hospital clinical outcomes of cangrelor use in this vulnerable population.

Methods: We conducted a multicentric, prospective, observational study involving all consecutive OHCA patients enrolled in the Lombardia CARE Registry from January 1, 2015, to December 31, 2022, who underwent PCI in seven centers in Northern Italy (figure 1). The primary end-point was survival at discharge. Propensity score (PS) matching was performed to compare patients who received cangrelor with those who did not. Patients were randomly matched based on their PS, and this process was repeated 25 times (figure 1).

Results: A total of 612 patients were admitted to the seven centres after OHCA, and 464 (60.3%) underwent PCI. Among these, cangrelor was administered to 34 (7.3%) patients during PCI. There were no significant

differences in OHCA characteristics between patients receiving cangrelor and those who did not. Radial access was more common in the cangrelor group, which also had a higher requirement for pharmacological circulatory support, a higher troponin peak, and more frequently achieved a final TIMI flow grade 3. In the cangrelor group, 82.4% of patients were alive

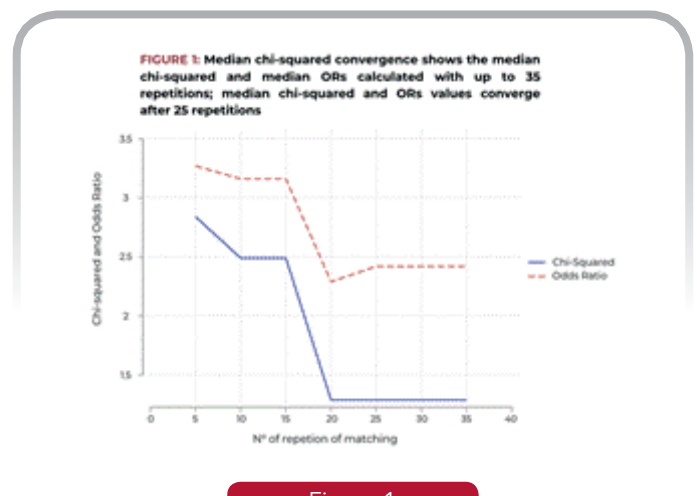
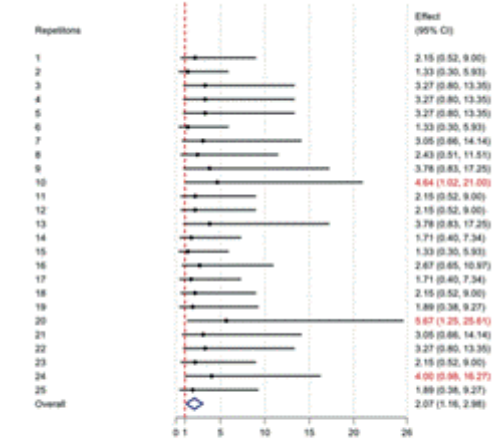


Figure 1

at discharge, compared to 65.3% in the no-cangrelor group (chi-square: 4.1015; p-value: 0.043). Univariable logistic regression for the primary endpoint showed that cangrelor use was associated with a higher probability of survival at discharge (OR 2.5; 95% CI: 1.1-6.1, p-value = 0.049). After multiple randomized matchings according to the PS, cangrelor remained associated with better survival at discharge (OR 2.07; 95% CI: 1.16-2.98) (figure 2).

Conclusions: the administration of cangrelor was associated with improved survival at discharge in OHCA patients undergoing PCI. In this subset of high hemorrhagic and thrombotic risk patients, our results suggest a potential net clinical benefit that may outweigh the potential increase in bleeding risk, possibly due to its protective effect against periprocedural thrombotic events. The conclusions should be considered exploratory, as generating hypotheses, and need to be confirmed in larger and specific studies.

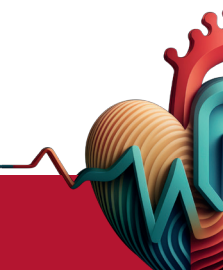
FIGURE 2: Forestplot displaying Odds Ratios in all 25 repetition of randomly matched patients based on their PS, with overall OR.



For each sample, considering only matched patients, chi-squared test and logistic regression were performed to test the association between cangrelor administration and patient survival at discharge. The median chi-squared test and the overall Odds Ratio (OR) derived from each samples were taken into account to confirm the association between cangrelor administration and survival at discharge.

OR: odds ratio; PS: propensity score

Figure 2



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 301
 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
 CORONARICA E STRUTTURALE)
 MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
 (CARDIOPATIA ISCHEMICA)
 DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)**

**MYOCARDIAL BRIDGE EVALUATION TOWARDS PERSONALIZED MEDICINE: FINAL RESULTS OF THE RIALTO
 REGISTRY**

Gaetano Rizzo* (f), Domenico D'amarico* (f), Giuseppe Ciliberti (a), Attilio Restivo (a), Renzo Laborante (a), Fabio Casamassima (a), Giuseppe Sangiorgi (d), Matteo Tebaldi (b), Italo Porto (e), Daniele Andreini (g), Rocco Vergallo (e), Gianluca Campo (b), Antonio Maria Leone (a), Paolo Zeppilli (a), Simone Biscaglia (b), Emanuele Barbato (c), Francesco Burzotta (a), Filippo Crea (a), Giuseppe Patti (f)

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 (b) UNIVERSITÀ DEGLI STUDI DI FERRARA - AOU FERRARA; (c) UNIVERSITÀ LA SAPIENZA DI ROMA - AOU SANT'ANDREA ROMA; (d) UNIVERSITÀ DI ROMA TOR VERGATA - POLICLINICO TOR VERGATA; (e) UNIVERSITÀ DI GENOVA - POLICLINICO SAN MARTINO; (f) UNIVERSITÀ DEGLI STUDI DEL PIEMONTE ORIENTALE - AOU MAGGIORE DELLA CARITÀ; (g) UNIVERSITÀ DEGLI STUDI DI MILANO

Background: Myocardial bridging (MB) is the most common inborn coronary artery anomaly in which a portion of myocardium overlies an epicardial coronary artery segment. Growing evidence suggested its association with myocardial ischemia through several pathophysiological substrates. However, to date, no data on long-term prognosis are available, nor on therapies improving cardiovascular outcomes. The Myocardial Bridge Evaluation Towards Personalised Medicine (the **RIALTO**) Registry (ClinicalTrials.gov Identifier: NCT05111418) is an ambispective, observational, multicentric registry with the aim to describe the incidence of major adverse cardiovascular events (MACE) and to generate real-world evidence to support the role of a personalized therapy based on different MB-related ischemia endotypes detected by an invasive intracoronary assessment.

Materials and Methods: The main inclusion criteria were patients undergoing coronary angiography (CA) for suspected CAD and found to have MB without obstructive epicardial lesions. Exclusion criteria were life expectancy

<12 months and/or severe valvular heart disease. The indication to perform a full-physiology assessment was left to the operator's decision. The primary endpoint of the study was the incidence of MACE, defined as the composite of cardiac death, myocardial infarction, cardiac hospitalization, and target vessel revascularization at 24 months. The secondary endpoints were the rate of patients with Seattle Angina Questionnaire (SAQ) summary score <70 and the impact of a personalized therapy based on invasive intracoronary functional assessment on MACE.

Results: Between June 2015 and March 2022, 23158 CA were analyzed using a dedicated software. The presence of MB was detected in 486 patients (2%). Chronic Coronary Syndrome was the most represented clinical presentation (57%), while up to 43% of the patients were found to have MB during an Acute Coronary Syndrome. Assessment with fractional flow reserve (FFR) was performed in 75 patients (15.4%), while an intracoronary acetylcholine test (ACH) in 75 (15.4%). At 2-year follow-up, the rates of MACE and SAQ <70 were respectively 18.2% and 17.2% in the

overall study population. We compared MB patients undergoing angiographic evaluation only (Angio-group) with those with positive ACH provocative-test discharged with calcium-channel blockers (ACH+ group), and those with pathologic FFR assessment discharged with beta-blockers (FFR+ group): the rate of MACE was significantly reduced in the ACH+ group (8% vs 20.7%, $p=0.01$) and FFR+ group (6.7% vs 20.7%, $p=0.01$) compared to the Angio-group.

Conclusions: MB is a challenging cause of ischemia in patients referred to coronary angiography, during an

ACS or CCS, highlighting that different mechanisms of myocardial ischemia may coexist. Patients with MB have a significant burden of symptoms with an impaired quality of life at long-term follow-up. A full-physiology-guided therapy significantly decreased the incidence of MACE at two years and was associated with a better quality of life. Based on the present results, a prospective multicentric, randomized controlled trial, the RIALTO-PRO (ClinicalTrials.gov Identifier: NCT06281967) has been recently launched to further confirm the relevance of the present findings.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 204
 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
 CORONARICA E STRUTTURALE)
 INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
 CORONARICA E STRUTTURALE)
 CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
 DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)**

A NOVEL INDEX OF MICROCIRCULATORY RESISTANCE (IMR) ASSESSMENT: CONTRAST IMR

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Background: The Index of Microvascular Resistance (IMR) has emerged as a pivotal index for characterizing and predicting prognosis in patients with and without coronary artery disease. However, the side effects of adenosine-induced hyperemia and the methodological complexities have limited its applicability.

Aims: Our objective is to evaluate the diagnostic efficacy and feasibility of a novel index, "contrastIMR" for assessing microvascular resistance.

Methods: We prospectively enrolled consecutive patients diagnosed with chronic coronary syndromes (CCS) who underwent a thorough functional assessment of the coronary tree using the thermodilution technique. Fractional Flow Reserve (FFR) and Thermo-IMR served as the standard of reference. Contrast-FFR (cFFR) was assessed during contrast medium induced hyperemia. cIMR was estimated by expert analysts using the following formula: [Contrast Distal Pressure (cPd) * Time of Transit (Tmn)]. cPd was obtained through pressure wire recording during contrast medium injection; Tmn was estimated from resting angiograms as the ratio between the number of frames (Nframes) needed for contrast dye to travel from the guiding catheter to a distal reference and

the acquisition rate (frames per second, fps). cIMR and Thermo-IMR were estimated and correlated each other.

Results: Analysis included 94 patients accounting for 100 lesions. The majority (87%) exhibited no significant epicardial stenoses (FFR>0.80) during the index procedure, with the left anterior descending (LAD) artery being the most frequently assessed (98%). Median IMR and cIMR values were 22.0 (14.0, 31.0) and 37.0 (31.7, 45.4) units, respectively. cIMR demonstrated a strong correlation ($r=0.87$; $p<0.001$) and excellent discriminatory power [AUC 0.92, CI (0.87-0.97)] compared to thermo-IMR. The optimal cut-off value of cIMR, assessed by the Youden Index, was 38, showing an accuracy of 85.0%, a positive predictive value (PPV) of 81.2% (95%CI, 74.3- 89.4%) and a negative predictive value (NPV) of 87.5% (95% CI, 81.0-94.0%) in detecting high resistance compared to thermo-IMR (≥ 25 U).

Conclusion: The utilization of cIMR for assessing microvascular resistance proves to be both feasible and accurate. cIMR emerges as a valid surrogate for IMR, enhancing its assessment by reducing procedural complexity and mitigating the collateral effects of adenosine-induced hyperemia.

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 821 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

A STRANGE ENDOCARDIAL IMAGE IN VERY SLOW MOTION: ARTIFACT OR REALITY?

Carlo Vignati (a), Francesco Balata (d), Simona Costantino (d), Paola Gripari (b), Cristina Ferrari (c),
 Maria Elisabetta Mancini (b), Piergiuseppe Agostoni (a)

(a) DIPARTIMENTO DI CARDIOLOGIA CRITICA E RIABILITATIVA, CENTRO CARDIOLOGICO MONZINO, IRCCS, MILANO; (b) DIPARTIMENTO DI IMAGING E CARDIOLOGIA PERIOPERATORIA, CENTRO CARDIOLOGICO MONZINO, IRCCS, MILANO; (c) DIPARTIMENTO DI CARDIOLOGIA INTERVENTISTICA, CENTRO CARDIOLOGICO MONZINO, IRCCS, MILANO; (d) SCUOLA DI SPECIALIZZAZIONE IN MALATTIE DELL'APPARATO CARDIOCIRCOLATORIO, UNIVERSITÀ DEGLI STUDI DI MILANO

We present the clinical case of an asymptomatic 51-year-old patient with past medical of coronary artery disease, previous double CABG and mitral valve repair cardiac surgery at age 43, combined tricuspid valve repair and mitral valve replacement surgery with mechanical prosthesis and TAVI at age respectively 48 and 49, underwent a routine follow-up echocardiographic examination which identified a linear hyperechogenic image within the right ventricle. (Figure 1A). A CT scan was performed and it revealed the presence of a linear and thin metallic foreign body running between the atrium and the right ventricle through the tricuspid valve plane which has a proximal end external to the right atrial profile, a few millimeters above the valve plane, and the distal end which stops with a loop in the infundibular region. (Figure 1B-1C) Based on previous surgical history it was labelled as non-infectious temporary epicardial pacing wire (TEPW). Guided by the patient's precarious but stable clinical conditions, we decided to perform an echocardiographic check after some months that showed the same image in the RVOT; CT, instead, showed the migration of the metal body up to the artery for the lower segment of the

left lower pulmonary lobe. (Figure 1D) At that point, considering the wire migration after almost 2 years it was considered appropriate to proceed with its removal. Interventional cardiology was consulted, and a fluoroscopic evaluation confirmed the feasibility of the minimally invasive procedure. Multi-Snare, a multiple retrieval loop, was chosen as the most suitable percutaneous interventional radiology tool for wire removal. (Figure 1E) The wire has been hooked, removed up to the IVC and then completely pulled out through femoral venous introducer. Successful recovery confirmed a TEPW originally attached to the right atrium. (Figure 1F).

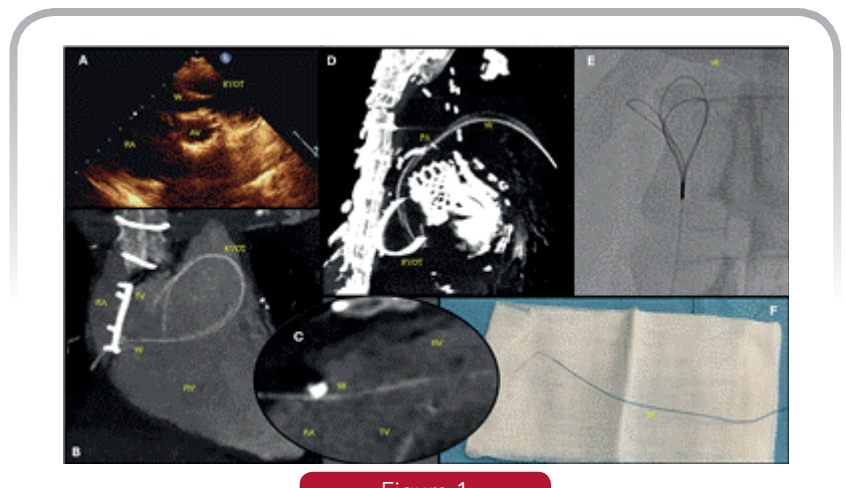


Figure 1



Retained wires can be the source of some dangerous consequences. The mechanism of wire's migration from its original attachment at the epicardium is still anatomically unclear but has been suspected to be due to direct perforation of the cardiac musculature or neighboring vascular structures; migrations into the right ventricle, left pulmonary artery, bronchial system, ascending aorta,

right carotid artery, abdominal viscera have all been reported. The peculiarity of the present case is that we have documented through serial investigations both the entry hole and the migration into the pulmonary arterial circulation of a non-infectious TEPW through the right cardiac chambers without causing symptoms in a patient in challenging clinical conditions.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 393 SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO) INFARTO STEMI (CARDIOPATIA ISCHEMICA) TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

PATTERNS OF DISEASE PROGRESSION AND OUTCOMES OF INFERIOR STELEVATION MYOCARDIAL INFARCTION COMPLICATED BY CARDIOGENIC SHOCK: INSIGHTS FROM THE INSTINCT REGISTRY

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(a) UNIVERSITÀ VITA SALUTE SAN RAFFAELE, MILANO, ITALIA; (b) U.O. EMODINAMICA E CARDIOLOGIA INTERVENTISTICA, IRCCS OSPEDALE SAN RAFFAELE, MILANO, ITALIA; (c) DIPARTIMENTO DI CHIRURGIA CARDIOTORACICA E VASCOLARE, IRCCS OSPEDALE SAN RAFFAELE, MILANO, ITALIA;

(d) FONDAZIONE POLICLINICO UNIVERSITARIO A. GEMELLI, ROMA, ITALIA; (e) SC CARDIOLOGIA 1, FONDAZIONE IRCCS POLICLINICO SAN MATTEO, PAVIA, ITALIA

Background: Cardiogenic shock (CS) is a frequent presentation of anterior ST-elevation myocardial infarction (STEMI), and up to 90% these patients are prone to in-hospital deterioration. However, disease progression in inferior STEMI and right ventricular dysfunction is poorly investigated. The aims of the present study are to analyze the patterns of disease progression and in-hospital outcomes of inferior STEMI complicated by CS.

Methods: The INSTINCT (Inferior ST-elevation myocardial Infarction complicated by Cardiogenic shock) Registry retrospectively included all consecutive patients who developed CS following inferior STEMI treated at three centres in Italy from 2015 to 2023. Patients were attributed a Society of Cardiovascular Angiography and Interventions (SCAI) stage (B-C-D-E) at diagnosis of shock and during disease progression and were defined "worsening patients" (WPs) if the SCAI stage increased.

Results: A total of 130 patients were included, only 20 (15.4%) experienced worsening CS. The figure shows the transition between SCAI stages and

highlights how most patients did not deteriorate during hospitalization. Worsening patients (WPs) had a higher rate of primary percutaneous coronary intervention failure, developed a more severe cardiometabolic shock, and required more aggressive mechanical circulatory support (MCS). WPs had a significantly higher rate of in-hospital mortality (65% vs 13.6%,

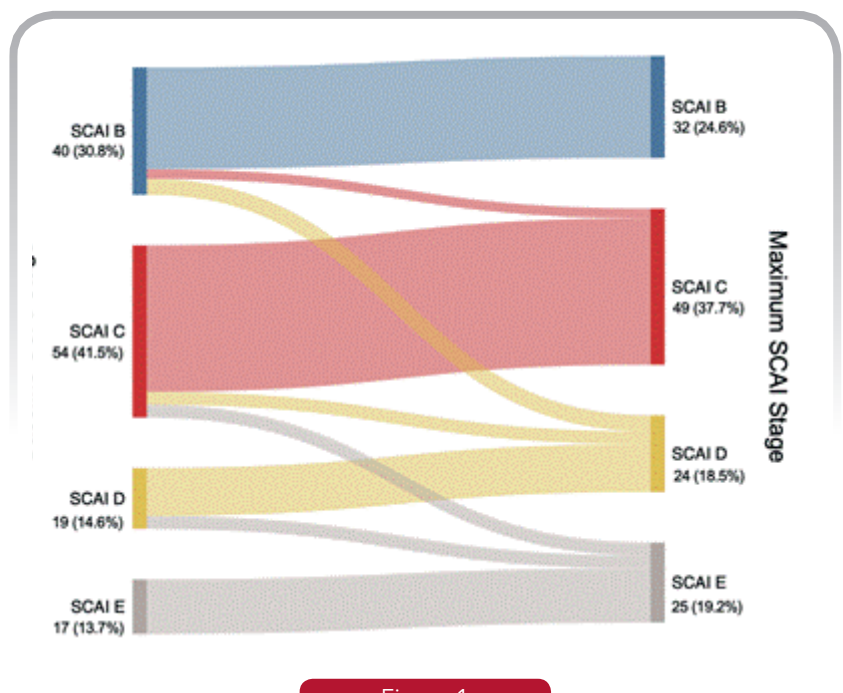
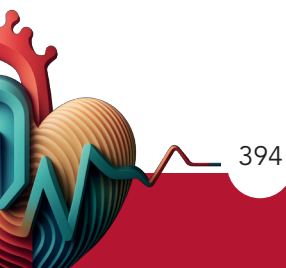


Figure 1

$p < 0.001$), major bleeding (20% vs 6.4%, $p = 0.044$) and MCS weaning failure (35% vs 2.7%, $p = 0.032$).

Conclusions: Deterioration of CS following inferior STEMI occurs rarely; however, it is associated with more

severe cardiometabolic deterioration, more aggressive management, and increased in-hospital mortality. Close monitoring and adequate upfront management of low stages of CS at baseline might prevent deterioration and improve outcomes.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 424
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)
INTELLIGENZA ARTIFICIALE (TELECARDIOLOGIA ED E-HEALTH)**

**3MENSIO STRUCTURAL HEART SOFTWARE FOR DEVICE SELECTION IN PATIENTS ELIGIBLE
FOR LEFT ATRIAL APPENDAGE CLOSURE (LAAC)**

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Valentina Menghini (b), Nardi Fabrizio (a), Achille Gaspardone (a)
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Title: 3mensio Structural Heart software for device selection in patients eligible for left atrial appendage closure (LAAC).

Background: In recent years, dedicated software has been developed for the optimal choice of devices to be implanted for LAAC based on echocardiographic images. In particular, 3mensio Structural Heart (3mSH) is employed in the preoperative evaluation to select proper device.

Aim: This study was aimed to evaluate the effective utility of 3mSH in predicting the size of the Watchman™ device used for LAAC.

Materials and Methods: Patients undergoing LAAC were consecutively enrolled. Pre-operative transoesophageal echocardiogram (TOE) were acquired with different angles (Table) and analyzed by 3mSH to determine the most appropriate size of the Watchman occluder. The analysis was performed measuring landing zone and length.

Results: Thirty-two patients were enrolled 20 males (63%) and 12 females (37%), with a mean age of 75 ± 8 years. In 16 out of 32 cases (50%), the measurement of the device indicated by 3mSH did not correspond to the implanted device; in 9 out of 32 cases (28%) a larger device needed to be implanted, while in 7

Measurements	Manual		3mSH		p value
	mean (mm)	±SD	mean (mm)	±SD	
LZ, 45° scan	18,5	3,5	17,6	3,6	0,79
LAA length, 45° scan	26,8	8,3	20,2	4,1	0,0001
LZ, 90° scan	17,3	3,9	17,1	4,4	0,35
LA length, 90° scan	26,5	7,4	19,2	3,9	0,0004
LZ, 135° scan	20,0	4,6	17,9	2,8	0,0049
LAA length, 135° scan	26,9	7,6	18,0	4,0	0,0001

LZ: landing zone; LAA left atrial appendage

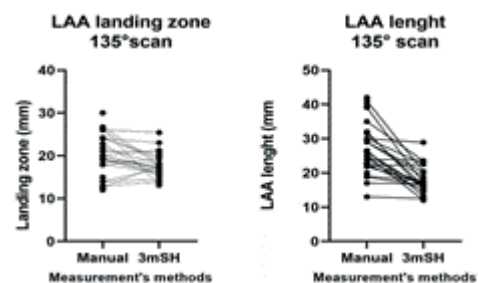


Figure 1



cases (22%) a smaller device needed to be used. The following table shows the LAA measurements resulted manually and using 3mSH.

Analyzing the measurements of the LAA dimensions conducted by operators, it is possible to observe a statistically significant difference in the measurement of the LAA's length across all scans and a significant difference in measurement of LAA's landing zone at 135° scan.

Conclusions: Despite advancements in AI and dedicated software like 3mSH for preoperative planning, our findings indicate discrepancies between

the device size predicted by 3mSH and the actual size implanted in half of the cases. In addition, the structure of the LAA is highly variable, and numerous hemodynamic factors can influence its measurement with non-invasive imaging. Standardizing scans and establishing well-defined landmarks can help reduce intra-operator differences. Probably, the assessments during intra-procedural angiography can provide more reliable information on the measurements to consider when selecting the device, especially taking into account the anatomy of the LAA and its variability in response to hemodynamic changes.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 959 PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

PREVALENCE, DETERMINANTS AND IMPACT OF PRE-PROCEDURAL ANEMIA ON 1-YEAR MORTALITY IN PATIENTS UNDERGOING TAVI: A RETROSPECTIVE SINGLE-CENTER REGISTRY

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Background: Anemia is a common and significant comorbidity among patients undergoing transcatheter aortic valve implantation (TAVI). Multiple factors contribute to anemia in these patients, including advanced age and comorbid conditions, which increase their susceptibility to adverse outcomes, including higher long-term mortality rates. This study aims to investigate the prevalence of pre-procedural anemia, determinants, and its impact on 1-year mortality in patients undergoing TAVI.

Methods: This observational, single-center registry included patients with severe aortic stenosis undergoing TAVI from September 2008 to November 2020 at a tertiary center. Baseline clinical, procedural, and in-hospital outcomes were included in a prespecified database. Anemia was assessed according to the World Health Organization definition (No anemia: Hb \geq 13 g/dL for men, Hb \geq 12 g/dL for women; Mild anemia: Hb 11–12.9 g/dL for men, Hb 11–11.9 g/dL for women; Moderate anemia: Hb 8–10.9 g/dL; Severe anemia: Hb $<$ 8 g/dL). The primary outcome measure was all-cause mortality 1 year after procedure. Patients were divided into two groups based on the presence or absence of pre-procedural anemia. Categorical variables were presented as counts (percentages) and compared using the χ^2 test. Continuous variables were expressed as mean (standard deviation) or median (interquartile range) depending on their distribution,

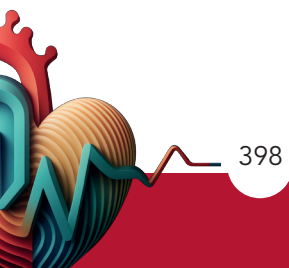
with comparisons made using the Student's t-test or corresponding non-parametric tests. Disparities in the primary outcome between groups were analyzed using a univariate Cox proportional hazards model, with results expressed as hazard ratios (HR) and 95% confidence intervals (95% CIs).

Results: A total of 623 patients were included, with 348 (55.86%) classified as having anemia and 275 (44.14%) without anemia. Among the anemic patients, 206 (33.07%) had mild anemia and 142 (22.79%) had moderate-to-severe anemia. There were no significant differences in baseline characteristics between the two groups, except for a higher prevalence of chronic kidney disease ($p = 0.027$) and dialysis ($p = 0.006$) in the anemic group. Notably, prior PCI was less common in the anemic group ($p = 0.008$). NT-proBNP and creatinine levels at admission were significantly higher in the anemia group ($p = 0.003$ and $p = 0.001$, respectively). Procedural outcomes were similar between the groups, except for significantly longer ICU and hospital stays ($p = 0.013$ and $p = 0.009$, respectively) in the anemic group. Blood transfusion within the first 48 hours was more common in the anemia group, while a hemoglobin drop >3 g/dL was more frequent in the non-anemic group ($p < 0.001$ and $p < 0.001$, respectively). No significant differences were observed in peri-procedural complications. Univariate analysis showed that 1-year mortality was more common in the



anemic group (HR 1.98 [95% CI: 1.06–3.70], $p = 0.03$). There was no association between mild anemia and the primary outcome (HR 1.66 [95% CI: 0.82–3.38], $p = 0.15$), but there was a strong association between moderate-to-severe anemia and the primary outcome (HR 2.46 [95% CI: 1.21–4.98], $p = 0.013$).

Conclusion: Pre-procedural anemia is a frequent finding in patients undergoing TAVI and is associated with multiple comorbidities. It is an independent risk factor for increased 1-year mortality, with moderate-to-severe anemia more than doubling the risk compared to patients without anemia.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 768 FIBRILLAZIONE ATRIALE (FA) (ARITMIE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

SAFETY AND EFFICACY OF EXTRACTION OF WATCHMAN DEVICE USING A DOUBLE TRANSEPTAL APPROACH

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(a) POLICLINICO TOR VERGATA; (b) TEXAS CARDIAC ARRHYTHMIA INSTITUTE;
(c) ST BERNARDS MEDICAL CENTER

Background: Left atrial appendage occlusion is a treatment for patients with atrial fibrillation who have a high risk of bleeding and are unable to take oral anticoagulants. The Watchman device is an option and has been shown to be safe and effective in reducing embolic stroke risk. Rare but serious and potentially life-threatening complications, such as dislodgment, can occur. Though there is a designated apparatus available for delivery and implantation of these devices, there are no predefined instructions or required equipment available for extraction of dislodged device.

Aim: This multicenter study aimed to describe the Watchman extraction procedure and to assess the success rates and potential complications associated with the procedure.

Methods: In this observational study, we analyzed prospectively collected data from 9 patients that underwent percutaneous Watchman extraction with an endoscopic gasping tool (Raptor) at two high volume centers for Watchman implant in United States between 2019 and 2023.

Procedural success was described as complete extraction of Watchman without procedural complication.

Results: The Watchman was removed due to dislodgement, a potential risk factor for device embolization. The maximum and the minimum size of the extracted Watchman were 24 and 31 respectively. Mean dwell time was 34 ± 8 days. In all the first attempt of retrieval the watchman was done with only one transeptal access with one bioptome (Raptor) to stabilize the watchman and trying to pull inside a 16 mm sheath. In 7 case a second transeptal was required to use another bioptome to allow entry into the sheath. Thus, in these cases sheath bigger than 16 mm was required to extract the Watchman.

The device was replaced with a bigger watchman in 6 cases, with an amulet in 1 case and in 2 cases, it was not replaced but oral anticoagulation therapy was continued.

Procedural success was obtained in 8 (73%) patients. In one case, the use of a single bioptome during extraction led to the embolization of the Watchman device into the ascending aorta, causing a dissection and the patient's subsequent death within the initial week.

Conclusion: Watchman extraction is a valuable option when complication, such as dislodgment, occur and should be done using two transeptal access with two bioptomes to improve safety and effectiveness.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 869
 ARTERIOPATIA DEI TRONCHI SOVRA-AORTICI (MALATTIE DEI VASI)
 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**ACUTE AND LONG-TERM SAFETY AND EFFICACY OF IVUS-GUIDED DRUG COATED
 BALLOON TREATMENT FOR CAROTID IN-STENT RESTENOSIS**

Bianca Ada Magnanini (a, b), Raffaele Del Maso (a), Edoardo Oscar Genta (a, b), Ludovica Torzolini (a, b),
 Matteo Ferrari (a, b), Stefano Galli (b), Giovanni Teruzzi (b), Sarah Troiano (b), Piero Montorsi (a, b)
 (a) UNIVERSITÀ DEGLI STUDI DI MILANO; (b) CENTRO CARDIOLOGICO MONZINO

Background: Drug-coated balloon (DCB) is a promising treatment for carotid in-stent restenosis (CISR).

Methods: We evaluated safety and efficacy of acute and long-term results of a large series of IVUS-guided DCB treatment. The role of IVUS includes 1:1 DCB-stent sizing at the level of Minimal Lumen Area (MLA, mm²), investigation of CISR etiology and quantification of acute lumen gain (ALG,

mm²). We retrospectively selected 29 patients (30 stenosis), mean age 70±7.2 years, 57% males, 97% asymptomatic with CISR (>80% DS or Peak Systolic Velocity [PSV]>3.0 m/s by Doppler US) at an average 27 months from index procedure.

Results: Angiographic stenosis, length and type were 83±6%,16±8 mm and 63% type III CISR, respectively. Distal filters were used in all cases. Predilatation was

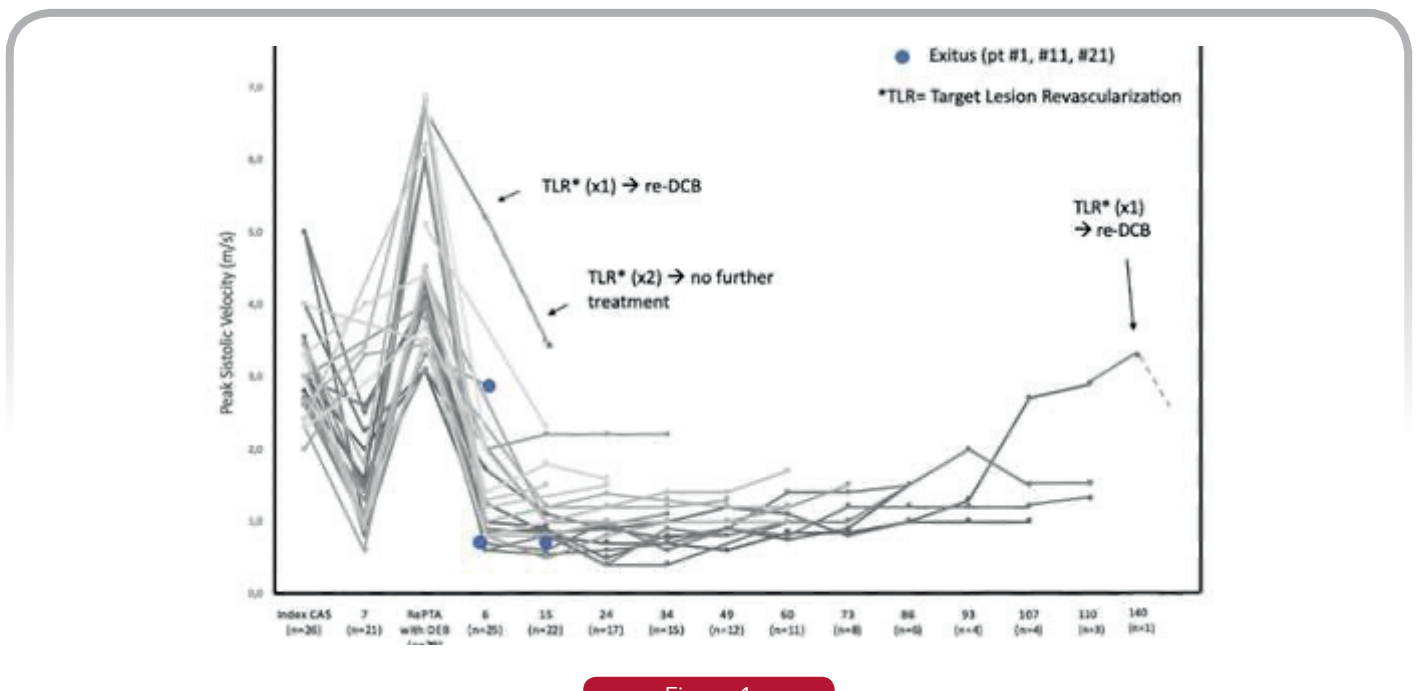
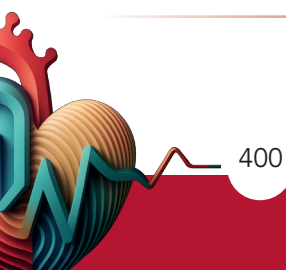


Figure 1



performed with scoring balloons followed by a single, 60", DCB inflation (In-Pact Admiral in 74% of cases).

Angiographic stenosis decreased to $15 \pm 5.2\%$ ($p < 0.001$); MLA increased from 3.5 ± 1.53 to 12.8 ± 1.76 mm^2 ($p < 0.001$) with an acute lumen gain (ALG) of 9.2 ± 3.46 mm^2 . Technical and procedural success were 100% and 97% (1 minor stroke).

Mean FU was 51 ± 39 months. One patient died for heart failure; two for cancer. Two MACCEs occurred (a

left hemispheric stroke and a retinal TIA). Three re-CISR occurred in 2 patients for a 6.8% and 10% per patient/lesion TLR, respectively. The median DUS PSV at FU was 1.2 m/s with no change over time ($p_{\text{trend}} = 0.087$). There was a significant correlation between ALG and latest PSV ($p = 0.033$), the larger ALG the lower PSV.

Conclusion: IVUS-guided DCB treatment of CISR is a safe, effective strategy with a very low TLR rate.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 548
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)**

DISTACCO DAL LEMBO ANTERIORE DI MITRA-CLIP

Claudio Mauro (a), Maddalena Immobile Molaro (a), Dalila Nappa (a), Andrea Mariani (a), Domenico Simone Castiello (a), Federica Ilardi (a), Ciro Santoro (a), Anna Franzone (a), Carmen Spaccarotella (a), Giovanni Esposito (a)

(a) A.O.U. FEDERICO II

Introduzione: La riparazione percutanea mediante tecnica edge to edge (TEER) della valvola mitrale con clip è considerata una procedura efficace e sicura ed ha rivoluzionato il trattamento dell'insufficienza mitralica severa nei pazienti ad alto rischio chirurgico. La più comune tra le complicanze è il distacco di uno dei lembi mitralici dal dispositivo. Questa complicanza si verifica nell'1-5% dei pazienti e spesso entro 30 giorni dalla procedura. Risulta perciò di massimo rilievo la caratterizzazione strutturale della valvola mediante TEE preprocedurale, per capire la feasibility dell'intervento, e durante la procedura, per poter eseguire al meglio il grasping.

Caso Clinico: Il caso riguarda un uomo di 57 anni con abitudine tabagica, sindrome coronarica cronica, scompenso cardiaco a ridotta frazione di eiezione HFrEF, FA permanente, pregresso impianto di CRT-D. Nel maggio u.s. accedeva al pronto soccorso per dispnea ingravescente ed edemi declivi bilaterali. Durante l'ospedalizzazione veniva diagnosticata un'insufficienza mitralica severa ad eziologia mista con tethering del lembo posteriore e pseudoprolasso del lembo anteriore. Valutato in Heart Team il paziente veniva indirizzato a trattamento edege to edge per l'elevato rischio cardiocirurgico. Il risultato ottenuto nell'immediato è stato considerato ottimale e soddisfacente: insufficienza mitralica residua lieve in assenza di gradiente transvalvolare significativo. Il paziente in UTIC è stato sottoposto a controllo con ecocardiografia transtoracica che ha evidenziato un

parziale detachment della clip da A2 determinante nuovamente MR di grado severo. Veniva programmato un nuovo intervento di riparazione edge to edge. In questa seconda procedura veniva posizionata con successo una seconda clip in posizione mediale con insufficienza mitralica residua lieve-moderata e gradienti transmitralici non significativi (5 mmHg).

Discussione: Secondo lo studio EXPAND, in una coorte di 1041 pazienti solo l'1.7% presentava un single leaflet detachment, tra questi solo il 17% presentavano anterior leaflet detachment. La ragione per cui il detachment della clip avviene nella maggior parte dei casi dal lembo posteriore è che questi si presenta di norma di lunghezza inferiore, con un grasping più complesso¹. Tuttavia la presenza di una eziologia mista e dello pseudoprolasso del LAM potrebbe aver favorito il detachment.

L'assenza di gradiente significativo, il posizionamento laterale della prima G4XT e l'assenza di complicanze, come tearing del lembo, intrappolamento cordale o embolizzazione della clip, hanno fatto sì che un secondo intervento MITRACLIP fosse possibile con successo.

Conclusioni: Lo sviluppo di nuove tecnologie e l'incremento dell'esperienza degli operatori permette di trattare anche casi più complessi di insufficienza mitralica mediante MITRACLIP con comprovati effetti sulla qualità di vita, il tasso di ospedalizzazione e, qualora il paziente sia COPAT-like^{2,3,4}, sulla mortalità

in pazienti ad alto rischio chirurgico. Sebbene il single leaflet detachment si verifichi più comunemente dal lembo posteriore per ragioni anatomiche, l'atteggiamento pseudo prolapsante o francamente

prolassante del lembo anteriore rappresenta un fattore da tenere in considerazione nel momento del grasping e, successivamente, prima del "deploy" definitivo della clip.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 753 FIBRILLAZIONE ATRIALE (FA) (ARITMIE) PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI) ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

DAPT OR SAPT AFTER LAAC IN A PATIENT WITH RECENT CEREBRAL BLEEDING - A CASE REPORT

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A 83 years old patient, affected by arterial hypertension and dyslipidemia, accessed at our emergency department for asthenia. At the ECG monitoring atrial flutter at high ventricular response. In history recurrent episodes of atrial flutter in DOACs therapy, treated previously with electrical cardioversion, without result. Three weeks earlier he had a head trauma complicated by an acute subdural hematoma in the right cerebral hemisphere underwent neurosurgical surgery. Due to this reason, the neurosurgeons contraindicated both therapy (vka and DOAC) and introduced Enoxaparin.

We started treating atrial flutter with rate-control therapy, ineffective. After a transesophageal echocardiogram, that documented the absence of thrombotic formations in the left atrial appendage, we proceeded with electrical cardioversion achieving an initial restoration of sinus rhythm. After a few hours, atrial flutter recurred complicated by acute pulmonary edema that we treated.

The new brain CT scan showed residual layer of subdural hematoma and the neurosurgery consulting confirmed that start the oral anticoagulant therapy was not indicated.

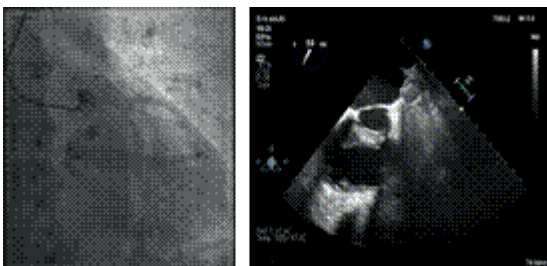


Figure 1. Brain TC scan with subdural hematoma in right fronto-temporal region after traumatic brain injury.

Figure 1

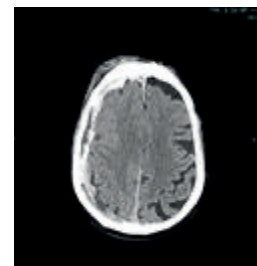


Figure 2A Left atrial appendage closure procedure with Watchman fix 24 mm. **2A** XRay image. **2B** Transesophageal echocardiography view.

Figure 2

Based on the recurrence of atrial flutter and the impossibility to start anticoagulants therapy, the frailty and the clinical conditions of the patient, we decided to proceed with the left atrial appendage closure at only 27 days from the subdural hematoma.

After the implantation of a Watchmann flx (24 mm) device we evaluated to start a dual antiplatelet therapy (Clopidogrel + Cardioaspirin) for 5 days after that we performed a brain CT scan that showed a marked reduction of sub-dural hematoma compared with

the CT performed at admission. In agreement with neurosurgical consultation, we decided to proceed with DAPT for two weeks and then switch to SAPT with ASA.

The follow-up brain CT scan was also scheduled at 30 days with evidence of significant reduction in the hyperintense area.

The follow up transesophageal echocardiographic, after 40 days, confirmed that the device was well placed and totally epithelialized.



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MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)**

**SYSTEMIC INFLAMMATORY RESPONSE INDEX PREDICTS IN-HOSPITAL COMPLICATIONS
IN TAKOTSUBO SYNDROME**

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Background: The role of inflammation in Takotsubo Syndrome (TTS) has been well established. Systemic inflammatory response index (SIRI) is a new index of inflammation with a significant prognostic role in several diseases.

Objectives: The aim of this study was to explore the association between SIRI and in-hospital adverse outcomes in TTS patients.

Methods: In this ambispective single center study, consecutive TTS patients were recruited both retrospectively and prospectively. Left ventricular end-diastolic pressure was measured at the time of catheterization. Transthoracic echocardiography was performed within 48 hours from hospital admission. Primary outcome was in-hospital complications (IHC), defined as a composite of all-cause death, acute heart failure and ventricular arrhythmias, while secondary outcomes were the singular components of the primary endpoint.

Results: We recruited 213 patients diagnosed with TTS (71.4 ± 11.7 years, female 73.9%), IHC occurred in 76 patients (35.6%), 16 patients died (7.5%), 52 experienced acute heart failure (24.4%) while 24 had ventricular arrhythmias (11.3%). At multivariate logistic regression the predictors for IHC were diabetes mellitus [OR 4.45, 95% CI (1.35-14.64); p=0.014], the presence of a physical trigger [OR 4.53, 95% CI (1.57-13.09); p=0.005] and SIRI [OR 1.17, 95% CI (1.05-1.31); p=0.006]. IHC were higher within the upper SIRI tercile (p=0.004) and this result was mainly driven by more episodes of acute heart failure (p=0.010) and higher in-hospital mortality (p<0.001). The area under the curve (AUC) for SIRI in the prediction of IHC was 0.657 (95% CI: 0.577-0.737; P<0.001) with sensitivity and specificity of 55% and 73% using a SIRI cut-off value of 3.11).

Conclusions: SIRI is an independent predictor of in-hospital complications in the acute phase of TTS. This novel inflammatory parameter can be an easy sampled and helpful in risk stratification of TTS patients.

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 659
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

**MITRAL AND TRICUSPID TRANS-CATHETER EDGE-TO-EDGE REPAIR PROCEDURES
 IN PATIENTS WITH CARDIAC AMYLOIDOSIS.**

Mariagrazia Piscione (a), Valeria Cammalleri (a), Valeria Maria De Luca (a), Giorgio Antonelli (a),
 Dario Gaudio (a), Myriam Carpenito (a), Francesco Grigioni (a), Gian Paolo Ussia (a)
 (a) FONDAZIONE POLICLINICO CAMPUS BIOMEDICO

Background: Cardiac amyloidosis is an infiltrative cardiomyopathy caused by the accumulation in the heart interstitium of amyloid fibrils formed by misfolded proteins. Two types of amyloids commonly infiltrate the heart: immunoglobulin light chain (AL) amyloidosis and transthyretin (ATTR) amyloidosis.

Methods: The study was conducted at the Fondazione Policlinico Universitario Campus Bio-Medico in Rome. From 2017 to 2024, 42 patients diagnosed with amyloidosis were enrolled according to the diagnostic criteria expressed by the European Society of Cardiology. In 17 cases the diagnosis was of AL amyloidosis, while the remaining 25 patients had ATTR amyloidosis. At the time of diagnosis, 9 patients with CA ATTR had severe tricuspid regurgitation, whereas in only 4 patient with CA AL, severe TR was found. Although present in many subjects affected by both CA AL and CA ATTR, mitral regurgitation was mostly mild, in only 4 cases MR was severe. In these patients, the decision on technical feasibility of percutaneous TEER (transcatheter edge-to-edge repair) repair was provided by our interdisciplinary team. All treated patients were considered unsuitable for surgical repair due to the high operative risk.

Results: 32 participants were included in the study, 68% were men. The mean age was 69 ± 13 years. At the diagnosis, most patients with amyloidosis presented

with New York Heart Association functional class II, while 4 patients were in NYHA class IV.

If in case of mitral insufficiency no significant differences emerged in terms of prevalence and severity, in case of tricuspid regurgitation, there was a significant difference in the prevalence of severe-torrential TR, which was more frequent in patients with ATTR amyloidosis than in those affected by the AL form ($p < 0.04$).

The feasibility of percutaneous treatment of both tricuspid and mitral regurgitation was therefore assessed: 10 patients out of the 32 evaluated met the anatomical feasibility criteria for TEER with Triclip, while only 2 patient met the feasibility criteria for TEER with Mitraclip. The trans-catheter procedures determined a reduction of at least two degrees of mitral and tricuspid regurgitations which was stable at one and six months follow-up.

Conclusion: Our data suggest beneficial effects of TEER procedures in patients affected by CA, although it is required further investigation on a larger cohort. Furthermore, our results also show an improvement in clinical conditions, expressed by the change in NYHA functional class. This is encouraging, considering that heart failure in such patients is severely symptomatic and not treatable with conventional drugs.



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INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)**

THE RIGHT TIME OF SEPTOSTOMY: A CASE OF VALVE IN MITRAL ANNULUS CALCIFICATION

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(a) UNIVERSITÀ DEGLI STUDI DI PADOVA

Mitral annular calcification (MAC) is a chronic process characterized by a progressive calcium deposition at the level of mitral annulus, a common finding in the aging population with high cardiovascular risk and linked to poor cardiovascular outcomes. Treatment options include transcatheter and surgical approaches but evidence from randomized trials is lacking. Surgical mitral valve repair or replacement remain the gold standard. On the other hand, percutaneous resolution, namely transcatheter MV replacement (TMVR) in MAC is still burdened by a high degree of morbidity and mortality due to possible complications, mainly LVOT obstruction (LVOTO) that occurs up to 40% of cases. We report a case of transeptal approach TMVR in MAC using an Edwards Sapien 3 29 mm in a patient with post-actinic heart disease and past SAVR with mechanical prosthesis. A 72-year-old man presented to the Emergency Department with worsening dyspnea due to Acute Heart Failure (AHF) during an episode of high ventricular response atrial fibrillation. Upon further investigation, it was noted that he underwent surgery and radiotherapy for a seminoma in 1976. The pre-procedural exams highlighted severe mitral stenosis (mean transvalvular gradient of 14 mmHg), along with extensive calcification involving the mitral annulus. A transoesophageal echocardiogram demonstrated thickened leaflets with extensive diastole-limiting movement calcification throughout the proximal portion of both leaflets and annulus, not involving subvalvular structures, and with a 3D-MVA of 1.3 cm². The patient was deemed surgically inoperable due to high surgical

risk. Additionally, valve and annular anatomy, with a Wilkins score of 14, excluded percutaneous balloon mitral valvuloplasty. Therefore, the patient was proposed for a percutaneous intervention of valve in MAC (TMVI ViMAC). A CT scan was performed identifying a landing zone at mitral annulus area > 8.6 cm², and CT-base MAC score of 8 was found; mean mitral annulus systolic diameter ≤ 38.3 mm, aorto-mitral angulation > 130°, and the annulus-to-apex distance < 100 mm. Post-processing analysis hypnotizing an implant of Edwards Sapien 3 29 mm resulted in an adequate neoLVOT. Eventually the patient was considered candidable to TMVI. A transfemoral valve in MAC using an oversized Edwards Sapien 3 29 mm during general anesthesia was performed. After trans-septal puncture, a non-compliant 14 mm balloon was conducted and then advanced and inflated into the mitral position, ensuring delivery sheath trackability and verifying correct pre-procedural sizing. Thus, the same balloon was employed to perform septostomy. Then, the valve (Edward Sapien 3 29 mm + 4 cc) was deployed during rapid ventricular pacing via Safari wire. Postprocedural angiography control showed trace peri-prosthetic regurgitant volume and a mean mitral gradient of 6 mmHg was confirmed. No complications were detected during or after the procedure. The patient remained asymptomatic with a good quality of life throughout the 4-year follow-up, with a stable echocardiographic transvalvular gradient. To our knowledge, this is the first published report of ViMAC with mitral valvuloplasty before septostomy. ViMAC is a challenging procedure

that may depend on MAC-specific anatomy. Moreover, it's not always a simple procedure to position the right valve in the right place: in this context, the septostomy puncture site plays an important role. In ViMAC

procedures, Inflating the balloon used for septostomy in mitral position first ensures the operator a correct trackability of valve delivery system avoiding second punctures and facilitating the procedure.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 320 INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

RESISTENZE VASCOLARI POLMONARI E UNCOUPLING VENTRICOLO ARTERIOSO NEI PAZIENTE SOTTOPOSTI A TAVI: UN'ESPERIENZA MONOCENTRICA

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Introduction: La dissociazione ventricolo-arteriosa è stata associata a esiti clinici avversi in varie condizioni. La disfunzione ventricolare destra (RVD) o l'ipertensione polmonare (PH) sono state associate a un rischio triplicato di morte cardiovascolare a un anno dopo TAVI, indipendentemente dallo stato di accoppiamento RV-PA; inoltre, la persistenza di RVD o PH dopo TAVI è stata associata a una tendenza verso un aumento del rischio di morte cardiovascolare a un anno, determinato principalmente dai pazienti con dissociazione persistente RV-PA.

Aim: L'obiettivo dello studio è valutare l'impatto clinico della dissociazione RV-PA nei pazienti con stenosi valvolare aortica sottoposti a TAVI che presentano RVD o PH.

Methods: lo studio è analisi osservazionale retrospettiva monocentrica. Abbiamo incluso nello studio tutti i pazienti con stenosi valvolare aortica severa sintomatici per dispnea, cardiopalmo o sincope con età superiore a 75 anni o con rischio chirurgico STS/EuroscoreII > 4% sottoposti tra l'1 Gennaio 2018 e 30 Settembre 2019 a correzione percutanea del vizio valvolare con TAVI TF. Tali pazienti sono stati valutati con un ecocardiogramma trans toracico completo pre- e post-procedura ed a coronarografia con catarismo sinistro e destro completi. Sono stati quindi esclusi i pazienti senza disfunzione ventricolare destra o ipertensione polmonare. I pazienti sono stati seguiti per un FU

medio di 6 anni durante il quale sono stati valutati la ricorrenza di ospedalizzazioni o morte per cause CV. Abbiamo individuato i pazienti con rapporto TAPSE/PAPs moderatamente ridotto (< 0.4) e lievemente ridotto (<0.5) e i pazienti con ipertensione polmonare (PAPm > 20 mmHg).

Results: sono stati valutati 293 pazienti con stenosi valvolare aortica severa sottoposti a TAVI TF di cui 89 che presentavano disfunzione ventricolare destra o ipertensione polmonare. Il campione analizzato presentava FA nel 27%, con più di due fattori di rischio cardiovascolare nel 51% ed in classe NYHA > 2 per il 31%. Dal punto di vista ecocardiografico il campione presentava una frazione d'eiezione media del 56% ± 2.8, un'area valvolare aortica media del 0.68 ± 0.1 cmq e una FAC del 35.2 ± 6%. Non si sono riscontrate differenze nelle caratteristiche cliniche al baseline nei due sottogruppi di pazienti (p 0.39). Si è riscontrato un T/P medio nella popolazione di 0.48 ± 0.15 e valori di resistenza arteriolari polmonari di 2.55 ± 1.1 UW. Valori di resistenze aumentate (i.e. > 3 UW) e un T/P ridotto (< 0.55) si sono dimostrati predittori di ricorrenza di ospedalizzazioni o morte per cause CV al FU (rispettivamente p=0.017 e p=0.04). Inoltre, la normalizzazione del rapporto T/P è predittiva di una miglior sopravvivenza al follow-up, seppur in maniera non statisticamente conclusiva (P= 0.06). Stratificando il miglioramento del rapporto T/P rispetto alle valore di resistenza al baseline, abbiamo osservato che la

sopravvivenza dei pazienti era peggiore per i pazienti con resistenze aumentate, indipendentemente dal rapporto T/P (p 0.50). Infine, stratificando i pazienti con rapporto T/P moderatamente ridotto per le resistenze arteriolari polmonari, si è osservato che i pazienti con resistenza arteriolari normali avevano una sopravvivenza migliore rispetto a coloro che avevano resistenze aumentate (p 0.017).

Conclusion: Il rapporto T/P si conferma un predittore di outcome non invasivo nei pazienti con disfunzione ventricolare destra o ipertensione polmonare, anche nei pazienti sottoposti a TAVI. Tuttavia una valutazione invasiva delle resistenze in questo subset di pazienti predice con maggior accuratezza tali outcome, aiutando a definire la sopravvivenza nei pazienti con T/P Intermedio.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 406
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**UNMASKING FIBROMUSCULAR DYSPLASIA:
WHEN SPONTANEOUS CORONARY ARTERY DISSECTION RINGS A BELL**

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(a) UNIVERSITÀ STATALE DI MILANO; (b) OSPEDALE SAN CARLO BORROMEO, MILANO

A 47-year-old woman presented to the emergency department complaining typical chest pain. She had a history of acute coronary syndrome (ACS) 8 years earlier, with no significant coronary artery disease reported at invasive coronary angiography (ICA). At that time, assuming a vasospastic etiology, she was put on non-dihydropyridine calcium channel blockers (NDCCB) ever since.

Upon arrival, the ECG showed sinus rhythm, with mild ST depression in infero-lateral leads. First cardiac troponin T was 23 ng/L and it increased to 114 ng/L two hours later. She was therefore transferred to the cath lab for early ICA, which revealed tapering of the ostium and proximal segment of the left circumflex artery (LCx) and moderate stenosis of the ostium and proximal segment of the obtuse marginal (OM) branch. The remaining epicardial coronary vessels were unremarkable. Due to non-univocal interpretation of these lesions, it was decided to perform a functional evaluation with instantaneous wave-free ratio (iFR). Short after engagement of the left main coronary artery with the guide catheter, total occlusion at the ostium of the LCx was observed. Intracoronary nitrates were administered, without any benefit. A guidewire was advanced easily to the distal portion of the OM and, through a microcatheter, the intraluminal position of the wire was confirmed. Given the persistent absence of antegrade flow, low-pressure pre-dilatation with

a 1.5 mm semi-compliant balloon was performed, without benefit. Suspecting occlusive dissection of the ostium of the LCx, a support guidewire was placed in the left anterior descending artery (LAD). Intravascular ultrasound (IVUS) confirmed proximal dissection of the LCx, from the ostium of the LCx to the middle segment of the OM, with the IVUS probe within the false lumen but the guidewire being correctly in the true lumen distally. Meanwhile, after the guidewire had been in place for some time, spontaneous dissection of proximal and mid-segment of the LAD occurred. At that point, the patient started complaining worsening angina and hemodynamics began to deteriorate. Given the worsening scenario, intra-aortic balloon pump (IABP) was positioned. IVUS-guided percutaneous coronary intervention (PCI) of LM and LCx-MO bifurcations axes were performed with the use of four DES in total. The result was satisfactory, with restoration of distal blood flow and improving vital signs. IABP was successfully removed the following day.

A few days later, relatives of the patient provided the images of the ICA performed 8 years earlier at a different hospital and whose report concluded for "normal coronary arteries with possible vasospasm". Surprisingly, what appeared to be a normal, thin, OM at the first ICA, presented, at the second ICA, a consistently greater diameter and broader distribution. This allowed to make a late diagnosis of spontaneous



coronary dissection at the time of the first ICA which was not diagnosed and progressively healed. Given the propensity for spontaneous dissection, female sex and the young age, in the suspicion of fibromuscular dysplasia, a thoraco-abdominal CT angiography was performed showing the typical "string of beads" appearance of the renal arteries and, thus, confirming the diagnosis. Before discharge, ICA was repeated,

confirming good outcome of recent stenting procedure and healing of the dissection on the OM. 2D echocardiography showed preserved ejection fraction, with hypokinesia of the basal inferior and inferolateral segments. The patient was discharged in good general condition, on DAPT, iACE and beta-blocker, PPI, statin. The patient was put on strict follow-up and no other lesions have developed ever since.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 200
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA
E STRUTTURALE)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)**

**FUNCTIONAL ASSESSMENT IN ANGINA AND NON-OBSTRUCTIVE CORONARY ARTERIES (ANOCA)
PATIENTS: FROM MICROVASCULAR RESERVE (MRR) TO DIFFERENT SUBTYPES
OF CORONARY MICROVASCULAR DYSFUNCTION (CMD)**

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Background: Coronary microvascular dysfunction (CMD) is a heterogeneous condition defined by a reduced coronary flow reserve (CFR) and low/high values of index of microvascular resistance (IMR). A new index, the microvascular resistance reserve (MRR) has been developed, but its clinical role is unclear.

Aims: We aimed to investigate the relationships between functional indices in ANOCA (Angina and No Obstructive Coronary Arteries) patients and to assess the hemodynamic and clinical characteristics of different CMD subtypes.

Materials and methods: We prospectively enrolled consecutive ANOCA patients who underwent a comprehensive functional assessment of microvascular domain by thermodilution technique. CFR, IMR and MRR were estimated and correlated each other. Patients were divided in two groups according to the presence of CMD (defined by a $CFR < 2.5$). Subsequently High Hyperaemic Resistance (HHR) and Low Hyperaemic Resistance (LHR) CMD

subtypes were defined according to low or high IMR values respectively (cut-off 25). Microvascular flow and resistance were estimated both at rest and during hyperaemia with Tm_{rest} / IMR_{rest} and Tm_{hyp} / IMR respectively. All functional indices were compared between groups.

Results: one hundred and eight patients were available for the analysis. 66 patients in the Normal Group ($CFR \geq 2.5$), 20 patients in HHR CMD ($CFR < 2.5$ and $IMR \geq 25$), 22 patients in LHR CMD ($CFR < 2.5$ and $IMR < 25$). MRR showed a strong correlation ($r = 0.966$, $p < 0.01$) with CFR, while a mild and negatively correlation was found between CFR and IMR ($r = -0.242$, $p = 0.01$) and MRR and IMR ($r = -0.261$, $p < 0.01$). MRR showed a good discriminatory power (AUC 0.97, 95% CI 0.94 – 0.99) and accuracy (85%) in detecting CMD when compared to CFR. LHR CMD patients showed reduced microvascular resistance ($IMR_{rest} 34.3 \pm 15.1$ vs 90.1 ± 54.5 Normal Group vs 75.8 ± 28.9 HHR CMD, $p < 0.01$) and increased flow at rest ($Tm_{rest} 0.37 \pm 0.17$ vs 0.96 ± 0.62 Normal Group vs 0.81 ± 0.43 HR CMD, $p < 0.01$), while HHR CMD patients had impaired flow

during hyperemia (T_{mnhyp} 0.45 ± 0.24 vs 0.26 ± 0.18 Normal Group vs 0.21 ± 0.07 LR CMD $p < 0.01$). MRR was reduced in CMD patients (Normal 4.70 ± 1.78 vs CMD 2.20 ± 0.59 , $p < 0.01$), with no differences between CMD subtypes (HHR 2.17 ± 0.47 vs LHR CMD 2.24 ± 0.70 , $p = 0.66$).

Conclusions: In ANOCA patients, MRR and CFR are strongly correlated and could be considered as functionally interchangeable tools. CMD involves reduced coronary flow reserve due to impaired resting or hyperaemic flow. IMR is crucial for differentiating these CMD endotypes.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 263 DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

EFFETTI DELLA SOMMINISTRAZIONE DEL NITRATO SULLA VALUTAZIONE FUNZIONALE DEL MICROCIRCOLO CORONARICO IN PAZIENTI INOCA

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(a) AOU FEDERICO II

Introduzione: L'ischemia miocardica riconosce diversi meccanismi patogenetici. Oltre alla presenza di stenosi a carico delle coronarie epicardiche, ulteriori meccanismi sono rappresentati dalla disfunzione microvascolare (CMD) e dal vasospasmo coronarico (epicardico oppure microvascolare). La condizione clinica in cui è presente evidenza di ischemia miocardica in assenza di stenosi coronariche significative prende il nome di INOCA (*Ischemia and No Obstructive Coronary Artery Disease*). L'obiettivo dello studio che presentiamo è quello di chiarire se la somministrazione di nitrati (NTG) per via intracoronarica abbia un impatto significativo sui parametri emodinamici valutati e, conseguentemente, sull'accuratezza diagnostica dell'angiografia funzionale.

Materiali e metodi: Lo studio è basato sull'analisi dei dati clinici, angiografici ed emodinamici ottenuti in pazienti sottoposti a coronarografia funzionale presso il Laboratorio di Emodinamica e dell'AOU Federico II di Napoli. Sono stati inclusi 48 pazienti che presentavano angina tipica, evidenza di ischemia miocardica ai test non invasivi e assenza di stenosi epicardiche angiograficamente o funzionalmente significative.

Risultati: Il **mTT**, prima della somministrazione del nitrato, è risultato essere 0.73 ± 0.53 secondi, mentre lo stesso parametro post-NTG è aumentato a 0.91 ± 0.6 secondi, risultando statisticamente significativo sia nei pazienti con test all'acetilcolina positivo che negativo. Anche per il **BRI** si è osservato un incremento statisticamente negativo in

entrambi i gruppi di pazienti: il valore medio pre-NTG era di 68.56 ± 49.55 , mentre post NTG è aumentato a 81.5 ± 51.8 . Analogamente, anche la **CFR** risultava aumentata in maniera statisticamente significativa in entrambi i gruppi di pazienti (valori pre-NTG pari a 2.75 ± 1.42 , valori post-NTG 3.43 ± 1.74). L'**MRR**, media rilevata in tutti i pazienti prima della somministrazione di NTG è risultata pari a 3.2 ± 1.7 , mentre la stessa post-NTG è aumentata a 3.7 ± 1.7 ($p < 0.01$). Ciò ha determinato, analogamente a quanto osservato per la CFR, una significativa riclassificazione dei pazienti con sospetta CMD, indentificati sulla base di un valore di $MRR < 3.0$. L'**IMR** è stato calcolato dopo somministrazione di NTG, poiché è stato già dimostrato che la somministrazione di NTG non influenza la valutazione dell'IMR, essendo quest'ultimo indipendente dal compartimento epicardico. Il valore medio è risultato pari a 22 ± 17 . La stratificazione dei pazienti in base all'endotipo di CMD ha rivelato informazioni importanti circa la prevalenza e la natura di diversi sottotipi di CMD prima e dopo la somministrazione di NTG. La valutazione combinata di CFR e IMR ha permesso di classificare i pazienti in quattro categorie: CMD strutturale ($CFR < 2.0$, $IMR > 25$), CMD funzionale ($CFR < 2.0$, $IMR < 25$), CMD strutturale iniziale ($CFR \geq 2.0$ e $IMR > 25$) e nessuna CMD ($CFR \geq 2.0$ e $IMR < 25$). In particolare, dopo la somministrazione di NTG la **CMD Strutturale** si riduce dal 14% all'8%; la **CMD Funzionale** si riduce dal 15% al 13%; la **CMD Strutturale Iniziale** aumenta dal 17% al 19%; **Nessuna CMD** aumenta dal 54% al 60%.

Conclusioni: Questo studio ha evidenziato come la metodologia e, in particolare, la corretta sequenza diagnostica invasiva, sia importante per eseguire

un'appropriata endotipizzazione dei pazienti INOCA, evitando una possibile sovrastima della presenza di disfunzione microvascolare.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 517
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**COMPARISON OF RADIAL HEMOSTASIS DEVICES IN PREVENTING COMPLICATIONS FOLLOWING
TRANSRADIAL PERCUTANEOUS CORONARY PROCEDURES: A LITERATURE REVIEW**

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Introduction: Transradial access in percutaneous coronary catheterization is now the vascular approach of choice for both urgent and elective procedures. However, radial artery occlusion (RAO) continues to be the primary adverse event following this procedure. The use of radial hemostasis devices can reduce the incidence of this complication, increase patient comfort, and shorten recovery times. There is limited data in the literature on which radial hemostasis device is the most effective.

Objective: To evaluate the performance of commonly used radial hemostasis devices following transradial percutaneous coronary procedures, with RAO as the primary endpoint, and other vascular access complications such as hematoma, bleeding, and pain as secondary endpoints.

Materials and Methods: This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). PubMed, Scopus, Web of Science, and CINAHL databases were searched. Randomized clinical trials evaluating the incidence of RAO following the placement of different radial hemostasis devices were included. Studies involving adult patients undergoing diagnostic coronary

angiography and percutaneous coronary angioplasty (PTCA) were considered.

Results: A total of 73 records were generated from the research question. After duplicate removal, 19 titles and abstracts were deemed eligible. 8 full texts were evaluated, and 4 clinical studies were included for review. A multicenter study demonstrated a significant reduction in RAO with the use of adjustable air-determined hemostatic compression devices TR-Band (Terumo) compared to non-adjustable compression devices Radistop (Abbott), with no significant difference in relation to secondary complications. Another prospective study compared two pneumatic compression systems (TR-band and Safeguard radial Merit Medical), but there was no significance in terms of RAO incidence and secondary complications. Additional 3 studies compared TR band hemostasis systems associated with the preventive placement of hemostatic pads (Chitosan). A statistically significant reduction in hemostasis time was observed when hemostatic pads were used compared to the control group. However, in relation to RAO incidence, no significant differences have been reported.

Conclusions: The review results are based on individual studies and do not provide a solid foundation for

developing practice guidelines. The use of the TR-band device reduced the incidence of RAO compared to non-adjustable devices. Preventive hemostatic pads with pneumatic compression reduced hemostasis time but

did not show significant differences in preventing RAO and secondary complications. Future research should further investigate complications associated with radial hemostasis in percutaneous coronary procedures.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 642
 PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)
 INFARTO STEMI (CARDIOPATIA ISCHEMICA)
 SHOCK CARDIogeno (ASSISTENZA CARDIACA IN ACUTO)
 INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
 CORONARICA E STRUTTURALE)
 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)**

LEFT MAIN CORONARY ARTERY STENTING IN PATIENT WITH CARDiogenic SHOCK DUE TO ACUTE TYPE-A AORTIC DISSECTION: HAVE WE GIVEN THE BEST CHANCE?

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Introduction: Acute type-A aortic dissection (AD) is a critical condition requiring urgent surgery. Although coronary involvement is rare (incidence of myocardial infarction with acute AD ranged from 3 to 7% in AD-patients), it can be a manifestation of the underlying aortic pathology and poses significant therapeutic challenges.

Some studies examined percutaneous coronary intervention (PCI) for left main coronary artery (LMCA) and left anterior descending artery (LAD) stenosis in patients with acute ST-elevation myocardial infarction (STEMI), in the context of acute type-A AD.

Case Report: a 52-year-old man presented to the emergency department (ED) with shock, right lower limb paresis and acute chest pain. Electrocardiogram showed transient anterolateral ST-elevation. An abdominal ultrasound at the ED revealed a flap in the abdominal aorta, prompting further investigation with a computed tomography scan of the chest/abdomen, which confirmed an acute type-A AD. The patient was immediately taken for surgical replacement of the ascending aorta with a vascular graft Vascutek 32mm. After aortic de-clamping, there was spontaneous resumption of sinus rhythm, but during chest closure, the patient experienced two episodes of ventricular

fibrillation, electrically cardioverted, with evidence of ST-segment elevation.

The patient was urgently transferred to the Cath lab and coronary angiography revealed critical stenosis from the ostium of the LMCA to the LAD. Intravascular ultrasound (IVUS) identified a large hematoma and dissection that originated from the aorta and extended into the LAD, thereby compressing the true lumen. Under IVUS guidance, coronary stenting was performed via the LMCA to the proximal LAD, which resulted in coronary blood flow restoration and no further propagation of dissection. Simple balloon was successfully performed on the left circumflex artery (LCx) ostium, completed by LAD-LCx kissing balloon. On the second post-surgery day, the patient exhibited a peak troponin I level of 311300 ng/L, which decreased rapidly over time.

The patient was discharged 11 days after surgery in good clinical condition, although with residual right lower limb paralysis, and transferred to a rehabilitation center.

Conclusion: Coronary malperfusion is one of the fatal complications of acute type-A AD. The in-hospital mortality rate ranges from 20 to 44% and malperfusion in LMCA is particularly associated with catastrophic outcomes, such as cardiogenic shock or cardiac arrest.



The current guidelines suggest surgical resection and thoracic aorta replacement as the gold standard for the treatment of AD and any delay in patients with STEMI undergoing PCI is associated with higher in-hospital mortality. This case highlights the complexity of managing coronary involvement following acute type-A AD. It is crucial to recognize that the coronary issues observed are manifestations of the underlying aortic pathology. The use of PCI and IVUS was essential in managing these issues.

Regarding LMCA malperfusion in AD, data are scarce because of its low incidence. Therefore, which treatment should take priority (surgical correction vs reperfusion therapy) remains controversial, or needs perhaps to be contextualized and individualized. This case raises important questions about the optimal therapeutic approach for patients with acute shock. It underscores the necessity of carefully considering immediate strategies to effectively address the complex issues faced by these patients.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 667 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO)

IATROGENIC LEFT INTERNAL MAMMARY ARTERY PERFORATION: AN EXEMPLARY CASE OF RESCUE PTA

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 Vincenzo Pestrichella (b), Sabino Iliceto (b)

(a) UNIVERSITÀ DEGLI STUDI DI BARI "ALDO MORO"; (b) MATER DEI HOSPITAL (BARI)

Introduction: Nearly seven decades have passed since the first pacemaker (PM) was implanted. Since then, important advances have been made in PM technology, continuously improving their safety and efficacy in treating patients with bradyarrhythmias. In spite of the progress, PM therapy is still associated with significant peri- and post-procedural complications. Blind puncture of the subclavian vein for PM lead insertion is a common procedure associated with potentially life-threatening complications. Those may include

pneumothorax, arteriovenous fistula, subclavian artery and vein, or left internal mammary artery (LIMA) injury or perforation.

Case presentation: A 48-year-old woman without a history of cardio-vascular disease was admitted at our emergency department for frequent lipothymic episodes and dizziness. ECG showed 2:1 atrioventricular block, while trans-thoracic echocardiogram (TTE) revealed normal biventricular function and excluded structural heart diseases. After three unsuccessful attempts of left subclavian venous puncture and several leads repositioning due to unstable pacing and sensing thresholds, a dual-chamber PM was implanted. Immediately afterwards, severe hypotension occurred requiring pharmacological support with a labile stabilization of the blood pressure values. Chest fluoroscopy showed signs of hemopneumothorax, while TTE excluded pericardial effusion. Our first thought, therefore, was to assess the exact site of bleeding by performing urgent angiography via femoral approach. The examination revealed an active contrast medium extravasation from the proximal segment of the LIMA leading to a massive hemothorax, without other sources of active bleeding. Therefore, we opted for an endovascular repair using two covered stents (2.5 x 23 mm; 3.0 x 13 mm) and the occluded arterial hole was checked by using contrast injection. Nevertheless, the patient required a chest drain insertion and blood transfusions. Given the very-high bleeding risk and the *secondary role* of the LIMA, we decided not to start dual-antiplatelet therapy.

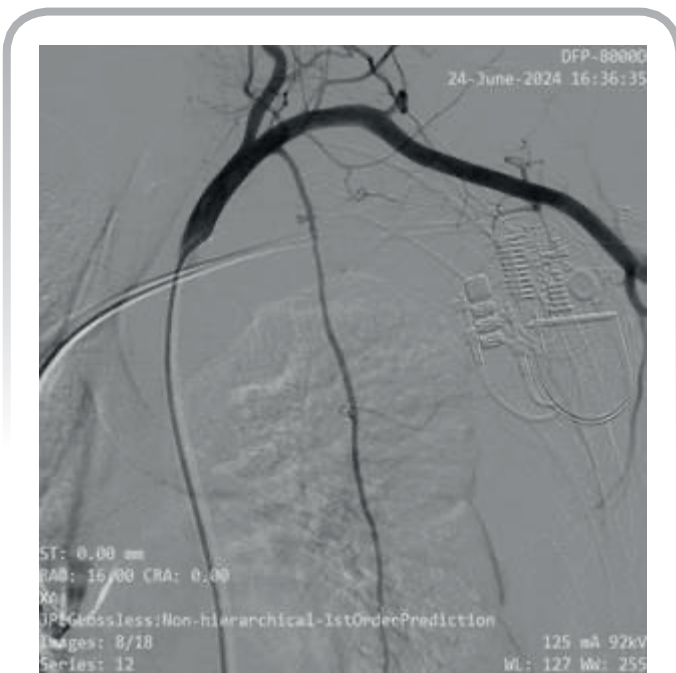


Figure 1

Comment: Inadvertent perforation of the LIMA during a blind approach to the subclavian vein for PM implantation is a very rare emergency that requires prompt identification of the bleeding site and immediate treatment. If unrecognized, it may lead to mediastinal and thoracic hematoma causing a

rapidly worsening hemodynamic condition. Covered stent deployment is a quick and effective treatment, especially in patients with hemodynamic instability. In critical patients, endovascular repair should always be the first option, especially if extensive operator experience in peripheral interventions is available.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 745
 INFARTO STEMI (CARDIOPATIA ISCHEMICA)
 MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
 (CARDIOPATIA ISCHEMICA)
 RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
 CARDIOVASCOLARE)**

A CASE OF VASOSPASTIC ANGINA IN A PATIENT WITH CANNABINOID ABSTINENCE

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Introduction: Vasospastic angina is a variant form of angina that occurs at rest as a consequence of coronary vasospasm, with or without atherosclerotic plaques. Risk factors include smoking, psychophysical stress, and cocaine abuse.

Clinical case: A 39-year-old woman was admitted for recurrent chest pain episodes at rest lasting up to 10 minutes, present for about two weeks. Anamnesis: smoker; discontinuation of cannabinoid use since about 3 weeks; cough and rhinorrhea in the last 10 days. On admission the ECG revealed negative T waves in the anterior derivations, isodiphasic T waves in the inferior derivations, QTc prolonged. High HS-Tn levels appeared. Echocardiography showed left ventricle reduced ejection fraction (EF 40%) due to interventricular septum and mid-basal inferior wall akinesia, which resulted thickened and hyperechogenic. Supportive therapy was started on myocarditis hypothesis. The next day the patient presented two new chest pain episodes at rest: the first in

the morning, lasting about 10 minutes, characterized by anterior and inferior ST-segment elevation on ECG during the symptom, regressed when symptom resolved; the second in the evening, of similar length, but with greater anterior and inferior ST-segment elevation on ECG than the previous episode, in association with lateral ST-segment depression. For vasospastic angina hypothesis, urgent coronarography was performed. During the procedure the patient presented another chest pain episode, and coronarography documented proximal left anterior descending and first diagonal branch ostium vasospasm at the same time (A), which regressed with IV nitroglycerin injection (B). Coronarography showed right coronary chronic occlusion too. Regarding these findings, patient was discharged with diltiazem as calcium channel blocker therapy, rosuvastatin/ezetimibe as hypolipidemic therapy and acetylsalicylic acid as antiplatelet therapy. Finally, to exclude a concomitant myocarditis, considering flu-like symptomatology presented on admission, a cardiac MRI was performed



Figure

following hospitalization. This showed subendocardial-LGE pattern at the interventricular septum and at the anterior, lateral and inferior mid-basal walls, compatible with ischemic cause (C, D, E), excluding concomitant myocarditis.

Discussion: Usually vasospastic angina diagnosis is complex because of difficulties documenting ongoing vasospasm on coronarography; hence it enters into differential diagnosis with other clinical conditions that may occur without significant stenosis

at coronarography, like other MINOCA causes or myocarditis. For a correct diagnosis, in absence of vasospasm evidence, is important to perform an acetylcholine stimulation test. Myocarditis may be excluded performing a cardiac MRI.

Conclusions: This clinical case documented a particular association poorly documented in literature: cannabinoid abstinence and vasospastic angina; indeed, symptoms started few days after the patient cannabis smoking stopped.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 749
 PLACCA VULNERABILE (ATEROTROMBOSI)
 TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 INFARTO STEMI (CARDIOPATIA ISCHEMICA)
 ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
 CARDIOVASCOLARE)**

L'IMPREVEDIBILITÀ DELLE PLACCHE INSTABILI NON STENOTICHE: NON TUTTO È VISIBILE AGLI OCCHI

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 Giuliana Bardelli (a), Alessandro Lupi (a), Matteo Della Torre (a), Rocco Sclafani (b)

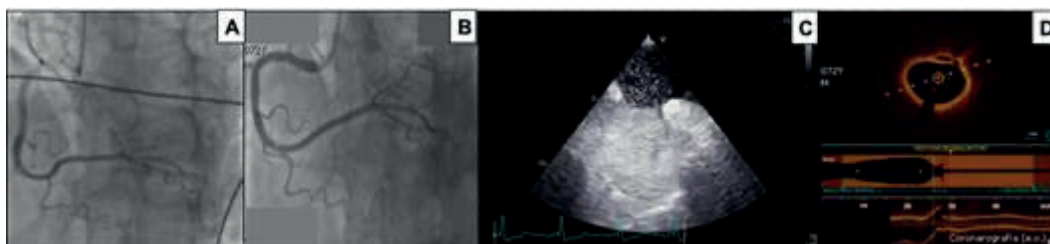
(a) *CARDIOLOGIA E FISIOPATOLOGIA CARDIOVASCOLARE, UNIVERSITÀ DEGLI STUDI DI PERUGIA;*

(b) *STRUTTURA COMPLESSA DI CARDIOLOGIA, AZIENDA OSPEDALIERA "S. MARIA DELLA MISERICORDIA", PERUGIA*

Introduzione: Le complicanze di placche instabili non stenotiche quali fessurazioni, erosioni o rotture, rappresentano una subdola causa di SCA e, talvolta, sono difficili da diagnosticare senza l'ausilio delle tecnologie di imaging intracoronarico.

Caso clinico: Uomo, 72 anni, giunto in PS per dolore toracico persistente associato a sudorazione algida. In anamnesi ipertensione arteriosa, iperuricemia ed insufficienza renale cronica. L'ECG era diagnostico per STEMI infero-posteriore; veniva pertanto somministrato carico di ASA, Prasugrel ed eparina sodica, e disposta la centralizzazione presso il centro Hub per essere sottoposto a PTCA primaria. Alla coronarografia riscontro di occlusioni distali di I° e II° ramo postero-laterale di Cdx (A), di verosimile natura embolica, rivascolarizzate con PTCA POBA con un buon risultato

finale (B). All'ecocardiogramma post-procedurale la funzione sistolica del ventricolo sinistro era conservata (FE 55%), residuava una lieve ipocinesia della parete inferiore basale; la cinesi del ventricolo destro risultava in ordine e non erano presenti valvulopatie significative. Nel sospetto di un infarto di natura embolica veniva eseguito un ETE che evidenziava un PFO, con al test alle micro-bolle lieve shunt dx-sx in basale, ma ampio shunt dx-sx in seguito a manovra di Valsalva (C); si iniziava dunque terapia anticoagulante. L'ecocolordoppler venoso degli arti inferiori risultava tuttavia negativo per trombosi venosa profonda. Malgrado il riscontro di PFO con shunt dx-sx facesse ipotizzare, come verosimile causa dell'infarto cardiaco, ad un'embolia coronarica paradossa, in considerazione dell'età avanzata del paziente, dei fattori di rischio cardiovascolare e della negatività dell'ecocolordoppler venoso degli arti inferiori,



Figure

risultava più probabile un'eventuale complicanza di placca. Così, al fine di ricercare possibili placche instabili attivate, pur non determinanti stenosi significative, il paziente veniva sottoposto a studio con OCT sulla coronaria dx che riscontrava, in prossimità di una stenosi moderata para-ostiale, un'erosione di placca (D). L'evento coronarico veniva pertanto attribuito con più probabilità ad un'embolizzazione distale di un trombo formatosi sulla placca erosa, piuttosto che ad una conseguenza di un'embolia paradossa. Si sospendeva perciò la terapia anticoagulante e si dimetteva il paziente in terapia con DAPT, statina ad alto dosaggio, beta-bloccante ed ACE-inibitore.

Discussione: Il riscontro di trombosi coronariche distali alla base di una SCA, in assenza di stenosi significative prossimalmente, può essere la conseguenza di molteplici cause. La presenza del PFO con ampio shunt dx-sx in seguito a manovra di Valsalva poteva essere fuorviante ma, l'appropriato ragionamento clinico e, soprattutto, l'utilizzo dell'imaging intracoronarico, hanno permesso di fare una corretta diagnosi.

Conclusioni: L'utilizzo dell'imaging intracoronarico è stato fondamentale per fare un'accurata diagnosi di attivazione di placca a livello di una stenosi <50% quale causa di SCA.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 840
 ARTERIOPATIA DEI TRONCHI SOVRA-AORTICI (MALATTIE DEI VASI)
 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**ENDOVASCULAR TREATMENT OF SEVERELY CALCIFIED CAROTID STENOSIS:
 ROLE OF IVUS-GUIDED PROCEDURE**

Edoardo Oscar Genta (a, b), Giuseppe Contini (a), Bianca Ada Magnanini (a, b), Ludovica Torzolini (a, b), Matteo Ferrari (a, b), Stefano Galli (b), Giovanni Teruzzi (b), Piero Montorsi (a, b)
 (a) UNIVERSITÀ DEGLI STUDI DI MILANO; (b) CENTRO CARDIOLOGICO MONZINO

Background: Calcified carotid stenosis is a challenging setting for carotid artery stenting (CAS). Potential issues include poor calcium quantification/distribution, lack of standardized protocol and high risk of acute/long-term complications. We aim to evaluate the role of IVUS-guided CAS in calcified stenosis.

Methods: We retrospectively selected 60 pts (44 males, age 75±6.9 years) with >70% stenosis and ≥180° calcium distribution by IVUS who were treated by either conventional predilation (<5 mm balloon size at 10-15 atms, n=41 pts) or predilation with intravascular lithotripsy (IVL, 4 mm balloon size at 4 atms, n=19 pts).

All had stent implantation (Wallstent 73%) and standard post-dilation (5.5-6.0 mm balloon size at 10-15 atms). Pre and post IVUS minimum lumen area (MLA, mm²) and acute lumen gain (ALG, mm²) were measured.

Results: CAS was successfully performed in all pts. Angiographic stenosis reduced from 85 [80-90]% to 10 [0-10]% (p<0.001) and MLA increased from 4.57±1.59 mm² to 12.4±2.51 mm² (p<0.001). A similar ALG was obtained in both groups (p=0.554) despite the different predilation protocol. One minor stroke occurred 7 days after discharge. At a median follow up of 931 [30-3416] days, one in-stent restenosis and one major

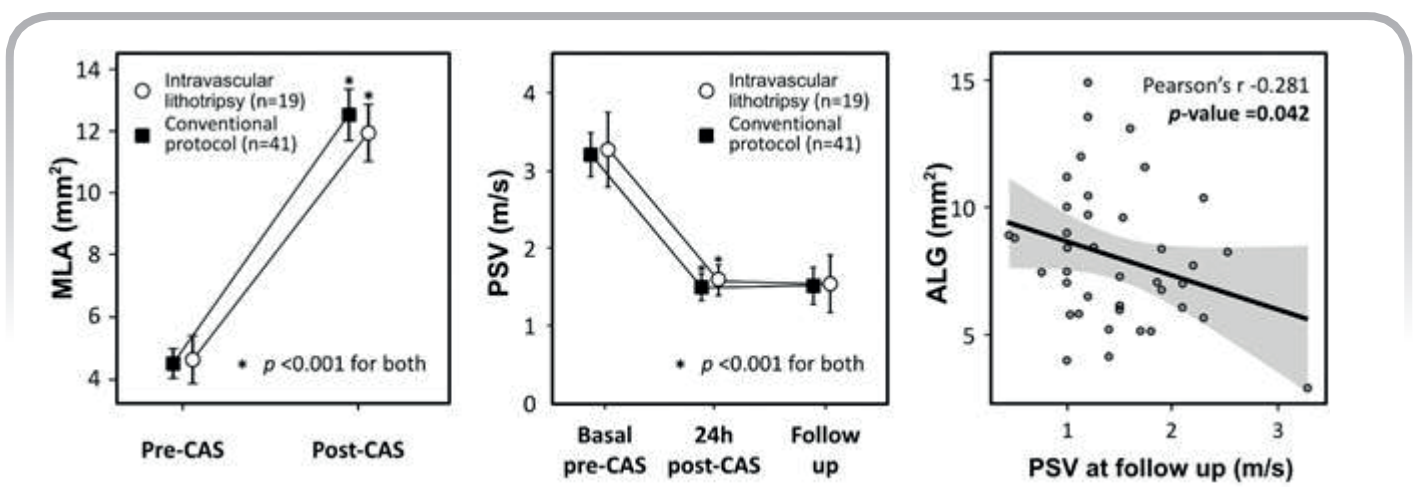


Figure 1



contralateral stroke occurred. A significant correlation between ALG and peak systolic velocity (PSV, m/s) at follow up was found ($p=0.042$) with the larger gain being associated with the lower PSV.

Conclusions: IVUS-guided CAS is a feasible, safe and effective strategy in severely calcified stenosis. The IVL technology represents a breakthrough for CAS treatment of calcified lesions.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 943
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)**

VALVE IN VALVE PROCEDURE: EDWARDS SAPIEN 26 IN DEGENERATED ACURATE NEO 2 - A CASE WITHOUT CORONARY STENTING

Dario Grassini (a, b), Marco Angelillis (b), Giulia Costa (b), Marco De Carlo (a, b)

(a) UNIVERSITÀ DI PISA; (b) AZIENDA OSPEDALIERA UNIVERSITARIA PISANA LABORATORIO DI EMODINAMICA

Valve-in-Valve Procedure: Edwards SAPIEN 26 mm in a Degenerated ACURATE neo2 Valve- A case without coronary Stenting

A case of an 84-year-old male presenting with a severely degenerated ACURATE neo2 aortic valve implanted in 2019 is discussed. The patient, classified as NYHA Class III with an ejection fraction (EF) > 50% and in sinus rhythm, exhibited severe aortic insufficiency due to valve degeneration. Pre-TAVI CT measurements revealed an aortic annulus of 79.0 mm and coronary heights of 11.8 mm for the right coronary artery (RCA) and 11.1 mm for the left coronary artery (LCA), with a valve-to-coronary (VTC) distance of 3.6 mm, raising concerns regarding coronary protection.

Despite the proximity of the valve to the coronary ostium, coronary angiography indicated more space

than expected, allowing the team to proceed without coronary stenting. An Edwards SAPIEN 26 mm valve was successfully implanted within the degenerated valve. Post-procedure evaluation confirmed the absence of complications and the patient was stable.

Key Insight: The space between the degenerated ACURATE neo2 valve and the left coronary ostium allowed for the safe deployment of the Edwards SAPIEN valve without the need for coronary stenting, highlighting a rare scenario in valve-in-valve procedures where coronary protection might not be required.

Clinical Relevance: This case provides valuable insights for future valve-in-valve procedures where coronary protection is a consideration. Long-term monitoring will be necessary to assess the durability of the valve and patient outcomes.

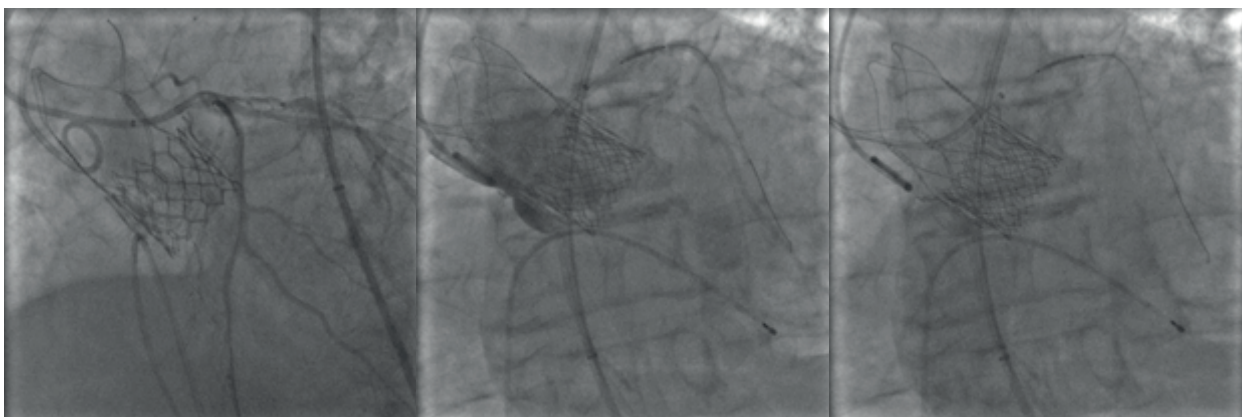


Figure 1

**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 62
 INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
 CORONARICA E STRUTTURALE)
 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E
 NUTRACEUTICI)
 TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
 INFARTO STEMI (CARDIOPATIA ISCHEMICA)**

BIOLIMUS-COATED BALLOON OR SIROLIMUS-COATED BALLOON VS PACLITAXEL-COATED BALLOON FOR IN-STENT RESTENOSIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Caterina Lecchi (a), Roel Meeus (c), Jesslyn Natalie Hariyanto (b), Hadiyah Ashraf (d), Tagbo-charles Nduka (e), Caroline De Oliveira Fischer Bacca (f)

(a) UNIVERSITÀ DEGLI STUDI DI TRIESTE, ITALY; (b) UNIVERSITAS PELITA HARAPAN, JAKARTA, INDONESIA; (c) CATHOLIC UNIVERSITY OF LEUVEN, BELGIUM; (d) RAWALPINDI MEDICAL UNIVERSITY, PAKISTAN; (e) CHRISTUS HEALTH, GOOD SHEPHERD HOSPITAL, LONGVIEW, TEXAS, USA; (f) UNIDAVI, BRAZIL

Introduction: Drug-coated balloon angioplasty with paclitaxel-eluting devices (PCB) is an established treatment for coronary in-stent restenosis (ISR). Using a new biolimus-coated balloon (BCB) or sirolimus-

coated balloon (SCB) may be non-inferior to using a standard PCB. This study aimed to do a meta-analysis comparing outcomes in patients undergoing treatment for ISR with BCB or SCB vs PCB.

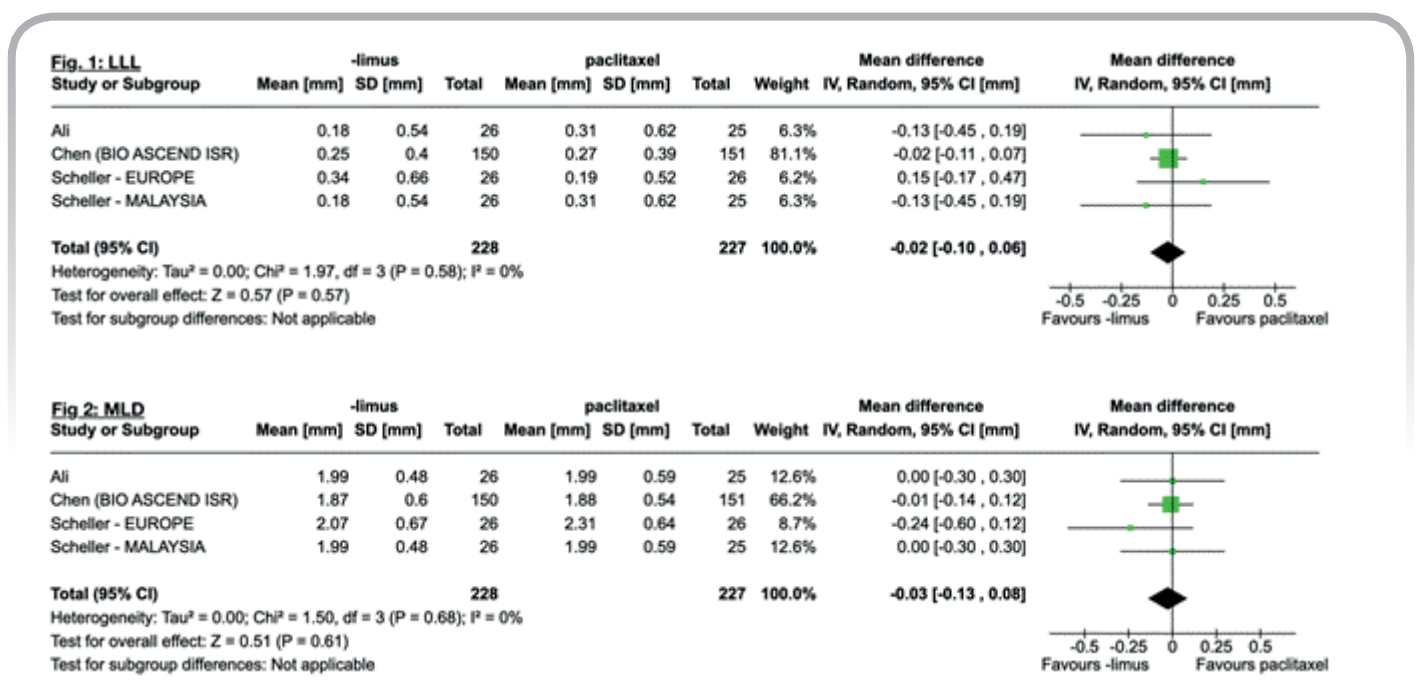


Figure 1



Methods: PubMed, SCOPUS and Cochrane Central were searched for cohort studies and randomized controlled trials (RCTs) that directly compared “-limus” coated balloons (BCB or SCB) to PCB for the treatment of ISR. Outcomes of interest were: target lesion revascularization (TLR), stent thrombosis, late lumen loss (LLL), minimal lumen diameter (MLD), myocardial infarction (MI), major adverse cardiovascular events (MACE) and diameter stenosis. The results were expressed in risk ratio (RR) or mean difference (MD). Statistical analysis was performed using Review Manager and heterogeneity was assessed with I^2 statistics.

Results: We included 1000 patients from six studies, of which five were RCTs. BCB or SCB were used to treat ISR in 534 (53.4%) patients. The follow-up period ranged from 6 to 12 months. TLR (RR 1.36; CI 0.74,

2.50; $P = 0.32$), stent thrombosis (RR 0.33; CI 0.05, 2.07; $P = 0.24$), MI (OR 1.06; CI 0.27, 4.15; $P = 0.94$), MACE (RR 1.10; CI 0.50, 2.39; $P = 0.81$) and diameter stenosis (MD 3.55; CI -1.91, 9.02; $P = 0.20$) showed no significant differences between treatment groups. LLL (MD -0.02; CI -0.10, 0.06; $P = 0.57$) and MLD (MD -0.03; CI -0.13, 0.08; $P = 0.61$) also did not show any relevant differences between the two treatments.

Conclusions: In patients treated with a drug-coated balloon for ISR, the use of a Biolimus-coated balloon or Sirolimus-coated balloon did not show any significant difference regarding the risk of TLR, stent thrombosis, MI, MACE, diameter stenosis, LLL or MLD when compared to a Paclitaxel-coated balloon. Further research is needed to fully unveil the potential benefits of these novel devices, since our study did not achieve statistical significance for non-inferiority.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 296
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

SYNERGISTIC USE OF DRUG COATED BALLOON AND ANGIOGRAPHY-BASED FFR: A CASE REPORT

Giovanni Martino (c), Rossella Quarta (d), Federico Battista (b), Roberto Caporale (b), Angelo Leone (b), Daniela Chiappetta (b), Letizia Romano (a), Antonio Curcio (a, d), Alberto Polimeni (b, d)

(a) DIVISION OF CARDIOLOGY, ANNUNZIATA HOSPITAL, COSENZA, ITALY; (b) DIVISION OF INTERVENTIONAL CARDIOLOGY, ANNUNZIATA HOSPITAL, COSENZA, ITALY; (c) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES, MAGNA GRAECIA UNIVERSITY, CATANZARO, ITALY; (d) DEPARTMENT OF PHARMACY, HEALTH AND NUTRITIONAL SCIENCES, UNIVERSITY OF CALABRIA, RENDE, ITALY

Rationale and Case Description: Drug-coated balloons (DCB) are effective devices currently recommended by international cardiology guidelines for treating in-stent restenosis (ISR). While the treatment of de novo coronary lesions with DCBs represents a new frontier in interventional cardiology, their efficacy compared to new-generation drug-eluting stents remains to be demonstrated. We present the case of a 77-year-old male admitted to our department for recurrent chest pain. His medical history included percutaneous coronary angioplasty (PCI) of the left anterior descending artery (LAD) in 2017. Coronary angiography revealed a long and sub-occlusive ISR of the proximal LAD, a 50% stenosis of the left circumflex artery, and a long 50-70% stenosis involving the mid-segment of the right coronary artery (RCA).

Clinical Resolution: We performed PCI of the proximal LAD ISR, modifying the lesion with non-compliant (NC) and cutting balloons, followed by inflation of a paclitaxel DCB. This led to a good angiographic and intravascular ultrasound result. To evaluate the hemodynamic significance of the RCA stenosis, we performed angiography-based fractional flow reserve, which provided a critical value of 0.70, strongly suggesting a need for treatment [Fig. 1a]. Subsequently, we performed lesion predilation with a 3.0 x 20 mm semi-compliant balloon, followed by a 3.0 x 20 mm

NC balloon and a 3.0 x 15 mm cutting balloon. This strategy led to an optimal angiographic and functional result, as assessed by angiography-based FFR: residual stenosis 15%; angio-FFR 0.96 (better than the predicted angio-FFR value of 0.92); the absence of flow-limiting coronary artery dissection (even though a linear and

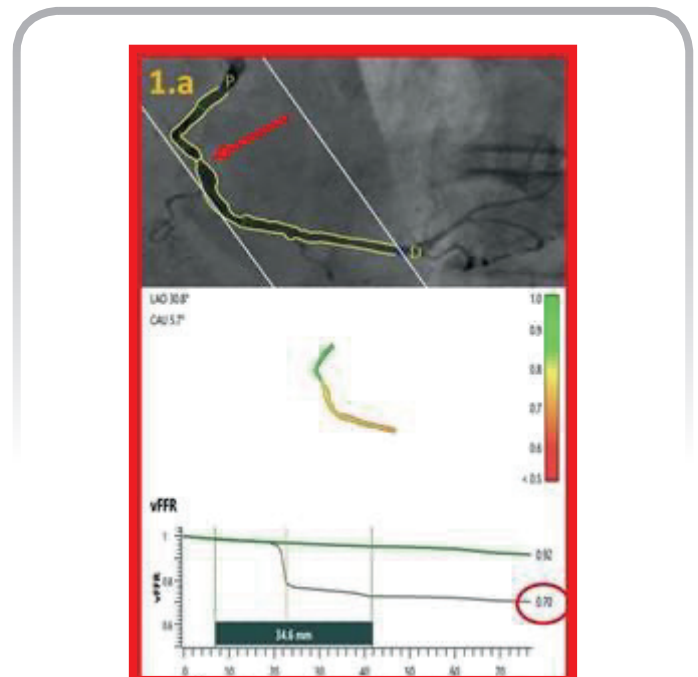
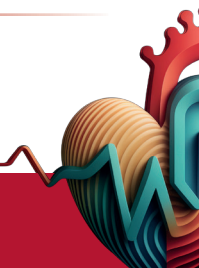


Figure 1-A



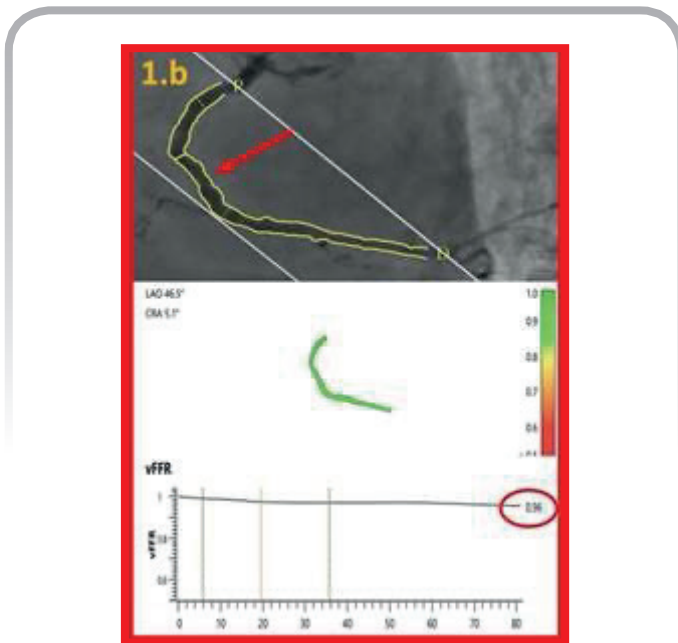


Figure 1-B

short subintimal type B dissection was present) [**Fig.1b**]. Given the patient's recent stent failure, we opted to complete the treatment with prolonged inflation of a paclitaxel DCB (sized 1:1 with the vessel diameter).

Conclusion: In the modern PCI era, angiography-based FFR measured immediately after balloon angioplasty in de novo coronary lesions could represent an appealing, non-invasive and time saving predictor of outcomes. Both DCB and angio-based FFR technologies have the potential to be game-changers for the future treatment of atherosclerotic coronary disease. Current published studies have shown encouraging results for the use of these technologies individually. However, to the best of our knowledge, research demonstrating the safety and efficacy of their combined use is lacking.

**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 591
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA
E STRUTTURALE)**

**FAILURE OF RADIAL APPROACH AND MULTIPLE TRANSRADIAL CORONARY PROCEDURES:
A SINGLE CENTER PROSPECTIVE STUDY**

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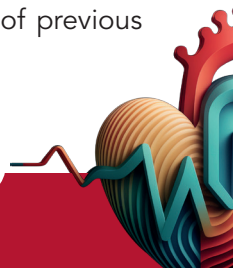
(a) UNIVERSITY OF L'AQUILA, L'AQUILA, ITALY; (b) SANT'ANDREA HOSPITAL, SAPIENZA UNIVERSITY, ROME, ITALY;
(c) UNIT OF CARDIOLOGY, SANDRO PERTINI HOSPITAL, ROME, ITALY

Background: Trans-radial approach (TRA) is recommended by international guidelines to reduce vascular complications during percutaneous coronary procedures. However, crossover of vascular access after transradial puncture is required in 4-10% of cases according to different studies. Multiple clinical predictors are unanimously associated to transradial failure as older age, female sex and short height but there are conflicting data for other variables as a previous coronary procedure performed through the same vascular access. Moreover, clinical characteristics of patients with radial failure after multiple procedures are not well known. Aim of our study was to evaluate the characteristics of patients with transradial approach failure according to single or multiple transradial accesses.

Methods: All patients who underwent to percutaneous coronary diagnostic or interventional procedures in our Center has been prospectively included. Patients that necessitated of vascular crossover after TRA failure were analyzed and divided in two groups: patients "naïve" to previous procedures (Group 1) and patients with at least a previous diagnostic or interventional procedure through the radial access that required crossover (Group 2). All patients were checked 24-hour post procedure to perform wrist vessels ultrasound

(US) and to evaluate possible vascular complications, radial occlusion and bleeding. US measurements were performed 1-3 cm proximal to the radial styloid process or the pisiform bone. Diameter, perimeter, area, intimal thickness and doppler parameters such as peak systolic velocity (PSV) and end-diastolic velocity (EDV) were measured.

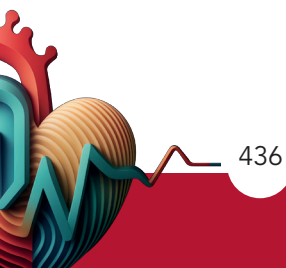
Results: Between July 2022 and May 2024 a total of 2235 procedures has been performed through transradial access in our Center (1341 procedures in "naïve patients" and 894 procedures in patients with a previous vascular access). The global rate of transradial failure was 4.9% (110 procedures): 84 patients (77%, 72 ± 13 years) in Group 1 and 26 patients (23%, 67 ± 10 , $p=0.11$) in Group 2. Group 1 and Group 2 did not differ for clinical and procedural characteristics as height, weight, blood pressure and PTCA rate, but female sex was more frequent in Group 1 (56%) compared to Group 2 (30%, $p=0.04$). Comparing ultrasound data, radial area and PSV of the failed TRA were similar in Group 1 (area 0.07 ± 0.1 cm²; PSV 50.4 ± 40.8 cm/s) compared to Group 2 (area 0.06 ± 0.38 cm², $p=0.37$; PSV 49.8 ± 46.8 cm/s; $p=0.95$). The rate of radial occlusion did not differ between Group 1 (7 cases, 8.3%) and Group 2 (2 cases, 7.7%, $p=1.0$). Compared to patients without radial failure, the rate of previous



multiple procedures was similar compared to Group 2 (25% vs 23% respectively, $P= 0.75$).

Conclusion: Patients with TRA failure after multiple vascular access showed similar clinical and echographic

characteristics compare to patients with single vascular access and transradial failure. Most of TRA failure were associated with female sex in patients without previous procedures but not in patients with multiple vascular access.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 353 INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE) SINCOPE (ARITMIE)

TAVI AND COGNITIVE IMPROVEMENT

Donato Tartaglione (a), Dario Prozzo (d), Renato Bianchi (a), Giovanni Ciccarelli (a), Maurizio Cappelli Bigazzi (a), Francesco Natale (a), Ettore Luisi (a, b), Achille Solimene (a, b), Luigi Marotta (a, b), Carmine Gentile (a, b), Rosa Franzese (a, b), Noemi Mollo (a, b), Francesco S. Loffredo (a, b), Enrica Pezzullo (a), Paolo Golino (a, b), Giovanni Cimmino (b, c)

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Background: Degenerative aortic valve stenosis (AS) is the most common valvular heart disease (VHD) among elderly. It is estimated that up to 3% of the population over 75 years of age is affected by severe AS. The prevalence of this VHD is expected to further increase because of aging. Once severe AS becomes symptomatic for syncope, angina or dyspnea, current guidelines recommend aortic valve replacement. Progressive aortic valve degeneration and calcification impair leaflets mobility, resulting in increased left ventricular afterload, reduced aortic blood flow, and gradually cardiac output (CO) impairment. It has been reported that low CO might induce abnormal brain-aging resulting in cognitive impairment and increased risk of dementia, such as Alzheimer's disease or vascular dementia. Although the mechanisms underlying AS-related dementia are not completely understood, it is postulated that the chronic reduction of cerebral perfusion might lead to a cerebral homeostasis impairment. On the contrary, cognitive improvement has been reported in patients in whom CO was restored. In the last few years, transcatheter aortic valve replacement (TAVR) has proven to be a safer alternative to surgical aortic valve replacement (SAVR), with a similar mid-term survival and stroke risk even in low-risk

patients. Moreover, TAVR is associated to an immediate improvement of ventricular filling pressures, increased pulse pressure, decreased systemic vascular resistance, and higher CO also effecting the cerebrovascular system, leading to an increased cerebral blood flow. What is still unknown is whether this improvement is also associated to a cognitive improvement. The present study aims at evaluate retrospectively this issue in a cohort of AS patient undergoing TAVR where cognitive assessment before and after aortic valve replacement was available. Methods: On this regard a total of 47 patients were selected. In all these patients a transcranial Doppler ultrasound (TCD) before and after TAVR was available. TASQ score as well as minimal state examination (MMSE) at baseline and up to 36 months was available. Results: TAVR was associated and immediate increase in peak velocity and mean cerebral flow at TCD. MMSE ranges between 17 to 26 at baseline and 20 to 27 at 36-months follow up with improved TASQ score mainly for symptoms, emotion and social interaction. Conclusions: our study indicates that TAVR induces an immediate cerebral flow increase that is associated to a cognitive and TASQ score improvement in long-term.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 388
 INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
 CORONARICA E STRUTTURALE)
 PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
 ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
 CARDIOVASCOLARE)
 TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)**

**MITRACLIP: REDUCTION IN HOSPITALIZATIONS AND COST SAVINGS
 IN THE AGE OF STANDARDIZED COSTS - AN ITALIAN EXPERIENCE**

Francesca Coppi (a), Gianluca Pagnoni (a), Ashraf Nassar (a), Francesca Grossule (a), Matteo Paolini (a), Arianna Maini (a), Anna Vittoria Mattioli (b), Giuseppe Boriani (a)

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Introduction: Mitral regurgitation (MR) is a serious valvular heart disease that significantly impacts patient morbidity, mortality, and hospitalizations due to heart failure (HF). Traditional surgical treatments are often risky, prompting the use of less invasive alternatives like the MitraClip device.

Methods: This study reviewed data from 32 patients who underwent MitraClip implantation. Hospitalizations were analyzed for one and two years before and after the procedure. Independent t-tests assessed differences between sexes and age groups. Data were gathered from discharge letters, electronic health records, and patient contact.

Results: Hospitalization Reduction: One year post-implantation saw a 53% reduction in hospitalizations (median decrease from 1.0 to 0.0; $p = 0.000043$). Two years post-implantation saw a 48% reduction (median decrease from 1.0 to 0.0; $p = 0.0042$). Comparing twice the hospitalizations one year pre-implantation to two years post-implantation showed a 63% reduction (median decrease from 2.0 to 0.0; $p = 0.00028$). No significant differences were found in outcomes between sexes or age groups.

Conclusions: MitraClip therapy substantially reduces HF-related hospitalizations, providing significant clinical benefits. Despite initial procedure costs of

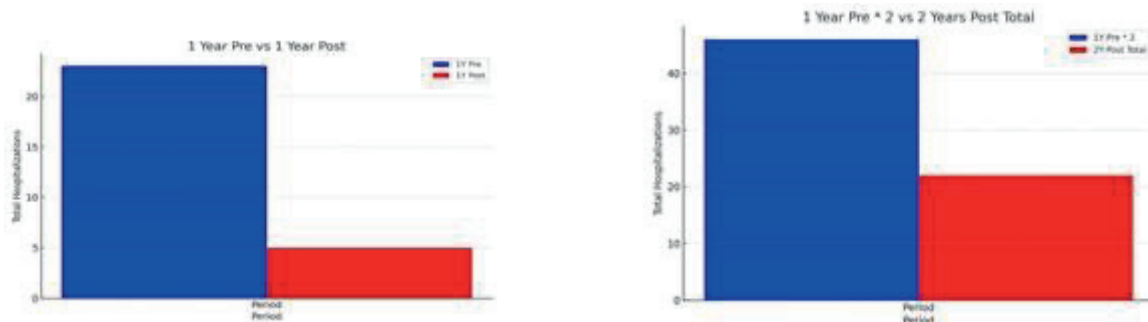


Figure 1

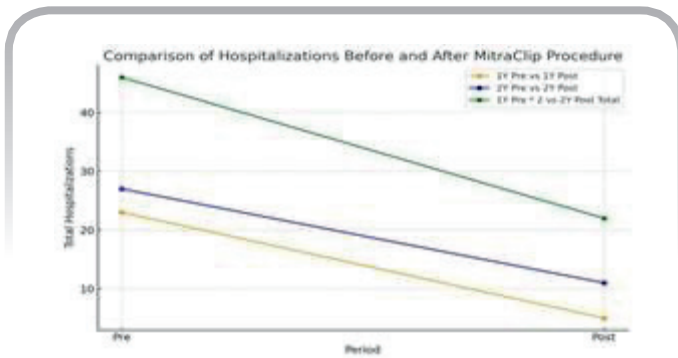


Figure 2

€34,500 to €43,000, the reduction in hospitalizations can lead to substantial cost savings (€66,000 in the first year and €129,507 over two years). Although immediate cost recovery is not achieved, the therapy enhances patient quality of life and reduces hospital admissions, demonstrating broad applicability across diverse patient demographics. Further studies with longer follow-up and larger samples are necessary to fully assess the long-term cost-effectiveness and clinical benefits of MitraClip therapy.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 64
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)**

MY CRAZY TAVR: NAVIGATING A DISSECTION

Andrea Panza (a), Tommaso Fabris (a), Giulia Masiero (a), Chiara Fraccaro (a), Luca Nai Fovino (a),
Francesco Cardaioli (a), Federico Arturi (a), Andrea Bertolini (a), Massimo Napodano (a), Giuseppe Tarantini (a)
(a) UNIVERSITÀ DI PADOVA

Transcatheter aortic valve replacement (TAVR) has become a well-established treatment for patients with previous degenerated surgical bioprostheses. These patients often present with several clinical comorbidities and anatomical challenges, such as hostile vascular access and aortopathy, which need to be carefully addressed during procedural plan.

Clinical case: An 86-years-old man was admitted to our ward for worsening dyspnea (NYHA III). His past medical history was significant for a Stanford Type A aortic dissection, which was treated by the implantation of an ascending aortic bioconduit (32 mm) and a Perimount aortic bioprosthesis (25 mm) in 2006. An echocardiography revealed a mild left ventricular systolic dysfunction (LVEF 50%) due to diffuse hypokinesia and bioprosthesis aortic valve dysfunction with severe intra-prosthetic regurgitation and moderate stenosis. Coronary angiography showed no significant coronary disease. Angio-CT scan reveals a residual chronic aortic dissection extended from the aortic arch to the proximal iliac axis. After heart team discussion, considering the patient's age and the high-risk re-operation, the patient was scheduled for trans-femoral TAVR valve-in-valve procedure. The failed surgical bioprosthesis was a stented valve with fracturable ring, moderate calcified pericardial leaflets, and a measured true ID of 22.5 mm. Coronary obstruction risk was deemed low given the presence of adequate virtual-THV-to-coronary (VTC) distance for both the coronaries (VT-LM 5.3 mm and VT-RCA 7.3 mm). Considering the presence of severe tortuosity and calcification of left iliac artery, a right

femoral approach was selected for TAVR despite a less favorable route involving the original false lumen of aortic dissection. Procedural strategy included the implant of a Sapien 3 Ultra (S3U) THV, mainly given the suitability to use a steerable delivery catheter system, which could offer safer and controlled advancement of the valve through the aortic dissection. Based on Aortic VIV app recommendations and CT scan measures, a 26 mm size was chosen, with a target implantation depth of 70:30 ratio. After right femoral access was obtained under fluoroscopic and echographic guidance, 2 Perclose Proglide were pre-mounted for large bore closure. Then, a pigtail catheter was carefully advanced over a standard J-wire across the original false lumen to reach the degenerated bioprosthesis. After positioning of a stiff wire in the left ventricle, the S3U was advanced into the bioconduit tract by accurate flexing of the delivery catheter, combined with coordinated push and pull of the stiff wire, in order to minimize the interaction with the fragile dissected aortic wall. The S3U 26 mm was successfully implanted without residual significant aortic regurgitation and trans-prosthetic gradients at invasive assessment. Final aortography revealed no complications, with optimal closure of the therapeutic access. The patient was discharged after 2 days.

Discussion: As illustrated in this case, potential anatomical challenges must be carefully addressed when planning a TAVR procedure. In particular, the presence of hostile vascular access requires thorough pre-procedural CT scan evaluation to select the most appropriate access route, as well as the most suitable

THV to minimize the risk of catastrophic complications. The evolving landscape of TAVR technology continues to advance, particularly in treating patients with challenging anatomical and clinical profiles. Future

directions may focus on enhancing pre-procedural planning tools and developing new generations of delivery catheters designed for complex vascular scenarios.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 220
EMBOLIA POLMONARE (CARDIOPATIE CONGENITE E MALATTIE
DEL CIRCOLO POLMONARE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)**

INVASIVE STRATEGY AS A FIRST-LINE THROMBOLYTIC TREATMENT FOR INTERMEDIATE AND HIGH RISK PULMONARY EMBOLISM: A MONOCENTRIC OBSERVATIONAL REGISTRY

Andrea Piemonti (a, b), Andrea Lorenzo Vecchi (b), Giuseppe De Nittis (b), Roberto De Ponti (a), Mario Galli (b)
(a) UNIVERSITÀ DEGLI STUDI IN SUBRIA, VARESE; (b) U.O. CARDIOLOGIA ASST-LARIANA, COMO

Introduction and Aim: Percutaneous catheter-directed thrombolysis (CDT) should be always considered for patients with high risk PE in whom systemic thrombolysis has failed or is contraindicated.

Few randomized controlled trials (RCTs) have been published to date regarding this methodical.

The aim of this study is to investigate the effectiveness and safety profile of CDT in an intermediate and high risk cohort of PE as a first-line thrombolytic treatment.

Methods: All consecutive patients who have been treated with CDT as first-line thrombolytic therapy have been enrolled from January 2017 to June 2024. As stated in the ESC 2019 guidelines on PE, sPESI, Troponin values, ultrasound (US) data and hemodynamic profile have been used to assess patients' risk class. AngioJet, Lightning and EKOS have been used as CDT devices.

Results: In this study, 26 consecutive patients have been enrolled. The mean age resulted in 65.3 ± 15 years, 23% of which were at least 80 years old, and 65% of the entire cohort were male. According to the 2019 ESC guidelines on PE, 2 patients (9%) have been stratified as intermediate-low risk class, 13 patients (59%) intermediate-high and 7 (32%) high risk. Individual risk stratification was not evaluable for 5 patients due to incomplete data. The mean sPESI was $1,96 \pm 1.2$. Right ventricle (RV) dysfunction has been identified in 90% of the cohort (mean TAPSE 14 ± 6 mm) and RV dilatation in 95% at admission, while RV D-shape was found in 57% of the patients. Mean

PAPs was 51 ± 12 mmHg with 83% of patients having pulmonary hypertension. Troponin I values were elevated in 93% of the patients, while nt-proBNP was elevated in 80%. Loss of consciousness (LOC) was experienced in 48% of the patients at presentation with 16% of the total population studied having a cardiocirculatory arrest (CCA). Angiojet CDT was performed in 12 (46%) patients, EKOS in 13 (58%) and Lightning on 1 (8%). We registered 2 procedural complications (8%) both as procedural hematoma, one of which required transfusion during the early phase of hospitalization. Another major bleeding needing a transfusion was registered from a patient with an arm trauma due to LOC. No pericardial effusion nor iatrogenic valvular damage was observed. The mean duration of hospitalization was $10,7 \pm 7$ days and the overall mortality rate was 19%. At discharge US parameters were as follows: RV dilation 27%, RV/LV > 0.9 in 8%, TAPSE > 18 mm 86%, PAPs > 35 mmHg in 25%, with a significant PAPs values reduction ($15,5 \pm 19$ mmHg).

Conclusion: In this monocentric experience, CDT is a valuable treatment option for intermediate and high risk pulmonary embolism as first thrombolytic treatment. It has been confirmed to be a safe methodical, with complication rates similar to other trials, even in elderly patients and those who experienced CCA at admission. Our study has a limited number of cases and an RCT including older and more critical patients is needed to better understand the potentiality of this methodical.

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 677

ABLAZIONE TRANSCATETERE (ARITMIE)

FIBRILLAZIONE ATRIALE (FA) (ARITMIE)

STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

ABLAZIONE DELLA FIBRILLAZIONE ATRIALE: DUE TECNICHE SINGLE SHOT A CONFRONTO

Antonio Scarà (a, b), Juri Bongiorno (b), Alessio Borrelli (a, b), Federico Zanin (a), Leonardo Pignalosa (a, b), Martina Nesti (c), Zefferino Palamà (b, d), Antonio Gianluca Robles (b), Silvio Romano (b), Luigi Sciarra (b)
(a) OSPEDALE SAN CARLO DI NANCY - GVM; (b) DIPARTIMENTO DI MALATTIE CARDIOVASCOLARI - UNIVERSITÀ DEGLI STUDI DELL'AQUILA; (c) AZIENDA OSPEDALIERO-UNIVERSITARIA PISANA; (d) CASA DI CURA VILLA VERDE

Introduzione: L'ablazione transcateretere rappresenta l'arma più efficace, a disposizione, per la cura della fibrillazione atriale. Ciò nonostante, i risultati a medio termine risultano ancora non del tutto soddisfacenti, con rischi procedurali non trascurabili. Per tale motivo, la ricerca scientifica è alla continua ricerca di nuove metodiche ablativie e tipologie alternative di energia da utilizzare.

Si è partiti infatti dall'utilizzo della radiofrequenza, con erogazione di energia "punto-punto", per poi sviluppare metodiche "single shot" per l'isolamento delle vene polmonari, come la crioablazione mediante pallone ed in ultimo, più di recente, l'ablazione con campi pulsati (PFA)

Scopo dello studio: confrontare l'efficacia e la sicurezza intraprocedurale di due metodiche single shot per l'isolamento delle vene polmonari: crioablazione mediante pallone ed ablazione con campi pulsati (PFA).

Metodi e risultati: Trenta pazienti affetti da fibrillazione atriale parossistica sono stati inclusi nello studio e sottoposti con rapporto 2:1 a crioablazione (Cryo) oppure ablazione con campi pulsati (PFA), a seconda delle disponibilità di sala operatoria. Le procedure cryo sono state eseguite in regime di sedazione.

Quelle PFA in anestesia generale con intubazione orotracheale. I pazienti dei due gruppi sono risultati omogenei per età e sesso (65 ± 7 vs 63 ± 6 anni - p 0,45; 18/20M vs 9/10M p 1,0). L'efficacia di isolamento delle vene polmonari è stata del 100% in entrambi i gruppi e nessuna complicanze intraprocedurale è stata registrata. La durata della procedura è stata di 57 ± 13 min nel gruppo Cryo e 50 ± 3 min nel gruppo PFA, non mostrando differenze statisticamente significative (p 0,16). Il tempo totale di fluoroscopia e la dose totale di radiazioni sono risultati significativamente differenti nei due gruppi: rispettivamente $16,1\pm 6,5$ min vs $8,2\pm 1,5$ min (p 0,0008) e $157,8\pm 126,4$ Gy \cdot cm 2 vs $65,0\pm 40,1$ Gy \cdot cm 2 (p 0,03).

Conclusioni: Nel nostro studio entrambe le metodiche single-shot utilizzate hanno mostrato ottime efficacia e sicurezza. La PFA ha determinato un minore utilizzo di radiazioni ionizzanti, con un potenziale vantaggio in termini di rischio radiologico, ma ha richiesto il ricorso da anestesia generale con intubazione orotracheale. Studi randomizzati, su più ampia scala, saranno necessari per confermare i risultati della nostra iniziale esperienza.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 954
 ARTERIOPATIA DEI TRONCHI SOVRA-AORTICI (MALATTIE DEI VASI)
 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)**

**TRANSRADIAL/BRACHIAL CAROTID ARTERY STENTING WITH PROXIMAL CEREBRAL PROTECTION:
 A FEASIBLE, SAFE AND EFFECTIVE FIRST LINE STRATEGY IN 147 CONSECUTIVE PATIENTS**

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Background: Transradial/brachial (TR/TB) carotid artery stenting (CAS) is an alternative approach to femoral catheterization. A major issue is the small radial artery size precluding use of large bore devices such as 8Fr proximal cerebral protection (PCP), hampering the comparison with the femoral route. We assessed the feasibility, safety and efficacy of CAS with PCP via TR/TB.

Methods: Of 703 patients (pts) with significant carotid stenosis scheduled for TR/TBCAS, 147 (21%) were deemed at high risk of embolic complications, requiring PCP with the Mo.MA Ultra system.

Results: Patients' age was 73±7 years, 92% were males, 90% asymptomatic, 45% at high surgical risk. All pts had soft, lipid-rich plaques by CT-angiography (Hounsfield <60 units). Radial/brachial approach was used in 101 and 46 pts, respectively. Target carotid axes were right (73 pts), left (68 pts) and left bovine (55 pts). An 8Fr, 5.5 or 11 cm-long sheath was used in radial or brachial approach. CAS was successfully completed in the full cohort (intention-to-treat). Four patients crossed over to FA due to hostile anatomy. To overcome this issue, we modified the technique allowing for more support and deliverability loading the Mo.MA catheter without mandrel on two-wire system (No.MA2 technique). The

Device Success	96.6% (142/147)	4 hostile anatomies 1 Mo.MA too short
Crossover to FA	2.7% (4/147)	4 Hostile anatomies
Technical Success	96.6% (142/147)	4 hostile anatomies 1 Mo.MA too short
MACCE (death, all strokes, retinal embolism, Myocardial Infarction)	1.3% (2/147)	2 Minor strokes
Procedural Success	95% (140/147)	
Intolerance to occlusion (shift to filter)	6.7% (10/147)	Acute: 6 Late: 4
Major vascular complications	0.67% (1/147)	1 Brachial Artery Pseudoaneurysm (surgical repair)
Radial artery occlusion	6.9% (7/101)	

Table

new technique was successfully used in 46 pts (31%), mainly as first line strategy in anatomies at high risk of failure with the standard technique. In-hospital and 30 days outcomes are reported in the Table. Chronic radial artery occlusion occurred in 7 pts at a median follow up time of 372 ± 163 days.

Conclusion: These results complete and expand the feasibility, safety and efficacy of TR/TB approach including high-risk patents/anatomies. Radial artery occlusion may be still an issue.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 442 GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) ELETTROSTIMOLAZIONE (ARITMIE)

UNA RARA COMPLICANZA DELL'IMPIANTO DI PACEMAKER DEFINITIVO

Marco Giardino (a), Giorgia Azzolini (a)

(a) AZIENDA OSPEDALIERO UNIVERSITARIA DI FERRARA

Introduzione: L'impianto di pacemaker definitivo rappresenta il trattamento di scelta in caso di blocco atrioventricolare avanzato. Le complicanze correlate agli elettrocateri, sebbene rare, sono le principale causa di reintervento.

Case report: Uomo di 89 anni, iperteso e dislipidemico con stenosi aortica severa recentemente sottoposto a TAVI, arrivava alla nostra attenzione per blocco atrioventricolare di terzo grado parossistico sintomatico per sincope. Veniva quindi sottoposto ad impianto di pacemaker bicamerale per via venosa ascellare sinistra eco-guidata, con posizionamento elettrocateri ventricolare destro e atriale destro entrambi con fissaggio a vite. La procedura si svolgeva in assenza di complicanze acute e il paziente veniva dimesso il giorno successivo, a seguito dell'esclusione di pneumotorace alla radiografia e del controllo del dispositivo, che risultava ben funzionante con ottimi parametri elettrici. A distanza di due settimane il paziente afferiva ai nostri ambulatori per la rimozione dei punti di sutura e per eseguire il primo controllo del dispositivo. Si osservava un aumento del valore di soglia di stimolazione ventricolare destro, con parametri di sensing e di impedenza nella norma e stabili rispetto al precedente controllo. I parametri elettrici atriali risultavano invece nei limiti. Il paziente veniva sottoposto a radioscopia in sala di elettrofisiologia per valutare la posizione dell'elettrocateri ventricolare, il cui sposizione veniva escluso. Si eseguiva una proiezione obliqua sinistra a circa 30°, che evidenziava la posizione dell'elettrocateri verso la parete libera del ventricolo

destro. Si eseguiva quindi ecoscopia, che confermava tale posizione e evidenziava la presenza di versamento pericardico con segni di iniziale organizzazione. Il paziente veniva dunque ricoverato presso la nostra UTIC. Veniva eseguita anche un'angioTC dell'aorta, per escludere possibili altre cause per lo sviluppo del versamento pericardico, alla luce del recente intervento di TAVI. Il giorno successivo il paziente veniva portato in sala di elettrofisiologia, l'elettrocateri ventricolare destro veniva spostato e riposizionato a livello settale. La procedura si è svolta in assenza di complicanze. Il paziente è stato mantenuto in osservazione per qualche giorno, escludendo ulteriore rifornimento del versamento pericardico e confermando la stabilità clinica. Alla dimissione i parametri elettrici sia atriali che ventricolari risultavano nei limiti.

Conclusioni: Le complicanze relate all'impianto di pacemaker sono al giorno d'oggi sempre più rare. In particolare, le complicanze a livello degli elettrocateri quelle più frequentemente associate alla necessità di reintervento. Nel caso riportato, l'elettrocateri ventricolare destro era stato posizionato erroneamente a livello della parete libera del ventricolo destro, nota per essere più sottile del setto interventricolare, con rischio quindi di perforazione a seguito dell'avvitamento dell'elettrocateri. La proiezione obliqua sinistra è dunque utile per confermare che la punta dell'elettrocateri ventricolare sia direzionata verso il setto interventricolare e dovrebbe essere eseguita durante ogni impianto per prevenirne l'errato posizionamento e le possibili complicanze ad esso associate.

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 148
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING
CARDIOVASCOLARE)
ARTERITI (MALATTIE DEI VASI)
PROGNOSI (SCOMPENSO CARDIACO)

A GIANT CHALLENGE: MANAGING CORONARY ANEURYSMS IN A COMPLEX CARDIAC CASE

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 Daniele Adorno (a), Aldo Lo Varco (a), Salvatore Evola (a), Giuseppe Vadalà (a), Giuseppina Novo (a),
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Introduction: Coronary aneurysms (CA) are rare manifestations, with an incidence of 0.2-4.9%, defined as dilations of the coronary arteries exceeding 1.5 times the reference vessel diameter. They more frequently affect males (83% vs. 60%), with the right coronary artery being the most involved, followed by the left anterior descending artery. CAs can be incidental findings, cause acute coronary syndrome, present as angina, manifest through their complications, or even lead to sudden cardiac death. The gold standard for their identification is coronary angiography, but imaging techniques such as multi-slice computed tomography angiography (MSCTA) allow for accurate stratification of aneurysm size and thrombotic burden.

Case Report: This document presents the clinical case of a patient admitted to our centre with new-onset heart failure. The patient's medical history includes multiple surgeries for thoracoabdominal and suprarenal and infrarenal abdominal aortic aneurysms. Diagnostic coronary angiography revealed obstructive coronary artery disease and a saccular aneurysm of the left anterior descending artery. The aneurysm's dimensions were further characterized using MSCTA, accurately

defining the lesion's relationships with surrounding structures, thereby guiding the decision on the most appropriate therapeutic strategy.

Discussion: The etiological definition of coronary aneurysms (CAs) is complex, but their management and the choice of the most appropriate therapeutic approach are even more challenging due to the rarity of these lesions and the gaps in the current evidence. Advanced imaging techniques and three-dimensional reconstructions are invaluable in accurately defining the anatomical variability of these lesions, allowing for detailed study of their relationships with surrounding structures.

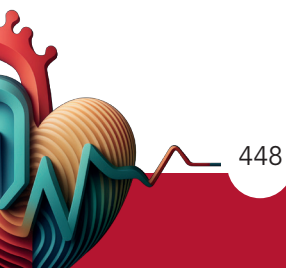


Figure 1



In the presented case, multiple aneurysmal lesions were identified in the context of severe hypokinetic dilated cardiomyopathy. This combination made the operative risk prohibitive for the patient. Additionally,

the excessive complexity of the lesions contraindicated a percutaneous interventional approach. Therefore, the patient was referred to the regional heart transplant centre for further evaluation and management.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 19
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING
CARDIOVASCOLARE)**

**ALTERNATIVE ACCESS TRANSCATHETER AORTIC VALVE REPLACEMENT:
DIVERSITY IS NOT AN ISSUE, BUT AN OPPORTUNITY**

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Background: Despite a plethora of technological iterations, transfemoral arterial transcatheter aortic valve replacement (TAVR) remains challenging and sometimes unsafe in a minority of cases, with trans-axillary (TA) access being the most famous alternative option. In this setting, TA access, especially the left access, was developed as the first alternative non-transfemoral peripheral arterial approach showing favorable outcomes. However, coaxiality, especially when using the right TA approach, may be problematic, especially with an aortoventricular angle $<70^\circ$. Therefore, the right TA approach, particularly in patients with small aortic annulus undergoing TAVR, can be challenging.

Case summary: We present a clinical case of a 77-year-old lady, with a history of prior percutaneous coronary interventions and Leriche syndrome treated with abdominal aortic resection and prosthetic replacement. She was admitted to the hospital due to worsening of the dyspnea and chest pain. Coronary angiography showed no significant coronary artery stenosis with good patency of the previously implanted stents. Therefore, an echocardiography was performed that revealed a severe aortic stenosis (mean Gradient 42 mmHg, V max 4.31 m/s, AVA VTI 0.7 cmq). The patient was classified as low-intermediate risk patients, and after multidisciplinary discussion in Heart Team, she was candidate for TAVR procedure. A computer tomography (CT) was performed showing significant

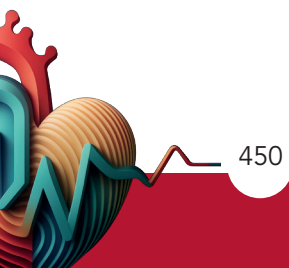
stenosis of proximal abdominal aortic anastomosis and 40% stenosis of left subclavian artery. Moreover, the CT of the aortic valve showed small aortic annulus, with low sinus of Valsalva diameters (< 30 mm). Therefore, a right TA approach was considered for the TAVR procedure. After surgical isolation of the right axillary artery (7F-14F access), an Inoue stiff wire was positioned in the left ventricle and after flexing maneuver, a self-expanding Portico 25 mm was released successfully during rapid pacing. Two days after the procedure, due to a new atrial-ventricular block 2:1 onset, the patient underwent pacemaker implantation. Moreover, due to a significant drop of the hemoglobin level, she was provided with blood transfusion. However, doppler evaluation showed no vascular complications and echocardiography control showed no paravalvular leaks, nor patient-prosthesis mismatch. During follow-up, the patient referred significant improvement of the symptoms.

Discussion: Left TA access has favorable anatomical configuration and allows more coaxial orientation of the valve with the aortic root. In right TA-TAVR, the delivery device needs to overcome two opposite curvatures to reach the aortic annulus and without proper techniques, suboptimal positioning of the valve could result in significant paravalvular leak or heart block. Therefore, CT is critical to assess patient eligibility for different access sites, to anticipate complications and



to plan bail-out strategies. Many studies showed that self-expanding valves have better hemodynamics in patients with small aortic annulus. However, right TA-TAVR can be a safe and feasible procedure despite the

different challenging points in this setting. Randomized head-to-head comparisons between alternative access routes are required in patients with small aortic annulus not eligible for transfemoral TAVR.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 636 FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA) CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

PROGNOSTIC IMPLICATIONS OF MYOCARDIAL BRIDGING-RELATED CORONARY ARTERY SPASM

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Background and Aims: Among several mechanisms underlying myocardial bridging (MB)-related ischemia, coronary artery spasm (CAS) may play a pivotal role in promoting anginal symptoms and adverse cardiac events. However, the prevalence of CAS and its prognostic implications in MB patients are still matter of debate. Therefore, the aim of our study was to assess the prevalence of CAS in MB patients and its impact on major adverse cardiovascular events (MACE).

Methods: A cohort of 73 MB patients undergoing invasive acetylcholine (ACH) provocative test was matched, according to a propensity score, to 153 control patients (~1:2 ratio) with angina and non-obstructive coronary artery disease (ANOCA), without MB, undergoing invasive ACH provocative test. ACH test was considered positive for epicardial CAS in the presence of epicardial coronary diameter reduction $\geq 90\%$, associated with the occurrence of anginal symptoms and ischemic ECG shifts. Microvascular CAS was diagnosed when anginal symptoms and typical ischemic ST-segment changes developed in the absence of epicardial coronary constriction. The primary and secondary endpoints were, respectively,

the incidence of CAS and MACE (defined as a composite of cardiac death, myocardial infarction and cardiac hospitalization) up to 24 months follow-up.

Results: CAS was diagnosed in 48 (65.8%) MB patients (43 epicardial CAS, 5 microvascular CAS) and in 81 (52.9%) ANOCA patients without MB. After matching for age, sex, cardiovascular risk profile and clinical presentation, the incidence of CAS resulted higher in patients with MB [Odds Ratio (OR) 1.18; Confidence Interval (CI) 95%; 1.04-1.37; $p < 0.01$]. Furthermore, among patients with a positive ACH test, the rate of MACE was significantly higher in patients with MB after matching for the same covariates (OR 1.23; CI 95% 1.08-1.32; $p < 0.01$).

Conclusions: CAS may be frequently detected in MB patients through invasive ACH provocative test and may underlie the development of symptoms and adverse outcomes. Furthermore, MB patients with CAS were found to have a higher occurrence of MACE compared to matched ANOCA patients with CAS, suggesting an additional ischemic contribution of MB in the development of adverse cardiac events.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 116 ELETTROSTIMOLAZIONE (ARITMIE) GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

A SINGLE-CENTRE PROSPECTIVE EXPERIENCE OF LEFT BUNDLE BRANCH AREA PACING (LBBAP)

Anthea Tonia D'amico (a), Gabriele Dell'era (a), Chiara Devecchi (a), Giuseppe Patti (a)

(a) OSPEDALE MAGGIORE DELLA CARITÀ DI NOVARA

Introduction: Left bundle branch area pacing (LBBAP) is increasingly used for treating bradycardia and heart failure. However, real-world data about safety and feasibility are limited. We collected prospective data on LBBAP procedures in our centre.

Methods: Observational data from 1 Italian site was analyzed for consecutive LBBAP procedures, comparing outcomes based on operator experience levels.

Results: From January 2022 to December 2023, 279 patients (median age 76, 68% male) underwent LBBAP attempt. Most frequent indications were atrioventricular block (42%) and sick sinus syndrome (19%). Successful lead implantation was achieved in the totally of procedures, with a median fluoroscopy time of 6.6 minutes. Significant QRS duration reduction was

observed in patients with interventricular conduction delay (144 ms to 120 ms). Compared to low-experience operators (0-10 previous cases), high-experience operators (>50 cases) had significantly better outcomes, with reduced fluoroscopy time (5.9 min versus 9.0 min) and an 86% lower risk of lead implantation failure. Periprocedural complications occurred in 4.3% of patients, unaffected by operator experience. Follow-up data on 1 year showed stable LBBAP pacing parameters.

Conclusions: LBBAP is a safe and feasible technique, with high success and acceptable complication rates, even when performed by less experienced operators. However, a learning curve of 50 procedures was shown to further improve outcomes. Electrical parameters remained stable with a low rate of LBBAP loss during short-term follow-up.

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 322 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE)

UN DOLORE TORACICO ANOMALO

Mario Ferraioli (a, b), Sara Turino (a, b), Alessandra Nocilla (a, b), Giuseppe Caliendo (a, b), Emanuele Nigro (a, b),
Francesco Vigorito (a), Tiziana Attisano (a), Gennaro Galasso (a, b)
(a) OSPEDALE SAN GIOVANNI DI DIO E RUGGI D'ARAGONA; (b) UNIVERSITÀ DEGLI STUDI DI SALERNO

Intro: L'avanzamento delle tecniche di imaging negli ultimi anni ha portato ad un considerevole aumento delle diagnosi di origine anomala delle arterie coronarie (AAOCA). Le linee guida forniscono delle indicazioni generali sull'approccio diagnostico-terapeutico dei pazienti con AAOCA non tenendo in considerazione l'ampio spettro di anomalie e la varietà dei sintomi.

Caso clinico: Una paziente di 40 anni giungeva presso il PS della nostra AOU per dolore toracico. All'ingresso non mostrava alterazione degli indici di miocardione necrosi o modifiche dell'elettrocardiogramma. La pz veniva ricoverata presso il nostro reparto di Cardiologia per gli accertamenti e le cure del caso.

Durante la degenza praticava test ergometrico risultato positivo per sintomi e segni di ischemia inferiore. Veniva, pertanto, posta indicazione ad effettuare esame coronarografico.

L'esame coronarografico mostrava un albero coronarico sinistro che riabitava, per via eterocoronarica tramite rami settali ed epicardici, l'arteria coronarica dx la quale mostrava un'origine anomala dal seno coronarico sx. La coronarica dx veniva visualizzata esclusivamente per via retrograda.

La pz veniva, pertanto, sottoposta a Coro-TC che confermava l'origine anomala della coronarica dx dal seno coronarico sx con decorso dapprima intramurale e poi interarterioso aorto-polmonare.

Le anomalie dell'origine della coronarica dx (AAORCA) sono le anomalie coronariche più frequenti e possono presentare un decorso benigno (retro-aortico o pre-polmonare) o ad elevato rischio anatomico (inter-arterioso aorto-polmonare). In questi ultimi, il meccanismo alla base dell'ischemia è ancora sconosciuto, l'ipotesi più accreditata ritiene che i principali fattori siano la compressione intramurale e la morfologia dell'ostio coronarico (angolo di takeoff acuto $\leq 45^\circ$; slit-like orifice).

Conclusioni: La coro-TC in questi pz è un esame di fondamentale importanza per identificare il tipo di anomalia coronarica ed il decorso, ed inoltre l'acquisizione di sequenze in sistole permette di valutare l'eventuale compressione sistolica della coronarica con decorso anomalo. Tuttavia, in questi pz, non vi sono chiare indicazioni sull'approccio diagnostico-terapeutico specifico per il tipo di anomalia coronarica riscontrata e sulla valutazione del rischio di eventi aritmici maggiori.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 464
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE
E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING DELLE CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE
E MALATTIE DEL CIRCOLO POLMONARE)**

**UNRAVELING COMPLEXITY: TAKING ADVANTAGE OF COMPLEX ANATOMY
TO CLOSE PATENT FORAMEN OVALE**

Federica Leotta (a), Sarah Ragonese (a), Carmelo Grasso (a), Jessica De Santis (a), Giuseppe Castania (a),
Davide Capodanno (a), Maria Elena Di Salvo (a)

(a) CENTRI ALTE SPECIALITÀ E TRAPIANTI (CAST) - POLICLINICO UNIVERSITARIO DI CATANIA

UNRAVELING COMPLEXITY: TAKING ADVANTAGE OF COMPLEX ANATOMY TO CLOSE PATENT FORAMEN OVALE

Razionale/Rational: This clinical case aims to illustrate the importance of proper evaluation of patent foramen ovale (PFO) anatomy to choose the best treatment strategy.

Risoluzione Tecnica/Technical resolution: The use of intracardiac echocardiography can help in the correct visualization and interpretation of the anatomy (long, stiff tunnel, ASA, Chiari's Network, cribiform septum). In this way, it can help in device selection and delivery.

Implicazioni cliniche/Clinical Implications: Despite the complex anatomy it was possible to close the patent foramen ovale by exploiting an intrinsic characteristic of the septum (cribiform septum) and also thanks to the characteristics of the device (radial force flexibility and adaptability to the septum).

Prospettive/Perspectives: Optimize the implant as much as possible by analyzing anatomy and best-fitting prosthesis by taking advantage of image definition rendered by intracardiac echocardiography (ICE).



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 27
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)**

**URGENT CORRECTION OF A SYMPTOMATIC FUNCTIONAL MR WITH THE CARILLON DEVICE IN A PATIENT
WITH ARRHYTHMIC PRESENTATION**

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Introduction: Functional mitral regurgitation is a growing issue in our population, and it is an important factor in hospital readmission. Generally, these are elderly patients with post ischemic heart disease and a history of concomitant atrial fibrillation who present to the cardiology intensive care unit with a picture of acute or subacute pulmonary edema. Not being candidates for cardiac surgery in most cases, the choice falls to percutaneous valve defect correction systems after obtaining maximum tolerated medical therapy. Furthermore, the anatomic basis of valve regurgitation can be variable among patients with secondary mitral regurgitation, and then edge-to-edge leaflet repair with devices such as MitraClip or Pascal may not be feasible or not provide adequate reduction for some patients.

Case Report: We report the case of a 79-year-old woman admitted to our CICU for heart failure decompensation with dyspnea lead by recurrent pulmonary oedema partially refractory to medical treatment and to ventilation. The admission transthoracic echocardiogram, performed during rapid AF rhythm (140bpm), showed a new onset HFrEF (EF 30% with global hypokinesis [EF 59% on October 2023]) and severe IM (EROA 0.4cm², regurgitant volume 62mL) lead by left atrial dilatation (LAVi 41mL

m²). A coronary angiography showing no significant stenosis was performed; furthermore, was performed also a transesophageal echocardiography to better characterize the valvular regurgitation and exclude the presence of thrombotic formations in the left atrium; immediately after the TEE, the sinus rhythm was obtained through an electrical cardioversion. Thereafter, after a few days spent on the optimization of the cardiological therapy, just a partial decongestion was obtained and therefore a transcatheter mitral annuloplasty with Carillon device was proposed and accepted by the patient. In the while, another TTE was performed, and it show an improvement of the LVEF (from 30% to 45%); nevertheless, the dyspnea remains with the need of oxygen therapy. The post-procedural transthoracic echocardiography showed a reduction of the mitral regurgitation from a severe to a mild-moderate grade. The patient was transferred from the cardiology ward and then to a rehabilitation institute in good general and hemodynamic conditions. The one-month follow-up with transthoracic echocardiogram showed a further improvement, with a mitral regurgitation of mild grade.

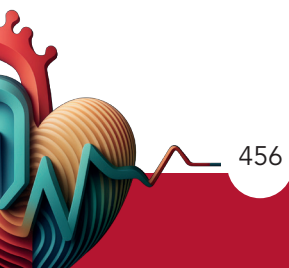
Discussion: This interesting case show the relevant of functional MR in a patient receiving already a maximum specific medical therapy. The recurrence and



the partially response to intravenous medical therapy and to ventilation convince our clinical decision to candidate the patient to the Carillon System not in elective condition but in CICU setting. Another important moment of the CICU management, after the partial compensation, was gain and maintain a sinus rhythm. Our patient showed an improvement in LVEF from 30% to 45% after the electrical cardioversion. This new hemodynamic condition allowed to perform with major safety the transcatheter mitral annuloplasty

to give to the patient an improvement of her valvular heart disease.

Conclusion: For our experience the Carillon Mitral Contour System is a useful and feasible device that provides an improvement in the clinical condition of the patient with severe mitral regurgitation in a CICU setting. We observe an improvement of the hemodynamic status and not only in the middle and a well result in a middle-term follow-up.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 295 INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)

A CASE OF ROTA-PELLA FOR THE MANAGEMENT OF SEVERE CALCIFIED LEFT MAIN BIFURCATION LESION

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(b) DEPARTMENT OF PHARMACY, HEALTH AND NUTRITIONAL SCIENCES, UNIVERSITY OF CALABRIA, RENDE, ITALY; (c) DIVISION OF CARDIOLOGY, ANNUNZIATA HOSPITAL, COSENZA, ITALY;
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Rationale: The treatment of severely calcified coronary artery disease involving the left main in patients with left ventricular dysfunction represents one of the most complex challenges for the interventional cardiologist. This requires detailed pre-procedural planning and meticulous attention to all phases of the procedure. Below, we present the case of an 83-year-old patient admitted for non-ST-elevation myocardial infarction (NSTEMI), with three-vessel coronary artery disease, involvement of the left main bifurcation, and severe and diffuse calcific pathology.

Technical Resolution: To ensure good hemodynamic stability throughout the intervention in a patient with left ventricular dysfunction, it was decided to implant a mechanical circulatory support system, specifically the Impella CP Smart Assist. For this purpose, a computed

tomography angiography (Angio-CT) of the aorto-iliac-femoral axes was performed to evaluate the extent and severity of peripheral vascular atherosclerotic disease and to exclude contraindications for transfemoral implantation. During the procedure, intravascular ultrasound (IVUS) was used to assess the morphology and extent of the calcium, as well as to evaluate the true dimensions of the treated vessels, an essential parameter for correct stent sizing. Given the severity and extent of the calcific pathology, multiple passes of rotational atherectomy with progressively larger burrs were performed, with a sequential approach toward the left anterior descending artery and the left circumflex artery. The choice of stenting technique for treating the bifurcation was the "T and Protrusion" method due to the presence of a favorable angle ($> 70^\circ$) and the simplicity of the technique. Angiographic and IVUS

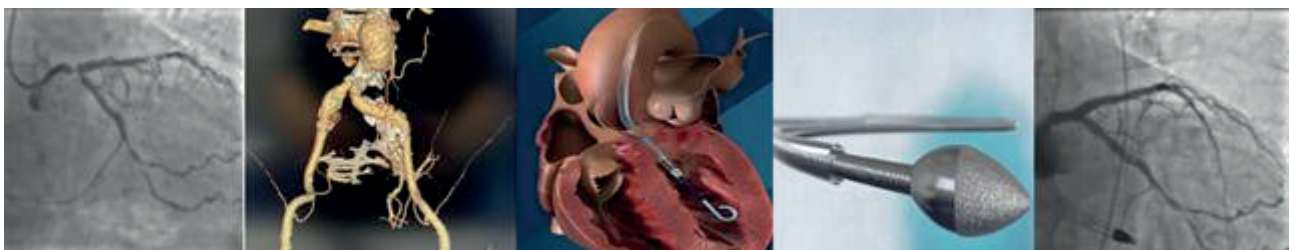


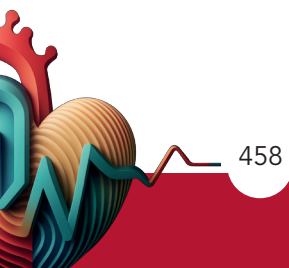
Figure 1



control demonstrated a satisfactory final angiographic result.

Clinical Implications: The support of Impella CP ensured all time long hemodynamic stability throughout the procedure, which was completed without complications. The device was removed at the end of the angioplasty, and large vascular bore closure was successfully managed with a “pre-close technique” using two Perclose Proglide devices at the beginning of the procedure. The patient was discharged a few days later with an uncomplicated follow-up.

Conclusion: The Impella CP is a circulatory support device that ensures hemodynamic stability during the most critical phases of the procedure. Rotational atherectomy is an effective tool for treating long and severe calcified lesions, even with involvement of the left main bifurcation. IVUS is essential for evaluating the morphology and extent of the calcium, as well as for assessing the true dimensions of the treated vessels, and should always be performed when possible in three phases: before, during, and after. Teamwork and good procedural planning are the determining factors for a successful outcome of highly complex procedures.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 585
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA
E STRUTTURALE)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)

A CASE OF ATHEROSCLEROTIC PLAQUE WITHIN A MYOCARDIAL BRIDGE SEGMENT

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Introduction: Myocardial bridging (MB) represents the most common congenital coronary anomaly consisting of an intra-myocardial course of an epicardial coronary artery tract. MB can occur in any coronary artery, although it is most commonly seen in the left anterior descending artery (LAD). Atherosclerosis preferentially develops immediately proximal to the bridged segment, likely due to alterations in shear stress, while the compressed segment itself is often spared.

Clinical Case: We present the case of a 67-year-old man, ex smoker with hypertension, hyperlipidemia. Six months before he had a hospitalization for NST-ACS: coronary angiography (CA) was performed showing a mild epicardial coronary atherosclerosis in the right coronary artery and circumflex, while aMB on the mid LAD was described with an intermediate fix stenosis within the segment of the LAD in which a "milking effect" was observed. The echocardiogram showed a normal left ventricular systolic function and no valvular abnormalities. For the persistence of exertional chest pain, the patient did an ergometric stress test (05/2024), which was positive for signs and symptoms of inducible myocardial ischemia. Therefore, the patient was referred to our hospital and underwent CA, which confirmed the previous findings. The decision was made to perform an intravascular imaging (i.e. OCT) that revealed images consistent with the presence of MB: specifically a homogenous band with intermediate light intensity

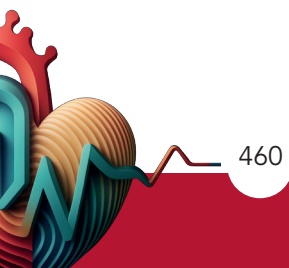
surrounding the vessel wall was present. Within the MB segment, a plaque, predominantly fibrous was observed appearing as a signal-rich, homogeneous region with low signal attenuation. The MLA during diastole was 1.8 mm². A full-Physiology approach was utilized to dissect the concomitant mechanisms of ischemia in this patient. At basal condition, the physiological assessment using i.v adenosine showed a borderline FFR value of 0.8 and RFR = 0.92. These results were coupled with slightly elevated IMR values and reduced CFR. During pharmacological stress using dobutamine and atropine (HR >120 bpm) RFR and FFR reached the value of 0,89 and 0.76, respectively. Considering the heavy burden of symptoms and the concomitant presence of a fixed stenosis within the MB, we performed an OCT/FFR guided PCI. DES was released covering the entire length of the MB (21 mm) after predilation with non compliant balloon. OCT performed after the implantation showed optimal apposition of the stent. Post-PCI values were FFR 0.90, IMR 31, RFR 0.94, CFR 3.8. Interestingly these data were not different during chronotropic and inotropic stimulation, pointing to the fact that the main mechanism of ischemia in this patient was related to the presence of a fixed atherosclerotic plaque. At 3 months follow-up the patient remained asymptomatic.

Discussion: Mechanical compression of the tunneled artery during systole (i.e., milking effect) represents the hallmark angiographic finding of MB. However, the



hemodynamic effect of MB is not limited to systolic compression alone, which could represent the “*primum movens*”, coexisting with other ischemic mechanisms. At the best of our knowledge, this is the first case able to demonstrate the presence of an atherosclerotic plaque within a MB segment. Until now, MB segment itself was

considered to be spared from atherosclerosis although the reasons for this phenomenon have never been fully elucidated. This case describes how in patients with symptomatic MB, the assessment of the mechanisms of ischemia and the personalisation of treatment are crucial in outlining the diagnostic therapeutic pathway.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 628 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

PROGNOSTIC ROLE OF THE COAPT RISK SCORE IN PATIENTS WITH SECONDARY MITRAL REGURGITATION (SMR) UNDERGOING M-TEER: RESULTS OF A REAL WORLD REGISTRY

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Background: The COAPT risk score is a simple tool used to predict mortality and HF hospitalization in patients with Secondary Mitral Regurgitation (SMR) undergoing Mitral Transcatheter Edge-to-Edge Repair (M-TEER).

Aim: This study aimed to evaluate the performance of the COAPT risk score in a real-world setting of patients enrolled in a multicenter observational registry undergoing M-TEER due to SMR.

Methods: The population of this multicenter registry was stratified into tertiles based on their COAPT risk scores. We evaluated the performance of the COAPT risk score in predicting clinical outcomes across the entire cohort.

Results: Among the 450 patients included in this registry, 226 had secondary mitral regurgitation (SMR) with complete data for COAPT risk score calculation. The median follow-up period was 474 days (IQR: 394.5-1141), with a one-year follow-up completed in 96% of cases and a two-year follow-up completed in 88% of cases. The incidence of the 2-year composite endpoint of all-cause death and hospitalization for heart failure

(HF) was 34.7%, 58.1%, and 65.3% across the three risk groups. Kaplan-Meier (KM) analysis showed poor performance of the COAPT risk score in stratifying the risk for the primary event, with the medium and high-risk groups presenting non-significant differences. Conversely, when evaluating the primary endpoint focused solely on all-cause mortality, the COAPT risk score better stratified the risk (14.8%, 29.2%, 48%). However, while assessing rehospitalization for heart failure individually, the score demonstrated poor risk stratification (28.5%, 51.6%, 47.7%).

Overall, the COAPT risk score performed poorly in predicting the composite primary endpoint (AUC 0.64; HL $p=0.84$) and heart failure hospitalization alone (AUC 0.57; HL $p=0.74$), but performed better in forecasting all-cause mortality across the study population (AUC 0.69; HL $p=0.52$). When evaluated across all these outcomes, the COAPT risk score exhibited good calibration overall.

Conclusions: The COAPT risk score performed poorly in predicting the primary composite endpoint in our real-world registry, particularly in identifying HF hospitalizations, while it demonstrated a better trend in forecasting mortality.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 162
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)**

**CARDIOGENIC SHOCK IN SUBACUTE STEMI WITH CONCOMITANT SEVERE AORTIC STENOSIS:
A CASE REPORT OF AN URGENT TAVR EVEN BEFORE THE REVASCULARIZATION**

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Background: We discuss a rare case of a female adult patient with a cardiogenic shock and a residual low-flow-low-gradient aortic stenosis needing for urgent TAVR and revascularization of the last vessel in a complex coronary artery disease. After the intervention a rapid haemodynamic stability and amelioration was immediately observed and consecutively an up-titration of the heart failure therapy for the reduced ejection fraction was possible. Before the Hospital discharge an ICD, therapy was decided for the high-risk of sudden cardiac death.

Case presentation: A 75-year-old patient had a history of systemic arterial hypertension, diabetes mellitus type II, dyslipidaemia and signs of myocardial infarction at previous cardiological visit without any experienced symptoms. Two years later the patient underwent a TAVR urgently due to a cardiogenic shock and high stenosis of the aortic valve followed by a PTCA of the right coronary because of subacute STEMI. A severe reduced ejection fraction was diagnosed at our observation with a severe remodelling of myocardium. During the recovery because of the high risk of sudden heart death she underwent a primary prevention treatment with ICD implantation.

Discussion: This interesting case shows the relevance of a procedure of TAVR performed not in elective condition but in ICCU setting as much as regards the haemodynamic stabilization in a patient strictly depending on NIV ventilation and high IV diuretic therapy. The patient was diagnosed a severe aortic stenosis low flow low gradient at the echocardiogram, a valvopathy responsible for labile haemodynamic status even before the ischemic setting. Thus, we decided to candidate the patient to an urgent TAVI in order to improve the stroke volume, to reduce the intracavitary pressure and to improve the congestion. In the days after we performed a PTCA on the remain vessels that could still benefit of a revascularization. Also, the medical therapy was rapidly up-titrated with ARNI and SGLT2i with a great tolerance of the patient thanks to the new great hemodynamical status.

Conclusion: A TAVR due to a high stenosis of the aortic valve is commonly performed successfully following many steps of the European protocol in order to proceed safely. An early TAVR without a preliminary study of the arterial status with Angio-TC and its vessels is very rare but can really improve the hemodynamic status of the patient and her prognosis. An ICD implantation within forty days after a MI could be a long-term benefit for the high risk of sudden heart death, especially after a MI with a non-viable myocardium.

CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 771 INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI) FIBRILLAZIONE ATRIALE (FA) (ARITMIE)

REGISTRO LAIT: LAMBRE ITALIAN REGISTRY

Stefano Albani (a), Francesco Pisano (a), Elisa Pelloni (a), Alessandro Bernardi (a), Lorenzo Zaccaro (a),
Paolo Scacciarella (a)

(a) SC CARDIOLOGIA OSPEDALE U. PARINI DI AOSTA

Background: La fibrillazione atriale (FA) colpisce tra il 2 e il 4% degli adulti. Pietra miliare della terapia della FA è l'utilizzo di un'appropriata terapia anticoagulante orale (TAO), quando indicata, per ridurre il rischio di ictus ischemico cardio-embolico³. Tuttavia, una percentuale non trascurabile di pazienti affetti da FA e con indicazione a TAO, ha controindicazione al trattamento con TAO a causa dell'elevato rischio emorragico conferendo loro un rischio maggiore di eventi sia ischemici che emorragici. I dispositivi di chiusura dell'auricola sinistra sono un trattamento alternativo alla TAO e il loro meccanismo d'azione è quello di "sigillare" il principale sito cardiaco correlato alla formazione trombotica: l'auricola sinistra. Il LAMBRE (Lifetech Scientific, Shenzhen, Cina) è un dispositivo di chiusura dell'auricola sinistra autoespandibile relativamente nuovo composto da due sezioni diverse ("l'ombrello" con 8 piccoli ganci distali e il "tappo" di chiusura), articolato per massimizzare la compatibilità anatomica con diverse morfologie di auricola sinistra. Vi è una parte di ancoraggio posizionata in profondità nella struttura auricolare, mentre la porzione dedicata alla copertura atriale provvede alla sigillatura dell'ostio dell'auricola. Il dispositivo LAMBRE ha più dimensioni ed è adatto per auricole di differenti morfologie. L'obiettivo del presente studio è quello di raccogliere tutti i dati disponibili sull'impianto LAMBRE in Italia monitorando outcome procedurali e a medio termine.

Metodi: Creazione di un registro prospettico e retrospettivo per valutare outcome dei pazienti

trattati. End point primario, composito di efficacia: ictus ischemico, embolizzazione sistemica e morte cardiovascolare/non specificata. 16 centri italiani partecipanti, analisi ad interim condotta su pazienti inviati da 6 centri.

Risultati: Sono stati arruolati 131 pazienti il follow up mediano è stato 246 (97-819) giorni, l'età media è stata di 76.9 ± 7.3 anni, sesso maschile 86 (65.6%), Charlson index medio 5.7 ± 2.4 , la maggior parte dei pazienti presentava FA permanente 73 (55.7%), CHA₂DS₂VASc score medio 4.3 ± 1.4 , HAS-BLED score 3.7 ± 1.1 , l'indicazione principale all'impianto del device è stata in 70 (53.3%) pazienti per sanguinamento maggiore. Il successo procedurale è stato raggiunto in 130 (99.2%) pazienti, il sealing completo in 129 (98.5%) pazienti. Gli eventi avversi al follow up sono stati: stroke 3 (2.6%), sanguinamenti maggiori 11 (9.5%), tamponamento cardiaco 2 (1.7%), decesso non device relato 17 (14.7%), decesso device relato 1 (0.8%). Embolizzazione sistemica 0 (0%) pazienti. Il 90% dei pazienti è stato dimesso in aspirina e il 75% in associazione con clopidogrel. La duplice terapia antiaggregante è stata inferiore a 3 mesi nel 43% dei pazienti.

Conclusioni: Il LAMBRE è un dispositivo sicuro ed efficace. La maggior parte dei pazienti nel registro sono affetti da comorbidità severa (Charlson >5) con elevato rischio cardioembolico (CHADSVASC 4). Vi è stata una elevata mortalità non device relata.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 73
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE E MALATTIE
DEL CIRCOLO POLMONARE)**

A CASE OF PRECISE COMMISSURAL ALIGNMENT WITH NEW NAVITOR TAVI SYSTEM

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Francesco Bedogni (a)
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Background: 87-year-old woman with a history of smoking, hypertension, and chronic obstructive pulmonary disease, presented with severe aortic stenosis and an episode of syncope. Coronary angiography revealed no critical stenoses but identified an anomalous origin of the LCx from the right sinus with anomalous vessel running along the anterior interventricular sulcus. The patient experienced exertional dyspnoea (NYHA II-III) and was recently hospitalized for acute pulmonary oedema, necessitating an elective transcatheter aortic valve implantation (TAVI) after recovery.

Clinical Findings: Transthoracic echocardiography confirmed severe aortic stenosis (Gmax/mean 75/44 mmHg), moderate aortic regurgitation, preserved left ventricular ejection fraction, moderate concentric hypertrophy, severe mitral regurgitation, and severe atrial dilation. Home therapy included Cardioaspirin, Atorvastatin, Ezetimibe, Bisoprolol, Ferrograd, Ramipril, Levothyroxine, and COPD inhalation therapy. STS Prom Operative Mortality Risk Score was 6.56%.

Pre-procedural Assessment: Computed tomography (CT) measured the minimum and maximum annulus dimensions (24.2 mm and 27.1 mm, respectively), with a perimeter of 81.4 mm and an area of 521.5 mm². The right coronary ostium height was 22.0 mm. A Neo Commissural alignment view was created by

shifting from standard commissural view of 60 degrees to perfectly align with right coronary ostium (i.e. only patent vessel).

Bioprosthesis: Navitor™ Vision valve. New Navitor bioprosthesis has visual depth assessment, and larger valve size (up to 35 mm). It is built with a large cell design which minimizes coronary obstruction and improves coronary access; the active-sealing cuff synchronizes to the cardiac cycle to reduce any PVLs. Finally, the three new radiopaque, highly visible markers provide clear visualization of 3 mm implant depth. The valve can easily fit a 14 – 15 Fr delivery system throughout all of its diameters.

TAVI Procedure: The procedure was conducted under local anaesthesia. Vascular access was obtained through the right femoral artery using a 14 French (Fr) sheath, guided by ultrasound. Additional access was gained via the left femoral artery with a 7 Fr sheath, also under ultrasound guidance. Venous access for pacing was established through the right femoral vein with a 4 Fr sheath. Balloon valvuloplasty was performed using a 25x40 mm Valver balloon catheter under rapid pacing conditions to prepare the aortic annulus for prosthesis deployment. Following valvuloplasty, a 29 mm Navitor VISION bioprosthesis was successfully implanted under rapid pacing. Post-implantation assessment showed excellent results,

with complete resolution of the transvalvular gradient and no paravalvular leak (PVL).

Hemostasis: Hemostasis of the right femoral artery was achieved with the deployment of two ProGlide devices. For the left femoral artery, an Angio-Seal 8 Fr device was used. Additionally, manual compression was applied to the venous access site upon removal of the venous introducer.

Conclusion: This case demonstrates the successful use of the Navitor™ Vision valve in an elderly patient with severe aortic stenosis and multiple comorbidities, resulting in excellent procedural outcomes and no complications. The procedure highlights the importance of precise pre-procedural planning and the advantages of the new bioprosthesis design in improving coronary access and reducing PVLs.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 18
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)**

**COMPLEX PERCUTANEOUS CORONARY INTERVENTION IN PATIENT WITH MULTIVALVULAR DISEASE:
ADDRESSING THE CHALLENGES**

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Background: The coexistence of mitral stenosis, aortic stenosis and secondary tricuspid regurgitation is not exceptional. It is necessary to balance the risk of a subsequent surgical procedure if one valvular involvement—which is considered to be of lesser importance—is ignored, against the increased mortality associated with multivalvular surgery. The complex scenario of concomitant complex coronary artery and multivalvular disease requires careful multidisciplinary and multifaced approach.

Case summary: Here, we present a case report of 73 years old female patient, with history of chronic heart failure, atrial fibrillation, and prior surgical aortic valve replacement, admitted to our hospital due to worsening of dyspnea (NYHA III). Moreover, there was an increase of the cardiac troponin I level. Transthoracic echocardiography showed mildly reduced ejection fraction with diffuse wall motion abnormalities, calcification of the mitral leaflets with partial fusion of antero-lateral commissure (mean gradient 9 mmHg, mitral valve area 1.1 cm², Wilkins score 8) and severe functional tricuspid and pulmonary valve regurgitation. A coronary angiography was performed showing three vessel coronary artery disease. Given the multiple comorbidities that classified the patient as high surgical and high bleeding risk patient, the case

was discussed in Heart Team. At first, she underwent a successful complete percutaneous coronary intervention (PCI) of the left anterior descending artery at the bifurcation with first diagonal branch, the ostial circumflex and distal right coronary artery, with stent implantation. Subsequently, a percutaneous mitral balloon valvuloplasty (PMBV) was performed. Under 3D trans-esophageal echocardiography guidance, a posterior-superior transeptal puncture was performed, and bidirectional steerable guiding catheter was positioned in the left atrium. Using balloon Numed 28 x 40 mm, a successful PMBV was performed with mild residual mitral regurgitation and significant drop of pulmonary pressures and trans-mitral gradients. The patient experienced significant improvement of the dyspnea and after 5 days she was discharged from the hospital. At 30 days follow-up she referred stable clinical conditions (dyspnea NYHA II), and echocardiography confirmed the good results of the PMBV. However, there was a persistent severe functional tricuspid valve regurgitation (FTR). Thus, a careful follow-up strategy was defined for monitoring the tricuspid regurgitation and program eventual future percutaneous tricuspid intervention.

Discussion: High risk patients with atrial fibrillation, complex coronary artery disease and mitral stenosis,

should undergo multidisciplinary and multifaced evaluation to determine the ideal timing, sequence of treatment (PCI vs. PMBV) and the correct post-procedural medical therapy. Real-time 3D transesophageal echocardiography during PMBV provides valuable insights into the morphological structure of the mitral valve and lesion location, aiding in correct transeptal puncture, balloon size decision

and lowering the periprocedural complication risk. Bidirectional steerable guiding sheath allows correct and easy antegrade crossing of the mitral valve in patients undergoing PMBV. However, patients with concomitant mitral stenosis and functional tricuspid regurgitation undergoing PMBV, should perform early follow-up to individuate eventual FTR recovery or necessity for percutaneous tricuspid repair/replacement.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 266 CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)

VALUTAZIONE FULL PHISYOLOGY IN PAZIENTE CON ANGINA VASOSPASTICA E INIZIALE DISFUNZIONE DEL MICROCIRCOLO

Luca Ciaramella (a), Luigi Di Serafino (a)
(a) AOU FEDERICO II

L'ischemia miocardica è associata alla presenza di stenosi a carico delle arterie coronarie epicardiche che limitano il flusso ematico e provocano uno squilibrio tra apporto e richieste di ossigeno al miocardio sotteso. Recentemente, l'attenzione si sta spostando su ulteriori meccanismi: la disfunzione microvascolare e il vasospasmo coronarico (epicardico e/o microvascolare). La valutazione invasiva di questi due meccanismi è generalmente eseguita in pazienti sintomatici per angor tipico e /o dispnea, con evidenza strumentale di ischemia miocardica e assenza di stenosi epicardiche angiograficamente significative. Tutti e tre questi meccanismi possono sovrapporsi e concorrere all'instaurarsi dell'ischemia miocardica. Pertanto, risulta necessario eseguire una diagnosi completa per poter offrire al paziente la migliore strategia terapeutica. Presentiamo il caso clinico di un paziente di 57 anni, affetto da ipertensione arteriosa, dislipidemia, tabagista (15 sigarette/die), con familiarità per CAD. Il paziente riferiva angor da sforzo associato a dispnea, che regrediva a riposo. Su consiglio del proprio medico curante eseguiva una Coro-TC che evidenziava la presenza di malattia aterosclerotica coronarica non significativa. Dato il persistere della sintomatologia il paziente effettuava una scintigrafia miocardica a riposo e sotto sforzo (SPECT) dall'esito anch'esso inconclusivo (evidenza di ischemia inducibile in corrispondenza della parete inferiore del ventricolo sinistro che ne coinvolgeva il 7%). Dopo aver inquadrato il paziente presso gli ambulatori della nostra A.O.U., gli si somministrava il questionario SAQ-7 per obiettivare la sintomatologia. Al ricovero, si

procedeva a eseguire esame coronarografico. L'Arteria Coronaria Destra era diffusamente ateromasica, esente da stenosi angiograficamente significative, con stenosi intermedia al tratto medio. I Rami Interventricolare Posteriore e Posterolaterale erano esenti da stenosi angiograficamente significative. Il Ramo Interventricolare Anteriore dell'Arteria Coronaria Sinistra era ateromasico, esente da stenosi angiograficamente significative e presentava un *bridge* intramiocardico al tratto medio. Anche i Rami Diagonali erano ateromasici ed esenti da stenosi critiche. Il Ramo Circonflesso e i Rami Marginali Ottusi erano a loro volta ateromasici e privi di stenosi angiograficamente significative. Si procedeva a valutazione funzionale mediante FFR della stenosi di grado intermedio al tratto medio dell'Arteria Coronaria Destra, che risultava non emodinamicamente significativa (FFR: 0.89). Successivamente, si eseguiva valutazione della funzione del microcircolo sotteso al Ramo Interventricolare anteriore dell'Arteria Coronaria Sinistra e si evidenziavano valori di CFR IMR compatibili con un'iniziale disfunzione microvascolare (CFR: 2.8, IMR: 27). Infine, si valutava la funzione endoteliale mediante somministrazione intracoronarica di acetilcolina. Alla dose di 100 µg (la più alta prevista dai protocolli) si verificava la comparsa di angor tipico in presenza di spasmo subocclusivo in corrispondenza del *bridge*. Sia lo spasmo che la sintomatologia anginosa regredivano in seguito alla somministrazione intracoronarica di nitroderivati. Nel caso in esame, data la presenza di vasospasmo coronarico e di iniziale disfunzione microvascolare, la terapia standard che in dimissione si somministra ai pazienti sottoposti ad

angioplastica coronarica era coadiuvata dall'aggiunta di Diltiazem 60 x 37diee Ranolazina 375 mg x 2/die. A un mese dalla dimissione, il paziente era asintomatico

per angor tipico e la frequenza cardiaca era di 70 bpm. Inoltre, il SAQ-7 che risultava migliorato rispetto al precedente (il punteggio era passato da 80 a 55).



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 56 FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

UNA PROCEDURA, DUE DIAGNOSI

Imma Forzano (a), Domenico Florimonte (a), Luca Ciaramella (a), Salvatore Monaco (a), Luigi Di Serafino (a),
Giovanni Esposito (a), Giuseppe Gargiulo (a)
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Introduzione: L'angina pectoris è uno dei sintomi più frequenti nei pazienti affetti da malattia coronarica ostruttiva (CAD). Nonostante ciò, le evidenze mostrano che il 70% dei pazienti con angina e segni di ischemia non presenta malattia ostruttiva delle arterie coronariche epicardiche alla coronarografia. Pazienti affetti da Angina ed Ischemia con Arterie Coronariche Non Ostruite (ANOCA/INOCA) hanno una presentazione clinica sovrapponibile a quelli affetti da CAD. ANOCA/INOCA comprendono una serie di condizioni quali: disfunzione coronarica microvascolare (CMD), spasmo microvascolare, disfunzione endoteliale, spasmo epicardico, bridge miocardico. Lo Scompenso Cardiaco a Frazione di Eiezione Preservata (HFpEF) è una sindrome caratterizzata da segni e sintomi di scompenso cardiaco con frazione di eiezione (FE) conservata ed evidenza di alterazioni cardiache e/o strutturali correlate con disfunzione diastolica del ventricolo sinistro o aumentate pressioni di riempimento, con aumento dei peptidi natriuretici atriali. ANOCA/INOCA ed HFpEF sono condizioni cliniche sotto diagnosticate, nonostante l'elevata prevalenza, morbilità e mortalità. Spesso, inoltre, pazienti affetti da ANOCA/INOCA si presentano con HFpEF e viceversa, suggerendo un'interconnessione tra le due patologie. La diagnosi di certezza di ANOCA/INOCA ed HFpEF è ottenuta mediante test invasivi quali la valutazione funzionale del microcircolo, il test all'acetilcolina ed il cateterismo cardiaco.

Caso Clinico: Uomo, 63 anni, iperteso, dislipidemico, obeso, affetto da fibrillazione atriale parossistica, BPCO

ed OSAS. Il paziente lamenta da anni angina e dispnea per cui era già stato sottoposto a coronarografia con evidenza di coronarie epicardiche ateromasiche ma esenti da stenosi angiograficamente significative. FE: 60%, NT-pro-BNP: 952 pg/mL. Per evidenza di ischemia inducibile alla SPECT miocardica, si pratica nuova coronarografia che conferma assenza di coronaropatia ostruttiva. Nel sospetto di ANOCA/INOCA o HFpEF, viene contestualmente effettuata valutazione funzionale del microcircolo sotteso al Ramo Discendente Anteriore e test all'acetilcolina, che mostra alterata funzione microvascolare (IMR: 99, valori normali <25) e ridotta riserva di flusso coronarico (CFR: 1.8, valori normali >2), e il cateterismo cardiaco destro con fluid challenge. Durante il cateterismo destro in condizioni basali i parametri registrati risultano essere nella norma ma dopo fluid challenge (700 mL di NaCl 0,9% somministrata per via endovenosa in 6 minuti) si registra una PCWP aumentata (26 mmHg, valori normali <25mmHg) come da HFpEF. Pertanto viene posta diagnosi di arterie coronariche epicardiche ateromasiche ma esenti da stenosi angiograficamente significative, angina microvascolare ed HFpEF. In dimissione viene impostata terapia mirata con l'aggiunta di: nebivololo, ranolazina ed empagliflozin. Alla visita post dimissione a 4 settimane il paziente riferisce miglioramento della sintomatologia anginosa e della dispnea.

Conclusioni: ANOCA/INOCA e HFpEF sono condizioni cliniche caratterizzate da un'elevata prevalenza, morbilità e mortalità. Causano un peggioramento della

qualità di vita dei pazienti e un elevato numero di ricoveri ed esami invasivi. Tuttavia le evidenze scientifiche a sostegno di protocolli diagnostici e terapeutici standardizzati non sono sufficienti. Di fondamentale

importanza è approfondire la fisiopatologia di queste condizioni cliniche per stabilire protocolli per la corretta diagnosi, terapia e un adeguato follow-up di ANOCA/INOCA e HFpEF.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 593
 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
 CORONARICA E STRUTTURALE)
 ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA
 CARDIACA IN ACUTO)**

AN UNPREDICTABLE JUMP - TAVI IN TAVI

Francesca Sturdà (a), Erika Pedio (a), Francesco Rizzo (a), Antonio Tondo (b), Dionigi Fischetti (b), Giuseppe Colonna (a)
 (a) UO CARDIOLOGIA ED UTIC - OSP. "VITO FAZZI" - LECCE; (b) UO CARDIOLOGIA INTERVENTISTICA - OSP.
 "VITO FAZZI" - LECCE

R.A. donna di 86 anni. In anamnesi ipertensione arteriosa, diabete mellito e fibrillazione atriale in NAO. In follow-up cardiologico per stenosi valvolare aortica. A febbraio 2024 si pone l'indicazione a sostituzione valvolare in quanto la paziente risulta essere sintomatica per sforzi lievi. Ecocardiogramma all'ingresso: Ventricolo sinistro di normali dimensioni, ipertrofico. FE: 60%. Insufficienza mitralica moderata. Valvola aortica calcifica con stenosi severa (Gradiente medio: 40 mmHg). Insufficienza di grado lieve. Aorta ascendente ectasica (41 mm). La paziente viene sottoposta a coronarografia (Vasi coronarici epicardici esenti da lesioni critiche) ed ad impianto di valvola aortica con approccio percutaneo transfemorale destro 14 F (Navitor 27 mm). L'impianto della valvola risulta leggermente alto. Le opzioni di scelta erano: TAVI-IN TAVI, WAIT AND SEE o RIPOSIZIONAMENTO. Si decide per l'approccio "Wait and See". Dopo 24 ore

la paziente è dispnoica, con diuresi contratta (< 500 cc). ECG: Ritardo di conduzione intraventricolare (non presente al tracciato di ingresso). Esami di laboratorio: Troponina: 52254.4 ng/L, creatinina: 2.37 mg/dL. Ecocardiogramma: FE conservata, ipocinesia del SIV medio-basale, protesi valvolare aortica con Grad max/medio: 42/22 mmHg e leak periprotetico di grado moderato. Si esegue fluoroscopia in urgenza con evidenza di dislocazione di protesi. Per instabilità emodinamica si procede ad intubazione orotracheale e si esegue impianto di protesi aortica (Edwards 26 mm) con approccio percutaneo transfemorale destro 14 F. Successivamente si procede ad estubazione e si osserva graduale ripresa della diuresi. Esami di laboratorio: Troponina 129151.5 ng/L > 2226.1 ng/L, Creatinina: 3.24 mg/dL > 1.32 mg/dL, LDH: 779 U/L > 441 U/L, CPK 1061 U/L > 91 U/L. Inoltre per comparsa di bradicardia marcata e BBSx completo si posiziona

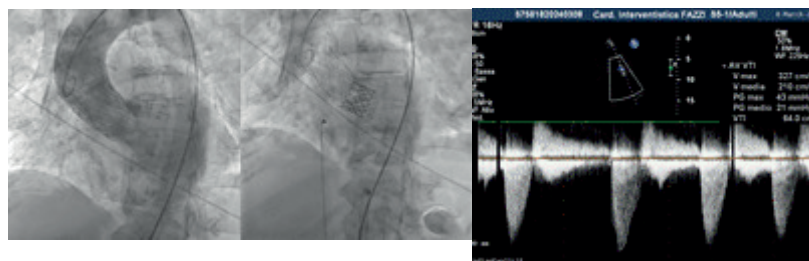


Figure 1

pace-maker definitivo. Ecocardiogramma: "FE 50%. Insufficienza mitralica e tricuspide severa. Bioprotesi in sede aortica, normoposizionata. Assenza di leak para/intraprotesici."

In conclusione, l'ottimale posizionamento della protesi rimane il dilemma tecnico più discusso, un atterraggio più basso è in genere più stabile ma può portare a maggior tasso di impianto di pacemaker e a rigurgito residuo, mentre una posizione più alta potrebbe dare una maggiore instabilità del dispositivo con eventuali pop-up richiedendo il salvataggio TAVI-in-TAVI o, nel peggiore dei casi, un intervento chirurgico d'urgenza. Molti altri fattori possono entrare in gioco nel salvataggio TAVI-in-TAVI, come caratteristiche anatomiche, esperienza dell'operatore, pre e post dilazione. L'impatto del piano di salvataggio TAVI-in-

TAVI ha un aumento del rischio di diversi esiti avversi intraospedalieri, tra cui morte, intervento chirurgico d'urgenza, eventi avversi gravi evento ed impianto di PM. Il processo decisionale ad personam rimane fondamentale per massimizzare i benefici della TAVI ed allo stesso tempo minimizzare i rischi.

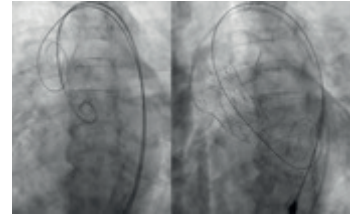


Figure 2



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 249
 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)
 INFARTO STEMI (CARDIOPATIA ISCHEMICA)**

DISCREPANCY BETWEEN HYPEREMIC AND NON-HYPEREMIC INDICES IN THE ASSESSMENT OF NON-CULPRIT LESION IN PATIENTS WITH STEMI: THE ROLE OF MICROVASCULAR DYSFUNCTION

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Background: Multivessel disease occurs in approximately half of the patients presenting with STEMI, and the best management of non-culprit lesions is still unclear. The case reports a patient with inferior STEMI in which the non-culprit lesion has been evaluated using a “full-physiology” approach with a pressure wire.

Case Description: A 52-year-old woman with a history of hypertension and diabetes was admitted to our center, diagnosed with inferior STEMI. Coronary angiography showed thrombotic occlusion (TIMI 0) of the right coronary artery (the culprit lesion) and intermediate stenosis of the proximal left anterior descending (LAD) artery. Primary PCI (p-PCI) of the right coronary artery was performed. After 4 days, a stepwise complete physiological approach to the LAD artery was performed. The physiological study showed a negative discrepancy between FFR - and RFR + with an increased index of microvascular resistance (IMR).

Discussion: Fractional flow reserve (FFR) represents the best-known invasive method for the functional evaluation of intermediate coronary stenosis. Unlike FFR, the resting flow ratio (RFR) is a non-hyperemic index that does not require the administration of a vasodilator such as adenosine, as is required for iwFR.

There are many factors that can lead to a negative discrepancy between hyperemic and non-hyperemic indices. In the presented case, the functional values found were: FFR: 0.90, RFR: 0.86, IMR: 76, CFR: 1.0. The FFR-/RFR+ disagreement may reflect the attenuating influence of microvascular disease on adenosine-mediated vasodilation. Therefore, we decided to treat the LAD lesion based on the RFR value with DES 3.0×33 mm implantation.

Conclusion: Myocardial infarction can result in altered microvascular and endothelial dysfunction, even in the non-culprit territory. The FFR-/RFR+ disagreement may reflect the attenuating influence of microvascular disease on adenosine-mediated vasodilation.



Figure 2

**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 475
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)**

**MULTIMODALITY IMAGING AND PROCEDURAL PLANNING: ESSENTIAL TOOLS IN THE SUCCESSFUL
MANAGEMENT OF MITRAL VALVE-IN-VALVE INTERVENTIONS- A CASE REPORT**

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With the increasing use of bioprosthetic valves, structural valve deterioration has become a significant issue affecting long-term outcomes. Valve-in-valve (ViV) procedures offer a minimally invasive solution for failing bioprosthetic valves, with success highly dependent on accurate periprocedural imaging and multidisciplinary patient selection. We report the case of a 71-year-old woman with a complex medical history, including multiple mitral valve surgeries, who presented with worsening dyspnea and was found to have severe degeneration of her mitral bioprosthetic valves. Given

her high surgical risk, a transcatheter mitral valve-in-valve (MViV) procedure was recommended. Initial attempts using a femoral approach were unsuccessful due to interatrial septal puncture complications. A successful transapical MViV procedure was then performed. Post-operative imaging confirmed optimal valve placement with no significant complications and the patient was discharged on post-operative day five. This case highlights the importance of a team-based approach to multimodality imaging and procedural planning in the management of valve-in-valve interventions.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 493
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE E
MALATTIE DEL CIRCOLO POLMONARE)
ECO-CONTRASTO (IMAGING CARDIOVASCOLARE)**

PLATYPNEA ORTHODEOXIA SYNDROME AFTER NISSEN FUNDOPLICATION

Valentina Bernardini (a, b), Giulia Antonelli (a, b)
(a) HUMANITAS GAVAZZENI; (b) HUMANITAS UNIVERSITY

Background: Platypnea-orthodeoxia syndrome (POS) is a rare condition characterized by positional dyspnea and hypoxemia. Symptoms appear when the patient is in upright position and improve with recumbency. For POS to occur, two conditions must coexist: an anatomical component, such as an interatrial communication (such as patent foramen ovale, PFO), and a functional component that causes a deformity in the atrial septum.

Case Report: A 76-year-old man was admitted to our hospital for laparoscopic Nissen fundoplication to treat a hiatal hernia.

During surgery, the patient developed intraoperative hypoxemia. A diagnosis of pneumothorax was made, which was promptly treated with a chest drainage tube. Despite the treatment, weaning from invasive mechanical ventilation at the end of the procedure was challenging due to persistent hypoxemia.

Postoperative chest x-ray and computed tomography

(CT) scans confirmed the resolution of the pneumothorax and ruled out hemidiaphragm elevation. However, after extubation, the patient exhibited significant dyspnea and hypoxemia in the upright position, which resolved when he was lying down.

A transthoracic echocardiogram with saline contrast (bubble study) was performed, revealing a right-to-left interatrial shunt.

The diagnosis of a PFO was confirmed.

Five days postoperatively, the PFO was successfully closed using an Amplatzer Occluder device. The patient's clinical condition improved markedly, with a resolution of both dyspnea and hypoxemia.

Conclusion: This case highlights the importance of considering POS in patients with unexplained positional hypoxemia and dyspnea, especially after surgical procedures. Prompt diagnosis and treatment of the underlying anatomical defect, such as PFO, can lead to significant clinical improvement.

**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 146
PLACCA VULNERABILE (ATEROTROMBOSI)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E
NUTRACEUTICI)**

LA CACCIA AL TROMBO: SFIDE E OPPORTUNITÀ NEL TRATTAMENTO DELLO STEMI

Saverio Coppola (a), Giada Bono (a), Giusy Sausa (a), Emmanuele Antonio Camarda (a), Alessandro D'agostino (a), Daniele Adorno (a), Federica D'angelo (a), Giuseppe Leggio (a), Giorgio De Michele (a), Danilo Puccio (a), Gianfranco Ciaramitaro (a), Salvatore Evola (a), Giuseppe Coppola (a), Giuseppe Vadalà (a), Giuseppina Novo (a), Egle Corrado (a), Alfredo Ruggero Galassi (a), Vincenzo Sucato (a)

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Introduzione: Una delle principali complicanze correlata all'esecuzione dell'angioplastica percutanea coronarica primaria (pPCI) nei pazienti con infarto miocardico acuto con persistente sopraslivellamento del tratto ST (STEMI) è quella legata al rischio di microembolizzazione distale di frammenti di placca instabile, che contribuisce a determinare una riperfusione miocardica incompleta. Ciò che è appena stato descritto può essere prevenuto tramite l'utilizzo della tromboaspirazione e degli inibitori della glicoproteina IIb/IIIa (GpIIb/IIIa).

Caso Clinico 1: Uomo di 62 anni con STEMI inferiore alla presentazione ECG-grafica mostra un quadro angiografico con occlusione trombotica acuta al tratto medio-distale della coronaria destra. In presenza di flusso TIMI 0 al passaggio del filo guida, prima di eseguire angioplastica e impianto di stent medicato si procedeva alla somministrazione di tirofiban e veniva effettuata efficace trombospirazione manuale, con buon risultato angiografico finale e con riduzione del tratto ST all'ECG post-procedurale.

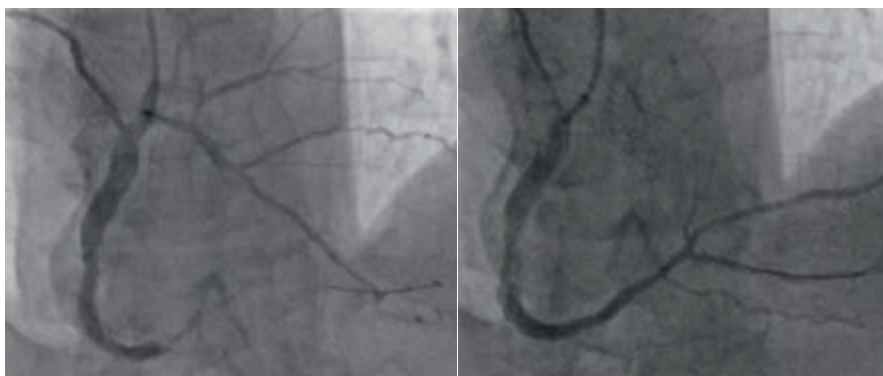


Figure 1



Caso Clinico 2: Uomo di 70 anni, sospende autonomamente la doppia terapia antiaggregante che gli veniva prescritta per un evento coronarico acuto dopo appena due mesi. Si presenta con un quadro ECG-grafico di STEMI infero-posteriore, alla coronarografia evidenza di trombosi intra-stent su arteria interventricolare anteriore con flusso a valle preservato, e occlusione trombotica acuta al tratto prossimale della coronaria destra. Dopo circa mezz'ora dall'inizio dell'infusione di cangrelor si osserva riduzione del burden trombotico e ripristino di flusso TIMI su tutti i distretti epicardici.

Discussione: Gli strumenti a nostra disposizione per ridurre il rischio di microembolizzazione dei frammenti di

placca durante l'esecuzione di una pPCI non mancano. Le sottoanalisi condotte sugli studi TASTE (Thrombus Aspiration in ST- Elevation Myocardial Infarction in Scandinavia) e TOTAL (Trial of Routine Aspiration Thrombectomy With PCI Versus PCI Alone in Patients With STEMI) hanno però smorzato l'entusiasmo nei confronti di tale metodica, suggerendo che l'uso routinario della tromboaspirazione non porta ad alcun sostanziale beneficio, e non ci sono sufficienti evidenze relativamente all'utilizzo degli inibitori GpIIb/IIIa a seguito dell'introduzione nella pratica comune dei potenti inibitori del recettore P2Y12. Bisogna pertanto identificare e selezionare correttamente i pazienti che possono trarre un reale beneficio da queste strategie terapeutiche.



**CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 479
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING
CARDIOVASCOLARE)**

A COMPLEX TAVI JOURNEY

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ANNUNZIATA, CHIETI; (c) CARDIOLOGIA E UTIC CON EMODINAMICA, OSPEDALE SAN SALVATORE, L'AQUILA

This clinical case focuses on a 56-years-old female who presented with dyspnea persisting for several days. Her medical history includes significant comorbidities: surgical aortic valve replacement with a Sorin Freedom 21 mm bioprosthesis, chronic kidney disease, type II diabetes mellitus, necrosis of the left first toe, previous transient ischemic attack, hypothyroidism, and severe obesity. Upon presentation, clinical and radiological evaluations indicated acute heart failure and hypoxemic and hypercapnic respiratory insufficiency. This necessitated urgent intervention to stabilize her cardiopulmonary status, including high-dose intravenous diuretic therapy and non-invasive ventilation. An echocardiogram revealed a mildly dilated and hypertrophic left ventricle with preserved ejection fraction, severe left atrial

dilatation, aortic biological prosthesis in place, gross calcific degeneration of the mobile prosthetic elements resulting in very severe stenosis (MG 60 mmHg, Vmax 5.3 m/sec, PG 120 mmHg), and moderate regurgitation due to coaptation defect.

The patient was admitted to the intensive cardiac care unit for further management. A cardiothoracic surgery consultation recommended coronary angiography and a cardiac CT scan. The angiography revealed no significant coronary stenosis, while cardiac CT showed Structural Valve Deterioration (SVD) of the bioprosthetic cusps and a high risk of coronary artery obstruction (CAO) because the Valve-to-coronary (VTC) distance of the left coronary artery was 2.8 mm and the right coronary artery was also 2.8 mm. Additionally, the Valve-to-sinotubular junction distance relative to the left coronary artery was 2.5 mm and the right coronary artery was 4.5 mm, indicating that the anatomy was at high risk of sequestration [Valve-in-Valve International Data (VIVID) class IIIc on the left side and IIIb on the right side]. However, the Heart Team decided to proceed with transcatheter aortic

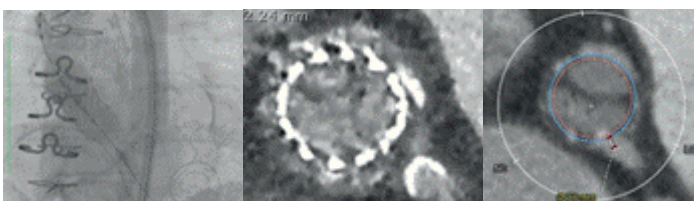
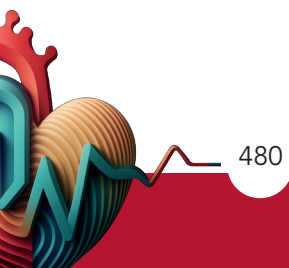


Figure 1



valve implantation. Pre-procedural planning included protecting the left coronary artery with a guide wire and stent for bail-out chimney technique. The TAVI procedure was successfully performed using a balloon-expandable valve. Post-procedural angiography suggested a subocclusion of the left main coronary artery by the bioprosthetic cusp. Intravascular ultrasound confirmed this subocclusion, leading to the use of the chimney technique with drug-eluting stent implantation to ensure coronary patency. Post-procedure, echocardiography in the ICCU suggested severe bioprosthesis dysfunction: high transvalvular gradients and altered parameters of valvular function

assessment (V_{max} 4.5 m/s, PG_{max} 76 mmHg, MG 48 mmHg, AT/ET 0.37, DVI 0.26, AVAi 0.52 cm^2 , SVi 45 ml/m^2), suspecting thrombosis. Subsequent cardiac CT showed findings consistent with hypo-attenuated leaflet thickening (HALT), commonly associated with valve thrombosis. A hematology consultation was requested, revealing a positive test for antiphospholipid antibody syndrome, and anticoagulant therapy with warfarin was started. The patient management involves 6-month follow-up with echocardiographic evaluations. This case demonstrated the critical role of a multidisciplinary team in addressing complex cardiovascular conditions, particularly in patients with significant comorbidities.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 387
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

**COMBINED PERCUTANEOUS INTERVENTIONS IN HIGH BLEEDING RISK ATRIAL FIBRILLATION PATIENTS:
 A CASE STUDY AND FUTURE IMPLICATIONS**

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 Anna Vittoria Mattioli (c), Giuseppe Boriani (a)

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 OF MODENA AND REGGIO EMILIA, MODENA, ITALY; (b) EMATOLOGY UNIT, POLICLINICO DI MODENA
 HOSPITAL, ITALY; (c) UNIVERSITY OF BOLOGNA, BOLOGNA, ITALY

Introduction: This case report explores the intersection of Von Willebrand syndrome (VWD) and atrial fibrillation (AF), emphasizing the complex relationship between bleeding disorders and thromboembolic events. VWD is characterized by abnormalities in von Willebrand factor, essential for platelet aggregation. AF increases the risk of thromboembolic events, particularly strokes. Innovations like the MitraClip device offer minimally invasive options for managing severe mitral regurgitation in elderly patients with significant comorbidities.

Case Presentation: A 72-year-old woman with VWD and AF, who also had hypertension, type 2 diabetes,

cirrhosis from HCV infection, and gastrointestinal angiodysplasias, presented with anemia secondary to melena and her first episode of atrial fibrillation. Given her high bleeding risk, she underwent percutaneous left atrial appendage closure with a Watchman device and a TEER procedure using the MitraClip for severe mitral regurgitation. Pre- and postoperative management included Haemate-P and ASA, following specific hematological guidelines.

Discussion: The aging population in Western countries is driving an increased need for structural interventional cardiology procedures. In this case, the combined use

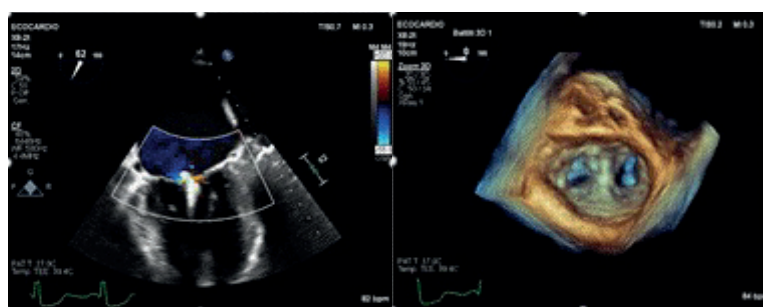
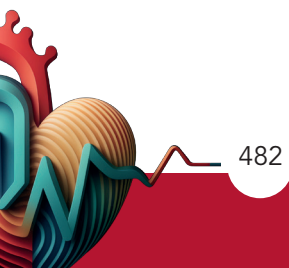


Figure 1



of percutaneous left atrial appendage closure and TEER optimized the management of bleeding and thromboembolic risks. This approach reduced operative and hospitalization times, improved the patient's quality of life, and lowered healthcare costs. The ability to perform multiple procedures in a single operation benefits high-risk patients by minimizing hospitalizations and the associated burden on healthcare systems.

Conclusions: The adoption of combined procedures is expected to grow, providing safe and effective solutions for patients with high bleeding risk and the need for anticoagulant therapy for non-valvular AF. These strategies improve clinical outcomes and patient management, requiring adequate training and multidisciplinary coordination to maximize benefits and minimize risks.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 463
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE
E MALATTIE DEL CIRCOLO POLMONARE)

A CHALLENGING CASE OF ATRIAL SEPTAL DEFECT CLOSURE

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 (a) *CENTRO ALTE SPECIALITÀ E TRAPIANTI (CAST) - POLICLINICO UNIVERSITARIO, CATANIA*

Clinical Background: Defects of the atrial septum (ASD) are the third most common type of congenital heart disease (80% OS, 15% OP, 5% SVC type).

Symptomatic patients with ASD, irrespective of age, should undergo closure to reduce subsequent morbidity (most commonly right ventricular dysfunction and failure, atrial tachyarrhythmias, or stroke) and mortality.

Percutaneous transcatheter closure is the **gold-standard treatment**, because of a comparable efficacy and less complications than cardio-thoracic surgery.

Case description: 52 y.o woman, smoker. She was diagnosed with ASD after TIA manifested with visual symptoms. Brain MRI showed punctiform foci of altered

signal in the left parietal subcortical region, compatible with ischemic outcomes, and further foci in the bilateral frontal subcortical areas. So, the patient underwent transesophageal echocardiogram (TEE) that confirming presence of **ASD OS type** (13 mm) with left/right shunt at rest and partial inversion after Valsalva. The right cavities were slightly dilated but had normal kinesis. The **aortic rim was poorly represented**. Despite that, the patient was suggested for percutaneous closure, made possible by the availability of specific types of devices that allow percutaneous treatment even in the presence of poorly represented rims.

Technical resolution: The procedure is performed in fluoroscopic and intracardiac ultrasound guidance. This

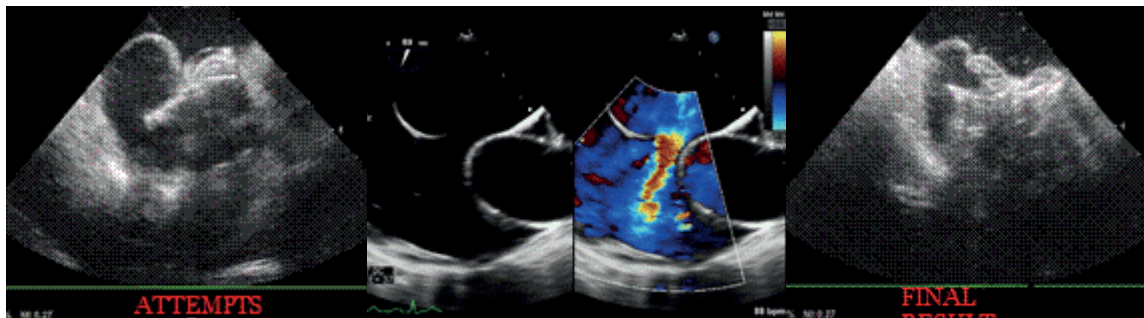
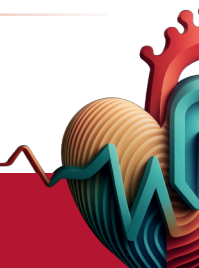


Figure 1



one allows better characterization of ASA anatomy and defect dimensions. Given these elements, we chose a flexible and filling device that is able to remain stable despite the short rim. This differs from the traditional rigid double-disc prostheses, which require a minimum rim of 6 mm and may pose a risk of aortic erosion.

The positioning is technically challenging because the **delivery orientation**, from the IVC, **is parallel to the defect**. So, we made several implantation attempts and also changed with a larger prosthesis, until we were satisfied of the result and certain of its stability.

Conclusions: Closing ASD can be technically challenging, especially in complex anatomy (lack of rims, floppy septum, large defect). The combined use of preprocedural TEE and **intraprocedural ICE** helps to clarify anatomy, assess the feasibility of intervention, and plan for it.

The availability of more **flexible 'filling' device**, allows for safe percutaneous correction of defect, even in the presence of poorly rims, thanks to the stability of the prosthesis on the rims, avoiding cardio-thoracic surgery.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 71 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)

STENT LOSS IN UNA BIFORCAZIONE CALCIFICA COMPLESSA: GESTIONE RAPIDA DI UNA COMPLICANZA INFREQUENTE

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Stefano Lucreziotti (b, c)

(a) UNIVERSITÀ DEGLI STUDI DI MILANO; (b) OSPEDALE SAN CARLO BORROMEO, MILANO; (c) ASST SANTI
PAOLO-CARLO, MILANO

Il case report riportato riguarda un paziente maschio di 76 anni, fumatore attivo (30 sigarette al giorno), iperteso, dislipidemico. Da circa 3 giorni il paziente riferisce dolore epigastrico di rilevante entità per cui si era anche recato in farmacia e dove gli era stato consigliato un PPI. Per il persistere della sintomatologia si reca in PS 72 ore dopo l'insorgenza dei sintomi. All'ECG segni di infarto anteriore subacuto, all'ecocardiogramma transtoracico

evidenza di disfunzione ventricolare sinistra (FE 35%) con acinesia dell'apice ed ipocinesia dei segmenti medi. In considerazione dell'attuale sintomaticità del paziente (GRACE SCORE 141) si optava per studio coronarografico che mostrava una patologia trivasale con una lunga patologia subocclusiva a carico di IVA media-prossimale, una patologia critica calcifica severa a carico della biforcazione Cx-Mo1 ed una patologia

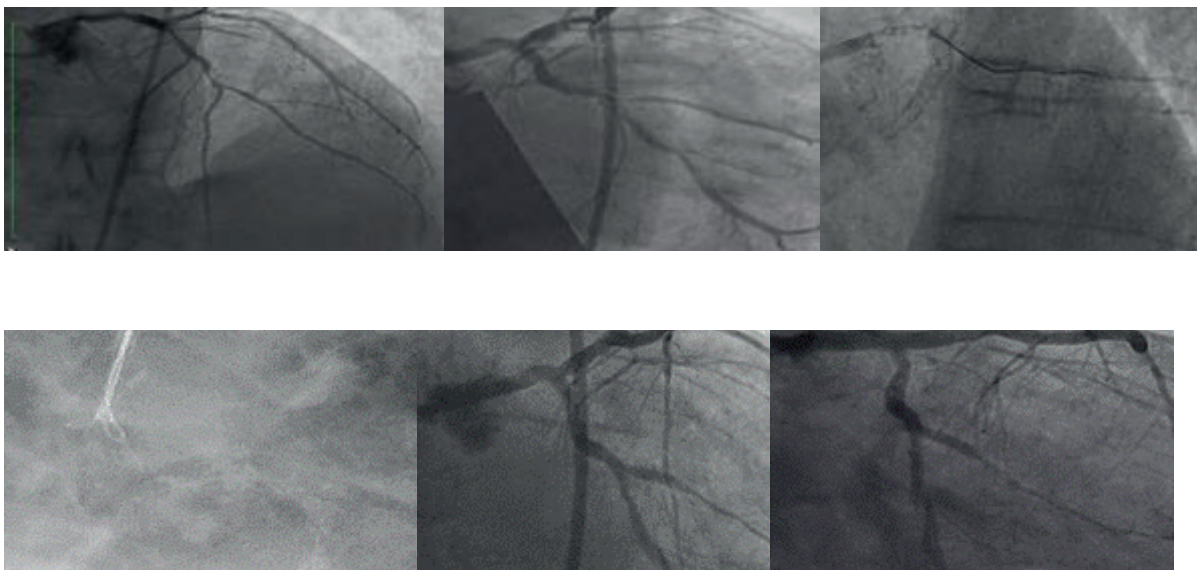
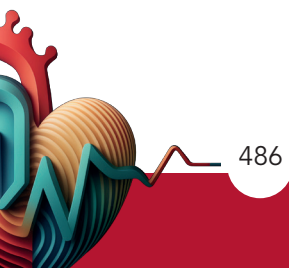


Figure 1



moderata a carico di Cdx. Si optava quindi per angioplastica primaria di IVA media-prox con impianto di 3 DES in overlapp con buon risultato finale. Dopo 72 ore di osservazione si procedeva a completamento di rivascolarizzazione di biforcazione Cx-Mo1 mediante "culotte technique". Dopo efficace stenting del side branch e POT si stava procedendo a stenting del main branch con difficoltà nell'avanzamento dello stent verosimilmente a causa dell'alto burden calcifico (confermato al controllo IVUS preliminare). Si tentava

di avanzare pertanto con push and pull technique, tuttavia, al controllo angiografico evidenza di stent loss. Si procedeva quindi a recupero efficace dello stent mediante device EN SNARE. Al successivo controllo angiografico evidenza di dissezione del tronco comune, trattato prontamente con impianto di 1 DES. Al successivo controllo IVUS si confermava buona espansione degli stent impiantati. La degenza proseguiva regolare e il paziente veniva dimesso dopo ulteriori 5 giorni di osservazione.



CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE 545 INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INFARTO STEMI (CARDIOPATIA ISCHEMICA) FISIOLOGIA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

DISSEZIONE ARTERIOSA CORONARICA SPONTANEA: QUALE TERAPIA OTTIMALE?

Marco Schizzarotto (a), Michele Occhipinti (b), Andrea Baldo (b), Francesca Croce (b), Federica Costanza Grimoldi (c), Roberta Piccinelli (a), Lucia Manfredini (a), Mario Galli (b), Roberto De Ponti (a)

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La dissezione coronarica spontanea (SCAD) è una patologia caratterizzata da separazione delle tonache vascolari delle coronarie, dovuta a lesione della tonaca intima che crea un falso lume, o ad un'emorragia dei vasa vasorum con formazione di un ematoma nel contesto della tonaca media del vaso che comprime il lume vascolare; il risultato, in entrambi i casi, è una ostruzione del flusso sanguigno con conseguente sindrome coronarica acuta. La SCAD si presenta tipicamente in donne giovani (22-35% dei casi di SCA nelle donne al di sotto dei 60 anni), senza o con pochi fattori di rischio cardiovascolare; può essere associata ad anomalie vascolari (displasia fibromuscolare o tortuosità coronarica), gravidanza o post-partum, connettivopatie, stress emotivi, ansia, depressione o disturbi neuro-psichiatrici. Il gold standard nella diagnosi di SCAD è l'angiografia coronarica. La SCAD, secondo la classificazione angiografica adottata dal consensus panel della Società europea di Cardiologia, si distingue in 4 tipi: nel tipo 1 (29% circa delle SCAD) il contrasto penetra nel falso lume dando l'apparenza di un doppio lume; il tipo 2 è il pattern più frequente (circa 67%) ed è caratterizzato da stenosi lunghe e lineari; il tipo 3 è una lesione che mima una lesione aterosclerotica focale (circa il 4%); il tipo 4 è caratterizzato dalla occlusione totale del vaso, che mima un'occlusione trombotica completa. Non c'è un consensus univoco sul management, ma generalmente si predilige un approccio più conservativo in caso di SCAD non complicata (efficace fino all'80% dei casi),

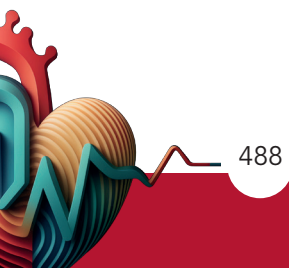
in considerazione del fatto che il vaso tende alla guarigione spontanea e che la rivascolarizzazione, oltre a non avere effetto preventivo sulle recidive, presenta una maggiore percentuale di complicanze e una peggior prognosi a lungo termine. In caso di SCAD ad alto rischio e con instabilità emodinamica può essere indicata l'angioplastica, ma con un approccio di minima, prediligendo ad esempio angioplastiche semplici con solo pallone, avendo come obiettivo principe quello di ripristinare il flusso.

Si riporta il caso di una donna di 48 anni, tabagista attiva ed ipertesa, senza precedenti cardiologici di rilievo. Allertava i Soccorsi per insorgenza di angina pectoris dapprima da sforzo e poi anche a riposo. All'ECG eseguito dai mezzi di soccorso riscontro di sopraslivellamento del tratto ST in V1 e V2, in riduzione all'arrivo in Pronto Soccorso. All'ecocardiografia frazione d'eiezione conservata in presenza di acinesia del setto interventricolare distale e della parete anteriore distale del ventricolo sinistro. Agli esami ematochimici TnI 32 ng/L e CK-MB 2.23 ng/mL. Allo studio coronarografico si riscontrava occlusione completa al tratto medio di IVA compatibile con quadro di SCAD di tipo 4 con ricircolo omocoronarico, trattata con POBA; restanti coronarie esenti da lesioni angiografiche. All'ecocardiogramma pre-dimissione FEVS 50-55% per ipocinesia apicale. Al follow up clinico a 3 mesi la paziente si presentava asintomatica ed in buon compenso emodinamico, senza recidive di angina pectoris né da sforzo né a riposo.



Con questo caso si intende porre attenzione alla gestione terapeutica delle SCAD, che è più spesso di tipo conservativo in considerazione del rischio di peggioramento della dissezione. Tuttavia, nei casi in cui il lume sia sub-occluso o occluso ed in caso di persistenza dei sintomi, la PCI può essere indicata,

procedendo a riaccollare la tonaca intima del vaso mediante POBA, senza ricorrere all'impianto di stent. Questa scelta viene presa per evitare l'impianto di stent su vasi non aterosclerotici, che tendono a guarire una volta riaperto il vero lume e riaccollato il flap intimale.



CardioSic

The background features a large, stylized graphic of a heart and an ECG line. The heart is rendered in a light blue and pink color scheme, with a prominent ECG line in red and black. The overall design is clean and modern, with a focus on medical and cardiovascular themes.

85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

CARDIOPATIA ISCHEMICA

CARDIOPATIA ISCHEMICA 924
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

COMPLETENESS, TIMING, AND GUIDANCE OF PERCUTANEOUS CORONARY INTERVENTION FOR ACUTE MYOCARDIAL INFARCTION IN PATIENTS WITH MULTIVESSEL DISEASE

Daniele Giacoppo (a), Claudio Laudani (a), Giovanni Occhipinti (a), Antonio Greco (a),
Marco Spagnolo (a), Davide Capodanno (a)

(a) *POLICLINICO RODOLICO-SAN MARCO, UNIVERSITA' DI CATANIA, CATANIA*

Introduction: Trials assessing the prognostic influence of completeness, timing, and guidance of complete revascularization (CR) in patients undergoing percutaneous coronary intervention (PCI) for myocardial infarction (MI) and multivessel coronary artery disease (MV-CAD) provided heterogeneous results. We aimed to comprehensively and simultaneously assess the available evidence on completeness, timing, and guidance of PCI for acute MI and MV-CAD.

Methods: Randomized trials of patients with myocardial infarction and MV-CAD comparing at least two PCI strategies among IRA-only revascularization, angiography-guided immediate CR, angiography-guided staged CR, functionally guided immediate CR, and functionally guided staged CR, were searched in PubMed, Scopus, Web of Science and Cochrane and major cardiology conferences archives. Data search and extraction were performed following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Statement and Cochrane collaboration recommendations. Data were analyzed thorough frequentist and Bayesian random-effect network models. Recurrent MI and cardiac death were the primary and co-primary outcomes.

Results: Fourteen trials including 14,433 patients

were pooled. In the frequentist five-node analysis, angiography-guided immediate CR reduced MI compared with IRA-only revascularization (hazard ratio (HR) 0.40, 95% confidence interval (CI) 0.25-0.62], angiography-guided staged CR (HR 0.54, 95% CI 0.35-0.84), and functionally guided staged CR (HR 0.35, 95% CI 0.19-0.65). The Bayesian analysis confirmed only an advantage over IRA-only revascularization (HR 0.45, 95% credible interval (CrI) 0.24-0.87). Functionally guided immediate CR was associated with reduced cardiac death compared with IRA-only revascularization (HR 0.50, 95% CI 0.26-0.98), but significant network inconsistency ($P=0.027$) was detected and results were not confirmed in the Bayesian framework. In frequentist three-node analyses, immediate CR reduced MI (HR 0.46, 95% CI 0.33-0.64) and cardiac death (HR 0.66, 95% CI 0.49-0.91) compared with IRA-only revascularization, and MI compared with staged CR (HR 0.51, 95% CI 0.36-0.73). The Bayesian analysis did not confirm the reduction in cardiac death. In the frequentist analysis, angiography-guided immediate CR (HR 0.33, 95% CI 0.19-0.59), functionally guided immediate CR (HR 0.50, 95% CI 0.27-0.94), angiography-guided staged CR (HR 0.43, 95% CI 0.23-0.81), and functionally guided staged CR (HR 0.44, 95% CI 0.22-0.87), reduced any revascularization compared with IRA-only revascularization.

Conclusions: In patients with acute MI and MV-CAD undergoing PCI, immediate CR reduces recurrent MI compared with IRA-only revascularization and staged CR. Whether CR is associated with reduced

cardiovascular death remains uncertain. CR, especially when immediate, reduces any revascularization compared with IRA-only revascularization



CARDIOPATIA ISCHEMICA 890
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)

**IMPACT OF TICAGRELOR OR PRASUGREL ON WNT/B-CATENIN AND DKK1 PATHWAYS IN STEMI PATIENTS:
THE BETA-MI STUDY**

Francesca Lofrumento (b), Roberto Licordari (a), Silvia Perfetti (b), Maria Cristina Procopio (b), Rosalba De Sarro (b), Francesco Saporito (a), Giampiero Vizzari (a), Pasquale Crea (a), Giuseppe Dattilo (a), Roberta Manganaro (a), Concetta Zito (b), Scipione Carerj (b), Natasha Irrera (b), Gianluca Di Bella (b), Francesco Costa (a), Antonio Micari (a)

(a) BIOMORF DEPARTMENT, POLYCLINIC G. MARTINO, UNIVERSITY OF MESSINA, 98122 MESSINA, ITALY;
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Introduction: Dual antiplatelet therapy (DAPT), consisting of the combination of aspirin and a potent P2Y₁₂ receptor inhibitor (e.g. ticagrelor or prasugrel, Class 1B), is the cornerstone of treatment for patients with ST-segment elevation myocardial infarction (STEMI) requiring percutaneous coronary interventions (PCI). Fibrosis is a key component of the reparative process following myocardial infarction (MI), with the WNT/ β -catenin signaling pathway and its antagonist DKK1 playing a significant yet largely unexplored role. Additionally, the impact of different P2Y₁₂ inhibitors on these molecular pathways remains understudied.

Aim: We conducted a single-center prospective study (BETA-MI, NCT05122741) to assess the effects of ticagrelor or prasugrel on β -catenin and DKK1 pathways in STEMI patients and to evaluate their potential impact on clinical outcomes.

Methods: 40 STEMI patients undergoing PCI were assigned to receive DAPT with either ticagrelor or

prasugrel. β -catenin and DKK1 levels were assessed using ELISA (enzyme-linked immunosorbent assay) and qPCR (quantitative polymerase chain reaction) before and after primary PCI, at 3 days, at discharge, and at a 45-day follow-up (Figure).

Results: Baseline and angiographic characteristics were similar between ticagrelor (62 \pm 8 years, 81% males) and prasugrel (61 \pm 9 years, 89% males) treated patients, with no difference in cardiovascular events both intra-hospital and at 45-days. No difference between β -catenin and DKK1 levels were observed in the two treatment groups at any timepoint (Figure, $p > 0.05$).

Conclusion: In STEMI patients undergoing primary PCI, DAPT with either ticagrelor or prasugrel does not differentially impact β -catenin and DKK1 pathways. These findings suggest that the choice between ticagrelor and prasugrel may not influence the cardiac remodeling pathways mediated by these molecular targets.

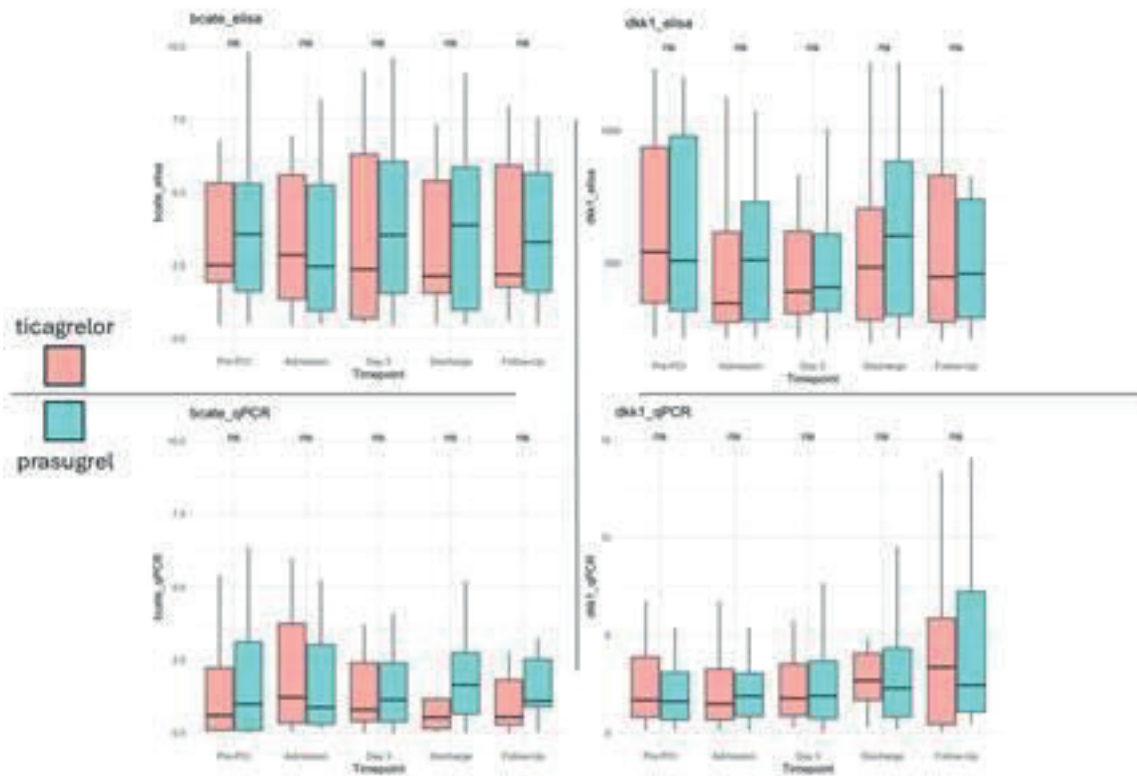


Figure 1



CARDIOPATIA ISCHEMICA 434
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)

PREVALENCE AND PROGNOSTIC RELEVANCE OF NON-OBSTRUCTIVE CORONARY ATHEROSCLEROSIS IN MINOCA: A META-ANALYSIS OF 35 STUDIES

Mariachiara Ciarlantini (a), Daniele Cavallo (a), Nicole Suma (a), Marcello Alvarez Casuso (a), Damiano Fedele (a), Andrea Impellizzeri (a), Francesca Bodega (a), Rebecca Belà (a), Giuseppe Pastore (a), Khrystyna Ryabenko (a), Carmine Pizzi (a)

DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES - DIMEC - ALMA MATER STUDIORUM, UNIVERSITY OF BOLOGNA, 40138, ITALY

Background: Myocardial infarction with non-obstructive coronary arteries (MINOCA) can result from a variety of pathological mechanisms, not always associated with atherosclerosis. It has been suggested to distinguish between patients without obstructive coronary artery disease (NObs-CAD, stenosis diameter 1-49%), and patients with smooth coronary arteries (NCA), but differences in terms of prognosis or therapeutic approaches have not been clearly elucidated.

Objectives: The aim of this study is to evaluate the prevalence and prognostic impact of NObs-CAD as assessed by invasive coronary angiography (ICA) in MINOCA.

Methods: A meta-analysis was performed including studies reporting the prevalence of NObs-CAD versus NCA in MINOCA patients. Data on prognosis stratified by the presence of NObs-CAD were collected. Random-effects models were used to estimate the prevalence of NObs-CAD. Pooled risk ratios (RR) with 95% confidence intervals (CI) for all-cause death, myocardial infarction (MI), and the composite of both outcomes of patients with NObs-CAD compared to NCA were calculated at short-term (<1 month), 1-year and long-term follow-up (more than 1 year).

Results: Thirty-five studies were analysed. The pooled prevalence of NObs-CAD estimated by ICA was 53% [95% CI 47-60%]. Heterogeneity was high ($I^2=98.0\%$),

but none of the clinical and instrumental characteristics tested in meta-regression analyses had a significant impact on the I^2 , except for age (residual $I^2=97.2\%$, $p=0.014$) and geographical context. Specifically, studies conducted outside Europe reported a higher prevalence of NObs-CAD with lower I^2 values. Thirteen studies provided prognostic data. The presence of NObs-CAD was associated with an increased risk of death or MI compared to NCA, as well as the risk of MI at 1-year follow-up (RR = 1.49 [95% CI 1.17-1.90] and RR = 1.80 [95% CI 1.26-2.59], respectively), whereas the risk of death was comparable. Similar results were observed at long-term, but not at short-term follow-up. Out of 13 studies, 4 provided information regarding the medications at discharge stratified by the presence or absence of NObs-CAD. NObs-CAD patients received more often aspirin (89% vs 69%; $p<0.01$), P2Y12-inhibitors (52% vs 29%; $p<0.01$), angiotensin-converting enzyme inhibitors/angiotensin-receptor blockers (53% vs 40%; $p<0.01$), beta-blockers (70% vs 57%; $p<0.01$), and statins (86% vs 60%; $p<0.01$) compared to NCA.

Conclusions: Stratification of patients according to the degree of coronary stenosis has prognostic implications in the setting of MINOCA, since NObs-CAD patients present a higher risk of reinfarction. Further dedicated trials are needed to clarify whether these patients may benefit from a tailored approach in terms of secondary prevention strategies.

CARDIOPATIA ISCHEMICA 379
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

**HEMOGLOBIN-TO-CREATININE RATIO PREDICTS ADVERSE OUTCOMES IN STEMI PATIENTS:
RESULTS FROM THE PRAISE REGISTRY**

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Giuseppe Biondi Zoccai (a), Marco Bernardi (a)

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(b) UNIVERSITY OF TURIN

Introduction: Anemia and renal impairment are key determinants of adverse outcomes in patients with acute coronary syndrome (ACS). The serum hemoglobin to creatinine (Hb/Cr) ratio, a simple and universally accessible index combining these two factors, was found to be predictive of adverse outcomes in ACS patients. However, there is limited evidence on its performance in the specific setting of ST-elevation myocardial infarction (STEMI). The aim of the study was to evaluate the prognostic impact of the Hb/Cr ratio at discharge in STEMI patients.

Methods: Out of 23,270 ACS patients enrolled in the international PRAISE registry between 2003 and 2019, we included only STEMI patients (11,236), excluding those with other forms of ACS or missing data. The primary endpoint was all-cause mortality at one-year follow-up. Secondary endpoints were the composite of all-cause mortality or reinfarction and major bleeding at one-year follow-up. A cut-point analysis using Liu's method was run to determine the most discriminative Hb/Cr ratio values for predicting the outcomes of interest.

Results: The cut-point analysis identified a cut-off value of 13.68 as the most discriminative for predicting all-cause mortality, and 14.42 for both secondary endpoints. Based on the discriminative value for all-cause mortality, we divided our population into low Hb/Cr (2,982 patients, 26.5%) and high Hb/Cr (8,254 patients, 73.5%) groups. Patients in the low

Hb/Cr group were older, had a higher prevalence of cardiovascular risk factors, comorbidities, and pre-existing coronary artery disease, and tended to receive less intensive medical therapy at discharge. One-year post-discharge, all-cause mortality (8.7% vs. 2.4%; $p < 0.001$), major bleeding (5.0% vs. 2.4%; $p < 0.001$), and the composite of all-cause mortality or reinfarction (11.5% vs. 4.9%; $p < 0.001$) were significantly higher in the low Hb/Cr group. Multivariate regression analysis showed that the Hb/Cr ratio was inversely associated with all-cause mortality (OR 0.94; CI 0.92–0.96; $p < 0.0001$), major bleeding (OR 0.93; CI 0.91–0.96; $p < 0.0001$), and the composite of all-cause mortality or reinfarction (OR 0.96; CI 0.94–0.97; $p < 0.0001$), with an extensive adjustment for several covariates, including cardiovascular risk factors, comorbidities, and discharge medical therapy. Propensity score matching analysis, adjusting for the same covariates, confirmed that event rates at one-year follow-up were significantly higher in the low Hb/Cr group. Eventually, the Hb/Cr ratio proved superior in predicting all-cause mortality compared to its individual components, with an AUC of 0.68 versus 0.65 for hemoglobin and 0.65 for creatinine, with statistically significant differences ($p < 0.0001$).

Conclusions: Hb/Cr ratio at discharge appears to be associated with one-year adverse outcomes in STEMI patients. Further research is warranted before routinely considering this index in clinical practice.



CARDIOPATIA ISCHEMICA 842
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
MICROCIRCOLAZIONE E COLLATERALI
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

THE INVISIBLE CULPRIT: DECODING VASOSPASM IN NON-OBSTRUCTIVE CORONARY ARTERY DISEASE WITH A MULTIMODALITY APPROACH

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 Edoardo Conte (b), Daniele Andreini (a, b)
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Diagnosing and managing MINOCA remains a complex clinical challenge. In absence of angiographic lesions, multimodal diagnostic approach should be pursued, including echocardiography, cardiac MRI, and repeated coronary angiography if necessary.

A 48 years-old female patient came to the attention for severe chest pain at rest with elevation of cardiac troponins at first patient contact (45 pg/mL, 1500pg/mL; 3800pg/mL). Risk factors included mild dyslipidemia and the patient had no past medical history. Upon examination, vital signs were within range. ECG showed no relevant abnormalities. Bedside echocardiography revealed left ventricular postero-lateral mid-apical hypokinesia.

Given the clinical picture compatible with non-ST elevation myocardial infarction and recurrent chest pain, the patient underwent invasive coronary angiography which showed normal angiographic appearance of the main epicardial coronary vessels.

Cardiovascular magnetic resonance (CMR), was performed at day 2. High signal intensity was observed in the inferior segment on T2-weighted images accompanied by endomyocardial enhancement on late gadolinium enhanced (LGE) CMR with an ischemic pattern in the mid-basal anterior septal and mid-apical infero-lateral regions, excluding myocarditis, Takotsubo syndrome, and cardiomyopathies.

According to the ischemic pattern presented at RMN and the working diagnosis of MINOCA, repeated coronary angiography was performed on day 5 which showed no signs of coronary artery dissection or embolization, no evidence of microcirculatory dysfunction on invasive functional assessment (CFR 5.5, IMR 10, FFR 0.9)

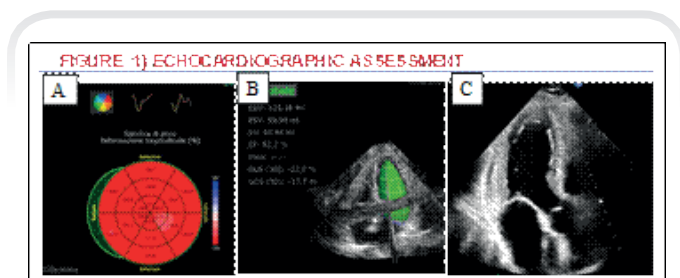


Figure 1

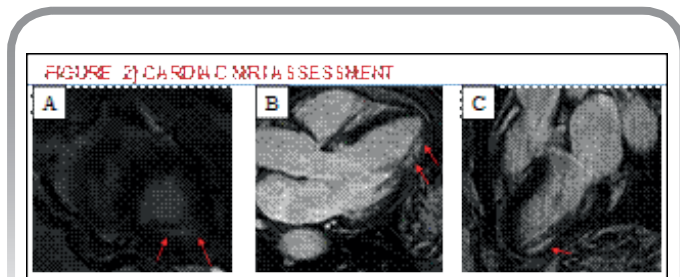


Figure 2



during hyperemic stimulus. After adequate time an step challenge with acetylcholine was performed. After administration of second dose of acetylcholine (40 mcg), severe coronary spasm was documented of a second marginal branch with the appearance of typical angina and ST-segment elevation in lead I and aVL with reciprocal changes in inferior leads. Symptoms rapidly regressed following nitrate administration. The patient received anti-anginal medication to treat vasospasm with a starting therapy of Diltiazem 60mg three times daily as the cornerstone treatment. Statin was added for its known role in improving endothelial function. The latter therapy resulted in improved patient's symptoms and QoL at 1 year follow-up. This comprehensive assessment framework, integrating patient demographics with advanced diagnostic techniques, is essential for addressing the unique challenges posed by MINOCA, emphasizing the condition's distinct nature and the multifaceted evaluation required for effective management.

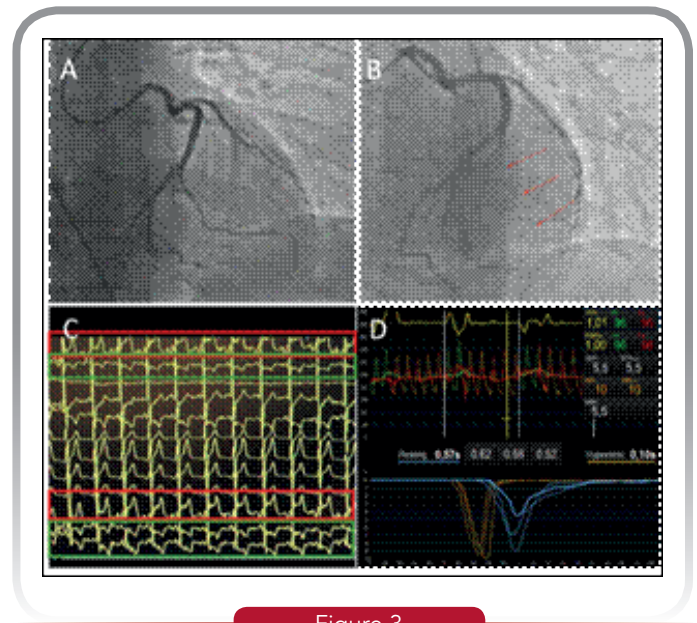


Figure 3

**CARDIOPATIA ISCHEMICA 24
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)**

**LIPOPROTEIN(A) IN YOUTH AND CHILDHOOD AS A MARKER OF CARDIOVASCULAR RISK STRATIFICATION:
A SISTEMATIC REVIEW AND META- ANALYSIS**

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Background and aims: Lipoprotein(a) (Lp(a)) is recognized as a risk factor for atherosclerotic cardiovascular diseases (ASCVD), yet its impact during childhood and youth remains understudied. This study aims to evaluate the role of Lp(a) as an independent risk factor for premature ASCVD among young patients.

Methods: PubMed, Scopus, and CINAHL Complete databases were systematically searched from inception to December 12, 2023 for adjusted observational studies examining the impact of Lp(a) in young patients. Premature coronary artery disease (CAD) and premature arterial stroke were designed as primary endpoints, while the association with family history of premature CAD and familial hypercholesterolemia (FH) were secondary endpoints.

Results: Fourteen studies, encompassing 9,923 patients, were included in the analysis. Nine studies assessed Lp(a) as an independent risk factor for premature CAD. Meta-analysis revealed Lp(a) to be significantly associated with premature CAD (OR 1.07, 95% CI: 1.01-1.13, $p=0.02$). Four studies revealed that the high levels of Lp(a) were associated with a more than twofold increased risk of arterial stroke (OR: 2.51; 95% CI: 1.51-4.16, $p=0.004$). However, insufficient studies were retrieved to perform a meta-analysis for the secondary endpoints.

Conclusion: Findings from adjusted observational studies suggest that Lp(a) serves a risk factor for premature CAD and for arterial stroke in the youngest population.

CARDIOPATIA ISCHEMICA 477
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
ANGINA INSTABILE (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

IMPACT OF CEREBROVASCULAR DISEASE ON LONG-TERM OUTCOMES IN PATIENTS WITH ACUTE CORONARY SYNDROMES: RESULTS FROM THE START- ANTIPLATELET REGISTRY

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Background: Cerebrovascular disease (CVD) often coexists with coronary artery disease (CAD) and has been reported to affect the prognosis of patients with CAD. We analysed the START- ANTIPLATELET registry to evaluate the impact of cerebrovascular disease on the long-term prognosis of patients after acute coronary syndromes.

Methods: From January 2014 to February 2023, 2233 patients with acute coronary syndromes were enrolled in the multicentre START-ANTIPLATELET registry. Patients were divided in two groups according to the presence of prior cerebrovascular disease, defined as previous ictus, transient ischemic attack (TIA), or carotid stenosis. We evaluated baseline characteristics, revascularization therapy, medical therapy at discharge and outcomes.

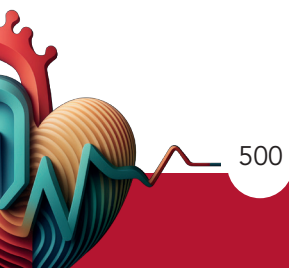
Results: Of the 2233 patients, 411 patients (18%) had

a history of CVD. Patients with CVD were older (69 ± 12 vs 66 ± 12 , $p < .001$), had more coronary risk factors such as hypertension (82% vs 71%, $p < .001$), dyslipidaemia (64% vs 56%, $p = 0.001$), diabetes (33% vs 26%, $p = 0.004$) and familial history of CAD (31% vs 24%, $p = 0.001$). The most common acute event in patients with CVD was STEMI (STEMI 49%, NSTEMI 42%, unstable angina 9%). NSTEMI was a more common presentation in CVD group (42% vs 33%, $p < .001$). Patients with CVD were less likely to receive an antiplatelet therapy based the on ticagrelor (56% vs 66%, $p < .001$) and more likely based on clopidogrel (34% vs 22%, $p < .001$). In addition, CVD group were less likely to receive medical therapy with ACE-i/ARBs (66% vs 74%, $p = 0.001$) and beta-blockers (70% vs 75%, $p = 0.027$) and to undergo percutaneous revascularization (84% vs 88%, $p = 0.013$) despite a more extensive coronary disease at the coronary angiography (22% vs 16%, $p = 0.017$). There was no difference in the use of anticoagulation therapy



with NOAC, but a higher use of Coumadin in CVD group (6% vs 3%, $p=0.029$). At the 12 months follow-up, patients with CVD had a higher incidence of all-cause death (19% vs 5%, $p<.001$), cardiovascular death (4% vs 2%, $p=0.032$), stroke (2% vs 1%, $p=0.042$), Bleedings (17% vs 13%, $p=0.03$) but not TIMI major bleedings (1% vs 1%, $p=0.42$), MACE (9% vs 6%, $p=0.007$), NACE (10% vs 7%, $p=0.01$), and MACCE (10% vs 6%, $p=0.006$).

Conclusion: In this multicentre real-world registry, 18% of patients with acute coronary syndromes had a prior CVD. In START-ANTIPLATELET registry, we found that CVD was associated with more coronary risk factors, more extensive CAD and worse outcomes. In addition, these patients received less aggressive treatment which may partly explain their worse outcome. Identification of these patients in the real-world population may provide an opportunity to reduce their risk through intensive secondary prevention efforts.



CARDIOPATIA ISCHEMICA 622
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

PROGNOSTIC ROLE OF CCTA-FFR AS FIRST STRATEGY IN PATIENTS WITH SYMPTOMATIC STABLE CORONARY ARTERY DISEASE: A SYSTEMATIC REVIEW AND METANALYSIS

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Background and Objectives. Despite the promising results, the clinical implications of the CCTFFR is already debated. This metanalysis aimed to determine the potential benefits of incorporating FFRCT into stable CAD management.

Methods. After searching for studies comparing outcomes of patients with suspected stable CAD who underwent FFRCT as a first strategy versus non-urgent cardiovascular testing after a clinical judgment, we calculated odds ratios (ORs) and 95% confidence intervals (CIs) using a random-effects or fixed-effects meta-analysis model depending on heterogeneity significance.

Results. 5 studies (3 RCTs and 2 observational studies) globally encompassing 5282 patients (CCTFFR = 2159 patients, Control Group = 2678 patients) were included in the quantitative analysis. The rates of ICA overall

(OR 1.57, 95%CI 1.36-1.81, p value <0.001) and those without obstructive CAD (OR 6.63, 95%CI 4.79- 9.16, p value<0.001) were reduced in the CCTFFR group, as compared to the control group. Moreover, CCTFFR patients underwent coronary revascularization more frequently than patients in the control arm (OR 0.48, CI 0.38-0.62, p value <0.001). There was no significance difference between the two strategies in terms of 1 year MACE (OR 1.11, CI 0.86-1.44, p value 0.42), nonfatal MI (OR 0.73, CI 0.41-1.33, p value 0.31), all-cause mortality (OR 1.29, CI 0.47-3.54, p value 0.63) and unplanned revascularization for angina (OR 0.99, 95%CI 0.65- 1.49, p value 0.95).

Conclusions. In the management of stable CAD, the use of CCTFFR was associated with lower overall rates of ICA but higher rates of coronary revascularization with no 1-year clinical impact.



**CARDIOPATIA ISCHEMICA 752
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)**

DISSEZIONE CORONARICA POST-TRAUMATICA: UN EVENTO RARO MA POTENZIALMENTE LETALE

Manuel Freschini (a), Francesco Notaristefano (b), Andrea Santucci (b), Maurizio Del Pinto (b), Gianluca Zingarini (b), Claudia Castellani (b), Laura Sperandini (b), Stefano Coiro (b), Francesca Jacoangeli (c), Michele Pagliaccia (a), Marco Del Papa (a), Federico Gobbi (a), Francesco Catania (a), Rocco Sclafani (b)
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(b) *STRUTTURA COMPLESSA DI CARDIOLOGIA, AZIENDA OSPEDALIERA "S. MARIA DELLA MISERICORDIA", PERUGIA;* (c) *AZIENDA USL UMBRIA 1, PERUGIA*

Introduzione: La dissezione coronarica secondaria ad una contusione cardiaca in paziente politraumatizzato da incidente stradale è un evento raro, ma con conseguenze che possono essere devastanti in quanto, se diagnosticata e trattata in ritardo, può determinare esiti potenzialmente irreversibili o, nel peggiore dei casi, l'exitus del paziente.

Caso clinico: Uomo, 51 anni, trasportato in urgenza in pronto soccorso per politrauma secondario ad incidente stradale. All'RX degli arti superiori bilaterali fratture multiple scomposte e pluriframmentarie sottoposte, previa sedazione, a riduzione manuale

ed immobilizzazione con gesso. Durante successiva valutazione cardiologica, in assenza di un franco dolore toracico ma in presenza di dolorabilità diffusa, riscontro all'ECG di STEMI antero-laterale (A) ed all'ecocardiogramma di severa disfunzione ventricolare sx e di sospetta immagine per flap intimale in aorta ascendente per cui, esclusa una dissezione aortica tramite TC con mdc, veniva eseguita coronarografia in urgenza. Alla procedura evidenza di occlusione completa dell'IVA prossimale secondaria a dissezione coronarica (B), sottoposta a PTCA con provisional stenting kissing balloon su TC distale, IVA prossimale (C) e Cx prossimale, efficace nel ripri-

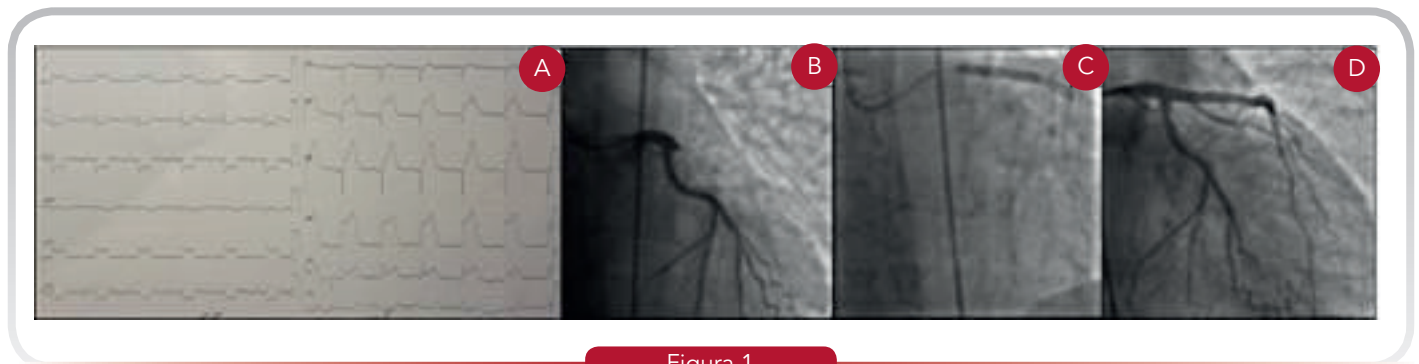


Figura 1

stino del flusso coronarico (D). Al fine di sostenere il circolo per la ridotta perfusione periferica, veniva inoltre posizionato temporaneamente IABP. All'ecocardiogramma post-procedurale LVEF del 25-30% per acinesia del SIV, della parete anteriore, della parete laterale e dell'apice. Durante la degenza veniva eseguito un ciclo di inotropi con Levosimendan, ottimizzata la terapia medica anti-ischemica e dello scompenso cardiaco, pur senza ottenere un miglioramento significativo della LVEF. Per tale motivo e per la presenza di episodi di TVNS con ciclo RR stretto, a circa 5 settimane dall'evento acuto, il paziente veniva sottoposto ad impianto di s-ICD in prevenzione primaria. Le molteplici comorbilità correlate al politrauma (fratture multiple, rischio emorragico elevato, deficit sensitivo-motorio agli arti) sono state gestite con l'aiuto di un team multidisciplinare.

Discussione: La dissezione coronarica post-traumatica è un evento raro che coinvolge, in genere,

l'IVA prossimale a causa della sua posizione anatomica posta subito dietro lo sterno. Farne diagnosi precoce, malgrado le possibili difficoltà riscontrabili in pazienti politraumatizzati, quali le molteplici comorbilità ed una clinica spesso confondente, risulta fondamentale. Infatti un suo trattamento tardivo, in considerazione del vasto territorio d'irrorazione nel caso dell'IVA prossimale, determina di solito esiti irreversibili ed un drastico peggioramento della prognosi. L'esecuzione di un ECG e di una valutazione cardiologica urgenti sono pertanto di primaria importanza in questi pazienti.

Conclusione: Un possibile coinvolgimento cardiaco potrebbe passare in secondo piano in un paziente politraumatizzato. Tuttavia, visto il suo significativo impatto prognostico, la sua presenza andrebbe sempre investigata con i primi accertamenti diagnostici, tra cui l'ECG.



CARDIOPATIA ISCHEMICA 30
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO)

ELIGIBILITY FOR AND PRACTICAL IMPLICATIONS OF SEMAGLUTIDE IN OVERWEIGHT AND OBESE PATIENTS WITH ACUTE CORONARY SYNDROME: DATA FROM THE START-ANTIPLATELET REGISTRY

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Aim: Semaglutide has been shown to reduce the incidence of cardiovascular events for secondary prevention in non-diabetic patients with preexisting cardiovascular disease and overweight or obesity. We evaluated the eligibility for and practical implications of semaglutide in overweight and obese patients with recent acute coronary syndrome (ACS) and no history of diabetes from a contemporary real-world registry.

Methods: Patients from the multicenter START-ANTIPLATELET registry (NCT02219984) were stratified to investigate the proportion of patients eligible for semaglutide therapy at 60 days after discharge for ACS (post-acute phase) according to the SELECT trial eligibility criteria: age ≥ 45 years; body mass index (BMI) ≥ 27 kg/m²; history of myocardial infarction (MI), stroke, or peripheral artery disease (PAD); no history of diabetes. Major adverse clinical events (MACE), defined as a composite of all-cause death, MI, target

vessel revascularization, or stroke, and net adverse clinical events (NACE), a composite of all-cause death, MI, stroke, or major bleeding, were assessed at 1-year follow-up.

Results: A total of 3,087 consecutive patients with ACS were considered for the analysis using data at hospital discharge. A total of 141 patients were excluded due to incomplete information on BMI. At 60 days after discharge, 811 patients (27.5%) met the SELECT eligibility criteria for semaglutide (SELECT-like group) and 2,135 patients were ineligible (not-eligible group). A total of 764 of 811 (94.2%) SELECT-like patients had a history of a single cardiovascular disease, with a prior MI being present in 98% of patients. A history of two or three different cardiovascular diseases was reported in 5.8% of patients. One-year follow-up data were available for 2,149 patients. The incidence of MACE (5.2% vs. 8.3%; $p=0.017$) and NACE (4.1% vs. 7.6%;

p=0.003) was significantly lower in the SELECT-like group compared to the not-eligible group. Among the individual endpoints, all-cause death (2.9% vs. 5.2%; p=0.021) and major bleeding (0.3% vs. 1.2%; p=0.064) were observed less frequently in the SELECT-like group.

Conclusions: In a contemporary real-world cohort of ACS patients, a significant proportion of patients met the eligibility criteria for semaglutide prescription according to the SELECT trial. The SELECT-like patients had lower rates of MACE and NACE compared to patients who did not meet the eligibility criteria of the trial.

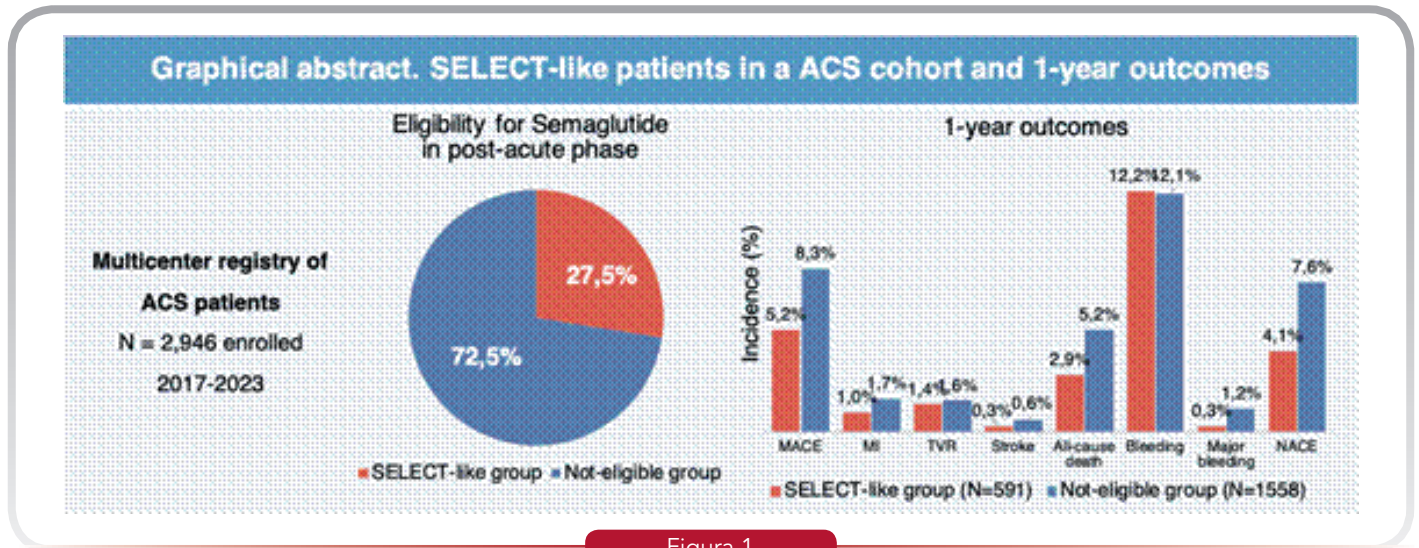


Figura 1



CARDIOPATIA ISCHEMICA 775
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA)

WNT/B-CATENIN SIGNALING PATHWAY IN MYOCARDIAL INFARCTION: A PROSPECTIVE COHORT STUDY

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 (a) UNIVERSITY OF MESSINA

Introduction: Heart failure (HF) is a major global health challenge, often developing after myocardial infarction (MI). Post-MI remodeling, particularly fibrosis, is a key factor in HF progression, impacting myocardial function and electrical conduction. Animal studies have suggested that the WNT/ β -catenin signaling pathway and adenosine receptors play roles in cardiac fibrosis, highlighting potential therapeutic targets; however, these findings have not been explored in human studies.

Aim: We conducted a single-center prospective study (BETA-MI, NCT05122741) to evaluate the WNT/ β -catenin and DKK1 signaling pathways in ST-segment elevation MI (STEMI) patients undergoing primary percutaneous coronary intervention (PCI).

Methods: A total of fifty patients were included: 40 STEMI patients undergoing primary PCI and 10 controls with chronic coronary syndrome (CCS) undergoing first elective PCI, all receiving dual antiplatelet therapy. Levels of β -catenin and DKK1 were assessed using ELISA and qPCR before and after PCI and at 45-day follow-up. Cardiac remodeling was evaluated through echocardiography and cardiac magnetic resonance (CMR) post-PCI and during follow-up.

Results: The average age was 62 ± 8 years, and 82% of patients were male. Among STEMI patients, DKK1 levels assessed by qPCR showed a significant increase over time ($p = 0.0144$), while β -catenin levels remained unchanged. Compared to controls, β -catenin levels were significantly elevated in STEMI patients at all timepoints ($p < 0.0001$). In-hospital β -catenin levels were the only independent predictor of left ventricular ejection fraction (LVEF) at follow-up ($p = 0.0278$ for pre-PCI levels). None of the parameters predicted changes

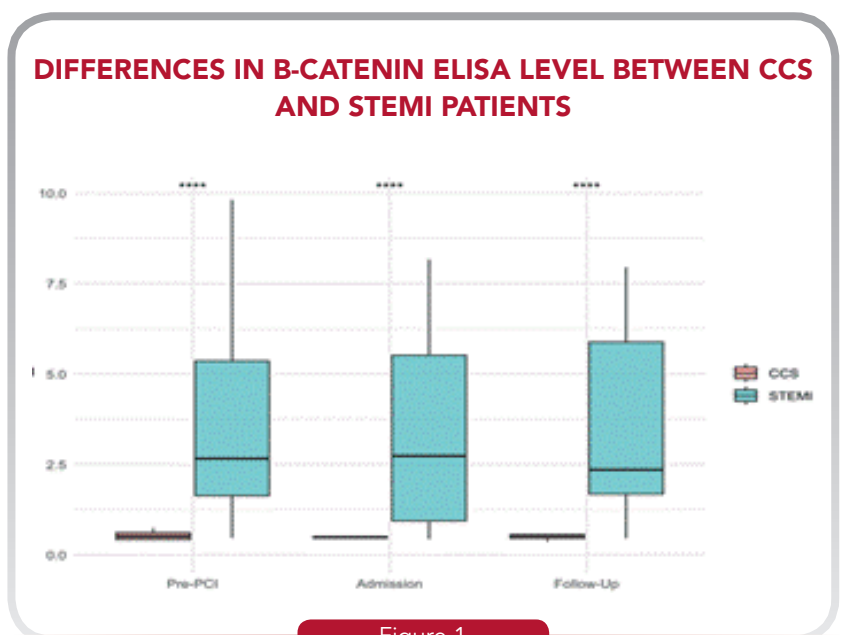


Figure 1

in NT-proBNP levels at follow-up.

Conclusion: Unlike DKK1, β -catenin levels remained consistently elevated in STEMI patients during both the in-hospital phase and follow-up and were significantly higher compared to CCS patients undergoing elective PCI. Moreover, β -catenin emerged as an independent predictor of LVEF at follow-up. These

findings provide the first real-world evidence of the WNT/ β -catenin pathway's dynamics in STEMI patients undergoing primary PCI, underscoring the need for further research to clarify its role in myocardial fibrosis post-MI and to explore its potential as a therapeutic target.



**CARDIOPATIA ISCHEMICA 800
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
SINCOPE (ARITMIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)**

A STRANGE CASE OF TAKO TSUBO SYNDROME

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Marco Basile (b), Angela Potenza (b)

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Introduction: Takotsubo syndrome is defined as a cardiomyopathy associated with an increase in myocardionecrosis enzymes without any evidence of coronary heart disease and mostly related to stressful stimulus.

Clinical case: An 81-year-old man suffering with hypertension, dyslipidemia, chronic coronary syndrome (revascularization in 2001 with coronary artery bypass graft – left mammary artery on left anterior descending coronary artery and venous graft on the right coronary artery). The patient was asymptomatic until July 2024, when he experienced syncope. He was admitted to our emergency department, the ECG showing complete atrioventricular block.

Echocardiogram highlighted: normal sized left ventricle, mid-basal inferior akinesia and preserved left ventricular function (LVEF: 60%) (figure 1). We administered isoprenaline per protocol while the patient underwent urgent implantation of a definitive dual-chamber pacemaker. Post- procedure echocardiogram showed no pericardial effusion but a globally hypokinetic left ventricle with a LVEF 35% and akinesia of the entire apex, mid-apical posterior septum, and mid-apical inferior wall. Enzymatic samples were carried out which showed increase in troponins (max 324 ng/ml). He underwent a coronary angiographic examination which highlighted chronic three-vessel disease not amenable to percutaneous revascularization. During the follow-

up period, serial echocardiograms demonstrated progressive improvement in the LVEF and reduction in myocardionecrosis enzymes. The patient was discharged after five days of hospitalization with the troponins value resetting to zero and improvement in LVEF (LVEF: 45%) (figure 2).

Conclusions: Takotsubo syndrome can occur in “atypical” situations, even in those with well-established coronary artery diseases. Our case

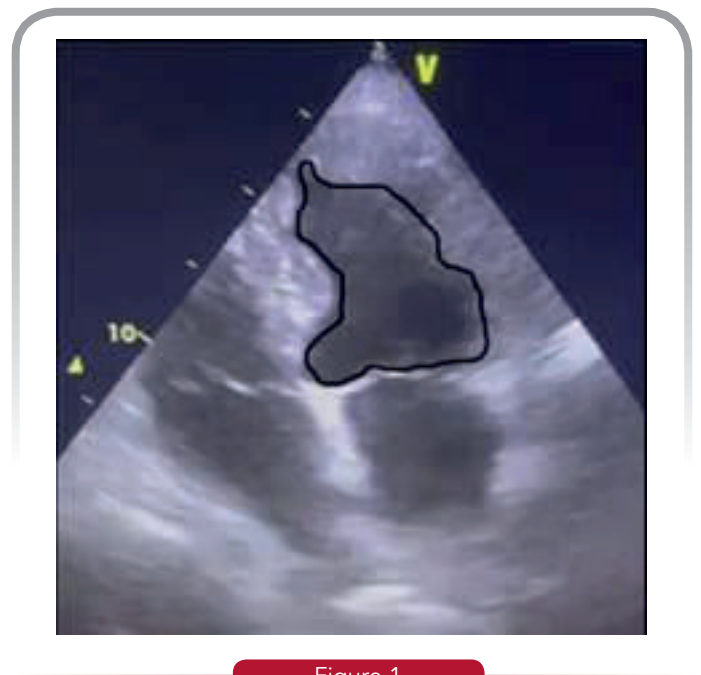


Figure 1

showed the association of Takotsubo cardiomyopathy to the synergistic exposure of exogenous (isoprenaline) and endogenous catecholamines such as pacemaker implantation. Despite our patient already suffered coronary artery disease, the modest increase in troponins, the sudden decrease in systolic function after isoprenaline and PM implantation, and the progressive recovery without performing revascularization let us consider this condition as a takotsubo-like syndrome.

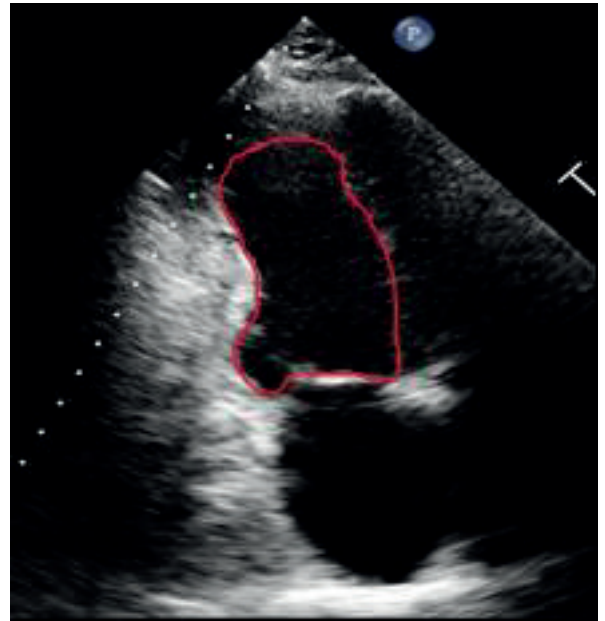


Figure 2



CARDIOPATIA ISCHEMICA 571 TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)

IMPACT OF THE NEW ESC GUIDELINES RECOMMENDATIONS IMPLEMENTED WITH A "FAST TRACK-APPROACH" ON THE EARLY REDUCTION OF LDL- CHOLESTEROL AND MAJOR CARDIOVASCULAR EVENTS IN CLINICAL PRACTICE

Alessandra Marengo (a, b), Leonardo Grisafi (b), Manuel Bosco (a, b), Luca Cumitini (a, b), Martina Solli (b),
Marco Giovanni Mennuni (a, b), Domenico D'amario (a, b), Giuseppe Patti (a, b)
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(b) A.O.U. MAGGIORE DELLA CARITÀ DI NOVARA

Background. The 2023 European Society of Cardiology (ESC) guidelines for acute coronary syndromes (ACS) emphasize the importance of reaching, as early as possible, the recommended target LDL-C levels after an ACS by starting high-intensity lipid-lowering treatment (LLT) (i.e. potent statins, ezetimibe and, possibly, PCSK9 inhibitors or siRNA) at an early stage, in order to reduce the risk of further cardiovascular (CV) events. For this reason, our center has implemented the use of these drugs from the early stages of patient's hospitalization ("fast track approach"- FTA). We analyzed the impact of the FTA on the early achievement of recommended LDL-C levels and the consequent benefit on the reduction of CV events compared to the previous clinical approach.

Methods. This ambispective study included 494 patients admitted for ACS in our center in the period between January 2019-June 2019 (managed according to previous ESC recommendations, which involved a target of LDL-C < 70 mg/dL), January 2021-June 2021 (managed according to the new 2019 ESC recommendations, which involves a target of LDL-C < 55mg/dL) and January 2023-June 2023 (managed according to the new 2019 ESC recommendations integrated with the FTA implementation). The parameters evaluated for each patient were: total cholesterol, LDL-C, HDL-C and triglycerides values at discharge, at first follow-up (FU) (i.e. 1 month

after discharge) and at second FU (6-9 months after discharge). The comparison of the prevalence of LLT at admission, at discharge and at post-discharge FU has been assessed, as well as the prevalence of patients who reached LDL-C target levels at the predefined FU for each period. The comparison between the incidences of CV events at 1-year FU between the three groups has also been analyzed. Data were analyzed using Stata 18 software (Stata Corp, USA).

Results. The preliminary analysis including 389 patients showed a significant increase in the use of the combination of potent statins with ezetimibe between the patients managed according to the previous ESC recommendations, the new ESC recommendations and the FTA implementation at discharge (2% vs 25% vs 75%, respectively; $p < 0,001$) at first FU (3% vs 16% vs 49%; $p < 0,001$) and at second FU (11% vs 42% vs 68%; $p < 0,001$) as well as an increase in the use of the triple LLT combination (potent statin, ezetimibe, PCSK9i) at discharge (<1% vs 2% vs 23%; $p < 0,001$), at first FU (<1% vs 1% vs 11%; $p < 0,001$) and at second FU (<1% vs 2% vs 16%; $p < 0,001$). Similarly, the analysis showed an increase in the percent of patients reaching target levels of C-LDL at first FU (30% vs 45% vs 77%; $p < 0,001$) and at second FU (36% vs 50% vs 65%; $p < 0,001$). The incidence of new ACS at 1-year FU was lower in patients managed with FTA implementation compared to those managed according to new 2019

ESC recommendations (without FTA) and to previous ESC recommendations (2% vs 11% vs 23%, respectively; $p < 0,001$).

Conclusion. The preliminary analysis of our study showed that the implementation of a FTA involving

the early introduction of high-intensity LLTs provides the prompt achievement of target LDL-C levels and a reduction in CV events compared to the previous clinical strategy, thus justifying this aggressive treatment approach.



CARDIOPATIA ISCHEMICA 377
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

**PROGNOSTIC IMPACT OF BMI IN PATIENTS TREATED WITH PRIMARY ANGIOPLASTY:
 ANALYSIS OF TRIESTE STEMI REGISTRY**

Edoardo Zen (b), Enrico Fabris (a), Andrea Pezzato (a), Giancarlo Vitrella (a), Marco Anzini (a), Andrea Perkan (a),
 Matteo Dal Ferro (a), Serena Rakar (a), Gianfranco Sinagra (a)
 (a) POLO CARDIOLOGICO - ASUGI - AZIENDA SANITARIA UNIVERSITARIA GIULIANO ISONTINA;
 (b) UNIVERSITA' DEGLI STUDI DI TRIESTE

Background: Obesity is one of the major cardiovascular risk factors and is associated with increased morbidity and mortality. However, some studies have suggested an "obesity paradox" where overweight and obese patients have better survival after myocardial infarction (MI) compared to normal weight patients. The relationship between body mass index (BMI) and outcomes in patients with ST-elevation myocardial infarction (STEMI) treated with primary percutaneous coronary intervention (PPCI) is still controversial.

Aims: The aim of this study was to investigate the impact of BMI on mortality in STEMI patients undergoing PPCI.

Methods: In this study were included a total of 744 STEMI patients treated with PPCI from January 2018 to December 2021 and followed for 21 months (8-37). We analyzed the prevalence of overweight in STEMI patients and the baseline characteristics of patients and the mortality based on the median BMI (26.1 kg/m²); Uni and multivariate COX regression analysis were performed to identify predictors of death.

Results: 62,4% of patients had BMI > 25 and 19,6% > 30. Patients with BMI above the median were less frequently aged over 75 years (23.2% vs 34% with p=0.001). Cardiovascular risk factors were more represented in patients with a BMI above the median: hypertension

(66,3% vs 50%, p<0,001), diabetes mellitus (25,1% vs 15,5%, p=0,001), while chronic renal insufficiency was less prevalent (13.7% vs 27.6% p<0.001) compared to patients with a BMI below the median. At the median follow up of 21.0 months, patients with BMI ≥26.1 had lower overall mortality (10% vs 15.8%, p=0.019). In the multivariate analysis, the independent variables associated death were: age (HR=1.054 with p<0.001), arterial hypertension (HR=1.764 with p=0.045), Killip class (HR=1.503 with p<0.001), hemoglobin (HR=0.788 with p<0.001), cardio-respiratory arrest (HR=2.142 with p=0.012), and BMI which was significantly associated with a reduced risk of mortality (HR=0.932 with p=0.028). ACE inhibitors or beta-blockers prescription were significantly higher in patients with BMI above the median, and when multivariate model included medications at discharge BMI was no longer statistically significant, though it still showed a certain protective trend with respect to the outcome (HR=0.938 with p=0.062).

Conclusions: The study confirms the high presence of concomitant risk factors in overweight patients presenting with STEMI. Patients with a higher BMI exhibit lower mortality, this may be influenced by age and comorbidities, who could translate into lower prescription of pharmacological therapy, such as ACE inhibitors and beta-blockers. However, age and drug therapy may be possible confounding factors.



CARDIOPATIA ISCHEMICA 451 INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) PLACCA VULNERABILE (ATEROTROMBOSI) DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)

TRIGGERS OF TYPE 2 INFARCTION: IMPLICATIONS FOR LONG-TERM PROGNOSIS

Virginia Marinelli (a), Khrystyna Ryabenko (a), Marcello Casuso Alvarez (a), Nicole Suma (a), Andrea Impellizeri (a), Damiano Fedele (a), Francesca Bodega (a), Giuseppe Pastore (a), Bergamaschi Luca (a), Bertolini Davide (a), Francesco Angeli (a), Angelo Sansonetti (a), Ornella Di luorio (a), Daniele Cavallo (a), Claudio Asta (a), Matteo Armillotta (a), Sara Amicone (a), Lisa Canton (a), Francesco Pio Tattilo (a), Carmine Pizzi (a)
(a) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES-DIMEC-ALMA MATER STUDIORUM, UNIVERSITY OF BOLOGNA, 40138, ITALY

Background: Type 2 myocardial infarction (T2MI) is characterized by a mismatch between myocardial oxygen supply and demand, unrelated to acute coronary thrombosis.

This discrepancy arises from triggers, which may or may not be of cardiac origin. Common cardiac triggers include coronary artery spasm, coronary embolism, and arrhythmias, whereas non-cardiac triggers encompass factors such as anemia, hypertension/hypotension, sepsis, renal damage, and respiratory failure. However, identifying these triggers isn't always straightforward.

Aim: Our study aimed to identify, whenever possible, the triggers contributing to the oxygen supply-demand mismatch in T2MI cases, as defined by the Fourth Universal Definition of Myocardial Infarction. Additionally, we sought to explore the correlation between these triggers and patient prognosis.

Methods: We enrolled all consecutive patients diagnosed with non-ST-segment elevation myocardial infarction (NSTEMI) who met the criteria for T2MI and underwent coronary angiography within 72 hours of diagnosis. Patients were categorized into three groups based on the trigger causing T2MI: cardiac, non-cardiac, and unidentified. The primary endpoint was the occurrence of major adverse cardiovascular events (MACEs), including all-cause mortality, new myocardial infarction, hospitalization for heart failure, and ischemic stroke, during long-term follow-up. We estimated MACE-free survival using Kaplan-Meier curves and

compared it among the three groups using the log-rank test. Multivariable logistic regression analysis was performed to identify independent predictors of MACE.

Results: The final cohort comprised 598 T2MI patients, with 308 having a cardiac trigger, 147 having a non-cardiac trigger, and 143 with an unidentified trigger. The mean age of the overall population was 69.6 ± 13.1 years, with a median follow-up time of 25 (13-49) months. Kaplan-Meier curves demonstrated statistically significant differences in MACEs based on the trigger causing T2MI ($p < 0.001$). Specifically, patients with an unidentified trigger exhibited a better prognosis, while those with a non-cardiac trigger had a worse prognosis during long-term follow-up. Multivariable logistic regression analysis confirmed that not having an identified trigger is an independent protective factor for MACEs (HR 0.63, 95% CI 0.45-0.89, $p = 0.009$, unidentified trigger vs cardiac + non-cardiac trigger).

Conclusions:

T2MI is prevalent in clinical practice, yet reliable outcome predictors remain elusive. Our findings indicate a relationship between the type of trigger precipitating T2MI and patient prognosis, notably demonstrating that the absence of a specific identifiable trigger is linked to a more favorable long-term outcome. Further studies are needed to better define the prognostic stratification of these patients.



CARDIOPATIA ISCHEMICA 214
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

**PARADOXICAL CORONARY EMBOLISM LEADING TO STEMI IN A PATIENT WITH CAVAL THROMBOSIS:
 A CASE REPORT**

Davide Restelli (a), Riccardo Molinari (b), Andrea Farina (c), Scipione Carerj (a)

(a) UNIVERSITÀ DEGLI STUDI DI MESSINA, MESSINA, ITALIA; (b) UNIVERSITÀ DEGLI STUDI DELLA CAMPANIA "LUIGI VANVITELLI", CASERTA, ITALIA; (c) ASST LECCO - OSPEDALE A. MANZONI, LECCO, ITALIA

Introduction: Chest pain is a very common condition that can potentially be caused by serious and rapidly evolving diseases. Among acute coronary syndromes, ST-segment elevation myocardial infarction (STEMI) represents the most urgent form. The main cause is the rupture of a plaque in the coronary arteries (type 1).

Case Report: A 48-year-old man presented to the Emergency Department with the onset of oppressive retrosternal chest pain about two hours prior. No previous cardiac history was reported. He had a history of left renal tumorectomy for papillary renal cell carcinoma approximately six years prior and right orchifuniclectomy for seminoma, with abdominal lymph node recurrence about two months ago. He was undergoing treatment according to the PEB scheme (Cisplatin, Etoposide, Bleomycin). Additionally, he had rheumatoid arthritis under treatment with methotrexate. ECG showed inferior-lateral STEMI. Killip class 1. Coronary angiography revealed distal non-dominant circumflex artery (Cx) occlusion and mid-distal first obtuse marginal branch occlusion, with a suggestive appearance of embolic etiology. Stent placement was deferred, and unfractionated heparin (UFH) infusion was initiated, along with aspirin. The patient was asymptomatic. Echocardiogram showed localized akinesia of the lateral and infero-lateral wall with ejection fraction at the lower limits, and no significant valvular diseases. In the following days,

there was regression of ST-segment elevation and the appearance of lateral necrosis-ischemia. Additionally, there was improvement in wall motion abnormalities. Suspecting an embolic etiology of STEMI, a diagnostic workup was initiated with a Doppler ultrasound of the lower limbs (negative), abdominal ultrasound (likely thrombotic formation in the inferior vena cava), and transesophageal echocardiogram (patent foramen ovale with right-to-left shunt visible during the Valsalva maneuver). Thoraco-abdominal CT confirmed a partial thrombosis of the inferior vena cava and progression of proliferative disease at the abdominal lymph node level. After a few days, a follow-up coronary angiography showed patency of the previously occluded vessels and no intimal alterations along the entire Cx axis on intracoronary imaging. The patient was then transferred to Oncology with subcutaneous anticoagulant therapy using low-molecular-weight heparin and cardioactive therapy with ACE inhibitors and beta-blockers.

Discussion: The presented case can be defined as a MINOCA (myocardial infarction with non-obstructive coronary arteries), caused by coronary embolism originating from the inferior vena cava with paradoxical embolism through a patent foramen ovale. Not all coronary occlusions during STEMI are due to acute plaque destabilization events. In this case, a conservative management approach was chosen, without the use of stents. This avoided the initiation

of dual antiplatelet therapy, which would have become triple therapy after the discovery of caval thrombosis, thereby precluding potential surgical approaches to the oncological disease in the short-medium term. Intracoronary imaging methods ultimately allowed

the exclusion of an unstable plaque, justifying the conservative approach and favoring anticoagulant therapy.



CARDIOPATIA ISCHEMICA 759

CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) ANGINA INSTABILE (CARDIOPATIA ISCHEMICA) BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

ASSOCIATION OF N-TERMINAL PRO-BRAIN NATRIURETIC PEPTIDE PLASMA LEVELS WITH THE SEVERITY OF STABLE CORONARY ARTERY DISEASE

Mirko Schivalocchi (a), Carlo Gaspardone (a), Alessandro Gentile (a), Andrea Tripoli (a), Riccardo Mazza (a), Paolo Costa (a), Giuseppe Barone (a), Anna Salerno (a), Alberto Margonato (a), Cosmo Godino (a)
(a) VITA-SALUTE SAN RAFFAELE UNIVERSITY, MILAN, ITALY

Background: The relationship between plasma N-terminal pro-brain natriuretic peptide (NT-proBNP) levels and the severity of stable coronary artery disease (CAD) remains uncertain.

Objective: This study aimed to investigate the association between plasma NT-proBNP levels and the presence and severity of angiographic lesions in patients with suspected CAD.

Methods: We prospectively measured plasma NT-proBNP levels in 656 patients referred to our center for elective diagnostic coronary angiography due to symptoms or signs of CAD over a two-year period. Patients with conditions known to elevate NT-proBNP levels, including heart failure, severe valvular disease, atrial fibrillation, severe chronic kidney disease (eGFR < 30 mL/min), prior coronary artery bypass grafting, or age over 80 years, were excluded.

Results: A total of 453 patients were included (mean age 65 ± 8 years; 22% women). Coronary angiography revealed critical CAD (obstruction ≥ 70% in at least one main epicardial vessel) in 326 patients (72%). Baseline characteristics were comparable between patients with critical and non-critical CAD. NT-proBNP levels were significantly higher in patients with critical CAD compared to those with non-critical CAD (202 vs. 136 pg/mL, respectively; p < 0.001). NT-proBNP levels

were positively correlated with the severity and extent of CAD. In receiver operating characteristic (ROC) curve analysis, an NT-proBNP value above 160 pg/mL identified patients with prognostic critical CAD (i.e., involvement of the left main or proximal left anterior descending artery) with an area under the curve (AUC) of 0.63 (95% CI: 0.58-0.68; p < 0.001).

Conclusion: NT-proBNP plasma level is associated with the severity of CAD.

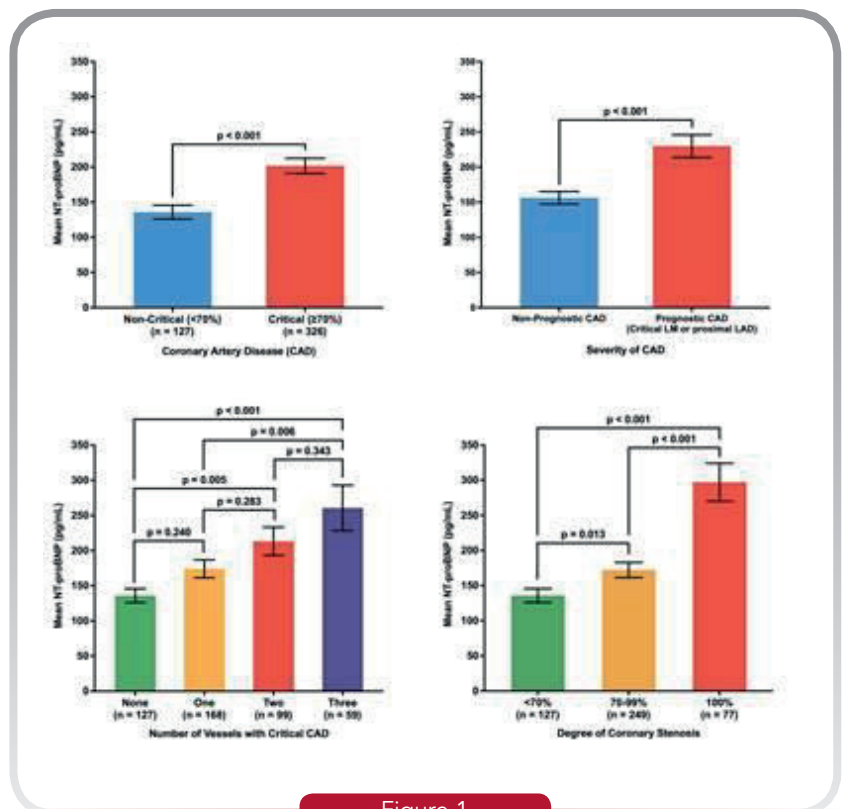


Figure 1

CARDIOPATIA ISCHEMICA 502
ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)

MARCATORI DI DISFUNZIONE AUTOFAGICA SONO ASSOCIATI ALLA PRESENZA DI MALATTIA CORONARICA IN PAZIENTI SOTTOPOSTI A CORONAROGRAFIA

Beatrice Simeone (b), Erica Rocco (b), Gianmarco Sarto (a), Luigi Spadafora (a), Marco Bernardi (a), Gianmarco Rossi (a), Maurizio Forte (c), Valentina Valenti (d, e), Francesco Versaci (e), Sebastiano Sciarretta (b, d) (a) *SCUOLA DI SPECIALIZZAZIONE IN MALATTIE DELL'APPARATO CARDIOVASCOLARE, "SAPIENZA" UNIVERSITÀ DI ROMA*; (b) *UOC UTIC/CARDIOLOGIA/EMODINAMICA DELL'OSPEDALE ICOT DI LATINA, POLO UNIVERSITARIO "POLO PONTINO", SAPIENZA UNIVERSITÀ DI ROMA*; (c) *DIPARTIMENTO DI ANGIO-CARDIO-NEUROLOGIA, IRCCS NEUROMED, POZZILLI*; (d) *DIPARTIMENTO DI SCIENZE E BIOTECNOLOGIE MEDICO CHIRURGICHE, "SAPIENZA" UNIVERSITÀ DI ROMA, LATINA*; (e) *UOC DI CARDIOLOGIA, OSPEDALE SANTA MARIA GORETTI, LATINA*

Introduzione: Le malattie cardiovascolari sono tra le principali cause di morte a livello mondiale. Numerosi studi preclinici hanno dimostrato che difetti nel processo autofagico contribuiscono allo sviluppo del danno cardiaco e vascolare. In letteratura è noto che una diminuzione della proteina autofagica ATG5 e un aumento di P62 sono indici di disfunzione autofagica. Un loro rapporto è dunque un parametro bifattoriale inversamente proporzionale dello stato dell'autofagia. Tuttavia, rimane tutt'oggi da chiarire come il processo autofagico sia influenzato dai fattori di rischio cardiovascolari e come l'autofagia si associ a disfunzione endoteliale, alterazioni cardiache strutturali e funzionali nell'uomo.

Obiettivi: Lo scopo del nostro studio è stato quello di ricercare nuovi predittori molecolari nonché nuovi bersagli terapeutici, tra i markers dell'autofagia, che possano predire lo sviluppo di malattia coronarica (CAD) e prognosticarne la gravità e la progressione.

Metodi: Lo studio è di natura osservazionale prospettica. Sono stati arruolati 128 pazienti, di età compresa tra i 18 e 85 anni con FE >50%, tutti sottoposti a coronarografia (CVG) e successivamente suddivisi in

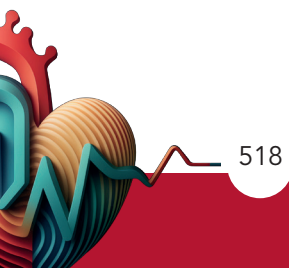
tre gruppi: 33 pazienti con sindrome coronarica acuta (SCA); 64 con cardiopatia ischemica cronica (CCS); 31 ad alto rischio per CAD ma assenza di coronaropatia significativa. Entro 48 h dalla CVG sono stati effettuati dei prelievi ematici per la valutazione dei livelli sierici delle proteine autofagiche P62 e ATG5 attraverso metodo ELISA. Infine, durante la degenza, sono stati valutati parametri biometrici, clinici, ematochimici, radiologici ed ecocardiografici.

Risultati: Sia in presenza di vasculopatia carotidea ($p=0.001$) che in presenza di malattia multivaso ($p=0.007$) il rapporto $p62/AT5$ è emerso significativamente aumentato. Nel caso della prima questo avviene solamente per una per una diminuzione significativa di ATG5 ($p=0.005$). Nel caso della malattia multivaso invece oltre alla diminuzione di ATG5 ($p=0.025$), risulta significativo anche l'aumento di P62 ($p=0.04$). Il t-test ha confermato come l'aumento di $P62/ATG5$ fosse statisticamente significativo in presenza di CAD ($p=0.05$). Successivamente i pazienti con CAD sono stati suddivisi sulla base del numero di vasi coinvolti. I valori medi del rapporto $P62/ATG5$ sono risultati più alti nei pazienti affetti da malattia multivaso rispetto ai pazienti con malattia monovaso



ed il test di Kruscall-Wallis ha dimostrato come la differenza della distribuzione del rapporto sia statisticamente significativa tra questi gruppi ($p=0.002$). Grazie al test di Mann Whitney si è riscontrato come la differenza del rapporto fosse maggiore soprattutto tra i pazienti con malattia monovasale rispetto a quelli con malattia multivasale ($p < 0.001$) e tra pazienti con coronarie esenti e pazienti con malattia multivasale ($p=0.006$). Tuttavia, il test di Mann Whitney non ha dimostrato una differenza significativa del rapporto tra il gruppo di pazienti con SCA e con CCS.

Conclusioni: Il nostro studio ha dimostrato come l'aumento del rapporto P62/ATG5, espressione della disfunzione autofagica, correli con la coronaropatia e la vasculopatia carotidea. Alla luce di questi risultati, il dosaggio di P62 e ATG5 potrebbe essere utilizzato come marker molecolare prognostico e diagnostico in pazienti affetti di malattia aterosclerotica. Infine, anche se occorrono ulteriori trials per corroborare queste evidenze, questo studio dimostra che l'autofagia potrebbe essere un nuovo e possibile target terapeutico in pazienti affetti da patologie cardiovascolari.



CARDIOPATIA ISCHEMICA 240
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
DIABETE E MALATTIE CARDIOVASCOLARI
(DIABETE E MALATTIE DEL METABOLISMO)

GENDER DIFFERENCES IN PREDICTIVE IGF-1 FEATURES FOR MAJOR ADVERSE CARDIOVASCULAR EVENTS IN PATIENTS WITH AMI

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Background: Insulin-like growth factor 1 (IGF-1) is a hormone that has been implicated in the pathophysiology of insulin resistance and diabetes. As IGF-1 is involved in stimulating tissue remodeling and improving cardiac contractility, its low concentration in acute myocardial infarction (AMI) survivors have been associated with a worse prognosis. However, to date, there is a paucity of evidence regarding gender differences in the prognostic value of IGF-1.

Purpose: To investigate whether there are any gender-based differences in the prognosis of patients with AMI based on insulin-like growth factor 1 (IGF-1) levels.

Methods: Blood samples were collected in the fasting state. The endpoint was a three-point major adverse cardiovascular events (MACE) consisting of all-cause mortality, reinfarction and development of heart failure.

Results: Overall, 630 patients were included in the study, of which 463 (73.5%) were male. The mean age of the cohort was 66.3 (11.3) years, 72% presented with STEMI and 17.6% had a previous ischemic event. The median IGF-1 concentration was 539.5 [285.1 – 823] pg/ml. No significant difference in IGF-1 levels was found between female and male patients (506 [261 – 781] vs 555.8 [292 – 842] pg/ml, respectively, $p=0.22$).

Low levels of IGF-1 were predicted by older age (OR: 1.36 [1.12 – 1.66], $p=0.003$), worse glomerular filtration rate (OR: 1.1 [1.04 – 1.12], $p=0.001$) and diabetes mellitus (OR: 1.7 [1.11 – 2.52], $p=0.01$), after correction for gender, body mass index, and left ventricular systolic function. During a median follow-up of 42 months, 230 (36.5%) patients reached the combined endpoint. Patients with MACE had lower levels of IGF-1 compared to event-free patients at the end of follow-up (415.4 [215.5 – 651.8] vs. 597.4 [338.8 – 880.4] pg/ml, respectively, $p<0.01$). At Kaplan-Meier analysis, patients in the first tertile were more likely to experience MACE ($p<0.001$). After stratification by gender, the same trend was observed in men ($p<0.001$), but not in women ($p=0.06$). Through continuous hazard ratio analysis, we identified a linear association between IGF-1 levels and incidence of MACE and determined the 538.1 pg/ml cut-off for the biomarker ($p<0.001$). In multivariable Cox regression analysis, IGF-1 levels below the cut-off were confirmed as an independent predictor of adverse outcome (HR: 1.4 [1.01 – 1.95], $p=0.04$) along with older age, worse left ventricular systolic function and worse glomerular filtration rate only in male patients, after correction for diabetes mellitus and body mass index.

Conclusion: In male AMI survivors, lower levels of IGF-1 are associated with a higher risk of adverse outcome.



**CARDIOPATIA ISCHEMICA 504
 CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
 INTERVENTISTICA, CORONARICA E STRUTTURALE)
 FISIOLOGIA CORONARICA
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

ECG EXERCISE STRESS TEST IN PATIENTS WITH NON-OBSTRUCTIVE CORONARY ARTERY DISEASE (NOCAD)

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 (a) UNIVERSITÀ CATTOLICA DEL SACRO CUORE SEDE DI ROMA

Background. Invasive coronary angiography (ICA) is the gold standard for the diagnosis of obstructive coronary arteries disease (CAD). About a half of undergoing ICA for suspected CAD, however, show either non-obstructive coronary arteries disease (NOCAD) or totally normal coronary arteries (NCAs). In this study, we aimed to assess whether there are differences in electrocardiogram exercise stress test (ECG-EST) results between the latter 2 groups of patients.

Methods. We retrospectively enrolled 311 consecutive patients, referred to our Hospital between 2018 and

2023 because of suspected stable angina pain, who underwent both an ECG-EST (standard treadmill Bruce protocol) and ICA (within 12 months of the ECG-EST), and were found to have either NOCAD or NCAs.

Results. Overall, 191 patients showed NOCAD (61.4%) and 120 patients had NCAs (38.6%). The main clinical and ECG-EST-derived parameters showed no significant differences between the 2 groups (Table 1), although patients with NOCAD were older than NCAs ($p < 0.001$).

Conclusions. In our study there were no differences in clinical and ECG-EST-derived parameters between NOCAD and NCAs.

	NOCAD (n=120)	NCAs (n= 192)	P value
Age	61.8 ± 12.02	66.4 ± 10.02	p=0.001
Basal heart rate	76.1 ± 13.2	75.2 ± 13.69	p=0.566
Basal SBP	129.67 ± 14.92	129.79 ± 14.11	p=0.941
Basal DBP	79.21 ± 9.28	78.69 ± 8.22	p=0.399
EST duration (min)	438.40 ± 148.14	439.44 ± 159.41	p=0.954
HR peak	142.32 ± 22.11	138.14 ± 18.94	p=0.076
%HR max	89.51 ± 12.59	89.82 ± 12.84	p=0.831
Peak SBP	165.75 ± 27.93	168.98 ± 25.27	p=0.293
Peak DBP	90.67 ± 15.01	89.17 ± 11.19	p=0.314
Positive EST	79 (65.8%)	124 (64.9%)	p=0.903
STD ≥ 5 leads	5 (4.2%)	5 (2.6%)	p=0.517
EST-induced angina	18 (15%)	17 (8.9%)	p=0.1
Negative EST and EST duration ≥ 12 min	5 (4.2%)	12 (6.3%)	p=0.609
Negative and Maximal EST	21 (17.5%)	36 (18.8%)	p=0.881

Table 1

CARDIOPATIA ISCHEMICA 114 MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) RIANIMAZIONE CARDIOPOLMONARE (ASSISTENZA CARDIACA IN ACUTO) INFARTO STEMI (CARDIOPATIA ISCHEMICA)

SIGNIFICANCE OF ST-SEGMENT ELEVATION AFTER THE RETURN OF SPONTANEOUS CIRCULATION (ROSC) IN OUT OF HOSPITAL CARDIAC ARREST (OHCA) PATIENTS. IT'S NOT ONLY A MATTER OF DIAGNOSIS

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(a) UNIVERSITA DI PAVIA; (b) IRCCS POLICLINICO SAN MATTEO DI PAVIA

Purpose of the study. Guidelines recommend performing a 12-lead electrocardiogram (ECG) after ROSC in OHCA patients and an urgent coronary angiography in case of ST-segment elevation myocardial infarction (STEMI). The aim of this study is to investigate whether the presence and morphology of ST-elevation may have, besides the known diagnostic role, also a prognostic role in post-resuscitation care.

Materials and methods. We collected 12-lead post-ROSC ECGs available from 01/01/2015 to 12/31/2023 in the OHCA registry of LombardiaCARE. ECGs were independently evaluated by two cardiologists. The diagnosis of STEMI was made according to ESC guidelines. According to literature, ST-elevation was classified by morphology (Figure 1). Univariable and

multivariable Cox regression models were run to test the association between independent variables with 30-day mortality.

Results. Among 1134 post-ROSC ECGs, 490 (43.7%) were diagnostic for STEMI (341 classic, 61 tombstone, 32 lambda, 46 triangular, 10 wave). Patients with STEMI were younger [67 years old (IQR 57-76) vs 71 (IQR 61-80), $p < 0.001$], with more frequently shockable rhythm at presentation (73% vs 37%, $p < 0.001$) and witnessed event by the emergency medical service (29% vs 20%, $p = 0.003$). Considering the 195 STEMI who underwent coronary angiography, the rate of false positive in non-classic ST-elevation morphologies was significantly less than in the classic pattern (23% vs 6%, $p = 0.016$). None of the non-classic morphologies was associated

ST-SEGMENT ELEVATION MORPHOLOGY

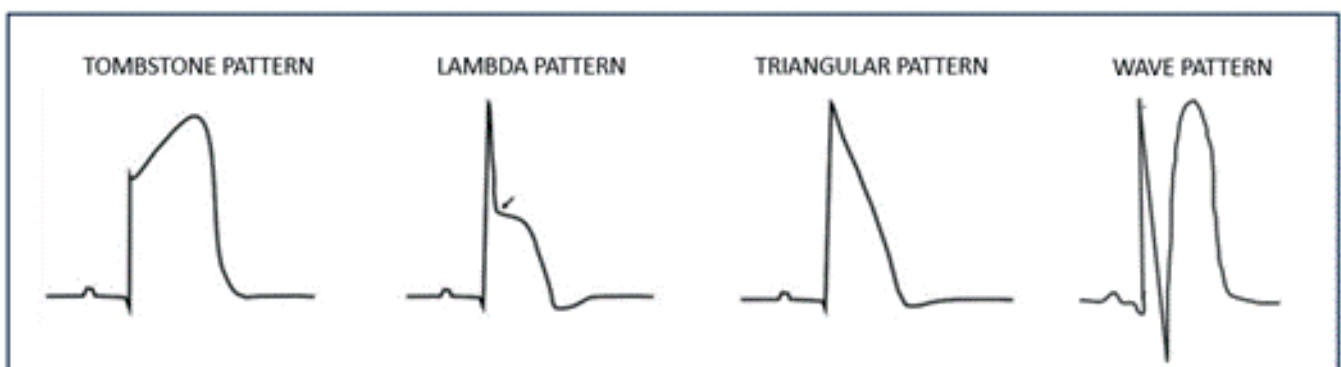
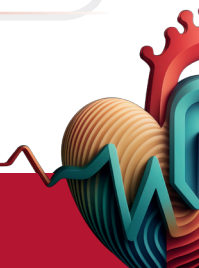


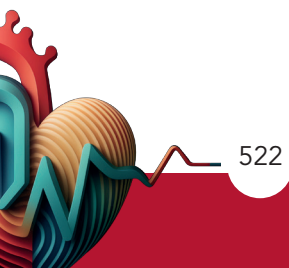
Figura 1



with 30-day mortality, when compared with the classic ST-elevation.

At multivariate analysis, STEMI wasn't associated with 30-day mortality (HR. 0.74 (95% CI: 0.49- 1.58); $p=0.231$), whereas the number of segments with ST-elevation was significantly associated with a worse prognosis [HR. 1.3 (95% CI: 1.03-1.66), $p=0.027$].

Conclusions. Besides the known diagnostic role, the post-ROSC ECG also has a prognostic role in predicting 30-day survival in OHCA patients according to the number of segments with ST- elevation and the number of false positive ECG findings for STEMI may be reduced by an accurate analysis of the post-ROSC ECG.



CARDIOPATIA ISCHEMICA 227

DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA) ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

POLIMORFISMI GENETICI E RUOLO NEL CROSS-TALK METABOLICO TRA ENOS E K-ATP NELLA CARDIOPATIA ISCHEMICA

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Introduzione: La cardiopatia ischemica è classicamente associata alla malattia coronarica. Tuttavia, recenti studi hanno documentato una stretta correlazione tra la cardiopatia ischemica e la disfunzione del microcircolo, indipendentemente dalla presenza di malattia delle coronarie epicardiche. Alla base dei meccanismi fisiologici del funzionamento microvascolare ritroviamo i canali ionici, effettori finali della regolazione del flusso sanguigno coronarico, e altri importanti pathway molecolari. È stato documentato come alcune varianti genetiche di questi complessi proteici influenzino la suscettibilità a sviluppare la cardiopatia ischemica, tramite alterazioni della normale regolazione del flusso ematico, inducendo una maggiore o minore predisposizione allo sviluppo della cardiopatia ischemica.

Obiettivo dello studio: L'obiettivo di questo studio è quello di analizzare l'associazione tra i polimorfismi a singolo nucleotide (SNPs) dei geni che codificano per proteine coinvolte nella regolazione del flusso sanguigno coronarico e la cardiopatia ischemica.

Materiali e metodi: Un totale di 468 pazienti consecutivi è stato arruolato e diviso in tre gruppi in base ai ri-

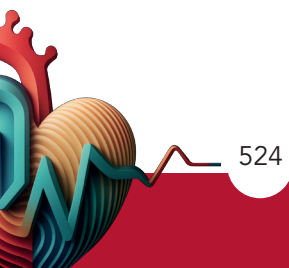
sultati dell'angiografia coronarica e dei test funzionali intracoronarici: G1, pazienti con malattia coronarica; G2, pazienti con disfunzione microvascolare coronarica; G3, pazienti con arterie coronariche normali sia angiograficamente che funzionalmente. È stata eseguita un'analisi genetica dei polimorfismi a singolo nucleotide rs5215 del gene del canale del potassio rettificante interno della famiglia J membro 11 (KCNJ11) e rs1799983 del gene della sintasi dell'ossido nitrico 3 (NOS3), che codificano rispettivamente per la subunità Kir6.2 dei canali del potassio sensibili all'ATP (KATP) e per la sintasi dell'ossido nitrico (eNOS), su campioni di sangue periferico intero.

Risultati: È stata rilevata un'associazione significativa dei polimorfismi rs5215_G/G di KCNJ11 e rs1799983_T/T di NOS3 nei controlli sani rispetto ai pazienti con malattia coronarica e disfunzione microvascolare coronarica. All'analisi multivariata, la co-presenza di rs5215_G/G di KCNJ11 e rs1799983_T/T di NOS3 potrebbe rappresentare un fattore protettivo contro la cardiopatia ischemica, indipendentemente dalla presenza di fattori di rischio cardiovascolare.



Conclusioni: I nostri risultati supportano l'idea che la genetica possa giocare un ruolo chiave nella suscettibilità alla cardiopatia ischemica. Inoltre, questo studio supporta l'ipotesi che l'associazione dei polimorfismi studiati possa influenzare il crosstalk tra il pathway

dell'ossido nitrico e l'attività del canale KATP coronarico, contribuendo alla regolazione positiva del flusso ematico coronarico e fornendo un potenziale effetto protettivo contro la cardiopatia ischemica.



CARDIOPATIA ISCHEMICA 254
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

AN UNEXPECTED CASE OF SPONTANEOUS CHEST WALL HEMATOMA SECONDARY DUAL ANTIPLATELET THERAPY

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(a) UNIVERSITA' DEGLI STUDI DI BARI "ALDO MORO"

Case presentation: a 70-year-old man presented to our ED with worsening dyspnoea, coughs and chest pain. His conventional risk factors were hypertension, dyslipidemia, type-2-dyabtes mellitus, past smoking habits and family history of coronary artery disease (CAD). His comorbidities consisted of COPD exacerbations with reactive thrombocytosis and IgG/lambda MGUS. He denied history of major bleeding, blood transfusions nor pathological fractures. Suspecting ACS, an invasive coronary angiography (ICA) was performed with evidence of triple vessel CAD and stenting of the LAD and of the Cx-MO bifurcation. Dual antiplatelet therapy (DAPT) with aspirin and ticagrelor was immediately started. Subsequently, the patient underwent staged PCI of the PDA and mid RCA. Unexpectedly, on the 7th day of hospitalization, our patient re-experienced acute chest discomfort associated with shortness of breath, marked hypotension and ST-segment elevation in inferior leads as ECG finding. Urgent ICA, now, revealed patency of infarct-related arteries without new coronary artery lesions. Lab tests reported no Hs-cTnI elevation, but a sudden 4,3 g/dL- hemoglobin (Hb) drop. After ICA, the patient started complaining of right-sided back pain, exacerbated by movement of the right upper limb. Clinical examination revealed a tender and painful swelling in the right posterior chest wall not present before. In order to assess the cause of the sudden severe hemoglobin loss, we decided to immediately perform a CT-scan, that showed a 14 x

18 cm inhomogeneous soft tissue blood storage in the right posterior chest wall. After contrast agent administration, no signs of hyperechogenic spot in the arterial phase were detected. Therefore, the patient was managed conservatively with analgesia and blood transfusion. Furthermore, according to ESC Guidelines, we promptly discontinued one antiplatelet drug, continuing SAPT with ticagrelor 90 mg bid. During the following two days, the patient was given additional blood transfusions due



Figure 1



to persistent anaemia and hematoma expansion. We accurately investigated a possible bleeding cause, but the patient denied any trauma nor strenuous exertion. Moreover, coagulation laboratory and genetic tests were normal except for reactive thrombocytosis, thus supporting a spontaneous aetiology of the hematoma. No more episodes of chest pain nor dyspnoea were reported in the following days. The hematoma started to self-adsorb and to move down the chest wall (for effect of gravity force).

Comment: according to ESC guidelines, DAPT is recommended for 12 months after PCI in ACS

patients unless there are contraindications such as high bleeding risk. Only a small number of cases of spontaneous hematomas associated with antiplatelet agents have been described in literature, even less with documented reactive thrombocytosis. Particularly, in our case, it occurred in an in-patient setting without evidence of precipitating factors, trauma nor strenuous exertion, thus making it a diagnostic challenge. In this life-threatening scenario worsened by severe Hb drops and requiring blood transfusions, we decided to stop aspirin and continue SAPT with Ticagrelor 90 mg bis in die. Fortunately, the patient improved and clinically stabilized within few days of the discontinuing DAPT.



CARDIOPATIA ISCHEMICA 143
SHOCK CARDIogeno (ASSISTENZA CARDIACA IN ACUTO)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)

ASSE CERVELLO-CUORE: SHOCK CARDIogeno SECONDARIO A REVERSE TAKOTSUBO IN SOSPETTA MALATTIA DEMIELINIZZANTE, CAUSA O COINCIDENZA?

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(a) UNITÀ CORONARICA - AZIENDA OSPEDALE UNIVERSITÀ DI PADOVA

La sindrome di takotsubo (TTS) è una patologia transitoria del muscolo cardiaco nella cui patogenesi il sistema nervoso simpatico sembra svolgere un ruolo centrale, per un effetto di tossicità catecolaminergica diretta sui cardiomiociti, solitamente elicitato da uno stress fisico o emotivo, determinante disfunzione ventricolare sinistra transitoria, con un tipico pattern, nella sua forma più comune, definito di "apical ballooning".

In circa il 2,2% dei casi la TTS si presenta, tuttavia, in una forma reverse, in cui le anomalie di cinesi risultano invertite (acinesia dei segmenti medio-basali ed ipercinesia apicale).

Riporto qui il caso di una paziente di 27 anni che ha sviluppato uno shock cardiogeno secondario ad una reverse takotsubo nel setting di una sospetta patologia infiammatoria del sistema nervoso centrale. La paziente, con anamnesi positiva per cefalea, accedeva in PS per comparsa di sintomatologia cefalgica a seguito dell'aver appreso l'esito di una risonanza cerebrale positiva per il sospetto di patologia demielinizzante. In PS si assisteva a rapido deterioramento delle condizioni cliniche della paziente con sviluppo di edema polmonare acuto ed ipotensione marcata, associati a contrazione della diuresi ed incremento dei lattati fino ad 8 mmol/l. Agli esami ematochimici da segnalare un rialzo della TnI fino ad un picco di 10.000 ng/L.

Alla luce di tale quadro la paziente veniva ricoverata presso la nostra UTIC, dove veniva sottoposta a

NIV e supportata con dobutamina e noradrenalina. Ad un ecocardiogramma transtoracico si evidenziava una severa riduzione della frazione d'eiezione ventricolare sinistra (FE 23%) con alterazioni della cinetica compatibili con reverse takotsubo. Sospetto confermato all'esame ventricolo-coronarografico che escludeva lesioni coronariche e descriveva un ventricolo sinistro non dilatato con severa riduzione della funzione sistolica complessiva per acinesia della parete basale anteriore, anterolaterale, basale posteriore e diaframmatica in presenza di ipercinesia dell'apice. Ad una risonanza magnetica cardiaca eseguita a distanza di 5 giorni si evidenziava edema miocardico ai segmenti medio-basali nelle sequenze T2 pesate, non segni di LGE e parziale recupero della funzione ventricolare sinistra (LVFE 40%).

Nelle giornate successive, si assisteva ad un rapido miglioramento della clinica nonché una risoluzione delle alterazioni della cinetica segmentaria all'imaging transtoracico.

La reverse takotsubo rappresenta una rara variante della TTS, colpisce prevalentemente soggetti giovani, di sesso femminile e correla con una prognosi migliore rispetto alla variante classica. Alcuni case reports hanno evidenziato una correlazione tra questa variante di TTS e malattie infiammatorie del SNC, suggerendo la possibilità di meccanismi fisiopatologici, alla sua base, che coinvolgano l'asse cervello-cuore.



CARDIOPATIA ISCHEMICA 542 INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA)

ANGIOPLASTICA CON PALLONE MEDICATO PER IL TRATTAMENTO DI LESIONI DE NOVO IN GRANDI VASI: METANALISI DELLA LETTERATURA

Francesco Giangiacomi (a), Cecilia Gobbi (b), Guido Pasero (a), Elisa Gherbesi (b), Andrea Faggiano (a), Lucia Barbieri (b), Gabriele Tumminello (b), Federico Colombo (b), Luca Mircoli (b), Stefano Carugo (a, b)
(a) DIPARTIMENTO DI SCIENZA CLINICHE E DI COMUNITÀ, UNIVERSITÀ DEGLI STUDI DI MILANO;
(b) DIPARTIMENTO AREA CARDIO-TORACO-VASCOLARE,
FONDAZIONE IRCCS CA' GRANDA OSPEDALE MAGGIORE POLICLINICO DI MILANO

Introduzione. L'utilizzo dei palloni a rilascio di farmaco (drug eluting balloons, DEB) per il trattamento di lesioni de novo in vasi di grande calibro rappresenta una strategia promettente al fine di ridurre il tasso di complicanze a lungo termine legate all'impianto di stent medicati (drug eluting stent, DES). Tuttavia, l'evidenza scientifica a riguardo è ancora limitata. La presente metanalisi ha l'obiettivo di descrivere gli outcome dell'angioplastica con DEB nel trattamento di lesioni de novo di vasi di grosso calibro, indipendente dalla presentazione cronica o acuta. Inoltre, abbiamo condotto una metanalisi per confrontare i risultati dell'angioplastica con DEB e con stent medicati negli studi con gruppo di controllo raccolti.

Metodi. Abbiamo condotto una revisione sistematica della letteratura ed una metanalisi in conformità ai criteri delle linee guida PRISMA. I database PubMed, OVID-MEDLINE e Cochrane library sono stati analizzati ricercando gli articoli pubblicati fino al 30 novembre 2023. Sono stati utilizzati i termini: "drug coated balloon", "drug eluting balloon" e "large vessels". Abbiamo incluso registri prospettici e retrospettivi, studi caso-controllo con propensity-score matching e trial clinici. I criteri di inclusione sono stati: 1) lesioni de novo, 2) diametro di riferimento del vaso > 2,75 mm, 3) trattamento con DEB della lesione target. Abbiamo scelto come outcome primario la rivascolarizzazione della lesione target (tar-

get lesion revascularization, TLR), e come outcome secondari la morte per cause cardiovascolari (CVM), e l'infarto miocardico (MI). Le analisi sono state condotte con il programma Comprehensive Meta-Analysis Version 2 (Biostat, Englewood, NJ). Per descrivere le incidenze medie degli outcome, i risultati sono espressi come tassi di eventi. Per confrontare le incidenze degli outcome nei pazienti trattati con DEB e con stent medicati, i risultati sono espressi come odds ratios (ORs) con un intervallo di confidenza (CI) del 95%.

Risultati. La metanalisi ha incluso un totale di 3988 pazienti da 15 studi. Le caratteristiche cliniche ed angiografiche erano: età 62 ± 1.4 anni, sesso maschile 80.2%, diametro di riferimento del vaso 3.24 ± 0.09 mm, lunghezza della lesione 24.4 ± 2 mm e bailout stenting 7.1%. Dopo un follow-up medio di 24.9 ± 7.6 mesi, l'incidenza di TLR nel gruppo di pazienti trattati con DEB ($n=2114$, dati da 5 studi) è risultata del 4%, mentre l'incidenza di MI del 5.7% e di CVM del 3.5%.

In nove studi controllati sono stati confrontati un totale di 1356 pazienti trattati con DEB contro 1874 pazienti trattati con DES. Dopo un follow-up medio di 29.1 ± 8.1 mesi, l'incidenza di TLR non ha raggiunto una differenza statisticamente significativa tra i due gruppi, con una tendenza in favore dei pazienti trattati con pallone medicato (4.3% vs 6.9%, OR 0.71, CI 0.497-1.013, $p=0.059$). Per quanto ri-

guarda gli outcome secondari, non sono state osservate differenze significative tra i due gruppi: MI 6.4% nel gruppo trattato con DEB contro 5.9% nel gruppo trattato con DES (OR 1.08, CI 0.779-1.494, $p=0.649$); CVM 4% vs 4.7% (OR 0.9, CI 0.618-1.334, $p=0.622$).

Conclusioni. La nostra metanalisi suggerisce che il trattamento con pallone medicato di lesioni de novo in vasi di ampio calibro è sicura ed efficace sia nel contesto delle sindromi coronariche croniche che acute, con una incidenza di eventi clinici simile a quella osservata nei pazienti trattati con stent medicato.



**CARDIOPATIA ISCHEMICA 678
 INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
 PLACCA VULNERABILE (ATEROTROMBOSI)
 DIAGNOSTICA INVASIVA INTRAVASCOLARE
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
 FISILOGIA CORONARICA
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
 CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)**

INTEGRATED ASSESSMENT OF CORONARY PHYSIOLOGY AND PLAQUE VULNERABILITY BASE ON CORONARY ANGIOGRAPHY IN HEART TRANSPLANTED PATIENTS

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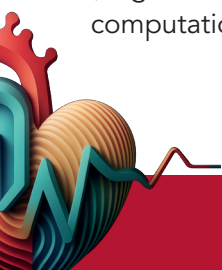
Introduction: Cardiac allograft vasculopathy (CAV) refers to an accelerated form of coronary artery disease that represents the primary cause of mortality and morbidity in heart transplant (HTx) patients. The diffuse nature of the pathology makes it difficult to detect in its early stages using conventional methods such as angiography, while the use of intracoronary imaging is flawed by technical and economic issues. The recent development of computational techniques derived from angiography to interpret plaque physiology and vulnerability could allow for the early identification of lesions at higher risk of adverse events in early phases of this disease.

Methods: The primary objective of our study is to evaluate whether the combined use of Radial Wall Strain (RWS), an index capable of defining plaque vulnerability, and Murray's law-based Quantitative Flow Ratio (μ FR), an index capable of interpreting the epicardial coronary flow reserve, both derived from angiography, can improve risk stratification in vessels without angiographically significant disease in heart transplant patients.

Our study cohort included 86 HTx patients (200 epicardial vessels) without significant CAD at baseline (degree of stenosis <50%), for whom μ FR and RWS computation was feasible on 286 coronary segments.

Plaque vulnerability was defined as a RWS value $\geq 13\%$, while coronary ischaemia as a μ FR ≤ 0.80 , as previously validated. Clinical events were assessed at a median clinical follow-up of 43 [23-66] months. The primary endpoint of the study was to assess the interaction between plaque vulnerability (RWS $\geq 13\%$) and the occurrence of target vessel failure (TVF), defined as the incidence of cardiac death, target-vessel myocardial infarction, silent vessel progression (degree of stenosis $\geq 50\%$) at the elective angiographic follow-up and target vessel revascularization.

Results: At baseline, the mean μ FR value was 0.94 ± 0.08 , with 15 segments (5.2%) considered flow-limiting (μ FR ≤ 0.80), while the RWS value was $13.4 \pm 4.9\%$, with 71 segments (24.8%) considered at high risk (RWS $\geq 13\%$). At follow-up, TVF occurred in 47 cases (16.4%). TVF-related segments were associated with lower mean μ FR values (0.89 ± 0.14 vs. 0.95 ± 0.05 ; $p < 0.007$) and higher RWS values (16.4 ± 8.7 vs. 11.8 ± 0.8 ; $p < 0.001$) compared TVF-free segments. At a per-vessel analysis a RWS value $\geq 13\%$ showed a significant interaction with TVF occurrence at 43 months (40.8% vs. 8.3%; HR 5.577; 95% CI 2.726-11.407; $p < 0.001$). At the receiver operating characteristic curve (ROC) a RWS value $\geq 13\%$ demonstrated an area under the curve (AUC) of 0.658 (95% CI 0.600- 0.713;



$p=0.003$) in predicting TVF occurrence, with a sensitivity of 55.3% (95% CI 40.1-69.8), a specificity of 86.5% (95% CI 81.5-90.6), a positive predictive value of 78.4% (95% CI 68.7-86.2), and a negative predictive value of 68.6% (95% CI 61.5-75.1).

Conclusions: In our original study, we demonstrated that the combined use of RWS and μ FR could improve the risk stratification of angiographically non-significant lesions in HTx patients.



CARDIOPATIA ISCHEMICA 813
FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO
(IPERTENSIONE ARTERIOSA)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

**STRESS MENTALE E VALUTAZIONE ECOCARDIOGRAFICA IN PAZIENTI CON MALATTIA CORONARICA:
DATI PRELIMINARI DELLO STUDIO ACS STRESS- ACTION**

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(a) AZIENDA OSPEDALIERO UNIVERSITARIA DI PARMA, DIPARTIMENTO DI CARDIOLOGIA

Introduzione: La malattia cardiovascolare (CV) è un importante fattore di morbilità e mortalità in tutto il mondo. Nonostante un'ampia scelta di strategie preventive secondarie, persiste un elevato rischio residuo.

Di conseguenza, una crescente attenzione è stata recentemente rivolta ai fattori di rischio non tradizionali, come lo stress mentale cronico. Un eccesso di cortisolo, che caratterizza l'esposizione allo stress, è infatti associato ad effetti avversi sul sistema CV e a rimodellamento negativo del ventricolo sinistro (LV).

Materiali e Metodi: Tra i pazienti arruolati nello studio STRESS-ACS ACTION presso l'Unità Operativa di Cardiologia dell'Azienda Ospedaliero Universitaria di Parma, Dipartimento di Cardiologia, sono stati considerati per la presente analisi quelli ammessi per sindrome coronarica acuta (SCA) di tipo 1 o sindrome coronarica cronica (SCC).

Campioni di sangue, urine e capelli sono stati raccolti da ciascun paziente, insieme a dati anamnestici, dati di laboratorio e parametri ecocardiografici. Sono state analizzate le caratteristiche basali della popolazione per presentazione clinica ed in base alla mediana di HC. Inoltre, sono stati misurati ecocardiograficamente i parametri della geometria del ventricolo sinistro come lo spessore relativo della parete (RWT) e l'indice di massa ventricolare sinistra (LVMi).

Risultati: Per il presente studio sono stati reclutati un

totale di 119 individui: 90 pazienti con SCA di tipo 1 e 29 pazienti con SCC. Il livello medio di HC era 3,5 ng/g. Nella popolazione di insieme, 61 pazienti avevano livelli di HC < 3,5 ng/g e 57 pazienti avevano livelli di HC > 3,5 ng/g.

Abbiamo rilevato un significativo aumento dei livelli di HC in base alla gravità della presentazione clinica, infatti la concentrazione media di HC per i pazienti con STEMI è di 4,5 ng/g (DS 16.0), rispetto a 3,9 ng/g (DS 9.6) per il gruppo NSTEMI e a 2,5 ng/g (DS 2.5) per il gruppo SCC (p for trend=0.001). Inoltre, nel gruppo di pazienti con HC più elevato, è stata riscontrata una prevalenza maggiore di fattori di rischio CV.

Nel gruppo SCA rispetto al gruppo SCC per i livelli di proteina C-reattiva (PCR) (29,4 40,9 mg/L vs. 2,3 1,9 mg/L p = 0,016).

Per quanto riguarda i parametri ecocardiografici, si è riscontrato un significativo aumento del RWT nei pazienti con livelli di HC maggiori (44.0 7.4 vs. 42.5 7.9, p = 0.03), mentre il LVMi era numericamente inferiore (95.8 21.0 g/ m² vs. 96.4 20.8 g/m², p = 0.11).

Conclusioni: Nel presente studio abbiamo rilevato un trend significativo verso un aumento dei livelli di HC, in base alla severità della presentazione clinica, con livelli più bassi nei pazienti con SCC e livelli progressivamente più alti nei pazienti con NSTEMI e STEMI. I pazienti con livelli più elevati di HC presentavano un incremento significativo dei marcatori di infiammazione e di

fattori di rischio CV. Inoltre, concentrazioni più elevate di HC esprimevano una tendenza verso un rimodellamento concentrico negativo del ventricolo sinistro, con una correlazione significativa tra incremento di HC ed incremento del RWT ($p = 0.02$).

Di conseguenza, HC può essere un biomarcatore uti-

le per identificare quei pazienti a rischio CV elevato, che potrebbero beneficiare dell'attuazione di misure preventive secondarie aggressive, tra cui strategie per gestire lo stress mentale e la creazione di un piano di gestione olistico per migliorare la prognosi a lungo termine.



**CARDIOPATIA ISCHEMICA 922
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
ANGINA INSTABILE (CARDIOPATIA ISCHEMICA)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

CORONAROPATIA COMPLESSA IN PAZIENTE CON SEVERA DISFUNZIONE SISTOLICA

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(a) AORN A CARDARELLI

Il caso clinico si riferisce ad un uomo di 65 anni affetto presso la nostra UTIC con diagnosi di angina instabile già sottoposta a pregressa rivascolarizzazione percutanea. In anamnesi fumo ed ipertensione arteriosa sistemica. All'esame ecocardiografico evidenza di severa disfunzione sistolica (FE 25%) per acinesia e fibrosi della parete inferiore, dell'apice in toto e della parete anteriore in toto. All'esame coronarografico evidenza di occlusione cronica totale intrastent di coronaria destra ed arteria interventricolare anteriore al tratto prossimale, e restenosi critica sub occlusiva intrastent del ramo circonflesso (last remaining vessel). In attesa di stabilire il più corretto iter terapeutico viene praticata PET che mostra assenza di vitalità nei segmenti acinetici e fibrotici. Dopo Heart team e counseling con paziente che esprime assoluta volontà di non sottoporsi ad intervento cardochirurgico si programma procedura di angioplastica protetta con sistema di assistenza ven-

tricolare percutaneo tipo IVAC 2L (pompa pulsante). Dopo aver posizionato in ventricolo sinistro, via arteria femorale destra sistema IVAC2L, si procede attraverso accesso arterioso radiale destro ad angioplastica di stenosi critica sub occlusiva intrastent di ramo circonflesso ed impianto di stent medicati del tronco comune verso ramo circonflesso distale in parziale overlap tra loro. L'emostasi femorale destra viene ottenuta mediante utilizzo di sistema di chiusura MANTA.

Il trattamento della coronaropatia complessa con utilizzo di sistemi di assistenza ventricolare permette un miglior outcome intraprocedurale nel paziente ad alto rischio di decadimento emodinamico (CHIP)

Il maggiore utilizzo di sistemi di assistenza ventricolare percutanei consentirà di eseguire procedure ad alta complessità in pazienti CHIP.



CARDIOPATIA ISCHEMICA 706 INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

AN NSTEMI WITH ONE TOO MANY RED FLAGS

Elisa Soranzo (a, b), Laura Munaretto (a, b), Rosa Pecoraro (b), Alessio Della Mattia (b), Andrea Sante Pascotto (b), Daniela Pavan (b), Gianfranco Sinagra (a)

(a) AZIENDA SANITARIA UNIVERSITARIA GIULIANO ISONTINA, DIPARTIMENTO CARDIO-TORACO-VASCOLARE, TRIESTE, ITALIA; (b) AZIENDA SANITARIA FRIULI OCCIDENTALE, S. C. CARDIOLOGIA, PORDENONE, ITALIA

Case report: 45-year-old man with no prior cardiac history presented with exertional angina, dyspnoea, and dizziness. EKG showed first-degree AV block (AVB I) and right bundle branch block (RBBB). A stress test revealed a 2:1 AVB without inducible ischemia. Later he was admitted for NSTEMI.

Coronary angiography showed a localized critical stenosis in the mid-distal right coronary artery, treated successfully, with otherwise clear arteries.

Advanced AVB persisted for over five days post-revascularization. After excluding infectious and infiltrative causes, a PM device was implanted. Post-discharge MRI showed biventricular dysfunction (LVEF 36%, RVEF 28%) and extensive patchy transmural and subepicardial late gadolinium enhancement (LGE) mainly in the basal antero-septum extending to the infero-septum, basal and apical inferior wall, basal anterior and antero-lateral wall, involving also most of the RV. Accordingly, PET-CT demonstrated FDG accumulation consistent with the MRI locations. Pending endomyocardial biopsy results, findings strongly suggest sarcoidosis.

Discussion: This clinical case is notable for its unusual presentation, initially resembling acute coronary syndrome but revealing inconsistencies. The atrioventricular block observed is not justified by the extent, severity, or location of the coronary artery disease, which persisted despite percutaneous treatment. Moreover, the axiom of a young patient



Figure 1

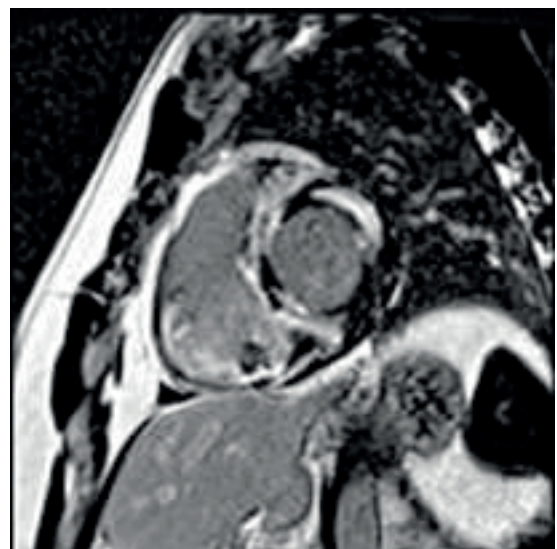
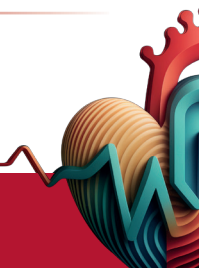


Figure 2



with advanced block should always raise suspicion of a non-ischemic aetiology, even if common sarcoidosis associated biomarkers (ACE and 24-hour urinary calcium) are negative, due to their low sensitivity and specificity (22-86% and 54-95%, respectively). Although sarcoidosis is a rare disease, with a global prevalence ranging from 1-5 cases per 100,000 in East Asian countries to 140-160 cases per 100,000 in Northern European countries, clinical and instrumental red flags such as advanced BAV in young patients, RBBB, extensive biventricular LGE wildly affecting the RV as well, must warrant suspicion. Comprehensive evaluation with advanced imaging techniques, particularly magnetic resonance imaging (MRI) and PET-CT, is essential for accurate diagnosis.

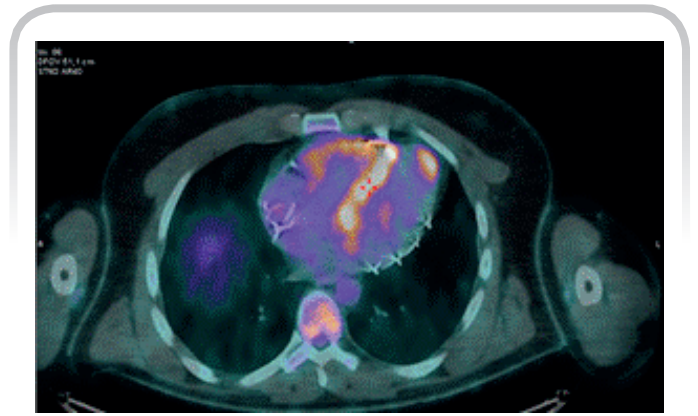


Figure 3

CARDIOPATIA ISCHEMICA 80 INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA) PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

EFFICACY AND SAFETY OF P2Y12 MONOTHERAPY VS STANDARD DAPT IN PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION: META- ANALYSIS OF RANDOMIZED TRIALS

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Background: Dual antiplatelet therapy (DAPT) is the cornerstone in patients with coronary artery disease (CAD) undergoing percutaneous coronary intervention (PCI) with the scope of treating or preventing atherothrombotic events. The need to balance the thrombotic risk, particularly during the first month after drug-eluting stent (DES) implantation, with the concurrent bleeding risk of the patient, has led to the development of different and personalised antithrombotic therapy strategies. Recently, trials have suggested that monotherapy with P2Y12 inhibitors and discontinuing aspirin after a short course of DAPT might be a promising option. However, these studies were not specifically designed to evaluate individual endpoints. Moreover, the question of whether the particular P2Y12 inhibitor chosen for monotherapy has a distinct influence on safety and efficacy remains a topic of discussion. P2Y12 inhibitors play a crucial role in preventing thrombotic events by inhibiting platelet P2Y12 receptors. Most studies have evaluated the efficacy of DAPT therapy after PCI, and currently only a limited number of trials have evaluated the efficacy of a single P2Y12 inhibitor after P2Y12 inhibitor monotherapy in patients undergoing PCI. Thus, the evaluation of individual outcomes is crucial to ascertain the comparative efficacy and safety of P2Y12 monotherapy versus standard DAPT. We aimed to perform a meta-analysis of randomized controlled trials (RCTs) investigating the clinical outcomes of P2Y12 monotherapy versus standard DAPT.

Methods: Multiple databases were searched. Six RCTs with a total of 24877 patients were included. The primary endpoint was all-cause mortality at 12 months of follow-up. The secondary endpoints were cardiovascular mortality, myocardial infarction, probable or definite stent thrombosis, stroke events, and major bleeding. The study is registered with PROSPERO (CRD42024499529).

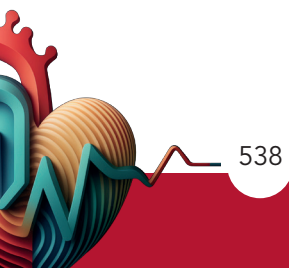
Results: Monotherapy with P2Y12 inhibitor ticagrelor significantly reduced both all-cause mortality (HR 0.71, 95 CI [0.55-0.91], $P = 0.007$) and cardiovascular mortality (HR 0.66, 95% CI [0.49-0.89], $P = 0.006$) compared to standard DAPT. In contrast, clopidogrel monotherapy did not demonstrate a similar reduction. The decrease in mortality associated with ticagrelor was primarily due to a lower risk of major bleeding (HR 0.56, 95% CI [0.43-0.72], $P < 0.001$), while the risk of myocardial infarction (MI) remained unchanged (HR 0.90, 95% CI [0.73-1.11], $P = 0.32$). The risk of stroke was found to be similar across treatments. There were no significant differences in definite or probable stent thrombosis between strategies therapies (HR 0.83 [0.59–1.17], $P=0.57$).

Conclusions: P2Y12 inhibitor monotherapy, specifically with ticagrelor is superior to standard DAPT in reducing both all-cause and cardiovascular mortality. This finding is attributed mainly to the lowered bleeding risk, emphasizing the critical need for a balanced approach



in antithrombotic therapy that weighs anti-ischemic benefits against bleeding hazards. Thus, P2Y12 inhibitor monotherapy, particularly with ticagrelor, is a potentially safe and effective strategy in managing

patients post-PCI at 12 months. Further studies are needed to confirm the long-term efficacy and safety of P2Y12 monotherapy.



CARDIOPATIA ISCHEMICA 449

INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI) ANGINA INSTABILE (CARDIOPATIA ISCHEMICA) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA) DIABETE E MALATTIE CARDIOVASCOLARI (DIABETE E MALATTIE DEL METABOLISMO)

THE URIC ACID TO HDL-C RATIO: A NEW RISK FACTOR IN ACUTE CORONARY SYNDROME?

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Luigi Marotta (a, b), Noemi Mollo (a, b), Rosa Franzese (a, b), Carmine Gentile (a, b), Francesco
S. Loffredo (a, b), Enrica Pezzullo (a), Rossella Stigliani (b), Francesco Ciaramella (a), Rita Boenzi (d),
Filomena Pisacane (d), Paolo Golino (a, b), Giovanni Cimmino (b, c)

(a) CARDIOLOGIA VANVITELLI, OSPEDALE MONALDI, NAPOLI; (b) DIPARTIMENTO DI SCIENZE MEDICHE
TRASLAZIONALI, SEZIONE DI CARDIOLOGIA, UNIVERSITÀ DEGLI STUDI DELLA CAMPANIA LUIGI VANVITELLI,
NAPOLI; (c) CARDIOLOGIA, AOU LUIGI VANVITELLI, NAPOLI; (d) BIOCHIMICA CLINICA,
OSPEDALE MONALDI, NAPOLI

Background: Low levels of high-density lipoprotein cholesterol (HDL-C) are known as prominent risk factors for acute coronary syndrome (ACS). An elevated acid uric to HDL-C ratio, known as UHR, has recently identified as a new marker of inflammation and metabolic syndrome. Glycated hemoglobin (HbA1c) is an important indicator of long-term glycemic control and it is associated with the risk of long-term diabetes complications, including ACS. To date, the relationship between UHR and HbA1c in patients with ACS has not been investigated yet.

Methods: A total of 48 patients with ACS, admitted in the Cardiology Unit of our hospital between January 2024 and June 2024, were retrospectively enrolled in our study. Sex, age, blood levels of uric acid, total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides, uric acid to HDL-C ratio (UHR), C-reactive protein (CRP) and lipoprotein(a) [Lp(a)] were obtained from our database. Linear regression and Principal Component Analysis (PCA) were performed to assess the association between the UHR and HbA1c levels.

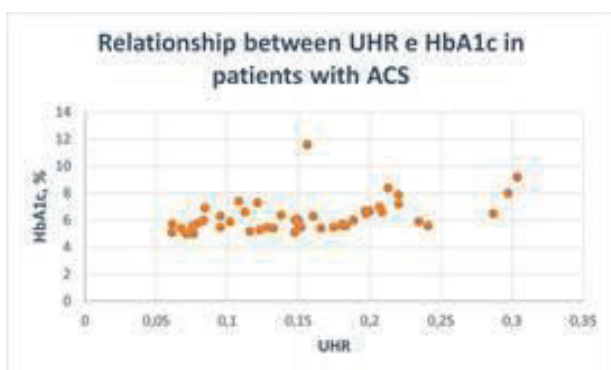


Figure 1

Table 1. Clinical characteristics of the patient cohort.

	All n = 48	Male n = 34 (71%)	Female n = 14 (29%)
Age, yr	67±12	66±12	69±10
UA, mg/dL	5.8±1.6	6.1±1.6	5.2±1.6
HDL-C, mg/dL	41.6±11.4	39.3±9.3	47.1±14.3
UHR	0.152±0.063	0.163±0.056	0.126±0.073
HbA1c, %	6.3±1.2	6.1±0.8	6.8±1.8
CRP, mg/dL	3.1±5.6	3.7±6.4	1.9±2.6
Lp(a), mg/dL	24.9±21.9	29.2±24.5	14.6±1.8
LDL-C, mg/dL	96.4±38.6	92.9±34.4	104.7±47.6
TC, mg/dL	162.3±43.8	156.9±37.1	175.4±56.3
TG, mg/dL	121.5±74.0	12.2±68.5	119.8±88.9

Table 1

Results: The UHR was significantly and directly correlated with HbA1c levels ($r = 0.451$, $p = 0.001$) in patients with ACS, and we observed a stronger correlation in male ($r = 0.516$, $p = 0.002$) than female subjects ($r = 0.646$, $p = 0.01$).

Conclusions: An elevate UHR level could be a new risk factor for acute coronary syndrome, particularly in male subjects, since it has significant association with HbA1c levels.

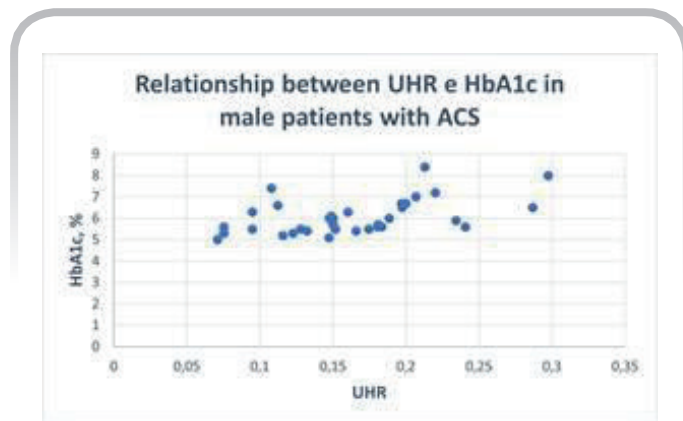


Figure 2

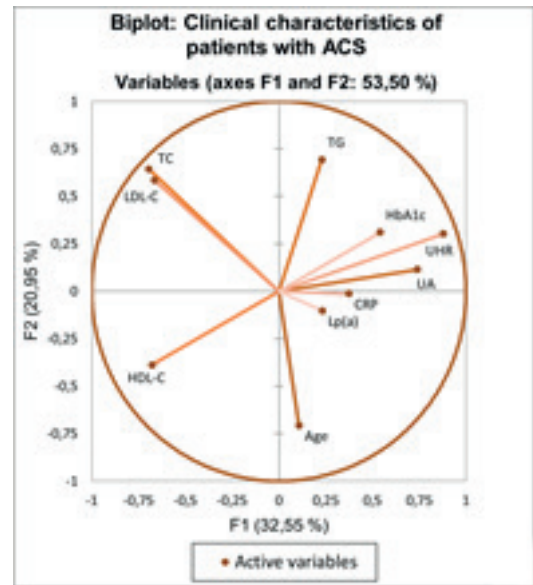


Figure 3

CARDIOPATIA ISCHEMICA 355
ANGINA INSTABILE (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

THE IMPACT OF TRIGLYCERIDE-GLUCOSE (TYG) INDEX ON FUTURE CARDIO AND CEREBROVASCULAR EVENTS IN PATIENTS WITH ACUTE CORONARY SYNDROME, DURING 3 YEARS OF FOLLOW UP

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Background: Triglyceride-glucose (TyG) index is a new alternative insulin resistance (IR) biomarker. The aim of this study was to investigate the prognostic value of the TyG index in patients with acute coronary syndrome (ACS).

Methods: We studied 118 consecutive subjects, 84 males and 34 females, all referred to Unit of Cardiovascular Care for ACS. The TyG index was calculated as $\ln [\text{fasting triglyceride (mg/dL)} \times \text{fasting glucose (mg/dL)} / 2]$. The subjects were divided into tertiles according to TyG index values and we performed a 3 year follow-up study.

We performed a 3 year follow up by telephone or outpatient clinical visit, to estimate the incidence of new cardiovascular or cerebrovascular events (MACCEs), as Angina Pectoris, Acute Myocardial Infarction or Reacute Myocardial Infarction, cardiac failure, coronary revascularization with CABG (Coronary Artery Bypass Grafting) or PTCL (Percutaneous Transluminal Coronary Intervention) and stroke.

Results: We found a significant statistic correlation between HOMA index and TyG index ($p=0.001$).

The incidence of MACCEs increased with TyG index tertiles at a 3-year follow-up. Multivariate Cox hazards regression analysis revealed that the TyG index was an independent predictor of MACCEs (95% CI 1,8158 to 16,8068; $P 0,0026$). The optimal TyG index cut-off for predicting MACCEs was 4,73 (sensitivity 69,1% and specificity 72,2%), with an area under the curve (AUC) of 0.690 (95% CI: 0.593–0.776, $P=0.002$).

Conclusion: The elevated TyG index seems to significantly have an important prognostic role in fact the Tyg index was independently associated with future MACCEs in patients with ACS independently of known cardiovascular risk factors and insulin resistance quantified by HOMA index, therefore the TyG index may be a useful marker for risk stratification and prognosis in patients with ACS



CARDIOPATIA ISCHEMICA 402
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

ROLE OF LATE GADOLINIUM ENHANCEMENT IN TAKOTSUBO SYNDROME AT EARLY CMR

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Background: Takotsubo syndrome (TTS) is an acute and transient heart failure syndrome characterized by a temporary weakening of the left ventricle, usually triggered by emotional or physical stress. Cardiac magnetic resonance (CMR) is a valuable tool for assessing ventricle function, myocardial edema, late gadolinium enhancement (LGE) and complications. To date, the presence and characteristics of LGE in TTS patients are controversial and still under investigation.

Purpose: To evaluate the clinical presentation and the presence of LGE at CMR in patients with Takotsubo Syndrome (TTS).

Methods: In our study we evaluated 128 patients hospitalized with TTS between January 2016 and December 2021 in Italy. Diagnosis of Takotsubo syndrome was based on the international Takotsubo diagnostic criteria (InterTAK Diagnostic Criteria). CMR was performed in 66 patients during hospitalization (mean 7.5 ± 3.7 days). Patients with LGE were categorized as the LGE+ group (n=14), and others formed the LGE- group (n=52).

Results: The mean age was 68.7 ± 11.1 years, with 81% being female. Emotional and physical stress triggers

were reported in 44% and 56% of patients, respectively. CMR confirmed typical apical ballooning in 87% of patients, with only 4.5% exhibiting a midventricular pattern. LGE was present in 21% (LGE+ group) and displayed a patchy distribution, primarily in the lateral (11.9%) and inferior segments (10.4%). Notably, LGE was more frequent in patients experiencing physical stress as a trigger (38.1% vs. 13%; $p=0.04$). While LVEF (mean $55.3 \pm 10.9\%$) did not differ significantly between groups (53 ± 12.3 vs. 43.3 ± 7.7 ; $p=0.06$), the LGE+ group exhibited a trend towards lower values. LGE + group also presented more frequently type 2 diabetes (0% vs. 31%; $p<0.001$), anamnestic high blood pressure (31% vs. 65%; $p=0.02$), and at admission presented ST-segment elevation (15% vs. 44%; $p=0.04$), angina (38% vs. 76%; $p=0.01$), and atrial fibrillation (2.3% vs. 24%; $p=0.01$). Additionally at admission, LGE + population had higher Killip class (Killip > 2: 9% vs. 31%; $p=0.02$), heart rate (83 ± 18 vs. 105 ± 30 ; $p=0.01$), and lower systolic blood pressure (130 ± 20 vs. 100 ± 30 ; $p=0.04$) upon admission. Finally, no differences were found in MACE at follow-up between the groups.

Conclusions: Early CMR is crucial in suspected TTS due to the time-dependent nature of certain parameters and the dynamic alterations that might resolve over



time (such as myocardial edema). In our study patients with LGE at CMR presented with worse hemodynamic compromise and symptoms upon admission. While LGE may be associated with more severe acute myocardial injury, it does not necessarily affect long-

term recovery of heart function. The precise role of LGE in TTS pathophysiology and prognosis remains unclear, but it may be helpful for differentiating TTS from other heart conditions and identifying potentially higher-risk patients.



**CARDIOPATIA ISCHEMICA 471
 DIAGNOSTICA INVASIVA INTRAVASCOLARE
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
 MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
 (CARDIOPATIA ISCHEMICA)
 FISILOGIA CORONARICA
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**THE ROLE OF INVASIVE ASSESSMENT IN DEFINING THE AETIOPATHOGENESIS OF MINOCA:
 INTRACORONARY IMAGING AND CORONARY FUNCTION TESTING**

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Background. The aetiology of Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA) is highly heterogeneous, frequently leading to uncertainties in the diagnostic work-up and therapy. Cardiac magnetic resonance is crucial in MINOCA to exclude alternative diagnosis and stratify prognosis, but invasive techniques are often required to establish the exact pathogenesis.

Purpose. To assess the prevalence of the different pathological mechanisms underlying MINOCA through invasive assessment tools.

Methods. A systematic review of the literature was performed to identify studies addressing the use of intracoronary imaging and coronary functional testing in MINOCA. When more than 2 studies were identified, the pooled prevalence of pathological findings was calculated using a random effects model meta-analysis. Subgroup analysis and meta-regression analysis including the most relevant clinical characteristics were performed to explain heterogeneity.

Results. Five studies reported optical coherence tomography (OCT) pathological findings in MINOCA,

but only four were included in the final analysis due to biases concerns. We found a 62% prevalence [95% CI 44-78%; I²=79%] of acute findings on OCT, including a 47% prevalence of plaque disruption, 6% of lone thrombus, 6% of spontaneous coronary artery dissection, and 2% of eruptive calcified nodule. Some clinical characteristics could explain the heterogeneity: age (residual I²=13%, p<0.001), smoking status (residual I²=46%, p=0.007), diabetes mellitus (residual I²=61%, p=0.034), and dyslipidaemia (residual I²=44%, p=0.007). Furthermore, some studies suggested that patients with an OCT acute finding could suffer from a poorer prognosis. Only 2 studies used intravascular ultrasound (IVUS) in MINOCA, reporting a 38-45% prevalence of plaque disruption. Seven studies analysed the application of invasive vasospasm testing in MINOCA. We calculated a 49% [95% CI 31-67%; I²=95%] of positive tests, with studies using acetylcholine rather than ergonovine showing a higher prevalence of positive results and less heterogeneity, although without reaching significance. Finally, microvascular dysfunction in MINOCA has been non-invasively evaluated by some studies, but only one used the invasive coronary angiography-derived index of microvascular resistance, which resulted abnormal in 51% of patients.



Conclusions. Intravascular imaging is effective to identify the pathological mechanism in MINOCA. Our results show a high prevalence of OCT findings able to explain the acute myocardial injury, whereas IVUS showed a lower prevalence. This may be explained by the lower resolution of IVUS in detecting superficial plaque features. Of note, a high prevalence of positive vasospasm tests was found, suggesting that a prolonged coronary artery spasm could lead to myocardial damage. Lastly, limited data were found on coronary microvascular dysfunction in MINOCA, currently representing a gap in knowledge.

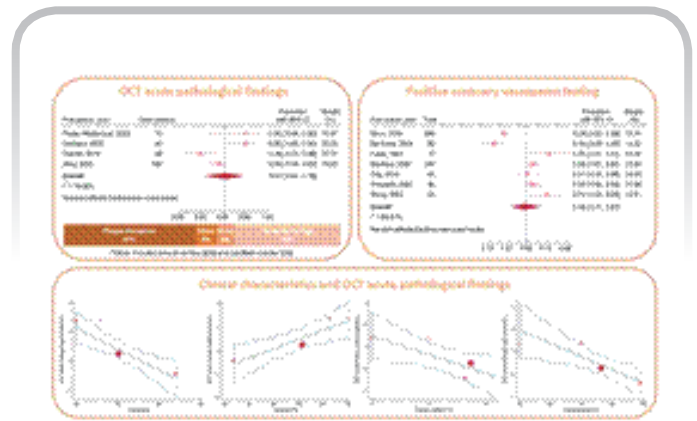


Figure 1



CARDIOPATIA ISCHEMICA 539
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

PROGNOSTIC IMPACT OF THE EXTENT OF CORONARY ARTERY DISEASE IN PATIENT WITH ACUTE TRANSMURAL MYOCARDIAL INFARCTION UNDERGOING COMPLETE PERCUTANEOUS REVASCULARIZATION

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Background: The management of acute myocardial infarction has been revolutionised by the introduction of early coronary angiography and the reperfusion strategies. Recent studies support the standard of care of complete myocardial revascularization in all patients with ST-elevation myocardial infarction (STEMI) without assessing the prognostic role of the extent of coronary artery disease (CAD).

Purpose: To evaluate whether the extent of CAD in patients with STEMI has a prognostic impact independent of complete myocardial revascularization.

Methods: Observational cohort study of 365 patients with STEMI who underwent complete revascularization. For each patient the extent of CAD has been quantified using Gensini Score (GS), which takes into account both the severity and location of the lesions. The primary endpoint of the study was all-cause mortality, while cardiovascular mortality and a composite of major adverse cardiovascular events (MACE: cardiovascular mortality, recurrent acute myocardial infarction or myocardial revascularization and stroke) were defined as secondary endpoints. To assess the prognostic role of GS in predicting all-cause mortality, the area under the curve (AUC) was calculated. The best cut-off was

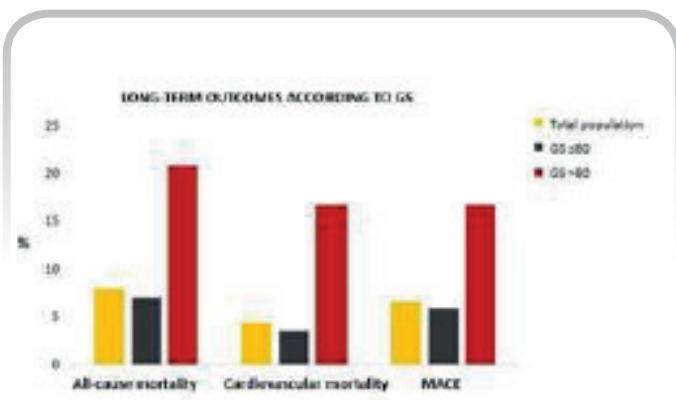


Figure 1

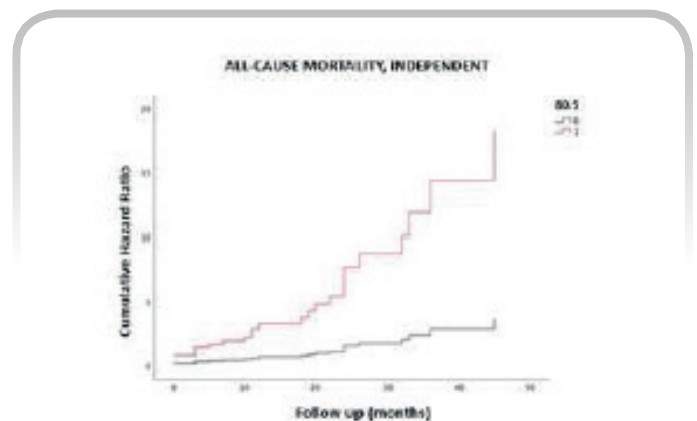


Figure 2

determined as the one that maximized Youden's index (sensitivity + specificity - 1).

Results: Patients with a GS >80, indicating extensive coronary disease, had significantly higher rates of both cardiovascular [4 (16.7%) vs. 12 (3.5%); $p = 0.002$] and all-cause mortality [5 (20.8%) vs. 24 (7%); $p = 0.016$], than those with a GS ≤ 80 . A GS >80 was demonstrated to be an independent predictor of all-cause mortality

[hazard ratio = 5; 95% confidence interval: 1.5-16.8; $p = 0.01$]

Conclusions: The Gensini Score can identify high-risk patients with STEMI who may benefit from more intensive therapies to improve prognosis, although current guidelines do not specify treatment based on the extent of coronary disease.



**CARDIOPATIA ISCHEMICA 508
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

ECG EXERCISE STRESS TEST PREDICTORS OF SEVERE CORONARY ARTERY DISEASE

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(a) UNIVERSITÀ CATTOLICA DEL SACRO CUORE SEDE DI ROMA

Background. Severe coronary artery disease (CAD), defined as three vessel and/or left main (LM) and/or LM-equivalent CAD, heavily affects prognosis of patients with stable angina pain. Thus, its identification/exclusion is an important step in the diagnostic work-up of these patients. In the past decades, several studies demonstrated the utility of electrocardiogram exercise stress test (ECG-EST) for the identification of severe CAD. However, the pre-test probability of CAD of subjects referred for ECG-EST has significantly changed in the last decades. Accordingly, in this study we aimed to assess the predictive value of ECG-EST for the presence/absence of severe CAD in a contemporary population of patients with suspected stable CAD.

Methods. We retrospectively enrolled 763 consecutive patients, referred to our Center between years 2018 and 2023 because of suspected angina chest pain, who underwent both an ECG-EST (standard treadmill Bruce protocol) and invasive coronary angiography (ICA) within 12 months of the ECG-EST). Patients with a history of coronary artery bypass surgery were excluded.

Results. Overall, 125 patients (16.3 %) were found to have severe CAD at ICA (Group 1). Non-severe CAD (1 or 2-vessel, other than LM-equivalent, CAD) was found

in 327 patients (42.9%) (Group 2); while 311 patients (40.8%) showed no obstructive coronary lesions (Group 3). A positive ECG-EST was found in 109 patients (87.2%) of Group 1, compared to 226 (69.1%) and 203 (65.3%) patients of Group 2 and 3, respectively ($p < 0.001$). A higher proportion of Group 1 patients reported EST-induced angina, compared to the other 2 groups (23.2% vs. 16.5% vs. 11.2%; $p = 0.006$). A large extension of myocardial ischemia, as indicated by a number of ECG leads with EST-induced ST-segment depression (STD) ≥ 5 , was found in 23.2% Group 1 patients and 10.4% of Group 2, but in only 3.2% of Groups 3 patients ($p < 0.001$).

No patient with a negative ECG-EST and EST duration > 9 minutes ($n = 34$) had severe CAD. On the other hand, among patients with a negative test who achieved 85% of maximal heart rate predicted for age ($n = 100$ patients; 13.1% of the population), severe CAD was present in 6% only, compared to 37% and 57% of Group 2 and Group 3 patients ($p < 0.001$).

Conclusions. Our data indicate that ECG-EST continues to be a valuable tool for predicting the presence/absence of severe CAD in contemporary populations of patients with angina chest pain suspected for obstructive CAD.



**CARDIOPATIA ISCHEMICA 246
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)**

A CASE OF SPONTANEOUS CORONARY ARTERY DISSECTION IN A YOUNG WOMAN IN TREATMENT WITH HORMONAL THERAPY

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(a) DEPARTMENT OF PHARMACY, HEALTH AND NUTRITIONAL SCIENCES, UNIVERSITY OF CALABRIA, RENDE, ITALY; (b) DIVISION OF CARDIOLOGY, ANNUNZIATA HOSPITAL, COSENZA, ITALY; (c) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES, MAGNA GRAECIA UNIVERSITY, CATANZARO, ITALY; (d) DIVISION OF INTERVENTIONAL CARDIOLOGY, ANNUNZIATA HOSPITAL, COSENZA, ITALY

Background. Spontaneous coronary artery dissection (SCAD) is a condition characterized by the non-traumatic and non-atherosclerotic separation of the inner layer of the coronary artery from the underlying vessel wall.

Case presentation. A 43-year-old woman was admitted to the emergency department due to retrosternal chest pain that began a few hours after an argument with her husband. The patient reported elevated blood pressure along with her symptoms. Her medical history included a smoking habit and hypertension. She had also undergone hormonal therapy (chorionic gonadotropin and clomiphene citrate) for fertility purposes up to eight months prior to the current presentation. Additionally, she had recently undergone a uterine polypectomy and was receiving prednisone at a daily dose of 25 mg since the procedure. Initial blood tests revealed a highly elevated troponin I HS level of 64326.6 ng/l (normal range <14 ng/l). An electrocardiogram performed upon admission showed ST elevation in the antero-lateral leads, indicating a myocardial infarction with ST elevation (STEMI). Consequently, the patient was promptly taken for emergent coronary angiography. Coronary angiography was performed, revealing the presence of a type IIb SCAD in the mid anterior descending coronary artery, resulting in vessel occlusion

(TIMI flow 0-1). The SCAD lesion was successfully treated with percutaneous coronary intervention using plain old balloon angioplasty in the affected segment, resulting in an excellent angiographic outcome (TIMI 3) and complete resolution of symptoms and ST-elevation. A follow-up coronary angiography performed after ten days confirmed the favorable angiographic outcome.

Discussion. Risk factors for SCAD include fibromuscular dysplasia, pregnancy, postpartum state, hormonal therapy (as in the case of our patient), connective tissue disorders, and systemic inflammatory diseases. SCAD can be triggered by intense physical exercise, the Valsalva maneuver, childbirth, recreational drug use leading to a hypersympathetic response, or extreme emotional stress (as experienced by our patient). Currently, there are no consensus guidelines for the management of SCAD. A conservative approach to the acute management of SCAD is preferred whenever feasible, as it has the potential to reduce arterial shear stress, promote healing, and decrease the risk of long-term recurrence. Revascularization procedures should be reserved for cases with clinical instability or high-risk anatomical features, such as proximal vessel dissection with a significant reduction in coronary perfusion.



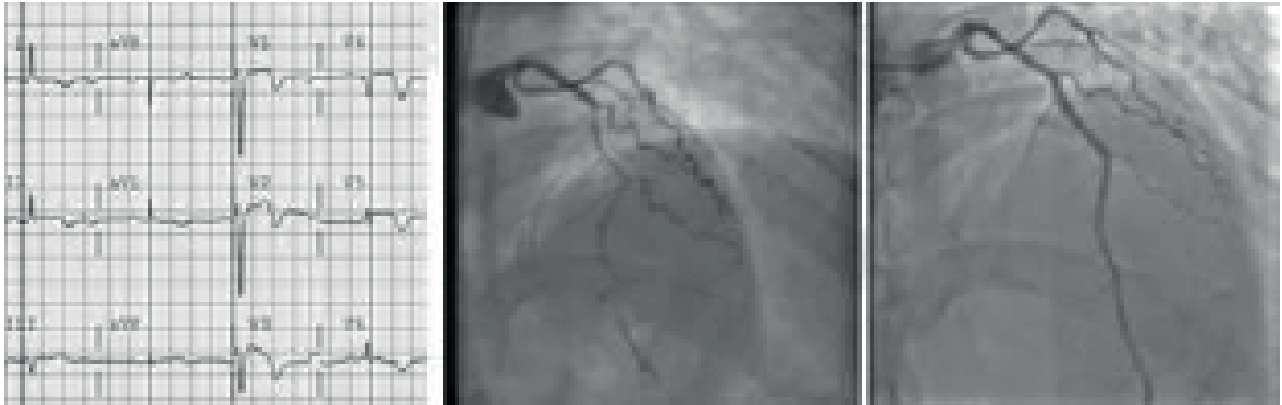


Figura 1

CARDIOPATIA ISCHEMICA 827 FIBRILLAZIONE ATRIALE (FA) (ARITMIE) INFARTO STEMI (CARDIOPATIA ISCHEMICA) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

INCIDENCE AND OUTCOMES OF TRANSIENT NEW ONSET ATRIAL FIBRILLATION COMPLICATING ACUTE CORONARY SYNDROMES: RESULTS FROM A SYSTEMATIC REVIEW AND META-ANALYSIS

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Salvatore De Rosa (b), Sabato Sorrentino (b), Daniele Torella (a)

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(b) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES, MAGNA GRAECIA UNIVERSITY, CATANZARO, ITALY

Background: The overall risk of long-term adverse events of a transient episode of new-onset atrial fibrillation (AF) in patients with acute coronary syndrome (ACS) remains uncertain. This meta-analysis aimed to assess the prognostic impact of transient new-onset AF complicating ACS.

Methods: Cohort studies examining the risk of adverse events in patients with transient new-onset AF compared to those in sinus rhythm after ACS were identified through a comprehensive search of MEDLINE, Scopus, Cochrane and Google Scholar Library. Studies reporting the incidence of ischemic stroke events, recurrent AF, and all-cause mortality at

the longest follow-up were included. Adjusted hazard ratios (HRs) with 95% confidence intervals (CI) were synthesized using inverse variance-weighted random-effects meta-analysis.

Results: In the 7 observational studies included, comprising 151,735 patients, 6,597 (4.3%) experienced transient new-onset AF, which was associated with an increased risk of ischemic stroke, recurrent AF, or all-cause mortality (hazard ratio (HR): 2.24, 95% Confidence Interval (CI): 1.75-2.85; $p < 0.0001$; $I^2=30.76\%$; 7 studies) (Figure 1). The results remained consistent across each individual endpoint, including ischemic stroke (HR 2.38, 95% CI: 1.64-3.44; $p < 0.01$; $I^2=50.2\%$;

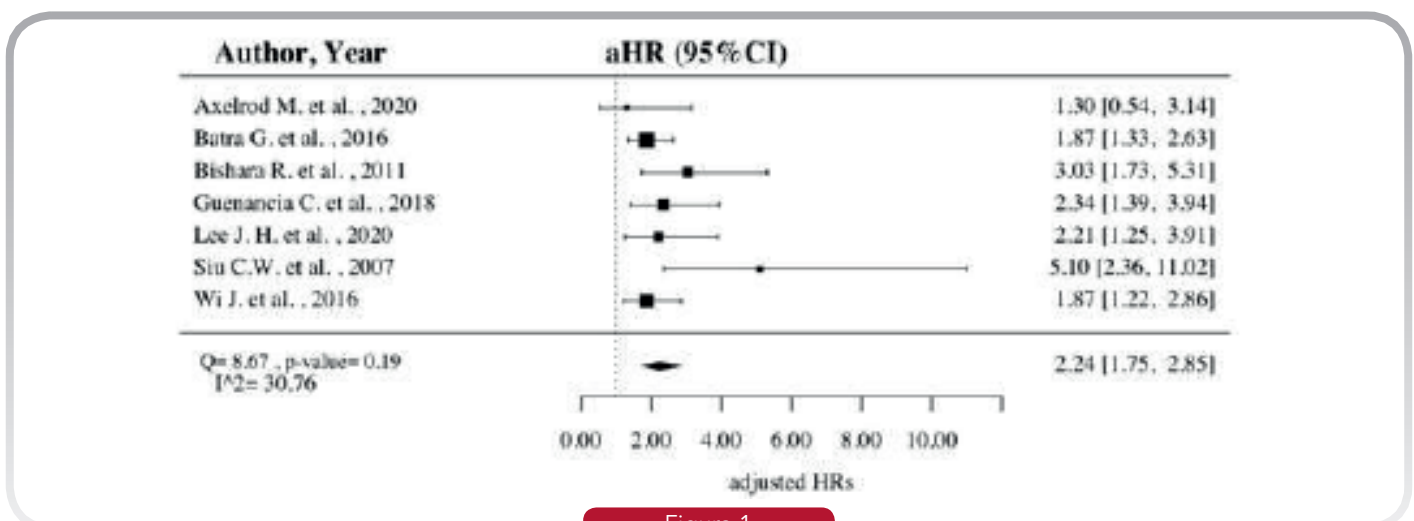


Figura 1



5 studies), recurrent AF (HR 4.68, 95% CI: 2.07-10.59; $p=0.0002$; $I^2=50.2\%$; 4 studies), and all-cause mortality (HR 1.36, 95% CI: 1.08-1.71; $p=0.0089$; $I^2=53.25\%$; 4 studies). Meta-regression analyses revealed a significant increase in these adverse events associated with ST-elevation myocardial infarction (STEMI) ($p=0.001$), while there was a tendency for their decrease associated with oral anticoagulant (OAC) prescription at discharge ($p=0.07$).

Conclusions: The occurrence of transient new-onset AF is associated with an elevated long-term risk of stroke, recurrent AF, and all-cause mortality in patients with ACS. Consequently, these data urge randomized clinical trials to assess the best antithrombotic regimen while potentially helping the current treatment decision-making process for these patients.

CARDIOPATIA ISCHEMICA 330 INFARTO STEMI (CARDIOPATIA ISCHEMICA) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI) DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

ACUTE THROMBOSIS IN RIGHT CORONARY ARTERY ECTASIA: A CASE OF RECURRENT STEMI MANAGED WITH LONG TERM ANTICOAGULANT

Tommaso Simone (a), Sakis Themistoclakis (b), Ada Cutolo (b)

(a) DIPARTIMENTO DI SCIENZE CARDIO-TORACO-VASCOLARI E SANITÀ PUBBLICA, UNIVERSITÀ DEGLI STUDI DI PADOVA; (b) UOC CARDIOLOGIA, OSPEDALE DELL'ANGELO VENEZIA-MESTRE

Case presentation: A 60-years-old male patient, former smoker, presented to the emergency department for retrosternal chest pain. No previous cardiovascular history was present and no specific medication were reported. Symptoms and ECG were suggestive of inferior STEMI. Emergent coronary angiography revealed proximal thrombotic occlusion of right coronary artery, which was recanalized with balloon angioplasty with no stent placement and thrombus aspiration because of high thrombus burden. There was no angiographic evidence of atherosclerotic stenosis and the right coronary artery appeared ectatic. Because of residual thrombus the patient was discharged with triple antithrombotic therapy with Warfarin. After one month planned angiography showed no residual thrombus and Warfarin was interrupted. Two months later, for recurrence of chest pain, the patient presented again to the emergency department with a recurrence of inferior STEMI. Emergent angiography showed total thrombotic occlusion of distal right coronary artery. Again, coronary flow was restored without evidence of residual stenosis and without stent implantation. Few days later IVUS showed unclear evidence of distal atherosclerotic plaque and no proximal lesions. This finding was not sufficient alone to justify the thrombus burden of the two events experienced by our patient. Considering the age of our patient thrombophilia screening was not performed and acquired causes of thrombophilia were not investigated due to low clinical suspicious. Atrial fibrillation was not found during the >48 hours of rhythm monitoring. The main

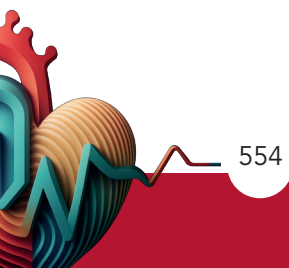
suspect was that coronary artery ectasia associated with slow flow state represented an important trigger to acute thrombosis. Considering also the recurrence of the event after anticoagulant interruption, patient was discharged with dual antithrombotic therapy with Warfarin and indication to maintain anticoagulant.

Discussion: Patients with coronary artery ectasia (CAE) are exposed to a higher risk of coronary artery thrombosis and in acute settings large thrombus burden can be seen. Slow coronary flow, one element of the Virchow's triad, represents one of the main predisposing factors for thrombus formation and antiplatelet therapy alone might not be appropriate. In our case the recurrence of thrombosis after Warfarin interruption supported the importance of anticoagulation therapy. Evidence concerning the use of long-term anticoagulation in patient with CAE and acute myocardial infarction (AMI) are scarce. In a case series single/dual antiplatelet therapy alone failed to provide adequate protection against AMI recurrences in CAE, especially CAE without other obvious stenotic lesions, while the addition of anticoagulant showed a better outcome. It has been showed that among CAE patient with AMI the occurrence of major adverse cardiovascular event was not observed in those who received Warfarin. The use of direct oral anticoagulants has further scarce evidence with only few cases described. Our patient was discharged with dual antithrombotic therapy with Clopidogrel and Warfarin for 12 months, a switch to a direct oral anticoagulant will be evaluated during



the follow-up. For CAE patient presenting with AMI there are no clear guidelines indication for medical therapy. The management must be individualized until further evidence is available. The use of long-term

anticoagulation can play a role, due to turbulence and stasis of blood in the ectatic vessel, to prevent AMI recurrences.



CARDIOPATIA ISCHEMICA 233
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

ECTASIA CORONARICA. QUALE TERAPIA LONG TERM?

Donatella Tansella (a), Nicola Gasparetto (b)

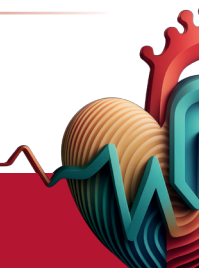
(a) UNIVERSITÀ DEGLI STUDI DI PADOVA; (b) OSPEDALE CA' FONCELLO - TREVISO

L'ectasia coronarica è una dilatazione delle arterie coronarie, in cui il diametro dell'arteria è ≥ 1.5 volte maggiore rispetto a quello del segmento vascolare integro adiacente e viene coinvolto il vaso per più del 50% della sua lunghezza. Il meccanismo eziopatogenetico sottostante non è ancora del tutto chiarito; negli adulti la patologia è causata soprattutto dall'aterosclerosi coronarica o dal danno di parete provocato dall'impianto di stent. Cause più rare sono: uso di cocaina, infezioni sistemiche, probabilmente anche la suscettibilità genetica gioca un ruolo importante e i processi infiammatori cronici con attivazione di metalloproteasi e rimodellamento della tonaca vascolare. E' stata dimostrata una stretta associazione tra ectasia coronarica e sindrome coronarica acuta; in questo contesto le scelte interventistico-terapeutiche sono ancora motivo di ampio dibattito e il trattamento va individualizzato in base alle caratteristiche fenotipiche del singolo paziente. Uomo di 63 anni, senza precedenti cardiologici di rilievo allertava il 118 per dolore toracico da sforzo, gravativo retrosternale, irradiato al giugulo. All'ECG evidenza di sopraST nelle derivazioni inferiori, motivo per cui il paziente veniva centralizzato presso il nostro nosocomio. In ecoscopia acinesia della parete infero-posteriore medio apicale, FE 40%. Picco di Tnl 1800 ng/L. Alla coronarografia riscontro di ampia ectasia della coronaria destra che appariva occlusa al tratto prossimale-medio, veniva quindi eseguita tromboaspirazione efficace con recupero della pervietà del vaso con somministrazione di Tirofiban ev. Si procedeva successivamente a sospensione di Tirofiban, somministrazione di Aspirina e Clopidogrel e infusione

di eparina, successivamente shiftata a Coumadin. A differenza della malattia coronarica aterosclerotica, i dati relativi alle opzioni terapeutiche nei pazienti con patologia ectasiante sono pochi. Il trattamento non è stato ancora sufficientemente studiato e standardizzato. È ragionevole ipotizzare che gli eventi coronarici siano da attribuire all'occlusione trombotica del vaso aneurismatico e/o alla diffusa e ripetuta microembolizzazione nei segmenti più distali, quindi la terapia antiaggregante piastrinica è consigliabile in tutti i casi di ectasia coronarica; il dilemma del clinico rimane l'uso di farmaci anticoagulanti. Alcuni studi hanno dimostrato una riduzione della ricorrenza di eventi nei pazienti trattati anche con anticoagulanti. E' pratica comune riservare tale trattamento ai pazienti a rischio più elevato (es. malattia multivasale o ricorrenza



Figure 1



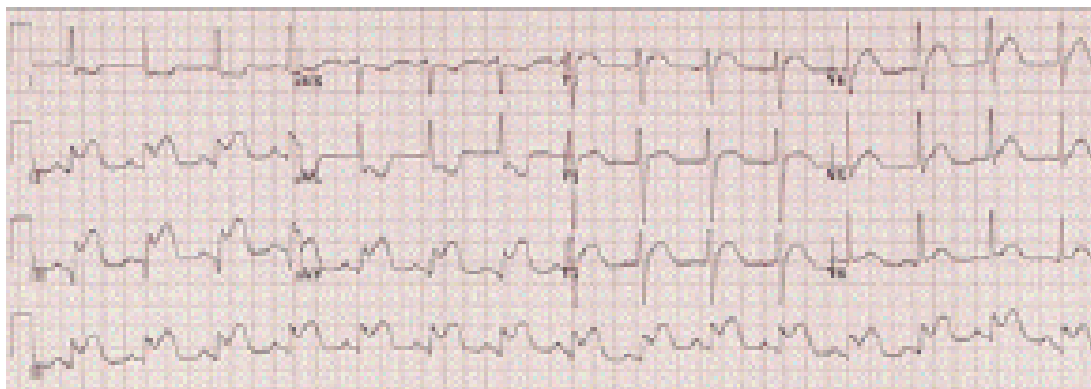


Figura 2

di eventi nonostante duplice terapia antiaggregante).
Riconoscendo i limiti delle attuali conoscenze in merito

all' ectasia coronarica, l' approccio va individualizzato
sulla base dei rischi e benefici.

CARDIOPATIA ISCHEMICA 102 INFARTO STEMI (CARDIOPATIA ISCHEMICA) MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES) (CARDIOPATIA ISCHEMICA) TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

UN ECG INGANNEVOLE IN UN CASO DI MINOCA

Emilia Raytcheva (a), Giulia Vinco (b), Mauro Larcher (c), Rupert Paulmichl (a)

(a) DIPARTIMENTO DI CARDIOLOGIA, OSPEDALE DI MERANO FRANZ TAPPEINER, BOLZANO; (b) DIPARTIMENTO DI RADIOLOGIA, AZIENDA OSPEDALIERA UNIVERSITARIA INTEGRATA, VERONA; (c) PRESIDENTE ARCA TRENINO ALTO ADIGE, ROVERETO

Una paziente di 65 anni si presenta in PS per intenso dolore da 12 h all'emitorace e fianco di sinistra, inizialmente intermittente, ma da circa un'ora costante con NRS 6. In anamnesi: DM II, ipercolesterolemia e fumo. All'EO parametri vitali nei limiti. All'ECG: tachicardia sinusale, soprasslivellamento ST in sede inferiore e laterale (Fig. 1, A). All'ecocardiografia: ipocinesia inferolaterale con funzione sistolica globale lievemente ridotta. Agli ematochimici: Emoglobina 14.4 g/dl; Leucociti 0.9 x 1000/ μ l; PCR 26.40 mg/dl; Troponina T 26.6 ng/l. Durante il monitoraggio le alterazioni ECG alternano fasi di normalizzazione a fasi di soprasslivellamento ST inferolaterale (Fig. 1, B). La coronarografia urgente non rileva stenosi coronariche significative (Fig. 1, C). Persiste dolore al fianco sinistro, all'EO addome trattabile con dolenzia alla palpazione profonda in fianco sinistro. La paziente riferisce pregresso intervento per megacolon e alvo regolare. Si ripete l'ECG, che mostra normalizzazione

del tracciato in clinostatismo su fianco destro e soprasslivellamento del tratto ST con intensificazione del dolore su fianco sinistro. Viene quindi richiesta una TC addome (Fig1, D), che mostra un megacolon ripieno di materiale fecale (frecche verdi) che comprime il ramo interventricolare posteriore (freccia gialla), e la parete inferiore ed inferolaterale del ventricolo sinistro. La paziente viene sottoposta a procedura colonscopica desufflativa, terapia antibiotica e clismi, con progressiva canalizzazione dell'alvo, riduzione della dilatazione colica e scomparsa della sintomatologia e delle alterazioni elettrocardiografiche. Questo caso dimostra l'importanza di un'attenta valutazione clinica del paziente a 360°. La presenza di soprasslivellamento del tratto ST all'ECG rappresenta un'emergenza medica in cardiologia, che richiede immediata attenzione ed intervento nel contesto di un infarto miocardico acuto. Nel nostro caso infatti, data la presentazione di sintomatologia dolorosa associata alle alterazioni ECG,

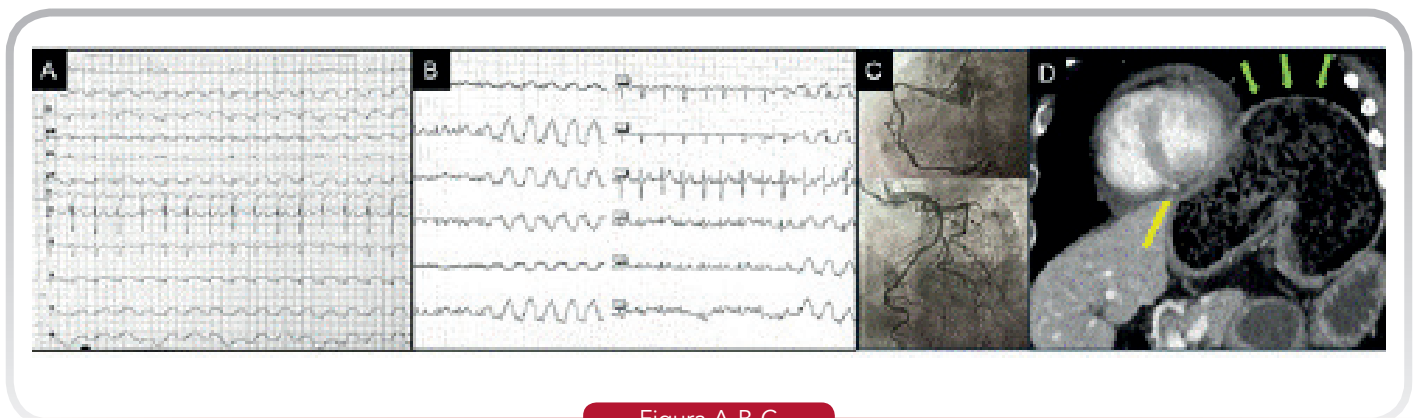
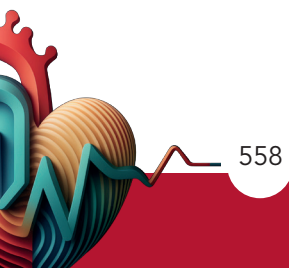


Figura A-B-C



è stata in primis eseguita una coronarografia urgente nel sospetto di una genesi coronarica. Tuttavia è importante ricordare che, come nel caso presentato, il sopraslivellamento ST può presentarsi in una varietà di condizioni cardiache, polmonari e anche addominali. In letteratura sono riportati alcuni altri casi di sopraslivellamento del tratto ST causato da distensione gastrica, o da ostruzione intestinale, tuttavia il nostro è il primo caso che descrive un quadro di megacolon

come causa delle alterazioni ECG, peraltro modificate dinamicamente dai cambiamenti posizionali. Riteniamo che la genesi delle alterazioni ECG nel nostro caso sia dovuta sia al cambiamento posizionale del cuore in relazione agli altri organi, sia all'effetto irritativo e di compressione diretta da parte del colon sulle pareti inferiore ed inferolaterale del ventricolo sinistro e sui rami coronarici epicardici rivascolarizzanti tali territori.



CARDIOPATIA ISCHEMICA 407
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

**SIMULTANEOUS STEMI AND ISCHEMIC STROKE IN 65-YEAR OLD PATIENT:
A COMPLEX THERAPEUTIC CHALLENGE**

Chiara Belardinelli (a), Federico Fortuni (b), Bruno Guarascio (b), Gianluca Serena (b), Johny Helou (b), Laura Bernetti (c), Ilaria Di Pietro (a), Claudio Bernetti (a), Maurizio Scarpignato (b)

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Introduction: ST-segment elevation myocardial infarction (STEMI) and acute ischemic stroke (AIS) are life treating conditions, associated with severe complications if not treated promptly. The onset of both pathologies at the same time is very rare, some authors reported an incidence between 0.009% and 0.29%, but the exact percentage is unknown.

Case report: A 65-year-old patient was found unconscious in front of the Emergency Department. After a rapid and spontaneous recovery of consciousness the patient reported acute chest pain. The electrocardiogram showed an inferior STEMI with third degree atrio-ventricular block (AVB). While waiting for primary percutaneous coronary intervention the patient suddenly developed aphasia, right hemiparesis and left deviation of head, with a National Institutes of Health Stroke Scale (NIHSS) of 13. A computed tomography (CT) was performed and no acute ischemic or hemorrhagic alteration was detected. Given the complexity of the case, a urgent multidisciplinary neurological-cardiological assessment was performed. In consideration of a suspected cardioembolic origin of STEMI and ischemic stroke, the chosen therapeutic

path involved the execution first of percutaneous coronary intervention (PCI), avoiding stents to delay the use of double antiplatelet therapy (DAPT); this allowed the administration of fibrinolytic therapy for ischemic stroke, reducing the risk of hemorrhagic transformation (HT) of AIS. Invasive coronary angiography showed a right coronary artery (RCA) occluded by a thrombus in the middle section: PCI with drug coating ballon was performed and a TIMI 3 flow was restored. After the procedure ST segment elevation resolution was >50% and AVB resolved in a few hours. Fibrinolytic therapy for stroke was then administered, with partial recovery of neurological signs and symptoms. The patient was admitted in the Cardiology intensive care unit and no cardiological complications occurred. After a week he was transferred to the Neurology ward. A control invasive coronary angiography was performed and it showed good angiographic results of primary PCI of RCA and no evidence of thrombus or significant plaque. The control brain CT confirmed the diagnosis of AIS and the absence of HT. DAPT with Acetylsalicylic Acid and Clopidogrel was then introduced.

At 1-month follow-up visit the patient reported no



further cardiac symptoms and at echocardiography the ejection fraction was normal; only dysarthria persisted as neurological alteration.

Discussion: the rarity of this condition and the lack of shared guidelines for its management make its treatment even more complex. A rapid diagnosis and a choice of therapeutic path were fundamental to improve the patient's prognosis.

Conclusion: When rare events with a no well-codified therapeutic path occur, a timely diagnosis and a multidisciplinary team discussion are essential to improve patient outcome.

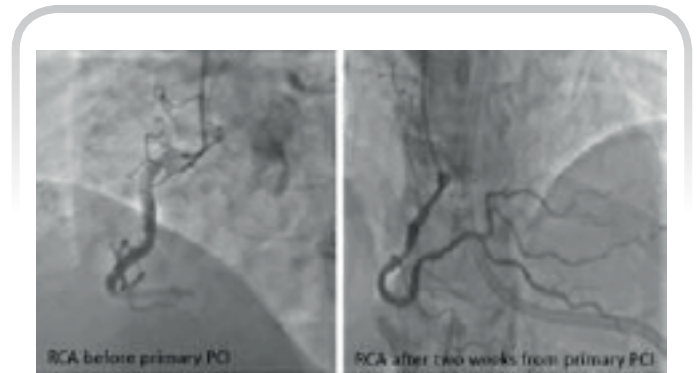


Figure 1

CARDIOPATIA ISCHEMICA 754
ASSISTENZA CARDIACA PRE-OSPEDALIERA (ASSISTENZA CARDIACA
IN ACUTO) ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI
EMERGENZA (ASSISTENZA CARDIACA IN ACUTO)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

REGIONAL DISPARITIES IN STEMI MANAGEMENT AND OUTCOMES IN ITALY: AN ANALYSIS OF TIME-DEPENDENT REPERFUSION NETWORK AND IN-HOSPITAL LOGISTICS

Iginio Colaïori (a), Giuseppe Biondi-zoccai (c), Luigi Spadafora (c), Marco Bernardi (c), Beatrice Simeone (b), Erica Rocco (b), Gianmarco Sarto (b), Sebastiano Sciarretta (b, c), Francesco Versaci (a)
 (a) UOC EMODINAMICA/UTIC/CARDIOLOGIA - OSPEDALE SANTA MARIA GORETTI;
 (b) ICOT ISTITUTO MARCO PASQUALI ; (c) DIPARTIMENTO DI SCIENZE E BIOTECNOLOGIE MEDICO-CHIRURGICHE - SAPIENZA UNIVERSITÀ DI ROMA

Importance: prompt reperfusion therapy is critical for patients with ST-segment elevation myocardial infarction (STEMI) to improve outcomes. Variability in regional healthcare delivery may influence treatment times and patient outcomes. Objective: to evaluate the differences in management and outcomes of STEMI patients across Northern, Central, and Southern Italy, focusing on time-dependent reperfusion and in-hospital logistics.

time was consistent across regions (30 minutes; IQR: 20-50 minutes). Significant regional disparities were noted in the time from symptom onset to balloon inflation, with the Southern and Islands region experiencing the longest median time (180 minutes) compared to the Central (170 minutes) and Northern (154 minutes) regions ($p < 0.01$). The study revealed a

Design, Setting, and Participants: a prospective observational study conducted from September 1 to 25, 2023, including 554 STEMI patients treated at high-volume hub centers operating 24/7. Data were collected through structured surveys completed by Cath Lab directors across different Italian regions.

Results: primary outcomes included door-to-balloon (DTB) time, time from symptom onset to balloon inflation, and regional disparities in pre- and post-PCI management. Secondary outcomes included in-hospital mortality, discharge destinations, and medication regimens. Results: The median DTB

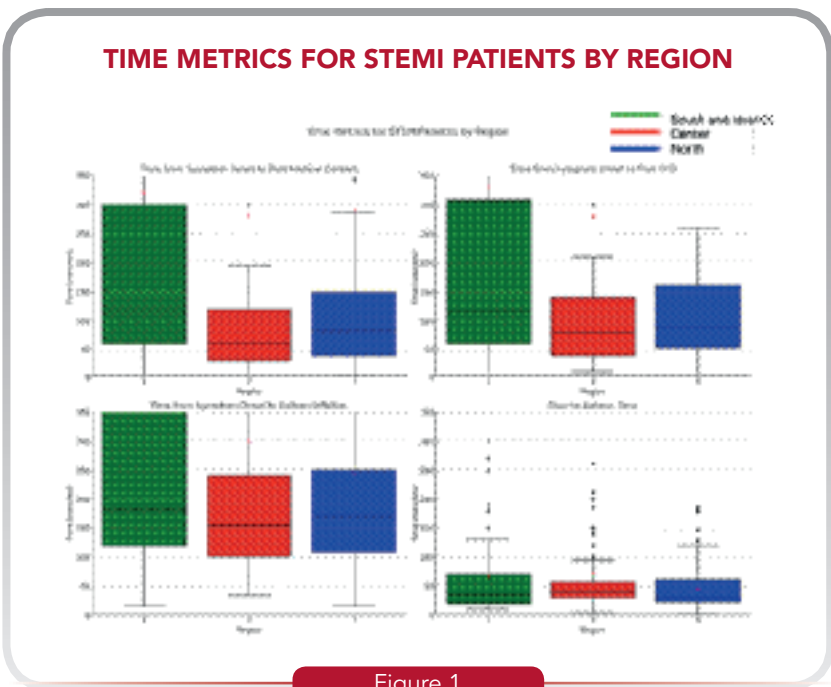


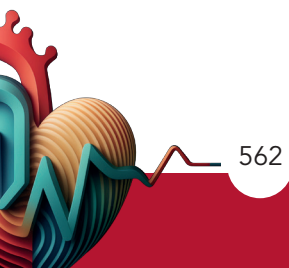
Figure 1



significant reduction in DTB time associated with ECG teletransmission from ambulances (mean reduction of 25 minutes, $p=0.03$). In-hospital mortality rates were similar across regions ($p=0.828$).

Conclusions and Relevance: this study highlights significant regional disparities in the management

and treatment timelines of STEMI patients in Italy. Despite these differences, in-hospital care was consistently timely across regions, suggesting that pre-hospital logistics critically influence overall treatment times. Enhanced pre-hospital ECG teletransmission could further optimize reperfusion times, potentially improving patient outcomes.



**CARDIOPATIA ISCHEMICA 230
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
PROGNOSI (SCOMPENSO CARDIACO)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)**

REVIVE-ING AN HYBERNATED MYOCARDIUM: BEYOND THE PARADIGM OF VIABILITY

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Carmino Dario Vizza (a)

(a) DEPARTMENT OF CARDIOVASCULAR AND RESPIRATORY SCIENCES, SAPIENZA UNIVERSITY OF ROME, ROME

We are presenting a case of a 76 year old male patient admitted to the emergency department after a syncopal episode resulting in physical trauma to the face, which had occurred while at rest and without prodromes. The patient had an unremarkable past medical history, he was not taking prescription medications, and no cardiovascular risk factors or familiarity for cardiovascular diseases or sudden cardiac death were reported.

On arrival, the ECG showed sinus rhythm, left bundle branch block, and diffused ventricular repolarization abnormalities. CT scan confirmed an orbital fracture without urgent need for surgery. Blood tests revealed high NT-proBNP and stable hs-troponin T.

Echocardiography showed a severely enlarged left ventricle with a 20% ejection fraction and global hypokinesia. The right ventricle function was slightly reduced. There were mild-to-moderate mitral insufficiency and mild aortic and tricuspid insufficiencies. Telemetry recorded frequent PVCs and an asymptomatic 15-beat NSVT.

The patient underwent coronary angiography, revealing critical stenoses in the left main coronary artery, LAD, circumflex, and right coronary arteries.

A contrast-enhanced CMR showed an enlarged left ventricle with a severely reduced ejection fraction (16%) and global hypokinesia, particularly in the septum; subendocardial LGE affected up to 25% of the

left ventricle wall in several regions, with no signs of edema.

After evaluation, a complete revascularization with a two-stage PCI procedure with Impella CP support was chosen over CABG due to high operative risk. The patient was weaned off Impella support quickly. During the hospital stay, heart failure and antiarrhythmic treatment were optimized. The patient experienced no further symptoms or arrhythmias and was discharged in stable conditions. After discharge, the patient noted overall symptom improvement in daily activities, but follow-up echocardiograms at three and six months revealed a persistently low left ventricular ejection fraction (23%) and global hypokinesia. A 24-hour Holter monitor indicated a significant reduction in PVCs and no NSVT.

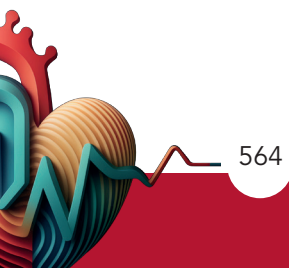
This case underscores the challenges in managing severe left ventricular (LV) dysfunction due to chronic multivessel coronary disease. Despite viable myocardium and revascularization with PCI, the patient's LV function did not improve as expected.

The concept of myocardial hibernation suggests that chronic ischemia can reduce myocardial contractility without causing necrosis, leading to adaptive changes. In this case, viable myocardium indicated by CMR led to the decision for PCI, hoping to restore function and reduce arrhythmias by improving blood flow. However, follow-up showed no improvement in LV function. This



aligns with findings from the REVIVED-BCIS2 trial, which showed that PCI in patients with severe ischemic LV dysfunction did not improve survival or LV function, even with viable myocardium. So if the tissue is alive

but incapable of regaining its contractile function, what kind of tissue is really left? Do we need to rethink the concept of viability itself?



**CARDIOPATIA ISCHEMICA 896
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**IMMEDIATE VERSUS STAGED COMPLETE REVASCULARIZATION IN PATIENTS WITH ST ELEVATION
MYOCARDIAL INFARCTION AND MULTIVESSEL CORONARY DISEASE: A METANALYSIS**

Gianluca Di Pietro (a), Riccardo Improta (a), Ovidio De Filippo (b), Paola Scarparo (c), Barba Stahli (e), Francesco Bruno (b), Alessandra Giansante (a), Alessio Mattesini (d), Seung- whoon Rha (g), Etienne Puymirat (h), Luigi Politi (f), Federico Giacobbe (b), Marco Tocci (a), Lucia Ilaria Birtolo (a), Irene Borzillo (b), Federico Conrotto (b), Carlo Di Mario (d), Gennaro Sardella (a), Gaetano Maria De Ferrari (b), Fabrizio D'ascenzo (b), Massimo Mancone (a), Carmine Dario Vizza (a)

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Aims. Complete revascularization improves survival of patients with ST segment elevation myocardial infarction (STEMI) and multivessel coronary disease, although the optimal timing of revascularization of non-culprit stenosis remains controversial. This meta-analysis aims to investigate the optimal timing of complete revascularization in patients undergoing primary percutaneous coronary intervention (PCI) for STEMI and concomitant multivessel coronary disease.

Methods. PubMed/Scopus/Google Scholars were searched until December 2023 for randomized controlled trials (RCTs) comparing immediate versus staged complete revascularization (ICR vs. SCR). A total of 9 RCTs were included in the primary analysis and 11 in a sensitive one including post-hoc studies. The primary endpoint was rates of major adverse cardiovascular events (MACE) at a median follow-up of 12 months. All-cause death, cardiac death, recurrent non-fatal MI, any unplanned revascularization, stent thrombosis, target

vessel revascularization, any bleedings, stroke, and duration of hospital stay were secondary endpoints.

Results. Nine RCTs with a total of 2,262 patients (ICR 1,150 vs SCR 1,112 patients) were included in the primary analysis. At 12 months, the risk of MACE did not differ between the two groups (OR 0.84, 95% CI 0.56 -1.27), as did the risk of all-cause death (OR 1.50, 95% CI 0.91 -2.46,) and cardiac death (OR 1.55, 95% CI 0.79 to 3.09). An ICR strategy reduced the risk of recurrent non-fatal MI (OR 0.47, 95% CI 0.28 -0.80) and unplanned revascularization (OR 0.58, 95%CI 0.39 -0.87).

Conclusions. In patients with STEMI and multivessel coronary disease, an ICR strategy showed similar rates of MACE and reduced the risk of non-fatal MI and unplanned revascularization as compared to a SCR strategy.



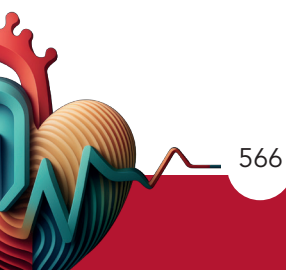
CARDIOPATIA ISCHEMICA 918
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

RECUPERO DI STENT PERSO IN TRONCO COMUNE DURANTE ANGIOPLASTICA PRIMARIA

Fulvio La Rocca (a), Ciro Mauro (a), Davide D'andrea (a), Fulvio Furbatto (a), Gerardo Carpinella (a), Alessandro Bellis (a)
 (a) AORN A CARDARELLI

Il caso clinico riguarda la risoluzione di una complicanza causata dalla perdita per decrimpaggio di uno stent medicato in tronco comune verso ramo circonflesso. Il paziente si presentava con diagnosi di stemi posteriore: La lesione culprit coinvolgeva il ramo circonflesso medio in biforcazione con ramo marginale ottuso.

La risoluzione si basa sulla tecnica del loop snare che ha permesso la rimozione completa dello stent e la successiva ed efficace angioplastica della lesione culprit. La risoluzione completa della complicanza permette di evitare il ricorso a tecniche alternative che peggiorano il risultato e l'outcome a lungo termine della procedura.



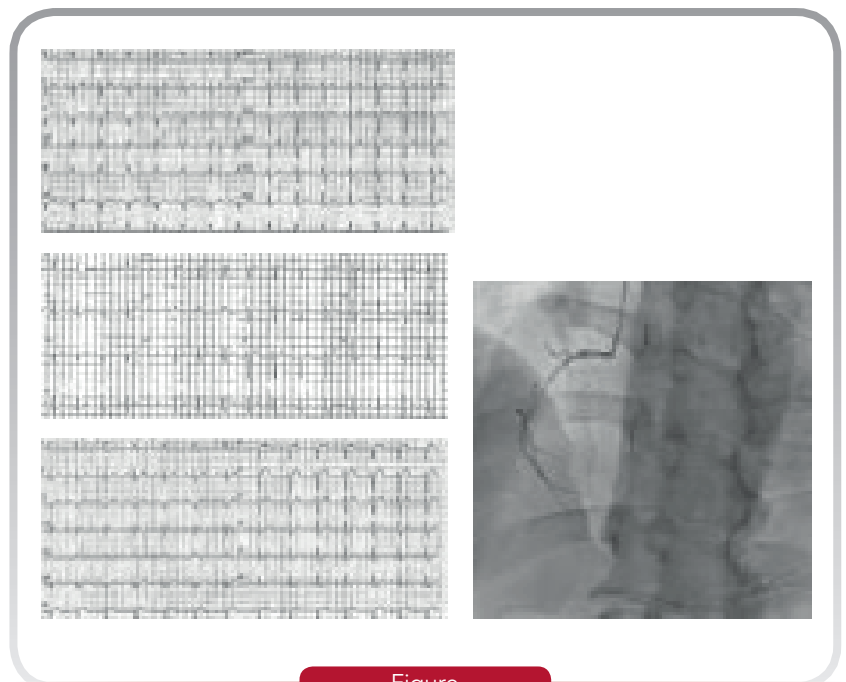
CARDIOPATIA ISCHEMICA 369
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)

ERRORE DI VALUTAZIONE: L'INFARTO DEL VENTRICOLO DESTRO

Daniele Cavallo (a), Luca Bergamaschi (a), Francesco Angeli (a), Matteo Armillotta (a), Carmine Pizzi (a)
 (a) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES-DIMEC-ALMA MATER STUDIORUM,
 UNIVERSITY OF BOLOGNA

Paziente di 56 anni, maschio, di etnia caucasica, dislipidemico e iperteso, affetto da sindrome coronarica cronica post-infartuale (pregresso STEMI inferiore nel 2016 trattato mediante PTCA primaria e impianto di DES sul tratto medio della coronaria destra, residuava FE Vsn 60% con acinesia della parete infero-basale). Il paziente da alcuni giorni lamentava episodi di dispnea a riposo (mai da sforzo) con autorisoluzione in assenza di dolore toracico. Durante la mattina insorgenza di parestesia all'emitorace sinistro irradiata agli AASS per cui si recava in PS. ECG: ritmo sinusale, FC 82 bpm, PA 153/86 mmHg. Durante la degenza in PS si verificava pre-lipotimia con ipotensione (PA 93/57 mmHg). Alla ripetizione dell'ECG riscontro di nuove alterazioni con soprasslivellamento del tratto ST in V1-V2 con paziente sempre asintomatico per angor. Successiva rapida normalizzazione del tracciato (< 20 minuti). I hs- cTn 3,4 ng/L. Dato il quadro clinico-laboratoristico sfumato si soprassedeva ad accesso diretto in emodinamica e per sospetto quadro di NSTEMI-ACS quale angina instabile, possibilmente anche ad alto rischio, il paziente veniva trasferito in UTIC. Al momento del ricovero PA nella norma, paziente totalmente

asintomatico e tracciato ECG nella norma (tracciati ordinati dall'alto in basso). Fino a questo momento il sospetto clinico si orientava verso un'eventuale SCA con lesione sul ramo IVA. Tuttavia, all'ecocardiogramma si confermavano normali dimensioni e cinetica globale del VSn con nota acinesia della parete infero-basale; il nuovo dato che veniva riscontrato era l'acinesia della parete libera del VDx

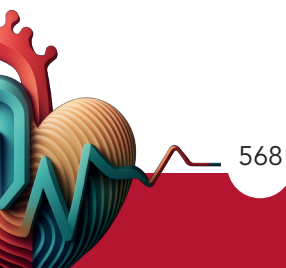


Figure



associata ad ipocinesia globale di grado moderato (FAC 26%, TAPSE 1,6 cm). Nel sospetto di infarto del ventricolo destro veniva iniziato riempimento volemico al fine di aumentare il precarico. Curva hs-cTn mostrava un netto incremento con danno miocardico acuto (463-1.313-15.330 ng/L). Durante la notte, inoltre, insorgenza di nausea con rigurgito con tendenza all'ipotensione con ECG sempre nei limiti di norma. Al mattino eseguita coronarografia che mostrava subocclusione con placca ulcerata ed elevato carico trombotico al tratto prossimale della coronaria destra a monte del ramo marginale acuto, trattata mediante PTCA, tromboaspirazione e impianto di DES (procedura OCT-guidata). Conclusioni: il caso in questione rappresenta un quadro di IMA puro del ventricolo destro con tutti i crismi che lo contraddi-

stinguono (clinica molto sfumata con ipotensione, assenza di angor e sintomi vagali). La rarità di questa tipologia di infarto portano in molti casi a misdiagnosticarlo. In effetti, il sopraslivellamento del tratto ST nell'infarto del VDX può estendersi anche nelle prime derivazioni precordiali tanto da simulare infarti anteriori (come nel caso in questione). Inoltre, circa 1/3 dei casi di IMA inferiore da coronaria destra presenta coinvolgimento del VDX, per tale motivo in queste 2 specifiche situazioni sarebbe sempre opportuno eseguire le derivazioni destre. Sarebbe cruciale identificare questa entità clinica, soprattutto per il diverso trattamento che ne consegue basato sul riempimento volemico e sull'evitare l'utilizzo di diuretici e nitrati.



**CARDIOPATIA ISCHEMICA 415
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
DIABETE E MALATTIE CARDIOVASCOLARI
(DIABETE E MALATTIE DEL METABOLISMO)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)**

IMPACT OF STRESS HYPERGLICEMIA RATIO ON PERIPROCEDURAL MYOCARDIAL INFARCTION IN PATIENTS WITH NSTEMI

Claudio Asta (b), Matteo Armillotta (b), Daniele Cavallo (b), Nicole Suma (b), Virginia Marinelli (b), Marcello Casuso Alvarez (b), Giuseppe Pastore (b), Lisa Canton (b), Damiano Fedele (b), Khrystyna Ryabenko (b), Mariachiara Ciarlantini (b), Francesca Bodega (b), Rebecca Bela' (b), Leonardo Luca Bavuso (b), Francesco Angeli (b), Carmine Pizzi (a)

(a) ALMA MATER STUDIORUM - UNIVERSITA' DEGLI STUDI DI BOLOGNA; (b) ALMA MATER STUDIORUM - UNIVERSITÀ DEGLI STUDI DI BOLOGNA, DIPARTIMENTO DI SCIENZE MEDICHE E CHIRURGICHE (DIMEC)

Background: Stress hyperglycemia ratio (SHR), a new marker that reflects the true metabolic hyperglycemic state of patients regardless of the presence of diabetes mellitus, is strongly associated with adverse clinical outcomes in patients with acute myocardial infarction (AMI). However, studies on the impact of SHR on periprocedural (type 4a) myocardial infarction (MI) are limited.

Purpose: The aim was to elucidate the relationship between SHR and type 4a MI in patients presenting with non-ST-segment elevation myocardial infarction (NSTEMI) undergoing percutaneous coronary intervention (PCI).

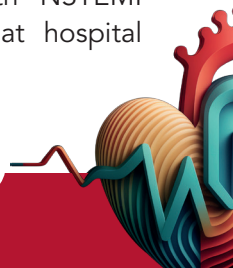
Methods: We evaluated consecutive patients with NSTEMI, both diabetic and non-diabetic, who underwent PCI and exhibited stable ($\leq 20\%$ variation) or falling pre-procedure baseline cardiac troponin values and with sampled glycated hemoglobin available during hospitalization. Using receiver operating characteristic (ROC) curves, we categorized patients into two groups (higher SHR and lower SHR) based on the value associated with the highest Youden index. Subsequently, we assessed the incidence of type 4a MI in these two groups. Finally, we conducted Cox regression analyses to determine the independent

prognostic impact of SHR on the risk of developing type 4a MI.

Results: We identified a threshold value of SHR=1.14 using ROC curves (AUC=0.684). The final study population comprised 837 patients with NSTEMI who underwent PCI, with 362 patients exhibiting SHR >1.14 at hospital admission.

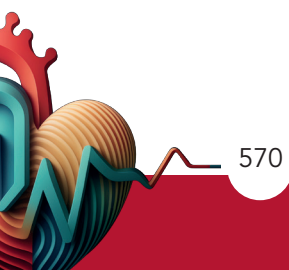
At baseline, patients with SHR >1.14 were older and had more comorbidities, including hypertension, diabetes, chronic kidney disease, and atrial fibrillation. Regarding coronary angiography and PCI characteristics, patients with higher SHR exhibited more frequent multivessel disease and consequently underwent more complex PCI procedures. Patients with SHR >1.14 developed type 4a MI more frequently than those with lower SHR (27.6% vs. 9.7%, $p < 0.001$). Cox regression analysis demonstrated that, after adjusting for major comorbidities and complex PCI, the presence of SHR >1.14 at admission independently predicted a higher risk of type 4a MI after PCI in NSTEMI patients (OR=3.36; 95% CI 2.23 - 5.13; $p < 0.001$). The adverse prognostic impact of higher SHR was further confirmed concerning in-hospital and long-term outcomes.

Conclusions: In patients presenting with NSTEMI undergoing PCI, elevated SHR (>1.14) at hospital



admission is strongly associated with an increased risk of type 4a MI post-PCI, independent of major comorbidities and procedural complexity. These findings underscore the importance of SHR as a valuable prognostic tool in risk-stratifying patients

with NSTEMI undergoing PCI, suggesting its potential utility for optimizing patient management strategies and improving clinical outcomes. Further research is warranted to validate these findings and explore the broader implications of SHR in cardiovascular care.



CARDIOPATIA ISCHEMICA 428

INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) PLACCA VULNERABILE (ATEROTROMBOSI) DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)

PROGNOSTIC ROLE OF CORONARY ARTERY DISEASE EXTENT IN TYPE 2 MYOCARDIAL INFARCTION

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Background: Type 2 myocardial infarction (T2MI) is due to a mismatch between oxygen supply and demand in the absence of acute atherosclerotic plaque disruption. Since the advent of high-sensitivity cardiac troponin assays its diagnosis has become increasingly common. Its prognosis is worse than, or at least comparable to, that of type 1 myocardial infarction, but still very little is known about outcome predictors. The presence and extent of coronary artery disease (CAD) could be among such predictors, but few studies evaluated their role. Moreover, these studies suffer from some limitations, the main one being a coarse definition of CAD.

Purpose: The aim of our study was to rigorously investigate the link between T2MI and CAD in relation to major adverse cardiovascular events (MACE).

Methods: We retrospectively identified a series of patients (n=598) admitted to two hospitals which fulfilled the definition of T2MI, underwent coronary angiography (CA) within 72 hours after the diagnosis and had at least 6 months of follow-up (FU). Diagnosis of T2MI was assigned according to the 4th universal definition of myocardial infarction. Patients were followed-up for a median of 25 months (IQR 13-39) to evaluate the incidence of MACE (all-cause mortality, new myocardial infarction, heart failure requiring hospitalization, ischemic stroke). To test the role of CAD as predictor of MACE we calculated the Gensini score (GS) and the modified Duke score (mDS) of each patient according to their CA. We then classified them

into two groups, namely low and high atherosclerotic burden (ASB), on the basis of the median value of each score. MACE-free survival was estimated using Kaplan-Meier curves and compared with the log-rank test between the 2 groups for each score. Cox proportional hazard regression was used to identify independent predictors of MACE. A correction was made using the main comorbidities associated with worse prognosis.

Results: Mean age of total population was 69.6 ± 13.1 years. 48.8% (n=292) and 44.3% (n=265) of the patients resulted to have high ASB according to GS and mDS, respectively, with a total number event of 235. Kaplan-Meier curves (images 1-2) showed a difference in the long-term FU between the low ASB group and the high ASB group, with the event curves separating early (log-rank GS $p=0.001$; mDS $p<0.001$). CAD extent was found to be independent predictor of MACE at the multivariate analysis. Patients with high ASB were at greater risk in comparison with those with low ASB in both scores (HR GS 1.04 (CI95% 1.01-1.07, $p=0.004$); HR mDS 1.07 (CI95% 1.01-1.14, $p=0.044$).

Conclusions: Despite its relevance, T2MI still needs solid outcome predictors. CAD probably plays a major role in the prognosis of this pathology, yet robust tools for risk stratification are lacking. Our study demonstrates for the first time that a precise quantification of the ASB in T2MI using two simple, commonly used scores can independently predict MACE.



**CARDIOPATIA ISCHEMICA 435
 INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
 INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
 PLACCA VULNERABILE (ATEROTROMBOSI)**

THE ROLE OF INFLAMMATORY STATUS IN TYPE 2 MYOCARDIAL INFARCTION

Leonardo Luca Bavuso (a), Rebecca Bela (a), Jessica Salerno (a), Marcello Casuso Alvarez (a), Angelo Maida (a), Nicolò Vasumini (a), Mariachiara Ciarlantini (a), Virginia Marinelli (a), Francesco Pio Tattilo (a), Ornella Di Iuorio (a), Khrystyna Ryabenko (a), Giuseppe Pastore (a), Claudio Asta (a), Sara Amicone (a), Lisa Canton (a), Andrea Impellizzeri (a), Davide Bertolini (a), Nicole Suma (a), Damiano Fedele (a), Francesca Bodega (a), Daniele Cavallo (a), Matteo Armillotta (a), Francesco Angeli (a), Carmine Pizzi (a)

(a) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES - DIMEC - ALMA MATER STUDIORUM, UNIVERSITY OF BOLOGNA

Background: there is a wealth of evidence on the importance of inflammatory status in destabilization of chronic artery plaques that led to acute myocardial infarction. However, its role in the setting of type 2 myocardial infarction (T2MI) is not yet specifically known.

Purpose: we investigated prognostic role of inflammatory parameters in T2MI.

Methods: we consecutively enrolled 461 T2MI patients from January 2017 to June 2021. T2MI was defined according to the fourth Universal Definition of Myocardial Infarction. We divided the overall population in patients who experience major cardiovascular events (MACE), n=166, and in those who do not (n=277). Receiver operating characteristic (ROC) curve analysis were used to assess the diagnostic accuracy of various inflammatory parameters for predict MACE occurrence during long term follow-up. We divided patients into two groups (high and low inflammatory burden) based on the value associated with the highest Youen index. Cox proportional hazards regression models were constructed to estimate the independent role of these parameters in predict MACE.

Results: we found that patients who experienced MACE had a higher level of inflammatory parameters, in particular hs-CRP (2.21 ± 3.7 vs 1.48 ± 3.5 , $p < 0.001$)

and platelet-to-neutrophil ratio (3.72 ± 1.52 vs 3.7 ± 1.43 , $p = 0.02$). Using ROC analysis, the area under the curve (AUC) of hs-CRP was the largest among all inflammatory parameters and the optimal threshold, according to Youden's index, was found to be 1.2 mg/dL. MACE-free survival curves, comparing groups with low hs-CRP (< 1.2 mg/dL) and high hs-CRP (≥ 1.2 mg/dL), showed that high hs-CRP was associated with a worse prognosis ($p < 0.001$). At Cox regression models, hs-CRP value ≥ 1.2 mg/dL was independently associated with MACE ($p = 0.01$) together with diabetes ($p = 0.006$), chronic obstructive pulmonary disease ($p = 0.006$), previous stroke ($p = 0.001$) and older age ($p < 0.001$).

Conclusion: T2MI patients who experienced MACE

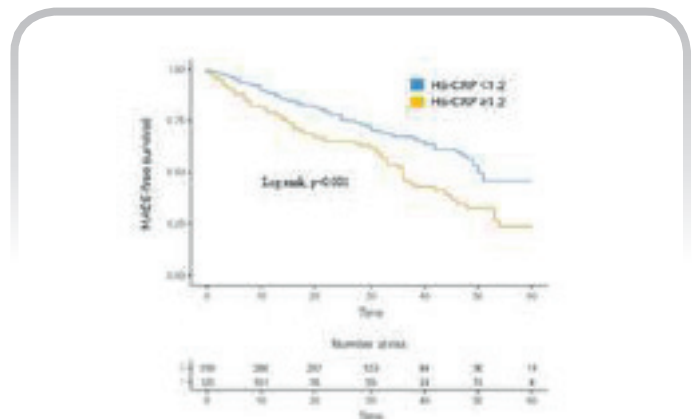


Figure 1

exhibited higher levels of inflammatory parameters. Patients with hs-CRP levels ≥ 1.2 mg/dL had a worse prognosis, independently predicting MACE. These findings underscore the potential utility of hs-CRP as

a prognostic biomarker in risk-stratifying patients with T2MI and highlight the importance of addressing inflammatory status in optimizing patient management and improving outcomes.



CARDIOPATIA ISCHEMICA 250 CARDIOLOGIA DELLO SPORT (ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

HIGHLANDER SYNDROME AND SPONTANEOUS CORONARY ARTERY DISSECTION: A CONFLUENCE OF CIRCUMSTANCES

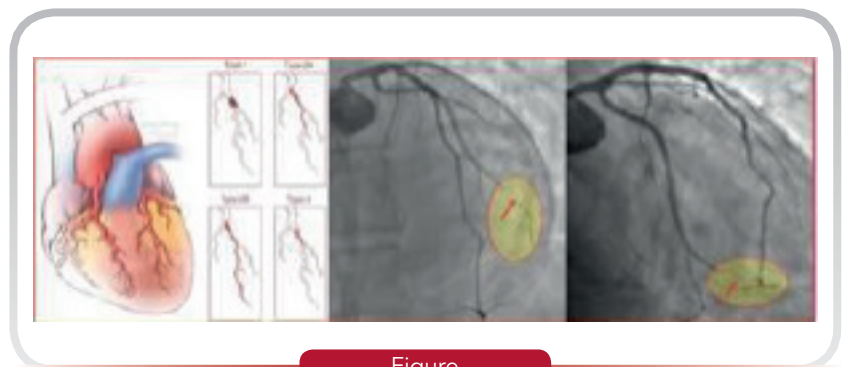
Giovanni Martino (c), Rossella Quarta (a), Angelo Leone (d), Daniela Chiappetta (d), Roberto Caporale (d), Federico Battista (d), Letizia Romano (b, c), Francesco Greco (d), Antonio Curcio (a, b), Alberto Polimeni (a, d)
(a) DEPARTMENT OF PHARMACY, HEALTH AND NUTRITIONAL SCIENCES, UNIVERSITY OF CALABRIA, RENDE, ITALY; (b) DIVISION OF CARDIOLOGY, ANNUNZIATA HOSPITAL, COSENZA, ITALY; (c) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES, MAGNA GRAECIA UNIVERSITY, CATANZARO, ITALY; (d) DIVISION OF INTERVENTIONAL CARDIOLOGY, ANNUNZIATA HOSPITAL, COSENZA, ITALY

Background: Spontaneous Coronary Artery Dissection (SCAD) is a rare and often underdiagnosed cause of acute coronary syndrome and its treatment is challenging. It is correlated with physical activity in up to 32% of patients. The Highlander Syndrome, also known as the "syndrome of immortality," affects master athletes over 40 years old who push their limits in sports, finding a source of well-being and self-esteem in their activities. Vigorous physical exercise may increase the risk of SCAD.

Case Description: A 58-year-old Caucasian man with a history of hypertension and dyslipidemia was admitted to our center for typical chest pain that started a few hours after an extreme enduro motorcycle competition that required vigorous and unusual physical effort. Upon admission, a diagnosis of ACS-NSTEMI was made. The ECG presents only a few signs of ARV. Coronary angiography showed a sub-occlusive, non-flow-limiting stenosis involving the distal and terminal segments of the second obtuse marginal branch (OM2), suggesting a type 2A SCAD. A conservative approach was chosen, and

optimal medical treatment was initiated with a cardio-selective beta-1-blocker and dual antiplatelet therapy (clopidogrel on top of aspirin) for a month. At the 1-month follow-up, he reported no symptoms, good arterial blood pressure control, and no MACEs.

Discussion: SCAD consists of a spontaneous epicardial coronary artery dissection, with the acute development of a false lumen within the coronary artery wall, which may compromise coronary flow, leading to ischemia. Strenuous physical exercise may trigger SCAD. The management of SCAD remains a subject of ongoing debate, but suitable intensity sports activity should not be always prohibited after a SCAD episode.



Figure

CARDIOPATIA ISCHEMICA 879 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INFARTO STEMI (CARDIOPATIA ISCHEMICA)

BEYOND ANGIOGRAPHY: THE KEY ROLE OF OCT IN DIAGNOSING PLAQUE EROSION IN A YOUNG STEMI PATIENT

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(b) UOC DI CARDIOLOGIA INTERVENTISTICA - AOCS ANNUNZIATA; (c) UOC DI CARDIOLOGIA - AOCS ANNUNZIATA; (d) DIPARTIMENTO DI SCIENZE MEDICHE E CHIRURGICHE - UNIVERSITÀ MAGNA GRAECIA

Introduction: Acute coronary syndromes (ACS) with ST-segment elevation (STEMI) typically affect older individuals, with a predominantly atherothrombotic etiology. However, cases of STEMI in individuals under 40, although rare, are still possible. For these younger patients, it is essential to establish an etiological diagnosis and adopt a personalized diagnostic approach.

Case presentation: We present the case of a 34-year-old male patient with a history of epilepsy treated with carbamazepine, with no family history of cardiovascular diseases. Following the onset of intense chest pain, the patient presented to the nearest emergency department, where an anterior STEMI was diagnosed, and he was subsequently transferred to our department for primary PCI. Emergency coronary angiography demonstrated an acute thrombotic occlusion in the mid-segment of the left anterior descending artery (LAD). After several mechanical thrombectomy maneuvers using a Penumbra Cath Rx without stent implantation, coronary flow was restored with TIMI III flow. Given the patient's young age, screening for thrombophilia and substance abuse was performed, both of which were negative. Moreover, blood tests indicated elevated LDL cholesterol levels (213 mg/dL). Five days later, a follow-up angiography showed patency of the LAD, with no angiographically significant stenosis and TIMI

III coronary flow. Optical coherence tomography (OCT) of the coronary artery was performed, which identified erosion of a plaque (approximately 13 mm in size) in the proximal-mid segment of the LAD, with small residual thrombotic spots. The lesion was treated with medical therapy. The patient was subsequently discharged on dual antiplatelet therapy and triple lipid-lowering therapy according to a "fast track" protocol (high-intensity statin, ezetimibe, and a PCSK9 inhibitor), with recommendations for family screening for hypercholesterolemia and angiographic follow-up evaluation in approximately three months.

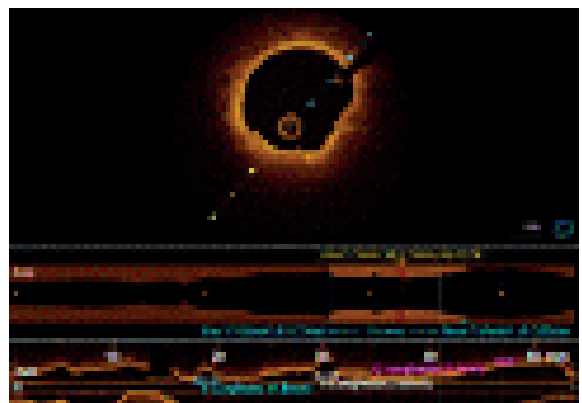
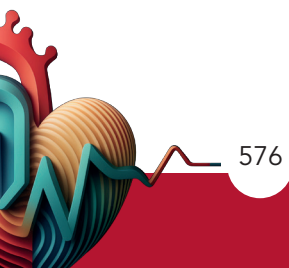


Figure 1



Conclusion: Hypercholesterolemia is a well-known pro-atherogenic factor that can contribute to the development of acute coronary syndromes even in younger patients. For these patients, it is crucial to have an appropriate diagnostic workup aimed at identifying the underlying etiology. In our case, intracoronary

imaging, particularly OCT, proved to be a fundamental diagnostic tool. Thanks to its high spatial resolution, OCT was able to detect a small coronary plaque erosion that was not visible with other techniques, significantly influencing the therapeutic strategy, prognosis, and follow-up of our young patient.



CARDIOPATIA ISCHEMICA 627
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
BIG DATA (TELECARDIOLOGIA ED E-HEALTH)

SEX DISPARITIES IN MORTALITY FROM ISCHEMIC HEART DISEASE IN EUROPE, 2009-2015

Benedetta Romeo (a, b), Maria Bergami (a, b), Edina Cenko (a, b), Olivia Manfrini (a, b), Raffaele Bugiardini (a, b)
(a) *LABORATORIO DI CARDIOLOGIA CLINICA ED EPIDEMIOLOGICA, DIPARTIMENTO DI SCIENZE MEDICHE E CHIRURGICHE, UNIVERSITÀ DI BOLOGNA*; (b) *IRCCS AZIENDA OSPEDALIERO-UNIVERSITARIA DI BOLOGNA, OSPEDALE SANT'ORSOLA, BOLOGNA, ITALIA*

Background: Ischemic heart disease (IHD) is the leading cause of death in the European Union (EU). Understanding variations by sex, income, and geography can help in tailoring effective public health policies.

Methods: We conducted a cross-sectional analysis of IHD using the Global Burden of Disease Study Database to examine trends in sex specific age-standardized mortality rate (ASMR)-to-age-standardized prevalence rate (ASPR) ratio (ASMR-to-ASPR index) per 100,000 inhabitants/year across the EU from 2005 to 2019.

Results: Men showed higher ASMR than women. However, the ASMR-to-ASPR index was notably higher in women than in men indicating that women who develop IHD have a higher risk of dying from the disease compared with their male counterparts. Despite a significant decline in ASMR across EU from 2005 to 2019 both among women and men, sex disparities in ASMR-to-ASPR index persisted with

a women-to-men ratio ranging from 1.05 to 1.40. No significant relationship was found between country-specific ASMR or country income status and ASMR-to-ASPR index. Examples include Romania which displayed higher ASMR (men: 219.87, women: 143.54) compared with Germany (men: 107.22, women: 60.76), yet with smaller differences in ASMR-to-ASPR index between women and men (Romania: 6.54% vs 5.85%; ratio: 1.12 and Germany: 4.79% vs 3.80%; ratio: 1.26).

Conclusions: Mortality from IHD has decreased substantially among EU countries. However, the declines were accompanied by a persistently higher ASMR-to-ASPR index in women, indicating significant potential for further gains in closing the gender gap in IHD mortality.

Abbreviations: ASMR, age standardized mortality rate; ASPR, age-standardized prevalence rate; IHD, ischemic heart disease



CARDIOPATIA ISCHEMICA 559
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA)

TIME FOR A NEW PARADIGM?

Davide Rossi (a), Maria Luana Rizzuto (a), Matteo Fabrizi (a), Marcello Panunzi (a), Giulia Renda (a), Fabrizio Ricci (a), Sabina Gallina (a)

(a) UNIVERSITÀ DEGLI STUDI "GABRIELE D'ANNUNZIO" CHIETI-PESCARA

Background: Occlusion Myocardial Infarction (OMI) marks a significant advancement in our comprehension and treatment of acute coronary syndromes. Representing 15-20% of all acute coronary occlusions, posterior OMI's often pose diagnostic challenges due to their non-classical ECG signatures. Additionally, epistenocardic pericarditis, which occurs in 10-15% of patients following an acute myocardial infarction, can obscure the initial diagnosis and management.

Case Report: A 59-year-old male, with a history of hypertension and smoking, presented to the emergency department with oppressive chest pain that worsened with deep breaths, persisting for 24 hours. His ECG showed sinus rhythm at 77 bpm, small Q waves in the inferior leads and slight ST-segment elevation in aVF, slight ST-segment depression in V1-V3 with dominant R wave in V1, and a negative T wave in aVL, with no ST elevation in V7-V9. Laboratory tests indicated neutrophilic leukocytosis, a highly sensitive cardiac troponin I level of 31725 pg/mL, BNP at 115 pg/mL, and a significantly elevated CRP of 130 mg/L. Bedside echocardiography revealed a moderately reduced left ventricular ejection fraction of 45-50%, hypokinesia in the basal and mid posterolateral and inferior wall segments, and mild mitral regurgitation. The initial assessment considered NSTEMI versus myopericarditis. Subsequent coronary angiography identified a thrombotic occlusion in the mid-circumflex artery (dominant) and a 90% stenosis in the proximal left anterior descending artery, confirming a diagnosis of infero-posterior OMI-STEMI(-). The patient underwent

percutaneous coronary intervention on the circumflex artery, followed by staged PCI with a drug-eluting stent on the LAD four days later. Post-procedural management included DAPT with adequate treatment for epistenocardic pericarditis, with follow-up echocardiography revealing a non-hemodynamically significant pericardial effusion.

Discussion: This case highlights the critical importance of recognizing (infero)posterior OMI in atypical presentations, which may initially mimic NSTEMI or myopericarditis, as evidenced by pleuritic chest pain, elevated cardiac biomarkers, and inflammation markers. The case underscores the vital role of coronary angiography in resolving diagnostic uncertainties, challenges the conventional STEMI/NSTEMI classification, and demonstrates the utility of the OMI paradigm in directing immediate revascularization



Figure 1

strategies for patients with acute coronary occlusions, even when they do not meet the traditional criteria for STEMI. In clinical practice, any anterior ST depression

should be considered indicative of posterior OMI until proven otherwise.



Figure 2

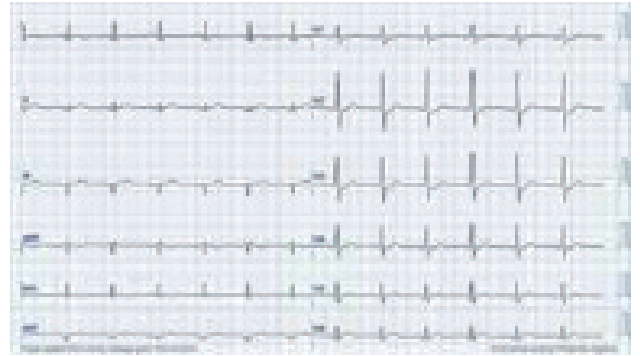


Figure 3



CARDIOPATIA ISCHEMICA 733
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

**STROKE, ACUTE CORONARY SYNDROME AND TAKOTSUBO SYNDROME: WHO GOT THE PARTY STARTED?
 A CHALLENGING CASE REPORT**

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Case report: A 75-year-old man presented to the ED with hemianopsia. Medical history included skin melanoma, dyslipidemia and hypertension. Brain CT revealed ischemic lesions in the right occipital and left frontal regions confirmed by RMN, suggesting an embolic origin, and lesions likely neoplastic recurrence with leptomeningeal involvement. Lab showed a rise-and-fall in hsTnI values despite ECG and echo were unremarkable. Few hours later serial ECGs revealed T waves inversion in the anterolateral region with QTc prolongation (495 ms) and echo showed reduction in left ventricular function (EF 50%) due to hypokinesia of the apex. Coronary angiography revealed thrombotic occlusion of the RDA (culprit lesion, extremely distal, unfavorable for interventional approach) and severe stenosis of the distal posterolateral branch of the RCA (infarct-related lesion). In the next days, echo showed further reduction in LVEF due to hypokinesia of the middle-apical segments (TTS-like) and intracavitary thrombotic formation in the apex (20x10 mm). The patient was started on TAT (Dabigatran for high risk of hemorrhagic transformation of the ischemic lesions and the need for an effective reversal). After some days cardiac segmental and global function progressively improved, QTc returned within limits and thrombotic mass dimensions' reduced at cost of hemorrhagic infarction of ischemic lesions. The patient was transferred to cardiac rehabilitation, dying 15 days later, due to cardiac arrest.

Discussion: In this case report we hypothesize a coexistence of acute coronary syndrome (ACS) and Takotsubo syndrome (TTS). Although the primum movens is the cerebrovascular event, the primary trigger between ACS or TTS remains unclear given the impossibility to perform a CMR. Previous case reports have described TTS causing ACS (by emboli, SCAD) as well as cases of ACS triggering TTS (by CAD, vasospasm) both because of excessive catecholamines release. Stroke- heart-syndrome (SHS) refers to cardiac complications that occur after stroke including arrhythmias, QT prolongation, myocardial injury and myocardial ischemia. It causes autonomic dysfunction with over-release of catecholamines, destruction of blood-brain barrier, system immune dysregulation and exosome release, leading to prothrombotic effects, emboli, plaque activation and microcirculatory

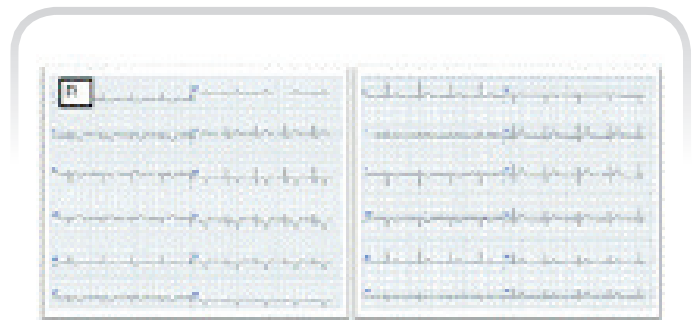


Figure 1

dysfunction, potentially causing TTS or ACS. Furthermore, in this case, high thrombotic burden could also be related to the metastatic melanoma, as it's also not possible to exclude its myocardial involvement due to cardiac tropism. The interaction between myocardial ischemia and stroke needs to be better characterized:

TTS induced by stroke and SHS may be two sides of the same coin, both linked by sympathetic dysregulation causing myocardial involvement. Moreover, TTS and ACS may not be mutually exclusive and may coexist, especially in these conditions, in ways we have yet to discover.

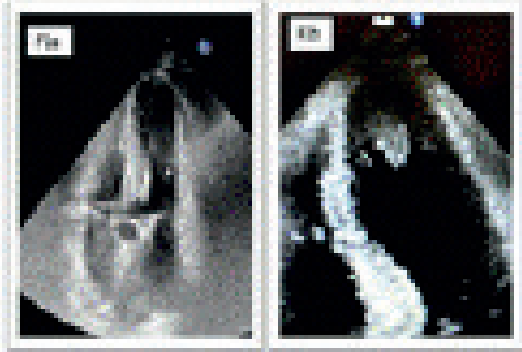


Figure 2

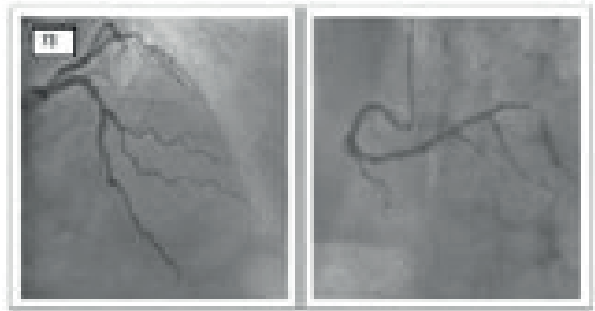


Figure 3



**CARDIOPATIA ISCHEMICA 740
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**ACUTE ISCHEMIC STROKE ASSOCIATED WITH ACUTE MYOCARDIAL INFARCTION: A CLINICAL CASE OF
DIFFICULT MULTIDISCIPLINARY MANAGEMENT**

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Introduction: Acute ischemic stroke (AIS) and acute myocardial infarction (AMI) are leading causes of mortality and disability globally. These conditions can occur concurrently or in close succession, with the presence of one increasing the risk of the other. While reperfusion therapy is the most effective treatment for both conditions, managing them simultaneously presents a significant clinical challenge.

Case Report: A 73-year-old male, with no medical history, presented to our Emergency Department in February 2024 with right-sided hemiparesis, ataxia and dysarthria. Urgent investigations were performed, CT scan excluded intracerebral hemorrhage and CT angiography demonstrated occlusion of the M2-M3 branch of the left middle cerebral artery with fronto-parietal involvement. ECG at admission revealed ST-segment elevation in the anterolateral leads, accompanied by elevated high-sensitivity troponin I 10,000 ng/L. Transthoracic echocardiography revealed a mildly reduced left ventricular ejection fraction (LVEF 40-45%) with apical akinesia and a suspected apical thrombus formation, later confirmed by cardiac CT. Diagnosis of concomitant acute ischemic stroke and anterior-lateral ST-segment elevation myocardial infarction was made. After a multidisciplinary discussion and considering the patient's hemodynamic stability, absence of angina and no absolute cardiological

contraindications to systemic thrombolysis, alteplase infusion was initiated. Subsequently, a diagnostic coronary angiography revealed critical disease in the left main (LM) and proximal left anterior descending (LAD) arteries. At 24 hours, CT scan was repeated, confirming the absence of intracranial hemorrhage. Given the low risk of hemorrhagic transformation and significant cardiac risk, percutaneous coronary intervention (PCI) with drug-eluting stent placement in the LM-LAD axis was performed and dual antiplatelet therapy (aspirin and clopidogrel) was initiated. Then the patient underwent a further CT scan that showed extension of the ischemic area and an intralesional hemorrhage. Thus, given the absolute indication for anticoagulant and dual antiplatelet therapy, after evaluating the favorable clinical and neuroradiological evolution of the ischemic and hemorrhagic lesions, triple antithrombotic therapy was initiated and continued for one month. The patient experienced near-complete neurological recovery and cardiac anti-remodeling therapy was implemented.

Conclusions: Both AIS and AMI require prompt intervention and significantly benefit from specialist management. As highlighted by the 2018 American Heart Association/American Stroke Association Guidelines and the European Stroke Organisation Guidelines, patients with AIS and concomitant AMI

(within 6 hours of onset) should initially receive intravenous alteplase for the treatment of cerebral ischemia, followed by PCI. Considering the high risk of complications associated with this treatment approach,

continuous monitoring and evaluation by specialists, as well as inter-disciplinary collaboration, are essential.

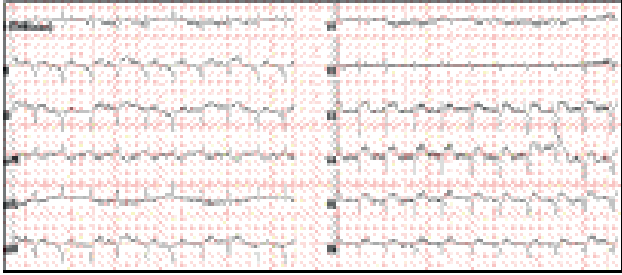


Figure 1



Figure 2



**CARDIOPATIA ISCHEMICA 931
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)**

MIDTERM CLINICAL IMPACT OF SEX DISPARITIES IN ST ELEVATION ACUTE MYOCARDIAL INFARCTION PATIENTS: A METANALYSIS OF ADJUSTED OBSERVATIONAL STUDIES

Gianluca Di Pietro (a), Riccardo Improta (a), Ovidio De Filippo (b), Lucia Ilaria Birtolo (a), Emanuele Bruno (a), Riccardo Colantonio (a), Marco Tocci (a), Alessandra Giansante (a), Fabrizio D'ascenzo (b), Gennaro Sardella (a), Massimo Mancone (a), Carmine Dario Vizza (a)

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Background. The clinical impact of gender differences on midterm outcomes after pPCI for acute ST Elevation Myocardial Infarction (STEMI) remains an evidence gap.

Methods. After searching Google Scholars, PubMed and Scopus, we performed a metanalysis of age and multivariable-adjusted observational studies that investigated the midterm outcomes of women presenting with STEMI.

Results. 22 observational studies globally encompassing 358,140 patients (169,659 women vs 188,490 men) were included in the quantitative analysis. After a median follow up of 3.3 years, no

significant differences in terms of all-cause of mortality were reported after multivariable adjustments (adjHR 1.04, 95%CI 0.98-1.10, p-value 0.24). Women had a higher rates of cardiac death compared with men after multivariable adjustments (adjHR 1.86, 95%CI 1.25-2.77, p value 0.002). No other significant differences in terms of recurrent MI, stent thrombosis and target vessel revascularization persisted between women and men after multivariable adjustments.

Conclusions. Women undergoing pPCI for acute ST elevation myocardial infarction experience an increased risk of cardiac death compared with men after a midterm follow-up.



CARDIOPATIA ISCHEMICA 961

CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA)

A SHARK-FIN HEART ATTACK: WHAT IS THE CULPRIT?

Maria Bernadette Giordano (b), Silvio Saraullo (b), Davide Rossi (b), Lorena Iezzi (b), Davide Mansour (b), Lorenzo Molinari (b), Roberta Magnano (c), Laura Pezzi (c), Alberto D'alleva (c), Massimo Di Marco (c), Sabina Gallina (a, b)

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An 87-year-old woman presented at emergency department with typical chest pain and SARS- COV2 infection. Her cardiology history included a previous CABG and bioprosthetic aortic valve replacement. The initial ECG showed sinus tachycardia, non-specific intraventricular conduction disorders, and "lambda-like" ST-segment elevation in the precordial leads without specularity. (F1). The patient was transported to cath-lab to perform a coronary angiography which revealed patency of the previously implanted bypasses (LIMA to LAD), plaque erosion without thrombus formation on distal RDA, treated with PCI. Echo showed: normal size of LV with depressed systolic function (EF 45%) related to complete apical and mid walls akinesia with hyperkinesis basal segments (TTS-like); no bioprosthetic valve dysfunction and failure. Blood tests revealed marked severe hypokalemia (K 2.6 mmol/l) and hypocalcemia (Ca 8.15 mmol/L), increase hsTnI values (10000 pg/ml) and CRP. The following serial ECGs revealed a marked ST-segment elevation in the precordial leads with triangular waves mimicking the "shark fin" pattern, as well as a QTc prolongation (Figure 2). After electrolytes imbalance correction and on 7 day, the ECG showed reduction in ST-segment elevation with diffuse T waves inversion (Fig. 3). This clinical presentation might be consistent with ischemia-induced Takotsubo syndrome due to the possibility that an acute plaque event with total LAD's occlusion

followed by spontaneous intracoronary thrombolysis could have release intracoronary mediators, including norepinephrine, leading to microvascular dysfunction and so explaining the TTS wall motion abnormalities beyond apex. In the literature, there are several cases of Takotsubo syndrome induced by acute coronary syndrome, and it is also well established that the presence of CAD worsens the prognosis of patients with TTS. There are only few reports of activated plaque detection in intracoronary imaging making its role unclear, nevertheless, it may contribute to the induction of TTS pattern from a pathological point of view. Moreover, hypokalemia has rarely been associated with this ECG pattern and myocardial injury TTS-like. It results in slowed conduction, delayed ventricular repolarization and shortened refractory period with: ST-segment elongation, T wave inversion with T-U fusion and so pseudo- QTc prolongation. However, the ECG could be also explained by aberrant conduction during tachyarrhythmia, followed by the typical progression of TTS-like changes. We believe that further tests (e.g. cMR) would not lead to a change in the diagnostic-therapeutic approach. In conclusion, this clinical case demonstrates: (1) this ECG patterns are associated with important myocardial injury, (2) the importance of investigating potential underlying causes of MI such as electrolyte imbalances, and (3) intracoronary imaging use to uncovering the "hidden culprit" of ischemia.





Figure 1

**CARDIOPATIA ISCHEMICA 919
PLACCA VULNERABILE (ATEROTROMBOSI)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

IL TRATTAMENTO DI BIFORCAZIONE IN BAIL OUT

Federica Serino (a), Ciro Mauro (a), Davide D'andrea (a), Fulvio Furbatto (a), Gerardo Carpinella (a),
Vittorio Tagliatela (a), Fulvio La Rocca (a)
(a) AORN A CARDARELLI

Il caso clinico si riferisce a paziente di 45 anni che affersisce presso il nostro dipartimento per angor tipico per minimi sforzi. Per lo stesso motivo ha praticato una settimana prima coronarografia ed angioplastica di interventricolare anteriore al tratto medio in biforcazione con grosso ramo diagonale (IVA dual) con tecnica provisional.

Per la tipicità del sintomo viene praticato esame coronarografico che mostra dissezione lineare del ramo diagonale ed aspetto ipodenso dell'edge prossimale dello stent in arteria interventricolare anteriore. L'esame OCT conferma la dissezione del ramo diagonale, significativa per estensione e profondità, e rivela la presenza di materiale trombotico

apposto alla porzione prossimale dello stent in ramo interventricolare anteriore. Si pratica angioplastica di ramo interventricolare verso ramo diagonale con secondo stent in bail out (tecnica culotte). La procedura è ottimizzata mediante visione OCT.

L'utilizzo dell'imaging nel trattamento della malattia coronarica permette la scelta della strategia più accurata per raggiungere un miglior outcome a lungo termine.

La padronanza ed il diffuso utilizzo delle metodiche di imaging permette una migliore versione dell'angioplastica convenzionale.



CARDIOPATIA ISCHEMICA 392
INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
ARTERITI (MALATTIE DEI VASI)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)

MANAGING THE COMPLEX INTERSECTION OF MULTIPLE CORONARY DISSECTIONS AND SYSTEMIC VASCULITIS: A MULTIDISCIPLINARY APPROACH IN A CRITICAL CASE

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Introduction: Multiple coronary dissections, a rare and critical condition, involve the rupture of the intima of coronary arteries and the formation of false lumens, compromising blood flow. This pathology poses a significant clinical challenge due to its complexity and high risk of acute ischemic events. It is rare, accounting for 1-4% of all acute coronary syndromes, and its actual incidence may be underestimated due to diagnostic difficulties and variability in clinical presentations.

Case Presentation: A 57-year-old obese, active smoker with no significant cardiovascular history was hospitalized for worsening dyspnea and respiratory failure, later diagnosed with pneumonia. Following intubation, elevated troponin levels and electrocardiographic changes led to a diagnosis of NSTEMI. Coronary angiography revealed severe three-vessel coronary artery disease with multiple dissections. Conservative therapy, including dual antiplatelet therapy, was initiated. A multidisciplinary evaluation suggested systemic vasculitis, confirmed by a PET scan. Treatment with corticosteroids and tocilizumab normalized inflammatory markers.

Discussion: This rare case of multiple coronary

dissections was complicated by respiratory failure and suspected vasculitis. Contributing factors included obesity, smoking, and a recent influenza A infection. The patient's initial presentation with respiratory failure and subsequent cardiac arrest led to the discovery of coronary dissections. Given the absence of ongoing ischemia during angiography and the patient's asymptomatic state, conservative management was chosen. The patient's cardiac function and inflammatory markers improved with treatment, and she was discharged with tapering steroid therapy, tocilizumab, and dual antiplatelet therapy.

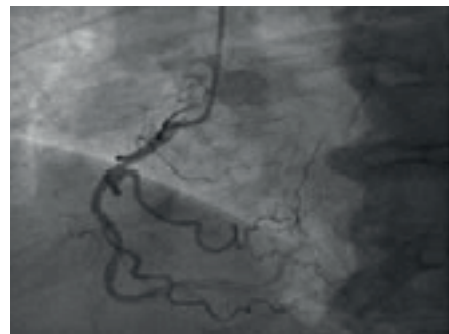


Figure 1

Conclusions: Managing multiple coronary dissections, especially when complicated by vasculitis, requires a personalized, multidisciplinary approach. Continuous monitoring and developing new therapeutic strategies

are crucial for improving patient outcomes. This case highlights the need for evidence-based guidelines for this complex condition.

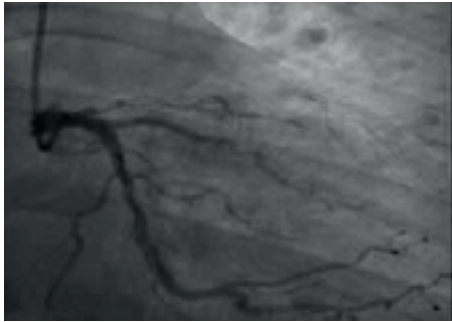


Figure 2

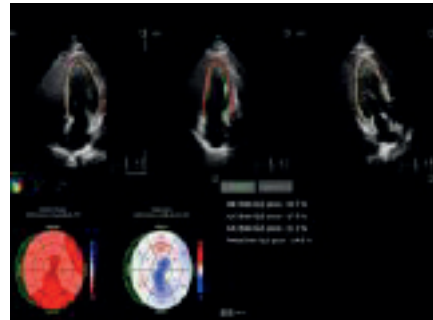


Figure 3



CARDIOPATIA ISCHEMICA 687
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

MINOCA ON VASOSPASM DUE TO CARCINOID SYNDROME: A CLINICAL CASE

Silvia Pellegrini (a), Natalia Ceneda (a)

(a) UNIVERSITÀ LA SAPIENZA DI ROMA- SCUOLA DI SPECIALIZZAZIONE IN MALATTIE DELL'APPARATO CARDIOVASCOLARE

Case description: This case presentation describes a 55-year-old man with a known ileal neuroendocrine tumor (NET) with liver and peritoneal metastasis and an history of symptomatic carcinoid syndrome, presenting to the Emergency Department (ED) with acute chest pain and dyspnea. The 1st EKG revealed an antero-septal ST-elevation and a bedside echocardiography showed regional akinesia of interventricular septum and apex. The patient was immediately sent to the cath-lab with the ongoing diagnosis of acute anterior STEMI. Coronary angiography revealed a 60% lesion on circumflex artery and an intramyocardial bridge on the LAD, ventriculography was performed to rule out Takotsubo's syndrome. During the procedure the patient's chest pain was in remission. No significant atherosclerotic disease was found to explain this clinical presentation, suggesting the diagnosis of MINOCA. After one hour of observation, the patient experienced a second episode of chest pain associated with hemodynamic instability (BP 70/40 mmHg), flushing of face, neck and upper chest. A new EKG was performed showing shark-fin like antero-lateral ST elevation, that was attributed to a coronary vasospasm and was successfully managed with intravenous verapamil. About twenty minutes later the EKG showed a regression of the ST alterations, relief of symptoms and a restoration of the hemodynamic stability.

The patient was finally transferred to the Intensive Cardiac Care Unit (ICCU) where calcium channel blockers therapy was administered, initially intravenously then by oral formulation. A new minor episode of angina and ST anterolateral elevation occurred, remission was furtherly obtained by IV bolus of verapamil. Calcium channel blockers therapy was titrated, and nitroglycerin transdermal patch was added on top of maintenance therapy.

Discussion: The patient's presentation with acute STEMI and non-obstructive coronary arteries (MINOCA) was consistent with a coronary vasospasm.

The patient's medical history was significant for carcinoid syndrome, characterized by flushing and diarrhea, managed with a monthly administration of long-acting somatostatin analogue (lanreotide). We attributed coronary vasospasm to the carcinoid syndrome since an abnormal release of serotonin can cause significant vasoconstriction if there is an underlying atherosclerotic disease with endothelial dysfunction, thus contributing to ischemic events.

Intravenous calcium channel blockers like verapamil can be effective in resolving vasospasm during the acute phase and long-acting somatostatin analogues can mitigate the serotonin release.

Conclusion: While carcinoid-related heart disease (Hedinger's Syndrome) with valvular involvement has been well documented, coronary vasospasm in the context of carcinoid syndrome is an underrecognized complication; few cases are described in literature. Herein, this case discusses the presentation, diagnosis, and management of a MINOCA with vasospastic etiology in a patient with carcinoid syndrome and

emphasizes the need for awareness of its potential role in patients with NETs and acute coronary syndromes. Further investigation is needed to understand if a well targeted carcinoid's syndrome therapy together with orally given calcium channel blockers and/or nitrates, may prevent new episodes of coronary vasospastic angina in these setting of patients.



CARDIOPATIA ISCHEMICA 401
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA)

MYOCARDIAL INFARCTION IN PATIENTS WITH PATENT STENTS: OUTCOMES AND PROGNOSIS COMPARED TO MIOCA AND MINOCA

Francesco Pio Tattilo (a), Rebecca Bela' (a), Sara Amicone (a), Claudio Asta (a), Daniele Cavallo (a), Khrystyna Ryabenko (a), Ornella Di Iuorio (a), Giuseppe Pastore (a), Virginia Marinelli (a), Leonardo Luca Bavuso (a), Marcello Casuso (a), Jessica Salerno (a), Francesco Angeli (a), Carmine Pizzi (b)

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Background: patients with acute myocardial infarction (AMI) without evidence of new obstructive coronary arteries and previously implanted patent stents (AMI-PS) are a group not yet characterised. They should be distinguished from acute myocardial infarction with non-obstructive coronary artery disease (MINOCA) and from myocardial infarction with obstructive coronary artery disease group (MIOCA). Several studies have demonstrated a better prognosis for MINOCA patients compared to those with MIOCA. Within this context, AMI-PS occupies a grey area with limited available data and a lack of evidence regarding optimal therapeutic approaches.

Purpose: to analyze clinical profile and prognosis of AMI-PS patients compared to MIOCA and MINOCA.

Methods: we enrolled consecutive patients referred to our Centre from January 2017 to September 2021 with diagnosis of non-ST-segment elevation myocardial infarction (NSTEMI) according to the fourth universal definition of AMI and undergoing coronary angiography during hospitalization. MINOCA patients were defined according to the current European guidelines criteria. Patients were classified into AMI-PS by the absence of an epicardial vessel with $\geq 50\%$ stenosis and patency

of previously implanted stents. Short-term outcomes included in-hospital death, re-AMI and arrhythmias. Long-term outcomes were all-cause mortality, re-infarction and the composite endpoint of major cardiovascular adverse events (MACE).

Results: a total of 2311 patients were recruited (MIOCA: n= 2032; MINOCA: n= 239; AMI-PS: n= 39). As predictable, patients with AMI-PS showed clinical characteristics and cardiovascular risk profile comparable to MIOCA counterpart. Specifically, they were older and with a higher prevalence of hypertension, type-2 diabetes, dyslipidaemia, history of or current smoking, kidney disease, and peripheral arterial disease (PAD). Furthermore, due to their prior stent implantation, this subgroup more frequently received secondary prevention and cardioprotective treatments at the time of the event, such as single or dual antiplatelet therapy, statins, β -blockers, and renin-angiotensin-aldosterone system (RAAS) inhibitors. Short-term outcome during hospitalization was better in AMI-PS compared to MIOCA and MINOCA group, indeed intra-hospital events were respectively 2.6% vs 11.8% vs 5.4% ($p=0.003$). However, Kaplan Meier curves showed that there were no differences among the three groups regarding overall and MACE-free survival at long term follow-up (median 36 months, IQR

21-55) but re-infarction free-survival curves showed a high risk in AMI-PS compared to MINOCA and MIOCA ($p = 0.02$).

Conclusions: AMI-PS is a not well known nosological

entity with comparable clinical features and prognosis to MIOCA despite the presence of patency stent but with a lower rate of intra-hospital events. Nevertheless, further studies are needed to assess this specific population and subsequent optical medical therapy.



**CARDIOPATIA ISCHEMICA 444
ARITMIE VENTRICOLARI (ARITMIE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)**

**INCIDENCE AND OUTCOMES OF ACUTE MYOCARDIAL INFARCTION WITH ARRHYTHMIC ONSET:
A RETROSPECTIVE COHORT STUDY**

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Introduction. A proportion of patients with acute coronary syndrome (ACS) have concomitant ventricular arrhythmias (VA). The long-term prognostic significance of this association is unclear.

Purpose. The aim was to define the incidence of arrhythmic events in patients admitted for ACS to the Cardiac Intensive Care Unit (CICU) and to determine the short- and long-term prognosis in patients with arrhythmic onset compared with patients without arrhythmic onset.

Methods. This is a single-center retrospective cohort data analysis of 1587 patients admitted with a diagnosis of ACS to the CICU of Niguarda Hospital, from 2014 to 2022. We classified the patients into two groups according to the arrhythmias at presentation: VA (sustained VT or VF) and no-VA. Kaplan–Meier estimated the probability of remaining event free after ACS and were compared between VA and no-VA groups, using the log-rank test. Cox regression analysis was used to explore the association of specific variables with the occurrence of cardiac events in univariate and multivariate analysis. Statistical analyses were performed with R 42.0 statistical package.

Results. Among ACS patients, 4.6% had arrhythmic onset (4.0 % had a diagnosis of VF and 0.6% of VT). Patients with VA were significantly younger (63 y. vs 67 y., $p=0.026$) and had a lower incidence of cardiovascular risk factors, such as hypertension and dyslipidemia,

compared with no-VA group. VA group had a higher risk of arrhythmias during the hospitalization (9.6% vs 1.3%, $p<0.001$) and had a clinical course characterized by a significantly higher use of mechanical support with intra-aortic balloon pumps (IABP, 35.6% vs. 6.8%, $p<0.001$) and a greater use of inotropic drugs (34% vs. 9%, $p<0.001$). We observed in VA group a six-fold increase in-hospital mortality (23% vs 4%, $p<0.001$). Likewise, mortality at 40 days after the acute event was higher in the VA group than in the no-VA group (22% vs. 5%, $p<0.001$). Conversely, during a median follow-up of 5.9 years, VA onset did not affect long-term mortality in patients discharged alive (Figure 1).

Conclusion. In this long-term follow-up retrospective registry involving ACS patients, concomitant VA at admission was found to be linked with an increase in in-hospital arrhythmic complications and in-hospital mortality. The mortality rate at 40 days post-ACS

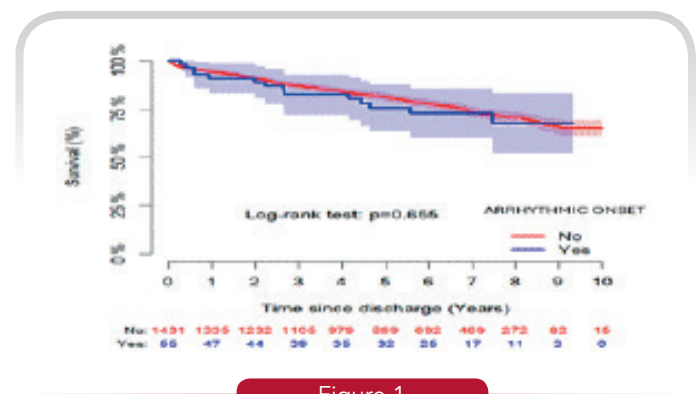


Figure 1

was also notably higher in the VA group. This study underscores the complexity of arrhythmic presentation in ACS patients, emphasizing the critical need for vigilant monitoring throughout their hospitalization and

particularly in the initial 6 weeks following the event index. This heightened surveillance is justified by the documented elevated levels of morbidity and mortality during this phase.



CARDIOPATIA ISCHEMICA 241
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)

THE CO-PRESENCE OF LOW IGF-1 LEVELS AND HYPOVITAMINOSIS D IS ASSOCIATED WITH A WORSE PROGNOSIS IN PATIENTS WITH MYOCARDIAL INFARCTION

Alessandra Lucia Fluca (a, b), Milijana Janjusevic (a, b), Agnese Derin (a), Lorenzo Zandonà (d), Andrea Chicco (d), Daria Beltrame (a), Antonio Paolo Beltrami (c), Stefano D'errico (b), Maria Marketou (e), Gianfranco Sinagra (a, b), Aneta Aleksova (a, b)

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Background: Low levels of vitamin D and IGF-1 are implicated in the development of coronary artery disease (CAD).

Purpose: This study aims to investigate the combined effects of hypovitaminosis D and low IGF-1 on the severity of CAD and the outcome of patients with AMI.

Methods: Blood samples were obtained from participants in a fasting state. Hypovitaminosis D was defined as vitamin D levels ≤ 20 ng/ml and severe CAD was identified as the presence of left main disease and/or three-vessel disease. The endpoint was the occurrence of a major adverse cardiovascular event (MACE), which included all-cause mortality, re-infarction, and the development of heart failure.

Results: A total of 631 patients with AMI were enrolled. The mean age of the cohort was 66 (11) years, 73.4% of whom were male and 72.6% had STEMI presentation. Severe CAD was observed in 28% of all patients. The median levels of IGF-1 and vitamin D were 539.05 [285.5 – 821.6] pg/ml and 18.4 [11.6 – 25.2] ng/ml, respectively. Among the 56.6% of patients with hypovitaminosis D, concentration of IGF-1 was lower than in those without hypovitaminosis D (512.6 [258.8 – 797] vs 563.7 [338 – 852.6] pg/ml, respectively,

$p=0.02$). Severe CAD was predicted by low IGF-1 concentrations (OR: 1.8 [1.03 – 3.1], $p=0.04$) along with older age, male gender and worse renal function, after correction for vitamin D concentrations, diabetes mellitus and low-density lipoprotein levels. During the median follow-up of 43 month, 233 (36.9%) patients reached the composite endpoint. Using continuous hazard ratio analysis, we identified a linear association between IGF-1 levels and MACE incidence, finding a cut-off value of 533.5 pg/ml for his hormone.

Hence, the cohort was divided into four groups: group 1 comprised patients with levels of IGF-1 below the cut-off and hypovitaminosis D, group 2 included patients with low levels of IGF-1, but without hypovitaminosis D, group 3 with patients whose levels of IGF-1 were above the cut-off and had hypovitaminosis D and group 4 consisted of patients with high levels of IGF-1 and without hypovitaminosis D. Kaplan-Meier survival analysis indicated that patients in group 1 (with both low IGF-1 levels and hypovitaminosis D) exhibited a higher likelihood of encountering MACE than patients with hypovitaminosis D alone ($p=0.003$) and those with both high levels of IGF-1 and optimal vitamin D concentrations ($p<0.001$). The multivariable Cox regression analysis confirmed that the compresence of low IGF-1 levels and hypovitaminosis D was associated with a higher susceptibility to adverse



outcomes compared to patients solely affected by hypovitaminosis D (HR: 1.54 [1.04 – 2.3], $p=0.03$), along with older age, reduced left ventricular systolic function and worse renal function.

Conclusions: In patients with AMI, low levels of IGF-1 are associated with severe CAD and a worse prognosis when present alongside a state of hypovitaminosis D.



**CARDIOPATIA ISCHEMICA 75
 INFARTO STEMI (CARDIOPATIA ISCHEMICA)
 PLACCA VULNERABILE (ATEROTROMBOSI)
 IMAGING MIOCARDICO-PERICARDICO
 (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)**

A CASE OF LEFT VENTRICULAR PSEUDOANEURYSM WITH A PARTICULAR ECHOCARDIOGRAPHIC SIGN

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(a) SOCIETA ITALIANA DI CARDIOLOGIA ; (b) SOCIETÀ ITALIANA DI CHIRURGIA CARDIACA ; (c) SOCIETÀ ITALIANA DI ECOCARDIOGRAFIA E CARDIOVASCULAR IMAGING

Left ventricular pseudoaneurysm (LVP) is an uncommon but potentially life-threatening mechanical complication of acute myocardial infarction (AMI). It consists of a narrow fissuration in a weak spot of the ischemic heart wall, connecting with visceral pericardium. The visceral pericardium surrounding the malacic area seals the leak, creating a new, extremely brittle wall, prone to fissuration and rupture.

Early detection and treatment of this condition is of utmost importance. The diagnosis relies on a strict echocardiographic follow-up of at-risk patients. Patients vulnerable of developing LVP are more frequently female, elderly, with no collateral circulation after the acute coronary syndrome. Unfortunately delay in diagnosis might occur due to nonspecific clinical presentation of this condition until rupture. To date, little is known about the echocardiographic signs predicting LVP development.

This report presents a case of a 70-year-old man urgently admitted to our emergency department with the diagnosis of inferior ST-elevation myocardial infarction (STEMI). The patient underwent to an urgent coronary angiography revealing a critical stenosis of anterior descending branch (IVA) and a total occlusion of the right posterolateral branch (RPL), culprit lesion. A percutaneous transluminal coronary angioplasty with the apposition of a stent were performed on RPL and IVA. At the time of discharge, an echocardiogram confirmed a heart function of 52% with akinesia of mid to basal inferior-posterior segments of heart-wall and moderate aortic insufficiency. The infarctuated myocardial wall showed a peculiar echocardiographic sign resembling the ground glass appearance of an infiltrative disease (figure 1 - arrow).

The patients was discharged with dual antiplatelet therapy (aspirin and ticagrelor). At the first follow-up

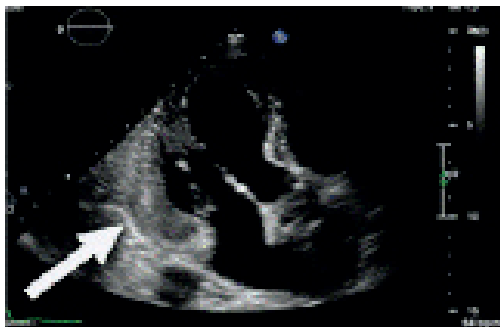


Figure 1

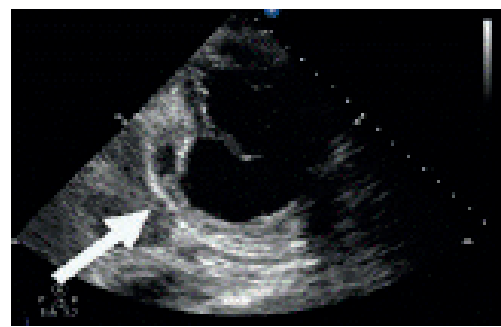


Figure 2

the echocardiogram revealed a 3 cm pseudoaneurysm of the mid-basal segments of inferior wall (figure 2 - arrow). The patient was admitted to the ICU (intensive care unit) and underwent to an angio-CT that confirmed the pseudoaneurysm with an unchanged coronary anatomy following the previous PTCA. The patient underwent a surgical aneurismectomy procedure restoring the left ventricular size and shape with no

short-term complications.

This case highlights the importance of a strict follow-up of patient prone to developing LVP. The ground glass appearance of the infarcted myocardial wall could be a predictive sign to developing LVP, a stricter follow-up for patient with this echocardiographic characteristic may be advisable.



CARDIOPATIA ISCHEMICA 457
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

ROLE OF INFLAMMATION AND PSYCHOSOCIAL STRESS IN CORONARY ARTERY DISEASE:PRELIMINARY RESULTS OF THE STRESS-ACS ACTION STUDY

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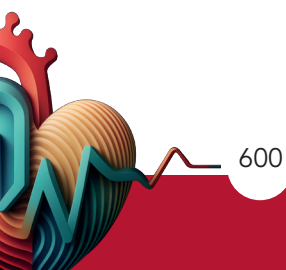
Background: Secondary prevention in coronary artery disease (CAD) was mainly focused on traditional cardiovascular (CV) risk factors control; however emerging evidence highlighted chronic psychosocial stress (PSS) as a new potential CV risk factor. The aim of the present study was to investigate the potential association of PSS, expressed by hair cortisol (HC) levels and inflammation in a real-world cohort of CAD-patients.

Materials and Methods: Among patients enrolled in the STRESS-ACS-ACTION study, those presenting with ST-, non-ST-elevation myocardial infarction (STEMI or NSTEMI) or CAD were considered for the present analysis. Hair samples to assess HC were processed and analyzed by a centralized laboratory. A correlation analysis was performed to describe the relationships between significant variables at univariate analysis.

Results: Out of 119 patients, 90 (75%) were diagnosed with ACS; these patients were younger (58.9 ± 9.0 vs 63.5 ± 8.5 , $p=0.021$), more frequently smokers (43.3

vs 24.1, $p=0.050$) with less traditional CV risk factors and they were less commonly treated with secondary prevention therapies (12.8% vs 32.6% and 19.1% vs 39.5% for aspirin and statin respectively, $p<0.05$). White blood cells, neutrophils, lymphocytes, neutrophil to lymphocyte ratio (NLR) and high-sensitivity C-reactive protein (hs-CRP) were all significantly increased in ACS patients ($p<0.05$), while HC (7.7 ± 13.3 vs 3.3 ± 2.5 , $p=0.080$) was only numerical increased. A positive significant correlation was found between HC and hs-CRP (R Pearson= 0.265, $p=0.024$). At 12-month follow-up, HC decreased significantly in STEMI-patients (from 7.7 to 3.5 ng/l, $p<0.001$) but not in NSTEMI.

Conclusion: ACS patients present higher levels of HC and inflammation. PSS activates chronically the inflammatory cascade that is implicated into the development of CV events. Thus, secondary prevention therapies targeting residual CV risk may be individualized on tailored profiles in selected patients.



CARDIOPATIA ISCHEMICA 530 INFARTO STEMI (CARDIOPATIA ISCHEMICA) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

SPONTANEOUS LAD DISSECTION IN WOMAN WITH SUSPECTED STEMI, MIMICKING A TAKOTSUBO SYNDROME

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Introduction: Takotsubo cardiomyopathy (TTS) and spontaneous coronary artery dissection (SCAD) are two non-atherosclerotic causes of myocardial infarction (MI). Although the exact mechanism is yet not fully understood, they have some features in common, such as a major incidence in women, they may be preceded by an emotional stress or unusual severe physical exercise. Both they present signs and symptoms compatible with acute coronary syndrome.

Presentation of the case: A 73 y.o. woman, hypertensive and dyslipidaemic, with history of anxiety disorder, presented with acute chest pain following a stressful event, radiating to both arms. At the admission to the ER, ECG showed ST elevation in the lateral leads (DI, V4-V6). It was practiced a thrombolytic therapy with Tenecteplase and she was transferred to our cathlab. Echocardiogram showed reduced LVEF (30%

S), akinesis of the left ventricular apex, hyperkinesia of the mid-wall and mild mitral insufficiency, mimicking a Takotsubo syndrome.

The blood exams showed raised levels of High-sensitivity T-Troponin (1978 ng/L) and CK-MB (36,4 ng/ml). The coronary angiography showed a caliber reduction extending from the mid to distal left anterior descending (LAD) coronary artery, suggestive of SCAD type 2. The CMR confirmed subendocardial late enhancement areas in the cardiac apex, highly suggestive of ischemia, so Takotsubo diagnosis was ruled out. The clinical course was complicated by the finding of a left ventricular apical thrombus, so it was introduced anticoagulation therapy. The patient was discharged to a cardiac rehabilitation centre.

Conclusions: Although Takotsubo syndrome and

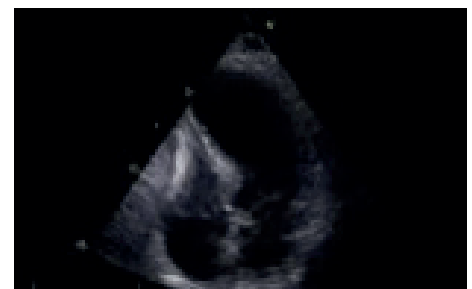
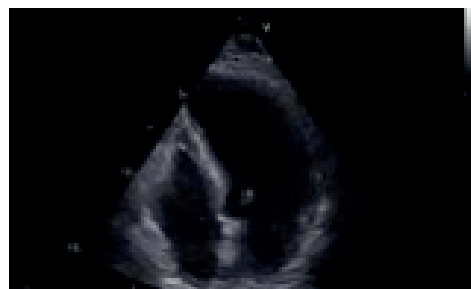
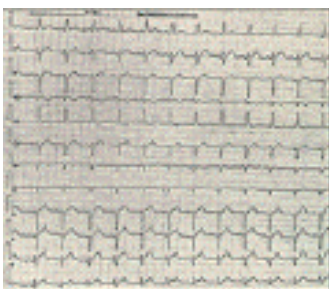


Figure 1



spontaneous coronary artery dissection may present similarly and even coexist, often the two are separate entities which can lead to misdiagnosis or underdiagnosis. SCAD should always be considered

as a differential diagnosis, in patient presenting with diagnostic signs suspicious of Takotsubo cardiomyopathy.

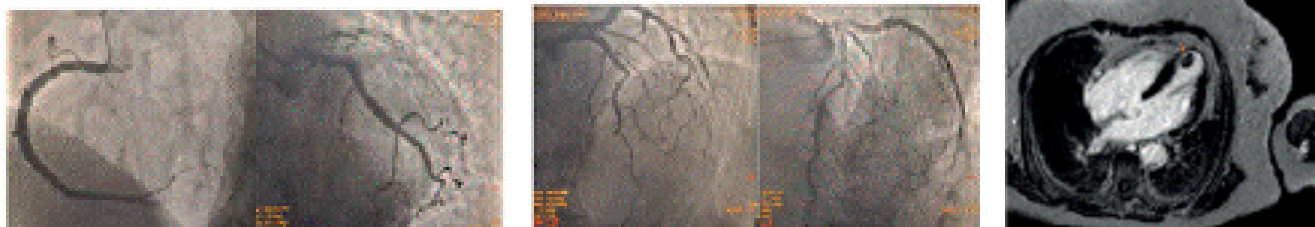


Figure 2

CARDIOPATIA ISCHEMICA 963 PROGNOSI (SCOMPENSO CARDIACO) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

OLTRE I VALORI TARGET DI LDL: QUALI VALORI SIERICI DI LP(A) POSSONO AVERE UN IMPATTO SUL RISCHIO DI NUOVI EVENTI CARDIOVASCOLARI?

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(b) UOC MEDICINA DI LABORATORIO, POLICLINICO TOR VERGATA, ROMA

La lipoproteina(a) [Lp(a)], prodotta dal fegato, è composta da una particella di LDL legata con ponte disolfuro, in modo covalente, con una molecola di apolipoproteina (a). Studi in vitro hanno dimostrato che la Lp(a) ha un effetto pro-infiammatorio, pro-aterogeno e pro-trombotico e può provocare instabilità di placca attraverso molteplici meccanismi: aumentata espressione di VCAM-1; aumento della produzione di chemochine da parte dell'endotelio; aumento della produzione di IL-8 da parte dei macrofagi; inibizione del TGF- β con aumentata proliferazione e migrazione delle cellule muscolari lisce, trasporto di fosfolipidi ossidati, ecc. Studi prospettici hanno documentato un'associazione tra livelli elevati di Lp(a) e rischio di eventi cardiovascolari (CV) in pazienti con valori di LDL a target per la classe di rischio CV (fino a 4 volte maggiore negli uomini e 2 volte maggiore nelle donne, rispetto a soggetti con valori normali di Lp(a) e sembra che il rischio di major adverse cardiovascular events (MACEs) sia aumentato già per valori moderatamente elevati Lp(a): 30-70 mg/dL.

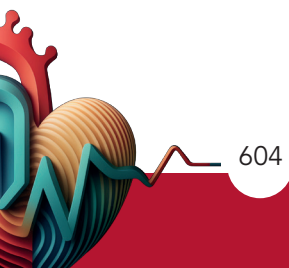
Nel presente studio prospettico, monocentrico, sono stati arruolati, tra settembre 2023 e settembre 2024, 281 pazienti, ricoverati presso la UOC di Cardiologia del Policlinico Tor Vergata di Roma per sindrome coronarica acuta (SCA) o sindrome coronarica cronica (SCC). Al ricovero, in ciascun paziente sono stati valutati i valori ematici di colesterolo totale, LDL, HDL, trigliceridi e Lp(a). Inoltre, sono stati raccolti dati inerenti al sesso, età, BMI e presenza dei canonici fattori di rischio CV: familiarità per CAD, ipertensione arteriosa,

dislipidemia, diabete mellito, fumo di sigaretta. Nei pazienti con valori di LDL a target per la loro condizione di base (<55 mg/dl) e contestuale concentrazione ematica di Lp(a) tra 30 e 70 mg/dl è stata valutata l'incidenza di nuovi eventi CV (SCA o progressione di coronaropatia aterosclerotica). Ventinove dei 281 pazienti rientravano nei criteri suddetti e hanno mostrato un'incidenza di coronaropatia de novo o di progressione di patologia pari al 58% (17 su 29) di cui il 38% con SCA. I valori medi di LDL nei pazienti che hanno avuto progressione di malattia o nuovo evento cardiovascolare all'ingresso erano di 49 mg/dl \pm 8 mg/dl mentre i valori di Lp(a) si attestavano su 40 mg/dl \pm 6 mg/dl; di questi pazienti, 3 erano fumatori, 15 affetti da ipertensione, 8 diabetici, mentre tutti e 17 erano adeguatamente trattati con farmaci ipocolesterolemizzanti. L'analisi statistica eseguita mediante test del Chi-quadro non ha mostrato correlazione tra il verificarsi di una SCA o progressione di patologia coronarica aterosclerotica e la presenza dei fattori di rischio come fumo, diabete ed ipertensione ($p=0,98$, $p=0,41$ e $p=0,34$, rispettivamente). Inoltre, considerato che i pazienti di sesso maschile risultavano essere 25 su 29 il test del Chi-quadro non ha mostrato correlazione con il verificarsi di SCA o progressione di patologia coronarica ($p=1$). I dati del nostro studio, seppur limitato per numero di pazienti, supportano l'ipotesi che i tradizionali fattori di rischio CV non correlano con l'incidenza di MACEs o progressione di malattia aterosclerotica coronarica, nei pazienti con storia nota di coronaropatia che sono trattati adeguatamente con farmaci ipolipemizzanti



e con valori di LDL a target: <55 mg/dl. Pertanto, si può ipotizzare che valori di Lp(a) moderatamente aumentati (30-70 mg/dL) possano giocare un ruolo fisiopatologico importante nell'aumentare il rischio CV

residuo in pazienti con nota malattia coronarica anche se trattati in modo ottimale con farmaci ipocolesterolemizzanti.



CARDIOPATIA ISCHEMICA 255 INFARTO STEMI (CARDIOPATIA ISCHEMICA) ARITMIE VENTRICOLARI (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

SOSPENSIONE DELLA TERAPIA ANTICOAGULANTE IN PAZIENTE CON STORIA DI FIBRILLAZIONE ATRIALE E PREGRESSO STENTING CORONARICO: E' SEMPRE COSI' SICURA?

Jessica Luchetti (a), Giorgia Marsili (a), Cinzia Razzini (a), Enrica Giuliana Mariano (a), Vincenzo Bernardo (a),
Gaetano Chiricolo (a), Giuseppe Sangiorgi (a), Francesco Barillà (a)
(a) POLICLINICO TOR VERGATA - ROMA

Background: La gestione della terapia antitrombotica nei pazienti con sindrome coronarica cronica e stent coronarici, candidati ad intervento chirurgico, risulta spesso complessa. Nonostante vi siano chiare raccomandazioni sulle modalità d'interruzione della terapia antitrombotica in previsione di un intervento chirurgico volte a bilanciare il rischio ischemico individuale e il rischio emorragico legato alla procedura, talvolta i pazienti risultano esposti ad eventi cardiovascolari avversi durante il periodo di sospensione.

Caso Clinico: Uomo di 70 anni con obesità di classe III, iperteso, ipercolesterolemico, affetto da diabete mellito tipo II, fibrillazione atriale parossistica in terapia con Edoxaban 60 mg e cardiopatia ischemica cronica (nel 2021 angioplastica con uno stent medicato su arteria discendente anteriore (DA) prossimale). Ad un anno dall'angioplastica veniva sospesa la terapia antiaggregante in favore della sola terapia con DOAC. A gennaio 2024, 48 ore prima di eseguire intervento di correzione di fimosi serrata veniva sospesa la terapia anticoagulante. Al termine dell'intervento il paziente presentava dolore toracico con quadro di STEMI anteriore, complicato da FV trattata mediante multipli DC shock. Alla coronarografia evidenza di occlusione trombotica dello stent precedentemente impiantato su DA, trattata mediante PCI primaria con pallone medicato. All'ecocardiogramma evidenza di severa

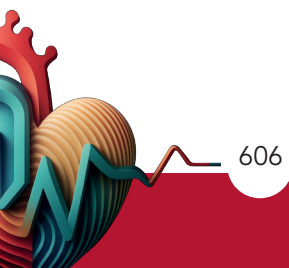
disfunzione ventricolare sinistra con acinesia apicale e frazione d'eiezione del 30%. Si verificavano episodi di ematuria post-procedurali. Nei giorni seguenti evidenza di storm aritmico trattato con infusione di Lidocaina. Nel corso del ricovero il paziente veniva sottoposto ad impianto di ICD monocamerale, in prevenzione secondaria e dimesso in buon compenso emodinamico, in terapia con Clopidogrel 75 mg e Edoxaban 60 mg.

Discussione: Il paziente giunto alla nostra osservazione, affetto da sindrome coronarica cronica stabile in fase asintomatica, con un buon controllo dei fattori di rischio cardiovascolare, non presentava caratteristiche angiografiche tali da giustificare un prolungamento della durata della duplice terapia antitrombotica. Pertanto, a dodici mesi dall'angioplastica era stata sospesa la terapia antiaggregante in favore della sola terapia con DOAC. Il paziente è stato sottoposto ad intervento chirurgico a tre anni di distanza dalla rivascolarizzazione coronarica, in una finestra temporale in cui il rischio trombotico legato ad un'incompleta endotelizzazione dello stent risultava pressoché nullo. L'anticoagulante è stato sospeso 48 ore prima di un intervento considerato a rischio di sanguinamento lieve dalle linee guida e moderato dall'Urologo che non avrebbe eseguito l'intervento in terapia anticoagulante. Con questo caso clinico vogliamo sottolineare che dietro una sindrome coronarica cronica stabile e ben trattata può celarsi un



elevato rischio trombotico, che si manifesta talvolta in maniera drammatica al momento della sospensione della terapia antitrombotica. Da qui l'importanza di

un'attenta valutazione del rapporto rischio-beneficio prima della sospensione dell'anticoagulante nella cardiopatia ischemica cronica con pregresso stenting



CARDIOPATIA ISCHEMICA 376

CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) PROGNOSI (SCOMPENSO CARDIACO)

PERCUTANEOUS CORONARY INTERVENTION IN LEFT VENTRICULAR DYSFUNCTION: PREDICTORS OF ALL-CAUSE MORTALITY AND HEART FAILURE HOSPITALIZATION

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(a) POLO CARDIOLOGICO - ASUGI - AZIENDA SANITARIA UNIVERSITARIA GIULIANO- ISONTINA; (b) UNIVERSITÀ DEGLI STUDI DI TRIESTE - DIPARTIMENTO DI SCIENZE MEDICHE, CHIRURGICHE E DELLA SALUTE

Background: the role of revascularization in patients with left ventricular dysfunction and whether revascularization should be guided by viability testing is still poorly investigated.

Aims to identify predictors of all-cause mortality and re-hospitalization for HF in patient with LVD, treated with PCI plus OMT, and to evaluate the role of viability testing.

Methods: in this retrospective observational study, we analysed patients with left ventricular ejection fraction (LVEF) less than 50% who underwent PCI between 2016 and 2022 at University Hospital of Trieste. Patients with STEMI presentation were excluded. The primary endpoint was a composite of all-cause mortality and re-hospitalization for heart failure (HF). Uni and multivariate COX regression analysis were performed to identify predictors of outcomes. The role of myocardial viability was examined in a subgroup of patients in which viability testing was performed.

Results: 207 patients were enrolled, 77.8% were male and mean age was 71 (± 9.5). Mean LVEF was 34.3% (± 8.1). Primary endpoint occurred in 41.1%, during a median follow-up of 31 months (IQR 15-54).

At multivariate COX regression analysis, age (HR 1.034, 95% CI 1.007-1.062) diabetes (HR 1.614, 95% CI 1.027-2.537), and NYHA functional class (HR 2.232, 95% CI 1.590-3.133) were independent predictors of all-cause mortality and re-hospitalization. Conversely, PCI on LAD was independently associated to lower risk (HR 0.505, 95% CI 0.321-0.796). In patients in which viability testing was performed (n=56), the presence of viability was associated with better outcome (HR: 0.214 CI [95%] 0.078-0.592, $p=0.003$). Additionally, PCI in a viable territory was also associated with better outcome HR: 0.342 CI [95%] 0.126-0.925) whereas PCI in globally non-viable myocardium was associated with worse outcomes (HR 6.238, 95% CI 2.134-18.231).

Conclusions: patients with left ventricular dysfunction who underwent PCI represent a complex population with poor prognosis. While some baseline characteristics identified patients at higher risk of events, PCI on LAD is independently associated with better outcome highlighting the prognostic relevance of LAD revascularization in the setting of ischaemic cardiomyopathy. Finally, searching for myocardial viability may give prognostic information and could guide revascularization strategy.



CARDIOPATIA ISCHEMICA 929 PLACCA VULNERABILE (ATEROTROMBOSI) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

L'IMPORTANTE RUOLO DELL'IMAGING INTRACORONARICO NELLA DIAGNOSI DELLA PLACCA INSTABILE

Giuseppe Nicoletti (a), Gerardo Carpinella (a), Fulvio Furbatto (a), Fulvio Larocca (a), Vittorio Tagliatela (a),
Mafalda Esposito (a), Federica Serino (a), Davide D'andrea (a), Alessandro Bellis (a), Ciro Mauro (a)
(a) AORN CARDARELLI UOC CARDIOLOGIA

Introduzione: Alla base della cardiopatia ischemica, vi è la formazione di placche aterosclerotiche nel circolo vascolare arterioso date dall'ossidazione della componente lipidica delle LDL (oxLDL). Le dimensioni della placca non sono prognostiche della sua rottura, infatti quelle critiche possono presentare una capsula molto spessa, essere stabili e provocare angina stabile durante esercizio fisico; le placche non critiche, invece, possono avere capsule sottili ed essere prone alla rottura, alla formazione di trombi e conseguente SCA.

Caso clinico: Donna di 47 anni giunta in ps per dolore toracico tipico: obesa, ipertesa e fumatrice. All'esame clinico: paziente emodinamicamente stabile (PA:140/80mmHg, eupnoica ed apiretica). All'ECG: bradicardia sinusale, FC:55bpm, bassi complessi QRS, anomalie aspecifiche del recupero ventricolare sinistro (Fig1). All' esame ecocardiografico transtoracico: rimodellamento concentrico del ventricolo sinistro con preservata funzione sistolica globale (FE:55%) ed ipocinesia della parete inferiore; assenza di aortopatia; sezioni destre nei limiti per dimensioni, normocinetiche; non segni di IPA. Alla prima determinazione si evidenziano incremento della Tnl (1.7ng/ml) e valori LDL:135mg/dl. Si pone diagnosi di NSTEMI, si somministra flectadol 1g ¼ di fiala e viene introdotta terapia statinica assieme all'ezetimibe e cardioaspirina. Si pratica, nella giornata successiva,

esame coronarografico che evidenzia diffusa malattia aterosclerotica dell' albero epicardico coronarico con presenza di placca (angiograficamente non critica) con contestuale immagine iperecogena nel tratto distale della coronaria dx ulteriormente indagata mediante OCT che, invece, evidenzia erosione di placca con apposizione trombotica (Fig2-3). Si procede quindi all' impianto di un DES. La paziente in quinta giornata viene dimessa in buon compenso emodinamico ed asintomatica in DAPT (ASA ed P2Y12i), triplice terapia antidislipidemica (statina ad alta densità, ezetimibe, PCSK9i) e in terapia antipertensiva.

Discussione: la valutazione delle lesioni associate all'instabilità delle placche minori è basata sull'indagine angiografica che fornisce informazioni di profilo del

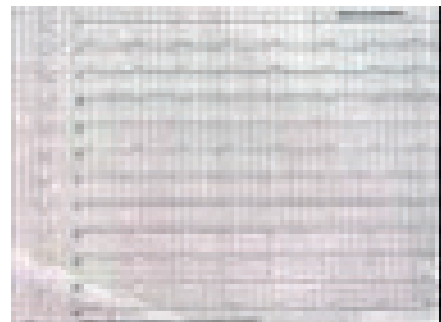


Figure 1

lume ma non identifica le caratteristiche biologiche della placca. Attualmente, l'OCT è l'unica metodica di imaging in grado di valutare: la composizione della placca, lo spessore del cappuccio fibroso, la eventuale rottura, l'apposizione trombotica, la formazione di neovasi, le dissezioni spontanee, la corretta espansione degli stent, eventuali dissezioni residue all'impianto e il processo di restenosi.

Conclusioni: Le placche non critiche possono causare SCA. Utile è l'utilizzo dell'OCT che definisce struttura e composizione della placca aterosclerotica e permette di valutare il burden di rottura della stessa. Fondamentali, l'inizio precoce e la durata della terapia ipolipidemizzante con statine ad alta intensità, Ezetemibe e inibitoridel PCSK9, per mantenere ai valori minimi il colesterolo LDL.



Figure 2

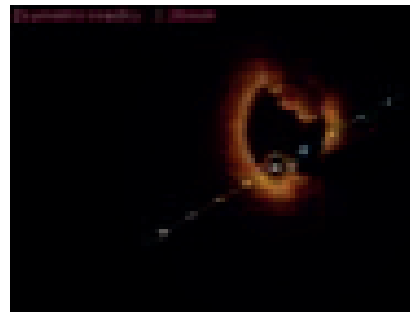


Figure 3



CARDIOPATIA ISCHEMICA 573
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

L'IMPORTANZA DEGLI ECG SERIATI NEL DOLORE TORACICO E LA GESTIONE DELLA TERAPIA FARMACOLOGICA: UN CASO DI ECTASIA DELLE ARTERIE CORONARIE

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Il caso in oggetto tratta di un paziente di 54 anni originario della Rep. Dominicana che accede in pronto soccorso per dolore toracico tipico. Nessun precedente cardiovascolare (CV) né fattori di rischio CV in anamnesi. Il giorno dell'evento accusava dolore toracico gravativo (intensità 6/10) insorto circa 20 ore prima del primo contatto medico. Il primo ECG dell'automedica mostrava: ritmo sinusale 62 bpm, alterazioni dell'ST non significative e T isodifasica (ma prevalentemente positiva) nelle derivazioni infero-laterali, con ST stirato in V4-V6. Veniva quindi indirizzato in PS dove si presentava ancora sintomatico, emodinamicamente stabile. In PS l'ECG mostrava onde Q in sede inferiore, associate a lieve sopra-ST e negativizzazione marcata dell'onda T, oltre che da inversione dell'onda T anche in V5-V6, per cui veniva disposto ricovero urgente in UTIC.

In UTIC l'ECG cambiava nuovamente, con regressione dell'onda Q in inferiore e T isodifasiche nella stessa sede. Al primo dosaggio la Troponina I ad alta sensibilità era di 2147ng/L (URL 42) e l'ecocardiografia mostrava ventricolo sinistro marcatamente ipertrofico con setto interventricolare di 17 mm (e parete posteriore di 13mm) con presenza di gradiente medioventricolare non emodinamicamente significativo in assenza di SAM, normale volumetria, FE conservata (60%) con ipocinesia circoscritta della regione basale della parete inferiore, assenza di valvulopatie di rilievo emodinamico, PAPs non cifrabile.

In considerazione della persistenza di dolore toracico

veniva avviato a coronarografia urgente (tempo precoronarico 23h) con riscontro di circolo coronarico a dominanza destra con occlusione subacuta di CDx al tratto medio con debole perfusione retrograda tramite circolo eterocoronarico, nel contesto di severa malattia aterosclerotica ectasica dei tre vasi con flusso lento. Si procedeva a multiple tromboaspirazioni con minima riperfusione del vaso a valle con persistenza di flusso lento (TIMI II). Venivano inoltre somministrati farmaci vasodilatatori con scarso beneficio (sodio nitroprussiato e nitroglicerina). In considerazione dell'anatomia coronarica ectasica, lo scarso run-off e del tempo di insorgenza dei sintomi non si procedeva ad impianto di stent. Si avviava infusione di Abciximab e di UFH. Al termine della procedura l'ECG mostrava emblocco posteriore sinistro con alterazioni della ripolarizzazione in sede inferiore. Il picco di TnI-hs raggiungeva 19'450ng/L.

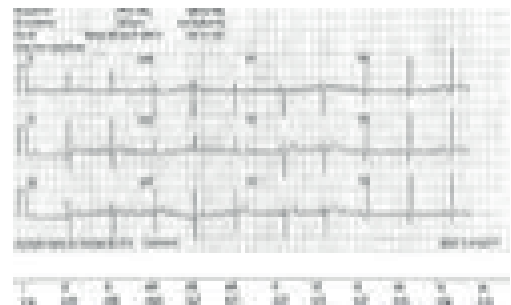


Figure 1

Nei giorni successivi si optava per terapia anticoagulante con AVK (embricato con eparina a basso peso molecolare), in aggiunta a clopidogrel e aspirina (la quale veniva sospesa dopo 7 giorni).

In questo caso clinico emerge la variabilità dell'ECG con segni alternanti di ischemia, possibilmente dovuti alla natura subacuta dell'occlusione con minima

riperfusion da circolo eterocoronarico che può giustificare differenti gradi di perfusione del miocardio stordito. Inoltre, la malattia ectasica delle arterie coronariche è oggetto di intenso dibattito circa la sua terapia interventistica e farmacologica, in particolare riguardo la terapia anticoagulante e antiplastrinica.



Figure 2

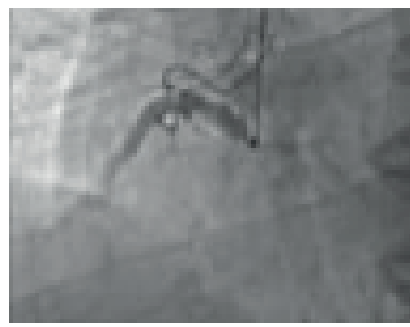


Figure 3



CARDIOPATIA ISCHEMICA 668

PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI) TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

RISK OF INTRACRANIAL HEMORRHAGE WITH ORAL ANTITHROMBOTIC AGENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Vincenzo Castiglione (b), Giulio Stefanini (c), Raffaele De Caterina (a), Doralisa Morrone (a)
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Background and Aims: Intracranial hemorrhage (ICH) is a severe and often life-threatening condition defined by bleeding within the cranial vault. It can result from various etiologies, including trauma, hypertension, aneurysmal rupture, and vascular malformations. Anticoagulant and antiplatelet therapies, while crucial for preventing thromboembolic events, have been implicated in increasing the risk of ICH. Understanding the impact of these therapies, both individually and in combination, on the incidence and outcomes of ICH is critical for optimizing patient care. This study aims to evaluate the risk of ICH associated with oral antithrombotic and anticoagulation treatments, alone and in combination.

Methods: Following the Preferred Reporting Items of Systematic Reviews and Meta-Analyses (PRISMA) guidelines, we conducted a systematic review and meta-analysis of randomized controlled trials (RCTs) comparing oral antithrombotic and anticoagulant treatments across various cardiovascular diseases. Two independent reviewers searched PubMed and Web of Science databases up to January 2023 to identify eligible RCTs comparing any of the abovementioned agents against placebo or another agent, alone or in combination. Outcomes of interest were ICH and mortality, with odds ratios (OR) and 95% confidence intervals (CI) calculated using random-effects meta-analysis.

Results: Of the 11,547 studies screened, 47 studies were included. Compared to placebo, ASA significantly increased the risk of ICH (OR 1.33, CI 1.11-1.6; $p=0.002$)

but did not affect mortality (OR 0.97, CI 0.93-1.02; $p=0.32$). When compared to P2Y12i, ASA showed similar risks of ICH (OR 0.81, CI 0.46-1.41; $p=0.45$) and mortality (OR 1.1, CI 0.83-1.45; $p=0.50$). ASA alone, compared to the combination of P2Y12i and ASA, showed no difference in ICH (OR 1, CI 0.74-1.34; $p=0.99$) or mortality (OR 1, CI 0.76-1.3; $p=0.97$). Comparing ASA to DOACs, the risks of ICH (OR 1.13, CI 0.61-2.1; $p=0.71$) and mortality (OR 0.91, CI 0.8-1.05; $p=0.20$) were similar. ASA alone also showed similar ICH (OR 0.95, CI 0.61-1.47; $p=0.82$) and mortality (OR 0.94, CI 0.65-1.35; $p=0.72$) rates when compared to its combination with DOACs. Warfarin had a significantly increased risk of ICH (OR 0.42, CI 0.32-0.55; $p<0.001$) and mortality (OR 0.88, CI 0.84-0.93; $p<0.001$) compared to DOACs. Warfarin combined with Dual Antiplatelet Therapy (DAPT) showed a significantly higher risk of ICH (OR 0.41, CI 0.19-0.88; $p=0.02$) and a trend towards increased mortality (OR 1.06, CI 0.82-1.37; $p=0.65$) compared to DOACs combined with DAPT. In contrast, DAPT alone, compared to DOACs combined with DAPT, carries a reduced risk of ICH (OR 3.37, CI 1.83-6.19; $p<0.001$) without excess mortality (OR 0.93, CI 0.73-1.18; $p=0.54$).

Conclusion: Therapy with ASA is associated with an increased risk of ICH without providing a mortality benefit. The risk of ICH is similar between patients receiving DAPT and those on ASA alone. DOACs show a comparable risk of ICH to ASA alone and have a reduced risk of both ICH and mortality compared to warfarin. Combining DOACs with ASA does not increase the risk of ICH compared to ASA alone.

**CARDIOPATIA ISCHEMICA 515
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

A RARE CASE OF ACUTE CORONARY SYNDROME AFTER MISOPROSTOL TREATMENT: KEEP AN EYE OUT

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Background: Misoprostol is a synthetic prostaglandin E1 analogue used in obstetrics and gynaecology for pregnancy termination, induction of labour, and treatment of metrorrhagia. It has an excellent safety profile and mild gastrointestinal intolerance is the most common reported side effect. However, life-threatening cardiovascular events were described in literature in rare cases.

Case report: A 50-year-old female without cardiovascular risk factors was admitted to the gynaecology department for acute abdominal pain and metrorrhagia related to a large oval mass in the cervical canal requiring endometrial curettage. After taking 400 mg of misoprostol orally, the patient complained sudden chest pain irradiated to the left arm. She reported no previous cardiovascular events or known drugs hypersensitivity. She also denied the use of illicit substances and drugs. The vital parameters and clinical evaluation were unremarkable. Serial ECGs did not show any sign of myocardial ischaemia. The transthoracic echocardiogram was normal with preserved biventricular global and regional systolic function. Intravenous nitrates were promptly initiated, leading to a rapid improvement of symptoms. The blood count, renal function, and plasma electrolyte levels were all within normal limits, whereas a mild

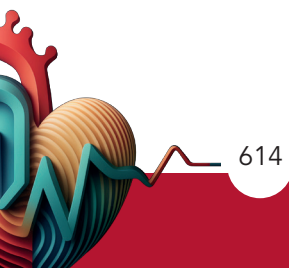
increase of serum ultrasensitive troponin levels was revealed during serial evaluations. Thus, the diagnosis of myocardial infarction without ST elevation (NSTEMI) was posed and antiplatelet therapy was prescribed. The subsequent coronary angiography showed a patent coronary circulation, thus a working diagnosis of myocardial infarction with non-obstructive coronary arteries (MINOCA) was made. No further investigations were conducted because coronary vasospasm was considered the most likely cause (Naranjo Score 7/13 points) and chronic oral therapy with calcium channel blockers was prescribed. The subsequent gynaecological evaluation confirmed the absence of any remaining blood material and the patient was discharged at home in good clinical conditions.

Discussion: MINOCA represents an emerging cause of acute coronary syndrome, mainly among females, often related to coronary vasospasm. This could be elicited by various triggers such as cold, emotional/physical stress, cigarette smoking, and drugs. The synthetic prostaglandin E1 analogues were associated with coronary spasms and stroke in rare cases. The pathophysiological mechanism is little known but appears related to the EP1 and EP3 receptors and the alteration of adrenergic tone. The most frequently reported severe clinical presentation was a myocardial



infarction with ST elevation, sometimes complicated with cardiac arrest not responsive to cardiopulmonary resuscitation manoeuvres. The prompt treatment with vasodilators is crucial to reduce vasospasm, leading to a decrease of symptoms and myocardial ischaemic

area. Moreover, the close monitoring of patients during the first few hours after misoprostol administration is essential for a timely identification and treatment of these rare, but potentially life-threatening, complications.



CARDIOPATIA ISCHEMICA 528
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
ANGINA INSTABILE (CARDIOPATIA ISCHEMICA)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
IL SISTEMA SANITARIO NAZIONALE DOPO COVID-19 (COVID-19)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)

ANALISI COMPARATA DEI VOLUMI DI ACCESSO IN PRONTO SOCCORSO PER MALATTIE ISCHEMICHE DEL CUORE NEI PERIODI PRE E POST PANDEMIA COVID-19

Valerio Di Nardo (a, b), Mirio Camuzzi (b), Fabrizio Armando Ferilli (a, b), Claudio Fiorelli (a, b), Annalivia Cercarelli (b), Mauro Scimmi (a), Benedetto De Rosa (b), Gabriele Ferrante (b)

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Introduzione: Le malattie cardiovascolari sono un gruppo di patologie che colpiscono il cuore e/o i vasi sanguigni. Rappresentano la prima causa di morte, morbosità e invalidità in Italia e nel mondo e costituiscono un importante problema di sanità pubblica per il loro rilevante impatto umano, sociale ed economico. Tra quelle più frequenti rientrano la cardiopatia ischemica, che comprende principalmente l'infarto acuto del miocardio, e lo scompenso cardiaco. La prevenzione è l'arma più importante per mantenere in salute il cuore e per contrastare l'insorgenza e la progressione delle malattie cardiovascolari. Le principali raccomandazioni per la loro prevenzione sono: adottare e mantenere stili di vita salutari, riconoscere precocemente e tenere sotto controllo, con l'aiuto del medico curante e degli specialisti, eventuali fattori che aumentano il rischio di insorgenza di malattie cardiovascolari, quali ipertensione arteriosa, dislipidemie e diabete mellito (Ministero della Salute, 2022). La letteratura riporta che oltre alle manifestazioni derivanti dall'infezione da SARS-CoV-2, la pandemia ha avuto un'importante ripercussione sui sistemi sanitari globali, e i programmi di screening e gli esami ritenuti non urgenti sono stati rinviati con conseguenti ritardi diagnostici (Bisceglia, 2021). Nonostante i pazienti affetti da malattie croniche necessitino di un accesso continuo e routinario ai servizi sanitari per poter effettuare visite ed esami

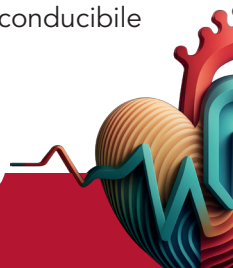
ematochimici e strumentali, la pandemia COVID-19 ha fatto emergere tutte le fragilità del SSN impedendo, di fatto, a molti di sottoporsi a un corretto follow-up (GIMBE, 2021). L'impatto indiretto della pandemia ha quindi interessato anche quelle aree cliniche nelle quali la tempestività di intervento è fondamentale, come l'infarto miocardico (De Rosa et al. 2020).

Obiettivo: Confrontare il numero di accessi al Pronto Soccorso (PS) dell'Azienda Ospedaliera di Terni per malattie ischemiche del cuore nel 2019 (pre-pandemia) con quelli registrati nel 2022 (post pandemia).

Materiali e metodi: Sono stati estrapolati dal database gli accessi per malattie ischemiche del cuore (Codici 401-405), identificati secondo il Sistema di codifica ICD-9-CM, registrati negli anni 2019 e 2022 attraverso un foglio di lavoro Excel.

Risultati: Gli accessi al PS sono stati 44833 nel 2019 e 41024 nel 2022, ma nonostante una riduzione di oltre l'8%, il numero assoluto di accessi per Malattie Ischemiche del Cuore risulta aumentato per tutte le diagnosi, come si evince dal grafico.

Conclusioni: L'aumento del ricorso al PS per malattie ischemiche del cuore potrebbe essere riconducibile



agli effetti indiretti della pandemia quali la riduzione delle visite cardiologiche e delle prestazioni diagnostico-terapeutiche, le sequele cardiovascolari a medio-lungo termine del COVID-19 e gli effetti sfavorevoli del lockdown sulla salute cardiovascolare (Di Pasquale et al. 2021). Lo studio non considera il numero di decessi e di interventi effettuati dai servizi di 118/112. Studi del genere possono fornire elementi utili a valutare l'efficacia dei diversi modelli territoriali, in termini di prevenzione delle riacutizzazioni e di riduzione di accessi in PS (Di Nardo et al. 2023) nonché per pianificare specifici interventi sia organizzativi che di formazione.

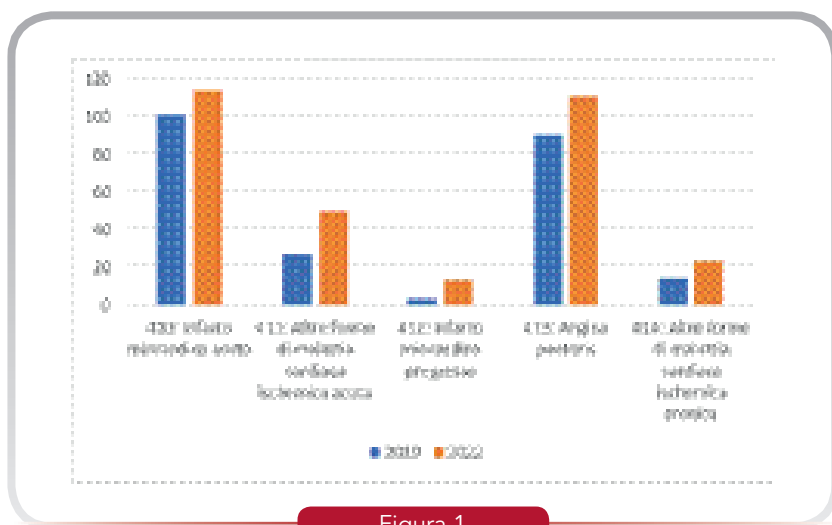
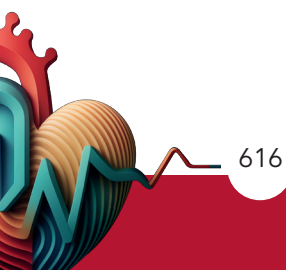


Figura 1



CARDIOPATIA ISCHEMICA 328
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

DISSEZIONE CORONARICA IATROGENA ESTESA ALL'AORTA ASCENDENTE

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(a) UNIVERSITÀ DEGLI STUDI DI PADOVA

Si riporta il caso di una paziente di 82 anni con stenosi valvolare aortica sottoposta a TAVI.

Alla coronarografia preoperatoria veniva riscontrata una coronaropatia critica monovasale a livello del tratto medio della coronaria destra. Pertanto, veniva posta indicazione a rivascolarizzazione percutanea dopo l'intervento di TAVI durante il quale veniva utilizzata una bioprotesi aortica Medtronic Core Valve EvolutR 26 mm.

Durante la procedura di rivascolarizzazione veniva in primo luogo eseguita una predilatazione del vaso malato con pallone Sapphire 2.5x20 mm. Dopo iniezione di mezzo di contrasto comparve una dissezione coronarica destra estesa all'aorta ascendente.

Veniva quindi eseguito impianto di duplice stent

medicato al tratto prossimale e medio della coronaria destra.

Essendo la dissezione coronarica con estensione all'aorta ascendente un evento potenzialmente fatale, è importante individuare i fattori predisponenti (ad esempio, l'interventistica su coronaria destra, il sesso femminile, malattie del collagene, l'utilizzo di cateteri con curva Amplatz left).

Nella maggior parte dei casi il trattamento è di tipo conservativo e prevede l'esecuzione di TC di controllo seriate, monitoraggio in UTIC ed ottimizzazione della terapia antipertensiva. Talvolta in alcuni casi si rende necessaria l'esecuzione di un intervento cardiocirurgico.



**CARDIOPATIA ISCHEMICA 175
 INFARTO STEMI (CARDIOPATIA ISCHEMICA)
 TRATTAMENTO POST-INFARTO
 (CARDIOPATIA ISCHEMICA)
 ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
 (ASSISTENZA CARDIACA IN ACUTO)
 SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)**

SUBACUTE LEFT VENTRICULAR FREE WALL RUPTURE

Giuseppe Astuti (a), Giulia Mingoia (a), Giuseppe Leggio (a), Federica D'angelo (a), Giorgio De Michele (a), Danilo Puccio (a), Gianfranco Ciaramitaro (a), Giuseppe Coppola (a), Giuseppina Novo (a), Alfredo Ruggiero Galassi (a), Egle Corrado (a)
 (a) U.O.C. CARDIOLOGIA, A.O.U.P. PAOLO GIACCONE - UNIVERSITA' DEGLI STUDI DI PALERMO

Introduction: Left ventricular free wall rupture is a rare mechanical complication after myocardial infarction. The mortality rate is described from 75% to 90%. Surgical exploration and rupture repair is the definitive diagnostic and therapeutic procedure.

Case Report: We report the case of a 69-year-old male with no significant cardiac history, except for known dyslipidemia, admitted to our department for an inferior-lateral ST-segment elevation myocardial infarction (STEMI), manifesting as chest pain and subsequent loss of consciousness. On admission, the patient was hemodynamically stable with a blood pressure of 100/60 mmHg and a heart rate of 127 bpm. Urgent coronary angiography indicated acute thrombotic occlusion of the circumflex artery's

OM branch, necessitating percutaneous coronary intervention (PCI) on the affected vessel. Color-Doppler echocardiography identified akinesia in the inferior septal, inferior, and inferior-lateral walls, along with pericardial effusion with hemorrhagic density (maximum 3.7 cm near the atrioventricular junction in subcostal projection), causing marked biatrial compression and significant dilation of the suprahepatic venous system. Urgent angio-CT ruled out aortic dissection or ventricular wall rupture. However, due to deteriorating hemodynamic conditions, emergency median sternotomy with pericardial toilet was performed, revealing no evident breaches in the cardiac walls and targeted echocardiography revealed residual known kinetic defects and a mild circumferential pericardial effusion (1.1 cm).

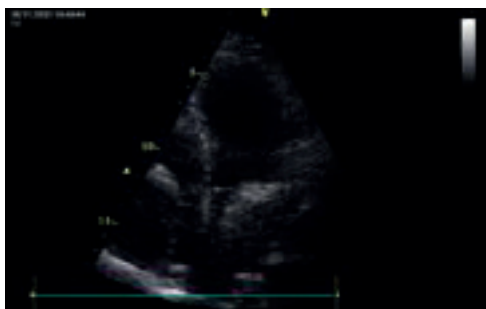


Figure 1

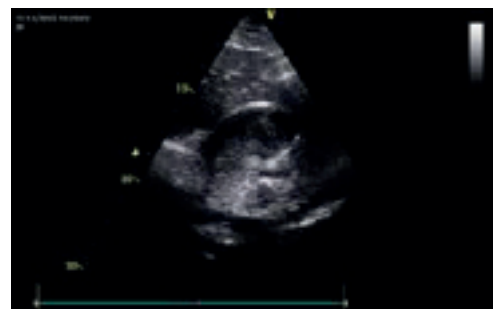


Figure 2

Following amino and inotropic support, the patient's clinical conditions stabilized. On the fifteenth day post-acute event, a new syncopal episode occurred (BP: 110/70 mmHg, HR 90 bpm). Color- Doppler echocardiography showed an organized clot compressing right atrium and right ventricular inflow tract during the systo-diastolic phase.

A second angio-CT revealed a voluminous blood collection at the left ventricular apex, supplied by iodinated contrast, suggesting a probable rupture of the postero-inferior cardiac wall. Consequently, a second emergency median sternotomy exposed profuse

bleeding from a left ventricular wall pseudoaneurysm. After initiating extracorporeal circulation, the clot was evacuated, and a 1 cm breach in the left ventricular inferior wall was sutured. Considering recent STEMI and the need for high doses of inotropic support, an intra-aortic balloon pump (IABP) was positioned. Post-procedural transesophageal echocardiography confirmed successful repair with no subvalvular mitral apparatus alterations. Unfortunately, after approximately 12 hours of intensive monitoring, the patient succumbed to refractory cardiogenic shock despite therapy.



CARDIOPATIA ISCHEMICA 846 ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA) TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

CAN VERICIGUAT ADDRESS THE UNMET NEEDS IN ANTERIOR MYOCARDIAL INFARCTION TREATMENT?

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Anterior myocardial infarction (MI) is a critical condition with significant implications for cardiac function and patient prognosis, causing substantial damage to the heart muscle, particularly the left ventricle. Despite advancements in reperfusion therapies, optimizing recovery during the early phases of MI remains challenging. Long-term effects of anterior MI, such as chronic heart failure, left ventricular remodeling, and persistent arrhythmias, can severely impact patients' quality of life and overall prognosis.

Vericiguat, a soluble guanylate cyclase (sGC) stimulator, has shown promise in heart failure but its role in early anterior MI has not been fully explored. By enhancing sGC activity, vericiguat may increase cyclic guanosine monophosphate (cGMP) production, leading to vasodilation, inhibition of platelet aggregation, and potential cardioprotective effects. The nitric oxide (NO)-sGC-cGMP signaling pathway is crucial for vascular function, but during MI, NO availability is often reduced, impairing this pathway and exacerbating ischemic injury. Vericiguat can bypass this impairment by directly stimulating sGC, potentially restoring cGMP levels even under reduced NO conditions.

Current treatment options for anterior MI focus primarily on reperfusion strategies and managing complications. However, there is a critical need for adjunctive therapies that target the pathophysiological changes in the early phases of MI. Vericiguat's mechanism offers a novel approach to improving vascular function

and myocardial health, which could contribute to developing innovative treatment strategies.

Potential benefits of vericiguat in early anterior MI include improved blood flow to the ischemic myocardium, reduced myocardial damage, enhanced overall cardiac function, prevention of further coronary artery occlusion, and reduction in cardiac remodeling and fibrosis. These effects could mitigate adverse cardiac remodeling, a common consequence of extensive myocardial injury, and a precursor to heart failure.

However, several challenges must be addressed, including the safety profile of vericiguat in the acute MI setting, particularly the risk of hypotension in hemodynamically unstable patients, and potential interactions with standard MI therapies such as antiplatelet agents, anticoagulants, and beta-blockers.

In conclusion, vericiguat could represent a novel approach for anterior MI by targeting the NO- sGC- cGMP pathway. Its potential to promote vasodilation, reduce myocardial injury, and prevent adverse cardiac remodeling could significantly improve both acute and long-term outcomes for patients. Further research is essential to confirm its benefits, optimize its usage, and ensure safety. If proven effective, vericiguat could become a valuable addition to the therapeutic arsenal, offering hope for improved management and prognosis of anterior myocardial infarction.

**CARDIOPATIA ISCHEMICA 921
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

DEBULKING CON LASER AD ECCIMERI NEL TRATTAMENTO DEL TRONCO COMUNE IN ACUTO

Fulvio Furbatto (a), Ciro Mauro (a), Davide D'andrea (a), Gerardo Carpinella (a), Alessandro Bellis (a),
Vittorio Tagliatela (a), Fulvio La Rocca (a)
(a) AORN CARDARELLI

Il caso clinico si riferisce a paziente di 58 anni che accede in PS per STEMI con evidenza angiografica di occlusione trombotica intrastent del corpo del tronco comune, non dilatabile con palloni di piccolo calibro

La risoluzione tecnica della patologia acuta è avvenuta mediante utilizzo di tecnica di debulking, in acuto, su tronco comune, con erogazione di laser ad eccimeri con catetere Turboelite, e successiva angioplastica convenzionale.

L'utilizzo del debulking con laser ad eccimeri, nel contesto della patologia acuta del tronco comune, ha inciso notevolmente sul buon esito della procedura e relativa sopravvivenza del paziente all'evento acuto

La padronanza di tecniche di debulking utili nella patologia coronarica calcifica non crossabile al pallone permette, anche se raramente, il trattamento efficace anche della patologia acuta.



CARDIOPATIA ISCHEMICA 673
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)

PROGETTO RIABILITOMICA, DATI PRELIMINARI: RISPOSTA METABOLICA ALLA RIABILITAZIONE CARDIOLOGICA DOPO INFARTO MIOCARDICO ACUTO

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Premesse - Gli effetti benefici della riabilitazione cardiologica (RC) dopo infarto miocardico acuto (IMA) sono noti. Non è ancora chiaro se e come RC influenzi i processi metabolici nei pazienti (pz) dopo IMA. La metabolomica è l'analisi quali-quantitativa delle risposte metaboliche dell'organismo a stimoli fisiopatologici o ad alterazioni genetiche. Sono state dimostrate associazioni di numerosi metaboliti (amminoacidi e lipidi) con il rischio cardiovascolare, e descritte modificazioni metabolomiche indotte dal training (strenuo in atleti, blando in pz obesi o con sindrome metabolica). Il progetto RIABILITOMICA intende valutare per la prima volta dal punto di vista metabolomico la risposta all'esercizio fisico alla RC, dopo un primo IMA.

Metodi - Abbiamo arruolato 25 pz maschi, non diabetici, di età < 75 anni (56±6 anni), che iniziavano RC entro 6 settimane da IMA. Il protocollo di RC prevedeva 3-5 sedute/settimana (90 min, 22±2 sedute), con allenamento aerobico (interval training e calistenici). Ad inizio e fine RC si eseguivano: ecocardiogramma colorDoppler, test del cammino dei 6 minuti (6MWT), esami ematici (colesterolo LDL, lipoproteina(a), HbA1c, PCR-HS, omocisteina, folati, BNP). Al termine di RC si eseguiva test cardiorespiratorio (CPET). I prelievi per le analisi metabolomiche erano eseguiti: (1) all'ingresso in RC, (2) prima e dopo il primo allenamento, (3) prima

e dopo allenamento a metà percorso, (4) prima e dopo l'ultimo allenamento.

Risultati. Presentiamo i risultati dei primi 4 pz in cui l'analisi metabolomica è stata completata: all'ecocardiogramma, miglioravano wall motion score index (1.47 > 1.20, -16,6%; p=0.007) e global longitudinal strain (-11.77% > -15.97%, +26,3%; p=0.059). Agli esami ematici, PCR-HS si riduceva del 60% e BNP del 46%. Il 6MWT migliorava (610 > 652 mt, p=0.065); Al CPET, VO2 picco era 22.4 mL/kg/min (76% del predetto).

A fine RC, si osservava inoltre una variazione del metaboloma: le concentrazioni di xantina, acido urocanico e C5-carnitina si riducevano, e le concentrazioni di ipoxantina e guanina aumentavano (Figura 1).

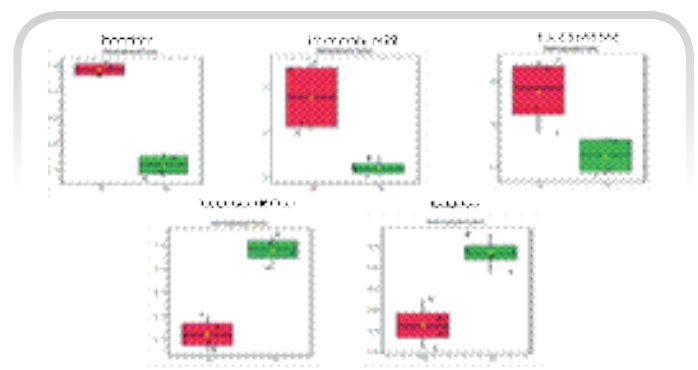


Figure 1

Conclusioni questi dati preliminari confermano i benefici di RC su contrattilità cardiaca e tolleranza all'esercizio, e soprattutto mostrano con chiarezza progressive variazioni nel metaboloma (con modifiche rilevanti nel metabolismo delle purine, dell'istidina

e nello stress ossidativo). Le analisi metabolomiche, con il loro innovativo approccio unbiased, inserite nel contesto della riabilitazione cardiologica, potrebbero far emergere conseguenze ancora ignote del training fisico.



**CARDIOPATIA ISCHEMICA 260
 INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)
 INFARTO STEMI (CARDIOPATIA ISCHEMICA)
 INTERVENTISTICA CORONARICA
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

OCCCLUSION MYOCARDIAL INFARCTION ECG PATTERNS ENHANCE RISK STRATIFICATION IN NSTEMI PATIENTS

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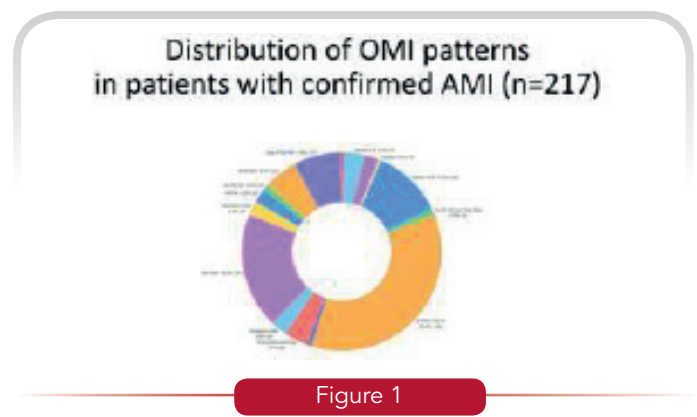
Background: Current STE criteria fail to detect nearly one-third of acute coronary occlusions, leading to delayed emergent reperfusion in non-STE myocardial infarction (NSTEMI) patients with total occlusion. Given that various electrocardiographic findings can accurately indicate OMI, we conducted a comparison between the established STEMI/NSTEMI and OMI/NOMI paradigm. This evaluation aims to enhance the identification of patients requiring urgent reperfusion therapy.

Objective: We aimed to compare the STEMI/NSTEMI and OMI/NOMI paradigms within a single population, in relation to infarct size, angiographic characteristics, and time to catheterization. Additionally, we aimed to analyze the incidence of different OMI ECG patterns and the outcomes in our study population.

Methods: We performed a retrospective, observational study on a cohort of 250 patients with suspected of acute coronary syndrome (ACS) and referred for angiography. We collected electrocardiograms, demographic characteristics, laboratory results, angiographic data, and outcomes. Three blinded operators reviewed ECGs for STEMI criteria and subtle signs. We evaluated infarct size through peak troponin

I levels, presence of culprit lesions on angiogram and time to catheterization. The composite endpoint included death, re-infarction, and heart failure hospitalization.

Results: Among 250 patients with suspected ACS at admission, 217 had acute myocardial infarction. Of these, 35.9% were STEMI(+)OMI(+), 45.2% were STEMI(-)OMI(+), and 18.9% were STEMI(-)OMI(-). Median peak troponin I for the STEMI(+) OMI, STEMI(-) OMI, and no occlusion groups was respectively 77778±9915 ng/L, 29729±4410 ng/L, and 6860±3149 ng/L (P<0.001). A violin plot illustrates differences in peak troponin levels among ECG OMI patterns. The median door-to-needle time was 1.4 hours for STEMI(+)



OMI compared with 13.5 hours for STEMI(-) OMI(+) and 26 hours for STEMI(-) OMI(-) ($P < 0.001$). The composite endpoint of death, reinfarction, and heart failure showed no statistically significant differences among the three groups. However, a subgroup analysis of female patients indicated a higher incidence of events in STEMI(-) OMI(+) women compared to STEMI(+) OMI(+) and STEMI(-) OMI(-) women, with rates of 50%, 20%, and 23%, respectively ($P=0.036$).

Conclusions: STEMI(-) OMI patients had significant infarct size and delays to catheterization. These data support the OMI/NOMI paradigm and the importance of further research into emergent reperfusion for STEMI(-)OMI(+) patients.

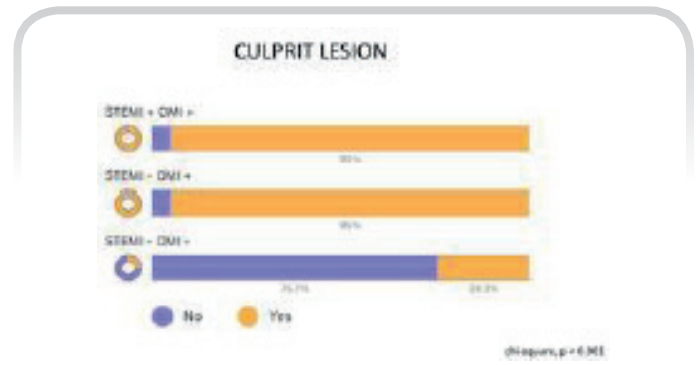


Figure 2

CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE

CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 949
CARDIOPATIE CONGENITE NELL' ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE) RISONANZA MAGNETICA
CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

FONTAN OBSTRUCTION IN AN ADULT PATIENT: A CLINICAL CASE

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Background: The population of patients with a Fontan palliation is aging[i]. Due to their passive pulmonary circulation, it is important that there is no stenosis in the cavo-pulmonary connection. Obstruction is an important cause of morbidity and mortality in Fontan patients.[ii] We report a case of sub-occluded conduit obstruction in 25-year-old woman with a Fontan circulation.

Clinical Case: A 25-year-old female with a Fontan Circulation was referred to our ACHD Unit for progressive dyspnea on exertion (NYHA II), bilateral peripheral edema and thrombocytopenia. Her cardiac background was atrioventricular septal defect with unbalanced ventricles, hypoplastic ascending aorta and persistent left superior vena cava. She underwent a complete Fontan palliation with extracardiac conduit at age of 3 years. On physical examination, blood pressure was 136/80 mmHg, resting oxygen saturation 96%, the rhythm was sinus with an heart rate of 86 bpm. On blood tests, Haemoglobin was 147mg/dL was with

normal iron storage, platelets 67.000/mm³ with raised transaminases, GGT and INR. The abdomen ultrasound showed increased dimension of the heterogenous liver parenchyma, hypertrophy of the caudate lobe and nodular focal regenerative areas.

The trans-thoracic echocardiogram showed preserved systolic function of the single ventricle, moderate valve regurgitation (five leaflets), no obstruction in systemic outflow tract. An hyperechogenic structure in the lumen of the extracardiac Fontan conduit was noted. This, together with the abnormal wave Doppler in the venous caval flows, raised the suspicion of tunnel obstruction.

Due to the suspicion of conduit obstruction, second level imaging techniques were performed. The Cardiac Magnetic Resonance (CMR) study confirmed preserved systolic function of the single ventricle and moderate valve regurgitation. The presence of severe obstruction of the tunnel at its superior part was shown.



The 3D-SSFP post gadolinium injection allowed a better visualization of the obstruction and together with flow calculation, numerous veno-veno collaterals were identified. The Glenn's anastomosis and pulmonary branches were unobstructed.

The Cardiac Computational Tomography allowed a precise characterization of the mass obstructing the lumen of the extra-cardiac conduit which appeared severely calcific with a small central lumen and some residual circumferential flow. An extensive veno-venous collateral circulation between the inferior and superior caval system, bypassing the obstructed tunnel segment, was demonstrated. These features, together with the clinical assessment, confirmed the chronic nature of the obstruction. There were no signs of pulmonary embolism.

The case was urgently discussed in the Multidisciplinary Team and the patient underwent surgical extracardiac conduit replacement. The patient was discharged 1 week later with already an improved clinical status (no peripheral oedema, improving thrombocytopenia).

Conclusions: Chronic conduit sub-occlusion in a Fontan circulation is an infrequent event but should always be suspected in case of sign and symptoms of decompensation. Second level imaging techniques offer a definitive diagnosis. Particularly, CT allows characterization of calcific masses and a better temporal-spatial resolution of the veno-veno collaterals/anatomical structure, important for the pre-surgical planning.

[i] Constantine A, Ferrero P, Gribaudo E, Mitropoulou P, Krishnathasan K, Costola G, Lwin MT, Fitzsimmons S, Brida M, Montanaro C, Kempny A, Heng EL, Chessa M, Dimopoulos K, Rafiq I. Morbidity and mortality in adults with a Fontan circulation beyond the fourth decade of life. *Eur J Prev Cardiol.* 2024 Aug 22;31(11):1316-1323. doi: 10.1093/eurjpc/zwae031. PMID: 38306409.

[ii] D'Angelo EC, Ciuca C, Egidy Assenza G. Management of Fontan failure. *Heart.* 2022 Oct 28;108(22):1822-1831. doi: 10.1136/heartjnl-2022-321006. PMID: 35973785.

CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 275

CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

GRAVIDANZA E CARDIOPATIA (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

PREGNANCY OUTCOMES IN ADULT CONGENITAL HEART DISEASE WOMEN: A SINGLE CENTRE EXPERIENCE

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Rossella Iuzzolino (a), Gianfranco Butera (a)

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BAMBINO GESU' HOSPITAL AND RESEARCH INSTITUTE, IRCCS, ROME, ITALY

Background: Pregnancy is associated with significant hemodynamic changes in women with congenital heart diseases (ACHD), increasing the risk of cardiac, obstetric and fetal complications.

Material and Methods: We collected data of ACHD pregnant women evaluated at "ACHD program" between January 2018 and October 2023.

Cardiological risk of pregnancy was estimated according to World Health Organization (WHO) classification.

Primary outcomes included cardiological complications: mortality, functional class worsening, arrhythmias and thrombosis.

Results: We collected data of 73 consecutive patients and 78 pregnancies (5 women had 2 pregnancies). Mean age at pregnancy was 33 years old (± 2.6 years). Eight patients had an history of previous spontaneous miscarriages.

Seventy-one patients had a natural pregnancy, 2 patients underwent to medical assisted procreation. Sixty-four patients had a left systemic ventricle physiology and the most frequent primary diagnosis was Tetralogy of Fallot in 24 patients (33%).

Five patient had systemic right ventricle physiology and 4 patient Fontan circulation.

According to WHO classes: WHO I: 11 patients (15 %);

WHO II: 31 patients (42 %); WHO II-III: 15 patients (21 %); WHO III: 16 patients (22%). None patient was in class WHO IV.

Ten pregnancy are still ongoing, and 2 miscarriages occurred in first trimester. Mean gestational week at delivery (66 pregnancies) was 38 weeks (SD ± 1.9 weeks). Forty-one patients (62%) underwent to Cesarean Section (CS). Three patients underwent to urgent CS for fetal distress. Preterm births (birth < 37 weeks) were 5 while 4 low birth weights (birth weight < 2500g) occurred. One Fontan patients had a twins-birth.

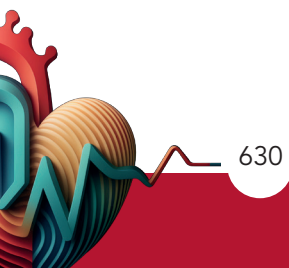
During pregnancy and puerperium rate of cardiovascular events was 12%. During pregnancy functional class worsening occurred in 2 patients: in one case worsened after delivery due to incremental gradient through aortic valve which led to surgery in follow-up. Arrhythmias occurred in 3 patients during pregnancy, in one patient relapsed during puerperium and in one presented after delivery. All arrhythmias were supraventricular arrhythmias. During pregnancy 1 patient developed hypertensive disorder.

During the puerperium one Fontan patient developed deep venous thrombosis and pulmonary embolism. All complications occurred in patients in III WHO class. No maternal or neonatal mortality occurred.



Conclusions: In the current era, pregnancy can be carried out successfully also in selected women with congenital heart diseases. Correct counseling is mandatory in this population. Strict follow-up during

gestational time but also after delivery in a tertiary center is recommended.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 462 ELETTROSTIMOLAZIONE (ARITMIE) CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) PROGNOSI (SCOMPENSO CARDIACO)

PACEMAKER E CIRCOLAZIONE DI FONTAN: ESPERIENZA DI UN SINGOLO CENTRO CON 15 ANNI DI FOLLOW-UP

Giulia Iannaccone (a, b), Polona Kacar (a), Pietro Paolo Tamborrino (a), Gerhard-paul Diller (a, c), Tom Wong (a), Janice Till (a), Jonathan Clague (a), Andreas Hoschtitzky (a), Barnabe Rocha (a), Darryl F Shore (a), Michael A Gatzoulis (a), Claudia Montanaro (a)

(a) ADULT CONGENITAL HEART CENTRE AND NATIONAL CENTRE FOR PULMONARY HYPERTENSION, ROYAL BROMPTON HOSPITAL; (b) DEPARTMENT OF CARDIOVASCULAR AND PULMONARY SCIENCES, CATHOLIC UNIVERSITY OF THE SACRED HEART; (c) DEPARTMENT OF CARDIOLOGY III-ADULT CONGENITAL AND VALVULAR HEART DISEASE, UNIVERSITY HOSPITAL MÜNSTER, GERMANY

Introduzione: L'impianto di pacemaker (PM) è frequentemente necessario dopo intervento di Fontan. Tuttavia, le complicanze a lungo termine dell'impianto di PM in pazienti con fisiologia univentricolare non sono note. Lo scopo del nostro studio è quello di valutare la prognosi a lungo termine di pazienti adulti con circolazione di Fontan e portatori di PM.

Materiali e metodi: Pazienti adulti (>16 anni) con circolazione di Fontan e PM sono stati identificati dal registro elettronico del nostro centro. Dati riguardanti l'anatomia, l'impianto di PM, le caratteristiche cliniche ed ecocardiografiche e il test cardiopolmonare sono stati retrospettivamente raccolti. I pazienti con follow-up <1 anno sono stati esclusi.

Risultati: Tra i 233 pazienti Fontan, 52(22%) erano portatori di PM. Di questi, 48(età mediana 19.4 anni, 48% donne) sono stati arruolati. L'indicazione più frequente all'impianto di PM è stata blocco atrio-ventricolare. L'età mediana all'impianto di PM era 17.5(12-26.8)anni, il 71% ha impianto un PM epicardico(ePM). Durante un follow up mediano di 14.7(8.5-20.4)anni, 7 pazienti sono deceduti[13% con ePM, 27% con PM transvenoso (tPM),p=ns].Eventi avversi cardio e cerebrovascolari

maggiori(MACCE) si sono verificati in 13 pazienti(27%); i quali erano più vecchi sia al momento dell'intervento di Fontan(p=0.046) che dell'impianto di PM(p=0.013), erano maggiormente portatori di tPM(p=0.003), presentavano più frequentemente classe NYHA≥III alla prima visita(p=0.003) e disfunzione contrattile almento media del ventricolo unico (p=0.008). Alla regression di Cox, età all'impianto di PM(p<0.001), classe NYHA ≥ III(p=0.003) e tPM(p=0.046) sono stati confermati predittori indipendenti di MACCE. La sopravvivenza libera da MACCE è stata inferior tra I pazienti con tPM rispetto a quelli con ePM(log-rank p=0.039). I pazienti con tPM erano più grandi di età(p=0.05), con peggiore VO2% di picco(p=0.016) e sono andati più frequentemente incontro a malfunzionamento di elettrocatteter(p=0.05) e ad aritmie atriale di nuova insorgenza(p=0.031).

Conclusioni: L'impianto di PM è stato necessario nel 22% dei pazienti Fontan adulti. Età all'impianto, ridotta capacità funzionale e tPM si sono dimostrati associati con maggiore incidenza di MACCE. Studi prospettici sono necessari per stabilire le tempistiche di impianto e il tipo di PM ottimali in questa crescent popolazione.



**CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 816
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
MIocarditi (MALATTIE DEL MIocardIO E DEL PERICARDIO)**

**RIVAROXABAN FOR INTRACARDIAC THROMBOSIS IN THE PEDIATRIC POPULATION AT DIFFERENT
CARDIAC SITES: EARLY EXPERIENCE OF ANTICOAGULATION APPROACH AND TREATMENT OUTCOMES**

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Background: Intracardiac thrombi (ICT) are associated with significant morbidity and mortality. Anticoagulation is the first line of treatment and may be complemented by thrombectomy or thrombolysis. However, optimal anticoagulant duration still needs to be defined. Most individuals benefit from 3-to-6-month treatment; however, warfarin anticoagulation is still the first-line therapy. In adults with ICT, rivaroxaban, a direct oral anticoagulant (DOAC), is associated with similar efficacy and a significantly lower rate of major bleeding compared with low molecular weight heparin (LMWH) followed by dose-adjusted vitamin K antagonist [VKA] therapy). In pediatrics, rivaroxaban is a promising treatment for deep vein thrombosis and ICT.

Purpose: To determine the efficacy of rivaroxaban treatment for intracardiac thrombi resolution in pediatric patients diagnosed with intracardiac thrombosis.

Methods: In 2023-24, we enrolled 7 [0.8 (0.3-11, Q1-Q3) years-old, 57% males] consecutive pediatric patients (< 16 years old) treated with rivaroxaban (dosage based on patient's body weight) due to intracardiac thrombosis (ICT). ICT was suspected by echocardiography and confirmed with cardiac computed tomography (CCT) or magnetic resonance (CMR) imaging. All the participants were treated with enoxaparin for 7 days before the rivaroxaban implementation. CCT/CMR

was repeated to confirm ICT resolution. N=3/7 (43%) presented with right ventricular thrombosis, n=3/7 (43%) with right atrial thrombi, and n=1/7 (14%) with a left atrial appendage thrombus. Of them, n=4/7 (57%) patients experienced biventricular dysfunction due to CMR-confirmed myocarditis. All patients n=7/7 (100%) were previously treated inefficacy with warfarin.

Results: The mean dosage of rivaroxaban was 10±7.2 mg/day. After 3-month of rivaroxaban treatment, all the thromboses were resolved and confirmed at the CCT/CMR imaging; no major bleeding event was documented during the treatment based on the BASIC bleeding assessment scale. After a follow-up period of 6 months, no recurrences were detected at the echocardiography evaluation. Compared with the previous warfarin treatment, the duration of rivaroxaban therapy was shorter than the previous one (P<0.001). Besides, an international normalized ratio (INR) between 2-and-3 was achieved only after a mean period of coumadin treatment of 9.6±3.5 days, with a time in the therapeutic range <21% during the whole treatment.

Conclusions: Among pediatric patients with ICT, regardless of the thrombosis site and etiology, rivaroxaban effectively resolved thrombus with a reasonable risk profile and more patient and family compliance.

CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 280
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IPERTENSIONE POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

**USE OF SILDENAFIL IN PEDIATRIC PATIENTS WITH SINGLE VENTRICLE PALLIATION:
 A TEN YEARS EXPERIENCE IN A TERTIARY CENTRE**

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Background e Obiettivi dello studio: L'intervento di Fontan o intervento di connessione cavo-polmonare totale (CCPT) ha radicalmente modificato la storia naturale dei pazienti affetti da cardiopatia congenita complessa in cui non sia possibile una riparazione chirurgica biventricolare. Nella circolazione di Fontan, le resistenze vascolari polmonari (RVP) giocano un ruolo cruciale nelle diverse fasi della palliazione chirurgica e, se elevate, possono controindicare il completamento di Fontan. Allo stesso tempo, nel postoperatorio precoce o tardivo si può osservare un aumento delle RVP con fallimento del circuito. Ad oggi, l'utilizzo dei vasodilatatori polmonari (VP) nei pazienti con fisiopatologia univentricolare non è regolamentato da linee guida specifiche e in letteratura non esistono evidenze sufficienti che ne supportino l'uso routinario nei pazienti che si avviano o siano stati sottoposti a palliazione secondo Fontan. Scopo del nostro studio è stato quello di analizzare l'uso e gli effetti del sildenafil nei pazienti da sottoporre o già sottoposti a completamento di Fontan presso il nostro centro.

Materiali e metodi: il nostro è uno studio osservazionale retrospettivo monocentrico su una coorte di 100 pazienti pediatrici affetti da cardiopatia complessa e sottoposti ad intervento di Fontan tra gennaio 2014 e dicembre 2023. Sono stati raccolti dati demografici, diagnosi anatomica, storia clinica,

l'uso del sildenafil prima, durante e dopo l'intervento di Fontan, le complicanze chirurgiche e il follow-up post-intervento. Sono stati retrospettivamente estratti i parametri emodinamici al cateterismo pre-Fontan (pressione media in arteria polmonare mPAP, gradiente transpolmonare GTP, RVP); inoltre sono stati estrapolati la durata di intubazione post-intervento, il tempo di permanenza dei drenaggi toracici, la necessità di ossigenoterapia e giorni di ospedalizzazione totale. Un valore di $p < 0.05$ è stato considerato statisticamente significativo.

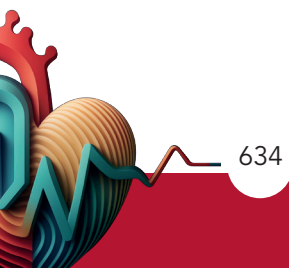
Risultati: Sono stati identificati un totale di 100 pazienti pediatrici affetti da cardiopatia congenita complessa sottoposti ad intervento di Fontan tra gennaio 2014 e dicembre 2023 di età media 3.5 anni di cui 35 (35%) di sesso femminile. Di questi pazienti 26 (26%) erano affetti da sindrome del cuore sinistro ipoplasico, 24 (24%) da atresia della tricuspide, 22 (22%) da cuore univentricolare, 22 (22%) da altre cardiopatie (canale atrioventricolare sbilanciato, ventricolo destro a doppia uscita, ventricolo sinistro a doppia uscita), 4 (4%) da difetti interventricolari multipli e 2 (2%) da sindrome di Shone. La mediana (IQR) dei mesi di follow up è stata di 51,9 (26,5-96,8). In 13 pazienti (13%) non considerati idonei per completamento di Fontan, è stata evidenziata una riduzione significativa della mPAP ($p < 0,008$) dopo introduzione della terapia con sildenafil (mediana dei



mesi di trattamento 14,0 (7,0-26,0), rendendo possibile l'intervento. Nell'immediato post-operatorio della CCPT, 42 pazienti (42%) hanno introdotto il sildenafil, più comunemente per pressione polmonare elevata al monitoraggio invasivo, drenaggi produttivi >15 giorni, difficoltà all'estubazione, necessità di ossigenoterapia e/o desaturazione significativa. Non è emersa alcuna differenza significativa in termini di intubazione, tempo di mantenimento dei drenaggi, necessità di ossigenoterapia e giorni di ospedalizzazione totale nei pazienti in terapia con VP prima dell'intervento di

Fontan 12(12%) rispetto ai pazienti non era in terapia 88 (88%). All'ultimo controllo di follow up, un totale di 16 pazienti (34,8%-17.2% overall) risultava in terapia cronica con sildenafil.

Conclusioni: Nella nostra esperienza, l'uso dei VP si è dimostrato efficace nel ridurre in maniera significativa la pressione media in polmonare permettendo il completamento della circolazione di Fontan. Studi longitudinali di follow-up sono necessari per validare l'efficacia di questi protocolli clinici nel tempo.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 292
IPERTENSIONE POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
PROGNOSI (SCOMPENSO CARDIACO)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

PROGNOSTIC VALUE OF FOLLOW-UP MEAN PULMONARY ARTERIAL PRESSURE AND PULMONARY VASCULAR RESISTANCE IN PATIENTS WITH PULMONARY ARTERIAL HYPERTENSION REACHING A LOW-RISK PROFILE

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Background: Hemodynamic variables such as right atrial pressure, cardiac index (CI), stroke volume index (SVI), and mixed venous oxygen saturation have been associated with survival in PAH. New treatments improve short-term outcome reducing mean pulmonary arterial pressure (mPAP) and pulmonary vascular resistance (PVR) without increasing CI or SVI.

Objective: The aim was to define the incremental prognostic role of a mPAP <35 mmHg and PVR <5 WU in idiopathic, hereditary, drug-induced PAH (I/H/D-PAH) and PAH associated with connective tissue disease (CTD) or congenital heart disease (CHD) reaching a low-risk profile at follow-up after first-line treatment.

Methods: treatment naïve patients were assessed at 1 follow-up (3–6 months after starting specific therapy; 1 F-UP) with 6-minute walk distance, WHO-FC, BNP/NT-proBNP and right heart catheterization. Risk was assessed according to COMPERA 1.0, FPHR-invasive, Bologna and COMPERA 2.0 risk tools. The primary

outcome was all-cause death and a combined endpoint of all cause death + need of treatment escalation. Analyses with Cox regression in reaching low-risk at 1 F-UP.

Results: 794 enrolled (54% I/H/D, 28% CTD, 18% CHD) and 706 have a complete re-evaluation 4 (3–6) months after starting first-line treatment. Death occurred in 54% over a median follow-up duration of 5.8 (2.4–11) years. Univariate analyses for all-cause death in reaching a low-risk profile at 1 F-UP in Table 1. Univariate analyses for all cause death + need of treatment escalation, together with initial treatment strategy and median time from 1 F-UP to death/need of treatment escalation in reaching a low-risk profile at 1 F-UP in Table 2.

Conclusion: mPAP <35 mmHg and PVR <5 WU are not of incremental prognostic value for all-cause death in reaching a low-risk profile at 1 F-UP after first-line treatment but predict the need of future treatment escalation (after median time >3 years).



**CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 905
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)**

ASSESSING LEFT VENTRICULAR HYPERTROPHY AND TWIST MECHANICS IN FAMILIAL FABRY DISEASE: ECHOCARDIOGRAPHIC INSIGHT ACROSS ADULT AND PEDIATRIC COHORTS

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(a) UNIVERSITA MAGNA GRECIA DI CATANZARO

Background: Fabry disease is a rare X-linked storage disorder caused by a deficiency of the lysosomal enzyme α -galactosidase A and generally causes multiorgan dysfunction.

Cardiac involvement is common, and left ventricular hypertrophy (LVH) is the main cardiac manifestation. Thickening of the left ventricular walls due to the deposition of globotriaosylceramide has profound effects on the heart's mechanical properties, including its twisting motion during systole and diastole.

Aims: This study aimed to analyze a set of echocardiographic parameters to determine the incidence of left ventricular hypertrophy in a cohort of adult and pediatric patients with familial Fabry disease and to investigate cardiac twisting mechanics in patients with and without LVH.

Methods: We prospectively included patients diagnosed with Fabry disease, confirmed by genetic testing, and compared with age- and sex-matched healthy controls. All patients underwent a complete echocardiographic study.

LVEF was determined using Simpson's biplanar method. Left ventricular torsion parameters Twist, were calculated as the difference between end-systolic rotation values at the apical and basal segments and

compared with an age-matched control group without evidence of Fabry disease.

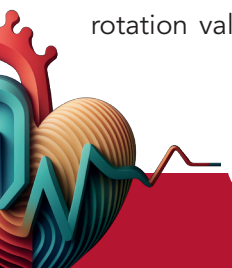
Results: Eighteen prospective patients were included in the study (32.7±15.6), including 4 pediatrics (age < 17 years).

Left ventricular ejection fraction was normal in both groups (p=NS). Three patients present with overt asymmetrical cardiac hypertrophy.

Patients with LVH were older (49 ±7.7), whereas Fabry patients without left ventricular hypertrophy were younger (28±14.2).

The left ventricular (LV) twist was significantly reduced in Fabry patients (6±3°) compared to CTRL (13±5°, p <0.001). LV twist was significantly worse in Fabry patients with LVH compared to those without (p=0.013). Even Fabry patients without overt LVH present with LV twist significantly reduced compared to paired CTRLs (7±3° vs 13±5°, p = 0.005).

Conclusions: Left ventricular torsion analysis provides a novel and sensitive approach to understanding and managing cardiac involvement in Fabry disease. Including torsion analysis in the management of patients with Fabry disease may help identify subclinical myocardial impairment and facilitate the planning of early clinical interventions.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 592
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IPERTENSIONE POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

L'IMPREVEDIBILE IMPATTO DI UNA FISTOLA CORONARO-POLMONARE SULLA FISILOGIA DEL CUORE DESTRO: UN CASO CLINICO

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Presentiamo il caso di una donna di 61 anni, normopeso, con solo lievi fattori di rischio cardiovascolari (pregressa attività tabagica, dislipidemia) e senza precedenti cardiologici noti. Giungeva alla nostra attenzione per episodi di costrizione giugulare e dispnea ingravescenti per sforzi di media entità e breve durata a risoluzione spontanea. Per tale motivo veniva eseguito test ergometrico durante il quale si assisteva a ricomparsa della stessa sintomatologia e breve run di TVNS ma che risultava negativo per ischemia inducibile. L' Holter ECG 24 h e l'Ecocardiogramma risultavano sostanzialmente negativi per cui veniva eseguita TC

coronarica che mostrava una fistola coronaro-polmonare tra ramo dell'arteria circonflessa che decorre postero-medialmente risalendo lungo la parete anteriore dell'atrio di sinistra e diramazione accessoria lobare inferiore dell'arteria polmonare di destra. All'esecuzione della coronarografia e del cateterismo cardiaco destro si confermava la presenza di fistola coronaro-polmonare in assenza di impatto emodinamico nonostante le significative dimensioni del tramite (PAP 17 mmHg, WP 10 mmHg, RVP 1.1 UW). Elemento interessante, però, risultava quello relativo alle saturazioni dell'ossigeno che mostravano

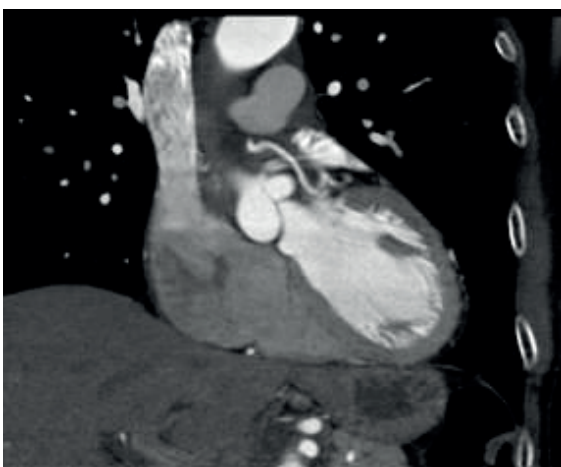


Figura 1

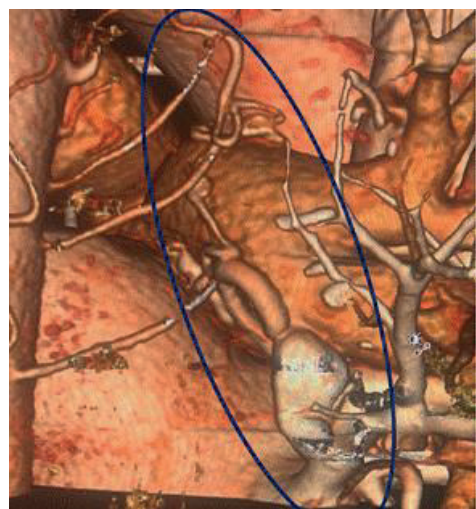


Figura 2



valori incrementati rispetto a quelli attesi, in particolare SpO2 RA: 74% e SpO2 PA: 89%, confermando come la fistola producesse un consistente shunt verso le sezioni di destra.

Alla luce di questi rilievi il caso veniva discusso in Heart team e veniva posta indicazione a temporaneo wait & watch, con stretto follow-up della funzionalità e delle pressioni polmonari.

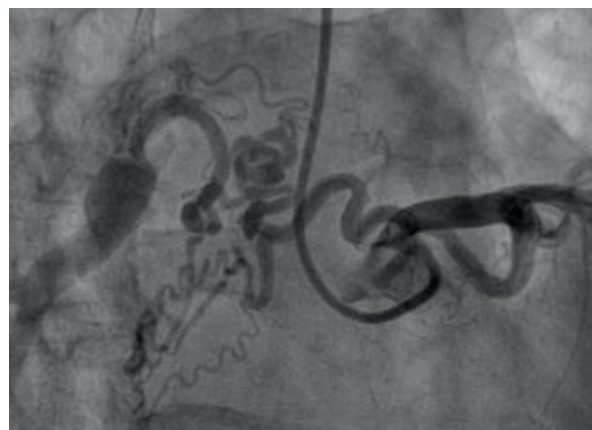


Figura 3

CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 359 ECO-CONTRASTO (IMAGING CARDIOVASCOLARE) IPERTENSIONE POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE)

PULMONARY HYPERTENSION IN PATIENTS WITH PRIMARY SJOGREN'S SYNDROME: PREVALENCE, CLINICAL-SEROLOGIC CORRELATES. WHICH PATIENTS REQUIRE MORE FREQUENT EVALUATION?

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Introduction: Sjogren's Syndrome (SS) can lead to complications like pulmonary hypertension (PH). The prevalence of PH in SS varies depending on diagnostic methods and ethnic differences. This study aims to determine the prevalence of PH in SS patients at our center and compare age, cardiovascular risk factors, autoantibody profiles, pulmonary function tests, and echocardiographic parameters between patients with and without interstitial lung disease (ILD).

Materials and Methods: The study included 63 patients with primary Sjogren's Syndrome (pSS). PH was diagnosed using right heart catheterization (RHC). Patients with ILD and those without ILD were compared.

Results: The prevalence of PH was 1.6% (1 out of 63 patients). ILD patients were older (77.13 ± 10.69 years) compared to those without ILD (64.21 ± 11.03 years, $p=0.001$) and had higher rates of diabetes (21.1% vs 0%, $p=0.018$), dyslipidemia (47.8% vs 10.3%, $p=0.001$), and hypertension (56.5% vs 18.4%, $p=0.003$). Pulmonary function tests showed significant reductions in ILD patients: FVC (2.23 ± 0.7 vs 2.98 ± 0.56 , $p=0.004$) and DLCO-Sb (3.87 ± 1.52 vs 5.31 ± 1.26 , $p=0.017$). Echocardiography revealed sPAP > 35 mmHg in 33.3% of ILD patients ($p=0.028$). TAPSE was reduced in ILD patients (22.15 ± 3.52 vs 24.16 ± 4.35 , $p=0.05$).

Conclusions: The prevalence of PH in pSS patients,

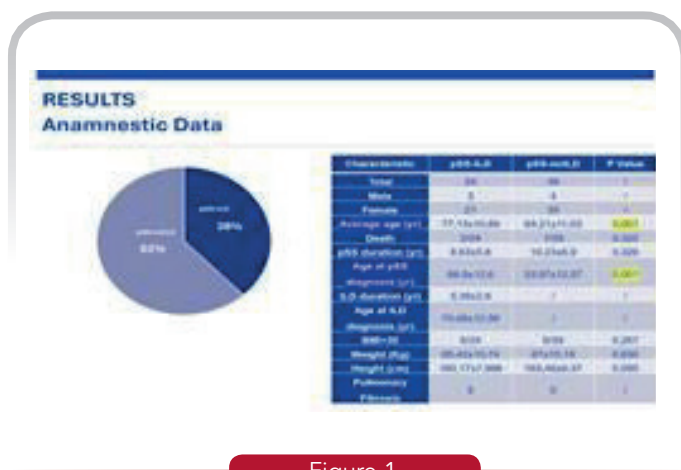


Figure 1

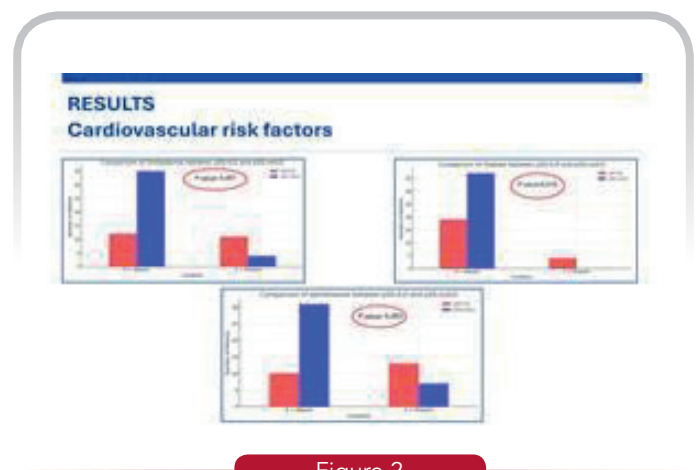


Figure 2



diagnosed with RHC, is lower than in previous studies based on echocardiography. Patients with ILD have higher cardiovascular risks and reduced pulmonary function, requiring regular monitoring.

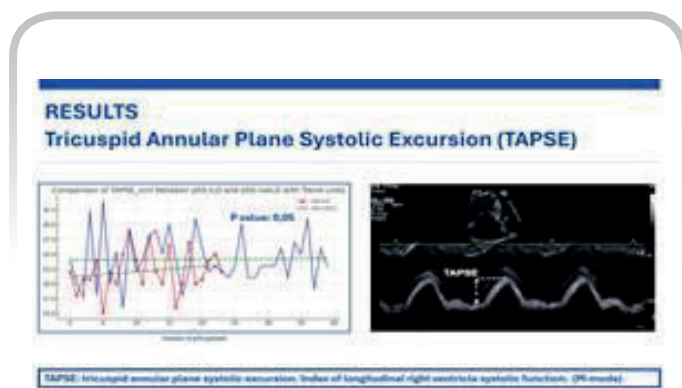


Figure 3

CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 588
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

SINDROME DI LEOPARD: ESORDIO FETALE

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La sindrome di Leopard (LS) è una rara malattia autosomica dominante causata da mutazioni nel gene PTPN11. Segnalati circa 200 casi di LS in letteratura, l'effettiva incidenza non è nota. L'acronimo LEOPARD descrive le caratteristiche più comuni: lentiggini multiple, difetti di conduzione cardiaca, ipertelorismo, stenosi polmonare, anomalie genitali, ritardo della crescita e sordità neurosensoriale. Le lentiggini compaiono più comunemente entro i 4-5 anni. L'anomalia cardiaca più comune è la cardiomiopatia ipertrofica progressiva (HCM).

Riportiamo il caso di un neonato con LS nato a 38+1 SG nato da parto vaginale indotto per diabete materno e macrosomia con diagnosi ecografica prenatale di CHD complessa: canale atrioventricolare (CAV), arco aortico ipoplastico e ipertrofia biventricolare secondaria all'ostruzione degli efflussi. Alla nascita il paziente presentava le caratteristiche comuni della LS comprese le lentiggini multiple. L'ecocardiografia eseguita alla nascita confermava il quadro ecografico prenatale e ha evidenziato ventricolo destro a doppia uscita (DORV), displasia delle valvole aortica e polmonare. Tale quadro ha portato al decesso del paziente in quarta giornata di vita per insufficienza cardiaca congestizia con idrotorace bilaterale, edema polmonare e insufficienza acuta multiorgano. L'esame autoptico che ha escluso

la diagnosi di DORV e ha confermato il quadro di CHD precedentemente descritto. L'esame microscopico ha mostrato: arterie epicardiche con grave iperplasia intimale concentrica con alterazione strutturale dei miociti.

Questo quadro descrive un raro caso di LS a esordio fetale, caratterizzato dalla compresenza di un CHD complessa e di HCM biventricolare con disordine miocardico e proliferazione accelerata dei cardiomiociti e iperplasia intimale epicardica e intramiocardica coronarica. Il rimodellamento ipertrofico dei ventricoli potrebbe essere ascritto al difetto strutturale del cuore con disorganizzazione secondaria e alterato sviluppo del miocardio che spiegherebbe l'ipertrofia del VD. Le caratteristiche proliferative di vasi e cardiomiociti con un aumentato indice di proliferazione sono più in linea con una possibile cardiomiopatia fatale associata a LS e/o al diabete gestazionale con macrosomia e stimolo metabolico proliferativo durante la gravidanza.

Per quanto ne sappiamo, questa è la prima descrizione in letteratura di LS a esordio fetale con CHD complessa, con conseguente decesso entro il primo anno di vita. LS deve essere sospettata nei feti con grave ipertrofia cardiaca e, in tali casi, può essere effettuato il test del DNA prenatale.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 691
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

IS IT MYOCARDITIS? A CHALLENGING DIAGNOSIS OF ALCAPA DURING A COMMON VIRAL INFECTION

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Introduction: Anomalous origin of the left coronary artery (LCA) from the pulmonary artery (ALCAPA) is a congenital heart defect which affects approximately 1 in 300 000 live births and accounts for 0.5% of all congenital heart disease. Without treatment, the mortality of this anomaly is around 90% in the first year of life. We report a challenging case of an infant presenting with fever, common respiratory symptoms, but hiding a lethal cardiovascular condition.

Case Report: A 9-week-old male infant presented with cough, rhinitis and conjunctivitis persisting for 2 days. Nasopharyngeal swab detected a rhinovirus and patient was discharged with supportive therapy. Mother brought her son the next day for worsening tachypnea, indrawing of intercostal spaces and of the neck tissue. Chest x-ray (Figure 1A) revealed an enlarged heart and a following EKG (Figure 1B) demonstrated changes and abnormal Q waves over inferior and lateral leads

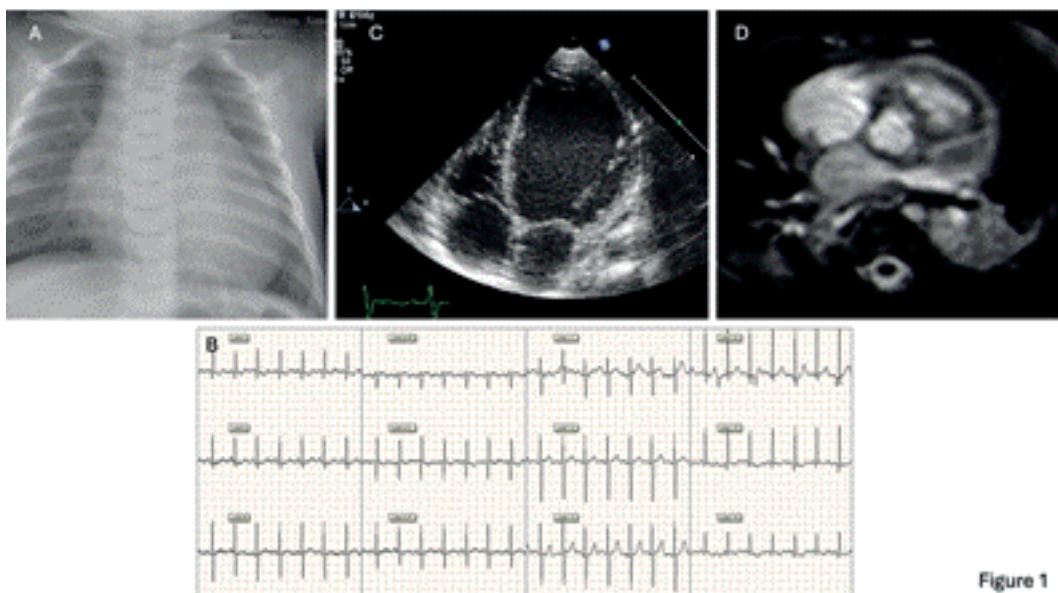


Figure 1

Figure 1

with unreversed T waves V1-V3. Echocardiography showed a markedly dilated left ventricle and depressed ejection fraction (EF 25%) (Figure 1C). CMV IgM and IgG positivity led to an initial incorrect diagnosis of acute myocarditis. Cardiac MRI confirmed the previous finding but documented an ALCAPA. The patient was referred to the cardiac surgery center for evaluation and correction of the coronary anomaly. Postoperative follow-up for 3 years was uneventful, with a complete recovery of ejection fraction.

Conclusion: ALCAPA is a rare but well-known cause of

pediatric myocardial ischemia. Detection of ALCAPA may be challenging given the “drop-out effect” under echocardiography, masquerading a normal appearance of LCA origin. The method of choice for anatomical imaging is ECG-triggered or gated multislice CT, but the exposure to rays may be excessive for pediatric patients. The great advantage of MRI is the absence of radiation exposure for these patients even if cardiac MRI is better suitable for detection of the reverse of flow in the LCA rather than structural evaluation of anatomy.



**CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 126
 IPERTENSIONE POLMONARE
 (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
 TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
 EMBOLIA POLMONARE
 (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

BALLOON PULMONARY ANGIOPLASTY IN CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION: A SINGLE CENTER 9-YEARS EXPERIENCE

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(a) ALMA MATER STUDIORUM UNIVERSITA' DI BOLOGNA - POLICLINICO SANT'ORSOLA IRCCS

Introduction. Balloon pulmonary angioplasty (BPA) has been developed as an alternative and less- invasive treatment strategy for chronic thromboembolic pulmonary hypertension (CTEPH), but therapeutic efficacy and technical safety of the technique must be established. Aim of this study is to examine the effects of BPA in patients (pts) with inoperable disease or with residual pulmonary hypertension (PH) after pulmonary endarterectomy (PEA).

Methods. From June 2015 to May 2024, symptomatic (WHO functional class ≥II) inoperable CTEPH pts and pts with residual PH after PEA were enrolled. At baseline and after 3 to 6 months after last BPA session all pts underwent clinical evaluation, six-minute walking

distance (6MWD) and right heart catheterization (RHC). Data are presented as median and interquartile range. The comparison of the same parameter between before and after BPA was conducted with a two-tailed T-test for paired data and the significance was assessed with the Wilcoxon Signed-Rank Test for the non-normal distribution of the data.

Results. Seventy pts [male 42%, median age 69 (55-76) years, 59 inoperable and 11 with residual PH after PEA] were treated for a total of 197 sessions [median number of sessions for each pt: 2 (1- 4); median number of vessels treated for each pt: 5 (3-9)]. Sixty-seven pts were assuming pulmonary arterial hypertension specific drugs before BPA (22 were in combination therapy). All

	RA (mmHg) n=64	mPAP (mmHg) n=64	CI (l/min/m ²) n=64	PVR (WU) n=64	PAC (ml/mmHg) n=64	6MWD (m) n=56	NYHA FC n=70
Pre-BPA	6 (4-7)	40 (32-48)	2.7 (2.3-3.0)	6.1 (4.3-9.4)	1.34 (0.85-2.00)	434 (358-506)	3 (2-3)
Post-BPA	6 (4-7)	33 (26-39)	2.9 (2.5-3.4)	4.0 (2.7-6.2)	2.03 (1.23-3.03)	479 (370-584)	2 (2-2)
p-value	ns	<0.00001	0.00019	<0.00001	<0.00001	<0.0005	<0.00001

RAP, Right Atrial Pressure; mPAP, mean Pulmonary Arterial Pressure; CI, Cardiac Index; PVR, Pulmonary Vascular Resistance; PAC, Pulmonary arterial compliance; 6MWD, 6 Minute Walking Distance

Table 1



pts received life-long anticoagulation therapy (vitamin K-antagonist: 36 patients, direct oral anticoagulation: 33, fondaparinux: 1). Six pulmonary artery dissection and 8 hemoptysis with clinical impairment were documented during the procedures; 5 pts had access site complications. Clinical and haemodynamics results are shown in the Table. Survival starting from baseline RHC is showed in Kaplan–Meier Curve.

Conclusions. BPA is safe and effective at improving symptoms and hemodynamic profile in inoperable CTEPH patients and in patients with residual PH after PEA.

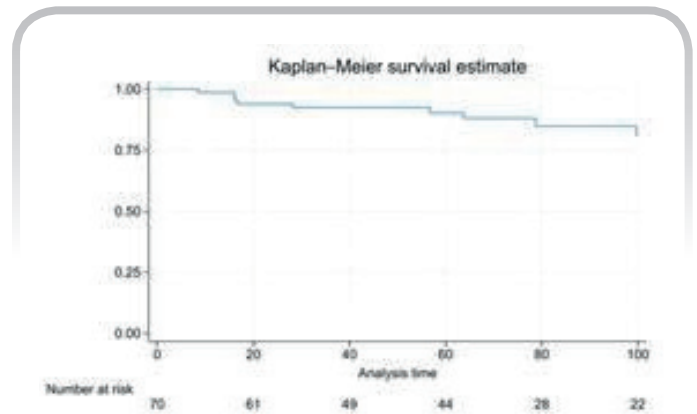


Figure 1



**CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 129
 IPERTENSIONE POLMONARE
 (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
 DIAGNOSTICA INVASIVA INTRAVASCOLARE
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

PROGNOSTIC VALUE OF MAIN PULMONARY ARTERIAL PRESSURE AND PULMONARY VASCULAR RESISTANCE IN PATIENTS WITH PULMONARY ARTERIAL HYPERTENSION AT FOLLOW-UP

Monica Salvi (a), Daniele Guarino (a), Alberto Ballerini (a), Federico Donato (a), Francesco Cennerazzo (a), Riccardo Bertozzi (a), Alessandra Manes (a), Nazzareno Galiè (a), Massimiliano Palazzini (a), Fabio Dardi (a)
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Introduction. Hemodynamic variables related to right ventricular (RV) function have consistently been associated with survival in pulmonary arterial hypertension (PAH). New PAH treatments, however, seems to improve RV coupling reducing RV afterload [e.g. mean pulmonary arterial pressure (mPAP) and pulmonary vascular resistance (PVR)], but without increasing cardiac output. The prognostic role of a mPAP <35 mmHg at follow-up and PVR values <5 WU in prevalent patients have been described. The aim of this work was to define the prognostic role of a mPAP <35 mmHg and PVR <5 WU in patients with idiopathic, hereditary, drug-induced PAH (I/H/D-PAH) and PAH associated with connective tissue disease (CTD-PAH) or congenital heart disease (CHD- PAH) at follow-up after first-line treatment strategy.

Methods. Treatment naïve PAH patients were assessed at 1st follow-up (3–6 months after starting PAH-specific therapy; 1st F-UP) with right heart catheterization. The primary outcome was all-cause death. Analyses were performed using Kaplan Meier curves and comparisons were done with Log-rank test. Cox regression analysis was used to find the predictive value of mPAP and PVR at bivariate analysis. Data are expressed as median (IQR).

Results. 794 patients with PAH were enrolled (54% I/H/D, 28% CTD, 18% CHD) and 706 have a complete

re-evaluation 4 (3–6) months after starting first-line treatment. Death occurred in 54% of patients over a median follow-up duration of 5.8 (2.4–11) years. Survival curves according to a cut-off value of 35 mmHg for mPAP and 5 WU for PVR are shown in the Figure. Patients with PVR <5 WU and mPAP ≤35 mmHg have a better prognosis than patients with PVR ≥5 WU (independently from mPAP; p-values <0.02) but have the same prognosis of patients with PVR <5 WU and mPAP >35 mmHg (p-value= 0.666). Patients with PVR <5 WU and mPAP >35 mmHg have a better prognosis than patients with PVR ≥5 WU and mPAP >35 mmHg (p-value= 0.031) and a trend toward a better prognosis than patients with PVR ≥5 WU and mPAP ≤35 mmHg (p-value= 0.06). Patients with PVR

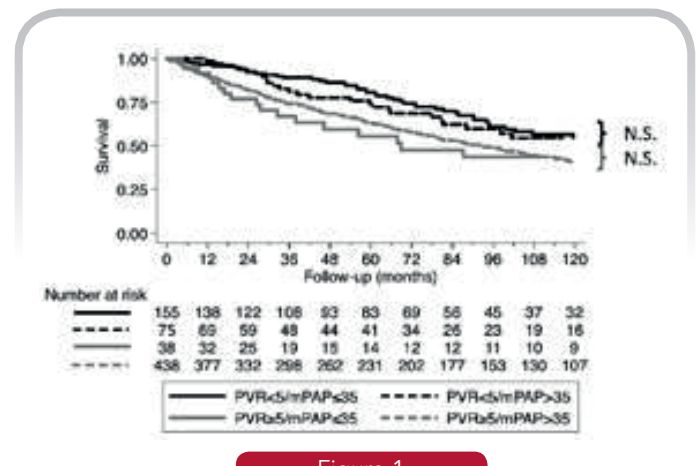


Figure 1

≥ 5 WU have the same prognosis independently from mPAP (p-value= 0.683). In a bivariate Cox regression analysis only PVR < 5 WU predict prognosis [HR (95%CI)= 0.61 (0.44–0.84); p-value= 0.002] while a mPAP < 35 mmHg is not prognostic [HR (95%CI)=

1.00 (0.72–1.40); p-value= 0.991].

Conclusions. mPAP < 35 mmHg does not further discriminate the survival over a cut-off value of 5 WU of PVR.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 555
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

LIVE(R) WITH A FONTAN CIRCULATION: A EUROPEAN SURVEY AND A PROPOSED EXPERT CONSENSUS ON LIVER SURVEILLANCE

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Background and aims: The term Fontan Associated Liver Disease (FALD) includes a wide spectrum of structural and functional liver modifications that affect virtually all patients with a Fontan circulation. A widely accepted protocol for the diagnosis and follow up of FALD is currently lacking, thus we undertook a European survey with the aim of developing a shared screening algorithm.

Methods: In this cross-sectional qualitative study, 39 Adult Congenital Heart Disease (ACHD) Centres in

Europe were invited to participate in a survey of their individual approach to FALD diagnosis and surveillance. A questionnaire was sent to all Centres between August 2023 and April 2024.

Results: Twenty-two (54.5%) Centres from 11 European countries responded to the survey. In the majority of Centres, patients with a Fontan circulation had annual liver assessment with routine review of the results by a specialist hepatologist. Different scoring systems were employed to quantify the severity of FALD, including



Child-Pugh score, MELD XI and FIB4. Ultrasound was the preferred imaging modality, followed by MRI and CT. Liver fibrosis was assessed with different modalities (such as Fibroscan, scores) and at variable time intervals ranging from 6 months to 1 year, with the most used technique being the Fibroscan (74%). Screening for portal hypertension and hepatocellular carcinoma was undertaken in the majority of the Centres (78%). Half of them would consider cardiac transplantation in the presence of FALD. Combined heart-liver transplantation

was performed in 8 Centres only.

Conclusions: Our data suggests universal agreement amongst European ACHD Centres on the need for regular assessment of adult patients for FALD with involvement of an hepatologists, albeit the individual protocols appeared highly variable. We hereby propose a FALD surveillance algorithm based on multiple centres experience, to homogenise the approach to this complex condition.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 338 CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE) IMAGING DELLE CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

FISTOLA CORONARICA IN NEONATA CON CIRCOLAZIONE MONOCORONARICA

Anna Maria Anselmi (a), Laura Lanzoni (a), Elena Giulia Milano (b), Carmelo Ciccì (a), Giulio Molon (a)

(a) IRCCS OSPEDALE SACRO CUORE DON CALABRIA ,NEGRAR; (b) CENTRE FOR CARDIOVASCULAR IMAGING GREAT ORMOND STREET HOSPITAL FOR CHILDREN NHS FOUNDATION TRUST

Le fistole coronariche sono rare anomalie congenite il cui riscontro è spesso casuale in età pediatrica e nella maggior parte dei casi non provocano ripercussioni emodinamiche. Talvolta però possono avere implicazioni importanti che possono rendere necessari interventi invasivi.

Il caso in discussione è suggestivo perché riporta la diagnosi in età pediatrica di un'ampia fistola coronarica con terminazione in camera cardiaca destra in circolazione monocoronarica.

Abbiamo visitato nel nostro ambulatorio delle cardiopatie congenite una bambina di due mesi per esclusione di cardiopatia in sospetta sindrome di Charge secondaria a riscontro di colomboma idroretinico da parte della pediatra.

La bimba nata con taglio Cesareo programmato a 38 settimane in gravidanza normodecorsa, alla visita appariva normopeso per età, reattiva, con un soffio sistolico dolce 1/6.

Elettrocardiogramma normale per età con lievi segni di prevalenza ventricolare destra. All'ecocardiogramma si evidenziavano situs solitus, apparati valvolari normali, piccolo difetto interatriale con lieve shunt sinistro destro, contrattilità biventricolare normale, non chiara dilatazione delle sezioni destre. Si evidenziava coronaria destra con normale origine e severa ectasia nel tratto iniziale (calibro 2,5 mm z score +4), non evidenziabile la coronaria sinistra. Al color Doppler presenza di flusso diastolico a livello della parete del ventricolo

destro come da presenza di sigmoidi. La bimba in ottimo compenso emodinamico ha eseguito rapidamente angioTc coronarica previa premedicazione con beta bloccante. All'angio Tc evidenza di normale origine della coronaria destra , ectasica lungo tutto il suo decorso (calibro 2,5-3 mm); da essa origina regolarmente il ramo interventricolare posteriore che si sviluppa fino all'apice. Dalla coronaria destra origina un ramo con decorso posterolaterale che in prossimità del solco atrio ventricolare di sinistra fa un piccolo coiling e poi risale verticalmente terminando nel tratto di efflusso ventricolare destro attraverso una fistola lunga 4-5 mm di calibro sottile (1mm circa). Dalla coronaria destra origina anche un esile ramo che si porta lungo la parete anteriore del ventricolo sinistro. Non è evidenziabile



Figura 1

l'ostio coronarico sinistro. La bimba, attualmente di due anni di età, è in costante follow up clinico strumentale ed è asintomatica e presenta crescita regolare. I seriatî controlli ecocardiografici non evidenziano dilatazione

delle sezioni destre né comparsa di disfunzione ventricolare; al monitoraggio con holter dinamico non sono mai stati rilevate aritmie. A breve è previsto cateterismo cardiaco e studio angiografico.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 405
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

**A RARE CASE OF ANOMALOUS AORTIC ORIGIN OF CORONARY ARTERY IN PATIENT
 PRESENTING WITH NSTEMI**

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 Ilaria Di Pietro (a), Claudio Bernetti (a), Maurizio Scarpignato (b)

(a) CARDIOLOGY AND CARDIOVASCULAR PATHOPHYSIOLOGY, SANTA MARIA DELLA MISERICORDIA HOSPITAL,
 UNIVERSITY OF PERUGIA, PERUGIA, ITALY; (b) DEPARTMENT OF CARDIOLOGY, SAN GIOVANNI BATTISTA
 HOSPITAL, FOLIGNO, ITALY; (c) DEPARTMENT OF RADIOLOGY, SAN GIOVANNI BATTISTA HOSPITAL,
 FOLIGNO, ITALY

Introduction: Coronary artery abnormalities (CAA) are congenital anatomic variants of coronary arteries origin, course, destination, size or number, that can occur separately or in combination. Usually the term CAA is used for anomalies with an incidence < 1%. Anomalous origin of coronary artery includes pulmonary and aortic origin (AAOCA) of coronaries and congenital atresia of the left main artery. AAOCA is associated with different course subtypes: retrocardiac, retroaortic, interarterial, subpulmonic (intraconal or intraseptal) and prepulmonic. A segment of the artery can also develop within the aortic wall (intramural segment). Interarterial course and proximal intramural course are the variants most commonly associated with increased risk of sudden cardiac death (SCD).

Case report: A 49-year-old male patient with no cardiovascular risk factors presented to the Emergency Department with acute chest pain, radiating to both arms, appearing after moderate intensity physical activity. The electrocardiogram did not show specific alteration of ventricular repolarization. Wall motion abnormalities were not present on the echocardiographic

assessment, but hypertrabeculation of left ventricular apex was observed. High sensitive troponin levels showed a typical rise and fall curve (hsTNI peak value: 413,9 ng/l – normal value 2,3 – 19,8 ng/l) so the patient was admitted to our Cardiology ward for NSTEMI acute coronary syndrome. Coronary angiography revealed the absence of left coronary ostium and a single coronary artery originating from right coronary sinus of Valsalva; this common coronary segment then divided into three branches: a right coronary artery, dominant and normoperfused, an hypoplastic and thin left anterior descending artery (LAD) and a thin circumflex artery (Cx). The invasive coronary angiography did not reveal any significant stenosis. Coronary computed tomography was performed for a better definition of the course of the three vessels. The exam confirmed a shared ostium; the LAD presented a prepulmonic course and the Cx a septal subpulmonic course with an intramural tract of 30 mm. Considering the onset of the first episode of myocardial ischemia symptoms at the age of 49, the small caliber of the LAD and the presence of an intramural tract only pertaining to the Cx, also a vessel of small caliber, a SPECT was scheduled and did



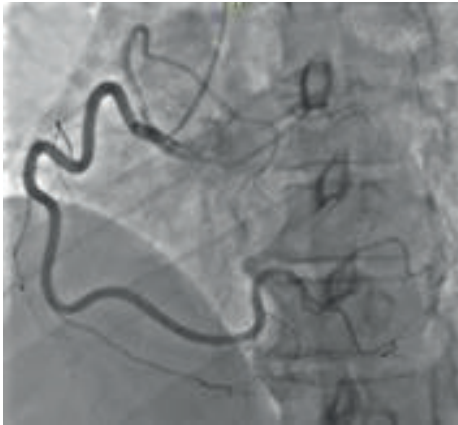


Figura 1



Figura 2

not show any sign of inducible ischemia.

Discussion: Coronary artery bypass surgery is recommended in patients with AAOCA and symptoms or diagnostic evidence consistent with myocardial ischemia attributable to the anomalous coronary artery. However, coronary artery bypass surgery has a non-negligible risk of mortality and complications,

so provocative testing could be helpful to better discriminate patients that really need to be treated. Conclusion: Although the absolute risk of SCD related to these anomalies remains unclear, it is important to think about CAA in patients with symptoms of myocardial ischemia, particularly in young people and athletes without cardiovascular risk factors.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 684
IPERTENSIONE POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
EMBOLIA POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

SYSTEMIC SCLEROSIS AND CHRONIC THROMBOEMBOLIC PULMONARY DISEASE OVERLAP IN PULMONARY HYPERTENSION: A CASE REPORT

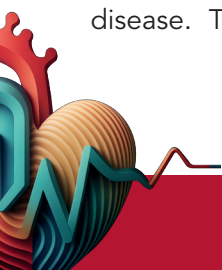
Valentina Braia (a, b), Pier Paolo Bocchino (a), Claudia Raineri (a), Gaetano Maria De Ferrari (a, b)
 (a) DIVISION OF CARDIOLOGY, CARDIOVASCULAR AND THORACIC DEPARTMENT, CITTA DELLA SALUTE E DELLA SCIENZA, TURIN; (b) DEPARTMENT OF MEDICAL SCIENCES, UNIVERSITY OF TURIN

Patient presentation and work-up: A 43-year-old woman presented at the Emergency Department for dyspnoea on minor exertion, palpitations and worsening peripheral edema. She has been suffering from systemic sclerosis complicated by digital ulcerations, Barrett's esophagus and suspected primary biliary cholangitis. She was on daily prednisone, ursodeoxycholic acid and furosemide. On admission, she had signs of right heart failure. ECG showed normal sinus rhythm with right bundle-branch block, ST depression and negative asymmetrical T waves in the precordial leads. On echocardiography severe right ventricular dilation and dysfunction (TAPSE 11 mm, FAC 25%) with pulmonary hypertension (systolic pulmonary artery pressure [sPAP] of 65 mmHg) were found. Computed tomography pulmonary angiography (CTPA) showed dilatation of the pulmonary trunk without acute pulmonary embolism. Blood tests showed elevated NT-BNP (2653 pg/mL), D- dimer (1396 ng/mL) and total bilirubin (2 mg/dL). Intravenous furosemide was started, with rapid clinical improvement.

Diagnosis and management: High-resolution computed tomography and pulmonary functional tests, including lung diffusion capacity for carbon monoxide, excluded ventilatory dysfunction and interstitial lung disease. There were no signs of chronic infectious

disease. Abdominal ultrasound ruled out portal hypertension. A ventilation/perfusion scan detected non-matched subsegmentary perfusion defects, suggestive of chronic thromboembolic pulmonary hypertension (CTEPH). The thrombophilic screening was negative. Right heart catheterization (RHC) showed elevated mean pulmonary artery pressure (mPAP, 41 mmHg) and pulmonary vascular resistance (PVR, 14.4 WU) with reduced cardiac index (CI, 1.5 L/min/mq) and normal pulmonary arterial wedge pressure (5 mmHg). The patient was at intermediate risk according to ESC/ERS risk assessment. Anticoagulation with apixaban was started, along with macitentan and riociguat. The patient progressively improved.

Follow-up: On discharge the patient was asymptomatic. At one month follow-up, due to persistently elevated sPAP with trivial dyspnea improvement, RHC was repeated, showing a mPAP of 37 mmHg, with PVR of 6.62 WU and an increased CI of 2.63 L/min/mq. As the patient was still in the intermediate-risk category according to the ESC/ERS risk assessment with moderate haemodynamic impairment, Selexipag was added and gradually up-titrated. At eight-months follow-up, the patient was asymptomatic and in stable haemodynamic condition with improved mPAP (27 mmHg), PVR (2.99 WU) and CI (3,9 L/min/mq) at the RHC.



Conclusions: Different groups of pulmonary hypertension exist, each with its underlying physiopathology and specific treatment. In our case report, two scenarios overlapped, namely pulmonary arterial hypertension associated with systemic sclerosis and CTEPH. Pulmonary arterial hypertension associated with systemic sclerosis defines a condition with ominous prognosis if left untreated. Concomitant

chronic thromboembolism poses an additional pressure load on an already altered pulmonary vascular bed with right heart dysfunction and requires specific treatment with oral anticoagulation and evaluation for potential specific invasive treatment. Serial risk assessment to define clinical and hemodynamic progression of the disease is essential to better stratify each individual phenotype and tailor treatment accordingly.



**CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 311
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)**

DESMNOPLAKIN-ASSOCIATED ARRHYTHMOGENIC CARDIOMYOPATHY: COULD ADRENERGIC HYPERACTIVATION PLAY A ROLE IN TRIGGERING HOT PHASES?

Elena Sofia Canuti (a), Annalisa Caputo (a), Roberto Badagliacca (a), Crdmine Dario Vizza (a)
(a) POLICLINICO UNIVERSITARIO UMBERTO I

A 40 year-old white female reported chest pain, shortness of breath and fatigue after a job interview. The patient had a known desmoplakin-associated arrhythmogenic cardiomyopathy (ACM) with recurrent episodes of myopericarditis-like hot phases.

Upon admission the diagnosis of a new hot phase was made, based on troponin levels.

A contrast-enhanced cardiac magnetic resonance (CMR) was performed (27/9/23), showing findings compatible with an inflammatory condition. At post contrast, in T1 weighted sequences acquired in the late phase, there was circumferential subepicardial late gadolinium enhancement (LGE) with a ring-like pattern, more prominent in the lower regions at medio-basal levels and in the lateral wall at medio-apical levels of the LV. There was concomitant mesocardial enhancement in the apical portion of the interventricular septum, as well as in the lower portion of the free wall of the RV, involving the inferior interventricular junction. Similar findings were observed during another hot phase in July 2022, while in June 2023 (three months before the index case), during a silent phase, the CMR exhibited circumferential subepicardial fibrotic outcomes in the postero-lateral wall and the inferior interventricular septum of the LV, and in the RV, with normal T2 map signal and no traces of edema.

In accordance to ARVC (Arrhythmogenic Right Ventricular Cardiomyopathies) risk calculator, a primary prevention implantable cardioverter-defibrillator (ICD) was implanted and treatment with betablockers was safely uptitrated.

Twelve months after dismissal, at the ICD check

no significant arrhythmic events were found, atrial stimulation was 26%, ventricular stimulation was 2% and sensing parameters improved, as myocardial inflammation and edema progressively resolved. The patient also underwent a follow-up CMR which showed an improvement in biventricular systolic function (LVEF 59%, RVEF 52%), a complete resolution of myocardial edema at the T2 STIR sequences, and LV LGE with a subepicardial ring-like distribution, and RV LGE in the inferior portion of the free wall.

Our case represents a rare example of DSP-associated ACM, typically characterized by recurrency of acute myocarditis-like events, known as hot-phases, in which intense emotional and physical stress (e.g., job interviews and house moves) seems to be the trigger. Moreover, her treatment upon arrival at our hospital consisted only of very low-dose bisoprolol due to intolerance, suggesting that adrenergic hyperactivation and hypersensitivity may trigger emotional stress-induced hot-phases, akin to Tako-tsubo syndrome. Hence, bridling sympathetic hyperactivity with beta-blocker therapy is essential, especially during hot phases. It is noteworthy that all hot-phases in our patient's history recurred during summer, hinting at the potential influence of environment, as observed in other conditions with a seasonal incidence. In conclusion, our case underscores the pathophysiological complexity of DSP-associated ACM and highlights the importance of considering various triggers, including emotional stress and environmental factors, in understanding and managing hot phases in affected individuals.

**CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 690
ECMO (ASSISTENZA CARDIACA IN ACUTO)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
IPERTENSIONE POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**CORONARY ANGIOGRAPHY IN LEFT MAIN COMPRESSION SECONDARY TO PULMONARY ARTERY
DILATION COMPLICATED BY ACUTE BIVENTRICULAR DYSFUNCTION**

Sara Corradetti (a, b), Emiliano Fiori (a, b), Raffaella Mistrulli (a, b), Andrea Berni (a, b), Emanuele Barbato (a, b)
(a) SANT'ANDREA HOSPITAL, ROME, ITALY; (b) DEPARTMENT OF CLINICAL AND MOLECULAR MEDICINE,
SAPIENZA UNIVERSITY OF ROME, ROME, ITALY

A 36-year-old female with pulmonary hypertension (PH) associated with peripheral pulmonary arterial stenoses (PH group IV, non-chronic thromboembolic PH) presented with significant dyspnea (NYHA Class III) and exercise intolerance. Echocardiography showed slightly reduced right ventricular systolic function, mild D-shaping of the interventricular septum, and a significant increase in trans-tricuspid valve gradient. There was also new onset septal dyskinesia and a slight reduction in left ventricular systolic function (LVEF approximately 50%). Exercise testing revealed frequent multifocal premature ventricular contractions. The patient was admitted for right heart catheterization (RHC) and coronary computed tomography angiography (CCTA), confirming severe precapillary PH and proximal narrowing of the left main coronary artery (LMCA).

Coronary angiography was initially challenging, but successful indirect engagement of the LMCA was finally achieved using a 6 Fr AL 0.75 guiding catheter and a BMW Universal 0.014" wire. The nonselective contrast injection revealed 99% stenosis of the proximal LMCA. However, the wire caused occlusion and acute reduction of coronary blood flow, leading to hemodynamic instability and pulseless electrical

activity (PEA), requiring immediate cardiopulmonary resuscitation.

After resuscitation, percutaneous coronary intervention (PCI) with a drug-eluting stent (DES) was performed with the assistance of an intra-aortic balloon pump (IABP). Despite IABP and intravenous inotropes and vasopressors support, the patient developed refractory cardiogenic shock due to biventricular failure, prompting a rapid mechanical circulatory support escalation to veno-arterial extracorporeal membrane oxygenation (VA ECMO) as bridge to recover strategy. During ICU stay we observed a gradual recruitment to complete recovery of LV systolic function, together with the reduction of VA-ECMO blood flow. The patient has been completely weaned by mechanical circulatory support by day 2 and was discharged after 10 days.

LMCA compression by a dilated pulmonary artery is one of the lesser known but critical complications in the setting of severe PH. This phenomenon can lead to critical myocardial ischemia and poses unique diagnostic and therapeutic challenges. Due to its non-specific symptoms, LMCA compression is frequently under-diagnosed. Early recognition is crucial as it significantly impacts outcomes by preventing the



progression to biventricular dysfunction and reducing the risk of sudden death. Advanced imaging techniques, especially CCTA, play a pivotal role in diagnosis, while invasive coronary angiography remains the gold standard. Management typically requires a multidisciplinary approach, with PCI often being the treatment of choice due to the high surgical risk in PH patients. In this case, the use of VA-ECMO was essential in stabilizing the patient during acute biventricular cardiogenic shock, underscoring the importance of timely and precise intervention.

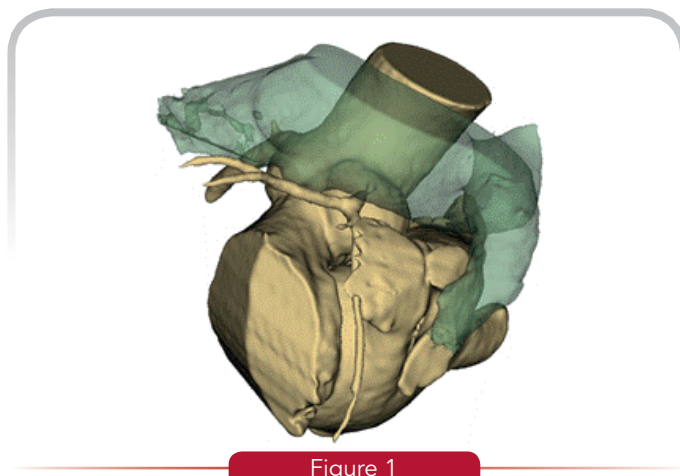


Figure 1

CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 612 IPERTENSIONE POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO) EMBOLIA POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

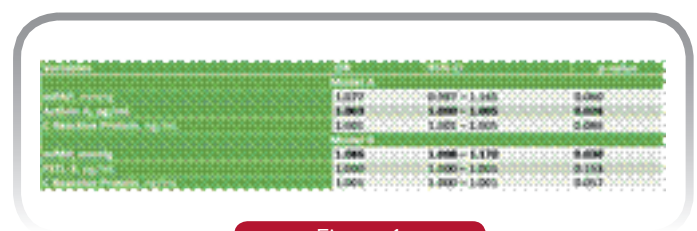
BIOMARKER DEL PATHWAY DELL'ACTIVIN E RIMODELLAMENTO VASCOLARE POLMONARE IN PAZIENTI AFFETTI DA CTEPH CON INDICAZIONE ALLA CHIRURGIA

Alessandra Cuomo (a), Corinne Normand (c), Raphael Thuillet (c), Ly Tu (c), Xavier Jais (c), Mitja Jevnikar (c), David Montani (c), Athenais Boucly (c), Olivier Sitbon (c), Elie Fadel (c), Olaf Mercier (c), Valentina Mercurio (b), Christophe Guignabert (c), Marc Humbert (c), Laurent Savale (c)

(a) DIPARTIMENTO DI MEDICINA CLINICA E CHIRURGIA, UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II;
(b) DIPARTIMENTO DI SCIENZE MEDICHE TRASLAZIONALI, UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II;
(c) INSERM UMR_S 999 "PULMONARY HYPERTENSION PATHOPHYSIOLOGY AND NOVEL THERAPIES", LE PLESSIS-ROBINSON, FRANCE


L'ipertensione polmonare cronica tromboembolica (CTEPH) è legata alla persistenza di un'ostruzione a livello del circolo vascolare polmonare data dalla mancata dissoluzione del materiale trombotico e dalla presenza di rimodellamento vascolare polmonare distale. Nonostante sia noto che il pathway dell'activin svolga un ruolo importante nel processo di rimodellamento vascolare polmonare, non è ancora chiaro quale sia il suo ruolo nei pazienti affetti da CTEPH. In questo studio abbiamo cercato di chiarire se tale pathway possa essere coinvolto nella microvasculopatia tipica dei pazienti CTEPH e abbiamo valutato il suo ruolo come potenziale biomarker. Abbiamo quindi valutato i livelli plasmatici di activin-A, follistatin-like 3 (FSTL3) ed altri biomarker dell'infiammazione in una coorte di pazienti affetti da CTEPH e candidati a trattamento chirurgico con trombo-endoarterectomia polmonare (PEA). Sono stati arruolati 69 pazienti (età media 62 ± 13 anni, 51% maschi), di cui 29 presentavano PH residua post-chirurgia e 2 sono deceduti per complicanze post-operatorie. I pazienti CTEPH presentavano livelli plasmatici di activin-A, FSTL3, C-X-C motif chemokine ligand 9 (CXCL9), beta-nerve growth factor (β -NGF), C-reactive protein (CRP), and pro-brain natriuretic peptide (pro-BNP) più elevati rispetto ai controlli

(corte di controllo composta da 44 pazienti sani). Livelli preoperatori più elevati di activin-A hanno dimostrato essere correlati con un rischio maggiore di sviluppare PH persistente dopo la PEA (hazard ratio, 1.003 [95% CI, 1.000–1.005]; $P=0.026$), quando corretti per età, pressione arteriosa polmonare media (mPAP) misurata prima della PEA e concentrazione plasmatica di proteina C reattiva. L'analisi istologica di campioni di tessuto polmonare derivati da paziente CTEPH sottoposti a



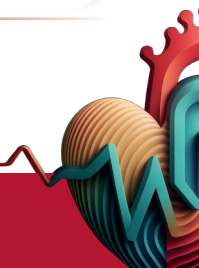
Variables	OR	95% CI	p-value
mPAP, mmHg	1.077	0.997 – 1.165	0.060
Activin A, pg/mL	1.003	1.000 – 1.005	0.026
C Reactive Protein, ng/mL	1.005	1.001 – 1.005	0.086

Figura 1



Variables	OR	95% CI	p-value
mPAP, mmHg	1.086	1.008 – 1.170	0.030
FSTL-3, pg/mL	1.000	1.000 – 1.001	0.153
C Reactive Protein, ng/mL	1.001	1.000 – 1.001	0.057

Figura 2



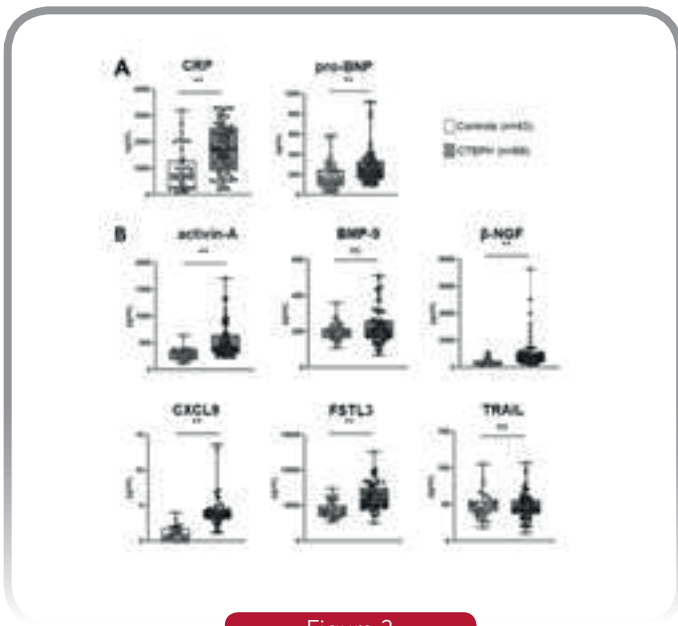


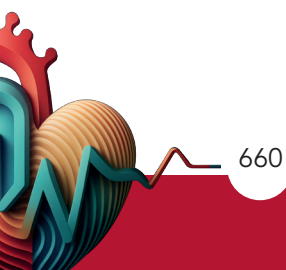
Figura 3

Variables	OR	95% CI	p-value
6MWD, m	0.998	0.993 – 1.002	NS
NYHA-FC I/II, n	0.939	0.354 – 2.491	NS
mPAP, mmHg	1.095	1.020 – 1.176	0.012
PCWP, mmHg	1.176	0.965 – 1.432	NS
RAP, mmHg	1.113	0.951 – 1.303	NS
PVR, WU	1.145	0.946 – 1.385	NS
CI, L/min/m ²	1.591	0.657 – 3.851	NS
SwO ₂ , %	0.983	0.908 – 1.065	NS
PAH specific vasodilators, n	0.343	0.096 – 1.226	NS
BMP-9, pg/mL	1.017	0.979 – 1.058	NS
Endothelin-1, pg/mL	1.170	0.978 – 1.058	NS
CXCL-9, pg/mL	1.001	1.000 – 1.001	NS
TRAIL, pg/mL	1.009	0.982 – 1.038	NS
Activin A, pg/mL	1.003	1.001 – 1.006	0.003
β-NGF, pg/mL	1.196	0.900 – 1.590	NS
FSTL-3, pg/mL	1.000	1.000 – 1.001	0.025
C Reactive Protein, ng/mL	1.001	1.000 – 1.002	0.007
proBNP, pg/mL	1.001	0.999 – 1.003	NS

Figura 4

trapianto polmonare ha dimostrato che è presente un accumulo a livello nucleare di Smad 2 fosforilata e un upregulation delle subunità βA e βB dell'activin, oltre che un upregolazione del recettore ACTRIIB e di FSTL3 nelle arteriole muscolarizzate polmonari.

Tutti questi risultati suggeriscono che l'activin-A possa avere un ruolo come biomarker predittivo di rischio di PH residua dopo PEA. Ulteriori studi sul pathway dell'activin sono necessari per scoprire se questo possa avere un risvolto terapeutico.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 319 DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) EMBOLIA POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

IL TROMBO VIAGGIATORE: UN CASO DI EMBOLIA PARADOSSA

Sara Turino (a, b), Mario Ferraioli (a, b), Alma Grossi (a, b), Alessandra Nocilla (a, b), Francesco Vigorito (a),
Tiziana Attisano (a), Amelia Ravera (a), Gennaro Galasso (a, b)
(a) OSPEDALE SAN GIOVANNI DI DIO E RUGGI D'ARAGONA; (b) UNIVERSITÀ DEGLI STUDI DI SALERNO

Intro: L'embolia Polmonare è la terza causa di morte per patologie cardiovascolari. Lo spettro delle manifestazioni cliniche è vario ed è pertanto necessario stratificare il rischio del paziente per la scelta del miglior approccio terapeutico.

Caso clinico e risultati: Una donna di 75 anni, con storia di insufficienza venosa agli arti inferiori, accedeva in pronto soccorso per sincope. Alla valutazione clinica, evidenza di edema all'arto inferiore sinistro con dolore alla palpazione del polpaccio omolaterale; PA 110/70 mmHg e SpO₂ 96% in aria ambiente. All'emogasanalisi arteriosa ipossia ipocapnica (pO₂ 70 mmHg; pCO₂ 31 mmHg). I dati di laboratorio mostravano di D-dimero 16314 ng/L e Tnlhs 672 ng/L. L'ECG evidenziava tachicardia sinusale e pattern S1Q3T3. L'ecocardiogramma mostrava sezioni destre dilatate (RVD1 41 mm; RAA 22 cmq), con ridotta funzione ventricolare destra (TAPSE 8 mm) e segni di ipertensione polmonare (PAPS 47 mmHg; segno di McConnell e movimento paradossoso del SIV). Nel sospetto di TEP veniva praticata angio-TC del torace che documentava difetti di opacizzazione delle arterie polmonari bilateralmente all'origine dei rispettivi rami lobari e segmentari. La paziente veniva, pertanto, trasferita in unità di terapia intensiva cardiologica (UTIC) e iniziata una terapia con eparina sodica. Il giorno successivo, la paziente lamentava improvvisamente oppressione

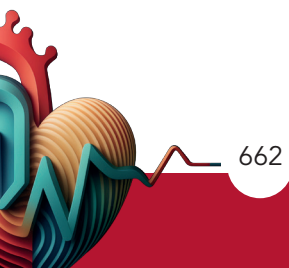
toracica e sudorazione profusa, con evidenza ECG-grafica di STEMI inferiore. Veniva dunque trasportata in urgenza in sala di emodinamica per eseguire l'esame coronarografico che confermava la trombosi acuta della coronaria destra al segmento medio-prossimale. Si è eseguita tromboaspirazione meccanica della coronaria destra con sistema Penumbra inizialmente, poi, per flusso anterogrado TIMI 1 si integrava con aspirazione manuale mediante catetere Recover che rimuoveva un'ulteriore componente trombotica distale ripristinando un flusso a valle TIMI 3. Si procedeva nella stessa seduta, per instabilizzazione del quadro respiratorio, trombectomia polmonare meccanica percutanea con sistema Flow Trierer, il quale dopo multiple aspirazioni riusciva nella rimozione di grosse quantità di materiale trombotico bilateralmente. Al termine della procedura si riscontrava riduzione delle pressioni in arteria polmonare (da 50/25/30 mmHg a 29/19/10 mmHg), miglioramento degli indici ventricolari destri (RVD1 32 mm; TAPSE 15 mm; PAPS 38 mmHg) e miglioramento dell'emodinamica della paziente.

Conclusioni: La trombectomia meccanica polmonare percutanea trova attualmente indicazione in pazienti con TEP ad alto rischio con controindicazione a trombolisi sistemica o dove essa è risultata inefficace. La cautela degli autori nel raccomandare tale metodica è motivata anche dalla scarsità di studi randomizzati. È



pertanto necessario ampliare la casistica documentata per valutarne l'estensione ad uno spettro di pazienti più ampio ed aiutare la selezione di pazienti che possano trarne maggiore beneficio. Resta mandatorio l'inquadramento del paziente, la stratificazione del

rischio di instabilizzazione e la valutazione del rischio-beneficio di terapie invasive. Nel nostro caso alla procedura invasiva è seguito un rapido miglioramento clinico della paziente, delle pressioni polmonari e della funzione ventricolare destra.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 707
IPERTENSIONE POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

**EFFICACIA CLINICA DI SOTATERCEPT COME ADD-ON THERAPY NELL'IPERTENSIONE ARTERIOSA
POLMONARE IDIOPATICA: ESPERIENZA MONOCENTRICA PRE MARKETING**

Serena Rossi (a), Paolo Alfonso Ciarelli (c), Federica De Donno (c), Marco Addari (c), Sabina Gallina (c), Livio Giuliani (b)
(a) UOSD EMODINAMICA DIAGNOSTICA ED INTERVENTISTICA, PO SS. ANNUNZIATA, CHIETI; (b) UOC
CARDIOLOGIA E UTIC CON EMODINAMICA, PO SAN SALVATORE, L'AQUILA; (c) DIPARTIMENTO DI
NEUROSCIENZE, IMAGING E SCIENZE CLINICHE, UNIVERSITA' G. D'ANNUNZIO, CHIETI

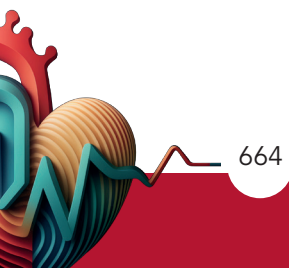
Donna di 56 anni giunge presso il nostro ambulatorio per sospetta ipertensione polmonare in classe funzionale WHO III e con segni clinici ed ecocardiografici di scompenso destro. Viene pertanto sottoposta a cateterismo cardiaco destro che conferma la diagnosi di ipertensione arteriosa polmonare (RAP 9 mmHg PAP s/d/m 116/48/71mmHg PAWP 11mmHg IC 2,3 L/min/mq PVR 15 WU). Alla valutazione multiparametrica la paziente risulta nella fascia di rischio alta per cui viene intrapresa triplice terapia specifica con Sildenafil 60 mg/die, Macitentan 10 mg/die e treprostinil sc titolato fino al dosaggio massimo tollerato (85 ng/kg/min) con un iniziale lieve miglioramento clinico ed emodinamico. Dopo circa sei mesi, tuttavia, si assiste ad un nuovo peggioramento clinico con necessità di ricovero ospedaliero per riacutizzazione di scompenso cardiaco destro (comparsa di edemi declivi, necessità di diuretico ev). Al cateterismo cardiaco destro si evidenzia un indice cardiaco persistentemente ridotto, una pressione atriale destra elevata e resistenze vascolari polmonari ancora elevate (RAP 13 mmHg; PAP s/d/m 64/30/43 mmHg; PAWP 8 mmHg; PVR 10 mmHg; CI 1,9 l/min/mq) associati a livelli di NTproBNP elevati (NT proBNP 3500 pg/ml) e a segni ecocardiografici di impegno delle camere cardiache destre (D-shape del setto interventricolare, ventricolo destro dilatato e versamento pericardico circonferenziale). In considerazione delle condizioni cliniche della

paziente, previo consenso da parte del comitato etico di competenza, si decide di aggiungere in terapia Sotatercept ad uso compassionevole. La paziente viene dunque sottoposta a prima somministrazione del farmaco al dosaggio di 0.3 mg/kg s.c, in assenza di eventi avversi. Nelle settimane successive il farmaco viene titolato secondo scheda tecnica a 0.7 mg/kg s.c. continuando con tale dosaggio nei mesi successivi a cadenza trisettimanale con ottima tolleranza da parte della paziente. Alla valutazione clinica si documenta progressivo miglioramento dei segni di scompenso destro e della classe funzionale (da WHO III a WHO II). Si assiste inoltre a netta riduzione del valore di NT proBNP da 3500 pg/ml a circa 300 pg/ml e significativo incremento della distanza percorsa al 6MWT (da 160 mt a 450 mt). All'ecocardiogramma si rileva scomparsa del versamento pericardico e miglioramento della morfovolumetria del ventricolo destro; consensuale anche il dato emodinamico con miglioramento dell'indice cardiaco e riduzione delle resistenze vascolari polmonari. Alla valutazione multiparametrica la paziente ad oggi risulta nella fascia di rischio bassa. Il Sotatercept è una proteina di fusione che inibisce le attivine e i fattori di differenziazione della crescita coinvolti nell'ipertensione arteriosa polmonare, agendo direttamente sul rimodellamento vascolare che risulta alterato in questa categoria di pazienti. Attualmente commercializzato negli USA, in Italia è



autorizzato al momento solo per uso compassionevole in aggiunta alla triplice terapia specifica in pazienti con ipertensione polmonare di gruppo 1 e classe funzionale WHO-FC II e III. Lo Stellar trial, studio multicentrico randomizzato di fase III, ha dimostrato su una popolazione di 323 pazienti, a 24 settimane dall'inizio del trattamento, un significativo miglioramento della classe funzionale, dei metri al 6MWT e una riduzione

dei valori di NT proBNP rispetto a Placebo, oltre ad una riduzione delle resistenze vascolari polmonari. Il nostro caso clinico ha confermato tali risultati evidenziando un netto miglioramento dei parametri clinici, laboratoristici, ecocardiografici ed emodinamici già a 12 settimane dall'inizio del trattamento, permettendo alla paziente di passare da una classe di rischio alta ad una classe di rischio bassa.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 245 EMBOLIA POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

THE ROLE OF ULTRASOUND-ASSISTED THROMBOLYSIS IN A CASE OF PARADOXICAL PULMONARY EMBOLISM COMPLICATED BY RENAL INFARCTION

Alessio Falagario (a), Nino Camassa (b), Antonia Mannarini (b), Vittoria Ostuni (b), Carlo D'agostino (b)
(a) UNIVERSITA' DEGLI STUDI DI BARI "ALDO MORO"; (b) POLICLINICO DI BARI

Case report: a 67 years old Angolan woman was referred to our hospital for worsen dyspnea, palpitation and left flank pain while walking. She had no relevant medical history and her only cardiovascular (CV) risk factor was hypertension. For high suspicion of pulmonary embolism (PE), an abdominal-thoracic CT was performed, demonstrating the presence of bilateral PE with a greater thrombotic burden of the right branch, right ventricle (RV) enlargement and left renal infarction. She was stratified in an intermediate-high risk class. The patient was hemodynamically stable (BP: 120/65 mmHg, HR: 115 bpm) with a calculated PESI class of III and elevated Hs-cTnI. Transthoracic echocardiography (TTE) showed RV dilation, McConnell sign, flattened intra-ventricle septum, mild pulmonary and severe tricuspid valve regurgitations. Therefore, we decided to start anticoagulation and to perform ultrasound-assisted thrombolysis (USAT) without procedural complications. A venous echo-doppler demonstrated the presence of thrombosis of the left popliteus veins. Moreover, screening for thrombophilia syndromes and neoplastic markers were negative. The day after, a partially-restored flow was noticed on renal artery US. The bubble test during transesophageal echocardiography revealed a patent foramen ovale (PFO) with a moderate right-to-left shunt. From these findings, a paradoxical embolism (PDE) through a moderate PFO was confirmed as the cause of her renal infarction. After 7 days of hospitalization, the patient

was discharged on anticoagulant (apixaban) in good health status and with reduced serum creatinine levels.

Discussion: PE is the 3rd leading cause of CV mortality. A rare scenario in PE is PDE, manifesting in this case with acute kidney injury, with no other organ involvement. PDE occurs when a thrombus crosses an intracardiac defect into systemic circulation and it usually follows PE because elevated right-side pressure enhances right-to-left shunting. For patients with intermediate-risk PE, there is no clear consensus on 1st-line therapy. In our case, USAT has been effective in

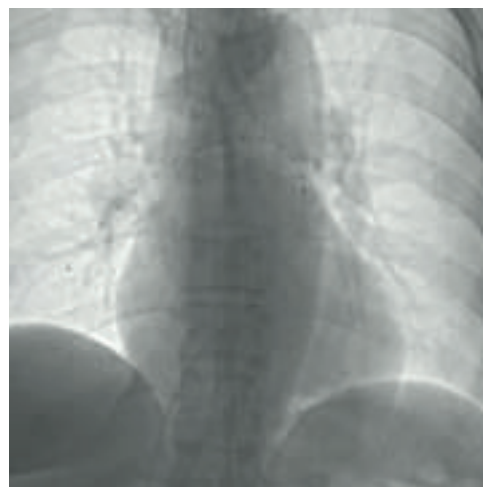
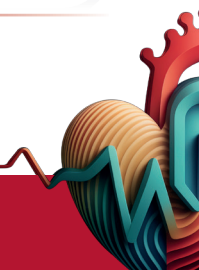


Figure 1



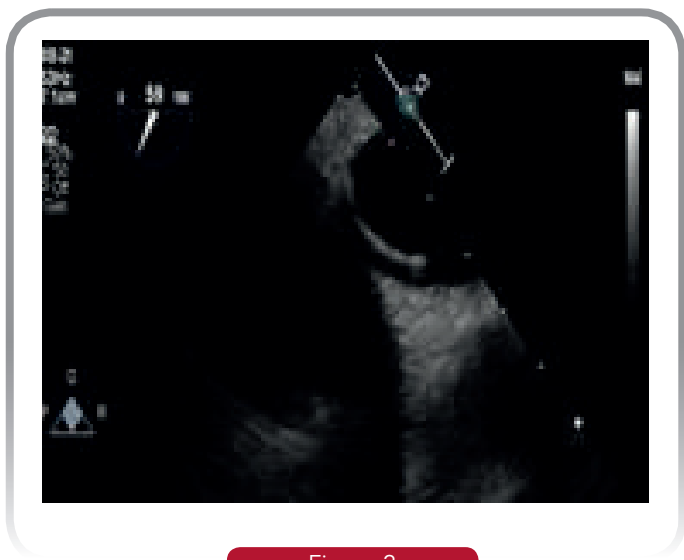


Figure 2

reversing RV dysfunction with early decrease of right-side pressures by TTE assessments. Compared with anticoagulation alone, USAT may quicker protect from PDE recurrence and potentially reduce the incidence of chronic thromboembolic pulmonary hypertension, a rare but serious long-term complication. Moreover, as we observed, thrombolytic local release can dissolve systemic clots.

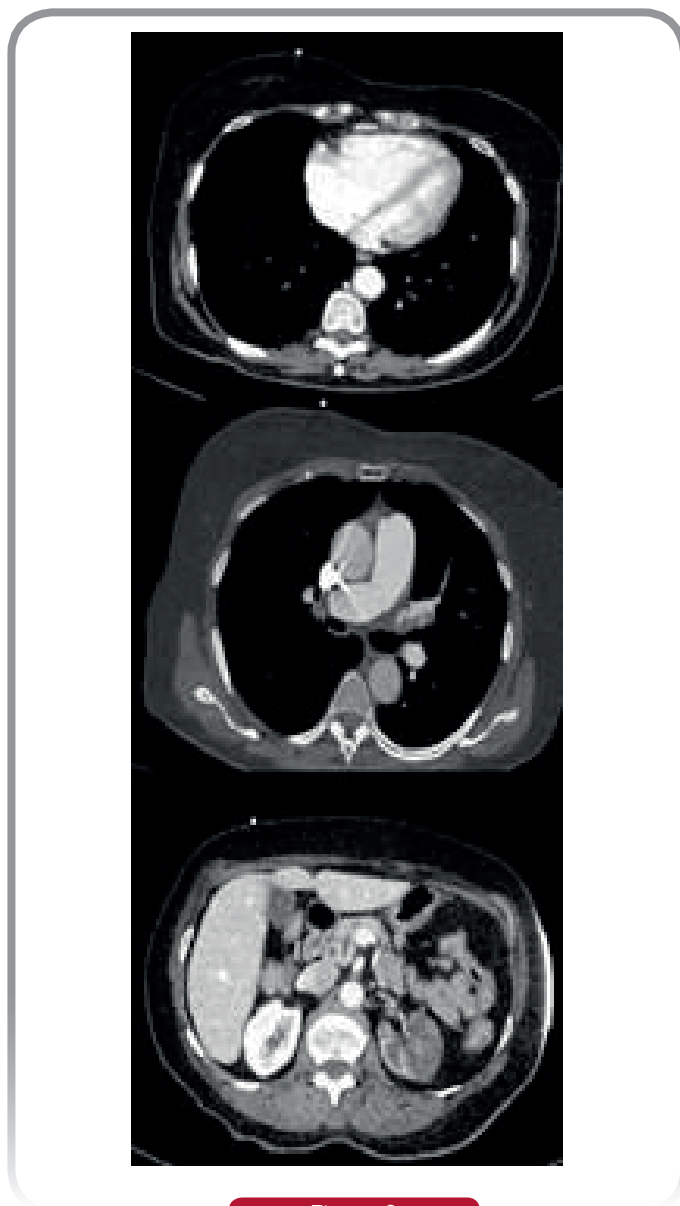


Figure 3

CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 461
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

STORIA NATURALE DI FINESTRA AORTOPOLMONARE E VENTRICOLO DESTRO A DOPPIA USCITA IN UN BAMBINO DI DUE ANNI

Matteo Patti (a), Giovanni Di Salvo (a), Ornella Milanese (a)

(a) UNIVERSITA' DEGLI STUDI DI PADOVA - DIPARTIMENTO DELLA SALUTE E DELLA DONNA DEL BAMBINO

La finestra aorto-polmonare (APW) associata a doppia uscita dal ventricolo destro (DORV) è una cardiopatia congenita (CHD) complessa molto rara. Riportiamo il primo caso descritto in letteratura.

Bambino etiope di due anni e sei mesi, peso corporeo di 10kg, condotto presso l'ospedale di Kidane Mehret, Adwa, per scarsa crescita e distress respiratorio. Presentazione clinica: minima cianosi, lieve polidispnea, clubbing digitale. Alla valutazione Fc 85 bpm, saturazione pre-post duttale > 95% in aria ambiente, PA 100/75 mmHg. Obiettività toracica negativa. Polsi periferici palpabili e pieni. Precordio iperattivo. All'auscultazione S1 normale, S2 singolo, pause libere. Non epatosplenomegalia. L'ecocardiografia ha

mostrato: Situs solitus, levocardia, malposizione delle grandi arterie. Ritorni venosi sistemici e polmonari regolari. Valvole atrioventricolari normofunzionanti, ventricolo sinistro con spessori conservati, ventricolo destro ipertrofico. Aorta a cavaliere che supera più del 50% il setto ventricolare. Deviazione anteriore e superiore del setto infundibulare che causa stenosi sotto-polmonare. Ipoplasia della valvola polmonare e dell'arteria polmonare (AP) media. AP destra e sinistra confluenti e di calibro regolare. Il Color Doppler mostra bassa velocità attraverso la valvola polmonare e l'AP media, compatibile con l'assenza di murmure all'auscultazione. Il quadro di ipoplasia polmonare e assenza di murmure ha condotto a ricercare un

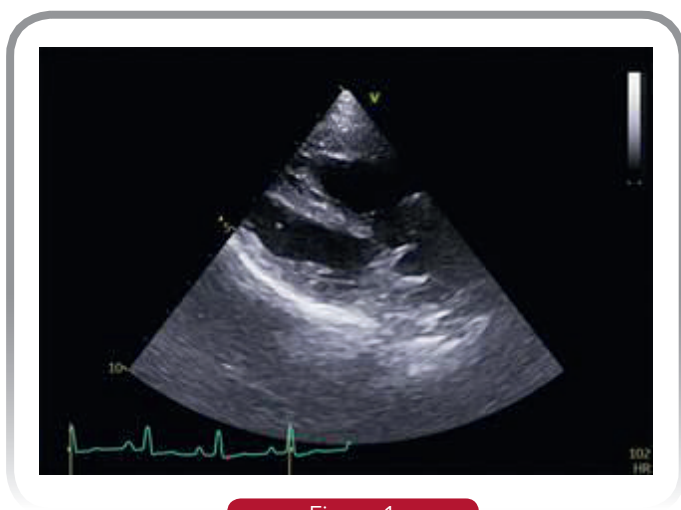


Figura 1

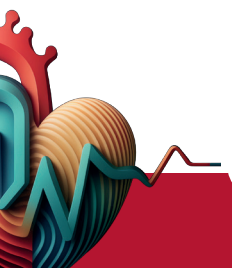


Figura 2

flusso ematico diretto verso il circolo polmonare. Il color-doppler ha consentito di escludere shunt aortopolmonari come dotto arterioso pervio (PDA) e arterie collaterali aortopolmonari maggiori (MAPCAS) e ha mostrato la presenza di APW di 7 mm, abbastanza ampio da permettere una normale crescita dei rami polmonari e causare ipertensione polmonare. La presentazione clinica con minima cianosi e clubbing digitale testimonia un'inversione dello shunt durante lo sforzo.

Primo caso in letteratura di una CHD complessa caratterizzata da DORV, ampia APW, stenosi sottopolmonare e della valvola polmonare in paziente

non precedentemente trattato. Il bambino presentava lieve polipnea e dispnea con clubbing digitale e assenza di murmure all'auscultazione cardiaca. I pazienti che si presentano senza soffi cardiaci e stenosi polmonare all'ecocardiografia devono far sospettare una differente fonte di flusso ematico polmonare. Il PDA può spiegare la presentazione clinica descritta ma raramente è abbastanza ampio da causare ipertensione polmonare. Le MAPCAS solitamente sono multiple, spesso stenotiche e raramente confluenti, non permettendo una regolare crescita dei rami polmonari. Solo la APW può completamente spiegare la presentazione e la fisiologia della malformazione in questo paziente.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 544

EMBOLIA POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI) IPERTENSIONE POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

"WHO NEEDS A FILTER?": CASE REPORT DI UN GIOVANE ADULTO CON EMBOLIA POLMONARE MASSIVA

Erika Pedio (a), Francesca Sturdà (a), Francesco Rizzo (a), Massimiliano Garzya (a), Giuseppe Colonna (a)
(a) UO CARDIOLOGIA ED UTIC - OSPEDALE "VITO FAZZI" - LECCE

G.G., giovane di 23 anni affetto da disabilità neurologica per disturbo dello spettro autistico, accede in Pronto Soccorso per dispnea ingravescente, astenia marcata e febbricola nelle ultime settimane. L'emogasanalisi evidenzia severa insufficienza respiratoria ipossiemicai-pocapnica (pO₂ 45 mmHg, pCO₂ 26 mmHg, SpO₂ 79%). T 39°C. PA: 95/50 mmHg. ECG: Tachicardia sinusale, aspetto S1-Q3-T3. Data la presenza di una formazione testicolare destra si esegue ecografia che mostra struttura sovvertita omosede a causa di formazione nodulare riferibile a processo eteroformativo (circa 4,5 cm). Alla TC torace con mezzo di contrasto si rilevano numerosi difetti di riempimento di significato trombo-embolico in entrambe le arterie polmonari, che si estendono nelle diramazioni lobari ed in multipli rami segmentari e subsegmentari. Si procede a completamento diagnostico con TC total body che documenta diverse lesioni parenchimali polmonari, adenopatie necrotiche a livello addominale

che determinano compressione della vena cava inferiore, nel cui lume è presente grossolano difetto di riempimento trombotico (circa 29 mm) che interessa la sede di confluenza della vena renale sinistra. Pertanto si ricovera in UTIC con diagnosi di embolia polmonare massiva a rischio intermedio-alto in paziente con neoplasia testicolare misconosciuta metastatizzata. L'ecocardiografia evidenzia ventricolo destro dilatato, ipocontrattile e segni di ipertensione polmonare (Tempo di accelerazione polmonare 53 msec, PAPs 50 mmHg). Praticata terapia con eparina non frazionata e.v. con valori di aPTT sovente inferiori al range terapeutico. Considerato l'elevato rischio di recidiva di embolia polmonare, con accesso eco- radioguidato, per via transgiugulare destra, si posiziona filtro cavale in sede iuxta-sovrarenale.

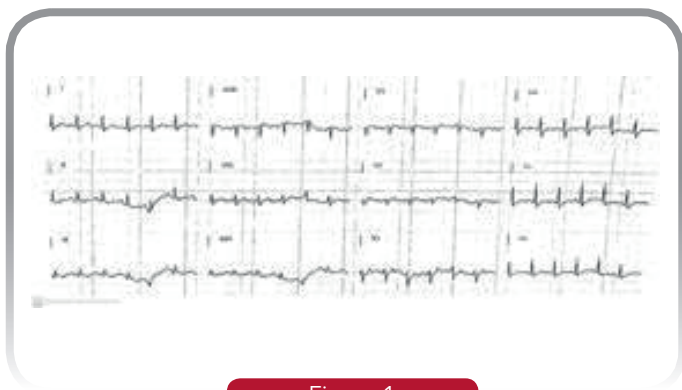


Figura 1

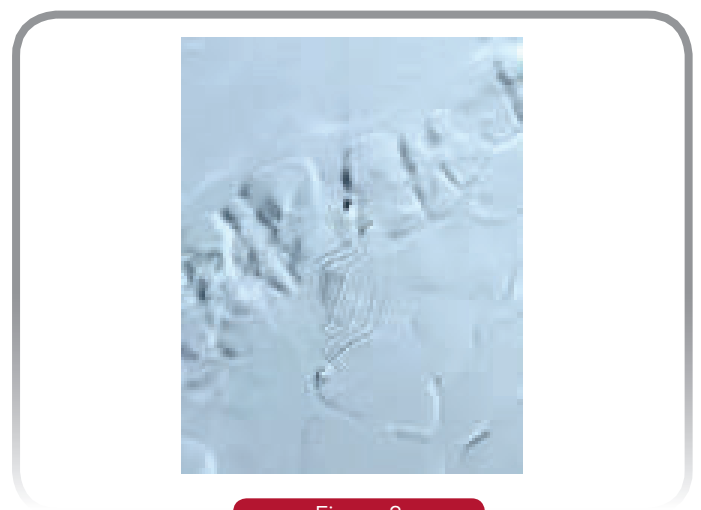


Figura 2



Dopo una settimana, in condizioni di stabilità emodinamica, si trasferisce il paziente presso U.O. Oncologia dove, dopo discussione collegiale, intraprende il primo ciclo di chemioterapia e si programma intervento di orchifuniculectomia destra. In conclusione, l'embolia polmonare massiva è una patologia che può determinare severa insufficienza respiratoria. Il cancro metastatizzato è un fattore predisponente la sua insorgenza ed al contempo un fattore di rischio emorragico. Nei pazienti a rischio intermedio-alto di mortalità è indicato un inizio precoce della terapia con anticoagulanti, però non in tutti i casi si raggiunge l'adeguato target. Il filtro cavale è un dispositivo che previene meccanicamente nuovi episodi di embolia polmonare ed è indicato nei pazienti con controindicazioni alla terapia anticoagulante e nei casi di recidiva di embolia polmonare nonostante l'anticoagulazione. Una indicazione relativa è la trombosi a livello della vena cava inferiore ed una

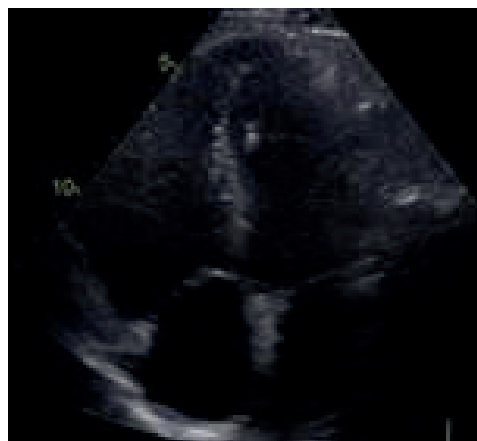


Figura 3

scarsa risposta alla terapia anticoagulante, come nel nostro paziente. Pertanto l'impiego del filtro cavale è utile in casi selezionati.

CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 450
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
EMBOLIA POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IPERTENSIONE POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

LA GESTIONE DEL PAZIENTE EISENMENGER: IL DELICATO EQUILIBRIO TRA TROMBOSI E SANGUINAMENTO

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 (a) UNIVERSITÀ DI VERONA

La sindrome di Eisenmenger (ES) rappresenta la forma più avanzata di ipertensione arteriosa polmonare associata a cardiopatia congenita. Il rischio di trombosi polmonare è aumentato nei pazienti con ES. Nei pazienti con ipertensione arteriosa polmonare in cui si presenta trombosi intravascolare, si ricorre alla scagulazione per aumentare la sopravvivenza. La ES si presenta tuttavia come un dilemma per il clinico, la terapia anticoagulante ha in questi casi un ruolo limitato a causa della tendenza al sanguinamento e della difficoltà nel monitoraggio dell'INR. Presentiamo il caso di una donna di 45 anni che

giunge in shock cardiogeno presso altro centro, con riscontro di fibrillazione atriale ad alta risposta ed evidenza di tromboembolia polmonare massiva. Nota sindrome di Eisenmenger in ampio difetto interatriale di tipo ostium secundum in storia naturale. All'ecocardiogramma si riscontava severa dilatazione e disfunzione sistolica del ventricolo destro insufficienza tricuspidalica severa e PAPs di 105 mmHg. Si introducevano in terapia Dobutamina e Amiodarone, poi sospeso per tireotossicosi. Si impostava BiPAP e si assisteva a successiva stabilizzazione emodinamica che permetteva svezzamento da Dobutamina. La



Figura 1

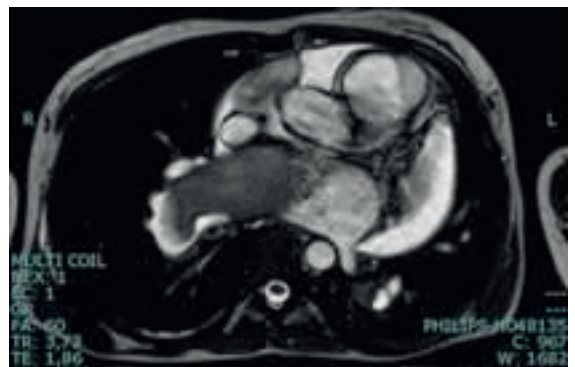


Figura 2



paziente veniva riferita quindi al nostro centro. All'arrivo stabilità emodinamica, ma persistenza di dispnea con necessità di maschera venturi 60%.

Si introduceva duplice terapia vasodilatatrice polmonare.

Si eseguiva HRCT che mostrava grossolani difetti endoluminali delle arterie polmonari principali. Si richiedeva pertanto angioRMN, che confermava la trombosi endoluminale massiva delle arterie polmonari.

Si otteneva un graduale ripristino dell'equilibrio cardiocircolatorio grazie alla terapia anticoagulante.

Durante la degenza si assisteva tuttavia a menometrorragie infrenabili, con necessità di molteplici trasfusioni, di revisione uterina e posizionamento di spirale endouterina, poi embolizzazione di arterie uterine.

La paziente, a distanza di due mesi, accedeva nuovamente in Pronto Soccorso per peritonite da sospet-

ta salpingite e appendicite acuta in malattia infiammatoria pelvica, si rendeva necessario intervento di isterectomia e annessiectomia destra e appendicectomia. L'intervento era ben tollerato, nonostante l'elevato rischio chirurgico della paziente.

Conclusioni: i pazienti affetti da Sindrome di Eisenmenger sono altamente complessi e questo caso è paradigmatico poiché dimostra come la terapia anticoagulante in questo contesto, sia particolarmente controversa e vada attentamente considerata caso per caso. Le attuali linee guida danno indicazione alla terapia anticoagulante in caso di aritmie atriali e in presenza di tromboembolismo in pazienti con basso rischio emorragico. Tuttavia, anche in questi casi possono presentarsi complicanze emorragiche rilevanti che ostacolano il raggiungimento della stabilità clinica. L'utilizzo di anticoagulanti con possibilità di veloce reverse è sicuramente auspicabile.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 860 IPERTENSIONE POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

PULMONARY HYPERTENSION AND AIR POLLUTION: IS THERE A LINK. STUDY DESIGN

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(a) UOC CLINICA PNEUMOLOGICA DIPARTIMENTO DI MEDICINA E CHIRURGIA AOU PARMA

Air pollution is a complex mixture of gases and other molecules that permeate the atmosphere, making exposure inevitable in most indoor and outdoor environments. Sources of particulate matter (PM), such as traffic, cigarette smoke, dust can affect individuals in indoor and outdoor locations. All sources of PM have the potential to have an impact on human health. The fine particles suspended in the air can easily enter the respiratory system, leading to the formation of reactive oxygen species, as well as the activation of inflammatory mediators capable of exacerbating a possible lung inflammation, to induce an increase in blood clotting and to generate endothelial dysfunction. The activation of the inflammatory process is probably the link between the inhalation of pollutants and the development of cardiovascular events. Like all homeostatic mechanisms in the body, the interaction between ET-1 and NO must be in equilibrium for the vascular system to function properly, and it is when these two factors become unbalanced that pathological states such as endothelium dysfunction may begin to develop. Material and Method: This study aims to assess whether exposure to air pollutant emissions caused adverse health effects in Parma's metropolitan and suburban areas and the nearby cohorts of Langhirano and Sorbolo, south and north of the city, respectively. Furthermore, we wanted to assess whether the exposure rate to particulates had a greater effect on the development of pulmonary vasculopathy

and mortality depending on the residence of patients suffering from pre-capillary pulmonary hypertension. The patients divided into Smokers and NO-Smokers, were recruited from a database of the Register of Pulmonary Hypertension of the University Hospital of Parma. 4 were the air sampling sites and the distance between these sites and the patients' residences was measured in metres. The following data will be analyzed retrospectively: TAPSE TAPSE/sPAP; sPAP/PAAT; RVDd, Haemodynamic: PVR and PFR: Dlco; FVC/DLco. The diagnosis of PH was confirmed by right cardiac catheterization. ARPAE Emilia Romagna provided the environmental pollution data and referred to the average values of the same period between 2015 and 2024.

Preliminary Data 84 were patients of 59 F, 25 M : 26 were smokers. 79 patients had precapillary pulmonary hypertension of which 21 were associated with scleroderma. 4p.ti were affected by post-capillary and 1 by combined form. As of December 2023, 11 patients had died, 9 of them from refractory cardiac insufficiency, 1 from pulmonary complications related to Sars-Covid infection, and 1 from cerebral neoplasia. The analysis of the data still to be completed should determine whether the residence of patients in areas more exposed to particulates is related to increased incidence of pulmonary hypertension and consequent cardiovascular mortality.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 760
ARITMIE VENTRICOLARI (ARITMIE)
CARDIOPATIE CONGENITE NELL' ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)

MIOCARDITE O CARDIOMIOPATIA ARITMOGENA? IL RUOLO DELLA RISONANZA MAGNETICA CARDIACA E LA PREVENZIONE DELLA MORTE CARDIACA IMPROVVISA - CASE REPORT

Giuseppe Valadà (a), Daniela Dugo (a), Paolo Zappulla (a), Paola Pruiti (a), Riccardo Prezavento (a), Umberto Romeo (a), Marco Marsala (a), Francesco Barreca (a), Josef Milazzo (a), Veronica Trovato (a), Alessandra Tasca (a), Salvo Pagano (a), Francesco Platania (a), Angelo Antonio Di Grazia (a), Davide Francesco Maria Capodanno (a)
 (a) ELETTROFISIOLOGIA

Introduzione: La cardiomiopatia aritmogena è una patologia del miocardio coinvolgente il ventricolo dx, il sn o entrambi, caratterizzata da necrosi con sostituzione fibrosa o fibro-adiposa, infiltrati di cellule infiammatorie associata a episodi di dolore toracico e/o innalzamento degli enzimi miocardio-specifici simil-miocarditici, suggerendo un possibile ruolo della cascata infiammatoria nella fisiopatologia della malattia. La CMA è associata a disfunzione ventricolare loco-regionale o globale e ad aritmie ventricolari maligne, indipendente dal grado di disfunzione contrattile e la cui terapia prevede l'utilizzo di beta-bloccanti per la riduzione del burden aritmico e l'impianto di ICD per la prevenzione della morte cardiaca improvvisa. Caso clinico: Una ragazza di 20 anni, senza fattori di rischio ma con familiarità per cardiopatia dilatativa non ischemica con aritmie ventricolari, è giunta alla nostra attenzione per sospetta CMD in corso di miocardite acuta coinvolgente i piani basali e medi del ventricolo sinistro, diagnosticata mediante RM cardiaca eseguita presso altro centro dopo episodi di astenia, cardiopalmo e dolore toracico tipico con picco troponinico >10000ng/L. Agli esami ematici riscontro di positività per IgM C. Pneumoniae e HSV tipo 1 per cui eseguita terapia antibiotica e antivirale. Trasferita presso la nostra UO, si assisteva a negativizzazione degli indici di flogosi e della troponina. All'ECG si registrava

RS a 70bpm, ritardo della conduzione intraventricolare destra e turbe della ripolarizzazione a sede inferiore. L'ecocardiogramma evidenziava lieve dilatazione del ventricolo sinistro (diametro telediastolico 58mm) con discinesia del setto e globale e diffusa ipocinesia delle rimanenti pareti, FE 42%, global longitudinal strain alterato (12.3%) soprattutto in corrispondenza dei segmenti mediobasali del setto e basali anteriore ed inferiore. Messa in dubbio la diagnosi di miocardite, la paziente è stata sottoposta a ulteriore RM cuore (Fig. 1) con riscontro di disfunzione ventricolare sinistra associata a dilatazione, edema intramiocardico e LGE a distribuzione circonferenziale ("ring like" - numero di segmenti interessati > 5) a sede prevalentemente medioventricolare e basale, compatibili con presentazione "Hot Phase" di CMA desmosomiale e non ventricolare sinistra, specie in relazione alla morfologia dell'LGE rilevato. Sottoposta a test genetici per CMA, ancora in corso di elaborazione. In considerazione del burden aritmico (extrasistolia ventricolare polimorfa e runs di TV non sostenuta -Fig.2), è stata iniziata terapia farmacologica con Metoprololo 50mg b.id., tuttavia non tollerata della paziente per ipotensione. Valutato il sospetto di CMA e la familiarità per CMD con aritmie, nonché la giovane età, la paziente è stata sottoposta a impianto di S-ICD con ottimi parametri elettrici e nessuna complicanza. Conclusioni: La CMA è associata

a disfunzione ventricolare e ad aritmie ventricolari maligne, talvolta associata a riscontro di patologie infettive e/o infiammatorie che mimano un processo miocarditico. Il ruolo dell'imaging è di fondamentale importanza per il corretto riconoscimento e trattamento

della patologia. La terapia con beta bloccante e l'impianto di ICD sono riportati nelle ultime linee guida come strategia terapeutica per il controllo del burden aritmico e la prevenzione della morte cardiaca improvvisa.



Figura 1: RMN cuore. Si reperta edema intramiocardico e LGE a distribuzione circonferenziale "ring like" a sede prevalentemente medioventricolare e basale, compatibili con presentazione "Hot Phase" di CMA.
Figura 2: Tachicardia ventricolare non sostenuta registrata durante la degenza.

Figura 1



**CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 352
EMBOLIA POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IPERTENSIONE POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

THE ROLE OF PULMONARY ARTERY PULSATILITY INDEX TO ASSESS THE OUTCOMES FOLLOWING CATHETER DIRECTED THERAPY IN PATIENTS WITH INTERMEDIATE-TO-HIGH AND HIGH-RISK PULMONARY EMBOLISM

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(a) UNIVERSITÀ VITA-SALUTE SAN RAFFAELE; (b) OSPEDALE SAN GIOVANNI BOSCO;
(c) POZNAN UNIVERSITY CLINICAL HOSPITAL; (d) IRCCS SAN RAFFAELE

Background: The clinical impact of catheter-directed therapy (CDT) for pulmonary embolism (PE) on right ventricular function and its potential role as procedural outcomes has to be defined.

Methods: Consecutive patients who underwent CDT for PE at San Giovanni Bosco Hospital, Italy and First Department of Cardiology, Poznan University Clinical Hospital, Poland, between 2021 and 2023 were included in an observational fashion. Data about clinical characteristics, PE risk stratification, pre and post-interventional invasive pulmonary artery pressure (PAP) and Pulmonary Artery Pulsatility Index (PAPi) were collected. The primary endpoint was in-hospital death. Results: 101 patients were included in the study, with a majority being female (53%) and a mean age of 63 ± 5.6 years; of these patients, 65.6% had more than one PE risk factor. Additionally, 38% were classified as high-risk (HR) PE, while the remaining patients were stratified as having intermediate-high risk (IHR). Of the patients, 17% were treated with transcatheter thrombolysis (all in the intermediate-to-high-risk cohort), 10% with the FlowTriever device, and 73% with the Indigo Cath8 or Lightning 12 device. Additionally, 7% of the procedures were performed under ECMO support. Patients classified in intermediate-to-high risk

(IHR) showed a mean PAP was reduced (31.7 ± 7.1 to 23.4 ± 6.1 mmHg $p < 0.01$), as well as PAPi (3.1 ± 0.1 to 2.9 ± 0.1 $p < 0.01$) after the procedure. In the HR group, 18.4% of patients experienced the primary endpoint. In this population, the mean PAP (pre-procedure 24 ± 4.5 mmHg vs. post-procedure 26.7 ± 3.6 mmHg, $p = 0.11$) and PAPi (pre-procedure 1.2 ± 0.2 vs. post-procedure 1.4 ± 0.5 , $p = 0.2$) did not change significantly. On the other side, those who survived without events had a significant reduction in mean PAP (pre 29.1 ± 8.7 vs post 23.8 ± 5.5 $p < 0.02$) while the PAPi significantly increased (1.5 ± 0.6 vs 2 ± 0.5 $p < 0.01$). In the HR population, a delta PAPi > 0.45 demonstrated a 65.7% sensitivity and 75% specificity for positive outcome AUC 0.83 at ROC curve analysis.

Conclusion: Catheter-directed therapy (CDT) for pulmonary embolism (PE) significantly alters pulmonary artery pressure (PAP) and pulsatility index (PAPi) in acute PE patients. While in IHR patients the overperforming PAPi seems to normalize, in HR patients it increases and may be a marker of procedural success and right ventricle recovery. These hemodynamic changes may be an important marker for procedural efficacy and outcome assessment in IHR and HR patient groups undergoing CDT for PE.

**CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 337
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)**

A RARE CASE OF TAKOTSUBO SYNDROME AND CORONARY ANOMALY

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(a) POLICLINICO TOR VERGATA ROMA VIALE OXFORD 81

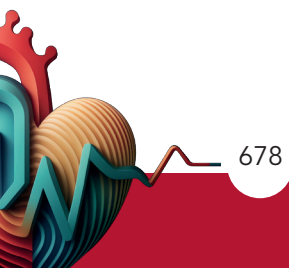
According to literature, CAAs affect around 1% of general population, ranging from 0.3%-5.6% in studies concerning coronary angiography, and approximately 1% of routine autopsy. Although CAAs are relatively uncommon, they are the second most common cause of SCD among young athletes. The risk correlated with a CAAs usually depends on the location and course of the anomalous origin of a coronary artery (AOCA). CAAs may coexist with other cardiologic conditions, including ischaemic heart disease or cardiomyopathies, such as Takotsubo syndrome. TTS is a reversible acute ventricle dysfunction, usually linked to a significant physical or emotional stressor. A 60-year-old female, former smoker, affected by diabetes, dyslipidemia and hypertension, presented to emergency department after experiencing chest pain during memorial family ceremony. At the admission ECG showed sinus bradycardia with non-specific abnormalities of ventricular repolarization (QTc 432 msec) and blood raise of cardiac enzymes (Trop I 4602 ng/ml; CK-MB 27,8 ng/ml and Myoglobin 107 ng/ml). Transthoracic echocardiography showed mild decrease of systolic function with apical akinesia and hyperkinesia of basal segments (EF 45%). Overnight, for persistence of chest pain despite nitrate therapy, she undergone coronary angiography during which, due to the difficulty in channeling the left coronary artery, aortography was performed, which documented abnormal origin of circumflex artery and anterior descending artery from right sinus of Valsalva. The coronary arteries were free from hemodynamically significant lesions, so that

ventriculography was performed with evidence of apical akinesia and basal hyperkinesia, compatible with Takotsubo syndrome. During hospitalization, patient underwent CCTA, which confirmed the common origin of left coronary artery from the right cusp and its retro-aortic course. Moreover, post-contrast sequences exclude myocardial oedema. The subsequent clinical course was free from complications and major arrhythmic events. The patient was discharged at 6th day after optimization of medical therapy with introduction of Bisoprolol. At discharge, transthoracic echocardiography documented partial recovery of left ventricular function. The diagnosis of CCAs is frequently an incidental finding during diagnostic workup for ischemic heart disease. Coronary angiography is the most important tool to identify and classify CAAs but, because of its invasiveness, relatively low spatial resolution it has been progressively replaced by CCTA, that offers a detailed characterization of the anatomic clues associated with high-risk CAAs and CMR that is becoming an alternative to investigate coronary anatomy. In our clinical case MRI and I-MIBG were not performed, since patient refused them. CCTA confirmed the abnormal origin of LCA from right sinus Valsalva with a retro-aortic course that is a very rare variant, with a reported prevalence of 0.02%-0.05% on angiographic studies. A coronary artery that arises from the contralateral sinus of Valsalva has five potential course patterns with different and prognostic significance: pre-pulmonic, retro-aortic, inter-arterial, trans-septal and retro-cardiac. Our retroaortic variant,



according to current data does not appear to be associated with hemodynamically significant effects. Concerning CCAs, the prognostic consequences are extremely variable, and each therapeutic choice should be tailored to the patient's characteristics.. According

to the literature, the point of contact between these two conditions lies in the fact that coronary artery anomalies can provoke intermittent vasospasm and endothelial dysfunction, which can cause Takotsubo syndrome



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 762
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT)

OVERWEIGHT IN PEDIATRIC CONGENITAL HEART DISEASE

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 Giulio Calcagni (a), Giovanni Antonelli (a), Marco Alfonso Perrone (a, b), Michele Lioncino (a), Carla Favocchia (a),
 Gabriele Rinelli (a), Fabrizio Drago (a)

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Background: Some studies suggest that children with congenital heart disease (CHD) are at an increased risk of obesity compared to the general population. In this population, the prevalence of overweight and obesity seems to be highly variable, with numbers ranging between 9.5–31.5% and 9.5–26%, respectively. In addition, being overweight seems to be associated with an increased risk of morbidity both in CHD patients as well as in the general population.

Aim: To determine the current prevalence of overweight and obesity in children and adolescents with CHD and to identify if there is a significant association between being overweight and hypertension, echocardiographic and blood pressure monitoring abnormalities.

Methods: CHD were classified in four groups: univentricular heart (UH), aortic coarctation (COA), aortic stenosis (AS) and biventricular heart (all the remaining congenital hearts abnormalities) (BH). Patients were categorized by body mass index (BMI): normal (BMI 20–24.9 kg/m²), overweight (BMI 25–29.9 kg/m²), and obese (BMI > 30 kg/m²). Patients with genetic diseases, syndromes, cardiomyopathy and comorbidities which are known to adversely affect body habitus were excluded. Clinical, demographic and echocardiography data were included. Demographics and incidence of specific morbidities were statistically compared using Fisher's exact test and analyses of variance (anovas).

	normal	overweight	obese	Total
Univentricular heart	66	3	3	72
Aortic coarctation	44	5	4	53
Aortic stenosis	7	0	1	8
Biventricular heart	245	31	7	282
<i>Total</i>	<i>362</i>	<i>39</i>	<i>15</i>	<i>416</i>

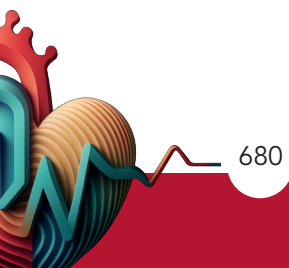
Table 1



Results: Four hundred sixteen patients with CHD were included (39% females; mean age 13.0 ± 3.8 years). Univentricular hearts were 17%, COA 13%, AS 2% and BH 68% of all population. The prevalence of overweight and obesity was 9% and 4%, respectively. There was a significant association between being overweight and hypertension (classified as an increase of systolic blood pressure more than 120 mmHg) ($p < 0.001$). Interestingly, there were no statistically significant differences in anomalies in the blood pressure monitoring or in echocardiography parameters (interventricular septum, posterior wall thickness, left ventricular ejection fraction

$< 55\%$, tricuspid annular plane systolic < 17 mm, global longitudinal strain $\geq -20\%$ and right ventricle fractional area change $> 35\%$) between overweight patients with hypertension and those with normal weight without hypertension.

Conclusion: Overweight in pediatric CHD, although significantly associated with higher systolic blood pressure, seems not to have a significant impact on the echocardiographic parameters of ventricular hypertrophy and/or global systolic function.



CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE 427 IPERTENSIONE POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE) BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE) BIOLOGIA MOLECOLARE CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

WHY MEN FARE WORSE: GENDER DIFFERENCES IN SCLERODERMA- ASSOCIATED PULMONARY HYPERTENSION

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Introduction: Systemic sclerosis is an autoimmune disease affecting various organs, with significant clinical variability among patients. Pulmonary arterial hypertension (PAH) is a common and severe complication, negatively impacting outcomes. While PAH is more common in female scleroderma patients, males have worse outcomes, including higher mortality and increased cardiovascular events, influenced by hormonal and genetic factors. This study examines the clinical criteria predicting mortality and cardiovascular events in male scleroderma patients with PAH, highlighting the need for gender-specific management strategies.

Methods: We analyzed clinical data from scleroderma patients with PAH, distinguishing between men and women. Parameters included right ventricular dilation, cardiovascular events, mortality, pericardial effusion, pulmonary arterial pressure, renal crises, active pattern, extensive interstitial lung disease (ILD), and RNA polymerase III positivity. The sample included 11 males and 50 females.

Results: Men had significantly more cardiovascular events than women (Median

Men: 2.00; Median Women: 1.00; $p = 0.031987$). Mortality was higher in men (88.89% vs 57.69%, $p = 0.134426$). Men also had higher rates of right ventricular dilation (100.00% vs 44.23%, $p = 0.002195$), pericardial effusion (33.33% vs 11.54%, $p = 0.124605$), and renal crises (11.11% vs 1.92%, $p = 0.275410$). Men exhibited a more active disease pattern (66.67% vs 36.54%, $p = 0.141794$) and greater RNA polymerase III positivity (11.11% vs 0.00%, $p = 0.147541$). Extensive ILD was more frequent in men (66.67% vs 42.31%, $p = 0.278651$).

Conclusions: Managing male scleroderma patients with PAH requires careful monitoring of identified predictors to improve prognosis. Addressing right

Variable (Patient with pulmonary Hypertension)	Male Percentage (n° 9) Confidence Interval	Female Percentage (n° 52) Confidence Interval	p-value
Right ventricular dilation	100.00% (66.37 - 100.00)	44.23% (30.24 - 59.30)	0.002195
Telangiectasia	33.33% (11.82 - 64.55)	80.77% (67.57 - 89.53)	0.007240
ACA positive	11.11% (1.98 - 42.94)	51.92% (38.12 - 65.47)	0.030954

Figure 1



ventricular dilation, pulmonary vascular resistance, and the TAPSE/sPAP ratio is crucial. The higher prevalence of lung involvement, particularly extensive ILD, underscores the need for regular pulmonary assessments and aggressive management tailored to male patients.

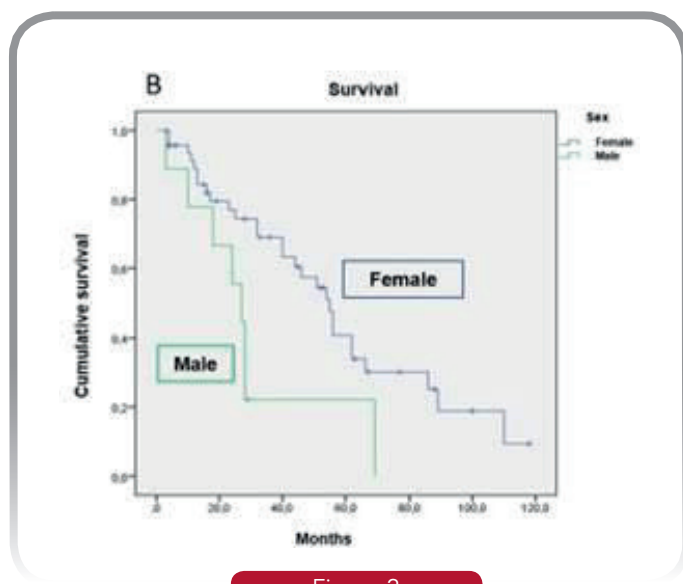
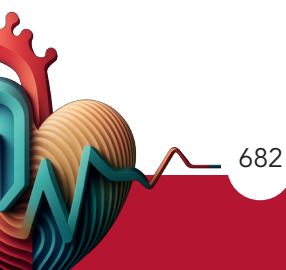


Figura 2



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

COVID-19

COVID-19 519
IPERTENSIONE ARTERIOSA E COVID-19
(IPERTENSIONE ARTERIOSA)
SARS-COV-2 (COVID-19)
FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)

**ENDOTHELIAL ACTIVATION AND ARTERIAL HYPERTENSION AFTER THE VIREMIC PHASE IN COVID-19
CORRELATE WITH WORSE PROGNOSIS**

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Introduction: in moderate to severe form of COVID-19 there is a tendency towards hypertension (HTN) and pulmonary vasoconstriction. This is probably caused by activation of the endothelium and the Renin-Angiotensin System (RAS). A phase of endothelial activation could be the link between the initial Viremic Phase and the subsequent Cytokine Phase. The purpose of the present study is to analyze parameters indicative of the endothelial phase and to correlate the rise in blood pressure (BP) to a specific moment during the disease.

Methods: we conducted a retrospective study, in COVID-19 patients confirmed by nasophariongeal swab with PCR and admitted in a cardio-respiratory unit. A blood sample was performed to detect viral RNA in the first days after admission (T0). We then confronted those patients who presented viral RNAemia and those who did not, as the absence of viraemia is a marker of later stages of the infection, before the Cytokine Phase. We compared the mean values of systolic (SBP), mean (MBP) and diastolic blood pressure (DBP) and levels of Potassium at admission and T0 as a marker of RAS activation, in particular of aldosterone.

A further analysis was conducted to investigate the correlation between BP trends and a composite outcome: discharge vs. death/Intensive care unit (ICU) admission. Functional T-Tests for group comparison and Functional Logistic Regression were used.

Results: We enrolled 45 patients, 80% of which were males, with a mean age of 59 years. Viral RNA was detected in 24 patients (53%), within a mean T0 of 2 days after admission.

We observed higher values of BP at T0 in non RNAemic patients:

- SBP showed an almost significant trend towards higher values in non-viremic patients (SBP: 142,5 vs 129,8 mmHg; $p = 0,050$)
- MBP was significantly higher in the non-viremic group (101,6 vs 91,5 mmHg; $p = 0,013$).
- DBP resulted higher in patients with undetectable viral RNA (81,19 vs 72,33 mmHg; $p = 0,019$).

The delta between the serum Potassium concentration at admission and at T0 was significantly greater in patients with negative RNAemia. In fact, these patients exhibited a greater decrease in Potassium concentration during hospitalization (mean delta = -0.18 mEq/L vs. +0.09 mEq/L; $p = 0.035$).



Comparing the BP trends, a significant difference was found concerning MBP ($p = 0.013$) and DBP ($p < 0.001$), with higher values correlating with the outcome death/ICU admission.

Conclusions: Our data confirm that COVID-19 patients tend to develop HTN, specifically, after the Viremic phase, as demonstrated by the absence of

detectable Viral RNA in those patients.

Thus, HTN does not seem to be a direct effect of the virus presence but a consequence of its activation of RAS.

Finally, our data also suggest a correlation of the endothelial activation and a worse prognosis (need for ICU admission or death)



COVID-19 936
MIOCARDITI & COVID 19 (COVID-19)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
SARS-COV-2 (COVID-19)

COVID19 VACCINES DO NOT INCREASE MYOCARDITIS AND PERICARDITIS INCIDENCE: RESULTS FROM THE NATIONAL REGISTRY OF THE ITALIAN SOCIETY OF CARDIOLOGY

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Aim: Reports about myocarditis and pericarditis following COVID-19 vaccination raised concerns worldwide. However, the heterogeneous diagnostic criteria for post-vaccination inflammatory heart diseases may result in overestimating incidence rates. The aim of this multicentre Italian registry is to evaluate the impact of COVID-19 vaccines on the incidence of myocarditis and pericarditis in the Italian population.

Methods: Consecutive patients admitted to Italian hospitals for acute myocarditis and/or pericarditis in the same period (1st June- 31st October) of 2019 and 2021 were enrolled, irrespective of the potential association with the COVID-19 vaccines. Acute pericarditis and/or myocarditis were defined as "vaccine-related" whether clinical presentation occurred within 15 days after COVID-19 vaccination,

independently of the dose.

Results: There was a comparable incidence rate ratio (IRR) for inflammatory heart diseases in 2019 and 2021 (2019: IRR 0.67 vs 2021: IRR 0.74, p-value= 0.45). In particular, the IRR did not differ in myocardial involvement (2019: IRR 0.33 vs 2021: IRR 0.33, p-value= 1) and pericarditis (2019: IRR 0.37 versus 2021: IRR 0.49, p-value= 0.09) in both periods. Among 125 cases registered in 2021, 32 (25.6%) were "vaccine-related". Among those who experienced "vaccine-related" myocarditis and/or pericarditis, males with age under 40 years old were over-represented (53.12%, p value= 0.021).

Conclusions: COVID-19 vaccines do not affect the incidence of pericarditis and myocarditis.



COVID-19 648
SARS-COV-2 (COVID-19)
EMBOLIA POLMONARE & COVID 19 (COVID-19)
DISTURBI DEL RITMO E COVID-19 (COVID-19)
MIOCARDITI & COVID 19 (COVID-19)

PECULIARITIES OF RHYTHM DISORDERS IN PATIENTS WHO DIED DUE TO SEVERE CORONAVIRUS DISEASE

Nazar Danilevych (a), Tetiana Danilevych (a), Lesya Rasputina (a)
 (a) UKRAINA

Introduction. Studying the impact of COVID-19 on the heart rhythm can help to develop optimal protocols for monitoring and treatment of cardiac complications.

The aim - to establish the predictors of mortality in the patients with severe COVID-19.

Materials and methods. 88 patients who were in the ICU of a clinical city hospital in Ukraine in the period 2020-2023 and have died as a result of severe COVID-19 were included in the study. Among them were 46 (52.3%) men ($X^2 = 0.182$, $p = 0.67$). The average age was 68.22 ± 11.51 years. Middle-aged and elderly patients were dominated in the age structure ($p = 0.001$). The total duration of stay in hospital was 9.14 ± 7.21 days. The average duration of stay in ICU was 7.13 ± 6.33 days. Comorbidities were: CHF 79 (89,8 %), CAD 83 (94,3%), hypertension 73 (83,0%), combination of CAD and hypertension 72 (81,8%), obesity 35 (39,7%), diabetes mellitus 25 (28,4%), gastrointestinal diseases 15 (17,0%), kidney diseases 18 (20,5%), cerebrovascular diseases 18 (20,5%), COPD/bronchial asthma 10 (11,4%), oncological diseases 12 (13,6%), thyroid disease 3 (3,4%), musculoskeletal disorders 4 (4,5%), valvular disease 6 (6,8%).

Results: structure of acute complications in the patients who died from COVID-19: pulmonary edema 82 (93,2%), brain edema 75 (85,2%), acute myocardial infarction 3 (3,4%), stroke 10 (11,4%), acute thrombophlebitis 14 (15,9%), acute HF 9 (10,2%), pulmonary embolism 9 (10,2%), toxic shock 10 (11,4%), acute renal failure 12 (15,6%), bleeding 2 (2,3%), pneumothorax 1 (1,1 %), pancreatic necrosis 1 (1,1%), lung abscess 2 (2,3%). Acute arrhythmias were in 67 (76.1%) patients, among them tachyarrhythmias in 5 (81,8 %), bradyarrhythmias in 47 (70,2 %) patients, respectively.

Predictors of mortality in patients with severe COVID-19: Hypertension (-0,170 [1,085-2,765], $p = 0,01$), CAD (-0,310 [1,93 - 10,418], $p < 0,01$), stroke in anamnesis (-0,133 [1,058 - 2,244], $p = ,05$), tachyarrhythmias (-0,305 [1,600 - 4,073], $p < 0,01$), atrial fibrillation (-0,245 [1,373 - 2,519], $p < 0,01$), increase of D-dimer -0,142 [1,03—1,947], $p = 0,04$).

Conclusions: tachyarrhythmias, atrial fibrillation are likely ECG-predictors of mortality in patients with severe COVID-19. Probable clinical predictors of mortality in patients with severe COVID-19 are: hypertension, CAD, history of stroke, increased D-dimer.



COVID-19 705
SARS-COV-2 (COVID-19)
MIOCARDITI & COVID 19 (COVID-19)
CARDIOPATIA ISCHEMICA E COVID 19 (COVID-19)

CORRELATION BETWEEN PATHOGENIC AND LIKELY PATHOGENIC VARIANTS IN GENOTYPES ASSOCIATED WITH THE DEVELOPMENT OF LONG COVID SYNDROME

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Background: Although SARS-CoV-2 infection is already well known, little is still understood about the pathophysiological mechanisms underlying the Post-Acute Sequelae Syndrome or Long Covid Syndrome, a debilitating condition characterized by the persistence of symptoms affecting different organs even months after initial infection.

Aim of the study: to verify a possible correlation between the symptoms of Long Covid Syndrome and genetic variants disease-related.

Methods: analytical prospective monocentric study, enrolling ambulatory patients with symptoms related to post-Covid syndrome between April 2021 and September 2023. Blood samples were collected. Genetic testing analyzed genes linked to fatigue and muscle weakness mendelian syndrome and different polymorphisms. A next-generation sequencing (NGS) panel comprising 494 genes potentially associated with chronic fatigue syndrome and fatigue syndromes was developed. The selection of genes for this panel was carried out using data from different databases (HGMD Professional, OMIM, Orphanet, Gene Reviews and PubMed). We used technology Twist Bioscience to create the custom DNA probes for this panel. The interpretation of the identified variants was carried out using the classification developed by Magi. An analysis of variance (ANOVA) was conducted to assess the between-class relationship genetics and minor allele

frequency (MAF), regression was conducted to assess the relationship between inheritance types and MAF and chi-square test was used to investigate the link between P and LP mutations.

Results: From April 2021 to September 2023 we enrolled 124 long-Covid pts, then a comprehensive analysis of 494 genes was conducted in a cohort of 95 of them. 75 gene variants were identified and subsequently classified as pathogenic or likely to pathogenic in 57 patients, using the interpretation algorithm devised by MAGI's lab. Of our total cohort of 95 patients, 25% had cardiological symptoms. Within this subgroup, 8% had cardiological symptoms, some of which were pre-existing, and has received a diagnosis that is likely to be positive for genetic diseases in cardiology such as dilated cardiomyopathy (ABCC9, TTN, MYH6, DES), atrial fibrillation (ABCC9, SCN1B, KCNA5), coronary artery disease (LRP6), arrhythmogenic right ventricular dysplasia (DSG2).

Conclusion: we detected gene variants with different inheritance, related to respiratory, cardiovascular, neurological, immunological deficits. It is also possible that COVID-19 infection played a role in the development and manifestation of several Mendelian genetic disorders that may have been latent or had mild signs prior to infection. These findings could have direct implications for diagnostic and therapeutic management of patients with long COVID syndrome.



COVID-19 776 SARS-COV-2 (COVID-19) COAGULAZIONE E COVID-19 (COVID-19) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

UNVEILING POTENTIAL INFLAMMATORY BIOMARKERS IN LONG-COVID: RESULTS FROM A COMPARATIVE SERUM PROTEOMIC ANALYSIS

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Background: Long COVID (also known as post-acute sequelae of SARS-CoV-2 infection, PASC) is defined as the persistence or new onset of symptoms after recovery from the acute phase of COVID-19. It consists of a multiorgan syndrome expressing itself with a wide variety of cardiovascular and non-cardiovascular symptoms such as chest pain, fatigue, shortness of breath, autonomic dysfunction, cognitive impairment, and sleep disorders, even in the absence of clear evidence of organ dysfunction. Some previous studies have suggested the potential role of an abnormal inflammatory response after SARS-CoV-2 infection; however, the specific underlying mechanisms remain unclear.

Purpose: To identify potential biomarkers that may act as diagnostic indicators or therapeutic targets for long-COVID through proteomic analysis.

Methods and Results: We enrolled 124 long-COVID patients. We then performed a proteomic analysis of the serum of 98 of them and of 50 healthy controls. We compared the levels of proteins in both the long COVID group and a control group using multivariate and univariate analyses. Both PLS-DA and PCA analyses showed a clear distinction between the two groups; clustering analysis also clearly separated the control group from long COVID patients. Proteins were then filtered based on (a) statistical analysis, considering

proteins with a VIP > 1 (PLS-DA) and $p < 0.05$ (t-test); (b) coefficient of variation (CV), where only proteins with CV < 10 were considered; and (c) fold change (FC), for which proteins with FC < 0.67 (total proteins = 4) or FC > 1.5 were selected. The identified proteins were then subjected to ROC curve analysis to identify antithrombin as a potential biomarker, as it has an area under the curve (AUC) near 1. Other proteins displaying an AUC > 0.98 were also identified as

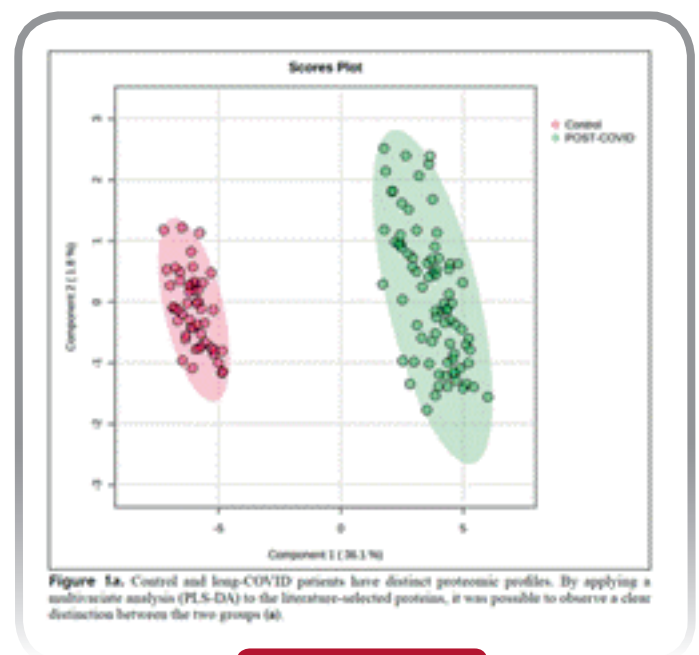
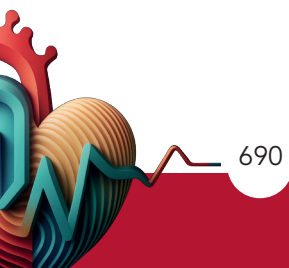


Figure 1

potential biomarkers (Sirtuin 1, Natriuretic Peptide B, Hemopexin, Arachidonate 5-Lipoxygenase). Additionally, a multivariate ROC method using linear SVM as the classification method identified that a combination of these proteins would also result in an AUC near 1. Finally, a correlation analysis between the proteins of interest and the clinical manifestations was performed. A positive correlation (above 0.5) was found between dyspnea and Glucocorticoid Receptor, and between memory deficit and Antithrombin. Arachidonate 5-Lipoxygenase was negatively correlated (below -0.5) with tremors and hair loss, while Mannose Binding Lectin 2 was positively linked to asthenia,

Antithrombin was correlated with concentration deficit, and Endothelin-2 was associated with muscle aches.

Conclusions: The identified biomarkers are associated with inflammatory processes, corroborating literature evidence that long COVID patients develop an inflammatory state that damages many tissues. Further studies are needed to validate this data in larger cohorts to identify specific biomarkers and guide future preventive strategies or treatments for long COVID and its cardiovascular and non-cardiovascular sequelae.



COVID-19 777 SARS-COV-2 (COVID-19) INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI) MIOCARDITI & COVID 19 (COVID-19)

PRESENCE OF VIRAL SPIKE PROTEIN AND VACCINAL SPIKE PROTEIN IN THE SERUM OF PATIENTS WITH POST-COVID-19 SYNDROME: A NEW PATHOGENETIC HYPOTHESIS?

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Background: COVID-19 pandemic had a dramatic impact on global health and economy since the outbreak in 2020. Some individuals experienced a long-Covid syndrome characterized by the persistence for months or years of symptoms affecting different organs with a poorly impact on quality of life and work activity. The underlying pathophysiological mechanisms remain poorly understood. Moreover, it has been recently proposed that the spike protein, the primary antigen targeted by COVID-19 vaccines, could be linked to the development of long-Covid syndrome.

Purpose: this study aimed to specifically investigate the presence of viral and vaccine spike proteins in the serum of long-Covid syndrome patients (pts).

Methods: In this prospective monocentric study, we employed a metabolomic-based approach utilizing mass spectrometry to analyze the serum and PCR was used to check for Sars-CoV-2 integration in the genome of long-Covid pts. The selected variables were evaluated at two different times: the time of entry in the study (T0) and 6 months after recruitment (T1). The patients were recruited consecutively at our site between April 2021 and September 2023. The blood samples were collected by each patient during the first visit.

Results: Among 124 long-Covid pts recruited by April 2021 to September 2023, so far we have analyzed the serum of 70 pts (Table 1). We identified the presence of the natural Spike protein in one patient and the vaccine Spike protein in two patients two months after the vaccination. Control samples from unvaccinated individuals were negative for spike protein. The two patients, for whom vaccine spike protein was identified, had their second dose administered in the month of February 2021. The mass spectrometry analysis revealed the presence of both viral and vaccine spike

Table 1: Summary of Clinical Data for 70 Patients: Demographics, Vaccination Status, Symptoms, and Additional Information

Characteristics	Case Subjects (n =70)	
Sex	Male	35 (50%)
	Female	46 (65.71%)
Age (year)	52	
Vaccine (YES)	51 (72.86%)	
Severity score	Asymptomatic	0 (0%)
	Mild symptoms	34 (48.57%)
	Severe symptoms	35 (50%)
	Intensive care	1 (1.43%)
	Asthenia (during covid)	7.8 %
	Asthenia (post-covid)	5.1 %
	Headache (during covid)	4.4 %
	Headache (post-covid)	2.1 %
Clinical data	Pneumonia (NO)	31 (44.29%)
	Pneumonia (YES)	39 (55.71%)
	Fever (NO)	16 (22.86%)
	Fever (YES)	54 (77.14%)
Serology	Not done	35 (50%)
	Negative	13 (18.57%)
	Doubtful	0 (0%)
	Positive	22 (31.43%)

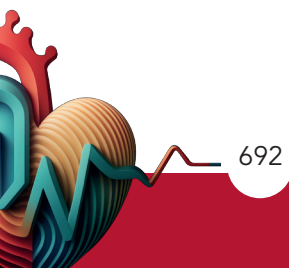
Table 1



protein fragments in a subset of patients with long-Covid syndrome even two months after vaccination. The data indicates that a considerable proportion of patients (72.86%) received the Pfizer vaccine.

Conclusions: Our results were not able to prove the viral integration hypothesis but support the hypothesis

that the presence of Spike protein may be associated with the development of long-Covid syndrome. Further research is required to elucidate the molecular mechanisms and to explore potential therapies. This study contributes to our understanding and highlights the need for continued investigation to improve the lives of pts affected by long-Covid.



COVID-19 933

MIOCARDITI & COVID 19 (COVID-19)

MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

SARS-COV-2 (COVID-19)

THE IMPACT OF VACCINATION STATUS ON POST-ACUTE SEQUELAE IN HOSPITALIZED COVID-19 SURVIVORS USING A MULTIDISCIPLINARY APPROACH: AN OBSERVATIONAL SINGLE CENTER STUDY?

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Background: COVID-19 vaccines reduced mortality, hospitalizations and ICUs admissions. Conversely, the impact of vaccination on Long COVID-19 syndrome is still unclear. This study compared the prevalence of post-acute sequelae at short and long-term follow-up among hospitalized unvaccinated and vaccinated COVID-19 survivors through a multidisciplinary approach.

Methods: After 2 months from discharge, unvaccinated and vaccinated COVID-19 survivors underwent a follow-up visit at a dedicated "post-COVID-19 Outpatient Clinic". The follow-up visit included a cardiovascular evaluation, blood tests, chest computed tomography, six-minute walking test (6MWT), spirometry. A one-year telephone follow-up was performed to assess re-hospitalizations, death and long-lasting symptoms. An additional 1:1 case-control matching analysis adjusted for baseline characteristics was performed.

Results: Between June 2020 and June 2022, a total of 458 unvaccinated and vaccinated patients (229 per group) underwent the follow-up visit. Vaccinated patients had lower rates of ICU admissions (1.7% vs 9.6%, $p < 0.001$) and severe respiratory complications

requiring intubation (1.3% vs 7%, $p = 0.002$) or non-invasive ventilation such as high-flow nasal oxygen therapy (1.7% vs 7.9%, $p = 0.02$), CPAP (1.3% vs 20.1%, $p < 0.001$), and low-flow oxygen therapy (3.5% vs 63.3%, $p < 0.001$) compared to unvaccinated ones. At 2-month follow-up, vaccinated patients had fewer persistent ground-glass opacities (2.6% vs 52.8%, $p < 0.001$) or consolidations (0.9% vs 8.3%, $p < 0.001$). Additionally, unvaccinated patients experienced more frequent myocarditis (4.8% vs 0.9%, $p = 0.013$) and pulmonary embolism (1.8% vs 0%, $p = 0.042$) and exhibited more significant respiratory impairment as evidenced by desaturation during the 6MWT (10.2% vs 3.5%, $p = 0.005$) and altered spirometry (14% vs 8.7%, $p = 0.043$) compared to vaccinated ones. At one-year, unvaccinated patients reported more symptoms such as dyspnea (20.5% vs 10%, $p = 0.002$), psychological symptoms (10% vs 3.5%, $p = 0.005$) and chronic rhinosinusitis/cough (6.6% vs 2.6%, $p = 0.04$) as compared to vaccinated ones. The 1:1 case-control matching analysis also confirmed these results.

Conclusions: COVID-19 vaccines improve short-term outcomes and may reduce Long COVID-19 prevalence.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

DIABETE E MALATTIE DEL METABOLISMO

**DIABETE E MALATTIE DEL METABOLISMO 889 DISLIPIDEMIE
(DIABETE E MALATTIE DEL METABOLISMO)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)**

PCSK9-TARGETING DRUGS AND GENDER: EFFICACY, SAFETY AND ADHERENCE

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Background: Despite common perceptions, recent European statistics have documented that the absolute numbers of women living with and dying from ASCVD (atherosclerotic cardiovascular disease) exceed those of men, highlighting the need for aggressive management of risk factors. Research has indicated a gender disparity in dyslipidemia management, with women being significantly more likely to fail to meet LDL-C targets and less likely to receive high-intensity lipid-lowering medications in response to elevated LDL-C levels. The aim of this analysis was to highlight potential gender differences in response to and tolerance of novel drugs targeting PCSK9 (monoclonal antibodies, Evolocumab and Alirocumab, and siRNA, Inclisiran), and to investigate adherence to LDL-C targets according to the latest ESC guidelines.

Population and Methods: Between April 2018 and June 2024, patients who accessed to Dyslipidemia reference centre to begin PCSK9mAb (monoclonal antibodies) and PCSK9siRNA (small interfering RNA) therapy were included in a prospective registry. Our cohort consisted of 341 patients: 122 (35.8%) were women, mean age was 64.83 ± 12.11 years. Among them, 80 (23.5%) were at high cardiovascular risk, and 261 (76.5%) were at very high cardiovascular risk.

Results: In our population, women were more frequently affected by heterozygous familial hypercholesterolemia (HeFH) (61,5% vs 38,3%, $p < 0,001$) and, compared to

men, had a lower frequency of cardiovascular events (62,3% vs 84,5%, $p < 0,001$), resulting in a higher proportion being classified as high cardiovascular risk (37,7% vs 15,5%, $p < 0,001$). Among patients with very high cardiovascular risk, women demonstrated a lower rate of achieving LDL-C targets (44,7% vs 62,2%, $p = 0,010$). This discrepancy is likely attributed to the higher prevalence of familial hypercholesterolemia (40% vs 27%, $p = 0,048$) and consequently to the higher baseline LDL-C levels among very high CV risk women. We did not observe gender differences in the prescription of first- and second-line lipid-lowering medications or in tolerance to therapies, and no absolute differences in response to PCSK9-targeted therapy were noted.

Conclusions: In our analysis, no gender differences were observed in terms of efficacy and tolerance to the new PCSK9 inhibitors. The observed difference in target achievement within our cohort is attributed to the higher percentage of women with heterozygous familial hypercholesterolemia (HeFH) who have extremely poorly controlled LDL-C levels. In contrast, male patients, possibly due to heightened awareness of cardiovascular risk and recurrence—both in the general population and among healthcare professionals—appear to present at our center with better-controlled LDL-C levels, even following a cardiovascular event. This finding is consistent with other studies indicating that women, particularly those with familial hypercholesterolemia, are diagnosed later and undertreated compared to men.



**DIABETE E MALATTIE DEL METABOLISMO 826
 INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
 MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
 (CARDIOPATIA ISCHEMICA)
 DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)
 DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
 PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
 (PREVENZIONE E RIABILITAZIONE)**

**IS CARDIO-OBESITY ASSOCIATED WITH NON-HDL CHOLESTEROL LEVELS?
 UNVEILING A HIDDEN CARDIOVASCULAR RISK IN ASYMPTOMATIC SUBJECTS**

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Rationale: Non-HDL cholesterol encompasses all atherogenic lipoproteins, making it a significant marker for cardiovascular diseases (CVD). Epicardial fat is the layer of adipose tissue found between the myocardium and the visceral pericardium, directly overlying the heart. Epicardial Fat Volume (EFV) has recently become regarded as a novel cardiovascular risk marker. Focusing on asymptomatic subjects allows for the study of early pathophysiological changes before the onset of symptomatic cardiovascular disease.

Objective: The purpose of this study was to investigate the correlation between serum non-HDL cholesterol levels and epicardial adipose tissue volume in asymptomatic individuals, to assess their predictive value for cardio-obesity and potential cardiovascular risk in a prospective cohort.

Methods: 3,018 subjects, ages 20-79, were screened for CVD risk using the Early Cardiovascular Health Risk Scoring System (ECVHRS), which has been previously published, The ECVHRS includes 10 cardiovascular tests: 7 of these tests are vascular (C1, C2, retinal artery, abdominal aorta ultrasound, carotid intima-media thickness (CIMT), microalbumin, resting and post-exercise blood pressure), 3 tests are cardiac (proBNP, ECG, and Echo). Out of these consecutive subjects, 962 asymptomatic and on no medication, were also evaluated for CACS and EFV using a cardiac CT scan, Siemens Somatom Definition Dual- Source CT scanner 64x2. These subjects were divided into 4 groups according to the levels of non-HDL values (> 200 mg/dL, 160-199, 130-159, < 130). The results are illustrated in Table1 and Figure 1.

GROUPS	# of Subjects	Non-HDL	TG	ApoB	CRP (mg/dL)	Epicardial Fat	BP_Rise
Subjects with non-HDL>200	39	221.20	286.50	156.22	0.75	125.13	28.03
Subjects with non-HDL 199-160	172	176.64	148.71	125.23	0.31	93.02	24.63
Subjects with non-HDL 130-159	316	143.70	122.76	104.40	0.26	92.10	22.50
Subjects with non-HDL <130	435	102.45	83.33	76.55	0.31	95.73	22.04
Total number of Subjects	962						
			p<0.0001	p<0.0001	p=0.0257	p=0.0324	p=0.0304

Table 1

Results: Table1.

Conclusion: Our findings, integrating current and past data, show:

- (1) Epicardial fat volume (cardio-obesity) is significantly associated with Cardiovascular structural and functional abnormalities and correlates with Non-HDL Cholesterol levels.
- (2) Notably, Non-HDL Cholesterol levels above 200 mg/dL are linked with increased epicardial adipose tissue volume, compared to levels between 130-159 mg/dL in asymptomatic individuals. Therefore, future research is needed to assess the long-term effects of Non-HDL Cholesterol on epicardial fat volume and its cardiovascular implications.
- (3) Our goal is set to improve risk assessment and prevention of cardio-obesity.
- (4) Early detect to protect.

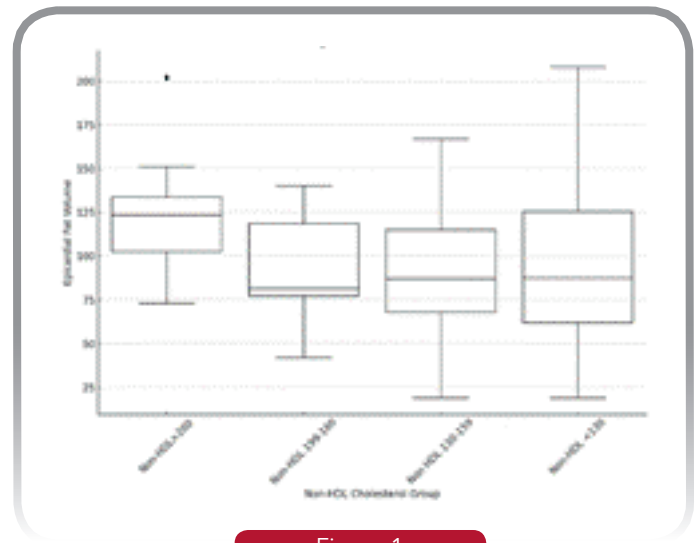


Figure 1



DIABETE E MALATTIE DEL METABOLISMO 608

FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO) MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

REAL WORLD USE ORAL SEMAGLUTIDE IN ADULT WITH TYPE 2 DIABETES. THE PIONEER REAL SWITZERLAND MULTICENTRE, PROSPECTIVE, OBSERVATIONAL STUDY

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(a) CARDIOCARE CCARDIOLOGICAL MEDICAL PRAXIS CENTER LUGANO SWITZERLAND

Introduction: Real-world data provide insight into how medications perform in clinical practice. PIONEER REAL Switzerland aimed to understand clinical outcomes with oral semaglutide in adults with type 2 diabetes (T2D).

Methods: PIONEER REAL Switzerland was a 34–44-week, multicentre, prospective, non-interventional, single-arm study of adults with T2D naïve to injectable glucose-lowering medication who were initiated on oral semaglutide in routine clinical practice. The primary endpoint was change in HbA_{1c} from baseline (BL) to end of study (EOS); secondary endpoints included change in body weight (BW) from BL to EOS and the proportion of participants achieving HbA_{1c} <7.0% and the composite endpoints HbA_{1c} reduction ≥1% with BW reduction ≥3% or ≥5% at EOS. Safety was assessed in participants who received ≥1 dose of oral semaglutide.

Results: Of 185 participants (female/male, n = 67/118) initiating oral semaglutide, 168 (90.8%) completed the study and 143 (77.3%) remained on treatment with oral semaglutide at EOS. At BL, participants had a mean age of 62 years, diabetes duration of 6.4 years, HbA_{1c} of

7.7%, BW of 95.6 kg and body mass index of 33.2 kg/m²; 56.2% of participants were receiving glucose-lowering medications. Significant reductions were observed for HbA_{1c} (estimated change [95% confidence interval (CI)] -0.91% [-1.10, -0.71]; p < 0.0001), as well as BW (estimated change [95% CI] -4.85% [-5.70, -4.00]; p < 0.0001). In total, 139 adverse events (AEs) were reported in 65 (35.1%) participants; most were mild or moderate. The most frequent were gastrointestinal disorders (27.0%), and 31 AEs in 20 (10.8%) participants led to discontinuation of oral semaglutide. Six serious AEs were reported; all were considered unlikely to be related to oral semaglutide.

Conclusion: People living with T2D treated with oral semaglutide in Switzerland achieved clinically significant reductions in HbA_{1c} and BW, with no new safety signals.

Clinical Trial Registration NCT04537624

Graphical abstract A graphical abstract is available for this article.

DIABETE E MALATTIE DEL METABOLISMO 35
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

HYPERTRIGLYCERIDEMIA IN PATIENTS WITH ACUTE AND CHRONIC CORONARY SYNDROME: PREVALENCE AND THEIR ASSOCIATION WITH EXTREME CARDIOVASCULAR RISK AND LEFT VENTRICULAR FUNCTION

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Objective: Hypertriglyceridemia prevalence in Acute and Chronic Coronary Syndrome (ACS and CCS respectively) patients in the era of very low LDL target is still unknown. The objective of our study is to evaluate the prevalence of triglyceride levels above 150 or 200 mg/dL despite statin therapy and LDL cholesterol at targets in ACS and CCS subjects enrolled in a Cardiac Rehabilitation (CR) program.

Methods: This cross-sectional observational study was conducted in our hospital. Patients undergoing CR after ACS/CCS from January 1, 2012, to March 28, 2023, were included. Data on demographic, clinical, laboratory, and instrumental variables were collected.

Results:

The study population consisted of 740 patients with a mean age of 64.3 ± 10.7 years, predominantly male (81.7%). Triglyceride levels significantly decrease during the CR period (131.1 ± 63.8 vs 116.9 ± 75.9 mg/dL; $p < 0.001$) similarly to LDL cholesterol (107.9 ± 38.8 mg/dL vs 69.9 ± 25.9 mg/dL, $p < 0.001$). 50.8%

of the subjects reach the LDL cholesterol target. The percentage of patients with triglycerides >150 mg/dL at CR ends was 17.8% (15.6% when considering only patients that reach the LDL target of 55 mg/dL) while it is only 6.8% for triglycerides >200 mg/dL (5.9% when considering only patients that reach LDL target). Patients with triglycerides >150 mg/dL had higher baseline BMI, LDL cholesterol and uric acid with lower ejection fraction at CR ends. Hypertriglyceridemia significantly correlates with extreme CV risk ($R = 0.08$, $p = 0.025$). At multivariate analysis, FE (dependent variable) was significantly associated with triglycerides ($\beta = -0.145$, $p = 0.026$) and systolic BP ($\beta = 0.137$, $p = 0.032$).

Conclusion: Despite high intensity statin therapy and lower LDL cholesterol targets, a substantial proportion of patients in cardiac rehabilitation still had elevated triglyceride levels. This study highlights the potential role of Icosapent Ethyl in managing hypertriglyceridemia in these patients.



DIABETE E MALATTIE DEL METABOLISMO 862
DIABETE E MALATTIE CARDIOVASCOLARI
(DIABETE E MALATTIE DEL METABOLISMO)
FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

CARATTERIZZAZIONE DEL PROFILO DI RISCHIO CARDIOVASCOLARE E DELLA GESTIONE TERAPEUTICA IN PAZIENTI AFFETTI DA DIABETE MELLITO DI TIPO 2: STUDIO OSSERVAZIONALE MULTICENTRICO ITALIANO

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Obiettivi: I dati di mondo reale sulla prevalenza delle malattie cardiovascolari (CV) in pazienti affetti da diabete mellito di tipo 2 (T2DM) sono limitati. L'obiettivo del Registro "Cardiovascular Risk Profile and Therapeutic Management in Patients with Type 2 Diabetes Mellitus: Italian Multicenter Observational Study (CardioMET)" è stato quello di raccogliere dati su pazienti affetti da T2DM afferenti ad ambulatori ospedalieri di medicina interna e cardiologia al fine di consentire una fotografia della situazione italiana in merito al profilo di rischio CV e la gestione farmacologica del T2DM, secondo le raccomandazioni delle correnti linee guida ESC e AHA, in soggetti in prevenzione primaria e secondaria per malattia CVD.

Metodi: CardioMET è un registro osservazionale, multicentrico, italiano. Lo studio ha compreso una fase T0 – Raccolta dati retrospettiva (ottobre 2022-marzo 2023), una fase di Attività Educative, e una fase T1 – Raccolta dati prospettica (marzo-ottobre 2023). Nella presente analisi descriviamo la fase T0 focalizzandoci sulla descrizione della popolazione arruolata e sulla terapia farmacologica prescritta.

Risultati: Ventuno centri hanno arruolato 1162 pazienti con T2DM; l'età media del campione complessivo di studio era di $71,4 \pm 11,8$ anni e il 68,0% dei partecipanti

era di sesso maschile. Il BMI medio era $28,2 \pm 6,2$. L'HbA1c media era $7,40 \pm 1,1\%$ e la durata media del diabete era di $15,1 \pm 4,9$ anni.

Riguardo il profilo cardiovascolare, le patologie prevalenti erano sindrome coronarica acuta (65,5%), ateromasia carotidea significativa (28,6%) ed ICTUS (12,4%). Il 69,0% dei pazienti era a rischio cardiovascolare alto e molto alto. Per quanto riguarda la gestione farmacologica del T2DM, il 69% dei pazienti a rischio molto-alto era in trattamento con metformina, il 65,9% con insulina, il 23,7% con Inibitori della dipeptidil-peptidasi IV (DPP4i), il 39% con agonisti recettoriali del glucagon-like peptide 1 (GLP1-RA) e il 16,2% con inibitori del trasportatore Sodio-Glucosio di tipo 2 (SGLT2i).

Conclusioni: Il Registro CardioMET dimostra che solo il 55% dei pazienti a rischio CV alto e molto alto riceve terapia target con SGLT2i e/o GLP1-RA da solo o in associazione con metformina secondo quanto raccomandato dalle linee guida. Tali dati supportano la necessità di strategie per migliorare l'implementazione della terapia farmacologica nei pazienti con T2DM in prevenzione primaria e secondaria per malattia cardiovascolare nella pratica clinica, al fine di migliorare gli outcomes a lungo termine e rallentare la progressione della malattia.

DIABETE E MALATTIE DEL METABOLISMO 583
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)

INVESTIGATING THE INTERPLAY AMONG CARDIOVASCULAR HEALTH, MENOPAUSE, BODY COMPOSITION, AND THYROID FUNCTION IN POST-MENOPAUSAL WOMEN

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Background: The global surge in obesity has amplified the incidence of metabolic syndrome and its cardiovascular consequences, especially among post-menopausal women. Thyroid hormone imbalances, which are essential for metabolic control, frequently contribute to obesity and its associated disorders. This study aimed to investigate the relationships between thyroid function, body composition, and cardiovascular health in post-menopausal women.

Materials and Methods: We conducted a prospective, open-label observational clinical study with post-menopausal women, divided into two groups based on post-menopausal weight changes: the Menopausal Weight Gain Group (MWGG) and the Menopausal Weight Maintenance Group (MWMG). Participants underwent comprehensive cardio-metabolic evaluations, including thyroid function tests, blood pressure measurements, arterial stiffness assessments, body composition analysis, and cardiovascular risk profiling. Statistical analysis involved t-tests and Pearson correlation coefficients.

Results: The study included 12 women in the MWGG and 8 women in the MWMG. The MWGG exhibited significant increases in the Augmentation Index (AI@75) and adiposity indicators (BMI, total fat mass in percentage and kilograms, and lean-to-fat mass ratio) compared to the MWMG. A significant reduction in FT3 and the FT3/FT4 ratio was observed in the MWGG. Additionally, differences in cholesterol levels and insulinemia were noted between the groups. Strong correlations were found between AI@75 and weight, BMI, and total fat mass, while a strong negative correlation was observed with the lean-to-fat mass ratio.

Conclusions: Our findings highlight vascular and metabolic changes in post-menopausal women who experienced weight gain, with thyroid function playing a crucial role. This emphasizes the necessity for further research to elucidate the underlying mechanisms and to develop targeted interventions for managing menopause-related cardio-metabolic risks.



DIABETE E MALATTIE DEL METABOLISMO 934 FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

EFFICACIA DI INCLISIRAN SUI LIVELLI DI LDL E FUNZIONE ENDOTELIALE NEI PAZIENTI DISLIPIDEMICI INTOLLERANTI O REFRATTARI ALLA TERAPIA IPOLIPEMIZZANTE ORALE

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Premesse: Sebbene le statine restino il trattamento di prima linea in tutti i pazienti con ipercolesterolemia, l'ampia variabilità di risposta e l'intolleranza al trattamento determinano il mancato raggiungimento degli obiettivi terapeutici. Grazie all'innovativo meccanismo d'azione e allo specifico regime terapeutico, l'Inclisiran rappresenta una nuova risorsa per superare le suddette limitazioni. Questo studio si prefigge, pertanto, l'obiettivo di esplorare gli effetti cardiovascolari di questa molecola nel trattamento della dislipidemia.

Metodi: Nell'arco temporale compreso fra il febbraio 2023 e il Settembre 2024, sono stati inclusi 26 pazienti dislipidemici, intolleranti o refrattari alla terapia ipolipemizzante orale, trattati mediante Inclisiran presso il nostro centro (Tabella 1). L'efficacia del trattamento basata sulla valutazione del profilo lipidico (LDL) e della funzione endoteliale è stata analizzata al basale e dopo 9 mesi. La funzione endoteliale è stata valutata mediante la misurazione dell'indice di iperemia reattiva (RHI) tramite EndoPAT e gli indici strumentali di arterial stiffness (Augmentation Index [AI] e Pulse Wave Velocity [PWV]) mediante SphygmoCor.

Risultati: I valori di LDL, RHI, AI e PWV al basale e a nove mesi sono mostrati in Tabella

2. Le variazioni di tutti gli indici valutati si sono rivelate statisticamente significative. Inoltre, non è emersa una

TABELLA 1

	Pazienti (n=26)
Età anni [media ± DS]	67.9 ± 9.06
Sexe maschile [n(%)]	22 (84.61)
Ipercolesterolemia [n(%)]	18 (69.23)
Diabete [n(%)]	2 (7.692)
CAD [n(%)]	18 (69.23)
BMI kg/m ² [media ± DS]	26.1 ± 3.7

Tabella 1 Caratteristiche cliniche basali dei ventisei pazienti trattati con Inclisiran

BMI = indice di massa corporea, CAD = cardiopatia ischemica, n = numero pazienti, DS = deviazione standard

TABELLA 1

	Basale	9 mesi	P value
LDL-c [media (IQR)]	86 (71-114.5)	51 (33.25 - 74)	< 0.0001
RHI [media (IQR)]	1.35 (1.33 - 1.35)	2.09 (1.71 - 2.49)	< 0.0001
AI [media ± DS]	28 ± 9.06	20.1 ± 9.38	< 0.0001
PWV [media (IQR)]	8.6 (7.58 - 14.18)	7.62 (6.98 - 10.5)	< 0.05

Tabella 1 Variazioni dei valori di LDL, e degli indici di funzione endoteliale tra tempo basale e a 9 mesi di trattamento

RHI = indice di iperemia reattiva; AI = augmentation index normalizzato per frequenza cardiaca (75 bpm); PWV = pulse wave velocity; IQR = range interquartile; DS = deviazione standard.

P value ottenuto mediante calcolo del t test o Wilcoxon test come appropriato.

Tabella 1 - 2

correlazione significativa tra i valori di LDL e gli indici di funzione endoteliale (RHI $r=0.21$, $p=0.31$; AI $r=-0,15$, $p=0.48$; PWV $r=-0.26$ $p=0.19$; Figura 1).

Conclusioni:

In conclusione, possiamo affermare che l'inclisiran è in grado di migliorare già dopo 9 mesi di trattamento il profilo lipidico e la funzione endoteliale nei pazienti dislipidemici, intolleranti o resistenti a terapia ipolipemizzante orale e che il miglioramento della funzione endoteliale non sembrerebbe solamente imputabile alla riduzione dei valori di LDL.

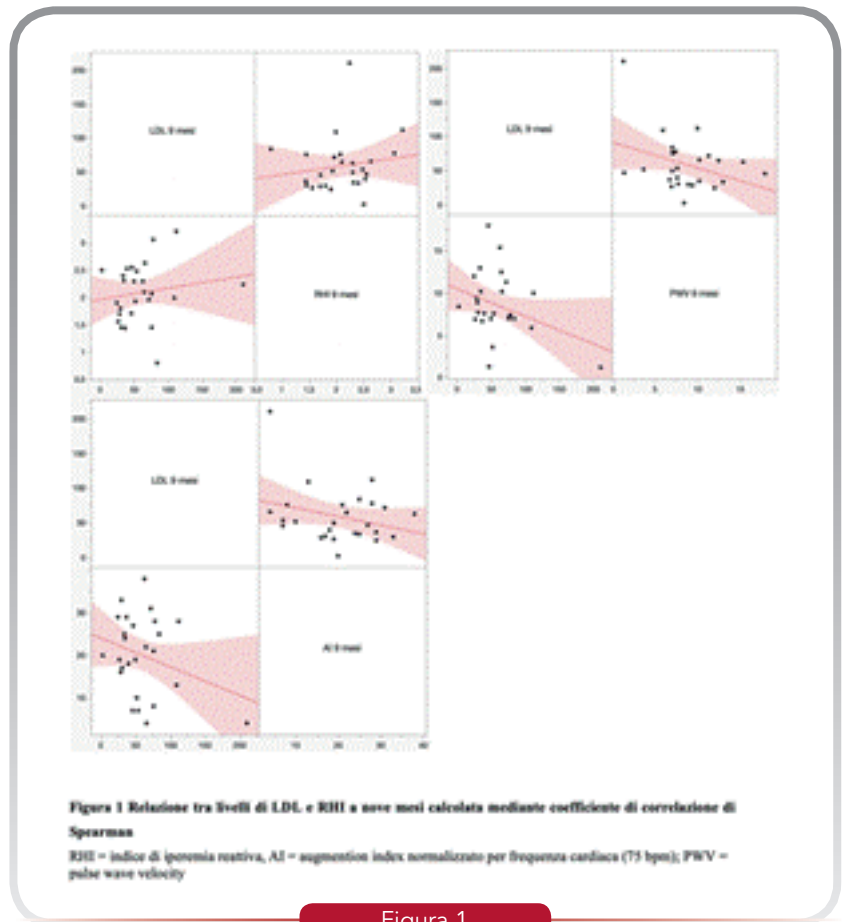


Figura 1



**DIABETE E MALATTIE DEL METABOLISMO 798
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)**

**REAL-WORLD LONG-TERM HEAD-TO-HEAD COMPARISON OF PCSK9 INHIBITORS ON LIPID OUTCOMES:
INSIGHTS FROM THE ALIEVO-IT REGISTRY**

Leone Giovanni Musci (a), Carlo Gaspardone (a), Cosmo Godino (a)
(a) OSPEDALE SAN RAFFAELE

We report a retrospective multicenter study including 244 patients with at least 1 year follow-up for investigating and comparing long-term lipid outcomes of the two major PCSK9 inhibitors. The two cohorts shared similar baseline characteristics. Median follow-up duration was 2.7 years for alirocumab and 3.0 years for evolocumab group. Both drugs were effective in meeting primary endpoint of LDL-C reduction from baseline ($p < 0.001$) without differences between the two cohorts after a long-term follow-up. TC and TGs

shared similar behaviour whereas HDL-C (all secondary endpoints) significantly increased as compared to baseline only for the evolocumab cohort ($p < 0.001$) which also demonstrated significant greater HDL-C rise (both absolute and percentage, $p < 0.05$) compared to alirocumab cohort. Interestingly, similar extent of LDL-C reduction as compared to major trials (case-control studies) at similar follow-up duration, was reported. Whether this results could impact on clinical outcomes remains to be determined

DIABETE E MALATTIE DEL METABOLISMO 357

DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)

MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)

PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI

(PREVENZIONE E RIABILITAZIONE)

MANAGING MYOTONIC DYSTROPHY TYPE 1 COMPLICATED BY METABOLIC SYNDROME

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(a) DEPARTMENT OF BIOMEDICAL, CARDIOLOGY DIVISION, METABOLIC AND NEURAL SCIENCES, UNIVERSITY OF MODENA AND REGGIO EMILIA, MONDENA, ITALY; (b) UNIVERSITY OF BOLOGNA, BOLOGNA, ITALY

Introduction: We present a case of a 52-year-old woman with type 1 myotonic dystrophy, non-alcoholic steatohepatitis, and mixed hyperlipidemia consistent with metabolic syndrome. Due to statin intolerance, we opted for combination therapy with bempedoic acid and ezetimibe, added to a PCSK9 inhibitor.

Case Presentation: Diagnosed with type 1 myotonic dystrophy, the patient developed hyperlipidemia and was treated with ezetimibe due to statin intolerance. Elevated lipid levels prompted adding a PCSK9 inhibitor. Despite this, LDL-C levels remained high, leading to the introduction of bempedoic acid.

Results: Baseline lipid panel during ezetimibe monotherapy showed total cholesterol of 328 mg/dL, LDL-C of 194 mg/dL, and triglycerides of 232 mg/dL. After one month of PCSK9-inhibitor therapy with ezetimibe, LDL-C was 161 mg/dL. Adding bempedoic acid reduced LDL-C to 95 mg/dL after one month, and to 63 mg/dL after eight months, with no muscle-related side effects.

Discussion: Combining ezetimibe, a PCSK9 inhibitor, and bempedoic acid effectively lowered LDL-C levels in a statin-intolerant patient with high cardiovascular

risk. Myotonic dystrophy complicates hyperlipidemia management, but bempedoic acid provided significant LDL-C reduction without muscle-related side effects.

Conclusion: This case report demonstrates a successful treatment strategy for a patient with type 1 myotonic dystrophy, metabolic syndrome, and statin intolerance, achieving significant LDL-C reduction and lowering cardiovascular risk. The combination of ezetimibe, a PCSK9 inhibitor, and bempedoic acid is effective for high-risk patients, highlighting the need for further studies to evaluate long-term benefits.

Baseline lipid panel during ezetimibe monotherapy

Total cholesterol (mg/dL)	LDL cholesterol (mg/dL)	HDL cholesterol (mg/dL)	Triglycerides (mg/dL)	Creatine kinase (IU/L)
328	194	87	232	326

Lipid panel after 1 month of PCSK9-inhibitor therapy + ezetimibe

Total cholesterol (mg/dL)	LDL cholesterol (mg/dL)	HDL cholesterol (mg/dL)	Triglycerides (mg/dL)	Creatine kinase (IU/L)
307	161	80	329	281

Lipid panel after 2 month of PCSK9-inhibitor and 1 month of bempedoic acid initiation + ezetimibe

Total cholesterol (mg/dL)	LDL cholesterol (mg/dL)	HDL cholesterol (mg/dL)	Triglycerides (mg/dL)	Creatine kinase (IU/L)
180	95	85	278	224

Lipid panel after 8 month of PCSK9-inhibitor and 6 month of bempedoic acid initiation + ezetimibe

Total cholesterol (mg/dL)	LDL cholesterol (mg/dL)	HDL cholesterol (mg/dL)	Triglycerides (mg/dL)	Creatine kinase (IU/L)
100	63	54	189	337

Figura 1



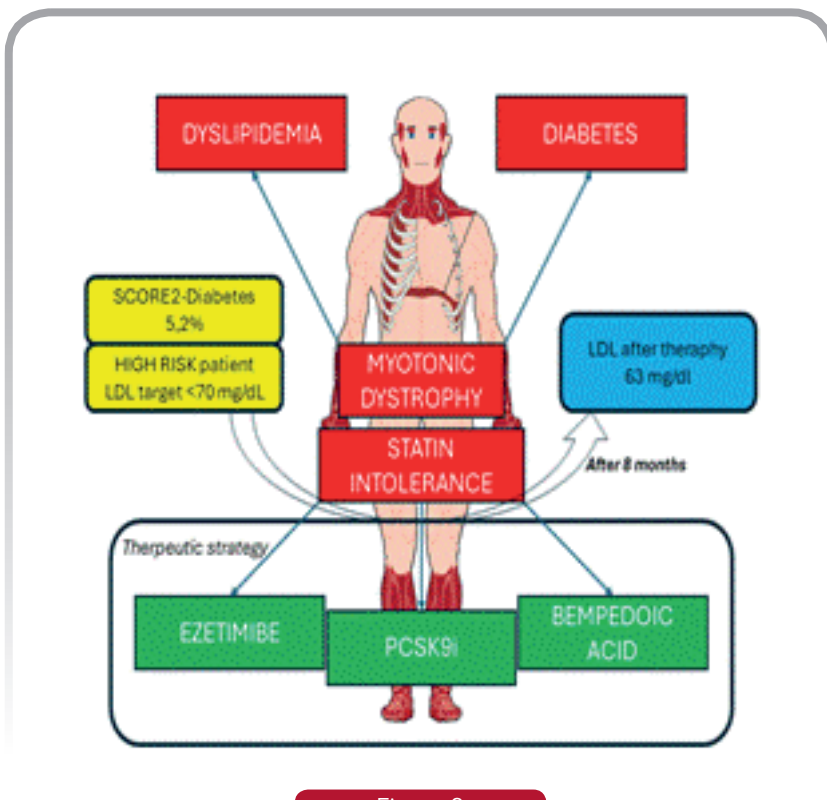
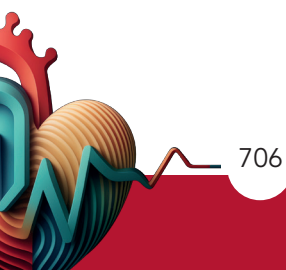


Figura 2



DIABETE E MALATTIE DEL METABOLISMO 500
DIABETE E MALATTIE CARDIOVASCOLARI
(DIABETE E MALATTIE DEL METABOLISMO)
MICROCIRCOLAZIONE E COLLATERALI
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO)

**COMPARISON OF THE EFFECT ON ENDOTHELIAL FUNCTION OF SGLT2 INHIBITOR VS GLP1-RA THERAPY
IN PATIENT WITH TYPE 2 DIABETE MELLITUS: A RANDOMIZED STUDY (DAPADULA HEART)**

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(a) UNIVERSITA' CATTOLICA DEL SACRO CUORE

Background. Two new classes of antidiabetic drugs, i.e., sodium-glucose cotransporter-2 (SGLT-2) inhibitors and glucagon-like peptide-1 receptor agonists (GLP-1-RA) have consistently been found to improve cardiovascular outcomes in patients with type 2 diabetes mellitus (T2DM). The mechanisms involved in their beneficial effects, however, have not been fully clarified, although they are likely to be multiple. In particular, there are poor data about whether these classes of drugs may improve endothelial function, which is crucial in the structural and functional integrity of circulation.

Aim of this study was to compare the effects of an SGLT2-i (Dapaglifozin) with those of an GLP-1-RA (Dulaglutide) on peripheral endothelial function.

Methods. We enrolled patients with T2DM, followed at the Diabetic Center of our University Hospital, who fulfilled the following inclusion criteria: 1) suboptimal control of blood glucose levels despite optimal dose of metformin; 2) absence of any evidence of cardiovascular disease (as assessed by clinical history, physical examination and 12-lead ECG); 3) age between 30 and 75 years; 4) no contraindications to SGLT2 and GLP-1-RA therapy. Eligible patients underwent an open randomization to treatment with the SGLT-2 inhibitor

Dapaglifozin, at the dose of 10 mg once a day or with the GLP-1-RA Dulaglutide, at the dose of 0.75 mg sc, once a week. Peripheral vascular was assessed at baseline (before starting treatment, and after 3 months from starting therapy.

Endothelium-dependent vascular function was assessed by measuring flow-mediated dilation (FMD) of the brachial artery in response to 5-minute hyperemia. Endothelium-independent vasodilation was assessed by measuring nitrate mediated dilatation (NMD) of the same artery by administration of 25 µg of sublingual glyceryl trinitrate. FMD and NMD are expressed as the maximum percent change of the brachial artery diameter compared to the basal diameter during hyperemia and after nitrate administration, respectively.

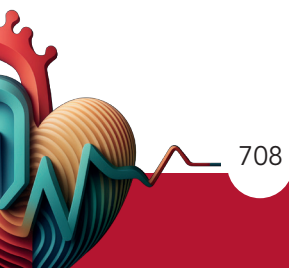
Results. Overall, 22 patients (56.4±7.6 years; 68% males) were enrolled in the study, 12 of whom were randomized to Dapaglifozin and 10 to Dulaglutide. Basal clinical characteristics of patients did not differ significantly between the 2 groups. Basal FMD was 5.30(±1.90) mm and 5.29 (±1.61) mm in the 2 groups respectively (p= 0.287). No significant changes in FMD were observed in both groups after 3 months of therapy. Accordingly, FMD at follow-up also did not



differ significantly between the 2 groups (Dapaglifozin 5.19 (+2.29) mm , Dulaglutide 4.13 mm (+1.74); ($p=0.384$).

Similar results were observed for NMD, that was comparable in the 2 groups both at baseline Dapaglifozin 8.62 (+2.16) mm , Dulaglutide 8.38 (+3.43) mm; ($p=0.498$) and at 3-month follow-up Dapaglifozin 9.01 (+4.59) mm , Dulaglutide 9.78 (+7.92) mm; ($p=0.698$), without any significant changes within each group.

Conclusions. In this randomized open study we failed to show any significant effect of an SGLT-2 inhibitor (Dapaglifozin) and a GLP-1-RA (Dulaglutide) on peripheral vascular function (particularly, endothelial function) after a short period of treatment (3 months). Future studies should assess whether longer periods of treatment with these drugs may result in significant effects on vascular dilator function.



DIABETE E MALATTIE DEL METABOLISMO 69 DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

STRATEGIE DI PREVENZIONE CARDIOVASCOLARE: EPIDEMIOLOGIA DELLE DISLIPIDEMIE ED EFFICACIA DELLA TERAPIA IPOLIPEMIZZANTE

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Francesca Tampieri (a, b), Emanuela Paoloni (a, b), Maria Grazia Modena (a, b)

(a) CENTRO P.A.S.C.I.A. (PROGRAMMA ASSISTENZIALE SCOMPENSO CARDIACO, CARDIOPATIE DELL'INFANZIA E A RISCHIO) AOU POLICLINICO DI MODENA; (b) UNIMORE- UNIVERSITÀ DI MEDICINA E CHIRURGIA DI MODENA E REGGIO EMILIA

Introduzione: Le dislipidemie rappresentano un significativo fattore di rischio per le malattie cardiovascolari, contribuendo in maniera sostanziale alla morbilità e mortalità globali. La gestione efficace delle dislipidemie attraverso terapie ipolipemizzanti adeguate è cruciale per la prevenzione delle complicanze cardiovascolari. Questo studio analizza l'epidemiologia delle dislipidemie in pazienti valutati in regime di urgenza breve e la prevalenza dell'utilizzo di terapie ipolipemizzanti per la prevenzione delle malattie cardiovascolari.

Metodi: Sono stati raccolti dati da 683 pazienti durante visite cardiologiche con urgenza breve effettuate presso il nostro centro ospedaliero. I pazienti sono stati valutati per la presenza di dislipidemia come fattore di rischio e per l'uso di terapie ipolipemizzanti. Sono stati analizzati l'aderenza alla terapia, i tipi di trattamento utilizzati e la loro efficacia nel raggiungere i target lipidici.

Risultati: Dei 683 pazienti, 359 (52,6%) riferivano di presentare dislipidemia come fattore di rischio cardiovascolare. Di questi 359 soggetti, una percentuale importante, il 42% (152 pazienti), non assumeva alcuna terapia ipolipemizzante, né adottava alcuna strategia per migliorare il proprio assetto lipidico. Dei restanti 207 pazienti: 192 assumevano effettivamente una terapia ipolipemizzante a base di statine, da sole o in associazione; 9 assumevano una

terapia ipolipemizzante non comprensiva di statine (a base di Ezetimibe o Fenofibrato); 10 assumevano un integratore alimentare a base di monacolina; 4 non sapevano riferire se assumevano una terapia; 1 solo soggetto dichiarava di assumere la terapia con statine in maniera parziale.

Conclusioni: I risultati evidenziano l'elevata prevalenza delle dislipidemie tra i pazienti valutati in regime di urgenza breve e l'importanza della terapia ipolipemizzante nella riduzione del rischio cardiovascolare. Tuttavia, una percentuale significativa di soggetti dislipidemici non assumeva un'adeguata terapia. Questa situazione è giustificabile solo parzialmente da una possibile intolleranza dei soggetti alla classe farmaceutica delle statine, in quanto solo 9 soggetti assumevano una terapia ipolipemizzante alternativa. Tutto ciò si riflette perciò in una mancata collaborazione efficace tra i medici di medicina generale e gli specialisti nel trattare tempestivamente e secondo le linee guida le dislipidemie, con il risultato di non raggiungere i target lipidici raccomandati. È cruciale migliorare l'aderenza alle terapie ipolipemizzanti di prima linea, che sono molto efficaci e poco costose, per ridurre il rischio di eventi cardiovascolari. Questi dati indicano la necessità di un approccio più coordinato e consapevole tra i professionisti sanitari per ottimizzare il trattamento delle dislipidemie e migliorare gli esiti per i pazienti ad alto rischio.



**DIABETE E MALATTIE DEL METABOLISMO 68
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)**

LONG TERM FOLLOW-UP AND TREATMENT OF PATIENTS WITH FAMILIAL HYPERCHOLESTEROLEMIA IN MODENA LIPIGEN COHORT

Francesco Pugnaghi (a, b), Fabio Nascimbeni (c), Simonetta Lugari (c), Elisa Lodi (a, b), Maria Grazia Modena (a, b), Francesca Carubbi (b, c)

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Familial hypercholesterolemia is a genetic disorder characterized by high levels of low-density lipoprotein cholesterol (LDL-C) and an increased risk of atherosclerotic cardiovascular events. Strategies to reduce LDL-C are essential to improve the prognosis of patients affected by familial hypercholesterolemia. The advent of new lipid-lowering drugs has improved the management of these patients in recent years. However, real-life studies are needed to confirm the impact of these pharmacological advancements in clinical practice. This retrospective observational study aims to evaluate the trend in the use of lipid-lowering medications and the achievement of LDL-C therapeutic targets in a cohort of patients with familial hypercholesterolemia followed at a tertiary level LIPIGEN Center.

A total of 413 patients diagnosed with familial hypercholesterolemia based on clinical and/or genetic criteria were enrolled in this retrospective observational cohort study (mean age 49 [33-59] years, 49% male, genetic diagnosis 73%, maximum LDL-C 250 [210-309] mg/dl, secondary cardiovascular prevention 15.7%). All patients were followed at the LIPIGEN Center in Modena. Clinical and laboratory data related to lipid profiles, cardiovascular events, and pharmacological treatment were collected at baseline (first visit to the Center) and during a median follow-up of 39 [19-55] months. LDL-C therapeutic targets were defined according to the 2019 ESC/EAS guidelines.

At baseline, LDL-C levels were 162 [127-208] mg/dl. Only 60% of the patients were treated with statins, with 49.6% of them receiving high-intensity statin-based therapy. Ezetimibe and PCSK9 inhibitors were used in 34.9% and 1.7% of cases, respectively. Only 4 patients (1.0%) had a guideline-recommended LDL-C level. During follow-up, there was a significant increase in the prescription and association of lipid-lowering medications: statins (89.1%), with 58.2% receiving high-intensity therapy, ezetimibe (75.5%), and PCSK9 inhibitors (31%) (all $p < 0.001$). This led to a 48% reduction [25.9-63.6]% in LDL-C levels compared to baseline, reaching a median of 88 [59-109] mg/dl ($p < 0.001$) and allowing the achievement of the target in 124 patients (30%) ($p < 0.001$). The use of the triple combination of statin, ezetimibe, and i-PCSK9 in 113 patients (27.4%) resulted in the therapeutic target being reached in 88.5% of cases, with median LDL-C levels of 45 [39-57] mg/dl. Patients who achieved the therapeutic target during the follow-up were significantly older and more frequently male, probands, with a genetic diagnosis of Familial Hypercholesterolemia, a family and/or personal history of cardiovascular events, higher LDL-C burden, and a higher prevalence of cardiovascular risk factors (smoking, hypertension, diabetes, visceral adiposity). Fourteen patients (3.4%) experienced incident cardiovascular events during the follow-up, with age, LDL-C burden, personal history of previous cardiovascular events, hypertension, diabetes, and

visceral adiposity emerging as predictors of incident cardiovascular events.

The treatment of patients with Familial Hypercholesterolemia has improved over time. However, a considerable percentage of individuals fail

to achieve the LDL-C therapeutic target. The use of triple combination therapy with a statin, ezetimibe, and i-PCSK9 represents the best strategy for LDL-C reduction, allowing the target to be achieved in the majority of FH patients at higher cardiovascular risk.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

EPIDEMIOLOGIA E POLITICA SANITARIA

**EPIDEMIOLOGIA E POLITICA SANITARIA 101
DIABETE E MALATTIE CARDIOVASCOLARI
(DIABETE E MALATTIE DEL METABOLISMO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
BIG DATA (TELECARDIOLOGIA ED E-HEALTH)**

**CLINICAL BURDEN OF ELEVATED LEVELS OF LIPOPROTEIN(A) ON PATIENTS WITH ATHEROSCLEROTIC
CARDIOVASCULAR DISEASE: AN ANALYSIS IN THE ITALIAN REAL CLINICAL PRACTICE**

Chiara Biancotto (a), Diletta Valsecchi (a), Claudia Cristofani (a), Simone Poli (a), Chiara Veronesi (b),
Valentina Perrone (b), Luca Degli Esposti (b)

(a) NOVARTIS FARMA S.P.A., MILANO, ITALIA; (b) CLICON SOCIETÀ BENEFIT, HEALTH, ECONOMICS & OUTCOMES
RESEARCH, BOLOGNA, ITALIA

Background and objectives. Elevated Lp(a) is independently and causally associated with increased risk of cardiovascular disease (ASCVD)¹. The objective of this real-world analysis is to compare the characteristics of ASCVD patients with normal (<30 mg/dL) or elevated Lp(a) (≥ 50 mg/dL) levels and to assess the clinical impact of elevated Lp(a) on the occurrence of future cardiovascular events.

Methods. This retrospective cohort study investigated patients with available Lp(a) measurement and established ASCVD found between 2012 and March 2023 in the laboratory and administrative database of a pool of Italian healthcare entities. Index-date was defined as the time of the first detected ASCVD hospitalization during the observation period. After stratification by normal and elevated Lp(a) levels, the groups were compared for demographics, clinical characteristics, comorbidities, medications at baseline, and occurrence of cardiovascular events at 2-year follow-up.

Results. At index-date, patients with elevated Lp(a) levels (N=719) compared to those with normal levels (N=2585) were younger (67.5 ± 12.9 vs 69.2 ± 13.4 years, $p < 0.010$), had similar sex distribution (nearly 70% males), higher likelihood of ischemic heart disease as index ASCVD hospitalization (73.9%, vs 68.5% $p < 0.010$) and lower rates of previous atrial fibrillation

(5.4% vs 8.5%. $p < 0.010$) and COPD (17.9% vs 22.0%. $p < 0.05$). Patients with elevated Lp(a) levels showed a larger utilization of lipid-lowering therapies (statins: 57.3% vs 48.4%. $p < 0.001$; statins + ezetimibe: 12.4% vs 7.1%. $p < 0.001$; ezetimibe alone: 1.3% vs 0.5%. $p < 0.05$), and had higher LDL-cholesterol levels (107.1 ± 42.0 vs 99.5 ± 39.4 mg/dL, $p < 0.001$). At 2 years of follow-up, the rates per 100 person-year for ASCVD-events were higher among patients with elevated Lp(a) than those with normal levels (9.7 vs 5.8, $p < 0.001$).

Conclusions. This real-world analysis showed that ASCVD patients with elevated Lp(a) levels have an increased risk of experiencing a second ASCVD event within two years from the first event. These findings corroborate the importance of Lp(a) testing/screening to implement more effective cardiovascular risk assessment and prevention of future events in high-risk ASCVD patients, which in turn might alleviate the economic burden sustained by the healthcare system for disease management.

References

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**EPIDEMIOLOGIA E POLITICA SANITARIA 421
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)**

ASSOCIATION BETWEEN COGNITIVE IMPAIRMENT AND CHRONIC KIDNEY DISEASE IN PATIENTS WITH ATRIAL FIBRILLATION: AN ANALYSIS FROM A PROSPECTIVE COHORT

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Background and aim of the study: Cognitive impairment (Clmp) and chronic kidney disease (CKD) are frequently encountered in patients with atrial fibrillation (AF), due to the aging of the population and the increase in clinical complexity. Therefore, the aim of this study was to evaluate the association between these conditions and the outcomes in AF patients.

Methods: We analysed in-and out-patients with AF enrolled in a prospective registry. For the purpose of this analysis, patients were stratified according to the presence of Clmp and CKD into 4 groups, as follows: (i) Group 1: No Clmp – No CKD (487, 57.3%); (ii) Group 2: No Clmp – Yes CKD (173, 20.4%); (iii) Group 3: Yes Clmp – No CKD (97, 11.4%); and (iv) Group 4: Yes Clmp – Yes CKD (93, 10.9%). Kaplan-Meier curves were built, and Cox regression analyses were performed to assess differences in terms of outcome. 2 models were used: Model 1 was adjusted for age and sex; Model 2 was adjusted for the CHA2DS2-VASc score, use of oral anticoagulants (OAC), anaemia, and type of AF. Moreover, an interaction analysis was performed to assess if the association between Clmp and the outcome was modified by the presence of CKD. The primary outcome was all-cause death.

Results: A total of 850 patients with available data about Clmp and CKD were included (median age 75, IQR 66-82; females 316, 37.2%). Clmp was present

in 190 (22.4%) of patients, and CKD in 266 (31.3%). Median CHA2DS2- VASc and HAS-BLED scores were respectively: 4 [IQR 2- 5], and 1 [IQR 1-2]. The vast majority of patients was treated with OAC (780, 91.8%), with no differences among the groups (p=0.221). Patients belonging to Group 4 were more females

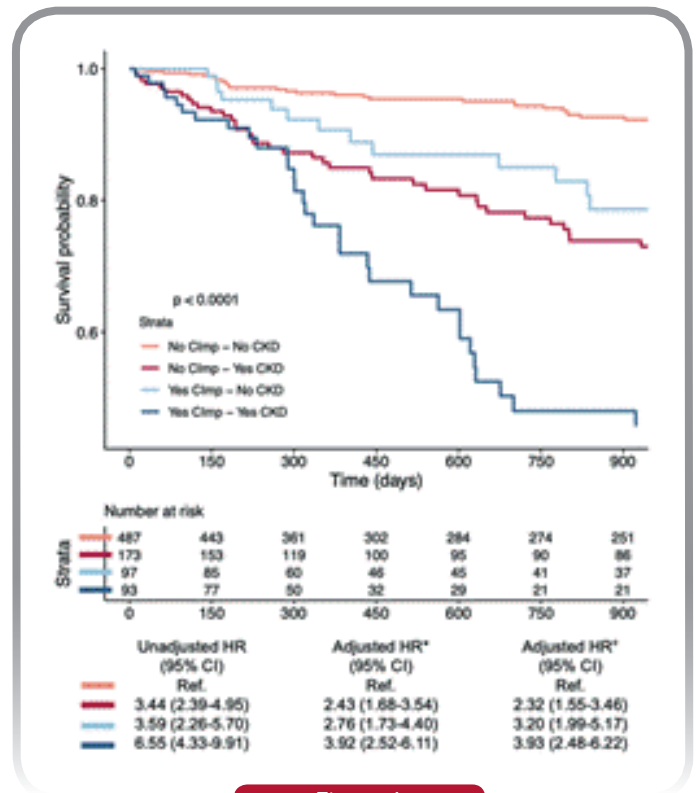


Figure 1

(52.7%), older (median age 80, IQR 80-88), and more frequently suffered from hypertension (88.2%) (all $p < 0.001$). Permanent AF was the most common type of AF in Group 4 (64.5%, $p < 0.001$). During a median follow-up of 755 days [IQR 221- 2247], 182 (21.4%) events of all-cause death occurred. Kaplan- Meier curves for the primary endpoint based on the different groups are reported in the Figure. At multivariable Cox regression analysis, compared to patients of Group 1, all the other groups showed a higher risk of all-cause death, after adjusting for covariates (Figure). The

interaction analysis showed a statistically significant interaction ($P_{int} = 0.045$), with the effect of Clmp that seemed to be more pronounced in patients without CKD (HR 3.20, 95% CI 1.99-5.17) than in patients with CKD (HR 1.70, 95% CI 1.13-2.55), suggesting a possible dilution of outcome in comorbid patients.

Conclusion: In a contemporary cohort of real-world AF patients, Clmp and CKD are common conditions present in about one out of four patients. Their presence is associated with an increased risk of all-cause death.



**EPIDEMIOLOGIA E POLITICA SANITARIA 83
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)**

LIPOPROTEIN(A) AS AN EARLY MARKER OF CARDIOVASCULAR EVENTS IN HIGH-RISK SUBJECTS: INSIGHTS FROM THE MOLI-SANI COHORT STUDY

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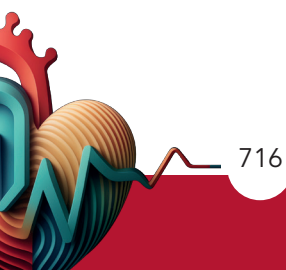
Background. Epidemiological studies have unveiled the pivotal role of lipoprotein(a) in the pathophysiology of CVD, suggesting its potential use in cardiovascular prevention. The aim of this study was to analyze the association between lipoprotein(a) levels and risk of CVD in individuals with a history of CVD.

Methods. The longitudinal analyses were conducted in the framework of the Moli-sani Study (a cohort of Italian 24,325 men and women, aged ≥ 35 years between 2005 and 2010), focusing on a subgroup of individuals with a previous CVD. Data from standardized questionnaires and from blood pressure, anthropometric and laboratory measurements were collected and used as covariates for these analyses. Lipoprotein(a) was measured on biobank samples. The cohort was followed for fatal and non-fatal cardiovascular events. The association between lipoprotein(a) concentration and the risk of CVD events was analyzed using Kaplan-Meier and Cox regression models.

Results. A total of 1,289 subjects reported a history

of CVD at baseline. During study follow-up (median 7.3 years), a total of 307 secondary CVD events were recorded and validated. Prevalences of subjects with high Lp(a) concentration (≥ 30 mg/dl, ≥ 50 mg/dl, ≥ 70 mg/dl, ≥ 90 mg/dl) were respectively 25.45%, 14.74%, 7.14% and 3.96%. Subjects belonging to the highest lipoprotein(a) category (≥ 90 mg/dL, N=51, 3.96%) showed a worse trend during the early follow-up period when compared with the lowest category (< 30 mg/dL), with a peak during the first 18 months (HR=3.16, 95% CI:1.30-7.65). This result increased in the subgroups of subjects not treated with statins (HR=4.31, 1.30-14.37) or with history of multiple CVD events (HR=6.25, 2.47-15.81).

Conclusion. High levels of lipoprotein(a) were found associated with increased hazard of secondary cardiovascular events in individuals with history of multiple CVDs or without lipid-lowering treatments, suggesting lipoprotein(a) as a soon modifiable biomarker for CV risk assessment, to be included in CVD risk algorithms for prevention of secondary events.



EPIDEMIOLOGIA E POLITICA SANITARIA 491 ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) PLACCA VULNERABILE (ATEROTROMBOSI)

ATELLICA POCT VS ARCHITECT HS-TNI: A RETROSPECTIVE OBSERVATIONAL STUDY ON HIGH-SENSITIVITY TROPONIN I MEASUREMENT

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The assessment of chest pain is currently limited in pre-hospital settings by the need for high-sensitivity cardiac troponin (hs-cTn) measurement. The guidelines highlight the usefulness of point-of-care (POCT) hs-cTn devices for the rule-in/rule-out of patients, particularly those at low cardiovascular risk, to mitigate emergency department overcrowding, reduce healthcare costs, and improve clinical outcomes.

An observational retrospective study is underway, involving patients presenting to the Emergency Department with chest pain. These patients undergo two serial blood samples for hs-cTnI measurement using the ARCHITECT STAT hsTnI Immunoassay – Abbott (reference method) and the Atellica VTLi hsTnI Immunoassay – Siemens (POCT). The study aims to validate the POCT hsTnI measurement by comparing it with the reference method and to retrospectively evaluate if potential pre-hospital rule-in/rule-out based on POCT troponin correlates with clinical outcomes, defined as the diagnosis of type 1 or type 2 acute myocardial infarction (AMI).

Currently, 52 patients have been enrolled, of whom 5 were admitted with type 1 AMI and 3 with type 2 AMI, while the remaining were discharged with non-cardiac chest pain (NCCP). A significant difference was observed between the mean hsTnI values measured by Architect and Atellica ($t = 2.52$, $p < 0.10$), with the mean hsTnI level being significantly higher with Architect compared to Atellica. All patients diagnosed with AMI had hsTnI levels above the upper reference limit (URL) with both Architect and Atellica. However, 8 cases were identified as false negatives with POCT (hs-cTnI $<$ URL with Atellica, $>$ URL with Architect), including 5 patients with NCCP. Of these, 6 measurements were excluded due to probable interference with elevated plasma metabolites, such as lipase. Excluding these false negatives, the negative predictive value of Atellica was observed to be 95%. Thus, it can be concluded that Atellica POCT is a valid tool for identifying pathological increases in hsTnI relative to the reference gold standard, offering the benefits of a shorter turnaround time and feasibility for pre-hospital use.



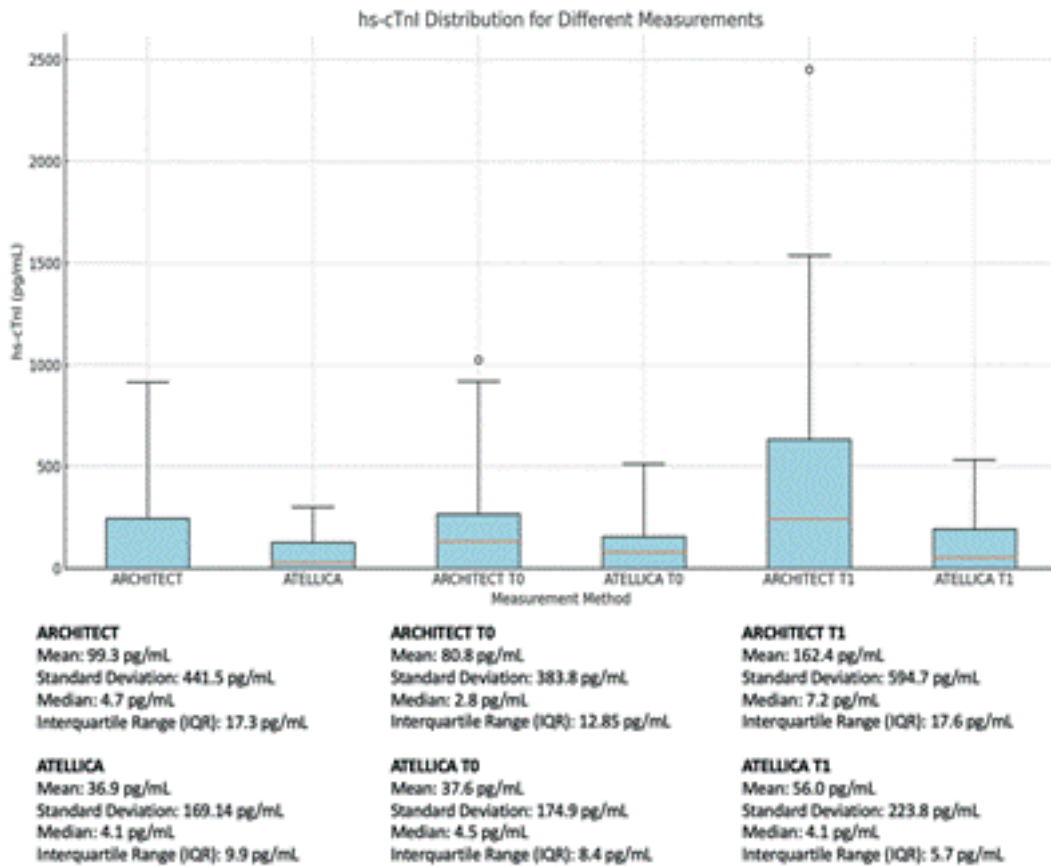
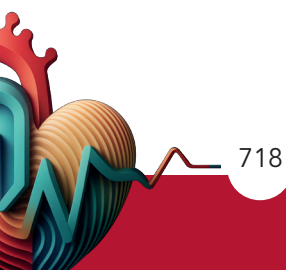


Figure 1



EPIDEMIOLOGIA E POLITICA SANITARIA 135
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
IL SISTEMA SANITARIO NAZIONALE DOPO COVID-19 (COVID-19)

UTILIZZO DELL'ECOCARDIOGRAMMA FOCUS PER OTTIMIZZARE LA DIAGNOSI E IL TRATTAMENTO NELLE VISITE CARDIOLOGICHE URGENTI: UN'ANALISI DELL'APPROPRIATEZZA E DEI RISULTATI CLINICI DI UN ANNO DI ATTIVITÀ AL CENTRO P.A.S.C.I.A. POLICLINICO DI MODENA

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Letizia Reggianini (a), Elisa Lodi (a, b), Maria Grazia Modena (a, b)

(a) CENTRO P.A.S.C.I.A. (PROGRAMMA ASSISTENZIALE SCOMPENSO CARDIACO, CARDIOPATIE DELL'INFANZIA E A RISCHIO) - AOU POLICLINICO DI MODENA; (b) AOU POLICLINICO DI MODENA - UNIVERSITÀ DI MODENA E REGGIO EMILIA - SCUOLA DI SPECIALIZZAZIONE IN MEDICINA DELLO SPORT E DELL'ESERCIZIO FISICO

Introduzione: Questo studio ha esaminato i dati relativi alle visite cardiologiche urgenti svolte presso il centro P.A.S.C.I.A. nel 2023, con un duplice obiettivo: valutare l'appropriatezza delle indicazioni per cui i pazienti sono stati inviati e determinare l'effetto dell'uso dell'ecocardiogramma focalizzato (focus) in termini di risparmio di tempo per la diagnosi e il trattamento.

Risultati: Dal 01 gennaio 2023 al 31 gennaio 2023 sono state eseguite 683 visite cardiologiche in regime di urgenza (B), coinvolgendo 326 uomini e 357 donne, con un'età media di 67 anni. L'indicazione alla visita cardiologica urgente è risultata essere: sospetto di insufficienza cardiaca o di sua riacutizzazione (25,2%), aritmie (21,4%), dolori toracici (20,6%), ipertensione arteriosa non controllata (7,6%) e sincope/presincope (6,4%).

Le indicazioni alla visita sono risultate appropriate nell'85% dei casi, mentre il 15% degli accessi non era giustificato alla luce della sintomatologia presentata.

Nei casi in cui è stato ritenuto dirimente per la gestione del paziente (87,2%), durante la visita è stato effettuato un ecocardiogramma focus che nel 56% è risultato nei limiti di norma o invariato rispetto ai precedenti; nel 44% ha permesso di individuare anomalie di nuovo riscontro o un peggioramento rispetto al precedente controllo. Dei 596 ecocardiogrammi eseguiti, 586 han-

no evitato la necessità di ulteriori accessi, mentre 10 pazienti (1,7%) hanno richiesto un ecocardiogramma completo per per inquadrare meglio le alterazioni riscontrate durante l'ecocardiogramma focus. In aggiunta, nel 33,3% sono stati richiesti ulteriori accertamenti, quali esami ematici (68), seguiti da holter ECG (66), test da sforzo (33), visite specialistiche di altre discipline (24, pneumologica, gastroenterologica, diabetologica, endocrinologica), ecodoppler del tronchi sovraortici (25), angioTC coronarica (10), coronarografia (8) e Rx torace (5). La terapia farmacologica è stata modificata nel 34,3% dei casi e il 3,5% dei pazienti ha richiesto un ricovero ospedaliero.

Conclusioni: L'analisi dell'appropriatezza degli invii alle visite cardiologiche ha rivelato che una quota significativa di questi era ingiustificata, con conseguente spreco di risorse per il sistema sanitario e per i pazienti. L'uso dell'ecocardiogramma focus ha migliorato la gestione del paziente, riducendo i tempi di diagnosi e il numero di prestazioni necessarie, e ha consentito una valutazione rapida della gravità clinica, con tempestiva gestione terapeutica e ricovero quando necessario. Questa strategia ha ridotto significativamente la richiesta di ecocardiogrammi completi, prevenendo il sovraccarico del sistema sanitario nazionale.



EPIDEMIOLOGIA E POLITICA SANITARIA 152
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ARITMIE VENTRICOLARI (ARITMIE)

EPIDEMIOLOGIA DELLA MORTE CARDIACA IMPROVVISA: IL MODELLO (ESPORTABILE) DEL REGISTRO REGIONALE DEL FRIULI VENEZIA GIULIA

Raffaella Vetrini (a), Giorgia Giroto (b), Beatrice Spedicati (b), Matteo Dal Ferro (c), Massimo Zecchin (c), Aneta Aleksova (a), Stefano D'errico (a)

(a) UNIVERSITA' DI TRIESTE; (b) IRCCS BURLO GAROFOLO TRIESTE; (c) S.C. UCO CARDIOLOGIA AZIENDA SANITARIA UNIVERSITARIA GIULIANO ISONTINA (TRIESTE)

La morte cardiaca improvvisa è un problema di salute pubblica mondiale "maggiore" e incide per oltre il 20% dei decessi nei Paesi Occidentali. La reale incidenza del fenomeno, nonostante i numerosi contributi nella letteratura scientifica internazionale che attestano un tasso compreso tra

36.8 per 100.000 a 39.7 per 100.000 nella popolazione generale, resta tuttavia sconosciuta a causa di numerosi bias legati alle modalità dell'accertamento anatomico-patologico e medico-legale ed anche ad un sistema di raccolta del dato epidemiologico frammentario e per nulla sistematizzato. L'idea di un Registro Regionale delle Morti Cardiache Improvvise in età giovanile in Friuli Venezia Giulia nasce, sulla spinta di tali considerazioni e di un concreto impegno istituzionale a supportare un progetto multidisciplinare che, aderente ai più recenti orientamenti scientifici in materia, ha creato un modello che oggi si avvia a concludere il quarto anno di attività e di cui gli Autori condividono modalità operative e risultati che contribuiscono a definire con una certa affidabilità l'epidemiologia del fenomeno, ad intercettare problematiche di salute della popolazione giovanile e sicurezza sociale legate al consumo di sostanze d'abuso non altrimenti identificabili e ad avviare percorsi di screening genetico e cardiologico per la prevenzione di nuovi drammatici eventi all'interno del nucleo familiare. In tre anni e sei mesi di attività, sono stati inclusi nel Registro Regionale delle Morti Cardia-

che Improvvise in età giovanile 110 casi provenienti dai territori provinciali di Trieste, Gorizia, Udine e Pordenone che corrispondono allo 0.68%, all'1% e allo 0.86% di tutti i decessi regionali occorsi in soggetti deceduti in età inferiore a 55 anni rispettivamente nell'anno 2021, 2022 e 2023. Il dato epidemiologico fornito dal Registro Regionale consente di stratificare la casistica in funzione dell'età e del sesso, delle comorbidità e della familiarità per morte improvvisa cardiaca e fornisce un dato epidemiologico delle cause di morte, tra le quali rileva l'incidenza della patologia ostruttiva coronarica e l'influenza dell'assunzione (non nota) di sostanze d'abuso, soprattutto nella popolazione medio-adulta. In 13 casi per i quali vi era diagnosi morfologica di cardiomiopatia o una diagnosi di sindrome della morte aritmica improvvisa (SADS) è stato condotto l'esame del genoma mediante tecnologia NGS e l'analisi di geni noti per l'associazione con sindromi aritmiche ereditarie (es. SCN5A, KCNQ1, RYR2, ecc). In 4 casi sono state identificate varianti patogeniche o "likely pathogenic" per cardiomiopatia ipertrofica e per SADS cui è seguita la presa in carico cardiologica e genetica congiunta del nucleo familiare. Nei restanti la presenza di varianti di incerto significato (VUS) associate a cardiomiopatia e disturbi del ritmo, ha richiesto una valutazione cardiologica di primo livello dei familiari da parte dei centri cardiologici di riferimento provinciali. Il complesso modello realizzato in Friuli Venezia Giulia, che

si ispira a modelli organizzativi Hub&Spoke, premia la multidisciplinarietà dell'approccio alla morte cardiaca improvvisa e valorizza le competenze territoriali in ambito patologico (medicina legale e anatomia patologica), radiologico, tossicologico, genetico e cardiologico, responsabilizzando anche settori della medicina necropsica tradizionalmente affidati all'assistenza primaria

(medici di medicina generale) che diventano l'anello fondamentale per l'avvio dell'indagine autoptica e il contatto con le famiglie. Gli autori si soffermano infine su punti di forza e debolezza del modello organizzativo, attraverso una analisi SWOT che individua futuri sviluppi e azioni di miglioramento.



EPIDEMIOLOGIA E POLITICA SANITARIA 63
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

OTTIMIZZAZIONE DELLE CURE: EFFICACE UTILIZZO DELL'ECOCARDIOGRAFIA NEL CONTESTO DI VISITE
CARDIOLOGICHE CON URGENZA BREVE

Maria Luisa Poli (a, b), Elisa Lodi (b), Letizia Reggianini (a), Eleonora Rodighiero (a, b), Francesco Pugnaghi (a, b),
 Francesca Tampieri (a, b), Emanuela Paoloni (a, b), Maria Grazia Modena (a, b)

(a) CENTRO P.A.S.C.I.A. (PROGRAMMA ASSISTENZIALE SCOMPENSO CARDIACO CARDIOPATIE DELL'INFANZIA E A RISCHIO) AOU POLICLINICO DI MODENA; (b) UNIMORE- UNIVERSITÀ DI MEDICINA E CHIRURGIA DI MODENA E REGGIO EMILIA

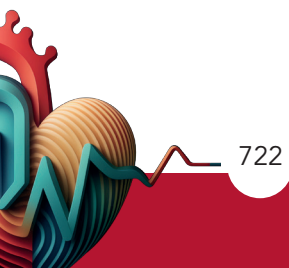
Introduzione: Le visite cardiologiche in regime di urgenza breve spesso richiedono un'approfondita valutazione diagnostica per escludere condizioni critiche e pianificare il trattamento. L'uso dell'ecografo in questo contesto può migliorare la completezza della visita, riducendo la necessità di prestazioni sanitarie successive e ottimizzando l'allocazione delle risorse del sistema sanitario nazionale.

Metodi: Sono stati analizzati i dati relativi all'utilizzo dell'ecografo durante le visite cardiologiche in urgenza breve presso il nostro centro ospedaliero. L'analisi ha incluso il numero di ecocardiogrammi evitati grazie all'uso immediato dell'ecografo e il riscontro di ecografie normali che hanno contribuito a ridurre ulteriori indagini diagnostiche.

Risultati: Durante il periodo di studio, l'utilizzo dell'ecografo ha permesso di evitare 586 ecocardiogrammi che sarebbero stati altrimenti richiesti in un contesto successivo. Questo risultato dimostra una significativa

riduzione delle prestazioni sanitarie successive, consentendo un risparmio notevole in termini di tempo e risorse per il sistema sanitario nazionale. Inoltre, molti dei pazienti sottoposti a ecografia durante la visita hanno mostrato risultati normali, confermando l'efficacia di questo approccio nell'escludere patologie cardiache acute e nel fornire un immediato piano di trattamento.

Conclusioni: L'integrazione dell'ecografo nelle visite cardiologiche con urgenza breve si è dimostrata cruciale per migliorare la completezza delle valutazioni cliniche, riducendo significativamente la necessità di ecocardiogrammi successivi. Questo approccio non solo migliora l'efficienza diagnostica e terapeutica, ma rappresenta anche un'importante strategia per ottimizzare le risorse del sistema sanitario nazionale, evitando prestazioni sanitarie superflue e garantendo un'assistenza più tempestiva e mirata ai pazienti. Ulteriori studi sono necessari per quantificare l'impatto economico a lungo termine e per sviluppare linee guida per l'implementazione di questa pratica su larga scala.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

FARMACI CARDIOVASCOLARI E NUTRACEUTICI

FARMACI CARDIOVASCOLARI E NUTRACEUTICI 453
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

**CANGRELOR IN CONTEMPORARY PATIENTS WITH STEMI PRETREATED WITH TICAGRELOR:
 PHARMACODYNAMIC DATA FROM THE POMPEII STUDY**

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The optimal antithrombotic management of patients with ST-segment Elevation Myocardial Infarction (STEMI) undergoing PCI remains of debate. Indeed, in Acute Coronary Syndromes (ACS) patients the full antiplatelet effect of oral P2Y₁₂-inhibitor may be delayed of some hours and cangrelor could be an useful option. Pharmacokinetic (PK) and Pharmacodynamics (PD) investigations suggest that in contrast with clopidogrel and prasugrel, ticagrelor may not have drug- drug interactions (DDI) in cangrelor-treated patients, however most data derive from studies in which ticagrelor was not administered before cangrelor. A recent randomized study in patients with stable coronary artery disease demonstrated that cangrelor enhanced platelet inhibition in patients pretreated with ticagrelor with no differences in PK/PD profiles after discontinuation of drug infusion indicating the absence of a DDI. However, data in STEMI patients pretreated with ticagrelor are warranted. We conducted a prospective study enrolling all patients undergoing PCI receiving cangrelor at operator's discretion. PD assessments were performed with 3 assays: 1) the gold standard light transmittance aggregometry (LTA) (20- and 5- μ M adenosine diphosphate [ADP] stimuli); 2) VerifyNow P2Y₁₂-test; 3) Multiplate electrode aggregometry (MEA), ADP-test. Among 150 patients enrolled from March 2021 to June 2024 (mean age 56.5 \pm 14.8 years, 21% were female), 24 patients presented with STEMI

and were pretreated with ticagrelor within 1 hour at the time they underwent primary PCI receiving cangrelor. All patients received aspirin, unfractionated heparin, and cangrelor (30- μ g/kg bolus followed by 4- μ g/kg/min infusion for 2 hours) prior to the start of PCI per standard of care. Blood samples for PD assessments were collected at baseline (ticagrelor pretreatment within 1h and before cangrelor bolus administration), at 30 minutes, 3 hours (thus, 1h after cangrelor infusion stop) and 4-6 hours (thus, 2-4h after cangrelor infusion stop) after cangrelor initiation. All PD tests were performed within 30 minutes from blood collection. Ticagrelor pretreatment with 180 mg oral loading-dose was performed 41.9 \pm 14.7 minutes before cangrelor bolus administration. No deaths, no ischemic events and 3 (12.5%) minor bleeding occurred within 48h. Our analysis showed that adding cangrelor resulted effective and safe with the majority of patients (n=22; 92%) having appropriate platelet inhibition during and after primary PCI with 2 (8%) cases of high residual platelet reactivity (HRPR) at 30 minutes and 3h and 1 up to 6 hours. PD data showed that in contemporary real-world STEMI patients pretreated within 1h with ticagrelor undergoing primary PCI, adding cangrelor resulted in faster and increased platelet inhibition, thus suggesting that cangrelor may bridge the gap until ticagrelor reaches its effect. Prior PD data showed that cangrelor interruption at 2 hours might expose some

patients to a rebound effect. These findings can be clinically relevant considering that in the daily practice STEMI patients are still often pretreated with ticagrelor at first medical contact but most patients have not yet

reached adequate platelet inhibition at the time of or immediately after PCI. However, further investigation in an adequately powered clinical trial are needed.



FARMACI CARDIOVASCOLARI E NUTRACEUTICI 637
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)

USAGE OF BEMPEDOIC ACID AND/OR ITS FIXED-DOSE COMBINATION WITH EZETIMIBE IN ITALIAN PATIENTS WITH DYSLIPIDAEMIA: BASELINE CHARACTERISTICS AND 8-WEEK FOLLOW-UP DATA FROM THE MILOS STUDY

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Background: Bempedoic acid (BA) is a first-in-class adenosine triphosphate-citrate lyase inhibitor that has demonstrated reductions in low-density lipoprotein cholesterol (LDL-C) levels and risk of cardiovascular (CV) events in randomised trials. However, real-world data with BA in clinical practice are limited.

Methods: MILOS is a European, prospective, observational study (NCT04579367) in adult patients with primary hypercholesterolaemia or mixed dyslipidaemia that evaluates the effectiveness and safety of BA or BA + ezetimibe (EZE) fixed-dose combination in routine clinical practice. Here, we report the interim 8 weeks (8W) follow-up data of BA or BA + EZE combination for patients enrolled between 23 March 2023 and 30 December 2023 across 106 sites in Italy.

Table: Demographics and patient characteristics - patients using BA or BA+EZE combination at pre-treatment.

	Patients at pre-treatment (N=1,289)
Age, years, mean (SD)	66.0 (10.6)
Male, n (%)	763 (59.2)
BMI, kg/m ² , mean (SD)	26.3 (4.1)
HeFH, n (%)	135 (10.5)
Diabetes mellitus, n (%)	193 (15.0)
Primary prevention patients, n (%)	540 (41.9)
Secondary prevention patients, n (%)	749 (58.1)
History of CAD, n (%)	487 (37.8)
History of CVD, n (%)	131 (10.2)
History of PAD, n (%)	137 (10.6)
Risk classification by investigator, n (%)	
Low risk	37 (2.9)
Moderate risk	193 (15.0)
High risk	371 (28.8)
Very high risk	688 (53.4)
LLT-derived drug combination prior BA initiation, n (%)	
No LMT documented	423 (32.8)
Statin monotherapy	218 (16.9)
Ezetimibe monotherapy	95 (7.4)
Statin + ezetimibe	334 (25.9)
PCSK9i monotherapy	87 (6.8)
PCSK9i combination	67 (5.2)
Any other oral LMT monotherapy	36 (2.8)
Any other oral combination LMT	29 (2.3)

Abbreviations: BA, bempedoic acid; BA+EZE, bempedoic acid + ezetimibe fixed-dose combination or as separate pills; BMI, body mass index; CAD, coronary artery disease; CVD, cardiovascular disease; EZE, ezetimibe; HeFH, heterozygous familial hypercholesterolaemia; LDL-C, low-density lipoprotein cholesterol; LLT, lipid-lowering therapy; PAD, peripheral artery disease; PCSK9i, proprotein convertase subtilisin/kexin type 9 inhibitor; SD, standard deviation.

Table 1

Results: Of 1,342 patients enrolled in Italy, 627 patients (BA=329, BA+EZE=298) had LDL-C data at both pre-treatment and 8W and could be used for this interim analysis. The overall mean (standard deviation [SD]) age of patients was 66.0 (10.6) years, and 59.2% were male (Table). The mean BMI was 26.3 kg/m², about 10.5% of the patients had heterozygous familial hypercholesterolemia, and 15% had diabetes mellitus. Additionally, the majority were secondary prevention patients (58.1%). Most patients (82.2%) were classified by the investigators as very high and high CV risk patients. Out of the patients that received BA at baseline, ~85% patients received it in combination with other lipid-lowering therapies (LLTs). Over an 8-week follow-up period from 2.8 mmol/L (108.5 mg/dL) to 2.0 mmol/L (78.4 mg/dL), following initiation of BA or BA+EZE treatment with or without background LLTs. Overall, the proportion of patients achieving LDL-C goals increased from 7.2% (45/627) at pre-treatment to 37.6% (236/627) at 8W (Figure). Compared to previous reports, no new safety signals were observed during this follow-up period.

Conclusions: The interim analysis from the Italian 8W follow-up cohort of the MILOS study demonstrated that the addition of BA or its combination with EZE, with or without other LLTs, was associated with one-fifth

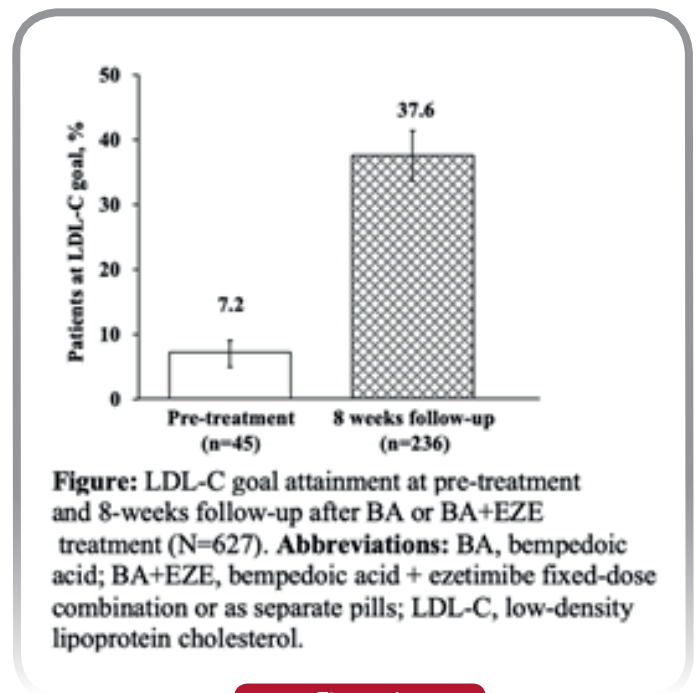


Figure 1

relative reduction in LDL-C from pre-treatment to 8W, and a greater than five-fold increase in proportion of patients achieving their LDL-C goal.

FARMACI CARDIOVASCOLARI E NUTRACEUTICI 441 DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

LA PRECEDENTE SOMMINISTRAZIONE DI ANTI-PCSK9 AB RIDUCE L'EFFICACIA DI INCLISIRAN: UN'ANALISI PER SOTTOGRUPPI DEL REGISTRO CHOLINET

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Obiettivi: Trials randomizzati hanno dimostrato che inclisiran è in grado di ridurre i valori di colesterolo LDL (LDL-C) di circa il 50% rispetto ai valori basali, in assenza di significativi effetti collaterali. Tuttavia, dati sulla sua efficacia e sicurezza nel mondo reale appaiono limitati. Precedenti piccoli studi di mondo reale hanno dimostrato elevata variabilità dell'efficacia di inclisiran nella riduzione dei valori di LDL-C, ma i fattori in grado di influenzare la risposta alla terapia non sono completamente conosciuti. Dati preliminari suggeriscono che in pazienti con pregressa esposizione ad anti-PCSK9 ab la riduzione dei valori di LDL-C è minore in confronto ai pazienti naive alla terapia. Cholinet (Cholesterol inclisiran Italian Network) è un registro osservazionale multicentrico italiano, disegnato per valutare efficacia, sicurezza e persistenza alla terapia con inclisiran nel mondo reale. Per valutare l'effetto della pregressa terapia con anti-PCSK9 ab sulla risposta al trattamento con inclisiran, sono stati studiati i pazienti inclusi nel registro Cholinet con storia di assunzione di anti-PCSK9 ab e confrontati con pazienti naive al trattamento.

Metodi: Da novembre 2022 a febbraio 2024, nel registro Cholinet sono stati arruolati 659 pazienti che

ricevevano inclisiran, le cui caratteristiche cliniche all'inizio del trattamento, inclusi dati demografici, fattori di rischio cardiovascolare (CV), valori di laboratorio, comorbidità, diagnosi di Ipercolesterolemia Familiare (FH) e tipo e dose della terapia ipolipidemizzante (LLT) sono state valutate alla baseline e ai successivi follow-up. Dei 659 inclusi nel registro, 513 hanno completato il follow-up a 3 mesi e 171 a 9 mesi.

Risultati: Abbiamo analizzato i pazienti in terapia con inclisiran che avevano avuto una precedente esposizione ad anti-PCSK9 ab (n=63; 37 evolocumab e 26 alirocumab), in confronto ai pazienti naive ad anti-PCSK9 ab (n=450) al follow-up di 3 mesi. Le due popolazioni non erano significativamente differenti, ad eccezione di una maggiore prevalenza di ipercolesterolemia familiare e minore prevalenza di terapia ipolipidemizzante orale nei pazienti con pregressa assunzione di anti-PCSK9 ab. Dei 63 pazienti con precedente esposizione ad anti-PCSK9 ab, 24 (38.1%) hanno modificato la terapia sostituendo l'anti-PCSK9 ab con l'inclisiran a causa di scarsa aderenza, 17 (27%) a causa di scarsa tolleranza e 22 (34.9%) per motivi non specificati. La riduzione percentuale mediana di LDL-C è risultata significativamente inferiore nei

pazienti con precedente esposizione ad anti-PCSK9 ab rispetto ai pazienti naive (34.1% vs 53.9%; $p < 0.001$). Similmente, dei 171 pazienti al follow-up di 9 mesi, 23 avevano una precedente esposizione ad anti-PCSK9 ab. In questo gruppo, la riduzione percentuale mediana del LDL-C a 9 mesi (22% vs 57.4%; $p < 0.001$) è stata significativamente inferiore nei pazienti con precedente esposizione ad anti-PCSK9 ab rispetto ai pazienti naive.

Conclusioni: La pregressa esposizione ad anti-PCSK9 ab potrebbe diminuire l'efficacia di inclisiran nel ridurre i valori di LDL-C e contribuirebbe a spiegare la variabilità di risposta al trattamento. La conoscenza di questi meccanismi è cruciale per poter personalizzare e ottimizzare al meglio la terapia ipolipidemizzante.



**FARMACI CARDIOVASCOLARI E NUTRACEUTICI 788
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E
NUTRACEUTICI) EMBOLIA POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)**

DRUG INTERACTION IN INCIDENT DOAC USERS AND RISK OF BLEEDING

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Introduction: Oral anticoagulants (DOACs) are known to have a better safety profile than Vitamin K antagonists, but their metabolism largely depends on the P-glycoprotein and CYP3A4. Therefore, all drugs inhibiting those proteins may affect DOACs' bioavailability, by increasing the risk of drug-drug interaction, particularly the risk of bleeding.

Purpose: The objective was to describe the pattern of polypharmacy in a large cohort of DOAC users, at baseline and within one year after starting anticoagulant treatment.

Materials and Methods: All persons residing in the catchment areas of Caserta LHU during the years 2012–2020 were considered. From the source population, all patients with at least 1 year of database history and receiving at least one DOAC dispensing during the observation period were identified. Of these, incident (i.e. no DOAC dispensing within one year prior to the first dispensing date, Index Date) DOAC users were included into the cohort. Among incident DOAC users, the distribution of interacting drugs number dispensed Pre-ID (within three months before the Index date) and Post-ID (within 12 months after Index date) was explored stratified by high/low dose of anticoagulant. In order to evaluate the risk of bleeding associated with the use of DOACs, the frequency of incident DOAC users with at least one hospitalization for major bleeding within one year after ID was also calculated and stratified by high/low dose of DOACs and the number of drug-drug interactions. A statistically significant test result was considered if $p \leq 0.05$.

Results: 20.491 incident NOAC users were identified from Caserta LHU and 16.367 (79.9%) DOAC incident users with at least one year of follow-up after ID were included in the analysis. Overall, a higher proportion of women than men were treated with DOACs and almost 50% of the study cohort was 65-79 years old. The number of interacting drugs dispensed within one year after ID increased from pre-ID to post-ID. 2.077 (12.7%) incident DOAC users without any interacting drugs within 3 months pre-ID received 1 interacting drug within one year after ID. Instead, 11.3% and 8.4% of incident DOAC users increased from 1 interacting drug (Pre-ID) to 2 interacting drugs (Post-ID) and from 2 interacting drugs (Pre-ID) to 3-5 interacting drugs (Post-ID). During the first year after the ID, 322 (2%) incident DOAC users were hospitalized for major bleeding and 309 (96%) of these, had received at least one interacting drug. Indeed, as expected, the proportion of DOAC users with a major bleeding increased with the increasing number of interacting drugs, reaching 2.9% and 2.1% among low-dose and high-dose DOAC users respectively with more than 9 interacting drugs.

Conclusions: The results of the current analysis suggest that independently from the type and the dose of DOAC, the number of interacting drugs prescribed with DOACs is consistent and tends to increase after the first administration of DOACs. Moreover, hemorrhagic events are more related to the number of interacting drugs instead of high/low dose of anticoagulant.

FARMACI CARDIOVASCOLARI E NUTRACEUTICI 581 DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

EFFICACIA E SICUREZZA DI INCLISIRAN NEL MONDO REALE: DATI DAL REGISTRO OSSERVAZIONALE MULTICENTRICO CHOLINET

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Obiettivi: Trials randomizzati hanno dimostrato che inclisiran riduce in maniera efficace e sicura i valori di colesterolo LDL (C-LDL), determinando il raggiungimento dei valori target di C-LDL. Tuttavia, dati sull'utilizzo di inclisiran nella pratica clinica provenienti da studi di mondo reale sono limitati. In questo contesto è stato disegnato lo studio Cholinet, che è un registro italiano, multicentrico, osservazionale, prospettico, di fase IV che ha arruolato pazienti di età superiore a 18 anni con indicazione clinica ad iniziare terapia con inclisiran.

Metodi: Dei 668 pazienti eleggibili per lo studio, 9 sono stati esclusi a causa di dati incompleti e sono stati arruolati 659 pazienti in 31 centri italiani. Dei 659 pazienti, 513 (77,8%) avevano completato il follow-up a tre mesi e 171 (25,9%) avevano completato il follow-up a nove mesi al momento di questa analisi.

Risultati: Nella popolazione arruolata, l'età media era di 63,1 anni (± 10.2) e la maggioranza era di sesso maschile (69,3%). 485 pazienti (73,6%) erano affetti da ipertensione, 129 (19,6%) avevano diabete mellito di tipo 2, 169 (25,6%) erano fumatori e 79 pazienti (12%) avevano avuto una precedente esposizione ad anticorpi anti-PCSK9. Complessivamente, 99 pazienti

(15%) avevano una diagnosi di ipercolesterolemia familiare e 556 pazienti (84,4%) avevano malattia cardiovascolare aterosclerotica. 614 pazienti erano a rischio cardiovascolare molto alto (93,2%), 24 ad alto rischio (3,6%) e 21 a rischio moderato (3,2%).

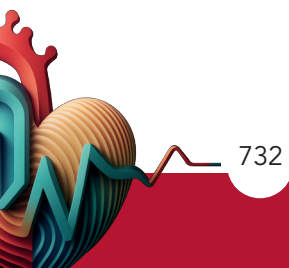
In 513 pazienti che avevano completato il follow-up a tre mesi, la riduzione percentuale mediana di C-LDL è stata del 51,2% (Q1, Q3 35,3, 66,7) con il 57,3% e il 69,2% dei pazienti a rischio molto alto che hanno raggiunto il target di C-LDL di <55 mg/dL e <70 mg/dL di C-LDL, secondo le linee guida ESC e ACC/AHA rispettivamente. In 171 pazienti che avevano completato il follow-up a nove mesi, la riduzione mediana di C-LDL è stata del 55,7% (Q1, Q3 37,1, 72,5) e il 66,7% e l'80,2% dei pazienti hanno raggiunto il target di C-LDL di <55 mg/dL e <70 mg/dL, rispettivamente. Inoltre, nei 513 pazienti con il follow-up a tre mesi, la riduzione percentuale mediana di C-LDL è stata del 58,7% (Q1, Q3 40,4, 72,7) in coloro che ricevevano una terapia concomitante con statina \pm ezetimibe ($n=355$) e del 42% (Q1, Q3 26,6, 54,1) in quelli senza ($n=178$) ($p < 0,001$). Inoltre, all'analisi multivariata la terapia di combinazione con statina/ezetimibe (4,14; $p < 0,001$) era significativamente associata al raggiungimento del target di C-LDL. Non sono stati segnalati eventi avversi maggiori e la persistenza al trattamento è stata



del 96,9% e del 95,9% al follow-up a tre e nove mesi, rispettivamente.

Conclusioni: Inclisiran riduce efficacemente i livelli di C-LDL in un contesto di mondo reale, ottenendo il

raggiungimento del target di C-LDL nella maggior parte dei pazienti, senza effetti collaterali significativi e con maggiore efficacia quando somministrato in combinazione alla terapia con statine.



FARMACI CARDIOVASCOLARI E NUTRACEUTICI 304

FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

STATINE NEL PAZIENTE CON TRAPIANTO DI CUORE: VERSO UNA DEFINIZIONE DEI TARGET METABOLICI E DELL'EFFICACIA

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Introduzione. Il paziente con trapianto di cuore è ad elevato rischio cardiovascolare; le attuali linee guida, pur raccomandando l'uso delle statine in tutti i pazienti per migliorare la sopravvivenza, non definiscono un target di C-LDL. Inoltre, considerandone anche la ridotta tollerabilità per le interazioni con gli immunosoppressori, non è noto se anche dosi non elevate conferiscano un beneficio. Lo scopo di questo studio è valutare l'efficacia delle statine sugli outcomes metabolici e clinici in questo gruppo di pazienti e di fare luce sul loro utilizzo.

Metodi. In questa analisi retrospettiva di dati raccolti in modo prospettico, sono stati inclusi i pazienti trapiantati a Bologna (2013-23) sopravvissuti per almeno un anno per i quali fossero disponibili i dati del profilo lipidico e della terapia con statine. Abbiamo analizzato la prevalenza dell'uso delle statine e la loro efficacia a un mese, un anno e 5 anni. Le statine sono state definite ad alta potenza sia in base alla dose secondo le linee guida ACC/AHA (es atorva >40 mg/die) che all'effetto sulla riduzione C-LDL (30-50% potenza moderata, \pm 50% alta). L'outcome primario è stato la mortalità cardiovascolare a 5 anni dal trapianto; quello secondario la prevalenza della malattia coronarica (CAV) alla coronarografia a 1 e 5 anni dal trapianto.

Risultati. Nei 189 pazienti (73% maschi, 52 ± 12 anni, 30% eziologia ischemica) che hanno costituito la coorte di studio, l'uso delle statine è aumentato nel corso del primo anno (interrotto nel 3%), ma è rimasto invariato fino al quinto (46.4%, 77.9%, 68.9% rispettivamente, $p < 0.05$ un

anno vs 1 mese, $p = NS$ 5 anni vs 1 anno); i parametri metabolici (C-LDL, C-non HDL, trigliceridi) sono migliorati nel primo anno, senza variazioni successive ($p < 0.05$ un mese vs 1 anno, $p = NS$ uno vs 5 anni per tutti); tuttavia, a un anno il 90% dei pazienti aveva C-LDL > 100 mg/dl.

La sopravvivenza libera da MACE era $85.5 \pm 3.2\%$ a 5 anni; tra i parametri ad un anno, i predittori di outcome all'analisi univariata sono stati: C-LDL, C-non HDL (+1.5% e +1% di aumento di rischio per ogni mg/dl), i trigliceridi (+0.7% ogni 10 mg/dl), la riduzione di C-LDL nel primo anno. All'analisi ROC, C-LDL ± 110 mg/dl prediceva i MACE (sensibilità: 60% specificità: 75%, AUC: 0.62).

L'uso della statina ad alta potenza definita in base alla dose aumentava ai tre timepoints (6% vs 15.7% vs 30.0, $p < 0.05$) ma, anche se più efficace nel ridurre C-LDL a un anno ($-21.8\% \pm 40.0\%$ vs $-12.4\% \pm 31.7\%$ vs $+14.9 \pm 51.3\%$, alta vs media potenza vs no statina, $p < 0.01$), non riduceva il rischio di MACE. L'uso della statina a media o alta potenza definita in base all'efficacia nella riduzione di C-LDL nel primo anno era associata ad un minor rischio di MACE a 5 anni ($91.7 \pm 8.0\%$ vs $93.3 \pm 6.4\%$ vs $81.9 \pm 4.1\%$, $p = 0.02$) e a una prevalenza numericamente minore di CAV (55% vs 72%).

Conclusioni. Nel paziente trapiantato di cuore, pur essendo spesso difficile seguire l'approccio di titolazione ad alta dose delle statine come nella popolazione generale, un utilizzo volto a raggiungere un target C-LDL < 110 mg/dl o una riduzione del colesterolo LDL > 30% sembra ridurre gli eventi cardiovascolari.



FARMACI CARDIOVASCOLARI E NUTRACEUTICI 666 ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) FARMACI ANTIARITMICI (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE)

INAPPROPRIATE SINUS TACHYCARDIA: EFFECTS OF A NOVEL DIETARY SUPPLEMENT

Antonio Scarà (a, b), Sara Burazor (b), Alessio Borrelli (a, b), Antonio Gianluca Robles (b), Lorenzo Lupo Dei (b), Federico Zanin (a), Leonardo Pignalosa (a), Elena Cavarretta (c), Silvio Romano (b), Luigi Sciarra (b)
(a) OSPEDALE SAN CARLO DI NANCY-GVM; (b) DIPARTIMENTO DI MALATTIE CARDIOVASCOLARI -UNIVERSITA' DEGLI STUDI DELL'AQUILA; (c) UNIVERSITÀ DEGLI STUDI "LA SAPIENZA"

Introduction: inappropriate sinus tachycardia (IST) has been described as a syndrome characterized by unexpectedly fast and prolonged sinus rates at rest or with minimal physical activity. Epidemiologic characteristics are uncertain but most patients are young and female. Managing IST (controlling symptoms and reducing rate) remains a substantial challenge, particularly when it occurs in sportsmen. We designed an observational pilot study to investigate if SPINOFF® food supplement can be useful in the treatment of IST in this kind of patients.

Methods: we enrolled 32 consecutive patients affected by frequent recurrences of IST. Twelve leads ECG and Holter ECG parameters were recorded at enrolment (T0) and after a 6 month treatment (T1) with food supplement. Symptoms and quality of life were also evaluated through specific questionnaires. Study population was compared to an historical control group of 20 patients receiving ivabradine as treatment for the same clinical condition.

Results: rest ECG heart rate was 88.7 ± 12.4 bpm (T0) and 73.6 ± 6.6 bpm (T1) ($p < 0.00001$); Holter average heart rate was 88.4 ± 3.3 bpm and 74.9 ± 4.8 bpm ($p < 0.0001$). Holter ECG maximum heart rate was 147.1 ± 16.7 bpm and 139.2 ± 16.8 bpm ($p 0.06$); Holter minimum heart rate was 49.9 ± 6.5 bpm and 50.5 ± 6.9 bpm ($p 0.33$). Finally, the number of sustained decreased from 3.3 ± 1.7 to 0.8 ± 0.8 ($p 0.00001$). The following variations of ASTA scores were observed: ASTA symptom scale (range scale: 0-27) decreased from 14.9 ± 2.1 to 5.8 ± 1.4 ($p < 0.00001$), while ASTA HR QoL (range scale: 0-39) from 24.1 ± 2.1 to 10.8 ± 2.3 ($p < 0.00001$).

Conclusions: the findings of our pilot study suggest that this food supplement could play a beneficial role to manage symptoms and improve quality of life in those patients affected by IST, who refuse standard medical therapy; these clinical effects would appear to correlate with a significant improvement of rest ECG parameters and some Holter ECG parameters.

FARMACI CARDIOVASCOLARI E NUTRACEUTICI 910 DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

VALUTAZIONE DELLA FUNZIONE ENDOTELIALE E DELLA STIFFNESS AORTICA IN PAZIENTI TRATTATI CON ACIDO BEMPEDOICO

Andrea Drera (a), Matteo Pagnesi (a), Giovanni Battista Bonfioli (a), Elisa Brangi (a), Francesca Capasso (a), Riccardo Rovelli (a), Marco Metra (a), Enrico Vizzardi (a)

(a) U.O.C. CARDIOLOGIA, ASST SPEDALI CIVILI DI BRESCIA

Background: L'acido bempedoico è un farmaco ipolipemizzante, entrato recentemente sul mercato italiano, in grado di ridurre i livelli circolanti di colesterolo legato a lipoproteine a bassa densità (LDL-c) attraverso l'inibizione dell'enzima ATP citrato liasi. Anche altri farmaci ipolipemizzanti, come le statine e gli anticorpi monoclonali contro la proteina PCSK9, si sono rivelati essere utili nel miglioramento della funzione endoteliale e della stiffness aortica, ma tale relazione non è ancora stata indagata per l'acido bempedoico.

Metodi: Abbiamo effettuato uno studio prospettico su pazienti a cui è stato introdotto in terapia acido bempedoico e giudicati idonei secondo i criteri di inclusione.

I pazienti reclutati erano pazienti non trattati precedentemente con acido bempedoico in prevenzione primaria e secondaria. Gli obiettivi dello studio erano vedere la consistenza della riduzione dei valori di LDL con acido bempedoico e l'effetto della molecola sulla funzione endoteliale valutata attraverso RHI (Reactive Hyperemia Index), ottenuto tramite metodica EndoPAT, e sulla rigidità aortica valutata attraverso PWV (Pulse Wave Velocity) e Aix (Augmentation Index), ottenuto mediante metodica SphygmoCor.

Risultati: Nello studio sono stati inclusi 33 pazienti. I pazienti sono stati valutati con le metodiche EndoPAT e SphygmoCor prima dell'inizio della terapia con acido bempedoico e dopo 6 mesi.

Abbiamo osservato una riduzione dei valori di LDL da un valore medio pre-trattamento di 112.69 ± 47.09 mg/dL ad un valore di 67.33 ± 27.67 mg/dL (Δ LDL 45.33 ± 39.17 mg/dL, 95% CI; 31.47 a 51.25). Inoltre, abbiamo osservato un aumento dei valori di RHI, con un significativo miglioramento della funzione endoteliale (da 1.68 ± 0.63 a 2.02 ± 0.51 , Δ RHI -0.34 ± 0.41 , 95% CI; -0.49 a -0.20) e una riduzione significativa sia di Aix (da 34.18 ± 10.41 a 29.45 ± 13.23 , Δ Aix 4.73 , 95% CI; -0.90 a 8.56) che di Aix@75 (da 29.73 ± 10.17 a 24.00 ± 10.59 , Δ Aix@75 5.73 ± 9.38 , 95% CI; 2.40 a 9.05) al follow-up.

Tuttavia, non abbiamo osservato una riduzione statisticamente significativa di PWV e, attraverso analisi statistica di regressione, non abbiamo evidenziato una correlazione statisticamente significativa tra Δ LDL e Δ RHI. Una possibile spiegazione potrebbe risiedere nel fatto che, a concorrere al miglioramento della funzione endoteliale, non ci sia soltanto la riduzione dei valori di LDL-c, ma anche altri meccanismi al momento non ancora chiariti. Una limitazione del nostro studio è, sicuramente, il piccolo campione analizzato, che andrebbe ampliato per effettuare ulteriori valutazioni ed analisi

Conclusioni: Nei pazienti trattati con acido bempedoico abbiamo osservato una riduzione dei valori di LDL-c consistente con i dati disponibili in letteratura e che il farmaco ha portato ad un miglioramento di alcuni parametri di disfunzione endoteliale e stiffness aortica (in particolare RHI e Aix).



FARMACI CARDIOVASCOLARI E NUTRACEUTICI 543
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO)

SEMAGLUTIDE PER IL TRATTAMENTO DEI PAZIENTI OBESI NON DIABETICI CON SCOMPENSO CARDIACO A FRAZIONE DI EIEZIONE PRESERVATA

Norman Lamaida (a), Antonio Cerciello (a)
 (a) CLINICA TRUSSO- OTTAVIANO - NAPOLI

Background: Di recente lo studio STEP-HFpEF ha dimostrato in pazienti obesi con scompenso cardiaco a frazione di Eiezione preservata (HFpEF), che la somministrazione di semaglutide alla dose di 2.4 mg/settimana, rispetto al placebo, ha determinato una riduzione dei sintomi per scompenso cardiaco e un miglioramento della qualità di vita. Inoltre si è evidenziato una riduzione della PCR e dei livelli di NT-proBNP. Scopo del nostro studio è stato di valutare l'efficacia e la sicurezza di semaglutide in pazienti obesi con scompenso cardiaco (HFpEF) senza diabete.

Metodi: Abbiamo eseguito uno studio osservazionale, retrospettivo, su 40 pazienti obesi (BMI >30 Kg/m²), senza diabete, con HFpEF con i seguenti criteri : "FE≥45%,classe NYHA:II-III, Kansas city Cardiomyopathy Questionnaire (KCCQ)-Clinical Summary Score(CSS) < 90 punti e elevati livelli di NT-proBNP e di PCR" che hanno assunto semaglutide per sei mesi.

Gli end-point valutati erano la valutazione dei sintomi secondo lo score KCCQ-CSS, la classe NYHA, BMI, dosaggio NT-proBNP.

Risultati: dal tempo 0 a 6 mesi c'è stato un significativo miglioramento del KCCQ-CSS score (58±22 vs 75,4 ±25.3 punti p < 0.01),una riduzione dei pazienti dalla classe NYHA III (30.2 % a 12.2%, p <0.01) e una riduzione del NT-pro BNP (970±550 vs 550 ±300 pg/ml, p < 0.01).Inoltre si è evidenziato una perdita di peso / -10 kg) e una significativa riduzione della PCR. Effetti collaterali significativi non sono stati evidenziati.

Conclusioni: nei pazienti obesi non diabetici con HFpEF, la somministrazione di semaglutide una volta a settimana si è dimostrata nei nostri pazienti sicura ed efficace migliorando sensibilmente la loro qualità di vita, associata anche naturalmente a un calo ponderale.



FARMACI CARDIOVASCOLARI E NUTRACEUTICI 436 DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

EFFICACIA DI INCLISIRAN NEI PAZIENTI AFFETTI DA IPERCOLESTEROLEMIA FAMILIARE: DATI DAL REGISTRO CHOLINET

Ciro Coticelli (a), Paola Gargiulo (a), Mario Crisci (b), Emilio Di Lorenzo (b), Rossella Marcucci (c), Alessandro Maloberti (d), Cristina Giannattasio (d), Filippo Maria Sarullo (e), Antonella Corleto (f), Ferdinando Varbella (f), Stefano Carugo (g), Gavino Casu (h), Giuseppe Colonna (i), Amedeo Picciolo (i), Marco Matteo Ciccone (j), Claudio Bilato (k), Alberto Polimeni (l), Antonio Curcio (l), Angelo Catalano (m), Pasquale Perrone Filardi (a)

(a) UNIVERSITA' DEGLI STUDI DI NAPOLI FEDERICO II; (b) AORN DEI COLLI OSPEDALE MONALDI; (c) UNIVERSITA' DEGLI STUDI DI FIRENZE; (d) OSPEDALE NIGUARDA CA' GRANDA; (e) OSPEDALE BUCCHERI LA FERLA FATEBENEFRAPELLI; (f) OSPEDALE DI RIVOLI; (g) FONDAZIONE OSPEDALE MAGGIORE IRCCS POLICLINICO; (h) AZIENDA OSPEDALIERA SANITARIA DI SASSARI; (i) OSPEDALE V.FAZZI; (j) UNIVERSITA' DEGLI STUDI DI BARI; (k) OSPEDALI DELL'OVEST VICENTINO; (l) UNIVERSITA' DELLA CALABRIA; (m) OSPEDALE MARIA SS.ADDOLORATA

Obiettivi: Trials randomizzati hanno dimostrato che inclisiran riduce i valori di colesterolo LDL (LDL-C) di circa il 50%. Tuttavia, nei trials che hanno incluso pazienti affetti da ipercolesterolemia familiare (FH) trattati con inclisiran la riduzione dei valori di LDL-C era minore nei pazienti affetti da FH, ed in particolare non significativa, in confronto con il placebo, nei pazienti con FH omozigote. Attualmente dati di mondo reale sulla riduzione del LDL-C in pazienti affetti da FH e trattati con inclisiran sono scarsi e contraddittori. Cholinet è uno studio multicentrico, osservazionale, prospettico di fase IV che ha arruolato pazienti di età superiore a 18 anni con indicazione clinica a iniziare terapia con inclisiran ed è attualmente il più grande registro di singola nazione. Dal registro Cholinet sono stati estratti ed analizzati separatamente i dati di pazienti affetti da FH e confrontati con quelli di pazienti senza FH, per valutare l'efficacia di inclisiran in questa popolazione.

Metodi: Sono stati confrontati pazienti con e senza diagnosi di FH. Quest'ultima veniva posta sulla base dei criteri del Dutch Lipid Clinical Network Score (DLCNS).

Risultati: Abbiamo analizzato separatamente 78 pazienti affetti da FH e confrontati con 435 non affetti

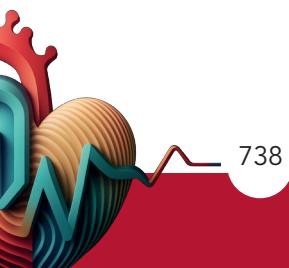
da FH. Al basale, nel primo gruppo il valore mediano di LDL-C era di 160 mg/dL, nel secondo di 100 mg/dL. Nella popolazione non affetta da FH prevalevano – rispetto alla popolazione non affetta da FH - in maniera statisticamente significativa ipertensione arteriosa (79.1% vs 48.7%), diabete mellito di tipo 2 (23.9% vs 9%), nonché diagnosi di malattia aterosclerotica cardiovascolare (sindrome coronarica acuta, 69.2% vs 21.8%; sindrome coronarica cronica 48% vs 16.7%; malattia cerebrovascolare, 9% vs 2.6%). Inoltre, la popolazione non affetta da FH, in origine, beneficiava di un trattamento ipolipidemizzante (LLT) in percentuale maggiore rispetto alla popolazione non affetta da FH (89.2% vs 74.4%). A 3 mesi, la riduzione mediana di LDL-C è risultata significativamente inferiore nei pazienti affetti da FH rispetto ai pazienti senza FH (46.3% vs 53.3%; $p < 0.001$); similmente, la percentuale di pazienti che hanno raggiunto il target di LDL-C per la propria classe di rischio era significativamente inferiore nei pazienti affetti da FH (24.4% vs 63.4%). Similmente, nei 171 pazienti che avevano completato il follow-up a 9 mesi, la riduzione percentuale dei valori di LDL-C era significativamente più bassa nei 27 pazienti con FH in confronto con quella osservata nei 144 senza FH (47.6% vs 40.5%). Inoltre, la percentuale di pazienti che



raggiungeva il target di LDL-C era significativamente più bassa nei pazienti con FH in confronto coi pazienti senza (22.2% vs 73.6%). Inoltre, all'analisi multivariata, che includeva LLT, sindrome coronarica cronica, ipertensione, sesso maschile, diabete, età, pregressa terapia con anti-PCSK9 Ab e FH, solo la presenza di terapia di combinazione con statina ed ezetimibe (4.14; $p < 0.001$) e la diagnosi di FH (0.47; $p = 0.037$) erano predittori associati significativamente rispettivamente

al raggiungimento o meno del target di LDL-C.

Conclusioni: La minor efficacia di inclisiran nei soggetti con FH potrebbe riconoscere svariati ipotetici meccanismi fisiopatologici come genotipo, funzione residua dei recettori per LDL-C e mutazioni multiple. Pertanto, si rendono necessari ulteriori studi per una miglior caratterizzazione di tale cluster di pazienti.



FARMACI CARDIOVASCOLARI E NUTRACEUTICI 621 DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

UTILIZZO DI SACUBITRIL/VALSARTAN NELLA PRATICA CLINICA ITALIANA: DATI DAL REGISTRO OPTIMIZATION OF THERAPY IN THE ITALIAN MANAGEMENT OF HEART FAILURE (OPTIMA-HF)

Ermanno Nardi (a), Stefania Paolillo (a), Fabrizio Perrone Filardi (a), Franco Guarnaccia (b), Matteo Cameli (c), Natale Daniele Brunetti (d), Angelo Aloisio (e), Stefano Carugo (f), Laura Casalino (g), Deborah Cosmi (h), Ferdinando Ferrara (i), Emilia Chiuini (j), Ugo Oliviero (k), Giuseppe Putorti (l), Giuseppe Patti (m), Mauro Larcher (n), Frank Lloyd Dini (o), Alberto Palazzuoli (c), Marco Pepe (p), Marco Metra (q), Pasquale Perrone Filardi (a)

(a) UNIVERSITA' DEGLI STUDI DI NAPOLI FEDERICO II; (b) CARDIOLOGIA CENTRO ANGIOCARD; (c) UNIVERSITA' DEGLI STUDI DI SIENA; (d) UNIVERSITA' DEGLI STUDI DI FOGGIA; (e) CASA DI CURA VILLA VERDE; (f) ICCS CA' GRANDA OSPEDALE MAGGIORE POLICLINICO; (g) CARDIOLOGIA TERRITORIALE ASL 3 GENOVESE; (h) OSPEDALE GUBBIO-GUALDO TADINO; (i) ASL SALERNO; (j) ASL UMBRIA 1; (k) ARCA CAMPANIA; (l) ASP 5 REGGIO CALABRIA; (m) UNIVERSITA' PIEMONTE ORIENTALE; (n) ROVERETO; (o) ISTITUTO AUXOLOGICO IRCCS; (p) CASA DI CURA SAN MICHELE; (q) UNIVERSITA' DEGLI STUDI DI BRESCIA

Obiettivi: Le linee guida europee raccomandano nei pazienti con scompenso cardiaco a frazione di eiezione ridotta (HFrEF) una terapia di combinazione con quattro classi di farmaci definiti disease- modifiers. Tra questi, i bloccanti del recettore dell'angiotensina/neprilina (ARNI) rappresentano attualmente la base del blocco neuro-ormonale; tuttavia, non è chiaro in quale misura le lacune nell'utilizzo di questi farmaci persistano nella pratica clinica ambulatoriale. Obiettivo della presente analisi del Registro italiano Optimization of Therapy in the Italian Management of Heart Failure (OpTIMa-HF) è stato effettuare una valutazione dei pazienti affetti da HFrEF idonei al trattamento con ARNI sulla base dei criteri del trial PARADIGM-HF, considerando l'associazione tra l'idoneità al trattamento e le caratteristiche di base della popolazione.

Metodi: OPTIMA-HF è un registro italiano, multicentrico in cui sono stati arruolati pazienti ambulatoriali affetti da HFrEF che ricevevano almeno un farmaco orale per la gestione della patologia. I pazienti sono stati caratterizzati in base all'uso e alla dose iniziale di farmaci disease- modifiers con un'analisi specifica sulla

presenza dei criteri di arruolamento dello studio PARADIGM-HF, ovvero età di almeno 18 anni, classe NYHA II-IV, frazione di eiezione <40%, pressione arteriosa sistolica >100 mmHg, eGFR >30 ml/min, potassio sierico <5.2 mmol/l, nonchè sull'associazione tra idoneità al trattamento e reale presenza di ARNI in terapia.

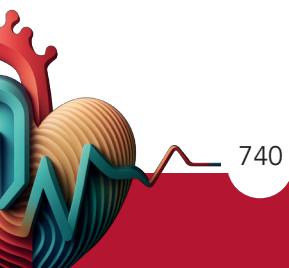
Risultati: Nella presente analisi sono stati esaminati i dati di 1390 pazienti affetti da HFrEF inclusi nel Registro OPTIMA-HF tra gennaio 2022 e settembre 2023, provenienti da 29 centri ambulatoriali, di cui 18 centri ospedalieri universitari e 11 centri ambulatoriali del territorio. 863 pazienti (62,1%) soddisfacevano i criteri del trial PARADIGM-HF e 674 di questi (78,1%) erano effettivamente in trattamento con ARNI. Dei 1390 pazienti arruolati, 387 (27,8%) non erano in trattamento con ARNI, di cui 137 (35,4%) non soddisfacevano i criteri di inclusione del PARADIGM-HF per la prescrizione del farmaco. Le ragioni di mancata soddisfazione dei criteri del PARADIGM-HF erano: iperkaliemia (16,8%), ipotensione (35,8%), malattia renale cronica (47,4%). In un modello di regressione logistica, non essere in trattamento con ARNI era associato a età avanzata,



malattia renale cronica, non essere portatori di terapia di resincronizzazione cardiaca, avere valori pressori più bassi, BMI più basso e PAPs più alta, identificando il quadro di un paziente più fragile al netto della conformità con i criteri del PARADIGM-HF.

Conclusioni: Tra i pazienti ambulatoriali italiani con HFrEF arruolati nel registro OPTIMA-HF, il 62,1% sod-

disfa i criteri del trial PARADIGM-HF ed una quota rilevante di pazienti non è in trattamento pur avendo i criteri per accedere al farmaco. Tali dati di real-life si rendono indispensabili per ricevere informazioni sulla pratica clinica e per individuare i punti deboli su cui intervenire. Rimangono, pertanto, urgentemente necessarie strategie per migliorare l'uso dei farmaci per l'HFrEF nella pratica clinica.



**FARMACI CARDIOVASCOLARI E NUTRACEUTICI 569
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
EMBOLIA POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)**

PLASMA LEVELS OF THE FOUR DIRECT ORAL ANTICOAGULANTS IN PATIENTS WITH ATRIAL FIBRILLATION AT THE TIME OF THROMBOEMBOLIC AND BLEEDING EVENTS

Cosmo Godino (a), Riccardo Mazza (a), Carlo Gaspardone (a), Alessia Minerva (a), Rachele Sena (a), Paolo Costa (a), Gianmarco Cozzani (a), Lorenzo Zaccaria (a), Giuseppe Barone (a), Anna Salerno (a), Alberto Margonato (a), Armando D'angelo (b)

(a) CARDIOLOGY DEPARTMENT, IRCCS SAN RAFFAELE SCIENTIFIC INSTITUTE, MILAN, ITALY; (b) IN MEMORY OF PROF. ARMANDO D'ANGELO, RECENTLY DECEASED

Background: Direct oral anticoagulants (DOACs) are the preferred treatment for preventing thromboembolic events in patients with non-valvular atrial fibrillation (AF). DOACs are typically administered without the need for plasma level monitoring.

Objectives: This study aimed to assess the relationship between DOAC plasma levels and the incidence of thromboembolic and bleeding events in AF patients.

Methods: We prospectively enrolled AF patients taking DOACs who accessed the hospital emergency department for either a thromboembolic or bleeding event (cases) or for other medical reasons (controls). Plasma levels of DOACs were measured for all patients, categorized into quartiles, and correlated with the type of event.

Results: A total of 1651 patients (mean age 79 years, 48% female) who had plasma levels tested for a thromboembolic event (7%), bleeding event (12%), or other reason (81%) were enrolled. 45% of the patients were on Apixaban, 19% on Dabigatran, 19% on Rivaroxaban, and 17% on Edoxaban. Results indicated that patients with thromboembolic events had lower plasma levels of DOACs compared to

controls, while those with bleeding events had higher levels. Specifically, plasma levels of DOACs in the first quartile were associated with a significantly higher risk of thromboembolic events OR 1.59 (95% CI: 1.06-2.35; $p = 0.021$), whereas plasma levels in the fourth

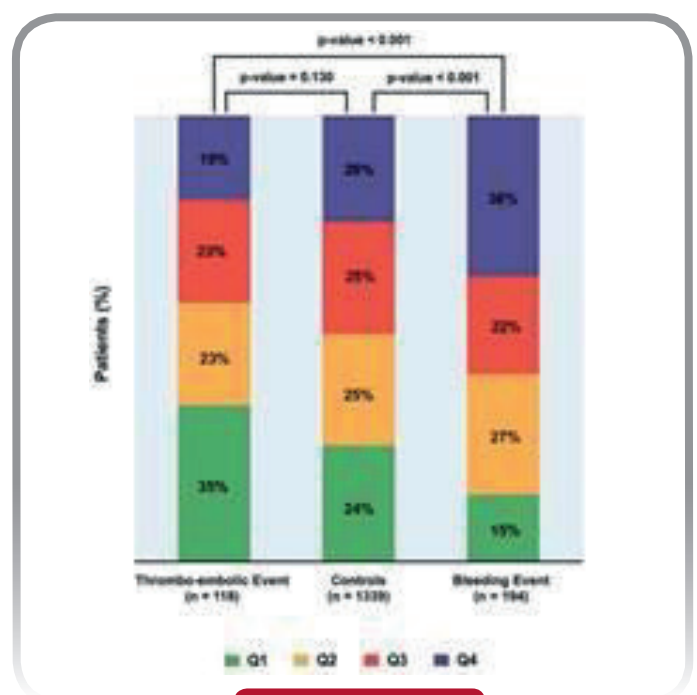
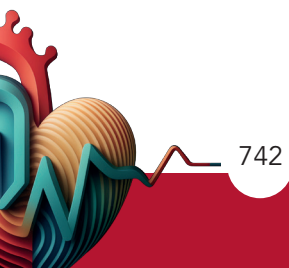


Figure 1

quartile were associated with a significantly higher risk of hemorrhagic events OR 1.81 (95% CI: 1.31-2.49; $p < 0.001$).

Conclusion: This study highlights the significant

interindividual variability in DOAC plasma levels and their relationship with thromboembolic and bleeding events. These findings suggest that monitoring DOAC plasma levels in clinical practice could help in estimating the risk of thromboembolic and bleeding events.



FARMACI CARDIOVASCOLARI E NUTRACEUTICI 476
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)

SICUREZZA ED EFFICACIA DI UN NUOVO PROTOCOLLO RAPIDO DI DESENSIBILIZZAZIONE ALL'ACIDO ACETILSALICILICO IN PAZIENTI CANDIDATI A PROCEDURE INTERVENTISTICHE CARDIOVASCOLARI PERCUTANEE

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Introduzione: L'acido acetilsalicilico (ASA) rappresenta uno dei cardini terapeutici nel trattamento della malattia cardiovascolare aterosclerotica e dopo varie procedure interventistiche cardiovascolari. L'ipersensibilità all'ASA, raramente causata da vera allergia, è una condizione con prevalenza non trascurabile nella popolazione e con importanti implicazioni terapeutiche. Diversi protocolli di desensibilizzazione ad ASA sono stati descritti. Tuttavia, la durata e la complessità organizzativa di questi ultimi ne hanno ampiamente limitato la diffusione, rendendo frequentemente l'ipersensibilità all'ASA un problema clinicamente rilevante.

Materiali e Metodi: Presentiamo qui l'esperienza sulla desensibilizzazione di sei pazienti consecutivi, giunti alla nostra attenzione per sindrome coronarica acuta senza sopraslivellamento del tratto ST (1), pervietà del forame ovale con indicazione alla chiusura percutanea per recente ictus di origine cardio-embolica (1), sindrome coronarica cronica con indicazione ad angiografia coronarica elettiva per evidenza di severa ischemia miocardica inducibile (3), fibrillazione atriale parossistica con indicazione a chiusura percutanea dell'auricola sinistra per recente ictus emorragico (1). I pazienti presentavano in anamnesi pregresse reazioni avverse all'assunzione di ASA, principalmente caratterizzate da coinvolgimento cutaneo con quadri di orticaria acuta.

Previa acquisizione del consenso informato, i pazienti, edotti sui rischi correlati alla procedura, sono stati sottoposti alla desensibilizzazione secondo protocollo rapido, modificando e semplificando quello precedentemente proposto da Rossini et al. (Circ Cardiovasc Interv 2017 Feb;10(2):e004368).

Risultati: I sei pazienti sottoposti alla procedura non hanno manifestato reazioni avverse durante o al termine della procedura di desensibilizzazione, venendo pertanto ritenuti idonei alla somministrazione del principio attivo. Dopo aver terminato l'iter diagnostico e terapeutico, i pazienti sono stati dimessi al domicilio in buone condizioni cliniche, asintomatici ed in buon compenso emodinamico, in assenza di eventi avversi e con prescrizione domiciliare di ASA. Al momento non sono state segnalate sensibilizzazioni ritardate all'ASA.

Conclusioni: La nostra esperienza dimostra la sicurezza e l'efficacia del protocollo di desensibilizzazione rapida all'ASA. La standardizzazione di un protocollo nel mondo reale e nei percorsi terapeutici agevolerebbe di gran lunga la gestione di casi allo stato attuale complessi, garantendone l'impiego su più larga scala e fornendo ai medici, e di conseguenza ai pazienti, uno strumento terapeutico fondamentale nel trattamento di numerose patologie cardiovascolari.



FARMACI CARDIOVASCOLARI E NUTRACEUTICI 127

FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

EARLY LDL-C REDUCTION WITH INCLISIRAN IN A REAL LIFE POPULATION

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Background: Atherosclerotic Cardiovascular disease remains the leading cause of morbidity and mortality worldwide. Atherosclerotic plaque formation has been correlated with elevated levels of LDL-cholesterol. According to ESC/EAS guidelines, reduction of LDL-C levels below a certain threshold leads to a decrease in atherosclerotic cardiovascular events. Several studies have shown a gap between LDL-C goals described in guidelines and target achievement in daily practice. Multiple causes exist for the missed target, among which nonadherence, intolerance to statin therapy and under use of novel therapeutic strategies.

Inclisiran is a small interfering RNA able to prevent Proprotein Convertase Subtilisin/Kexin type 9 (PCSK9) translation in hepatocytes and leading to sustained reductions LDL-C in large randomized controlled trials, however real-world data of its use are limited, particularly its efficacy in the very short-term period.

Methods: In this observational, single-center, retrospective cohort study we enrolled patients affected by dyslipidemia and unable to achieve their LDL-C target despite a maximum tolerated oral lipid-lowering therapy (LLT) or intolerant to statins. Inclisiran was administered as a subcutaneous injection of 284 mg. Blood samples with lipid profile were taken at

baseline (before the injection) and then one week and one month after Inclisiran administration. We evaluated LDL-C target achievement within one month after first administration (primary endpoint) and the rate of LDL-C reduction in the same period (secondary endpoint).

Results: A total of 33 patients were enrolled, two of them were excluded from data analysis because of statin therapy modification or discontinuation during follow-up. At a median follow-up of 32 days, 21 (67.7%) patients reached their LDL-C target according to the ESC/EAS 2019 guidelines (primary endpoint). At 7 days after Inclisiran injection LDL-C mean value decreased to 97.9 ± 53.6 mg/dl ($p < 0.001$), with a reduction of 29.9 ± 20.6 %. At 32 days LDL-C mean value was 58.5 ± 42.8 mg/dl ($p < 0.001$), with a reduction of 56.9 ± 20.9 % (secondary endpoint). There were no serious side effects reported during follow-up.

Conclusion: In a real-life population Inclisiran allowed a safe achievement of LDL-C target in two-thirds of patients within one month, and with a significant reduction of LDL-C serum levels already in the early days after the first administration. This data is consistent with that observed in large RCTs.

**FARMACI CARDIOVASCOLARI E NUTRACEUTICI 1
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
NUTRACEUTICI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)**

**THE LIPID-LOWERING EFFICACY OF A NUTRACEUTICAL COMBINATION INCLUDING LEUCOSELECT
PHYTOSOME, RED RICE, POLICOSANOL AND FOLIC ACID IN DYSLIPIDAEMIA PATIENTS:
REAL-WORLD INSIGHTS**

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Background: Cardiovascular disease is a global health concern and reducing plasma LDL-C levels is a major goal in cardiovascular prevention. Our study aimed to evaluate the effectiveness of a nutraceutical formulation including leucoselect® phytosome®, red yeast rice, policosanol and folic acid on LDL-c levels in patients at low cardiovascular risk with dyslipidemia.

Materials and Methods: We prospectively enrolled all consecutive patients with dyslipidemia at low cardiovascular risk who were unresponsive to diet and physical activity. Clinical assessments and laboratory analyses, encompassing lipid profile, hepatic function, and CPK levels, were performed at baseline prior to initiating treatment and repeated at the 12-week mark following administration of the study nutraceutical.

Results: Sixty (60) consecutive patients (mean age 48.02 ± 10.1 years; 60% male) were included. At the 12-week follow-up, a statistically significant reduction in Total Cholesterol (13.1%) and LDL-c serum level (20.4%) was observed. Hepatic and muscular function remain stable over the time. The adherence to therapy was 99% and the persistence was maximum.

Discussion: The main findings of the present study are as follows: the use of a nutraceutical formulation including leucoselect® phytosome®, red yeast rice, policosanol and folic acid determines a significant reduction of 20% in the LDL-C serum level among patients at low cardiovascular risk with dyslipidaemia not responsive to diet and physical exercise; 75% of treated patients achieved the LDL-C therapeutical level within 12 weeks of treatments. The use of this novel nutraceutical combination is safe and well-tolerated in a real-world setting and it is characterized by maximum persistence and high adherence. A pleiotropic effect on inflammatory biomarkers has been shown.

Conclusions: The nutraceutical formulation including leucoselect® phytosome® red yeast rice, policosanol and folic acid significantly reduced the LDL-c plasma levels, consistent with previous research showing that the bioactive component in red yeast rice—lovastatin—is effective in addressing problems with lipid metabolism. Importantly, it was safe and well-tolerated among patients with dyslipidemia in a real-world setting.



CardioSic

The background features a large, stylized graphic of a heart and a DNA double helix. The heart is rendered in shades of red and pink, while the DNA helix is in shades of blue and teal. The graphic is semi-transparent and occupies the right side of the page.

85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

GENETICA E BIOLOGIA MOLECOLARE

GENETICA E BIOLOGIA MOLECOLARE 229
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

LUMICAN INHIBITS CARDIAC ANGIOGENESIS

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The mammalian heart loses its ability to regenerate within the first week after birth, coinciding with a reduction in its capacity for angiogenesis. Although numerous studies have focused on the changes in cardiac cells, particularly cardiomyocytes, that may be responsible for this loss of regenerative ability, the role of the extracellular matrix (ECM) in regulating cardiac regeneration and angiogenesis remains largely unexplored. Therefore, our study aims to investigate the alterations in cardiac ECM shortly after birth and evaluate their impact on the loss of angiogenic potential in the postnatal heart. We conducted a proteomic analysis of vascular cells and the surrounding ECM in neonatal and adult hearts. To label proteins accessible from the cardiac vasculature *in vivo*, we perfused neonatal and adult hearts with a biotin-containing solution. The hearts were then homogenized, and biotinylated proteins were enriched using streptavidin-conjugated beads for identification through mass spectrometry. Bioinformatic analysis revealed a list of proteins differentially expressed in the vessels of neonatal and adult hearts. Lumican, a small leucine-rich proteoglycan produced by fibroblasts, was found to be significantly enriched in the adult vasculature. We noted that Lumican isoforms had a higher molecular weight

in the adult heart compared to the neonatal heart. To determine whether the differential glycosylation of Lumican in neonatal and adult hearts affects the organ's angiogenic potential, we purified Lumican directly from tissues via immunoprecipitation with magnetic beads and tested its impact on angiogenesis. Adult or neonatal lumican was incorporated into collagen gels and used as a seeding substrate for cardiac endothelial cells (ECs). We observed that ECs seeded on adult lumican proliferated significantly less than those seeded on either neonatal Lumican or pure collagen, which is consistent with reduced MMP-14 activity, a key target for Lumican, in the adult heart. *In vivo* Lumican knockout in mice led to a significant increase in both endothelial cell numbers and vessel density in the heart, indicating that adult lumican inhibits cardiac angiogenesis. Injection of siRNA targeting Lumican after myocardial infarction in adult mice resulted in an increased rate of endothelial cell proliferation and new blood vessel formation. Overall, our findings identify Lumican as a negative regulator of cardiac angiogenesis in the adult mammalian heart and suggest new therapeutic strategies targeting Lumican and its post-translational modifications to enhance cardiac revascularization.



GENETICA E BIOLOGIA MOLECOLARE 880
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

MODELING TITIN-DILATED CARDIOMYOPATHY THROUGH GENETICALLY ENGINEERED HUMAN HEART TISSUES

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Introduction. Dilated cardiomyopathy (DCM) is a leading cause of heart failure and sudden cardiac death, with titin-truncating variants (TTNtv) being the most common genetic cause, representing approximately 25% of familial DCM cases. Despite progress in genetic understanding, the molecular mechanisms driving TTNtv-mediated DCM remain poorly understood, requiring advanced models for further investigation.

Purpose. This study aims to generate patient-specific human induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs) to model TTNtv-induced DCM, providing a comprehensive molecular characterization, and evaluating potential therapeutic approaches using engineered heart tissue (EHT) models.

Methods. hiPSC-CMs were generated from a patient-specific cell line (TTN03) carrying a TTNtv (57847+4 delGTAA). Molecular characterization was performed through immunostaining, proliferation assays, and signaling pathway dissection using AAV6-fluorescent

reporters, activated downstream the NOTCH, YAP, and WNT transcriptional activators. Western blot and RT-PCR analyses were conducted to assess titin expression and post-transcriptional regulation. EHTs were created to evaluate contractile performance, cell proliferation, and mechanical properties.

Results. Immunostaining revealed disassembly of sarcomeric structures in TTN03 hiPSC-CMs, with reduced expression of both titin and α -actinin compared to healthy controls. Proliferation assays showed significantly reduced EdU incorporation in TTN03 cells. Activation of both NOTCH and YAP signaling pathways were significantly increased in TTN03 cells, compared to healthy donor hi-PSCs, suggesting a key role of TTN in modulating cell cycle re-entry. Western blot and RT-PCR analyses indicated a marked reduction of the wild-type protein, suggesting post-transcriptional regulation of titin. EHT analysis demonstrated increased contractile force and frequency in TTN03 hiPSC-CM-derived tissues, alongside decreased proliferative capacity.

Conclusions. Our patient-specific hiPSC-CM and EHT models successfully replicate key aspects of TTNtv-associated DCM, including sarcomeric disruption and altered contractility. The activation of NOTCH and YAP pathways in TTN03 cells highlights potential

mechanistic contributors to the disease phenotype. These models provide a valuable platform for dissecting the molecular mechanisms of TTNtv-mediated DCM and for testing potential therapeutic interventions.



GENETICA E BIOLOGIA MOLECOLARE 244
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

ENDOTHELIAL DYSFUNCTION IN DUCHENNE MUSCULAR DYSTROPHY: INSIGHTS FROM HIPSC-DERIVED ENDOTHELIAL CELLS

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Introduction: Duchenne Muscular Dystrophy (DMD) is a severe X-linked recessive neuromuscular disease affecting 1 in 3,500 to 5,000 male newborns. The disease is characterized by a lack of dystrophin, which leads to progressive skeletal and cardiac muscle degeneration, often resulting in heart failure and death by the second or third decade of life. While the effects of dystrophin deficiency in cardiomyocytes in DMD-associated cardiomyopathy are well-characterized, endothelial dysfunction remains unexplored. This study aims to investigate the endothelial contribution to DMD cardiomyopathy using human induced pluripotent stem cell (hiPSC)-derived endothelial cells (ECs).

Methods: We generated and validated a hiPSC line from a 43-year-old male DMD patient with deletions in exon 49 and 50, and an isogenic control line, corrected through gene editing. These hiPSCs lines were differentiated into ECs and enriched by CD34-selection. Differences in gene expression were investigated by RNA Seq and proteomic analysis. To characterize EC phenotype, we evaluated the expression of endothelial (CD31, vWF, VECADH, KDR and VEGF), inflammatory (TFG- β , IL-1 β , IL-6, ACE1, TNF- α , and IP10), oxidative stress (ROS production, SOD1, Nox4 expression) and nitric oxide (NO) production (NOS3, eNOS and P-eNOS) markers by qPCR, western blot, FACS, proteome profiler and IF-staining. Finally, we assessed

whether DMD1-ECs affect cardiomyocyte phenotype and function in a 3D engineered heart tissue (EHT) model.

Results: RNA sequencing revealed 67 differentially expressed genes, while proteomic analysis highlighted dysregulation in cell stress and angiogenesis pathways. DMD1-ECs exhibited significant upregulation of CD31 and vWF compared to controls, suggesting endothelial dysfunction. Inflammatory markers TNF- α , IL-1 β , TFG- β , and IP10 were significantly elevated in DMD1-ECs, indicating a pro-inflammatory phenotype. ROS production was higher, with downregulated Nox4 and upregulated SOD1 expression. NO production was significantly reduced in DMD1-ECs, with a notable decrease in eNOS and P-eNOS expression. When challenged mechanically, DMD1-EC exhibited altered nuclear morphology. Finally, incorporating DMD1-ECs into EHTs resulted in reduced contraction force and shorter relaxation time.

Conclusion: Our findings demonstrate significant endothelial dysfunction in DMD hiPSC-derived ECs, characterized by pro-inflammatory, oxidative stress, and impaired NO synthesis phenotypes. This dysfunction likely contributes to the pathogenesis of DMD cardiomyopathy, paving the way for targeted endothelial therapies.

GENETICA E BIOLOGIA MOLECOLARE 285
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

CIRCULATING SMALL NUCLEOLAR RNA SNORD3A: A NOVEL DIAGNOSTIC BIOMARKER AND POSSIBLE THERAPEUTIC TARGET FOR MYOCARDIAL ISCHEMIA

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Background: Heart failure (HF) is a leading cause of death worldwide and, despite optimal therapy, it remains a relentless and deadly disease. Human cardiac biopsies are invaluable resources for identifying cardiac signaling pathways, however blood fractions and peripheral blood mononuclear cells (PBMCs) could be used as a source of surrogate biomarkers of signaling pathway activation in human heart failure.

Purpose: In the present study we aimed to identify novel circulating biomarkers mirroring human myocardial signaling in HF and to study the role played by small nucleolar RNA SNORD3A in cardiomyocyte survival and death.

Methods: RNA sequencing (RNASeq) analysis was performed in paired human myocardial left ventricle (LV) and PBMC samples obtained from heart failure patients (n = 8) and healthy subjects (n = 2). Five identified transcripts, KCNQT1, MIAT, SCR1, MALAT1, and SNORD3A, were then validated by real-time quantitative PCR in PBMC and LV.

Next, HF was induced in 8-week-old wild-type C57BL/6 mice by transverse aortic constriction (TAC, n = 6) and myocardial infarction (MI, n = 25). Sham-operated (sham) mice were used as controls (n = 10). Cardiac function was analyzed by echocardiography and LV and PBMC samples were collected after sacrifice, specifically after 12 weeks of TAC, while in MI a time course of 3 hours, 24 hours, 3 days, 1 week and 4 weeks was performed. To further investigate the role of SNORD3A in

cardiomyocyte function and survival, SNORD3A antisense oligonucleotides (SNOaso) and scramble control sequences (GFPaso) were synthesized and tested in H9C2 cardiomyoblast cells under normoxic or hypoxic conditions to evaluate SNORD3A transcription levels, cell death by Annexin V assay, and protein synthesis by incorporation of puromycin into cells.

Results: SNORD3A expression was significantly increased in both LVs and PBMCs of heart failure patients compared to control subjects. Similarly, in the mouse model of HF, SNORD3A levels were increased in both hearts and PBLs of TAC mice compared to sham mice. Three days after MI, SNORD3A levels increased in the heart, whereas in PBMCs SNORD3A levels increased after 24-hour-MI. In vitro hypoxia significantly increased SNORD3A expression levels in H9C2 cells, compared to normoxia, and SNOaso transfection reduced SNORD3A transcripts under basal conditions and after 3-h hypoxia. Depletion of SNORD3A levels increased cardiomyocyte death and reduced protein synthesis in H9C2 cells.

Conclusion: Our results show that in humans, mouse models, and in vitro, SNORD3A is upregulated by hypoxia or HF, and its silencing induces cell death and reduces protein synthesis. Upregulation of SNORD3A in PBMCs largely couples its regulation in myocardial samples, suggesting that it may represent a possible novel biomarker in heart failure.



GENETICA E BIOLOGIA MOLECOLARE 247

GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

MOLECULAR AUTOPSY IN SUDDEN CARDIAC DEATH: CONCLUSION OF "COLD- CASES"

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(a) DIPARTIMENTO DI SCIENZE CARDIO-TORACO-VASCOLARI E SANITÀ PUBBLICA, UNIVERSITÀ DEGLI STUDI DI
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Sudden cardiac death (SCD) occurs within an hour of symptomatology in an apparently healthy individual and is a traumatic event for families. Non-ischaemic structural heart diseases and channelopathies, which are partly genetically driven, account for a high proportion of SCD. The incidence of this event in adolescents and young adults (< 35 years) is 1:100,000 per year. With no past medical history and no, or only minor, non-diagnostic findings at autopsy, the role of genetic analysis is of utmost important in risk stratification and might reveal disease in primary electrical diseases in up to 40% of individuals, but DNA of sufficient quality is one of the biggest challenges in this setting. In this study, 88 SCD patients after autopsy evaluation underwent Whole Exome Sequencing (WES). Variant prioritization and classification were performed following current guidelines of American

College of Medical Genetics and Genomics. DNA was extracted from blood (n=57) or from formalin-fixed paraffin-embedded (FFPE) tissue (n=27) (average FFPE time = 8.8 years). Genetic variants in genes associated with inherited cardiomyopathies were identified in 40 cases (45%). Among them, only 14 were classified as P/LP (positivity rate 16%). Of note, 57% of P/LP genetic variants (n=8) were identified in FFPE sub-cohort, resulting in a positivity rate of 30%. Identifying the genetic cause in SCD leads to a more accurate diagnosis, it is important for the family in aiding closure and it is a marker to determine the risk of SCD in living relatives. Successful DNA isolation from SCD FFPE samples can guarantee quality genetic evaluation and may contribute significantly in the conclusion of "cold cases" molecular autopsy.

GENETICA E BIOLOGIA MOLECOLARE 315
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

**ATAXIA TELANGIECTASIA MUTATED: A NOVEL MODULATOR OF LIPID AND GLUCOSE METABOLISM,
 PREVENTING PATHOLOGICAL CARDIAC REMODELING AND FUNCTION**

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Background: Post-mitotic cells such as cardiomyocytes cannot repair DNA lesions with DNA replication, so they use for their survival efficient sensors and effectors that orchestrate DNA damage response (DDR). Ataxia Telangiectasia Mutated (ATM) protein kinase is the most important sensor of oxidative stress and DNA damage response (DDR), but the precise mechanisms underlying ATM functions in the heart remain largely unclear.

Purpose: We hypothesised that ATM might control and regulate energy metabolism in the heart under stress, to promote DNA repair.

Methods: We analyzed the effects of ATM inactivation on cardiomyocyte hypertrophy, cardiac function, DDR and metabolism in heart from ATM-mutated mice (*Atm*^{-/-}) and their respective wild-type littermates (*Atm*^{+/+}) under sham conditions or after pressure overload by transverse aortic constriction (TAC). Targeted metabolomic analyses were performed to assess free carnitine and acylcarnitines, pyruvate and lactate levels in the serum and in heart tissues using LC-MS/MS or GC/MS. We have also analysed the pyruvate dehydrogenase (PDH) activity by using a colorimetric assay kit in H9C2 cell line, which was stimulated by

KU-55933 (KUDOS 10 μ M) for 24 hours, which is an inhibitor of ATM and then by etoposide (25 μ M) for 1 hour.

Results: ATM inactivation in *Atm*^{-/-} mice induced cardiomyocyte hypertrophy, fetal gene expression re-activation and a specific metabolomic signature in

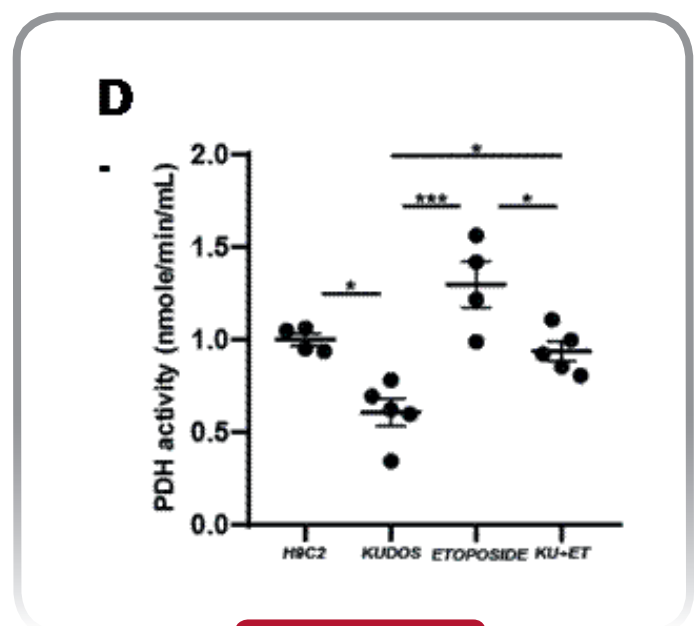


Figure 1

the heart, characterized by significant accumulation of pyruvate, branched chain amino-acids, short-medium acyl-carnitines and metabolites of tricarboxylic acid cycle. The levels of the glycolytic enzymes, hexokinase-2 (HK2) and phosphofructokinase (PFK), were elevated. Pyruvate was trapped in the cytosol because mitochondrial carriers were suppressed and the enzymes that process pyruvate were dysregulated. The PDH activity was reduced after inhibition by KUDOS in H9C2 cell line. Because of pyruvate metabolic block, fatty acids oxidation was inefficient and resulted in the accumulation of acyl- carnitines and insulin resistance.

These metabolic changes were amplified by TAC, which rapidly induced heart failure in *Atm*^{-/-} mice. These results demonstrate that ATM rewires the metabolism of cardiac cells by inducing glycolysis and fatty acids oxidation. ATM stimulates glycolysis to repair DNA lesions and protect the heart against stress-induced dysfunction.

Conclusion: Our data show that ATM regulates the levels of critical enzymes involved in pyruvate metabolism in the heart. The metabolic block due to ATM inactivation accelerates heart failure.



GENETICA E BIOLOGIA MOLECOLARE 875
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

TITIN REGULATES CARDIOMYOCYTE PROLIFERATION

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 Rossella Cannilla (a, b, d), Ilaria Secco (c), Antonio Mura (b), Moimas Siliva (b), Chiara Collesi (b, d),
 Gianfranco Sinagra (a, d), Matteo Dal Ferro (a), Mauro Giacca (b, c, d)

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Introduction: Sarcomere disassembly is an essential step to progress towards mitosis and cytokinesis in cardiomyocytes (CMs). Integrity of sarcomere structure depends on integrity of the giant protein titin, the largest protein encoded by the human genome. Notably, heterozygous truncating variants (tv) in the Titin gene (TTN) are the most frequent genetic cause of dilated cardiomyopathy (DCM), one of the main causes of heart failure.

Aim: This study explores titin's role in the control of CM proliferation, assuming that this protein might be involved in the regulation of cell cycle progression. This, in turn, may contribute to DCM development.

Materials and methods: We developed an AAV9 vector expressing an shRNA that downregulates titin in CMs and administered this vector to neonatal and adult CD1 mice. An shRNA targeting luciferase was used as a control. Animals were monitored by echocardiography and CM proliferation was investigated by immunofluorescence or using a genetic reporter system that genetically labels proliferating CMs (the CycleTrack system). Titin downregulation in vitro was obtained using a panel of siRNAs that target different regions of the protein. Titin expression levels were assessed by qPCR and specific antibodies, while signal transduction was explored using transcriptomics, immunoblotting, and microscopy.

Results: Titin downregulation in neonatal mice resulted in the development of severe DCM and animal death. On the contrary, titin downregulation in adult mice resulted in the development of an opposite cardiac phenotype with a massive increase in LV wall thickness. CMs were not hypertrophic (normal cross-sectional area). In contrast, they showed increased proliferative activity (increase in EdU+, S-phase cells and PH3+, G2/M cells), which led to cardiac hyperplasia. The CycleTrack system confirmed proliferating CMs through labelling of G2/M phase of the cell cycle: the number of fluorescent CMs was markedly increased in the treated adult animals. Transcriptomic analysis in neonatal mice showed an immature transcriptomic profile with a delay in the cardiac differentiation process, while that in adult mice exhibited a pro-proliferative profile accompanied by modulation of the YAP pathway and of genes involved in cytoskeletal reorganization. In primary neonatal CMs, siRNA-mediated downregulation of both Titin isoforms increased cardiomyocyte proliferation. As assessed using a TEAD-GFP reporter system, this correlated with YAP pathway activation.

Conclusions: Reduction in total Titin levels drives sarcomere remodelling and adult CMs re-entry into the cell cycle. Marked cardiac TTN downregulation in adult mice does not recapitulate the DCM phenotype due to TTNtv in humans.



GENETICA E BIOLOGIA MOLECOLARE 935 ARITMIE VENTRICOLARI (ARITMIE) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

APPROCCIO TIPO "GENOTYPE FIRST" PER LA PREDIZIONE DI ARITMIE VENTRICOLARI NELLA POPOLAZIONE UK BIOBANK

Ilaria Gandin (b), Andrea Mario Vergani (d), Alessia Paldino (a), Martina Setti (c), Maria Perotto (a), Maddalena Rossi (a), Michela Carlotta Massi (d), Emanuele Di Angelantonio (d), Giulia Barbati (b), Matteo Dal Ferro (a), Gianfranco Sinagra (a), Francesca Ieva (d)

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Background: Le varianti patogeniche (P) e probabilmente patogeniche (LP) nei geni associati a cardiomiopatie (dilatative -DCM- e non dilatate del ventricolo sinistro -NDLVC-), sono sempre più comunemente identificate come secondary findings (SF) di test genetici nella popolazione generale. La penetranza di malattia e soprattutto il rischio aritmico ventricolare associato a queste varianti nei portatori asintomatici, tuttavia, sono ancora poco definiti, complicando la gestione clinica e la stratificazione del rischio. Questo studio utilizza i dati di UK Biobank (UKB) per valutare, nella popolazione generale, l'impatto prognostico di varianti P/LP in geni cardiomiopatici sul rischio aritmico.

Methods: Abbiamo analizzato 469,671 partecipanti UKB con dati whole exome sequencing (WES) per identificare: 1) il numero di soggetti portatori di varianti P/LP nei geni validati per DCM e NDLVC e la penetranza fenotipica (in termini di percentuale di diagnosi di DCM); 2) il profilo prognostico per eventi aritmici ventricolari maggiori (MVA) rispetto ai non portatori.

Results: In UKB, 7,423 soggetti (1,6%) sono risultati portatori di varianti P/LP in geni validati per DCM e

NDLVC. L'incidenza di carriers è significativamente più bassa nella popolazione UKB rispetto alla popolazione di controllo di GnomAD (v2.1, Non Finnish European), confermando l'healthy bias di UKB. Tra i portatori, la diagnosi di DCM è bassa (0,7%) ma maggiore rispetto ai non portatori (0,3%). In un follow up mediano di 14 aa (IQR 13-15), portatori di varianti hanno mostrato un rischio aumentato di MVA (HR 1,25; $p < 0,02$) rispetto ai non portatori.

Conclusioni: Il genotipo positivo per varianti P/LP nei geni validati per DCM e NDLVC è un predittore indipendente di rischio per MVA anche in una popolazione generale (relativamente depleta di genotipi cardiomiopatici). Sebbene la penetranza delle varianti (misurata in termini di diagnosi codificate DCM) sia, come noto, bassa, l'associazione con gli eventi aritmici indica che le varianti hanno comunque un effetto. Questi risultati migliorano la comprensione del rischio associato a varianti genetiche identificate come SFs, supportando l'uso di un approccio "gene first" per una stratificazione del rischio più accurata nei portatori asintomatici e rafforzando l'importanza del follow-up clinico.

GENETICA E BIOLOGIA MOLECOLARE 117
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

AUTOSOMAL RECESSIVE HYPERTROPHIC CARDIOMYOPATHY ASSOCIATED WITH TRIM63 HOMOZYGOUS AND COMPOUND HETEROZYGOUS VARIANTS

Adelaide Ballerini (a), Francesca Girolami (a), Gozzini Alessia (a), Silvia Passantino (b), Mattia Zampieri (b), Alberto Marchi (b), Alessia Tomberli (b), Giovanni Battista Calabri (b), Gaia Spaziani (b), Giulio Porcedda (b), Elena Bennati (b), Silvia Favilli (b), Iacopo Olivotto (b, c)

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(b) CARDIOLOGY UNIT, MEYER CHILDREN'S HOSPITAL IRCCS, FLORENCE, ITALY; (c) DEPARTMENT OF EXPERIMENTAL AND CLINICAL MEDICINE, UNIVERSITY OF FLORENCE, FLORENCE, ITALY

Background: Hypertrophic cardiomyopathy (HCM) was traditionally described as an autosomal dominant Mendelian disease caused by variants in sarcomere genes. The genetic analysis, allows the identification of a disease-causing variant in approximately 30% of sporadic and 60% of familial cases. Recently, variants in several additional genes, encoding non-sarcomeric proteins (ACTN2, ALPK3, CSRP3, FHOD3, FLNC, JPH2, KLHL24, PLN and TRIM63), have been shown to

be disease-causing in a small number of patients. Specifically, TRIM63 gene, encoding Muscle-specific Ring-Finger protein 1 (MuRF1), a member of ubiquitin ligases subfamily, has been described with robust autosomal-recessive association with HCM.

Aim of the study: Since HCM is associated with rare genetic variants with limited data about its clinical course and prognosis, we investigated the genotype-phenotype correlations between TRIM63 variants and patients' clinical features.

Materials and Methods: After genetic counselling, genetic testing was performed by Next Generation Sequencing in 517 adult index cases with HCM.

Results: Causative variants in TRIM63 were identified in four HCM patients (two homozygous and two compound heterozygous variants) (Figure). All patients, with early onset HCM, showed severe hypertrophy, extensive fibrosis, frequent left ventricular systolic dysfunction and an end-stage form, leading to eligibility for cardiac transplant, was found in one patient. All heterozygous family members were found to be healthy.

Conclusions: TRIM63 variants appear to be an uncommon cause of HCM with an autosomal-recessive inheritance (<1%) and are associated with severe hypertrophy, early onset HCM and a high rate of left ventricular systolic dysfunction. Despite the small number of cases described, peculiar characteristic features of the disease could distinguish this form from the classical sarcomeric phenotype. In conclusion, homozygous or compound heterozygous TRIM63 patients are at higher risk of adverse events and the identification of an autosomal recessive form of HCM can impact genetic counselling as well as the clinical management.



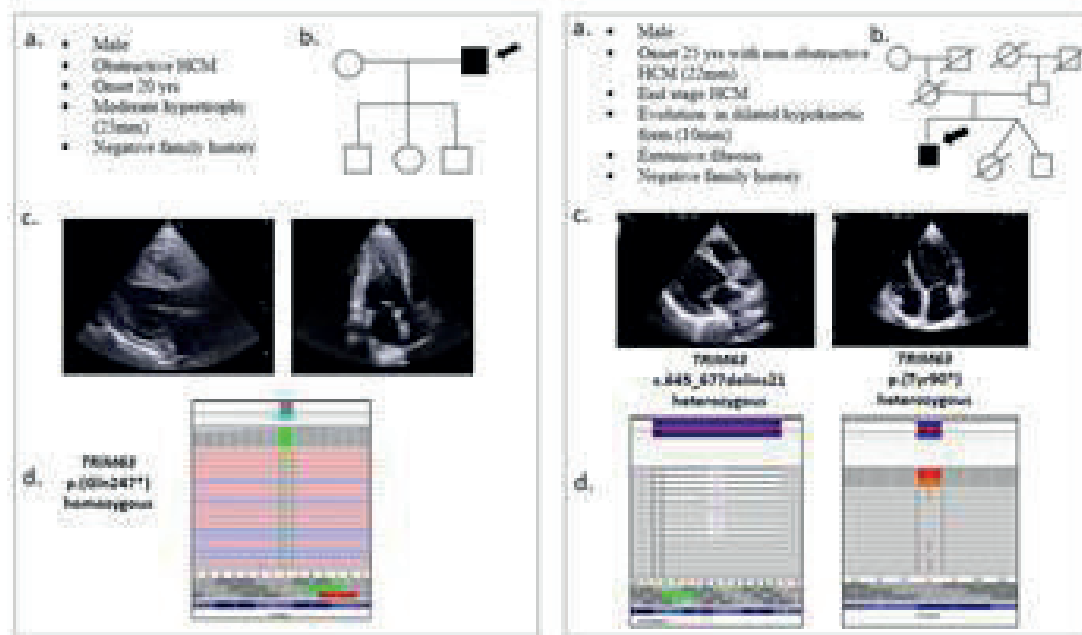


Figure. Two HCM patients (case 2 and case 4) with variants in TRIM63
 a. Patients clinical features b. Pedigree c. Echocardiogram d. IGV visualization of TRIM63 variants

Figure 1

GENETICA E BIOLOGIA MOLECOLARE 258
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

MITOCHONDRIAL A KINASE ANCHOR PROTEIN 1 (AKAP1) PRESERVES GUT BARRIER INTEGRITY AND PROTECTS THE HEART DURING AGEING

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(b) DIPARTIMENTO DI FARMACIA UNIVERSITÀ DEGLI STUDI DI DANPOLI FEDERICO II ; (c) DIPARTIMENTO DI BIOLOGIA UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II ; (d) DIPARTIMENTO DI MEDICINA MOLECOLARE E BIOTECNOLOGIE MEDICHE UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

Background: Several members of the large family of mitochondria A kinase anchor proteins (mitoAKAPs) locally amplify cAMP/PKA signaling to mitochondria. Mitochondrial dysfunction and oxidative stress are involved in aging and regulation of intestinal barrier function and microbiota composition, the role of mitoAKAPs during aging is still poorly understood.

Purpose: The purpose of this study was to determine the role of mitoAKAPs in the gut-heart axis during cardiovascular aging.

Methods: Young (4-6-month-old) and old (18-24-month-old) genetically modified Akap1^{+/+} and Akap1^{+/-} mice of either sex underwent evaluation of cardiac function by transthoracic echocardiography. To evaluate the integrity of the intestinal barrier, we analyzed the expression levels of the intestinal junction proteins occludin (Ocln) and zonulin (Tjp1) in colon samples. To study intestinal permeability in vivo, we analyzed circulating levels of FITC D4000 dextran (D) after oral gavage administration in all experimental groups. We also assessed circulating levels of Tumor Necrosis Factor-alpha (TNF-alpha), lipopolysaccharide (LPS), interleukin-1 (IL-1), and interleukin-10 (IL-10). Fecal microbiota transplantation (FMT) was performed for five weeks to test whether changing the composition of the gut microbiota could influence cardiac function

and intestinal integrity. Moreover, LEfSe was used to find significant bacteria associated with each group of animals, and we performed an untargeted metabolomic profiling analysis of the heart and serum conducted by Metabolon Inc.

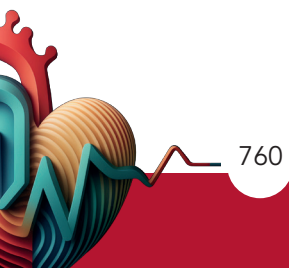
Results: A reduction in left ventricular shortening percentage (FS%) was observed in 6 and 24 m Akap1^{+/-} mice compared to Akap1^{+/+} mice compared to age-matched Akap1^{+/+} mice. This result was associated with an increase in intestinal permeability, in fact in young Akap1^{+/-} mice reduced levels of Ocln and Tjp1 in the colon, increased intestinal permeability to FITC-dextran, increased circulating levels of LPS, TNF-alpha were observed, IL-1 that reduced IL-10 levels. FMT of fecal bacterial species from old Akap1^{+/-} mice to young Akap1^{+/+} mice induced intestinal abnormalities and cardiac dysfunction, while FMT from young Akap1^{+/+} donors improved cardiac dysfunction in old Akap1^{+/-} mice. Compositionally distinct metacommunities were found in Akap1^{+/-} mice with a more severe degree of microbiota alteration in the old mice subgroup. Analysis comparing FMT-treated mice to those that received vehicle showed specific taxa that failed to engraft in the transplanted mice while others thrived. Metabolomics studies revealed a genotype-dependent effect in the hearts and serum of the study groups. We observed increased sphingosine-1-phosphate (S1P)



and phenylacetylglycine (PAG) in the heart and serum in aged mice, and their levels were modulated by genotype and age.

Conclusions: MitoAKAPs play a crucial role in

modulating cardiac and gut function during aging. Modulation of gut microbiota composition influences intestinal permeability and cardiac function. MitoAKAPs could represent an important diagnostic and therapeutic target for cardiac and intestinal dysfunction.



GENETICA E BIOLOGIA MOLECOLARE 864
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

INDUCED PLURIPOTENT STEM CELL-DERIVED CARDIOMYOCYTES

Rossella Cannilla (b, e), Rebecca Artioli (b, e), Simon Cotič (b, e), Matteo Maria Riccio (b, e), Alessia Paldino (d), Maria Perotto (a, d), Francesca Bortolotti (a, b), Antonio Mura (b), Marco Merlo (a, d), Matteo Dal Ferro (d), Mauro Giacca (c), Gianfranco Sinagra (a, d), Chiara Collesi (a, b)

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Introduction. Dilated cardiomyopathy (DCM) can have a familial predisposition, often involving mutations in genes that are critical for the structure and function of heart muscle cells. Variants in sarcomeric, cytoskeletal, and desmosomal proteins **as well as in ion channels have been associated with the disease.** Less common are variants of Z disc proteins, such as Nexilin. Nexilin is a protein that plays a crucial role in maintaining the structural integrity of cardiac and skeletal muscle cells. It is an actin-binding protein, located in the Z-disc of the sarcomere, performing a critical role in connecting actin filaments to the plasmalemma and ensuring the structural integrity of the Z-disc during the repetitive contraction and relaxation cycles of the heart. In DCMs associated with NEXN described variants, the destabilization of the Z-disc due to defective nexilin results in impaired force transmission during systole, leading to progressive weakening of the heart, dilation of the ventricles, and eventually heart failure.

Purpose. The aim of this project is to characterize cardiac models of DCM, generated through human

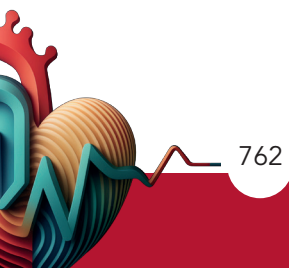
induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs), from patients carrying NEXN truncating variants from the Trieste's Heart Muscle Disease Registry of Trieste, providing a comprehensive molecular characterization, and to evaluate potential therapeutic approaches using engineered heart tissue (EHT) models.

Methods. A combination of molecular biology, histological, and genetic techniques were used to model NEXN-tv induced DCM. Following successful setting-up of hiPSC-CM differentiation in our laboratory, we proceeded with the in vitro characterization of the NEXN 1384_1387del variant. Upon expression from AAV6 vectors, we identified the cellular localization of the wt and mutant isoforms by Immunostaining, their homo/ heterodimerization in the Z disk, a poisoning effect of the truncated isoform towards the wt protein function and an alteration in the interacting molecular partners at the cytosolic level. Intracellular signalling pathway dissection was performed using AAV6-fluorescent reporters, specifically activated downstream the NOTCH, YAP, and WNT proteins.



Results. Overexpression of the NEXN1384_1387del variant in hi-PSC-CMs induced a partial disassembly of actin filament network and a net destabilization of the Z disc structure, resulting in weakened cellular integrity and involution of the sarcolemma.

Conclusions. Our patient-specific hiPSC-CMs successfully replicate key aspects of NEXNtv-associated DCM, including sarcomeric disassembly, increased fibrosis and altered contractility. These models provide a valuable platform for dissecting the molecular mechanisms of NEXNtv-mediated DCM and for testing potential therapeutic interventions.



GENETICA E BIOLOGIA MOLECOLARE 300
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

MECHANICAL LOAD REGULATES PROLIFERATION OF MULTIPLE CELL TYPES IN THE HEART

Giulio Ciucci (a), Daniela Lorizio (h), Andrea Colliva (a), Nicoletta Bartoloni (a), Simone Vodret (a), Anh-vu Nguyen (b), Bernhard Texler (b), Benno Cardini (b), Sofia Bindelli (a), Ilaria Del Giudice (a), Roman Vuerich (a), Samuel Wall (g), Henrik Nicolay Finsberg (g), Mattia Chiesa (h), Rossana Bussani (c), Manuel Maglione (b), Thomas Eschenhagen (e), Paolo Golino (f), Francesco Loffredo (f), Serena Zacchigna (a, h)

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Introduction: Cardiac cells actively proliferate during embryonic development, whereas the regenerative capacity of the mammalian heart markedly diminishes in adulthood. The loss of cardiomyocyte (CM) proliferation shortly after birth coincides with a reduction in the heart's angiogenic potential. Additionally, the incidence of cancer in the heart is low, with both primary and secondary cardiac tumors being uncommon. This suggests that the same mechanisms that inhibit cardiac cell proliferation may also halt cancer cell growth in the adult heart. Here, we investigate whether alterations in mechanical load affect the proliferation of multiple cell types in the heart.

Methods: Engineered heart tissues (EHTs) were generated using a dedicated system, to finely tune mechanical load. We included different types of cancer cells in EHTs, which were cultured in both static and beating conditions. Heart unloading in vivo was achieved by heterotopically transplanting mouse hearts into the neck of syngeneic recipient mice, followed by cancer cell injection in both native and transplanted hearts. Spatial transcriptomics was performed on samples of primary tumor, cardiac and extra-cardiac metastasis from the same patients.

Results: In line with our hypothesis, mechanical unloading in EHTs significantly increased the

percentage of proliferating CMs, ECs different types of cancer cells. On the other hand, increasing afterload resulted in reduced cell proliferation and improved CM maturation, characterized by increased cross-sectional area and force of contraction. Consistent with in vitro results, in vivo cardiac unloading by heterotopic heart transplantation resulting in significant CM and EC proliferation, which was almost absent in native hearts. Finally, lung cancer cells did not grow in native hearts, whereas they massively proliferated in unloaded hearts. Spatial transcriptomics showed overexpression of several histone deacetylases (HDAC) genes by cardiac metastasis compared to extracardiac lesions, independent from the origin of the primary tumor. Consistently, cancer cells implanted in mechanically-loaded heart tissue displayed chromatin condensation. The LINC complex, and in particular Nesprin 2, was identified as a key mediator in translating mechanical forces into inhibition of cancer cell proliferation both in vitro and in vivo.

Conclusion: Overall, these data indicate that mechanical load in the heart inhibits the proliferation of multiple cell types, including CMs, ECs, and cancer cells and that the effect of mechanical load on cancer cells is mediated by Nesprin 2. The identification of the mechanisms that protect the heart from cancer will pave the way to a mechanical therapy for other solid tumors.



**GENETICA E BIOLOGIA MOLECOLARE 414
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)**

TWO CASES OF GERMLINE MOSAICISM IN INHERITED CARDIOMYOPATHIES: AN UNDERESTIMATED INHERITANCE MODE?

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The definition "germline mosaicism" is referred to those DNA variants that are present just in the gonads of an individual (ovaries or testes) and can occur during meiosis, gametes formation or postzygotically. As a such, they can be transmitted to offspring but the parents are not carriers of the pathogenic variant identified in one or more offspring. Germline mosaicism is a rare inheritance mode, nevertheless its incidence may be underestimated. The correct identification of germline mosaicism is crucial for recurrence risk estimation and family evaluation during genetic counseling. Here, we report two cases of germline mosaicism identified in 2 unrelated families undergoing to extended molecular analyses for the clinical suspicion of an inherited cardiomyopathy. Indeed, we routinely carry out genetic cardiomyopathies evaluation by analyzing a large custom panel of 207 genes by next generation sequencing (NGS). In particular, genomic DNA is extracted by peripheral blood samples in EDTA and used to prepare a library by enriching with capture probes the genes of interest (Agilent SureSelect chemistry). The obtained libraries are then sequenced using the Illumina MiSeq instrument generating FastQ data that are analyzed by an in-house developed pipeline allowing for sequence mapping, variants

calling and filtering. In the first case, the proband is a 14 years boy with a clinical diagnosis of Long QT syndrome. NGS-based analysis identified a FLNC likely pathogenic variant (c.3050A>G, p.Ala427ThrfsTer59) suggesting an inherited cardiomyopathy. Following post-test genetic counseling, the patient's parents were tested for the identified FLNC variant and they resulted both not carriers while their daughter (the proband's sister) carried it. In the second case, we analyzed a 12 years old girl with a clinical diagnosis of arrhythmogenic cardiomyopathy in which identified a pathogenic DSP variant (c.247+1G>A, p.?). Also in this case, we extended the molecular test to other family members and searched the pathogenic DSP variant in the parents and also in the proband's sister. The latter was found to carry the variant while the parents not. Short tandem repeat PCR (STR) analyses was performed confirming the genetic relationship of the family members within the 2 described cases and, consequently, the hypothesis of 2 germline mosaicisms. Proving germline mosaicism is challenging, however, our data suggest that it may be not so rare as usually thought. The correct identification of parental mosaicism is of great significance in clinical molecular diagnosis for genetic counseling, as it greatly impacts on recurrence risk.

GENETICA E BIOLOGIA MOLECOLARE 168 MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA) BIOLOGIA MOLECOLARE CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

ALTERAZIONI DEL METABOLISMO CARDIACO NELLA MORTE CARDIACA IMPROVVISA. APPLICAZIONI POST MORTEM DI METABOLOMICA SU TESSUTO CARDIACO

Stefano D'errico (a), Davide Radaelli (a), Maria Buffon (a), Mariano Stornaiuolo (b), Matteo Dal Ferro (c), Aneta Aleksova (a)

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(c) AZIENDA SANITARIA UNIVERSITARIA GIULIANO ISONTINA - TRIESTE

L'introduzione di applicazioni di metabolomica nella pratica clinica ha portato alla individuazione di specifici profili metabolici da impiegare come possibili biomarcatori di diagnosi e prognosi delle principali malattie cardiovascolari. E' stato ad esempio osservato che metaboliti come il glicerofosfolipide e l'acido alfa-linolenico sono significativamente modificati nei pazienti con infarto miocardico. Altri studi hanno suggerito una "signature" metabolomica da parte di amminoacidi, lipidi, corpi chetonici e lattato nella necrosi cellulare miocardica, nella risposta infiammatoria e nella fibrosi e, conseguentemente, un possibile ruolo causale nella progressione dell'insufficienza cardiaca. Variazioni significative nel metabolismo di alcuni amminoacidi come triptofano, prolina e arginina e modificazioni della beta-ossidazione degli acidi grassi sono state osservate in pazienti affetti da cardiopatia aritmogena. Gli autori presentano i risultati preliminari di uno studio pilota condotto su soggetti deceduti improvvisamente e inaspettamente in età inferiore a 50 anni, arruolati nel Registro Regionale delle Morti Cardiache Improvvise della Regione Friuli Venezia Giulia nei quali lo studio autoptico ha documentato un quadro ostruttivo coronarico severo (mono, bi o trivasale) e, alle indagini microscopiche le stimate di una morte aritmica senza segni istopatologici di infarto (c.d. hyperacute). Campioni di tessuto cardiaco provenienti da questa coorte di soggetti sono stati sottoposti a studio metabolomico mediante cromatografia liquida e spettrometria di massa. Prelievi di miocardio eseguiti

al tavolo autoptico su soggetti di età inferiore a 50 anni deceduti in seguito all'assunzione di sostanze d'abuso (c.d. toxic) sono stati impiegati come casi controllo. I dati sono stati elaborati mediante analisi statistiche univariate e multivariate. Lo studio ha consentito di identificare profili metabolici distinti tra i due gruppi, con aumento di sfingomieline a catena lunga e alcune fosfatidilcoline nel gruppo c.d. "hyperacute", e aumento di trigliceridi e fosfatidilinositoli nel gruppo "toxic". L'analisi multivariata ha confermato la presenza di cluster metabolici specifici per ciascuna condizione. I risultati suggeriscono che l'ischemia iperacuta e le cause tossiche inducono alterazioni metaboliche distinte nel tessuto cardiaco, supportando l'ipotesi di meccanismi fisiopatologici diversi. L'ischemia sembra attivare le sfingomielinasi, causando l'accumulo di sfingomieline e ceramidi, mediatori di apoptosi e disfunzione cardiaca. L'aumento di trigliceridi nel gruppo "toxic" suggerisce la possibilità di un'alterazione del metabolismo lipidico indotta dall'abuso di sostanze. Gli autori, propongono le possibili frontiere di ricerca derivanti dall'uso della metabolomica nell'identificazione di biomarcatori specifici per la diagnosi post-mortem di sudden cardiac death e nella comprensione dei meccanismi molecolari alla base delle diverse cause di morte cardiaca improvvisa. Ulteriori studi con campioni più ampi e diverse cause di morte saranno necessari in futuro per convalidare i risultati ottenuti.



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MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)

SUDDEN CARDIAC DEATH IN THE YOUNG: AN EMBLEMATIC CASE

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Sudden Cardiac Death (SCD) is defined as "a fatal, natural, and unexpected event occurring within an hour of symptom onset, in an apparently healthy individual or in one where the disease was not so severe as to predict a sudden outcome". According to other authors, SCD is defined as "an unexpected and premature death caused by a cardiac condition in a person with known or unknown heart disease".

Despite the identification of prevention strategies, death from cardiac causes is still the leading cause of death in the world; in particular, SCD represents a serious international public health problem and therefore a real challenge for modern medicine, especially when it affects young people.

Sudden Cardiac Death in the Young (SCDY) is defined as "SCD that affects a population aged <35 years or between 1-35 years", both non-athletes and athletes, with multiple hereditary/genetic or non-hereditary/genetic causes.

In particular, the incidence of SCD in young individuals deserves separate consideration and varies depending on the age group of the study population. In individuals aged < 30 years, the overall risk of SCD is approximately 1-2.8 per 100,000, with a case rate of 19% in children aged 1-13 years and 30% in adolescents aged 14-21 years.

When the cause of death remains unknown despite an autopsy being performed, it is called sudden unexplained death, often caused by cardiomyopathies and cardiac channelopathies. In these cases, a post-mortem genetic study such as molecular autopsy is necessary.

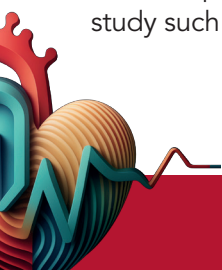
We describe the case of a 23-year-old man suffering a sudden collapse while working with his family. The family members tried the cardio-pulmonary resuscitation and called the emergency medical service. The ambulance staff, quickly arrived, was unable to save the young, despite of the adrenaline and multiple defibrillator shocks. Since the cause of death was unclear, an autopsy was requested to establish the causes of the sudden death.

At autopsy, the heart shows at the left ventricular apex a minute eversion of the ventricular chamber of 0.8 cm with walls thinned by 0.2 cm; the coronary arteries are patent with the presence of a complete myocardial bridge of the anterior descending artery extending 3 cm and at a distance of 3.5 cm from the emergence of the coronary artery.

At histological examination, the left ventricular apex with minute eversion and thinning is characterized by dissociation of myocardial fibers and interstitial fibrosis as by "apical thinning"; the anterior descending coronary artery is characterized by intramyocardial tunneling as by a "complete myocardial bridging" and with discreet fibrous thickening of the intima.

At molecular autopsy, a unique de novo genetic mutation of SCN5A was detected, which is associated with "cardiac channelopathies" such as Brugada syndrome and long QT syndrome and "cardiomyopathies" such as dilated cardiomyopathy.

What is the cause of SCD?



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GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

ASPETTI GENETICI DELLE ARITMIE (ARITMIE)

MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

CAVEOLIN 3 VARIANT T78M COMBINED WITH ADRB1 AND GRK5 GENE MUTATION IS ASSOCIATED WITH HIGH RISK BRUGADA SYNDROME PHENOTYPE

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Background: Brugada syndrome (BrS) is an inherited primary channelopathy syndrome associated to sudden cardiac death. Although several genetic mutations have been linked with BrS, SCN5A gene mutation is highly prevalent. Caveolin-3 (CAV3) is a protein that could interfere and modulate Nav1.5 function.

Aim of the Study: to characterize a multi-generational family with BrS syndrome carrying a CAV3 mutation and other susceptible BrS gene mutations.

Methods: Clinical and genetic investigations were performed. Genetic testing was performed with whole-exome sequencing (WES). Variants found by WES was confirmed in all members of family by bi-directional capillary Sanger resequencing. The effect of the mutation was investigated by using in silico prediction of pathogenicity.

Results: The index case was a 48-year-old man, with type 1 BrS, that experienced resuscitated cardiac arrest.

WES of the index case identified a missense mutation (T78M) of the CAV3 gene. Two additional variants for BrS-susceptibility genes were detected: L353M of the ADRB1 gene and T129M of the GRK5 gene.

Five out of 11 family members had the CAV-3 (T78M) mutation and had type 1 BrS pattern spontaneous or drug induced. Meanwhile two out of 11 had also GRK5 and ADRB1 mutation.

Family members carrying CAV3 mutation and both GRK5 and ADRB1 (2 out of 11) had documented sustained ventricular tachycardia or syncope and underwent ICD implant. At long-term follow-up, the index patient had ventricular fibrillation treated with DC shock.

Conclusions: Caveolin 3 gene mutation could be associated with BrS. This mutation is associated with an increased arrhythmic risk especially if combined with other susceptible BrS gene mutations as ADRB1 and GRK5.



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GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

MECCANISMI DELLE ARITMIE (ARITMIE)

ASPETTI GENETICI DELLE ARITMIE (ARITMIE)

CARDIAC CALSEQUESTRIN (CASQ2) AS A CAUSE OF BRUGADA SYNDROME. EVALUATION OF A LARGE ITALIAN FAMILY

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Alessandra Ranaldi (a), Maria D'apolito (a), Maurizio Margaglione (a), Natale Daniele Brunetti (a)
(a) FACULTY OF MEDICINE, UNIVERSITY OF FOGGIA, ITALY

Background: Brugada syndrome (BrS) is an inherited primary channelopathy syndrome associated with the risk of ventricular fibrillation (VF) and sudden cardiac death in a structurally normal heart. Aim of the Study: to evaluate clinically and genetically a large family with severe autosomal dominant Brugada syndrome.

Methods: Clinical and genetic studies were performed. Genetic analysis was conducted with NGS technologies (WES) using the Illumina instrument. According to the standard procedure, variants found by WES were confirmed in all available families by Sanger sequencing. The effect of the variants was studied by using in silico prediction of pathogenicity.

Results: The proband was a 52-year-old man who was admitted to the emergency department for syncope at rest. WES of the index case identified a heterozygous VUS CASQ2, c.532T>C, p.(Tyr178His). We studied the

segregation of the variation in all pedigree members. All the patients were heterozygous for the variation CASQ2 p.(Tyr178His), whereas the remaining healthy individuals in the family were homozygous for the normal allele. Structural analysis of CASQ2 p.(Tyr178His) was performed and revealed an important effect of the missense variation on monomer stability. The CASQ2 Tyr180 residue is located inside the sarcoplasmic reticulum (SR) junctional face membrane interaction domain and is predicted to disrupt filamentation.

Conclusions: Our data suggest that the p.Tyr178His substitution is associated with BrS in the family investigated, affecting the stability of the protein, disrupting filamentation at the interdimer interface, and affecting the subsequent formation of tetramers and polymers that contain calcium-binding sites.

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GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO
(IPERTENSIONE ARTERIOSA)
FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

PREVALENCE AND SIGNIFICANCE OF RARE SARCOMERE VARIANTS IN SECONDARY LEFT VENTRICULAR HYPERTROPHY DUE TO ARTERIAL HYPERTENSION AND WILD-TYPE TRANSTHYRETIN-RELATED CARDIOMYOPATHY

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Background: The term left ventricular hypertrophy (LVH) describes an augmentation of LV mass (LVM) caused by increased cardiomyocyte size. LVH can be physiological, or it can be a pathological condition, which is either primary (i.e., genetic) or secondary. The degree of LVH is very heterogeneous within each condition associated with it, and in both primary and secondary LVH, the phenotype is influenced by several genetic and environmental modifiers. Mutations in sarcomere (SARC) genes classically associated with the development of hypertrophic cardiomyopathy (HCM), a typical example of primary LVH. However, rare SARC variants have been found outside of the HCM phenotype, with a prevalence in the general population of up to 1:200, and, independently from the cardiac morphology, SARC variants have been associated with adverse cardiovascular outcomes. Their role in secondary forms of LVH, however, has never been investigated.

Methods: This was a cross-sectional study. We investigated prevalence and clinical correlated of rare SARC variants in two cohorts of secondary LVH, a group of patients with LVH due to arterial hypertension and a group of patients with wild-type transthyretin-related cardiac amyloidosis (ATTRwt). In both cohorts, LVH was defined based on echocardiography, as either LV wall thickness ≥ 12 mm (independently of sex) and/

or LVMi >95 g/m² for women and >115 g/m² for men. Genetic sequencing was performed by next generation sequencing (NGS) using a focused panel including genes involved in HCM (Illumina TrueSight Cardio panel) on Illumina MiniSeq platform.

Results: In the arterial hypertension cohort, the prevalence of rare SARC variants was 19% (3 out of 16 patients), while in the ATTRwt cohort it was 23% (5 out of 22 patients). Patients carriers of SARC variants from both cohorts did not show significant differences in terms of LV morphology as compared to non-carriers.

Conclusions: In this pilot cross-sectional study, rare SARC variants were found in a non-negligible proportion of patients with secondary LVH, warranting further investigations. Definitive results regarding a possible role of rare SARC variants as predisposing factors for LVH development, outside the HCM phenotype, cannot be drawn with certainty. Larger cohorts, with control groups, are needed to ascertain their role and relevance within the different subsets of secondary LVH. Pathophysiological mechanisms at the basis of LVH due to arterial hypertension and ATTRwt remain largely undefined. Unravelling specific predisposing factors in the two conditions may prove beneficial to develop targeted treatments.



**GENETICA E BIOLOGIA MOLECOLARE 856
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)**

OVERCOMING THE BARRIERS TO HEART REGENERATION: A DUAL APPROACH TARGETING CM PROLIFERATION AND ANGIOGENESIS

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One major obstacle to heart regeneration is the inability of mature mammalian CMs to proliferate after birth. Although the heart can regenerate with full functional recovery during the early postnatal period, this regenerative capacity sharply declines as CMs lose their ability to divide. Recent studies, including my work, suggest that this decline in CM regenerative potential is closely linked to a diminished ability to form new blood vessels (angiogenesis), which are crucial for delivering oxygen and nutrients necessary for tissue repair. In neonatal heart regeneration, endothelial cells (ECs) colonize the damaged area prior to CM proliferation, indicating that new blood vessel formation is essential to initiate cardiac regeneration. However, the adult heart loses this angiogenic potential during postnatal development. The question remains: what changes during postnatal development inhibit both angiogenesis and regeneration? Among the key developmental shifts, the maturation of CMs from a neonatal to an adult state is particularly critical. Shortly after birth, CMs undergo significant changes in gene expression, leading to structural reorganization, altered metabolism, and enhanced contractility, all of which are necessary for sustaining lifelong heart function. However, these changes also impair their proliferative ability. In my research, I explored whether these phenotypic changes in CMs also influence EC

proliferation. By co-culturing CMs and ECs from different developmental stages, I observed that adult, mature CMs—but not embryonic or neonatal CMs—emit anti-angiogenic signals to cardiac ECs, inhibiting their proliferation and angiogenic capabilities. Furthermore, ECs injected into neonatal hearts integrated and formed vascular structures, whereas they failed to do so in adult hearts, suggesting that the adult heart is an unfavorable environment for angiogenesis. These findings underscore the importance of CM-EC communication in regulating angiogenesis and suggest that mature CMs may contribute to the poor regenerative capacity of the adult heart. To rescue the angiogenic potential of adult heart, I induced CM de-differentiation in vivo by overexpressing miR-199a, a potent pro-proliferative miRNA, in combination with VEGF-A to stimulate angiogenesis, using adeno-associated viral vectors. This approach promoted EC proliferation and the formation of new blood vessels in healthy and infarcted heart, demonstrating that partial CM de-differentiation can restore the angiogenic potential of cardiac ECs. This project paves the way for an innovative combined therapy that simultaneously promotes both CM proliferation and angiogenesis, offering a promising new approach to surpass current ineffective treatments for heart failure.



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CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ASPETTI GENETICI DELLE ARITMIE (ARITMIE) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

MOLECULAR AND CLINICAL SPECTRUM OF CARDIOMYOPATHIES AND ARRHYTHMIAS: A SINGLE-CENTER STUDY

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(a) IRCCS CASA SOLLIEVO DELLA SOFFERENZA

Primary cardiomyopathies (PC) and arrhythmia syndromes (AS) are genetically heterogeneous cardiac diseases with substantial clinical implications. This study aimed to comprehensively characterize the genetic and clinical landscape of PC and AS in a Southern Italian cohort.

A cohort of 679 individuals, comprising 368 index cases and 311 relatives, underwent targeted next-generation sequencing (NGS) to investigate the genetic basis of PC and AS. Consistent with previous studies, PC demonstrated a higher prevalence (69.95% of total cases, 71.46% of index cases) compared to AS (30.05% of total cases, 28.54% of index cases).

Genetic analysis identified pathogenic or likely pathogenic (PLP) or variants of uncertain significance (VUS) in genes associated with the clinical phenotype in 47.86% of individuals. Multiple variants were detected in 11.93% of cases.

The remaining 52.14% had no identifiable genetic cause for their cardiomyopathy or arrhythmia syndrome. PLP variants primarily involved MYBPC3, PKP2, SCN5A and KCNQ1. The most frequent VUS were identified in NEXN, MYBPC3, SCNA5A, RBM20, MYOM1, MYH6, JUP, ILK, DSC2, ACTN2, RYR2, MYH7, LDB3, LAMA4 and BAG3.

Molecular variant classification was conducted using adapted ACMG guidelines criteria according to a Bayesian method. In select cases, the integration of family history, clinical data, and functional studies enabled reclassification of a subset of variants of uncertain significance (VUS) to pathogenic/likely pathogenic or likely benign categories.

In some cases, genetic analysis has allowed us to refine some initial diagnoses. For instance, identification of a DSC2 variant reclassified a patient with advanced heart failure and ventricular extrasystoles to arrhythmogenic cardiomyopathy. Furthermore, NGS revealed a SYNE1 variant in a patient with hypertrophic cardiomyopathy and spastic diplegia, leading to a diagnosis of Emery-Dreifuss muscular dystrophy type 4. Additionally, a 43-year-old patient with syncope, sustained polymorphic VT, and post-immersion VF was initially diagnosed with CPVT. Furthermore, genetic testing identified a pathogenic KCNJ2 mutation, prompting a revised diagnosis.

Our findings underscore the pivotal role of integrating comprehensive phenotyping and advanced genetic testing in managing cardiomyopathies and arrhythmias. This approach enabled improved diagnostic accuracy, tailored treatment strategies, and enhanced risk stratification for sudden cardiac death.

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CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

UNA RARA DOPPIA MUTAZIONE GENETICA DELLE PROTEINE ANACTOMINA 5 E TITINA IN UN PAZIENTE CON DISTROFIA MUSCOLARE DEI CINGOLI E INTERESSAMENTO CARDIACO

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Introduzione. Le distrofie muscolari dei cingoli (LGMD) sono malattie genetiche rare progressive caratterizzate da ipo-atrofia e debolezza dei muscoli volontari delle aree dei cingoli con interessamento anche di altri muscoli compreso il cuore. L'età di esordio (11-50 anni), la gravità e la progressione dei sintomi variano notevolmente in base all'alterazione genetica sottostante. Le varie forme di LGMD possono essere ereditate come tratti autosomici dominanti o recessivi. La forma autosomica recessiva è nota come LGMD2 e presenta diverse alterazioni genetiche, fra le quali quella dell'Anoctamina5 (ANO5), proteina adibita alla stabilizzazione e riparazione del sarcolemma, con un coinvolgimento cardiaco che si verifica nel 10-30% dei portatori di tale alterazione, responsabile della forma LGMD2L. La Titina (TTN) è anch'essa una proteina strutturale adibita alla stabilizzazione del sarcomero, responsabile della forma LGMD2J che porta spesso ad una cardiopatia dilatativa. L'analisi genetica in questi casi è dirimente per formulare una diagnosi certa. Di seguito presentiamo un caso con doppia rara alterazione genetica responsabile di un coinvolgimento muscolare striato e cardiaco.

Caso clinico. Paziente di 23 anni, fumatore, iperteso, dislipidemico, obeso, iperinsulinemico in trattamento farmacologico, familiarità positiva per cardiopatia non meglio precisata (zia materna deceduta all'età di 35 anni, zio deceduto all'età di 31 anni per morte improvvisa e con associata difficoltà alla deambulazione all'età di 20

anni). Da circa 4 anni riferita astenia, incremento dei valori di CPK e transaminasi in assenza di epatopatia, associata ad episodi di bassa saturazione periferica dell'ossigeno e cardiopalmo; riferiva inoltre facile faticabilità e sudorazione algida dopo sforzi lievi. Nel sospetto di malattia neuromuscolare, veniva eseguita l'analisi genetica che metteva in evidenza una rara variante da alterato splicing in eterozigosi c.155A>G nell'esone 4 del gene ANO5 (un solo caso riportato in letteratura con coinvolgimento muscolare non cardiaco) e una rara, non ancora descritta in letteratura, mutazione frameshift in eterozigosi c30617-30622 nell'esone 144 del gene TTN (mutazioni compatibili con la LGMD). All'ecocardiogramma Color-Doppler: FE 57%, GLS lievemente ridotto (-17%), area di bulging all'apice del ventricolo destro. All'ECG Holter: episodi di BAV II° Mobitz 2. La RM cardiaca confermava il bulging apicale ventricolare destro.

Conclusioni: il nostro caso riporta una doppia rara mutazione a carico del gene ANO5 (già descritta in letteratura come patogenetica) e una mutazione frameshift in eterozigosi c30617-30622 GTA-TGA nell'esone 144 del gene TTN non ancora descritta in letteratura. Tale doppia associazione e nuova variante del gene TTN sembrano associarsi ad un concomitante interessamento cardiaco con disturbo della conduzione A-V. Ulteriori casi sono necessari per confermare tale associazione. Ulteriori approfondimenti verranno eseguiti durante il follow-up.

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IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)

SINDROME PLATIPNEA-ORTODEOSSIA IN UNA PAZIENTE CON PERVIETA' DEL FORAME OVALE E BLOCCO ATRIOVENTRICOLARE COMPLETO GIOVANILE. IL RUOLO DEL COUNSELLING GENETICO

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Introduzione: La sindrome platipnea-ortodeossia è una patologia rara, caratterizzata da dispnea e desaturazione che si manifestano nella posizione eretta e migliorano con la posizione supina. Alla base della sindrome ci sarebbe uno shunt destro-sinistro (intracardiaco o polmonare) oppure un alterato rapporto ventilazione/perfusione. Il forame ovale pervio (PFO), quindi, risulta essere una delle cause più frequenti di questa sindrome.

Caso clinico: Una donna di 51 anni, portatrice di pacemaker bicamerale per blocco atrioventricolare completo dall'età di 32 anni, giunge alla nostra attenzione a seguito della comparsa di dispnea per sforzi lievi-moderati dopo sostituzione dell'unità stimolante.

Venivano eseguiti scintigrafia ventilo-perfusiva polmonare e TC torace ad alta risoluzione che risultavano nella norma, mentre la saturimetria dell'ossigeno nelle 24 ore documentava una saturazione del 90% costante, con desaturazioni fasiche poco profonde. Il test cardiopolmonare documentava deficit vascolo polmonare con VE/VCO₂ slope di 35,37.

Alla luce della storia di BAV completo giovanile veniva eseguito counselling genetico che documentava mutazione missense del gene CAV3 (esone 2, c.233 C > T ; p.Thr78Met) e mutazione nonsense del gene GATA4 (esone 1, c.495 C > A; p.Tyr165Ter) che è associata con difetti della formazione del setto interatriale e/o interventricolare. Pertanto si decideva di sottoporre la paziente a ecocardiotrassesofageo che documentava aneurisma del setto interatriale (tipo 1 Olivares-Reyes) e pervietà del forame ovale con shunt destro -> sinistro di grado severo alle manovre di ecocontrasto (basale). Si poneva dunque indicazione a chiusura del PFO, eseguita con dispositivo Ceraflex 30/30. Al follow-up di sei mesi, la paziente presenta miglioramento della sintomatologia clinica con risoluzione della dispnea.

Conclusioni: Presentiamo un caso di sindrome da platipnea-ortodeossia associata a pervietà del forame ovale e mutazione nonsense del gene GATA4. Il counselling genetico in casi selezionati può guidare nella diagnosi e nella gestione clinica di patologie rare.



GENETICA E BIOLOGIA MOLECOLARE 828
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO
(IPERTENSIONE ARTERIOSA)

PRIMARY DILATED AND NONDILATED HYPOKINETIC CARDIOMYOPATHY: FOCUS ON TTN TRUNCATING AND MYH7 MISSENSE VARIANTS

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Objectives: Current guidelines emphasize the role for genetics in the management of patients with primary cardiomyopathy (CM), either hypertrophic (H), dilated (D), nondilated (ND) and other forms. Both D and ND hypokinetic CMs are continuously under investigation due to their usually poor prognosis. Several gene mutations are implicated in the different phenotypes and clinical manifestations, included arrhythmias. To date, genetic study has become a central framework of the patient's risk assessment. Mutations in the Lamin A/C and/or Phospholamban genes have already been identified as potential triggers of atrial and ventricular arrhythmias. We investigated the full- genotype next generation sequencing (NGS) panel in patients with heart failure (HF) and primary nonhypertrophied CM.

Methods: Genetic studies were performed in consecutive patients referred to our Cardiology unit (Univ. Hospital of Messina, Italy) either for unstable HF (hospitalized) or HF follow-up office from 2018 to 2022. Patients likely to have primary CM with left ventricular (LV) ejection fraction $\leq 55\%$ on echocardiography or cardiac magnetic resonance, were asked to perform the NGS panel on a voluntary basis.

Results: From the initial cohort of 70 patients, 35

were excluded for secondary DCM, primary HCM, and negative NGS panel. The final study population consisted of 19 patients, 14 men (74%) and 5 women (26%), aged 49.6 ± 11.5 yrs, mostly belonging to the same family, who had at least a single CM-related gene mutation. Main results are depicted in Table. Overall, mutations were uncovered in LNMA (n=6), MYBPC3 (n=5), MYH7 (n=3), and TTNC1, VLC, SCN5A, FHOD3, PRKAG2, KLHL24, TTN (n=1 each) genes. This latter was a new truncating variant (TTN gene, nucleotide c.5416G>T) in a patient with hypokinetic DCM and arrhythmias (case 19). Among 14 VUS, MYH7 gene mutation (c.2359 C>T) was uncovered in a patient with severely impaired NDCM and atrial fibrillation (case 1).

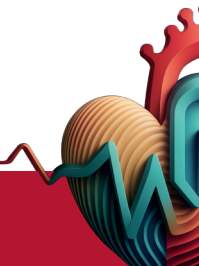
Conclusions: Overall, 37% of our study population showed informative genetic testing, with mutations classified as probably pathogenic (class 4) in 7 patients, chiefly men with either DCM (n=4), NDCM (n=1), or no CM (n=2). A novel TTN-gene truncating variant was recognized in a DCM patient. Twelve more patients showed VUS, but the MYH7 missense variant (combined with a TTNC1 mutation) in case 1 was reasoned to be pathogenic for NDCM with impaired LV function and arrhythmic burden.



CASE	GENDER	AGE	GENE	NUCLEOTIDE VARIANT	CLASS	DISEASE	LVEF	ARRHYTHMIAS / DEVICE
1	M	47	TNNC3	c.305 G>T	VUS	NDCM	29%	CRTD / AF
			MYH7	c.2359 C>T	VUS	NDCM	29%	CRTD / AF
2	M	45	FHOD3	c.1874 C>A	VUS	NDCM	15%	
3	F	56	PRKAG2	c.66 G>A	VUS	DCM	20%	ICD / AF
4	M	43	MYH7	c.4687 C>G	VUS	NDCM	45%	
5	M	51	SCN5A	c.3521 T>C	VUS	DCM	20%	CRTD
6	M	50	KLHL24	c.1609_1610 delTG	VUS	DCM	20%	
7	F	33	VCL	c.2378 C>A	VUS	NO CM	55%	
8	M	54	VCL	c.2378C>A	VUS	DCM	28%	
9	M	22	MYH7	c.4687 C>G	VUS	NO CM	28%	
10	F	60	MYBPC3	c.836G>C	VUS	NO CM	55%	
11	F	42	MYBPC3	c.836 G>C	VUS	NO CM	54%	
12	M	72	MYBPC3	c.836G>C	VUS	NDCM	20%	ICD
			MYBPC3	c.836 G>C	VUS	NDCM	30%	CRTD / SVT / NSVT
13	M	66	LMNA	c.949G>A	Class 4	NDCM	30%	CRTD / SVT / NSVT
			MYBPC3	c.836 G>C	VUS	NO CM	55%	PVB
14	M	52	LMNA	c.949 G>A	Class 4	NO CM	55%	PVB
15	M	59	LMNA	c.949G>A	Class 4	DCM	20%	ICD / NSVT
16	M	48	LMNA	c.949 G>A	Class 4	DCM	35%	CRTD / NSVT
17	F	53	LMNA	c.949G>A	Class 4	NO CM	55%	
18	M	37	LMNA	c.949 G>A	Class 4	DCM	25%	ICD / PAF / PVB
19	M	52	TTN	c.54016 G>T	Class 4	DCM	28%	PAF / VT / ICD

AF, Atrial Fibrillation; AVB, Atrio-Ventricular Block; CM, Cardiomyopathy; CRTD, Cardiac Resynchronization Therapy Device; DCM, Dilated CM; ICD, Implantable Cardiac Defibrillator; NDCM, Nondilated CM; NSVT, Nonsustained Ventricular Tachycardia; PVB, Premature Ventricular Beats; SVT, Supraventricular Tachycardia; VT, Ventricular tachycardia. In yellow color, the new variants.

Table 1



GENETICA E BIOLOGIA MOLECOLARE 751

GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

CLINICAL IMPACT OF THE TPM1 P.TYR221CYS VARIANT CAUSING HYPERTROPHIC CARDIOMYOPATHY

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Background: Hypertrophic cardiomyopathy (HCM) is a relatively common (about 1 in 500) inherited cardiac condition characterized by hypertrophy of the left ventricle wall. The most severe forms can be responsible for sudden cardiac death.

Purpose: Here, we report the possible “likely-pathogenetic” role of a TPM1 variant, up to now classified as VUS, in a patient with HCM.

Methods: A 66-years-old female was referred to our inherited cardiac condition clinic. Due to abnormal findings on the ECG (Figure 1 B), an echocardiogram was performed showing a thicker/asymmetric septum. The HCM features were confirmed by cardiac magnetic resonance, which showed a septum of 25mm with patchy late enhancement and dilated left atrium (Figure 1 A). The family history was clinically significant (Figure 1 C). Customized exome panel was performed on the proband. 164 genes were investigated. The variant TPM1 (NM_001018005.1):c662A>G (pTyr221Cys), up to now classified as VUS, was identified in the proband

and confirmed by Sanger sequencing.

Results: All the 4 patients affected by HCM were found to also carry the TPM1 variant. The other family members without disease did not show the mutation. The human TPM1 gene encodes tropomyosin 1, a thin filament protein expressed in both cardiac and fast skeletal muscle fibers. TPM1 is member of a family of actin-binding proteins (Figure 1 D). The missense variant c.662A>G described in this family, results in substitution of a highly conserved Tyrosine with Cysteine in residue 221 of the protein (p.Tyr221Cys). The final effect could be an accelerated rate of actin-myosin interactions, decrease relaxation, and increase force production. To date, this variant is classified as VUS (ACMG Richards 2015).

Conclusion: In view of the strong segregation in affected family members reported in this study, it seems reasonable to reassess the variant classification from VUS to Likely Pathogenic for HCM.

GENETICA E BIOLOGIA MOLECOLARE 689

GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)

NUOVA MUTAZIONE DI SIGNIFICATO INCERTO IN DISLIPIDEMIA REFRAATTARIA A TERAPIA BIOLOGICA

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Francesco Andreozzi (a)

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CHIRURGICHE - SCUOLA DI SPECIALIZZAZIONE IN MEDICINA INTERNA

RG, uomo di 81 aa, anamnesi di cardiopatia ischemica rivascolarizzata con BPAC e terapia massimale con ezetimibe/inibitori di HMGCoA reduttasi; effettua accesso per controllo ordinario lamentando mialgie e parestesie poplitee/surali, con evidenza di rialzo degli indici di miolisi; la valutazione dell'assetto lipidico in tale occasione rileva scarso controllo (LDL 100 mg/dL), per cui, in ossequio alla scarsa risposta a terapia massimale, modesto beneficio di politerapia addizionale e necessità di rimodulare terapia statinica, il paziente veniva switchato a ezetimibe/PCSK9i (alirocumab) a dose piena, con piena educazione del paziente circa le modalità di somministrazione. A controllo semestrale, nessuna risposta con invece peggioramento del quadro ematochimico (LDL 120 mg/dL); veniva rimodulata terapia con statina a bassa potenza a bassa dose (subito sospesa per ripresa di miolisi), acido bempedoico/ezetimibe e inclisiran; al controllo trimestrale e al primo semestrale (antecedente a terza dose) ancora scarso beneficio, confermato a ulteriore ciclo con somministrazione dell'iniezione dal nostro stesso personale (LDL 95 mg/dL). Il paziente veniva quindi indirizzato ad analisi genetica, con riscontro di mut. c. 8965c>A/p.(Gln2989Lys) in eterozigosi sul gene APOB, non riportata in letteratura e considerata di significato incerto. L'apolipoproteina B

(ApoB) è l'apolipoproteina primaria ed è il trasportatore per i seguenti lipidi: chilomicroni, LDL, VLDL, IDL e lipoproteina (a). Lo stesso gene codifica sia per ApoB48 intestinale che per ApoB 100 epatica. L'Apo B-100 è necessaria per l'assemblaggio di VLDL nel fegato e funge anche da ligando primario per la clearance mediata dal recettore LDL delle particelle LDL dal sangue. Per quanto i software computazionali in silico non suggeriscano effetto dannoso dell'alterazione, è bene sottolineare come l'estrema rarità (3 alleli su 250994 in GnomAD) e l'interessamento di una regione moderatamente conservata potrebbero sottendere anomalie più sfumate di APOB che, pure in presenza di una proteina funzionalmente stabile (si evidenzia come i livelli di LDL di RG fossero non accettabili per il suo rischio cardiovascolare imponente un target di 55mg/dL ma pienamente nella media per la popolazione generale, aldilà delle considerazioni di lower is better) risulti essere refrattaria al meccanismo di riciclaggio e persistenza in membrana di LDL-R promosso per vie differenti da PCSK9i e inclisiran, rendendo refrattari alla strategia di correzione pure in presenza di un assetto biochimico non eclatantemente alterato. Ulteriori dati, specie se derivanti da studi funzionali, sono richiesti per delineare l'impatto effettivo di c.8965C>a/p. (Gln2989lys).



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

IMAGING CARDIOVASCOLARE

IMAGING CARDIOVASCOLARE 390
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
ARITMIE VENTRICOLARI (ARITMIE)

THE TRICUSPID ANNULAR DISJUNCTION IN ARRHYTHMIC MITRAL VALVE PROLAPSE: FUNCTIONAL OR ARRHYTHMIC ROLE?

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(a) DEPARTMENT OF CARDIAC, THORACIC, VASCULAR SCIENCES AND PUBLIC HEALTH, UNIVERSITY OF PADUA, PADUA, ITALY; (b) CLINICAL CARDIOLOGY, AOU CAGLIARI, DEPARTMENT OF MEDICAL SCIENCE AND PUBLIC HEALTH, UNIVERSITY OF CAGLIARI, ITALY; (c) RADIOLOGY UNIT, UNIVERSITY OF PADUA - AZIENDA OSPEDALIERA, PADUA, ITALY

Background. Arrhythmic mitral valve prolapse (MVP) is characterized by left ventricular (LV) fibrosis, due to an excessive myocardial stretch on the LV basal-mid inferolateral wall. Mitral annular disjunction (MAD) and systolic curling are common findings in MVP patients. Cardiac magnetic resonance (CMR) demonstrated to clearly identify these morpho-functional alterations in MVP patients, as well as myocardial fibrosis with late gadolinium enhancement (LGE). Recently, the right-sided annulus alterations emerged as an interesting finding in the natural history of MVP patients. However, its role in a population of arrhythmic MVP patients without valve regurgitation has not been investigated. Purpose. The primary aim of the study was to evaluate the prevalence and role of tricuspid annulus disjunction (TAD) in arrhythmic MVP patients without valve regurgitation. Secondly, we evaluated the relationship of TAD with ventricular arrhythmias (VAs) presence, morphology and severity.

Methods. Consecutive patients with a classical MVP echocardiographic diagnosis, undergoing CMR for the presence of VAs, and without valve regurgitation were enrolled. Patients were divided into 2 groups according to the presence of TAD. Premature ventricular beats (PVB) were classified as left bundle branch block (LBBB)

or right bundle branch block (RBBB) if V1 was negative or positive/isodiphasic in lead V1. Finally, the presence of severe VAs (ventricular tachycardia runs ≥ 180 beats/min and/or history of sustained ventricular tachycardia/fibrillation) was also analyzed.

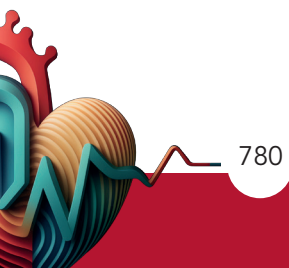
Results. We included 110 patients (62% female, median age 49 years); TAD was identified in 35 MVP patients (66% female, median age: 52 years). MVP patients with TAD were older (52 versus 44 years, $p=0.026$) and presented reduced biventricular end-diastolic volumes, despite normal, in comparison with those without TAD (left ventricle: 85 versus 98 ml/mq, $p=0.008$ and right ventricle: 76 versus 85 ml/mq, $p=0.023$). Curling was more common in MVP patients with TAD (86% versus 60%, $p=0.007$). Although LV fibrosis was present in the overall population, MVP patients with TAD presented a higher quantity of LGE (2% versus 1.6%, $p=0.028$). Finally, MVP patients with TAD showed a higher prevalence of tricuspid valve prolapse (100% versus 40%, $p<0.001$). VAs were present in 79 MVP patients (72%), without difference on the basis of TAD (69% versus 73%, $p=0.605$). According to the presence of LV fibrosis, RBBB PVBs were identified in 55 MVP patients (50%), regardless the presence of TAD (51% versus 49%, $p=0.838$), as well as LBBB PVBs (23% versus 25%,



$p=0.779$). Severe VAs were reported in 60 MVP patients (55%), without any difference regarding the presence TAD (54% versus 55%, $p=0.970$).

Conclusions. We reported that the presence of TAD was associated with a greater prevalence of curling, as well as a more pronounced myocardial fibrosis, in

arrhythmic MVP patients without valve regurgitation. So, the contextual presence of TAD and MAD in arrhythmic MVP patients is an expression of a morpho-functional biannular disease, due to an increased biventricular myocardial stretch, not related a more severe VAs burden.



IMAGING CARDIOVASCOLARE 97 CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE) PLACCA VULNERABILE (ATEROTROMBOSI) DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)

PREVALENCE OF ATHEROSCLEROSIS AND HIGH-RISK PLAQUE FEATURES IN PATIENTS WITH AND WITHOUT FAMILY HISTORY FOR CAD: THE FRATER STUDY

Francesca Di Lenarda (b), Angela Balestrucci (b), Edoardo Conte (a), Daniele Andreini (a)
(a) OSPEDALE GALEAZZI SANT'AMBROGIO; (b) UNIVERSITA' DEGLI STUDI DI MILANO STATALE

Background: Coronary Artery Disease (CAD) and following Myocardial Ischemia (MI), is the most common cause of mortality and morbidity worldwide and results from the complex interplay of a person's individual environmental, lifestyle and genetic factors. To-date available CV risk scores do not include Family History (FH) as variable kept into consideration to evaluate CV risk, which is instead considered as Risk Modifier. Emerging evidence is confirming its pivotal role in determining CAD and Acute Coronary Syndromes (ACS).

Coronary Computed Tomography Angiography (CCTA) is emerging as screening test in subjects with low-intermediate pre-test probability, currently limited to Coronary Artery Calcium (CAC) evaluation; recently,

it has proved high accuracy in characterising plaque composition.

Aim: the aim of this study is to retrospectively analyse prevalence of CAD and of high-risk plaque features at CCTA in patients with and without FH for CAD.

Materials and Methods: The study will require recruitment of 525 patients who have performed CCTA, 350 of which without FH for CAD and 175 of which with FH for CAD. Patients are questioned as for presence of main cardiovascular risk factors (MCVRF), of FH for CAD specifying which family member was affected and baseline therapy. CCTA analysis focuses on quantification of plaque volume, description of

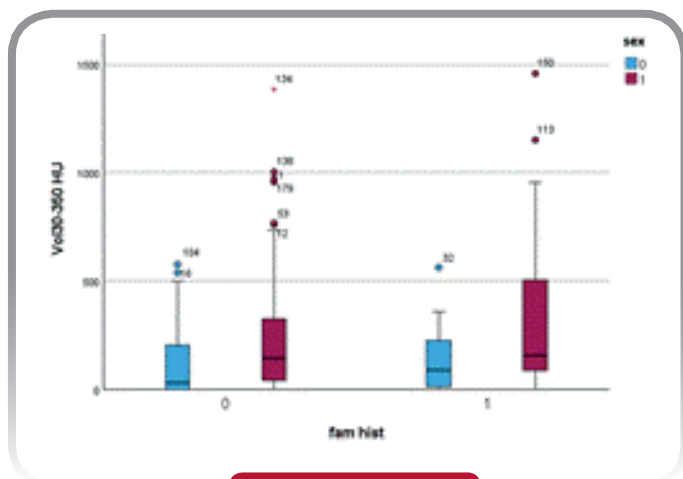


Figure 1

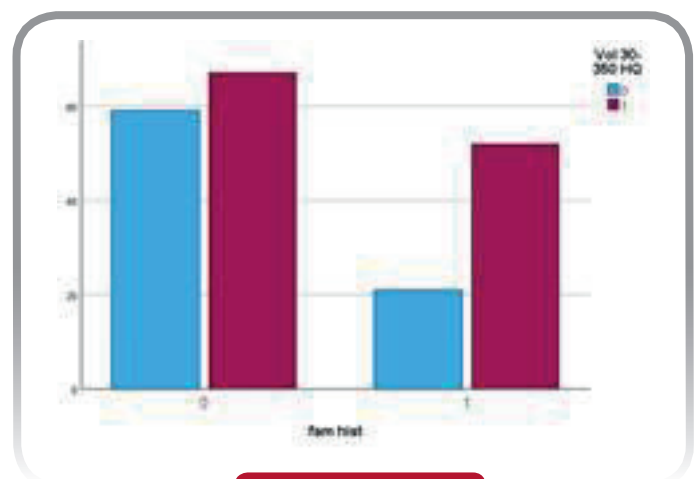


Figure 2



plaques composition (Hounsfield Units) and presence of high-risk plaque features. To follow, results from a preliminary analysis of 199 patients.

Results: Out of 199 patients, 126 (63%) had no FH for CAD; 127 (64%) were men. Dyslipidaemia was more frequent upon men (40%) than women (28%) and was significantly more frequent upon patients with FH for CAD (76%) than patients without (55%) [p-value 0,022]. All of patients with a sister affected by CAD presented with high-risk plaques. FH for CAD significantly correlated with fibrofatty plaque volume (30-350 HU) [p-value 0.012], and with presence of Low-attenuated plaques (LAP) [p-value 0.013]. Sub-analysis for genre confirmed the above in men but were not statistically significant in women. Univariate analysis confirmed

FH for CAD as risk factor for high burden of fibrofatty plaques (OR 2.18, p-value 0.013), for LAPs (OR 2.1, p-value 0.014) and for positive plaque remodelling (OR 1.8, p-value 0.064). Multivariate analysis considering dyslipidaemia, FH and male sex confirmed their statistically significant impact on raising risk for fibrofatty plaque burden (OR respectively 2.1, 2.2, 2.7) and for LAP (OR respectively 2.7, 1.7, 2.8).

Conclusions: FH for CAD has a significant impact on plaque composition, as well as dyslipidaemia and male sex. Inclusion of the former in CV risk scores and use of CCTA as screening test in patients with FH for CAD are therefore to be considered given the emerging evidence,



IMAGING CARDIOVASCOLARE 523
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)

THE PROGNOSTIC ROLE OF FEATURE-TRACKING CARDIAC MAGNETIC RESONANCE IN PATIENTS WITH CARDIAC AMYLOIDOSIS: A PROSPECTIVE STUDY

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(a) UOC CARDIOLOGIA UNIVERSITARIA, DIPARTIMENTO INTERDISCIPLINARE DI MEDICINA (DIM), UNIVERSITÀ DEGLI STUDI DI BARI "ALDO MORO", AOUC POLICLINICO DI BARI, BARI; (b) DEPARTMENT OF CARDIOLOGY, CIBERCV, UNIVERSITY HOSPITAL VALL D'HEBRON, BARCELONA, SPAIN

Background: Cardiac Magnetic Resonance (CMR) has gained a pivotal role in the diagnostic workflow of cardiac amyloidosis (CA) with important therapeutic and prognostic implications. Previous studies pointed out that the presence of late gadolinium enhancement (LGE), the value of native T1 mapping and extra-cellular volume may provide prognostic information. Instead, the importance of myocardial deformation parameters assessed by feature-tracking Cardiac Magnetic Resonance (FT-CMR), in this context, has yet to be established. The aim of this study was to evaluate the prognostic role of FT-CMR data in a cohort of patients affected by CA.

Methods: An observational, prospective, monocentric study was conducted enrolling consecutive patients with CA undergoing CMR and clinically followed up for 3 years in our cardiomyopathy Unit. Global longitudinal strain (GLS), global circumferential strain (GCS) and global radial strain (GRS) were obtained by CMR cine images. Baseline patients' history, clinical, electrocardiographic and laboratory data were also collected. As primary endpoint was considered all-cause mortality. Secondary endpoints were cardiovascular

(CV) mortality and acute heart failure (AHF).

Results: From 2010 to 2020 a total of 81 patients with CA were enrolled with a median follow-up of 38 (IQR 40) months. The median age was 72 (IQR 25) years with a male sex prevalence (79%). There were 37 deaths, of these 28 were related to CV cause, while 44 patients developed AHF. At univariate Cox analysis, among strain parameters, the presence of apical sparing, a $GCS > -16.3\%$ and $GLS > -12.2\%$ were associated with a higher risk of all-cause mortality, CV mortality and AHF. At multivariate Cox regression analysis, a $GLS > -12.2\%$ was a strong predictor of all-cause mortality (HR 2.85, 95% CI from 1.33 to 6.12, $p=0.007$), CV mortality (HR 5.18, 95% CI from 1.89 to 14.17, $p=0.001$) and AHF (HR 3.07, 95% CI from 1.50 to 6.26, $p=0.001$).

Conclusions: GLS assessed by FT-CMR may provide relevant prognostic information in patients affected by CA. In particular, a GLS value $> -12.2\%$ was significantly associated with a worse prognosis. This technique should be incorporated in CMR protocols to more accurately predict outcomes in CA, especially when LGE or mapping data are not available.



IMAGING CARDIOVASCOLARE 238
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
ARITMIE VENTRICOLARI (ARITMIE)

MITRAL ANNULUS DISJUNCTION IN CONSECUTIVE, UNSELECTED PATIENTS: WHERE IS THE BOUNDARY BETWEEN NORMALITY AND DISEASE?

Stefano Figliozzi (a), Kamil Stankowski (a, b), Mauro Gitto (a, b), Costanza Lisi (a, b), Lorenzo Monti (a, b), Federica Catapano (a, b), Renato M Bragato (a), Marco Francone (a, b), Gianluigi Condorelli (a, b)
 (a) IRCCS HUMANITAS RESEARCH HOSPITAL; (b) HUMANITAS UNIVERSITY

Background: The presence of mitral annulus disjunction (MAD) has been considered a high-risk feature for sudden cardiac death based on selected study populations. We aimed to assess the prevalence of MAD in consecutive patients undergoing clinically-indicated Cardiac Magnetic Resonance (CMR), its association with ventricular arrhythmias, Mitral Valve Prolapse (MVP), and other CMR features.

Methods: This single-center retrospective study included consecutive patients referred to CMR at our Institution between June 2021 and November 2021. The MAD was defined as a ≥ 1 mm displacement between the left atrial wall-mitral valve leaflet junction and the left ventricular wall during end-systole. The MAD extent was defined as the maximum longitudinal displacement. Associates of MAD were evaluated at uni- and multi-variable regression analysis. A study endpoint including (aborted) sudden cardiac death, unexplained syncope, and sustained ventricular tachycardia was evaluated at 12-month follow-up.

Results: Four-hundred-forty-one patients (55 ± 18 years, 61% males) were included, and 29 (7%) had MVP. The prevalence of MAD ≥ 1 mm, 4 mm, and 6 mm were 214

(49%), 63 (14%), and 15 (3%), respectively. Patients with MVP showed a higher prevalence of MAD greater than 1 mm (90% vs. 46%; $p < 0.001$), 4 mm (48% vs. 12%; $p < 0.001$), and 6 mm (10% vs. 3%; $p = 0.03$), and a greater MAD extent (4.2 mm, 3.0-5.7 mm vs. 2.8 mm, 1.9-4.0 mm; $p < 0.001$) than patients without MVP. The MVP was the only morpho-functional abnormality associated with MAD at multivariable analysis ($p < 0.001$). A high burden of ventricular ectopic beats at baseline Holter-ECG was associated with MAD ≥ 4 mm and MAD extent ($p < 0.05$). MAD ≥ 1 mm (0.9% vs. 1.8%; $p = 0.46$), MAD ≥ 4 mm (1.6% vs. 1.3%; $p = 0.87$), or MVP (3.5% vs. 1.2%; $p = 0.32$) were not associated with the study endpoint, whereas patients with MAD ≥ 6 mm showed a trend towards a higher likelihood of the study endpoint (6.7% vs. 1.2%; $p = 0.07$).

Conclusions: A MAD of limited entity was common in consecutive patients undergoing CMR. Patients with MVP showed higher prevalence and greater extent of MAD. Extended MAD was rarer and showed association with ventricular arrhythmias at baseline. The mid-term prognosis of MAD seems benign, however prospective studies are warranted to search for potential "malignant MAD extents" to improve patients' risk stratification.



IMAGING CARDIOVASCOLARE 216

ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

TRIVO SCORE: A NEW TOOL FOR PREDICTING OUTCOME IN PATIENTS WITH SECONDARY TRICUSPID REGURGITATION

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Background: Predicting outcomes in patients with significant secondary tricuspid regurgitation (STR) is extremely challenging.

Objectives: This study sought to develop and validate the TRIVO-SCORE, utilizing advanced echocardiographic parameters, for predicting hospitalization for heart failure (HF) and mortality in moderate and severe STR patients.

Methods: We retrospectively studied 504 consecutive STR outpatients (mean age 74 ± 13 years, 44% men), randomly divided into derivation (49%) and validation (51%) cohorts. The primary endpoint included all-cause death and/or heart failure HF hospitalization, whereas the secondary endpoint focused on HF hospitalization or all-cause death. Score discrimination was assessed using time-dependent area under the receiver operating characteristic curve (AUROC), and calibration was evaluated via the Hosmer-Lemeshow goodness-of-fit test. In a subset of patients (162/504, 29%) with severe STR and comprehensive clinical, laboratory, and echocardiographic data, we compared TRIVO-SCORE with TRI-SCORE and TRIO-SCORE.

Results: After Multivariable Cox Regression Analysis, four variables were incorporated into the final model: moderate to severe chronic kidney disease (CKD,

GFR <30 mL/min), effective Right Ventricular Ejection Fraction (eRVEF $<20\%$), right Ventricular free wall longitudinal strain/pulmonary artery systolic pressure (RVFWLS/PASP) <0.48 , and effective regurgitant orifice area (EROA) >0.41 cm². The final score ranged from 0 to a maximum of 5 points.

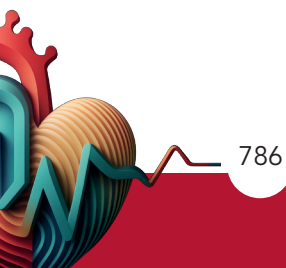
The TRIVO-SCORE demonstrated satisfactory performance in both the derivation cohort (AUROC 0.78, 95% CI 0.73-0.84) and the validation cohort (AUROC 0.71, 95% CI: 0.65-0.77) at 2-year. TRIVO-SCORE accurately predicted separate endpoints for HF hospitalization or mortality. Per each point of TRIVO-SCORE, the risk of experiencing the composite endpoint increased by 1.5 times (HR 1.55 [95% CI 1.35–1.80], $p < 0.001$, for each stage increase). This progressive increase in risk persisted when stratifying the population into atrial and ventricular STR. The discrimination and calibration for mortality prediction were superior to those of TRI-SCORE (AUROC 0.61) and TRIO-SCORE (AUROC 0.57).

Conclusions: The TRIVO-SCORE, integrating both clinical and advanced echocardiographic variables, proved to be a robust tool for enhancing risk stratification in patients with moderate to severe STR, providing a stronger association with outcomes than previously validated risk scores.



	Cox Mutivariable Analysis		Final Scoring
	HR (95% CI)	<i>p</i> value	
Severe CKD	2.279 (1.443-3.601)	0.002	2
NYHA	1.349 (0.909-2.000)	0.137	
eRVEF <20	1.861 (1.259-2.750)	<0.001	1
RVFWS <21	1.309 (0.774-2.216)	0.315	
RVFWS/PASP <0.48	1.801 (1.176-2.759)	0.007	1
EROA >0.41	1.826 (1.177-2.832)	0.007	1
Total			5

Table 1



IMAGING CARDIOVASCOLARE 89

FIBRILLAZIONE ATRIALE (FA) (ARITMIE)

ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

QUANTIFICAZIONE DELLA MASSA VENTRICOLARE SINISTRA TRAMITE ECOCARDIOGRAFIA TRIDIMENSIONALE NEI PAZIENTI CON CARDIOMIOPATIA IPERTROFICA, ASSOCIAZIONE A FIBROSI MIOCARDICA ED ARITMIE VENTRICOLARI

Francesco Paolo Perelli (a, b), Valeria Rella (a), Michele Tomaselli (a), Marco Penso (a), Giorgio Oliverio (a), Silvia Castelletti (a), Alexandra Clement (a, d), Alexandra Buta (a), Caterina Delcea (a, c), Silvia Ravaro (a), Sabrina Salerno (a), Davide Mariani (a), Gerardina Fratianni (a), Paolo Cerea (a), Mariam Khuyadze (b), Gianfranco Parati (a, b), Lia Crotti (a, b), Luigi Badano (a, b), Denisa Muraru (a, b)

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Premessa: Nei pazienti affetti da cardiomiopatia ipertrofica (CMI), la quantificazione della massa ventricolare sinistra (VS) ha importanti implicazioni prognostiche. L'ecocardiografia bidimensionale (2D) ha un'accuratezza limitata per il calcolo della massa del VS, a causa di errori di posizione del piano, presupposti geometrici e distribuzione asimmetrica della massa VS. Scopi: Ci siamo proposti di esplorare: (1) l'accuratezza dell'ecocardiografia tridimensionale (3D) rispetto alla 2D per quantificare la massa LV nella CMI rispetto alla risonanza magnetica cardiaca (RMC); (2) la relazione tra massa VS 3D e la presenza di tachicardia ventricolare non sostenuta (TVNS) e di late gadolinium enhancement (LGE) $\geq 15\%$ alla RMC.

Metodi: Abbiamo valutato la massa VS con ecografia 2D e 3D in pazienti consecutivi affetti da CMI, seguiti presso l'ambulatorio cardiomiopatie, tra il 2020 e il 2023. La funzione sistolica VS è stata valutata mediante frazione d'iezione (FEVS) in 3D e con picco 2D del global longitudinal strain (2DGLS). Inoltre sono stati raccolti dati riguardo la clinica, ECG Holter 24 ore e di RMC.

Risultati: Sono stati arruolati 180 pazienti (Età media 58 ± 18 anni, 55% uomini). La forma di CMI apicale è stata riscontrata in 56 pazienti (31%) e la forma ostruttiva in 69 pazienti (38%). Lo spessore massimo della parete

VS (SPmax) 2D misurato è stato di 20 ± 5 mm. La massa VS è risultata 150 ± 51 g/m² in 2D, 80 ± 25 g/m² in 3D e 79 ± 26 g/m² in RMC. In 57 pazienti (32%) sono state riscontrate TVNS al monitoraggio ECG Holter. La presenza di LGE $\geq 15\%$ è stata riscontrata in 57 pazienti (32%). Obiettivo n. 1: Nel sottogruppo dei 63 pazienti sottoposti a RMC, la massa VS 3D è risultata significativamente correlata alla massa VS della CMR ($r=0,85$, $<0,001$), diversamente dalla massa VS 2D ($p=0,38$). La massa VS in 3D ha mostrato una migliore concordanza con la massa VS della RMC (bias 3,8 g/m², LOA da -25 a 32 g/m²) rispetto alla 2D (bias 68 g/m², LOA da -35 a 172 g/m²). Obiettivo

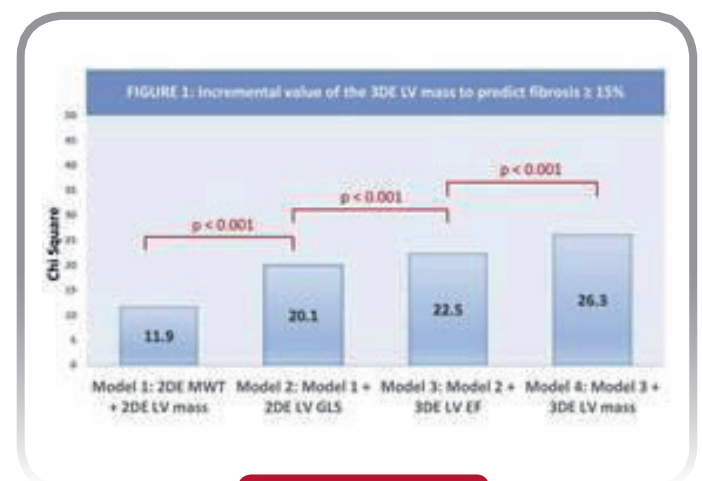
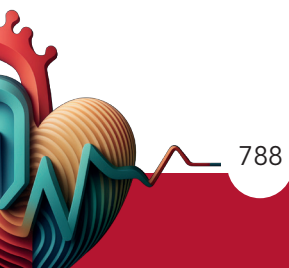


Figura 1

n. 2: nell'intera coorte, la massa VS 3D ha presentato un'associazione più forte rispetto alla massa VS 2D con la presenza di LGE \geq 15% (AUC 0,68 per 3D vs. 0,56 per 2D, $p=0,08$) e di TVNS (AUC 0,65 per 3D contro 0,54 per 2D, $p=0,06$). All'analisi multivariata, la massa LV 3D è risultata fattore predittivo indipendente del LGE \geq 15% (HR 1,03) e delle TVNS (HR 1,03), superando 2DGLS e l'SPmax. Il cutoff ottimale per la previsione del LGE \geq 15% alla RMC, utilizzando la massa 3D è risultato 87 g/m³. L'aggiunta della massa VS 3D a un modello comprendente SPmax, massa VS 2D e 2DGLS ha avuto

un effetto incrementale significativo sulla previsione della LGE \geq 15% (Figura 1).

Conclusioni: Nei pazienti affetti da CMI, la massa VS 3D è risultata fortemente correlata alla massa VS in RMC e predittore indipendente di fibrosi miocardica e di aritmie ventricolari. Nei centri con scarso accesso alla RMC, la quantificazione ecocardiografica tridimensionale della massa VS nei pazienti con CMI può migliorare la stratificazione del rischio aritmico rispetto alla metodica bidimensionale.



IMAGING CARDIOVASCOLARE 268 ARITMIE VENTRICOLARI (ARITMIE) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

CMR SCAR CHARACTERIZATION IN PATIENTS AFFECTED BY CARDIAC AMYLOIDOSIS

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Introduction: Cardiac magnetic resonance (CMR) imaging has a critical importance in the study of cardiomyopathies; apart from its diagnostic role, an additional emerging feature is the ability of merging structural data with electro-anatomical maps. This is made possible by using a software (ADAS 3D, Galgo Medical, Barcelona, Spain) able to provide 3D cardiac models by detecting fibrosis along the whole thickness of myocardial walls.

Materials and Methods: This is a retrospectively conducted analysis of CMR imaging in patients affected by CA treated in our center. Data were processed with the ADAS 3D Software when possible while searching for a possible correlation between morphometric parameters and follow-up events. The outcome was a composite of all-cause mortality, unplanned cardiovascular hospitalizations, sustained ventricular arrhythmias (VAs), permanent reduction in left ventricular ejection fraction and pacemaker implantation. The secondary outcomes were the need for a pacemaker implantation and sustained VAs.

Results: A total of 14 patients were deemed eligible for the software analysis: 8 patients affected by wild type transthyretin CA, 5 with light chain CA, and 1 with transthyretin hereditary CA. Most imaging features

were not related to the composite outcome, but atrial wall thickening displayed a significant association with the primary outcome ($p = 0.003$) mainly determined by a significant association with the secondary outcome of pacemaker implantation ($p = 0.003$). In addition the software was able to differentiate between core zones and border zones of scars, with the latter being the most represented in all the patients included. Furthermore, in the cohort of patients with the highest degree of core zone fibrosis among epicardial layers we found a higher incidence of the primary outcome, but this result did not lead to a statistical significance ($p = 0.18$). The presence of slow-conducting channels dispersed in scar did not show a clear correlation with follow-up events.

Conclusions: CMR imaging has a central role in the study of cardiomyopathies. Our analysis shows the importance of the data derived from such instrument in all types of CA. We could not only differentiate between different layers of scars, but we were also able to identify the presence of fibrosis channels among the different scar zones. None of the data derived from the ADAS 3D software seemed to be related to cardiac events in the follow-up, but this might be imputable to the restricted number of patients enrolled in the study.



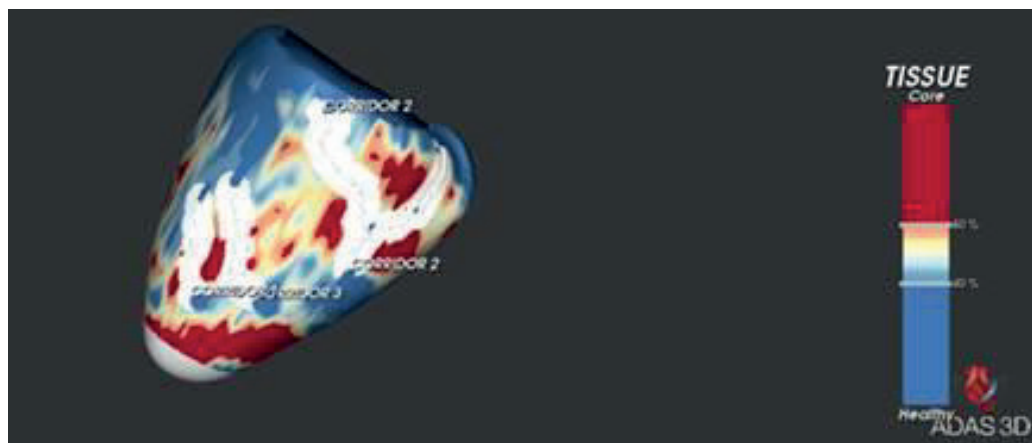


Figure 1

IMAGING CARDIOVASCOLARE 20 PROGNOSI (SCOMPENSO CARDIACO) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

ECHOCARDIOGRAPHIC ESTIMATE OF PULMONARY CAPILLARY WEDGE PRESSURE IMPROVES OUTCOME PREDICTION IN CHRONIC HEART FAILURE

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(a) SCUOLA SUPERIORE SANT'ANNA, PISA; (b) FONDAZIONE TOSCANA GABRIELE MONASTERIO, PISA; (c) UNIVERSITÀ DI FIRENZE; (d) UNIVERSITY OF LIÈGE, CHU OF LIÈGE, BELGIUM

Background: An echocardiographic algorithm to estimate pulmonary capillary wedge pressure (ePCWP) and pulmonary vascular resistance (ePVR) has been recently validated versus right heart catheterization.

Purpose: The aim of this study was to assess the prognostic significance of these measures in heart failure (HF) patients.

Methods: Consecutive outpatients with HF and left ventricular ejection fraction (LVEF) <50% undergoing echocardiography were selected and followed-up for the composite endpoint of cardiac death or HF hospitalization.

Results: Out of 2,214 patients (71±12 years, 76% males, LVEF 35±9%), ePCWP (16±6 mmHg) was elevated (>15 mmHg) in 52% of cases and ePVR (1.7±0.7 WU) was elevated (>2 WU) in 25% of cases. Patients with increased ePCWP were older, had a higher NYHA class, more pronounced cardiac remodeling, systo/ diastolic dysfunction, and neurohormonal activation, particularly when ePVR was also elevated (p<0.001). Over a median follow-up of 33 (17-48) months, both measures stratified patients for the risk of the primary endpoint (Log-Rank 152 for PCWP, and 44 for ePVR, p<0.001). At adjusted regression analysis, ePCWP (hazard ratio for 1 mmHg increase 1.03 [95%CI 1-01-1-05], p<0.001) but not ePVR (p=0.584) predicted the

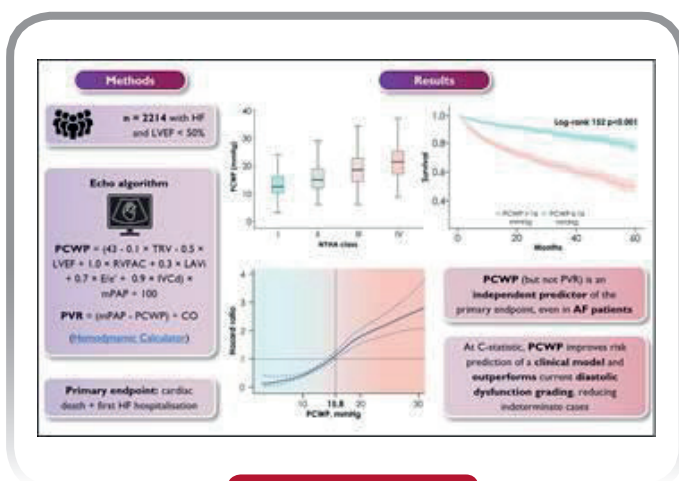


Figura 1

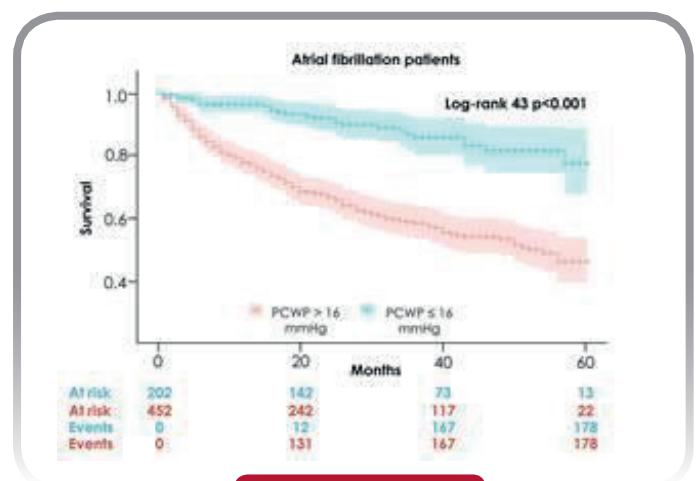


Figura 2

primary endpoint, even in the subpopulation of patients with atrial fibrillation ($p=0.003$). ePCWP outperformed current diastolic dysfunction grading (Δ C-statistics 0.068 [95% CI 0.045-0.093], $p<0.001$), and stratified patients' risk across each diastolic dysfunction grade at univariate analysis (Grade I: $p=0.002$; Grade II-III: $p<0.001$; Indeterminate cases: $p=0.010$). The addition of ePCWP to a multivariable prognostic model, including patients' age, NYHA class III-IV, chronic obstructive pulmonary disease, estimated glomerular filtration rate, NT-proBNP, and LVEF, improved the

accuracy of risk prediction (Δ C-statistics 0.008 [95% CI 0.002-0.014], $p=0.007$).

Conclusion: The echocardiographic estimates of PCWP retained clinical and prognostic significance in a large contemporary cohort of patients with chronic HF and LVEF $<50\%$. This algorithm could facilitate early identification of high-risk patients, possibly reducing the need of right heart catheterisation, and allowing a tailored therapeutic approach.

IMAGING CARDIOVASCOLARE 516 ECO-CONTRASTO (IMAGING CARDIOVASCOLARE) VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

WHAT CONTRAST ENHANCED ECHOCARDIOGRAPHY CAN AND CAN NOT IMPROVE IN CLINICAL PRACTICE? OUR 5 YEARS' EXPERIENCE

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(a) UNIVERSITA' DEGLI STUDI DI VERONA

Purpose: To compare contrast-enhanced echocardiography (CEE) and standard echocardiography (SE) in evaluating cardiac function at Verona Hospital from 2019 to the 2024.

Methods: We retrospectively analysed echocardiographic images from patients who provided informed consent. Parameters of left and right ventricular function (left ventricular ejection fraction (LVEF), left ventricular stroke volume, right ventricular fractional area change (RVFAC), ventricular dimensions), and Doppler-derived parameters obtained from CEE and SE were compared.

Results: 165 patients were included in the study. The most frequent indications for CEE were the assessment of systolic function in patients with poor acoustic windows and exclusion of apical thrombus. Rare indications were assessment of regional wall motion abnormalities and wall thickness in patients with suspected hypertrophic cardiomyopathy. No significant difference in LVEF or RVFAC assessed from CEE and SE were found, showing a strong correlation observed ($r=0.846$, $p<0.001$ for LVEF, $r=0.406$ $P<0.001$ for RVFAC). Interestingly, right ventricular end-diastolic and end-systolic areas were significantly larger with SE ($19.92 \pm 5.17 \text{ cm}^2$ vs $18.44 \pm 4.75 \text{ cm}^2$; $11.50 \pm 3.76 \text{ cm}^2$ vs $10.56 \pm 3.07 \text{ cm}^2$, $P<0.001$ for both). Furthermore, left ventricular stroke volume with doppler technique (LVOT VTI)

calculated as the product of LVOT cross sectional area (assuming that LVOT is circular) to the LVOT VTI with SE, compared to left ventricular stroke volume calculated as volume differences with CEE did not significantly differ and showed a strong correlation ($p>0.0001$). All Doppler measurements, including LVOT VTI, E/A ratio, pulmonary vein S and D waves, and mitral valve E and A waves, were significantly different when measured from CEE and SE ($p<0.05$ for all). In 22 cases of suspected apical thrombus, CEE such diagnosis was confirmed in 9 cases while SE missed 3, highlighting the superior sensitivity and specificity of CEE in this context.

Conclusions: In our experience, CEE does not clearly improve the assessment of LVEF or RV function compared to SE, although it may enhance endocardial borders, especially in the evaluation of RV dimensions. This enhancement, however, does not translate into a significant difference in ventricular function evaluation. CEE is superior in the detection of apical thrombus and may also be advantageous in the assessment of segmental wall motion. Doppler measurements differ significantly between the two modalities, highlighting the potential of CEE to enhance flow assessment. Our findings underscore the importance of considering the strengths and limitations of both techniques when choosing the appropriate imaging modality for specific clinical scenarios.



**IMAGING CARDIOVASCOLARE 883
 PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
 RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
 (IMAGING CARDIOVASCOLARE)
 ARITMIE VENTRICOLARI (ARITMIE)**

DISEASE PROGRESSION IN ARRHYTHMIC MITRAL VALVE PROLAPSE: A MULTICENTRIC LONGITUDINAL OBSERVATIONAL CMR STUDY

Annagrazia Cecere (a), Nicolo' Martini (a), Andrea Barison (b), Valeria Cammalleri (c), Andrea Chiampan (d), Carmelo Ciccio' (d), Domenico De Stefano (c), Clementina Dugo (d), Stefano Figliozzi (e), Martina Gelfusa (c), Lorenzo Monti (e), Rita Pavasini (f), Gianluca Pontone (g), Chiara Rovera (g), Giancarlo Todiere (b), Elisabetta Tonet (f), Sabino Iliceto (a), Alberto Cipriani (a), Martina Perazzolo Marra (a)

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Background. Mitral annular disjunction (MAD) and left ventricular (LV) myocardial fibrosis are typical features of arrhythmic mitral valve prolapse (MVP). Myocardial fibrosis, assessed in vivo by cardiac magnetic resonance (CMR) through late gadolinium enhancement (LGE), represents a critical determinant of ventricular arrhythmias (VAs) in MVP patients. However, the natural history of myocardial fibrosis in MVP patients with its potential clinical and arrhythmic implications over time have not been fully elucidated.

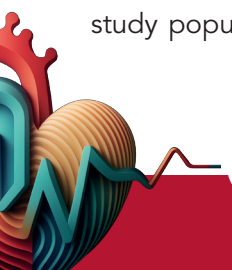
Purpose. This multicentric Italian study aimed to assess whether the presence and extent of LV myocardial fibrosis, assessed by CMR, could change over time and its potential clinical impact.

Methods. All patients from seven Italian Centers (2013-2023) with arrhythmic MVP who underwent two clinical evaluations, 12-lead 24-hour ECG Holter and CMR, performed at least after 12 months, were retrospectively included.

Results. 36 patients were identified and constituted the study population (18 females; median age 46 years).

On CMR-1, 24 MVP patients (67%) showed LV LGE and, compared with those without, were characterized by a higher posterior mitral leaflet excursion ($p=0.04$), mitral annulus diameter ($p<0.001$) and inferolateral, inferior and anterior MAD length (respectively, $p=0.004$, $p=0.03$ and $p=0.03$). CMR-2 was performed with a median of 28 months (13-63) after the CMR-1. No patients without LGE on CMR-1 developed LGE on CMR-2. Conversely, compared to CMR-1, LGE patients showed a greater mitral leaflets excursion ($p=0.001$), worse mitral valve regurgitation grading (regurgitant volume, 45 ± 19 versus 39 ± 21 ml, $p=0.03$; regurgitant fraction 34 ± 9 versus 29 ± 12 %, $p=0.04$), greater inferolateral, inferior and anterolateral MAD length (respectively, $p=0.04$, $p=0.002$ and $p=0.01$), as well as an increase in LGE amount (3 ± 1 versus 2 ± 1 5-SD%, $p<0.001$). Progression of LGE was associated with worsening of arrhythmic burden (OR 12, 95% CI 2.00-70.22, $p=0.005$).

Conclusions. Mitral valve abnormalities and myocardial fibrosis in patients with arrhythmic MVP seems to progress over time. Disease progression is associated with worsening of arrhythmic burden.



IMAGING CARDIOVASCOLARE 70

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

EXPLORING THE INTER-VENDOR VARIABILITY OF GLS: A MYOCARDIAL DEFORMATION ANALYSIS ON A COHORT OF HEALTHY VOLUNTEERS

Piera Ciaramella (a), Antonella Ciuffreda (a), Sara Monosilio (a), Lucrezia Netti (a), Vincenza Paladino (a), Giovanni Rubino (a), Danilo Angotti (a), Nicola Galea (a), Livia Marchitelli (a), Sara Cimino (a), Roberto Badagliacca (a), Dario Carmine Vizza (a), Viviana Maestrini (a)
(a) SAPIENZA, UNIVERSITA' DI ROMA

Background: Global longitudinal strain (GLS) by Speckle-tracking Echocardiography (STE) has emerged as the most sensitive marker of myocardial function with a prognostic value in many cardiac diseases. GLS could also be calculated by cardiac magnetic resonance (CMR) which is the gold standard method for LV morph functional evaluation, applying the feature-tracking (FT) technique. However, there are still difficulties related to the lack of interchangeability between STE and FT techniques and the inter-vendor variability of myocardial deformation parameters.

Aim: To assess the variability of transmural GLS measurements using different analysis software packages from three different specific vendors (Echo 1-2-3) and to compare the variability of endocardial GLS measurements using an independent vendor software between cine-loops obtained by three different echo machines and CMR.

Methods: We enrolled 50 healthy volunteers (age 29 ± 3 years, males 60%, BSA 1.7 ± 0.2 m²) without cardiovascular risk factors. All the subjects were in sinus rhythm (HR 69 ± 12 bpm) and had a good acoustic window. Each volunteer underwent an echocardiographic study on three different echo machines on the same day (Echo 1, Echo 2, Echo3). Over the course of a week, 11 patients also underwent a CRM without contrast administration. The images were acquired on each echo machine by an expert operator. All transmural GLS measurements were

performed by a single observer using the dedicated post-processing software package of the respective vendor that were based on a semi-automatic method with possible manual adjustments by the operator. The same operator analyzed the cine-loops obtained from the three echo machines and CMR with an independent software which performed the analysis of STE/FT parameters with a semi-automatic method. The following parameters were obtained: left ventricular (LV) Circumferential Global Strain (GCS), GLS, EF, end-diastolic volume (EDV) and end-systolic volume (ESV).

Results: Comparing the parameters obtained by the three specific software vendors of the echo machines, there were no statistically significant differences in transmural GLS values ($p=0.313$); (Picture 1). Comparing the parameters obtained by an independent software vendor, there were no statistically significant differences between the endocardial GLS, GCS and EF computed by the software (respectively $p=0.290$, $p=0.655$ and $p=0.51$ (Table 1).

Conclusions: In clinical practice, transmural GLS do not differ using specific vendor software of different echo machines on a cohort of healthy volunteers. At the same time, endocardial GLS, GCS and EF values calculated by an independent multivendor software using echo cine-loops of three different echo machines do not differ between them and from CMR-FT obtained GLS and GCS values.



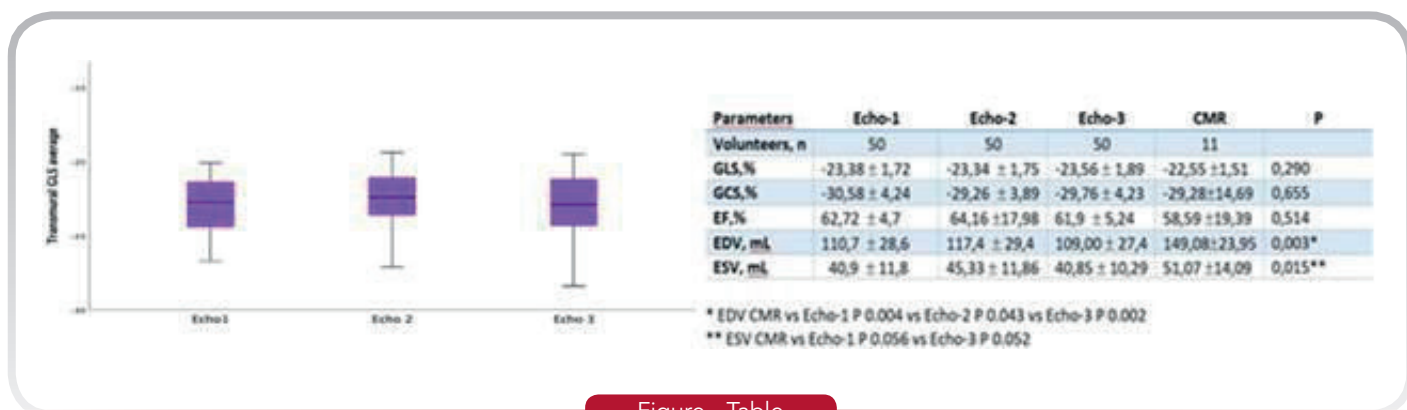
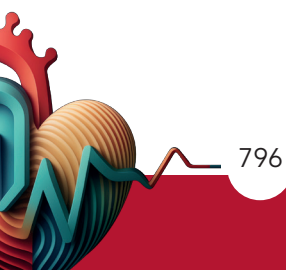


Figure - Table



IMAGING CARDIOVASCOLARE 115

ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

ARITMIE VENTRICOLARI (ARITMIE)

ASPETTI GENETICI DELLE ARITMIE (ARITMIE)

EVALUATION OF ATRIAL STRAIN MEASUREMENT IN PATIENTS AFFECTED BY BRUGADA SYNDROME AND ITS CORRELATION WITH HIGH RISK CLINICAL FEATURES

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Introduction: Brugada Syndrome (BrS) is an hereditary channelopathy which can induce malignant arrhythmias that may lead to syncope or sudden cardiac death. The electrical substrate can be studied with an electrophysiological study in order to assess the risk of ventricular arrhythmias, but the role of echocardiography in this setting is still unclear.

Objective: The primary aim of this study is to assess peculiar echocardiographic features in BrS patients vs healthy controls and their correlation with an high risk clinical setting.

Methods: We enrolled 153 patients affected by BrS. The control group was composed of 57 healthy subjects with a negative provocative drug test. 100 out of the 153 affected patients have received a genetic testing for BrS associated genes. All patients have undergone a complete cardiologic examination, EKG, and echocardiography. The gathered data comprehend medical history, basal EKG, Shanghai Score, clinical evaluation, genetic test, response to provocative test, 24-hrs holter EKG and ecocardiographic parameters: chambers quantification, ejection fraction, transmitralic doppler parameters, right ventricle function parameters, and longitudinal strain values.

Results: Atrial fibrillation (AF) was reported in 16 out of 153 (10.5%) BrS patients and in 2 out of 57

(3.5%) healthy controls. Among BrS patients, 15 (9.8%) reported major ventricular arrhythmias (VA). The analysis showed a significant divergence in BrS patients compared to healthy controls with regard to the following measurements: RAVI (23.8 ± 6.6 vs 20.7 ± 6.7); E/A (1.2 ± 0.4 vs 1.6 ± 0.6); A wave (64.6 ± 18.7 vs 53.4 ± 16.9); DTE (215.4 ± 49.7 vs 190.4 ± 43.5); LASr-ED (44.5 ± 12.6 vs 50.8 ± 13.8); LAScd-ED (-27.5 ± 10.7 vs -33.8 ± 11.4); RASr-ED (39.5 ± 10.6 vs 47.9 ± 9.5); RAScd-ED (-25.1 ± 8.7 vs -31.9 ± 8.3). Among BrS patients, at the univariate analysis the onset of atrial fibrillation was correlated to the following parameters: LAVI (p 0.001); RAVI (p 0.015); LASr-ED (p 0.013); LASct-ED (p 0.029). LAVI was also correlated to atrial fibrillation at the multivariate analysis (p 0.02). Ventricular arrhythmic episodes were correlated, among BrS patients, to RASct-ED (p 0.004) and LV-GLS (p 0.042) at the univariate analysis. RASct-ED was also correlated to ventricular arrhythmias at the multivariate analysis (p 0.011) and could predict VAs with a cut-off value of -10.85% (sensitivity 0.75; specificity 0.79).

Conclusions: When compared to healthy controls, atrial reservoir and conduit phase are altered in BrS for both left and right atrium. AF episodes are correlated with atrial volumes and LA strain. VA episodes correlate with RASct-ED, which may be helpful as a prediction parameter (cut-off -10.85%). These features could help to better stratify high risk patients.



IMAGING CARDIOVASCOLARE 194
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
PIASTRINE E TERAPIA ANTIAGGREGANTE (ATEROTROMBOSI)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

MARANTIC ENDOCARDITIS: THE TIP OF THE ICEBERG

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 (a) UNIVERSITA' DEGLI STUDI DI BARI 'ALDO MORO'

Case presentation: a 45 years-old female without relevant cardiological past medical history was referred to our hospital for 'Brugada Syndrome' family screening. At the age of 20 years old, during blood tests carried out for frequent episodes of dizziness and uncontrollably itching on contact with water, a very severe thrombocytosis was detected and the diagnosis of essential thrombocythemia (ET) V617F-JAK2 negative was made. Throughout years, non-negligible benefits were achieved by aspirin assumption. At the age of 31 years old, due to presumed infertility and several IVF failed cycles, she was investigated for thrombophilia without autoantibody positivity nor pathogenic mutations. To our attention, the patient was asymptomatic. Trans-thoracic echocardiogram revealed normal left atrium and ventricle (LV) with a preserved ejection fraction. Unexpectedly, during visualization of short-axis view, we observed 11-mm-sessil-masses adherent to the LV-side of the aortic valve leaflets, that appeared with irregular borders, heterogeneous echodensity and absence of independent motion. Moreover, a mild aortic regurgitation was noted on color Doppler assessment. We didn't report significant damage to the valvular apparatus nor local complications such as abscesses, fistulae, or disruption of the leaflets and chordae. Those findings were highly suggestive of non-bacterial thrombotic endocarditis (NBTE). Given that most common associations with NBTE are advanced cancer and other systemic inflammatory conditions, an extensive laboratory screening was performed, resulting negative. Additionally, because of the risk of embolic cerebrovascular phenomena, a CT-scan

was obtained ruling out any brain lesions. Despite the lack of specific guidelines and striking the right balance between thrombotic and hemorrhagic risks, we started anticoagulation treatment with vitamin K antagonists. While data are limited to guide the timing of NBTE-follow-up echocardiography, we decided to plan cardiological controls every 3 months. Moreover, low-dose aspirin was not re-introduced because of the normalized platelet count and in order to avoid any gastro-intestinal discomforts.

Discussion: NBTE is a rare condition characterized by the presence of sterile vegetations on cardiac valves.

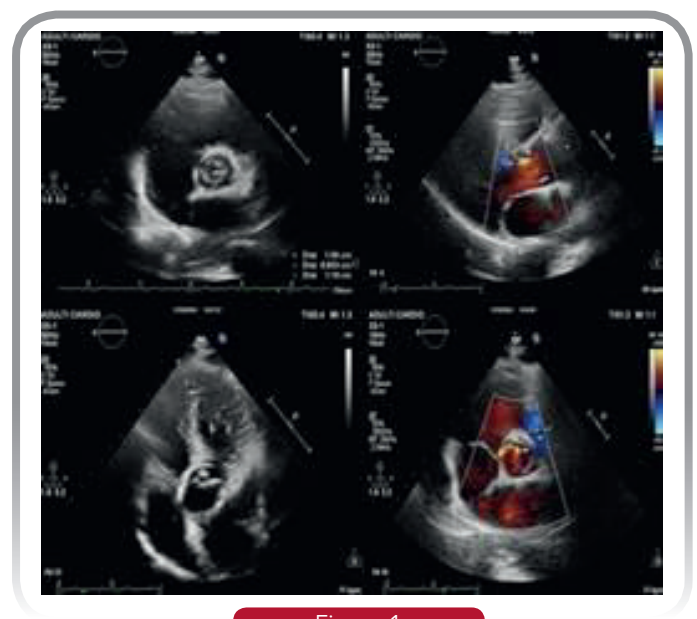


Figura 1

Although its pathogenesis is not entirely clear, the majority of cases are associated with malignancy. In literature, the cardiac involvement during ET and other myeloproliferative disorders has been little described. Because the ongoing assessments resulted negative, it raised the question of a possible pathogenetic relationship between ET and the development of NBTE. We believe that platelets over-production and

resulting abnormal aggregation could have played a pivotal role in thrombi formation on aortic valve. Experiencing a more turbulent blood flow than the mitral valve, the aortic one may be able to facilitate the disruption of such abnormal platelets. Moreover, its physiological reduced range of motion could accelerate the activation of the hemostatic cascade on the LV-side of its leaflets.



IMAGING CARDIOVASCOLARE 468
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ECO-CONTRASTO (IMAGING CARDIOVASCOLARE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
CARDIOPATIE CONGENITE NELL' ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

UNVEILING HIDDEN PATHOLOGY: MULTI-MODALITY IMAGING IN THE DIAGNOSIS OF RIGHT VENTRICULAR ENDOMYOCARDIAL FIBROSIS-CONTRAST ECHOCARDIOGRAPHY TO THE RESCUE

Domenico Galzerano (a), Naji Kholaf (a), Bandar Alamro (a), Sultan Alzaher (b), Maie Alshahid (b), Alaa Hamad (e), Abdulrahman Habib (b), Muhammad Saleem (b), Sara Di Michele (f), Giovanni Di Salvo (d)

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Eosinophilic infiltration of the myocardium is a rare and life-threatening condition often linked to hypereosinophilic syndromes. This case involves isolated eosinophilic infiltration of the right ventricle, highlighting diagnostic methods and the role of contrast echocardiography (E) and magnetic resonance imaging (MRI) in diagnosis and management. A 32-year-old male with non-insulin dependent diabetes mellitus presented with exertional dyspnea for 1 month. He had no orthopnea, chest pain, or syncope, and no history of respiratory or cardiovascular illnesses. Physical examination was unremarkable. Laboratory tests showed hemoglobin: 15.9 g/dl, WBC: 18870 (eosinophils 47.25%), and platelet count: 182000. Liver enzymes, renal functions, troponin, and proBNP were normal. Peripheral blood film showed normocytic normochromic cells with leukocytosis and absolute eosinophilia. EKG revealed normal sinus rhythm with right atrial enlargement. Transthoracic E showed a large mass occupying two-thirds of the right ventricle, resembling a tumorous mass (figure 1a). Contrast echocardiogram with Optison revealed non-homogeneous opacification and

patchy hyperintense uptake, visualizing small flickering masses attached to the ventricular edge of the mass (figure 1b). Echocardiographic features suggested eosinophilic infiltration. Cardiac MRI showed average-sized right ventricle with obliterated mid to apex cavity due to endomyocardial thickening, without involving

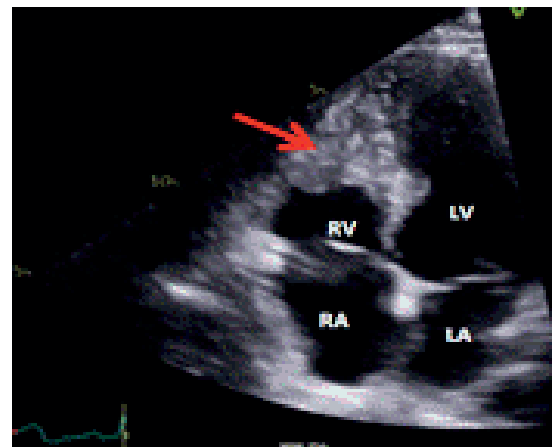


Figura 1

the RVOT and tricuspid valve. The MRI showed a double V sign after gadolinium injection, indicating subendocardial enhancement with overlying non-enhanced surface thrombus. The patient was treated with high-dose corticosteroids (prednisone 1 mg/kg/day) and anticoagulation therapy with Apixaban 5 mg twice a day due to thromboembolic risk. Discussion: Isolated eosinophilic infiltration of the right ventricle is an uncommon presentation of eosinophilic myocarditis. Prompt recognition and treatment are essential to prevent complications like heart failure, arrhythmias, and thromboembolism. While cardiac MRI and endomyocardial biopsy are key in diagnosis, biopsy has risks of complications and high false-negative rates. Contrast echocardiography, though used in few cases, remains a non-invasive modality for detecting eosinophilic endomyocarditis at any stage. This case highlights the importance of both contrast echocardiography and MRI in the diagnostic pathway

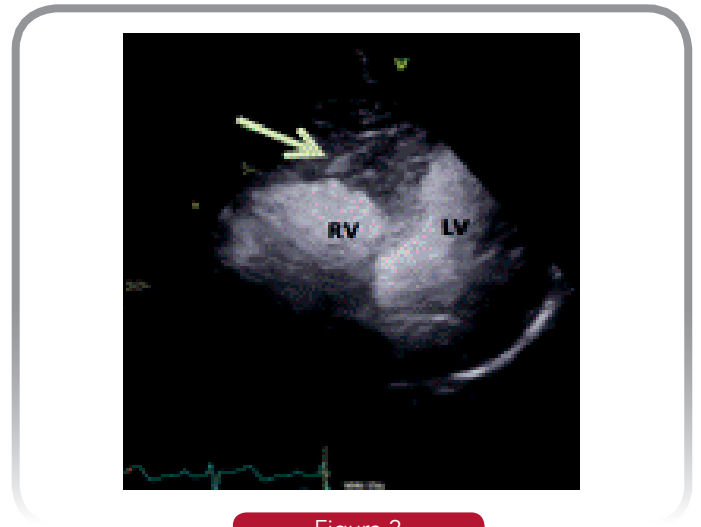


Figura 2

and follow-up challenges. A) Apical 4 chamber RV mass (red arrow) B) Apical 4 chamber with optison, patchy uptake (green arrow)



IMAGING CARDIOVASCOLARE 460
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
EMBOLIA POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

CMR THE MODERN SOLUTION FOR CARDIAC MASSES DILEMMA

Giulia Giacomobono (a), Simona Fortunato (a), Gino Puntel (a), Giovanni Benfari (a), Enrico Tadiello (a)
 (a) AZIENDA OSPEDALIERA INTEGRATA VERONA

Cardiac masses diagnosis and treatment are a true challenge. They encompass a broad set of lesions that include neoplastic (primary and secondary), non-neoplastic masses and pseudomasses.

Cardiac magnetic resonance (CMR) is an essential tool in the evaluation of cardiac masses, due to its incomparable tissue characterization and multiplanar imaging capabilities.

We reported a case of a 76 years-old man suffering from a previous surgically removed melanoma and evaluated in the emergency department for dyspnea and asthenia. CT scan raise the suspicion of pulmonary thromboembolism due to the finding of two small filling pulmonary artery defects and a right atrial mass. Furthermore, CT brain scan reveals multiple cerebral masses plausible for secondary localizations, with a high risk of bleeding if an anticoagulant therapy would be prescribed.

An echocardiogram was performed without clear evidence of right heart dysfunction and without signs of pulmonary hypertension; on the other hand, it showed a rounding mass (15 x 16 mm) attached to the right atrial wall (subcostal view, fig. 1).

In the suspicion of cardiac metastasis and to obtain a clear definition of the mass, we ordered a CMR (1.5 T, Philips). This exam confirmed two atrial masses with intermediate intensity in cine sequences (4 chamber view fig.2 and modified right heart view fig.3), signal hyperintensity in T1 weighted sequences (fig. 4).

Melanoma metastasis are characterized by high signal intensity on T1 weighted images due to the presence of a high amount of melanina. After gadolinium administration, masses showed marked and heterogeneous late gadolinium enhancement, another typical feature of malignant cardiac tumors (fig. 5). Therefore IV stage (TNM classification) melanoma was



Figura 1

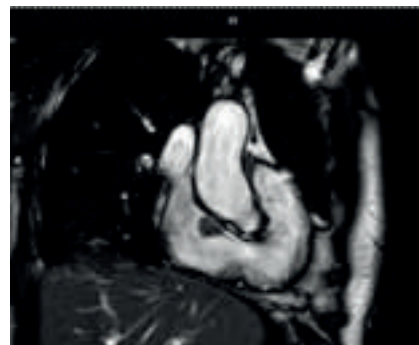


Figura 2

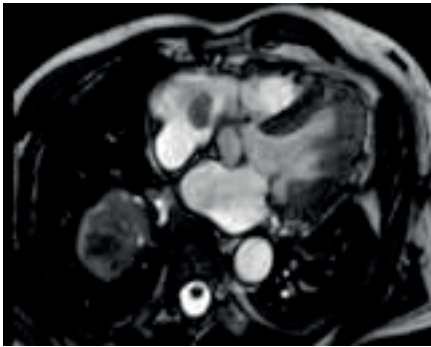


Figura 3

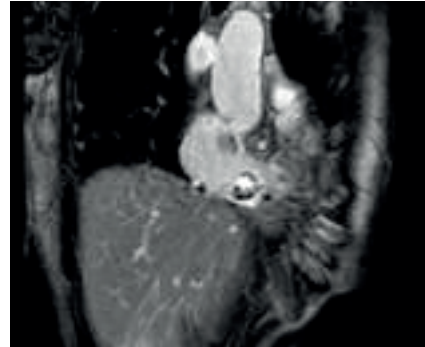


Figura 4

diagnosed, anticoagulation was not administered and the patient was referred to the oncology team in order to perform radiotherapy and chemotherapy. In conclusion, CMR is nowadays the gold standard method for the noninvasive characterization of cardiac masses and can play a key-role in distinguishing thrombus from neoplastic masses with a great impact on patient management.



Figura 5



**IMAGING CARDIOVASCOLARE 12
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)**

I NUOVI ORIZZONTI NELL'IMAGING CARDIOVASCOLARE CON LA TC A CONTEGGIO DI FOTONI (PCCT)

Aldo Lo Varco (a)

(a) U.O.C. DI CARDIOLOGIA - DIPARTIMENTO DI EMERGENZE - URGENZE, AZIENDA OSPEDALIERA
UNIVERSITARIA POLICLINICO PAOLO GIACCONE, PALERMO

Introduzione: La cardio TC eseguita attraverso la TC multidetettore (TCMD) è ormai diventata un esame di routine nella pratica quotidiana grazie al continuo sviluppo delle apparecchiature e alla rapidità di esecuzione. Nonostante l'evoluzione tecnologica, vi sono dei limiti legati alla tecnica che vanno a degradare la qualità dell'immagine. Nell'ottica di un ulteriore sviluppo trova luogo la TC a conteggio di fotoni (PCCT) la quale permette di ottenere immagini con una maggiore risoluzione spaziale, permette di rilevare le calcificazioni e valutare l'estensione, la composizione della placca coronarica e degli stent permettendo di effettuare una diagnosi più accurata.

Metodi: La PTCC è l'ultima frontiera dell'imaging medico ottenuto tramite raggi X e ciò che la differenzia dalla TC tradizionale è il modo in cui i fotoni vengono rilevati dal detettore. Nel caso della PCCT il detettore a conteggio di fotoni (PCD) converte in maniera diretta il fotone in elettroni e rilevati dai pixel producono un segnale proporzionale all'energia di partenza del fotone. Questo nuovo metodo presenta dei vantaggi quali: rumore elettronico assente, dose efficace più alta, risoluzione maggiore, imaging spettrale e di conseguenza una qualità dell'imaging maggiore.

Risultati: L'incremento della risoluzione spaziale e di contrasto permette una valutazione più accurata del lume residuo dell'arteria coronarica in presenza

di placca calcifica. La quantificazione del calcium score attraverso il metodo Agatston, permette di ottenere valori significativi nella previsione dell'evento cardiovascolare. Ulteriore campo di applicazione di questa tecnica innovativa è la caratterizzazione della placca coronarica, ossia differenziare se si tratti di placca calcifica, fibrotica o lipidica e l'identificazione di caratteristiche come l'assottigliamento del cappuccio fibroso o la presenza di emorragia all'interno della placca. L'analisi spettrale viene usata anche nella valutazione dello stent, poiché grazie alla riduzione di artefatti da blooming, da indurimento del fascio e metallico si è in grado di valutare il lume del vaso all'interno dello stent e predire eventuali re-stenosi. Inoltre può essere applicata nella caratterizzazione del tessuto miocardico, nella valutazione della perfusione e nella determinazione del tessuto adiposo epicardico e pericoronarico.

Conclusioni: L'introduzione dei detettori a conteggio di fotoni (PCD) rappresenta un notevole sviluppo in avanti poiché ha permesso di superare alcuni limiti legati alla TCMD andando a migliorare la risoluzione spaziale, di contrasto, la riduzione del rumore elettronico, una migliore dose efficace e l'analisi multi spettrale. Tuttavia, nonostante i suoi numerosi vantaggi, la tecnologia non è priva di sfide. Fenomeni come la condivisione di carica e il pile-up possono degradare la qualità dell'immagine ma nonostante ciò, rimangono di gran lunga superiori

a quelle prodotte con tecniche tradizionali. Questa evoluzione ha permesso di aprire nuovi orizzonti nella valutazione delle patologie che colpiscono il cuore e le arterie coronariche permettendo una diagnosi più

accurata ed efficace, migliorare la stratificazione del rischio e ottimizzare le strategie di trattamento delle malattie cardiovascolari



IMAGING CARDIOVASCOLARE 264
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO
(IMAGING CARDIOVASCOLARE)

PISA METHOD CORRECTION BY LEAFLET TETHERING ANGLE AND REGURGITANT JET VELOCITY, AND ITS ASSOCIATION WITH OUTCOMES IN PATIENTS WITH SECONDARY TRICUSPID REGURGITATION

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Background: Although the correction of the proximal isovelocity surface area (PISA) method has been shown to improve the accuracy of assessing the severity of secondary tricuspid regurgitation (STR), its clinical impact remains to be investigated.

Purpose: To compare the strength of the association of the quantitative parameters of STR severity obtained from the corrected and conventional PISA methods with outcomes in patients with either atrial- or ventricular STR.

Methods: We used both the conventional and corrected PISA method to obtain effective regurgitant orifice area (EROA and EROAc, respectively), regurgitant volume (RegVol and RegVolc, respectively), and regurgitant fraction (RegFr and RegFrc, respectively) in 519 consecutive patients (75±12 years, 44% men, 74% ventricular STR) with moderate and severe STR. The endpoint was a composite of heart failure hospitalization and all-cause death.

Results: EROAc, RegVolc, and RegFrc were significantly larger than EROA (bias= 21 mm², Limits of agreement, LOA= 25 mm²), RegVol (bias= 18 mL, LOA= 18 mL), and RegFr (bias= 24%, LOA= 17%) (P < 0.001 for

all). After a follow-up of 19±15 months, 210 patients reached the endpoint. Threshold values for an excess of events using the corrected PISA parameters were larger in patients with ventricular (EROAc = 51 mm², RegVol = 42 mL) than atrial STR (EROAc = 46 mm², RegVolc = 30 mL, p=0.001), except the RegFr that was significantly smaller in patients with ventricular STR (56% vs. 69%, p=0.001). Using time-dependent ROC curves, the AUCs of the parameters obtained from the corrected PISA were more closely associated with outcomes at two years than those obtained with the conventional PISA: EROAc vs. EROA (0.62 vs. 0.60, p<0.001), RegVolc vs. RegVol (0.63 vs. 0.62, p=0.001), and RegFrc vs. RegFr (0.66 vs. 0.63, p<0.001) in patients with ventricular STR. Conversely no significant differences between AUCs were detected in patients with atrial STR. In both univariable and multivariable analyses, both EROA and EROAc, RegVol and RegVolc, or RegFr and RegFrc consistently emerged as independently associated with outcomes in patients with ventricular STR (p<0.001 for all). Conversely, in patients with atrial STR, although EROA and EROAc retained their independent predictive power, neither uncorrected nor corrected RegVols and RegFr were found to be independent predictors of outcomes after multivariable adjustment.

Conclusions: Correcting the PISA method for the leaflet tethering angle and the velocity of the regurgitant jet provides larger quantitative parameters of STR severity. In patients with ventricular STR, the

parameters obtained with the corrected PISA method are more closely associated with those obtained with the conventional PISA.



IMAGING CARDIOVASCOLARE 187
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)

IDENTIFICATION OF RISK PHENOGROUPS AMONG PATIENTS WITH MODERATE- TO-SEVERE TRICUSPID REGURGITATION BY UNSUPERVISED CLUSTER ANALYSIS

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Background: Assessing the individual risk of patients with secondary tricuspid regurgitation (STR) is challenging as it requires integrating disease severity and mechanism with different clinical and imaging characteristics. Several scores and cluster analysis have recently been proposed, almost all of them using visual estimation or conventional echocardiography for the evaluation of right ventricle (RV) size and function. However, advanced echocardiography has been scarcely used so far in this context.

Purpose: We sought to identify the different phenogroups of STR using unsupervised cluster analysis and assess their association with clinical outcomes.

Methods: We included 558 consecutive patients (mean age 74 ± 14 years, 54.7% women) with moderate and severe STR who underwent comprehensive two-, three-dimensional, and speckle-tracking echocardiography. The primary endpoint was a composite of heart failure hospitalization and all-cause mortality. Four unsupervised algorithms were used to cluster STR patients based on 16 variables recruited from demographics or echocardiographic domains, routinely obtained for the assessment of STR or having prognostic value.

Results: Over a median follow-up of 16.5 months, 215 patients reached the composite endpoint. A cluster analysis divided the patients into three phenogroups with distinct characteristics: Phenogroup 1 "lowest-risk STR" (rate of event-free survival at two years: $80 \pm 3\%$) with moderate STR, preserved RV size and function, and moderately dilated but normofunctional RA; Phenogroup 2 "Intermediate-risk STR (hazard ratio [HR] 2.37, 95% confidence interval [CI] 1.14-4.92, $p=0.02$) characterized by older age, severe STR, mildly dilated but uncoupled RV; and Phenogroup 3 "highest-risk STR" (HR 3.83, 95% CI 1.94-7.54, $p<0.001$), characterized by younger age, massive-torrential TR, severely dilated and overtly dysfunctional RV, and dysfunctional RA. After adjusting for multiple variables, the clustering analysis remained independently associated with the composite endpoint (HR 1.40, 95% CI 1.13-1.70, $p=0.002$, for each increased-risk phenogroup). Additionally, a supervised machine learning model was developed to assist clinicians to assign patients to one of the three phenogroups. The model successfully matched each patient with an accuracy of 0.91, precision 0.91, recall 0.91, and F1 score of 0.91.

Conclusions: The unsupervised cluster analysis

has identified three risk phenogroups with distinct characteristics and different risk of experience death or hospitalization for HF which could potentially assist

clinicians in developing more personalized treatment and follow-up strategies for STR patients.



**IMAGING CARDIOVASCOLARE 212
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

THE ROLE OF CARDIAC CT DERIVED TOTAL CALCIUM SCORE IN MORTALITY PREDICTION FOR SEVERE AORTIC STENOSIS: UNDERSTANDING CALCIFICATION BURDEN AND PATIENT OUTCOME

Maria Teresa Savo (a), Morena De Amicis (a), Elena Cozza (a), Dan Alexandru Cozac (b), Gabriele Cordonì (a), Diana Di Paolantonio (a), Eleonora Lassandro (a), Donatella Tansella (a), Simone Corradin (a), Giorgio De Conti (a), Barbara Bauce (a), Dario Gregori (a), Raffaella Motta (a), Valeria Pergola (a)

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Background: Cardiac computed tomography (CCT) can provide valuable insights into coronary arteries (CAC), mitral annulus (MAC), aortic valve (AVC), and thoracic aorta (TAC) calcifications in patients with severe aortic stenosis (AS) planned for aortic valve replacement (AVR). However, the influence of these CCT-detected calcifications on patient's cardiovascular outcomes remains unclear.

Objective: To investigate whether the CAC, MAC, AVC and TAC score, in addition to the new total calcium (NTC) score, could influence major adverse cardiovascular events (MACE), all-cause and non-cardiovascular mortality for this population.

Methods: CCT scans of 331 AS patients who had undergone AVR were analyzed semi-quantitatively, and CAC, MAC, TAC, and AVC scores were calculated based on current recommendations. A new, holistic TAC score that incorporates characteristics of ascending, arch and descending aorta was applied. The new total calcium (NTC) values were derived by adding the scaled scores of the afore mentioned scores, and compared to

traditional risk scores, and their predictive values were assessed.

Results: In univariate Cox models severe MAC score was significantly associated with MACE (HR 2.32, 95% CI [1.13-4.77], $p=0.02$), all-cause (HR 2.37, 95% CI [1.36-4.16], $p<0.001$), and non-cardiovascular mortality (HR 2.09, 95% CI [1.05-4.16], $p=0.03$). Also, TAC score was a significant predictor for MACE (HR 1.49, 95% CI [1.01-2.20], $p=0.04$), all-cause (HR 1.63, 95% CI [1.19-2.24], $p<0.001$), and non-cardiovascular mortality (HR 1.73, 95% CI [1.19-2.51], $p<0.001=0.004$). Comparatively, the NTC score had a higher predictive capacity for MACE (HR 2.12, 95% CI [1.21-4.10]), all-cause (HR 2.46, 95% CI [1.52-3.99]), and non-cardiovascular mortality (HR 2.67, 95% CI [1.50-4.77]) compared to EuroScore II and STS risk scores.

Conclusion: The newly derived CCT scores could represent promising, practical clinical tools; integrating these scores into routine practice could significantly improve the identification of AS patients requiring more intensive monitoring and follow-up.

IMAGING CARDIOVASCOLARE 180 ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE) ECOSTRESS (IMAGING CARDIOVASCOLARE) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

SEPTUM DISPLACEMENT IMPLICATIONS IN THE LIMITED CARDIAC RESERVE, RV TO PC COUPLING AND OXYGEN UPTAKE DURING EXERCISE IN HEART FAILURE

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(a) UNIVERSITA' DEGLI STUDI DI MILANO; (b) OSPEDALE SAN PAOLO MILANO; (c) UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

Background: Exertional dyspnea is crucial in heart failure (HF) and may be determined by an unfavorable dynamic of ventricular interaction. This concept has been poorly addressed over time and we hypothesized that a careful study of the interventricular septum adaptations during maximal exercise in HF might be implicated in the limited cardiac reserve, uncoupling of right ventricular (RV) to pulmonary circulation (Pc), both yielding to a limited O₂ uptake.

Aim: To address the pathophysiology behind biventricular interaction during exercise in HF, studying the role of I septum displacement during exercise and how and whether it would affect peak exercise oxygen consumption (VO₂ peak). Through a limited cardiac output (CO) increase and some degrees of RV to PC uncoupling assessed by TAPSE/PASP.

Methods: 22 HF underwent a combined cardiopulmonary exercise testing imaging (CPET imaging) with RV 3D-imaging analysis and were compared with a control population.

3D imaging of the RV chamber was examined off-line using the 4D RV TomTec software and obtained 3D mesh of the RV model using custom software to obtain the mean curvature value of IVS in 4 regions of: inflow tract (RVIT), outflow tract (RVOT), apical and body. We acquired measurements of curvature during end-diastole (ED) and at end systole (ES) phases and obtained a parametric curvature map.

Results: HF patients (mean age 72±12, 27% female) typically exhibited an abnormal septal curve, with a more leftward configuration either at rest and under exercise (rest = -0.01±0.007 at ED, and -0.01±0.009 at ES; peak exercise = -0.01±0.006 at ED, and -0.01±0.007 at ES) compared to controls (rest = -0.02±0.002 at ED, and -0.02±0.006 at ES; peak exercise = -0.02±0.006 at ED, and -0.02±0.01 at ES, Figure). Notably, the degree of the IVS curvature was found to linearly correlate with an impaired gas exchange performance as showed by a lower peak VO₂, a limited CO and impairment of TAPSE/PASP in HF (respectively, r=0.64, p<0.001, r=0.5, p<0.001, r=0.53, p<0.001 at ED during exercise; r=0.61, p<0.001 at ES during exercise; Figure).

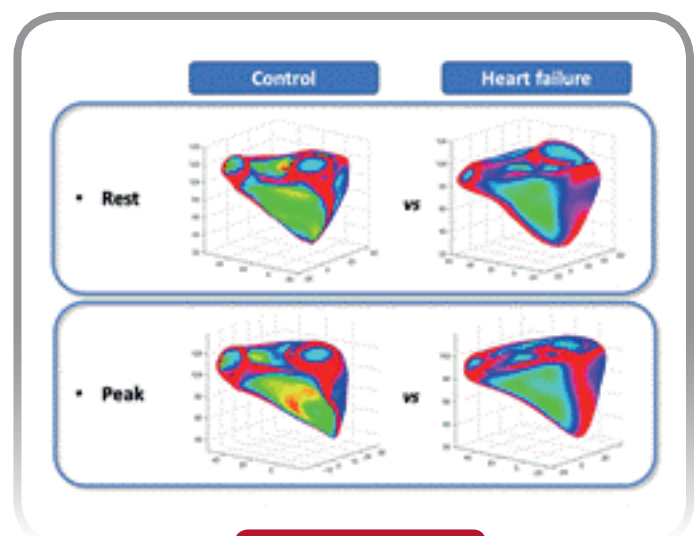


Figura 1

Conclusions: In HF, the occurrence of right to left IVS displacement appears worth of investigation, tightly contributing to a reduced CO response, and RV-PA uncoupling during exercise. These findings clearly point

to the utility of assessing how therapeutic strategies may modulate the negative septum displacement and overall cardiac mechanics.

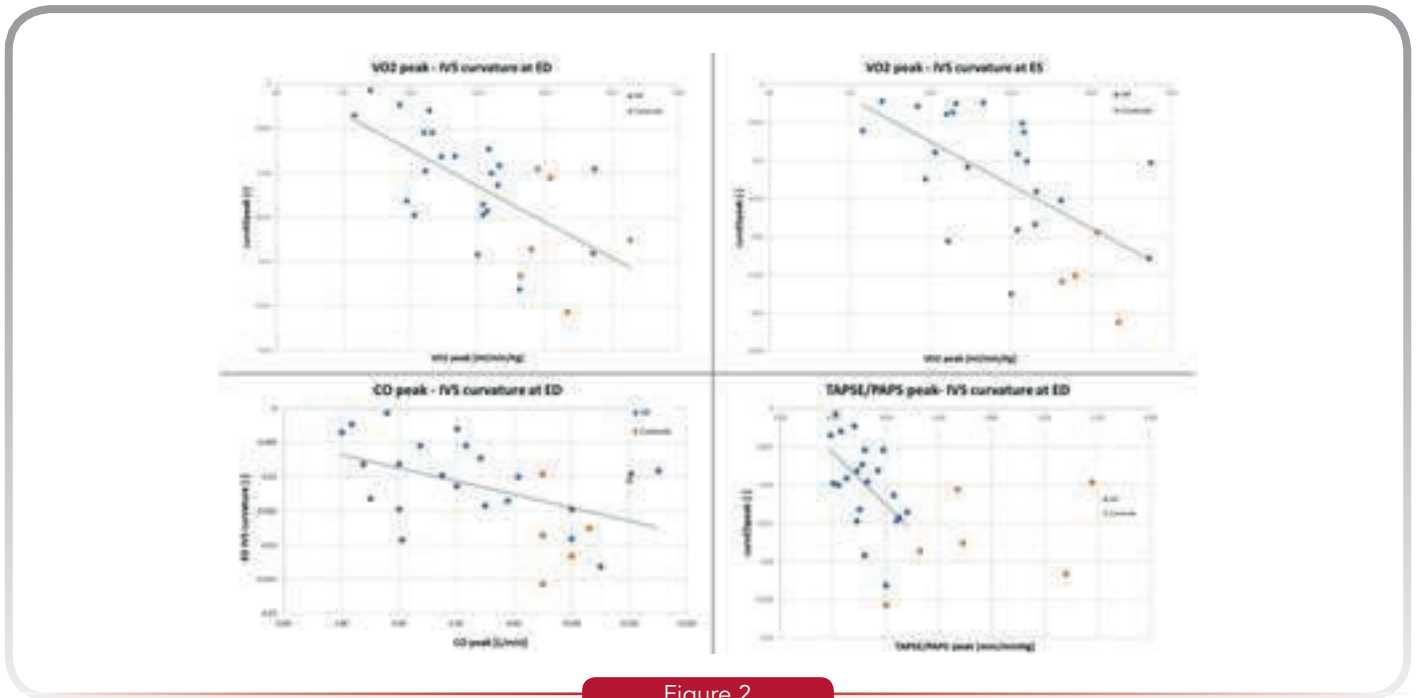
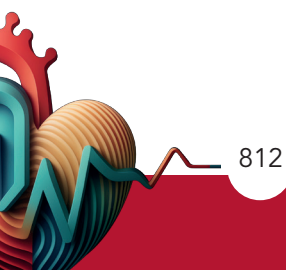


Figure 2



IMAGING CARDIOVASCOLARE 482

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO) IPERTENSIONE POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

RIGHT VENTRICULAR MYOCARDIAL WORK: A STEP FORWARD FOR THE ASSESSMENT OF RIGHT VENTRICULAR TO PULMONARY ARTERY COUPLING

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Federico Gobbi (a), Daniela Grassano (a), Filippo Massei (a), Marzia Maltempi (a), Giuseppe Ambrosio (a),
Erberto Carluccio (a)

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UNIVERSITY OF PERUGIA, ITALY

Background: Right ventricular myocardial work (RVMW) is a novel method for non-invasive assessment of right ventricular (RV) function. By integrating RV global longitudinal strain as systolic function parameter, pulmonary systolic and diastolic pressures as afterload indices, and pulmonary and tricuspid valves timings, RVMW could provide a more comprehensive evaluation of RV function. The aim of this study was to assess patterns of RVMW indices in patients with preserved and impaired RV to pulmonary artery (PA) coupling (RVAC), as assessed by RV free wall longitudinal strain/pulmonary artery systolic pressure (RVFWLS/PASP) ratio.

Methods: We studied by echocardiography 158 consecutive patients with stable HF and left ventricular (LV) systolic dysfunction (LV ejection fraction < 50%). RVAC was assessed by RVFWLS/PASP and patients were grouped according to the median value. Four parameters of RVMW were obtained: RV global work index (RVGWI), RV global constructive work (RVGCW), RV global wasted work (RVGWW) and RV global work efficiency (RVGWE).

Results: According to RVFWLS/PASP ratio, patients were divided into two groups: A) preserved RVAC (RVFWLS/PASP ratio ≥ 0.51 ; N=84) and B) impaired

RVAC (RVFWLS/PASP ratio < 0.51; N= 74). Both RVGWI (371 ± 156 vs 384 ± 207 mmHg%, P=NS) and RVGCW (449 ± 171 vs 516 ± 249 mmHg%, P=NS) did not significantly differ between the two groups (figure 1). However, group B (impaired RVAC) showed

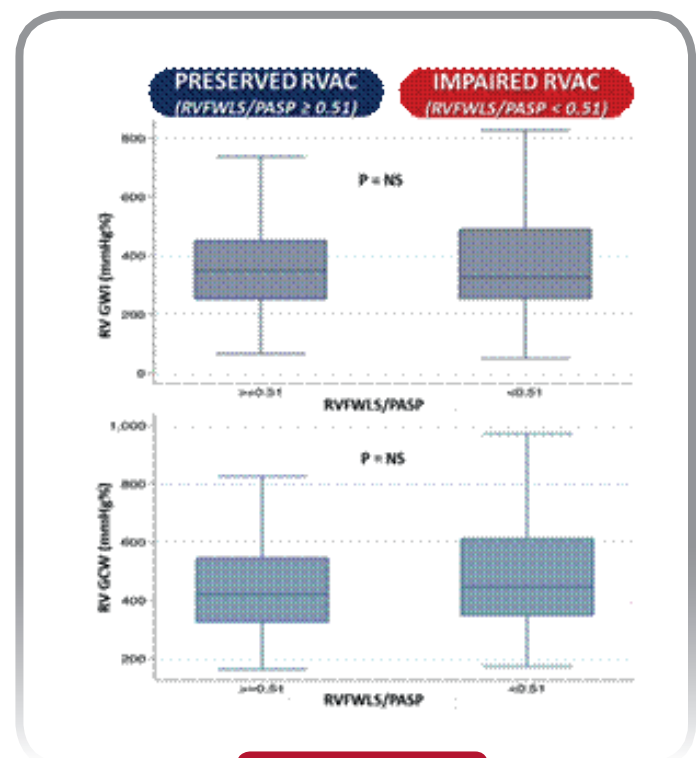


Figura 1

significantly greater RV wasted work (94 ± 69 vs 44 ± 30 mmHg%, $P=0.0001$) and significantly lower RV work efficiency (80 ± 13 vs 88 ± 8 %, $P=0.0001$) compared to group A (preserved RVAC, figure 2).

Conclusions: RVMW provided new insight in the RV function assessment, highlighting lower efficiency due to higher wasted work in RV to PA uncoupled patients.

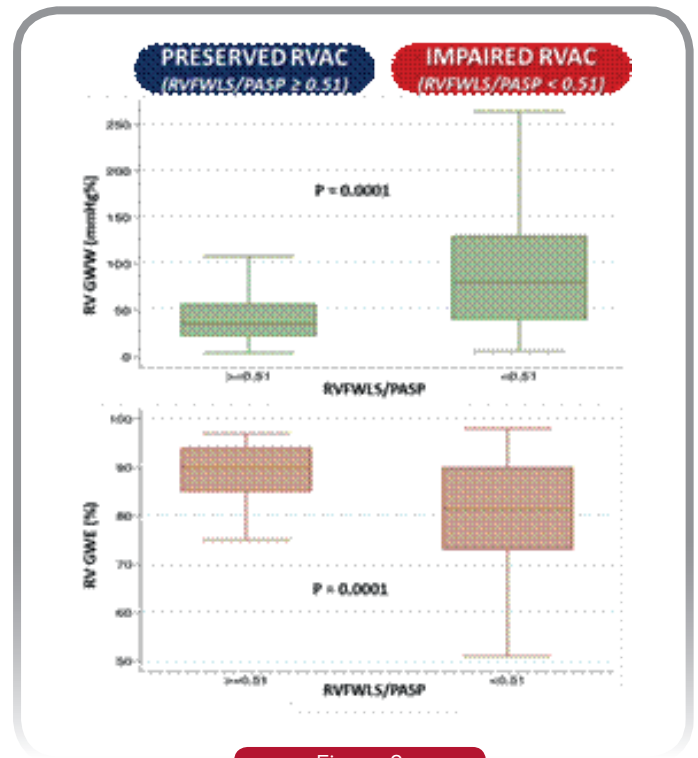


Figura 2

IMAGING CARDIOVASCOLARE 823

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

LEFT ATRIAL STRAIN AS A PREDICTOR OF ADVERSE OUTCOME IN HYPERTROPHIC CARDIOMYOPATHY: A CMR STUDY

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Background: Hypertrophic cardiomyopathy (HCM) is associated with an increased risk of major adverse cardiovascular events (MACE). However, current risk stratification methods are not perfect. Left atrial global longitudinal strain (LA GLS) is an increasingly acknowledged predictive parameter, yet its potential role in HCM is not well defined.

Purpose: This study aims to investigate the prognostic role of cardiac magnetic resonance (CMR)- derived LA GLS for the occurrence of MACE in patients with HCM.

Methods: A retrospective, single-centre, CMR study of HCM patients was conducted. CMR images were analysed by two blinded investigators. LA GLS was derived from CMR two-chamber cine images by a semiautomatic method and was categorized according to its median value. The endpoint was a composite of major adverse cardiovascular events (MACE), including

all-cause death, sudden cardiac death (SCD), sustained and non-sustained ventricular tachycardias, appropriate implantable cardiac defibrillator shocks, heart failure hospitalization, syncope, stroke and new-onset atrial fibrillation. Cox regression analysis was performed.

Results: A total of 135 HCM patients were included, mean age was 57 years \pm 17 and 41% were female. Average maximal wall thickness (MWT) was 17.7 \pm 4.6 mm, 39% had left ventricular outflow tract obstruction (LVOTO) and 46% had positive late gadolinium enhancement (LGE).

After a mean follow-up of 6.6 \pm 3.4 years, 61 patients (45%) experienced the composite endpoint.

LA GLS was significantly lower in patients with MACE compared to those without (26.4 \pm 15% vs 30.4 \pm 14%, $p=0.046$). Multivariate Cox regression analysis revealed that an LA GLS below the median value of 28.2% showed a tendency to be independently associated



with MACE (HR 1.57, 95% CI: 0.877-2.814, $p=0.128$). Additionally, the presence of LGE (HR 2.2, CI: 1.233-3.801, $p=0.007$) and a left ventricular ejection fraction (LVEF) $< 50\%$ (HR 5.4, 95%, CI: 1.451-19.831, $p=0.012$) were also independently associated. Among low risk HCM patients (LVEF $> 50\%$, MWT < 30 mm, absence of LGE and/or LVOTO), LA GLS demonstrated an additional prognostic role: those with an LA GLS above the median value exhibited a more favourable prognosis. In fact, among patients considered at low risk according to the European Society of Cardiology HCM risk score ($< 4\%$ risk of SCD at 5 years) ($n = 83$),

LA GLS $< 28.2\%$ (HR 2.6, 95% CI: 1.037-6.461, $p=0.042$) and LVEF $< 50\%$ (HR 15.1, 95% CI: 2.877-79.530, $p=0.001$) remained the only variables independently associated with MACE.

Conclusions: CMR-derived LA GLS is a predictor of outcomes in HCM beyond established imaging prognostic factors. Particularly, LA GLS appears to be useful in risk-stratifying low risk HCM patients: those with a normal LA GLS show a favourable prognosis. If confirmed in larger studies, LA GLS could be used to individualise HCM management.



IMAGING CARDIOVASCOLARE 619
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

CHANGES IN LEFT VENTRICULAR STRAIN IN HYPERTROPHIC CARDIOMYOPATHY: RELATIONSHIP WITH DISEASE PROGRESSION AND OUTCOME

Alberto Aimo (a, b), Mauro Silvestri (c), Alessandro Parlato (c), Andrea Barison (a, b), Chrysanthos Grigoratos (a), Vincenzo Castiglione (a, b), Giovanni Aquaro (c), Davide Garamella (c), Filippo Cademartiri (a), Carmelo De Gori (a), Ignazio Gueli (a), Michele Emdin (a, b), Giancarlo Todiere (a)

(a) FONDAZIONE TOSCANA GABRIELE MONASTERIO, PISA; (b) SCUOLA SUPERIORE SANT'ANNA, PISA; (c) AZIENDA OSPEDALIERA UNIVERSITARIA PISANA, PISA

Background: Hypertrophic cardiomyopathy (HCM) is a major health concern, with cardiac magnetic resonance (CMR) playing a crucial role in risk assessment. The effectiveness of sequential CMR, particularly strain analysis, for tracking HCM progression remains to be established.

Methods: We evaluated HCM patients undergoing two CMR scans over a decade, focusing on the first and last scans. We measured changes in left ventricular (LV) strain measures and examined their yearly changes as predictors of cardiovascular outcomes (cardiac death, stroke, life-threatening ventricular arrhythmias, urgent cardiovascular hospitalizations, and new-onset atrial fibrillation).

Results: Our cohort included 64 HCM patients (70% male, median age 52 years, obstructive HCM in 14%,

median HCM risk score 2%) undergoing two CMR scans over a median of 5.2 years (interquartile range 2.8–7.0 years). LV longitudinal and circumferential strain deteriorated significantly. LV strain worsened in parallel with increasing LV fibrosis, assessed as late gadolinium enhancement (LGE) mass. During a 6.2-year median follow-up, 29 patients (52%) experienced an endpoint event. Annual absolute changes in LV longitudinal strain predicted endpoint occurrence regardless of baseline LVMI ($p=0.014$) and LGE mass ($p=0.043$), as well as absolute changes in LVEF ($p=0.013$) and LGE mass ($p=0.012$).

Conclusions: Serial CMR-based strain analysis in HCM patients may reveal subtle variations in LV systolic function that refine risk prediction over findings from baseline CMR, and changes in LVMI or LVEF across repeated exams.



**IMAGING CARDIOVASCOLARE 620
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE) IMAGING MULTI-MODALE / IMAGING IBRIDO
(IMAGING CARDIOVASCOLARE) MINOCA
(MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)**

MINOCA AND ANOMALOUS CORONARY ARTERY ORIGIN: ADDED VALUE OF MULTIMODALITY IMAGING

Alberto Aimo (a, b), Ignazio Gueli (a, b), Giancarlo Trimarchi (c), Alberto Clemente (a), Alessio Lilli (a), Giancarlo Todiere (a), Chrysanthos Grigoratos (a), Carmelo De Gori (a), Michele Coceani (a), Andrea Barison (a, b), Umberto Paradossi (a), Michele Emdin (a)

(a) FONDAZIONE TOSCANA GABRIELE MONASTERIO, PISA E MASSA; (b) SCUOLA SUPERIORE SANT'ANNA, PISA;
(c) UNIVERSITÀ DI MESSINA, MESSINA

Multimodality imaging is the current approach to determine the underlying cause of Myocardial Infarction With Nonobstructive Coronary Arteries (MINOCA). Despite advancements, significant knowledge gaps remain in the diagnostic work-up, particularly in cases involving both anomalous aortic origin of a coronary artery and MINOCA. A 63-year-old Caucasian man was admitted because of chest pain and dynamic elevation of high-sensitivity troponin T. A previous coronary computed tomography angiography (CCTA), performed because of angina, had revealed a left coronary artery originating from the right aortic sinus and with a retro-aortic course. Urgent coronary angiography confirmed the anomalous origin of the left coronary artery and excluded obstructive epicardial disease. On the third day, cardiac magnetic resonance (CMR) imaging demonstrated normal biventricular

function, as well as edema and subendocardial late gadolinium enhancement (LGE) in the mid infero-septum, indicating recent MI. A review of the previous CCTA scan identified a small septal branch artery with an inter-arterial course, which likely accounted for the infarction. The CCTA 3D-Cinematic Rendering showed the morphology of the left atrial appendage without opacification defects, and the 4-Chamber CCTA image showed no interatrial defects, excluding embolism as the cause and confirming the role of the small septal branch artery in the recent myocardial necrosis. This case underscores the importance of multimodality imaging in patients who, despite showing evidence of necrosis on CMR, do not have a clear angiographic correlate and thus require CCTA to identify the vessel supplying the ischemic territory in the context of complex coronary anatomies.



IMAGING CARDIOVASCOLARE 361
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)

CLINICAL CORRELATES OF T2 MAPPING CARDIAC MAGNETIC RESONANCE IN PATIENTS WITH TAKOTSUBO SYNDROME

Luca Arcari (a), Giovanni Camastra (a), Federica Ciolina (b), Emanuela Belmonte (a), Massimiliano Danti (b),
Viviana Maestrini (c), Stefano Sbarbati (b), Luca Cacciotti (a)

(a) UNITÀ DI CARDIOLOGIA, OSPEDALE MADRE GIUSEPPINA VANNINI, ROMA; (b) UNITÀ DI RADIOLOGIA, OSPEDALE MADRE GIUSEPPINA VANNINI, ROMA; (c) UNITÀ DI CARDIOLOGIA, SAPIENZA UNIVERSITÀ DI ROMA

Background: extensive myocardial edema is a key feature of acute takotsubo syndrome (TTS) and it can be quantitatively assessed by T2 mapping cardiac magnetic resonance (CMR) imaging. Clinical correlates of myocardial edema in TTS are not well characterized.

Methods: Sixty patients with acute TTS underwent CMR with T2 mapping within one week of hospitalization. Disease severity was assessed by a validated risk score (GEIST-score).

Results: mean age of the study population was 71 ± 12 years (92% females). Mean mid-septal T2 time was 58 ± 6 ms. Higher T2 mapping values were found in patients with left ventricular ejection fraction (LVEF) $\leq 40\%$ (60 ± 6 ms vs 56 ± 5 ms; $p=0.006$), male sex (66 ± 7 ms vs 58 ± 6 ms; $p=0.010$), dyspnea on admission (63 ± 7 ms vs 58 ± 6 ms; $p=0.006$), absence of an emotional

trigger (60 ± 7 ms vs 57 ± 5 ms; $p=0.039$), intermediate-to-severe GEIST-score (63 ± 7 ms vs 58 ± 6 ms; $p=0.045$) and in-hospital complications (61 ± 1 ms vs 58 ± 6 ms; $p=0.009$). A trend towards higher values was observed in patients who died at follow-up (62 ± 8 ms vs 58 ± 6 ms; $p=0.098$). On linear regression analysis, T2 mapping did not correlate with the timing of CMR (Beta -0.182 , $p=0.170$), whereas after multivariable correction, lack of emotional trigger (Beta 0.262 , $p=0.031$), decreasing LVEF (Beta -0.254 , $p=0.024$) and increasing GEIST score (Beta 0.282 , $p=0.024$) remained independently associated with T2 mapping.

Conclusions: in patients with acute TTS undergoing a timely CMR within the first week after admission, T2 mapping was stable over time, higher in patients displaying high-risk features, and independently associated with the GEIST risk score.



IMAGING CARDIOVASCOLARE 884
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
ARITMIE VENTRICOLARI (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)

MAD ACCUSED: GUILTY OR INNOCENT?

Dario Donia (a, b), Kamil Stankowski (a, b), Federica Catapano (a), Diego Penela (a), Riccardo Mantovani (a), Renato Maria Bragato (a), Pier-giorgio Masci (c), Marco Francone (a, b), Gianluigi Condorelli (a, b), Stefano Figliozzi (a) (a) IRCCS HUMANITAS RESEARCH HOSPITAL, VIA ALESSANDRO MANZONI, 56, 20089 ROZZANO, MILANO, ITALY; (b) DEPARTMENT OF BIOMEDICAL SCIENCES, HUMANITAS UNIVERSITY, VIA RITA LEVI MONTALCINI, 4, 20090, PIEVE EMANUELE, MILANO, ITALY; (c) SCHOOL OF BIOMEDICAL ENGINEERING AND IMAGING SCIENCES, KINGS COLLEGE LONDON, ST THOMAS' HOSPITAL, LONDON, UNITED KINGDOM

Background: Mitral annular disjunction (MAD) is a displacement between the atrial wall-mitral valve leaflet junction and the left ventricular myocardial attachment that can be found in patients with mitral valve prolapse (MVP). An association between this imaging feature and the risk of malignant ventricular arrhythmias is debated.

Case presentation: Patient 1 was a 31-year-old woman who presented with exertional unexplained syncope. ECG revealed sinus rhythm with nonspecific ventricular repolarization abnormalities. Transthoracic echocardiography (TTE) revealed a single-leaflet non-classic MVP with trace mitral regurgitation and MAD of a limited entity. In the hypothesis of an "arrhythmic MVP", cardiac magnetic resonance (CMR) confirmed MAD but excluded systolic curling or tissue abnormalities. Cardiac computed tomography (CCT) then showed an anomalous aortic origin of the left coronary artery with high-risk anatomical features, and the patient underwent surgery.

Patient 2 was a 32-year-old man who

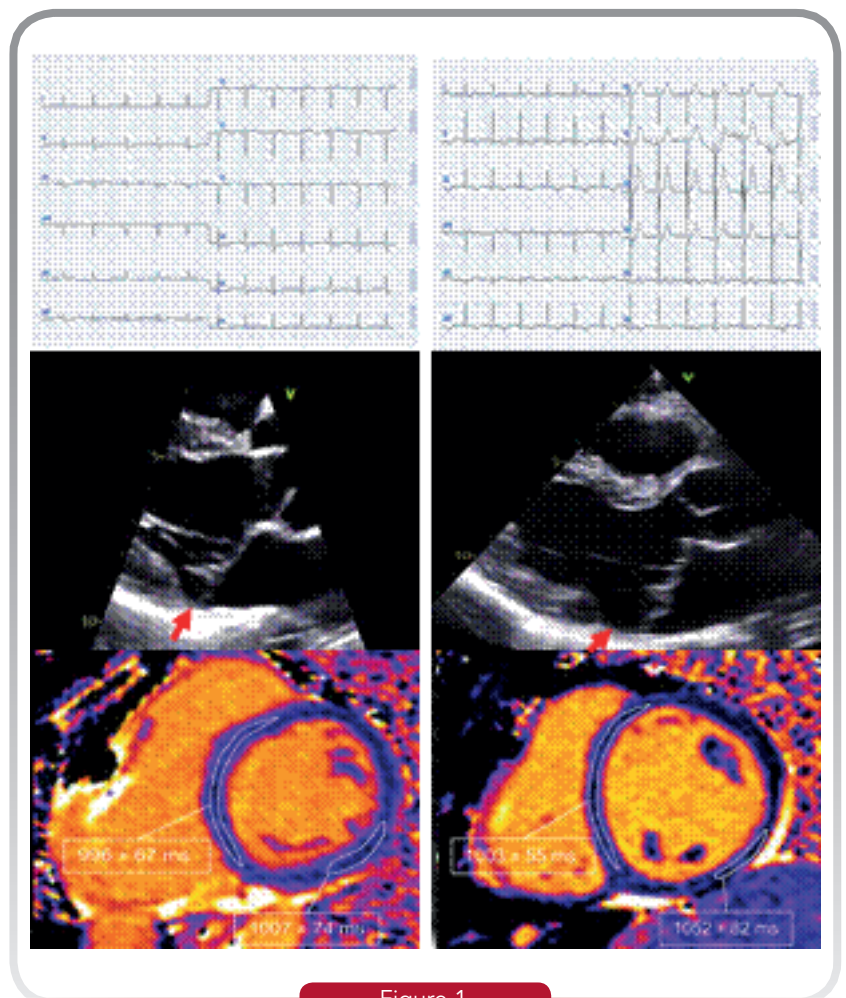


Figure 1

presented with sudden cardiac arrest due to ventricular fibrillation. The ECG indicated sinus rhythm and T-wave inversion in the inferolateral leads. TTE showed Barlow's disease with moderate mitral regurgitation, as well as an extended MAD. Systolic curling and Pickelhaube sign were noted. CCT findings were unremarkable. CMR confirmed echocardiographic findings and demonstrated an increased value of

native T1-mapping in the inferolateral basal wall, with no obvious late gadolinium enhancement. The final diagnosis was "arrhythmic MVP", and the patient received implantable-cardioverter-defibrillator.

Conclusion: The present cases show the ambivalent nature of MAD, whose clinical implications depend on its severity and on the clinical and imaging context.



**IMAGING CARDIOVASCOLARE 901
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)**

WHAT IF THERE ARE MULTIPLE ETIOLOGIES UNDER A HYPERTROPHIC PHENOTYPE?

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Background: Cardiomyopathies with hypertrophic phenotype have a large amount of etiology. Diagnosis is based on clinical signs of heart failure and the presence of increased wall thickness. However, it is common to be faced with nuanced pictures. Nowadays, CMR has established as second-line diagnostic method for cardiomyopathies.

Case History: 73-year-old woman with arterial hypertension and type 2 diabetes mellitus. Admitted to emergency department for chest pain and dyspnea. Objective assessment: third heart sound, rales, bilateral leg edema. On ECG diffuse negative T waves. On echocardiogram concentric hypertrophy, apical obliteration, EF 50%, grade II diastolic dysfunction (Figure 1). Lab tests: NT-proBNP 1193 pg/ml, troponin 212 ng/L, normal renal function and protein electrophoresis. Once coronary angiography revealed absence of epicardial coronary artery disease, the suspicion for hypertrophic cardiomyopathy was deepened. Therefore, the patient underwent to CMR with evidence of

normal size left ventricle, moderate thickening of the apex and septum (15 mm), apical implantation of papillary muscles, normal systolic function (Figure 2a and 2b); in the LGE sequences, LGE diffused, <15% of LV mass (Figure 2c); in T1 mapping sequences, native T1 times were diffusely increased (Figure 2d). These

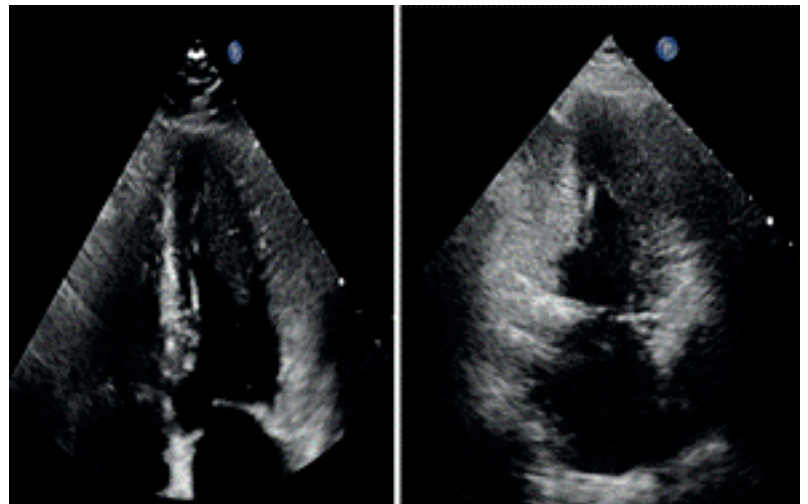


Figure 1.

Figure 1

findings were suggestive of hypertrophic cardiomyopathy with apical involvement and concomitant cardiac amyloidosis.

Discussion: Nowadays, the attention of the scientific society is strongly directed towards in-depth study and diagnosis of cardiomyopathies. The great advantage of CMR is its power of tissue characterization which is not comparable to any other imaging method. Therefore, the extensive use of CMR in the study of cardiomyopathies also opens the door to discover new mixed phenotypes.

Conclusion: The emblematic clinical case presented here describes the diagnosis of a late-expressing hypertrophic cardiomyopathy, probably underdiagnosed in the past, which was superimposed, given the age, by an initial picture of senile cardiac amyloidosis. The aim of this clinical case is to underline the importance of the role of cardiac CMR among patients with suspected

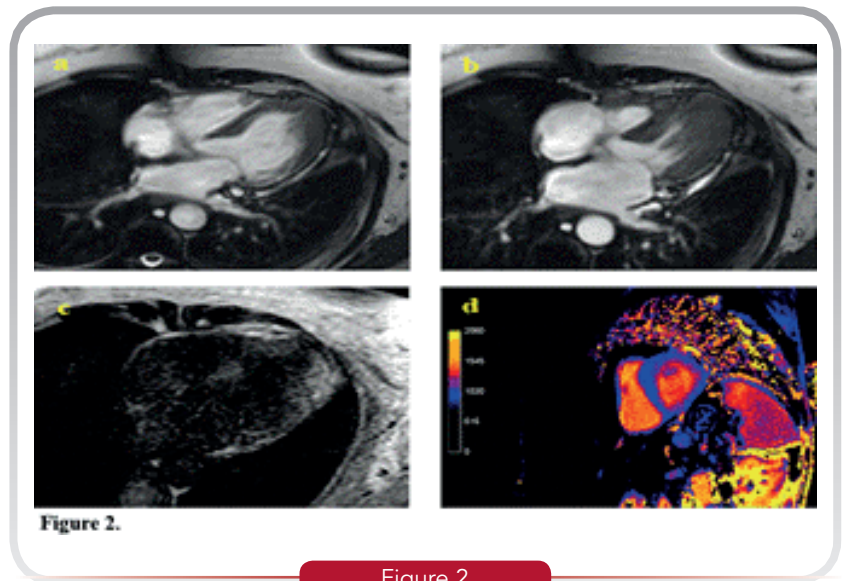


Figure 2

hypertrophic cardiomyopathy. Thus, CMR allows a complete myocardial characterization, in order to get earlier to diagnosis, as the recent drugs, developed for cardiomyopathies, need to be started as soon as possible, in order to have impact on patient prognosis.



IMAGING CARDIOVASCOLARE 430
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

PREVALENCE AND CORRELATIONS OF RIGHT VENTRICULAR DYSFUNCTION IN PATIENTS WITH SEVERELY DEPRESSED LEFT VENTRICULAR SYSTOLIC FUNCTION: A CMR STUDY

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Background: In patients with a very severe reduction of left ventricle (LV) ejection fraction ($EF \leq 20\%$), right ventricle (RV) dysfunction may coexist due to the progression of heart failure or the potential extension of the primary pathological process to the RV. This study aimed to evaluate the prevalence and correlations of RV dysfunction in a subset of patients with very severe LVEF reduction, with both ischemic and non-ischemic etiologies.

Methods: A total of 116 patients with LVEF $\leq 20\%$, as assessed by cardiac magnetic resonance (CMR), were retrospectively enrolled. This cohort included 32 patients with ischemic heart disease (Isc Group) and 84 patients with non-ischemic heart disease (NIsc Group), based on clinical history and tissue characterization results. Indexed volumes of both ventricles, indexed LV mass, and RVEF were recorded. The presence, extent, and distribution pattern of late gadolinium enhancement (LGE) were also analyzed. Significant RV dysfunction was defined as RVEF $\leq 40\%$. Pearson's linear correlation index, Fisher's exact test, and t-tests were performed to evaluate correlations and statistical significance differences between the Isc and NIsc groups.

Results: The study population, comprising patients with LVEF $\leq 20\%$ (mean LVEF 17%; range 8%- 20%), included 93 males with a mean age of 53 years. Significant RV dysfunction was observed in 65% of patients in the NIsc Group, compared to 31% in the Isc Group ($p < 0.05$). Additionally, the NIsc Group demonstrated significantly lower RVEF (mean $36\% \pm 14\%$) compared to the Isc Group (mean $49\% \pm 16\%$; $p < 0.001$), larger RV indexed end-diastolic volume (mean $98 \text{ ml/m}^2 \pm 34 \text{ ml/m}^2$ vs. $75.8 \text{ ml/m}^2 \pm 28.5 \text{ ml/m}^2$; $p < 0.001$), and larger RV indexed end-systolic volume (mean $66 \text{ ml/m}^2 \pm 32 \text{ ml/m}^2$ vs. $42.1 \text{ ml/m}^2 \pm 25.1 \text{ ml/m}^2$; $p < 0.001$). The NIsc Group was also constituted by younger patients (mean age 49 ± 16 years vs. 59 ± 12 years; $p < 0.001$) and reduced LGE segmental extension (mean 2.9 ± 4.1 vs. 6.3 ± 3.9 ; $p < 0.001$). No significant correlations between LGE segmental extension and RVEF were found in either group.

Conclusion: In patients with a very severe reduction of LVEF, significant RV dysfunction is commonly observed and varies with the underlying etiology. Compared to ischemic patients, those with non-ischemic etiology exhibit a higher prevalence of RV dysfunction, characterized by lower RVEF, larger RV volumes,

and less extensive LGE segmental extension. These findings underscore the importance of distinguishing between ischemic and non-ischemic etiologies in

patients with severely reduced LVEF, as the etiology significantly impacts the prevalence and characteristics of RV dysfunction.



IMAGING CARDIOVASCOLARE 911
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

A DOUBLE MINOCA: WHEN CMR ENLIGHTENS ANGIOGRAPHY

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Introduction: MINOCA (myocardial infarction with non-obstructive coronary arteries) is common in current clinical practice. Both the European and American cardiology guidelines endorse cardiac magnetic resonance (CMR) as the gold-standard non-invasive imaging modality in the diagnostic work-up of MINOCA. We present a rare case of a recurrent MINOCA in which CMR provided a definitive diagnosis.

Case report: We present the case of a 51-year-old man with a past medical history significant for typical chest pain and troponin elevation with normal coronary angiography diagnosed as MINOCA. Additionally, he had dyslipidemia, paroxysmal AF (atrial fibrillation) not on anticoagulant therapy (CHA2DS2-VASc<1), and a history of smoking. A few months later, he experienced recurrent chest pain, elevated cardiac troponin (3510 ng/L), and AF. Coronary angiography, including an ACh-provocation test and microcirculation study, was normal. CMR during admission was performed: cine sequences revealed normal geometry and systolic function,

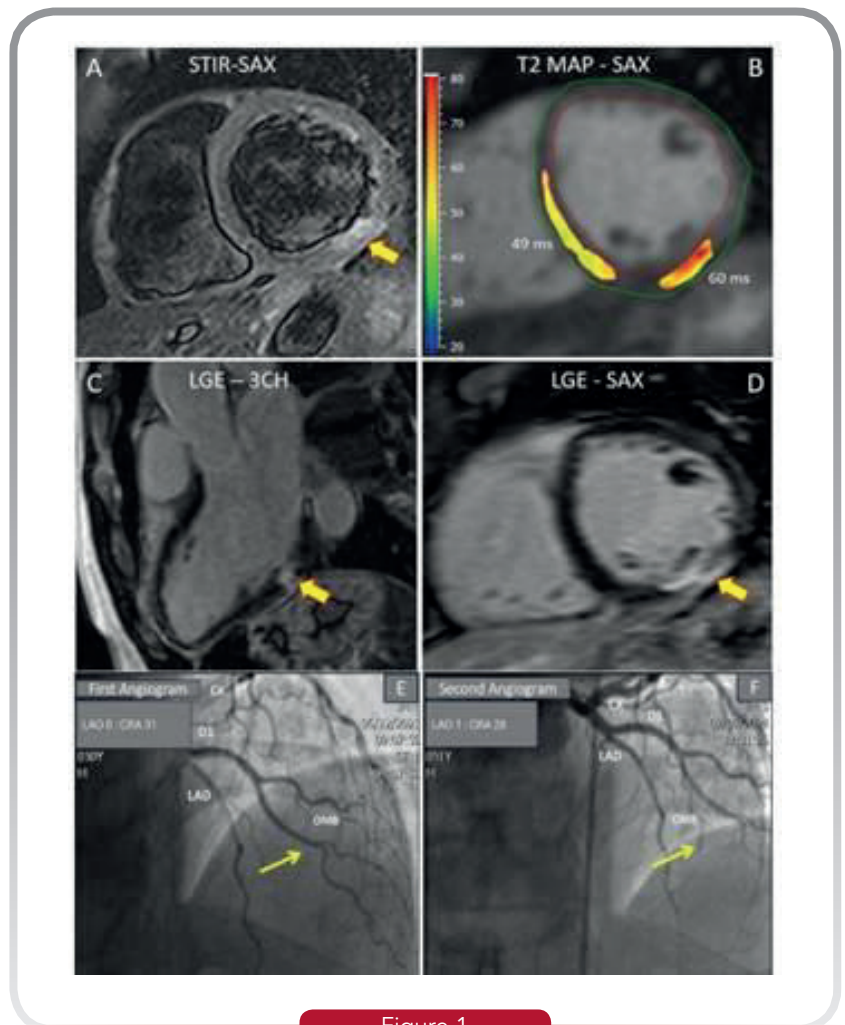


Figure 1

however a mild hypokinesis was observed in the mid inferolateral wall. STIR-T2W imaging showed a hyperintense area in the same region, consistent with focal myocardial edema, which was corroborated by an increased T2 map value compared to remote myocardium (panels A-B). On LGE, the same region showed subendocardial to transmural enhancement (panels C-D). These findings were indicative of a recent MINOCA. A closer review of the coronary angiography revealed that, compared to the angiogram performed in occasion of the first chest pain event, a small obtuse marginal branch was occluded, likely responsible for the new MINOCA (panels E-F).

Discussion: MINOCA can be caused by a variety

of mechanisms, including coronary vascular spasm, microvascular disease, spontaneous coronary dissection, embolization and plaque rupture/erosion. CMR is a valuable, safe and non-invasive test that can identify the underlying etiology of myocardial injury, as well as to risk-stratify such patients. In this case, CMR not only provided a definitive diagnosis, but also helped refining the angiogram description by identifying the culprit lesion.

Conclusion: Recurrent MINOCA, though rare, is a possible entity. In this case CMR proved its unmatched value to refine the diagnosis and find the most likely etiology of myocardial injury in such conditions.



IMAGING CARDIOVASCOLARE 107
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)

ASSOCIATIONS OF STRUCTURAL CARDIAC ALTERATIONS WITH SVD NEURORADIOLOGICAL MARKERS IN ELDERLY PATIENTS ON ORAL ANTICOAGULANTS FOR ATRIAL FIBRILLATION: THE STRAT-AF 2 STUDY

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Background and aims: Neurological complications of Atrial Fibrillation (AF) extend beyond cardioembolic stroke. Neuroradiological assessment of AF patients has revealed a higher risk of cerebral Small Vessel Disease (cSVD), a potential pathological substrate of neurological manifestations. Considering the important role of cardiac dysfunction in the development and maintenance of AF, there is a growing interest in testing the association of cardiac abnormalities with neuroimaging cSVD markers. In the present study we evaluated the association of echocardiographic and cardiac MRI parameters with cSVD markers in a cohort of elderly AF patients on anticoagulant therapy.

Methods: The Strat-AF 2 study (Stratification of cerebral bleeding risk in AF) is an observational single-center hospital-based study that enrolled elderly patients with AF and ongoing anticoagulant therapy at the Centre for Thrombosis of Careggi. All participants underwent a clinical visit and a neuroradiological exam (either brain MRI or head CT), resulting in two different cohorts (MRI and CT cohort). SVD markers were assessed in the total cohort and separately in the MRI and CT cohorts. MRI patients also underwent cardiac MRI.

Results: Of 182 patients enrolled (mean age: 78.6 ± 6.7 years, male sex: 58%, 56% MRI cohort, 44% CT cohort), almost half (47%) presented moderate-to-severe White Matter Hyperintensities (WMHs), 38% had at least one lacune, and 58% had moderate-to-severe cortical atrophy, with a total of 80% having at least one cerebral microangiopathic marker (mean SVD total score = 1.6 ± 1.1). In univariate association analyses, higher left atrial volume (LAV) was associated with the prevalence of lacunes (99.1 ± 36.2 vs. 85.8 ± 37.0 mL/m², $p=0.021$). In patients with moderate-to-severe cortical atrophy we observed higher left and right atrial dimensions (LAV, 97.6 ± 35.3 vs. 81.3 ± 38.0 mL/m², $p=0.004$; right atrial volume, RAV, 66.1 ± 36.9 vs. 55.4 ± 29.7 mL/m², $p=0.047$), as well as a higher prevalence of left ventricular hypertrophy (LVH, 51% vs. 36%, $p=0.043$). None of the echocardiographic parameters was associated with WMHs. Correlation analyses, conducted separately in the two cohorts, showed: in the MRI cohort, positive correlations of WMHs with RAVi ($r=0.207$, $p=0.044$), microbleeds (MBs) with LAD ($r=0.269$, $p=0.008$), basal ganglia-enlarged perivascular spaces (EPVS) with RAVi ($r=0.224$, $p=0.033$), SVD total score with LAV ($r=0.222$,

$p=0.40$), LAVi ($r=0.206$, $p=0.040$) and RAVi ($r=0.257$, $p=0.012$); in CT cohort, only the SVD total score presented a significant positive correlation with LAD ($r=0.231$, $p=0.042$). Cardiac MRI imaging confirmed the association between atrophy and LAVi (122.5 ± 53.9 vs. 85.9 ± 26.6 mL/m², $p=0.025$) and between MBs and indexed LV mass (73.6 ± 26.6 vs. 56.3 ± 20.5 g/m², $p=0.028$).

Conclusions: In our cohort, microangiopathic markers were associated with echocardiographic alterations affecting the left and right atria and the left ventricle, suggesting a determining role of arrhythmia-related cardiac substrate in developing the total burden of SVD.



IMAGING CARDIOVASCOLARE 365
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
PROGNOSI (SCOMPENSO CARDIACO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

MIOPATIA ATRIALE SINISTRA VALUTATA CON STRAIN: PREDITTORE DI PROGNOSI A LUNGO TERMINE IN PAZIENTI IPERTESI E DIABETICI DI ENTRAMBI I GENERI

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Background: L'ipertensione arteriosa (IA) e il diabete mellito tipo 2 (DM2) determinano una disfunzione diastolica (DD) che culmina nel rimodellamento profibrotico dell'atrio sinistro (AS) e nella sua disfunzione, condizione definita come "miopatia atriale". Lo strain dell'AS (PALS) è un ottimo marker di miopatia atriale.

Obiettivo: Lo scopo del nostro studio era valutare la capacità del PALS di predire eventi avversi maggiori cardiovascolari (MACE) in pazienti con IA e nell'ambito di prevenzione primaria. **Metodi:** Abbiamo screenato retrospettivamente pazienti con IA e/o DM2 >40 anni, in ritmo sinusale. Abbiamo analizzato dati riguardanti l'anamnesi personale, l'ecocardiografia standard e avanzata. I criteri di esclusione erano: presenza di eventi CV precedenti, chirurgia cardiaca, pacemaker, insufficienza e/o stenosi valvolare di grado >moderato, mancanza di consenso informato. Tutti i pazienti sono stati seguiti per lo sviluppo di: primo episodio di fibrillazione atriale (FA), ospedalizzazione per scompenso, attacco ischemico transitorio, ictus, infarto miocardico/rivascolarizzazione coronarica, morte CV e/o morte per tutte le cause. Sono state eseguite regressioni di Cox univariate e multivariate stepwise per stimare l'Hazard Ratio (HR). Le curve di Kaplan-Meier (KM) hanno confrontato la sopravvivenza tra i pazienti con diversi range di PALS. È stato eseguito il test log-rank per confrontare le curve

KM. **Risultati:** La popolazione finale dello studio ha incluso 292 adulti (63,0±9,0 anni, 50% donne), di cui 210 ipertesi e 102 diabetici. Tutti i pazienti avevano una frazione di eiezione (FE) del ventricolo sinistro (VS) preservata (58,2±4,9%) con un variabile grado di disfunzione VS subclinica (strain longitudinale VS -17,0±6,6%). Il volume AS era superiore alla norma (52,9±24,9 ml) e la funzione atriale prevalentemente anormale (PALS 29,7±11,1%). Durante un follow-up medio di 11,2±1,3 anni, 110 pazienti hanno sviluppato almeno un evento CV: 52 decessi per tutte le cause, 28 decessi CV, 30 ricoveri per insufficienza cardiaca, 31 FA di nuova insorgenza, 18 TIA/ictus, 25 infarti

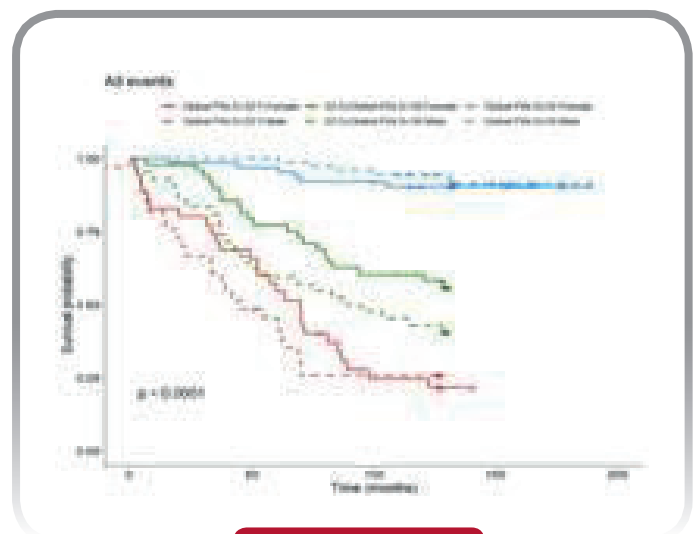


Figura 1

miocardici/rivascolarizzazioni coronariche. Dividendo la popolazione in base all'outcome, i pazienti con eventi avevano una FEVS simile ($p=0,06$), ma erano più anziani ($65,8\pm 9,6$ vs $61,3\pm 9,0$ anni) e con peggiore funzione diastolica (rapporto E/E' $10,6\pm 5,0$ vs $8,7\pm 3,6$), strain longitudinale del VS (GLS, $-17,7\pm 2,9$ vs $-15,7\pm 3,4\%$) e PALS ($34,6\pm 9,9$ vs $21,6\pm 7,7\%$, tutti $p < 0,001$). All'analisi statistica univariata, età, E/E', PAPs, GLS e PALS erano tutti predittori di eventi, ma solo l'età (HR 1,03, $p=0,03$) e il PALS (PALS<22,5% HR 18,99 e PALS 22,5-30 HR 7,68, $p < 0,001$) sono rimasti indipendentemente associati all'outcome nell'analisi multivariata. I pazienti con PALS<22,5 avevano una sopravvivenza libera da eventi dell'82,4% a 1 anno,

49,8% a 5 anni e 25,3% a 10 anni rispetto al 100% a 1 anno, 98,5% a 5 anni e 92,5% a 10 anni se PALS>30%. Gli stessi risultati analizzati nella metà femminile della popolazione sono stati confermati (Fig.1).

Conclusioni: L'analisi della funzione atriale con PALS rappresenta un sensibile strumento diagnostico di miopatia atriale. Nella prevenzione primaria di pazienti con IA e DM un PALS anormale è emerso come il più potente strumento di predizione di eventi cardiovascolari stimolando la ricerca di terapie farmacologiche che possano migliorare lo strain e ridurre la fibrosi parietale.



**IMAGING CARDIOVASCOLARE 124 FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE) TOMOGRAFIA AD EMISSIONE DI POSITRONI
(PET) (IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)**

**STUCKED BETWEEN A ROCK AND A HARD PLACE: HEART FAILURE WITH BILATERAL ATRIAL APPENDAGE
THROMBI AND DISSEMINATED INTRAVASCULAR COAGULATION**

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A 69 year-old man was admitted to the hospital for progressive dyspnea and new onset diarrhoea. His physical examination was significant for signs of left ventricular heart failure (HF); laboratory tests showed marked thrombocytopenia (32,000/mcL) and coagulopathy with international normalized ratio (INR) of 2.04. He had fever and cultures were positive for *Morganella Morganii*. Transthoracic echocardiogram (TTE) revealed a large, mobile left atrial mass and severely reduced left ventricular (LV) contractility. TEE was performed trying to define the nature of the mass and showing a highly mobile mass within the LAA and another mass in the RAA. Native valves were free from echocardiographic appreciable vegetations. Positron emission tomography/Computed Tomography (PET/CT) scan excluded infective endocarditis and malignancies. Platelet transfusion was performed, with a rapid raise in platelet count. Intravenous infusion of heparin, furosemide and antibiotics were started. Few days later he had a severe intestinal bleeding from rectal varices with the necessity of blood transfusions and stopping anticoagulation. His hemodynamic status was initially optimized but unfortunately it was complicated by multiorgan failure. At

the end he developed cardiogenic shock unresponsive to medical and interventional treatments and died suddenly. Simultaneous bilateral atrial appendages thrombosis is an uncommon presentation in AF. The incidence of thrombus formation in LAA in presence of AF is about 10–15%. RAA clot is rare with a frequency of less than 2%. DIC is a pathologic syndrome characterized by intravascular fibrin formation in response to

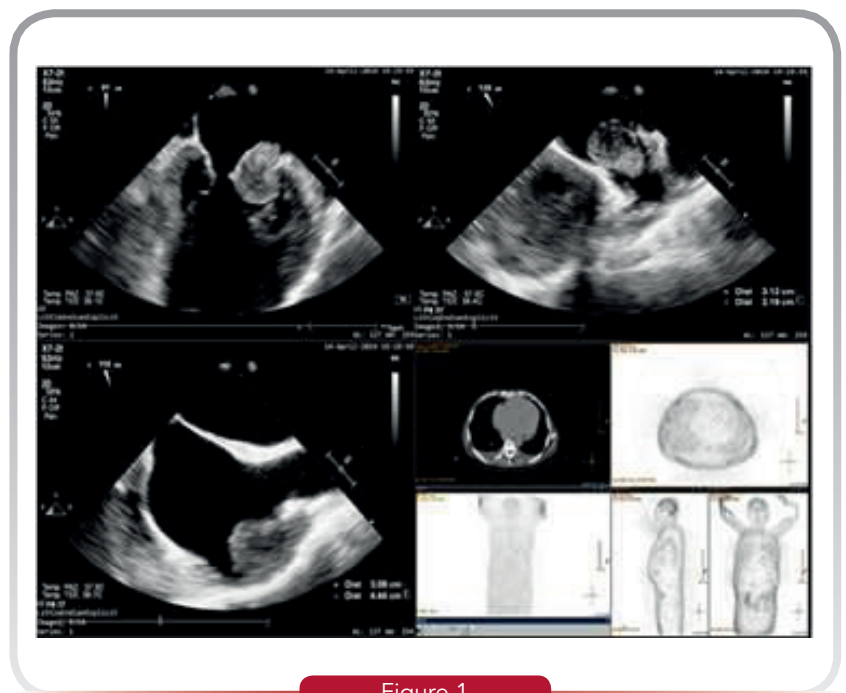


Figure 1

excessive blood protease activity. DIC is an uncommon but severe complication of an underlying disease and is most associated with sepsis, trauma, and malignancies. Although DIC most often manifests with bleedings, both DIC and HF can predispose to thrombosis. In our case, both AF and DIC may have facilitated RAA

thrombosis, that is "per se" an uncommon event in AF. In fact, we should remember Virchow's triad: stasis induced by AF and hypercoagulability induced by DIC may have acted synergistically, favoring the formation of simultaneous LAA and RAA thrombi.



IMAGING CARDIOVASCOLARE 90 FIBRILLAZIONE ATRIALE (FA) (ARITMIE) ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

FUNZIONALITÀ ATRIALE SINISTRA ED INDICI DI ACCOPPIAMENTO ATRIOVENTRICOLARE SINISTRO PER LA PREVISIONE DELLA FIBRILLAZIONE ATRIALE NELLA CARDIOMIOPATIA IPERTROFICA

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Premessa Nella cardiomiopatia ipertrofica (CMI), la fibrillazione atriale (FA) è un marker di progressione di malattia e di outcome peggiore, aumentando il rischio di eventi tromboembolici.

L'identificazione dei pazienti con CMI a rischio di fibrillazione atriale è fondamentale per la gestione clinica e del follow-up dei pazienti. Scopo Abbiamo cercato di capire se una valutazione ecocardiografica dettagliata del rimodellamento e della funzionalità dell'atrio sinistro (AS) possa migliorare il valore predittivo di FA rispetto ai parametri standard.

Metodi Nei pazienti consecutivi affetti da CMI, seguiti presso l'ambulatorio dedicato tra il 2020 e il 2023, abbiamo misurato i volumi dell'AS mediante ecocardiografia bidimensionale (2D), il global longitudinal strain (GLS) del ventricolo sinistro (VS) e la deformazione dell'AS con metodica speckle-tracking. I volumi del VS, dell'AS, e la frazione di svuotamento totale (FST) dell'AS sono stati misurati anche con l'ecocardiografia tridimensionale (3D). L'indice di accoppiamento atrioventricolare sinistro (LACI) in 3D è stato calcolato come il rapporto tra il volume dell'AS e quello del VS, ed è espresso in percentuale.

Inoltre sono stati raccolti dati clinici, ECG ed ECG Holter 48 ore.

Risultati Un totale di 180 pazienti con CMI (58 ± 18 anni, 55% uomini) è stato seguito per 23 ± 13 mesi. Ventisette pazienti hanno avuto almeno un episodio di FA durante il follow-up. Questi pazienti erano più anziani e avevano valori di GLS del VS ($-13 \pm 4\%$ vs $-15 \pm 4\%$, $p=0,004$), della FST dell'AS (31 ± 12 vs $42 \pm 11\%$, $p=0,001$) e dello strain reservoir dell'AS (ASRs, 10 ± 6 vs $16 \pm 8\%$, $p=0,001$) più compromessi rispetto ai pazienti senza FA. Inoltre, sono stati riscontrati valori significativamente maggiori di LACI ($75 \pm 51\%$ vs $43 \pm 25\%$, $p=0,009$) nei pazienti con FA di nuova insorgenza. All'analisi univariata di Cox, il LACI, la FST dell'AS e ASRr sono risultati associati alla FA (AUC 0,68, 0,69 e 0,72, rispettivamente, $p < 0,001$). I cutoff ottimali per predire la FA erano un valore di LACI $> 59\%$ e di FST dell'AS $< 26\%$, il valore discriminativo è risultato significativo all'analisi di Kaplan-Meier (pannello A). L'aggiunta del LACI e della FST dell'AS 3D ad un modello che includeva i parametri 2D (GLS del VS e volume dell'AS indicizzato 2D) ha avuto un valore incrementale significativo nel prevedere l'insorgenza di FA (pannello B).

Conclusioni Nei pazienti affetti da CMI, la valutazione dei volumi, della funzione dell'AS e dell'accoppiamento atrioventricolare mediante 3D può migliorare l'identificazione dei pazienti a rischio di nuovi episodi di FA entro 1 anno di follow-up.

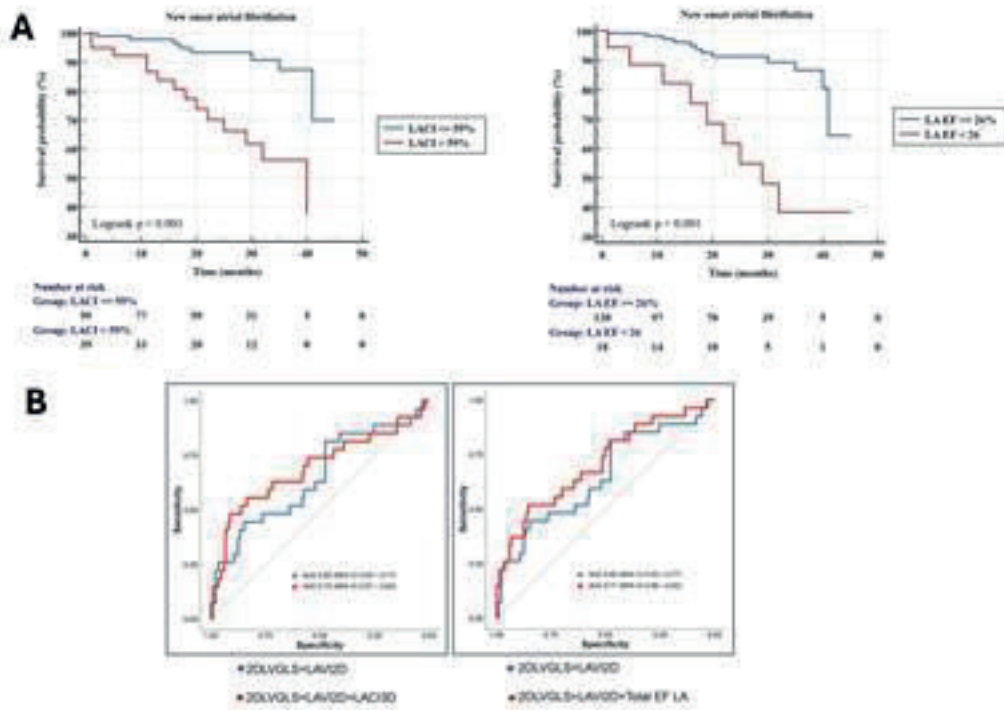


Figura 1



IMAGING CARDIOVASCOLARE 272
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO
(IMAGING CARDIOVASCOLARE)

ASSOCIATION OF TRANSAORTIC FLOW RATE WITH OUTCOMES IN PATIENTS WITH MODERATE AORTIC STENOSIS

Jessica Pizzini (a), Paolo Springhetti (a), Gianmarco Gargano (e), Michele Tomaselli (b), Leonardo Portolan (a), Marco Penso (b), Denis Leonardi (a), Alexandra Clement (c), Alessandra Rota (b), Roberto Scarsini (a), Flavio Luciano Ribichini (a), Denisa Muraru (b, d), Giovanni Benfari (a), Luigi Badano (b, d)

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Background: In patients with severe aortic stenosis (AS), the transvalvular flow rate (FR) is a key determinant of the prognostic value of the aortic valve area (AVA). However, the prognostic significance of FR in patients with moderate AS remains unclear.

Purpose: To assess the association with outcomes of FR in patients with moderate AS. **METHODS:** 292 outpatients (mean age 80 ± 9 years, 45% female) with moderate degenerative AS (defined as $1 \text{ cm}^2 < \text{AVA} < 1.5 \text{ cm}^2$) underwent transthoracic echocardiography between January 2019 and July 2022 and were retrospectively included in this study. The FR was calculated using the derivation method [$\text{FR}_{\text{der}} = \text{mean jet velocity (cm/s)} \times \text{AVA (cm}^2\text{)}$], and was validated in a random sample of 90 patients. In these patients, FR was also calculated using the direct method [$\text{FR}_{\text{dir}} = \text{stroke volume (mL)} / \text{ejection time (s)}$]. The primary study endpoint was a composite of all-cause mortality and hospitalization for heart failure (HHF).

Results: After median follow-up of 19.3 (Interquartile-Range 12.3–26.0) months, 73 patients reached the primary endpoint, with 22 experiencing HHF and 51 deaths. Patients who met the combined endpoint had lower values of FR_{der} compared to those who didn't experience these outcomes ($201 \pm 47 \text{ mL/s}$ vs $225 \pm 48 \text{ mL/s}$). The FR_{der} showed excellent correlation with

FR_{dir} ($R^2=0.93, p<0.0001$). The best threshold value for identifying patients at higher risk of experiencing adverse outcomes of FR_{der} was determined to be 210 mL/ms through spline curve analysis.

Female sex [Odds Ratio (OR) 5.3 (C.I.95% 2.8-10.3), $p<0.0001$], chronic kidney disease ($\text{eGFR} < 60 \text{ mL/min}$) [OR 3.2 (C.I.95% 1.5-7.0), $p=0.003$], previous myocardial infarction (OR 3.9 [C.I. 95% 1.7-8.6], $p=0.001$), stroke volume indexed (SVi) [OR 0.8 (C.I.95% 0.8-0.9), $p<0.0001$] and at least moderate tricuspid regurgitation (OR 2.9 [C.I. 95% 1.2-6.8], $p=0.017$) resulted independent predictors of FR_{der} less than 210 mL/ms.

At Cox multivariable regression analysis, FR_{der} less than 210 mL/s resulted associated with events (adjusted Hazard Ratio 2.17 [C.I. 95% 1.14 – 4.12], $p=0.018$), after adjustment for age, coronary artery disease, left-ventricular ejection fraction, right-ventricular dysfunction and low flow state-defined as $\text{SVi} < 35 \text{ mL/m}^2$.

Conclusion: In patients with moderate degenerative AS under medical management, FR_{der} less than 210 mL/ms is independently associated with increased mortality and HHF at medium term follow-up. Further research is needed to determine whether patients with moderate AS and impaired flow rates might benefit from more intensive monitoring or earlier aortic valve replacement.

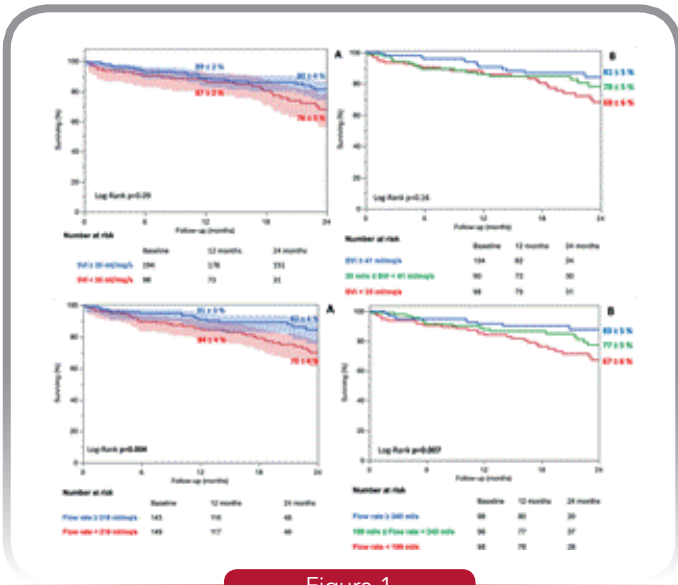


Figura 1

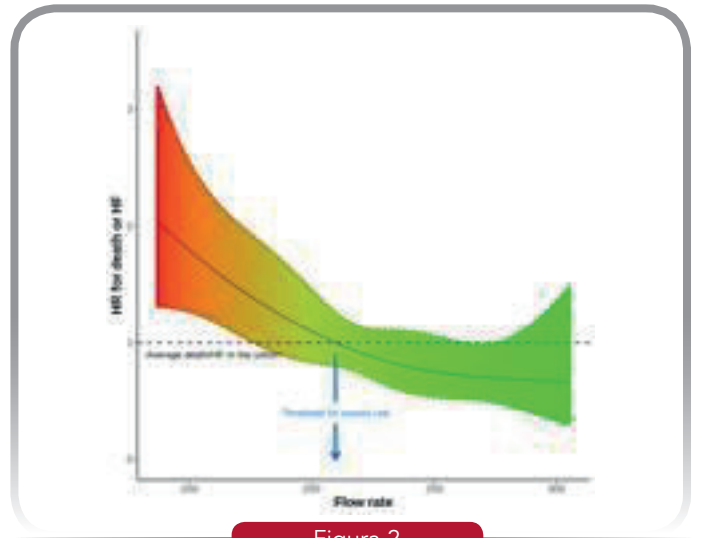


Figura 2



IMAGING CARDIOVASCOLARE 354

ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

DIABETE E MALATTIE CARDIOVASCOLARI (DIABETE E MALATTIE DEL METABOLISMO)

RIGHT HEART FUNCTION AND DM1: ADVANCED ECHOCARDIOGRAPHIC EVALUATION

Martina Pucci (a), Roberta Esposito (a), Pasquale Megaro (a), Andrea Salzano (c), Alberto Maria Marra (c), Vincenzo Guardasole (c), Mariarosaria De Luca (c), Angelo Foglia (c), Eduardo Bossone (b), Antonio Cittadini (c)
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(b) DEPARTMENT OF PUBLIC HEALTH, FEDERICO II UNIVERSITY, NAPLES, ITALY; (c) DEPARTMENT OF TRANSLATIONAL MEDICAL SCIENCES, FEDERICO II UNIVERSITY, NAPLES, ITALY

Background: Diabetic Cardiomyopathy is a diabetes mellitus-induced pathophysiological condition that can result in heart failure (HF). From ESC guidelines 2023, it is known that most of the concepts expressed for type 2 diabetics can partly be extended to type 1 diabetics, but it is necessary to consider that there are differences in the etiology and treatment of the two pathological conditions and this is why ad hoc studies on patients with type 1 diabetes are necessary.

Objectives: The aim of the study is to evaluate right ventricular function with standard and advanced echocardiographic techniques in patients with type 1 diabetes in order to highlight subclinical cardiac damage.

Methods: 59 patients with type 1 diabetes mellitus (mean age 38.93 ± 10.58) were included in this prospective study and 62 healthy controls comparable for age and sex (mean age 35.00 ± 11.45). Echo-Doppler assessment was realized according to the standards of the European Association of Cardiovascular Imaging (EACVI) standardization of the echo report. A comprehensive assessment of RV geometry, systolic and diastolic function was performed. A complete 3D analysis of the right chambers was performed with the determination of end-diastolic and end-systolic volumes of right ventricle (RV EDV and RV ESV), ejection fraction of the RV (RV EF) and RV global longitudinal

strain (RV GLS). Continuous normally distributed variables were compared by using the Student t- test. A probability value < 0.05 was considered statistically significant. Analyzes were performed with SPSS version 25 (IBM Corporation, Somers, New York).

Results: Statistically significant differences were found regarding the systolic function of the right ventricle in patients with type 1 diabetes, in particular these patients had major values of RV basal diameter compared to healthy controls (33.98 ± 3.76 vs 27.09 ± 10.9 , p-value < 0.001), significant differences in ventricular volumes measured by 3D: RV EDV (91.00 ± 34.36 vs 108.07 ± 25.55 , p- value 0.001), RV ESV (44.36 ± 18.67 vs 56.36 ± 17.35 , p-value 0.001) with overlapping values of right ventricular ejection fraction (51.81 ± 7.56 vs 51.30 ± 6.52) but with global longitudinal strain values analyzed by 3D-speckle tracking echocardiography (STE) reduced compared to healthy controls (19.85 ± 4.23 vs 23.99 ± 4.30 , p-value < 0.001)

Conclusions: The use of advanced echocardiographic techniques such as 3D-STE evaluation can allow us to highlight cardiac involvement even in a subclinical phase in patients suffering from type 1 diabetes, with the aim of better characterizing the structural and functional cardiovascular alterations and prevent cardiac damage with appropriate tailored therapy.

IMAGING CARDIOVASCOLARE 830 ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE) VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE) ENDOCARDITI (VALVULOPATIE) PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

PROSTHETIC VALVE ENDOCARDITIS (PVE): A LIFE-THREATENING CONDITION?

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MEDICINE, SURGERY AND DENTISTRY, UNIVERSITY OF SALERNO, BARONISSI (SA), ITALY; (d) DEPARTMENT OF
MEDICINE AND HEALTH SCIENCES "VINCENZO TIBERIO", UNIVERSITY OF MOLISE, CAMPOBASSO, ITALY

Clinical Case: 74-year-old man at the beginning of August 2024 accesses emergency room (ER) for fever with chills and loss of appetite. The patient underwent in February 2024 aortic valve replacement (AVR) with a biological prosthesis (Perimount Magna Ease 25 mm) and ascending aorta replacement with a prosthesis of 28 mm in fusiform dilation of ascending aorta (maximum caliber 50 mm) and severe aortic valve insufficiency. In remote pathological history: arterial hypertension, prostatic hypertrophy, dorsal spondylosis, depression in therapy with SSRI and previous removal of right renal neoplasia in current follow up.

In ER Transthoracic echocardiogram (TTE) raises the suspicion of endocarditis, blood cultures are performed, empirical antibiotic therapy is started and the patient is transferred to our operating unit of "Clinical Cardiology and Cardioimaging". Upon arrival the patient is alert, oriented and cooperative, asymptomatic for angina and dyspnea. Vital signs: BP 100/60 mmHg; HR 74 bpm; SpO₂ 96% in AA., body temperature 37°C. ECG: sinus rhythm with first degree AV block (PR 220 msec) and non-specific repolarization abnormalities. Blood tests: normocytic normochromic anemia (Hb 9.2 g/dl, MCV 85.4 fl, MCH 28.3 pg), WBC 7.72, PLT 257, creatinine 0.74 mg/dl, sodium 136 mEq/l, K 4.20 mEq/l, PCR > 100; PCT negative. Transesophageal echocardiogram (TEE) shows: normally positioned aortic bioprosthesis, no evidence of rocking of the prosthesis; evidence of

an iso-hyperechogenic mass measuring 20x10 mm in maximum size, mobile, with irregular margins, attached to the arterial side of the right anterior prosthetic cusp which appears thickened and hypomobile, generating significant obstruction to the outflow with an average gradient of 43 mmHg and a maximum velocity of 4.4 m/sec, and evidence of peri-root thickening with doubtful involvement of the intervalvular fibrosis (image suspicious for abscess formation). TEE also shows secondary mitral insufficiency of moderate degree (III/IV) with large central regurgitant jet with major central-lateral component and moderate tricuspid insufficiency due to dilation of the annulus with associated mild pulmonary arterial hypertension (PAPs 48 mmHg). The patient is sent to perform a total body CT scan with contrast to search for any encephalic or peripheral embolisms and for better characterization of the aortic root. Imaging shows: an area of hypodensity starting from the right semilunar cusp with extension into the aortic sinus, suggestive of infectious vegetation; in correspondence with the right pulmonary recess, areas of diffuse inhomogeneity with hypodensity at circumscribed margins, suggestive of phlogistic area. It also shows: an area of cuneiform consolidation of the posterior basal segment of the lower lobe of the left lung, suggestive of pulmonary infarction; thromboembolic occlusion of the superior mesenteric artery extending for 2 cm at the level of the II-III



jejunoileal branch; an area of cuneiform hypodensity at the level of the middle third of the spleen, as from splenic infarction. Blood cultures drawn from a peripheral vein in 3 sets 30 minutes apart are positive for methicillin-resistant *Staphylococcus Epidermidis*. The diagnosis of PVE is therefore confirmed based on the modified Duke criteria: evidence of 2 major criteria, both microbiological and positive imaging. Specific antibiotic therapy is set up in accordance with the 2023 ESC guidelines: Vancomycin 30-60 mg/kg iv divided into 3 daily doses, Rifampicin 900 mg/day iv in 3 daily doses and Gentamicin 3 mg/kg/day iv in 2 daily doses. Considering the high embolic risk of the vegetation (> 10 mm) and the presence of peripheral embolisms as documented by CT, the patient is sent for surgery after a collegial evaluation in the Heart-Team.

Conclusions: Prosthetic valve endocarditis (PVE) represents the most severe form of infective endocarditis (IE) and occurs in 1-6% of patients with

prosthetic valves, with an incidence of 0.3-1.2% per patient-year. It is responsible for 20-30% of all cases of IE and more frequently affects bioprosthetics than mechanical valves. PVE is difficult to diagnose, because the clinical presentation is often atypical, especially in the early postoperative period when fever and inflammatory conditions frequently arise. PVE also presents complexities in terms of defining the optimal therapeutic strategy and is associated with an unfavorable prognosis; in fact, an extremely high in-hospital mortality rate of 20-40% has been reported. From The EurObservational Programme (EORP) of the European Society of Cardiology EURO-ENDO (European Infective Endocarditis) registry it is known that patients with theoretical indication for cardiac surgery, who do not undergo surgical treatment, have higher mortality and therefore worse prognosis. This clinical case underlines the importance of imaging in the early diagnosis of this condition and above all in defining the most appropriate therapeutic management.



IMAGING CARDIOVASCOLARE 950 TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE) CARDIOLOGIA DELLO SPORT (ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT) IMAGING DELLE CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

ANOMALOUS ORIGIN OF LEFT CIRCUMFLEX ARTERY FROM THE RIGHT SINUS OF VALSALVA: CLINICAL OUTCOMES IN A CONSECUTIVE SERIES OF MASTER ATHLETES

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(a) IRCCS GALEAZZI-SANT'AMBROGIO - DIPARTIMENTO DI CARDIOLOGIA UNIVERSITARIA; (b) UNIVERSITÀ DEGLI STUDI DI MILANO - DIPARTIMENTO DI SCIENZE CLINICHE E DI COMUNITÀ; (c) FONDAZIONE POLICLINICO UNIVERSITARIO AGOSTINO GEMELLI IRCCS - UNITÀ DI CARDIOLOGIA DELLO SPORT

Purpose. Aim of the study was to collect and describe a case series of consecutive master athletes in whom an anomalous origin of left circumflex artery (LCx) from the right sinus of Valsalva (ALCx) was detected at a clinically indicated coronary CT angiography CCTA) in order to establish a focused clinical management and counselling about sport activity in those subjects.

Methods. We analyzed a prospective registry of subjects referred to a clinically indicated CCTA. Information about the clinical status was obtained by previous clinical records and clinical evaluation at time of image acquisition; follow-up allowed to record symptoms, outcomes and downstream testing.

Results. The study population consisted in 14 subjects, of which one competitive athlete and 13 recreational master athletes. Mean age was of 67.2 ± 10.6 years (71% of male); follow-up lasted 6.4 ± 2.6 years. The major high-risk anatomy features (inter-arterial course, intramural segment, high take-off and slit-like ostium) were absent. None had abnormal ostial morphology and all had full retroaortic course; three subjects (21%) presented an acute take-off angle. CAD was present in 10 patients (71%). Major outcomes (cardiac hospitalization, death for all causes) recorded were not related to the anomalous LCx. Symptoms were most related to atherosclerotic CAD in different vessels

whereas two subjects without CAD exhibited cardiac symptoms, without hospitalization.

Conclusions. Our study suggests that the diagnosis of ALCx, being usually associated to low-risk anatomical characteristics, could be considered a benign finding, with scarce or no implications for physically active individuals neither for recreational athletes.

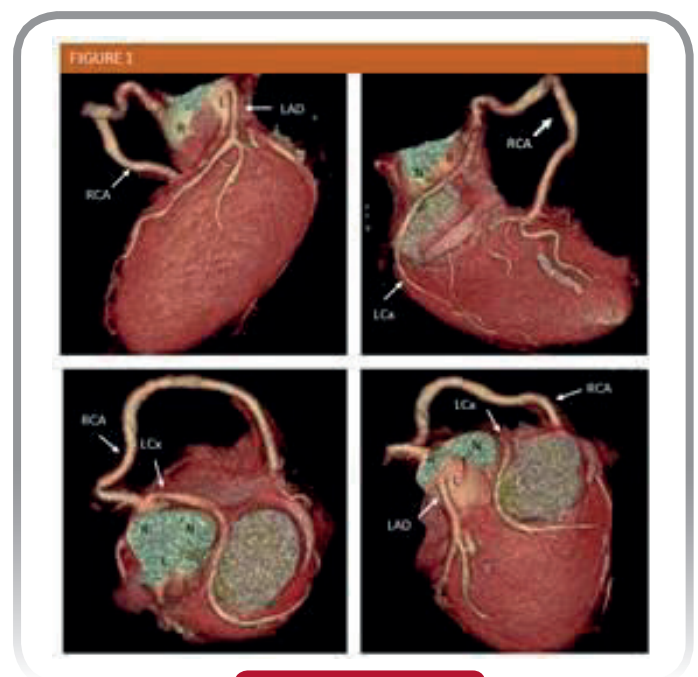


Figure 1



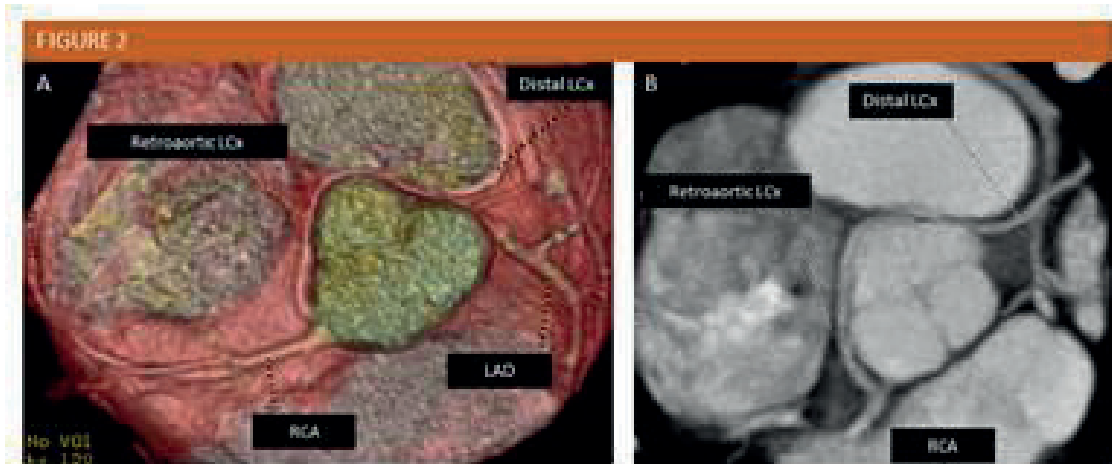


Figure 2

IMAGING CARDIOVASCOLARE 808

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

VALIDATION OF AN INNOVATIVE NON-INVASIVE MODEL FOR ESTIMATING PRESSURE-VOLUME LOOPS IN HEALTHY SUBJECTS

Stefania Sacchi (a), Antonella Sabatini (b), Monica Barki (a), Carmine Galdieri (a), Francesco Calvo (a), Luca Baldetti (a), Vittorio Pazzanese (a), Mario Gramegna (a), Beatrice Peveri (a), Lorenzo Cianfanelli (a), Giacomo Ingallina (a), Eustachio Agricola (a), Silvia Ajello (a), Mara Scadroglio (a)

(a) SAN RAFFAELE UNIVERSITY HOSPITAL, MILAN, ITALY; (b) VERONA UNIVERSITY HOSPITAL, VERONA, ITALY

Background: Pressure-volume (PV) loops are critical for comprehensively understanding cardiac function, as they provide detailed insights into the heart's mechanical performance. The ability to derive these loops non-invasively represents a significant advancement in cardiac diagnostics.

Hypothesis: We developed and validated an innovative model-based algorithm to derive non-invasive left ventricular PV loops.

Methods: We conceived and implemented a simple, intuitive, and practical model-based algorithm for the non-invasive left ventricular PV loop diagram visualization and analysis. This model is based on the quantitative numerical calculation of the product of two time-varying curves, namely the LV volume $V(t)$

multiplied by the time varying LV elastance function, $E(t)$, to obtain the time varying LV pressure curve, $P(t)$, according to the well-known relation: $P(t) = E(t) * V(t)$ (formula F1) (Seeman et al. 2019). The algorithm works as follows: 1) Input parameters: HR, EDV, ESV, Estimated LV elastance value for healthy;

2) Picked qualitative illustrations exhibiting time-varying dynamics of a) Normal LV Elastance, b) Normal LV Volume. Digitized, appropriately scaled, and adapted to input, curves in step (2), using MATLAB®, a2023b, Mathworks®, Natick, Massachusetts, USA: 1) $P(t)$ obtained by applying formula (F1) in Excel Spreadsheet; 2) Construction of the PV Loop diagram in Microsoft Excel Spreadsheet. The performance of our algorithm was assessed by comparing the derived PV loops with the strain-volume relationship loops obtained through echocardiography using the GE system.

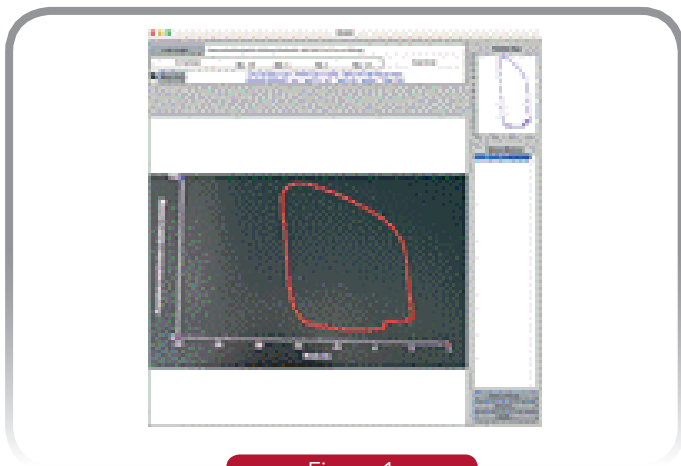
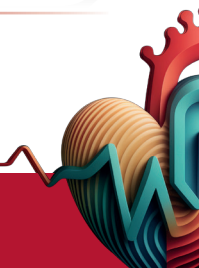


Figure 1



Figure 2



Results: Ten healthy subjects (mean age 25 ± 5 years, 80% male) were enrolled in the study. Non-invasive input parameters were collected to derive the algorithm-based PV loops, and strain-volume relationship loops were obtained via echocardiography. The results showed a high correlation and consistency between the non-invasive algorithm-derived PV loops and the

strain-volume relationship loops (correlation coefficient 0.86 ± 0.09).

Conclusions: In healthy subjects, the novel model-based algorithm successfully derived reliable non-invasive PV loops that were highly consistent with the strain-volume loops obtained through echocardiography.

Subject #	HR (bpm)	SBP (mmHg)	DBP (mmHg)	LVEDV BipL (mL)	LVESV BipL (mL)	EF (%)	LVCO BipL (L/min)	LVSV (mL)	GLS (%)	GWR (mmHg%)	GCW (mmHg%)	GWW (mmHg%)	GWE (%)	Correlation Coefficient
Subject1	83	110	80	130	51	61	4.80	79	-23	2247	2490	88	96	0.93
Subject2	75	130	80	126	70	56	5.20	70	-18	1936	2390	111	95	0.77
Subject3	82	120	70	78	33	57	2.60	43	-19	1686	2156	110	95	0.89
Subject4	68	110	70	87	38	57	3.20	49	-17	1555	1872	130	93	0.93
Subject5	76	125	80	135	62	54	5.00	73	-16	1558	1974	147	93	0.93
Subject6	90	120	80	104	41	61	5.50	63	-19	1622	2020	110	94	0.90
Subject7	64	120	80	143	63	56	5.00	80	-18	1643	1896	178	90	0.89
Subject8	59	115	79	140	63	55	4.30	77	-18	1642	1772	151	91	0.85
Subject9	77	125	75	101	38	62	4.90	62	-17	1679	2029	83	95	0.87
Subject10	70	97	66	94	50	47	3.10	44	-16	949	1435	149	91	0.63
Average	70 ± 9	117 ± 10	76 ± 5	114 ± 24	51 ± 13	57 ± 4	4.36 ± 1.02	64 ± 14	-18 ± 2	1652 ± 325	2003 ± 301	126 ± 30	93 ± 2	0.86 ± 0.09

Table 1



IMAGING CARDIOVASCOLARE 483

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE) ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE) PROGNOSI (SCOMPENSO CARDIACO)

(DIS)AGREEMENT BETWEEN NEW AND OLD PARAMETERS OF RIGHT VENTRICULAR SYSTOLIC DYSFUNCTION AND THEIR ASSOCIATION WITH OUTCOMES IN A CONTEMPORARY HEART FAILURE COHORT: A 3D- ECHOCARDIOGRAPHIC STUDY

Stefano Sforza (a), Paolo Biagioli (a), Sandra D'addario (a), Rosanna Lauciello (a), Alessandro Lupi (a), Eugenio Trovarelli (a), Benedetta Casini (a), Ilaria Di Pietro (a), Enrica Fede (a), Claudio Bernetti (a), Giuseppe Ambrosio (a), Erberto Carluccio (a)

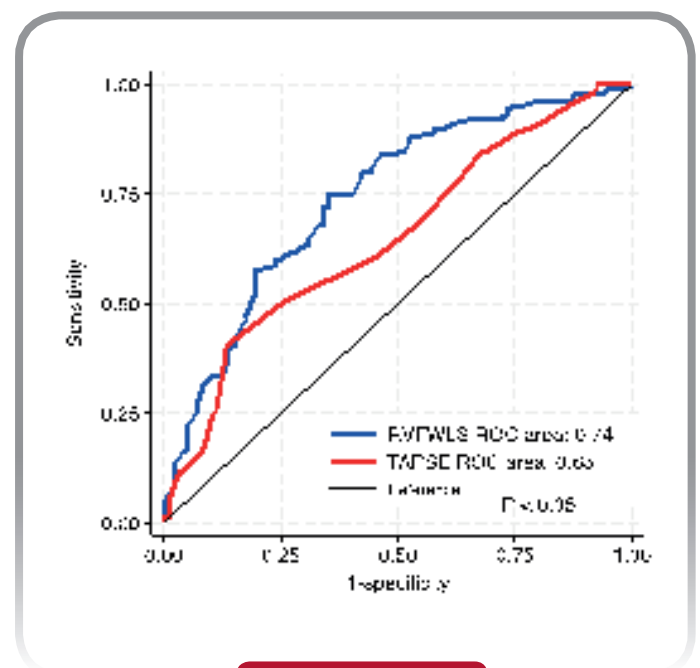
(a) CARDIOLOGY AND CARDIOVASCULAR PATHOPHYSIOLOGY, SANTA MARIA DELLA MISERICORDIA HOSPITAL, UNIVERSITY OF PERUGIA, ITALY

Background: Right ventricular (RV) systolic function is an important predictor of prognosis in heart failure (HF). Tricuspid annular plane systolic excursion (TAPSE) has shown limitation in the assessment of RV function; RV free-wall longitudinal strain (RVFWLS) is a step forward providing better prognostic risk stratification; finally, 3D echocardiography-derived RV ejection fraction (RVEF) can provide a comprehensive assessment of the complexity of RV function. Concordance or disagreement between these indices and their association with outcome, in a contemporary optimally treated cohort of patients with HF, has not been investigated yet.

Methods: We studied 197 HF patients with left ventricular (LV) systolic dysfunction (ejection fraction, EF, <50%) by means of 2- and 3-dimensional echocardiography. A value of RVEF <45% defined RV dysfunction against which both TAPSE and RVFWLS were compared using guideline-recommended thresholds (TAPSE <17 mm, RVFWLS >-20%, respectively). Patients were followed-up for a composite of all-cause mortality/HF-rehospitalization.

Results: Among HF patients with normal RVEF (n=97), 13.4% and 34% had impaired TAPSE and RVFWLS, respectively ($P < 0.0001$ for both). Conversely, a significant proportion of patients with reduced RVEF had normal TAPSE (60%) or RVFWLS (29%). By receiver-

operating characteristic analysis, RVFWLS showed the highest area under the curve for identifying RV dysfunction (RVEF <45%, Figure 1). Over a median 21-months follow-up, 24% of patients reached the endpoint. At univariable Cox regression, both RVFWLS and RVEF, but not TAPSE, were significantly associated with outcome. Incidence rate (per 100 pts/year) was the lowest (5.1%) when both RVFWLS and RVEF were normal, and progressively increased when only one of



them resulted impaired, with the highest rate (24.3%) seen when both parameters were impaired ($p < 0.0001$, Figure 2).

Conclusion: In this contemporary cohort of patients with HF and LV dysfunction, guideline- recommended cutoff values of conventional echocardiographic parameters of RV systolic function show modest agreement with RVEF by 3D-echo. RVFWLS was better correlated with the RVEF than TAPSE. Combining RVFWLS and RVEF provides the best risk stratification tool in these patients, emphasizing a multiparametric approach in the assessment of RV function.

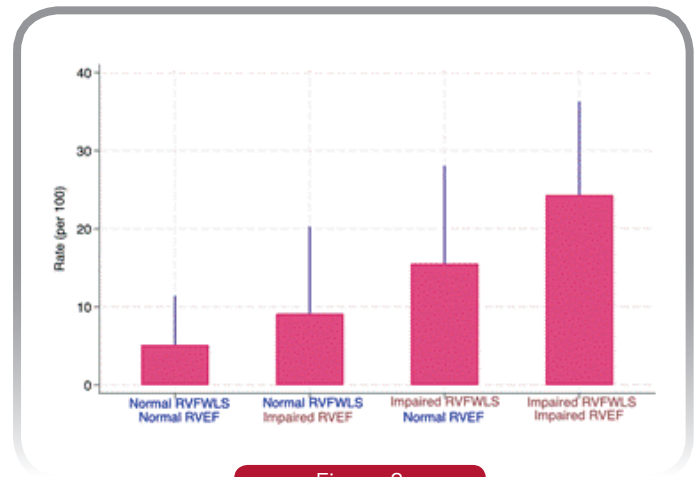


Figure 2



IMAGING CARDIOVASCOLARE 375
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

UN SETTO INTERATRIALE ANOMALO IN UNA PAZIENTE CON STROKE ISCHEMICO: PIU' DI UN SINGOLO DIFETTO

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Caso clinico: Una donna di 77 anni affetta da ipertensione arteriosa e dislipidemia entrambe in trattamento farmacologico e priva di altre comorbidità rilevanti, ha sviluppato improvvisamente afasia, deviazione della rima buccale e debolezza del braccio destro.

Una TC encefalo e dei tronchi sovra-aortici è stata immediatamente eseguita all'accesso in PS, ma non sono state rilevate alterazioni rilevanti in acuto. La fibrinolisi prontamente eseguita ha portato la paziente ad un completo recupero clinico. La RM encefalo con protocollo FLAIR/DWI effettuata pochi giorni dopo ha evidenziato molteplici piccole aree iperintense a livello della giunzione parieto-temporale-occipitale, compatibili con ischemia cerebrale subacuta. Nell'ambito del successivo work-up diagnostico, è stato necessario indagare sulla possibile causa dell'ictus. L'ECG Holter delle 24 ore è risultato nei limiti.

E' stato pertanto eseguito un ecocardiogramma transtoracico (TTE) presso gli ambulatori della nostra Unità Operativa. L'esame ha evidenziato una buona cinetica biventricolare: la frazione di eiezione ventricolare sinistra era preservata (LVEF 62%) con normale contrattilità regionale, il ventricolo destro non era dilatato (diametro basale telediastolico 38 mm) ed aveva una regolare escursione sistolica (TAPSE 21 mm). Non sono state segnalate valvulopatie rilevanti né segni indiretti di ipertensione polmonare. Tuttavia,

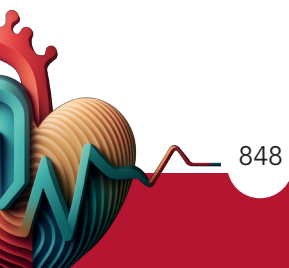
il setto interatriale si presentava aneurismatico: si notava inoltre al Color Doppler un piccolo getto tra l'atrio sinistro e quello destro, non però ulteriormente valutabile. Si è rivelata necessaria un'ulteriore valutazione con ecocardiogramma transesofageo (TOE). Il TOE ha mostrato un'anatomia più complessa del previsto. L'anomalia più rilevante era un difetto del setto atriale (ASD) di tipo ostium secundum nella porzione anteriore del setto interatriale. L'ASD aveva una larghezza di 17 mm*10 mm e il color doppler riportava uno shunt continuo tra l'atrio sinistro e quello destro. È stato segnalato anche un forame ovale pervio (PFO). Tuttavia, il reperto più singolare riguardava una settazione all'interno dell'atrio destro, come in un cor triatriatum. Pochi giorni dopo, la paziente è stata dimessa dal nostro ospedale ed è stata indirizzata a un follow-up neurologico presso l'ambulatorio post-ictus. La terapia alla dimissione includeva cardioaspirina, simvastatina/ezetimibe, valsartan/idroclorotiazide e bisoprololo.

Discussione: Secondo le attuali Linee Guida ESC per la gestione delle cardiopatie congenite dell'adulto, l'ecocardiogramma transtoracico è lo strumento diagnostico di prima linea nei pazienti con ASD. Dovrebbero essere valutati in prima istanza i segni di sovraccarico ventricolare destro e di ipertensione polmonare. Qualora questi non fossero presenti, ma in pazienti con



storia di sospetta tromboembolia paradossa, dovrebbe essere presa in considerazione la chiusura dell'ASD (Classe di indicazione IIA, Livello di evidenza C). Il caso è stato quindi proposto al Cardiologo interventista e al Cardiochirurgo per procedere alla chiusura dell'ASD, al fine di prevenire recidive di ictus. La strategia più adatta per la paziente (percutanea o chirurgico)

deve essere ancora discussa in un prossimo Heart Team. In conclusione, lo stroke ischemico causa annualmente numerosi decessi o invalidità ogni anno: il tromboembolismo paradossale è solo uno dei possibili meccanismi eziopatogenetici mentre l'identificazione di più difetti congeniti è invece decisamente rara.



IMAGING CARDIOVASCOLARE 303

ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)

PROGNOSI (SCOMPENSO CARDIACO)

ASSOCIATION WITH OUTCOMES OF THE PLANIMETRY OF VENA CONTRACTA AREA BY 3-DIMENSIONAL COLOR DOPPLER ECHOCARDIOGRAPHY IN PATIENTS WITH SECONDARY TRICUSPID REGURGITATION

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Background: The cut-off value for defining severe secondary tricuspid regurgitation (STR) using the planimetry of color Doppler three-dimensional echocardiography (3DE) vena contracta area (VCA) has been determined in previous studies based on its correlation with the values of the effective regurgitant orifice area (EROA), obtained using the proximal isovolumic surface area (PISA) method, in patients with severe STR. However, the association of VCA with outcomes has not been examined in these studies.

Aims: We sought to 1) identify the cut-off value of 3DE VCA associated with an increased risk of death for any cause or heart failure hospitalization (HF) in patients with STR; 2) test if the planimetry of 3DE VCA may improve the risk stratification over the quantitative parameters of STR severity.

Methods: Retrospective analysis of patients with STR consecutively enrolled in the FUTURE 3DECHO study (ClinicalTrials.gov Identifier: NCT05747404) who had good quality 3DE dataset for VCA planimetry.

Results: We selected 184 patients (76±13 years, 43% women). According to the guideline- recommended multiparametric approach, 15% of the patients had mild, 51% moderate, 22% severe, and 12% massive

STR. The mean 3DE VCA was 0.72±0.41 cm² and it increased significantly with the severity of STR. Among all the quantitative parameters of STR severity, the strongest correlation of 3DE VCA was found with EROA by PISA (Spearman: 0.63, p < 0.001). Using spline curve analysis, a 3DE VCA of 0.65 cm² was identified as the threshold value associated with increased risk of experiencing the composite endpoint in the whole population. At univariate analysis, a 3DE VCA > 0.65 cm² carried a 4-fold increased risk of combined events and it also stratified the risk in patients with EROA < 0.4 cm². When added to a multivariable model including right atrial volume, right ventricular ejection fraction, pulmonary arterial systolic pressure, STR EROA and regurgitant volume, VCA increased significantly the predictive power of the model and maintained its independent correlation with outcomes (HR: 1.011, CI 95%: 1.003-1.019, P=0.007; C2 of models: 44 vs 39, p value <0.001).

Conclusion: 3DE VCA has independent and incremental value over the other parameters of severity for predicting the risk of events in patients with STR. 3DE VCA > 0.65 cm² identified STR patients with EROA < 0.4 cm² at higher risk of experiencing the composite endpoint of death and HF.



IMAGING CARDIOVASCOLARE 885
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

USEFULNESS AND FEASIBILITY OF A RAPID SCANNING CARDIAC MAGNETIC RESONANCE PROGRAM IN A HIGH-VOLUME CENTER

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Background: The steep surge in Cardiac Magnetic Resonance (CMR) demand due to the increased test representation in the guidelines calls for measures to ensure accessibility. In particular, long scanning time represents a critical barrier even in high-resource settings. Rapid and ultrarapid scanning protocols (< 20') effectively guide diagnosis and management while fully adhering to guidelines for specific indications. [1] Until now, rapid/ultrarapid protocols have been used mostly in low/medium-resource settings. We wished to test the feasibility and efficacy of a rapid scanning pilot program in the context of a high-volume, tertiary referral CMR centre.

Methods: In a single high-volume CMR centre (~800 scans/year), a 20-minute scan slot was created. Scanning protocol included bSFFP cines (4-, 2-, 3-, short-axis stack, LV outflow tract, aortic valve), T1 mapping (3 short axis) and late-enhancement (LV long

axis, short-axis stack), as in the figure. Eligible patients, i.e. those referred for hypertrophic cardiomyopathy (HCM) screening in genetic positive / phenotype negative probands' relatives, viability assessment in chronic ischemic heart disease, left ventricular hypertrabeculation, and hypertensive heart disease, were identified by medical record review at the time of CMR scan scheduling, by an experienced CMR doctor.

Results and discussion: 15 patients (7 HCM relatives, 4 viability, 2 hypertrabeculation, 2 hypertensive heart disease; F: 6 [40%], average age 40±23y, age range 18-80y) underwent the rapid scanning protocol over 4 months (1 slot/week). The average scanning time was 20±4 min (range 16-29 min), meaning that two rapid CMR scans can be performed in a standard 45-minute slot, and the shortened scan duration may also improve patients' experience. No patients needed re-protocolling during the scan nor scan repetition (i.e.

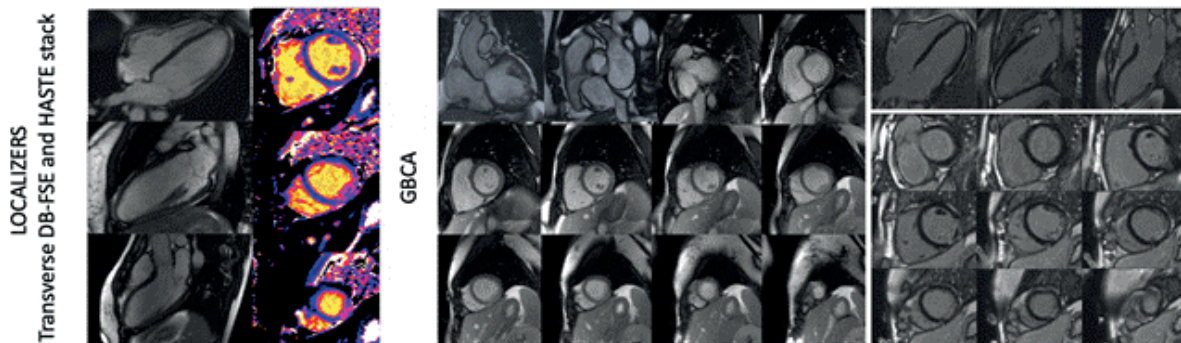


Figure 1

no extra sequences were needed), meaning that the patient's selection was appropriate.

Conclusion: Rapid scanning CMR is feasible in high-volume CMR centres. Its routine use may contribute to resource optimization and supports CMR accessibility. Further research with an up-scaled program is needed to assess the potential economic impact, given that the

protocol is suitable only for a subgroup of patients, and to explore the applicability of rapid scanning in other circumstances, e.g., claustrophobia.

[1] *Standardized image interpretation and post-processing in cardiovascular magnetic resonance - 2020 update.* Schulz-Menger, Jeanette et al. *JCMR2020*, 22(1):19.



IMAGING CARDIOVASCOLARE 409
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

CLINICAL VALIDATION OF ARTIFICIAL INTELLIGENCE FOR INTERPRETING LEFT VENTRICULAR SYSTOLIC FUNCTION: A COMPARISON BETWEEN CMR, TTE AND AUTO-EF CALCULATED BY A NOVEL HANDHELD ULTRASOUND DEVICE

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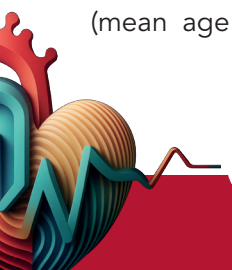
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Background. LVEF is the most widely used instrumental parameter in clinical cardiology for evaluating left ventricular systolic function. TTE is essential due to its portability and rapid image acquisition, allowing for fast interpretation in both elective and emergency settings. The biplane method of disks (modified Simpson's rule) is the currently recommended 2D method for assessing LVEF. In patients with good image quality, 3DE-based EF measurements are accurate and reproducible and should be used when available and feasible. CMR is widely recognized as the most accurate non-invasive imaging modality for assessing left ventricular function. With state-of-the-art MRI scanners, EKG-gated cine images depicting LV function with high contrast and excellent spatial and temporal resolution are readily acquired in breath-holds of 5 to 10 heartbeats. Nowadays, b-SSFP cine MRI has become the standard technique for studying cardiac function. Recently, machine learning techniques have been used to automatically identify left ventricular endocardial boundaries on A4C and A2C heart views to estimate LVEF. The goal of this study is to compare EF-CMR with traditionally calculated LVEF by modified Simpson's rule and auto-EF calculated by AI-device.

Technical resolution. This study included 40 subjects (mean age 50 ± 18 years, 65% male, 35% female)

scheduled for CMR evaluation in our hospital. The same patients were subsequently scanned at the echocardiography laboratory by calculating the traditional modified Simpson's rule. Moreover, left ventricular systolic function was also automatically calculated with a device using deep learning algorithms. Continuous variables were expressed as means \pm standard deviation. Categorical variables were presented as counts and/or percentages. Comparison between continuous variables was performed using paired Student's t-test or analysis of variance (ANOVA) with Bonferroni's correction in post-hoc tests. Categorical variables were compared using the χ^2 test. For all statistical tests, a two-tailed P value < 0.05 was considered statistically significant. Statistical analysis was performed using SPSS software. Comparing these three techniques, no statistically significant differences were recorded between EF-CMR and auto-EF ($p = 0.418$) while they were recorded between EF-CMR and traditional TTE-LVEF ($p = 0.043$) and between TTE-LVEF and auto-EF ($p = 0.049$). These results were valid regardless of the left ventricular systolic function ($< 40\%$, $41-49\%$, $> 50\%$). Therefore AI technologies may present a reliable and precise method to estimate LVEF in a clinical setting.

Conclusions. AI offers real time data on systolic



cardiac function, directly at the bedside, with good repeatability and reproducibility. Assessment of EF using the AI-algorithm is an objective method that can reduce interobserver and intraobserver variability. AutoEF using a novel handheld ultrasound device is feasible within a few seconds and its results are comparable to

the ones derived by CMR, regardless of left ventricular systolic function. AI technology can provide new possibilities to generate accurate, consistent and automated interpretation of echocardiography exams in both elective and emergency clinical settings with important diagnostic and prognostic implications.



IMAGING CARDIOVASCOLARE 652
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

GLOBAL LONGITUDINAL STRAIN PREDICTS THE CONCOMITANT PRESENCE OF CHRONIC CORONARY ARTERY DISEASE REQUIRING BYPASS GRAFT SURGERY IN PATIENTS WITH SEVERE AORTIC STENOSIS REFERRED TO SAVR WITHOUT PREVIOUS CORONARY ARTERY REVASCULARIZATIONS

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Background: Aortic stenosis (AS) is the most common valvular heart disease requiring surgical or transcatheter intervention in Europe. Its prevalence is rapidly rising as a consequence of the ageing population. Coronary artery disease (CAD) and severe AS frequently coexist (1), probably due to similar risk factors such as age, smoking and hypertension and common pathogenetic features (2). Global longitudinal strain (GLS) is a sensitive marker for identifying subclinical myocardial dysfunction in CAD (3). The use of non-invasive cardiac imaging methods such as GLS could help in the early identification of patients candidate for surgical aortic valve replacement (SAVR) with CAD susceptible for concomitant coronary artery bypass grafting (CABG).

Purpose: To evaluate whether GLS was a good predictor of concomitant CAD requiring coronary artery bypass graft (CABG) in a cohort of patients with severe AS referred for SAVR without a previous history of percutaneous or surgical coronary artery revascularizations.

Methods: The study population was from a single centre, prospective registry of patients with severe

native valve AS who were referred for SAVR between June 2020 to October 2022. Patients with a previous history of CAD were excluded. At baseline, all patients underwent a comprehensive clinical and echocardiographic characterization.

Results: In our cohort of 106 patients with severe AS, 21 (20%) had a concomitant CAD. Table 1 summarizes the main differences at pre-operative assessment in patients with and without CAD. Patients with CAD were more frequently males (90% vs. 46%, $p < 0.001$) and suffered from diabetes (43% vs. 20%, $p = 0.029$). Echocardiography revealed significantly lower EF (57% [45-65] vs. 63% [58-65], $p = 0.029$) and GLS (11.6% [8.1-15.2] vs. 16.1 [14.2-19.6], $p < 0.001$) values in patients with concomitant CAD. At logistic regression analysis, a decrease in GLS was associated with an increased risk of concomitant CAD. When correcting for other potential confounding factors (age, body mass index, hypertension, dyslipidemia, diabetes, and chronic kidney disease), GLS and male sex remained the only variables predicting the concomitant presence of CAD ($p = 0.047$ and $p = 0.030$, respectively) (Figure A). Patients with GLS $< 15\%$ showed a significant higher

risk of concomitant CAD (odds ratio [OR] 7.26 [2.40-21.92], $p < 0.001$). When considering patients with EF $> 50\%$ ($n=94$, 89%), 15 (16%) had a concomitant CAD. In these patients, male sex (OR 11.78 [1.96-40.83], $p=0.007$) but not GLS (OR 0.88 [0.72-1.08], $p=0.242$) predicted the concomitant presence of CAD.

Conclusions: In a cohort of patients undergoing SAVR for severe AS with no previous history of CAD, GLS and male sex predicted the concomitant presence of severe CAD susceptible of CABG. When considering patients with preserved EF, male sex but not GLS predicted a concomitant CAD.

Variables	OR (95% CI)	p value
GLS	0.82 (0.68-0.99)	0.047
Male sex	16.24 (2.62-50.56)	0.030
Age	1.00 (0.93-1.01)	0.812
BMI	0.89 (0.79-1.02)	0.099
Hypertension	0.66 (0.17-2.53)	0.546
Dyslipidemia	1.89 (0.51-6.97)	0.338
Diabetes	2.25 (0.61-8.24)	0.221

Figure 1

	non-CAD (n=85)	CAD (n=17)	p
Clinical characteristics			
Age, years	72 (66-76)	73 (67-76)	0.927
Male sex, n (%)	38 (45)	19 (80)	0.001
BMI, kg/m ²	26.2 (24.1-29.0)	26.9 (22.7-30.2)	0.803
Hypertension, n (%)	50 (59)	15 (71)	0.617
Dyslipidemia, n (%)	58 (68)	15 (71)	0.677
Diabetes, n (%)	17 (20)	9 (43)	0.009
NYHA class III-IV, n (%)	80 (95)	17 (100)	0.888
Echocardiographic characteristics			
IVS, mm	13 (11-14)	13 (12-14)	0.375
PW, mm	11 (10-12)	11 (10-12)	0.375
EDD, mm	49 (45-54)	53 (50-58)	0.006
LVEF, g/m ²	129 (109-148)	138 (121-172)	0.168
LAVI, mL/m ²	37.8 (33.4-44.7)	37.1 (35.9-45.3)	0.987
SAV	0.72 (0.61-0.90)	0.82 (0.61-0.90)	0.053
SA	12.8 (9.3-18.3)	9.4 (7.7-11.8)	0.006
sPAP, mmHg	30 (25-35)	30 (25-40)	0.371
Stroke, mmHg	96 (87-72)	93 (89-62)	0.205
EF, %	69 (69-66)	67 (68-66)	0.008
GLS, %	16.1 (14.2-18.0)	17.6 (8.7-15.2)	0.001

Table 1. Clinical and echocardiographic characteristics in severe AS patients with and without concomitant CAD.

BMI, body mass index; CAD, coronary artery disease; EDD, end-diastolic diameter; EF, ejection fraction; GLS, global longitudinal strain; LAVI, left atrial volume index; LVEF, left ventricular ejection fraction; NYHA, NYHA, IVS, interventricular septum, New York Heart Association; PW, posterior wall; sPAP, systolic pulmonary artery pressure.

Figure 2



**IMAGING CARDIOVASCOLARE 136
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)**

**ASSESSMENT OF LEFT ATRIAL FUNCTION AFTER PERCUTANEOUS CLOSURE OF PATENT FORAMEN OVALE
IN PATIENTS WITH ISCHEMIC CEREBRAL EVENTS**

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Background: Patent foramen ovale (PFO) is a common interatrial septal defect found in about 25 % of adults. It results from a failure or incomplete closure of the foramen ovale within the first year of life. Although there is still uncertainty about the best management, the increasingly rapid rate of innovation in percutaneous closure procedures for PFO has begun the method of choice for defect repair. PFO closure devices could result in potential adverse effects on atrial function and electrical stability. Several echocardiographic parameters have been described for assessing the morphology and function of the left atrium. Recently, strain and strain rate (SR) imaging have been proposed as a tool to assess left atrial (LA) function.

Aim: The purpose of this study is to evaluate changes in left atrial function using traditional 2D echo parameters and SR imaging tools before and after percutaneous PFO closure.

Method: Out of one hundred and thirty-eight patients who underwent PFO closure implantation between July 2020 and June 2024, left atrial function was assessed in 44 patients. Each patient was evaluated with a transthoracic echocardiogram (TTE) baseline before PFO closure and at 1 month after hospital discharge. Left atrial function was evaluated by using volumetric and speckle-tracking analysis assessing the following parameters: total emptying fraction (EF), strain values

of the reservoir (LASr), conduit (LAScd) and contraction phase (LASct).

Results: All 44 patients who underwent percutaneous PFO closure had ischemic cerebral events (stroke or transient ischemic attack) and cerebral lesions on MRI. The mean ROPE score was 5.49 (± 1.90), and the mean CHA₂DS₂-VASc score was 2.60 (± 1.47). PFO dimension was 4.88 mm (± 3.46), meanwhile the tunnel length was 12.4 mm (± 4.9); the most used devices were generally medium size and the most implanted was Figulla occluder (38%). At basal TTE the percentage of aneurysm was 96% and severe shunt detected with transcranial eco-Doppler was 72%. LAVi value was 22.3 (± 7.1), with 8.3% of patients exhibiting atrial dilation. LASr value was averaged 35 (± 9) before closure, decreasing to 31 (± 13) at one-month follow-up ($p=0.026$). LAScd was -20 (± 8) before closure, decreasing to -16 (± 9) after 1 month. LASct started at -15.0 (± 5.2) at baseline and remained relatively stable at -15 (± 5) post-procedure. Similarly, LAEF was 58 (± 11) before closure, and slightly reduced to 55 (± 10).

Conclusions: Significant changes were observed in LASr and LAScd values following percutaneous PFO closure, indicating a slight decrease in atrial function parameters at one month. Further follow-up is needed to understand the long-term impact of PFO closure on atrial function.

IMAGING CARDIOVASCOLARE 267

RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)

TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

GIANT CARDIAC FIBROMA CHARACTERIZED WITH MULTIPLE CARDIAC MAGNETIC RESONANCE SEQUENCES

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Introduction Cardiac masses represent a diagnostic challenge. Cardiac magnetic resonance (CMR) plays a pivotal role for their differential diagnosis. We present a case of a giant cardiac mass characterized with multiple CMR sequences.

Case report A 20 years-old male, without history of cardiovascular (CV) diseases, was referred to our advanced CV imaging center for the incidental detection of a cardiac formation by transthoracic echocardiography performed during a routine sport cardiology evaluation. CMR showed a giant ovoid cardiac mass (95x69x60 mm) originating from the myocardium and located into the lateral, anterior and inferior medium-basal walls. While the geometry of the mitral annulus was compromised as per CINE imaging evaluation, mitral leaflets motion was preserved and there was no evidence of outflow or inflow tract obstruction (A-B).

For tissue characterization, with the short tau inversion recovery-T2weighted (STIR-T2W) and the white blood-T2W sequences the mass appeared hypointense, which excluded a cardiac cyst, while with the black blood-T1W sequence it appeared iso/hypointense, which ruled out adipose tissue (C). Myocardial first pass perfusion sequences showed only mild enhancement in the mass which excluded hyper vascularization (D). Conversely

late gadolinium enhancement (LGE) depicted a strong enhancement (E-F). These characteristics, compatible with a low malignant and mesenchymal tumor, suggested the diagnosis of giant myocardial fibroma. While the Heart Team decided for myocardial biopsy, it wasn't performed according to patient's will. Due to likely benign nature and high surgical procedural risk, close clinical and instrumental follow up was indicated.

Discussion Myocardial fibroma is a rare benign tumor, it's more common in children than in adults and it involves most frequently the left ventricle. Patients are usually asymptomatic, but they could also experience arrhythmias, heart failure, syncope, chest pain or sudden death. The management remains controversial, since it ranges from surgical resection, medical management with antiarrhythmic drugs and, in selected cases, cardiac transplantation, according to tumor size, location and the patient's symptoms.

Conclusion CMR is the gold standard non-invasive imaging modality for cardiac mass characterization, providing detailed information regarding haemodynamic involvement, localization, dimensions and, above all, tissue characterization; however it cannot provide definite diagnosis, which requires histological analysis.



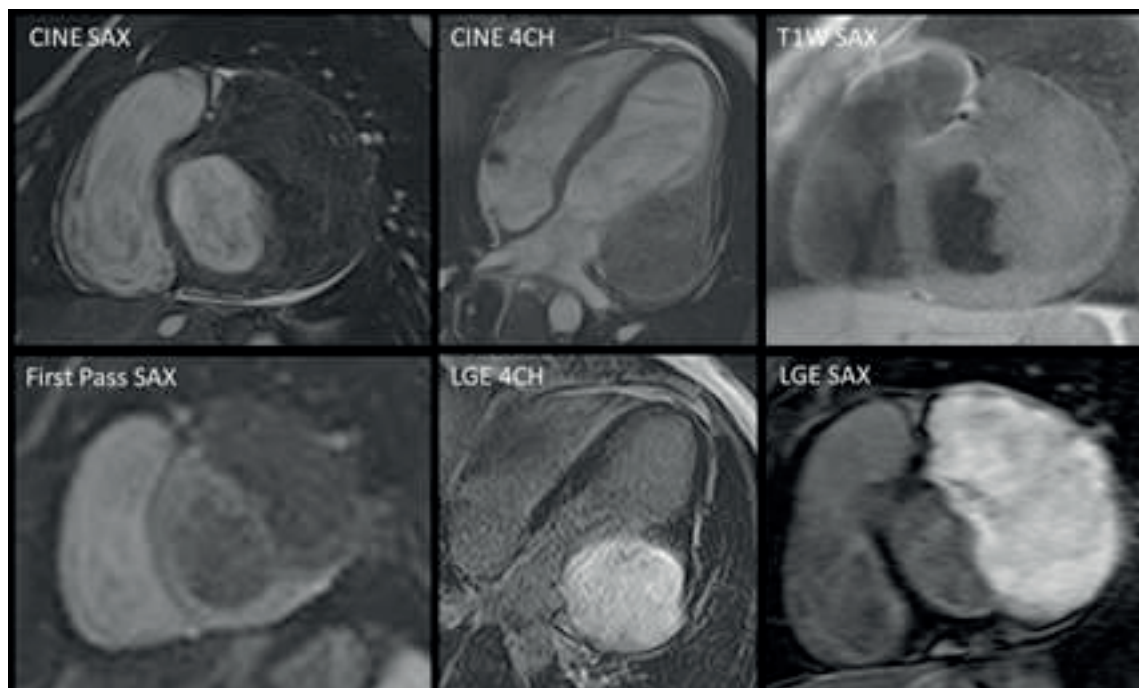


Figure 1



IMAGING CARDIOVASCOLARE 299

CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)

UNUSUAL PRESENTATION OF A MECHANICAL COMPLICATION OF MYOCARDIAL INFARCTION

Margherita Mariani (a), Luca Ponti (a), Gabriella Di Giovine (a), Barbara Conconi (a), Stefano Lucreziotti (a),
Ludovica Senese (a), Paolo Vanelli (b)

(a) ASST SANTI PAOLO E CARLO; (b) FONDAZIONE IRCCS CA' GRANDA-OSPEDALE MAGGIORE POLICLINICO

A 62-year-old active smoker man affected by obesity, type II diabetes mellitus, hypertension and dyslipidemia with a cardiological history in 2017 of myocardial infarction with late presentation treated with suboptimal staged PCI presented to our pre-hospitalization ward to be evaluated for a removal of a left infraorbital basalioma asportation. The last cardiac ultrasound showed a mild reduced ejection fraction (EF 46%) due to an akinetic infero-postero-lateral wall. Drug regimen was composed of Ranolazine 500mg bid, Acetyl-salicylic acid 100 mg Sid, Ramipril 2.5 mg Sid, Bisoprolol 2.5 mg bid, Atorvastatin 80 mg sid. At the pre-hospital evaluation, the patient was completely asymptomatic and in a fair hemodynamic state. The lab work was unremarkable except for a slight leukocytosis, with no increase of myocardial necrosis enzymes. At the ECG evaluation the ventricular repolarization was affected by the presence of ST-elevation in the anterior leads (V1-V4) with negative inferolateral T-waves. For this reason, Cardiology was paged to evaluate the patient's ECG. The bedside echocardiogram showed a severely depressed left ventricular ejection fraction (about 30%) and an image compatible with pseudoaneurysm or aneurysm of the inferior wall containing a thrombus. The patient was therefore admitted in the Cardiology Unit for further evaluation: coronary angiography to evaluate the ejection fraction decrease and multimodal imaging to discriminate between true aneurysmal sac and false, pseudoaneurysm. Coronary angiogram showed the presence of a previous stenting of the left anterior descending artery, with a total chronic occlusion of all the three main epicardial arteries. Thorax computed tomography permitted the diagnosis of a

pseudoaneurysm of the inferior left ventricular wall filled with thrombotic material (diameter 62 mm x 47 mm with a neck of 30 mm). Nevertheless, he also underwent a cardiac MRI which confirmed the diagnosis of pseudoaneurysm and on top of that excluded the

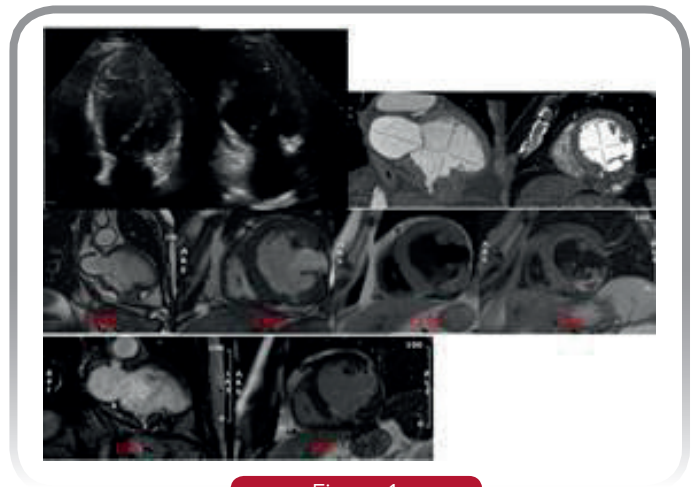


Figure 1

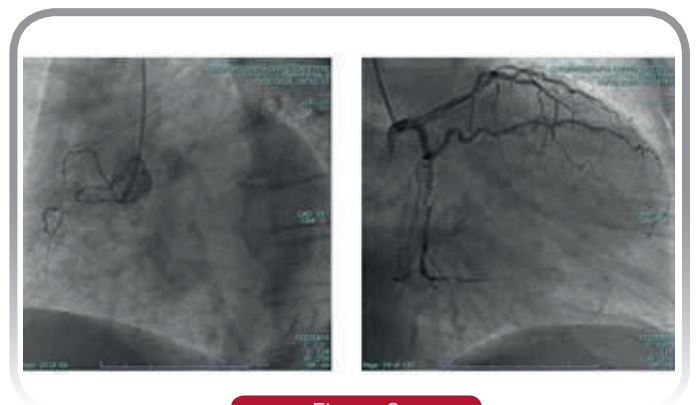
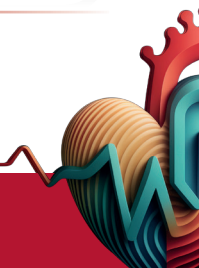


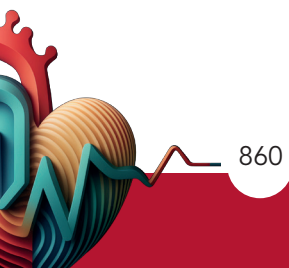
Figure 2



acute setting of the event (t2 weighted images were negative). Finally, the patient underwent cardiac surgery to perform BPAC, excision of the pseudoaneurysm and restoration of the left ventricle with a bovine pericardial patch.

A multimodality imaging approach is fundamental to differentiate between aneurism and pseudoaneurysm.

Nevertheless, it can rule out the acute setting of the lesion and guide the surgical approach according to the architecture of the left ventricle, investigating also the possible involvement of the papillary muscle and the subsequently possible mitral valve regurgitation associated.



**IMAGING CARDIOVASCOLARE 895
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MULTI-MODALE / IMAGING IBRIDO
(IMAGING CARDIOVASCOLARE)
SINCOPE (ARITMIE)**

AN UNEXPECTED CULPRIT: THE CURIOUS CASE OF A HIDDEN MUSCLE BUNDLE

Andrea Ottaviani (a), Maria Vittoria Caprio (a), Federica De Donno (a), Fabrizio Ricci (a), Giulia Renda (a),
Sabina Gallina (a)

(a) DIPARTIMENTO DI NEUROSCIENZE, IMAGING E SCIENZE CLINICHE, UNIVERSITÀ DEGLI STUDI
"G. D'ANNUNZIO" CHIETI-PESCARA, CHIETI

A 67-year-old woman presented to the emergency department for post-micturition syncope, preceded by prodromes (sweating, weakness). Her medical history included active smoking. She denied any prior cardiac issues or family history of cardiovascular disease. She was not on any home medications. Upon clinical examination, the patient was hemodynamically stable. Heart sounds were regular and rhythmic. A 3/6 systolic murmur was predominantly heard over the mesocardium. The 12-lead ECG showed sinus rhythm, heart rate of 91 bpm, with non-specific, non-dynamic ventricular repolarization abnormalities. Blood tests showed elevated Troponin I HS (375pg/ml), with a significant increase on the second measurement (631pg/ml). The echocardiogram revealed a left ventricle of normal size and motion (EF 70%) and no apparent segmental wall motion abnormalities. At the level of the anterior-basal interventricular septum, a likely muscle bundle (Figure A) was observed inserting into the lateral apical segment, causing mid-ventricular kissing and obstructive SAM with a significant dynamic gradient during the Valsalva maneuver (Figure B). The right ventricle and the atrial chambers were normal. The mitral valve showed moderate-to-severe functional insufficiency due to SAM of the anterior mitral leaflet. No significant abnormalities were noted in the other valves. No signs of congestion were observed (VExUS

0), and there was a low probability of pulmonary hypertension. The patient was therefore admitted to a cardiology unit for further diagnostic evaluation of the previously undetected cardiac condition. A coronary angiogram was performed during the hospital stay, revealing severe three-vessel CAD. The cardiomyopathy was also characterized using second-level imaging. Cardiac MRI confirmed the accessory muscle bundle (Figure C), with a maximum thickness of 9 mm, originating from the anterior basal septum (septal thickness of 15 mm with normal thickness in the remaining segments), and inserting into the lateral apex. Additionally, supernumerary papillary muscles with apical attachment and thin basal-apical parasternal muscle fibers were noted (Figure D). Tissue characterization did not show myocardial edema. Subendocardial LGE with an ischemic pattern was documented at the basal anterior-septal segment, the mid inferior interventricular septum, and the apical septal and inferior segments. In conclusion, the findings were suggestive of an atypical hypertrophic cardiomyopathy, where the obstruction was due to the insertion of the muscle bundle on the basal septum, with ischemic consequences resulting from the CAD. After a Heart Team discussion, genetic testing and surgery including CABG and muscle bundle resection were recommended.



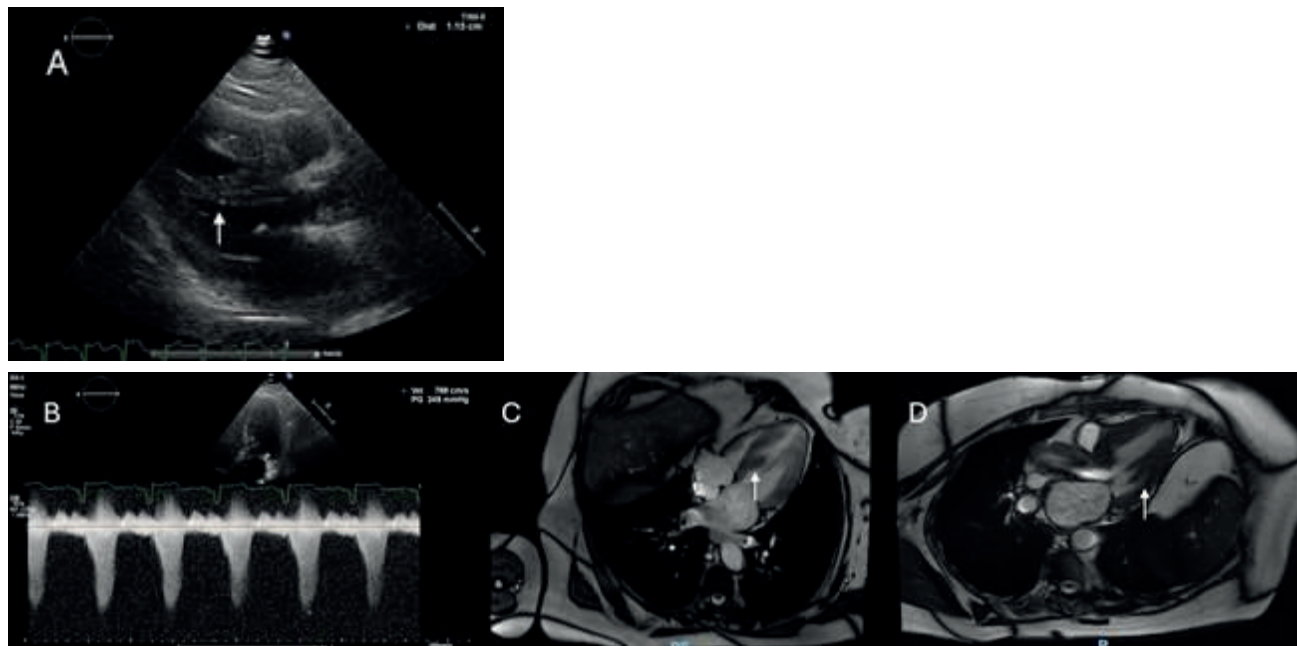


Figure 1

IMAGING CARDIOVASCOLARE 87 TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

CARDIAC REVERSE REMODELING AFTER SGLT2i: BEYOND THE SEX

Silvia Prosperi (a), Sara Monosilio (a), Andrea D'Amato (a), Valentina Ambrogio (a), Sara Sgura (a), Danilo Angotti (a), Giovanni Tonti (b), Gianni Pedrizzetti (c), Sara Cimino (a), Domenico Filomena (a), Lucrezia Netti (a), Roberto Badagliacca (a), Paolo Severino (a), Carmine Dario Vizza (a), Viviana Maestrini (a)

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Background: Sodium-Glucose Transport Protein 2 Inhibitors (SGLT2i) have proven beneficial cardiac reverse remodeling effects in heart failure (HF) regardless the ejection fraction (EF). The imaging studies focus mainly on the left ventricle (LV) or atrium (LA) remodeling, with an existing lack in knowledge regarding the right ventricle (RV). In addition, there are no studies analysing the effect of sex on SGLT2i's cardiac remodelling.

Purpose: To explore the cardiac reverse remodeling in a group of HF patients before and after 6 months from SGLT2i therapy initiation and to investigate the influence of sex on cardiac reverse remodeling.

Methods: We enrolled HF patients naive to SGLT2i prior therapy commencing (on top to the maximum of HF tolerated therapy). Data were collected before therapy (T0) and at 6 months (T1). The LV, LA and RV dimensions and function were evaluated with both standard and advanced echocardiographic parameters, including ejection fraction (EF), fractional area change (FAC), global longitudinal and circumferential strain (GLS and GCS). The NYHA Class and pro-BNP values were also collected. Patients were then divided according to sex. **RESULTS:** Forty-nine patients were recruited (mean age

73±12 y.o., 69% male and 31% female). Comparing echocardiographic parameters at T0 and T1, a significant reduction in both systolic and diastolic LV volumes along with a significant improvement in LV EF, GLS and GCS were detected. Furthermore, we found a significant increase of LA-EF and GLS, RV-GLS and FAC. A significant reduction of NYHA Class (NYHA > 2 = 35,7% at T0 vs 20,7% at T1; p 0,006) and pro-BNP values were observed (pro-BNP median value 912 (425 – 2308) pg/ml at T0 vs 556 (271 - 915) pg/ml at T1 (p =0,039). The analysis based on sex revealed a similar improvement of the LV volumes, EF, GLS and GCS. Regarding LA and RV, male showed a reverse

PARAMETER Pts n= 49	T0	T1	P-VALUE
LV EDV (ml)	149±65	122±44	0,001
LV ESV (ml)	108±66	72±33	<0,001
LV EF (%)	32±12	42±13	<0,001
LV GLS (%)	-9±4	-13±5	<0,001
LV GCS (%)	-13±7	-19±8	<0,001
E/e'	11±6	9±4	0,101
RV GLS (%)	-14±7	-16±6	0,015
FAC (%)	31±10	37±9	0,012
LA EF (%)	34±15	41±14	0,015
LA GLS (%)	15±9	22±15	0,001

Figure 1



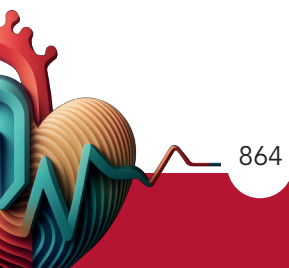
remodeling comparable to the entire population, while female, although confirming a similar trend, did not reach the statistical significance (limited cohort).

Conclusions: After 6 months of therapy with SGLT2i, HF patients showed a significant improvement in LV, LA and RV function, and a decrease of pro-BNP

values. The sex analysis showed a similar tendency of reverse cardiac remodeling in the two sexes, although in female LA and RV improvement did not reach statistical relevance. These data suggest that SGLT2i determined a global cardiac reverse remodeling, regardless of sex.

PARAMETER	MALES (n=34)			FEMALES (n=15)		
	T0	T1	P- VALUE	T0	T1	P- VALUE
LV EDV (ml)	158±68	131±41	0,013	125±53	97±42	0,014
LV ESV (ml)	108±59	77±32	0,002	107±83	61±32	0,018
LV EF (%)	32±13	42±13	< 0,001	30±11	41±13	0,014
LV GLS (%)	-10±4	-14±5	< 0,001	-9±5	-13±4	0,011
LV GCS (%)	-15±7	-20±8	< 0,001	-12±5	-18±8	0,021
RV GLS (%)	-13±8	-16±6	0,060	-14±4	-18±5	0,932
FAC (%)	30±10	37±9	0,003	35±10	35±10	0,932
LA EF (%)	33±16	41±14	0,004	38±14	40±14	0,694
LA GLS (%)	14±10	23±17	0,002	16±5	21±10	0,214

Figure 2



**IMAGING CARDIOVASCOLARE 159
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)**

THE CARDIOLOGIST SAILING THE SEAS OF RHEUMATOLOGY: AN OVERLAP OF AORTIC COARCTATION AND TAKAYASU SYNDROME

Tommaso Recchioni (a), Giovanna Manzi (a), Sara Cimino (a), Lucrezia Netti (a), Sara Monosilio (a), Danilo Angotti (a), Carmine Dario Vizza (a), Viviana Maestrini (a)
(a) DEPARTMENT OF CLINICAL, ANESTHESIOLOGICAL AND CARDIOVASCULAR SCIENCES, SAPIENZA UNIVERSITA' DI ROMA, 00161, ROMA

Introduction: Coarctation of the aorta (CoA) can be a congenital disease or the consequence of large vessels vasculitis (LVV) such as Takayasu's arteritis (TAK). TAK occurs mostly in Asian populations and is characterized by granulomatous inflammation of large arteries walls, especially in atypical (non-isthmic) sites. TAK should be considered in the differential diagnosis of CoA, as the patient can be treated with specific medical therapy.

Case presentation: The present clinical case involves a 30-year-old Asian woman admitted to the emergency department with haemoptysis. A diagnosis of CoA was known since she was 10 years old. Over the last decade she complained of worsening claudicatio intermittens, not investigated as she was living abroad without access to healthcare system. During the hospital stay she underwent 12-lead electrocardiogram, showing sinus rhythm and signs of left ventricular hypertrophy, and echocardiography, confirming concentric left biventricular hypertrophy and the known CoA (Fig. 1). Interestingly, the echocardiography also revealed an increased wall thickness of the ascending aorta, appearing hyperechogenic (Fig. 2). Thus, a CT was requested, showing alveolar haemorrhage, diffuse

thickening of the thoracic aorta and epiaortic vessels walls and a complete obstruction of infrarenal abdominal aorta (interruption of its flow for 2 cm) and re-habitation via lumbar branches (Fig. 3). A CMR was also requested and confirmed the diffuse thickening without contrast enhancement of the vascular walls (Fig. 3). Despite blood test for inflammatory markers and autoantibodies were negative, the imaging findings led to the diagnosis of chronic TAK with associated aortic narrowing. A therapy based on methylprednisolone was then commenced by rheumatologist successfully: specifically, haemoptysis was solved and functional capacity at three-month follow-up was improved.

Discussion: TAK is one of the major forms of LVV. Complications from vascular damage can result in substantial morbidity, including stroke, myocardial infarction, mesenteric and limb ischaemia. As shown in our case report, the consequences of TAK can often mimic congenital CoA, especially if in atypical non-isthmic sites. Specifically, if CoA occurs in typical sites, the differential diagnosis can be challenging, and a multimodality imaging approach is needed to solve the conundrum.



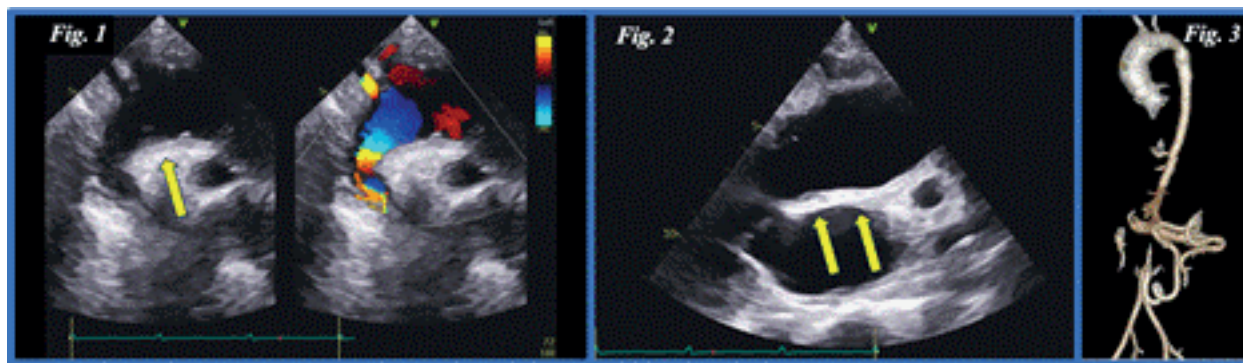


Figure 1

Conclusions: This report highlights the role of a multimodality imaging approach based on multidisciplinary collaboration (cardiologist, rheumatologist, radiologist) to reach the diagnosis in a challenging condition of LVV in a young patient.

The suspicion raised by an accurate echocardiogram, followed by advanced imaging tests with tissue characterization of the vessels, led to the final diagnosis and specific, successful, therapy.

IMAGING CARDIOVASCOLARE 57
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

THE REVIVAL OF RIGHT SUB-SCAPULAR AND PARASTERNAL VIEWS IN UNVEILING HEART FAILURE MECHANISMS IN PATIENTS WITH PRIOR PNEUMONECTOMY

Federica Barbara Beatrice Testerini (a, b), Dario Donia (a, b), Stefano Frittella (a, b), Silvana Di Maio (b), Martina Ruffo (b), Carlo Maria Dellino (b), Carlo Andrea Pivato (a, b), Riccardo Mantovani (b), Giulio Giuseppe Stefanini (a, b), Stefano Figliozzi (b), Gianluigi Condorelli (a, b), Renato Maria Bragato (b)

(a) DEPARTMENT OF BIOMEDICAL SCIENCES, HUMANITAS UNIVERSITY, VIA RITA LEVI MONTALCINI, 4, 20090 PIEVE EMANUELE, MILANO, ITALY; (b) IRCCS HUMANITAS RESEARCH HOSPITAL, VIA ALESSANDRO MANZONI, 56, 20089 ROZZANO, MILANO, ITALY

Background: Paravertebral and subscapular echocardiographic views were introduced more than 30 years ago but are not utilized in standard practice. After pneumonectomy the cardiac position change within the chest cavity, affecting the image quality of standard echocardiographic views.

Case presentation: A 84-year-old woman, known for right-sided pneumonectomy due to adenocarcinoma, was hospitalized because of worsening dyspnea and swollen legs. Chest X-rays revealed bilateral pleural effusion. Standard 2D trans-thoracic echocardiogram (TTE) was not conclusive, so a right parasternal view, paravertebral and sub-clavicular posterior right approaches were attempted. For the posterior views, the patient assumed a forward-leaning position, the transducer was positioned in both longitudinal and transverse scanning planes along the lower border of the 10th to 11th rib and systematically moved craniocaudal to evaluate various segments of cardiac chambers. From such views, there was evidence of right ventricular systolic dysfunction, pulmonary hypertension, severe functional tricuspid regurgitation (3D-calculated EOA = 0.8 m²), and severe right atrial

dilatation. Inferior vena cava was dilated and non-collapsible. In contrast, left heart was normal in terms of dimensions and systolic function in the absence of valvular heart disease. Chest CT revealed lateral cardiac shift without underlying pulmonary infections, and heart failure secondary to cor pulmonale was diagnosed. Mechanical ventilation, diuretics and anti-hypertensive treatments were administered with rapid clinical improvement. During hospitalization, a cycle of Levosimendan treatment was administered. Upon acceptable compensation and improvement of symptoms, the patient was discharged with titrated diuretic and cardioactive therapy, with no symptoms and good hemodynamic compensation.

Conclusions: In the present case, the void left by the removal of the lung filled with pleural effusion favored the visualization of cardiac structures by improving the acoustic interface at paravertebral and subscapular views. Thus, our case encourages the recurrence of these outdated echocardiographic views as key diagnostic tools in patients with prior pneumectomy and non-diagnostic standard echocardiographic.



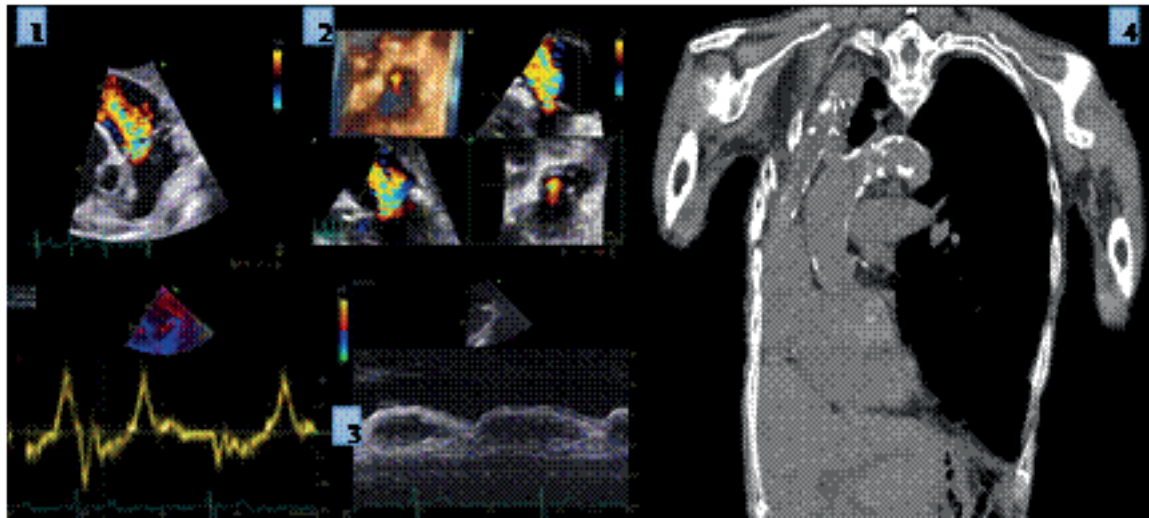


Figure 1

IMAGING CARDIOVASCOLARE 729
TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE) TOMOGRAFIA COMPUTERIZZATA A RAGGI
X (CT) (IMAGING CARDIOVASCOLARE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)

UN RARO CASO DI ICTUS CARDIOEMBOLICO - SARCOMA ATRIALE SINISTRO

Eugenio Trovarelli (a), Giuliana Bardelli (a), Francesca Lisi (a), Manuel Freschini (a), Alessandro Lupi (a), Rosanna Lauciello (a), Cinzia Zuchi (a), Anna Mengoni (a), Sandra D'addario (a), Maria Grazia Sardone (b), Marcello Bergonzini (c), Rocco Sclafani (b)

(a) CARDIOLOGIA E FISIOPATOLOGIA CARDIOVASCOLARE, OSPEDALE SANTA MARIA DELLA MISERICORDIA, UNIVERSITÀ DEGLI STUDI DI PERUGIA, ITALIA; (b) STRUTTURA COMPLESSA DI CARDIOLOGIA, OSPEDALE SANTA MARIA DELLA MISERICORDIA, PERUGIA, ITALIA; (c) STRUTTURA COMPLESSA DI CARDIOCHIRURGIA, OSPEDALE SANTA MARIA DELLA MISERICORDIA, PERUGIA, ITALIA

Introduzione: Le masse cardiache rappresentano un dilemma diagnostico per la loro eterogeneità clinica e prognostica. Si classificano in primitive, metastatiche e pseudo-tumorali. Per lo più il loro riscontro è incidentale nel corso di esami eseguiti per dispnea, aritmie, fenomeni embolici o sospette vegetazioni endocarditiche.

Caso clinico: uomo di 73 anni, ex fumatore, giunto in pronto soccorso per disturbo dell'eloquio e deviazione della rima orale compatibile con ictus cerebri di natura ischemica (la TC encefalo escluse fenomeni emorragici). L'ECG mostrava fibrillazione atriale di nuovo riscontro mentre la ecocardiografia transtoracica evidenziava una voluminosa massa ovoidale disomogenea a livello dell'atrio sinistro (fig.1) inducente stenosi mitralica di grado severo (G medio 10 mmHg); il successivo esame ecocardiografico transesofageo confermava la presenza di voluminosa massa occludente completamente l'auricola sinistra e gran parte dell'atrio sinistro con estensione verso l'imbocco della vena polmonare superiore sinistra in assenza di chiaro piano di clivaggio con le pareti cardiache (fig.2). A completamente diagnostico

veniva eseguita una TC cuore con mdc che confermava la presenza della massa atriale sinistra di circa 8 cm di diametro occupante l'auricola e buona parte dell'atrio con densitometria disomogenea e progressivo moderato enhancement con focolai di neoangiogenesi (fig.3), la RM cuore che evidenziava tessuto patologico disomogeneamente iso-iperintenso in T1 ed iperintenso in T2 con enhancement eterogeneo e progressivo, massimo in fase tardiva ed una coronarografia che mostrava malattia coronarica critica di IVA. Il paziente veniva sottoposto a rimozione della massa atriale, ricostruzione del tetto dell'atrio sinistro e dell'origine della vena polmonare superiore sinistra con pericardio bovino, anuloplastica mitralica con anello Memo3D 28, singolo bypass aorto-coronarico (AMI sinistra su IVA), amputazione e sutura di auricola sinistra. L'analisi istopatologica è risultata positiva per neoplasia connettivale maligna, estesamente necrotica ed emorragica, a morfologia fusata, con aree mixoidi ipocellulate ed aree ipercellulate compatte, compatibile con sarcoma intinale ad elevato grado di replicazione e meritevole di terapia adiuvante chemioterapica. Il successivo controllo



ecocardiografico e la RM cuore post-operatoria non evidenziavano lesioni residue né rigurgiti valvolari significativi (fig.4).

Conclusioni: il caso clinico sottolinea ancora una volta la diagnosi accidentale delle masse cardiache intracavitarie, anche di grandi dimensioni, che

nel caso citato è stata possibile a seguito di una sintomatologia neurologica ictale secondaria a embolismo cardiaco. Risulta quindi fondamentale includere l'imaging cardiaco nelle manifestazioni cliniche cerebrali a carattere ictale per una precisa e corretta definizione eziologica del disturbo.



Figure 1



Figure 2

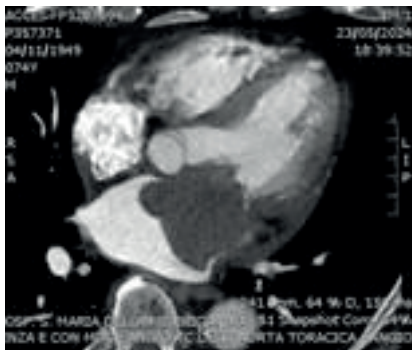


Figure 3

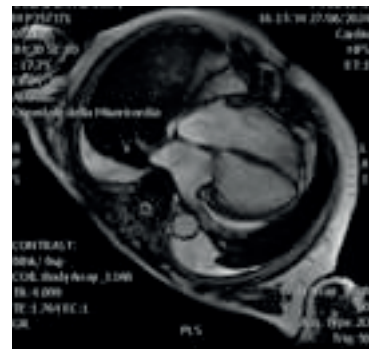
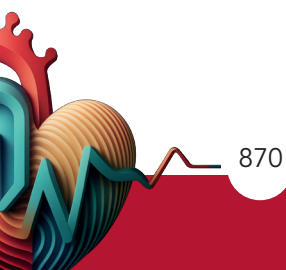


Figure 4



IMAGING CARDIOVASCOLARE 605
ECOSTRESS (IMAGING CARDIOVASCOLARE)
CARDIOLOGIA DELLO SPORT
(ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

REPORT OF LONG APPLICATION EXPERIENCE OF EXERCISE STRESS ECHO. (RELEESE) IN CLINICAL PRACTICE. PREDICTIVE VALUE AND INDICATIVE SUGGESTIONS

Flavio Acquistapace (a, b, c, d, e, f, g, h)

(a) CARDIOCARE SCA CENTRO MEDICO CARDIOLOGICO LUGANO SWITZERLAND ; (b) SWISS MEDICAL NETWORK ARS MEDICA CLINIC LUGANO ; (c) GVM CARE&RESEARC ROME - LECCO SERVIZIO CARDIOVASCOLARE ; (d) POLICLINICO DI MONZA CARDIOLOGY AND REHAB DEPARTEMENT ; (e) SAN DONATO IRCCS - AND COMO VILLA APRICA CLINIC; (f) VILLA ELENA CASIGLIO HOTELIER MEDICALE ERBA COMO ; (g) ISC CARDIOLOGICAL INSTITUTE CAMOGLI GENOVA ; (h) UNIVERSITY OF PARMA CARDIOLOGY SCHOOL

The predictive and prognostic value of the functional is still debated by the evidences for appropriate and cost effective evaluation under different condition: assesment of Coronary Heart Deesease (CHD) screening, Valvular detection and decision making assessment, gender, Sport Cardiology The operational variability and therefore the practical expertise play a primary role in the best application of clinical practice. The aim is to Report a Long standing applicantion Experience (20years) of Exercise Stress Echo (ReLEESE) applied in different clinical condition. Evaluating the predictive value and cost/effective value . Methods 15.000 ESE patients (pts) evaluated (50% men and women) .f rom 1994 to 2024,june), 13.000 for CHD primary and secondary screening , 1500 valvular assessment, 500 sport cardiology screening . 2 groups: primary evaluation, or absence of events, and secondary, presence of CAD (cardiovascular event and/or revascularization). Evaluated: Risk Factors (FRC) presence of clinical parameters limiting the predictive value of the Stress ECG from Effort (EE) such as: ECG abnormalities – branch blocks - of ecg, hypertrophic, cardiomyopathy, gender. FRC evaluated Hypertension 12.800 pts(85.%) Hypercholesterolemia 8300 (55%: 52%u; 48%d) Smoking 3000 (20.% 57%u 43%d), Familiarity

7000 (45%, 50% m 50%f) Anxiety Depression Dystonia 6000 (40%: 80%f 20%m)- Diabetes 3000 (20%: 1-55%m 45% f). Results all pts were subjected to ESE: Outcome at 1 year of CAD for mortality due to myocardial infarction, hospitalization for unstable angina major complications (CMC): no pts. After ESE 4500 pts(30%) was followed in coronary angiography (CAG). Revascularizations (PTCA/CABG) 750 (5%: 680%m20% f.). ESE/CAG correspondence in 100%; comparison of CAD without revascularizations, ie diffuse atheromasia with sub-critical stenosis (5% male-25%, female-75%:) all in primary evaluation (without events) and all hypertensive, compatible as vasospastic ischemia (ie, x syndrome). All the men was in secondary evaluation (CAD events and revascularized) and with multiple risk factors and diabetic also. No pts was exposed to further radioactive stress procedures during the observation period. Conclusions Discussion: the functional imaging stress test(FIST) with ESE appears to be a valid efficient tool for screening and follow-up of Ischemic Heart Disease (IHD), as well as Valvular Hemodynamic Detection., in Sport Cardiology , in Women and in general for pts with multiple risk factors or pathophysiological diversity. Like other FIST (RMN Scintigraphy ex.) and with a better cost/effectiveness



ratio (they are more radioactive exposed).As well ESE reduce to the risk of an unappropriated useless number investigations, Limit ; provided a high level of practical experience to reduce the observational

variability index.. It should be kept in mind that an appropriate choice of the appropriate and cost/ effectiveness improves the quality in decision making and reduces the healthcare consumerism.



IMAGING CARDIOVASCOLARE 610 ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE) ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE) PATOLOGIA DELLE VENE (MALATTIE DEI VASI)

LONG JOURNEY OF A HUGE POST LUNG TRANSPLANT CLOT

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Title: Long journey of a hug post lung transplant clot
Keywords: Lung Transplant – Thrombus – Intracardiac – Ventricle thrombus

Introduction: The development of intracardiac thrombi subsequent to lung transplantation, a rare yet critical complication, Originating predominantly intracardiac, which consequence of a heightened coagulative propensity, Which might raises risk of thromboembolic phenomena.

Case Presentation: Here we discuss a 28-year-old female, with medical history of advanced cystic fibrosis, complicated by chronic hypercapnic respiratory failure, Patient underwent bilateral Lung Transplant. Extracorporeal Membrane Oxygenation (ECMO) assisted till Left lung was transplanted firstly, as the patient was not tolerating single left lung ventilation, necessitating putting her back on ECMO through cannulating the aorta and right atrial appendage alongside with Unfractionated Heparin infusion ECMO protocol. Peri-operative TEE showed a long filamentous mass suggestive of clot originating from the left upper pulmonary vein extending to the left ventricle occupying most of the LV cavity and protruding into the LVOT . Cardiac surgery team in consultation with

thrombosis team felt the patient was too high risk for surgical intervention and opted for anticoagulation with close follow up. Subsequent echocardiography showed regression of the thrombus over 3 months of therapy.

Discussion: Multiple reports have mentioned the occurrence of intracardiac thrombi, particularly affecting suture lines within the atria less so for the pulmonary veins. These thrombi can lead to embolic phenomena. However such a huge thrombosis has never been reported at the best of our knowledge. Furthermore even the surgical treatment have been indicated by anticoagulation it had been possible to treat such a complication. These finding is likely related to the high thrombophilic state that is present in cystic fibrosis....

Conclusion: Advancements in lung transplant facilities have led to increased complications, including thromboembolic events. Investigating causes and optimizing care is crucial for lung transplant recipients. Our case highlight the benefits of post-operative TEE in selected case at high risk of clot formation in order to detect life threatening complications is vital for assessing function and predicting complications



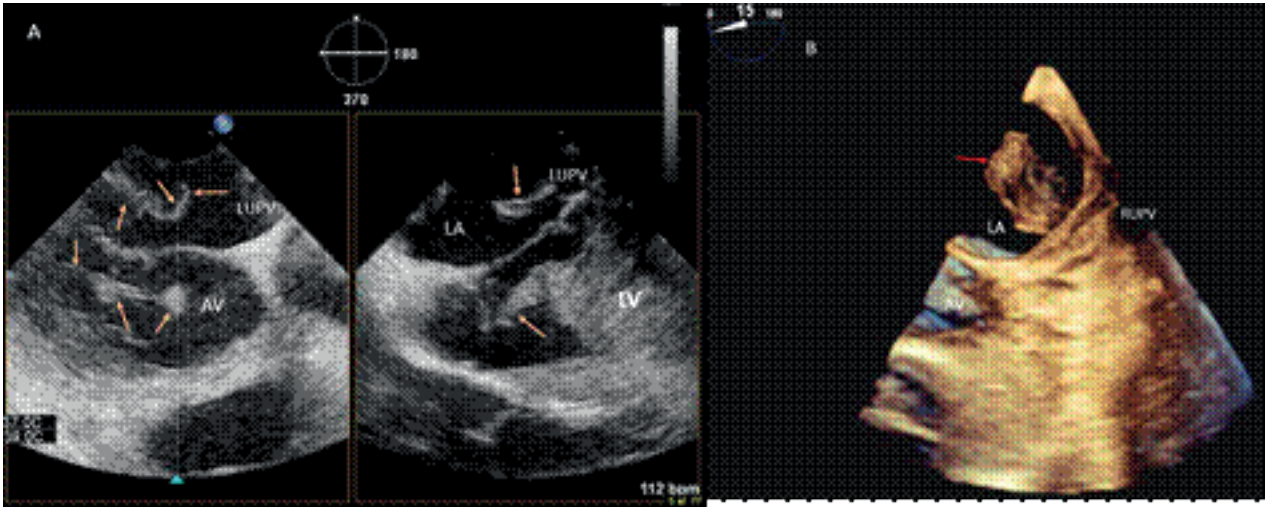


Figure 1: 2D TEE: huge large clot (Arrow: huge clot, AV: aortic valve, LUPV: Left upper pulmonary vein)
 Figure 2 : 3D TEE: huge large clot (Arrow: huge clot , AV: aortic valve, LUPV: Left upper pulmonary vein)

Figure 1-2



IMAGING CARDIOVASCOLARE 171

ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)

ECHOCARDIOGRAPHIC CHARACTERIZATION OF ATYPICAL RIGHT VENTRICULAR MASS

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Background: Papillary fibroelastoma (PFE) is a rare primary benign cardiac tumor that mostly affects left-sided heart valves adjacent to areas of endocardial damage. Diagnosis with conventional echocardiography is often challenging.

Case presentation: A 73-year-old man, affected by metastatic pancreatic adenocarcinoma, was hospitalized because of worsening dyspnea. Thoracic CT revealed extensive bilateral pulmonary embolism (PE) without signs of deep venous thrombosis and with a normal coagulation profile. At 2D-transthoracic echocardiography (TTE), a mobile hyperechogenic mass into the right ventricle was suspected of thrombus. There was no tricuspid regurgitation, and other TTE features were unremarkable. After two weeks of anticoagulation therapy, the patient repeated TTE. The 2D-TTE findings were unchanged, and 3D-TTE comprehensively revealed the 3-dimensional structure of the mass, which appeared to be pedunculated, attached to the chordal apparatus of the tricuspid valve and in contact with its anterior leaflet, measuring 1.2 x 0.9 x 0.6 cm. A fringed and gelatinous appearance was evident, resembling a "sea anemone," in keeping with a diagnosis of sub-tricuspid PFE. Transoesophageal echocardiography (TOE) confirmed 3D-TTE findings. Despite the dimensions of PFE and the embolic event, surgical removal of the mass was excluded due to

the poor patient's prognosis related to his oncologic comorbidity, and the patient was discharged on low-molecular-weight heparin after activation of palliative home-care services.

Conclusions: Right-heart PFE is a rare condition with possible devastating clinical complications and can

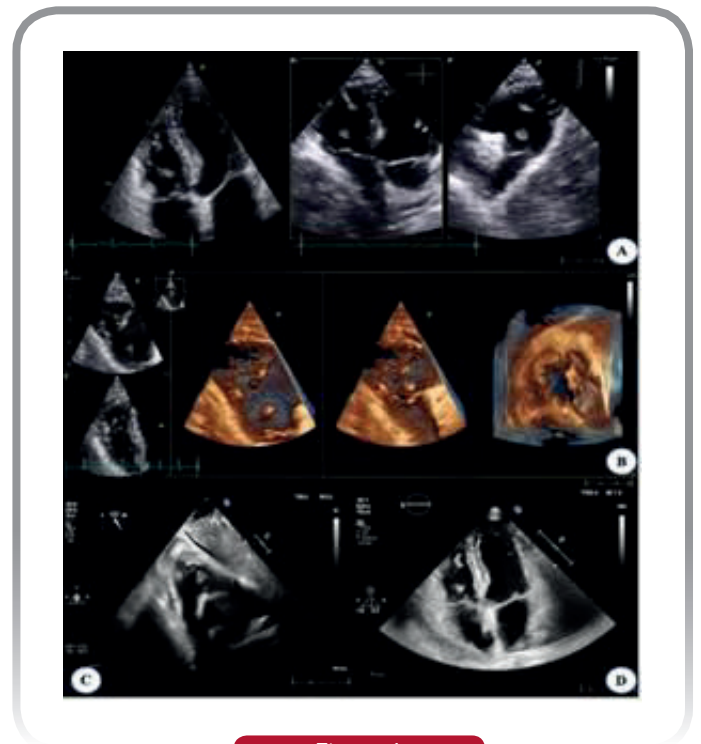
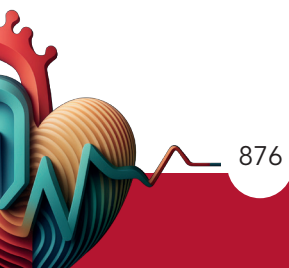


Figure 1



be hard to diagnose at conventional imaging. The recurrence of 3D echocardiography was crucial in guiding our diagnosis and had practical implications for clinical management. This case highlights the

importance of an in-depth echocardiographic evaluation through 3D echocardiography in cardiac masses for accurate non-invasive characterization, especially in atypical locations.



IMAGING CARDIOVASCOLARE 287
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE) IMAGING MULTI-MODALE / IMAGING IBRIDO
(IMAGING CARDIOVASCOLARE) INFARTO STEMI (CARDIOPATIA ISCHEMICA)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

IMAGING MULTIMODALE NELLA ROTTURA DI CUORE: UN CASO CLINICO

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Roberta Montisci (a)

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Introduzione: La rottura della parete libera del ventricolo sinistro è una complicanza dell'infarto miocardico acuto poco frequente ma ad alta mortalità. Sebbene la rivascolarizzazione miocardica precoce ne abbia ridotto l'incidenza, è fondamentale sospettarla in presenza di fattori di rischio e di red flags all'imaging ecocardiografico.

Caso Clinico: Paziente di 54 anni, affetto da cardiopatia ischemica con pregresso infarto anteriore trattato con rivascolarizzazione percutanea e lupus eritematoso sistemico in terapia. Si presenta alla nostra attenzione riferendo epigastralgia preceduta nelle 24 ore precedenti da dolore alla base del muscolo trapezio e al braccio sinistro e diarrea. L'ECG documentava sopralivellamento del tratto ST in sede infero-dorsale, pertanto è stata eseguita coronarografia in emergenza, che ha confermato un buon esito della pregressa rivascolarizzazione sulla discendente anteriore in assenza di apparenti evidenti lesioni culprit. Al rientro in terapia intensiva il paziente, emodinamicamente stabile, persisteva sintomatico per epigastralgia; agli esami ematici troponina aumentata. Inquadro il caso come MINOCA, veniva sospettata una miocardite per via della comorbidità autoimmune e della sintomatologia gastro-intestinale. All'ecocardiogramma il ventricolo sinistro risultava di normali dimensioni e spessori, con moderata riduzione

della frazione d'eiezione (40%) per acinesia della parete laterale e inferiore di nuovo riscontro; presente, inoltre, un versamento pericardico circonferenziale di moderata entità, con segni ecocardiografici di lieve impatto emodinamico e con ecogenicità disomogenea in prossimità della parete laterale del ventricolo sinistro (Fig.1). Per meglio chiarire l'eziologia del versamento veniva eseguita una risonanza magnetica cardiaca in urgenza entro 3 ore dall'ingresso con riscontro di emopericardio e di ispessimento parietale del segmento posteriore basale e medio interessato da edema e late-gadolinium-enhancement transmurali indicativi di ischemia miocardica acuta con segni di ostruzione microvascolare, unitamente a un diverticolo intramurale (Fig.2). Tale reperto, confermato da una successiva TC cardiaca (Fig. 3), insieme alla presenza di emopericardio ha consentito la diagnosi tempestiva di rottura subacuta di parete libera del ventricolo sinistro. Il paziente, ancora stabile, è stato trasferito in sala di cardiocirurgia per intervento in emergenza di riparazione della rottura di parete libera ventricolare con patch in politetrafluoroetilene ed è sopravvissuto; successiva rapida dimissione a domicilio. La rivalutazione della coronarografia ha consentito la diagnosi, inizialmente mancata, di occlusione di ramo postero-laterale.

Conclusioni: L'imaging multimodale può consentire





Figura 1

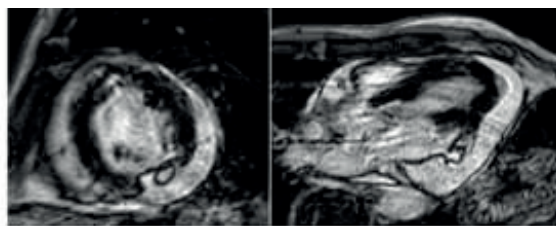


Figura 2

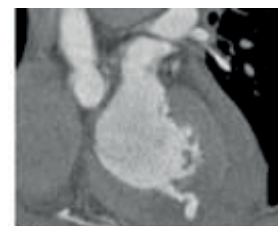
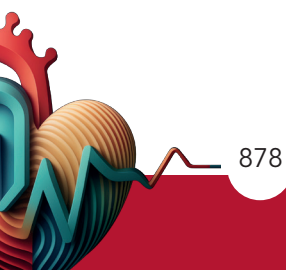


Figura 3

Figure

la diagnosi precoce di complicanze dell'infarto acuto del miocardio temibili ma trattabili. Il versamento pericardico con ecogenicità disomogenea e il dolore

pericarditico sono red flags per i quali la risonanza magnetica cardiaca può dare una risposta diagnostica e fornire informazioni utili al trattamento cardiocirurgico.



IMAGING CARDIOVASCOLARE 480
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

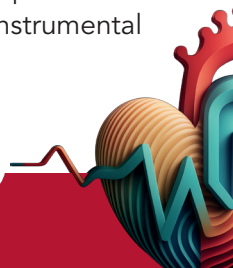
CARDIAC MAGNETIC RESONANCE FACILITATES DIAGNOSIS OF EOSINOPHILIC MYOCARDITIS IN PATIENT WITH EOSINOPHILIC GRANULOMATOSIS WITH POLYANGIITIS (EGPA)

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A 36-years-old man with history of allergic asthma, nasal polyposis, and no cardiovascular risk factors, was admitted to the emergency department with acute chest pain radiating to the left arm. The patient was dyspneic, arterial blood pressure was 110/65 mmHg, heart rate (HR) was 95 bpm, SpO₂ was 92%. Arterial blood gas showed respiratory alkalosis, hypoxemia. Lab tests showed high sensitivity troponin I of 1429 pg/ml, NT-proBNP level of 1300 pg/mL, C-reactive protein level of 59 mg/L, ferritin levels of 691 ng/mL, leukocytosis (WBC 15690/mm³ with 15% of eosinophils). Electrocardiogram showed a sinus rhythm (95 bpm), low QRS voltages in peripheral leads, q wave of necrosis in V1-V2 leads with ST segment anomalies in the infero-lateral leads. Transthoracic echocardiogram revealed normal volume of left ventricle (LV) with slightly reduction of global function (EF 44%). Right ventricular function was preserved. Furthermore, there was a mild pericardial effusion. The patient was therefore admitted in cardiac intensive care and underwent a coronary angiography which showed no coronary lesions.

High-resolution CT scan showed bilateral pleural effusion, bilateral smooth interlobular septal thickening, peripheral parenchymal opacification (subpleural ground-glass), hilar and mediastinal lymphadenopathy. Cardiac magnetic resonance (CMR) showed a widespread increase in LV wall thicknesses, LVEF was 53%, at tissue characterization images there was the presence of very extensive, active myocardial damage (native T1 of 1200 ms) with LGE diffuse subendocardial of the left ventricle, as from suspected eosinophilic myocarditis. The patient, therefore, underwent right ventricle endomyocardial biopsy (BEM) which showed eosinophilic myocarditis with multiple centers of interstitial myocarditis with associated a fine network of interstitial fibrosis. Other possible causes of peripheral hypereosinophilia with secondary organ involvement were excluded and finally, the diagnosis of eosinophilic myocarditis in patient with eosinophilic granulomatosis with polyangiitis (EGPA) was made. High-dose corticosteroid therapy was initiated plus Mepolizumab with a prompt clinical, laboratory and instrumental



response and a long-term remission. EGPA is a rare small-vessel vasculitis with a heterogeneous phenotype which evolves through three different phases: allergic, eosinophilic with tissue infiltration and a vasculitic phase.

Cardiac involvement, especially in the ANCA negative form, is frequent and seem to be associated with a poorer survival. Given the rarity of the disease, it is essential to have a high index of suspicion and to screen for possible cardiac involvement. In a meta-analysis, CMR proved to be the most sensitive method in demonstrating cardiac involvement in the case of eosinophilic myocarditis. A recent study evaluated the CMR findings in histologically proven eosinophilic

myocarditis with key CMR characteristics that were myocardial edema resulting in apparent LV hypertrophy, moderate-to-severe systolic dysfunction of a frequently non-dilated left ventricle, myocardial LGE multifocal and predominantly subendocardial (in some segments it was transmural) and pericardial effusion. It is therefore essential in case of clinical suspicion of EGPA to carry out a CMR to evaluate the characteristic findings suggestive of eosinophilic myocarditis to guide the subsequent execution of BEM, which can offer the definitive histopathological diagnosis. The sooner a definitive diagnosis is obtained, the sooner targeted immunosuppressive therapy can be started with short and long-term benefits for the patient.



IMAGING CARDIOVASCOLARE 863
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

TAKOTSUBO SYNDROME FOLLOWING FROZEN ELEPHANT TRUNK AND BENTALL-DEBONO PROCEDURE FOR ACUTE AORTIC DISSECTION

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Case summary: A 44-years woman was admitted to out institution for acute chest pain. She had a past medical history of ascending aortic aneurysm and anxiety treated with anxiolytic drugs. Urgent Computed tomography (CT) confirmed the suspicion of Stanford type A acute aortic dissection (ATAAD) with a primary tear in the aortic root, extending from the aortic valve (AV) to the iliac bifurcation. ECG was substantially normal. Transthoracic Echocardiography (TTE) showed normal left ventricular (LV) dimensions and systolic function, with an ejection fraction (EF) of 55%. The patient was urgently transferred to the operating room for emergency repair of her ATAAD. Aortic arch replacement was performed with Frozen Elephant Trunk (FET) technique while aortic root and aortic valve replacement was obtained with Bentall-De Bono procedure. Both left main button and right main button appeared fragile, but they have good hemostasis and flow. After uneventful weaning off cardiopulmonary bypass, transesophageal echocardiography showed normal global and regional LV contraction. The patient was transferred to the ICU and was extubated 8 hours later. Her condition deteriorated on the second postoperative day. She became dyspneic, hypotensive, and oliguric. ECG showed atrial fibrillation with a ventricular rate of 130 to 140 bpm. Tn I level was 20154 ng/mL. ETT showed enlarged LV with depressed systolic function and extensive akinesis of all apical and midventricular segments (LVEF: 20%). Adrenaline

and noradrenaline were administered without clear benefits. Based on the typical shape of the LV and the fact that the extensive wall motion abnormalities did not follow a coronary distribution pattern, Takotsubo syndrome (TTS) was suspected. The hypothesis was enhanced by an InterTAK diagnostic score value of 70 points. Intravenous levosimendan and esmolol were then started and adrenaline was suspended. Due to the patient's clinical instability and concern of about the fragility of the coronary buttons, coronary angiography was considered unsafe at the time. With TTE, the coronary ostia appeared free of residual intimal flap and coronary blood flow velocity was systematically explored through a modified two-chamber view. In this way, the distal portion of left anterior descending (LAD) coronary artery was visualized. Pulsed-wave Doppler recording was attempted using color flow as a guide. The spectral trace of coronary flow velocity consisted in a biphasic flow with prevalent diastolic component, consistently with our hypothesis. Daily transthoracic echocardiography demonstrated gradual improvement of LV function and LV ejection fraction. On postoperative day 12, the patient was transferred to a regular ward. Subsequently, coronary artery button disease was excluded by CT. After 20 days the patient was discharged, ECG findings appeared normal, and EF was restored with residual septal dyskinesis likely due to CPB.



IMAGING CARDIOVASCOLARE 61
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

EVALUATION AND COMPARISON OF STRAIN AND MYOCARDIAL WORK PARAMETERS IN PATIENTS UNDERGOING PERCUTANEOUS EDGE-TO-EDGE MITRAL VALVE REPAIR WITH MITRACLIP SYSTEM

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Introduction: Myocardial Work (MW) is an advanced echocardiographic technique that assesses left ventricular performance, considering the hemodynamic load on the ventricle. Unlike traditional measures such as ejection fraction (EF) and global longitudinal strain (GLS), MW provides a comprehensive evaluation throughout the cardiac cycle.

Objective: This study evaluates and compares echocardiographic parameters, specifically GLS and MW, before and after percutaneous edge-to-edge repair with the Mitraclip system, to highlight post-procedural improvements in ventricular performance.

Methods: A total of 59 patients with severe symptomatic mitral regurgitation, candidates for Mitraclip, were enrolled from March 2023 to April 2024. Parameters included GLS, Global Work Index (GWI), Global Constructive Work (GCW), Global Wasted Work (GWW), and Global Work Efficiency (GWE). Pre- and post-procedure measurements were analyzed using paired t-tests, considering patient comorbidities. The chi-square test and logistic regression were used to evaluate associations and predictive capacities.

Results: Significant improvements were observed in post-procedural GLS (-9.17 ± 5.95 to -13.41 ± 5.22 , $p=0.0001$), GWI ($p < 0.005$), and GWE ($p < 0.005$), with a

reduction in GWW ($p = 0.0001$). In hypertensive patients there was a significant increase in GWI and GWE, and reduction in GWW. In non-hypertensive patients there was a significant increase in GWI and GWE, and reduction in GWW. In diabetic and dyslipidemic patients there was a significant improvement in GWI, GWE, and GLS; reduction in GWW. In patients with atrial fibrillation there was a significant improvement in GWI, GWE, and GLS; reduction in GWW. In patients with coronary artery disease patients there was a significant increase in GWI and GWE. No significant changes in GCW were observed in any group. For degenerative mitral regurgitation (DMR), leaflet fibrosis was associated with residual mitral regurgitation post-procedure (more than mild). In functional mitral regurgitation (FMR), ischemic etiology was not significantly associated with residual regurgitation (more than mild). Logistic regression indicated that reduced GWI and increased GLS were linked to adverse outcomes, though not statistically significant.

Conclusions: GLS and MW are highly sensitive and useful non-invasive diagnostic parameters compared to ejection fraction, demonstrating improvements in myocardial work efficiency and ventricular performance post-Mitraclip. Long-term follow-up studies are needed to confirm the durability and clinical outcomes of these benefits.



IMAGING CARDIOVASCOLARE 147
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

EARLY CARDIAC ABNORMALITIES DETECTED BY ADVANCE ECHOCARDIOGRAPHY PARAMETERS IN ADOLESCENTS WITH ANOREXIA NERVOSA

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Aims: Patients diagnosed with anorexia nervosa (AN) have an increased risk of cardiac anomalies, including pericardial effusion and myocardial dysfunction. Although limited information exists regarding risk factors for the development of these cardiac complications. Standard ultrasound methods reveal relatively preserved systolic and diastolic functions. However, novel echocardiography parameters, utilizing speckle tracking echocardiography (STE), which can detect subtle and early alterations in left ventricular (LV) and left atrial (LA) function, are underutilized in patients with AN. The aim of our study was to investigate with finer echocardiographic methods the presence of early cardiac abnormalities among young patients diagnosed with anorexia nervosa.

Methods and results: We assessed the cardiac function evaluating LV and LA strains, as well as myocardial work (MW), and hypothesized possible alterations. Sixteen patients (mean age 20.1 ± 5.6 y; all women) with AN diagnosed with DSM-5 diagnostic criteria and sixteen control patients (mean age 22.8 ± 5.9 y; all women)

were enrolled and underwent a transthoracic Doppler echocardiography. Diastolic and systolic function was investigated using standard (PW and TDI Doppler and cardiac chamber quantification) and advanced parameters (LV and LA strain and LV MW). We evaluated Constructive MW (CMW), MW index (MWI), MW efficiency (MWE) and wasted MW (WMW).

Conclusion: Echocardiography revealed a structurally normal heart in all patients. Pericardial effusion was observed in 6 (37.5%) of AN patients. Interestingly, AN patients had a statistically significant difference in both atrial and ventricular strain as well as MW parameters except for MWE, which was not statistically significant for a small margin. This observed trend in patients with anorexia nervosa (AN), not present in the control group, strongly supports early detection of myocardial dysfunction in this population. These parameters can assist in identifying patients at a high risk of cardiac dysfunction, warranting closer follow-up for mitigating the progression of cardiac abnormalities and improve overall outcomes in this vulnerable population.



IMAGING CARDIOVASCOLARE 329
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA) INFARTO NSTEMI
(CARDIOPATIA ISCHEMICA) ANGINA INSTABILE (CARDIOPATIA ISCHEMICA)

CORRELATION OF ECHOCARDIOGRAPHIC EPICARDIAL FAT THICKNESS AND CORONARY ARTERY DISEASE EXTENT IN ACUTE CORONARY SYNDROME

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Introduction: Epicardial fat is a well-known indicator of cardiovascular risk. Atherosclerosis causing coronary artery disease is a chronic process that can present with a stable or unstable clinical setting after a period of quiet. Epicardial adipose tissue (EAT) locally affects the morphology and function of the heart through the proatherogenic and proinflammatory cytokines it secretes that affect coronary arteries' vessel wall, either directly or through the vasa vasorum. Therefore, it plays an active role in the process of coronary artery disease. The relationship between EAT and coronary artery disease has been demonstrated in many studies. Various imaging methods (CT, MRI, Echo) are used to measure the amount of EAT. Transthoracic echocardiography (TTE) is the preferred method for measuring EAT because of its advantages, such as easy accessibility, cost-effectiveness, no radiation exposure, and simultaneous acquisition of other cardiac parameters. The aim of our study was to correlate epicardial fat thickness with the severity of coronary artery disease in patients with acute coronary syndrome.

Methods: This study is a retrospective, single-center observational study. It included 80 patients discharged from our cardiology department with a diagnosis of STEMI, NSTEMI and UA from January 2023 to December 2023. Anamnestic, laboratory, angiographic

and echocardiographic records of each of them were assessed. Epicardial fat thickness was measured as suggested by current consensus and the extent of coronary artery disease as mono-, bi-, or trivascular was assessed. In order to evaluate the correlation between epicardial fat measurement, 4 quartile groups of the measured values were constituted and compared by 2 test with the finding of trivascular disease. Significance for all analyses is for $p < 0.05$.

Results: The results of the statistical analysis showed that of the 80 selected patients 53 (66.3%) had mono- or bi-vascular disease, and 27 (33.8%) presented with trivascular disease. What emerged by evaluating the individual quartiles was that in the first three quartiles (mean EFT values 3.5 mm, 5.2 mm, 7.1 mm, respectively) only less than 50% had trivascular disease. In the fourth quartile, the mean epicardial fat thickness was 8.7 mm, and 50% of patients had trivascular disease. The p -value < 0.034 makes the hypothesis of the observed data statistically significant. This helped us to confirm the pro-atherogenic pathogenic role of epicardial fat in patients with coronary artery disease and allows us to conclude that as the thickness of epicardial fat increases, the extent of coronary artery disease and the severity of acute coronary syndrome increases.

Conclusions: The results showed that increased EFT is associated with higher CAD severity in acute coronary syndromes. If supported by further evidence, this may be used to predict the onset and severity of CAD, assuming an important positive predictive value. It could also play an important role in predicting and

stratifying cardiovascular risk. More evidence is needed to assess whether epicardial fat thickness could have such diagnostic and predictive properties and become a routine method for assessing cardiovascular risk in clinical settings.



**IMAGING CARDIOVASCOLARE 140
ECOSTRESS (IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)**

PREDICTIVE VALUE OF EPICARDIAL FAT IN ECOSTRESS

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Background: epicardial fat is now considered a new cardiovascular risk factor, in particular with regard to coronary heart disease. It represents the portion of cardiac visceral adipose tissue located between the myocardium and the visceral pericardium; it's classified as beige adipose tissue since it could modify its behaviour according to environmental conditions. The occurrence of atherosclerosis of the coronaries is attributable to the fact that epicardial adipose tissue becomes dysfunctional and produces pro-inflammatory and pro-fibrotic cytokines.

Aim: The purpose of this study is to examine the correlation between epicardial fat and major cardiovascular risk factors, particularly obesity, as epicardial fat is a marker of intra-abdominal visceral fat. Another objective is to investigate the association between epicardial fat, positive stress echocardiography results, and the need for myocardial revascularization.

Method: this retrospective study included 79 patients with an average age of 65.3 (± 10) suspected of coronary heart disease, who underwent stress echocardiography between 01/01/2023 and 31/05/2024. Transthoracic stress echocardiography images were obtained using GE VIVID ultrasound. Pharmacological and physical stress tests were conducted to assess regional wall

motion abnormalities under stress. Epicardial fat thickness was measured at end-diastole perpendicular to the right ventricle free wall to estimate the thickness of the space between the myocardium and visceral pericardium.

Results: Statistical analysis using SPSS v.26 showed a stronger correlation with coronary artery disease in patients with epicardial fat > 5.73 mm (third and fourth quartiles) and positive stress tests. In particular, the sensitivity of ecostress alone compared to coronary heart disease at coronarography was 36%; combining ecostress with epicardial fat measurement, the sensitivity increased up to 63%.

Conclusions: overall, the findings of this study suggest that epicardial fat could serve as a valuable marker for cardiovascular risk assessment, particularly in patients with suspected coronary heart disease. The combination of epicardial fat measurements and stress echocardiography could enhance the diagnostic accuracy in identifying patients who may benefit from myocardial revascularization. Therefore, further research is warranted to explore the potential of epicardial fat as a prognostic tool in the management of cardiovascular diseases.

IMAGING CARDIOVASCOLARE 92 INFARTO STEMI (CARDIOPATIA ISCHEMICA) VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE) INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

A UNIQUE CASE OF ISCHAEMIC VENTRICULAR SEPTAL DEFECT AND "PARACHUTE" ENDOCARDIUM

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(a) POLO CARDIOLOGICO - ASUGI - AZIENDA SANITARIA UNIVERSITARIA GIULIANO ISONTINA

An 89-year-old woman, with no cardiac history, was admitted to our department for chest pain and cardiogenic shock. On admission ECG, infero-lateral STEMI and inferior necrosis. On echocardiography, moderate dysfunction of the left ventricle and mild basal inferior aneurysm, dilated and hypokinetic right ventricle, no significant valvular disease. On coronary angiography, an occlusion of the middle right coronary artery was treated acutely with angioplasty and drug-eluting stent. Troponin peak 11773 ng/L. Subsequent clinical stabilization. 24 hours after the acute event, evidence of a mesocardial systo-diastolic murmur. On the echocardiogram, evidence of a large post-infarct ventricular septal defect (max. diameter 10mm) at the infero-basal septal level resulting in a significant left-right shunt (QP/QS 0.76). Subsequently, the patient developed

oligoanuria and systemic hypotension (SBP 90 mmHg). Clinical conditions were stabilized with moderate doses of intravenous furosemide. The interesting aspect of this case report is how the patient's clinical conditions were extremely inconsistent with the entity and size of the ventricular septal defect. This is probably explained by the fact that the flow of the left-right shunt was hindered by the unmining of the right ventricular endocardium. The right ventricular endocardium acted like a "parachute" in systole and put a brake on the blood flow directed towards the right ventricle. To the best of our knowledge, there are no similar cases described in literature. In consideration of the patient's general clinical status, it was collectively decided to opt for conservative and palliative therapy. The patient was transferred to a hospice and died 2 weeks after the acute event.



Figure 1

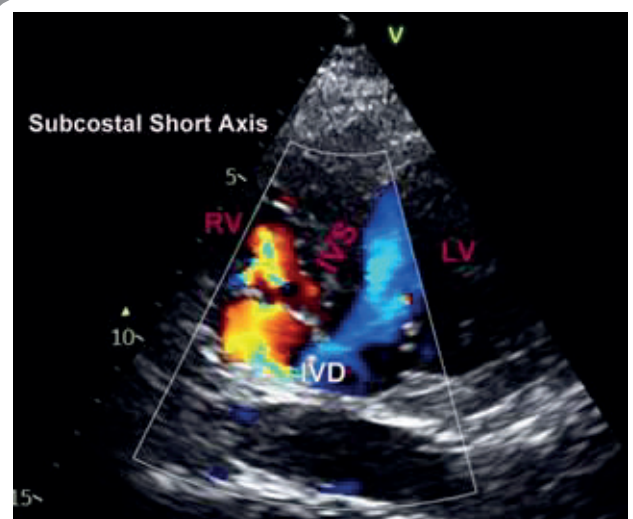


Figure 2



IMAGING CARDIOVASCOLARE 169
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
DIAGNOSTICA INVASIVA INTRAVASCOLARE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

AN UNUSUAL CASE OF STRESS CARDIOMYOPATHY COMPLICATED BY LEFT VENTRICULAR THROMBUS WITH FATAL DETACHMENT

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An 80-year-old patient was admitted for chest pain at rest, started few days earlier following a violent argument. Her medical history included hypertension and recent removal of adenocarcinoma of the descending colon. ECG showed sinus rhythm, negative T waves from V1 to V6, in D2, D3, AVF and long QT (480 ms). Laboratory exams documented an increased Tnl, myoglobin, CK-MB and BNP was 1379.5 pg/mL (nv < 100). Transthoracic echocardiography (TTE) showed a reduced ejection fraction, “apical ballooning” with hyperkinesis of the basal segments of left ventricle (LV), very suggestive for stress cardiomyopathy, and an extensive thrombotic stratification in apex (3.3 x 2.1 cm). Coronary arteries were normal. Warfarin and anti-remodeling therapy (ACE inhibitor and beta-blocker) were stated. On 7th day from admission, the patient complained an intense and sudden pain in lower extremities bilaterally. An urgent computed tomography angiography was required, which showed an acute occlusion at the level of the descending aorta, just above the bifurcation in the common iliac arteries, with bilateral obstruction. The patient was

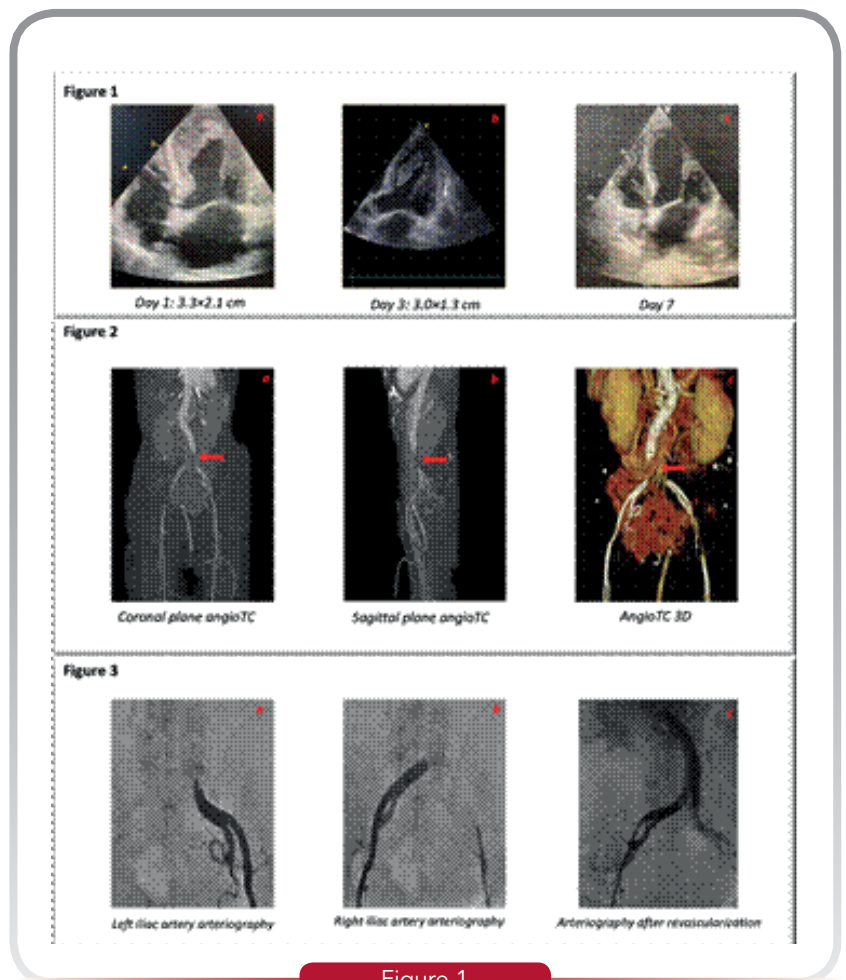


Figure 1

transferred promptly to interventional radiology to attempt the recanalization of the bis-iliac carrefour. However, few hours after the procedure, the patient's hemodynamic conditions worsened until the exitus. Cardioembolism by left ventricular thrombosis represents

a rare complication of stress cardiomyopathy and the clinical impact on outcome remains unclear. A hot topic is the management of these patients, often difficult and multidisciplinary, as well as the anticoagulation therapy to adopted in acute phase.



IMAGING CARDIOVASCOLARE 937
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

PSEUDOANEURISMA MIOCARDICO: RARO CASO DI COMPLICANZA PERIPROCEDURALE IN PAZIENTE CON STEMI ANTERIORE E SUPPORTO DI CIRCOLO MECCANICO

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 (a) IRCCS OSPEDALE SAN RAFFAELE

Un uomo di 51 anni viene ricoverato per infarto miocardico acuto con sopraslivellamento del tratto ST (STEMI) anteriore con iniziali segni di shock cardiogeno, per cui veniva sottoposto ad angioplastica primaria protetta da supporto di circolo meccanico con pompa microassiale. Alla coronarografia si evidenziava coronaropatia critica trivasale con subocclusione di IVA al tratto medio-proximale trattata mediante impianto di 2 DES. Il paziente si è mantenuto asintomatico per dolore toracico per tutta la durata della successiva degenza, con rapido recupero della funzione cardiaca e regolare svezamento dai supporti di circolo. Agli accertamenti predimissione è stata evidenziata mediante l'utilizzo di ecocardiografia transtoracica e risonanza magnetica cardiaca con mezzo di contrasto una lesione compatibile con breccia miocardica a tutto

spessore e pseudoaneurisma associato, successivamente confermata tramite tomografia computerizzata cardiosincronizzata.

Discusso collegialmente il caso in Heart Team è stata posta indicazione a intervento cardiocirurgico per completamento di rivascolarizzazione, pseudoaneurismectomia e sutura diretta di rottura di parete.

Questo caso dimostra come l'utilizzo di device per il supporto di circolo meccanico, seppur indispensabile e di fondamentale importanza in certi quadri clinici, può associarsi a complicanze gravi, con presentazione alle volte subdola, non sempre di facile diagnosi anche a fronte dell'utilizzo di più metodiche di imaging, e il cui mancato riconoscimento può comportare esiti anche fatali per il paziente.



IMAGING CARDIOVASCOLARE 410
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

EVOLUTIONARY STAGES OF INFECTIVE ENDOCARDITIS: A COMPLEX CASE OF LIGHTNING FAST AORTIC ENDOCARDITIS

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Background. Infective endocarditis (IE) is an infection of the endocardium and heart valves. The development of IE usually requires several conditions, including the presence of predisposing risk factors (i.e. a surface/structure that could be colonized by bacteria), pathogens entering the bloodstream and the competence of the host's immune response. Complications from IE are common and include heart failure, uncontrolled infection, septic shock, systemic embolism and other issues related to prosthetic valve or cardiac implantable electronic devices. A multidisciplinary care team comprising infectious disease specialists, cardiologists and cardiac surgery physicians is recommended to reduce complications. Intravenous antibiotics are the first-line therapy with cardiac surgery being reserved for certain complications of IE and/or clinical situations with a high risk of complications.

Technical Resolution: We present the case of a 63-year-old man referred to the intensive care unit (ICU) for fever, chills, night sweats, fatigue, chest pain and myalgias lasting about a month. His medical history included heavy smoking, dyslipidemia and hypothyroidism under replacement treatment; additionally, he had undergone dental implants approximately six months earlier. On admission, the patient was feverish, hypotensive and in pain. Physical examination revealed a grade 4/6 systolic murmur. Blood tests showed neutrophilic leukocytosis with marked increase in both inflammation indices and myocardial necrosis markers. ABG analysis revealed metabolic acidosis with increased lactate and

hypoxemia, so an oxygen therapy was started. An EKG showed slight ST elevation in the inferior leads. A chest X-ray indicated pulmonary edema. TTE suggested a pseudoaneurysm of the aortic root near the right coronary cusp, likely due to an infectious cause. TEE and CT confirmed a fibrocalcific aortic valve with an abscess and a fistulized pseudoaneurysm into the right atrium, resulting in moderate-severe aortic stenosis and regurgitation; other vegetations were observed on the tricuspid leaflets and the anterior mitral leaflet. Blood cultures were sent and intravenous broad-spectrum antibiotics (ampicillin, ceftriaxone and gentamicin) were started according to ESC guidelines for management of endocarditis (2023). Blood cultures later revealed growth of *Streptococcus Mitis*, a normal inhabitant of human oral and gastrointestinal flora, leading to targeted antibiotic therapy. Based on clinical and instrumental data, the patient was urgently transferred to the cardiac surgery department to continue the therapeutic process.

Conclusions. Complications of infective endocarditis can involve the heart and adjacent structures or be extracardiac. Cardiac complications caused by IE are varied and frequently life-threatening. The first stage of infection is the development of intracardiac vegetations, which may further spread, with an increase in size and number, leading to destructive valve lesions and perivalvular extension of the infection. These anatomical lesions cause hemodynamic disorders, mainly valvular regurgitation leading to heart failure, which may necessitate referral to cardiac surgery.



IMAGING CARDIOVASCOLARE 411
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

CASE REPORT: AN UNUSUAL CASE OF INTERATRIAL SEPTUM MASS

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Background. Masses in and near the interatrial septum may be either benign or malignant. While the most common cause of interatrial septal thickening is septal lipomatous hypertrophy, an extensive differential diagnosis should be considered including atrial myxoma, thrombus, iatrogenic haematoma, invasive or metastatic tumour, lipoma or liposarcoma. Echocardiography is the most reliable diagnostic modality showing typical findings including morphology, mobility and stalk in some cases; the typical echographic aspect should be known to avoid unnecessary surgical resection. A multimodality imaging approach in some cases is crucial for arriving at the appropriate diagnosis using the tissue characterization capabilities of CT and CMR.

Technical resolution: We present the case of an 81-year-old man referred to emergency department for acute heart failure. His medical history included hypertension, impaired fasting blood sugar, benign prostatic hypertrophy, a history of urolithiasis, previous left inguinal hernioplasty and right knee prosthesis. On admission, the patient was severely dyspneic, tachycardic and hypotensive. ABG analysis revealed hypoxemia, so oxygen therapy was started. Physical examination revealed a grade 4/6 systolic murmur and reduced vesicular breath sounds at the right lung base. A chest X-ray confirmed the presence of a right pleural effusion. The EKG showed atrial fibrillation with high mean ventricular response; as the arrhythmia was not known, anticoagulants were started and beta-blockers were administered to slow the mean ventricular

response. TTE revealed an intracardiac mass within or attached to the interatrial septum, characterized by an oval shape and anechoic content. TEE confirmed a mass at the level of the fossa ovalis, measuring 6 cm x 4 cm, apparently in continuity with superior vena cava, right pulmonary veins and aortic root. To further localize the mass and evaluate for a tumour, total-body PET-CT was performed showing multinodular goiter, the aforementioned mass of the interatrial septum and voluminous nodular formations in the mediastinum and hepatic hilum, initially suspected to be lymphoglandular formations. Biopsy confirmed the diagnosis of large B-cell lymphoma and the patient began chemotherapy.

Conclusions. This case highlights the differential diagnosis of an interatrial septal mass. Echocardiography is the most commonly used imaging modality for delineating characteristics of a cardiac mass such as size, location, mobility, mechanism of tumor implantation, relationship with adjacent structures and potential for hemodynamic consequences. Additional imaging modalities (CCT, CMR) should be used to acquire more information. Multimodality imaging is key for establishing an early diagnosis and determining treatment strategies, including chemotherapy and surgery. Septal lipomatous hypertrophy is the most common cause of interatrial septal thickening. Primary malignant cardiac tumors are extremely rare and lethal, while secondary tumors are more common. Lymphoma tends to spread via the blood, lymphatics or directly from a mediastinal lymphoma and can affect the heart with myocardial nodular masses.

IMAGING CARDIOVASCOLARE 509

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

APPLICAZIONE DELLA TC CARDIACA NELLA DIAGNOSI E NEL FOLLOW UP DI PAZIENTI AFFETTI DA CARDIOMIOPATIA ARITMOGENA: DUE CASI CLINICI ESEMPLIFICATIVI

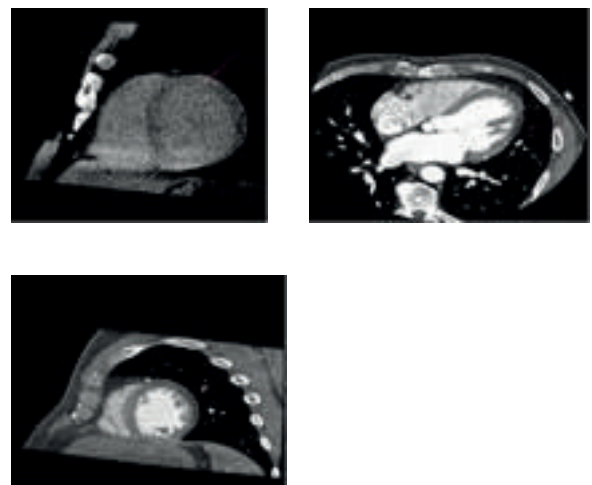
Eleonora Lassandro (a), Maria Teresa Savo (a), Marika Martini (a), Filippo Amato (a), Raffaella Motta (a), Giulia Mattesi (a), Ilaria Rigato (a), Barbara Bauce (a), Sabino Illiceto (a), Valeria Pergola (a)
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Nella diagnosi e nel follow up dei pazienti affetti da cardiomiopatia aritmogena l'uso della TC cardiaca è attualmente limitato all'esclusione di una sottostante patologia coronarica congenita o acquisita. Presentiamo due casi clinici esemplificativi di applicazione di questa metodica di imaging in grado di dimostrarne le potenzialità anche nella caratterizzazione tissutale.

Nel primo caso clinico un uomo di 57 anni, con anamnesi cardiologica non significativa ed in assenza di sintomatologia specifica, giunge all'attenzione medica per extrasistolia ventricolare frequente a morfologia blocco di branca sinistra-asse superiore. L'ecocardiogramma transtoracico non documenta alterazioni strutturali e gli esami ematici, compresi di indici di flogosi, risultano nei limiti. Al tracciato ECG basale si riscontrano onde T piatte nelle derivazioni laterali e bassi voltaggi dei complessi QRS nelle derivazioni periferiche. Data la claustrofobia del paziente non è stato possibile sottoporlo a risonanza magnetica cardiaca, dunque si è optato per l'esecuzione di una TC cardiaca con protocollo specifico per la caratterizzazione tissutale. La TC è stata in grado di identificare aree ipodense indicative di infiltrazione fibro-adiposa a livello delle pareti infero- laterale ed anteriore del ventricolo sinistro. Inoltre nella fase post contrastografica è stato possibile rilevare la presenza di una stria di late enhancement sub-epicardica (pattern non ischemico) nelle stesse regioni del ventricolo sinistro. Infine è stata definitivamente esclusa la presenza di coronaropatia critica come causa aritmica. Questi riscontri imaging, unitamente alla presenza di extrasistolia ventricolare ed alle alterazioni elettrocardiografiche, hanno consentito

di porre la diagnosi di cardiomiopatia aritmogena a dominanza sinistra.

Il secondo caso clinico riguarda un uomo di 65 anni con nota diagnosi di cardiomiopatia aritmogena a dominanza sinistra e portatore di ICD monocamerale dal 1998 in prevenzione secondaria per tachicardie ventricolari sostenute recidivanti. Al controllo ambulatoriale annuale il paziente si presenta totalmente asintomatico ed all'ecocardiogramma transtoracico si documenta una frazione di eiezione del ventricolo sinistro conservata pur in presenza di ipocinesia apicale e della parete infero-laterale media non nota in precedenza. Si decide di eseguire come esame di secondo livello una TC



Figure



cardiaca in quanto l'ICD non risulta compatibile con risonanza magnetica e per ridurre gli artefatti indotti dalla presenza del device. La TC ha consentito di identificare diffusi segni di metaplasia adiposa a distribuzione sub-epi-intramiocardica a livello della parete infero-laterale medio-basale, del setto interventricolare, della parete anteriore basale e dell'apice in toto. È stato inoltre

possibile riscontrare la presenza di late enhancement a distribuzione subepicardica nelle medesime regioni, indicativo della presenza di fibrosi. L'esecuzione della TC cardiaca con protocollo specifico per caratterizzazione tissutale ha così consentito di valutare efficacemente l'estensione della malattia, rivelando la sua utilità nel follow up a distanza di questa categoria di pazienti.



IMAGING CARDIOVASCOLARE 640

TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)

(IMAGING CARDIOVASCOLARE)

UMNAMS KING PRIMARY CARDIAC LYMPHOMA

Raffaella Mistrulli (a), Domenico Dardani (a), Luigi Salerno (a), Fabrizio D'andrea (a), Allegra Battistoni (a), Emanuele Barbato (a)
(a) UNIVERSITÀ LA SAPIENZA, OSPEDALE SANT'ANDREA

A 49-year-old female patient presented to our emergency department following a syncopal episode. She had experienced dyspnea and dizziness for a month, along with edema and ascites. Six months earlier, she had a car accident causing chest trauma, with a chest CT revealing a mediastinal hematoma and circumferential pericardial effusion. Follow-up scans showed resolution of these findings. She was not on any outpatient therapy.

At admission, she had dyspnea, blood pressure of 145/85 mmHg, and SaO₂ of 98%. The electrocardiogram showed right bundle-branch block and T-wave inversion from V1 to V4. Blood tests revealed neutrophilic leukocytosis, increased D-dimer, BNP, and altered transaminases. Echocardiography showed a large intracardiac mass from the right interatrial septum, obstructing tricuspid inflow (diastolic mean gradient 10 mmHg), with a dilated, non-collapsible vena cava. A CT scan confirmed a mass in the right atrium protruding into the right ventricle, infiltrating the interatrial and interventricular septum, basal ventricular wall, right hemidiaphragm, and magna cardiac vein. There was also a moderate circumferential pericardial effusion, right pleural effusion, and ascites. The patient was transferred to the ICU for multiparametric monitoring.

Cardiac MRI showed a large mass in the RA extending to the RV outflow tract (7x8 cm) with diffuse post-contrast

enhancement. Intracardiac trans-venous biopsy and PET/CT revealed pronounced fluorine-18 fluorodeoxyglucose uptake of the cardiac mass, with no other active lesions. Histopathology confirmed diffuse large B-cell non-Hodgkin lymphoma, leading to a diagnosis of primary cardiac lymphoma. Surgery was not feasible due to extensive infiltration. Immunochemotherapy (cyclophosphamide, doxorubicin, vincristine, prednisone, and rituximab) was initiated. The patient had no arrhythmic events and started diuretic and antihypertensive therapy.

After two immunochemotherapy cycles, follow-up PET/CT showed a significant metabolic response and echocardiogram indicated reduced intracardiac mass. Primary cardiac lymphomas are rare, with few documented cases. Diagnosis is challenging due to variable clinical presentations, often dependent on the size, growth rate, and location of cardiac involvement. Complications include hemodynamic problems, pulmonary embolism, and atrioventricular block. Imaging modalities like echocardiography, CT, and MRI are valuable, but trans-venous biopsy remains essential for definitive diagnosis. Primary cardiac lymphoma progresses rapidly, often fatal within days without prompt treatment. Chemotherapy shows favorable responses, while surgical treatment is palliative. The prognosis remains poor, with a median survival of about 7 months



IMAGING CARDIOVASCOLARE 251

ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)

(IMAGING CARDIOVASCOLARE)

TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

IL RUOLO DELL'IMAGING MULTIMODALE NELLA CARATTERIZZAZIONE DI UNA MASSA CARDIACA

Domenico Scelfo (a), Ludovico Rossetto (b), Daniela Di Lisi (b), Oreste Fabio Triolo (b), Fabio Balasus (b), Francesca Macaione (a), Cristina Madaudo (a), Giuseppe Puccia (a), Alfredo Ruggero Galassi (a), Giuseppina Novo (a)
 (a) PROMISE, DIPARTIMENTO DI PROMOZIONE DELLA SALUTE, MATERNO- INFANTILE, DI MEDICINA INTERNA E SPECIALISTICA "G. D'ALESSANDRO"; (b) POLICLINICO UNIVERSITARIO "PAOLO GIACCONE" - PALERMO

Presentiamo il caso di un paziente oncologico, cui veniva riscontrata una massa cardiaca caratterizzata tramite imaging multimodale.

Caso clinico. Un uomo di 66 anni, ex fumatore, iperteso, dislipidemico, con diagnosi di osteosarcoma a livello lombo-sacrale in trattamento chemioterapico da circa un anno, giungeva alla nostra osservazione clinica nel corso dei regolari follow-up cardio-oncologici. Si presentava in buone condizioni cliniche generali e buon compenso emodinamico. Veniva eseguito un esame ecocardiografico con riscontro di una formazione ovalare (30X18 mm) nel contesto del setto interventricolare anteriore medio-distale, caratterizzata da ecorifrangenza diversa rispetto al muscolo cardiaco. L'integrazione con

ecocardiografia 3D e TrueVue (Figura A) consentiva di caratterizzare meglio le dimensioni della massa e i suoi rapporti con la cavità ventricolare e permetteva di delineare meglio i contorni della stessa sul piano spaziale (al 3D è possibile notare che la massa non infiltra l'endocardio). Alla luce della storia clinica del paziente nel sospetto di lesione ripetitiva veniva richiesta una risonanza magnetica cardiaca con mezzo di contrasto al fine di caratterizzare meglio la massa (Figura B). Questa confermava la presenza della massa intramiocardica in corrispondenza del setto interventricolare, isointensa al miocardio nelle sequenze PD e spiccatamente iperintensa nelle sequenze STIR. Questi reperti suggerivano un'origine neoplastica della formazione, compatibile con secondarismo. In considerazione dello

Ecocardiografia 2D, 3D e TrueVue

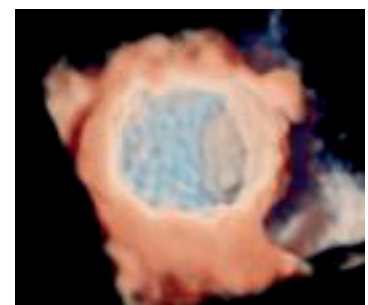
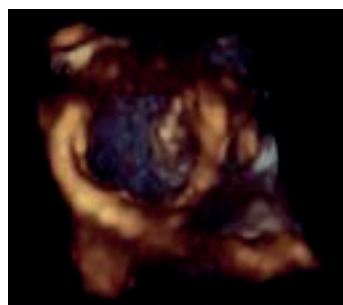


Figura A

stadio avanzato di neoplasia del paziente si decideva di non sottoporlo a resezione chirurgica della massa, di continuare la chemioterapia già praticata e di seguire l'evoluzione della massa cardiaca mediante tecniche di imaging. Alla risonanza magnetica cardiaca di follow-up a sei mesi, la massa si presentava di dimensioni stabili a quelle precedentemente descritte. Analogamente le caratteristiche della massa si presentavano stabili all'ecocardiografia 2 e 3D. Il paziente prosegue in atto il trattamento chemioterapico.

Conclusioni. L'ecocardiografia è la tecnica di prima scelta per diagnosticare le masse cardiache. L'ecocardiografia 3D fornisce informazioni aggiuntive e consente di caratterizzare meglio la massa rispetto all'ecocardiografia bidimensionale. I progressi nell'eco 3D con la tecnologia TrueVue consentono un imaging più realistico delle strutture cardiache e una maggiore comprensione della morfologia anatomica. TrueVue illumina i dettagli dei tessuti e crea la percezione

Cardio - RMN

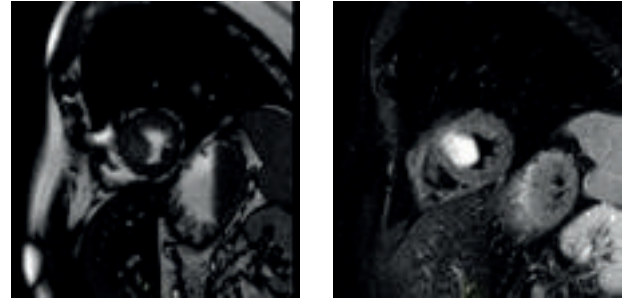


Figura B

della profondità nella ricostruzione anatomica ed è uno strumento importante che può guidare il chirurgo durante la resezione complessa di masse cardiache. Infine, l'ecocardiografia 3D fornisce informazioni riproducibili rispetto alla risonanza magnetica cardiaca, pertanto potrebbe essere considerata come alternativa alla cardio RM nel follow up dei pazienti.



IMAGING CARDIOVASCOLARE 48 IMAGING DELLE CARDIOPATIE CONGENITE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE)

BETTER LATE THAN NEVER: A RARE CAUSE OF CRYPTOGENIC STROKE UNEXPECTEDLY FOUND ON CARDIAC CT

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(a) DIPARTIMENTO DI SCIENZE CARDIO-TORACO-VASCOLARI E SANITÀ PUBBLICA, UNIVERSITY HOSPITAL OF PADUA, ITALY

Background: Unroofed coronary sinus (UCS) is a rare congenital anomaly characterized by a complete or partial absence of the roof of the coronary sinus, resulting in communication between the left atrium and coronary sinus. This is considered a "hidden" type of atrial septal defect. The clinical presentation is variable: the defect can be asymptomatic, with a diagnosis established in adulthood, or it can range within the context of typical symptoms of a left-to-right or right-to-left shunt, such as paradoxical embolism and brain abscess. Instrumental diagnosis relies on transthoracic echocardiography (TTE), cardiac bubble test and cardiac CT angiography (CCTA).

Case summary: A 70-year-old man presented to the Emergency Department with chest pain lasting several hours; usual investigations were normal. The patient reported as part of his previous clinical history an episode of left lower limb paresthesia thirty-five years earlier, with no pathological findings detected on neuroradiologic investigations, and an episode of anomia twelve years earlier; in this case brain magnetic resonance imaging (MRI) showed microinfarct outcomes in the frontal and parietal subcortical regions and in the paratrighal

regions of both sides.

He was therefore referred to CCTA, which showed no coronary arteries plaques but detected a type III and type IV UCS.

In light of all these discoveries the patient underwent a cardiac bubble test, which showed the presence of a right-to-left shunt of bubbles; however, no shunt of the interatrial septum or the coronary sinus was seen at TTE.

Discussion: The role of CCTA in the investigation of stroke etiology is known, although at the moment it cannot be recommended as a primary imaging method. In the UCS diagnosis, TTE still has a non-negligible disadvantage compared to CCTA: in fact, as previously shown, echocardiography found a right-to-left shunt but couldn't determine the source of microembolism, probably because of the poor acoustic window for posterior anatomical structures. The patient was originally referred to a cardiology consultation in order to investigate his chest pain: as a result, after many years, our diagnostic path gave a plausible explanation to his previous neurological history. Thus, implementing CCTA in the diagnostic path of cryptogenic stroke may be useful in clinical practice.



IMAGING CARDIOVASCOLARE 641

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)

INFARTO STEMI (CARDIOPATIA ISCHEMICA)

IMPACT OF ROBOTIC-ASSISTED MIDCAB SURGERY ON VENTRICULAR FUNCTION ASSESSED BY ECHOCARDIOGRAPHY

Raffaella Mistrulli (a), Marco Coli (a), Luigi Salerno (a), Fabrizio D'andrea (a), Emiliano Navarra (a), Emanuele Barbato (a), Giovanni Melina (a)
(a) UNIVERSITÀ LA SAPIENZA, OSPEDALE SANT'ANDREA

Introduction: Early cardiac dysfunction following surgical myocardial revascularization is a prognostic factor related to both immediate and late outcomes. Theoretically, robotic-assisted minimally invasive direct coronary artery bypass (r-MIDCAB) may be a low-impact surgical procedure for revascularization with satisfactory long-term clinical outcomes. However, changes in left (LV) and right ventricular (RV) function assessed by echocardiography have never been studied.

Purpose: The aim of the present study was to assess the impact of r-MIDCAB on RV and LV function assessed by trans-thoracic echocardiography (TTE).

Methods: We performed a retrospective analysis on a consecutive series of 80 patients undergoing isolated robotic-assisted MIDCAB between April 2022 and January 2024. Exclusion criteria were cardiac arrhythmias, other valve operation, and poor TTE imaging windows. A comprehensive TTE evaluation was performed within 30 days before surgery and within 10 days after, using the protocols recommended by the European Association of Cardiovascular Imaging. Statistical analyses were performed using R version 4.1.2. Paired Student's t-tests and Chi-square tests were used when indicated. A significance level of 5% was considered for all statistical tests.

Results: A total of 25 consecutive patients were included in the study (Table 1). Mean age was 67 ± 7 years and 84% were male (Table 1). Three patients were treated with primary percutaneous coronary intervention prior to r-MIDCAB due to an acute coronary syndrome. LV ejection fraction (LVEF) was $57 \pm 9\%$ preoperatively and $58 \pm 6\%$ at 10 days after surgery ($t(24) = 0.112$, $p = 0.911$). The chi-square test showed no significant difference in diastolic dysfunction grades between the two time points ($\chi^2(2) = 0.25$, $p = 0.881$). Pre-operative TAPSE was impaired in 16% of cases with a mean value of 23.2 ± 3.9 mm. Postoperatively, the mean TAPSE was 18.52 ± 3.2 mm, and a worsening was found in only 24% of the patients. No statistical differences were found between pre- and postoperative TAPSE values ($t(24) = -0.308$, $p = 0.761$) (table 2).

Conclusion: Our study showed no significant changes in RV and LV function post-robotic-assisted MIDCAB surgery. Additionally, robotic intervention had minimal impact on diastolic dysfunction, with no significant difference pre- and post-surgery. Our results highlight the importance of a comprehensive TTE to assess the impact of the MIDCAB intervention on cardiac function. Further studies are needed to assess the long-term results and the impact on the clinical outcomes.



IMAGING CARDIOVASCOLARE 546
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

ECHO ASSESSMENT EVALUATION IN GAUCHER DISEASE: A MYOCARDIAL WORK STUDY

Daniele Paoletta (a), Martina Pucci (a), Luca Maria Capece (a), Paolo Manzi (a), Domenico Rendina (a), Antonio Barbato (a), Roberta Esposito (a)

(a) DIPARTIMENTO DI MEDICINA CLINICA E CHIRURGIA, UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

Background: Gaucher disease (GD) is an inherited, autosomal recessive lysosomal storage disorder caused by a homozygous or compound heterozygous mutation in the gene encoding acid beta- glucosidase (GBA) on chromosome 1q22. Cases of myocardial involvement, left ventricular (LV) hypertrophy and diastolic dysfunction at Doppler echocardiography have been described in individual cases of patients affected by GD.

The aim of the present study was to investigate whether subclinical anomalies of the myocardium of the left ventricle can be detected in a group of patients with GD regularly followed.

Methods: An observational study was conducted by analyzing 22 GD patients and 22 age- and sex-matched normal controls (NC); they were compared initially by standard echo Doppler examination: LV mass index (LVMI), relative wall thickness (RWT) and left ventricular ejection fraction (LVEF), diastolic function parameters, left atrial volume index (LAVi) were determined. Subsequently added parameters were evaluated by advanced echo Doppler examination: Global Longitudinal Strain (GLS), Global Work Index (GWI), Global Constructive Work (GCW), Global Wasted Work (GWW), Global Work Efficiency (GWE).

Results: As can be seen from data in Table1 the intergroup difference of LVMI and RWT was statistically significant, increased in GD patients versus NC. There was no difference between Transmitral E/A ratio and

left atrial volume index (LAVi). Ejection fraction (EF) was reduced in patients with GD in comparison with NC (p<0,05). Myocardial Work were all statistically significant, denoting a reduction in GWI, GCW, GWE in patients affected by GD over NC, while GWW was considerably high in GD patients.

Conclusions: The results obtained highlighted a possible and real correlation between subclinical LV contraction impairment and myocardial infiltrative damage due

Parameter	GD (n=22)	NC (n=22)	P Overall
RWT	0,37 ± 0,73	0,31 ± 0,74	0,015
LVMI	33,16 ± 8,60	31,39 ± 6,66	0,45
LAVi	25,60 ± 7,28	24,86 ± 6,84	0,72
E/A	1,12 ± 0,49	1,19 ± 0,37	0,58
EF	61,45 ± 3,18	65,45 ± 4,42	0,001
GLS	18,81 ± 1,78	23,7 ± 2,32	0,000
GWI	1808,22 ± 289,66	2380 ± 441,04	0,000
GCW	2038,09 ± 315,47	2733,27 ± 369,67	0,000
GWW	113,40 ± 62,53	69,36 ± 35,83	0,006
GWE	93,86 ± 3,05	96,54 ± 2,36	0,002

Table 1

to Gaucher cells could, as the mechanism underlying these alterations. In conclusion, GD is associated with subclinical LV contraction impairment compared to NC, however, to establish to what extent this relationship

is due to GD or to cardiovascular risk factors in this population sample, a study on larger numbers is certainly mandatory.

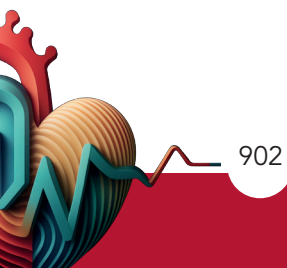


CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

IPERTENSIONE ARTERIOSA



IPERTENSIONE ARTERIOSA 930
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
ARTERIOPATIA DEI TRONCHI SOVRA-AORTICI (MALATTIE DEI VASI)

INCREASED CARDIOVASCULAR RISK IN YOUNG ADULTS WITH COELIAC DISEASE

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(a) CARDIOLOGIA UNIVERSITARIA, POLICLINICO DI BARI; (b) PEDIATRIC GASTROENTEROLOGY GIOVANNI XXIII CHILDREN'S HOSPITAL-UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

Background. Coeliac disease is a chronic small bowel immune-mediated enteropathy caused by exposure to dietary gluten in genetically predisposed individuals. Impaired immune response in coeliac disease involves different organs through unknown mechanisms. Recently, heart disease, has also been reported in coeliacs. Atherosclerosis is a well-known cardiovascular risk factor in immune-mediated disease but few data are available in coeliac disease.

Aim of the study. To evaluate instrumental and biochemical signs of atherosclerosis risk in 20 young adults at first diagnosis of coeliac disease and after 6–8 months of gluten-free diet with mucosal recovery.

Methods. We analysed total, high-density lipoprotein (HDL) and low-density lipoprotein (LDL) cholesterol, triglycerides, homocysteine, C-reactive protein, folate and vitamin B12; ultrasound measurement of carotid intima-media thickness (IMT) and endothelium-dependent dilatation were performed at diagnosis and after gluten withdrawal. Twenty healthy Med students served as matched controls for vascular examinations.

Results. At baseline, total and HDL-cholesterol (HDL-C) were within normal range, mean LDL-cholesterol concentration was slightly increased in coeliacs; gluten free diet was associated with an increment in total and HDL-C (69.2 ± 16.4 vs. 50.5 ± 19.5 mg/dL; $P < 0.001$) and a significant improvement in total/HDL-C ratio (3.02 ± 0.73 vs. 3.71 ± 0.98 ; $P < 0.02$). Mean plasma homocysteine was elevated and not influenced by diet. C-reactive protein significantly decreased with diet (1.07 ± 0.51 vs. 1.98 ± 1.35 mg/dL; $P < 0.05$). At baseline, in coeliacs, IMT was increased (0.085 ± 0.011 vs. 0.057 ± 0.012 cm; $P < 0.005$), while endothelium-dependent dilatation was decreased (9.4 ± 1.2 vs. $11.1 \pm 1.3\%$; $P < 0.05$). Gluten free diet allowed the correction of IMT and endothelium-dependent vaso- dilatatory response.

Conclusions. Adults with coeliac disease has potential increased risk of early atherosclerosis as suggested by vascular impairment and unfavourable biochemical pattern. Chronic inflammation might play a determining role. Gluten free diet with mucosal normalisation seems to revert to the observed alterations.



IPERTENSIONE ARTERIOSA 750 TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

EFFICACY AND SAFETY OF RENAL DENERVATION IN RESISTANT HYPERTENSION: A RETROSPECTIVE STUDY

Marco Bernardi (b), Luigi Spadafora (b), Giuseppe Biondi-zoccai (b), Radovan Lipic (b), Iginio Colaïori (c), Antonio Di Matteo (c), Mattia Galli (b), Francesco Gemelli (c), Marco Borgi (c), Lucia Mitrano (c), Gaetano Pero (c), Massimiliano Scappaticci (c), Domenico Scordino (c), Sebastiano Sciarretta (a, b), Francesco Versaci (c)

(a) UOC UTIC/CARDIOLOGIA/EMODINAMICA - ICOT ISTITUTO MARCO PASQUALI ; (b) DIPARTIMENTO DI SCIENZE E BIOTECNOLOGIE MEDICO-CHIRURGICHE - SAPIENZA UNIVERSITÀ DI ROMA; (c) UOC UTIC/ EMODINAMICA/CARDIOLOGIA OSPEDALE SANTA MARIA GORETTI

Introduction: Renal denervation (RDN) has emerged as a promising treatment for resistant hypertension. This study aims to evaluate its effect on preventing cardiovascular, neurological, and renal events in patients with resistant hypertension.

Methods: We conducted a retrospective study involving 25 consecutive patients with resistant hypertension who underwent RDN at a high-volume Italian cardiovascular center from July 2019 to February 2024. Two groups were formed: one receiving primary prevention RDN without prior hypertension-related events (n=10) and the other receiving secondary prevention RDN after

hypertension-related events (n=15). We assessed cardiovascular, neurological, and renal event rates, along with changes in blood pressure, antihypertensive therapy requirements, and renal function post-RDN in both groups.

Results: Over the follow-up period at 1, 6, and 12 months post-RDN, no cardiovascular, neurological, or renal events were observed in either group. Both groups experienced a significant decrease in systolic blood pressure, with a mean reduction of -20 ± 21 mmHg (95% CI -27.643 to -12.357 , $p < 0.001$). The mean arterial pressure also decreased significantly by -9

Changes in systolic blood pressure, mean blood pressure, and the number of antihypertensive medications before and after renal denervation in patients with resistant hypertension.

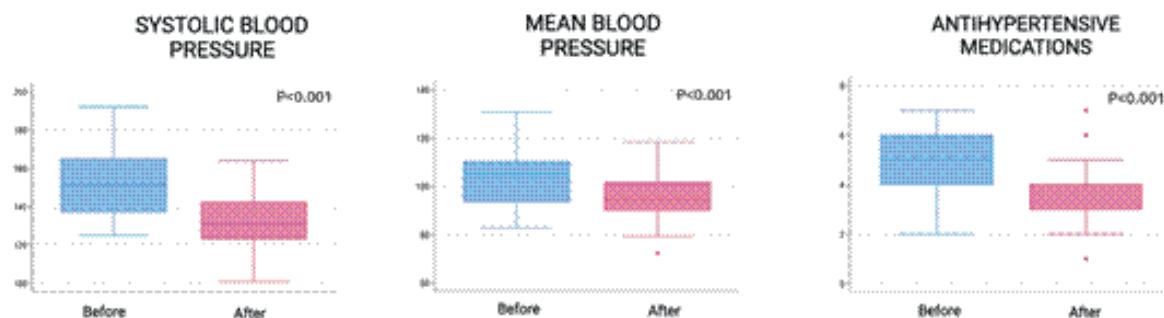


Figure 1

± 8 mmHg (95% CI -11.912 to -6.088, $p < 0.001$) in both groups. Additionally, there was a significant decrease in the requirement for antihypertensive medications, with patients reducing their medication use by an average of -1.3 ± 1.3 medications (95% CI -1.773 to -0.827, $p < 0.001$). No significant changes in renal function were observed in either group.

Conclusion: In this study population, RDN is associated with a significant reduction in blood pressure and antihypertensive medication use without affecting renal function. Neither group had any cardiovascular, neurological, or renal events during follow-up. Further studies are needed to validate RDN's role in broader patient populations and longer-term outcomes.



**IPERTENSIONE ARTERIOSA 960
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE
ARTERIOSA) FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO
D'ORGANO (IPERTENSIONE ARTERIOSA)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)**

PHEOCHROMOCYTOMA INDUCED REVERSE TAKOTSUBO SYNDROME

Davide Donelli (a), Nicolo' Pasini (a), Cecilia Massera (b), Giorgia Paoli (a), Ignazio Verzicco (b), Filippo Luca Gurgoglione (a), Aderville Cabassi (b), Diego Ardissino (a), Giampaolo Niccoli (a)

(a) CARDIOLOGY DIVISION, UNIVERSITY HOSPITAL OF PARMA, PARMA, ITALY; (b) CLINICA E TERAPIA MEDICA, UNIVERSITY HOSPITAL OF PARMA, PARMA, ITALY

BACKGROUND: Pheochromocytoma (PHEO) may cause myocardial injury through excessive catecholamine release, leading to acute cardiac complications like stress cardiomyopathy (takotsubo).

CASE PRESENTATION: A 58-year-old woman with a history of hypertensive episodes requiring emergency department visits and a diagnosis of bipolar disorder was airlifted to our hospital due to the sudden onset of dyspnea, vomiting, and epigastric pain. Upon arrival of emergency medical services, she developed severe hypotension, necessitating intravenous noradrenaline (NA) support. At home, the patient was on lamotrigine and lacidipine therapy and reported dysuria in the days preceding hospitalization. On admission, she was hemodynamically stable under NA support but exhibited respiratory failure. An ECG revealed ST upsloping depression in the anterior leads, while laboratory tests showed neutrophilia, elevated CRP and procalcitonin levels, and a urinalysis suggestive of a urinary tract infection. Empirical antibiotic therapy with piperacillin/tazobactam was initiated, later confirmed by a positive urine culture for *E. coli*. Echocardiography demonstrated a left ventricular (LV) reverse Takotsubo-like pattern (C), with basal segment akinesia and reduced ejection fraction (EF 38%), accompanied by

pulmonary congestion. Additionally, a 5 cm lesion was identified in the right adrenal gland (A). A CT scan was ordered, ruling out pulmonary embolism and confirming a right adrenal mass measuring 49x36 mm with rapid, intense contrast enhancement in the arterial phase, highly suspicious for PHEO (B). Coronary angiography

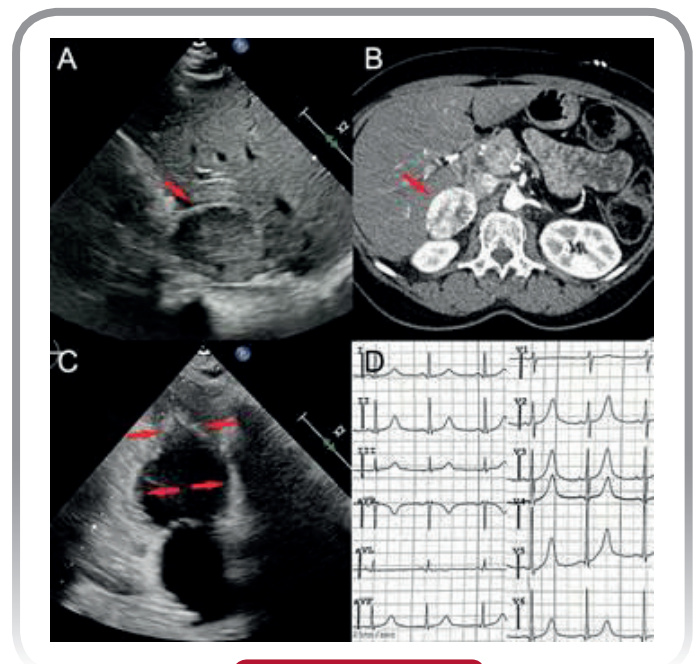


Figure 1

revealed no hemodynamically significant coronary lesions, excluding an ischemic etiology. Treatment with diuretics, antibiotics, and oxygen therapy resulted in gradual weaning from NA and from oxygen support. After five days, repeat echocardiography showed near-complete recovery of LV contractility (EF 54%) with only slight residual basal hypokinesia. The ECG evolved with high peaked anterior T waves and a peak QTc of 640ms (D). Urinary metanephrine levels were markedly elevated (metanephrine 562 µg, normetanephrine 5882 µg, 3-methoxytyramine 428 µg in 2L/24 hours), and

scintigraphy confirmed the diagnosis of PHEO. Alpha- and beta-blocker therapy was initiated with clinical improvement and adrenalectomy was planned.

CONCLUSION: This case illustrates a reverse Takotsubo syndrome induced by a PHEO crisis, likely triggered by the urinary infection; however, it remains undocumented whether an hypertensive crisis occurred prior to presentation, despite the patient's known history. The shock state on arrival was likely due to an overlap of acute heart failure and incipient sepsis.



IPERTENSIONE ARTERIOSA 907

FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA) FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO (IPERTENSIONE ARTERIOSA) INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)

CARDIOVASCULAR OUTCOMES OF VASCULAR AGEING ASSOCIATED PROTEOMIC PHENOGROUPS IN NORMOTENSIVE AND HYPERTENSIVE PATIENTS: RESULTS FROM THE UK BIOBANK

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(a) INTERNAL MEDICINE, DEPARTMENT OF CLINICAL AND EXPERIMENTAL SCIENCES, UNIVERSITY OF BRESCIA, BRESCIA, ITALY; (b) CENTRE FOR CARDIOVASCULAR SCIENCE, QMRI, UNIVERSITY OF EDINBURGH, EDINBURGH, UK; (c) DEPARTMENT OF INTERNAL MEDICINE, FACULTY OF MEDICINE, JAGIELLONIAN UNIVERSITY MEDICAL COLLEGE, CRACOW, POLAND; (d) CENTER FOR MEDICAL GENOMICS OMICRON, FACULTY OF MEDICINE, JAGIELLONIAN UNIVERSITY MEDICAL COLLEGE, CRACOW, POLAND

Background: Arterial stiffness is a hallmark of vascular ageing and can be assessed by measuring the arterial stiffness index (ASI) derived from finger photoplethysmography. The pathophysiologic mechanisms behind vascular ageing in hypertension pathogenesis and complications are not fully understood, therefore a more precise phenotypical classification of hypertension, based on vascular ageing mechanisms, is needed.

Methods: In the UK Biobank Caucasian population with plasma OLINK proteomic data, we used a general linear model adjusted for sex, age, body mass index (BMI), smoking status, and alcohol intake frequency to identify biomarkers associated with ASI in either normotensive or untreated hypertensive individuals (279 and 180 proteins respectively out of 2,923; at FDR $p < 0.05$). These analytes were then used to cluster in different phenogroups the normotensive ($n=16,375$) or hypertensive untreated subjects ($n=11,619$) utilising a model-based clustering technique. We analysed the pathways associated with stiffness with GO and KEGG. One-way ANOVA and χ^2 were used to compare phenogroups' clinical characteristics. Kaplan-Meier analysis and Cox regressions were used to assess phenogroups' cardiovascular outcome adjusting for cardiovascular risk factors.

Results: Normotensive and hypertensive subjects were divided into 5 biomarkers-driven phenogroups which differed in terms of age, sex, BMI, diabetes prevalence, smoking status, ASI, systolic and diastolic blood pressure, Townsend deprivation index, LDL and HDL cholesterol (ANOVA $p < 0.001$). In the normotensive patients, the phenogroup with the highest level of pro-inflammatory proteins has the most unfavourable cardiovascular profile, lowest event-free survival for hypertension, acute myocardial infarction (AMI), stroke, aortic aneurysm or dissection (AAD), heart failure (HF), cardiovascular death and composite of non-fatal stroke, non-fatal acute myocardial infarction and cardiovascular death (CVD) (all $p < 0.001$). Adjusting for cardiovascular risk factors, it also conveys an increased hazard of hypertension (HR 1.43 [95% CI, 1.14–1.79] $p=0.002$), AMI (HR 2.70 [95% CI, 1.35–5.38] $p=0.01$), HF (HR 2.64 [95% CI, 1.53–4.53] $p < 0.001$), cardiovascular death (HR 3.43 [95% CI, 1.82–6.44] $p < 0.001$) and CVD (HR 2.22 [95% CI, 1.49–3.30] $p < 0.001$) compared to the phenogroup with the lowest levels of pro-inflammatory proteins. In the hypertensive group the phenogroup with the highest levels of proteins involved in lysosomal activity, inflammatory and drug metabolic pathways showed the worst cardiovascular profile, the lowest event-free survival for cardiovascular death, CVD, AAD (all $p < 0.001$) and hypertensive heart disease ($p=0.004$).

Adjusting for cardiovascular risk factors, it displays an increased risk of cardiovascular death (HR 2.23 [95% CI, 1.35–3.66] $p=0.002$), CVD (HR 1.78 [95% CI, 1.28–2.48] $p<0.001$) compared to the phenogroup with the lowest levels of the same proteins.

Conclusions: Proteomic phenogroups based on

a vascular ageing index can prospectively identify normotensive patients with the highest risk of hypertension and poorest cardiovascular outcome and stratify hypertensive patients based on their cardiovascular risk. This approach may prompt future prevention strategies.



**IPERTENSIONE ARTERIOSA 34
FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO
(IPERTENSIONE ARTERIOSA)
TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)**

HYPERTENSIVE EMERGENCIES AND URGENCIES: ADHERENCE TO GUIDELINES AND RELATIONSHIP BETWEEN BLOOD PRESSURE MANAGEMENT AND IN- HOSPITAL MORTALITY

Alessandro Maloberti (a, b), Tommaso Valobra (c), Rita Cristina Myriam Intravaia (a), Valentina Giani (b), Ilaria Garofani (b), Lorenzo De Censi (b), Michele Galasso (b), Valentina Colombo (b), Alessandro Menna (b), Alessandro Menna (b), Annalisa Giacalone (b), Cecilia Ferretti (b), Andrea Sultana (b), Andrea Sultana (b), Silvia Gheda (d), Nicolò Capsoni (d), Filippo Galbiati (d), Michele Bombelli (b, c), Cristina Giannattasio (a, b)

(a) CARDIOLOGIA 4, ASST GOM NIGUARDA, MILANO, ITALIA; (b) SCUOLA DI MEDICINA E CHIRURGIA, UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA, MILANO, ITALIA; (c) OSPEDALE DI DESIO PIO XI, DESIO, ITALIA; (d) DIPARTIMENTO DI EMERGENZA- URGENZA ACCETTAZIONE (DEA), ASST GOM NIGUARDA, MILANO, ITALIA

Introduction: Data regarding prevalence and clinical management of hypertensive emergencies and urgencies are lacking and heterogeneous. Our goal is to characterize patients with hypertensive emergencies and urgencies admitted to the Emergency Department (ED) of our two hospitals.

In this population we also want to evaluate factors associated with organ damage, adherence to guidelines and the impact of Blood Pressure (BP) management on in-hospital mortality.

Method: We performed a multi-centre retrospective study collecting data about all adult patients with systolic BP ≥ 180 mmHg and/or diastolic BP ≥ 120 mmHg admitted to our hospitals' ED during 2017 and 2019.

Results: Admission to ED for BP elevation were 1838 (0.95% of total admission to ED), of whom 38% were hypertensive emergencies and 62% were hypertensive urgencies. Patients with hypertensive emergencies were older, mainly male, with more comorbidities and

more symptomatic at ED admission. In the emergencies group, we observe a SBP mean reduction of 39.50 mmHg (± 26.35) and a DBP mean lowering of 16.28 mmHg (± 17.57); the most used drugs were furosemide, nitroglycerin and parenteral labetalol. In the urgencies group, the mean reduction was 39.09 mmHg (± 22.46) for SBP and 15.34 mmHg (± 16.07) for DBP. The most used drug was short-acting nifedipine benzodiazepine and amlodipine in this group. Age, sex, clinical history of heart failure and chronic obstructive pulmonary disease, symptoms at ED admission and eGFR have been recognised as factors associated with organ damage. Instead, BP at ED admission and its management didn't appear to have a significant impact on outcomes.

Conclusions: Our study demonstrated better adherence to guidelines in the treatment of hypertensive emergency than of hypertensive urgencies. Furthermore, no significant association were found between the BP management in the ED and in-hospital mortality.

**IPERTENSIONE ARTERIOSA 34
FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO
(IPERTENSIONE ARTERIOSA)
TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)**

HYPERTENSIVE EMERGENCIES AND URGENCIES: ADHERENCE TO GUIDELINES AND RELATIONSHIP BETWEEN BLOOD PRESSURE MANAGEMENT AND IN- HOSPITAL MORTALITY

Alessandro Maloberti (a, b), Tommaso Valobra (c), Rita Cristina Myriam Intravaia (a), Valentina Giani (b), Ilaria Garofani (b), Lorenzo De Censi (b), Michele Galasso (b), Valentina Colombo (b), Alessandro Menna (b), Alessandro Menna (b), Annalisa Giacalone (b), Cecilia Ferretti (b), Andrea Sultana (b), Andrea Sultana (b), Silvia Gheda (d), Nicolò Capsoni (d), Filippo Galbiati (d), Michele Bombelli (b, c), Cristina Giannattasio (a, b)

(a) CARDIOLOGIA 4, ASST GOM NIGUARDA, MILANO, ITALIA; (b) SCUOLA DI MEDICINA E CHIRURGIA, UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA, MILANO, ITALIA; (c) OSPEDALE DI DESIO PIO XI, DESIO, ITALIA; (d) DIPARTIMENTO DI EMERGENZA- URGENZA ACCETTAZIONE (DEA), ASST GOM NIGUARDA, MILANO, ITALIA

Introduction: Data regarding prevalence and clinical management of hypertensive emergencies and urgencies are lacking and heterogeneous. Our goal is to characterize patients with hypertensive emergencies and urgencies admitted to the Emergency Department (ED) of our two hospitals.

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Conclusions: Our study demonstrated better adherence to guidelines in the treatment of hypertensive emergency than of hypertensive urgencies. Furthermore, no significant association were found between the BP management in the ED and in-hospital mortality.



IPERTENSIONE ARTERIOSA 36 PATOLOGIA DELL'AORTA (MALATTIE DEI VASI) FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA) ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA)

CAROTID-FEMORAL PULSE WAVE VELOCITY PROGRESSION IN HYPERTENSIVE PATIENTS IS ASSOCIATED WITH SUBSEQUENT CARDIOVASCULAR OUTCOMES

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(a) CARDIOLOGIA 4, DIPARTIMENTO "A. DE GASPERIS", OSPEDALE NIGUARDA CA' GRANDA, MILANO, ITALIA; (b) SCUOLA DI MEDICINA E CHIRURGIA, UNIVERSITÀ DI MILANO BICOCCA, MILANO; (c) CENTRO DI BIOINFORMATICA BICOCCA, BIostatistica E BIOIMAGING (CENTRO B4), SCUOLA DI MEDICINA E CHIRURGIA, UNIVERSITÀ DI MILANO BICOCCA, MILANO; (d) UNITÀ DI EPIDEMIOLOGIA, ATS DI MILANO, MILANO; (e) UNITÀ DI EPIDEMIOLOGIA, ATS BRIANZA, MONZA

Objective: Arterial stiffness (Pulse Wave Velocity - PWV) is associated with CV events and mortality. However, little is known on the relationship of its progression (Δ PWV) over time with CV outcomes. The aim of our study was to evaluate the relationship between PWV progression and all-cause mortality and CV events in hypertensive subjects.

Methods: We enrolled 402 consecutive hypertensive outpatients. At baseline anamnestic, clinical, BP, laboratory data and PWV were assessed. We performed a PWV follow-up examination at a median time of 3.7 ± 0.5 years. Patients were subsequently followed for a median time of 10.1 (IQR 9.5 - 10.5) years recording all-cause mortality and CV events.

Results: At baseline the mean age was 53.2 ± 13.0 years, SBP and DBP were 141.8 ± 17.5 and 86.8 ± 10.5 mmHg and PWV was 8.5 ± 1.9 m/s. Despite an improvement in

BP control (-9.2 ± 19.5 and -8.0 ± 12.3 for SBP and DBP respectively), at follow-up the population showed a PWV increase (Δ PWV $+0.6 \pm 1.9$ m/s). Progressors (Δ PWV ≥ 0.5 m/s, 204 patients, 50.7%) had a significantly lower survival probability and higher cumulative incidence of composite events, while no differences were seen for CV events (unadjusted analysis). At cox multivariable analysis neither Δ PWV ≥ 0.5 m/s (progressors) nor Δ PWV (as a spline function) were associated with CV events and with all-cause mortality. However, the association with survival probability and cumulative incidence of CV events, as a composite outcome, was significant (HR = 2.32, 95% CI: 1.33 - 4.04, $p=0.003$).

Conclusions: In conclusion, our study shows that PWV progression of at least 0.5 m/s is frequent in hypertensive patients and that it is associated with a significantly higher risk of developing CV events or dying (composite outcome).

IPERTENSIONE ARTERIOSA 853

BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)

FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA

(IPERTENSIONE ARTERIOSA) BIOLOGIA MOLECOLARE CARDIOVASCOLARE

(GENETICA E BIOLOGIA MOLECOLARE)

ALTERAZIONI PRECOCI E TARDIVE DEL MICROBIOTA INTESTINALE IN RELAZIONE ALL'OCCORRENZA DI ICTUS NEI RATTI SPONTANEAMENTE IPERTESI E PREDISPOSTI ALL'ICTUS ALIMENTATI CON UNA DIETA AD ALTO CONTENUTO DI SALE

Silvia Bencivenni (c), Donatella Pietrangelo (b), Speranza Rubattu (a, b)

(a) IRCCS NEUROMED; (b) DIPARTIMENTO DI MEDICINA CLINICA E MOLECOLARE, LA SAPIENZA; (c) DIPARTIMENTO DI FARMACIA E BIOTECNOLOGIE, UNIVERSITÀ DI BOLOGNA

L'ictus è la seconda causa di mortalità globale, responsabile del 10%-12% dei decessi annuali e principale causa di disabilità. I meccanismi alla base della patogenesi dello stroke non sono ancora stati completamente chiariti. Il ratto spontaneamente iperteso predisposto all'ictus (SHRSP) è un modello ottimale per indagare i meccanismi molecolari predisponenti all'evento cerebrovascolare. Il ratto SHRSP alimentato con una dieta ad alto contenuto di sale e basso contenuto di potassio (dieta in stile giapponese, JD), sviluppa danno d'organo e mostra un'incidenza di ictus del 100% al termine delle 7 settimane, a differenza del ceppo di controllo, ratto spontaneamente iperteso e resistente all'ictus (SHRSR). L'insorgenza dell'ictus negli SHRSP è preceduta da un aumento della proteinuria, perdita di peso e diarrea, suggerendo il coinvolgimento delle alterazioni del Microbiota Intestinale (MI) nella predisposizione all'ictus. Il lavoro ha caratterizzato il profilo del MI nei ratti SHRSP e SHRSR alimentati con JD allo scopo di identificare possibili alterazioni associate con lo stroke. La somministrazione di JD è stata effettuata per 4 settimane (Tempo breve) o per un massimo di 10 settimane (Tempo lungo). I ratti di controllo hanno ricevuto dieta regolare per la stessa durata di tempo. Nei ratti SHRSP alimentati con JD, il MI ha mostrato alterazioni della composizione rispetto ai ratti SHRSR,

sia nel breve che nel lungo periodo. In particolare, al termine delle 4 settimane, gli SHRSP hanno mostrato una riorganizzazione a livello tassonomico elevata che coinvolge i principali phyla Firmicutes e Bacteroidetes, con una sovrarappresentazione di Streptococcaceae (Streptococcus) e una sotto rappresentazione di Lachnospiraceae. È da notare che Streptococcus è stato trovato in eccesso nei soggetti ipertesi e nel MI a seguito di ictus nell'uomo, rafforzando l'associazione dei dati sperimentali con i dati clinici. I ratti hanno continuato la JD fino all'occorrenza della morte per ictus, avvenuta tra la sesta e la nona settimana. Anche in questo caso SHRSP e SHRSR hanno rivelato una diversa composizione del microbiota, con aumento di Patobionti quali Coriobacteriaceae e Desulfovibrio e riduzione di Lachnobacterium e Faecalibacterium. L'abbondanza di Coriobacteriaceae è stata associata a livelli alti di proteinuria nei ratti SHRSP, indice di danno renale. In conclusione, i nostri dati suggeriscono che alterazioni sia precoci che tardive del MI negli SHRSP alimentati con JD potrebbero danneggiare l'omeostasi intestinale e contribuire all'occorrenza dello stroke. Sulla base dei nostri risultati attuali, studi futuri potrebbero esaminare se la rimodulazione del microbiota mediante trattamento antibiotico o trapianto fecale possa influenzare l'incidenza dell'ictus nei ratti SHRSP.



**IPERTENSIONE ARTERIOSA 186
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI) VALUTAZIONE
ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)**

DIFFERENZE DI GENERE NELL'UTILIZZO DI FARMACI ANTIPERTENSIVI E RELATIVO SVILUPPO DI DANNO D'ORGANO: UNO STUDIO EPIDEMIOLOGICO DI PAZIENTI VALUTATI IN REGIME DI URGENZA BREVE

Emanuela Paoloni (a, b), Maria Luisa Poli (a, b), Elisa Lodi (b), Letizia Reggianini (a), Maria Grazia Modena (a, b) (a) CENTRO P.A.S.C.I.A. (PROGRAMMA ASSISTENZIALE SCOMPENSO CARDIACO, PATOLOGIE DELL'INFANZIA E A RISCHIO) AOU POLICLINICO DI MODENA; (b) UNIMORE, UNIVERSITÀ DI MEDICINA E CHIRURGIA DI MODENA E REGGIO EMILIA

Introduzione: L'ipertensione arteriosa rappresenta una delle principali cause di morbidità e mortalità a livello globale. L'ipertensione arteriosa può avere diversi effetti negativi sul cuore, tra cui l'aumento del carico di lavoro con conseguente ipertrofia ventricolare sinistra, e una ridotta elasticità delle arterie che può ripercuotersi a livella dell'aorta ascendente provocando ectasia. Questo studio si propone di valutare le differenze di trattamento in pazienti con ipertensione arteriosa che hanno svolto visita cardiologica ed Ecocardiografia doppler per la valutazione di danno d'organo associato.

Metodi: Sono stati raccolti dati da 683 visite cardiologiche con urgenza breve eseguite presso il nostro centro da Gennaio 2023 a Dicembre 2023. In seguito ad una prima osservazione sono stati selezionati tutti i soggetti che riferivano di essere ipertesi e di assumere una terapia farmacologica. I pazienti sono stati suddivisi successivamente in due gruppi in base alla presenza o meno di segni di danno d'organo all'ecocardiografia doppler (ipertrofia del ventricolo sinistro e/o ectasia dell'aorta ascendente e/o dilatazione isolata dell'atrio sinistro) correlati all'ipertensione arteriosa. Infine si sono indagate la tipologia di trattamento che il paziente effettuava per l'ipertensione arteriosa e le relative differenze di genere.

Risultati: Dei 683 pazienti 333 riferivano di presentare ipertensione arteriosa, di questi 161 erano donne (48,3%) e 172 uomini (51,7%). Tra i pazienti con danno d'organo, i maschi erano il 29% e le femmine il 33,5%. Le donne con segni di danno d'organo assumevano betabloccanti nel 46,6% dei casi, calcio-antagonisti nel 33,3%, ACE-inibitori nel 33,3% e ARB nel 22,2%. Le donne senza segni di danno d'organo assumevano betabloccanti nel 59,8% dei casi, calcio-antagonisti nel 29,9%, ACE-inibitori nel 30,8% e ARB nel 28%. Tra gli uomini con danno d'organo, il 56% assumeva betabloccanti, il 36% calcio-antagonisti, il 30% ACE-inibitori e il 32% ARB. Gli uomini senza segni di danno d'organo assumevano betabloccanti nel 55,6% dei casi, calcio-antagonisti nel 29,5%, ACE-inibitori nel 43,3% e ARB nel 21,3%. Inoltre, il 44% delle donne e il 41,3% degli uomini assumevano farmaci diuretici.

Conclusioni: Questo studio ha messo in evidenza che esistono differenze significative di genere nell'uso di farmaci antipertensivi e nello sviluppo di danno d'organo nei pazienti con ipertensione arteriosa valutati in regime di urgenza cardiologica breve. I dati raccolti mostrano che una proporzione consistente di pazienti presenta segni di danno d'organo, con una distribuzione simile tra uomini e donne. Tuttavia, è emersa una differenza

nella distribuzione delle classi farmacologiche per il trattamento dell'ipertensione arteriosa nelle popolazioni con e senza segni di danno d'organo suddivise per genere. Inoltre, un'elevata percentuale di pazienti, indipendentemente dal genere, non ha raggiunto un adeguato controllo della pressione arteriosa,

sottolineando la necessità di strategie terapeutiche più efficaci e personalizzate. Questo studio suggerisce che un monitoraggio attento e un approccio terapeutico individualizzato, che tenga conto delle differenze di genere, sono essenziali per migliorare gli esiti clinici nei pazienti ipertesi.



IPERTENSIONE ARTERIOSA 579

TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA) FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA) MONITORAGGIO DELLA PRESSIONE AMBULATORIALE (IPERTENSIONE ARTERIOSA)

RIDUZIONE PRECOCE DELLA PRESSIONE ARTERIOSA CENTRALE E DELLA PULSE WAVE VELOCITY IN PAZIENTI CON IPERTENSIONE ARTERIOSA RESISTENTE SOTTOPOSTI A DENERVAZIONE RENALE

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CARDIOLOGIA, AZIENDA OSPEDALIERO-UNIVERSITARIA SANT'ANDREA, ROMA, ITALIA

Introduzione. La denervazione renale (RDN) è una procedura efficace, sicura e raddomandata nei pazienti con ipertensione arteriosa resistente (RHT) con o senza altre comorbidità. I suoi effetti sulla Pressione Centrale Aortica (cPA) e sulla funzione vascolare periferica non sono del tutto noti.

Obiettivo. Valutare gli effetti della RDN ad 1 mese ed a 6 mesi sulla cPA e sulla Pulse Wave Velocity (PWV) in una coorte di pazienti con RHT sottoposti a RDN.

Metodi. In questo studio monocentrico, osservazionale, di coorte, sono stati inclusi pazienti con RHT sottoposti a RDN presso la UOC di Cardiologia, AOU Sant'Andrea di Roma. Tutti i pazienti sono stati sottoposti in modo consecutivo alla misurazione della PA brachiale (bPA) clinica, alla valutazione del danno d'organo correlato all'ipertensione arteriosa e della aderenza alla terapia farmacologica. In particolare, la valutazione non invasiva della funzione vascolare, incluso PWV e cPA, è stata eseguita mediante un misuratore automatico, oscillometrico, validato (Mobil-O-Graph PWA Monitor, I.E.M. GmbH, Stolberg, Germany). Dopo la procedura di RDN, i pazienti sono valutati ad 1-3-6 mesi dalla procedura di RDN.

Risultati. Sono stati inclusi nel presente studio 4 pazienti maschi, adulti, con RHT (età 56.6 ± 8.4 , IMC 28.9 ± 3.4 , cPA sistolica/diastolica $143.5 \pm 12.6/92.6 \pm 6.9$ mmHg) in terapia con 5.1 ± 0.8 classi di farmaci antipertensivi. I risultati della procedura di RDN sulla cPA e sulla PWV sono illustrati nella Figura 1. Ad 1 mese dalla procedura di RDN sono state osservate riduzioni significative della PA sistolica e diastolica, sia brachiale ($P < 0.001$) che centrale ($P < 0.001$). Inoltre, sono state osservate riduzioni significative della pressione di polso centrale (cPP), della PWV ($P < 0.001$) e del numero di farmaci antipertensivi assunti dai pazienti con RHT ($P < 0.001$). Non si sono verificati eventi avversi a seguito della procedura di RDN, né sono state registrate variazioni dei parametri di funzione renale (creatinina, eGFR).

Conclusioni. La procedura di RDN si conferma essere efficace e sicura nei pazienti con RHT, non solo in termini di riduzione della bPA, ma anche della cPA, sia sistolica che diastolica, della funzione vascolare, espressa come riduzione della cPP, della PWV, e della semplificazione della terapia farmacologica antipertensiva (riduzione del numero e del dosaggio dei farmaci).

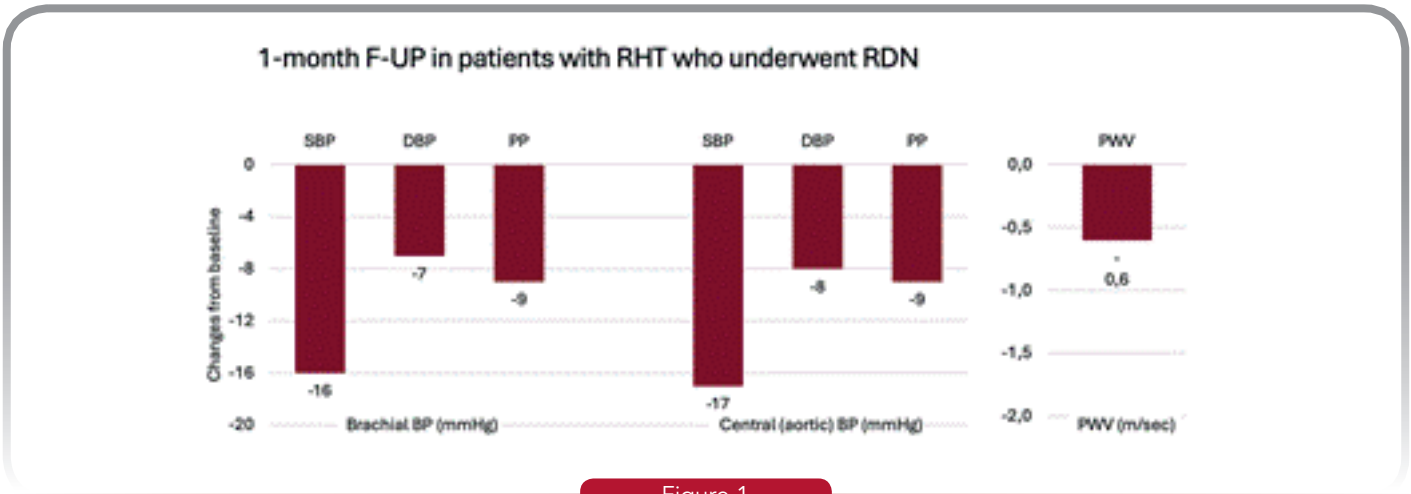


Figure 1



**IPERTENSIONE ARTERIOSA 596
MONITORAGGIO DELLA PRESSIONE AMBULATORIALE
(IPERTENSIONE ARTERIOSA) FISIOPATOLOGIA DELL'IPERTENSIONE
ARTERIOSA (IPERTENSIONE ARTERIOSA)
TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)
DIABETE E MALATTIE CARDIOVASCOLARI
(DIABETE E MALATTIE DEL METABOLISMO)**

**CORRELAZIONE TRA AUMENTO DEI VALORI PRESSORI SISTOLICI NOTTURNI ED IPERGLICEMIA IN
UNA COORTE DI PAZIENTI ADULTI CON IPERTENSIONE ARTERIOSA SOTTOPOSTI A MONITORAGGIO
AMBULATORIALE DELLE PRESSIONE ARTERIOSA DELLE 24 ORE**

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CARDIOLOGIA, AZIENDA OSPEDALIERO-UNIVERSITARIA SANT'ANDREA, ROMA, ITALIA

Introduzione. L'iperglicemia a digiuno in assenza di una terapia farmacologica ipoglicemizzante è un importante fattore di rischio per lo sviluppo e la progressione di coronaropatia, soprattutto in presenza di ipertensione arteriosa.

Obiettivo. Valutare i valori di pressione arteriosa (PA) clinica, diurna e notturna in una coorte di pazienti adulti con ipertensione arteriosa ed iperglicemia a digiuno rispetto ad un gruppo di pazienti normoglicemici.

Metodi. In questo studio monocentrico, osservazionale, di coorte, sono stati inclusi pazienti adulti affetti da ipertensione arteriosa, sottoposti in modo consecutivo alla valutazione del profilo pressorio completo (PA clinica e monitoraggio PA 24 ore) mediante un misuratore automatico, oscillometrico, validato (Mobil-O-Graph PWA Monitor, I.E.M. GmbH, Stolberg, Germany). La popolazione è stata suddivisa in tre gruppi sulla base dei valori di glicemia a digiuno (FPG): 1) normoglicemia, FPG <100 mg/dl; 2) iperglicemia, FPG compresi tra 100 e 126 mg/dl; 3) diabete mellito, FPG \geq 126 mg/dl. Sono stati esclusi dal presente studio tutti i pazienti in terapia farmacologica ipoglicemizzante, con obesità grave, con precedenti cardiovascolari o con altre condizioni cliniche tali da condizionare i valori di FPG.

Risultati. Sono inclusi nel presente studio 2256 pazienti adulti (42.4% donne, età media 59.5 ± 14.8 anni, IMC 28.9 ± 5.8 kg/m²), di cui 1495 (66.3%) nel gruppo 1 (controlli), 635 (28.1%) nel gruppo 2 e 126 (5.6%) nel gruppo 3. Non sono state osservate differenze significative tra gruppi in relazione ai valori di PA clinica, sia sistolica (P=0.185) che diastolica (P=0.446), ai valori di PA sistolica media diurna (P=0.113), PA diastolica media 24 ore (P=0.139), diurna (P=0.421) e notturna (P=0.930). Di contro, sono stati registrati valori significativamente aumentati di PA sistolica media nel gruppo 3 rispetto al gruppo 2 ed 1, sia durante le 24 ore (133.8 ± 16.3 vs. 130.2 ± 12.4 vs. 129.6 ± 13.3 mmHg; P=0.031) che soprattutto durante il periodo notturno (125.2 ± 20.0 vs. 120.8 ± 14.4 vs. 119.0 ± 14.7 mmHg; P<0.001). Date queste differenze, i pazienti nel gruppo 3 hanno mostrato un minore dipping notturno, sia per la sistolica (8.5 ± 6.4 vs. 9.5 ± 8.3 vs. 10.7 ± 7.4 mmHg; P=0.004) che per la diastolica (13.5 ± 10.5 vs. 14.0 ± 8.0 vs. 15.3 ± 8.5 mmHg; P=0.010). Sono state osservate correlazioni significative e positive tra valori di PA sistolica sia delle 24 ore (r=0.062; P=0.015) che notturna (r=0.090; P<0.001), ma non con i valori di PA sistolica clinica (P=0.063) e diurna (P=0.071).

Conclusioni. L'iperglicemia a digiuno è risultata associata ad un aumento significativo dei valori di PA sistolica durante monitoraggio ambulatoriale delle 24 ore, particolarmente nel periodo notturno. Questo andamento assieme alla riduzione/assenza di dipping

notturno possono contribuire a spiegare l'elevato rischio di coronaropatia e disfunzione ventricolare sinistra nei pazienti con ipertensione arteriosa ed alterato metabolismo glucidico.



IPERTENSIONE ARTERIOSA 683 MONITORAGGIO DELLA PRESSIONE AMBULATORIALE (IPERTENSIONE ARTERIOSA) TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA) FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA)

ANALISI DEL PROFILO PRESSORIO DELLE 24 ORE IN PAZIENTI CON URGENZA IPERTENSIVA

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Introduzione. L'urgenza ipertensiva è una condizione clinica caratterizzata da un aumento stabile e persistente dei valori di pressione arteriosa (PA) clinica sistolica/diastolica al di sopra di 180/110 mmHg in assenza di segni e sintomi acuti di danno d'organo mediato dall'ipertensione arteriosa (HMOD).

Obiettivo. Valutare il profilo pressorio delle 24 ore in una coorte di pazienti ambulatoriali con urgenza ipertensiva.

Metodi. In questo studio monocentrico, osservazionale, di coorte, retrospettivo, sono stati inclusi pazienti adulti riferiti in modo consecutivo presso il Centro per la Diagnosi e la Cura dell'Ipertensione Arteriosa, UOC di Cardiologia, AOU Sant'Andrea di Roma, per la valutazione del profilo pressorio completo (PA clinica e monitoraggio PA 24 ore) e la valutazione del HMOD. Tutti i pazienti sono stati sottoposti a misurazione della PA mediante un misuratore automatico, oscillometrico, validato (Mobil-O-Graph PWA Monitor, I.E.M. GmbH, Stolberg, Germany). La popolazione è stata suddivisa in due gruppi sulla base dei valori di PA clinica:

1) pazienti con urgenza ipertensiva, PA clinica sistolica/diastolica $\geq 180/110$ mmHg; 2) pazienti senza urgenza ipertensiva, PA clinica sistolica/diastolica $< 180/110$ mmHg. Sono stati esclusi dal presente studio tutti i pazienti con ipertensione in gravidanza, ipertensione secondaria, con precedenti cardiovascolari o con altre condizioni cliniche acute o croniche tali da condizionare la misurazione della PA.

Risultati. Sono stati inclusi nel presente studio 11,812

pazienti, adulti, con misurazioni di PA clinica ed ambulatoriale 24 ore valide (48.7% donne, età 58.1 ± 14.0 anni, IMC 27.0 ± 4.5 kg/m², PA clinica $143.5 \pm 12.6/92.6 \pm 6.9$ mmHg, PA ambulatoriale 24 ore $130.7 \pm 13.8/79.6 \pm 9.9$ mmHg), di cui 409 (3.3%) con urgenza ipertensiva. Pur in presenza di un numero maggiore (1.8 ± 1.5 vs. 1.3 ± 1.3 ; $P < 0.001$) e di una percentuale maggiore di pazienti in terapia farmacologica antipertensiva (67.5 vs. 60.2%; $P = 0.02$), i pazienti del gruppo 1 hanno mostrato valori persistentemente e significativamente elevati di PA delle 24 ore sistolica (150.4 ± 16.7 vs. 130.0 ± 13.1 mmHg; $P < 0.001$) e diastolica (86.9 ± 12.5 vs. 79.4 ± 9.6 mmHg; $P < 0.001$), diurna sistolica (155.0 ± 16.9 vs. 133.5 ± 13.5 mmHg; $P < 0.001$) e diastolica (90.5 ± 13.1 vs. 82.7 ± 10.2 mmHg; $P < 0.001$), notturna sistolica (138.7 ± 18.8 vs. 120.1 ± 14.3 mmHg) e diastolica (77.6 ± 13.2 vs. 70.4 ± 9.7 mmHg; $P < 0.001$), rispetto al gruppo di controllo. Tali differenze sono rimaste significative sia in presenza che in assenza di terapia farmacologica antipertensiva. Inoltre, i pazienti del gruppo 1 sono risultati avere una maggiore età (62.7 ± 12.2 vs. 58.0 ± 14.0 anni; $P < 0.001$), IMC (28.4 ± 5.7 vs. 26.9 ± 4.5 kg/m²; $P < 0.001$) e diabete (19.8 vs. 11.3%; $P < 0.001$) rispetto a quelli del gruppo 2.

Conclusioni. I pazienti ambulatoriali con urgenza ipertensiva hanno mostrato un profilo pressorio delle 24 ore, diurno e notturno consistentemente peggiore rispetto a quello dei pazienti senza urgenza ipertensiva, indipendentemente della presenza o meno di terapia farmacologica antipertensiva.

CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

MALATTIE DEI VASI

**MALATTIE DEI VASI 650
 PATOLOGIA DELLE VENE (MALATTIE DEI VASI)
 ABLAZIONE TRANSCATETERE (ARITMIE)
 FIBRILLAZIONE ATRIALE (FA) (ARITMIE)
 COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
 (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)**

**PULMONARY VEIN STENOSIS FOLLOWING RADIOFREQUENCY ABLATION:
 AN ACQUIRED AND DREADED COMPLICATION**

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(a) UNIVERSITA' DEGLI STUDI DI MILANO; (b) OSPEDALE GALEAZZI SANT'AMBROGIO

Background: Transcatheter ablation is the gold standard treatment of AF in patients refractory to antiarrhythmic drugs. A rare but serious complication is pulmonary vein stenosis (PVS), whose recognition is frequently delayed because of misleading symptoms such as dyspnea, hemoptysis, chest discomfort and cough suggesting other pathologies (pulmonary cancer, pneumonia, interstitial lung disease and idiopathic pleural effusion).

Diagnosis: Computed tomography angiography (CTA) is the pivotal test for defining PV anatomy and PVS with related parenchymal and vascular lung alterations. Magnetic resonance angiography may be also used to avoid radiation exposure, while transthoracic and transesophageal echocardiogram allows pulmonary hypertension assessment and PV flow. Pulmonary

ventilatory/perfusion scanning may provide information on pulmonary functional modifications.

Treatment: Percutaneous transluminal angioplasty (PTA) with bare metal stent (BMS) implantation, gold standard treatment for PVS, correlates with high success rate but is limited by significant incidence of in-stent restenosis (ISR). Cutting balloon angioplasty and drug-coated balloon may be used to treat ISR. Main intraprocedural complication is hemoptysis, due to wire-related perforations or collateral bleeding. Postprocedural therapy includes dual antiplatelet therapy (DAPT) ± oral anticoagulation (OAC). Latest evidence suggests that DAPT + OAC for 6 months may lower ISR rate. Follow-up (FU) with CTA is indicated at 6 months or when symptoms recur.



Figure 1

Our clinical series: Since 2009, 19 patients underwent PTA+BMS for PVS treatment after AF ablation. ISR occurred in 6 (32%). After initial procedure, two (11%) patients required 2 additional treatments for a total of 30 procedures. Most patients were male (14/19, 74%) and mean age was of 53 [31-71] years. Dyspnea was present in 84% of patients, hemoptysis in 63%, fatigue in 58%, cough in 42%. An initial misdiagnosis (cancer or pneumonia) was made in 7 patients. The PVs most frequently involved were the left superior (LSPV) in 29/30 (97%) and the left inferior (LIPV) in 20/30 (67%) procedures. Right PVs were less frequently involved.

Stenosis of the RSPV and RIPV were found in 4/30 (13%) and 6/30 (20%) procedures, respectively. Symptom improvement was observed in 97% of patients: in these, NYHA class improvement was of at least one grade.

Conclusions: PVS is still a dreadful complication of AF ablation despite new ablation technologies and imaging guidance. Misdiagnosis is frequent and may cause disease progression and late disease recognition. Percutaneous intervention with PTA+BMS is standard of care but is limited by ISR. Thus, FU with CTA is mandatory. Future techniques are needed to optimize treatment and minimize ISR.



MALATTIE DEI VASI 8

ARTERIOPATIA ARTI INFERIORI (MALATTIE DEI VASI)

ARTERIOPATIA DEI TRONCHI SOVRA-AORTICI (MALATTIE DEI VASI)

PATOLOGIA DELLE VENE (MALATTIE DEI VASI)

STROKE ISCHEMICO IN SOGGETTI ANZIANI: CORRELAZIONE CON IL GRADO DI STENOSI DELLA PLACCA E SOPRAVVIVENZA A 12 MESI

Davide Ceccato (a), Anna Ramin (a)

(a) UOC ANGIOLOGIA, AZIENDA OSPEDALIERA UNIVERSITA DI PADOVA

Introduction: In elderly individuals, cerebrovascular disease is one of the leading causes of mortality and disability. The primary cause underlying ischemic events is atherosclerotic stenotic-occlusive pathology of the extracranial carotid arteries. These plaques are responsible for 20% of strokes with an embolic or hemodynamic etiology. However, it is not known whether the degree of stenosis correlates with survival after an ischemic event. The aim of the study was to assess the association between symptomatic carotid plaques and the recurrence of ischemic cerebrovascular events in elderly patients hospitalized for acute ischemic stroke.

Methods: From July 2022 to October 2023 patients with acute cerebrovascular events were recruited at the Geriatric Clinic of Padua and followed for at least 12 months after discharge. Atherosclerotic plaques were defined using arterial echo(color)doppler of the supra-aortic trunks within 5 days of the onset of the stroke. The primary outcome was mortality and the recurrence of ischemic stroke within 12 months based on the degree of carotid plaque stenosis. Mortality from stroke and all causes, the incidence of new events, hemorrhagic infarction, new hospitalizations, and possible correlations between carotid plaques and adverse events were also evaluated.

Results: The cohort includes 112 hospitalized patients: 87 (76%) with non-significant carotid stenosis (<50%), 15 (13%) with significant stenosis (50-70%), and 10 (8.9%) with critical stenosis (>70%). Thus, we observed an incidence of hemodynamically significant supra-aortic trunk artery disease of approximately 22%; however, survival was not dependent on the degree of carotid plaque stenosis. Additionally, the recurrence of ischemic stroke and the need for rehospitalization at 12 months showed a similar trend regardless of plaque type.

Conclusions: In elderly individuals with ischemic stroke, carotid plaques do not appear to correlate with mortality and the occurrence of adverse events at 12 months post-event. The data indicate that the distribution of CAD and PAD varies significantly between the two plaque groups. Patients with hemodynamic plaques have a higher incidence of CAD and PAD compared to those with non-hemodynamic plaques, confirming that these patients are often polyvascular. These results support the literature recommending a comprehensive vascular assessment to identify arteriopathies in various regions, even in the presence of non-hemodynamic plaques. Therefore, in this patient cohort, a secondary prevention plan for cardiovascular events is necessary regardless of the level of carotid plaque stenosis.

MALATTIE DEI VASI 845

PLACCA VULNERABILE (ATEROTROMBOSI)

ARTERIOPATIA DEI TRONCHI SOVRA-AORTICI (MALATTIE DEI VASI)

PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI

(PREVENZIONE E RIABILITAZIONE)

TRANSRADIAL/BRACHIAL CAROTID ARTERY STENTING IN 703 CONSECUTIVE PATIENTS. A FEASIBLE, SAFE AND EFFECTIVE FIRST OPTION ENDOVASCULAR STRATEGY TO TREAT CAROTID ARTERY STENTING

Matteo Ferrari (a), Ludovica Torzolini (a), Edoardo Oscar Genta (a), Bianca Ada Magnanini (a), Anna Pettazzi (a), Stefano Galli (a), Giovanni Teruzzi (a), Sarah Troiano (a), Piero Montorsi (a)
(a) UNIVERSITA' DEGLI STUDI DI MILANO - CENTRO CARDIOLOGICO MONZINO

Background: Carotid artery stenting (CAS) is usually performed through femoral approach (FA). However, specific anatomic settings (bovine aortic arch, lack of patent peripheral axes, aortic arch disease) make this strategy difficult, increasing the risk of periprocedural cerebral complications.

Aim: to evaluate feasibility, safety and efficacy of transradial (TR) or transbrachial (TB) CAS in patients (pts) with significant carotid stenosis evaluated via Doppler US + CT-angiography (> 50% if symptomatic, >70% if asymptomatic).

Methods: Among 1600 CAS procedures performed from 2008 to 2024, 703 (44%) pts (75% males, mean age 74±7 years, 89% asymptomatic) entered the institutional

TR/TB CAS program: first 100 pts with anatomic 'contraindications' to FA, followed by an 'all comers' (603 pts). The choice of TR (637, 91%) or TB CAS was left at operator's discretion. The full femoral CAS tools were used including 8Fr proximal protection (149 pts, 21%). Index carotid axes were right, left and left bovine in 56%, 22%, 22%, respectively.

Results: Technical and procedural success were 99% and 94.4%, respectively. Cross-over to FA was 3.1% (22/703), confined to the first step period. In-hospital and 30-day MACCEs' rate is reported in the figure. Major vascular complications occurred in 13 pts (1.8%). Only one event (non-cardiac death) occurred after dismissal in the first 30 days.



MALATTIE DEI VASI 861
PLACCA VULNERABILE (ATEROTROMBOSI)
ARTERIOPATIA DEI TRONCHI SOVRA-AORTICI (MALATTIE DEI VASI)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

IMAGING OF CAROTID PLAQUE VULNERABILITY, INFLAMMATORY ACTIVITY AND SUBCLINICAL NEUROLOGICAL EVENTS IN ASYMPTOMATIC PATIENTS

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(a) UNIVERSITÀ DI PISA, PISA, ITALIA; (b) AZIENDA OSPEDALIERO UNIVERSITARIA PISANA, PISA, ITALIA; (c) FONDAZIONE GABRIELE MONASTERIO, MASSA, ITALIA

Background and Purpose: Asymptomatic carotid artery stenoses $\geq 60\%$ are susceptible to invasive treatment if they present imaging characteristics associated with an increased risk of stroke. Little is known about characteristics of plaque determining $< 60\%$ stenoses. We aimed at evaluating the role of imaging signs of plaque vulnerability and inflammatory plaque activity in patients with asymptomatic intermediate carotid artery stenoses.

Methods: In the Carotid Artery Multi-modality imaging Prognostic (CAMP) study (granted by Bando Ricerca Salute 2018 - Regione Toscana) we prospectively enrolled 200 patients with asymptomatic, intermediate (40-60%) carotid artery stenoses assessed by Doppler ultrasound (DUS). Unless contraindicated, patients were evaluated using multimodality imaging. Plaque vulnerability was defined by the presence of either plaque ulceration on computed tomography angiography (CTA) or intraplaque haemorrhage (IPH) or lipid-rich necrotic core (LRNC) on magnetic resonance angiography (MRA). Brain magnetic resonance imaging (MRI) was performed in all patients. A subgroup of 75 patients underwent ^{18}F -fluorodeoxyglucose positron emission tomography (PET).

Results: Imaging signs of plaque vulnerability were detected in 52% of patients (Figure) (IPH and/or LRNC was found in 26%, plaque ulceration was found in 37%). They were more frequent in patients with $\geq 50\%$ stenoses compared with $< 50\%$ at DUS (63% vs 28%, $p=0.002$). No difference in the prevalence of cardiovascular risk factors was noted between those with and without signs of vulnerability. Indices of high inflammatory plaque activity were associated with plaque ulceration and IPH, but not with LRNC. Subclinical embolic brain infarctions were found on brain MRI in 8.8% of patients. These patients had higher prevalence of LRNC (50% vs 17%, $p<0.05$), lower estimated glomerular filtration rate (55 ± 8 vs 73 ± 23 mL/min/1.73mq, $p<0.001$) and higher high-sensitivity cardiac troponin T (16 ± 4 vs 12 ± 8 ng/ml, $p<0.05$). LRNC was associated with a higher risk of prevalent embolic lesions (odds ratio 4.86, 95% confidence interval 1.08-21.8, $p<0.05$).

Conclusion: Imaging signs of vulnerability are highly prevalent in patients with asymptomatic intermediate carotid artery stenosis. LRNC significantly correlates with subclinical embolic brain infarcts on MRI. Non-invasive multimodality imaging helps to better characterize carotid plaques and can be used to identify a subgroup of patients at higher risk of events.

MALATTIE DEI VASI 791
ARTERIOPATIA ARTI INFERIORI (MALATTIE DEI VASI)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

**ARTERIOPATIA PERIFERICA COME PREDITTORE DI MORTALITA' ED EVENTI CARDIOVASCOLARI A 12 MESI
IN PAZIENTI CON STENOSI VALVOLARE AORTICA SINTOMATICA SOTTOPOSTI AD IMPIANTO DI TAVI**

Francesca Curri (b), Chiara Curreri (b), Davide Ceccato (a)

(a) AZIENDA OSPEDALIERA DI PADOVA UOC ANGIOLOGIA; (b) AZIENDA OSPEDALIERA DI PADOVA UOC GERIATRIA

Introduzione: i pazienti sottoposti ad impianto valvolare transcateretere (TAVI) presentano un rischio cardiocirurgico aumentato. Quindi, stratificare una coorte di soggetti candidati a TAVI rappresenta uno step strategico per ridurre l'incidenza di complicanze. Ad oggi pochi studi hanno valutato possibili predittori dopo l'intervento. Tra questi, l'OCEAN-TAVI Registry suggerisce l'indice pressorio caviglia-braccio (ABI) come possibile marker di sopravvivenza. Pertanto, è ragionevole ipotizzare che l'arteriopatia periferica (PAD) possa svolgere un ruolo nel selezionare paziente ad alto rischio di eventi avversi

Materiali: studio osservazionale prospettico condotto tra Gennaio 2021 e Aprile 2023, presso l'Azienda Ospedaliera Università di Padova, nei reparti/ambulatori di Cardiologia, Angiologia e Geriatria. Pazienti consecutivi con stenosi aortica serrata ad alto rischio sono stati sottoposti a TAVI. La stratificazione pre-operatoria ha previsto la raccolta delle caratteristiche basali e una valutazione della PAD con ecocolordoppler multi-distrettuale. Abbiamo definito PAD critica in caso di stenosi carotidea > 50%, arteriopatia obliterante degli arti inferiori > 50% oppure aneurisma dell'aorta

addominale > 5 cm. Sono stati esclusi i pazienti con sopravvivenza < 6 mesi dopo la procedura. I pazienti sono stati seguiti per 12 mesi, definendo l'outcome primario un composito di sopravvivenza e insorgenza di MACE.

Risultati: sono stati arruolati 204 pazienti, di cui 164 eleggibili per lo studio. Le caratteristiche basali sono risultate omogenee tra i gruppi con PAD critica e non. L'incidenza di PAD critica è stata del 20.1%, distribuita in modo prevalente a livello dei tronchi sovraortici (23 soggetti, 69%). Dopo un follow up di 12 mesi, i pazienti con PAD critica hanno presentato un maggior rischio di sviluppare eventi avversi (HR 4.77, IC 95%, 1.74-13.03). In particolare, soggetti con PAD critica a livello degli arti inferiori hanno presentato un rischio maggiore di mortalità per tutte le cause (HR= 6.72, IC 95% 3.52-12.83).

Conclusioni: la PAD potrebbe risultare come fattore prognostico non invasivo, da valutare in soggetti candidati a TAVI, per selezionare una coorte di paziente a più alto rischio di mortalità o MACE dopo la procedura



MALATTIE DEI VASI 208
PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
ARTERITI (MALATTIE DEI VASI)

BEYOND AORTIC SIZE: EXPLORING ALTERNATIVE PREDICTORS OF OUTCOME IN AORTIC DISSECTIONS, A LARGE SCALE RETROSPECTIVE ANALYSIS

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Background: Aortic dissection is a critical medical emergency that is characterized by the separation of the layers within the aortic wall. Timely diagnosis and intervention together with control of predisposing risk factors are essential for reducing the potentially life-threatening consequences.

Methods: This retrospective analysis encompasses patients undergoing surgery for aortic dissection in our center between 1985 and 2023, examining clinical data and risk factors to identify potential determinants of risk independent of aortic diameter. Exclusion criteria involved patient lacking sufficient clinical data. We stratified patients into two groups based on aortic diameter (below or above 55mm), and a comparative analysis was conducted between these populations. Subsequently, Cox multivariate analysis was applied to discern independent predictors of mortality. Primary endpoint was identifying factors predisposing to mortality in cases of aortic dissection.

Results: we enrolled 595 patients, mean age was $62.9 \pm$

13.2 years, 63 % male. Average BMI was $26,6 \pm 4,41$ Kg/m². Statistical analysis revealed significant differences in weight: 79.45 ± 15.9 in the <55 mm group vs. 72.87 ± 12.9 in the ≥ 55 mm group, and the type of aortic dissection, since type 1 was more prevalent in the smaller (<55 mm) diameter group (81% vs. 9%, $p < 0, 01$). Deaths at 30 days were 152, (101 males, 51 females), overall mortality was 25,54%. Body weight (Hazard ratio 1,03, CI [1,01; 1,06] p value 0,01) and age (Hazard ratio 1,06, CI [1,02; 1,1] p value $<0,01$) emerged as independent predictors of mortality.

Conclusions: our findings suggest that higher body weight could represent a risk factor for aortic dissection also in lower aortic diameters and support its role as marker of in hospital mortality after intervention for acute aortic dissection. The study underscores the importance of considering factors beyond aortic diameter in risk assessment and prognosis to provide tailored preventive strategies, with particular attention to body weight reduction

MALATTIE DEI VASI 314
PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)

PROSTHETIC ENDOCARDITIS: A DIAGNOSTIC CHALLENGE IN THE ERA OF MULTIMODAL IMAGING

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Introduction Prosthetic endocarditis is a clinical condition associated with high morbidity and mortality rates. The diagnosis of blood culture-negative forms, which are more complex to recognize, can benefit significantly from the support of multimodal imaging.

Case Summary and Initial Admission A 50-year-old man with a history of hypertension, dyslipidemia, smoking, post-traumatic epilepsy, psychiatric disorders, and recent dental abscess presented to the emergency department (ED) in January 2024 with acute heart failure during atrial fibrillation with rapid ventricular response. Echocardiography and CT scan revealed a bicuspid aortic valve with severe valve insufficiency, an aortic root aneurysm (maximum bulb diameter 62x51mm), and severe left ventricular dilation and dysfunction (LVEDV 178 ml/m², EF 38%). After coronary angiography, he underwent replacement of the aortic root and ascending aorta with a Valsalva graft (St. Jude Masters HP No. 27), reimplantation of the coronary arteries according to the Bentall procedure, and Atriclip 45mm placement. The postoperative course was complicated by a surgical site infection with 16s rRNA/NGS positivity for *S. thermophilus* 16%, *A. schindleri* 13%, *G. adiacens* 13%, treated with antibiotic therapy and removal of sternal steel wires (TZP+LZD for 2 weeks, then FEP+VAN+MET,

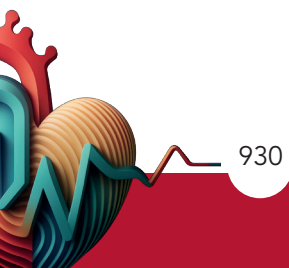
then FEP+LZD+MET for 2 weeks). He was discharged asymptomatic, afebrile, with an EF of 44%, and started on outpatient rehabilitation.

Second Admission and Urgent Treatment In June 2024, he was admitted to the ED with fever and elevated inflammatory markers (CRP 182.2 mg/L) without other symptoms. Suspecting a respiratory infection, he was discharged home on antibiotics (AMC+CLA). Due to persistent fever in the following days, an elective admission to Cardiology was arranged to exclude bacterial endocarditis. Upon admission, the patient was asymptomatic with decreasing inflammatory markers (CRP 15.6 mg/L, negative PCT, WBC within normal limits). Echocardiography showed normal functioning of the valve prosthesis, but the prosthetic conduit was not adequately assessable. To exclude prosthetic conduit endocarditis, a thoracic CT angiography was performed, revealing a fissure in the anterior wall of the native ascending aorta (25x20mm) above the prosthetic component, with contrast leakage into the mediastinum and a collection in the same location (26x67x75mm). The patient urgently underwent pseudoaneurysm repair, debridement of the hematoma and inflammatory material (negative cultures), and revision of the mechanical prosthesis. Postoperative anemia (Hb 7.2 g/dL) prompted a follow-up CT angiography, which



identified a periaortic hematoma (9x5x14cm) without active leakage but with air bubbles. He was treated with an intensive antibiotic regimen (DAP+GEN+FOF), but inflammatory markers remained elevated despite negative cultures. A brain CT scan excluded cerebral embolisms. The patient remains stable on continuous antibiotic therapy and reduced inflammatory markers.

Discussion and Conclusions This case highlights the importance of a multidisciplinary approach and multimodal imaging in the early diagnosis of prosthetic endocarditis, particularly in asymptomatic patients where diagnosis can be challenging. Given the high mortality rate, early diagnosis with the support of various imaging techniques is crucial, as is a multidisciplinary therapeutic approach.



MALATTIE DEI VASI 600

PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)

ARTERIOPATIA DEI TRONCHI SOVRA-AORTICI (MALATTIE DEI VASI)

ARITMIE VENTRICOLARI (ARITMIE)

UNCOVERING THE PATHOGENETIC SIGNIFICANCE OF A RARE SMAD3 MUTATION: A CASE OF AORTIC ROOT ANEURYSM AND CARDIAC INVOLVMENT IN LOEYS-DIETZ SYNDROME

Silvio Saraullo (a), Vittoria Zuardi (a), Francesco Pio Ruffo (a), Maria Luana Rizzuto (a), Fabrizio Ricci (a, b, c),
Giulia Renda (a, b), Sabina Gallina (a, b)

(a) DEPARTMENT OF NEUROSCIENCE, IMAGING AND CLINICAL SCIENCE - G. D'ANNUNZIO UNIVERSITY CHIETI-PESCARA; (b) HEART DEPARTMENT - SS ANNUNZIATA HOSPITAL CHIETI - ASL 2 ABRUZZO; (c) DEPARTMENT OF CLINICAL SCIENCE - LUND UNIVERSITY - MALMO

Case Report: A 43-year-old woman presented to ED with an arrhythmic storm triggered the activation of her ICD implanted six years earlier for primary prevention. Her medical history is notable for dilated cardiomyopathy (DCM) secondary to RDA spontaneous dissection (SCAD) seven years ago followed by multiple episodes of ventricular arrhythmias, atrial fibrillation on VKA due to past apical thrombus. Heart transplantation has been contraindicated due to the presence of chronic dissection of Kommerell's diverticulum, right mammary artery dissection, and pectus excavatum. During hospitalization, echo revealed a severely dilated and hypokinetic left ventricle (EF 20%), moderate aortic regurgitation (VCW 5 mm), and an aortic root aneurysm (52 mm). Serial ECGs demonstrated QT prolongation and numerous episodes of NSVT. Nadolol and mexiletine were started with stabilization of the arrhythmic condition. Due to the presence of marfanoid features, skeletal disorders and the aortic aneurysm, Loeys-Dietz syndrome (LDS) was suspected. Genetic testing revealed a rare SMAD3 missense mutation (c.1262G>A, p.Cys421Tyr), consistent with LDS type 3. This mutation was also found in her 21-year-old daughter, who has experienced episodes of atrial fibrillation, aortic root dilation and mitral valve prolapse. Further co-segregation analyses are ongoing in other family members.

Discussion: LDS is an autosomal dominant disorder caused by mutations in TGF- β receptors or ligands

genes, leading to aortic aneurysms, arterial dissections, and a range of skeletal abnormalities. LDS Type 3 results from mutations in the SMAD3 gene, which cause hyperactivation of the TGF- β pathway causing upregulation of collagen production, tissue fibrous substitution, and abnormal remodeling following tissue damage. SCAD has been reported in a few cases involving SMAD3 mutations. However, in patients with LDS, acute myocardial injury, such as SCAD, can lead excessive reparative fibrosis and adverse remodeling resulting in DCM. Atrial fibrillation is also common in LDS, likely due to atrial fibrous involvement. The missense mutation identified has high cardiac involvement (probably cardiac fibrosis and arrhythmic events for reentry circuits), but it has been classified as a variant of uncertain significance (VUS) due to insufficient data. However, its pathogenic role is supported by same pathologic phenotype observed in the patient's daughter and its high penetrance. Moreover, large-scale population studies are needed to determine its frequency, phenotype and penetrance. The management of patients with LDS requires careful consideration of not only vascular complications but also cardiac involvement, which is not yet fully understood. This case emphasizes the importance of genetic testing to guide the diagnosis of hereditary connective tissue disorders and highlights the need for further research to evaluate cardiac fibrosis (e.g. CMR) and so elucidate the cardiac pathological mechanisms.



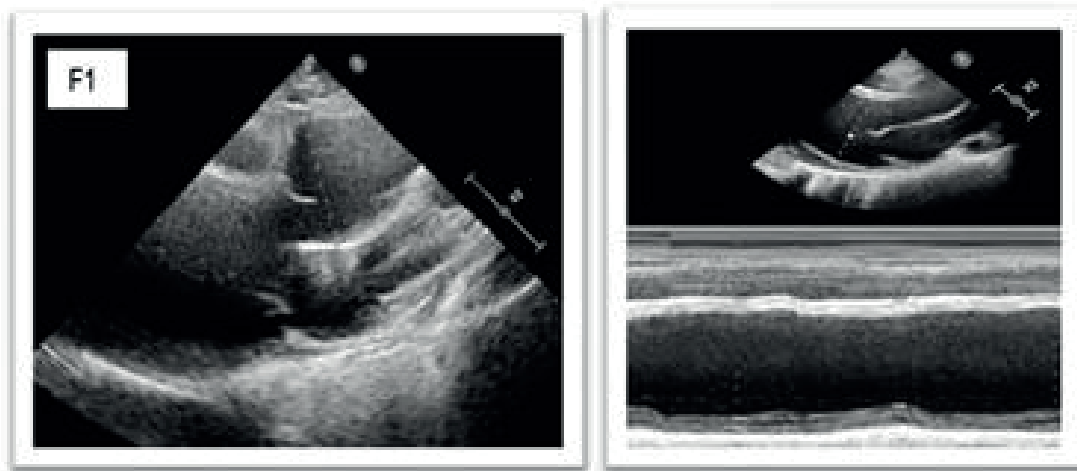


Figure 1

MALATTIE DEI VASI 28 INFARTO STEMI (CARDIOPATIA ISCHEMICA) ARTERIOPATIA ARTI INFERIORI (MALATTIE DEI VASI) ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA)

IMPAIRED ANKLE-BRACHIAL INDEX IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION: A SINGLE CENTRE COHORT STUDY

Monica Verdoia (a), Fabiana Patti (a), Enzo Forliti (a), Gaetano Senatore (b), Andrea Rognoni (a)
(a) NUOVO OSPEDALE DEGLI INFERMI; (b) ASL 4 TO OSPEDALE CIRIE'-LANZO IVREA

Background Ankle-brachial index (ABI) has been validated for the diagnosis and risk stratification of vascular disease in the healthy population. The prognostic role and predictors of ABI in patients with established coronary artery disease still remain debated, and especially among patients with acute myocardial infarction (AMI) and represented therefore the aim of the present study.

Methods We included patients undergoing coronary angiography and PCI for AMI in a single center from May 2022 to November 2024 and with no established history of peripheral arterial disease. ABI was measured before discharge in a phase of hemodynamic stability. PAD was defined for ABI < 0.90.

Results 130 patients with AMI were included, of whom 28 (21.5%) has impaired ABI values. No clinical or demographic difference was observed according to ABI, but for lower platelet count (216.7 ± 52.9 vs 264.8 ± 86.9 $p=0.006$), that emerged as the only independent predictor of impaired ABI (OR[95%CI]=0.989[0.982-0.997], $p=0.007$).

Patients with higher platelet count (III tertile, $n=44$) displayed significantly higher white blood cells count ($p<0.001$) and lower use of ASA ($p=0.06$). At multivariable regression analysis, we confirmed the

independent association between higher platelet tertiles values and impaired ABI (adjusted OR[95%CI]=0.147[0.037-0.576], $p=0.006$).

No significant interaction was observed for platelet count and abnormal values of ABI at subgroup analysis.

Conclusion Among patients with acute myocardial infarction, abnormal values of ABI are common, although similarly distributed across major established cardiovascular risk factors. In fact, platelet count emerged as the only independent predictor of impaired ABI and the inverse association between higher platelet count and ABI values was confirmed in different higher-risk subsets of patients. Future large-scale studies are due to provide larger understanding of our findings.

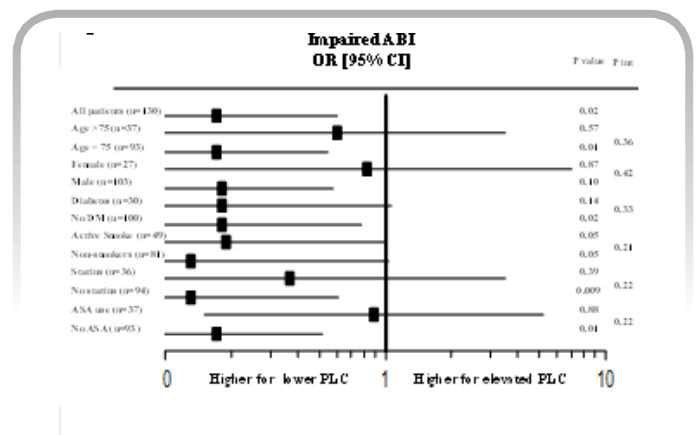


Figure 1

MALATTIE DEI VASI 625
PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR)
(IMAGING CARDIOVASCOLARE)
ARTERITI (MALATTIE DEI VASI)

AN UNUSUAL CASE OF THORACIC PAIN CAUSED BY ISOLATED ASCENDING AORTITIS

Valentina Vinco (a), Silvia Sacco (a), Leonardo Dalla Stella (a), Roberto De Ponti (a)
(a) OSPEDALE DI CIRCOLO, VARESE -UNINSUBRIA

Background: Aortitis refers to inflammation of the aorta and includes both infectious and non-infectious etiologies. Aortitis without systemic disease or involvement of other vascular territories is classified as isolated aortitis. Isolated non-infectious ascending aortitis is most commonly diagnosed through histopathology following the repair of thoracic aortic aneurysms in patients without systemic signs of illness.

Case Summary: We present a case of an 80-year-old Caucasian male with atypical chest pain and an abnormal troponin curve. He arrived at the hospital describing constriction in the neck and dizziness, with oppressive thoracic pain that was intermittent and variable in timing. The ECG was not suggestive of ischemia, but the troponin curve was (18 > 33 > 33 > 24 ng/L). Suspecting acute aortic dissection, we performed an Angio CT which revealed dilation of the ascending aorta with a hematoma in its wall, plus a small pericardial effusion. In urgent care, he also underwent a Cardiac CT which confirmed inflammation in the ascending aorta from the aortic valve to the brachiocephalic trunk. The cardiac surgeon did not indicate an immediate need for surgical intervention, so we admitted the patient to the Cardiology department. In the department, we discussed the case with vascular and cardiac surgeons and planned a PET-CT and cardiac MRI to understand the anatomy of the aorta and the extent of the inflammation, given the lack of urgency for surgery. We started medical therapy with colchicine 0.5 mg, high doses of aspirin, and aggressive blood pressure

control using zofenopril, amlodipine, and carvedilol. During the diagnostic workup, the patient's CRP levels decreased, and he no longer exhibited any symptoms or ECG alterations due to the optimized therapy. The PET-CT was suspicious for aortitis but not diagnostic. The cardiac MRI, with and without contrast, showed acute inflammatory activity with edema in TIRM sequence of the ascending aorta to the proximal thoracic aorta (maximum diameter 49 x 46 mm), from the aortic valve to the origin of the brachiocephalic trunk. We continued the workup to find the etiology: blood serology for infectious and autoimmune diseases all turned out to be negative, except for an interferon test which was not diagnostic for an ongoing TB infection. The echocardiography showed minimal aortic insufficiency and concentric thickening of the ascending aorta without any structural cardiac disease, with a preserved ejection fraction. Upon discharge, we scheduled close radiological and clinical follow-ups with optimized medical therapy.

This case highlights the importance of imaging in clinical decision-making to prevent major complications and avoid urgent cardiac interventions. It also underscores the relevance of optimized medical therapy in managing aortitis, which can become an emergency if inflammation and blood pressure are not immediately controlled. A multidisciplinary team is crucial in finding the best management strategy for the pathology and monitoring clinical stability over time.

MALATTIE DEI VASI 440
NUTRACEUTICI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE
(GENETICA E BIOLOGIA MOLECOLARE)
BIOLOGIA CELLULARE (GENETICA E BIOLOGIA MOLECOLARE)

IL PRETRATTAMENTO CON IL PEPTIDE 3 DELLA SPIRULINA PLATENSIS PREVIENE LO SVILUPPO DEL PROCESSO ATEROGENICO IN UN MODELLO MURINO DI ATEROSCLEROSI

Albino Carrizzo (a), Paola Di Pietro (b), Antonio Damato (c), Eduardo Sommella (b), Marina Sala (b), Eleonora Venturini (c), Pietro Campiglia (b), Carmine Vecchione (b)

(a) UNIVERSITÀ DEGLI STUDI DI SALERNO & IRCCS NEUROMED (POZZILLI); (b) UNIVERSITÀ DEGLI STUDI DI SALERNO; (c) IRCCS NEUROMED

L'aterosclerosi rappresenta una delle principali cause di morbilità e mortalità a livello mondiale. Il suo sviluppo è il risultato di un complesso interplay tra fattori genetici, metabolici e ambientali.

Nella ricerca di nuove strategie terapeutiche, la comunità scientifica ha posto grande attenzione verso le nuove biomolecole di origine naturale in grado di fornire soluzioni preventive efficaci e sicure per contrastare questa patologia. In questo contesto, i peptidi bioattivi derivati da fonti naturali stanno emergendo come promettenti candidati terapeutici. Mediante un approccio di digestione gastrointestinale simulata in vitro abbiamo ottenuto un nuovo peptide "SP3", estratto da estratto dalla *Spirulina platensis*, in grado di resistere alla digestione gastro-intestinale ed essere rilevabile nel plasma. Questo peptide ha dimostrato potenti proprietà anti-aterosclerotiche in un modello preclinico di aterosclerosi. Infatti, il pretrattamento dei vasi murini trattati con SP3 prima dell'esposizione alle LDL ossidate, era in grado di prevenire l'alterazione della funzione endoteliale. Dal punto di vista molecolare, l'SP3 era in grado di modulare l'espressione di molecole infiammatorie

quali ICAM e VCAM sulla parete endoteliale del vaso. Traslando la sua possibile azione in-vivo in un modello murino aterosclerotico ApoE KO sottoposto ad high fat diet, abbiamo potuto dimostrare che il pretrattamento con SP3 prima dell'iniziazione della malattia aterosclerotica è in grado di slentizzare l'accumulo lipidico a livello vascolare modulando in maniera differenziale la batteria di recettori coinvolti nella regolazione della via del colesterolo quali LDLr, LOX1, SR-1B e CD36 a livello endoteliale ed a livello epatico prevenendo il meccanismo di disfunzione endoteliale e la formazione della placca aterosclerotica.

L'identificazione di SP3 come un potenziale agente terapeutico per l'aterosclerosi offre quindi un'interessante prospettiva per lo sviluppo di trattamenti innovativi preventivi, che possano contrastare efficacemente la progressione di questa malattia cronica, riducendo così il rischio di eventi cardiovascolari e migliorando la qualità della vita dei pazienti aterosclerotici.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

MALATTIE DEL MIOCARDIO E DEL PERICARDIO

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 125 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO) SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)

PROGNOSTIC VALUE OF BASELINE AND FOLLOW-UP ECG IN PATIENTS WITH BIOPSY-PROVEN FULMINANT MYOCARDITIS

Michele Ciabatti (a), Giulio Cacioli (b), Razvan Berghi (c), Davide Gallo (b), Fabio Sbaraglia (b), Emilio D'Avino (b), Davide Maione (c), Maria Lucia Narducci (d), Federico Ranocchi (b), Carla Giordano (e), Giulia D'Amati (e), Leonardo Bolognese (a), Marco Merlo (c), Gianfranco Sinagra (c), Maurizio Pieroni (a)

(a) CARDIOVASCULAR DEPARTMENT, SAN DONATO HOSPITAL, AREZZO, ITALY; (b) CARDIAC SURGERY AND HEART TRANSPLANT UNIT, AZIENDA OSPEDALIERA SAN CAMILLO FORLANINI, ROME, ITALY;

(c) CARDIOVASCULAR DEPARTMENT, "OSPEDALI RIUNITI" AND UNIVERSITY OF TRIESTE, TRIESTE, ITALY;

(d) DEPARTMENT OF CARDIOVASCULAR AND THORACIC SCIENCES, FONDAZIONE POLICLINICO UNIVERSTIARIO A. GEMELLI IRCCS, ROME, ITALY; (e) DEPARTMENT OF RADIOLOGICAL, ONCOLOGICAL AND PATHOLOGICAL SCIENCES, SAPIENZA UNIVERSITY, ROME, ITALY

Background: Fulminant myocarditis represents a life-threatening condition with increased mortality and need for heart transplantation. Treatment largely relies on mechanical support and immunosuppressive

therapy, but reliable short-term prognostic markers are still lacking. We hypothesised that baseline and short-term ECG evolution may provide relevant prognostic information in this setting.

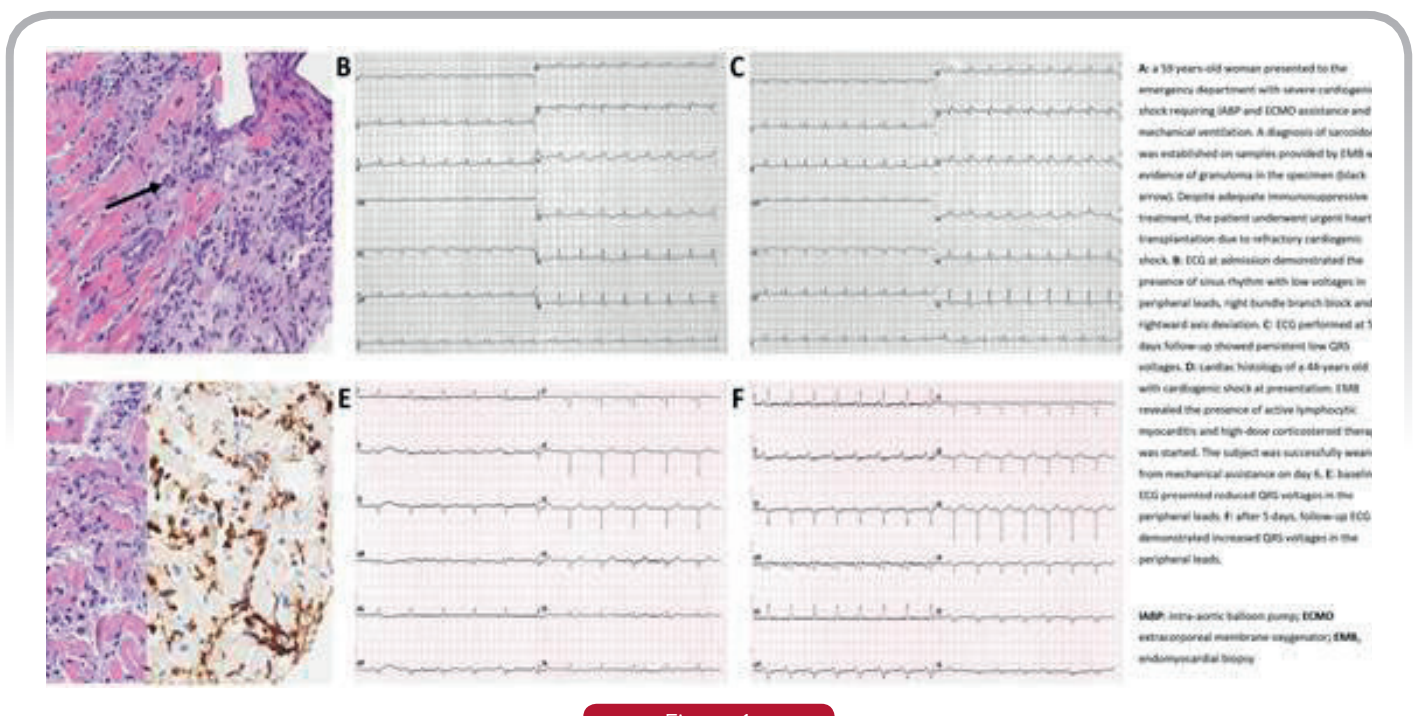


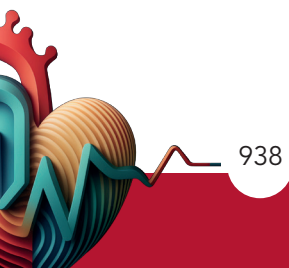
Figure 1

Methods: We retrospectively enrolled patients with biopsy-proven fulminant myocarditis, and we evaluated baseline and follow-up ECG together with clinical, laboratory and histologic data. The primary endpoint was a composite of in-hospital mortality or need for urgent heart transplantation.

Results: We enrolled 39 patients (22/39 males, mean age of 38 years). Histology demonstrated lymphocytic myocarditis in 35/39 subjects, 2 eosinophilic and 1 giant cell myocarditis and 1 sarcoidosis. Follow-up ECGs were performed after 4.8 ± 1.3 days from admission. The primary endpoint was reached in 7/39 patients (5 deaths and 2 urgent cardiac transplants). They more commonly required mechanical (85.7% vs 40.6%, $p=0.044$) or extracorporeal membrane oxygenator

(85.7% vs 12.5%, $p<0.001$) support with higher baseline lactate levels (11.0 ± 7.3 vs 4.2 ± 3.1 mmol/L, $p=0.001$). They also more frequently had cardiac arrest (50.0% vs 9.7%, $p=0.022$) and sustained ventricular tachycardia (71.4% vs 15.6%, $p=0.007$). Patients with a worse outcome showed persistence of low voltages at follow-up ECG (100.0% vs 37.5%, $p=0.003$). Low QRS voltages at baseline ECG were not associated with worse prognosis (71.4% vs 46.9%, $p=0.407$).

Conclusions: In patients with fulminant myocarditis, persistence of low QRS voltages at follow-up ECG is associated with adverse outcomes. Short-term ECG evolution can identify high-risk patients requiring earlier and more intensive mechanical and pharmacological treatment.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 577 PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) MICROCIRCOLAZIONE E COLLATERALI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

GENETIC VARIANTS IN PATIENTS WITH RECURRENT PERICARDITIS

Massimo Imazio (a), Flavio Faletra (a), Giuseppe Damante (a), Valentino Collini (a)
(a) AZIENDA SANITARIA UNIVERSITARIA FRIULI-CENTRALE (UDINE)

Aims: Presence of family cases and multiple recurrences of pericarditis suggests the presence of a possible genetic background in at least 10% of cases. Aim of the present study is to describe the genetic landscape of a cohort of patients with multiple recurrences (≥ 2 recurrences).

Methods: Retrospective cohort study of consecutive adult patients referred for ≥ 2 episodes of recurrences in a tertiary referral center. Genetic testing was performed by Whole Genome Sequencing (WES).

Results: Our cohort included 108 consecutive patients with recurrent pericarditis (median age 32 years, IQR 18.5; 67.6% females, all Caucasian, idiopathic aetiology in 71.1%) with a median number of recurrences of 5 (IQR 2). Overall, 16 patients (14.8%) had variants in genes related to the inflammatory response. Eleven variants were located in genes already associated to recurrent pericarditis (*NLRP3*, *TNFRSF1A* and *MEFV*) and five in inflammation/immunodeficiency related genes (*IFIH1*, *NFKBIA*, *JAK1*, *NOD2* and *ALPK1*). Furthermore, we identified 10 patients with variants located in genes

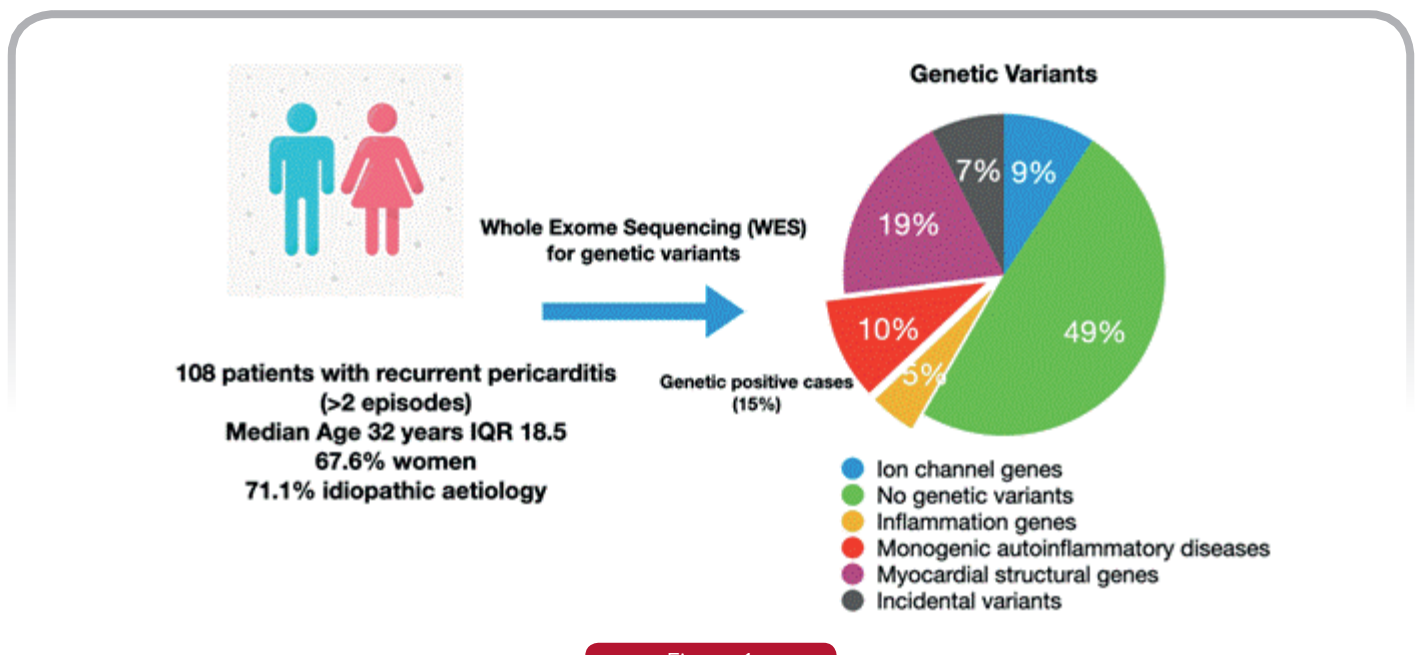
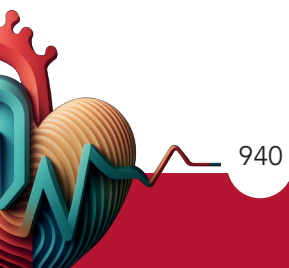


Figure 1

associated to heart electrical system, and 22 variants in 21 patients with genes related to heart structural genes.

Conclusion: In this first observational study using WES to assess genetic variants in patients with multiple recurrences of pericarditis, about 15% of patients

bore at least one variant that may be related to the disease. These findings highlight the importance of addressing the role of genetic predisposition in recurrent pericarditis. Moreover, 28,7% of patients carry variants in different cardiac genes, worthy of a deeper investigation.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 923 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA)

FREQUENCY AND PROGNOSTIC SIGNIFICANCE OF CORONARY ARTERY DISEASE IN WILD-TYPE TRANSTHYRETIN AMYLOID CARDIOMYOPATHY: A DIAMOND SUBSTUDY

Laura De Michieli (a), Giacomo Tini (b), Alessia Argirò (c), Francesco Cappelli (c), Alberto Cipriani (a), Marco Canepa (d)
(a) DEPARTMENT OF CARDIAC-THORACIC-VASCULAR SCIENCES AND PUBLIC HEALTH, UNIVERSITY OF PADUA, ITALY; (b) CARDIOLOGY, DEPARTMENT OF CLINICAL AND MOLECULAR MEDICINE, SAPIENZA UNIVERSITY OF ROME, ITALY; (c) TUSCAN REGIONAL AMYLOIDOSIS CENTRE, CAREGGI UNIVERSITY HOSPITAL, FLORENCE, ITALY; (d) CARDIOLOGY, OSPEDALE POLICLINICO SAN MARTINO IRCCS, GENOA, ITALY; DEPARTMENT OF INTERNAL MEDICINE, UNIVERSITY OF GENOA, ITALY

Background: Patients with wild-type transthyretin amyloid cardiomyopathy (ATTRwt-CM) are commonly elderly (> 70 years old) and present multiple cardiovascular (CV) and non-CV comorbidities, which might affect patients' survival over and above ATTRwt-CM itself. In particular, the frequency of coronary artery disease (CAD) in patients with ATTRwt-CM and its prognostic significance in this setting are still unknown.

Methods: Retrospective study of patients diagnosed with ATTRwt-CM at 17 Italian referral centers for cardiac amyloidosis. Several variables regarding CAD were collected, including history of CAD, diagnostic

tests performed to diagnose CAD, reasons for such tests (acute coronary syndrome [ACS], chest pain without dynamic troponin (cTn) changes, chronic cTn elevation without anginal symptoms, elective due to other indications). Prognosis was investigated with all-cause mortality as endpoint.

Results: Overall, 1280 ATTRwt-CA patients were included in the study. Of these, 265 (20.7%) patients had confirmed CAD, whereas CAD was excluded in 221 (17.3%) patients by invasive or non-invasive means. In the remaining cases (n=794, 62%), the presence of CAD was not clinically investigated. Among patients with

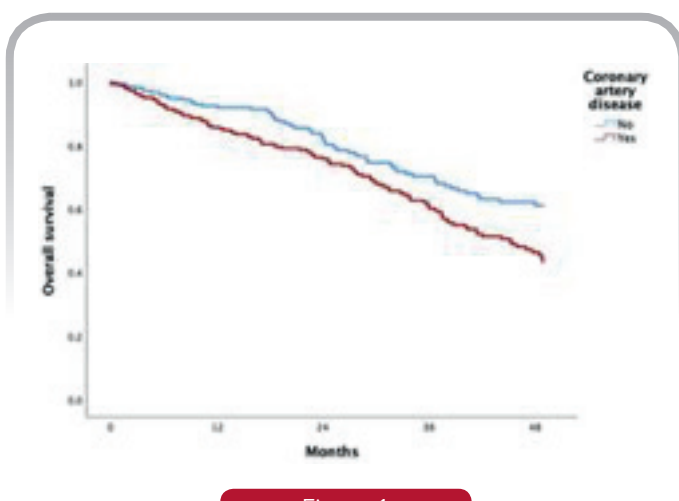


Figure 1

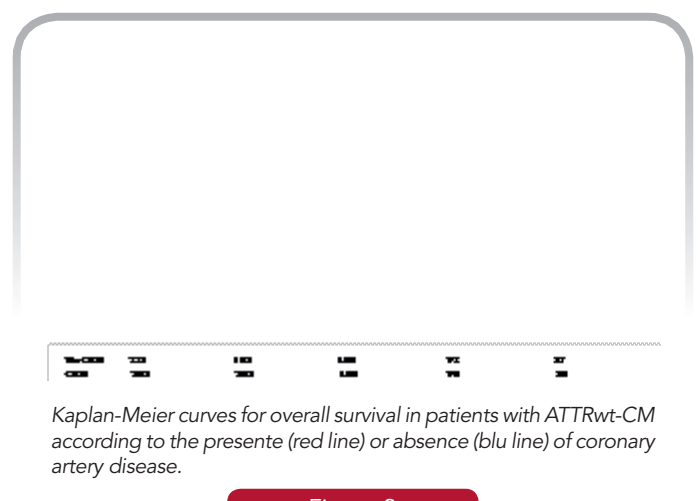


Figure 2

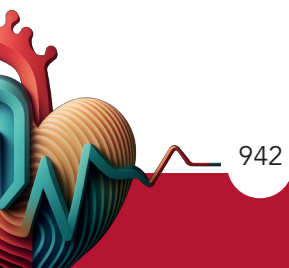
Kaplan-Meier curves for overall survival in patients with ATTRwt-CM according to the presence (red line) or absence (blue line) of coronary artery disease.



confirmed CAD and data on the indications for CAD testing (n=220), 109 (49.5%) had an ACS (including ST-segment elevation MI and non-ST-segment elevation MI), 46 (20.9%) had chest pain without dynamic cTn changes, 23 (10.5%) had chronic cTn elevation without anginal symptoms, and in 42 cases (19.1%) such investigations were performed electively due to other reasons. During a median follow-up of 28 months (Q1:16 – Q3:44), 508 patients died; in particular, there were 122/265 (46%) deaths in the subgroup of patients with confirmed CAD and 87/221 (39%) in the subgroup in

which CAD was excluded. At 48 months, overall survival (Figure) was worse for patients with known CAD versus those in which CAD was excluded (log rank 0.005).

Conclusions: Among patients with ATTRwt-CM, confirmed CAD is present in at least 20% of patients and in over half of the patients that underwent CAD-related clinical investigations. In most cases with confirmed CAD, the indication for testing was an ACS. Patients with confirmed CAD appears to have worse overall survival than those in which CAD was excluded.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 836
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

**THE 2024 PADUA CRITERIA TO PREDICT ARRHYTHMIC RISK IN NON-DILATED
LEFT VENTRICULAR CARDIOMYOPATHY**

Ignazio Alessio Gueli (a, b), Alberto Aimò (a, b), Bianca Alderotti (c), Giancarlo Todiere (b),
Andrea Barison (a, b), Michele Emdin (a, b)

(a) *INTERDISCIPLINARY CENTER FOR HEALTH SCIENCES, SCUOLA SUPERIORE SANT'ANNA;*

(b) *CARDIOLOGY DIVISION, FONDAZIONE TOSCANA GABRIELE MONASTERIO (FTGM);*

(c) *EMERGENCY URGENCY DEPARTMENT, AOUP*

Background: Non-dilated left ventricular cardiomyopathy (NDLVC) has been defined as non-ischemic left ventricular (LV) scarring or fatty replacement regardless of global or regional wall motion abnormalities, or isolated global LV hypokinesia without scarring. This entity overlaps with other cardiomyopathies, although there is limited information about its aetiology, clinical, genetic, imaging features, and prognostic variables.

Methods: All patients meeting the diagnostic criteria for NDLVC, with genetic testing and CMR scan between 2012-2022 were selected. All patients were assessed for the presence of new proposed diagnostic criteria for arrhythmogenic cardiomyopathy (2024 updated Padua Criteria). The endpoint was a composite of cardiac death, sustained ventricular tachycardia or ventricular fibrillation.

Results: The cohort included 225 patients (32% women, median age 55 years [interquartile range 44-64]). The aetiology was genetic in 43% of cases,

with 51 P/LP variant and 49 VUS; idiopathic NDLVC in 53% of cases, neuromuscular aetiology in 2% cases, rheumatic disease aetiology in 1% of cases and inflammatory aetiology (myocarditis) in 1% of cases. On ECG the most frequent alterations were negative T wave in inferior leads (20% of patients), or in V5-V6 (14% patients), or low voltage in precordial leads (6% patients). Over 3.3 years (1.5-6.0), 14 patients (6%) developed an endpoint event. The risk increased in patients with Padua criteria for ALVC and ACM-biv definitive diagnosis.

In the NDLVC cohort, LVEF <43%, negative T wave in inferior leads, and LGE >9% of LV mass were the most significant predictors of outcome.

Conclusions: Patients with NDLVC have a higher risk of SCD/MVA if they meet Padua criteria for definitive ALVC/ACM-biventricular, negative T waves in inferior leads, EF <43%, and LGE >9% of LV mass. These data can be integrated into clinical care to identify patients at high risk of mortality or life-threatening ventricular arrhythmias.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 432
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)

GO BURNING MY HEART!

Andrea Villatore (a), Giacomo De Luca (a), Chiara Di Resta (a), Davide Vignale (a),
 Corrado Campochiaro (a), Anna Palmisano (a), Elena Busnardo (a), Veronica Batani (a), Francesca Sanvito (a),
 Simone Sala (a), Antonio Esposito (a), Lorenzo Dagna (a), Paolo Della Bella (a), Giovanni Peretto (a)
 (a) IRCCS OSPEDALE SAN RAFFAELE

A 39-year-old woman presented with out-of-hospital cardiac arrest on ventricular fibrillation (VF), treated with multiple DC shocks. Past medical history was unremarkable, except for isolated Raynaud syndrome. Cardiovascular risk factors included hypertension and active smoke. She had no familiarity for coronary artery disease, cardiomyopathy, or sudden cardiac death. Estroprogestinic pill was the only ongoing medication. At the initial diagnostic work-up at another Center, ECG showed sinus rhythm, I-degree AV block, not specific repolarization abnormalities. Continuous Holter ECG monitoring recorded polymorphic premature ventricular complexes. Transthoracic echocardiogram showed severe depression of left ventricular function. Troponin T was elevated, while inflammatory markers, such as CRP and ESR, were normal. Coronary angiography showed

normal epicardial vessels. Cardiac magnetic resonance (CMR) showed subepicardial and mid-wall late gadolinium enhancement (LGE) in anterior and inferior septum and basal-medium inferior wall, and edema in T2 sequences with the same localization. Endomyocardial biopsy (EMB) documented extensive replacement fibrosis, with absent inflammation. PCR for viral genomes was negative. At screening for autoimmunity, positivity for ANA and anti-RNA polymerase III antibodies, suggestive for systemic sclerosis, was found. A subcutaneous ICD (S-ICD) was implanted in secondary prevention. However, a few months after discharge, she had multiple ventricular tachycardia (VT) and VF episodes, interrupted by S-ICD shocks. She was eventually admitted at our Center. In the suspect of persistently active inflammation, ¹⁸F-fluorodeoxyglucose (¹⁸F-FDG) was performed, which showed an extensive FDG uptake in medium-basal septum. EMB was repeated and showed =7/mm² CD3⁺ lymphocytes, without necrosis. No granulomatous infiltrates, or giant cells were found. A diagnosis of chronic active myocarditis was made. She was started off-label on anakinra, then switched to immunosuppressive therapy based on prednisone and azathioprine. During follow-up, LVEF recovered (51%). However, since she experience arrhythmic storm on monomorphic VT, VT ablation procedure was scheduled. Endocardial mapping

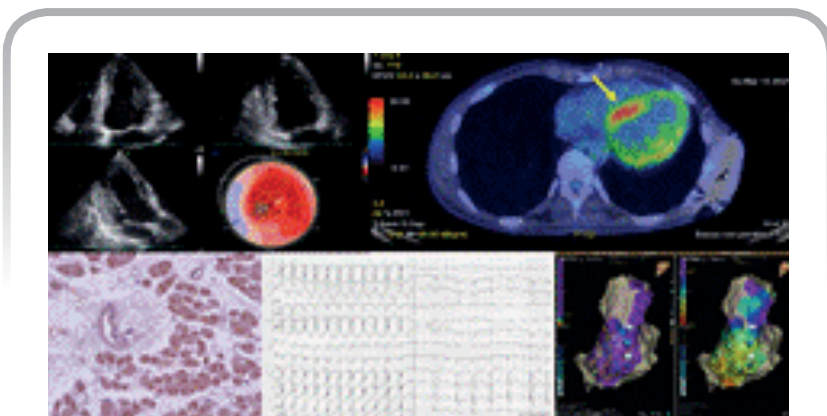


Figure 1



showed local abnormal ventricular activities and late potentials in inferior wall and septum. Finally, genetic test showed a likely pathogenic variant (deletion) in *LMNA* gene, consistent with cardiac laminopathy. By 12-month follow-up she remained asymptomatic and free from ICD shocks. To conclude, patients with pathogenic variants in cardiomyopathy-associated genes may increase

susceptibility to myocarditis. Myocarditis may represent a “hot-phase” during the progression of the disease in patients with *LMNA* mutations. Immunosuppressive therapy may be beneficial also in this subset of patients. Advanced multimodal imaging and management in third-level center for myocarditis and cardiomyopathies is essential.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 582
PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI
E NUTRACEUTICI)
MICROCIRCOLAZIONE E COLLATERALI (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)**

**INTRAVENOUS HUMAN IMMUNOGLOBULINS FOR RECURRENT PERICARDITIS:
A MULTICENTRE COHORT STUDY**

Valentino Collini (a), Francesco Venturelli (a), Razvan Berghi (b), George Lazaros (d), Antonio Brucato (e), Marco Merlo (b), Gianfranco Sinagra (b), Massimo Imazio (a)

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Aims: Based on limited data, intravenous immunoglobulins (IVIGs) have been proposed as possible therapeutic options for recurrent pericarditis refractory to the conventional therapies. The aim of this multicentre registry was to evaluate the efficacy and safety of IVIGs for the treatment of corticosteroid dependent and colchicine resistant pericarditis.

Methods: This multicentre cohort study enrolled consecutive patients with difficult-to-treat recurrent pericarditis. The primary outcome was the pericarditis recurrence rate after treatment. Secondary outcomes included corticosteroid and anakinra use after IVIG treatment and adverse events.

Results: A total of 43 patients (median age 43.3 (IQR 34-62) years, 64.3% women, 76.2% with idiopathic/viral aetiology) were included. The median duration of disease was 39 months (IQR 19-70) and the mean recurrences before IVIGs was 5. Most patients had elevated C-reactive protein (76.7%), pericardial

effusion (71.4%) and fever (69.0%). Thirty-nine patients (92.8%) were on colchicine at IVIG commencement, 26 (61.9%) were treated with corticosteroid and 22 (52.4%) were anakinra-dependent. IVIGs were generally administered at a dose of 400–500 mg/kg/day for 5 consecutive days with repeated cycles according to the clinical response. No serious adverse events occurred: adverse events consisted mostly of mild headache (23.9%), while only one patient discontinued IVIG due to onset of moderate neutropenia, reversible within a few days). After a mean follow-up of 73 months (8-84) recurrences occurred in 42.9% of cases, while 24 patients were recurrence-free. Corticosteroid and anakinra use (respectively from 61.9% to 14.3%; $P < 0.001$ and 52.4% to 26.2%; $P < 0.013$) were decreased by IVIGs.

Conclusions: In patients with recurrent pericarditis refractory to the conventional therapy, IVIGs have proven safe and effective in reducing recurrences and as corticosteroid-sparing agents.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 838 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

RING-LIKE LATE GADOLINIUM ENHANCEMENT ON CARDIAC MRI: PREVALENCE, ETIOLOGY AND PROGNOSIS

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Pier Giorgio Masci (c), Tomas Robyns (a), Jan Bogaert (a)
(a) UNIVERSITY HOSPITAL LEUVEN; KU LEUVEN; (b) SAPIENZA UNIVERISTÀ DI ROMA;
(c) KING'S COLLEGE LONDON

Background: Ring-like late gadolinium enhancement (LGE) refers to a specific pattern of non-ischemic LGE detected by cardiac magnetic resonance (CMR) that involves at least three consecutive segments of the myocardium. The identification of this LGE pattern is emerging as an important biomarker in non-ischemic cardiomyopathy. It has been associated with pathogenic genetic variants and adverse arrhythmic and non-arrhythmic outcomes. Data regarding ring-like LGE are limited to small patient cohorts.

Aims: To assess the prevalence of ring-like LGE in a large tertiary CMR center database, to provide a detailed clinical, electrocardiographic, and imaging-related description of these patients, and to describe clinically relevant outcomes for this cohort.

Methods: This single-center observational retrospective study included consecutive patients undergoing LGE-CMR between 2002 and 2024. Ring-like LGE was defined as continuous enhancement in ≥ 3 adjacent segments. We collected demographic, clinical, and ECG data at the time of CMR by reviewing electronic medical records. When available, genetic test results were also reviewed. Cardiomyopathy phenotypes were defined according to the 2023 European Society of Cardiology guidelines. The most likely etiology of the cardiomyopathy was determined by a consensus involving a radiologist and three experienced cardiologists, one of whom

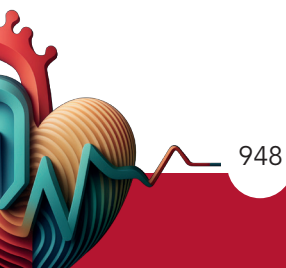
specialized in cardio-genetics. Patient follow-up began on the date of the CMR and continued until death, heart transplantation, implantation of a ventricular assist device, or the last available clinical follow-up in February 2024. The primary endpoint was a composite of all-cause mortality, heart transplantation, or LV assist device implantation. The secondary endpoint included sustained ventricular tachycardia, appropriate implantable cardioverter-defibrillator shock or anti-tachycardia pacing, or sudden cardiac death.

Results: Of the 23,472 patients, 19,696 (84%) underwent LGE-CMR, with ring-like LGE identified in 152 patients (0.8%; 74.3% male; median age 52 years). The most common clinical indication for CMR was heart failure with reduced ejection fraction (29%), followed by suspected myocarditis (12%). Ventricular arrhythmias were present in 41%, and four patients had experienced out-of-hospital cardiac arrest. A family history of sudden cardiac death was reported in 24% of cases. Electrocardiography showed QRS fragmentation in 50% and T-wave inversion in 63%, predominantly in the lateral leads. LGE was most commonly observed in the inferolateral segments, with a median of 10 affected LV segments. The most frequent morpho-functional phenotypes were dilated and non-dilated LV cardiomyopathy. Genetic testing identified likely pathogenic or pathogenic variants in 58% of patients, involving both desmosomal and non-desmosomal genes. Inflammatory cardiomyopathy was



diagnosed in 16%, while other rare etiologies included genetic neuromuscular diseases and inborn metabolic disorders. Over a median follow-up of 3 years, primary and secondary endpoints occurred in 18% and 17% of patients, respectively.

Conclusion: Ring-like LGE is an uncommon, non-disease-specific feature found in various morpho-functional CMP phenotypes. It is associated with frequent genetically determined etiologies and a high burden of adverse outcomes.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 908 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

CHANGE IN PREVALENCE OF TRANSTHYRETIN VARIANTS IN ITALY - RESULTS FROM A NATIONAL SURVEY

Carlo Fumagalli (a, b), Simone Longhi (c), Alberto Aimo (d), Alberto Barilaro (e), Alessia Argirò (b, e), Giulia Biagioni (b), Elena Biagini (c), Alberto Cipriani (g), Cristina Chimenti (f), Gianluca Di Bella (h), Michele Emdin (d), Francesca Graziani (j), Giuseppe Limongelli (l), Carla Lofiego (m), Stefania Marazia (o), Marco Merlo (p), Aldostefano Porcari (p), Roberta Mussinelli (r), Beatrice Musumeci (f), Giacomo Tini (f), Federico Perfetto (b), Giovanni Palladini (r), Stefano Perlini (r), Giuseppe Vergaro (d), Fabio Vagnarelli (m), Gianfranco Sinagra (p), Laura Obici (r), Francesco Cappelli (b, e)

(a) UNIVERSITY OF CAMPANIA, L. VANVITELLI, NAPLES, ITALY; (b) TUSCAN REGIONAL REFERRAL CENTER FOR CARDIAC AMYLOIDOSIS, AOU CAREGGI, FLORENCE, ITALY; (c) UNIVERSITY OF BOLOGNA, BOLOGNA, ITALY; (d) FONDAZIONE GABRIELE MONASTERIO, PISA, ITALY; (e) UNIVERSITY OF FLORENCE, FLORENCE, ITALY; (f) SAPIENZA UNIVERSITY OF ROME, ROME, ITALY; (g) UNIVERSITY OF PADUA, PADUA, ITALY; (h) UNIVERSITY OF MESSINA, MESSINA, ITALY; (i) SCUOLA SUPERIORE SANT'ANNA, PISA, ITALY; (j) FONDAZIONE POLICLINICO UNIVERSITARIO GEMELLI, ROME, ITALY; (k) UNIVERSITY HOSPITAL SANTA MARIA DELLA MISERICORDIA, UDINE, ITALY; (l) AORN MONALDI, UNIVERSITY OF CAMPANIA, L. VANVITELLI, NAPLES, ITALY; (m) MARCHE UNIVERSITY HOSPITAL, ANCONA, ITALY; (n) NEUROLOGY UNIT, POLICLINICO GEMELLI, ROME, ITALY; (o) VITO FAZZI HOSPITAL, LECCE, ITALY; (p) UNIVERSITY OF TRIESTE, TRIESTE, ITALY; (q) NIGUARDA HOSPITAL, MILAN, ITALY; (r) UNIVERSITY OF PAVIA, PAVIA, ITALY

Introduction: Hereditary transthyretin amyloidosis (ATTRv) is a rare, heterogenous, inherited disorder

caused by over 130 gene mutations. Its prevalence was estimated to 4.33/million in 2020 in Italy. Whether growing disease awareness and improved diagnostics may have increased national diagnoses in the last 4 years is unresolved.

Methods: All alive ATTRv diagnoses from 2004 to 2024 from 16 Italian referral centers were retrospectively assessed and included in the analysis.

Results: As of March 2024, 772 ATTRv patients were included, with 373 (48.3%) showing overt disease. Overall national prevalence increased from 2020 up to 6.33/million. The most prevalent mutations were Ile68Leu (25.1%), Phe64Leu (21.9%), Val30Met (19.3%), Glu89Gln (10.7%), and Val122Ile (6.7%). Ile68Leu, Val122Ile, and Val30Met were more common in Northern and Central Italy, while Glu89Gln and Phe64Leu were prevalent in Southern Italy. Cardiovascular phenotype was the most common (35.6%), followed by neuropathic (33.2%) and mixed phenotypes (31.2%). Referral

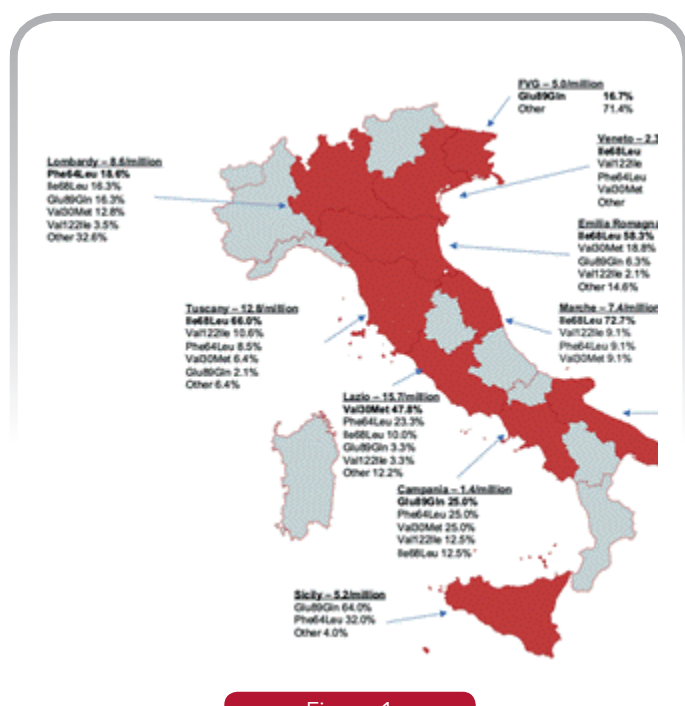
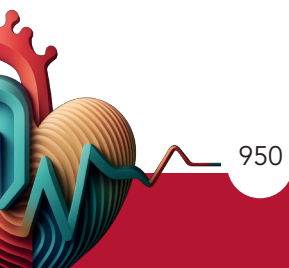


Figure 1

to disease-specific therapy mirrored the change in epidemiology. Tafamidis was prescribed to 64.0% of Val122Ile, 48.9% of Ile68Leu, and 47.2% of Val30Met patients. Patisiran was predominantly used in Glu89Gln patients (42.5%).

Conclusion: ATTRv prevalence in Italy has increased by 50%, with a shift towards milder disease stages and more mixed phenotypes. These changes may reflect improved disease awareness, enhanced genetic screening, and comprehensive care in specialized centers.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 412

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

BIOLOGIA MOLECOLARE CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

HIGH FREQUENCY OF ANTI-DSG2 ANTIBODIES IN ARRHYTHMOGENIC RIGHT VENTRICULAR CARDIOMYOPATHY AND MYOCARDITIS: A MULTICENTER STUDY

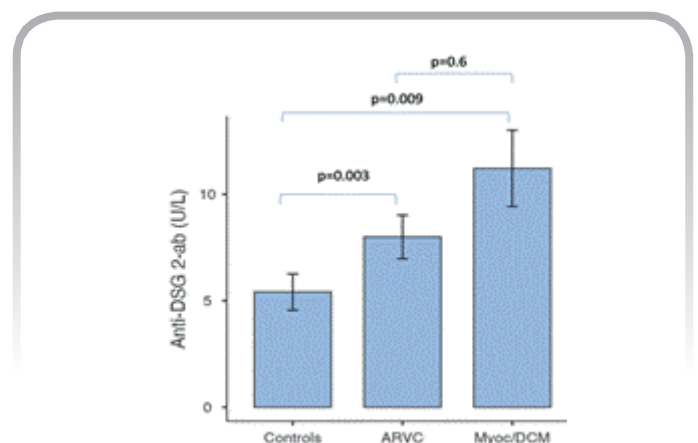
Andrea Silvio Giordani (a), Elena Pontara (a), Cristina Vicenzetto (a), Anna Baritussio (a), Maria Grazia Peloso-cattini (a), Elisa Bison (a), Sabino Illiceto (a), Renzo Marcolongo (a), Diptendu Chatterjee (b), Joseph Shaylyn (b), Meena Fatah (b), Robert Hamilton (b), Alida Caforio (a)
(a) CARDIOLOGIA, DIPARTIMENTO DI SCIENZE CARDIO-TORACO-VASCOLARI E SANITÀ PUBBLICA, UNIVERSITÀ DI PADOVA; (b) DIPARTIMENTO DI PEDIATRIA, THE LABATT FAMILY HEART CENTER AND TRANSLATIONAL MEDICINE, THE HOSPITAL FOR SICK CHILDREN AND RESEARCH INSTITUTE AND UNIVERSITY OF TORONTO, CANADA

Background: Autoantibodies against the desmosomal protein Desmoglein-2 (anti-DSG2-ab) were previously identified in ARVC by Enzyme-Linked ImmunoSorbent Assay (ELISA); anti-intercalated disk autoantibodies (AIDA) of unknown autoantigen specificity were found in myocarditis and in ARVC by indirect immunofluorescence (IFL). Our aims were to assess: 1) the disease specificity of anti-DSG2-ab in ARVC, myocarditis, and other immune-mediated diseases, 2) the correlation of AIDA positive status by IFL and anti-DSG2-ab detection by ELISA, 3) the potential clinical correlates of anti-DSG2-ab in ARVC.

Methods: These patient groups included: ARVC (n=77), myocarditis/dilated cardiomyopathy (DCM) (n=90), systemic immune-mediated diseases (n=52) and normal controls (n=26). Anti-heart antibodies (AHA) and AIDA were assessed by IFL on human heart and skeletal muscle, and anti-DSG2-ab by ELISA, expressed as optical density (OD) or units (U/L). Continuous variables were compared by T-student, Kruskal-Wallis, Mann-Whitney or Saphiro-Wilk test, categorical variables by Chi-square or Fisher exact test.

Results: A relevant proportion (60%) of ARVC patients was anti-DSG2-positive, and both ARVC (p=0.003) and myocarditis/DCM patients (p=0.009) had higher anti-

DSG2-ab levels than controls (**Figure 1**). Anti-DSG2-ab titer was not different between ARVC and myocarditis/DCM patients (p=0.6). AIDA positivity by ELISA and anti-DSG2-ab positivity by IFL were correlated (p=0.039 for OD, p=0.023 for U/L). In ARVC, AIDA-positive patients had higher probability of being AHA positive (p<0.001), presenting pre-syncope (p=0.025) and abnormalities in cardiac rhythm (p=0.03) than ARVC-AIDA negative patients, while anti-DSG2-ab positivity did not have clinical correlates.



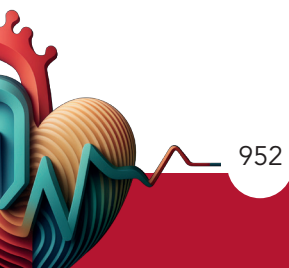
Anti-DSG2-ab levels assessed by ELISA (expressed as U/L), compared by patients' diagnosis (Kruskal-Wallis test).

Figure 1



Conclusions: Both ARVC and myocarditis patients had a higher frequency of anti-DG2-ab than controls, in keeping with immune-mediated pathogenesis to desmosomal proteins in both conditions. Anti-DSG2-ab by ELISA in ARVC correlates with positive AIDA status by IFL, confirming that DSG2 is one of the AIDA

autoantigens. In ARVC, AIDA status but not anti-DSG2-ab showed distinct clinical correlates, possibly reflecting a wider AIDA autoantigenic spectrum. Further studies are warranted to identify the full autoantigenic targets related to the AIDA IFL pattern seen in ARVC and myocarditis.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 501 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) PROGNOSI (SCOMPENSO CARDIACO)

RESTRICTIVE CARDIOMYOPATHY, A RARE AND CHALLENGING CARDIOMYOPATHY IN PAEDIATRIC PATIENTS: A SINGLE CENTER EXPERIENCE

Erica Mencarelli (a), Elena Cavarretta (a, c), Gessica Ingrasciotta (a), Alessio Franceschini (a),
Daniela De Angelis (a), Rosa Lillo (b), Antonio Amodeo (a), Rachele Adorasio (a)

(a) HEART FAILURE, TRANSPLANT AND MECHANICAL CIRCULATORY SUPPORT UNIT, ERN GUARD HEART,
BAMBINO GESÙ HOSPITAL AND RESERCH INSTITUTE, IRCCS, ROME, ITALY; (b) DEPARTMENT OF
CARDIOVASCULAR SCIENCE, FONDAZIONE POLICLINICO UNIVERSITARIO A GEMELLI IRCCS, ROME, ITALY;
(c) DEPARTMENT OF MEDICAL-SURGICAL SCIENCES AND BIOTECHNOLOGIES,
SAPIENZA UNIVERSITY OF ROME, ITALY

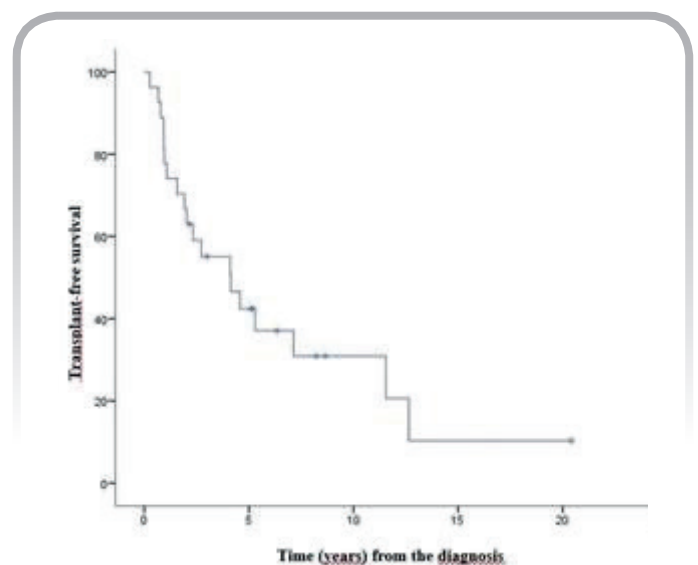
Background: Restrictive cardiomyopathy (RCM) is a rare disease, accounting for 2.5% to 5% of the paediatric cardiomyopathies. RCM has the worst outcomes among pediatric cardiomyopathy group with only 20% of patients free from death or transplant 5 years after diagnosis.

Purpose: We described the clinical presentation, aetiology and outcome of paediatric patients with pure RCM collected over 15 years, in a retrospective single center cohort study.

Methods: All consecutive children with a diagnosis of pure RCM between 1995 and 2021 were included; demographic, clinical and hemodynamic data and long-term outcome were analysed with descriptive statistics and Kaplan-Meier survival analysis.

Results: 27 children (14 female, 52%), mean age at diagnosis was $6.9 \text{ years} \pm 4.7$ (range 0.3-15) were included. In 14 of cases (52%) the RCM has been ascertained after symptoms; the remaining 13 patients (48%) were asymptomatic and identified due to pre-participation screening (37%), family history of cardiomyopathy (7%), or cardiac murmur (4%). All the patients had an abnormal electrocardiogram and left atrial dilatation at the echocardiogram. 80% of patients had postcapillary

pulmonary hypertension at the time of diagnosis (mean pulmonary pressure $23.7 \pm 6.8 \text{ mmHg}$, mean wedge pressure of $17 \pm 5.1 \text{ mmHg}$, mean pulmonary vascular resistance index of $2.5 \pm 1.2 \text{ UW/m}^2$ and mean cardiac index of $2.8 \pm 1.0 \text{ l/min/m}^2$). All patients were treated with standard medical therapy for heart failure and 10



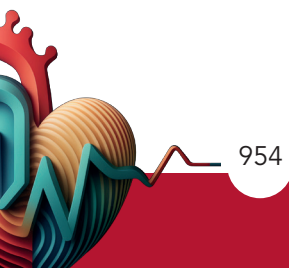
Kaplan-Meier survival analysis (95% confidence interval 3.738-9.206), transplant free survival

Figure 1



(37%) were assisted with a ventricular assist device, 17 (63%) underwent heart transplant while 3 children died before transplant, throughout the observation period. Transplant-free survival was 78%, 55% and 44% at 1, 3 and 5 years after the diagnosis respectively (95% confidence interval 3.738-9.206).

Conclusion: In the absence of specific and effective medical therapy, mechanical cardiac assistance and heart transplant often remain the only treatment options. Early referral to centres specialized in advanced strategies for the management of heart failure is paramount to ensure the survival of RCM patients.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 455 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) PROGNOSI (SCOMPENSO CARDIACO)

TRENDS IN EARLY DIAGNOSIS OF CARDIAC AMYLOIDOSIS WITH MILD HYPERTROPHY: INSIGHTS FROM TRIESTE AMYLOIDOSIS REGISTRY

Carla Indennidate (a, b), Marco Merlo (a, b), Gianfranco Sinagra (a, b), Aldostefano Porcari (a, b, c)
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(b) EUROPEAN REFERENCE NETWORK FOR RARE, LOW PREVALENCE AND COMPLEX DISEASES OF THE HEART-ERN GUARD-HEART; (c) NATIONAL AMYLOIDOSIS CENTRE, DIVISION OF MEDICINE, UNIVERSITY COLLEGE OF LONDON, ROYAL FREE CAMPUS, LONDON, UK

Introduction: Amyloidosis is an infiltrative disease affecting multiple tissues. The main forms include transthyretin (TTR, acquired or hereditary) and light chain (AL) amyloidosis. Cardiac amyloidosis (CA) is a subtle and prognostically significant expression of systemic amyloidosis, typically presenting with unexplained ventricular hypertrophy and restrictive cardiac physiology. Screening for the disease is primarily based on echocardiography, which has facilitated earlier diagnosis. The reference cut-off for defining unexplained ventricular hypertrophy is an interventricular septum (IVS) thickness of 13 mm, accompanied by other suggestive signs and/or symptoms. Increased early diagnoses should be associated with lower hypertrophy values.

Objective: To evaluate the number of CA diagnoses with mild hypertrophy over time.

Methods: A retrospective analysis of Trieste's Amyloidosis Registry, encompassing 207 patients (106 TTR, 35 AL, 24 other types), was performed. Diagnoses were categorized into historical periods: P1 (up to 2005), P2 (2005-2010), P3 (2010-2015), and P4 (from 2015 to present).

Results: Overall, 18% of patients were diagnosed with IVS thickness ≤ 13 mm (19 men, 19 women). The proportion of such diagnoses increased over the periods: 12% in P1, 16% in P2, 23% in P3, and 19% in P4, with an increasing prevalence among women.

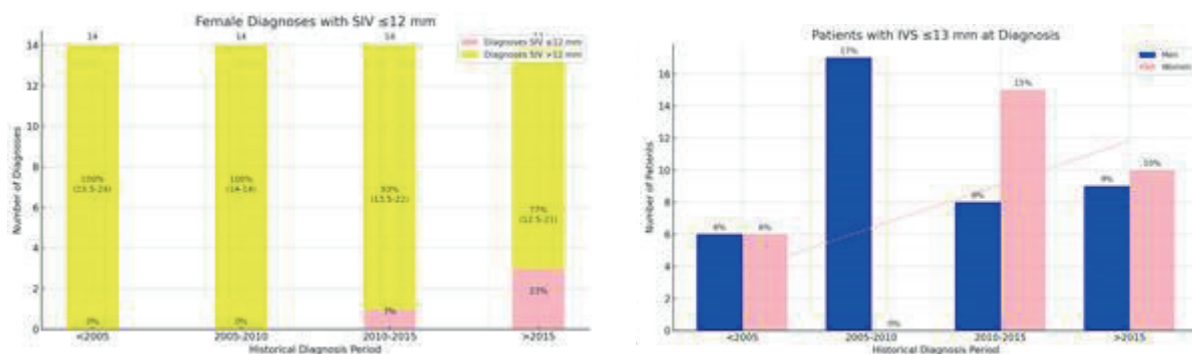


Figure 1

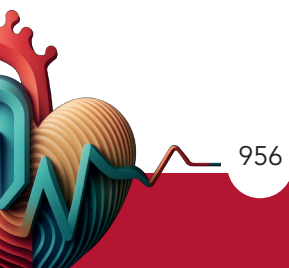


Specifically, 13 out of 35 female diagnoses in P4 were made with IVS ≤ 13 mm. Diagnoses for IVS ≤ 12 mm began in P3: 23% of women had IVS values between 10 and 12 mm (5 TTR, 3 AL; median 12 mm).

Discussion: The findings indicate that at least 1 in 5 patients has been diagnosed with an IVS thickness ≤ 13 mm in recent years, suggesting more frequent early diagnoses, particularly among women. This trend emphasizes the need for better characterization

of hypertrophy cut-offs for early-stage disease and gender differences.

Conclusion: In recent years, a significant proportion of CA diagnoses have been made with IVS thickness ≤ 13 mm, reflecting an increase in early detection, especially among women. These findings underline the necessity to refine hypertrophy cut-offs for early stages of the disease and consider sex-specific differences.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 94
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

NON-INVASIVE ASSESSMENT OF LEFT VENTRICULAR HEMODYNAMIC FORCES
IN HYPERTROPHIC CARDIOMYOPATHY

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 Manuel Garofalo (a), Angela Ilaria Fanizzi (a), Maddalena Ragagnin (a), Maurizio Pieroni (a),
 Gianni Pedrizzetti (c), Michele Emdin (b), Iacopo Olivotto (a)

(a) AZIENDA OSPEDALIERO UNIVERSITARIA CAREGGI, FIRENZE;

(b) SCUOLA SUPERIORE SANT'ANNA, PISA; (c) UNIVERSITÀ DEGLI STUDI DI TRIESTE

Background: Hemodynamic force (HDF) analysis allows non-invasive measurement of intraventricular pressure gradients, portraying cyclic spatial-temporal interaction between blood and tissues. Impaired HDFs have been implicated in early detecting of adverse cardiac remodelling in various cardiovascular disorders, providing insights into cardiac physiology not offered by traditional cardiovascular imaging (1). However, HDF analysis has not been previously applied to hypertrophic cardiomyopathy (HCM).

Purpose: To investigate differences in systo-diastolic function in HCM patients compared to healthy controls using HDF analysis. **Methods.** Forty patients with HCM diagnosis (20 obstructive and 20 non-obstructive) were retrospectively evaluated in comparison with 22 healthy controls. Left ventricular (LV) HDFs were derived from routine transthoracic apical 4-, 2- and 3-chamber views using a dedicated software. Apical-basal HDF curves were generated, where positive deflections represent forces directed from the LV apex to the base, whilst negative ones are directed toward the apex. Amplitude and timing parameters were derived, the latter indexed to total cardiac cycle duration.

Results: **Table 1** shows the main characteristics of HCM patients compared to controls. Patients with

Parameter	HCM (n=40)	Healthy Controls (n=22)	p-value
Age (years)	55 ± 14	50 ± 15	0.008
Male (%)	85	86	0.98
Heart rate (b/min)	58 ± 10	70 ± 12	<0.001
Systolic blood pressure (mmHg)	120 ± 15	120 ± 15	0.98
Diastolic blood pressure (mmHg)	70 ± 10	70 ± 10	0.98
Mean arterial pressure (mmHg)	75 ± 10	75 ± 10	0.98
LV mass (g)	180 ± 40	120 ± 30	<0.001
LV mass index (g/m ^{2.7})	105 ± 25	75 ± 15	<0.001
LV ejection fraction (%)	60 ± 10	60 ± 10	0.98
LV longitudinal strain (%)	-15 ± 3	-18 ± 3	0.002
LV longitudinal strain rate (1/s)	1.5 ± 0.2	1.8 ± 0.2	0.002
LV longitudinal strain time to peak (s)	0.15 ± 0.02	0.19 ± 0.02	<0.001
LV longitudinal strain duration (s)	0.29 ± 0.02	0.34 ± 0.02	<0.001

Table 1. Clinical and instrumental differences between hypertrophic cardiomyopathy (HCM) patients and healthy controls.

Table 1

HCM were older, had a slower heart rate due to treatment with beta-blockers, and showed higher LV ejection fraction. HCM patients showed reduced LV longitudinal force, i.e. the force during the whole cardiac cycle (4.17% vs. 6.01%, p=0.002), shorter time interval to systolic peak (0.15 vs. 0.19, p <0.001), and shorter duration of LV impulse (0.29 vs. 0.34, p



<0.001) (**Figure 1**). However, no differences in terms of systolic force peak ($p=0.283$) or LV impulse intensity

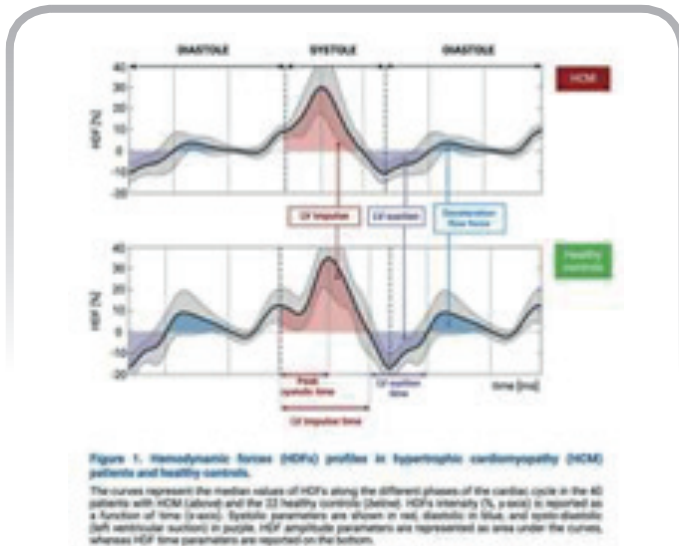


Figure 1

($p=0.689$) were detected. During the transition between systole and diastole, LV suction (i.e. the interval including late systolic deceleration and early diastolic suction) was significantly longer (0.26 vs. 0.23, $p=0.023$) but less pronounced (6.30% vs. 8.72%, $p=0.005$), likely reflecting a relaxation impairment from the very beginning of diastole. Such impairment was maintained during early diastolic filling, where the amplitude of the positive deceleration flow force was severely reduced in HCM compared to controls (2.98% vs. 7.11%, $p < 0.001$).

Conclusions: HDF analysis in HCM patients revealed unique systolic and diastolic changes reflecting faster LV contraction during systole and slower and weaker LV forces during diastole. This analysis deepens our understanding of HCM mechanic abnormalities and may help assess response to innovative treatment options.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 273

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

ENHANCING CLINICAL AND PROGNOSTIC EVALUATION IN CARDIAC AMYLOIDOSIS: SPECKLE TRACKING ECHOCARDIOGRAPHY AND FUNCTIONAL TESTS BEYOND KCCQ

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(a) DEPARTMENT OF MEDICAL BIOTECHNOLOGIES, DIVISION OF CARDIOLOGY, UNIVERSITY OF SIENA, SIENA, ITALY

Background: Cardiac amyloidosis (CA) is a progressive infiltrative disease causing diastolic and, in severe cases, systolic dysfunction, leading to reduced functional abilities, quality of life, and potential psychological repercussions. Several tests assess functional capacity, with the KCCQ score being the most widely used for heart failure symptoms, but it may overly rely on psychological factors. It is known that left atrial (LA) strain by speckle tracking echocardiography (STE) is a marker of left ventricular (LV) diastolic function and filling pressure but doesn't correlate with KCCQ scores. The relationship between other QoL tests and functional capacity and STE in CA remains unexplored.

Objective: This observational study aimed to assess the correlation between LA strain and LV global longitudinal strain (LVGLS) with functional tests such as the Minnesota score, DASI score, and KCCQ score. Furthermore, we aimed to examine the prognostic value of STE parameters in CA, encompassing both AL and ATTR subtypes.

Methods: We enrolled patients with CA during their follow-up visits. They underwent clinical assessments, echocardiographic, 6MWT, and functional capacity tests at baseline and after 3-6 months during follow-up visits. Speckle tracking was analyzed offline by a blinded, proficient operator. The patients were divided into event and

non-event groups based on outcomes. The combined endpoint included cardiovascular death, all-cause mortality, hospitalization or emergency department visits, and urgent cardiovascular visits for heart failure symptoms' exacerbation.

Results: In total, 67 patients diagnosed with CA (48 ATTR, 19 AL) were included in the study. The average age was 78, with only 18% (n=12) being female. Most patients at baseline exhibited a LVEF of 53 ± 7 , a LVGLS of $-13 \pm 6\%$ and mean PALS of $13 \pm 7\%$. NTproBNP displayed a positive correlation with the Minnesota score ($p = 0.003$), with DASI score ($p=0.04$) and an inverse correlation with the 6MWT ($p = 0.015$). 6MWT demonstrated a correlation with the Minnesota score ($p = 0.003$), with DASI score ($p < 0.001$) and with HQoL score ($p < 0.001$). Global PALS demonstrated a positive correlation with DASI score ($p=0.06$), with Minnesota score ($p=0.005$), with NTproBNP ($p=0.003$) and with

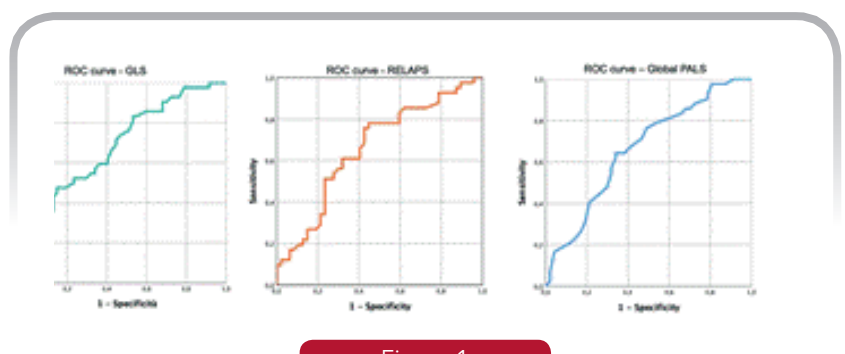
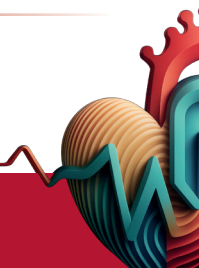


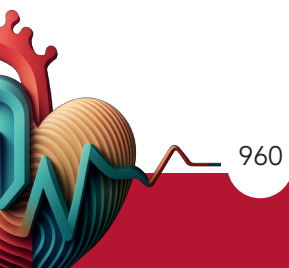
Figure 1



6MWT ($p=0,004$), while it does not correlate with KCCQ ($p=0.21$). Furthermore, GLS demonstrated a positive correlation with NTproBNP ($p=0,001$), with Minnesota score ($p=0.01$), with DASI score ($p=0.017$). In contrast, the KCCQ did not correlate with NT-proBNP, PALS, 6MWT, or GLS. 42 patients (47.2%) experienced the combined endpoint. GLS and PALS were lower in the group that experienced the endpoint, while SIV, NTproBNP and LAVi were higher. Applying ROC curves we showed that GLS, PALS, and apical sparing (RELAPS) were effective predictors of events, with GLS

exhibiting the highest accuracy (AUC 0.704, compared to 0.660 for PALS and 0.663 for RELAPS, Fig.1).

Conclusions: Our study affirmed correlations of functional tests, excluding KCCQ and PALS, with symptom severity in CA. Strong associations were found with 6MWT and NT-proBNP, suggesting their utility in objectively assessing disease severity. GLS emerged as the superior predictor of quality of life and cardiovascular events, enhancing prognostic assessment in clinical practice.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 877
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)

CARDIAC-ONLY TIMOTHY SYNDROME: WHEN CHANNELOPATHY MEETS CARDIOMYOPATHY

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 Damiano Cecchi (a), Antonio Esposito (a), Chiara Di Resta (a), Paolo Della Bella (a), Giovanni Peretto (a)
 (a) IRCCS OSPEDALE SAN RAFFAELE

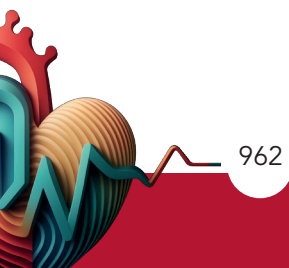
A 29-year-old man was evaluated for a family history of hypertrophic cardiomyopathy (HCM). Past medical history was unremarkable, and he was asymptomatic. At the initial diagnostic work-up, ECG showed sinus rhythm, normal atrioventricular conduction, prominent R waves in V5-V6, without fulfilling left ventricular hypertrophy criteria, and diphasic T wave in precordial leads. Transthoracic echocardiogram showed normal wall thickness and volumes, normal left ventricular function, with biventricular apical hypertrabeculation, and blood flow among trabecules at color Doppler. Cardiac magnetic resonance (CMR) showed a focal thickening of anteroseptal wall, confirmed marked hypertrabeculation with positive criteria for left ventricular non-compaction (LVNC) (NC/C 5.2, n.v. <2.3), and documented a 6% burden of late gadolinium enhancement (LGE), within septal and junctional localization. Holter ECG monitoring revealed dynamic QTc interval prolongation up to 520 ms. A loop recorder was implanted. Genetic testing for sarcomeric HCM genes was negative. However, upon extending the genetic analysis, the pathogenic (class 5) missense variant c.1553G>A, p.(Arg518His) in *CACNA1C* gene in heterozygous state. This gene is associated to LQTS and encodes the alpha-1C subunit of the long-lasting (L-type) voltage-gated calcium channel Ca_v1.2. The proband's father carried the same genetic mutation and exhibited a phenotype of HCM phenotype with prolonged QT

interval. Similarly, the paternal grandmother, who was affected by HCM and atrial fibrillation (AF) but was not genetically investigated. She died in old age due to an ischemic stroke after suspension of anticoagulant. Additionally, two pathogenic, heterozygous variants (c.2014C>T, p.(Arg672Trp) and c.1557_1561dup, p.(Glu521Glyfs*59)) were detected in *GAA* gene, associated with the autosomal recessive Pompe disease. Segregation analysis demonstrated that these two variants are in cis, both inherited from the father. Therefore, they both were healthy carriers, which definitely excluded the diagnosis of Pompe disease. Indeed, dried blood spot assay proved normal enzyme activity of acid alpha-glucosidase. By 36-month remote-monitoring follow-up, no major ventricular arrhythmias occurred, but episodes of AF were documented. Oral anticoagulation was started in spite of the low CHADS-VASc, considering current recommendations and evidences for HCM/LVNC. To improve arrhythmic risk stratification, invasive programmed ventricular stimulation (PVS) was performed, and resulted negative for life-threatening arrhythmia induction up to 4 extrastimuli. The rare variant in *CACNA1C* hereby reported, was previously described by Boczek et al. in families with HCM, long QT, congenital heart defects, and sudden cardiac death, defined as "cardiac-only Timothy syndrome". Remarkably, our patient did not show any extra-cardiac



involvement, such as syndactyly, facial dysmorphisms, and neurological symptoms, including autism and intellectual disability. Furthermore, they demonstrated a complex electrophysiological phenotype, including loss of current density, in combination with increased window current and late current, and decelerating voltage-dependent inactivation. Risk stratification

is challenging, as available tools, such as HCM Risk-SCD score, do not apply to this specific genotype. We conclude that, in patients with HCM/LVNC and long QT, *CACNA1C* should be suspected and included in genetic screening. Multimodal assessment, including LGE burden by CMR and PVS, could provide additional clues for risk stratification purposes.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 824
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PROGNOSI (SCOMPENSO CARDIACO)

PREDICTORS OF DISEASE PROGRESSION IN PATIENTS WITH NON DILATED LEFT VENTRICULAR CARDIOMYOPATHY

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Background: Non-Dilated Left Ventricular Cardiomyopathy (NDLVC) is a highly heterogeneous category of cardiomyopathies, introduced in the 2023 European Society of Cardiology guidelines. A comprehensive assessment of factors associated with long term left ventricular remodeling in NDLVC has never been performed.

Aims: This study aimed to identify factors associated with disease progression in a large multicenter cohort of patients with NDLVC.

Methods: NDLVC patients (diagnosed by the 2023 ESC criteria) with at least two echocardiographic evaluations were selected from two high-volume Italian centers and their data were retrospectively analyzed. The study endpoints were assessed at the latest available echocardiographic evaluation for each patient and included: a) worsening LVEF, defined as a decrease of at least 10 percentage points in LVEF or LVEF < 40% for patients with baseline LVEF between 40% and 50%, b)

evolution to dilated cardiomyopathy (DCM), as defined by 2023 ESC guidelines and c) a composite of both.

Results: 441 NDLVC patients were enrolled from January 2010 to May 2023. During a median follow-up of 77 months (IQR: 48-109), a worsening in LVEF occurred in 122 patients (27.7%), 127 patients (28.8%) progressed to DCM, and 81 patients (18.4%) reached the composite endpoint. A multivariate model, including presence of genetic variants together with detection of myocardial inflammation (M-Infl) at endomyocardial biopsy or cardiac magnetic resonance, family history for cardiomyopathy and/or sudden cardiac death, presence of bundle branch blocks or hemiblocks, baseline echocardiographic LVEF < 45%, a ring-like late gadolinium enhancement pattern on cardiac magnetic resonance, and non-sustained ventricular tachycardia at baseline, had the strongest discrimination power for worsening LVEF [AUC of 0.804 (95% CI: 0.75-0.86)], evolution to DCM [AUC 0.783 (95% CI: 0.73-0.84)] and the composite of both [AUC 0.84 (95% CI: 0.79-0.89)].



Absence of P/LP variants reduced the risk across all endpoints [(OR: 0.2, 95% CI: 0.1-0.4, $p < 0.001$), (OR: 0.2, 95% CI: 0.1-0.4, $p < 0.001$) and (OR: 0.1, 95% CI: 0.05-0.3, $p < 0.001$), respectively], while the presence of biopsy- or CMR-proven M-Infl, other than the genetic etiology alone, significantly increase the risk [(OR: 6.2, 95% CI: 3.1-12.2, $p < 0.001$), (OR: 2.1, 95% CI: 1.1-4, $p = 0.03$) and (OR: 3.7, 95% CI: 1.9-7.3, $p < 0.001$), respectively]. The same results were confirmed in the sensitivity analysis performed in NDLCV patients with baseline LVEF $> 45\%$.

Conclusion: In this large NDLCV cohort, a multiparametric model, including clinical, electrocardiographic, imaging, genetic and histological parameters, effectively stratifies the risk of disease progression. Absence of P/LP mutation in cardiomyopathy related genes emerged as the most significant protective factor and the presence of M-Infl was an adverse factor across all outcomes, both in the overall population and in the subgroup with a baseline echocardiographic LVEF $\geq 45\%$.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 915
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
ARITMIE VENTRICOLARI (ARITMIE)
PROGNOSI (SCOMPENSO CARDIACO)
MORTE IMPROVVISA / RIANIMAZIONE (ARITMIE)

**PROGNOSTIC ROLE OF THE GENOTYPE IN ARRHYTHMOGENIC CARDIOMYOPATHY:
 A SINGLE CENTER PERSPECTIVE**

Claudio Bergami (a), Raffaello Ditaranto (a, b), Maddalena Graziosi (a), Costantina Catalano (a),
 Vanda Parisi (a, b), Ludovica Barile (a), Ferdinando Pasquale (a), Elena Biagini (a, c)

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 (b) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCE (DIMEC), UNIVERSITY OF BOLOGNA, BOLOGNA, ITALY;
 (c) EUROPEAN REFERENCE NETWORK FOR RARE AND LOW PREVALENCE COMPLEX DISEASES OF THE HEART
 (ERN-GUARDHEART)

Background: Arrhythmogenic cardiomyopathy (ACM) is a scarring heart muscle disease, typically caused by mutations in desmosomal genes, and characterized by a high burden of ventricular arrhythmias (VA) and a progression towards heart failure (HF). In approximately half of cases, a likely pathogenic or pathogenic (LP/P) mutation is identified.

Purpose: We sought to investigate the role of genotype in risk stratification of ACM patients.

Methods: This was a single-center retrospective study evaluating genotyped ACM patients followed at our cardiomyopathy referral center between 1993 and 2024. The cohort was divided in gene-positive and gene-elusive patients according to the presence or absence of a LP/P variant. The study endpoint was a composite of adverse ACM outcomes including both arrhythmic events (sustained VA, defibrillator therapies, cardiac arrest) and HF-related events (hospitalization, death due to HF, heart transplantation). Analyses were performed using Cox proportional hazard models and Kaplan-Meier survival curves.

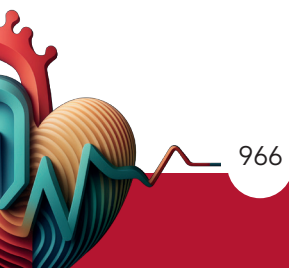
Results: The study population was composed of 115 patients: 77 (67%) were probands, 70 (61%) were males, median age at first contact was 48 years (IQR 28-53). Of

these, 28 (24%) had right dominant-ACM, 43 (37%) had left dominant-ACM, and 44 (38%) had a biventricular-ACM. Seventy-eight patients (68%) had a LP/P variant, most commonly in DSP (32, 41%), PKP2 (17, 22%), and FLNC (12, 15%) genes. Relatives were more represented in the gene-positive group (41% vs 15%, $p = 0.004$). Over a median follow-up of 80 months (IQR 42-139), 45 (39%) patients reached the study endpoint. By univariate Cox analysis, LV ejection fraction (0.956 [0.935-0.978], $p < 0.001$), indexed LV end-diastolic volume (1.022 [1.011-1.034]), RV fractional area change (0.915 [0.879-0.953], $p < 0.001$), TAPSE (0.824 [0.693-0.980], $p = 0.029$), RV end-diastolic area (1.037 [1.010-1.066], $p = 0.006$), and proband status (8.451 [2.608-27.380], $p < 0.001$) were associated with the study endpoint. At the multivariate analysis, RV fractional area change was the only independent predictor (0.928 [0.883-0.975], $p = 0.003$). No association with age or sex was found. By Kaplan-Meier curves, survival free from the study endpoint was similar between gene-positive and gene-elusive patients (log-rank $p = 0.25$, figure 1) also when considering probands only (log-rank $p = 0.25$). Although small in absolute numbers, no difference was noticed among the most frequent genotypes (DSP, PKP2, FLNC; log-rank $p = 0.4$). Biventricular ACM had more HF-related adverse events (log-rank $p = 0.03$, figure 2).



Conclusion: In this single-center ACM cohort, the risk of adverse events in gene-positive patients was not different compared to gene-elusive patients. At the

multivariate analysis, RV fractional area change was the only independent predictor of the occurrence of adverse events.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 78 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

PRIMARY RESULT FROM HELIOS-B, A PHASE 3 STUDY OF VUTRISIRAN IN PATIENTS WITH TRANSTHIRETIN AMYLOIDOSIS WITH CARDIOMYOPATHY

Francesco Cappelli (a), Marianna Fontana (b), John Berk (d), Julian Gillmore (b), Ronald Witteless (c), Martha Grogan (e), Brian Drachman (f), Thibaud Damy (g), Pablo Garcia Pavia (h), Scott Solomon (i), Nobuhiro Tahara (j), Peter Van Der Meer (k), Lili Yang (l), Satish Eraly (l), John Vest (l), Mathew Maurer (m)

(a) AZIENDA OSPEDALIERO UNIVERSITARIA CAREGGI, FIRENZE ITALY; (b) DIVISION OF MEDICINE, UNIVERSITY COLLEGE OF LONDON, ROYAL FREE HOSPITAL, LONDON UK; (c) DIVISION OF CARDIOVASCULAR MEDICINE, STANFORD UNIVERSITY SCHOOL OF MEDICINE, STANFORD, CA, USA; (d) BOSTON UNIVERSITY SCHOOL OF MEDICINE, BOSTON USA; (e) DEPARTMENT OF CARDIOVASCULAR DISEASES, MAYO CLINIC COLLEGE OF MEDICINE, ROCHESTER, MN, USA; (f) DEPARTMENT OF CARDIOVASCULAR MEDICINE, PENN PRESBYTERIAN MEDICAL CENTER, PHILADELPHIA, PA, USA; (g) REFERRAL CENTER FOR CARDIAC AMYLOIDOSIS, HOPITAL HENRY MONDOR, CRETEIL, FRANCE; (h) DEPARTMENT OF CARDIOLOGY, HOSPITAL UNIVERSITARIO PORTA DE HIERRO, MAJADAONDA, MADRID, SPAIN; (i) CARDIOVASCULAR DIVISION, BRIGHAM AND WOMEN'S HOSPITAL, BOSTON, MA USA; (j) DIVISION OF CARDIOVASCULAR MEDICINE, KURUME UNIVERSITY SCHOOL OF MEDICINE, KURUME, JAPAN; (k) UNIVERSITAIR MEDISCH CENTRUM GRONINGEN, UNIVERSITY OF GRONINGEN, GRONINGEN, THE NETHERLAND; (l) ALNYLAM PHARMACEUTICALS, CAMBRIDGE, MA USA.; (m) COLUMBIA UNIVERSITY MEDICAL CENTER, NEW YORK, NY, USA

Background: Transthyretin amyloidosis (ATTR) is a progressive, fatal disease caused by the deposition of misfolded transthyretin (TTR) amyloid fibrils in multiple organs and tissues, with the most prevalent manifestations being cardiomyopathy (CM) and polyneuropathy (PN). Patients with ATTR with CM (ATTR-CM) experience progressive symptoms of heart failure (HF), are frequently hospitalised and have a decreased survival rate, with few treatment options. Vutrisiran, an RNA interference therapeutic that rapidly and profoundly knocks down serum TTR, is approved for the treatment of hereditary ATTR with PN (hATTR-PN). Exploratory analyses of a predefined cardiac subpopulation in the HELIOS-A study (NCT03759379) demonstrated the potential for vutrisiran to improve the manifestations of CM in patients with hATTR-PN. The safety and efficacy of vutrisiran in patients with either wild-type ATTR (wtATTR) or hATTR-CM are being investigated in the HELIOS-B study (NCT04153149).

Methods: HELIOS-B is a phase 3, randomised, double-blind (DB), placebo-controlled, multicentre study of vutrisiran in patients with wtATTR or hATTR-CM. Patients were 18–85 years old with medical history of HF, evidence of cardiac amyloidosis by echocardiography, and ATTR amyloid deposition confirmed by tissue biopsy or non-biopsy diagnostic criteria, including cardiac technetium scintigraphy. At baseline (BL), patients were either not on tafamidis or were currently receiving tafamidis per the approved indication and dose for their country. Patients were randomised (1:1) to vutrisiran 25 mg subcutaneously or placebo, once every 3 months for up to 36 months, followed by open-label treatment with vutrisiran for up to 2 years. The two primary endpoints were a composite of all-cause mortality and recurrent cardiovascular (CV) events (CV hospitalisations and urgent HF visits) assessed in the overall population and in the vutrisiran monotherapy group (defined as patients not being on tafamidis at BL). Secondary endpoints (assessed in overall population



and vutrisiran monotherapy), were all-cause mortality and the change from BL to 30 months in functional capacity (6-minute walk test), health status and quality of life (Kansas City Cardiomyopathy Questionnaire-Overall Summary), and New York Heart Association Class. The pharmacodynamic effect of vutrisiran on serum TTR levels was assessed through 30 months, and the frequency and severity of adverse events were assessed throughout the study.

Results: Enrolment in HELIOS-B was completed in August 2021 with 655 patients, 654 dosed (25% US,

62% Europe, 13% Rest of World); median (range) age, 77 (45-85) years; male, 92.5%; on tafamidis at BL, 40%. Complete DB data will be available in July 2024. Primary and secondary endpoint data will be presented, in addition to safety data.

Conclusion: Vutrisiran has the potential to improve the CM associated with ATTR. The primary results of the HELIOS-B study will provide important information on the impact of vutrisiran on CV outcomes and survival, functional capacity, and health status and quality of life in patients with ATTR-CM.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 332 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

INCIDENCE AND CLINICAL CHARACTERISTICS OF CARDIAC AMYLOIDOSIS IN TUSCANY AND UMBRIA

Vincenzo Castiglione (a, b), Olena Chubuchna (a), Giulia Elena Mandoli (c), Yu Fu Ferrari Chen (a), Alberto Aimo (a, b), Michela Chianca (a, j), Giorgia Panichella (a, i), Lucrezia Bonino (b), Alessandro Paoletti Perini (d), Francesco Grossi (d), Massimo Milli (d), Annamaria Traini (e), Francesco Bellandi (e), Alessio Lilli (b, f), Giancarlo Casolo (f), Maurizio Pieroni (g), Serena Poli (h), Chiara Chiriatti (h), Simone Bartolini (i), Federico Perfetto (i), Alberto Palazzuoli (c), Claudio Passino (a, b), Riccardo Liga (j), Alberto Giannoni (a, b), Marta Focardi (c), Erberto Carluccio (k), Cinzia Zuchi (k), Carlo Di Mario (i), Giuseppe Ambrosio (k), Francesco Cappelli (i), Michele Emdin (a, b), Matteo Cameli (c), Giuseppe Vergaro (a, b)

(a) HEALTH SCIENCE INTERDISCIPLINARY CENTER - SANT'ANNA SCHOOL OF ADVANCED STUDIES - PISA - ITALY; (b) FONDAZIONE TOSCANA GABRIELE MONASTERIO - PISA - ITALY; (c) UNIVERSITY HOSPITAL OF SIENA - SIENA - ITALY; (d) OSPEDALE SANTA MARIA NUOVA - FLORENCE - ITALY; (e) OSPEDALE SANTO STEFANO - PRATO - ITALY; (f) OSPEDALE VERSILIA - LIDO DI CAMAIORE - ITALY; (g) OSPEDALE SAN DONATO - AREZZO - ITALY; (h) OSPEDALE DEL MUGELLO - BORGO SAN LORENZO - FLORENCE - ITALY; (i) CAREGGI UNIVERSITY HOSPITAL - FLORENCE - ITALY; (j) UNIVERSITY HOSPITAL OF PISA - PISA - ITALY; (k) OSPEDALE SANTA MARIA DELLA MISERICORDIA - PERUGIA - ITALY

Background: Recent advances in imaging and increased disease awareness have led to a significant rise in newly diagnosed cases of cardiac amyloidosis (CA) over the past decade. However, there remains a lack of epidemiological data regarding the true incidence of the disease.

Purpose: To determine the incidence and clinical characteristics of newly diagnosed cases of CA in a large Italian population.

Methods: Subjects with suspected CA underwent diagnostic work-up in 20 Centers in Tuscany and Umbria

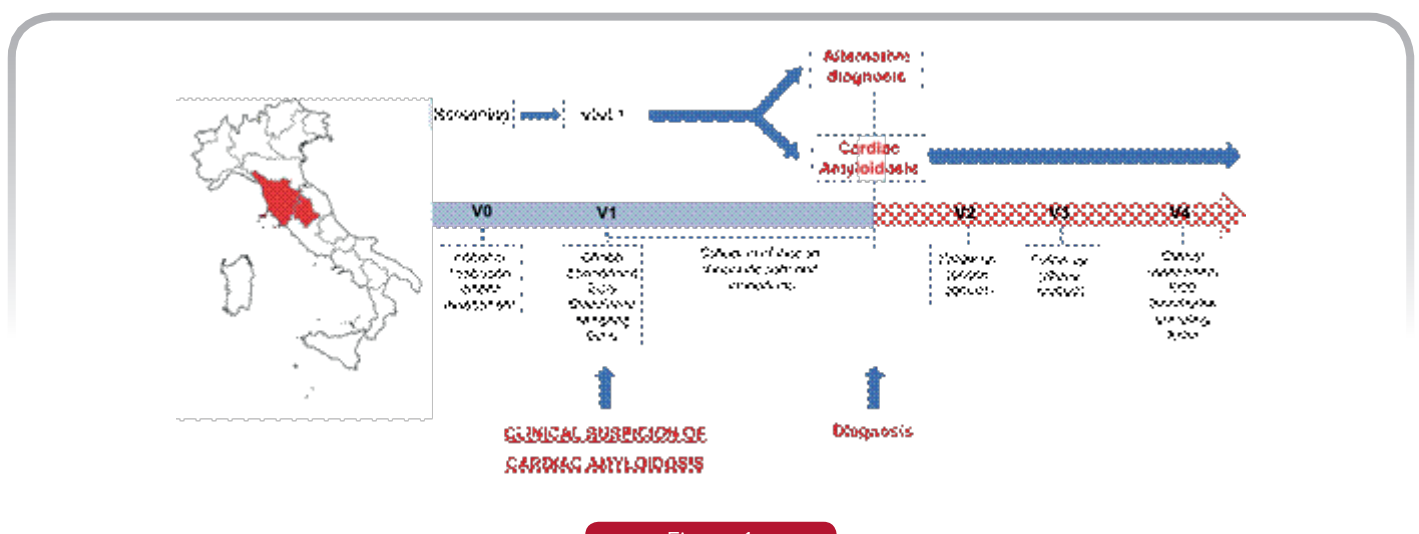


Figure 1

regions within the Cardiac Amyloidosis Registry (CARRY), between January 1st 2022 and December 31st 2022.

Results: A total of 551 subjects were enrolled in the registry, with complete data on the final diagnosis available for 448 individuals. CA was diagnosed in 179 patients (40%), with 28 (16%) classified as light chain CA (AL-CA), 114 (64%) wild-type transthyretin CA (ATTR-CA), 12 (7%) variant ATTR-CA, and 25 (13%) undetermined CA. Considering a reference population in Tuscany and Umbria in 2022 (4,518,388, according to the Italian National Institute of Statistics), this yields an estimated cumulative incidence of 39.6 cases per million inhabitants per year. Alternative diagnoses in the remaining patients mostly included hypertensive heart disease (n=157, 58%), hypertrophic cardiomyopathy (n=25, 9%), moderate-to-severe valvular heart disease (n=11, 4%), or a mixed phenotype (n=72,

27%). The primary referral pathway for the suspicion of CA was cardiological (n=345, 77%), followed by incidental finding during screening visits (n=58, 13%), and haematology referral (n=33, 7%). Patients with confirmed CA were older (81 [75-85] vs. 77 [72-83] years, $p<0.001$), and more frequently reported musculoskeletal red flags of CA, such as carpal tunnel syndrome (85 [48%] vs. 53 [20%] years, $p<0.001$), and spontaneous tendon rupture (39 [22%] vs. 18 [7%] years, $p<0.001$). Median time to diagnosis from clinical suspicion was 73 (37-140) days for CA and 84 (36-156) days for alternative diagnoses ($p=0.564$).

Conclusions: The diagnosis of CA is on the rise globally, with an estimated incidence of 39.6 new cases per million inhabitants per year in two large regions of Italy. These findings should inform policymakers in redefining the status of CA as a rare disease, potentially influencing patient care and treatment costs.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 626 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) TOMOGRAFIA AD EMISSIONE DI POSITRONI (PET) (IMAGING CARDIOVASCOLARE)

EXTRACARDIAC UPTAKE OF [18F]-FLORBETABEN PET/CT IN SYSTEMIC AMYLOIDOSIS

Vincenzo Castiglione (a, b), Alberto Aimo (a, b), Angela Durante (a, b), Dario Genovesi (b), Lucas Soares Bezerra (c), Maria Livia Del Giudice (d), Laura Camerini (a), Giovanni Dugo (a), Olena Chubuchna (a), Assuero Giorgetti (b), Gabriele Buda (d), Michele Emdin (a, b), Giuseppe Vergaro (a, b)

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Background: Systemic amyloidoses are a rare group of disorders characterized by the deposition of abnormal proteins (amyloid) in various organs, disrupting their normal function. Cardiac involvement is typically observed in either transthyretin (ATTR) or immunoglobulin light chain (AL) amyloidosis. [18F]-florbetaben is a radiopharmaceutical compound used in positron emission tomography (PET) imaging to detect amyloid plaques. Late scans with [18F]-Florbetaben PET can effectively distinguish AL cardiac amyloidosis (CA) from ATTR-CA or similar conditions. However, the clinical significance of extracardiac uptake on [18F]-florbetaben PET imaging has not been previously assessed.

Aim: To describe the prevalence and distribution of extracardiac uptake on [18F]-florbetaben PET imaging in patients with suspected CA.

Methods: Patients with suspected CA were recruited from January 2018 to April 2024 at a single tertiary referral Center in Italy. Each patient

underwent comprehensive clinical, biohumoral, and echocardiographic characterization along with a [18F]-florbetaben PET scan.

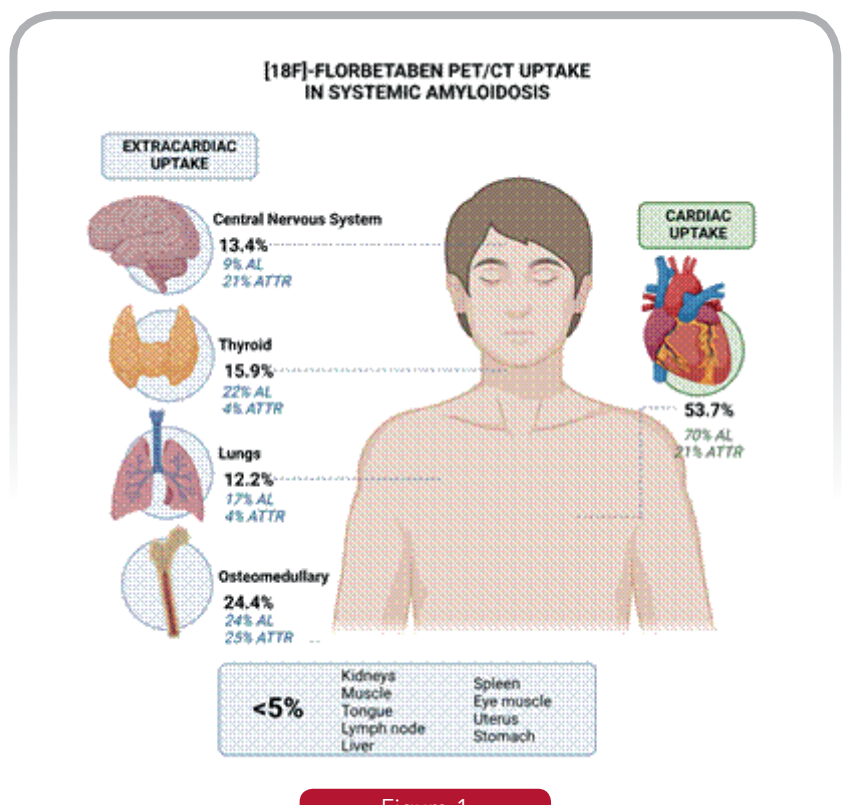


Figure 1

Results: Among the 142 patients enrolled, 54 had AL-CA and 28 had ATTR-CA, whereas cardiac amyloid involvement was excluded in 60 patients. The median age was 74 years (range: 67-80), and 73% were male. Extracardiac uptake was present in 61% of the patients (37 with AL-CA, 13 with ATTR-CA, and 36 without CA). The most common extracardiac sites of amyloid deposition were the osteomedullary region (32%), central nervous system (CNS; 16%), and thyroid (9%). Among patients with amyloidosis (n=82), osteomedullary (24%) and CNS (13%) sites were the most frequent. Most patients with osteomedullary uptake had plasma cell dyscrasia. Thyroid (22%) and lung (17%) uptake were also common

in patients with AL amyloidosis. Among patients without amyloidosis, extracardiac uptake of [18F]-florbetaben was observed only in the osteomedullary region, CNS, kidneys, and adrenal glands.

Conclusions: This is the first study to describe extracardiac uptake of [18F]-florbetaben in patients with suspected CA. Osteomedullary uptake is common, particularly in patients with plasma cell dyscrasia. Thyroid, CNS, and lung uptake are also frequently observed. Further research is needed to determine the clinical correlates and prognostic relevance of extracardiac uptake on [18F]-florbetaben PET.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 578 PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) MICROCIRCOLAZIONE E COLLATERALI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

AGE STRATIFIED PATTERNS IN CLINICAL PRESENTATION, TREATMENT AND OUTCOMES IN ACUTE PERICARDITIS

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Background: There are limited data on acute pericarditis according to different age groups. The aim of this study is to investigate the role of age-related features in clinical characteristics, management, and outcomes of acute pericarditis, with a focus on the geriatric population.

Methods: Patients with a first episode of acute pericarditis were consecutively enrolled between January 2014 and June 2022, and divided into four groups according to age (G1: 18-35 years; G2: 35-55 years; G3: 55-75 years; G4: >75 years). Clinical characteristics and medical therapy were recorded at baseline, and during follow-up.

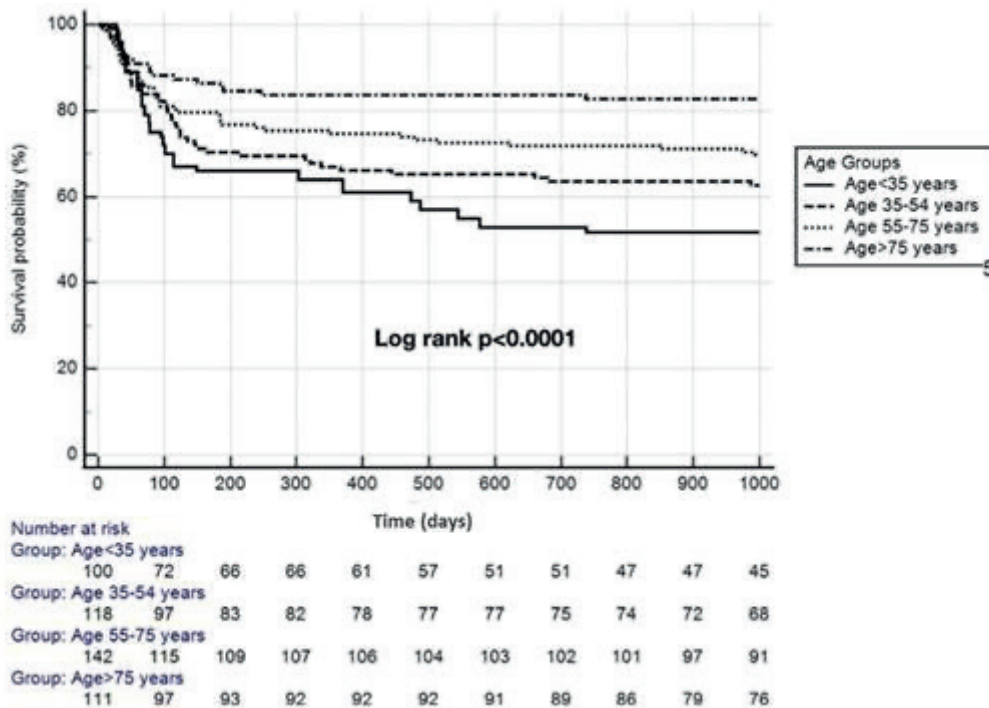


Figure 1



Results: A total of 471 patients (median age 56.3 (IQR 33-73) years, 32.3% women) were included. Younger age (G1-G2-G3) was associated with a higher frequency of chest pain, pericardial rubs ($p<0.0001$), ECG changes ($p=0.002$) and were more commonly treated with colchicine ($p<0.001$), and non-steroidal anti-inflammatory drugs ($p=0.006$). Older patients (G4) depicted more commonly dyspnoea, pericardial/pleural effusion ($p=0.007$) and were more often treated with corticosteroids ($p=0.037$). A secondary cause of pericarditis was detected in 128/471 (27.2%) patients. Older patients were more commonly hospitalised

and had a complicated course with new-onset atrial fibrillation ($p<0.001$) and cardiac tamponade ($p=0.005$), compared with younger patients, who presented more recurrences (respectively G1: 43.0%, G2: 34.7%, G3: 28.2% and G4: 16.2%; $p<0.001$). After multivariable analysis, younger age remained the strongest independent predictor for recurrences (HR 3.23, 95% CI 1.81 to 5.58, $p<0.001$).

Conclusion: Older age is associated with less recurrences of pericarditis, but more severe complications with need for hospitalisation



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 857 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

EFFETTI DEL TAFAMIDIS SUI LIVELLI SIERICI DI TRANSTIRETINA NEI PAZIENTI CON AMILOIDOSI CARDIACA DA TRANSTIRETINA

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Introduzione: L'amiloidosi cardiaca da transtiretina (ATTR) è una patologia caratterizzata dalla deposizione di fibrille amiloidi nel miocardio con conseguente compromissione progressiva della funzione cardiaca. Attualmente, diverse opzioni terapeutiche farmacologiche sono disponibili per il trattamento di questa malattia, tra cui il tafamidis, uno stabilizzatore del tetramero della transtiretina (TTR). Il tafamidis esercita la sua azione terapeutica prevenendo la dissociazione della TTR, riducendo così la formazione di fibrille amiloidi. In virtù del suo meccanismo d'azione, si ipotizza che il trattamento con tafamidis possa essere associato a un aumento dei livelli plasmatici di TTR. L'obiettivo primario del presente studio è quello di valutare, in un contesto di pratica clinica reale, le variazioni dei livelli ematici di transtiretina in pazienti affetti da ATTR trattati con tafamidis. Gli obiettivi secondari sono valutare la correlazione tra i livelli basali di TTR e troponinaThs, NT-proBNP, Kansas City Cardiomyopathy Questionnaire (KCCQ), il test del cammino di 6 minuti (6MWT), ed esaminare la relazione tra le eventuali variazioni dei livelli sierici di transtiretina e tali parametri, al fine di determinare se il monitoraggio dei livelli ematici di TTR possa rappresentare un potenziale indicatore dell'efficacia terapeutica del trattamento con tafamidis.

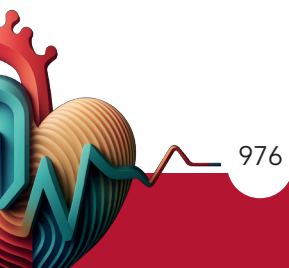
Metodi e risultati: Questo studio retrospettivo ha coinvolto una coorte consecutiva di 123 pazienti con diagnosi di ATTR (80 con ATTRwt e 43 con ATTRv) tra

gennaio 2022 e luglio 2024. Tra questi, 63 pazienti hanno iniziato la terapia con tafamidis, e di 39 (35 uomini, 89,74% e 4 donne, 10,25%, con età media di 79 anni) erano disponibili dati clinici completi sia al basale sia al follow-up. I livelli plasmatici di TTR, troponinaThs, NT-proBNP, punteggio del KCCQ e 6MWT sono stati misurati al baseline e alla prima visita di follow-up, avvenuta in un intervallo compreso tra 3 e 18 mesi (media $11 \pm 4,54$ mesi). Al basale, la mediana dei livelli plasmatici di TTR era di 26,7 mg/dL, mentre al follow-up è aumentata a 30,09 mg/dL, con un incremento percentuale del 12,7%, risultato statisticamente significativo ($p = 0,012$). Al baseline, è stata osservata una correlazione negativa tra i livelli di TTR e il punteggio Kansas (coefficiente = $-0,044$; $p = 0,789$), TroponinaThs (coefficiente = $-0,249$; $p = 0,127$) e NT-proBNP (coefficiente = $-0,214$; $p = 0,214$). Al contrario, è stata rilevata una correlazione positiva tra i livelli di TTR e il test del cammino di 6 minuti (coefficiente = $0,210$; $p = 0,242$). Utilizzando la variazione dei livelli di TTR come variabile di riferimento, sono state valutate le correlazioni con le variazioni del punteggio KCCQ, del 6MWT, di NT-proBNP e TroponinaThs. Pur non raggiungendo la significatività statistica ($p > 0,05$) è emersa una correlazione negativa tra Δ TTR e Δ Kansas (coefficiente = $-0,215$; $p = 0,281$), Δ NT-proBNP (coefficiente = $-0,038$; $p = 0,852$) e Δ Troponina (coefficiente = $-0,151$; $p = 0,461$), mentre una correlazione positiva è stata osservata con il Δ 6MWT (coefficiente = $0,158$; $p = 0,483$).



Conclusioni: Il trattamento con tafamidis determina un aumento significativo dei livelli sierici di TTR nei pazienti con ATTR, in linea con il suo meccanismo d'azione di stabilizzazione della proteina TTR. Il monitoraggio dei livelli sierici di TTR potrebbe rappresentare un indicatore utile per valutare sia lo stato basale della

malattia che l'efficacia del trattamento nel tempo. Studi prospettici su coorti più ampie sono necessari per confermare questi dati e per stabilire se un semplice prelievo ematico possa diventare uno strumento clinico di routine per stratificare la gravità della malattia e monitorare la risposta terapeutica.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 817
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI
E NUTRACEUTICI)
FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO
(IPERTENSIONE ARTERIOSA)

MYOSIN ATPASE INHIBITOR IN REAL WORLD PATIENTS WITH OBSTRUCTIVE HCM: DATA FROM AN ITALIAN MULTICENTRE REGISTRY

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Objectives: Approximately two-thirds of patients with hypertrophic cardiomyopathy present with obstructive physiology (OHCM). Most of these show symptoms that persist despite guideline-directed medical therapy (GDMT), with septal myectomy as the only chance for relieving dynamic obstruction through the left ventricular outflow tract (LVOT). However, new-generation drugs like myosin ATPase inhibitors have

been shown to reduce LVOT gradient and Mavacamten (MAVA) has been approved for treatment, although its administration in Italy is limited to a compassionate use, to date. Our group (Bertero et al. Eur J Heart Fail 2024) recently demonstrated that 49% of the real-world Italian OHCM patients are potentially eligible to MAVA according to EXPLORER-HCM trial entry criteria. In collaboration with the WG on myocardial and pericardial



diseases of the Italian Society of Cardiology, in this novel nationwide multicentre registry (Hypertrophic Obstructive Physiology Study, HOPS), we aimed at investigating the mechanisms of dynamic obstruction in various phenotypes (study rationale and design approved by the Ethical Committee [EC] of Messina [Italy], protocol no.16/2024, 2024/04/03). Accordingly, the proportion of patients currently treated with MAVA was attained as by the end of August 2024.

Methods: The registry involved tertiary Clinical Centres with documented experience in HCM, on a voluntary basis. Researchers were asked to provide anonymous findings of their patients from the last follow-up visit. The Diagnosis of OHCM was defined according to ESC

guidelines, after excluding any known infiltrative or storage disorder mimicking the HCM phenotype. All patients had evidence of obstructive physiology, but >80% were on GDMT, thus the dynamic gradient was lower than the native one. We also recognized the proportion of patients who started MAVA therapy and those who were eligible to a compassionate use as by the local EC in each Centre.

Results: 427 OHCM patients, 53% males, mean aged 63 ± 13 years, NYHA class 2.0 ± 0.7 were included in this registry. Ventricular septum and posterior wall thickness as by echocardiography averaged 20 ± 4 and 12 ± 3 mm, respectively. Peak dynamic gradient through the LVOT was 75 ± 35 mm Hg. Regarding therapy, 378 patients (88.5%) were on betablocker, 79 (18.5%) on disopyramide, 49 (10%) on verapamil, and 22 (5.2%) started MAVA therapy. In addition, 46 more patients (11%) were still waiting for compassionate use approval by the local EC.

Conclusions: Although participation in this nationwide registry was limited to a few tertiary Italian centers, present findings reveal that only a small proportion of real-world OHCM patients who are eligible for myosin ATPase inhibitor therapy are receiving it so far.

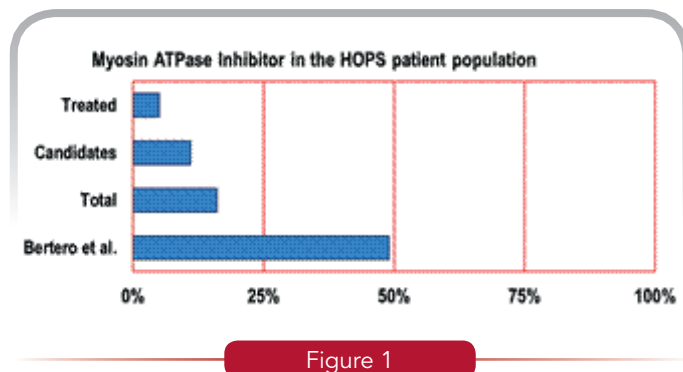
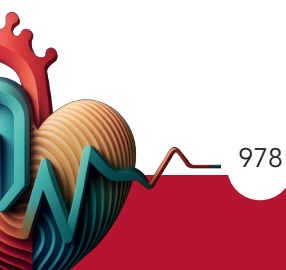


Figure 1



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 514 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) PROGNOSI (SCOMPENSO CARDIACO)

CAN'T SEE CLEAR

Edoardo Gabri (a, b), Alessandro Parodi (a, b), Giuseppe Patti (a, b)

(a) UNIVERSITÀ DEGLI STUDI DEL PIEMONTE ORIENTALE; (b) AOU OSPEDALE MAGGIORE DELLA CARITÀ DI NOVARA

In March 2024 Z.R., a 60 years old woman, referred to a cardiologist for worsening exertional dyspnea and fever. Her past medical history accounted for thyroidectomy, bilateral carpal tunnel surgery and MGUS with regular FU. She had multiple cardiovascular risk factors such arterial hypertension, obesity and she was a former smoker. ECG showed sinus rhythm and no particularities, a TTE was then performed finding a slightly hypertrophic LV with normal LVEF and minimal pericardial effusion. She was sent to ED where elevated inflammatory markers were borderline, with elevation of TnT (168 pg/ml and Nt- proBNP (2300 pg/ml). A myocarditis was diagnosed and she started ibuprofen and colchicine therapy, discharged at home. At the end of May 2025 due to aggravation of dyspnea, she referred to a cardiology. This time TTE showed a LVEF impairment (45%), restrictive diastolic pattern, ubiquitous pericardial effusion. The patient was sent to ED and she was admitted to cardiology department to work up. Blood samples showed an elevated (proBNP 8000 pg/ml), monoclonal pattern was found at QPE with K/L ratio severely impaired (consistently different from the MGUS pattern she presented in the last 4 years). A complete TTE showed concentric LVH, LVEF 40%, restrictive diastolic pattern with apical sparing "cherry sign" and circumferential pericardial effusion. In order to rule out CAD in a patient with different CVRF, a CA was performed and a significant proximal LAD lesion was found and treated with PCI + DES. Medical treatment was started and HFmrEF medications were all on board. The patient was discharged in 17/06, CMR and total-body scintigraphy with bone tracer were planned closely.

Ten days later the CMR showed biventricular dysfunction (LVEF 37%), elevated T1, difficult IT identification (shorter than blood), PSIR sequences not performed, no coronary distribution related hypoperfusion. A BM aspirate to evaluate possible progression of MGUS to myeloma was scheduled. On 29/06 she presented to ED with severe dyspnea, peripheral oedema and oligoanuria. Blood test showed AKI, Nt-pro BNP elevation (43000 pg/ml). The ECG showed AF and the TTE was unchanged. The patient progressively worsened going from SCAI A to SCAI C cardiogenic shock stage. Maximal vasopressors (noradrenaline) and inotropes (dobutamine) doses was reached shortly. Aki worsened with anuria and hemodiafiltration was started, Tn-T show a slight delta (40 at admission, 400 in severe cardiogenic shock). For persistent cardiogenic shock IABP was firstly chosen, during its placement periprocedural cardiac arrest with PEA showed up and ECMO was placed. Biventricular dysfunction (LVEF 10%, FAC 15%, TAPSE 5 mm) was found at ETT ECMO was placed for periprocedural cardiac arrest. The patient died due to ischemic arterial complications.

Conclusion: This tricky case helped us focus on the possible different strategies in worsening cardiac amyloidosis. The importance of a prompt diagnosis and characterisation, the possible misleading CAD in middle aged patients, the importance of SR in CA and the known hemodynamic deterioration due to FA onset, the poor response to usual CICU medications, the possible role of light chains toxicity in the rapid worsening LVEF.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 898
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)**

**AN EMBLEMATIC CASE OF DESMOSOMOPATHY WITH RECURRENT EPISODES
OF ACUTE MYOPERICARDITIS IN TWO YOUNG SISTERS WITH THE SAME GENETIC MUTATION**

Manuel Garofalo (a, b), Alessandra Fornaro (a), Laura Sasso (a), Mattia Targetti (a), Giacomo Bonacchi (a),
Francesca Girolami (c), Giorgia Panichella (a, b), Maurizio Pieroni (a, b), Iacopo Olivotto (a, b)

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(b) UNIVERSITÀ DEGLI STUDI DI FIRENZE, FIRENZE (IT); (c) CARDIOGENETICA, CARDIOLOGIA PEDIATRICA
E DELLA TRANSIZIONE, IRCCS MEYER, FIRENZE (IT)

Desmoplakin (DSP) is a critical component of desmosome structures and variants in desmoplakin gene are associated with a "unique" form of cardiomyopathy and a left ventricle (LV)-dominant arrhythmogenic cardiomyopathy (ACM). Recurrent "myocarditis-like" episodes of chest pain with acute myocardial injury (hot phases) lead to extensive fibrosis and consequently a high arrhythmic risk. Therefore, an accurate and tempestive diagnostic work up is crucial. We present the clinical case of two young sisters with early-onset disease: the younger sister, 27 years old aged, presented in April 2022 with an initial episode of acute myocarditis (peak of troponin T-hs 21,171 pg/ml and negative CRP), for which an urgent cardiac Magnetic Resonance Imaging (MRI) was performed, revealing subepicardial edema in the mid-distal lateral and inferolateral wall of the left ventricle (LV), as well as extensive areas of abnormal meso-subepicardial distribution of late gadolinium enhancement (LGE) uptake in the left ventricle. The right ventricle (RV) was of normal size and function, in absence of LGE. A six-months follow-up MRI revealed LGE in the mid-apical anterior region and the anterior wall of the RV with a non-ischemic sub-epicardial pattern and an area of LGE in the posterior junctional region. Initially suspected to be a post-viral myocarditis, steroid therapy was started. Subsequently, due to numerous recurrent episodes of chest pain, immunomodulatory therapy with anti-IL1r was also introduced leading to better

control of the chest pain symptoms. The patient was then referred to our Cardiomyopathy Unit for further evaluation. Based on the suspicion of a possible genetic cardiomyopathy onset (dilated/arrhythmogenic/non dilated LV cardiomyopathy) with familial characteristics (a paternal uncle died suddenly at 26 years old, no autopsy was performed), a genetic test was performed in July 2023, which resulted positive for a pathogenic/likely pathogenic heterozygous DSP variant (causing a premature stop codon) and two variants of uncertain significance (VOUS) in the CTNNA3 and TMEM43 genes. Due to the progressive worsening of the arrhythmic burden despite treatment with Nadolol, a repeat cardiac MRI was performed in June 2024, demonstrating preserved ejection function (EF) of the LV (EF 57%) and preserved right ventricular kinetics. However, there was a substantial increase in fibrotic burden, with diffuse subepicardial LGE in the lateral and inferior wall of the left ventricle and mid-wall patches in the septum and anterolateral regions with a non-ischemic pattern. The case was subsequently discussed collegially and both in consideration of worsening in fibrotic and arrhythmic burden and the 2023 ESC Guidelines for Cardiomyopathies, which suggest in class IIa (C) that "an ICD should be considered in patients with NDLVC with a genotype associated with high SCD risk and LVEF >35% in the presence of additional risk factors," an indication for primary prevention subcutaneous implantable cardiac defibrillator (s-ICD)

implantation was made to prevent sudden cardiac death (SCD). The “older” sister, 30 years old, was recently evaluated at our Center for disease onset presented in early 2023 with recurrent episodes of chest pain. A cardiac MRI in March 2023 showed a picture suggestive of subacute peri-myocarditis with LGE in the infero-basal and mid-infero-septal regions with a subepipericardial distribution (non-ischemic pattern), findings confirmed by a follow-up MRI six months later. Viral and immunological serologies were also tested, both of which were negative. Meanwhile, for better clinical assessment and considering her sister history, she was referred to our Center. A genetic test performed

on in May 2024 demonstrated a heterozygous DSP mutation (likely pathogenic variant), the same identified in her sister. Her most recent Emergency Department visit on September 9, 2024, was for chest pain with mild troponinosis (troponin T-hs 22 and 23 ng/mL, CRP 12), likely a mild recurrence of acute myocardial injury. She was prescribed continued colchicine and titration of ibuprofen. In agreement with Immunologists, anti-IL1r (anakinra) therapy was initiated in the context of an inflammatory “flare” in desmosomopathy. A follow-up cardiac MRI has been requested to reassess the burden of LGE and to better stratify the arrhythmic risk. Is this the beginning of a well-known story?



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 466
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)
CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E MALATTIE
DEL CIRCOLO POLMONARE)**

**PREDICTORS OF ALL-CAUSE DEATH AND HEART TRANSPLANT IN PAEDIATRIC
PATIENTS AFFECTED BY MYOCARDITIS**

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Background: Despite the indications of performing endomyocardial biopsy (EBM) in all patients suspected of myocarditis, in paediatric patients the diagnosis remains largely clinical.

Purpose: We aimed to identify the prognostic value of EBM and the potential predictive factors for all-cause death and heart transplantation (HTx) in paediatric patients with EBM-proved myocarditis.

Materials and Methods: All consecutive paediatric patients (age <18 years) with EBM-proved myocarditis referred to our hospital from 1988 to 2022 were included in this retrospective monocentric study.

Results: A total of 108 EBM-proved myocarditis patients were included (mean age 3.8 ± 3.7 years; 46 (42.6%) males; 56 (51.8%) patients with active myocarditis and 52 (48.1%) with borderline myocarditis, among them. Fibrosis at EBM was present in 10 patients (9.2%). EBM was uneventful in all patients and EBM guided the clinical

management according with the inflammatory pattern and virus presence. At 1-year follow-up 73 patients (67.5%) showed myocardial recovery, 8 (7.4%) patients underwent HTx, 8 (7.4%) died and 19 patients (17.6%) were lost at follow up. Active myocarditis without fibrosis at EBM resulted protective for all-cause death and HTx at 1-year follow-up (HR 0.084; IC 0.011-0.658; $p=0.018$). Predictors of unfavourable outcome were lower LVEF at admission (HR 0.91; IC 0.844-0.987; $p=0.022$); the presence of Herpes virus 1-2 (HSV1-2) viral genome at EBM (HR 14.263; IC 1.184-171.82; $p=0.036$); age at presentation (HR 1.14; IC 1.002-1.314; $p=0.047$). The presence of fibrosis coupled to inflammatory pattern at EBM was associated with a reduced survival at long-term follow-up (log rank=0.05) (tab 1).

Conclusions: The detection of fibrosis and/or HSV1-2 viral genome at EMB are potent predictors for all-cause death and HTx in paediatric patients affected by myocarditis. This study underlines the additional role of EMB for risk stratification in paediatric patients.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 498

TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

INTRAPERICARDIAL LIPOMA AS A RARE CAUSE OF CARDIAC TAMPONADE

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 (b) DEPARTMENT OF CLINICAL MEDICINE, UNIVERSITY OF INSUBRIA, VARESE, ITALY

Introduction: Pericardial lipomas are benign tumors with a predominance of adipose cells. They generally grow insidiously but can expand to compress and irritate adjacent anatomical structures. Rarely, they can cause pericardial effusion, mainly by inflammatory mechanisms.

Case Presentation: A 77-year-old, obese, dyslipidemic, active smoker male presented to our emergency department (ER) in March 2024 complaining of severe dyspnea. He denied thoracic pain, palpitations, syncope, fever or loss of weight. He had a history of permanent atrial fibrillation and hypertensive cardiopathy. In 2017, during routine pre-operative assessment for eye surgery, a chest X-Ray showed cardiomegaly, therefore, a computed tomography (CT) scan of the thorax was performed, leading to a diagnosis of epicardial and antero-lateral left mediastinic lipomatosis. At the time of admission in our ER, the patient was hypotensive

(BP 95/60 mmHg) with other parameters within normal limits. Electrocardiogram showed atrial fibrillation with a heart rate of 57 bpm. Cardiac ultrasound showed a hypertrophic left ventricle with a preserved ejection fraction and important ubiquitous pericardial effusion (with a maximal thickness of 3 cm at the apex, around the posterior wall of the left ventricle and the right cavities) with "swinging heart" pattern, with no relevant valve stenosis/regurgitations. Pericardiocentesis was subsequently performed and 2100 cc of hematic liquid were drained. The chemical-physical examination of pericardial fluid was typical for exudate, negative for tumoral cells and for mycorganism. To exclude a paraneoplastic cause, a thoracic and abdomen CT scan were performed and tumour markers (Cyfra 21.1, NSE) were assessed. All the aforementioned exams were negative. Screening for autoimmunity resulted negative as well. An infective etiology was also excluded with quantiferon and a hepatitis sierology panel.

The pre-discharge cardiac ultrasound confirmed pericardial lipomatosis, without any residual pericardial effusion. Anti-inflammatory therapy with colchicine was initiated. At one month follow-up, cardiac ultrasound was repeated, confirming the pericardial lipomatosis in the absence of pericardial effusion.

Discussion: Pericardial lipomas are a rare subset of cardiac lipomas. They are typically asymptomatic and represent

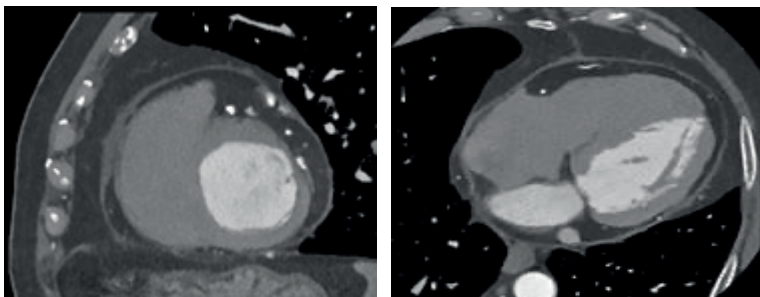
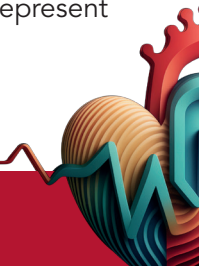


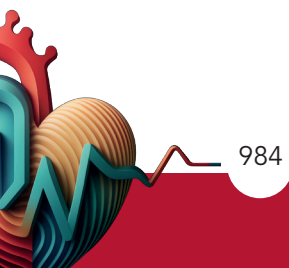
Figure 1



incidental findings on CT scans or magnetic resonance imaging (MRI). They seldom present with symptoms and they rarely present with significant pericardial effusion/cardiac tamponade. The mechanism of cardiac tamponade has previously been explained with two main theories: cardiac compression by the mass itself or pericardial inflammation resulting in fibrosis and significant pericardial effusion due to

extracellular matrix destruction and increased vascular filtration, with the latter appearing the most suitable for our case.

Conclusion: Pericardial lipomas are usually asymptomatic and with a good prognosis, but they can also result in life-threatening complications, such as cardiac tamponade.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 323
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PROGNOSI (SCOMPENSO CARDIACO)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)

**MIOCARDITE ACUTA: CORRELAZIONE TRA PRESENTAZIONE CLINICO-STRUMENTALE
E PROGNOSI A BREVE E MEDIO TERMINE**

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Maria Alfarano (a), Carmine Dario Vizza (a), Cristina Chimenti (a)
(a) UNIVERSITÀ LA SAPIENZA - ROMA

Introduzione: La miocardite è una malattia infiammatoria del miocardio caratterizzata da un ampio spettro di presentazione. La sua prognosi in acuto ed a lungo termine dipende prevalentemente dal quadro di presentazione, che può andare da un decorso paucisintomatico fino allo shock cardiogeno conclamato. La stratificazione del rischio all'esordio è fondamentale per la gestione ottimale del paziente. In pazienti con cardiomiopatia primitiva la miocardite può essere la prima presentazione della malattia ed il follow-up longitudinale in questi pazienti permette di identificare l'esistenza di un substrato miocardico predisposto.

Obiettivi: Lo scopo di questo studio è stato quello di valutare il valore prognostico delle caratteristiche di esordio e dell'evoluzione clinico-strumentale nei pazienti con diagnosi di miocardite con un follow-up a breve e medio termine.

Materiali e metodi: Nel presente studio retrospettivo monocentrico, sono stati inclusi tutti i pazienti consecutivi con più di 18 anni e capacità di fornire un consenso informato, che - tra gennaio 2019 e marzo 2023- hanno ricevuto una diagnosi di miocardite acuta certa o clinicamente sospetta, con un follow up clinico-strumentale di almeno 6 mesi, suddivisi in base all'esordio in presentazione con scompenso cardiaco,

aritmica o simil-infartuale. Gli outcomes clinici, valutati nella popolazione generale ed in ogni singolo gruppo, includevano la mortalità per tutte le cause, la riacutizzazione dello scompenso cardiaco, includendo sia le ospedalizzazioni per scompenso cardiaco che la necessità di titolazione della terapia diuretica, e gli eventi aritmici, come composito di necessità di aumento della terapia antiaritmica, evento aritmico o impianto di defibrillatore. Tutte le caratteristiche di esordio e quelle al controllo sono state correlate con i suddetti outcomes nella popolazione generale ed in ogni singolo gruppo.

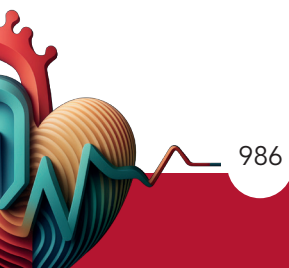
Risultati: Nello studio sono stati valutati 58 pazienti (età 50 ± 17 , 64% sesso maschile), 41% con presentazione simil-infartuale, 19% aritmica e 40% complicata da scompenso cardiaco. Nessun paziente appartenente al primo gruppo presentava familiarità per morte cardiaca improvvisa o cardiomiopatia. Nei restanti due gruppi è stato documentato un maggior numero di eventi al follow-up, con una differenza statisticamente rispetto ai pazienti con presentazione simil-infartuale. La frazione di eiezione ventricolare sinistra (LVEF) all'esordio ha mostrato una correlazione significativa con il tasso di ospedalizzazione (Rho -0,55; p value 0,001) e con gli eventi aritmici (Rho -0,47; p value 0,001) al controllo, con una buona capacità predittiva per entrambi gli outcomes (AUC: 0,85, cut-off: 40% e



AUC:0,78, cut-off: 47%, rispettivamente). Sono emerse correlazioni debolmente positive tra l'estensione del late gadolinium enhancement (LGE) al basale e il peggioramento dello stato di compenso e gli eventi aritmici, risultato statisticamente significativo solo nel gruppo con presentazione aritmica.

Conclusioni: Questo studio conferma come la severità della presentazione clinica sia il principale

determinante della prognosi in acuto e a medio termine nei pazienti con miocardite acuta. Il predittore più robusto di eventi avversi al follow-up è la LVEF all'esordio. Nei pazienti con cardiomiopatia sottostante, la presentazione più severa all'esordio e lo scarso recupero al controllo sono elementi che dovrebbero supportare l'utilizzo del test genetico, specialmente in caso di familiarità per cardiomiopatia o per morte cardiaca improvvisa.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 384
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
PROGNOSI (SCOMPENSO CARDIACO)

CARDIAC MAGNETIC RESONANCE AND GENETICS: AN INTEGRATED APPROACH TO PREDICT LEFT VENTRICULAR REVERSE REMODELING IN DILATED AND NON-DILATED CARDIOMYOPATHY

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Importance: Left Ventricular Reverse Remodeling (LVRR) is a prognostic marker in patients with dilated (DCM) and non-dilated left ventricular cardiomyopathy (NDLVC). The utility of integrating late gadolinium enhancement (LGE) and genetic testing in predicting LVRR in DCM and NDLVC remains a gap of knowledge.

Objective: To assess an integrated approach including cardiac magnetic resonance (CMR) imaging and genetics to predict LVRR in patients with DCM and NDLVC.

Design: In this retrospective cohort study, we enrolled consecutive DCM and NDLVC patients with available: I) baseline echocardiographic left ventricular ejection fraction (LVEF) of < 50%; II) genetic testing; III) baseline CMR and IV) 12-month follow-up echocardiographic data. The data were collected between January 1990 and December 2022.

Setting: This is a multicenter observational study which recruits patients from two referral centers for cardiomyopathies in Italy and USA.

Participants: From a total cohort of 894 DCM and NDLVC with available genetic testing, 313 patients met the eligibility criteria.

Main Outcome and Measure: The study endpoint was the achievement of LVRR, defined as LVEF \geq 50% or an absolute increase from baseline of \geq points% at 12-month follow-up, detected by echocardiography.

Results: Among 313 patients (242 DCM and 71 NDLVC, 45 \pm 14 years, 30% females), LVRR was observed in 177 (57%; LVEF at baseline: 33 \pm 11% to 43 \pm 10% at 12-month evaluation). The presence of



titin truncating variants (TTNtv), male sex and the absence of arrhythmogenic genes and of LGE ring-like pattern were identified as independently associated with LVRR. In patients with baseline LVEF < 35%, LGE ring-like pattern (OR: 0.18 [0.05-0.63]; $p=0.007$) and arrhythmogenic genes (OR vs other genes: 0.21 [0.05-0.92]; $p=0.04$) were confirmed less likely related to LVRR.

Conclusions and Relevance: In a large cohort of DCM and NDLC, the presence of TTNtv and male gender were independently associated with 12-month LVRR. Conversely, the presence of arrhythmogenic genotypes and LGE ring-like pattern were inversely related to LVRR, particularly in patients presenting with LVEF <35%. These results could guide clinicians through a tailored risk assessment and treatment planning.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 537 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

NATURE HISTORY AND PHENOTYPIC CHARACTERIZATION OF GENETICALLY DETERMINED ACUTE MYOCARDITIS

Giulia Bassetto (a), Alessia Paldino (a), Daniele Franceschin (a), Matteo Dal Ferro (a), Marta Gigli (a), Maria Perotto (a), Eva Del Mestre (a), Gianfranco Sinagra (a), Marco Merlo (a)
(a) UNIVERSITÀ DEGLI STUDI DI TRIESTE

Background and objectives: Acute myocarditis is an inflammatory disease of the myocardium with a broad spectrum of aetiologies and clinical manifestations. Recently the overlap between myocarditis and genetically determined cardiomyopathies presenting with “hot-phases” (myocarditis-like episodes) has been frequently described: identification of red flags that might suggest a genetic background is an unmet challenge for clinicians and little is known about the natural history of genetically determined acute myocarditis.

We sought to identify these “red flags” of a positive genetic testing for P/LP variants of genes associated with cardiomyopathies in patients presenting acute myocarditis and to characterize the prognostic significance of a positive genotype in acute myocarditis.

Methods and Results: The clinical, electrocardiographic, echocardiographic, and magnetic resonance imaging data of patients diagnosed with acute myocarditis and receiving care at the Cardiology Complex of Trieste will be comprehensively analyzed. The study aims to evaluate the likelihood of positive findings in

genetic screening for cardiomyopathies among these patients. The data of 254 patients diagnosed with acute myocarditis were analyzed; 94 of these patients underwent genetic testing, revealing pathogenic or likely pathogenic (P/LP) variants in 29 (31%) patients. From the results, male sex, a family history (of cardiomyopathies, myocarditis, sudden cardiac death), presence of inverted T waves in infero-lateral leads or “ring-like” patterns on CMR, onset of NSVT, and persistent left ventricular dysfunction at follow-up were identified as predictive factors for genetic testing positivity.

Additionally, these factors, combined with the recurrence of myocarditis, appear to be potential predictors for the presence of a P/LP variant in DSP.

Conclusions: The positivity to genetic testing for pathogenic or likely pathogenic (P/LP) variants in proarrhythmogenic genes is associated with worse outcomes in patients with acute myocarditis. Performing a genetic test can therefore enable early recognition of the patient’s condition and facilitate careful follow-up and adequate prevention of adverse events.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 843
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
ARITMIE VENTRICOLARI (ARITMIE)
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

**FAMILY SCREENING IN DILATED CARDIOMYOPATHY AND NON-DILATED CARDIOMYOPATHY:
METHODOLOGY AND PROGNOSTIC IMPACT**

Eva Del Mestre (a), Alessia Paldino (a), Carola Pio Loco Detto Gava (a), Ilaria Gandin (a),
Alessandro Folgheraiter (a), Jacopo Rizzi (a), Matteo Dal Ferro (a), Marco Merlo (a), Gianfranco Sinagra (a)
(a) *DIPARTIMENTO CARDIOVASCOLARE, AZIENDA UNIVESITARIA GIULIANO ISONTINA (ASUGI),
UNIVERSITÀ DI TRIESTE*

Background: The prognostic significance of detecting left ventricular systolic dysfunction (LVSD) during family screening programs (FSPs) in relatives of probands affected by dilated (DCM) and non-dilated left ventricular (NDLVC) cardiomyopathies remain unclear.

Objective: This study sought to evaluate the prognostic role of LVSD detection in relatives of DCM/NDLVC probands and to define the most accurate FSP in this setting.

Methods: Baseline and follow-up data of 1st-degree relatives of probands affected by DCM/NDLVC were collected. The primary outcomes were all-cause death and heart transplantation (HT). Secondary heart failure (HF) and arrhythmic outcomes were also included. Outcomes were evaluated in the total population in relation to LVD and FSP involvement.

Results: A total of 492 1st-degree relatives were enrolled. During a median follow-up of 110 months (IQR 57-188 months), only subjects that previously developed LVSD had primary outcomes (19 vs 0, $p < 0.001$) and secondary outcomes (HF: 12 vs 0, $p = 0.005$; arrhythmic: 30 vs 0, $p < 0.001$). Subjects with LVSD detected by FSP showed a lower rate of primary outcome (FSP, $n = 19$, 14%; not-FSP, $n = 40$, 37%; $p < 0.001$) and secondary arrhythmic outcomes (FSP, $n = 18$, 13%; not-FSP, $n = 38$, 38%; $p < 0.001$). In this contest, LV global-longitudinal-strain (LV-GLS) and ECG-Holter showed a relevant role in term of prediction of LVSD and outcomes into FSP.

Conclusions: Relatives of DCM/NDLVC probands who developed LVSD during a long follow-up, typically around the age of 40 years, showed incremental risk of major cardiovascular outcomes. FSP represented a significant tool for preventing major events, mostly if included ECG-Holter and LV-GLS.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 854 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

NON-INVASIVE CHARACTERIZATION OF HYPERTROPHIC PHENOCOPIES USING INTEGRATED ECG/ECHO INDEXES

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Background and Aims: Previous studies have demonstrated the value of several indexes reflecting the discordance between QRS complex voltages on electrocardiogram (ECG) and left ventricle (LV) wall thickness (LVWT) or mass index (LVMI) on echocardiogram (echo) for identifying amyloid cardiomyopathy (AC) in patients with hypertrophic hearts. However, these studies excluded patients with established hypertrophic cardiomyopathy (HCM) and Anderson-Fabry disease (AFD). The aim of this study was to assess the performance of ECG/echo indexes in screening for AC among patients with hypertrophic phenotype cardiomyopathies.

Methods: This was an Italian retrospective, cross-sectional, multicentric study. Data from ECGs and echocardiograms of patients with confirmed AC, HCM and AFD and a LVWT > 12 mm were analyzed to

calculate the most commonly used ECG/echo indexes (**Figure**).

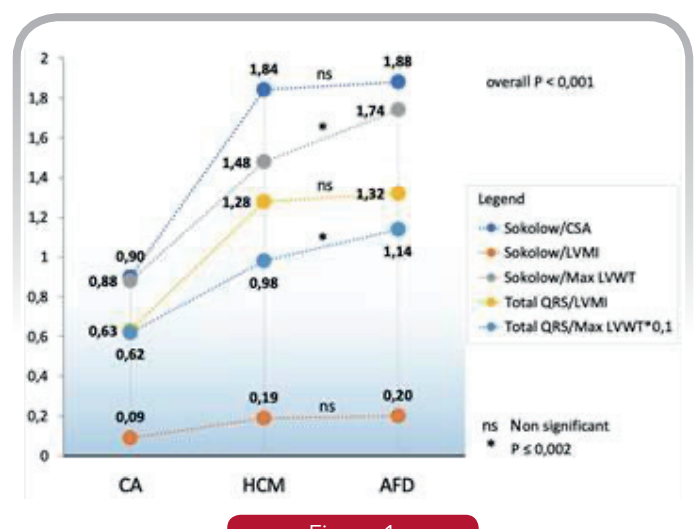
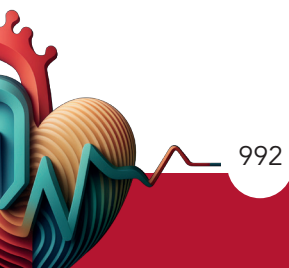


Figure 1

Results: Of the 1181 patients included, 416 had AC, 594 had HCM, 171 had AFD. All evaluated ECG/echo indexes were able to distinguish AC from other phenocopies ($p < 0.001$). The total QRS score/LVMI was the best performing ECG/echo index for differentiating AC from other hypertrophic phenotypes, with an accuracy of 83%. The total QRS/maximum LVWT was the best performing index in discriminating between the three cardiomyopathies with cut-off values of 6.21 vs 9.81 vs 11.47 in AC, HCM, AFD, respectively ($p < 0.001$

for all comparisons; **Figure**). A clinical model including age ≥ 65 years, male sex, chronic kidney failure and total QRS/max LVWT < 7.7 exhibited an area under the curve of 0.931, 0.815 and 0.685 for the diagnosis of AC, HCM and AFD, respectively.

Conclusions: ECG/echo indexes, and in particular total QRS/Maximum LVWT, may serve as an easily accessible first-line tool to differentiate AC from HCM and AFD, and to orient subsequent diagnostic work up.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 586 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

PROPIONIC ACIDEMIA AS A "HEART FAILURE STAGE A" GENETIC DISEASE: RESULTS FROM A LONG-TERM FOLLOW-UP MONOCENTRIC STUDY

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(a) OSPEDALE PEDIATRICO BAMBINO GESÙ, IRCSS

Background: Propionic acidemia (PA) is a rare metabolic disorder caused by a deficiency in propionyl-CoA carboxylase (PCCA), leading to toxic metabolite accumulation. It often presents as acute metabolic decompensation during the first years of life. Cardiac disease, in the form of dilated or hypokinetic cardiomyopathy, is a major manifestation and source of morbidity in PA; however, due to the rarity of the disease, its prevalence is not well understood.

Material and Methods: We conducted a monocentric retrospective study including all patients with a

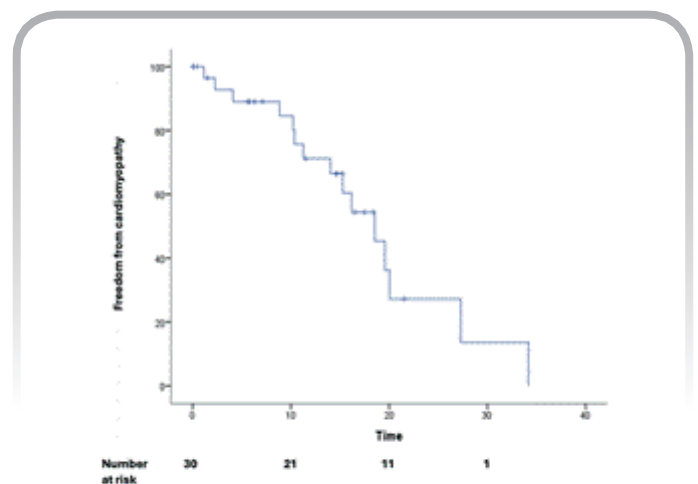
confirmed diagnosis of PA who underwent cardiological assessment at our tertiary center.

Results: A total of 31 patients with confirmed propionic acidemia were referred to our center between 1990 and 2023. Among these patients, 15 developed cardiomyopathy manifesting as dilated cardiomyopathy or isolated left ventricular dysfunction. **Figure 1** reports freedom from cardiomyopathy over a follow-up of 33 years illustrating that all at-risk patients eventually develop cardiomyopathy. Interestingly and in accordance to previous literature findings, 4 of these patients

	Overall	Metabolic failure as clinical onset (n=27)	Cardiomyopathy as clinical onset (n=4)
Age at diagnosis of PA (median)	8.5 days (3.0; 128.3)	5.0 days (2.8; 30.0)	10.5 years (7.7; 13.2)
Age at referral (median)	8.8 years (1.8; 12.9)	8.2 years (1.0; 13.0)	16.0 (14.1; 22.3)
Sex			
Male (n, % of total)	22 (71%)	21 (77%)	3 (75%)
Female (n, % of total)	9 (29%)	8 (29%)	1 (25%)
Clinical onset			
Metabolic failure (n, % of total)	27 (87%)	-	-
CM (n, % of total)	4 (13%)	-	-
Age at first metabolic failure (median, days)	8.5 (2.8; 7.0)	8.5 (2.8; 7.0)	-
Age at CM onset (median, years)	15.2 (10.7; 19.0)	13.6 (10.5; 17.3)	17.6 (14.1; 23.3)
CM			
DCM (n, % of total)	15 (48%)	11	4 (100%)
Isolated LV dysfunction (n, % of total)	11 (35%)	7 (26%)	
Isolated LV dysfunction (n, % of total)	4 (13%)	4 (15%)	
Liver transplantation			
For CM	8	3	1
For recurrent metabolic decompensation	4	4	-
Age at liver transplantation (median, years)	15.2 (2.6; 17.2)	15.7 (2.0; 17.2)	16.1
Antithrombotics (n, % of total)	2 (6%)	1	1
QTc (median, ms)	460 (445; 490)	460 (452; 480)	474 (435; 500)

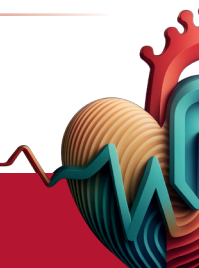
Demographic characteristics of study population. Patients have been divided into two different groups according to the different clinical onset (metabolic failure vs. cardiomyopathy).

Table 1



Kaplan-Meier curve reporting freedom from cardiomyopathy in patients with propionic acidemia.

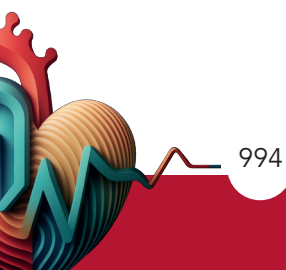
Figure 1



developed cardiomyopathy without any previous history of metabolic decompensation. Demographic characteristics of patients are reported in **table 1**.

Conclusion: Patients with PA constitute a high-risk group for developing cardiomyopathy (both dilated

or hypokinetic) and therefore deserve regular and long-term cardiological follow-up. In some rarer cases, cardiomyopathy may present as the initial and only manifestation of the disease, making PA a potential etiology for seemingly isolated cardiomyopathies.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 647

MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)

ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO)

RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)

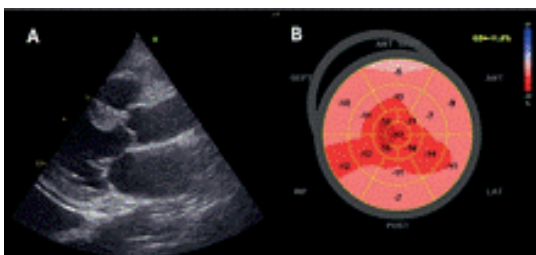
IPERTROFIA O PSEUDOIPERTROFIA? QUANDO LE RED FLAGS DIVENTANO RED SLOPES

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Introduzione: La miocardite è una condizione di danno infiammatorio del miocardio, caratterizzata da una presentazione clinica polimorfa, che può mimare altre entità nosologiche.

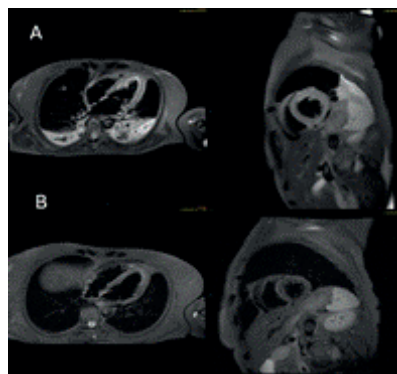
Presentazione del caso: Una donna di 69 anni si è presentata alla nostra attenzione per dolore toracico, dispnea ed astenia. L'iniziale sospetto di amiloidosi cardiaca a catene leggere, corroborato da red flags elettrocardiografiche, ecocardiografiche (Figura 1)

e laboratoristiche, è stato precocemente messo in discussione dall'evoluzione clinica; l'anamnesi accurata e la risonanza magnetica (Figura 2A) hanno permesso di porre la corretta diagnosi di miocardite fulminante in fase infiammatoria edemigena. L'evoluzione in shock cardiogeno ha richiesto l'avvio di terapia immunosoppressiva, supporto amminico e meccanico al circolo. La rapida risposta alla terapia avviata ha consentito un progressivo recupero della funzione sistolica ventricolare sinistra (FSVS), fino



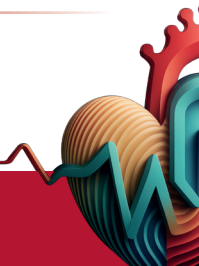
Ecocardiogramma all'ingresso.
 (A) Moderato aumento degli spessori parietali del ventricolo sinistro (VS).
 (B) Pattern "apical sparing" al Bull's eye degli strain longitudinali del VS.

Figure 1



Risonanza magnetica cardiaca con sequenze STIR-T2 nelle proiezioni quattro e due camere.
 (A) Alla diagnosi presenza di edema.
 (B) Al follow-up a 3 mesi marcata riduzione dell'edema.

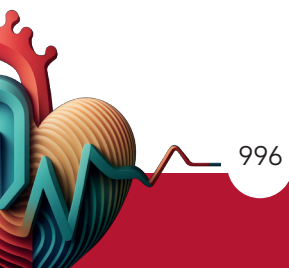
Figure 2



alla normalizzazione alla dimissione. La risonanza magnetica di controllo a 3 mesi (Figura 2B) confermava completo recupero della FSVS e l'assenza di segni di edema miocardico.

Discussione e conclusioni: Il riscontro ecocardiografico di pseudoipertrofia ventricolare sinistra e di bassi

voltaggi nelle derivazioni periferiche all'ECG è raro ma possibile nella miocardite acuta in fase infiammatoria edemigena e può mimare forme di cardiomiopatia infiltrativa come l'amiloidosi. Di fronte a tali reperti, nei pazienti emodinamicamente stabili, la risonanza magnetica cardiaca rappresenta una metodica fondamentale nel work-up diagnostico.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 106 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

PREVALENCE OF PATHOGENIC VARIANTS IN CARDIOMYOPATHY-ASSOCIATED GENES IN ACUTE MYOCARDITIS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Acute myocarditis is an inflammatory condition that may precede the development of dilated or arrhythmogenic cardiomyopathy. We aimed to investigate the reported prevalence of pathogenic/likely pathogenic (P/LP) variants in cardiomyopathy-associated genes in patients with acute myocarditis.

Methods: For this systematic review and meta-analysis, we searched Pubmed and Embase databases on March 04, 2023. Observational studies evaluating the prevalence of P/LP variants in cardiomyopathy-

associated genes in patients with acute myocarditis were included. Studies were stratified into adult and pediatric age groups and for the following scenarios: (a) complicated myocarditis (i.e., presenting with acute heart failure, reduced left ventricular ejection fraction, or life-threatening ventricular arrhythmias); (b) uncomplicated myocarditis. The study was registered on PROSPERO (CRD42023408668) and followed PRISMA guidelines.

Results: Of 732 studies identified, 8 met the inclusion criteria, providing data for 586 patients with acute myocarditis. A total of 89 P/LP variants in cardiomyopathy-associated genes were reported in 85 patients. In uncomplicated myocarditis the pooled prevalence was 4.2% (95% CI 1.8-7.4%, I^2 1.4%), while in complicated myocarditis pooled prevalence was 21.9% (95% CI 14.3-30.5%, I^2 38.8%) and 44.5% (95% CI 22.7-67.4%, I^2 52.8%) in adults and children, respectively. P/LP variants in desmosomal genes were predominant in uncomplicated myocarditis (64%), while sarcomeric gene variants were more prevalent in complicated myocarditis (58% in adults and 71% in children).

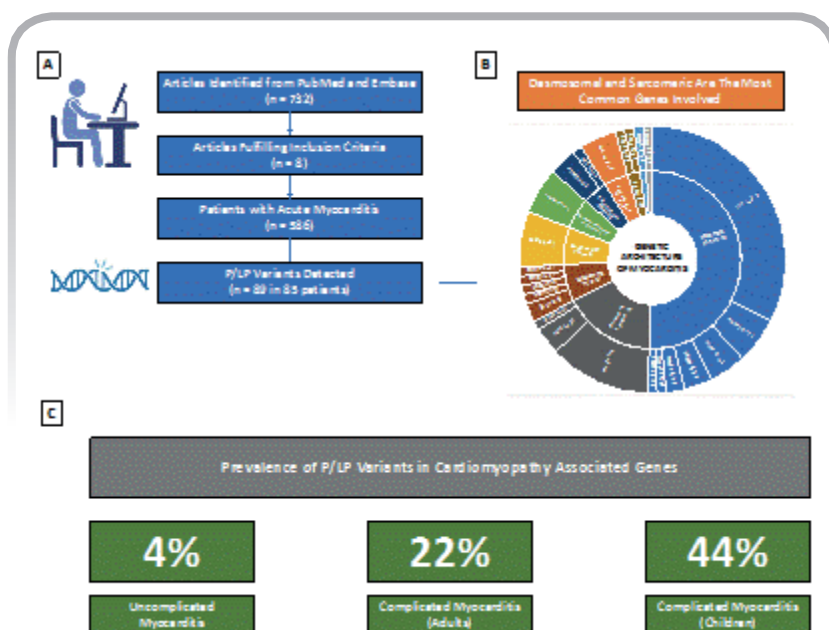


Figure 1

Conclusions: Genetic variants are present in a large proportion of patients with acute myocarditis. The prevalence of genetic variants and the genes involved vary according to age and clinical presentation.

**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 632
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)**

**AETIOLOGY AND CLINICAL MANIFESTATIONS OF PATIENTS FULFILLING DIAGNOSTIC CRITERIA
FOR NON-DILATED LEFT VENTRICULAR CARDIOMYOPATHY**

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(a) DIPARTIMENTO DI SCIENZE MEDICHE TRASLAZIONALI, UNIVERSITÀ DELLA CAMPANIA LUIGI VANVITELLI,
NAPOLI, ITALIA

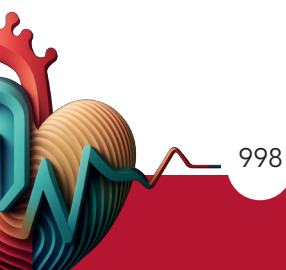
Aim: The aim of this study is to define the aetiology and clinical manifestations of consecutive patients with non-dilated left ventricular cardiomyopathy (NDLVC).

Methods: The cohort included consecutive patients with diagnostic criteria for NDLVC according to the 2023 European Society of Cardiology (ESC) guidelines on the management of cardiomyopathies. Patients underwent a comprehensive cardiovascular assessment and genetic testing.

Results: A total of 42 patients with diagnosis of NDLVC fulfilled the inclusion criteria and represented the final study cohort. Patients were classified as having: genetic aetiology in 16 cases (38.0%), with P/LP variants in NDLVC-associated genes (DES [n=2], FLNC [n=2], LMNA [n=2], JUP [n=2], DSP [n=3], PLN [n=1], MYH7 [n=2], TNNT2 [n=1], and TTN [n=1]); inflammatory

aetiology in 5 cases (11.9%), with 4 patients fulfilling diagnostic criteria for myocarditis and 1 for cardiac sarcoidosis; neuromuscular aetiology in 4 cases (9.5%), with 2 cases diagnosed with Duchenne muscular dystrophy and 2 with myotonic dystrophy type 1; idiopathic NDLVC in 17 cases (40.5%). Eight patients (19%) exhibited a myocarditis-like clinical presentation. Among these, 3 patients showed a P/LP variant in DSP and were classified as genetic NDLVC.

Conclusions: These observations support the concept of the 2023 ESC guidelines that the NDLVC phenotype represents a starting disease phenotype and should be considered as a working diagnosis that promptly triggers a multiparametric approach leading to an etiological diagnosis and, ultimately, individualized management.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 66 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

CLINICAL CHARACTERISATION OF PAEDIATRIC DESMOSOMAL CARDIOMYOPATHIES

Sara Moscatelli (a), Gabrielle Norrish (a), Ella Field (a), Stephanie Oates (a), Leonie Luedke (a), Joanna Jager (a), Annabelle Barnes (a), Imogen Heenan (a), Juan Pablo Kaski (a)
(a) CENTRE FOR PAEDIATRIC INHERITED AND RARE CARDIOVASCULAR DISEASE,
INSTITUTE OF CARDIOVASCULAR SCIENCES, UNIVERSITY COLLEGE LONDON

Background: Variants in genes encoding components of the cardiac desmosome, including plakoglobin (*JUP*), desmoplakin (*DSP*), plakophilin-2 (*PKP2*), desmoglein-2 (*DSG2*) and desmocollin-2 (*DSC2*), are associated with arrhythmogenic right ventricular cardiomyopathy (ARVC), dilated cardiomyopathy (DCM) and nondilated left ventricular cardiomyopathy (NDLVC). Although desmosomal cardiomyopathies have traditionally been considered conditions of young adulthood, recent studies have described cases with presentation in childhood.

Purpose: The aim of this study was to describe the clinical characteristics and outcomes of children with desmosomal cardiomyopathies.

Methods: Data on clinical presentation, treatment and outcomes from all patients aged ≤ 18 years with a diagnosis of cardiomyopathy secondary to pathogenic/likely pathogenic variants in desmosomal genes at a single tertiary cardiomyopathy centre were collected.

Results: 18 patients (mean age at diagnosis 9.9 ± 3.2 y; 9(56%) females) were included. Mean follow-up was 3.3 ± 3.2 years. 6 patients (33%) were heterozygous for *PKP2* variants; of these, 4 (66%) had a clinical diagnosis of ARVC, including 2 with subsequent LV involvement. The phenotype in the other 2 patients consisted of atrial tachycardia and non-sustained ventricular tachycardia (NSVT), respectively. 4 patients were referred for family history in a 1st degree relative and the remaining 2

because of symptoms. During follow-up, NSVT was identified in 4 patients (66%); 1 underwent primary ICD implantation, 1 underwent cardiac transplantation (CT) and 1 is currently listed for CT. 4 patients (22%) were heterozygous for *DSP* variants; 3 had DCM and 1 NDLVC. Reasons for referral were: symptoms ($n=1$), incidental finding ($n=1$) and family history ($n=2$). On follow-up, 3 experienced NSVT, 2 had ICDs implanted for primary prevention, and 1 is currently listed for CT. A further 6 patients (33%, including 2 sets of siblings) were compound heterozygotes for *DSP* variants, all showing DCM with RV involvement; 3 were identified incidentally, 2 referred for family history, and 1 due to symptoms. All had NSVT; 4 (66%) received ICDs for primary prevention, 5 were referred for CT, including 1 who died suddenly on the waiting list and 1 post-CT. 1 patient was compound heterozygous for a *JUP* variant and presented with heart failure (HF) symptoms due to DCM with RV involvement. Primary prevention ICD was implanted, but she had a cardiac arrest due to VT and subsequently underwent CT. 1 patient with a *DSG2* variant, displaying a DCM phenotype, presented with ventricular fibrillation cardiac arrest, and underwent secondary prevention ICD implantation.

Conclusion: Childhood-onset cardiomyopathies caused by desmosomal gene variants have a severe phenotype with a high burden of ventricular arrhythmia and heart failure symptoms. These findings highlight the importance of considering desmosomal disease as a cause of paediatric cardiomyopathy.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 348
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI
E NUTRACEUTICI)**

**EXPLORATORY ANALYSES FROM HELIOS-B, A PHASE 3 STUDY ON VUTISIRAN IN PATIENTS
WITH TRANSTHYRETIN AMYLOIDOSIS WITH CARDIOMYOPATHY**

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Introduction: Transthyretin amyloidosis (ATTR) is a progressive, fatal disease caused by the deposition of misfolded transthyretin (TTR) amyloid fibrils in multiple organs and tissues. Patients with hereditary (hATTR) or wild-type (wtATTR) amyloidosis frequently develop cardiomyopathy (ATTR-CM) resulting in a rapid worsening in measures of cardiac structure and function, with increased risk of hospitalization and mortality. Vutrisiran, an RNA interference (RNAi) therapeutic that rapidly and profoundly knocks down serum TTR, is approved for the treatment of hATTR with polyneuropathy (hATTR-PN). Exploratory analyses of a predefined cardiac subpopulation in the HELIOS-A study (NCT03759379) demonstrated the potential for vutrisiran to improve the manifestations of CM in patients with hATTR-PN, compared with an external placebo group. The safety and efficacy of vutrisiran in

patients with ATTR-CM are being investigated in the ongoing HELIOS-B study (NCT04153149).

Hypothesis: Rapid knockdown of TTR by the RNAi therapeutic vutrisiran provides benefit across a range of cardiac disease measures in patients with ATTR-CM.

Methods: HELIOS-B is a phase 3, randomized, double-blind, placebo-controlled, multicenter study of vutrisiran in patients with ATTR-CM (wtATTR or hATTR). Eligible patients (18-85 yrs) had echocardiographic evidence of ATTR-CM, and ATTR amyloid deposition confirmed by tissue biopsy or by non-biopsy diagnostic criteria, including cardiac technetium scintigraphy. Inclusion criteria included a medical history of heart failure (HF) due to ATTR with ≥ 1 prior HF hospitalization or clinical evidence of HF-related congestion requiring use of

diuretics. At baseline, patients were either not on tafamidis or were receiving tafamidis per the approved indication and dose for their country. Patients were randomized (1:1) to vutrisiran 25 mg or placebo subcutaneously, once every 3 months for up to 36 months. The two primary endpoints were a composite of all-cause mortality and recurrent cardiovascular (CV) events (CV hospitalizations and urgent HF visits), assessed in the overall population and in the vutrisiran monotherapy group (defined as patients not being on tafamidis at BL). A comprehensive set of exploratory endpoints comparing vutrisiran with placebo included biomarkers and additional assessments of outcomes. The pharmacodynamic effect of vutrisiran on serum TTR level was also assessed over 30 months.

Results: HELIOS-B completed enrollment (655 pts; 654 dosed) in August 2021 across 26 countries. Median (range) age, 77 (45-85) years; ≥ 75 years old, 61%; male, 92.5%; on tafamidis at BL, 40%; mean (SD) BMI, 27 (3.7) kg/m². The treatment effect of vutrisiran on clinical manifestations of cardiac TTR amyloid involvement will be presented across select exploratory measures.

Conclusions: Vutrisiran has the potential to improve the CM associated with ATTR. The exploratory endpoint results will help further define the impact of vutrisiran across a range of cardiac measures in patients with ATTR-CM.

**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 497
TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)**

**LINFOMA DIFFUSAMENTE INFILTRANTE IL MIOCARDIO
CON PRECOCE RISPOSTA ALLA CHEMIOTERAPIA: UN CASO CLINICO**

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(c) UNIVERSITÀ DEGLI STUDI DI PALERMO

Nonostante il linfoma a grandi cellule B possa interessare pressoché qualsiasi organo, il coinvolgimento cardiaco rimane raro ed è indicativo di una malattia più avanzata. L'infiltrazione miocardica ne aumenta la complessità del trattamento e può correlarsi ad una maggior frequenza di complicanze acute come aritmie, blocchi atrioventricolari, ischemia miocardica acuta e tamponamento cardiaco.

Di seguito è riportato il caso di un Paziente di 59 anni a basso profilo di rischio cardiovascolare con diagnosi di linfoma a grandi cellule B infiltrante diffusamente il miocardio con documentazione ecocardiografica di netta riduzione delle metastasi cardiache in seguito a singolo ciclo di chemioterapia (CHT) R-COMP.

Il Paziente è stato ricoverato a febbraio 2024 per una tumefazione latero-cervicale sinistra con diagnosi di linfoma B diffuso a grandi cellule NAS, non-GC secondo Hans, stadio IVB bulky con coinvolgimento miocardico, vertebrale e peritoneale. L'ecocardiogramma ha mostrato un ventricolo sinistro severamente ipertrofico (SIV 22 mm; PP 15 mm; DTD 35 mm) con aspetto disomogeneo delle pareti per presenza di formazioni tondeggianti ipoecogene intramiocardiche, di normali dimensioni cavitare (VTD 54 ml/mq) con funzione sistolica conservata e iniziale aumento delle pressioni di riempimento ventricolare (E/E' 13), lieve insufficienza mitralica. È stata avviata CHT di debulking con ciclofosfamide frazionata, seguita da doxorubicina liposomiale e Rituximab.

La risonanza magnetica cardiaca ha evidenziato ispessimento del setto interventricolare ai segmenti antero-settali (15 mm), ipo-discinesia della parete libera del ventricolo sinistro in regione medio-basale; con sfumate aree di late enhancement a distribuzione subepicardica ai segmenti anteriori della regione media e a livello della parete libera del ventricolo sinistro, di aspetto "patchy", più evidenti ai segmenti laterali della regione media ed in sede giunzionale inferiore e anteriore della regione medio-basale.

L'esito dell'ecocardiogramma ripetuto prima della somministrazione del secondo ciclo di CHT ha mostrato un'eccellente risposta alla CHT evidenziando una netta riduzione dell'ipertrofia ventricolare sinistra (SIV 15 mm; PP 9 mm; DTD 33 mm) e la pressoché completa scomparsa delle lesioni precedentemente descritte con persistenza unicamente di aspetto finemente disomogeneo del miocardio; segnalato inoltre lieve aumento delle dimensioni cavitare (VTD 67 ml/mq) con normalizzazione delle pressioni di riempimento ventricolare sinistro (E/E' 8) e peggioramento dell'insufficienza mitralica descritta di grado moderato di non chiara patogenesi.

Il paziente ha completato sei cicli di chemioterapia a giugno 2024, mantenendo una funzione sistolica ventricolare sinistra conservata senza segni di ripresa di malattia a livello cardiaco o di sviluppo di complicanze aritmiche, emodinamiche o emboliche. All'elettrocardiogramma non sono state riscontrate

alterazioni significative della ripolarizzazione ventricolare e agli esami ematici si è osservato un minimo rialzo dei valori di troponina T senza curva significativa (80-90 ng/L) associato ad un discreto aumento dei livelli di Nt-proBNP (2866 ng/L).

Questo caso evidenzia come, nonostante una diagnosi di malattia in stadio avanzato e ad alto grado di malignità, si possa osservare un'ottima risposta alla chemioterapia con netta riduzione del burden di malattia, fino a far prospettare un buon esito prognostico.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 418 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO)

EOSINOPHILIC MYOCARDITIS: BEYOND THE USUAL SUSPECTS!

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Italo Porto (a), Pietro Ameri (a), Matteo Toma (b)

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Background: Eosinophilic myocarditis (EM) is a rare and severe form of myocardial inflammation, which carries a significant risk of mortality and may be linked to numerous systemic disorders.

Clinical case: A 71-year-old woman, with a medical history of allergic asthma, moderate mitral regurgitation caused by posterior leaflet prolapse, and a prior myocarditis managed with corticosteroids, was admitted to the emergency department of a spoke center in November 2023 for chest pain, dysesthesia of the lower limbs and diffuse petechial lesions on the lower extremities. Laboratory tests revealed increased biomarkers of inflammation and leukocytosis with marked eosinophilia (leucocytes $7,400/\text{mm}^3$, eosinophils $2,800/\text{mm}^3$), together with a rise in cardiac biomarkers (high-sensitivity Troponin I $2,544 \text{ ng/L}$, NTproBNP $14,542 \text{ pg/mL}$). ECG was substantially normal while a small pericardial effusion was noted on transthoracic echocardiography, with no wall motion abnormalities. Angiography ruled out coronary artery disease and treatment with nonsteroidal anti-inflammatory drugs was initiated for suspected acute pericarditis. After four days of treatment, the patient exhibited signs of congestion, with a reduction in left ventricular ejection fraction (LVEF) to 40%, accompanied by hypokinesia of the inferior wall and worsening mitral regurgitation. Cardiac magnetic resonance (CMR) imaging confirmed the diagnosis of perimyocarditis, and the patient was transferred

to the intensive care unit of our tertiary center, where she was initially treated with intravenous diuretics, non-invasive ventilation and sodium nitroprusside. Moreover, despite the indication for endomyocardial biopsy in complicated myocarditis cases, considering the high clinical likelihood of eosinophilic perimyocarditis, intravenous methylprednisolone was started, resulting in clinical improvement and normalization of LVEF. Even though earlier investigations during the past myocarditis episode were negative (including autoimmunity tests), additional assessments were carried out to explore possible conditions associated with EM. No drugs that could be associated with hypersensitivity reactions were recently administered. Whole-body CT and PET scans ruled out oncological conditions. A faecal parasitological exam was negative, and the remaining infectious disease tests were normal. The research for BCR/ABL, BCR/FGFR1, TEL-PDGFRbeta, FIPL1-PDGFRalpha and Jak-2 mutations was negative. Bone marrow biopsy excluded myeloproliferative and lymphoproliferative diseases. Electroneurography showed a multi-neuropathic pattern indicative of vasculitic damage and the autoimmune panel demonstrated only anti-nuclear antibodies (ANA) positivity (1:80, speckled pattern). Considering the history of asthma, hypereosinophilia, peripheral polyneuritis and cardiac involvement, the diagnosis of eosinophilic granulomatosis with polyangiitis (EGPA) was made according to the American College of Rheumatology criteria. Rituximab was introduced alongside steroid

treatment, which was progressively tapered. At the six-month follow-up, she was stable with normal LVEF and eosinophil count under the established immunological therapy.

Conclusions: Eosinophilic myocarditis is a rare condition that frequently results in heart failure and can

be life-threatening. Identifying conditions associated with EM is crucial for targeted treatment and to reduce the risk of recurrence. Specifically, a history of asthma is commonly reported in idiopathic EM cases but may suggest a diagnosis of EGPA, where cardiac involvement has been documented in up to 60% of cases, especially in ANCA-negative forms.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 850
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
SCINTIGRAFIA MIOCARDICA (IMAGING CARDIOVASCOLARE)
PROGNOSI (SCOMPENSO CARDIACO)**

**CLINICAL PHENOTYPE AND PROGNOSIS OF ASYMPTOMATIC PATIENTS
WITH TRANSTHYRETIN CARDIAC AMYLOID INFILTRATION**

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Background: Patients with transthyretin (ATTR) cardiac amyloid infiltration are increasingly diagnosed at earlier disease stages with no heart failure (HF) symptoms and a wide range of cardiac amyloid infiltration. The aim

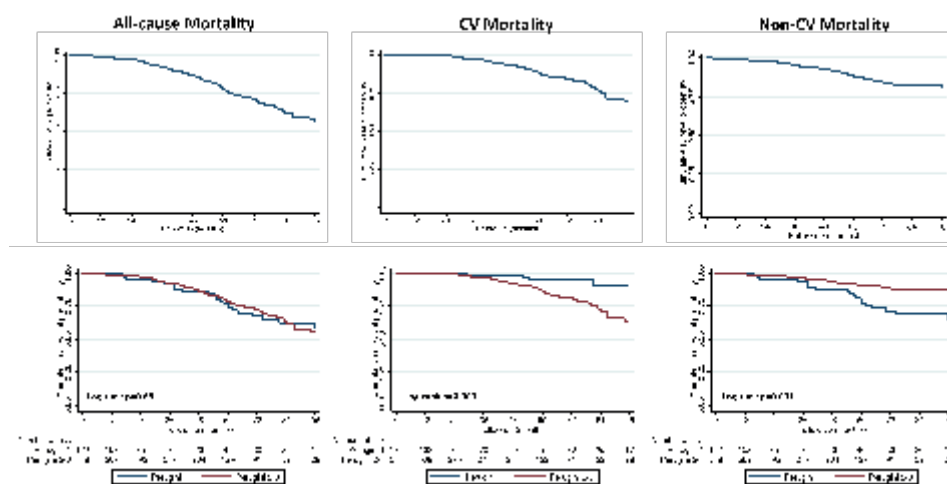


Figure 1

of the study was to characterize the clinical phenotype and natural history of patients with asymptomatic ATTR cardiac amyloid infiltration.

Methods: Data of consecutive patients at 12 international centres for amyloidosis (2008-2023) were analysed. Asymptomatic ATTR cardiac amyloid infiltration was defined as absence of HF, diuretic therapy, and plasma cell dyscrasia (histological confirmation of ATTR amyloid required with plasma cell dyscrasia) with evidence of myocardial uptake on bone scintigraphy.

Results: The study comprised 660 patients with asymptomatic ATTR cardiac amyloid infiltration (74.1 ± 9.7 years, 87% male, 21.5% hereditary ATTR amyloidosis), 81.5% (n=538) with grade 2 or 3 and 18.5% (n=122) with grade 1. The number of new diagnoses progressively increased over time. Grade 2 and 3 patients exhibited significant cardiac functional and structural abnormalities, whilst grade 1 patients exhibited broadly normal cardiac structure and function. At 3 years, compared with grade 1 patients,

those with grade 2 or 3 had greater development of a HF diagnosis (50% vs 23%), greater diuretic initiation and NT-proBNP progression (32.5% vs 12.6%), greater hospitalization for HF (6.6% vs 0%) and greater unplanned CV hospitalization (16.7% vs 4%). Over 41 months (IQR 23-73), the all-cause death rate was similar between grade 1 vs 2 and 3 patients; however, grade 2 and 3 patients had a 4-fold higher risk of CV mortality (3.0 vs 1.0 CV deaths per 100 patient-years; unadjusted hazard ratio 4.16 [95%CI 1.50-11.51], $p=0.006$) compared to grade 1.

Conclusions: Asymptomatic ATTR cardiac amyloid infiltration is increasingly common and encompasses a wide spectrum of disease severity. Asymptomatic patients with grade 2 and 3 experience an increased rate of CV events and CV mortality, whilst patients with grade 1 have lower CV event rate and predominantly non-CV mortality. These data support the use of disease-modifying treatments in asymptomatic grades 2 and 3 patients and highlight the need of large-scale studies to assess the role of disease-modifying treatment in grade 1 patients.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 945
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)**

**UNVEILING THE ASSOCIATION BETWEEN CARDIAC AMYLOIDOSIS
AND AORTIC VALVE STENOSIS THROUGH IN-DEPT HISTOLOGICAL ANALYSIS**

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Background: Transthyretin cardiac amyloidosis (ATTR-CA), has an established association with aortic valve stenosis (AS), with an average prevalence of 10%, ranging from 4 to 16%, based on inclusion criteria and diagnostic pathway. Whether aortic valve disease is the consequence of ATTR-CA or if isolated aortic valve amyloidosis exists as a distinct entity is not fully elucidated.

Aim: The aim was to assess a) CA prevalence among deceased patients with severe AS undergoing autopsy, b) presence and type of amyloid deposit in the aortic valve, and c) proportion of patients with isolated non-amyloid AS, isolated amyloid AS and dual pathology (CA + AS).

Methods: Data of consecutive patients with severe AS undergoing post-mortem examination (Jan 2023-Jun 2024) were analysed. Samples were collected from six sites, namely left and right ventricles and atria, aortic valve and ascending aorta. Samples were stained with Congo red and amyloid typing was performed by immunohistochemistry with antibodies directed against free light chains (AL), transthyretin (TTR) serum amyloid A (AA).

Results: The study comprised 54 deceased patients with history of severe AS. Histological proof of amyloid in 31 sample was identified in 46.5% (n=25) of cases. 44% (n=24) in the atria, 31.5% (n=17) in the left ventricle accompanied by amyloid deposit in the right ventricle in 94% (n=16/17) of cases, 20.4% (n=11) in the aortic valve and 9.3% (n=5) in the ascending aorta. Among Congo red positive samples, there was an overwhelming presence of ATTR amyloid on immunohistochemistry, approaching 100%, with only a single case of AA amyloid. In the total population, 13% (n=7) had age-related ATTR amyloid deposits

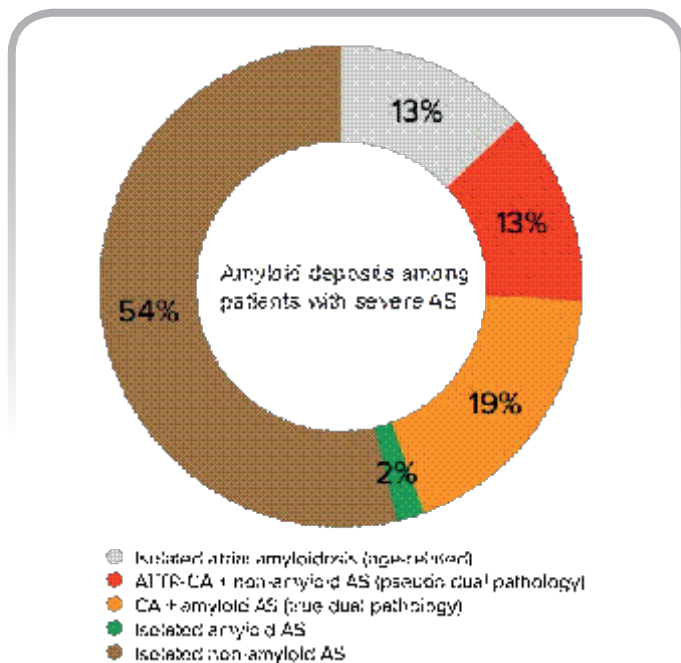


Figure 1

detected only in the atria, 13% (n=7) had ATTR-CA accompanied by non-amyloid AS (pseudo dual pathology), 18.5% (n=10) had CA (9 ATTR, 1 AA) accompanied by amyloid AS (true dual pathology) and 1.8% (n=1) had isolated aortic valve ATTR amyloid. The latter case was a man who died at 85 years, with no other clinical and imaging feature consistent with cardiac amyloidosis. Clinical and imaging suspicion of cardiac amyloidosis was retrospectively identified in 8 patients: 6 with diffuse amyloid infiltration in the ventricles and atria confirmed on histology, and 2 with no histological amyloid proof.

Conclusion: Amyloid deposits, predominantly of ATTR type, are present in about 50% of patients deceased with severe AS, being 2-fold higher than previously reported among unselected adults >80 years. The prevalence of ATTR-CA and dual pathology is 13% and 19%, respectively. Amyloid deposit in the aortic valve is commonly associated with diffuse cardiac amyloid infiltration, while isolated aortic valve amyloid deposition is extremely rare, accounting for <2% of cases. This data may inform clinicians in guiding diagnostic work up in among patients with aortic valve amyloid.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 851 PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE)

ANALISI DEL CALCIUM SCORE NELLA STENOSI AORTICA SEVERA IN PAZIENTI CON AMILOIDOSI CARDIACA - LO STUDIO CAUSATIVE

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Background: La stretta correlazione epidemiologica tra amiloidosi cardiaca da transtiretina (ATTR) e stenosi aortica (SA) è oramai acclarata. Sebbene siano state formulate varie ipotesi, i meccanismi che legano le due patologie non sono stati ancora delucidati.

Da un punto di vista fisiopatologico, i depositi di amiloide a livello valvolare potrebbero essere un trigger per la deposizione di calcio nella valvola, mentre il calcio ionizzato sembrerebbe facilitare a sua volta la scissione del tetramero di TTR e la deposizione di amiloide. Al contrario alcuni case-report/case-series hanno posto il sospetto che il calcio valvolare nei pazienti con SA severa e concomitante ATTR sia ridotto rispetto ai pazienti con sola SA, supponendo un ruolo causale preponderante dei depositi di amiloide nell'aggravamento della valvulopatia.

Obiettivi: Lo studio CAUSATIVE si propone di testare l'ipotesi che i valori di calcium score aortico siano differenti nei pazienti con doppia patologia (SA+ATTR) rispetto ai pazienti con sola SA severa.

Metodi: Si tratta di uno studio multicentrico, internazionale, osservazionale di coorte con arruolamento retrospettivo e prospettico. Sono stati arruolati retrospettivamente pazienti che hanno eseguito una valutazione per sostituzione valvolare aortica chirurgica (SAVR) o percutanea (TAVI) ed hanno eseguito, come da pratica clinica, ecocardiogramma, una TAC cardiosincronizzata ed una scintigrafia total-body con tracciante osseo. Sono stati arruolati prospettivamente pazienti con SA severa in percorso TAVI che hanno eseguito i medesimi esami. Per questa analisi i pazienti sono stati riclassificati in tre gruppi in base al grado di captazione cardiaca alla scintigrafia ossea. Sono stati esclusi i pazienti con sospetta amiloidosi AL sulla base degli esami di laboratorio.

Risultati: In questa analisi ad interim sono stati inclusi 130 pazienti, di cui 85 (65.5%) con un Perugini score di 0 (gruppo 1), 12 (9.0%) con score 1 e 33 (25.5%) con score 2-3. Le tre coorti sono risultate ben bilanciate

relativamente alle caratteristiche cliniche. I pazienti del gruppo 3 presentavano una età più avanzata [83.3 anni \pm 4.5 (gruppo 3) vs 80.0 anni \pm 4.7 (gruppo 1) e 80.8 anni \pm 5.2 (gruppo 2)], nonché un maggior burden di fibrillazione atriale e valori di NT-proBNP più elevati. Inoltre, si è osservato un incremento della prevalenza di stenosi low-flow low-gradient all'aumentare del grado di captazione [12% (gruppo 1) vs 18% (gruppo 2) vs 31% (gruppo 3), p per trend 0.02]. I valori mediani di calcium score aortico sono risultati simili nei tre gruppi analizzati (2270 AU, IQR 1513-3667 (gruppo 1); 2742 AU, IQR 1855.5-4056.5 (gruppo 2), 2705 AU, IQR 1896-3790 (gruppo 3); p-value 0.59).

Conclusioni: In una coorte di paziente con stenosi aortica severa e differenti gradi di captazione miocardica alla scintigrafia ossea, i valori di calcium score aortico sono risultati simili. Questi dati preliminari suggeriscono che gli attuali cut-off di calcium score utilizzati per corroborare la diagnosi di severità della stenosi siano adeguati anche nella popolazione di pazienti con ATTR. I nostri dati sono in discordanza con i risultati di precedenti case-series/case-reports che suggeriscono un minor ruolo causale dei depositi di calcio valvolare nei pazienti con amiloidosi cardiaca e SA severa. Il raggiungimento di un adeguato sample size (almeno 80 pazienti con diagnosi confermata di ATTR, aiuterà a validare questi risultati preliminari).



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 942
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
ELETTROCARDIOGRAFIA/CARDIOVERSIONE/DEFIBRILLAZIONE (ARITMIE)**

**PREVALENCE OF THE PSEUDO-DELTA WAVE IN ANDERSON-FABRY DISEASE
AND CHALLENGES IN DIFFERENTIATING FROM WOLFF-PARKINSON-WHITE SYNDROME**

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Ciro Indolfi (a), Elena Biagini (h)

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Background: ECG abnormalities in Anderson Fabry disease (AFD) are directly linked to the progressive accumulation of glycosphingolipids in the myocardium, in addition to ischaemia and fibrosis. The characteristic

shortening of the PR interval may complicate the differential diagnosis with Wolff-Parkinson-White (WPW) syndrome. This may erroneously lead to the performance of invasive diagnostic tests, such as

	AFD (n=10)	WPW (n=10)	P-value
Age (years)	47 (42-56)	48 (32-73)	0.475
Male sex	8 (80%)	8 (80%)	0.975
Heart rate	63 (52-74)	68 (55-78)	0.1
ECG phenotype	1 (10%)	1 (10%)	0.747
ECG features			
Pathological Q/Qr	9 (90%)	9 (90%)	0.714
ST-segment depression	10 (100%)	10 (100%)	0.54
Axial (Bifascicular) bundle branch block	1 (10%)	1 (10%)	0.975
PR interval (ms)	160 (130-190)	161 (120-190)	0.942
Short PR	1 (10%)	0 (0%)	1
QRS interval (ms)	88 (80-131)	90 (80-108)	0.908
Bundle branch block	2 (20%)	1 (10%)	0.413
Bundle branch block	2 (20%)	0 (0%)	0.268
Non-specific intraventricular conduction delay	2 (20%)	1 (10%)	0.508
ECG axis			
LAFB	1 (10%)	0 (0%)	1
Left axis deviation	1 (10%)	2 (20%)	0.624
QRS fragmentation	1 (10%)	2 (20%)	0.411
Q/RS interval ratio	4 (40-44)	4 (40-41)	0.532
Pathological Q/Qr interval	1 (10%)	1 (10%)	0.813
Pathological Q/Qr interval	1 (10%)	1 (10%)	0.813
Positive bundle branch block	0	1 (10%)	0.444
Concordant index (CI)	1 (10%)	1 (10%)	0.752
Positive CI	1 (10%)	1 (10%)	0.752
Small QRS axis (ms)	140 (130-161)	139 (120-152)	0.908
Left atrial enlargement	1 (10%)	1 (10%)	0.975
Right atrial enlargement	1 (10%)	0	0.444
Prolonged QTc	1 (10%)	1 (10%)	0.444
LV hypertrophy (diastolic)	4 (40%)	2 (20%)	0.111
Negative T wave	1 (10%)	1 (10%)	0.747
Echocardiogram			
MET index	12 (12-15)	11 (9-15)	0.544
LV Mass (g/m ²)	116 (108-130)	108 (71-131)	0.711
LV EF (%)	65 (61-67)	64 (60-66)	0.899
LA diameter (mm)	40 (39-44)	31 (30-41)	0.007

Table. Baseline clinical, ECG and echocardiographic characteristics of the study population.

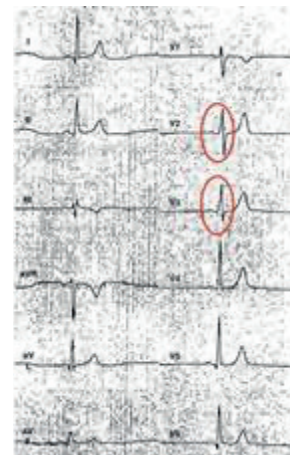


Figure 1

electrophysiological studies, to exclude the presence of an accessory pathway. In some cases, the differential diagnosis is further complicated by the presence of an initial slurred QRS, which can simulate a delta wave.

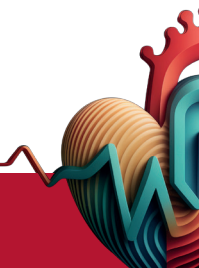
Aims: To evaluate the prevalence of the pseudo-delta wave in AFD patients and to identify the clinical and instrumental characteristics associated with this ECG finding.

Methods: We conducted a retrospective, international, multicenter study enrolling 220 consecutive AFD patients. For each patient main clinical, echocardiographic and 12-lead ECG data were collected. Pseudo-delta wave was defined by a QRS slurring ≥ 10 ms, causing a change in the QRS slope before the zenith of R wave or before the nadir of S wave, in at least two contiguous leads.

Results: Study population was composed by 220 patients: 89 (40%) males, with a median age of 44 years (IQR 8-86). Classical phenotype was present in 148 (67%). The pseudo-delta wave was detected in

12 patients (5.5%), both in patients with (n=10) and without (n=2) LVH by echo. Compared to patients without (see Table), patients with pseudo-delta wave had a significantly larger left atrial diameter (40 mm vs 35 mm; $p=0.007$), more QRS complex fragmentation (42% vs 11%; $p=0.011$) and pathological QTc interval (35% vs 25%; $p=0.013$). Additionally, there was no difference in the presence of short PR (8% vs 9%; $p=1$) or in the PR duration (140 ms vs 143 ms, $p=0.852$). There was no difference in age and sex and AFD phenotype.

Conclusion: The pseudo-delta wave is a rare but detectable feature in AFD. It is more frequently associated with specific ECG and echocardiographic abnormalities characteristic of the intermediate to advanced stages of the disease. Furthermore, its inconsistent association with a short PR interval supports the hypothesis that its origin is not linked to the presence of an atrioventricular accessory pathway, but rather reflects the accumulation of glycosphingolipids in the intraventricular conduction tissue.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 947
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ELETTROCARDIOGRAFIA / CARDIOVERSIONE / DEFIBRILLAZIONE (ARITMIE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)**

PROGNOSTIC VALUE OF ECG PATTERNS IN ANDERSON-FABRY DISEASE

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Background: Anderson Fabry disease (AFD) is an X-linked lysosomal storage disorder leading to a deficiency in α -galactosidase A and globotriaosylceramide (Gb3) deposition in different organs. Cardiac involvement is extremely common. It has been shown that the ECG abnormalities are directly correlated with the progressive accumulation of glycosphingolipids in the myocardium and cardiac conduction system. However, it is still

unclear whether the ECG alterations are correlated with clinical events.

Purpose: To evaluate the prognostic role of ECG patterns in an unselected population of patients with AFD.

Methods: We conducted a retrospective multicenter study enrolling 215 consecutive patients. Based on the baseline ECG the study population was divided into the following five groups: 1) normal ECG or minimal alterations; 2) left ventricular hypertrophy (LVH) without signs of overload; 3) isolated negative T waves in the inferior and/or lateral leads; 4) LVH with signs of overload with or without incomplete right bundle branch block (RBBB); 5) complete RBBB. The primary endpoint was the composite of sudden cardiac death, resuscitated cardiac arrest, sustained ventricular tachycardia, and heart failure.

	ECG Group 1	ECG Group 2	ECG Group 3	ECG Group 4	ECG Group 5	P value
Age average, years, median (25 th -75 th)	35 (24-46)	36 (22-47)	56 (48-62)	56 (47-67)	53 (49-61)	0.0001
Sex male, n (%)	22 (21%)	23 (77%)	4 (29%)	25 (53%)	12 (71%)	<0.001
Classic phenotype, n (%)	69 (65%)	23 (77%)	12 (86%)	30 (64%)	12 (71%)	0.395
Maximal diastolic wall thickness, mm, median (25 th -75 th)	9 (8-11)	12 (9-13)	11 (10-16)	16 (13-18)	19 (16-23)	0.0001
Ejection fraction, median (25 th -75 th)	64 (61-68)	64 (59-68)	65 (60-69)	63 (60-68)	60 (57-68)	0.6502
Arterial hypertension, n (%)	20 (19%)	9 (30%)	6 (43%)	23 (50%)	9 (53%)	0.001
Primary endpoint, n (%)	7 (6%)	3 (10%)	2 (14%)	14 (30%)	6 (35%)	<0.001

Characteristics of the patients at baseline and primary endpoint

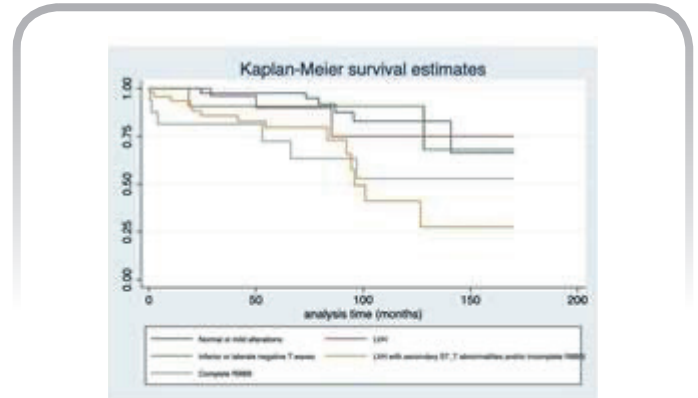
Figure 1

Results: Median age of study population was 45 years (32-57), and 86 patients

(40%) were men. The rate of classic phenotype was 68%. Patients in 4 and 5 group were older at baseline, more frequently affected by arterial hypertension, mostly male and showed greater left ventricular thickening, at a median follow up of 60 months (25-83) the overall Kaplan-Meier survival free from the primary endpoint was 57%: the Kaplan-Meier survival estimates of ECG groups were 66%, 75%, 68%, 27% e 52% respectively (log Rank 0.0026). On multivariable analysis patients belonging to either 4 or 5 group showed an increased risk of primary endpoint (HR= 2.45; 95% CI 1.04-5.78, $p=0.040$) compared to other groups.

Conclusion: ECG at baseline may be a useful tool to predict the risk of cardiovascular events in Anderson-Fabry Disease. Future studies should investigate if ECG

may be useful also to evaluate the clinical response to specific therapy.



Kaplan-Meier survival free from the primary endpoint

Figure 2

**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 837
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI
E NUTRACEUTICI)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)**

OUTCOME OF PATIENTS WITH WILD-TYPE TRANSTHYRETIN AMYLOID CARDIOMYOPATHY ON TREATMENT WITH TAFAMIDIS: REAL-WORLD DATA FROM ITALIAN NETWORK FOR CARDIAC AMYLOIDOSIS

Italian Network For Cardiac Amyloidosis (a)
(a) ITALIAN NETWORK FOR CARDIAC AMYLOIDOSIS

Background: Tafamidis is currently the only approved disease-modifying therapy for wild-type transthyretin cardiomyopathy (wtATTR-CM). To date, limited real-world data on the therapeutic effects of tafamidis are available.

Methods: This is a multicentre observational nationwide study performed in 19 referral centres in Italy including NYHA class I and II patients with wtATTR-CM treated with tafamidis. Treatment response was assessed according to 1) occurrence of composite endpoint of heart failure (HF) hospitalization and all-cause mortality; 2) clinical, biochemical and echocardiography recognized criteria of disease progression after 12 months of therapy.

Results: 683 patients were enrolled (91% males, median age 78 years, NAC stage I, II and III 64%, 29%, 67%, respectively). Over the 12 months after therapy start, the composite endpoint occurred 58 (8%) patients and was independently associated with higher daily loop diuretic dose (HR 1.29, 95% CI 1.14 – 1.46, $p < 0.001$) and NAC stage III (HR 2.51, 95% CI 1.00 – 6.26, $p = 0.047$), at baseline. After 12 months therapy, NTproBNP progression and ODI, NYHA

class and NAC stage worsening occurred in 71/625 (11%), 85/607 (14%) and 104/573 (18%), respectively. NTproBNP progression and ODI (HR 2.87, 95% CI 1.37 – 6.04, $p = 0.005$), together with NYHA class worsening (HR 3.20, 95% CI 1.60 – 6.41, $p = 0.001$) and NAC stage worsening (HR 2.81, 95% CI 1.38 – 5.71, $p = 0.004$) remained independent predictors of composite endpoint after 12-months evaluation. Baseline 6MWT (OR 1.19, 95% CI 1.05 – 1.35, $p = 0.006$), beta blockers therapy (OR 0.39, 95% CI 0.18 – 0.80, $p = 0.012$), E/e' ratio (OR 1.23, 95% CI 1.08 – 1.40, $p = 0.002$) and TAPSE/sPAP ratio (OR 1.23, 95% CI 1.03 – 1.51, $p = 0.035$) were independently associated with 12-months ODI and NTproBNP progression.

Conclusions: In this real-world cohort of NYHA class I and II patients with wtATTR-CM treated with tafamidis, 8% of patients experienced HF hospitalization or all-cause mortality and 11-18% met disease progression criteria, in the first 12 months of therapy. Characteristics of more advanced disease as weak functional status, high daily loop diuretic dose, high NAC stage, impaired diastolic function and right ventricular to pulmonary artery coupling are risk factors for poorer treatment response.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 899 RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

PERICARDIAL TISSUE CHARACTERIZATION WITH QUANTITATIVE METHODS IN CARDIAC MAGNETIC RESONANCE IN ACUTE OR RECURRENT PERICARDITIS

Luigi Tasseti (a), Giulia Piccinni (a), Andrea Baggiano (a), Saima Mushtaq (a), Fabio Fazzari (a), Marco Lioni (a), Alessandra Arcudi (b), Riccardo Maragna (a), Alessandra Volpe (a), Alberico Del Torto (a), Daniele Junod (a), Gianluca Pontone (a)

(a) CENTRO CARDIOLOGICO MONZINO; (b) OSPEDALE MAGGIORE DELLA CARITÀ DI NOVARA

Background: Cardiac Magnetic Resonance (CMR) is gaining importance for diagnosis and prognosis stratification of pericarditis. Tissue characterization, with edema and late gadolinium enhancement (LGE) evaluation, may help guide therapy especially in case of refractory symptoms. Data on quantitative evaluation of pericardial inflammation with CMR, including LGE and mapping techniques, are currently scarce.

Aim of the study: To assess the utility of tissue characterization of pericardium with quantitative evaluation methods in outcome prediction of acute or recurrent pericarditis, by measurement of: amount of LGE and edema with different techniques for quantification [i.e. different standard deviation (SD) and full width half maximum (FWHM) methods on inversion recovery and T2weighted (T2w) sequences]; T1 and T2 maximum values in inflamed pericardium measured with mapping sequences.

Materials and Methods: It is a retrospective and prospectival observational cohort study, conducted in a single tertiary centre. All consecutive patients hospitalized or referred to our centre from 2012 to 2023 to perform CMR with a diagnosis of acute or recurrent pericarditis were enrolled. CMR performed within one month from diagnosis of acute/recurrent pericarditis and clinical follow up of at least 6 months were the inclusion criteria. Clinical and imaging data

were collected. In the postprocessing analysis of CMR images, quantitative evaluation of the amount of edema and LGE on pericardium with different techniques was performed. Measurement of T1 and T2 maximum values on pericardium with mapping was performed, when feasible. Univariate/multivariate Cox regressions were performed to investigate the potential association between different MR quantitative parameters and the occurrence of recurrence; the propensity score based on clinical significant variable (age, sex and therapy) was used as adjustment.

Results: 61 patients who underwent CMR for acute or recurrent pericarditis from 2012 to 2023 were enrolled. Mean age was 48.43(\pm 18.2) years, 25 patients were male (41%). During a median clinical follow up of 23(12;66) months, 17 patients (28%) had pericarditis recurrence, 2(3%) developed constrictive pericarditis requiring pericardiectomy; 2(3%) were hospitalized for heart failure; 28(46%) patients had pericardial LGE, 31(50.8%) had pericardial edema detected on T2w. Pericardial LGE amount was higher when measured with FWHM technique [median value 31.2(9.02;54.54) gr] compared to 5SD and 6SD measurements [42.73(17.16;72.5) gr and 38.79(15.21;68.5)gr, respectively]. Median pericardial T1 and T2 values were 1356(1305;1523) ms and 77(73;81)ms, respectively. Quantitative LGE, but not T1 and T2 values, was associated to clinical outcome (both considering pericarditis recurrence and



composite outcome including constrictive evolution and heart failure hospitalization) also after adjustment for propensity score. The most accurate LGE method adopted was FWHM (HR 1.421;IC 1.124-1.795).

Conclusion: LGE is the most accurate imaging marker with prognostic value in acute and recurrent pericarditis. Quantitative LGE evaluation with FWHM and SD techniques showed an association between amount of

LGE and prediction of clinical recurrence, stronger for FWHM. Parametric T1 and T2 mapping did not show association with prognosis in pericarditis, probably because pericardium thin appearance, surrounded by epicardial fat and myocardium, makes it difficult to parameterize. The implementation of higher resolution mapping sequences might add further information on pericardial diseases on top of LGE, that is currently the most robust tool.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 871
SHOCK CARIOGENO (ASSISTENZA CARDIACA IN ACUTO)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)**

URGENT HEART TRANSPLANTATION IN A PATIENT WITH HEREDITARY TRANSTHYRETIN AMYLOIDOSIS AND REFRACTORY CARDIOGENIC SHOCK FOLLOWING MYOCARDIAL INFARCTION: A CASE REPORT

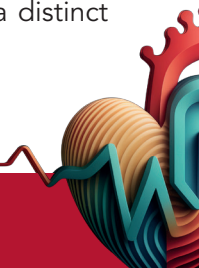
Mariangela Vigna (a, b), Maria Concetta Pastore (b), Elisa Giacomini (b), Giulia Elena Mandoli (b), Luna Cavigli (b), Flavio D'ascenzi (b), Sabato Sorrentino (a), Matteo Cameli (b), Marta Focardi (b)

(a) DIVISION OF CARDIOLOGY, DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES, "MAGNA GRAECIA" UNIVERSITY, CATANZARO, ITALY; (b) DEPARTMENT OF MEDICAL BIOTECHNOLOGIES, DIVISION OF CARDIOLOGY, UNIVERSITY OF SIENA, SIENA, ITALY

Background: Cardiac amyloidosis (CA) is a severe and progressive infiltrative disorder characterized by the deposition of amyloid fibrils within the cardiac tissue leading to hypertrophic restrictive cardiomyopathy, impaired diastolic function, and heart failure, typically with preserved ejection fraction. It is associated with arrhythmias, conduction disorders, microvascular dysfunction, ischemia, pericardial effusion and may mimic or exacerbate aortic stenosis. It may result from rare genetic mutations in hereditary forms or occur because of acquired conditions.

Case Description: This case report describes a 55-year-old man who, in February 2024, was transferred to our center from another due to refractory cardiogenic shock following a large anterior myocardial infarction. The initial management included percutaneous coronary intervention (PCI) with drug-eluting stent (DES) placement on the proximal left anterior descending artery (LAD) and plain old balloon angioplasty (POBA) on the first diagonal branch (D1). The procedure was complicated by a cardiopulmonary arrest, from which return of spontaneous circulation (ROSC) was achieved. Following the arrest, the patient developed severe ventricular dysfunction, necessitating the initiation of extracorporeal membrane oxygenation (ECMO) along with inotropic support using Dobutamine and Noradrenaline. Given the severity of his condition, the

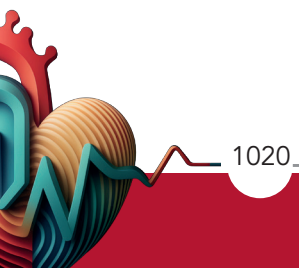
Heart Team decided to place him on the emergency heart transplant list with high-priority status within the macro-area. After four days, ECMO was weaned, Noradrenaline was stopped, and extubation occurred two days later while continuing Dobutamine therapy. The patient's medical history that the patient had cardiovascular risk factors including type 2 diabetes mellitus and heavy smoking (approximately 30 cigarettes per day). It also revealed that his mother was under care in Pavia for hereditary transthyretin amyloidosis (hATTR) with the Arg54Thr variant in the TTR gene, presenting with both cardiac and neurological involvement. The patient had undergone genetic counseling and was confirmed to be a carrier of the mutation, and he was awaiting clinical evaluation. The admission EKG showed right bundle branch block (RBBB), left anterior fascicular block (LAFB), and evidence of anterior necrosis with ST-segment elevation from V1 to V4. Laboratory tests revealed a significantly elevated NT-proBNP level. The admission echocardiogram showed increased wall thickness (posterior wall 13 mm, interventricular septum 14 mm) and severely reduced ejection fraction (10%) due to akinesia of all mid-apical segments and the basal septum. There was also a mild circumferential pericardial effusion without hemodynamic compromise. The speckle tracking strain analysis was notable, showing a markedly reduced global longitudinal strain (GLS) of -3.7%. The bull's eye plot revealed a distinct



pattern: blue segments indicating extensive necrosis due to the infarction, and red segments displaying minimal apical sparing. On May 2024, the patient underwent a heart transplant, which was successfully performed with a good outcome.

Discussion: There are few studies on heart transplantation in patients with mutated transthyretin cardiac amyloidosis. The potential use of siRNA therapies post-transplant to address progression of neurological or cardiac disease does not preclude these patients from being considered for transplantation due

to their chronic condition. In our case, the patient was listed for transplantation primarily because of refractory cardiogenic shock rather than the amyloidosis itself, which, as of today, does not constitute a contraindication unless accompanied by extracardiac manifestations such as neuropathy, malnutrition, or uncontrolled disease (e.g., AL amyloidosis). In conclusion, siRNA therapy remains a viable option for patients post-heart transplantation, allowing for continued management of the underlying disease. Therefore, such patients are not excluded from transplantation, as the condition can still be effectively treated after the procedure.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 615 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

NEUROHORMONAL THERAPIES AT BASELINE AND FOLLOW-UP AND SURVIVAL IN PATIENTS WITH WILD-TYPE TRANSTHYRETIN CARDIAC AMYLOIDOSIS

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Background: Transthyretin cardiac amyloidosis (ATTR-CA) typically manifests with heart failure (HF). Discontinuing beta-blockers and avoiding angiotensin converting enzyme inhibitors/angiotensin receptor blockers (ACEi/ARB) in patients with ATTR-CA has been recommended.

Methods: We investigated the prescription of neurohormonal therapies and their relationship with all-cause mortality in a multicenter cohort.

Results: Patients (n=926) had a median age of 79 years (interquartile range 74-83), 90% were men, 17% had a left ventricular ejection fraction (LVEF) \leq 40%, and 27% were in New York Heart Association (NYHA) class III/IV. At diagnosis, 60% of patients were on beta-blockers, 58% on ACEi/ARB/ARNI, and 35% on MRA. Patients on beta-blockers had more often NYHA class III/IV, a greater burden of comorbidities, and lower LVEF, and

those on ACEi/ARB/ARNI had more comorbidities. Nonetheless, the survival of patients on beta-blockers or ACEi/ARB/ARNI was not significantly shorter over a 2.5-year follow-up (1.6-3.8) ($p=0.577$ and $p=0.977$, respectively), and patients on both drugs had not a worse outcome than those not receiving any neurohormonal drug ($p=0.575$). During the entire follow-up, the number of neurohormonal drugs remained unchanged in 54%, decreased in 27%, and increased in 19%. Patients with a number of neurohormonal drugs either unchanged or increased had a lower risk of mortality (odds ratio 0.71, 95% confidence interval 0.53-0.95, $p=0.023$).

Conclusions: ATTRwt-CA patients on beta-blockers or ACEi/ARB/ARNI at diagnosis did not have a shorter survival. Beta-blockers were discontinued less often than ACEi/ARB/ARNI. There was no sign of better outcomes in patients discontinuing these therapies, or worse outcomes in those starting them.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 618
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)**

**IMPLEMENTING THE DEFINITION OF NON-DILATED LEFT VENTRICULAR CARDIOMYOPATHY
THROUGH DIAGNOSTIC CUT-OFFS WITH PROGNOSTIC VALUE**

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(a) FONDAZIONE TOSCANA GABRIELE MONASTERIO, PISA; (b) SCUOLA SUPERIORE SANT'ANNA, PISA; (c) AZIENDA OSPEDALIERA UNIVERSITARIA PISANA, PISA; (d) OSPEDALE CAREGGI, FIRENZE

Aims: Non-dilated left ventricular cardiomyopathy (NDLVC) has been defined as non-ischemic left ventricular (LV) scarring or fatty replacement regardless of global or regional wall motion abnormalities, or isolated global LV hypokinesia without scarring, in the absence of LV dilation. This definition omits specific thresholds for LV dilation or dysfunction or the possible right ventricular (RV) involvement.

Methods and Results: All adult patients undergoing a CMR scan from 2012 to 2022 with LV ejection fraction (LVEF) <55% and/or non-ischemic late gadolinium enhancement (LGE) and/or fatty replacement were identified. The endpoint was a composite of all-cause death, sustained ventricular tachycardia or fibrillation. The cohort included 388 patients (32% women, median age 55 years [interquartile range 43-63]). Over 4.3 years

(1.9-7.0), 59 patients (15%) developed an endpoint event. The risk increased exponentially with LVEDVi values, with inflection points of 96 mL/m² in women and 100 mL/m² in men. These values approached the upper reference limit of LVEDVi values (<96 mL/m² in women, <105 mL/m² in men): using these criteria, we identified NDLVC in 237 (61%) patients. In these patients, LVEF was the only predictor of outcome, with an increase in risk in patients with severe systolic dysfunction. Indeed, LVEF <40% was a strong predictor of outcome (hazard ratio 9.21, 95% confidence interval 2.90-29.23, p<0.001).

Conclusions: The definition of NDLVC may be integrated by the upper reference limits of LVEDVi (<96 mL/m² in women, <105 mL/m² in men) and LVEF ≥40% to identify patients with a homogeneous risk for death or life-threatening ventricular arrhythmias.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 257
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ELETTROSTIMOLAZIONE (ARITMIE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
SCINTIGRAFIA MIOCARDICA (IMAGING CARDIOVASCOLARE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)

PREVALENCE OF CARDIAC AMYLOIDOSIS IN ELDERLY PATIENTS
UNDERGOING PACEMAKER IMPLANTATION

Federico Ballatore (a), Ambra Fiamma Botticelli (a), Jacopo Costantino (a), Giulia Marchionni (a, b), Maria Alfarano (a), Nicola Pierucci (a), Marco Valerio Mariani (a), Carlo Lavalle (a), Carmine Dario Vizza (a), Cristina Chimenti (a)
 (a) UNIVERSITÀ DEGLI STUDI DI ROMA LA SAPIENZA; (b) UNIVERSITÀ DI PAVIA

Background: Cardiac amyloidosis is an infiltrative disease characterized by the accumulation of amyloid fibrils in cardiac tissue. These amyloid deposits are also observed in the context of the conduction tissue, often causing arrhythmic manifestations and leading patients, who are more frequently elderly subjects, to implantation of permanent intracavitary electrostimulation devices, such as pacemakers.

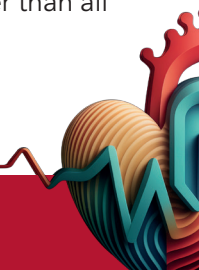
Objectives: The aim of the study was to investigate the prevalence of amyloidosis in elderly patients who implant pacemakers, currently likely underestimated, in order to anticipate the diagnosis and start “disease-modifying” therapies as early as possible.

Materials and methods: We selected 85 patients older than 70 years old who underwent pacemaker implantation. Of these, 23 patients also met the second criterion of IVS >12 mm of thickness and at least one other red flag of cardiac amyloidosis. The study was conducted then on 14 patients who met both selection criteria and who gave informed consent. Among the extracardiac red flags we searched for: MGUS, carpal tunnel syndrome, biceps tendon rupture, family history of amyloidosis, lumbar canal stenosis, polyneuropathy, trigger finger, macroglossia. Among the cardiac red flags, in addition to IVS hypertrophy: hypotension,

pre-implant electrocardiographic features (peripheral low voltage, pseudo Q waves, right and/or left bundle branch block, EAS, AVB), serum troponins above the range (>0.014 µg/ml), NT-proBNP above the range (>300 pg/ml), presence of pericardial effusion, diastolic dysfunction or aortic stenosis at the echocardiogram. In the selected patients, the diagnostic process was carried out following the most recent ESC guidelines: patients underwent scintigraphy and monoclonal analysis by dosing free light chains and immunohistochemical tests on serum and urine samples.

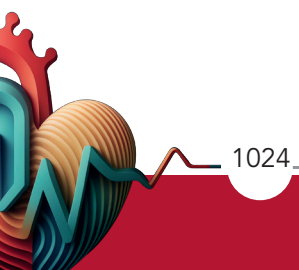
Results: All patients included in the study (N=14) underwent myocardial scintigraphy with bisphosphonates, which was positive (PS 2-3) in 5 patients. The search for the monoclonal component in laboratory tests was positive in 1 patient who had a positive scintigraphy. The patients also underwent genetic testing for transthyretin mutations and all were negative. In the 5 patients who were positive to the scintigraphy, the diagnosis of wild-type transthyretin cardiac amyloidosis was confirmed and specific treatment with Tafamidis was promptly started.

Conclusions: Our study demonstrated a high prevalence of cardiac amyloidosis in patients with selected red flags requiring PM implantation, a prevalence higher than all



studies conducted to date. Our study suggests that the search for red flags in patients older than 70 years old requiring PM implantation should be mandatory in

order to make early diagnosis of cardiac amyloidosis, reduce healthcare costs and improve patients's quality of life.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 720 RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

BASELINE C-REACTIVE PROTEIN AS A PREDICTOR OF NON-ISCHEMIC LGE IN MYOCARDITIS

Marco Bernardi (a), Valentina Valenti (a), Luigi Spadafora (a), Gianmarco Sarto (b), Beatrice Simeone (b),
Erica Rocco (b), Francesco Versaci (c), Sebastiano Sciarretta (a, b)

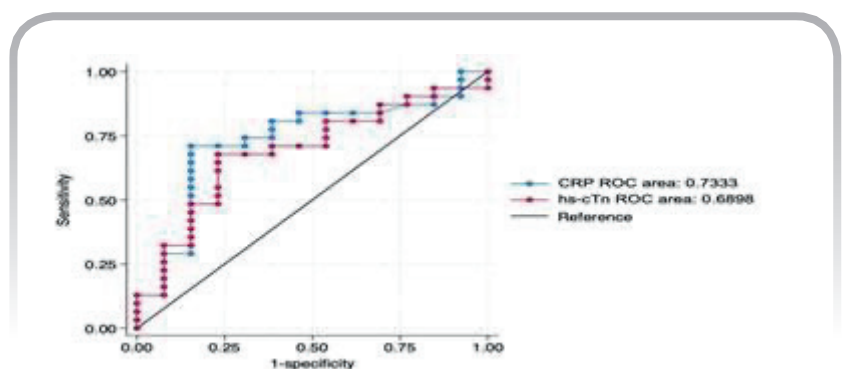
(a) DIPARTIMENTO DI SCIENZE E BIOTECNOLOGIE MEDICO-CHIRURGICHE;
(b) ICOT ISTITUTO MARCO PASQUALI; (c) OSPEDALE SANTA MARIA GORETTI

Background: Identifying reliable early indicators of myocardial injury in myocarditis is a pressing concern in cardiology. Despite their established role in detecting myocardial necrosis, traditional markers like high-sensitivity cardiac troponin (hs-cTn) may not fully capture the extent of myocardial damage identified by non-ischemic late gadolinium enhancement (LGE) on cardiovascular magnetic resonance (CMR).

Purpose: To identify early admission biomarkers associated with non-ischemic LGE in patients with myocarditis, offering the potential for improved risk stratification and therapeutic targeting.

Methods: In this retrospective study, we analyzed 59 myocarditis patients admitted to a high-volume medical center from 2017 to 2023, who underwent CMR to evaluate LGE. 41 patients (69.5%) exhibited non-ischemic LGE and 18 (30.5%) did not. We assessed baseline laboratory and echocardiographic parameters, employing Pearson correlation, logistic regression, and ROC curve analyses to elucidate the potential association of baseline biomarkers with non-ischemic LGE, while also discerning subepicardial from midwall patterns.

Results: Baseline C-reactive Protein (CRP) levels were significantly correlated with non-ischemic LGE (Pearson's $r=0.301$, $p<0.05$). Logistic regression analysis substantiated CRP as a predictor of non-ischemic LGE (OR=1.41, $p<0.05$), corroborated by a multivariate approach even after accounting for age and sex (OR=1.33; $p<0.05$). Among non-ischemic patterns, subepicardial LGE exhibited the strongest correlation with CRP (Pearson's $r=0.321$, $p<0.05$). In contrast, hs-cTn levels showed no significant association with non-ischemic LGE. The ROC analysis revealed that while both CRP and hs-cTn provide valid predictive values for non-ischemic LGE, with AUCs of



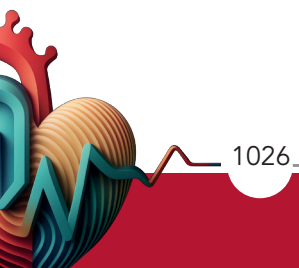
ROC curves for CRP and hs-cTn in predicting non-ischemic LGE in myocarditis patients. The AUC for CRP is 0.7333, indicating a higher discriminative performance compared to hs-cTn with an AUC of 0.6898.

Figure 1



0.7333 and 0.6898 respectively, CRP demonstrated a higher discriminative performance, indicating that CRP may offer a more reliable assessment in this clinical context. Additionally, diabetic status emerged as the most significant condition associated with increased CRP levels, with diabetic patients presenting a substantial elevation in baseline CRP compared to non-diabetic patients (8.75 mg/dl vs 3.21 mg/dl; $p < 0.05$).

Conclusion: CRP appears as a key early biomarker for non-ischemic LGE in myocarditis, with its predictive value being particularly evident in the subepicardial pattern and notably more pronounced among diabetic patients who demonstrate an increased inflammatory burden. These findings suggest a critical role for CRP in risk stratification right from the point of hospital admission and underline the potential for tailored therapeutic approaches that warrant further investigations.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 557

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)

CARDIOMIOPATIA ARITMOGENA BIVENTRICOLARE: UNA DIFFUSIONE DA SINISTRA A DESTRA?

Luca Canovi (a), Elisabetta Tonet (a), Matteo Bertini (a)
(a) UNIVERSITÀ DI FERRARA

La Cardiomiopatia Aritmogena (CMPA), originariamente associata al ventricolo destro, sta vivendo un cambio di paradigma grazie alle recenti scoperte. È ormai noto che possa manifestarsi con coinvolgimento biventricolare o addirittura "left-dominant". Al momento della diagnosi, tuttavia, è spesso già presente un coinvolgimento biventricolare, rendendo difficile l'identificazione del punto di origine del processo patologico.

Presentiamo due casi di pazienti affetti da CMPA biventricolare, la cui diagnosi precoce attraverso la RM cardiaca ha consentito di identificare un coinvolgimento precoce del ventricolo sinistro (VS) con successiva estensione al ventricolo destro (VD).

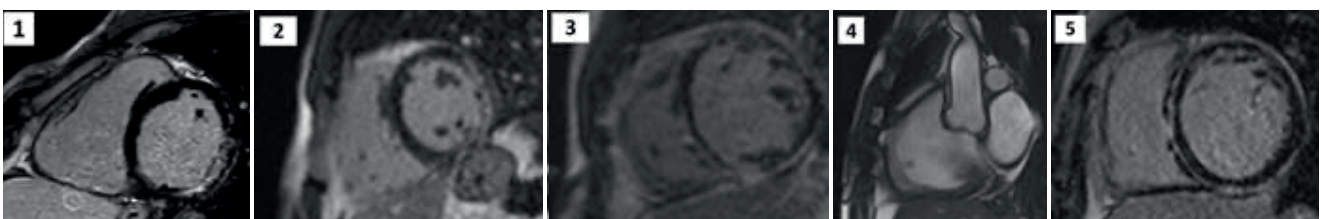
Le immagini 1 e 2 riguardano il Paziente 1, rispettivamente al tempo 0 e al follow-up di 2 anni. Nella prima immagine si osservano dimensioni biventricolari normali, con un unico reperto patologico rappresentato dalla presenza di LGE meso-subepicardico nella parete infero-laterale medio-basale del VS. Nella seconda immagine, oltre all'incremento dell'LGE nel VS con sostituzione fibro-

adiposa, si osserva un bulging della parete libera del VD con un focus di metaplasia adiposa nel setto medio-basale, patognomonico di una CMPA left-dominant con coinvolgimento iniziale del VD.

Le immagini 3 e 4 riguardano il Paziente 2 al tempo 0, mostrando una cardiomiopatia con fenotipo dilatativo che coinvolge il VS, senza segni di coinvolgimento del tratto di efflusso del ventricolo destro (RVOT), ben rappresentato nell'immagine 4.

Le immagini 5, 6 e 7 sono relative al follow-up a 1 anno del Paziente 2, dove si osserva un aumento dell'estensione dell'LGE del VS (immagine 5) e un coinvolgimento anche del VD, con dilatazione dell'RVOT e un evidente bulging della parete antero-laterale basale.

I casi presentati suggeriscono che le varianti di CMPA oggi note come "biventricolari" potrebbero avere un costante coinvolgimento precoce del VS, da cui origina il processo patologico che successivamente si estende al VD seguendo l'evoluzione naturale della malattia. In quest'ottica, la risonanza magnetica cardiaca si rivela fondamentale per una diagnosi precoce.



Figure



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 858 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

AMILOIDOSI CARDIACA DA TRANSTIRETINA NEL PAZIENTE ANZIANO: PREVALENZA E CARATTERISTICHE DELLA FORMA GENETICA

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Maria Alfarano (a), Carmine Dario Vizza (a), Cristina Chimenti (a)
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Introduzione: L'amiloidosi cardiaca da transtiretina (ATTR) rappresenta una malattia cardiaca progressiva determinata dall'accumulo extracellulare di fibrille amiloidi di transtiretina (TTR), che può manifestarsi sia nella forma ereditaria (ATTRv) che nella forma wild-type (ATTRwt). Negli ultimi anni, la ATTR è sempre più riconosciuta come una causa importante di insufficienza cardiaca nei pazienti anziani, tuttavia la diagnosi accurata del suo sottotipo genetico è spesso trascurata. Identificare la natura ereditaria della ATTR è cruciale, poiché consente non solo di offrire un adeguato counselling genetico, ma anche di attivare programmi di screening familiare, facilitando così la diagnosi precoce e migliorando il trattamento nei casi in cui sia presente polineuropatia attraverso l'uso di farmaci specifici per la TTR. Nonostante ciò, nella popolazione anziana si tende spesso a presupporre che la ATTR sia di origine wild-type, con conseguente mancata esecuzione di test genetici. Il presente studio si propone di valutare la prevalenza di ATTRv tra gli anziani affetti da ATTR e di identificare i predittori clinici, elettrocardiografici e di imaging associati alla presenza della forma ereditaria.

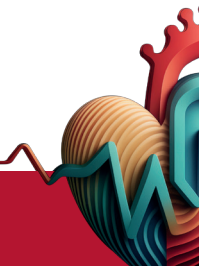
Metodi e risultati: È stata condotta un'analisi retrospettiva su pazienti consecutivi con sospetta amiloidosi cardiaca da transtiretina (ATTR-CM) presso il Dipartimento di Cardiologia dell'Ospedale Universitario Policlinico Umberto I, nel periodo compreso tra gennaio 2018 e luglio 2024. Durante lo studio, sono stati valutati 707 soggetti con sospetto

di ATTR-CM, di cui 189 hanno ricevuto una diagnosi confermata. Tra questi, 78 pazienti sono stati esclusi dallo studio per età inferiore ai 70 anni o per la presenza di una componente monoclonale in assenza di biopsia. Il campione finale era composto da 111 pazienti, di cui 96 maschi (86,5%) e 15 femmine (13,5%), con un'età media di 82 anni. Tutti i pazienti sono stati sottoposti a test genetico mediante amplificazione e sequenziamento del gene TTR. L'ATTRv è stata diagnosticata in 17 pazienti (11 maschi e 6 femmine), con una prevalenza del 15,3% (IC 95%: 8,5%-22,6%) e con predominanza della mutazione Ile88Leu (41,17%). L'analisi univariata ha rivelato diversi fattori significativamente associati alla forma ATTRv rispetto alla forma ATTRwt, tra cui il sesso femminile (odds ratio [OR]: [5.15]; IC 95%: [1,54 e 17,26]; p-value = [0,04]), la sindrome del tunnel carpale (odds ratio [OR]: [5.38]; IC 95%: [1,74 e 16,68]; p-value = [0,01]), un'età inferiore alla diagnosi ([media di 77 anni ATTRv media di 83 anni per ATTRwt]; p-value = [0,01]), una ridotta incidenza di ectopia sopraventricolare all'Holter delle 24 ore ([media 1307 ATTRwt, media 120 ATTRv]; p-value = [0,028]), ed una scintigrafia con bifosfonati più frequentemente negativa (odds ratio [OR]: [5.18]; IC 95%: [1,74 e 16,38]; p-value = [0,019]). Gli altri parametri clinici, ematici, elettrocardiografici ed ecocardiografici analizzati non presentavano invece differenze significative tra i due gruppi.

Conclusioni: L'ATTRv è presente in un numero consistente di pazienti con ATTR di età ≥ 70 anni,

soprattutto in soggetti di sesso femminile di età inferiore agli 80 anni, con sindrome del tunnel carpale e con bassa captazione alla scintigrafia. Questi risultati

giustificano l'esecuzione di test genetici di routine nei pazienti con ATTR, al fine di garantire una terapia mirata ed uno screening familiare tempestivo.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 399
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA
CARDIACA IN ACUTO)**

**LONG-TERM OUTCOMES AND WORSE CLINICAL COURSE IN TAKOTSUBO SYNDROME
PATIENTS WITH AMYOTROPHIC LATERAL SCLEROSIS**

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Monica Puligheddu (b), Roberta Montisci (a), Maria Francesca Marchetti (a)

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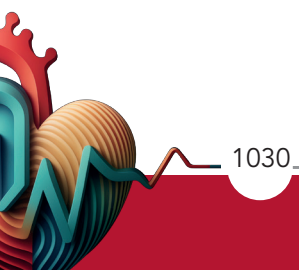
Background: Takotsubo syndrome (TTS) is usually triggered by either physical/psychological stressors or comorbidities, neurological among others. The prevalence of amyotrophic lateral sclerosis (ALS) among TTS and whether it has a worse clinical course is not known.

Methods: We retrospectively screened the overall TTS population admitted and followed up at our institution between 2007 and 2020 to assess ALS prevalence and its impact on clinical presentation, clinical course, and long-term mortality.

Results: 85 patients with TTS were included in our study. Overall, the mean age was 70 ± 12 years, 86% were females. Six patients (7% prevalence) were affected by ALS. At admission, patients with ALS were more likely to present left ventricular systolic dysfunction

($p=0.007$). The clinical course of ALS patients was more likely complicated by cardiogenic shock ($p=0.003$) which required catecholamines infusion ($p=0.001$) and mechanical ventilation ($p=0.009$). Despite similar in-hospital mortality rates, ALS patients exhibited significantly elevated all-cause mortality during a median 6-year follow-up (HR, 19.189, 95% CI 5.639-65.296, log-rank test $p<0.001$) with significantly shorter hospitalization to death time ($p=0.039$).

Conclusions: Our findings highlight a notable prevalence of ALS among TTS patients, with worse clinical presentation and in-hospital course in ALS-affected individuals. While in-hospital mortality rates were comparable, highlighting the reversible nature of TTS in both groups, long-term follow-up revealed significantly heightened all-cause mortality in ALS patients, emphasizing the impact of ALS on patient prognosis.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 248 CARDIOTOSSICITÀ DA FARMACI (CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ) MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

MIOCARDITE E STORM ARITMICO IN SOGGETTO CON MELANOMA METASTATICO IN CORSO DI IMMUNOTERAPIA

Simona Pavoncelli (a), Concetta Pastore (a), Giulia Elena Mandoli (a), Luna Cavigli (a), Flavio D'ascenzi (a), Anna Maria Di Giacomo (b), Serafina Valente (a), Matteo Cameli (a), Marta Focardi (a)
(a) DIPARTIMENTO DI BIOTECNOLOGIE MEDICHE, DIVISIONE CARDIOLOGIA, UNIVERSITÀ DEGLI STUDI DI SIENA; (b) DIPARTIMENTO DI SCIENZE MEDICHE, CHIRURGICHE E NEUROSCIENZE, UNIVERSITÀ DEGLI STUDI DI SIENA

L'immunoterapia (IMT) rappresenta una terapia utilizzata in soggetti con melanoma metastatico; presentiamo un caso di un uomo di 38 anni che viene inviato presso ambulatorio di Cardiologia per rialzo significativo dei valori di Troponina T high sensitive (1580 ng/L) durante ciclo di immunoterapia (IMT) con immune-checkpoint inhibitors (ICI). La visita cardiologica e l'ECG non hanno evidenziato nulla di significativo; l'ecocardiografia standard ha mostrato una minima disfunzione sistolica, ma l'analisi ecocardiografica mediante valutazione del global longitudinal strain (GLS) del ventricolo sinistro (V_{sin}) ha rivelato una riduzione di tale parametro (-15%). Come suggerito dalle ultime linee guida ESC 2022 della cardio-oncologia, in considerazione della presenza di un rialzo della Troponina T e dei valori di GLS, il paziente è stato ricoverato, anche se asintomatico, per eseguire una risonanza magnetica cardiaca (RMC) nel sospetto di una miocardite da ICI. La RMC ha mostrato focali aree di edema a livello della parete anteriore e setto anteriore con minimo delayed enhancement (DE). Il paziente asintomatico, con Troponina HS in calo viene successivamente dimesso e programmato follow up mensile; dopo 20 giorni il soggetto presenta storm aritmico con necessità di intubazione oro-tracheale (IOT), contropulsazione aortica (IABP) e ricovero in terapia intensiva cardiologica. Dopo valutazione multidisciplinari tra Cardiologi ed Oncologi viene sospesa terapia oncologica ed iniziata terapia per

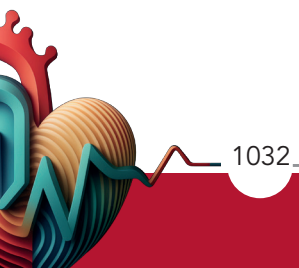
scompenso cardiaco in quanto il paziente mostrava all'ecocardiogramma una disfunzione biventricolare severa. Una successiva TC di stadiazione ha dimostrato una progressione della malattia con aumento delle metastasi per cui si è resa necessaria ripresa dell'IMT. A circa un mese dall'evento aritmico, una volta stabilizzato il paziente, viene eseguita nuova RMC che ha evidenziato estese aree di DE biventricolari con associata disfunzione biventricolare. Durante il ricovero si assiste ad un parziale recupero della funzione ventricolare sinistra (FE da 20% a 35%); in considerazione dell'aspettativa di vita del paziente, a causa della patologia oncologica, viene proposto impianto di defibrillatore life-vest per 6 mesi. Il paziente viene pertanto dimesso con programma di stretto follow up cardiologico ed oncologico; a 4 mesi di follow up il paziente ha mostrato un miglioramento della funzione ventricolare sinistra, ma una failure persistente del Vdx.

Conclusioni: L'IMT è una valida terapia nel soggetto con melanoma metastatico, ma può dare cardiotoxicità in rari casi con la comparsa di miocardite. Dalle linee guida ESC 2022 sulla cardio-oncologia si evidenzia come le metodiche ecocardiografiche di imaging avanzato hanno un ruolo nel rilevare disfunzioni sistoliche molto precoci. Nel nostro caso la presenza di un aumento dei valori di Troponina T high sensitive



e una riduzione dello strain (GLS) ci hanno indirizzato verso un approfondimento diagnostico con RMC ed evidenza di una miocardite da IMT in fase iniziale. L'approccio multidisciplinare tra oncologi e cardiologi ha garantito un percorso ottimale per la gestione di tale soggetto anche se purtroppo la progressione della miocardite ha comportato, in questo caso, una failure

biventricolare che ha portato ad una modifica della terapia oncologica con progressione delle metastasi. In futuro sarà necessaria una attenta valutazione cardiologica dei soggetti che vanno incontro a terapie oncologiche che non si basi solo su metodiche di imaging standard, ma di un approccio più avanzato per permettere una diagnosi precoce della cardiotossicità.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 511
TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)**

AN HIDDEN MASS IN THE FORGOTTEN VENTRICLE

Domenico Galzerano (a), Naji Kholaf (a), Awab Okasha (b), Mohammed Al Admawi (b),
Loay Tashkandi (c), Aya Ismail Elnegali (c), Sara Di Michele (f), Valeria Pergola (d), Giovanni Di Salvo (e),
Feras Khaliel (b), Hani Al Sergani (b)

(a) HEART CENTRE, KING FAISAL SPECIALIST HOSPITAL & RESEARCH CENTER AND COLLEGE OF MEDICINE,
ALFAISAL UNIVERSITY, RIYADH, SAUDI ARABIA; (b) HEART CENTRE, KING FAISAL SPECIALIST HOSPITAL AND
RESEARCH CENTER, RIYADH, SAUDI ARABIA; (c) COLLEGE OF MEDICINE, ALFAISAL UNIVERSITY, RIYADH, SAUDI
ARABIA; (d) DEPARTMENT OF CARDIO THORACO VASCULAR SCIENCES, UNIVERSITY OF PADUA, PADUA, ITALY;
(e) PEDIATRIC CARDIOLOGY AND CONGENITAL HEART DISEASE DEPARTMENT, UNIVERSITY OF PADUA, ITALY;
(f) DIVISIONE DI CARDIOLOGIA, OSPEDALE SAN FILIPPO NERI, ROMA, ITALIA

Cardiac hemangiomas are rare benign vascular tumors of the heart, often asymptomatic but potentially causing arrhythmias or obstruction. Detection is typically through imaging modalities like echocardiography or magnetic resonance imaging (MRI), which help delineate their size and location. Surgical resection is generally curative, with an excellent prognosis due to their non-malignant nature.

A 23-year-old male with exertional shortness of breath underwent two-dimensional and three-dimensional transthoracic echocardiography, revealing a rounded mass with myocardial-like texture and well-demarcated borders in the right ventricle (RV), measuring 14x18 mm and attached by a small peduncle to the basal/free walls below the tricuspid valve annulus (Panel B). Transesophageal 2D and 3D echocardiography further detailed the anatomical features (Panel A), showing a size of 18x12 mm. MRI confirmed these details, showing an isointense signal on T1 and a hyperintense T2 signal with gradual

post-contrast enhancement, indicating an abundant vascular supply (Panel B). Findings suggested a pedunculated, vascular benign tumor like hemangioma or vascular myxoma. The patient underwent successful

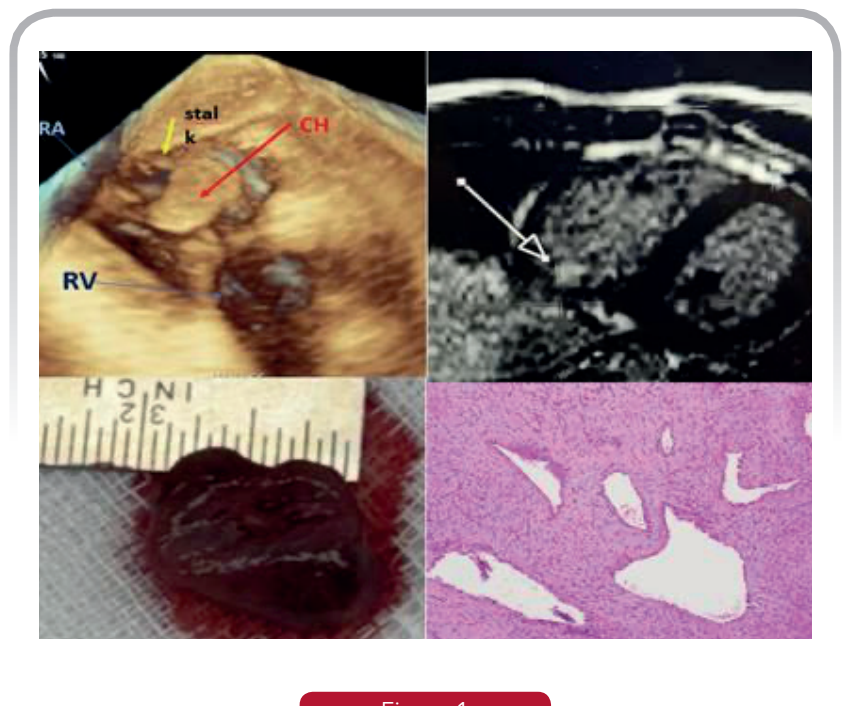
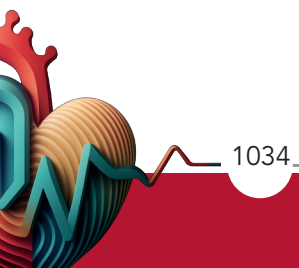


Figure 1

robotic surgical excision of a rounded pedunculated reddish mass (panel D), with histopathology confirming a mixed capillary-cavernous type cardiac hemangioma (Panel E). Post-surgery, the patient recovered well with an uneventful course. RV localization of cardiac

hemangiomas is rare and often asymptomatic or presenting with nonspecific symptoms. However, due to their potential to grow, cause arrhythmias, and embolism, early diagnosis is critical. A multimodality imaging approach is essential in the diagnostic pathway.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 478 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

RUOLO DELLA RIVALUTAZIONE PERIODICA DELLE VARIANTI DI INCERTO SIGNIFICATO (VOUS) NELLA DIAGNOSI DIFFERENZIALE DELLE FENOCOPIE DI CARDIOMIOPATIA IPERTROFICA: CASO CLINICO DI GLICOGENOSI DA PRKAG2

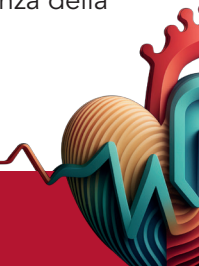
Manuel Garofalo (a, b), Annamaria Del Franco (a), Iacopo Olivotto (a, b), Mattia Targetti (a),
Giacomo Bonacchi (a), Francesca Girolami (c), Giorgia Panichella (a, b)

(a) CARDIOMIOPATIE UNIT, AOU CAREGGI; (b) UNIVERSITÀ DI FIRENZE;

(c) LABORATORIO DI CARDIOGENETICA, SOC CARDIOLOGIA PEDIATRICA E DELLA TRANSIZIONE, AOU MEYER

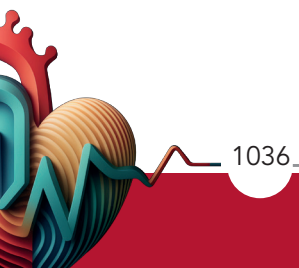
Maschio di 62 anni con cardiomiopatia ipertrofica (CMI) e labile ostruzione al tratto d'efflusso ventricolare sinistro (TEVS), con ipertrofia parietale asimmetrica prevalentemente a carico del setto interventricolare anteriore (SIV 22 mm) e funzione sistolica globale lievemente ridotta per patologica (FE 51%). Diagnosi effettuata nel 2003 all'età di 41 anni, a seguito di insorgenza di cardiopalmo durante un ricovero in neurologia per malattia demielinizzante. La storia familiare è negativa per CMI e per morte cardiaca improvvisa. Ha due figli, in buona salute e con fenotipo negativo. Esegue il primo test genetico nel 2011 con esito negativo (sequenziamento con metodica Sanger dei geni sarcomerici *MYH7*, *MYBPC3*, *TNNT2*, *TNNI3*, *TPM1*, *ACTC1*, *MYL2*, *MYL3*). Per BAV di III grado complicato da shock cardiogeno con dimostrazione di coronarie indenni da stenosi significative nel 2008, all'età di 46 anni, eseguito impianto di CRT-D. A Dicembre 2016 episodio di aritmia ventricolare di 7 secondi, prontamente riconosciuto dal dispositivo ed interrotto da ATP. A Settembre 2021 riscontro di fibrillazione atriale al controllo ICD, per cui veniva intrapresa terapia con anticoagulante orale diretto. Ripetuta consulenza genetica e test genetico a marzo del 2022 (analisi di un pannello di geni mediante Next Generation Sequencing) con riscontro della variante c.1643C>T p.(Ser548Leu) in eterozigosi nel gene *PRKAG2* interpretabile come variante di incerto significato (VOUS). Tentativi inefficaci, per scarsa tolleranza, di introduzione di terapia con betabloccante

per peggioramento del grado di ostruzione al TEVS. Stabile la capacità funzionale negli anni (NYHA II). A novembre 2023, a seguito di nuovi dati emersi in letteratura, risulta possibile riclassificare la variante da VOUS a probabilmente patogenetica. Il genotipo risulta compatibile con la diagnosi di glicogenosi cardiaca da mutazione di *PRKAG2*, con trasmissione autosomica dominante. La cardiomiopatia da accumulo di glicogeno correlata a *PRKAG2* si manifesta spesso con un fenotipo clinico sovrapponibile alla CMI sarcomerica ma con un profilo aritmico peculiare. Risulta infatti associata in circa il 30% dei casi ad anomalie della conduzione elettrica, più comunemente preeccitazione ventricolare e blocchi di branca e frequentemente si associa ad eventi tachiaritmici come flutter/fibrillazione atriale o bradiaritmici come blocchi atrio-ventricolari avanzati con necessità di impianto di PM, tipicamente nella terza e quarta decade di vita. Sebbene le cardiomiopatie metaboliche rappresentino solo una piccola percentuale (<1%) dei pazienti adulti con ipertrofia ventricolare sinistra inspiegabile riferiti per CMI, la diagnosi differenziale con la "CMI sarcomerica" è cruciale in quanto la storia naturale, la prognosi e, in alcuni casi, le strategie di trattamento sono diverse. Il paziente rappresenta un caso di fenocopia di CMI in cui l'avanzamento delle conoscenze e delle tecnologie sull'analisi genetica, insieme alla progressione del quadro clinico hanno permesso di arrivare ad una diagnosi definitiva con ricadute pratiche sulla gestione clinica. Questo caso è anche un esempio dell'importanza della



rivalutazione delle varianti VOUS nel tempo, e dimostra la necessità continua di scambio di informazioni tra il laboratorio ed il clinico. Infine, l'identificazione di una

variante probabilmente patogenetica ha permesso l'esecuzione della consulenza e del test genetico nei familiari del probando.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 119 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI) CARDIOTOSSICITÀ DA FARMACI (CARDIO-ONCOLOGIA E CARDIO- TOSSICITÀ)

CLOZAPINE-INDUCED MYOCARDITIS: A RARE BUT POTENTIALLY SERIOUS ADVERSE EFFECT

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Clozapine is the only FDA-approved antipsychotic agent for treating resistant schizophrenia. This drug is known for causing agranulocytosis but may also rarely cause serious cardiovascular complications, especially myocarditis.

We present the case of a 33 years-old schizophrenic woman, admitted to the inpatient psychiatric unit due to worsening of ideo-behavioral disorganization.

The patient was obese (BMI 31), heavy smoker with dyslipidemia, hypothyroidism and polycystic ovary syndrome. Her home therapy included haloperidol, promazine, alprazolam and levothyroxine. She had no history of cardiovascular diseases.

Clozapine treatment was started and titrated up to 125 mg/day. Eight days later, the patient complained of chest pain associated with nausea, vomit and diaphoresis. Cardiac examination was unremarkable. A 12-lead electrocardiogram revealed sinus tachycardia and a diffuse ST segment elevation and PR depression. Laboratory results showed elevated brain natriuretic peptide (214 pg/ml), high sensitivity troponin I (Hs-TnI, up to 858 ng/L) and C-reactive protein (CRP, 156 mg/L). Upper respiratory viruses panel, urine analyses

and chest x-ray were unremarkable. A transthoracic echocardiogram revealed a preserved left ventricular ejection fraction with mild circumferential pericardial effusion (max 8 mm).

Given the suspicion of non-infectious perimyocarditis, clozapine was stopped and bisoprolol, ibuprofen and colchicine were started.

Coronary computed tomography angiography ruled out coronary artery disease.

Cardiac magnetic resonance showed small subepicardial regions of edema and nonischemic subepicardial late gadolinium enhancement (LGE) of the mid-apical lateral wall consistent with myocarditis.

In line with the proposed IgE-mediated hypersensitivity underlying clozapine-induced myocarditis, serum IgE were found to be elevated (1260 IU/mL).

Vitals and labs progressively returned to normal range, the patient remained asymptomatic without episodes of significant arrhythmias or heart failure.

Clozapine-induced myocarditis is a rare but potentially fatal condition; therefore, we suggest symptoms, echocardiogram, hs-TnI and BNP monitoring at least during the first three months of therapy.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 134 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

DESCRIPTIVE ANALYSIS OF UNMET NEED IN A CONTEMPORARY COHORT OF TAFAMIDIS TREATED ATTR-CM PATIENTS

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Introduction: Transthyretin amyloidosis with cardiomyopathy (ATTR-CM) is a rapidly progressing, debilitating condition characterized by progressive heart failure, conduction disorders, and thrombotic events, leading to significant morbidity and mortality. Tafamidis, a TTR stabilizer, is currently the only approved treatment for ATTR-CM.

Hypothesis: A significant unmet need remains in addressing excess morbidity and mortality in ATTR-CM patients in current clinical practice. Our objective was to describe this unmet need in a large population of ATTR-CM patients treated with tafamidis in contemporary real-world practice.

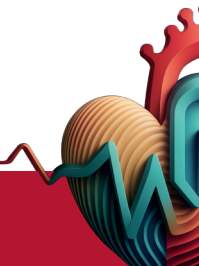
Methods: This cohort study utilized secondary, de-identified U.S. patient-level data from Optum's electronic health record database, from January 2016 to October 2022. Adult patients meeting criteria for an ATTR-CM diagnosis – i.e., 1) ICD-10 code E85.82 OR 2) ICD-10 code for non-wild-type, light chain, or secondary systemic amyloidosis + an ICD-10 code for cardiomyopathy/heart failure within 2 years of the amyloidosis code – together with evidence of tafamidis initiation upon or after meeting the criteria for ATTR-CM diagnosis were followed longitudinally from index (tafamidis initiation) until a censoring event, defined as the earliest of death, heart transplant, left ventricular assist device (LVAD) implantation, end of study period,

end of EHR activity (with a 180-day allowable gap), or (for event-based analyses) occurrence of the event of interest. Demographic and clinical characteristics were summarized over the baseline period (365 days to 1 day prior to index date) and incidence rates for CV hospitalizations and all-cause mortality were calculated over the post-index follow-up period, along with changes in clinical parameters during follow-up (per-patient mean of all follow-up measurements taken within 365 days post-index) relative to baseline.

Results: Among 813 tafamidis-treated ATTR-CM patients, the mean baseline age was 77.8 years, 81.2% were male, 26.2% were African American, 35.9% had a history of CV hospitalization and 43.3% were on diuretics during the baseline period. The median post-index follow-up time in this cohort was 354 (IQR 168 – 577) days, during which 18.8% of patients discontinued (non-death) tafamidis. During follow-up (i.e., during tafamidis treatment), the mean increase in NT-proBNP was 1,612pg/mL (n=175 with available data), the mean decrease in eGFR was 4.5mL/min/1.73m² (n=577 with available data), and 108 patients (23.4% of those not on diuretics at baseline) newly initiated diuretics. During the same period, CV hospitalization occurred in 294 (36.2%) patients (incidence: 418.5 per 1,000 person years) and 58 patients (7.1%) died (incidence: 63.4 deaths per 1,000 person years).

Conclusions: Despite treatment with tafamidis, ATTR-CM patients continue to experience cardiac worsening and disease progression, as evidenced by substantial rates of diuretic initiation, worsening biomarkers,

decreased kidney function, occurrence of CV hospitalization, and mortality. These findings highlight the significant unmet need for additional effective ATTR-CM treatments.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 334 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)

MIOCARDITI: RUOLO DELL'ISTOLOGIA, DELLA RISONANZA E DEL CATETERISMO CARDIACO

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Introduzione: La diagnosi di miocardite si basa attualmente sulla biopsia miocardica (BEM) nei contesti di presentazione acuta e alto sospetto clinico; tuttavia, poco è noto sulle caratteristiche di questi pazienti, sul ruolo integrato della RMN cardiaca e del cateterismo cardiaco (RHC). Nel nostro centro il RHC viene eseguito contestualmente alla BEM.

Metodi: Sono stati inclusi tutti i pazienti ricoverati e sottoposti ad una BEM nel sospetto di miocardite acuta presso il nostro Centro dal 2017 al 2023. Sono stati raccolti i dati istologici, di presentazione clinica, ECGgrafici, ecocardiografici e emodinamici. L'outcome valutato è stata la mortalità per causa cardiovascolare e la necessità di LVAD o trapianto urgente a 30 giorni e a un anno. Abbiamo inoltre descritto la concordanza tra la diagnosi BEM e RMN e analizzato i dati emodinamici.

Risultati: 80 pazienti (58.3% maschi, età: 44.7 ± 15.7 anni) hanno costituito la popolazione di studio. Il 67.5% aveva avuto almeno un sintomo prodromico (46.2% iperpiressia, 17% faringodinia, 20% sintomi gastrointestinali, 12.5% polmonite), il 56% dolore toracico, 51% dispnea; 11% sincope. Il 51% era in classe NYHA >III. Il 36.2% aveva una presentazione clinica fulminante; in particolare, il 12.5% aveva avuto un arresto cardiaco, il 21.2% una TV; all'ECG, il 22% presentava bassi voltaggi del QRS, il 7.5% BAV di II o III grado, 11.2% un QRS >120 msec, il

35.4% un QT prolungato; all'ecocardiogramma la FE era $32.9 \pm 11.6\%$, il 37.5% aveva un versamento pericardico. 9 pazienti (20.9%) con BEM positiva presentavano patologie infiammatorie croniche.

37 biopsie (46.4%) erano negative per miocardite; in 29 casi (36.2%) si riscontrava una miocardite linfocitaria, in 7 (8.8%) eosinofila, una gigantomitotica; due miocarditi avvenivano nel contesto di patologie infettive (una Toxoplasmosi, una infezione da C.albicans), 4 presentavano caratteristiche istologiche dubbie. Tra i 63 pazienti sottoposti a RMN, era positiva nel 65% dei casi, negativa 28.7%, dubbia 6.3%; in particolare, nei pazienti con biopsia positiva (n=34), la RMN era positiva o dubbia nell'85% dei casi, tra quelli con biopsia negativa o dubbia la RMN era positiva nel 43% dei casi.

Il cateterismo cardiaco destro mostrava un ridotto indice cardiaco e/o elevate pressioni di riempimento nel 56.5% dei casi. Nel complesso, i pazienti con una biopsia positiva presentavano una sopravvivenza libera da MACE dell' $88.9 \pm 5.2\%$ a un mese e $85.0 \pm 6.2\%$ a un anno; tuttavia, i pazienti con presentazione fulminante presentavano un outcome significativamente peggiore $81.3 \pm 8.4\%$ e $73.9 \pm 10.4\%$ vs 100% per entrambi i timepoint per le forme non fulminanti, $p < 0.01$). I pazienti con diagnosi istologica di miocardite e emodinamica alterata al cateterismo cardiaco avevano una prognosi a un anno peggiore ($90.0 \pm 3.5\%$ vs $80.3 \pm 5.5\%$, $p = 0.10$).

Conclusioni: La biopsia miocardica in pazienti ricoverati in acuto con sospetto di miocardite acuta ha noti limiti diagnostici e richiede una lettura integrata con la

RMN nei casi dubbi o negativi; la presentazione clinica e il quadro emodinamico al cateterismo cardiaco stratificano la prognosi.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 748 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) SCINTIGRAFIA MIOCARDICA (IMAGING CARDIOVASCOLARE) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

TEMPORAL TREND IN CARDIAC SCINTIGRAPHY WITH BONE TRACERS FOR THE DIAGNOSIS OF TRANSTHYRETIN-RELATED CARDIAC AMYLOIDOSIS IN LIGURIA

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(h) CARDIOLOGIA, IRCCS OSPEDALE SAN MARTINO, GENOVA

Introduction: There has been a growing interest in noninvasive diagnosis of transthyretin-related cardiomyopathy (ATTR-CM), particularly through the use of cardiac scintigraphy with bone tracers. We herein analyzed the characteristics and temporal trend of cardiac scintigraphies performed in the Liguria region since 2016.

Methods and Results: We gathered data on cardiac scintigraphies performed in all Ligurian Nuclear Medicine units between 2016 and March 2024. A total of 431 scintigraphy exams were performed, of which 179 (41.5%) were conducted at the San Martino Hospital, 27 (6.3%) at the Galliera Hospital, 124 (28.8%) at ASL 2, 48 (11.1%) at ASL 3, and 53 (12.3%) at ASL 5. Tested patients were mostly male (320, 74%), with an average age of 76.5 ± 9.5 years. About half of the cases (214, 49.7%) resulted positive with the following Perugini grades: grade 1 in 9 cases (4.2%), grade 2 in 108 cases (50.5%), and grade 3 in 97 cases (45.3%). SPECT was performed in 143 cases (33.2%), of which 101 (70.6%) at San Martino Hospital, 37 (25.9%) at ASL 2 and 5 (3.5%) at Galliera Hospital, and in patients with high Perugini score (98.3% in case of grade 2 or 3 vs 1.7% in grade 1). Positive patients

as compared to negative ones were older (80.4 ± 6.6 vs. 72.4 ± 11.4 years), more frequently male (88.3% vs. 60.4%, $p < 0.001$ for all); 46.7% of positive tests were performed at San Martino Hospital, and 39.3% were followed-up at San Martino Hospital. Over the years, we observed a gradual increase in the number of scintigraphies performed, rising from 59 in the 2016-2018 period to 142 in 2019-2021, and reaching 230 in 2022-2024 ($p < 0.001$). This trend was accompanied by a decrease in the rate of positive tests (from 67.8% in 2016-2018 to 54.2% in 2019-2021 to 42.2% in 2022-2024; $p = 0.001$) accompanied by a decline in the average age of patients undergoing the exams (from 79.5 ± 7.2 years in 2016-2018 to 76 ± 9.1 years in 2022-2024; $p = 0.025$) but not in those testing positive (from 81.5 ± 6.3 years in 2016-2018 to 80.2 ± 7.1 years in 2022-2024; $p = 0.44$).

Discussion: We observed a progressive and significant increase in the number of cardiac scintigraphies performed in the Liguria region over the years, which correlates with a growing awareness of the ATTR-CM disease and the possibility of performing a non-invasive diagnosis in majority of cases. This increase has led to a reduction in the rate of positive tests over

time, a reduction in the age at testing, but not in the age at diagnosis. The use of SPECT imaging is not very common; it is almost exclusively performed at one out of five institutions in patients with high Perugini score. About 40% of ATTR-CM patients who underwent a bone scintigraphy in Liguria are followed-up at the San Martino Hospital, which is the only hospital allowed to prescribe disease-modifying therapies in the region.

Conclusions: In this study involving all the five regional nuclear units in Liguria we demonstrated an increase in the number of cardiac scintigraphies performed over the years for diagnosing ATTR-CM, paralleled by a reduction in the rate of positive tests and in the age at test but not at diagnosis. Improvements must be made in ameliorating pathways leading patients to ATTR-CM diagnosis.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 364 ARITMIE VENTRICOLARI (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

UN CASO DI TACHICARDIA VENTRICOLARE IN CARDIOPATIA A FENOTIPO IPERTROFICO

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Caterina Scapicchi (a), Alessandro Mostarda (a), Andrea Scarpignato (a), Marco Giuranna (a),
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(a) UNIVERSITÀ DEGLI STUDI DI PERUGIA

Paziente maschio di 82 anni, giunge alla nostra osservazione inviato da altro presidio ospedaliero per episodio di tachicardia ventricolare sostenuta con iniziali segni di instabilità emodinamica regredita dopo DC-Shock e riscontro di valori di troponina aumentati. In anamnesi presentava una storia di cardiopatia ischemica cronica sottoposta a rivascolarizzazione percutanea (PTCA-DES su MO1) circa 20 anni prima e successiva rivascolarizzazione chirurgica mediante BPAC (AMIS su IVA, AMID su MO) per angina instabile. Due mesi prima del ricovero era stato sottoposto presso altro Centro ad impianto di PM monocamerale per episodi sincopali in corso di BAV avanzato parossistico. All'ingresso in Reparto il paziente si presentava dispnoico per sforzi minimi ed in decubito preferenziale semiortopnoico (NYHA III). All'esame clinico si riscontravano segni di congestione venosa periferica e polmonare. Agli esami di laboratorio incremento dei valori di troponina ad alta sensibilità a plateau (400 ng/L) ed incremento di NT-proBNP (5710 ng/L) e normali valori di funzione renale. L'ECG mostrava ritmo sinusale, emiblocco anteriore sinistro, QS in sede inferiore con bassi voltaggi nelle derivazioni periferiche. L'ecocardiogramma mostrava ipertrofia concentrica del ventricolo sinistro con pareti severamente ispessite e volumi aumentati con aspetto «granular sparkling» del setto interventricolare, disfunzione sistolica di grado moderato (FE=35%) per ipocinesia diffusa; alterata funzione diastolica con riempimento restrittivo irreversibile, severo incremento della pressione di riempimento e ridotta compliance (E/E' 25); dilatazione e ridotta funzione sistolica del ventricolo destro, dilatazione biatriale ed ispessimento

del SIA (9 mm); sclerosi valvolare aortica con conservata apertura delle cuspidi, lembi valvolari mitralici ispessiti con lieve insufficienza. Il paziente è stato sottoposto a coronarografia che ha evidenziato il buon funzionamento dei graft arteriosi per IVA e MO. Dato il riscontro di parametri ecocardiografici di sospetto e la presenza di numerose "red flags" (scompenso cardiaco in paziente di età superiore a 65 anni, anamnesi positiva per sindrome del tunnel carpale bilaterale, bassi voltaggi del QRS a dispetto del riscontro ecocardiografico di ipertrofia, pseudo onde Q all'ECG, storia di disturbi del sistema di conduzione, livelli di troponina cronicamente aumentati), nel sospetto di cardiopatia ipertrofica a genesi infiltrativa, veniva eseguito dapprima screening per amiloidosi AL che è risultato negativo e quindi una scintigrafia con tracciante osseo con intenso accumulo di tracciante a livello miocardico con conferma della diagnosi di amiloidosi da transtiretina. Dopo adeguato decongestionamento veniva impiantato un ICD in prevenzione secondaria previa estrazione del PM precedentemente impiantato. Nel nostro caso si è giunti quindi alla diagnosi di amiloidosi a partire da un evento aritmico ventricolare in corso di scompenso cardiaco a frazione di eiezione ridotta in un paziente con sindrome coronarica cronica stabile.

La diagnosi di amiloidosi cardiaca parte dal sospetto clinico e da reperti di imaging multimodale ed elettrocardiografici che concorrono al sospetto diagnostico che, una volta confermato, necessita l'identificazione del tipo di amiloidosi sottostante che condiziona la prognosi e la terapia.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 568
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MULTI-MODALE/IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
PROGNOSI (SCOMPENSO CARDIACO)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

**ADVANCING KNOWLEDGE ON EARLY ATTR-CA THROUGH CARPAL TUNNEL SURGERY:
TO TREAT OR NOT TO TREAT?**

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Introduction: Transthyretin cardiac amyloidosis (ATTR-CA) is increasingly recognized as a cause of heart failure (HF) and mortality. Early identification is essential for implementing patient-tailored management and treatment strategies. Carpal tunnel syndrome (CTS) is the earliest clinical marker of future amyloidosis and often precedes cardiac involvement by 5-10 years. Collection of tenosynovial tissue at the time of surgery is a unique screening opportunity to get biopsy proof of ATTR amyloid and assess for possible cardiac involvement.

Case Presentation: Angelo, a 75-year-old male with a history of hypertension, dyslipidemia, acute pancreatitis in the past, and stable JAK2-negative polycythemia, developed symptomatic bilateral CTS in January 2022. Routine cardiological assessment with electrocardiogram and echocardiogram demonstrated suspicious findings of cardiac infiltration, namely relative low voltages and poor R wave progression in anterior leads, significant increase in wall thickness not explained by other factors (max 1.6 cm), type 2 diastolic dysfunction, severe left

atrium dilation, normal ejection fraction with impaired global longitudinal strain (-15.5%, without apical sparing). In January 2023, tenosynovial sheath sample (0.7x0.5x0.3 cm) collected during carpal tunnel release surgery detected ATTR amyloid deposition. ATTR-CA was diagnosed on the basis of Perugini grade 3 myocardial uptake on ^{99m}Tc-pyrophosphate scintigraphy and absence of monoclonal proteins in serum and urine. The patient was asymptomatic, devoid of HF signs and in NAC ATTR Stage Ia (eGFR 83 ml/min, NT-proBNP 163 pg/ml).

Management and Outcomes: In the absence of randomized clinical trial, the decision regarding whether or not to treat asymptomatic patients with ATTR-CA is not currently supported by any real data. In this case, the low NT-proBNP concentration and the absence of HF signs and symptoms corroborated the exceedingly early disease stage and initiation of tafamidis was deferred. After 6 months the NT-proBNP increased to 291 pg/ml, but the patient remained



asymptomatic, with no HF sign and no need of diuretic therapy, under active follow-up to identify the optimal timing for initiation of disease-modifying therapy.

Discussion: This case confirms the role of CTS as early clinical marker of amyloidosis, which anticipated by a year the diagnosis of ATTR-CA, thus suggesting a window for early intervention. Current guidelines lack indications for early treatment, which could potentially prevent or delay disease progression.

Conclusion: Patients with ATTR-CA are increasingly diagnosed at earlier disease stages with no HF symptoms and CTS plays a key role for timely recognition. There is an urgent need to redefine screening programs for early diagnosis of amyloidosis and understanding the natural history of asymptomatic ATTR-CA for making informed clinical decisions at the patient level to define optimal type and timing of treatment initiation.



Figure 1

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 876

BIOLOGIA MOLECOLARE CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

GENOTYPE-PHENOTYPE CORRELATION IN A RARE TWO-CASE SERIES OF PRIMARY CARNITINE DEFICIENCY-ASSOCIATED CARDIOMYOPATHY

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A 20-year-old female patient with a family history of sudden cardiac death—her brother died at 30 from severe hypertrophic cardiomyopathy evolved into a dilated form—was evaluated for suspected cardiomyopathy. Previous genetic testing had not identified any mutations linked to cardiomyopathy. The patient had a history of heart failure at age 3, characterized by left ventricular dilation and dysfunction, as well as evidence of reduced left ventricular function (ejection fraction of 45%) following significant weight loss due to a hypocaloric diet. An electrocardiogram showed hyperacute T waves in the anterior leads and repolarization abnormalities in the inferior region. Echocardiography revealed a slightly enlarged left ventricle (end-diastolic volume index [EDVi] of 63 ml/m²) with increased thickness, mainly in the posterior wall (posterior wall thickness [PWT] of 13 mm), but with normal left ventricular function (ejection fraction of 55%). Cardiac magnetic resonance imaging (MRI) showed mild ventricular dilation (EDVi 117 ml/m²), mild parietal hypertrophy (PWT 13 mm), and mild left ventricular dysfunction (ejection fraction of 48%). Whole genome sequencing identified a pathogenic homozygous mutation (p.Arg169Trp) in the SLC22A5 gene associated with primary carnitine deficiency. Appropriate carnitine supplementation therapy was initiated.

A 23-year-old patient, also with a family history of sudden cardiac death—her 23-year-old sister had autopsy findings of genetically determined

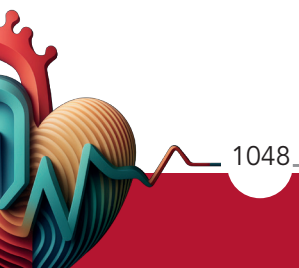
hypertrophic cardiomyopathy with a likely pathogenic MYBPC3 mutation—was evaluated for suspected cardiomyopathy. At age 2, she was hospitalized for Reye's syndrome and started carnitine therapy for suspected primary deficiency, which she inconsistently adhered to. Despite this, she remained asymptomatic from a cardiac standpoint. The electrocardiogram showed fragmented QRS complexes and repolarization abnormalities in the inferior leads. Echocardiography revealed increased left ventricular dimensions (EDVi 73 ml/m²) and thickness (interventricular septal diameter/posterior wall thickness of 14/12 mm) with mild left ventricular dysfunction (ejection fraction of 50%). Cardiac MRI indicated increased left ventricular dimensions (EDVi 108 ml/m²) and mild left ventricular dysfunction (ejection fraction of 46%) with diffuse hypokinesia. Genetic analysis revealed double heterozygous mutations in SLC22A5 associated with primary carnitine deficiency. Continuation of carnitine supplementation therapy was then highly recommended.

Primary carnitine deficiency is a rare autosomal recessive loss-of-function disorder of carnitine transport. The incidence is estimated to be 1:40,000. The presentation is more common in infancy or childhood. Carnitine is essential for the transport of long-chain fatty acids into the mitochondria for β -oxidation. In carnitine deficiency, the body is unable to utilize these fatty acids. This results in impaired energy production, particularly during periods of fasting or stress, and can



cause a variety of symptoms, including cardiomyopathy. Symptoms of carnitine deficiency are often exacerbated during fasting, as the body relies more heavily on fatty acid oxidation for energy production. Typical findings include tall, peaked T waves, especially in the precordial

leads. Dilated and hypertrophic cardiomyopathy are the most common cardiac manifestations, along with sudden cardiac death. L-carnitine supplementation has a positive impact on ventricular hypertrophy improving cardiac function.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 955
ELETTROSTIMOLAZIONE (ARITMIE)
PROGNOSI (SCOMPENSO CARDIACO)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)**

CHARACTERISTICS OF CARDIAC IMPLANTABLE ELECTRONIC DEVICES IN ATTR CARDIOMYOPATHY

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Background: Transthyretin amyloid cardiomyopathy (ATTR-CM) is an emerging cause of heart failure, arrhythmias and conduction system diseases which requires implantation of cardiac device (CIED) in 10% of patients within 3 years from diagnosis. Cardiac magnetic resonance in presence of cardiac device is often contraindicated or results in significant artifacts, limiting its use for monitoring disease progression. The aim of the study was to assess the potential use of electrical parameters to inform disease evolution and possibly to improve prognostic stratification.

Methods: Retrospective observational multicentric (Trieste, Pisa, Padua, Bologna, Brescia) study of patients with established ATTR-CM and CIED. ATTR-CM was established according to guideline diagnostic criteria. Patients with at least 2 CIED interrogations were included; baseline was defined as the first available CIED interrogation after at least 2 months from implantation. A control group

of non-amyloid patients with CIEDs was included for comparison.

Results: The study comprised 184 patients: 67 with ATTR-CM (95.5% wtATTR) and 117 non-amyloid controls. The median age was 77.5 ± 7.4 years and 80.5% were men.

Patients with ATTR-CM were more often male, with greater wall thickness and overall lower LVEF (despite similar rates of LVEF $\geq 40\%$). Patients with ATTR-CM had a significantly lower rate of atrial pacing and lower sensing, while they had a higher rate of ventricular pacing, higher ventricular impedance with a higher threshold value ($p 0.053$).

Conclusions: These preliminary data have already highlighted significant differences between the two groups at baseline and provide the basis for future analyses, especially to explore how these data changes over time along with other markers used for disease monitoring.



Parameters	All (n=184)	Cardiac Amyloidosis (n=67)	Controls (n=117)	p value
Age at first CIED check, years	77.5±7.4	78.5±6.7	76.9±7.7	0.08
Sex (male)	80.4% (148)	91.0% (61)	74.4% (87)	0.006
wtATTR	95.5% (64)	95.5% (64)	-	-
hATTR	4.5% (3)	4.5% (3)	-	-
Echocardiographic parameters				
IVSd, mm	14.3±4.2	17.6±3.6	11.7±2.4	<0.001
LVEF, %	53.1±11.5	50.4±11.2	55.2±11.2	0.002
LVEF £40%	17.6% (24)	22.0% (13)	14.3% (11)	0.24
CIEDs characteristics				
Pacemakers	76.6% (141)	59.7% (40)	86.3% (101)	<0.001
ICDs	7.1% (13)	10.4% (7)	5.1% (6)	
CRT-P	7.1% (13)	16.4% (11)	1.7% (2)	
CRT-D	9.2% (17)	13.4% (9)	6.8% (8)	
Primary CIEDs indication				
Pacemaker	83.7% (154)	76.1% (51)	88.0% (103)	0.035
SCD prevention	16.3% (30)	12% (14)	23.9% (16)	
CIEDs parameters				
RA threshold	0.50 [0.50–0.80]	0.70 [0.50–0.78]	0.50 [0.50–0.80]	0.102
RA impedance	500 [437–605]	512 [432–635]	494 [439–638]	0.99
RA pacing (%)	28 [5.0–68]	3 [0.0–18.3]	42 [8.4–70.3]	0.002
RV sensing	11.2 [7.9–15]	10 [7.5–12]	12 [8.0–16.2]	0.007
RV threshold	0.60 [0.50–0.75]	0.70 [0.50–0.80]	0.55 [0.50–0.75]	0.053
RV impedance	516 [450–618]	500 [418–583]	526 [462–645]	0.017
RV pacing (%)	76 [14–98]	91 [59–98.5]	56.5 [2.5–97.5]	0.013
Medications				
Disease-modifying therapy, any time	13.6% (25)	37.3% (25)		-

Table 1

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 105 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

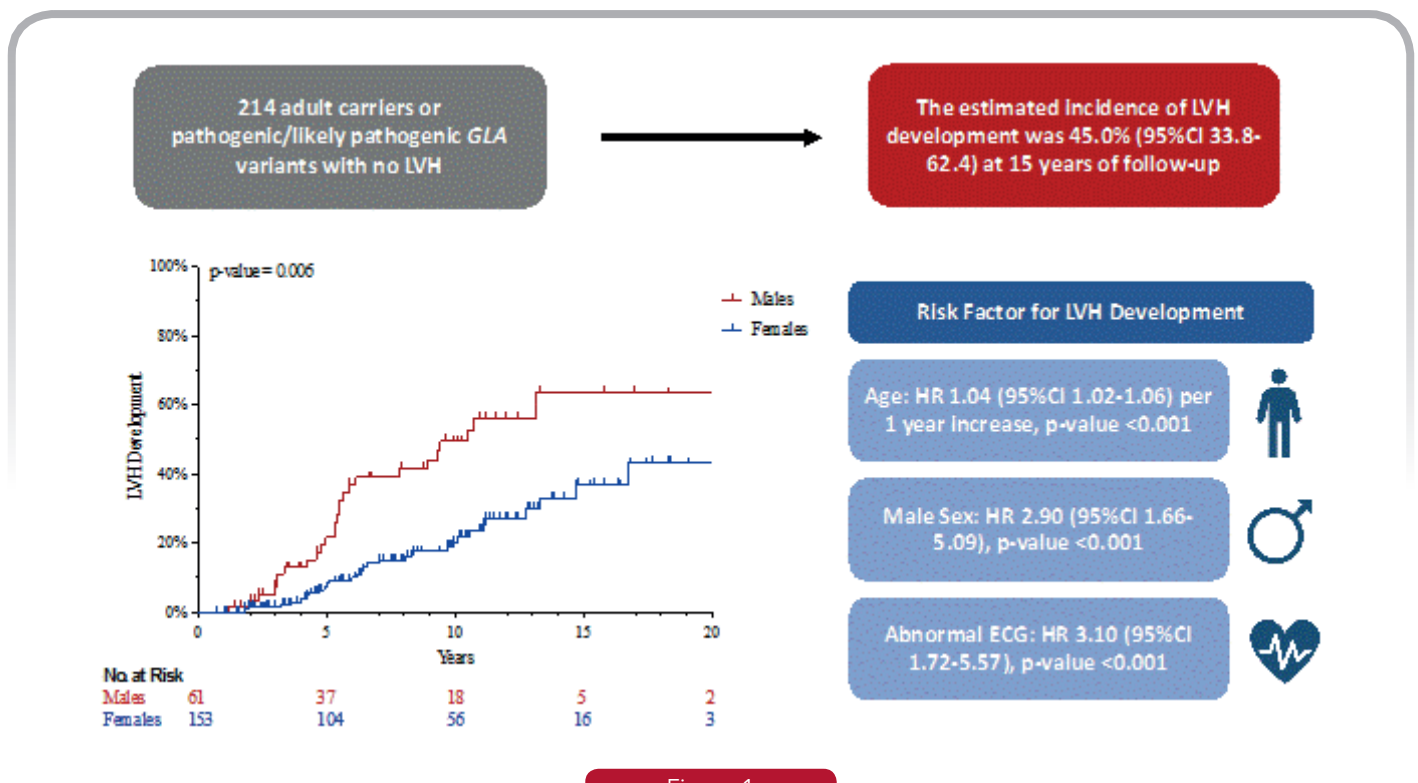
INCIDENCE AND RISK FACTORS FOR DEVELOPMENT OF LEFT VENTRICULAR HYPERTROPHY IN FABRY DISEASE

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Elaine Murphy (c), Derralyn Hughes (d), Giuseppe Limongelli (a), Perry Mark Elliott (b)

(a) INHERITED AND RARE CARDIOVASCULAR DISEASES UNIT, DEPARTMENT OF TRANSLATIONAL MEDICAL
SCIENCES, UNIVERSITY OF CAMPANIA "LUIGI VANVITELLI", MONALDI HOSPITAL, NAPLES, ITALY;
(b) INSTITUTE OF CARDIOVASCULAR SCIENCE, UNIVERSITY COLLEGE LONDON, LONDON, UK;
(c) CHARLES DENT METABOLIC UNIT, NATIONAL HOSPITAL FOR NEUROLOGY AND NEUROSURGERY,
QUEEN SQUARE, LONDON, UK; (d) LYSOSOMAL STORAGE DISORDERS UNIT, ROYAL FREE LONDON NHS
FOUNDATION TRUST, LONDON, UK

Background: Left ventricular hypertrophy (LVH) is the principal cardiac manifestation of Fabry disease (FD). This study aimed to determine the incidence and

predictors of LVH development in a contemporary cohort of patients with FD and no LVH at baseline evaluation.



Methods: Consecutively referred adult (age ≥ 16 years) patients with FD were enrolled into an observational cohort study. Patients were prospectively followed in a specialist cardiomyopathy centre and the primary endpoint was the first detection of LVH (left ventricular mass index (LVMI) ≥ 115 g/m² in men and ≥ 95 g/m² in women).

Results: From a cohort of 393 patients, 214 (age 35.8 ± 13.8 years; 61 [29%] males) had no LVH at first evaluation. During a median follow-up of 9.4 years (interquartile range [IQR] 4.7-12.7), 55 patients (24.6%) developed LVH. The estimated incidence of LVH was 11.3% (95% confidence interval [CI] 6.5-16.1) at 5 years, 29.1% (95%CI 21.5-36.7) at 10

years, and 45.0% (95%CI 33.8-62.4) at 15 years of follow-up. On multivariable analysis, independent predictors for LVH development were age (hazard ratio [HR] 1.04 [95%CI 1.02-1.06] per 1 year increase, p-value < 0.001), male sex (HR 2.90 [95%CI 1.66-5.09], p-value < 0.001), and an abnormal ECG (HR 3.10 [95%CI 1.72-5.57], p-value < 0.001). The annual rate of change in LVMI was +2.77 (IQR 1.45-4.62) g/m²/year in males and +1.38 (IQR 0.09-2.85) g/m²/year in females (p-value < 0.001).

Conclusions: Approximately one quarter of FD patients developed LVH during follow-up. Age, male sex, and ECG abnormalities were associated with a higher risk of developing LVH in patients with FD.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 496 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

INCIDENTAL NEGATIVE T WAVES FINDING

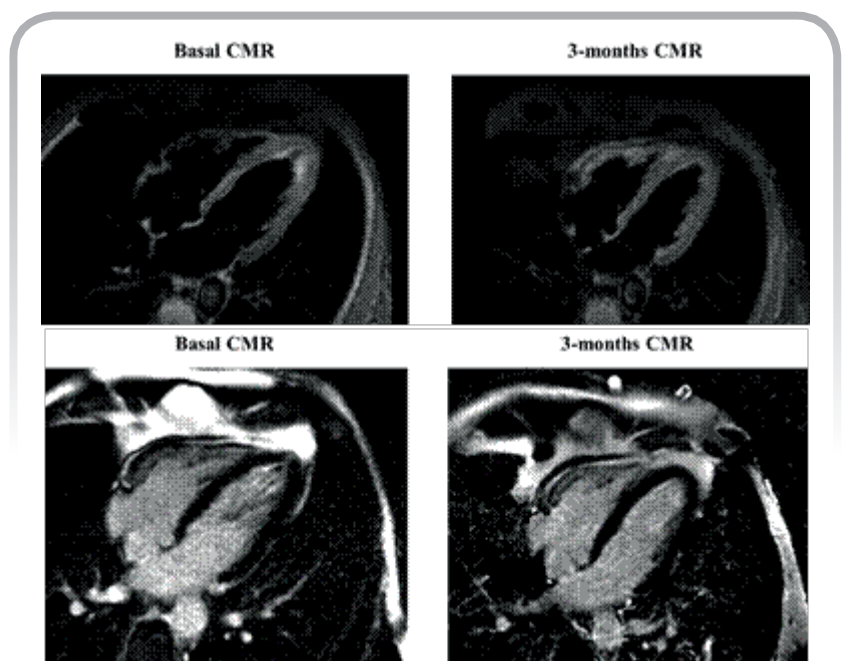
Matteo Nardin (a, b), Maria Lo Monaco (b), Rocco Mollace (b), Erika Bertella (b), Davide Cao (a, b)

(a) DEPARTMENT OF BIOMEDICAL SCIENCES, HUMANITAS UNIVERSITY, PIEVE EMANUELE, MILAN, ITALY;

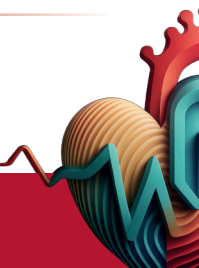
(b) DEPARTMENT OF CARDIOLOGY, HUMANITAS GAVAZZENI, BERGAMO, ITALY

A 58-year-old man was referred to our emergency center because of the incidental finding of diffuse deep negative T waves in the inferior and lateral leads on routine electrocardiogram (ECG). He had no cardiovascular risk factors with a normal body mass index. No family history of cardiovascular disease was reported. Six months early, the patient suffered gastrointestinal parasitic infection due to *Blastocystis omnis*, associated with mild peripheral eosinophilia, successfully treated with metronidazole. Upon arrival, the patient asymptomatic for chest pain, dyspnea, and palpitations with normal vital signs. High sensitivity troponin I was 109 ng/ml and brain natriuretic peptide (BNP) was 167 pg/ml. Mild peripheral eosinophilia was confirmed with an absolute count of 803 eosinophils/mm³. During the hospitalization, the echocardiogram revealed normal left ventricular volume but increased thickness at the septum, apex and posterior wall, and enhanced echogenicity at septum and apex. Left ventricular ejection fraction was 62%, without significant valvular diseases. Serial troponin assessments were inconclusive for acute or chronic myocardial injury. Cardiac magnetic resonance (CMR) showed a left ventricle with normal volume and marked apical thickness. Global left ventricular ejection fraction was preserved, despite apical hypokinesia. T2 STIR sequences showed enhanced signal at the apex.

Both T1 and T2- mapping sequences revealed increased signal at the apex. First pass myocardial perfusion sequences suggested the presence of a small left ventricle thrombus. Sub-endocardial late gadolinium enhancement of the apex was appreciated. Diagnosis of endomyocardial fibrosis (EMF) was made. We started the patient on oral anticoagulation with warfarin for the ventricular thrombosis, bisoprolol and ramipril. The patient was discharged and referred to the hematologist for the work up of the peripheral eosinophilia. Further diagnostic tests confirmed the

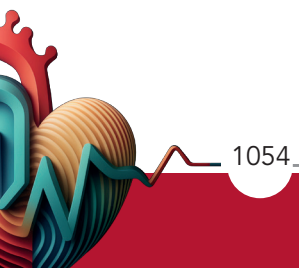


Figure



underlying diagnosis of chronic eosinophilic leukemia. Prednisone 1 mg/kg was started, leading to a rapid decrease in peripheral eosinophil count. At 3-month follow-up, our patient was still asymptomatic for heart failure and well tolerated the ongoing therapy. CMR showed significant amelioration of EMF, with

normalization of both T1- and T2-weight mapping values, and no more oedema at T2 STIR sequences. Left ventricular thrombosis was no longer present. Late gadolinium enhancement persisted only at the apical trabecular level. Oral anticoagulation was maintained until the bone marrow transplant.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 680
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
ARITMIE VENTRICOLARI (ARITMIE)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
MORTE IMPROVISA/RIANIMAZIONE (ARITMIE)
GESTIONE DELLA COMPLICANZE PM/ICD (ARITMIE)**

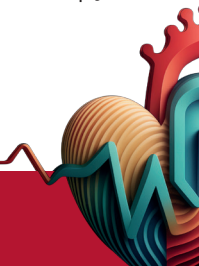
BEHIND ST-SEGMENT ELEVATION: A CHALLENGING DIAGNOSIS IN A YOUNG MAN

Filippo Novarese (a), Riccardo Molinari (b), Stefano Giovinazzo (c), Italo Porto (a, c)
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(b) DEPARTMENT OF CARDIOLOGY, SANTA CORONA HOSPITAL, PIETRA LIGURE, ITALY;
(c) CARDIOVASCULAR UNIT, IRCCS OSPEDALE POLICLINICO SAN MARTINO, GENOA, ITALY

A 47-year-old man suffered out-of-hospital cardiac arrest, witnessed by the bystanders who practiced CPR obtaining ROSC after a single automatic defibrillator DC-shock on ventricular fibrillation. Post ROSC EKG trace showed criteria for antero-lateral STEMI, the patient was conducted to the emergency room and underwent IOT intubation for respiratory failure. The man didn't have any cardiovascular risk factor and was on antiepileptic medication following the embolization of a cerebral angioma in 2008. The family reported a recurrence of an epileptic attack the previous night, coinciding with a febrile episode. Initial blood tests revealed the following values: high-sensitivity troponin I 9.000 ng/L, D-dimer 36.000 ug/L, CRP 10 mg/L, no ionic imbalances. The echocardiography showed a normally sized left ventricle with preserved systolic function with isolated akinesia of the antero-lateral wall at the medium segment. Right ventricle dimension and function resulted normal. The patient was therefore conducted to the cath lab for urgent coronary angiogram that showed no critical lesions. During the short stay in intensive care, myocardial necrosis markers lowered with a typical curve pattern, and inflammatory markers, after an initial raise, return to normal. The patient was then weaned from respiratory ventilator and transferred to the ICCU. The following hospital stay was characterized by a progressive neurologic improvement, a total myocardial kinetics

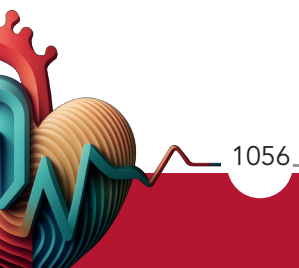
restitutio ad integrum, and a gradual resolution of the ST-segment elevation in the EKG, not showing any evolutive patterns. The baseline EKG didn't show any sign suspicious for arrhythmogenic cardiomyopathy, Brugada pattern or long QT syndrome. In consideration of the clinical presentation and the data obtained, a broad spectrum of differential diagnosis resulted plausible, the patient was therefore addressed to cardiac magnetic resonance. The MRI demonstrated an active phase myocarditis, with a diffuse patchy pattern. Considering the non-complicated clinical course and the quickly improved instrumental findings, no anti-inflammatory nor neuro-hormonal inhibition therapy was started. The patient was discharged with a wearable defibrillator with MRI follow-up in 2 months.

Discussion: Acute myocarditis continues to offer severe diagnostic challenges due to its wide range of presentations, which can mimic an ACS. The severity of the pathology ranges from an asymptomatic course in the subclinical variant to a severe left ventricular dysfunction complicated by cardiogenic shock requiring mechanical circulatory support. Presentation as cardiac arrest is reported in 2.5% of cases. Although endomyocardial biopsy (EMB) remains the gold standard diagnostic and offers advantages in terms of precise etiology and targeted therapy, it is reserved in the presence of heart failure, arrhythmias, or therapy



refractoriness. In clinical practice, the remaining cases are referred to MRI. The Lake Louise criteria give the method a 78% accuracy compared to endomyocardial biopsy. Unlike ischemic etiology, life-threatening arrhythmias during the acute phase of the disease have a high recurrence rate in myocarditis, reported at 45% at 3 years. A significant portion of these also results in post-myocarditis dilated cardiomyopathies (21% at 3

years). For these reasons, current European guidelines on prevention of SCD recommend the implantation of a defibrillator before hospital discharge with a class of recommendation IIa. In the proposed case, it was decided to protect the patient with a wearable defibrillator and postpone this decision following the resolution of the inflammation confirmed by MRI follow-up.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 893 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) BIOLOGIA MOLECOLARE CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

APPLICABILITY AND PERFORMANCE OF POLYGENIC RISK SCORES IN CARDIOMYOPATHIES: A PRELIMINARY ANALYSIS

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(a) DIPARTIMENTO CARDIOTORACOVASCOLARE ASUGI, UNIVERSITÀ DEGLI STUDI DI TRIESTE;
(b) DIPARTIMENTO DI STATISTICA, UNIVERSITÀ DEGLI STUDI DI TRIESTE; (c) IRCSS BURLO-GAROFOLO, UNIVERSITÀ DEGLI STUDI DI TRIESTE

Background: Genome-wide association studies (GWAS) have uncovered the role of common genetic polymorphisms in contributing to the genetic architecture of dilated and hypertrophic cardiomyopathies (DCM, HCM). Five polygenic risk scores (PRSs) have been proposed for DCM. One PRS has been developed for HCM. Robust evidences is lacking about their real-world performance.

Aims: To evaluate the performance of PRSs in a large cohort of DCM and HCM Italian patients.

Methods: This was a retrospective preliminary analysis enrolling DCM and HCM patients from the Familial Cardiomyopathy Registry of Trieste, who underwent Next-Generation Sequencing genetic testing and microarray analysis (Illumina platform - USA). For DCM we tested four PRSs developed from a GWAS of cardiac magnetic resonance imaging-derived left ventricular (LV) measurements in UK Biobank: body-surface-area (BSA) indexed LV end-diastolic volume PRS (LVEDVi PRS), BSA-indexed LV end-systolic volume PRS (LVESVi PRS), BSA-indexed stroke volume PRS (SVi PRS), LV ejection fraction PRS (LVEF PRS). Moreover we

tested a PRS derived from a three DCM-GWAS meta-analysis: PRS_D. For HCM we tested a PRS derived from common HCM susceptibility variants: PRS_{HCM}. PRSs were computed for the patients and compared with a local control population of unselected individuals who accessed Trieste Medical Genetics Department due to health-related concerns for their children.

Results: A total of 331 DCM patients (46±13 years, 70% male) and 104 HCM patients (44±12 years, 64% male) were enrolled. The control population was composed by 715 individuals (44±10 years, 51% male). All patients

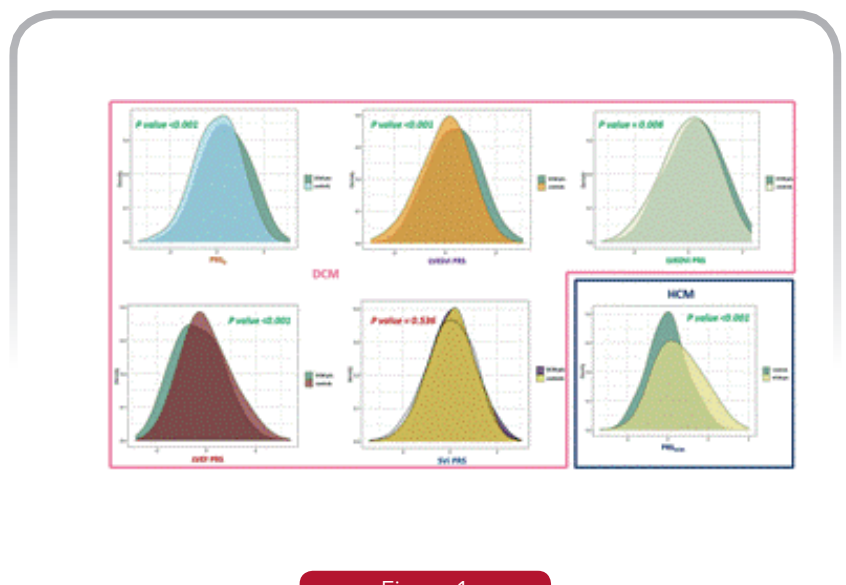
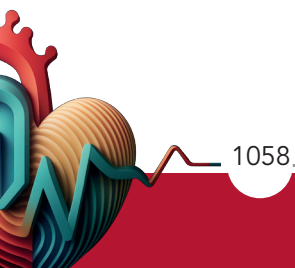


Figure 1

and controls were of European ancestry. We found a significant positive shift in PRS_D, LVESVi PRS and LVEDVi PRS distribution among DCM patients compared to general population with the score values significantly higher in the patients ($P < 0.001$ for PRS_D and LVESVi PRS, $P = 0.006$ for LVEDVi PRS). On the contrary LVEF PRS values were found to be significantly lower in DCM patients ($P < 0.001$). No difference emerged in SVi PRSs distribution between the two groups ($P = 0.536$). We found a significant positive shift in PRS_{HCM} distribution among HCM patients compared to general population

with the score values significantly higher in the patients ($P < 0.001$). No differences emerged between patients carriers or non carriers of pathogenic/likely pathogenic (P/LP) monogenic variants.

Conclusion: This is the first study investigating the performance of the previously developed PRSs in a large cohort of DCM and HCM Italian patients. Four PRSs showed a good performance in our DCM patients. The PRS developed for HCM showed a good performance in our HCM patients.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 958 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO) BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

LIVER DISORDERS IN TRANSTHYRETIN AMYLOIDOSIS WITH AND WITHOUT CARDIAC INVOLVEMENT

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(a) A.O.U. G. MARTINO, MESSINA

Background: Transthyretin amyloidosis (ATTR) is an infiltrative disease caused by the accumulation of transthyretin (TTR) in tissues. While cardiac and neurological involvement are the most common and have the greatest impact on patients' prognosis and quality of life, other manifestations of the disease are also possible. Liver damage has been largely overlooked in the study of cardiac amyloidosis (CA). However, recent small studies have shown subclinical liver damage in ATTR, bringing renewed interest to this aspect. A better characterization of liver involvement is crucial, as it may identify the liver as a new target for systemic evaluation in ATTR diagnosis, management, and monitoring of disease progression.

Purpose: The current study aimed to investigate liver damage in ATTR patients with and without cardiac involvement.

Methods: Patients with ATTR followed by an Italian referral center were prospectively recruited for a cross-sectional study. The diagnosis of ATTR was made using either invasive or non-invasive methods, and liver damage was assessed through both biochemical and instrumental evaluations. These included measurements of glutamate oxaloacetate transaminase (GOT), glutamate pyruvate transaminase (GPT), gamma-glutamyl transferase (gamma-GT), alkaline phosphatase (ALP), bile acids, total bilirubin, direct bilirubin, albumin, gamma globulins, IgM, ferritin, anti-mitochondrial antibodies, the fibrosis 4 (FIB-4) index, and liver elastography (FibroScan).

Results and discussion: In our study, 39 ATTR patients were recruited (28 wild-type ATTR, ATTRwt, and 8 variant ATTR, ATTRv). They majority were male (35/39, 90%) with a mean age of 75 ± 9 years. Among them, 33 patients had CA with 45% (16/33) having a National Amyloidosis Center (NAC) score of 2-3. Those with CA were more often male ($p=0.047$) and older compared to patients without CA ($p=0.02$). Liver elastography and FIB-4 revealed abnormal values (>7 kPa and >2.67) in 53% and 50% of patients, respectively, showing a higher prevalence in ATTR compared to the general population of similar age, where literature reports these findings in about 20-35% of cases. Although not statistically significant, there was a trend toward more impaired values in patients with CA compared to those without cardiac involvement (1.7 kPa vs 2.7 kPa and 3.1 kPa vs 5.27 kPa, $p=0.09$ and $p=0.12$, respectively). Spearman correlation showed that NT-proBNP, troponin T, and NAC score were not related to liver stiffness ($p=0.09$; $p=0.14$; $p=0.12$) or FIB-4 ($p=0.15$; $p=0.21$; $p=0.13$). No other pathological findings or significant differences between groups were observed in the hepatological parameters analyzed.

Conclusions: Liver stiffness and fibrosis are common findings in ATTR, with a higher prevalence than in the general population. This is likely secondary to a cardiohepatic syndrome rather than direct hepatic infiltration and damage, although our study was unable to show a significant difference between ATTR patients with and without CA. Further research involving larger populations is necessary to better understand this relationship.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 962 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ASPETTI GENETICI DELLE ARITMIE (ARITMIE)

THE DIAGNOSTIC VALUE OF THE 12-LEAD ECG IN ASYMPTOMATIC PATIENTS AND NON-DILATED CARDIOMYOPATHY: INSIGHT FROM CASCADE SCREENING DATA

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(a) ASST PAPA GIOVANNI XXIII - BERGAMO; (b) UNIVERSITÀ DEGLI STUDI MILANO BICOCCA

Background and Aims: ECG findings in asymptomatic patients with NDLVC have not been described. We sought to analyze the ECG characteristics of asymptomatic patients, in absence of overt clinical myocardial disease, referred to our cardiomyopathy center for cascade screening.

Methods: Asymptomatic relatives of patients affected by NDLVC were recruited during cardiological clinical evaluation for cascade screening. Enrolment was defined as the first outpatient visit; diagnostic work-up included genetic testing, 12-lead ECG, 24-hours ECG-Holter monitoring, exercise ECG testing, CPET and echocardiography. CMR imaging was considered if available or obtained within 120 days from baseline evaluation. Patients with simil-myocarditis events or arrhythmic episodes before enrolment or ventricular arrhythmias, detected with ECG-Holter monitoring or exercise ECG testing at baseline, were excluded. A complete ECG evaluation and novel ECG signs of NDLVC were evaluated.

Results: A group of 56 patients (male 41%, median age 44 years, median LVEF 53%) was identified, of whom 55% tested positive for likely pathogenic/pathogenic mutations of different genes related to NDLVC (DSG 2.4%, DSP 71%, FLMN 4.9%, JUP 4.9%, LMNA 7.3%, MYH7 9.8%).

Median QRS duration was 86ms (IQR 80-95ms), median QTc duration was 419ms (IQR 406-432ms) and 1-st degree AV block was present in 7.5%. The most frequent conduction disorder was LAFB, seen in 20% of relatives, followed by RBBB in 7.5%, whereas no patients showed LPFB or LBBB. Pathological Q waves were uncommon (2 patients/4.9%).

QRS fragmentation, low voltages and T waves inversion were respectively identified in 50%, 23%, 30% of patients. LAFB with the concordant axis deviation (28% vs 0%), low-voltage QRS in the peripheral leads (31% vs 0%) and the combination of SV1 + RV6 <12mm with RI+RII <8mm (24% vs 0%) were more frequently found in DSP-positive relatives. Of those patients with available CMR analysis (26 patients), median LVEF was 53% (IQR 47-58%) with a median LVEDi 88ml/m² (IQR 81-99 ml/m²). 19 patients/73% presented

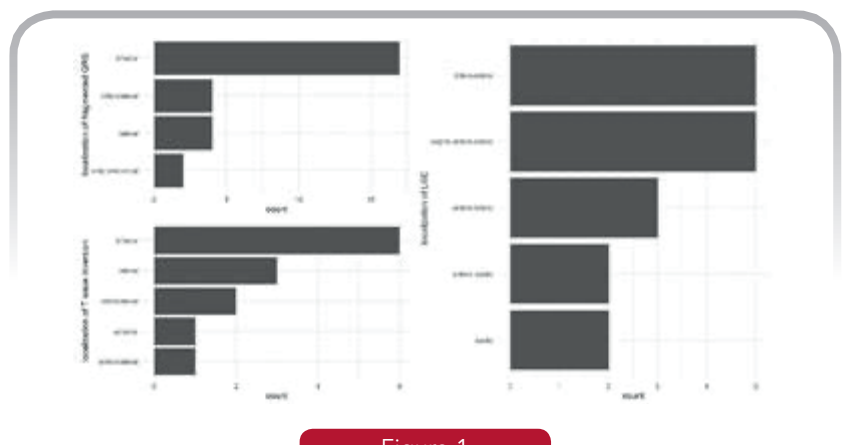


Figure 1

LGE abnormalities, whereas 7 patients/25% and 7 patients/25% respectively showed intramyocardial fat infiltration and a ringlike pattern. LGE (83% vs 44%), ringlike pattern (39% vs 0%) and intramyocardial fat (37% vs 0%) were more common in DSP-positive relatives. By comparing CMR LGE pattern and ECG abnormalities (**Figure 1**), the infero-lateral segments were the more common localization of abnormalities,

both in ECG and in CMR. Conclusion: our preliminary data suggest the important role of the 12-lead ECG in cascade screening of asymptomatic patients without signs of overt clinical disease. QRS fragmentation, low voltages and T waves inversion appear to be common findings in this subset of patients. Furthermore, our data suggest a specific pattern of ECG and CMR abnormalities in DSP-positive relatives.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 616
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
MICROCIRCOLAZIONE E COLLATERALI (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)

**AUTOMATED DETECTION OF AMYLOID BIRIFRINGENCE
BY DIGITAL PATHOLOGY IN ENDOMYOCARDIAL BIOPSIES**

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Alessandra Celi (d), Vincenzo Castiglione (a, b), Liam McDonnell (c), Giuseppe Vergaro (a, b),
Michele Emdin (a, b), Angela Pucci (d)

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(c) *FONDAZIONE PISANA PER LA SCIENZA, PISA*; (d) *AZIENDA OSPEDALIERA UNIVERSITARIA PISANA, PISA*;
(e) *OSPEDALE CAREGGI, FIRENZE*

Background: Cardiac amyloidosis (CA) is characterized by amyloid deposition in the extracellular spaces of the heart, leading to cardiac dysfunction and ultimately to a poor prognosis. Accurate manual quantification of cardiac amyloid on Congo Red (CR)-stained endomyocardial biopsies (EMBs) may be challenging as the pattern of amyloid deposition is interstitial or patchy. Automatic quantification of amyloid could help quantify tissue deposits.

Methods: We developed a digital pathology pipeline for quantification of apple-green amyloid birefringence on CR-stained EMBs. We analyzed 20 consecutive left ventricular EMBs from patients with CA (AL, n=12; ATTR, n=8) and 10 controls with cardiac hypertrophy and CA excluded. Tissue images of CR-stained sections were acquired by polarized light microscopy, together with a bright field image for calculating total sample areas. Polarized light images were converted into negative

images to obtain bright field images, then normalized and subjected to color deconvolution. Thresholding of amyloid channel allowed for the quantification of amyloid-positive pixels.

Results: Amyloid quantification showed significantly higher amyloid percentages in CA (mean 6.21%) than controls (mean 2.29%) with a 0.05 threshold. Reproducibility was tested on 6 independent acquisitions for each case (on the same section); the variation coefficient was 11.6%, showing good reproducibility.

Conclusions: We developed a digital pathology pipeline to quantify amyloid birefringence. Although diagnosis of CA must rely on pathologists' expertise, automated amyloid quantification allows a rigorous quantification of cardiac amyloid burden, which may hold prognostic significance.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 664 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

CHARACTERISTICS PREDICTING TRANSTHYRETIN CARDIAC AMYLOIDOSIS (CA) IN PATIENTS WITH SUSPECTED CA AND A MONOCLONAL PROTEIN

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(a) *SCUOLA SUPERIORE SANT'ANNA*; (b) *FONDAZIONE TOSCANA GABRIELE MONASTERIO*;
(c) *UNIVERSITÀ DI BRESCIA*

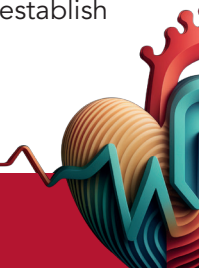
Background: Cardiac amyloidosis (CA) is emerging as an important cause of heart failure. Most causes of CA are caused by transthyretin (ATTR) or light-chain (AL) accumulation. ATTR- and AL-CA have different treatment, and AL-CA has a much more rapid progression than ATTR-CA when untreated. Differentiation between ATTR- and AL-CA in patients with a monoclonal protein requires a tissue biopsy, either in the heart or in a peripheral tissue. This has led the American College of Cardiology to recommend the search for a monoclonal protein as the first exam, followed by tissue biopsy whenever the monoclonal protein is present. Conversely, the European Society of Cardiology (ESC) recommends both the search for a monoclonal protein and scintigraphy with a bone tracer, while still recommending tissue biopsy whenever a monoclonal protein is found. We aimed to investigate the impact of scintigraphy in patients with suspected CA who have a monoclonal protein.

Methods: Forty-nine patients referred to 2 centers for suspected CA and without a history of hematological disorder (except for monoclonal gammopathy of unknown significance - MGUS) underwent tissue biopsy as part of the diagnostic workup for CA according to the ESC, with both the search for a monoclonal protein and scintigraphy.

Results: Forty-one patients (84%) underwent tissue biopsy (periumbilical fat biopsy, n=20; endomyocardial

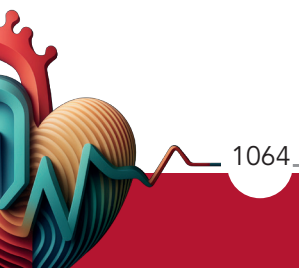
biopsy, n=30) because of a monoclonal protein (defined as positive serum and/or urine immunofixation and/or abnormal free kappa to lambda light chain ratio). The majority of these patients (n=29, 71%) were ultimately diagnosed with ATTR-CA (plus MGUS); the other patients had AL-CA. Among patients with a monoclonal protein, those with ATTR-CA had a median age of 78 years (interquartile range 75-82), with only 7 patients (24%) aged <75 years; 90% were males, 48% had a history of carpal tunnel syndrome (CTS) and 31% had bilateral CTS. Only 17% displayed a discrepancy between QRS voltages and LV mass, and 55% had apical sparing. Conversely, 90% had a Perugini grade 2-3. Compared to patients with a monoclonal protein and AL-CA, those with ATTR-CA were older (p=0.023), had a higher left ventricular mass index (p=0.005), a higher ratio between free kappa and lambda free chains (p=0.001), and a lower estimated glomerular filtration rate (p=0.022). Age \geq 75 years (p=0.010), bilateral CTS (p=0.029), and Perugini 2-3 (p<0.001) were also associated with ATTR-CA. We created a simple score including age \geq 75 years, bilateral CTS and Perugini 2-3, with 1 point for each element. A score \geq 2 had a 86% sensitivity, 100% specificity, 100% positive predictive value and 75% negative predictive value for the prediction of ATTR-CA.

Conclusions: Performing a scintigraphy together with the search for the monoclonal component allows at least to guide the final diagnosis and thus establish



the priority and the site for tissue biopsy. If the likely diagnosis is AL-CA, performing a biopsy directly in the clinically affected organ is preferable to reduce the time to diagnosis. If the likely diagnosis is ATTR-CA, one can start with a peripheral biopsy despite its limited sensitivity, as ATTR-CA is slowly progressing. In patients with suspected CA and a monoclonal protein,

the following variables may be considered: age ≥ 75 years, bilateral CTS, and Perugini score 2-3. If at least 2 of these features are present, the specificity for the diagnosis of ATTR-CA is 100%. In other words, patients suspected of CA and these characteristics are highly likely to have ATTR-CA instead of AL-CA, although histological confirmation is still deemed necessary.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 154
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
TOMOGRAFIA AD EMISSIONE DI POSITRONI (PET) (IMAGING
CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)**

**THE GREAT MIMICKER UNMASKED: A CASE REPORT OF CARDIAC SARCOIDOSIS HIDDEN
BY MYOCARDIAL INFARCTION AND COLON CANCER**

Mattia Alberti (a), Filippo Biondi (a), Valentina Barletta (a), Vincenzo Castiglione (b), Ida Rebecca Bort (a), Chiara Del Carlo (b), Antonio Tavoni (a), Chrysanthos Grigoratos (b), Giancarlo Todiere (b), Doralisa Morrone (a), Raffaele De Caterina (a), Giovanni Donato Aquaro (a)

(a) UNIVERSITÀ DI PISA; (b) FONDAZIONE TOSCANA GABRIELE MONASTERIO

Cardiac sarcoidosis is an insidious condition with a highly variable clinical presentation that often mimics other diseases. Its diagnosis is particularly challenging, requiring a high index of suspicion and a comprehensive approach. Multimodality imaging plays a critical role in differentiating it from other conditions.

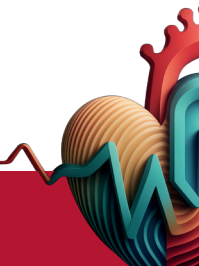
We present the case of a 44-year-old male who underwent CMR imaging to rule out arrhythmogenic cardiomyopathy due to family history.

Findings were compatible with cardiac sarcoidosis. However, the subsequent identification of severe three-vessel coronary artery disease and colon cancer provided alternative explanations for the observed

late gadolinium enhancement and lymphadenopathy, respectively, complicating the diagnostic process.

This case report illustrates the risk of oversimplifying complex clinical scenarios by attributing signs and symptoms to a single disease, particularly in young, otherwise apparently healthy individuals. In such cases, clinicians must include rare diseases in their differential diagnosis.

Treatment of such cases is not easier than diagnosis. While PET is a powerful diagnostic tool, CMR imaging uniquely offers essential prognostic capabilities and drives a therapeutic approach: it's the extensive fibrosis detected by LGE imaging that drives the arrhythmic risk, prompting consideration for an ICD.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 474
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)**

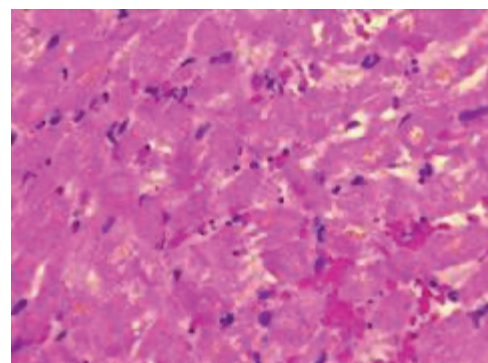
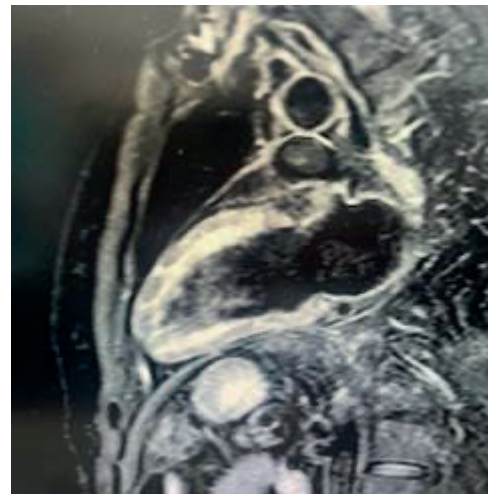
**SEVERE EOSINOPHILIC MYOCARDITIS IN A PATIENT WITH NASAL POLYPOSIS ON DUPILUMAB THERAPY:
A CASE REPORT AND REVIEW OF MULTIDISCIPLINARY MANAGEMENT STRATEGIES**

Antonia Ascrizzi (a), Fabio Valente (a), Rita Gravino (a), Carla Contaldi (a), Daniele Masarone (a)
(a) HEART FAILURE UNIT, DEPARTMENT OF CARDIOLOGY, AORN DEI COLLI-MONALDI HOSPITAL

Introduction: Eosinophilic myocarditis (EM) is a rare but potentially life-threatening disease characterised by the infiltration of eosinophils into the myocardium, leading to myocardial damage and heart failure. It can be associated with several underlying conditions, including granulomatosis with polyangiitis and certain medications. Dupilumab, a monoclonal antibody targeting the interleukin-4 and interleukin-13 pathways, is commonly used to treat eosinophilic diseases such as nasal polyposis and asthma. This case report examines the development of severe eosinophilic myocarditis in a patient undergoing dupilumab therapy and highlights the importance of recognising potential cardiovascular complications associated with this treatment.

Case presentation: A 55-year-old man with a history of nasal polyposis treated with dupilumab presented with sudden onset of severe chest pain. He had elevated cardiac biomarkers, including a troponin level of 5100 pg/mL and a B-type natriuretic peptide (BNP) level of 11949 pg/mL. Initial laboratory tests also showed significant eosinophilia and elevated inflammatory markers. Imaging studies, including transthoracic echocardiography and cardiac MRI, showed myocardial damage consistent with eosinophilic myocarditis. Coronary angiography excluded obstructive coronary artery disease. An endomyocardial biopsy confirmed the diagnosis of eosinophilic myocarditis, showing extensive areas of necrotizing myocarditis with a significant presence of degranulated eosinophils. The

patient was treated with high-dose corticosteroids and advised to discontinue dupilumab. He responded



Figure

well to treatment with resolution of symptoms and normalisation of cardiac biomarkers and eosinophil count.

Discussion: This case highlights the potential cardiovascular risks associated with dupilumab therapy in patients with eosinophilic disorders. Eosinophilic myocarditis can present with non-specific symptoms, making early diagnosis challenging but critical in preventing serious outcomes. The patient's presentation, combined with elevated cardiac biomarkers and imaging findings, highlighted the need

for a comprehensive diagnostic approach, including histopathological confirmation. Management of EM requires prompt initiation of high-dose corticosteroids and may include additional immunosuppressive therapies. Clinicians should maintain a high index of suspicion for EM in patients receiving monoclonal antibody treatment, and a multidisciplinary approach is essential for effective management. This case highlights the importance of regular surveillance and early intervention to reduce the risks associated with eosinophilic myocarditis in patients treated with dupilumab.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 228
MORTE IMPROVVISA/RIANIMAZIONE (ARITMIE)
ARITMIE VENTRICOLARI (ARITMIE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)

SUDDEN CARDIAC DEATH IN THE YOUNG: EMILIA-ROMAGNA REGIONAL NETWORK

Claudio Bergami (a), Serena Serratore (c), Maddalena Graziosi (a), Chiara Baldovini (b), Antonietta D'errico (b), Paolo Fais (g), Raffaello Ditaranto (a, d), Ornella Leone (b), Cesare Rossi (f), Vanda Parisi (a, d), Elena Biagini (a, e)

(a) CARDIOLOGY UNIT, IRCCS AZIENDA OSPEDALIERO-UNIVERSITARIA DI BOLOGNA, BOLOGNA, ITALY; (b) DEPARTMENT OF PATHOLOGY, CARDIOVASCULAR AND CARDIAC TRANSPLANT PATHOLOGY UNIT, IRCCS AZIENDA OSPEDALIERO-UNIVERSITARIA DI BOLOGNA, BOLOGNA, ITALY; (c) ISTITUTO DI CARDIOLOGIA, DIPARTIMENTO DI SCIENZE MEDICHE E CHIRURGICHE, UNIVERSITÀ DEGLI STUDI "MAGNA GRAECIA", CATANZARO, ITALY; (d) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCE (DIMEC), UNIVERSITY OF BOLOGNA, BOLOGNA, ITALY; (e) EUROPEAN REFERENCE NETWORK FOR RARE AND LOW PREVALENCE COMPLEX DISEASES OF THE HEART (ERN-GUARDHEART); (f) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCE, GENETICS SECTION, UNIVERSITY OF BOLOGNA, BOLOGNA, ITALY; (g) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCE (DIMEC), LEGAL MEDICINE SECTION, UNIVERSITY OF BOLOGNA, BOLOGNA, ITALY

Background: In 2018, the multidisciplinary network for the study of sudden cardiac death (SCD) in the Emilia-Romagna region was established. The network provides a defined pathway for the study of SCD in young people and involves a tight collaboration among cardiologists, cardiovascular pathologists, forensic doctors, and geneticists. Main objectives of the network are to define the causes of SCD and to track relatives of the victims implementing preventive measures when appropriate.

Aim: The study aim was to describe the results of the first 5 years of activity of the network.

Methods: All intercepted cases of SCD in individuals aged 1 to 55 years were included. Autopsies were executed according to European Guidelines, with hearts sent to a referral center for the specialized examination in case of negative result of the general autopsy. Further investigations, such as genetic, toxicological, and microbiological tests, were employed based on death circumstances and pathology findings. The cause of death was determined by the multidisciplinary team through a deep integration of the various data collected, including results of the family screening and past

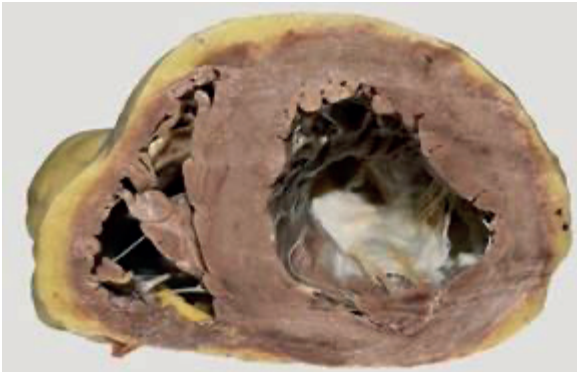
medical data where available. For hereditary diseases or otherwise unexplained deaths, clinical and instrumental screening of relatives was systematically offered.

Results: During the first five years of the network activity, 97 cases were included (mean age 38 ± 12.5 years, 75% male). A certain or highly probable diagnosis was achieved in 74 out of the 86 cases analyzed (86%). The most frequently identified causes of death were coronary artery disease (23 cases, 27%), cardiomyopathies (18 cases, 21%), myocarditis (9 cases, 10%), drug intoxication (7 cases, 8%) and channelopathies (3 cases, 3%). In 12 individuals (14%), neither autopsy nor subsequent genetic and laboratory investigations detected any possible cause of death. Family screening of probands led to the evaluation of 63 relatives from 19 families. Six relatives were found to be phenotypically affected by the same disease of probands. A defibrillator was implanted in 3 subjects for the primary prevention of SCD.

Conclusions: The recently established network for the study of SCD in the Emilia-Romagna region collected 97 cases of SCD in the first 5 years of activity. A certain

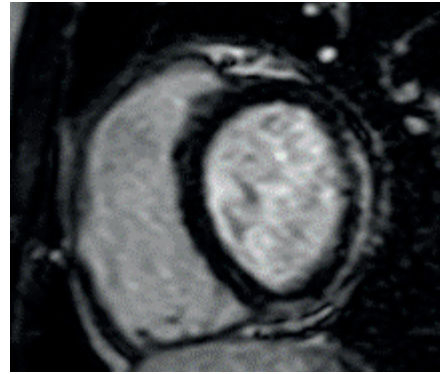
or highly probable diagnosis was achieved in 86% of examined cases. 63 relatives were evaluated and in 3 of them a defibrillator was implanted.

The results obtained over these initial five years represent a solid foundation for further expanding and improving this project in the forthcoming years.



Gross section of the heart of a SCD victim. Arrhythmogenic cardiomyopathy.

Figure 1



MRI of a relative of the victim whose heart is shown in Fig. 2.

Figure 2



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 46

MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

CARDIOTOSSICITÀ DA FARMACI (CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)

SINCOPE (ARITMIE)

DIAGNOSI, PREVENZIONE E TRATTAMENTO DELLA CARDIOTOSSICITÀ (CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)

LA MIOCARDITE DA PEMBROLIZUMAB: UN'ASSOCIAZIONE RARA E POTENZIALMENTE LETALE?

Pasquale Campana (a), Luigi Chianese (a), Veronica Amato (a), Vittoria Errigo (a), Vincenza Abbate (a), Elpidio Pezzella (a)

(a) PRESIDIO OSPEDALIERO PINETA GRANDE, CASTELVOLTURNO, ITALIA

Introduzione: Il Pembrolizumab è un anticorpo monoclonale che agisce come immunomodulatore, inibendo la proteina PD-1 che è coinvolta nei meccanismi di elusione del sistema immunitario. La sua attività promuove la regressione tumorale principalmente nel melanoma avanzato, ma anche in neoplasie quali carcinoma polmonare, carcinomi uroteliali e carcinoma mammario. In questo caso clinico, descriviamo una paziente con melanoma in terapia con Pembrolizumab che ha sviluppato blocco atrioventricolare di terzo grado (BAV III°) e miocardite acuta dopo la prima somministrazione.

Caso clinico: Una paziente di 72 anni accedeva in pronto soccorso per astenia e sincope non traumatica, negando fattori di rischio cardiovascolare. In anamnesi, evidenza di melanoma in stadio III sottoposto ad escissione chirurgica ed a successiva terapia con Pembrolizumab, circa 30 giorni prima dell'accesso in PS. L'ECG di ingresso evidenziava BAV III° condotto alla FC 30 bpm, scarsamente responsivo a terapia infusiva con Isoprenalina, per cui veniva sottoposta ad impianto di pacemaker temporaneo. Gli esami ematochimici evidenziavano

valori indosabili di troponina sierica e CK-MB, associati ad evidenza ecocardiografica di riduzione della cinesi globale del ventricolo sinistro (frazione d'eiezione 40%) con ipo-acinesia della parete inferiore e postero-laterale. La coronarografia mostrava arterie coronarie epicardiche esenti da lesioni significative, mentre la Risonanza Magnetica Cardiaca risultava suggestiva per miocardite acuta. Successivamente, un pacemaker definito veniva impiantato per persistenza del BAV III°. Pertanto, iniziava terapia infusiva con glucocorticoidi con rapido miglioramento del quadro clinico e successivo lento wash-out enzimatico.

Conclusioni: Il Pembrolizumab rappresenta un farmaco antitumorale di frequente utilizzo soprattutto nei melanomi avanzati e la sua cardiotoxicità è già stata precedentemente descritta. Pertanto, uno stretto monitoraggio ECG, ecocardiografico e degli enzimi cardiaci dovrebbe essere eseguito in tutti i pazienti sottoposti a terapia con Pembrolizumab per permettere un precoce riconoscimento degli eventi avversi fatali quali il BAV III° e la miocardite acuta. Futuri studi sono necessari per comprendere i meccanismi fisiopatologici relativi alla cardiotoxicità indotta da Pembrolizumab.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 336
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

**A RARE CASE OF TAKOTSUBO SYNDROME TRIGGERED BY PHYSICAL STRESSOR
IN A POSTMENOPAUSAL WOMAN**

Fabiana Malci (a), Edoardo Cecchini (a), Sara Sposini Ghezzi (a), Lorenzo Gerardi (a), Gaetano Chiricolo (a),
Giuseppe Massimo Sangiorgi (a), Cinzia Razzini (a), Enrica Mariano (a)
(a) POLICLINICO TOR VERGATA, VIALE OXFORD 81 ROMA

Takotsubo syndrome is a reversible acute ventricle dysfunction, usually linked to physical or emotional stressors. TTS diagnosis is often challenging because its clinical phenotype may closely resemble AMI regarding ECG abnormalities and biomarkers. Although it is generally considered a benign condition, hemodynamic and electrical instability during the acute phase may expose patient to serious adverse in-hospital events. Currently, coronary angiography with left ventriculography is considered the gold standard diagnostic tool. New international diagnostic criteria (InterTAK) have been developed to improve TTs identification and stratification. Interestingly male patients are more often triggered by physical stressor, while in women emotional trigger is more frequently observed. A 65-year-old female, former smoker, presented to emergency department after experiencing chest pain, diaphoresis and heart palpitation during mountain hike. At the admission ECG showed ST-segment elevation in the infero-lateral leads (QTc 441 msec) with blood raise of myocardial enzymes (Tnl hs 6011.80 ng/L). Transthoracic echocardiography showed mild decrease of global systolic function with mid-apical akinesia and hyperkinesia of basal segments (EF 40%). Urgent coronary angiography documented no coronary tight stenosis while ventriculography showed mid-apical segments akinesia and basal segments hyperkinesis. The subsequent clinical course was free of complications and major arrhythmic events. The patient was discharged at 4th after optimization of medical therapy with introduction of

Bisoprolol and Atorvastatin. At discharge, transthoracic and ECG showed T waves inversion in anterolateral leads (QTc 475 msec). Cardiac magnetic resonance (MRI) is very useful in the subacute phase to allow quantification of heart function and characterization of myocardial tissue while MIBG tomoscintigraphy and PET are used for perfusion and H/M ratio assessment. During the subacute phase I-MIBG documented extensive deficit of tracer fixation at apex, suggesting severely reduced adrenergic innervation, while MRI showed no frank areas of focal myocardial edema without sign of LGE, allowing distinction with acute myocarditis. On the other hand, TTS represents almost 2% of patients presenting with suspected ACS and in 90% of cases it occurs in postmenopausal women. TTS pathophysiology is still incompletely understood, but there is considerable evidence that sympathetic storm is crucial. In primary TTS (more frequent in women) heart dysfunction is the primary sign and the trigger is often emotional while in secondary one, a physical trigger associated with common acute illnesses (chronic obstructive pulmonary disease, subarachnoid haemorrhage,, thyrotoxicosis etc) or iatrogenic (surgery, dobutamine echocardiography and drug administration) is present. Patel et al. suggested that young females (<50 years of age) more often had a physical than emotional trigger factor compared to elderly females (≥50 years of age). Therefore, according to the literature, this case report documented an atypical condition of TTS, since our patient was in post-menopausal age (65 years old) and the trigger



was properly physical. Actually, therapeutic strategy guidelines are based on clinical experience and expert consensus (evidence level C). During the acute phase, beta-blockers seem to be reasonable until full recovery of LVEF such as ACEi or ARB while no clear benefit on

survival is showed for beta-blockers. To conclude, TTS represents an extremely heterogeneous pathological picture, for which adopting a tailored strategy for each individual, may impact on prognosis and recurrences prevention.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 356
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ARITMIE VENTRICOLARI (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
SINCOPE (ARITMIE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)

DISPLASIA ARITMOGENA DEL VENTRICOLO DESTRO: DAL SINTOMO AL TRATTAMENTO

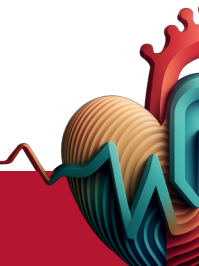
David Mecali (a, b), Marco Dell'uomo (a, b), Giovanni Carreras (a, b), Stefano Donzelli (a, b), Giulia Ceccotti (a, b), Marco Giuranna (a, b), Marco Mengoni (a, b), Alessandro Mostarda (a, b), Vincenzo Pace (a, b), Caterina Scapicchi (a, b), Andrea Scarpignato (a, b), Erberto Carluccio (a), Giuseppe Ambrosio (a, b)
(a) UNIVERSITÀ DEGLI STUDI DI PERUGIA; (b) AZIENDA OSPEDALIERA SANTA MARIA DI TERNI

Introduzione: La cardiomiopatia aritmogena del ventricolo destro (CAVD) è una malattia genetica del muscolocardiaco che colpisce principalmente il ventricolo destro e predispone all'insorgenza di aritmie ventricolari e morte improvvisa. Studi di genetica molecolare hanno dimostrato che la displasia aritmogena è una malattia dei desmosomi ed è causata da un difetto genetico delle proteine desmosomiali che determinano una progressiva perdita di miocardio con sostituzione fibroadiposa con conseguente alterazione della conduzione elettrica intramiocardica da disomogeneità tissutale e frammentazione del fronte d'onda di attivazione ventricolare; questo substrato anatomico predispone all'insorgenza di aritmie ventricolari da macro-rientro con morfologia del QRS tipo blocco di branca sinistra. La malattia si presenta in forma familiare in circa la metà dei casi. Nella variante fenotipica "classica" la malattia interessa prevalentemente il VD, mentre il ventricolo sinistro è coinvolto nelle fasi avanzate. Studi di correlazione genotipo-fenotipo hanno identificato delle varianti fenotipiche caratterizzate invece da un precoce coinvolgimento del VS.

Caso clinico: Paziente donna di 34 anni giunge al PS per episodi recidivanti di tipo pre-sincopale negli ultimi mesi e due episodi sincopali nella giornata antecedente al ricovero, preceduti da cardiopalmo e dispnea. La mattina del ricovero durante test ergometrico episodio

di tachicardia ventricolare sostenuta con pre-sincope con morfologia a blocco di branca sinistro e asse inferiore (Fig.). In anamnesi: A novembre 2013 SEF ed ablazione TC- RF di tachicardia atriale da microrientro a livello dell'ostio coronarico; recente Holter-ECG con evidenza di extrasistolia ventricolare molto frequente spesso in ritmo bigemino, in coppie e triplete. TD: Bisoprololo 2,5 mg 1/2 cp ore 8 (sospeso in previsione di test ergometrico). All'ECG ritmo sinusale, battiti ectopici ventricolari isolati; l'ecocardiogramma risultava nella norma; veniva eseguita una RMN cardiaca con riscontro di irregolarità del profilo parietale in sistole (bulging) della parete libera del ventricolo destro. In relazione ai dati clinici e strumentali si decideva di eseguire impianto di defibrillatore sottocutaneo (S-ICD) in prevenzione secondaria e la paziente veniva indirizzata presso il centro di riferimento regionale di Genetica Medica per eseguire l'analisi genetica (risultati tutt'ora in corso).

Discussione: In riferimento ai criteri diagnostici di cardiomiopatia aritmogena del ventricolo destro (Task Force internazionale, 2010) la nostra paziente presentava due criteri minori: tachicardia ventricolare sostenuta ad asse inferiore (QRS positivo in aVF) e un'area della parete libera del ventricolo destro con contrazione dissincrona in RMN, definendo una displasia aritmogena del ventricolo destro "possibile", in attesa dell'esito



genetico. In considerazione dell'evento sincopale si decideva comunque per impianto di s-ICD.

Conclusioni: La cardiomiopatia aritmogena del ventricolo destro presenta una notevole eterogeneità nelle manifestazioni cliniche, ma anche una notevole variabilità fenotipica. In futuro, una maggiore comprensione del background genetico sarà cruciale per una migliore stratificazione del rischio e per strategie terapeutiche più specifiche per questi pazienti.

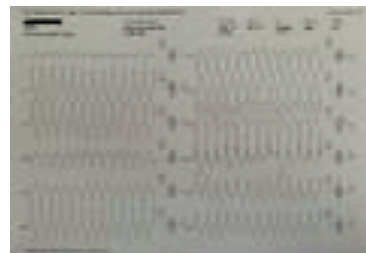


Figure 1

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 810 ELETTROCARDIOGRAFIA/CARDIOVERSIONE/DEFIBRILLAZIONE (ARITMIE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

CLUSTERING IN DILATED CARDIOMYOPATHY AT INITIAL EVALUATION: AN EFFECTIVE TOOL FOR CLINICAL STRATIFICATION

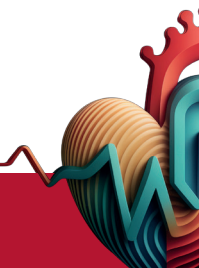
Ilaria Gandin (a), Perotto Maria (b), Alessia Paldino (b), Giovanni Bai (c), Denise Zaffalon (d), Andrea Pezzato (b), Cinzia Crescenzi (e), Fabiana Romeo (e), Annamaria Martino (e), Francesca Fanisio (e), Federica Toto (e), Maddalena Rossi (b), Marta Gigli (e), Matteo Dal Ferro (b), Leonardo Calò (e), Gianfranco Sinagra (b), Marco Merlo (b)
(a) *BIostatistics Unit, Department of Medicine, Surgery and Health Sciences, University of Trieste*; (b) *Cardiovascular Department, Azienda Sanitaria Giuliano-Isontina, University of Trieste. Member of ERN Guard Heart*; (c) *Department of Mathematics, Informatics and Geosciences, University of Trieste*; (d) *Cardiology Department, Azienda Unità Locale Socio-Sanitaria N 2 Marca Trevigiana, Montebelluna*; (e) *Division of Cardiology, Policlinico Casilino, Rome*

Background and aims: Dilated cardiomyopathy (DCM) has a highly variable presentation and disease course. Current stratification strategies are complex and require multimodality evaluation. Using machine learning (ML) on a large set of data obtained at first cardiological evaluation, this study aims to identify specific DCM subgroups.

Methods: In a retrospective cohort of DCM patients, baseline clinical, genetic, and outcome data were collected. Unsupervised clustering was performed and then simplified to identify patient subgroups. The subgroups were characterized in terms of all-cause mortality/heart transplantation/left ventricle assist device, sudden cardiac death/major ventricular arrhythmias (SCD/MVA) and heart failure related death/heart transplantation/left ventricular assist device implantation. These findings were then validated in an external population.

Results: In the derivation cohort of 409 patients (71% males, mean age 46 ± 14), two cluster-subgroups were identified: CL1 (82%) and CL2 (18%), differentiated mainly upon ECG characteristics. A simplified clustering using only three variables (QRS duration, presence of left bundle branch block, intrinsicoid deflection >50 ms) was equally effective and validated in the external cohort of 160 patients (68% males, mean age 54 ± 13). A lower risk for SCD/MVA events was observed for CL2 in the primary cohort (HR=0.29, 95% CI [0.13, 0.67]) and in the validation cohort ($p=0.017$).

Conclusions: Using ML, baseline ECG variables emerged as useful to identify two DCM subgroups that differ in terms of disease progression and arrhythmic stratification. This could serve as an effective tool for improving risk stratification of DCM patients upon their initial evaluation.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 835
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)**

MASSIVE INTRAVENTRICULAR THROMBOSIS IN NON-ISCHEMIC CARDIOMYOPATHY

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(a) AZIENDA SANITARIA UNIVERSITARIA GIULIANO ISONTINA, DIPARTIMENTO CARDIO-TORACO-VASCOLARE, TRIESTE, ITALIA; (b) AZIENDA SANITARIA FRIULI OCCIDENTALE, S.C. CARDIOLOGIA, PORDENONE, ITALIA

Case report: A 55-year-old man with no prior cardiac or family history was admitted for a first episode of heart failure, presenting with moderate left ventricular dilation, eccentric remodeling, and severe systolic dysfunction (LVEF 28%), along with mild right ventricular dysfunction and no significant valvular disease. The EKG showed sinus tachycardia, and diffuse T wave inversion. Coronary angiography revealed non-critical stenosis in the anterior descending artery. Due to hemodynamic instability, was treated with Levosimendan and optimized heart failure therapy, leading to clinical improvement. Tests for autoimmune, infectious, and thrombophilic diseases were negative. However, a follow-up echocardiogram 5 days later revealed persistent biventricular dysfunction and a large, mobile apical thrombus (42×27 mm) with a small stalk. The patient underwent urgent apical thrombectomy. Histopathology of intraoperative biopsy revealed severe mycotic degeneration and extensive interstitial and especially subendocardial fibrosis, suggestive of cardiomyopathy.

Discussion: In 20% of cases, left ventricular thrombosis is related to non-ischemic cardiomyopathy, with 8% linked to dilated cardiomyopathy. While Virchow's triad outlines thrombosis risk factors, few studies have explored those specific to NICM. In our patient, we hypothesize that endomyocardial dysfunction or injury, evidenced by extensive endocardial fibrosis, and blood stasis due to severe left ventricular dysfunction and dilation, contributed to the thrombus formation. The absence of significant functional mitral regurgitation,

which typically prevents thrombus formation by enhancing blood flow, is notable. A recent study proposed a risk stratification model incorporating laboratory markers such as D-dimer, WBC count, hs-CRP, hematocrit, and NT-proBNP, as indicators of myocardial inflammation and damage. This model



Figure

estimated a 10% risk of thrombus development in our patient. The study highlighted the interdependence of thrombosis and inflammation, particularly in the context of immunothrombosis, found in this study to be

independently associated with thrombotic formation. Nonetheless, cardiovascular intimal injury remains the primary cause of thrombosis, and these factors may be just hallmarks of such injury.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 211
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE/IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

LEFT ATRIAL STRAIN CORRELATION WITH CONGESTION AND FUNCTIONAL CAPACITY AND ADDITIONAL PROGNOSTIC VALUE OF SPECKLE TRACKING PARAMETERS IN CARDIAC AMYLOIDOSIS

Maria Concetta Pastore (a), Marta Focardi (a), Federica Marrese (a), Elisa Giacomini (a), Mariangela Vigna (a), Gian Luca Ragazzoni (a), Francesca Susini (a), Giulia Elena Mandoli (a), Luna Cavigli (a), Alessandro Gozzetti (a), Flavio D'ascenzi (a), Matteo Cameli (a)
 (a) DEPARTMENT OF MEDICAL BIOTECHNOLOGIES, DIVISION OF CARDIOLOGY, UNIVERSITY OF SIENA, SIENA, ITALY

Background: Cardiac amyloidosis (CA) is mainly characterized by diastolic dysfunction, with gradually worsening functional capacity and quality of life (QoL) and poor prognosis. Six-minute walking test (6MWT) and Kansas City Cardiomyopathy Questionnaire (KCCQ) are two validated methods to assess functional capacity in HF. Left atrial (LA) strain by speckle tracking echocardiography (STE) has shown to be an index of diastolic function and HF symptoms. However, its association with congestion and functional capacity in CA has not yet been investigated. The aim of this study was to evaluate the relationship of LA strain with biomarkers, 6MWT and KCCQ in CA and the potential prognostic value of speckle tracking variables in CA.

Methods: We enrolled consecutive patients with CA during routine follow-up visits including clinical and echocardiographic evaluation. On the same day, 6MWT was performed and KCCQ was administered. STE was performed offline. The primary endpoint was the correlation between global PALS and NTproBNP, 6MWT score and KCCQ. As secondary endpoint, a combination of all-cause or cardiovascular death and HF hospitalization was registered.

Results: Overall, 75 patients with CA (74±11 years, 48 ATTR, 27 AL) were enrolled. Mean LV ejection fraction was preserved (55±9%) and LV global longitudinal strain was reduced (GLS = -14 ± 5%), 56 with apical

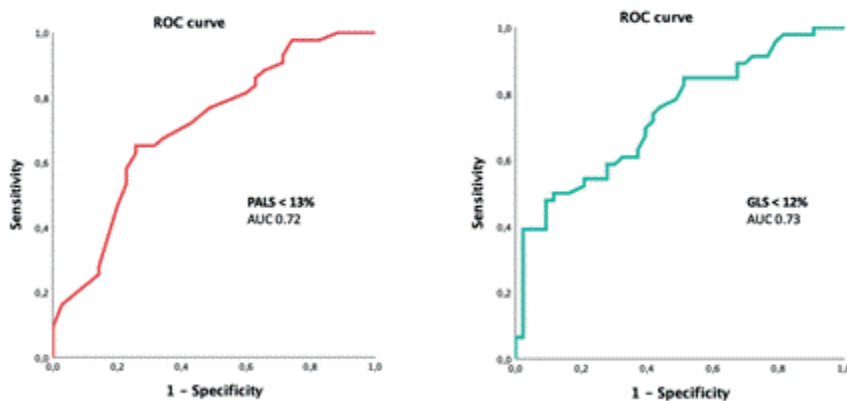


Figure 1

sparing pattern. Median global peak atrial longitudinal strain (PALS) was reduced (median[IQR]=14 [6.5;23.5]), mean 6MWT score was 347 ± 107 and mean KCCQ score was 67 ± 24 . Global PALS showed a significant direct correlation with N-terminal pro brain natriuretic peptide (NTproBNP, $P=0.3$, $p=0.017$), 6MWT ($P=0.4$, $R^2=0.2$, $p\text{-value}=0.004$), but no significant correlation with KCCQ ($P=-0.13$, $p=0.3$). GLS showed a significant direct correlation with N-terminal pro brain natriuretic peptide (NTproBNP, $P=0.3$, $p=0.017$) but not with 6MWT and/or KCCQ. Over a mean follow up of 12 ± 3 months, 42 patients reached the combined endpoint (39 HF hospitalization, 3 deaths of which 2 for cardiovascular causes). With ROC curves, both global PALS <13.5% and GLS >-12% provided a good

prediction of the combined endpoint (AUC 0.72 [0.6-0.82] and 0.73 [0.63-0.83] respectively, $p<0.0001$), higher than LAVI, TAPSE, LV EF, E/E', free wall right ventricular strain, NTproBNP (AUC 0.67, 0.62, 0.54, 0.65, 0.62, 0.63 respectively).

Conclusions: Our results show that global PALS is associated with congestion and functional capacity in CA (both AL and ATTR), suggesting its role as a more objective marker of disease severity in CA. The lack of association with KCCQ may suggest the need of more objective indices to assess QoL in patients with CA. Moreover, in light of these findings, we suggest the use of speckle tracking parameters to enhance prognostic stratification in CA.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 326
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

CORRELATION BETWEEN NAC AND COLUMBIA SCORES AND SPECKLE TRACKING ECHOCARDIOGRAPHY: TOWARDS BETTER PHENOTYPING OF CARDIAC AMYLOIDOSIS

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 (a) DEPARTMENT OF MEDICAL BIOTECHNOLOGIES, DIVISION OF CARDIOLOGY, UNIVERSITY OF SIENA, SIENA, ITALY

Introduction: The National Amyloidosis Centre (NAC) Classification and the Columbia Classification are used to categorize the severity and progression of cardiac amyloidosis (CA). Recent studies have indicated that myocardial involvement initially occurs at the atrial level, preceding the manifestation of standard echocardiographic alterations. Understanding how the currently approved clinical classifications correlate with more objective and sensitive parameters, such as speckle tracking echocardiography (STE), which showed to provide early markers of diagnosis and disease severity, may be pivotal to better define CA burden at its onset. The aim of our study was to assess the correlation between NAC and Columbia classifications and other parameters for amyloidotic burden estimation, with a particular focus on STE, in patients with CA.

Methods: Patients with CA (both ATTR and AL) referred to our reference center for CA were enrolled. Each patient was classified according to both NAC and Columbia systems by collecting clinical history, blood test results, and details of home diuretic therapy administered at the time of the visit. At the same time, patients underwent echocardiographic evaluation including speckle tracking analysis and six-minute walking test (6MWT). Then, the clinical classifications NAC and Columbia

were correlated with various parameters using Pearson’s correlation coefficient (P).

Results: Overall, 96 patients affected by CA was included (58 patients with ATTR-CA and 38 patients with AL-CA). The average age of was 77 ± 9 years. The NAC classification system shows a positive correlation with the NYHA class (NAC-NYHA, $r^2=0.281$, $p \leq 0.005$; Columbia-NYHA, $r^2=0.648$, $p \leq 0.001$), indicating a worsening of the perceived symptoms (NYHA) by patients with increasing NAC class. Both the NAC and Columbia classification systems show a positive correlation with left ventricular global longitudinal strain (GLS) (NAC-GLS, $P=0.3$, $p \leq 0.005$; Columbia-GLS, $r^2=0.4$, $p \leq 0.001$, Fig.1), indicating an effective deterioration of GLS which increases at the worsening of NAC and Columbia classes. Both systems also show a negative correlation with left ventricular ejection fraction (LVEF; NAC-LVEF, $P=-0.368$, $p \leq 0.001$; Columbia-LVEF,

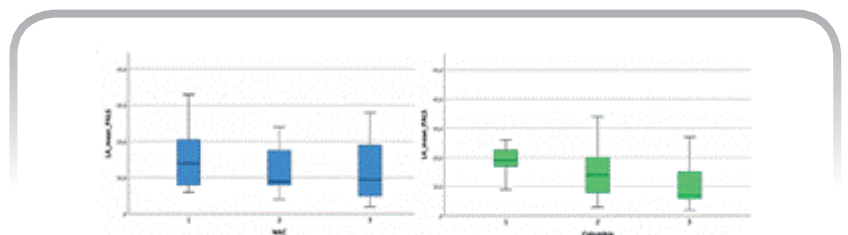
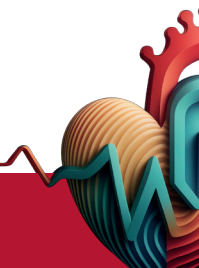


Figure 1

$P=-0.379$, $p\leq 0.001$) and peak atrial longitudinal strain (PALS; NAC-PALS, $P= -0.255$, $p\leq 0.005$; Columbia-PALS, $P= -0.398$, $p\leq 0.001$), demonstrating a reduction in LVEF and atrial strain with the increasing of NAC and Columbia system. Additionally, the Columbia system shows an inverse correlation with the 6MWT score ($P = -0.5$, $p\leq 0.001$) and a positive correlation with the presence of B-lines on chest ultrasound ($P=0.4$, $p\leq 0.05$).

Conclusion: NAC and Columbia classifications show significant correlations with echocardiographic indices and markers of functional capacity and congestion. An integration between NAC and Columbia values with left atrial and ventricular strain and 6MWT may be used to enhance CA phenotyping in order to personalize and monitor the specific therapy over time.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 855
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PROGNOSI (SCOMPENSO CARDIACO)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)**

**REDEFINING TREATMENT TARGETS IN HEREDITARY ATTR AMYLOIDOSIS
WITH CARDIOMYOPATHY AND POLYNEUROPATHY IN THE ERA OF DISEASE-MODIFYING TREATMENTS**

Aldostefano Porcari (a, b), Yousuf Razvi (b), Adam Ioannou (b), Simone Longhi (c), Beatrice Musumeci (d), Giacomo Tini (d), Matteo Serenelli (e), Francesco Cappelli (f), Carlo Fumagalli (f), Aviva Petrie (b), Gianfranco Sinagra (a), Ana Martinez-naharro (b), Philip N Hawkins (b), Julian D Gillmore (b), Marianna Fontana (b) (a) CENTRE FOR DIAGNOSIS AND TREATMENT OF CARDIOMYOPATHIES, CARDIOVASCULAR DEPARTMENT, ASUGI AND UNIVERSITY OF TRIESTE; (b) NATIONAL AMYLOIDOSIS CENTRE, DIVISION OF MEDICINE, UNIVERSITY COLLEGE LONDON; (c) CARDIOLOGY UNIT, IRCCS AZIENDA OSPEDALIERO-UNIVERSITARIA DI BOLOGNA; (d) DEPARTMENT OF CLINICAL AND MOLECULAR MEDICINE, SAPIENZA UNIVERSITY OF ROME; (e) CARDIOLOGIC CENTRE, UNIVERSITY OF FERRARA; (f) CARDIOMYOPATHY UNIT, CAREGGI UNIVERSITY HOSPITAL, UNIVERSITY OF FLORENCE

Background: The heterogeneity of patients with hereditary transthyretin amyloidosis presenting with cardiomyopathy and polyneuropathy (ATTRv-mixed) has posed challenges in designing large-scale studies. We characterised clinical phenotypes and prognosis, and assessed the prescription patterns, dosages, and discontinuation rates of heart failure (HF) medications in ATTRv-mixed.

Methods: Consecutive patients diagnosed with ATTRv-mixed at the National Amyloidosis Centre (NAC) and four Italian centres (2012-2023) were included. Severity of polyneuropathy was defined according to the polyneuropathy disability score (PND): I, preserved walking capacity; II, impaired walking capacity with no need for walking aids; IIIa, need for a stick or a crutch for walking; IIIb, 2 sticks or crutches required for walking; IV, wheelchair- or bed-bound. All patients received disease-modifying therapy. The primary outcome was all-cause mortality.

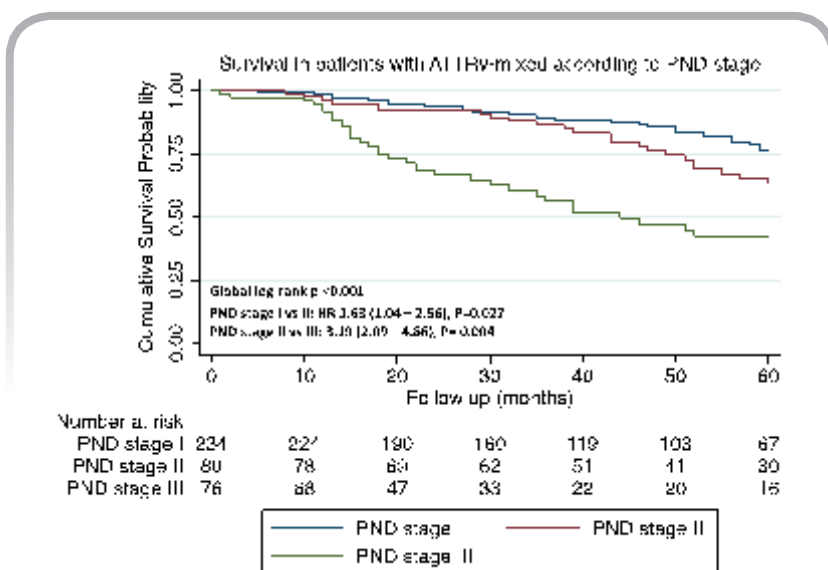
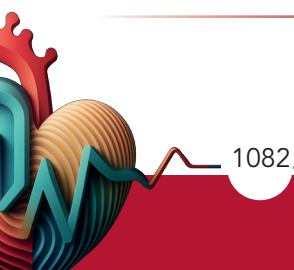


Figure 1

Results: The study comprised 390 patients with ATTRv-mixed (66.6±10.8 years, 64.1% men) associated to a pathogenic TTR variant: 141 (36.1%) p.T80A, 62 (15.9%) p.V50M, 40 (10.2%) p.I88L, and 147 (37.7%) other TTR gene variants. They had different severity of polyneuropathy: PND I 60% (n=234), PND II 20.5% (n=80), and PND III-IV 19.5% (n=76). Prescription of HF medications was greater among patients with more advanced cardiac disease and less severe neuropathy, comprising beta-blockers in 36.4% (n=142), renin-angiotensin-aldosterone



system inhibitors in 31.5% (n=123), mineralocorticoid receptor antagonists in 20.0% (n=78) of cases. Over 54 months (30-83), 1120 patients died. On multivariable analysis, PND stage was independently associated with overall survival, with higher PND stages being associated with increasing mortality rates (HR 1.66 [1.05-2.65] for PND II, $p=0.032$; HR 3.46 [2.21-5.40] for PND III, $p<0.001$).

Conclusions: ATTRv-mixed encompasses a heterogeneous spectrum of phenotypes and disease severity. HF medications are not widely prescribed in ATTRv-mixed. PND stage is independently associated with all-cause mortality. In the absence of large-scale studies, these data may inform clinicians regarding the impact of neuropathy as key target of treatment in ATTRv-mixed.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 309 RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) IMAGING MULTI-MODALE/IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

IMAGING ECOCARDIOGRAFICO AVANZATO NELLA VALUTAZIONE DEI PAZIENTI CON AMILOIDOSI CARDIACA: CONFRONTO TRA PARAMETRI DI RISONANZA MAGNETICA CARDIACA E STRAIN

Gian Luca Ragazzoni (a), Maria Concetta Pastore (a), Francesca Susini (a), Sara Rosi (a),
Elisa Giacomini (a), Giulia Elena Mandoli (a), Luna Cavigli (a), Flavio D'ascenzi (a), Matteo Cameli (a),
Benedetta Banchi (b), Marta Focardi (a)

(a) DIPARTIMENTO DI BIOTECNOLOGIE MEDICHE, DIVISIONE DI CARDIOLOGIA, UNIVERSITÀ DEGLI STUDI
DI SIENA; (b) UOC DIAGNOSTICA PER IMMAGINI, AOU SENESE

Background: Le amiloidosi cardiache sono un gruppo eterogeneo di malattie caratterizzate dalla deposizione extracellulare di sostanza amiloide. Le due forme più comuni di amiloidosi sono: l'amiloidosi AL, e la forma aTTR. Dal punto di vista diagnostico l'ecocardiografia è un importante metodica di studio, risulta utile nella diagnosi di coinvolgimento cardiaco in quanto è in grado di evidenziare un aumento degli spessori parietali e un pattern diastolico di tipo restrittivo. L'ecocardiografia avanzata mediante analisi speckle tracking (STE) consente di individuare alterazioni precoci della funzione sistolica anche con FE conservata, inoltre ci consente di evidenziare il caratteristico pattern di "apical sparing". La RMC è un esame di secondo livello che viene eseguito nei pazienti con sospetto di amiloidosi cardiaca consentendo di valutare la presenza di LGE e quindi di sostanza amiloide e la sua distribuzione.

Obiettivo: Lo scopo di questo studio è di valutare la correlazione tra i valori di strain e i dati di localizzazione ed estensione del LGE nei soggetti con amiloidosi cardiaca.

Metodi: Sono stati analizzati pazienti riferiti al nostro centro che presentavano un coinvolgimento cardiaco e sono stati sottoposti a visita cardiologica, ECG, ecocardiografia standard, avanzata e RMC. Valori di strain per ogni singolo segmento $\geq -13\%$ sono stati

considerati patologici in luce del consensus del 2021 dell'ESC sulla diagnosi dell'amiloidosi cardiaca. È stata successivamente confrontata la concordanza tra GLS patologico e la presenza di LGE in quel segmento. Lo strain longitudinale ventricolare e atriale sinistro è stato inoltre correlato con l'estensione dell' LGE alla RMC.

Risultati: Il GLS medio dei pazienti è $-14 \pm 4\%$. Il pattern caratteristico di apical sparing è presente nel 65% dei pazienti presi in esame. La presenza di uno strain considerato patologico corrispondeva alla presenza di LGE in quel segmento nel 60% dei casi. Inoltre è stata osservata una correlazione inversa tra il PALS e il numero di segmenti interessati dall'LGE alla risonanza ($R -0,60954502$, $p < 0,01$).

Conclusioni: L'utilizzo dell'ecocardiografia avanzata con analisi dello strain sia ventricolare che atriale consente di valutare in maniera più accurata la funzione cardiaca; nel gruppo di pazienti con amiloidosi inoltre correla in maniera statisticamente significativa con la quantità di LGE e può pertanto essere un valido strumento per stimare l'entità dell'infiltrazione. Questo studio ha anche mostrato risultati promettenti nell'utilizzo dello strain ventricolare per identificare la localizzazione dell'infiltrazione. Sono comunque necessari studi con una coorte più ampia per validare definitivamente questa correlazione.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 572
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)
ELETTROSTIMOLAZIONE (ARITMIE)

ATRIOVENTRICULAR BLOCK AND HYPERTROPHIC HEART: TWO SIDES OF THE SAME COIN

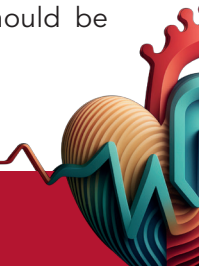
Simona Samperi (a, b), Francesco Starnazzi (a, b), Giampaolo Tocci (b), Marina Mustilli (b),
Priscilla Fina (b), Antonino Granatelli (b), Silvio Romano (a)
(a) UNIVERSITÀ DEGLI STUDI DELL'AQUILA; (b) OSPEDALE SANDRO PERTINI

Introduction: Cardiomyopathies with hypertrophic phenotype are defined as the presence of increased ventricular wall thickness or mass, that is not explained by abnormal loading conditions. Left ventricular hypertrophy (LVH) is often a diagnostic challenge, because it can be related with different diseases. Early diagnosis is essential, as the early introduction of therapy can change the prognosis of the disease.

Case report: A 69-years-old man coming from the Emergency Department for marked bradycardia. At blood tests hs-troponin was 0.11 ng/ml [<0.034 ng/ml], NTproBNP 3025 pg/ml [<125 pg/ml]. The electrocardiogram showed an atrial fibrillation and a complete atrioventricular block. The transthoracic echocardiography (TTE) confirmed severe concentric LVH with normal systolic function and reduced global longitudinal strain, in the absence of outflow obstructions, filling pressures was increased, mitral leaflets and aortic cusps were thickened and the right ventricle was hypertrophic. Given the persistence of symptomatic brady-arrhythmia despite Isoprenaline, the patient underwent a pacemaker implant. The cardiac magnetic resonance (CMR) was not performed due to the recent implant. Complete blood chemistry panel has been sent to identify the etiology of the cardiomyopathy. Results showed a reduced activity of beta-galactosidase A with increased levels of Lyso-

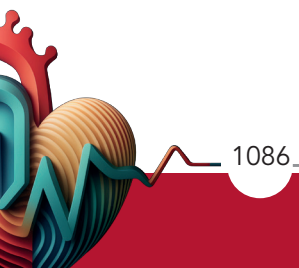
Gb3. The suspected diagnosis was Anderson-Fabry Disease (AFD). A genetic test revealed a cardiac variant of AFD, caused by a mutation on the GLA gene with an amino acid substitution (p.N215S). The reconstruction of patient's genealogical tree allowed the early identification of relatives affected by AFD. All relatives with a definite diagnosis started a targeted therapy with enzyme replacement or pharmacological chaperone treatment.

Discussion: AFD is a recessive X-linked disease related to a deficiency or absence of the alpha-galactosidase A (α -Gal A), an enzyme involved in lipid metabolism. This mutation causes cell dysfunction and activates cellular hypertrophy pathways. It is a multisystem disorder affecting particularly the heart, kidney, and brain. The degree of residual enzymatic activity determines a complex of pathological phenotypes, varying in terms of time of onset and severity of symptoms. The 'non-classical' Anderson-Fabry phenotype or later-onset phenotype has an incomplete systemic involvement with several level of residual enzyme activity, and in most cases manifesting as isolated cardiac involvement. In this case, diagnosis has often a delay of approximately 15 years. In cardiomyopathies with hypertrophic phenotype an early etiological diagnosis is necessary, combined Red Flags with diagnostic imaging and laboratory datas. The specific treatment should be



started as soon as possible. Therapy can stabilize the disease, but organ damage is not reversible. In consideration of the limited efficacy of therapy in advanced cases, an early start appears to be essential.

A family screening using genetic tests is necessary to identify affected subjects. Patients with AFD require a clinical monitoring to assess disease progression, through a multidisciplinary approach.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 302 ARITMIE VENTRICOLARI (ARITMIE) SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

UN CURIOSO CASO DI SHOCK CARDIOGENO, TRA STORM ARITMICO E FIBRILL...E

Valeria Setti (a), Federica Colio (a), Giacomo Bonacchi (a), Francesco Cappelli (a),
Iacopo Olivotto (a, b), Pasquale Bernardo (a), Flavia Caniato (a), Cecilia Agostini (a)

(a) AZIENDA OSPEDALIERA UNIVERSITARIA CAREGGI; (b) AZIENDA OSPEDALIERA UNIVERSITARIA MEYER

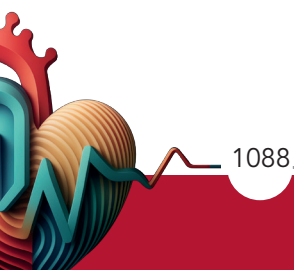
Donna di 65 anni in buono stato di salute, in anamnesi pregresso ricovero per dolore retrosternale a coronarie indenni, FE preservata ed alterazioni ECG grafiche aspecifiche. In considerazione dei reperti di CMR compatibili con esiti ischemici, LGE subendocardico a livello apicale, T1 mapping aumentato a livello di setto e parete inferiore e T2 aumentato in sede apicale, veniva dimessa con diagnosi di MINOCA. La paziente accedeva al DEAS a Gennaio 2024 per ACR sul territorio sottoposto a DC shock con ROSC immediato. Primo riscontro di severa disfunzione (FE 15%) e BBSn non presente nei tracciati precedenti, in concomitante quadro di severa insufficienza renale acuta. Veniva pertanto ricoverata in UTIC in shock cardiogeno con supporto aminico ad alto dosaggio, emodialultrafiltrazione e supporto ventilatorio non invasivo. Una volta esclusa l'eziopatogenesi ischemica mediante coronarografia, i sospetti diagnostici si sono indirizzati verso la miocardite e una malattia sistemica immuno-mediata. Venivano eseguite indagini laboratoristiche e strumentali che escludevano ragionevolmente la diagnosi di miocardite (ematochimici e BEM negativi) e di sarcoidosi cardiaca (18-FDG-PET ed ACE negativi, chitotriosidasi debolmente positiva, in assenza di reperti extracardiaci all'imaging). A causa di un peggioramento degli scambi respiratori veniva eseguita una TC torace-addome con rilievo di diffuse aree di rarefazione ossea ed in sospetto di MM veniva inviato pannello specifico. Le indagini di laboratorio evidenziavano catene κ e λ libere aumentate con componente monoclonale IgG κ e IgG λ con IgD λ di minor entità, rapporto κ/λ alterato e positività della protenuria di BJ. Veniva eseguita una BOM,

che risultava negativa ed escludeva l'iniziale diagnosi di mieloma e successivamente sottoposta ad una BEM, nel sospetto di Light Chain Deposition Disease, associata all'accumulo di catene leggere libere che non formano depositi di amiloide, ma creano accumuli granulari negativi alla colorazione Rosso Congo che coinvolgono reni, fegato e cuore con verosimile danno da tossicità diretta della catena circolante, ma anche tale indagine risultava negativa. Durante il ricovero la paziente presentava una graduale instabilità sul piano aritmico, con TVNS senza polso subentranti a regressione spontanea. Veniva pertanto potenziata la terapia antiaritmica ev fino alla comparsa di una TV degenerata in FV sottoposta ad MCE e DC shock e successivo storm aritmico caratterizzato dall'insorgenza di 7 TV con severo impatto emodinamico sottoposte a DC-shock con ROSC. Gli eventi aritmici sono stati risolti con posizionamento di PMK temporaneo da giugulare destra con overdrive efficace e successivo impianto di PMK definitivo bicamerale. Una volta stabilizzata la paziente, a completamento diagnostico è stata sottoposta a biopsia renale con rilievo di quadro diagnostico per amiloidosi a catene leggere con depositi perivascolari ed interstiziali. Questo caso clinico vuole sottolineare come la diagnosi di AL-CA si presenti spesso dopo iter diagnostico molto impegnativo, soprattutto nelle fasi iniziali di malattia. L'AL-CA presenta inoltre un rischio aritmico marcato in termini di burden ventricolare ed eventi aritmici fatali; la recente letteratura sottolinea questo aspetto, la cui gestione terapeutica e di previsione del rischio necessita di ulteriori evidenze. L'elevato burden ventricolare contraddistingue nettamente il



decorso dell'AL-CA rispetto all'amiloidosi cardiaca da transtiretina (ATTR-CA). Risultano promettenti i recenti risultati della scintigrafia con ¹⁸F-Florbetapir

(specifica per AL-CA) nella quantificazione del precoce coinvolgimento miocardico e nella predizione del grado di disfunzione ed il rischio di MACE.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 325 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ARITMIE VENTRICOLARI (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE)

CARDIAC COMPLICATIONS FOLLOWING HYDROCARBON EXPOSURE: A CASE REPORT

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UNIVERSITÀ DEGLI STUDI DI PADOVA*

Case presentation: A 47-years-old male patient, with diabetes mellitus and no preexisting diseases, presented to the emergency department after falling into a bitumen tank. The first presentation was a chemical pneumonitis with high concentration of aromatic hydrocarbons in urine sample. He then developed electrical instability with non-sustained ventricular tachycardias and one episode of ventricular fibrillation terminated by a single DC shock. ECG revealed diffuse ST elevation and troponin I increased to 1600 ng/L. Echocardiography showed severe biventricular dysfunction (EF 15%). Antiarrhythmic therapy with amiodarone and lidocaine was started. Progressive hemodynamic compromise required inotropic support with dobutamine. Owing to the persistence of ventricular arrhythmia the patient was treated with percutaneous stellate ganglion block, which was effective only for few hours. The arrhythmic burden was then progressively reduced with interruption of dobutamine. Coronary angiography showed no stenosis. Cardiac MRI was suggestive of acute myocarditis, it revealed myocardial edema and subepicardial patchy late gadolinium enhancement. Endomyocardial biopsy confirmed acute lymphocytic myocarditis and molecular analysis revealed positive B19V transcriptional activity with significant viral load (>500 copies/ug). As results of endomyocardial biopsy immunosuppressive therapy was not started. After two weeks echocardiography showed partial improvement of left ventricular function (EF 35%). Heart failure treatment was started and the patient was discharged with wearable cardioverter defibrillator.

Discussion: Aromatic hydrocarbons are recognized for their cardiotoxic effects, which include disruption

of myocardial ion channels and increased sensitivity to catecholamines, predisposing individuals to arrhythmias and exerting negative inotropic effects. The clinical course of our patient was marked by initial respiratory compromise due to chemical pneumonitis, followed by the development of severe cardiac manifestations, including life-threatening arrhythmias and significant myocardial dysfunction. The management involved antiarrhythmic drugs and inotropic support. In addition, percutaneous stellate ganglion block was fundamental in reducing ventricular tachycardias for several hours, highlighting its critical role in managing refractory catecholamines sensitive arrhythmias. The decision to discontinue dobutamine, despite initial concerns about hemodynamic compromise, was also critical in reducing the arrhythmic burden, stabilizing the patient's rhythm and improving overall hemodynamic status. The cardiac MRI findings and endomyocardial biopsy results confirmed the diagnosis of acute lymphocytic myocarditis. The presence of significant B19V viral load was unexpected but guided the decision against high dose corticosteroids therapy, reflecting the necessity of thorough diagnostic evaluation before commencing immunosuppressive treatment.

Conclusion: Aromatic hydrocarbons can precipitate severe cardiotoxic events, including acute myocarditis and significant arrhythmias. This case highlights the importance of carefully balancing inotropic support and arrhythmia management as well as considering the timing of corticosteroid therapy which must be delayed until biopsy results are available.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 716 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO) CARDIOTOSSICITÀ DA FARMACI (CARDIO-ONCOLOGIA E CARDIO-TOSSICITÀ)

CASO CLINICO DI MIOCARDITE LUPICA AD ESORDIO FULMINANTE NONOSTANTE TERAPIA MEDICA

Eugenio Trovarelli (a), Anna Mengoni (a), Cinzia Zuchi (a), Rosanna Lauciello (a), Giuliana Bardelli (a),
Sandra D'addario (a), Erberto Carluccio (a), Giuseppe Ambrosio (a)

(a) CARDIOLOGIA E FISIOPATOLOGIA CARDIOVASCOLARE, OSPEDALE SANTA MARIA DELLA MISERICORDIA,
UNIVERSITÀ DI PERUGIA, ITALIA

Caso clinico: Una donna, di 49 anni, ipertesa, giungeva alla nostra attenzione per nausea, vomito e febbre. Agli esami ematochimici: anemia normocromica, normocitica e leucopenia in assenza di alterazioni della formula leucocitaria. L'esame obiettivo e la RX del torace risultavano nella norma, all'ECG presenza di tachicardia sinusale (fig. 1) ed all'ecocardiogramma normale funzione biventricolare, in assenza di valvulopatie o versamento pericardico. Durante la degenza si è assistito alla comparsa di un eritema maculo-papuloso, non pruriginoso, diffusosi dal volto a tutto il corpo, associato ad ulcere aftoidi del cavo orale. Agli esami ematochimici peggioramento dell'anemia normocromica normocitica. Nell'ipotesi di un'etiopatogenesi autoimmune sono stati ricercati anticorpi anti-nucleo ed anti-cardiolipina entrambi risultati positivi, così come il test di Coombs, associati ad ipocomplementemia e proteinuria, che hanno avvalorato l'ipotesi diagnostica di Lupus Eritematoso

Sistemico (positivi 6 su 11 criteri dell'Associazione Americana di Reumatologia). È stata dunque iniziata terapia con steroide, immunoglobuline e ciclofosfamide (dose totale 750 mg), ma dopo 10 giorni la paziente ha sviluppato un quadro di edema polmonare acuto con comparsa di severa disfunzione ventricolare sinistra (FE 25%), insufficienza mitralica funzionale di grado moderato e successivamente anche compromissione della funzione sistolica ventricolare destra. Nelle ore successive, nonostante il supporto con inotropi, la situazione clinica peggiorava sino ad un quadro di shock cardiogeno. Dopo TC torace che ha escluso embolia polmonare ed una coronarografia che non ha evidenziato lesioni coronariche significative (fig. 2), è stata posta diagnosi di miocardite acuta. Si procedeva quindi a supporto inotropo e meccanico al circolo con successiva stabilizzazione emodinamica. Dopo alcune settimane la paziente è stata dimessa in compenso emodinamico e con normalizzazione della funzione biventricolare.

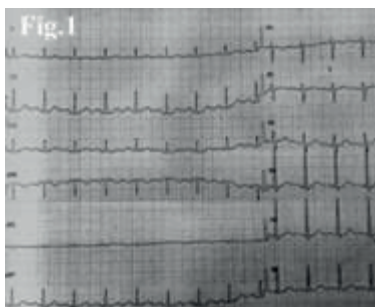


Figure 1



Figure 2

Discussione: Il caso è inoltre interessante poiché ha posto il dubbio sull'eziologia della miocardite. Infatti sia l'ipotesi di miocardite lupica che la somministrazione di ciclofosfamide avrebbero potuto spiegare il quadro clinico e il rapido deterioramento della funzione ventricolare. Tuttavia l'ipotesi della tossicità da ciclofosfamide è stata considerata poco probabile poiché generalmente si manifesta a dosaggi più alti di quello utilizzato (più di 270 mg/kg per 1-4

giorni o alla dose di almeno 1.55 g/mq) e spesso in presenza di una preesistente disfunzione ventricolare sinistra.

Conclusione: Questo caso riporta una rara manifestazione di Lupus Eritematoso Sistemico ed evidenza come la miocardite lupica, benché rara, possa manifestarsi anche come miocardite fulminante, nonostante la terapia farmacologica adeguata.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 602 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

MIOCARDITE ACUTA: OLTRE L'INDAGINE BIOPTICA ENDOMIOCARDICA

Samuela Zella (a), Lorenzo Carlo Broglia (a), Giuseppe Candileri (a), Lorenzo Di Filippo (a), Italo Porto (a)
(a) UNIVERSITÀ DEGLI STUDI DI GENOVA

Una donna di 55 anni accedeva presso la nostra degenza per scompenso cardiaco a frazione di eiezione ridotta di nuovo riscontro. In anamnesi presentava una diagnosi di asma allergico in terapia inalatoria con broncodilatatore e montelukast. In anamnesi patologica prossima, una settimana prima del ricovero, accedeva in Pronto Soccorso per addominalgia per cui avviava terapia antinfiammatoria, antispastica e antibiotica con ceftriaxone. In seguito a persistente astenia, nelle giornate successive eseguiva visita cardiologica con riscontro elettrocardiografico (ECG) di bassi voltaggi e segni di sovraccarico del ventricolo sinistro e riscontro ecocardiografico di frazione di eiezione del ventricolo sinistro (FEVS) ridotta (15%) per cui veniva posta indicazione a ricovero presso l'unità di terapia intensiva cardiologica del nostro ospedale, dove veniva confermato il quadro clinico. Agli esami ematochimici riscontro di leucocitosi eosinofila (valore assoluto $15,6 \times 10^9/L$, eosinofili 38%), incremento troponinico (TnIHS 4192), NT proBNP 23318. Nel sospetto di miocardite eosinofila acuta, eseguiva risonanza magnetica con riscontro di edema e flogosi del miocardio e diffuso late gadolinium enhancement (LGE) a morfologia "patchy" multifocale a carico del setto interventricolare, della parete inferobasale e dei segmenti distali. Il reperto imaging supportava il sospetto clinico, per cui cominciava terapia con metilprednisolone 40 mg/die. Ai fini della diagnosi eziologica veniva impostato un approccio multidisciplinare con i colleghi ematologi, immunologi ed infettivologi e pertanto venivano eseguite indagini di natura laboratoristica e radiologica che risultavano negative, con il solo riscontro di positività per le immunoglobuline G per coxsachievirus ed echovirus. Durante il ricovero si procedeva a

progressivo decalage dello steroide con concomitante riduzione degli enzimi di miocardiocitocitosi e degli indici di flogosi. All'ecocardiografia di controllo veniva riscontrato lieve miglioramento della FEVS (25%). Alla dimissione veniva confermata l'indicazione terapeutica al corticosteroide fino a nuova rivalutazione cardiologica ed ematologica. Dati gli elementi in nostro possesso, il team multidisciplinare poneva diagnosi di ipereosinofilia idiopatica, pur rimanendo incerta la possibilità di miocardite ad eziologia para-/post-infettiva; veniva invece esclusa l'ipotesi allergica farmaco-indotta. In conclusione, nonostante la BEM costituisca il gold standard per la diagnosi e la tipizzazione istopatologica della malattia infiammatoria del miocardio, solo l'8% dei pazienti con sospetto diagnostico di miocardite viene sottoposto a tale procedura, in virtù dell'invasività del metodo e delle complicanze relate. Nel presente caso, l'approccio multidisciplinare è risultato vincente nel corretto inquadramento diagnostico. Per la paziente è stato programmato uno stretto follow-up di cui avremo resoconto nei prossimi mesi.

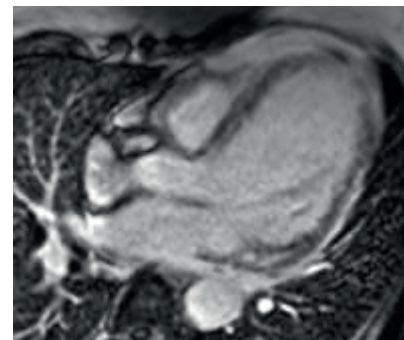


Figure 1

**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 72
ARITMIE VENTRICOLARI (ARITMIE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
MIOCARDITI & COVID 19 (COVID-19)**

PANCREATITIS-ASSOCIATED MYOCARDITIS: SYSTEMATIC REVIEW AND META-ANALYSIS OF A DEADLY DUO

Mattia Alberti (a), Alessandro Marcucci (a), Filippo Biondi (a), Lorenzo Faggioni (a), Dania Cioni (a),
Raffaele De Caterina (a), Emanuele Neri (a), Giovanni Donato Aquaro (a)
(a) UNIVERSITÀ DI PISA

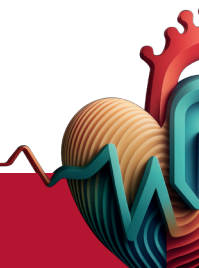
Background: Myocardial injury is a recognized complication of acute pancreatitis, whereas myocarditis has only been occasionally reported and has not been systematically evaluated.

Methods: We systematically reviewed PubMed literature published up to January 2024 for studies including both "myocarditis" and "pancreatitis" as keywords. Relevant data regarding patient characteristics and outcomes were collected and analyzed.

Results: Thirty-one patients were included. The etiology of pancreatitis was viral in 52%, bacterial in 20%, toxic in 16%, autoimmune in 9%, and idiopathic in 3%. 23% of patients were immunocompromised. Median high sensitivity-cardiac troponin T was 342 (IQR 73-890) ng/L and N-terminus-pro-brain natriuretic peptide was 11053 pg/mL (IQR 1397-26150). The average left ventricular ejection fraction was 33±13%. Fulminant myocarditis, presenting with cardiogenic shock and/or

malignant ventricular occurred in 48% of patients, more frequently in men than in women ($p=0.026$). Severe myocarditis occurred in 42% of edematous and 60% of necrotizing pancreatitis ($p=0.56$). No association was found between the severity of myocarditis and plasma levels of amylase ($p=0.98$) and lipase ($p=0.83$). The relative frequency of severe myocarditis was 80% in pancreatitis due to Leptospirosis, and 40% in pancreatitis due to viral infections. The mortality rate was 22%: 13% died during hospitalization and 9% after.

Conclusions: Myocarditis is a potentially lethal complication of pancreatitis and is more frequently associated with viral etiology in immunocompromised individuals. Based on such findings, cardiac troponin measurements and an electrocardiogram are advisable to exclude myocardial involvement in selected patients. Confirmatory diagnosis and prognostic assessments should be based on cardiac magnetic resonance imaging.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 796
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
BIOLOGIA MOLECOLARE CARDIOVASCOLARE (GENETICA E BIOLOGIA
MOLECOLARE)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)**

**CARDIAC AMYLOIDOSIS IN ELDERLY WITH POSITIVE SCINTIGRAPHY AND MONOCLONALITY:
A DIAGNOSTIC DILEMMA**

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(a) DEPARTMENT OF CLINICAL, INTERNAL, ANESTHESIOLOGIST AND CARDIOVASCULAR SCIENCES, SAPIENZA UNIVERSITY OF ROME; (b) DEPARTMENT OF RADIOLOGICAL, ONCOLOGICAL AND ANATOMICAL-PATHOLOGICAL SCIENCES, SAPIENZA UNIVERSITY OF ROME

Background: Identification of elderly patients (> 75 years) with concomitant positivity of bisphosphonate scintigraphy and monoclonal protein testing is increasing. In this case, accurate amyloid histologic subtyping is crucial.

Methods: Among 133 patients who received the diagnosis of cardiac amyloidosis from March 2021 to March 2023, 21 (16%) presented with an abnormality of both bisphosphonate scintigraphy and serum-immunofixation and underwent abdominal fat biopsy/needle aspiration. In case of negative results, an endomyocardial biopsy (EMB) was planned. Amyloid was identified at histology by Congo Red staining. Amyloid typing was obtained by immunohistochemistry using a recently developed amyloid antibody panel AmYkit (Amimed). The results were compared with those obtained with standard immunohistochemistry.

Results: Most patients were older than 75 years (81±10) with a grade 3 (62%) or 2 (33%) scintigraphy. Only 1 patient (65 ys) had a grade 1 positive scintigraphy (5%). In 78% the presence of monoclonal protein was unknown, while 22% had a several years history of MGUS. One patient had a TTR mutation, and none had hematologic disorders. Abdominal fat histology was negative for amyloidosis in all cases. Cardiac histology showed in all patients a positivity of Congo Red staining suggestive of cardiac amyloidosis. Immunohistochemistry performed with single antibodies showed positivity of TTR in 9 %, kappa/lambda in 5%, and both TTR and kappa/lambda chain positivity in 86%. Conversely the use of AmYkit panel of antibodies allowed to clearly distinguish among TTR (20 pts, 95%, 84±7 ys) and kappa/lambda chain (1 pts, 5%, 84 ys) amyloidosis. Immunohistochemistry performed with standard Abs was not able to discriminate between AL and ATTR, due

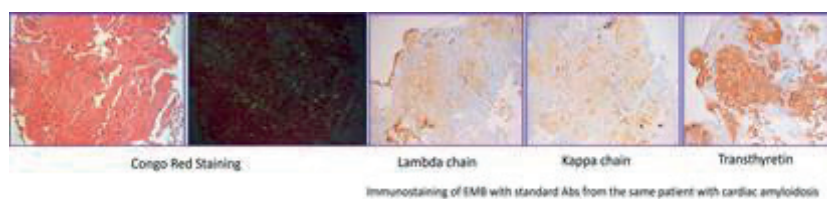


Figure 1

to signal overlapping of variable intensity (Figure 1). Conversely, our preliminary results with AmYkit panel of antibodies demonstrate absence of signal overlapping in over 90% of cases, allowing accurate histologic discrimination between AL and TTR (Figure 2).

Conclusion: In elderly patients with positivity of both bisphosphonate scintigraphy and monoclonal protein testing, TTR is the most frequent type of cardiac amyloid. Accurate amyloid subtyping is granted by a more sensitive panel of antibodies.

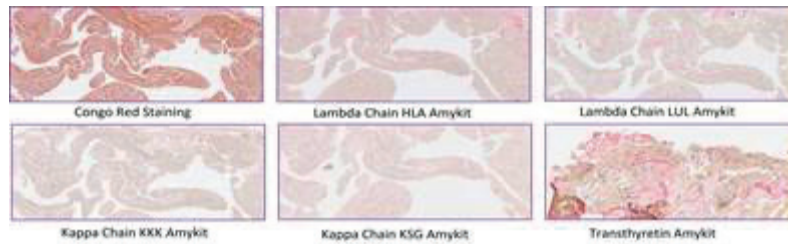


Figure 2



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 394
ARITMIE VENTRICOLARI (ARITMIE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)**

LEFT VENTRICULAR HYPERTRABECULATION AND VENTRICULAR ARRHYTHMIAS

Michele Alfieri (a, b), Samuele Principi (b), Alessandro Barbarossa (b), Federico Paolini (a, b), Lorenzo Torselletti (a, b), Antonio Dello Russo (a, b), Michela Casella (a, b), Federico Guerra (a, b)
(a) UNIVERSITÀ POLITECNICA DELLE MARCHE; (b) CLINICA DI CARDIOLOGIA ED ARITMOLOGIA

Background: Left ventricular hypertrabeculation is now defined as a phenotypic associated with heart failure, embolism and, most importantly, ventricular arrhythmias (VAs). Arrhythmic events still represent a major issue for these patients and data regarding their genesis and prevention is widely lacking. The objective of our study is to identify factors able to predict the occurrence of potentially fatal VAs in patients with excessive trabeculation of the left ventricle.

Methods: All consecutive patients meeting the echocardiographic and/or MRI criteria for excessive trabeculation were prospectively enrolled from October

2009 to December 2023. The primary outcome was a composite of sudden cardiac death (SCD), sustained ventricular tachycardias (sVTs), ventricular fibrillation (VF) or appropriate implantable cardioverter defibrillator (ICD) interventions. The secondary outcome was a composite of cardiovascular death and cardiovascular hospitalizations.

Results: 64 patients (34 males, mean age 46 ± 19 years old) were enrolled and followed for a mean time of 2.2 years. At the end of follow-up six patients (9.4%) experienced the composite outcome, of whom three with previous sVT and three with previous non-sustained VTs (nsVTs). The strongest predictors of the primary outcome were the anamnesis of nsVTs and sVTs, which were also significantly related to the secondary outcome.

Conclusions: Hypertrabeculation of the left ventricle is a relatively misunderstood condition whose status of cardiomyopathy is doubted by current guidelines. In our population, patients with excessive trabeculations experienced a high incidence of VAs, cardiovascular death and hospitalizations. Remarkably, sVTs and nsVTs were independent predictors of VAs regardless of systolic function.

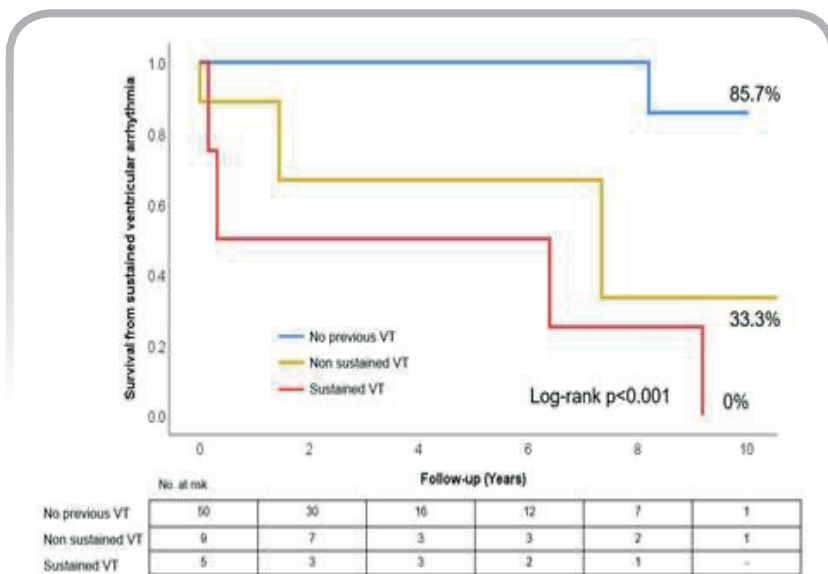
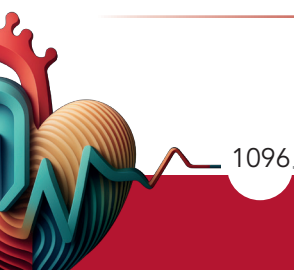


Figure 1



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 425 PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING CARDIOVASCOLARE)

A DYSPNEA BLESSING IN DISGUISE

Emanuel Barnoffi (a, b), Francesco Schiavone (a, b), Gennaro Ciliberti (a, b), Alessandra Malatesta (a, b), Lorenzo Torselletti (a, b), Enrico Rita (a), Giuseppe Ciliberti (a), Cristian Mattei (c), Elisa Nicolini (c), Alessandro Maolo (c), Tommaso Piva (c), Antonio Dello Russo (a, b), Michela Casella (a, b), Federico Guerra (a, b)
(a) CLINICA DI CARDIOLOGIA E ARITMOLOGIA, "OSPEDALI RIUNITI" ANCONA, ITALIA; (b) UNIVERSITÀ POLITECNICA DELLE MARCHE, ANCONA, ITALIA; (c) CARDIOLOGIA OSPEDALIERA E UTIC, DIPARTIMENTO DI EMODINAMICA, "OSPEDALI RIUNITI" ANCONA, ITALIA

Background: Pericardial diseases are a very common and treatable cause of chest pain and in some cases of dyspnea. In rare cases the inflammatory process can lead to a thickening of the pericardium that becomes inelastic and restricts cardiac chamber expansion, this form is known as constrictive pericarditis. The most common cause of constrictive pericarditis is tuberculosis (29.8%) and only a small percentage of patient with an acute pericarditis develop this form (1.8%). We present the case of a man with dyspnea and tachycardia.

Case summary: A 62-year-old man was admitted to the emergency department for dyspnea and tachycardia. His anamnesis was relevant for hypertension, past smoking habit, an episode of acute pericarditis in 1997 and an HCV-infection due to transfusion treatment that led to cirrhosis now completely eradicated and in ambulatory follow-up. The EKG showed Atrial Fibrillation whose onset was greater than 48 hours ago. Laboratory tests did not show any significant alteration, the Troponin levels were normal in two determinations. The echocardiogram in the emergency department showed a mildly reduced ejection fraction due to global hypokinesia (EF 45-50%), a normal systolic function of the right ventricle, a severely enlarged left atrium, a dilated vena cava, a mild tricuspid regurgitation with sPAP of 50mmHg and pericardial thickening. He was admitted to our department where a GDMT was

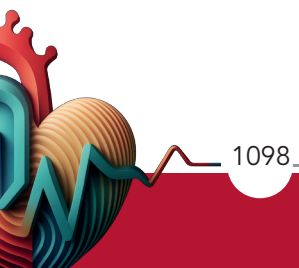
started with improvement in symptoms, CT-Scan and cardioversion were planned. After admission a complete echocardiogram was performed, that showed: normal left ventricle dimensions with concentric remodeling; a LVEF of 50% with a bounce movement of the IVS; enlargement of both atria (iLAV 55ml/m²; RAA 26cm²), a transmitralic pattern with a variation greater than 20-30% during respiration and a pericardial thickening of the posterior pericardium. No significant VHD was noted. The CT-Scan showed a calcified pericardium that was wrapped around both atria and no LAA thrombi, so a cardioversion was attempted without efficacy. A Coronary Angiogram and a Right Heart Catheterization (RHC) were performed. The angiogram did not show any significant stenosis, only a diffuse atheromasia of the LAD. The RHC showed: elevated RVP, mPAP 19 mmHg; PCWP 13 mmHg; PVR 1 WU; LVEDP 13 mmHg; CI 2,33 l/min/m²; equalization of the diastolic pressures in the cardiac chambers (LA 13 mmHg; RA 7 mmHg; RV 11 mmHg; LV 13 mmHg); a "dip-plateau" pattern and an increase in RV systolic pressure with a concomitant reduction in LV during inspiration. A diagnosis of constrictive pericarditis was made and the patient was referred to the Heart Surgeon. He is now waiting for the surgery.

Discussion: Constrictive pericarditis is a rare disease following an acute pericarditis. In this case the



constrictive form manifested after 20 years from the index episode with dyspnea and tachycardia due to atrial fibrillation on the EKG. The echocardiogram is crucial for the suspect that led to the diagnosis. The

treatment is pericardiectomy which has a mortality range of 6-12%, or medical therapy if the patient is in the "end-stage" of the disease characterized by Atrial fibrillation, cachexia and low cardiac-output at rest.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 702

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)

MIOCARDITE DA SCLEROSI SISTEMICA E AMILOIDOSI AL: QUANDO L'INSORGENZA SIMULTANEA DI DUE PATOLOGIE PUÒ DIVENTARE UNA SFIDA COMPLESSA

Chiara Belardinelli (a), Cinzia Zuchi (a), Anna Mengoni (a), Rosanna Lauciello (a), Giuliana Bardelli (a),
Sandra D'addario (a), Alessandro Lupi (a), Eugenio Trovarelli (a), Elisabetta Agliani (b), Daniele Mazzucca (d),
Carlo Perricone (c), Erberto Carluccio (a), Giuseppe Ambrosio (a)

(a) CARDIOLOGY AND CARDIOVASCULAR PHATOPHYSIOLOGY, SANTA MARIA DELLA MISERICORDIA HOSPITAL,
PERUGIA, ITALY; (b) HEMATOLOGY UNIT, SANTA MARIA DELLA MISERICORDIA HOSPITAL, PERUGIA, ITALY;
(c) RHEUMATOLOGY UNIT, SANTA MARIA DELLA MISERICORDIA HOSPITAL, PERUGIA, ITALY; (d) RADIOLOGY UNIT,
SAN GIOVANNI BATTISTA HOSPITAL, FOLIGNO, ITALY

Introduzione: La sclerosi sistemica (ScS) può coinvolgere il cuore, comportando una peggiore prognosi. La contestuale presenza di amiloidosi cardiaca, rende il trattamento molto complesso.

Case report: Donna di 56 anni con storia di ipertensione arteriosa. Esordio clinico con episodi sincopali legati ad ipotensione, dispnea da sforzo ed astenia. La paziente era in follow-up ematologico per una MGUS (IGM kappa); alla visita di follow-up venivano quindi prelevati NTproBNP e troponina hs. Per il riscontro di troponina hs marcatamente elevata (1500 ng/l, vn <14) la paziente veniva sottoposta ad esame coronarografico, che mostrava coronarie angiograficamente normali. Ad un ecocardiogramma venivano rilevati lieve ipertrofia del setto interventricolare con cinesi biventricolare conservata. Nel sospetto di amiloidosi cardiaca veniva quindi effettuato prelievo del grasso periombelicale che mostrava focali depositi interstiziali di sostanza fibrillare riferibile ad amiloide, positivi all'immuno-elettromicroscopia per catene leggere kappa. La paziente veniva ricoverata in Ematologia per iniziare trattamento chemioterapico per amiloidosi cardiaca AL. Durante il ricovero tuttavia si rilevavano spondilodattilite, ispessimento cutaneo e

restringimento della rima orale. Gli esami di laboratorio rilevavano positività degli ANA con ENA anti Scl70 ad alto titolo. Nel sospetto di ScS veniva quindi iniziata terapia con micofenolato. La paziente veniva inviata presso l'ambulatorio dell'Amiloidosi cardiaca dove all'ecocardiogramma si confermava la presenza di lieve ispessimento del SIV (11 mm), versamento pericardico circonfenziale, ma contestuale presenza di aree a-discinetiche in sede infero-posteriore e, considerando l'aspetto ecografico non tipico per amiloidosi cardiaca, veniva posta indicazione a biopsia endomiocardica. Tale esame confermava la presenza di focali depositi di amiloide positivi all'immuno-elettromicroscopia per catene leggere kappa, ma immersi in numerosi tralci di tessuto connettivo ed in presenza di dubbia necrosi dei miociti ed infiltrato linfo-monocitario all'esame istologico. In considerazione della conferma di amiloidosi AL veniva iniziata terapia di prima linea con (Daratumumab, Bortezomib, ciclofosfamide e desametasone). Dopo la prima somministrazione si assisteva a repentina e brusca riduzione della troponina hs (300 ng/l) che veniva attribuita all'effetto del cortisonico. Dopo discussione multidisciplinare reumatologica, ematologica e cardiologica, considerando il quadro cardiologico misto, da amiloidosi AL e coinvolgimento



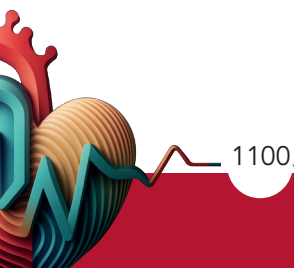
cardiaco di ScS, veniva posta indicazione ad effettuare RMN cardiaca per valutare l'alterazione strutturale prevalente. La RMN cardiaca evidenziava un quadro di estesa fibrosi coinvolgente anche il ventricolo destro, con estensione transmurale della parete infero-posteriore basale, compatibili con coinvolgimento miocarditico diffuso da ScS.

Dopo nuova discussione collegiale si decideva di sospendere il bortezumib, per la sua cardiotossicità potenziale in corso di miocardite, e veniva adeguato il dosaggio della terapia immunosoppressiva con ciclofosfamide e desametasone. Si assisteva quindi al

follow-up a progressiva riduzione dei valori di TnHs (23 ng/l) e NT-proBNP e miglioramento del quadro clinico soggettivo.

Discussione: L'uso integrato dell'imaging cardiovascolare e degli esami biotici guidati da un team esperto in cardiomiopatie è fondamentale per un corretto inquadramento dei pazienti.

Conclusioni: Quando si sovrappongono due malattie del miocardio, individuare quale incida di più sul danno d'organo è indispensabile per definire la terapia più efficace.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 284 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

FAMILIAL IMMUNE-MEDIATED INFLAMMATORY CARDIOMYOPATHY IN TWO SISTERS: ROLE OF GENETIC BACKGROUND

Nicola Campobasso (a), Andrea Silvio Giordani (a), Anna Baritussio (a), Martina Perazzolo Marra (a), Sabino Iliceto (a), Alida Linda Patrizia Caforio (a)
(a) UNIVERSITY OF PADOVA

Background: Myocarditis is an inflammatory disease of the myocardium that results from heterogeneous aetiologies, mainly infectious (i.e. viral) and immune-mediated/autoimmune, and variable clinical presentation ranging from heart failure to ventricular arrhythmias or sudden cardiac death and infarct-like features. Although spontaneous recovery occurs in many patients, some progress to chronic ventricular dysfunction. Many questions remain unanswered regarding the potential role of the host genetic background in disease progression and prognosis.

Case summary: A 42-year-old female with a family history of sudden cardiac death was admitted to the Cardiology Department for assessment after incidental findings of ECG abnormalities and dilated cardiomyopathy with moderately reduced ejection fraction on a transthoracic echocardiogram. Coronary artery disease was ruled out by coronary angiography and cardiac magnetic resonance (cMRI) demonstrated areas of late gadolinium enhancement (LGE) with a non-ischemic pattern. Consequently, to identify the underlying cause an endomyocardial biopsy was performed and revealed a dilated cardiomyopathy with inflammatory signs (virus negative); cardiac-specific anti-heart antibodies (AHA) and anti-intercalated disk antibodies (AIDA) tested positive. These findings were consistent with auto-immune myocarditis. A tailored immunosuppressive (IS) therapy was started with clinical improvement (azathioprine was switched to mycophenolate mofetil). After 3 years and a half of IS therapy, because of clinical worsening and a decrease

in ejection fraction, an ICD was implanted for primary prevention and the patient was included in elective heart transplant checklist. The patient was enrolled in a research study of biopsy-proven myocarditis and a sampling for genetic test demonstrated a pathologic mutation in the LMNA gene. The patient required multiple hospitalizations because of heart failure with need of intensive pharmacological support. Following admission for cardiogenic shock requiring mechanical circulatory support she underwent heart transplantation. Her 5-year-younger sister, at the age of 42 years, was admitted to the cardiology department for dyspnoea, fatigue, irregular heartbeat and peripheral edema following flu-like symptoms. Her transthoracic echocardiogram demonstrated dilated cardiomyopathy with severely reduced ejection fraction. Cardiac MRI demonstrated signs of myocardial edema and areas of LGE with non-ischemic pattern. Endomyocardial biopsy showed chronic virus negative myocarditis. AHA and AIDA tested positive. Genetic testing revealed the same LMNA gene mutation as her sister. She refused ICD implantation and is actively followed-up at the cardio immunology clinic.

Discussion and conclusion: In biopsy-proven myocarditis pathologic variants in structural genes (e.g. LMNA) might increase myocardial vulnerability to viral or immune-mediated damage. Genetic variants in structural cardiomyopathy-associated genes are present in a minority of patients; further identification of immune-system associated genes is needed to improve prediction of dismal outcome.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 663 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MULTI-MODALE/IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

SILENT TREATHS: A FIVE-STEP APPROACH TO DETECTING AND MANAGING CARDIAC SARCOIDOSIS - AN IN-DEPTH REVIEW

Simona Chiusolo (a), Erasmo Ditunno (a), Doralisa Morrone (a), Gabriele Masini (a), Giovanni Aquaro (b),
Raffaele De Caterina (a)

(a) *CARDIO-THORACIC AND VASCULAR DEPARTMENT, PISA UNIVERSITY HOSPITAL AND UNIVERISITY OF PISA, ITALY*; (b) *ACADEMIC RADIOLOGY UNIT, DEPARTMENT OF SURGICAL, MEDICAL AND MOLECULAR PATHOLOGY AND CRITICAL AREA, UNIVERISTY OF PISA, ITALY*

Background: Cardiac sarcoidosis (CS) presents significant diagnostic and therapeutic challenges, especially in patients without prior sarcoidosis diagnosis. This paper aims to refine diagnostic and therapeutic strategies for CS through a comprehensive literature review.

Methods: A non-systematic review was conducted using PubMed, Google Scholar, and Scopus with keywords such as "Cardiac Sarcoidosis," "Cardiomyopathies," and "Multi-modality Imaging." Five critical steps for effective CS detection and management were identified based on frequency of mention, strength of evidence, and clinical applicability.

Results: The first step involves considering CS in the differential diagnosis of patients with unexplained cardiac symptoms. Advances in imaging show cardiac involvement in 20-25% of systemic sarcoidosis patients, compared to the initial 5% prevalence indicated by earlier studies. Common manifestations include high-grade atrioventricular block (23-30%), ventricular tachycardia (23-47%), syncope (10-15%), sudden cardiac death (5-10%), heart failure (10-30%), and atrial arrhythmias (10-30%). The second step excludes mimics of CS, particularly arrhythmogenic cardiomyopathy, restrictive cardiomyopathies, non-dilated left ventricular cardiomyopathy (NDLVC), and giant cell myocarditis (GCM). Accurate CS diagnosis relies on non-invasive and invasive testing. Multimodal

imaging is crucial for diagnosis, treatment guidance, risk stratification, and prognosis. The use of CMR and FDG-PET has reduced the need for endomyocardial biopsy (EMB) from 60-80% to 10-30% of suspected cases. The fourth step involves treatment across three domains: immunosuppression, rhythm control, and heart failure management. Studies show benefits in combination therapy, with steroids and immunosuppressive agents like methotrexate, azathioprine, or mycophenolate mofetil, enhancing efficacy and reducing steroid burden. Catheter ablation for refractory ventricular arrhythmias, early device implantation, and advancements in heart failure management have improved CS management and prognosis, with current 10-year transplant-free cardiac survival rates around 89%. The final step emphasizes identifying poor prognosis predictors and appropriate follow-up. All steps should be performed by a multidisciplinary team to enhance diagnostic accuracy and treatment efficacy.

Conclusion: Managing cardiac sarcoidosis requires a comprehensive approach. Implementing the five-step strategy—from initial consideration in differential diagnosis to advanced multimodal imaging and targeted treatment—can significantly improve patient outcomes. Early detection, precise risk stratification, and appropriate therapeutic interventions, supported by a multidisciplinary team, are crucial for optimizing diagnosis, treatment, and long-term prognosis of patients with cardiac sarcoidosis.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 306

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

CARDIOMIOPATIA IPERTROFICA OSTRUTTIVA E STENOSI SUBAORTICA: L'IMPORTANZA DELLA DIAGNOSI DIFFERENZIALE

Federica Colio (a), Francesco Cappelli (a), Annamaria Del Franco (a), Mattia Targetti (a), Giacomo Bonacchi (a) Alessia Argirò (a), Valeria Setti (a), Iacopo Olivotto (a, b)
(a) AZIENDA OSPEDALIERA UNIVERSITARIA CAREGGI - FIRENZE;
(b) AZIENDA OSPEDALIERA UNIVERSITARIA MEYER - FIRENZE

Donna, 73 aa

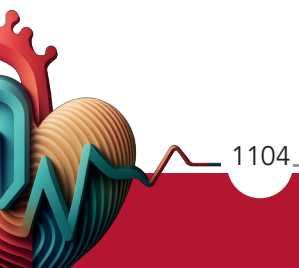
Nel 2019 primo riscontro di ipertrofia ventricolare sinistra (SIV max 15 mm a livello basale) ed evidenza di ostruzione, interpretata come fissa ad origine sottovalvolare con gradiente medio 66 mmHg e 96 mmHg dopo Valsalva, in paziente con dispnea. Nel 2021 fibrillazione atriale e riscontro di moderata disfunzione ventricolare sinistra (FE 45%), trattata con cardioversione farmacologica e NAO. Alla dimissione FE 60%, inquadrata come HFpEF associata a ostruzione sottovalvolare, veniva introdotta terapia diuretica (furosemide e spironolattone), con peggioramento della dispnea e dell'angina (NYHA III, CCS III) ed evidenza di gradiente al TEVS di 70 mmHg, per cui veniva introdotto dapagliflozin in terapia. Alle valutazioni successive persistevano sintomi e gradiente di 125 mmHg. Veniva ridotta la terapia diuretica e la paziente veniva riferita al nostro Centro. Alla valutazione confermata l'ipertrofia miocardica asimmetrica a carico del SIV, associata a lembi mitralici ridondanti con marcato allungamento del LAM e funzione sistolica ventricolare sinistra supernormale, determinanti SAM completo e gradiente al TEVS di 125 mmHg basale e con valore compreso tra 140 e 200 mmHg al Valsalva. Posta diagnosi di Cardiomiopatia ipertrofica ostruttiva. È stata dunque sospesa la terapia diuretica e con gliflozina. Per persistenza di gradiente di ostruzione al TEVS severo e di inappropriato cronotropismo, è stata scalata terapia betabloccante ed introdotta

disopiramide. Al controllo ecocardiografico successivo, veniva evidenziata riduzione del gradiente al TEVS (50 mmHg al basale e 95 mmHg dopo Valsalva), con miglioramento della sintomatologia. Per la persistenza di gradiente severo, veniva proposta strategia di riduzione del setto tramite approccio chirurgico. Veniva eseguito inoltre prelievo per il test genetico, ancora in corso. Al 4° mese di follow-up si confermava persistenza di gradiente severo al TEVS, NYHA II. Veniva pertanto proposto alla paziente inizio della terapia con mavacamten ("Early Access Program" per uso compassionevole di Camzyos, mavacamten), che la paziente accettava. Veniva dunque iniziata terapia con mavacamten 5 mg/die al 6° mese di follow-up. Ad un mese dalla terapia, la paziente è risultata asintomatica (NYHA I, CCS I). Al controllo ecografico è stata evidenziata una marcata riduzione del gradiente di ostruzione al TEVS (10 mmHg al basale e 21 mmHg dopo Valsalva), associato ad una riduzione del rigurgito mitralico; persiste disfunzione diastolica di II grado. È stato dunque confermato il dosaggio di mavacamten 5 mg 1 cp/die ed iniziato il decalage della terapia con disopiramide. Il presente caso mostra come la misdiagnosi iniziale di stenosi subaortica abbia determinato una gestione della paziente inadeguata con ulteriore peggioramento del quadro clinico. Utilizzando invece la terapia farmacologica ottimizzata per la CMI e successivamente introducendo terapia con mavacamten, è stato osservato un miglioramento con marcata riduzione del gradiente ostruttivo al



TEVS e la risoluzione della sintomatologia clinica. Il mavacamten è un inibitore allosterico reversibile della miosina cardiaca che riduce il numero di interazioni acto-miosiniche, riducendo pertanto l'ipercontrattilità miocardica e dunque l'ostruzione a carico del TEVS. È stato inoltre visto che mavacamten è in grado

di migliorare gli indici di disfunzione diastolica nel lungo periodo. Questi cambiamenti possono essere interpretati come un effetto di rimodellamento ventricolare positivo e rendono interessante indagare se mavacamten possa ridurre gli eventi cardiovascolari nei pazienti affetti da cardiomiopatie ipertrofica.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 867

MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

AN UNFAVORABLE CASE OF EOSINOPHILIC MYOCARDITIS

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Massimo Imazio (b), Gianfranco Sinagra (a)

(a) *SCUOLA DI SPECIALIZZAZIONE IN MALATTIE CARDIOVASCOLARI-TRIESTE;*
(b) *CARDIOLOGIA - AZIENDA OSPEDALIERA UNIVERSITARIA DI UDINE*

A 76 years old man, former smoker, hypertensive, allergic to allopurinol (severe and widespread skin rash about 2 months before) was admitted to our ICU after accessing to ER for abdominal pain, diaphoresis, hypotension and deep weakness. BP 90/50 mmHg, SO₂ 98%. The EKG showed Afib, HR 80 bpm, inferior necrosis with persistent mild ST-segment elevation and inverted T waves; first troponine 3.680 ng/mL, D-dimer 900 ng/dL, WBC 15.760/mm³, RCP 27,97 mg/L; CT scan negative for pulmonary embolism. At the ultrasonography: preserved LVEF with increased thickness (figure a), akinesia of the inferior wall, hypokinetic and enlarged RV, dilated IVC and minimal apical pericardial effusion (8 mm). Patient was quickly taken to the cath lab where angiography shows subcritical stenosis of the proximal RCA, in absence of evident culprit lesion. Troponin kept rising, up to 8990 ng/L. In the following hours quick and progressive worsening of the heart failure with diastolic

and moderate systolic LV dysfunction, dilated RV, increased thicknesses and slight pericardial effusion. At the blood tests conspicuous eosinophilia (WBC 20.580/mm³, Eosinophils 35% - 7.200/mm³) in MOF (AST/ALT 312/736 U/L, PCR 173, Creatinine 2.44 mg/dL), with still rising Troponin (29,700ng/mL). At the EKG progressive reduction of voltages, inferior pseudonecrosis, poor precordial R wave growth and rapid deterioration of conduction (RBBB + LPE). Next concomitant respiratory failure required orotracheal intubation. The serial EGAs showed severe metabolic acidosis with persistent hypoglycemia despite corrections (pH 7.08; pCO₂ 39 mmHg; Lactate 17.8 mMol/L).

In the meanwhile, a steroid therapy with hydrocortisone was started, with also a decreasing of the eosinophilia, but further HF worsening, needing inotropic support with adrenaline and noradrenaline, without any improvement, led to a cardiogenic shock, so much

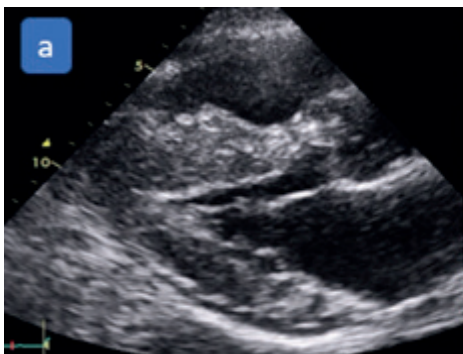


Figure A

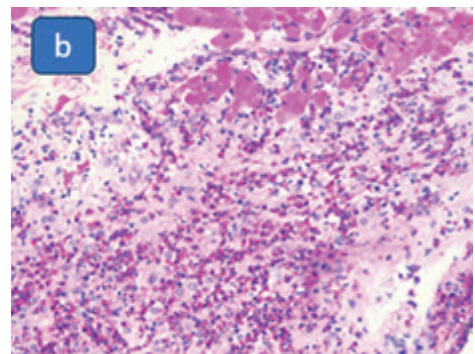
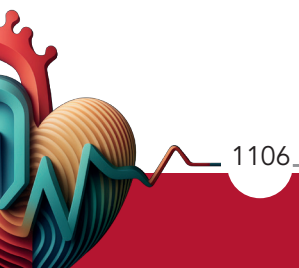


Figure B



that the patient was quickly scheduled for urgent biopsy, placement of temporary pacemaker and IABP, with still no benefits. So IABP was shifted to ECMO-VA. The sample shows widespread inflammatory infiltrates consisting of numerous eosinophilic granulocytes also with granulation aspects, some lymphocytes and occasional multinucleated histiocytes. Extensive myocytic necrosis is observed (figure b). Despite all these therapeutic attempts, the severity of the disease leads to the patient's death.

In conclusion clinical presentation of eosinophilic myocarditis may range from complete absence of symptoms to fulminant myocarditis with cardiogenic shock. The definite diagnosis is made by endomyocardial biopsy. The evidence of eosinophilic infiltrate among myocytes allows to start an immunosuppressive treatment, usually based on corticosteroids, that are the cardinal therapy for eosinophilic myocarditis. Unfortunately, in this case the outcome was unfavorable despite rapid initiation of steroid therapy.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 715
ARTERIOPATIA ARTI INFERIORI (MALATTIE DEI VASI)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)

CARDIOPATIA TAKOTSUBO BIVENTRICOLARE: UNA PRESENTAZIONE INUSUALE

Stefano Cossu (a), Enrica Fanni (a), Alessandro Martis (a), Luca Fazzini (a), Gianfranco De Candia (a), Daniela Boscarelli (a), Elena Picca (a), Francesco Arru (a), Francesca Argiolas (a), Roberta Montisci (a)
(a) POLICLINICO UNIVERSITARIO "DUILIO CASULA" DI MONSERRATO

Introduzione: La sindrome Takotsubo (TTS) è una cardiopatia caratterizzata da disfunzione sistolica regionale acuta del ventricolo sinistro, solitamente preceduta da "trigger" psicologico, fisico o combinato, reversibile e con maggiore prevalenza nel genere femminile. La disfunzione ventricolare sinistra classicamente si presenta con la forma *apical ballooning* o con anomalie della cinetica segmentaria coinvolgenti i segmenti medi e/o basali o di tipo focale, può inoltre essere presente coinvolgimento del ventricolo destro.

Presentazione del caso: Donna di 76 anni, obesa, affetta da ipertensione arteriosa, vasculopatia cerebrale cronica, arteriopatia ostruttiva cronica degli arti inferiori, fibrillazione atriale (FA) parossistica non trattata con terapia anticoagulante. Giunge in PS per la comparsa improvvisa, durante camminata, di intensa algia agli arti inferiori associata a sintomi neurovegetativi. Nega angor, dispnea, cardiopalmo e sincope. All'ECG evidenza di ritmo sinusale con ST sopraslivellato in DI e aVL e specularità in sede inferiore. Emodinamicamente stabile. Esame obiettivo cardiopolmonare nei limiti, assenza dei polsi femorali, poplitei e tibiali bilateralmente, arti inferiori freddi e mazzati fino alla radice di coscia bilateralmente. All'ecocardiogramma transtoracico severa disfunzione sistolica biventricolare con *apical ballooning* e stenosi mitralica moderata, non evidenza di trombosi endoventricolare. Agli esami ematochimici Tn hs 324 ng/ml, D-dimero 1,36

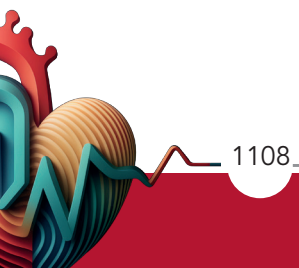
mg/l. L'angioTC torace, addome e arti inferiori ha escluso una sindrome aortica acuta ed evidenziato l'occlusione su verosimile base tromboembolica di entrambe le arterie iliache e femorali superficiali e profonde. Discusso il caso collegialmente con i colleghi Emodinamisti e Chirurghi vascolari, si concorda per l'esecuzione di coronarografia con evidenza di arterie coronarie esenti da stenosi significative, con ventricolografia compatibile con TTS. Viene quindi intrapresa terapia anticoagulante con enoxaparina sottocute ed eseguito intervento chirurgico vascolare urgente con embolectomia bilaterale iliaco-femorale con catetere Fogarty ed endoarterectomia dell'arteria femorale comune sinistra, con progressivo ripristino della perfusione degli arti inferiori. Durante il ricovero è stato eseguito ecocardiogramma transesofageo con evidenza di trombosi in auricola sinistra, per cui è stata successivamente introdotta terapia con AVK. Durante la degenza progressivo recupero della funzione sistolica biventricolare. La RMN cuore ha poi confermato la diagnosi di TTS biventricolare.

Conclusioni: L'esordio clinico con ischemia acuta bilaterale degli arti inferiori e riscontro di severa disfunzione sistolica biventricolare ha richiesto un work-up diagnostico complesso. Esclusa la sindrome aortica acuta come causa di ischemia degli arti inferiori, considerato il quadro ECG e la positività della Tn hs è stato poi eseguita coronarografia che ha escluso la



sindrome coronarica acuta, la ventricolografia ha posto il sospetto di TTS poi confermata anche dalla RMN. Sebbene non si possa stabilire con certezza il nesso

causale, verosimilmente la FA parossistica non trattata con anticoagulante ha determinato il cardioembolismo periferico, evento trigger della TTS biventricolare.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 560 ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE) IMAGING MULTI-MODALE/IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

DIAGNOSIS AND MANAGEMENT OF PRIMARY RIGHT ATRIAL ANGIOSARCOMA

Marco Fabio Costantino (a), Luisiana Stolfi (a), Francesca Cortese (b), Gianpaolo D'addeo (a)
(a) DIPARTIMENTO CARDIOVASCOLARE - AZIENDA OSPEDALIERA "SAN CARLO" - POTENZA;
(b) UNITÀ DI CARDIOLOGIA - OSPEDALE "MADONNA DELLE GRAZIE" - MATERA

Background: Angiosarcoma is an aggressive malignant tumor characterized by endothelial differentiation and poor prognosis. Typically located in the right atrium, it often affects individuals in their third to fifth decades of life. Symptoms are nonspecific, including chest pain, shortness of breath, malaise, and fever. Echocardiographic findings often reveal arrhythmias, heart block, and nonspecific ST segment and T wave abnormalities. Angiosarcomas are usually hemorrhagic with indistinct margins, and aggressive forms invade neighboring structures. Early detection through non-invasive imaging methods facilitates specific diagnoses prior to histopathological confirmation.

However, characteristics identified via imaging are not well-documented, as most knowledge comes from individual cases.

Case Presentation: In this case report, we present a 53-year-old man diagnosed with primary right atrial angiosarcoma through imaging techniques, subsequently confirmed by jugular intravenous right atrial biopsy with transesophageal echocardiography (TEE) guidance (Images A-B-C). The patient initially presented with exertional dyspnea, chest pain, frequent fevers, and arterial hypertension. Echocardiography revealed a right atrial mass and pericardial effusion, leading to further

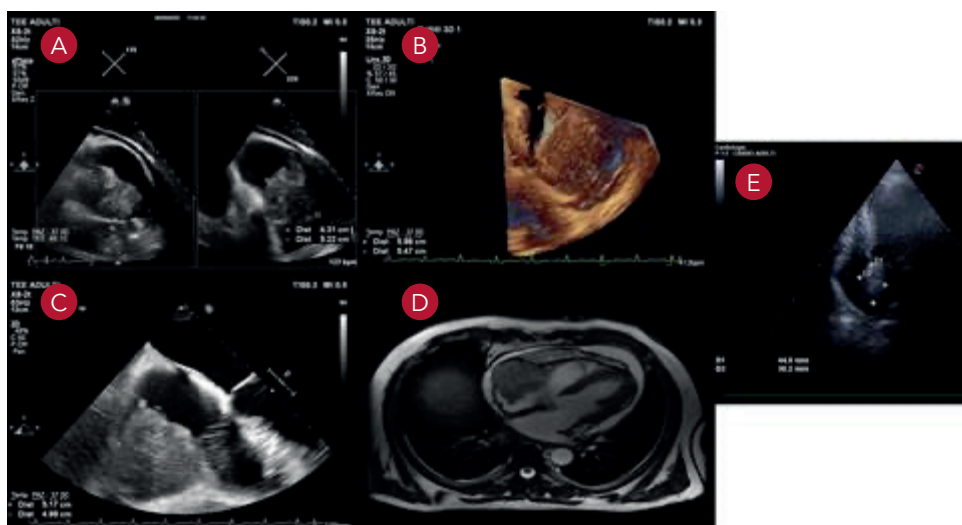
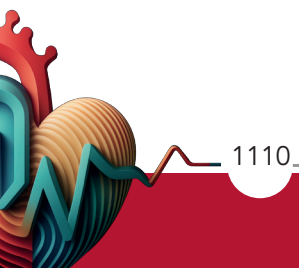


Figure 1

diagnostic evaluation and imaging (CT – Image D), which suggested a malignant cardiac heteroplasia. A biopsy confirmed the diagnosis of right atrial angiosarcoma. Following the diagnosis, the patient underwent chemotherapy with gemcitabine, resulting in a reduction in the mass size. The patient's condition is currently monitored with regular echocardiographic evaluations to assess cardiac function and detect any potential recurrence or complications (Image E).

Conclusion: This case underscores the importance of comprehensive imaging and histopathological confirmation in diagnosing cardiac angiosarcoma and highlights the effectiveness of gemcitabine chemotherapy in reducing tumor size. Regular echocardiographic monitoring is crucial in managing the patient's condition and ensuring timely detection of any changes in cardiac function or tumor recurrence.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 145
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
ARITMIE VENTRICOLARI (ARITMIE)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

MYCOPHENOLATE MOFETHIL IN CHRONIC INFLAMMATORY CARDIOMYOPATHY: A CASE REPORT.

Simona Covino (a), Enrica Pezzullo (b), Adriano Caputo (a), Roberta Alfieri (a), Carmine Gentile (a), Biagio Liccardo (b), Rossana Bussani (c), Gianfranco Sinagra (c), Paolo Golino (a, b), Francesco Loffredo (a, b)
(a) UNIVERSITÀ DEGLI STUDI DELLA CAMPANIA "VANVITELLI"; (b) OSPEDALE MONALDI - NAPOLI;
(c) UNIVERSITÀ DI TRIESTE

Case report: A 24 yrs-old man was admitted to our cardiological intensive care unit because of acute heart failure. He had experienced multiple episodes of lymphocytic myocarditis with no evidence of viral genome as shown by endomyocardial biopsy (EMB), with pericardial involvement during the previous year, which had been treated at first with ibuprofen and colchicine and, subsequently, with steroids and anakinra as second and third-line therapy. Genetic analysis did not show any pathogenic mutation in genes associated with cardiomyopathies. Previous cardiac MRI had shown signs of fibrosis at the basal and middle segments of left ventricle, with preserved LV and RV ejection fraction (EF). These data, together with chronic dismission of hs troponin, suggested the development of chronic inflammatory cardiomyopathy (infl-CMP). At admission, echocardiography showed a severe reduction in LVEF (30%, GLS - 6,9%) and thickening of LV walls (presumably due to inflammation and edema). EMB showed severe subendocardial fibrosis, interstitial edema and increased lymphocytic infiltration (CD45 LCA e CD8), overexpression of HLA-DR and no evidence of viral genomes. We observed a rapid clinical worsening up to cardiogenic shock that required hemodynamic support with IABP and CPAP therapy. Furthermore, the occurrence of arrhythmic storm (polymorphic ventricular tachycardia), required multiple DC shocks, deep sedation and high-dose iv

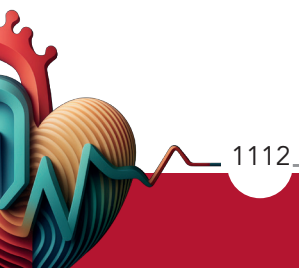
antiarrhythmic therapies. He was included in urgent heart transplant (HTx) list. The clinical scenario of infl-CMP prompted the administration of mycophenolate mofetil (MMF) 1000 mg twice a day. The response to the drug was dramatic: we observed a rapid stabilization of clinical parameters and reduction of arrhythmic events. The patient was weaned from hemodynamic support and finally discharged with immunosuppressive therapy including steroids and MMF 1000 mg twice a day. During follow up he was clinically stable and asymptomatic (NYHA II) and both LVEF and diastolic function had progressively improved (autoEF 40%, GLS -11.7%, E/A ratio 2,2, dT 180 msec at 8-month follow up). During this period, he required a single hospitalization because of bacterial pneumonia which required i.v. antibiotics. MMF was tapered to 1000 mg/die and steroids discontinued with stable LV function.

Discussion: Management of acute myocarditis, especially in setting of chronic inflammatory cardiomyopathy, is still debated. Immunosuppression is only indicated in acute myocarditis with clinical or EMB evidence of auto-immune disease or in chronic cardiac inflammation with no EMB evidence of viral infection. Currently, immunosuppression is often obtained using high-dose steroids. Two major trials are ongoing with the aim to investigate survival benefits of anakinra 100 mg/d (ARAMIS trial) and methylprednisolone 1g x 3d



(MYTHS trial) in the setting of acute myocarditis. We still lack solid evidence regarding MMF and its timing in inf-CMP.

Conclusion: Our case suggests that MMF should be considered as a treatment option in recurrent idiopathic myocarditis, in both acute and chronic settings.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 291 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ECOSTRESS (IMAGING CARDIOVASCOLARE) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

UNMASKING LATENT OBSTRUCTION IN HYPERTROPHIC CARDIOMYOPATHY THROUGH PHYSICAL STRESS ECHO

Denise Cristiana Faro (a), Matteo Fiscaro (a), Fabrizio De Gaetano (a), Gerlando Spirio (b),
Valentina Losi (a), Ines Paola Monte (a)

(a) UNIVERSITÀ DI CATANIA, DIPARTIMENTO CHIRMED; (b) UNIVERSITÀ DI MESSINA

Background: Hypertrophic cardiomyopathy (HCM) is a significant cause of sudden cardiac death, particularly affecting younger individuals. It is classified into obstructive (70%) and non-obstructive (30%) forms, with symptoms often exacerbated by dynamic left ventricular outflow tract obstruction (LVOTO). This study focuses on the early diagnosis of latent LVOTO through stress echocardiography.

Purpose: The primary objective is to evaluate the efficacy of exercise echocardiography in diagnosing latent LVOTO in patients with HCM, particularly when traditional transthoracic echocardiography at rest or with provocative maneuvers shows inconclusive results.

Methods: This retrospective, observational study included 78 patients diagnosed with HCM at the Rare Cardiomyopathy Centre, Cardiology Unit A.O.U Policlinico G. Rodolico-San Marco, Catania. Patients were assessed using clinical, electrocardiographic, and echocardiographic parameters. Inclusion criteria followed the ESC 2023 guidelines for HCM, requiring a maximum wall thickness ≥ 15 mm or ≥ 13 mm in familial cases. Participants underwent resting and stress echocardiography using a supine bicycle ergometer, following the Bruce protocol, with standard echocardiographic measurements at each step and a thorough assessment of LVOT gradient at rest, during Valsalva maneuver and at 50%, peak exercise and during recovery.

Results: The cohort consisted of 57 men and 21 women, aged 18 to 85 years, with an average age of 56.71 ± 16.32 years. Out of 78 patients, 18 (23.1%) had LVOTO at rest as detected by TTE. Among the remaining 60 patients without obstruction at rest, stress echocardiography revealed latent LVOTO in 13 patients (16.7%). Specifically, 6 patients showed an inducible gradient > 30 mmHg, and 7 patients showed an inducible gradient > 50 mmHg during peak stress. Thus, stress echocardiography identified a significant proportion of latent obstructive cases that were not evident at rest, emphasizing its diagnostic importance and widening the proportion of patients with a possible indication for myosin-inhibitors treatment.

Conclusions: Stress echocardiography is a valuable tool for detecting latent LVOTO in HCM patients, offering critical insights for early diagnosis and management. This method identified additional obstructive cases in 21.7% of the initially non-obstructive cohort. These findings underscore the importance of stress echocardiography in unveiling hidden obstructions, thereby improving patient stratification and guiding the selection of candidates for advanced therapies such as mavacamten. This approach enhances the ability to tailor treatment plans and improve patient outcomes by identifying individuals at higher risk of complications.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 781
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOLOGIA DELLO SPORT (ATTIVITA' FISICA E CARDIOLOGIA
DELLO SPORT)
ARITMIE VENTRICOLARI (ARITMIE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)

EXERCISE INTENSITY AND CARDIAC DISEASE DEVELOPMENT IN CARRIERS OF TITIN VARIANTS

Giulio Savonitto (a), Alessia Paldino (a), Martina Setti (b), Arianna Berra (a), Irena Tavcar (a), Flavio Luciano Ribichini (b), Giulia Barbati (c), Marta Gigli (a), Davide Stolfo (a), Matteo Dal Ferro (a), Marco Merlo (a), Gianfranco Sinagra (a)
(a) *CARDIOVASCULAR DEPARTMENT, AZIENDA SANITARIA UNIVERSITARIA GIULIANO ISONTINA (ASUGI), UNIVERSITY OF TRIESTE, ITALY. MEMBER OF THE EUROPEAN REFERENCE NETWORK FOR RARE, LOW-PREVALENCE, OR COMPLEX DISEASE OF THE HEART (ERN GUARD-HEAR); (b) DIVISION OF CARDIOLOGY, DEPARTMENT OF MEDICINE, UNIVERSITY OF VERONA, ITALY; (c) BIOSTATISTICS UNIT, DEPARTMENT OF MEDICINE, UNIVERSITY OF TRIESTE, ITALY*

Background: While the exacerbating effect of physical exercise and its correlation with arrhythmic outcomes have been demonstrated for Arrhythmogenic Right Ventricular Cardiomyopathy, the impact of physical exercise on other forms of cardiomyopathies is poorly characterized.

Purpose: We aimed to investigate the relationship between exercise lifelong intensity in the development of cardiac manifestation in subjects carrying a Likely Pathogenic (LP) or Pathogenic (P) truncating variant of titin (*TTNtv*).

Methods: We interviewed *TTNtv* carriers – patients and family members – regarding their regular physical activity from birth until diagnosis (type of activity, hours/week, weeks/months, months/years, and number of years of exercise).

Participants were categorized based on their exercise habits. Those engaging in ≥ 4 hours of vigorous exercise per week (equivalent to ≥ 1440 METs \times minutes/week) for a minimum of 6 years were classified as Vigorous athletes. All others were classified as Non-Vigorous athletes.

We explored the correlation between vigorous physical activity and development of left ventricular systolic dysfunction (LVSD), defined as left ventricular ejection fraction below 45% (LVEF <45%). Additionally, we

considered as secondary endpoints the occurrence of life-threatening ventricular arrhythmias (LTA - i.e. aborted cardiac arrest due to hyperkinetic arrhythmias, documented sustained ventricular tachycardia – SVT–, or appropriate implantable cardioverter-defibrillator therapy), non-LTA ventricular arrhythmias (i.e. >1000 premature ventricular complexes/24h and non-sustained ventricular tachycardia – NSVT), and development of atrial fibrillation or atrial flutter (AF/AFL) during follow-up.

Results: Among the 117 subjects (73% male, mean age 44 ± 16), 38 (32%) were vigorous athletes. Vigorous exercise was not associated with the development of LVEF <45% (adjusted OR 0.663, 95%CI 0.261-1.685, $p = 0.388$). Furthermore, vigorous exercise was not associated to the occurrence of LTA ($p = 0.607$), premature ventricular complexes/24h ($p = 0.243$), NSVT ($p = 0.515$), and supraventricular arrhythmias ($p = 0.701$) during follow-up.

Comparable results were obtained when considering the total amount of METs \times hours/life burned by subjects as a continuous variable.

Conclusions: In carriers of *TTNtv*, vigorous physical activity seems not associated with the presence or development of LVSD and LTA development.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 481 PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

UN CASO PARTICOLARE DI SCOMPENSO CARDIACO: QUANDO LA COPERTA È TROPPO...STRETTA

Jessica Salerno (a), Francesco Angeli (a), Matteo Armilotta (a), Luca Bergamaschi (a), Carmine Pizzi (a)
(a) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES-DIMEC-ALMA MATER STUDIORUM,
UNIVERSITY OF BOLOGNA, 40138, ITALY

Giunge in visita un paziente di 81 anni, iperteso, affetto da sindrome coronarica cronica in esiti di rivascolarizzazione percutanea del ramo interventricolare anteriore e da fibrillazione atriale permanente in terapia anticoagulante orale con apixaban. Il paziente riferisce nell'ultimo mese riduzione della tolleranza allo sforzo con comparsa di dispnea per sforzi lievi, significativo aumento ponderale (circa 7 Kg), e concomitante riduzione dell'appetito per dispepsia e gonfiore addominale. Nel mese precedente la visita viene segnalato un episodio di dolore addominale con diarrea profusa. Per tale motivo ha eseguito un'ecografia addominale che ha mostrato la presenza di abbondante versamento pleurico bilaterale e modesto versamento ascitico.

All'esame obiettivo si riscontrano edemi declivi degli arti inferiori bilaterali colonnari fino al ginocchio, ipertimpanismo alla percussione addominale e murmure vescicolare abolito alle basi polmonari bilateralmente.

Alla luce del quadro di scompenso cardiocircolatorio biventricolare, si predispone il ricovero del paziente presso il reparto di Cardiologia, dove viene avviata terapia diuretica endovenosa. Agli esami ematici all'ingresso il paziente presenta una lieve leucocitosi (globuli bianchi $12.7 \times 10^9/L$), proteina C reattiva 2,5 mg/dL, ma, sorprendentemente, normali peptidi natriuretici (BNP 100 pg/mL) rispetto al quadro clinico di scompenso cardiocircolatorio.

L'elettrocardiogramma all'ingresso mostra fibrillazione atriale con frequenza cardiaca pari a 65 bpm in assenza di altri elementi patologici di rilievo, mentre l'ecocardiogramma documenta normali volumi e funzione sistolica biventricolari, pattern transmitralico

da alterato rilasciamento e un versamento pericardico lieve-moderato in assenza di evidenti ripercussioni emodinamiche ad esclusione di vena cava dilatata e con ridotte escursioni respiratorie. Nel sospetto di una sindrome neoplastica il paziente viene sottoposto, inoltre, ad esecuzione di TC torace e addome che esclude la presenza di neoformazioni d'organo ma documenta omogeneo ispessimento dei foglietti pericardici, lievemente iperdensi nelle scansioni pre-contrastografiche, in assenza di evidenti calcificazioni, e dotati di diffusa impregnazione dopo iniezione di mezzo di contrasto come da fenomeni flogistici in atto. Nel sospetto di una forma costrittiva di pericardite ancora in fase essudativa, il paziente viene sottoposto, per la conferma diagnostica, a cateterismo cardiaco destro che, infatti, evidenzia, una differenza fra pressione atriale destra e pressione di incuneamento polmonare pari a 3 mmHg, RVEDP $>1/3$ RVSP (VDx 30/0/11 mmHg), mancata riduzione inspiratoria della pressione atriale destra, e aspetto a tipo dip-and-plateau della curva pressoria ventricolare destra, confermando il sospetto di costrizione pericardica. Agli esami sierologici eseguiti nel sospetto di pericardite si riscontra positività per IgM anti-Coxsackievirus tipo B, facendo propendere per una causa infettiva ed in particolare virale della patologia.

Il paziente è stato quindi sottoposto a terapia antinfiammatoria con ibuprofene e colchicina con successivo miglioramento del quadro clinico-strumentale.

Il presente caso clinico mostra un singolare caso di scompenso cardiaco da costrizione pericardica transitoria durante la fase acuta di flogosi pericardica, risoltasi dopo opportuna terapia anti-infiammatoria.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 499
MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)

UN RARO CASO DI MIOCARDITE

Tommaso Rinforzi (a, b), Francesco Paolo Perelli (a, b), Carlotta Munforti (a), Andrea Giuliano (a), Gianluca Caldara (a), Barbara Bilo (a), Mariaconsuelo Valentini (a), Camilla Torlasco (a), Silvia Castelletti (a), Roberto Brambilla (a), Gianfranco Parati (a, b)

(a) ISTITUTO AUXOLOGICO ITALIANO; (b) UNIVERSITÀ DEGLI STUDI MILANO BICOCCA

M, 20 anni, origine cingalese.

Anamnesi patologica remota: 01/24 parassitosi intestinale da *Strongyloides stercoralis* trattata con albendazolo, coprocultura di controllo negativa. 02/24 colonscopia: Rettocolite Ulcerosa, pancolite estesa, attività endoscopica moderata (Mayo2), clinica lieve.

Terapia al domicilio (TD): Mesalazina 800mg x6/die, 1 clisma di mesalazina 100ml.

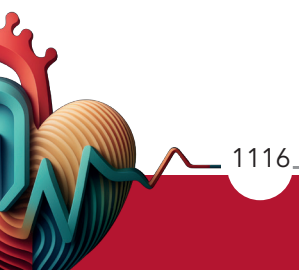
Anamnesi patologica prossima: Episodio di faringite e raffreddore con febbre 3-4 settimane prima dell'accesso in PS, test COVID-19 negativo. Accesso il 19/03/24 presso P.S. per dolore toracico a carattere trafittivo, peggiorato dall'inspirazione profonda e dalla posizione clinostatica; ECG negativo; TnT HS 45 ng/L, PCR 1.9 mg/dL, GB 18,600 (neutrofilia). Trasferito in reparto di cardiologia.

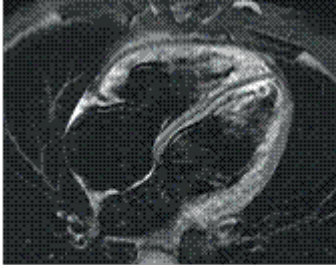
Decorso clinico: Durante la degenza, episodi sporadici di angore associati a comparsa di sopra ST diffuso all'ECG, trattati con FANS. Per picco febbrile associato

a cefalea eseguite quattro emocolture, risultate negative. Agli esami ematici evidenza di screezio enzimatico (picco TnT HS 87, alla dimissione 29), temporaneo aumento della PCR (picco 8) risoluzione della leucocitosi. Pannello virus cardiotropi: negativi. Pannello autoimmunità: negativi. IgE totali 716 kUI/L (limite <170). Coproculture di controllo negative. Ecocardiogramma color Doppler nella norma. Eseguita Risonanza magnetica cardiaca (RMN) con gadolinio: reperti di caratterizzazione tissutale compatibili con recente mio-pericardite, in via di risoluzione (figura 1 e 3). Impostata e titolata terapia betabloccante. In accordo con i colleghi gastroenterologi si concludeva per quadro di mio-pericardite secondaria a mesalazina e si sospendeva tale farmaco.

Follow up: 02/2024: tentativo di reintroduzione di mesalazina fallito per recidiva di precordialgia. 04/2024 RMN di controllo risoluzione dell'edema miocardico in assenza di esiti fibrotici (figura 2 e 4). 07/2024 Non più episodi di precordialgie.

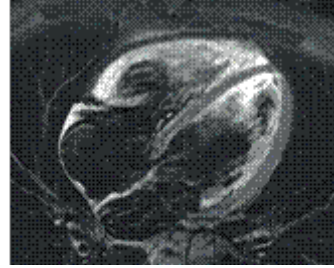
TD: Azatioprina 50 mg/die, prednisione 5 mg/die.





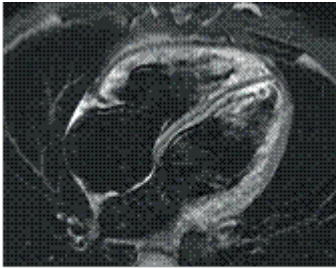
KMN T2-pesata 4 camere 03/2023

Figure 1



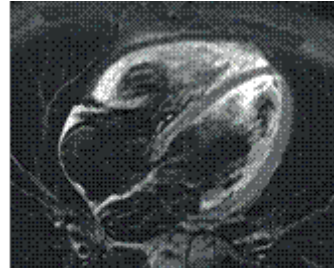
KMN T2-pesata 4 camere 04/2024

Figure 2



KMN T2-pesata 2 camere 03/2023

Figure 3



KMN T2-pesata 2 camere 04/2024

Figure 4



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 672 PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO)

A CASE OF BACTERIAL PERICARDITIS DUE TO STREPTOCOCCUS INTERMEDIUS COMPLICATED WITH CARDIAC TAMPONADE AND MULTIORGAN FAILURE

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Background: The reported incidence of bacterial pericarditis is less than 1%, while its mortality might range from 10 to 30%. The most common infective agents are staphylococci, streptococci, pneumococci, and are often associated with lung empyema and pneumonia.

This case report details a complex presentation of pericarditis caused by *S. intermedius* complicated with secondary multi-organ failure, pneumonia, and acute hemorrhagic diarrhea.

Streptococcus intermedius is a member of the *S. anginosus* group, commonly associated with abscesses formation in various organs. Pericarditis caused by *S. intermedius* is a rare finding.

Case Presentation: A 74-year-old female presented to a peripheral emergency department in Rome with a new onset precordial chest pain radiating to both shoulders and reported fatigue and melena over the preceding months. ECG revealed ST-segment elevation in the inferior leads, with reciprocal changes. Initial hemoglobin was critically low (5 g/dL), she received one unit of packed red blood and transferred to our tertiary care center for further management.

On arrival, physical examination revealed significant jugular venous distension. Bedside echocardiography demonstrated a large, circumferential pericardial effusion with initial signs of tamponade. The ECG continued to show a slight ST-segment elevation in

the inferolateral leads. CT angiogram ruled out aortic dissection but confirmed the presence of a large, loculated pericardial effusion with signs of pericarditis and bilateral pleural effusions with consolidation on the lower lobe of the right lung.

The patient was admitted to the intensive cardiac care unit (ICCU), where further labs revealed elevated procalcitonin (PCT) of 10 ng/mL, leukocytosis (WBC: 32,000/ μ L), and positive urinary antigen for *Streptococcus pneumoniae*. She was started on empirical therapy with Ceftriaxone.

A few hours later, the patient developed obstructive shock secondary to cardiac tamponade and was taken to the operating room for an emergency pericardial window. 400cc of a lactescent fluid, characteristic of streptococcal pericarditis, was drained and sent for culture. After the procedure she became hypotensive, anuric, and displayed signs of multi-organ dysfunction, including acute kidney injury (AKI) hepatic dysfunction, coagulopathy, and hyperlactatemia.

One day later she developed acute hematochezia, prompting an emergent abdominal CT, which showed ischemic colitis with splenic infarctions. Blood and stool cultures were negative, as well as the pleural fluids; the pericardial fluid showed positive for *Streptococcus intermedius*, susceptible to Ceftriaxone.

Despite continued care, including total parenteral nutrition and thoracentesis for worsening respiratory status, the patient's condition remained critical, with persistent diarrhea and fluctuating hemodynamics.

Over the next days, some laboratory markers showed an improvement in the renal and liver, but pancreatic enzymes and cholestatic markers remained elevated.

Given the presence of *S. intermedius* in the pericardial fluid, the potential for hepatic or cerebral abscess formation needs to be investigated.

Discussion: This case highlights the complex and severe progression of a bacterial pericarditis caused by *S. intermedius*, a pathogen known for abscess formation. The case was further complicated by cardiac tamponade, multi-organ failure, pneumonia, and ischemic colitis. The presence of *S. pneumoniae* in urinary antigen tests, likely a false positive, added diagnostic complexity. Early recognition and aggressive management, including pericardial drainage, broad-

spectrum antibiotics, and intensive supportive care, were to revert the patient's critical condition.

Conclusion: *Streptococcus intermedius* should be considered in cases of purulent pericarditis, it's a rare finding but it might rapidly compromise the clinical course and must be treated as soon as possible with an aggressive approach and with a specific antibiotic therapy. This case highlights the need for a multidisciplinary approach in managing severe, multifaceted infections and shows the importance of considering rare pathogens in atypical presentations.

Keywords: Pericarditis, Cardiac Tamponade, *Streptococcus intermedius*, Multi-Organ Failure, Hemorrhagic Diarrhea, Case Report.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 737
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

ARRHYTHMOGENIC CARDIOMYOPATHY: AN "EASY" DIAGNOSIS

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A 26-year-old female presented with palpitations. Initial first-level diagnostic tests were performed, including an echocardiogram, which revealed normal morpho-functional findings. The ECG showed sinus rhythm at 75 bpm, left posterior fascicular block (LPFB), terminal activation delay (TAD) with a terminal activation duration > 55 ms in right precordial leads as well as infero-lateral leads, isoelectric ST segment, inverted T waves in V1 and aVL, biphasic T wave in V2, and a QTc of 447 ms. This ECG also meets the Calò electrocardiographic criteria for the diagnosis of ARVC: R wave in DI + R wave in DII ³ 8 mm; S wave in V1 + R wave in V6 of 6 mm, and q waves in the inferior leads. A 24-hour Holter ECG revealed frequent ventricular ectopy. Some of the described findings are recognized as minor criteria for the diagnosis of arrhythmogenic cardiomyopathy (according to Padua criteria). LPFB has recently been associated with an increased risk

of sudden cardiac death, and a correlation with fibrosis of the inferolateral, inferior, or inferoseptal walls (a significant arrhythmogenic substrate) has been suggested. The coincidence of the described depolarization and repolarization abnormalities, along with the arrhythmic activity and conduction disturbance, prompted us to perform cardiac MRI, which revealed ring-like subepicardial late gadolinium enhancement (LGE) of the left ventricle and LGE of the right ventricular free wall, as in Calò findings. A diagnosis of biventricular arrhythmogenic cardiomyopathy was made. The patient subsequently underwent genetic testing, which revealed a pathogenic mutation in the desmoplakin gene.

This clinical case of arrhythmogenic cardiomyopathy serves to highlight that, even today, despite (or perhaps alongside) all the technological advancements in the medical field, a simple, widely available, and very low-cost method like the electrocardiogram can effectively guide the diagnostic process. Moreover, the new electrocardiographic diagnostic criteria proposed by Calò may offer future prospects for the formulation of a suspected diagnosis of ARVC based solely on ECG findings. The identification of a ring-like pattern on cardiac MRI, along with the presence of a mutation in the desmoplakin gene, suggests a strong correlation between electrocardiographic features, genetic alterations, and LGE pattern.

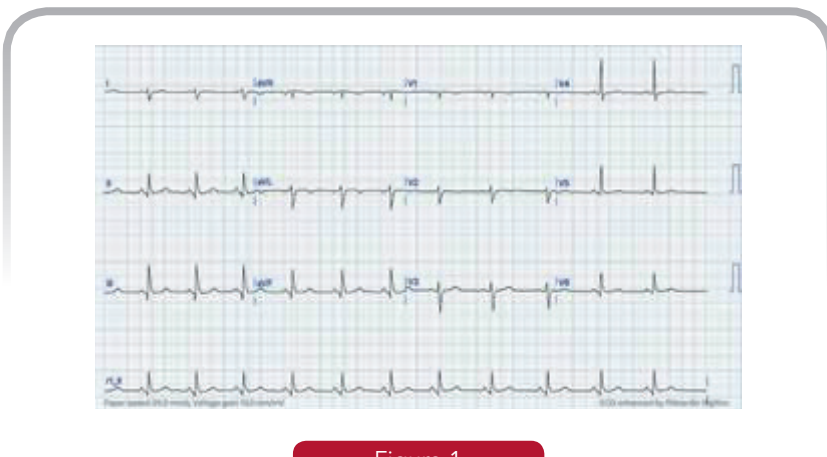


Figure 1

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 654 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) PROGNOSI (SCOMPENSO CARDIACO) BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

EARLY DIAGNOSIS, DISEASE STAGE AND PROGNOSIS ACCORDING TO DIAGNOSTIC PATHWAYS IN WILD-TYPE TRANSTHYRETIN AMYLOID CARDIOMYOPATHY: INSIGHTS FROM THE DIAMOND STUDY

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Background: Disease staging and prognostic scoring in wild-type transthyretin-related cardiac amyloidosis (ATTRwt-CA) can be captured by two systems (NAC and Columbia scores). However, uncertainty remains as epidemiology of the disease is evolving rapidly. We evaluated features associated with staging systems across ATTRwt-CA patients from different diagnostic pathways, and their association with prognosis.

Methods: We performed an analysis on DIAMOND patients with available data to evaluate NAC and Columbia score. DIAMOND was a retrospective study from 17 Italian referral centres for CA, enrolling 1281 patients diagnosed between 2016 and 2021, and aimed at describing characteristics of pathways leading

to ATTRwt-CA diagnosis. Of the original cohort, 811 patients were included in this analysis. Each patient had NAC and Columbia score calculated. Patients were grouped according to NAC and Columbia scoring classes. We described characteristics of patients according to staging classes and diagnostic pathways at diagnosis. Prevalence of early diagnoses, defined as NAC Ia, NYHA class I, no use of diuretics, no history of heart failure (HF) hospitalizations nor of atrial fibrillation prior to diagnosis, was investigated. Finally, prognostic variables were tested alone and grouped as NAC or Columbia scores in Cox univariate and multivariate regression analyses. Prognosis was investigated as all-cause mortality, in the whole population and dividing patients in HF versus other diagnostic pathways.



Results: Only 1% of the study population had an early ATTRwt-CA diagnosis. Distribution of prognostic variables and of NAC and Columbia classes was heterogeneous across diagnostic pathways. The prevalence of NAC III and Columbia III was higher in the HF diagnostic pathway, but all NAC and Columbia classes were present in all pathways. Both NAC and Columbia scores were associated with all-cause mortality at univariate Cox regression analysis in the whole population, in patients from the HF diagnostic pathway and in those from other pathways. At multivariate analysis, Columbia score

remained significantly associated with the outcome, together with age at diagnosis, left ventricular ejection fraction and maximal wall thickness.

CONCLUSIONS: In this contemporary nationwide cohort, an ATTRwt-CA early diagnosis was very rare. Disease staging with NAC and Columbia scoring systems determined classes of patients with heterogeneous features. Both scores were significantly associated with mortality, but other variables also had prognostic significance.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 866 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

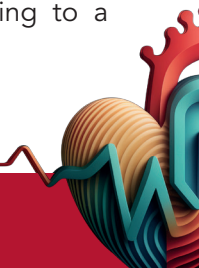
TRANSTHYRETIN CARDIAC AMYLOIDOSIS: A CASE REPORT ON DIAGNOSTIC CHALLENGES AND THE EMERGING ROLE OF SPECKLE TRACKING ECHOCARDIOGRAPHY

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Background: Cardiac amyloidosis (CA) is a major cause of cardiac dysfunction due to the deposition of amyloid fibrils. This condition can be inherited due to mutations in the transthyretin gene (ATTR_m) or occur due to the accumulation of wild-type transthyretin protein (ATTR_{wt}). Patients with transthyretin amyloid cardiomyopathy typically present with heart failure symptoms. ATTR cardiac amyloidosis can be diagnosed through characteristic findings from echocardiography, scintigraphy, or cardiac magnetic resonance. However, in patients with a Perugini score of 0-1, the likelihood of ATTR cardiac amyloidosis is low. False-negative scintigraphy results may occur in ATTR amyloidosis patients when myocardial infiltration is minimal, as seen in early disease stages, causing radiotracer uptake to fall below the diagnostic threshold. Certain TTR mutations may present with distinct cardiac abnormalities on echocardiography but yield negative scintigraphy results. Furthermore, in patients with a history of myocardial infarction, amyloid deposition may be restricted to non-scarred myocardial segments, potentially leading to uptake levels that are insufficient for a definitive diagnosis.

Case Description: In this case report, we present a 74-year-old male patient who was referred to our center on April 2024 for a cardiological evaluation due to exertional dyspnea classified as NYHA II. The patient's

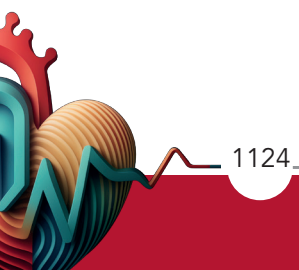
medical history includes prostate cancer currently being managed with hormone therapy, and he is under ongoing follow-up. Red flags included paresthesia in the extremities of both upper and lower limbs for several months, and difficulty with walking for approximately 2 years. On physical examination, bilateral mid-to-basal crackles were present. The electrocardiogram revealed a left axis deviation, a first-degree atrioventricular block (PR interval of 260 ms), and non-specific ventricular repolarization abnormalities in the inferolateral leads. The echocardiogram showed normal ventricular dimensions, mildly increased wall thickness, preserved systolic function, left atrial enlargement, mild mitral and tricuspid regurgitation, and grade I diastolic dysfunction. Speckle tracking echocardiography was performed to assess ventricular strain, revealing a reduced global longitudinal strain (GLS) with evidence of apical sparing. A diagnosis of cardiac amyloidosis was considered. The patient was subsequently recommended to undergo blood tests, which showed elevated NT-proBNP levels, increased high-sensitivity troponin, normal free light chain levels with a kappa/lambda ratio within the normal range, and serum and urine immunofixation results were also within normal limits. The salivary swab test for the *aTTR* gene mutation was negative. However, whole-body scintigraphy with a bone-seeking tracer revealed a significant radiotracer uptake in the myocardial walls, corresponding to a



Perugini score of 2. Interestingly, in 2020 and 2021, the patient underwent whole-body scintigraphy with a bone-seeking tracer, as part of prostate cancer staging, which did not show any myocardial uptake at that time.

Discussion: This case highlights the role of speckle tracking echocardiography in early amyloidosis detection and shows that patients with a Perugini score of 0-1 can still develop the disease, emphasizing the need for ongoing monitoring and additional diagnostic methods. Currently, there is insufficient data to guide the optimal timing for repeating scintigraphy or to determine when scintigraphy becomes positive in

the course of cardiac amyloidosis. Additionally, more robust data are needed to clarify the incidence of false-negative results associated with this imaging technique, highlighting the necessity for further research. For scintigraphy to be routinely used in the diagnosis and management of this condition, it is crucial that it is performed at appropriate intervals to reduce the likelihood of false-negative findings. In conclusion, there is an urgent need for additional research to identify early diagnostic markers for amyloidosis beyond whole-body scintigraphy with bone-seeking tracers. This could facilitate targeted monitoring, timely intervention, and personalized treatment, ultimately improving patient outcomes.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 157
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)

AN UNEXPECTED CASE OF CARDIAC SARCOIDOSIS: THE EARLIER DIAGNOSIS THE BETTER MANAGEMENT.

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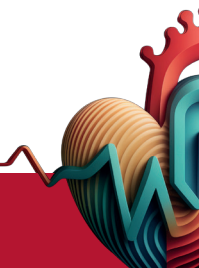
Introduction: Systemic sarcoidosis is a non-caseating granulomatous disease with an unknown etiopathology. Cardiac sarcoidosis typically presents with unexplained high grade atrioventricular block, unexplained ventricular arrhythmias, and/or reduced left ventricular ejection fraction with regional wall aneurysm/basal septal thinning. Rapid detection is crucial due to prognostic implications and the common potential systemic involvement, though diagnosis remains challenging.

Case report: A 65-year-old man was admitted to our Intensive Cardiovascular Care Unit (ICCU) for suspected marked iatrogenic sinus bradycardia. The patient presented to the Emergency Department with increasing dyspnea and fatigue. During the ICCU stay, the patient experienced an acute episode of dyspnea, promoting a high-resolution thoracic computed tomography, which raised suspicion of interstitial lung disease and lastly of stage 2 pulmonary sarcoidosis. Then a cardiac magnetic resonance suggested cardiac sarcoidosis with "patchy" non-ischemic late gadolinium enhancement (especially in mesocardial mid-segments interventricular septum, mid-basal segments of the inferior interventricular junction, subendocardial in left

basal inferolateral wall and subendocardial in left mid anterolateral wall). During the ICCU stay, our aim has been to promptly give a certain diagnosis to the patient and to improve a multidisciplinary drug treatment specific for his systemic sarcoidosis.

Discussion: This case report underscores the importance of considering rare pathologies when common diseases are ruled-out or do not fully explain the clinical presentation. In fact, in our case the patient shows no main clinical features for the sarcoidosis, nevertheless the clinical and cardiological presentation required for hospitalization. Important for the early diagnosis was the feasibility in our team to get early the requiring diagnostic excluding others potential causes. Multidisciplinary agreement favored patient treatment despite limited evidence, aiming to prevent disease progression and complications.

Conclusion: Systemic sarcoidosis is a rare non-caseating granulomatous disease that can affect any organ, particularly the lungs and heart. Cardiologist should be vigilant for the "red flages" of the disease to facilitate early diagnosis and target therapy, thereby improving patient prognosis.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 218
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
ECMO (ASSISTENZA CARDIACA IN ACUTO)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA
CARDIACA IN ACUTO)
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)

A BREACH IN THE WALL: GERBODE DEFECT IN POST-ISCHEMIC VENTRICULAR SEPTAL DEFECT

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Case report: A 70-year-old woman was admitted for cardiogenic shock (CS) in ADHF with biventricular dysfunction. The ECG revealed sinus tachycardia, tall R wave in V1, right axis deviation. The echocardiogram showed RV dilatation with reduced systolic function, massive tricuspid regurgitation and elevated probability of PH. A 20 mm continuity solution was detected in the postero-basal interventricular septum, below the tricuspid septal leaflet, with significant atrioventricular left to right

shunt (Gerbode defect, infravalvular indirect type). The LV has a normal volume with thinned hypokinetic posterior wall (LVEF of 45%). After sufficient clinical stabilization the patient underwent right heart catheterization which showed severe post-capillary PH, reduced cardiac index and left-right shunt (Qp/Qs 2,5). Coronary angiography showed a total proximal dominant RCA occlusion, collateralized by heterocoronary circulation. On the fifteenth day after the admission, surgical repair of VSD

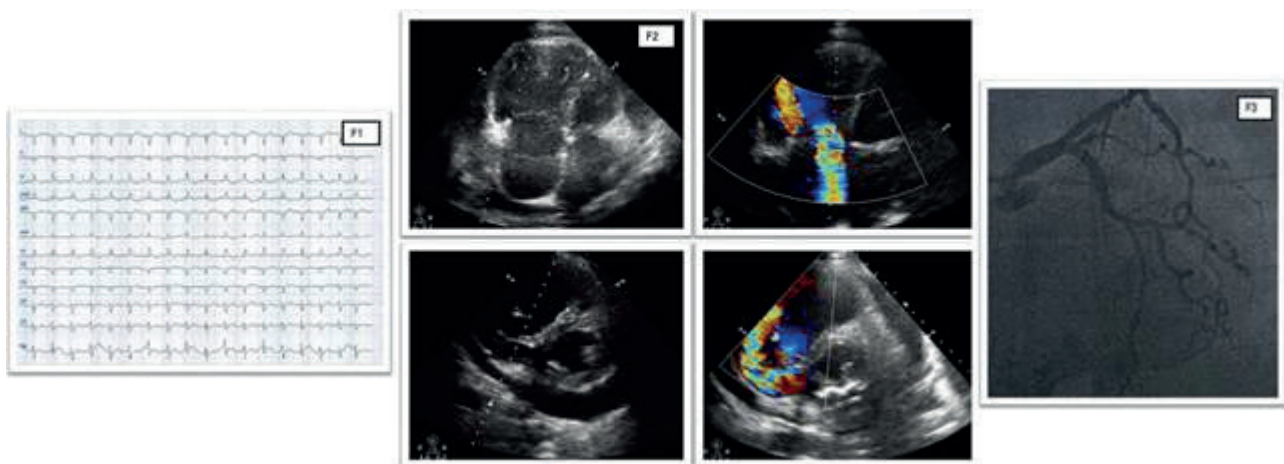


Figure 1

using a bovine pericardial patch and tricuspid valve repair were performed. Despite the VA-ECMO support, postoperative phase was complicated by refractory CS and rapid multi-organ failure, lastly a cardiac arrest (PEA) caused woman's death.

Discussion: Coronary chronic total occlusion and VSD are rarely associated, since VSD typically occurs with acute coronary occlusion. The optimal closure timing and treatment modality for post-ischemic VSD have not been defined. ESC guidelines recommend surgery only in case of refractory CS or persistent ventricle dysfunction beyond 7 days after diagnosis. In-hospital mortality rates for surgical or interventional repair are approximately 50% and exceeds 95% in untreated patients. In case of CS, large defect and

anatomical relation with valvular apparatus, surgical repair should be preferred over percutaneous closure. Acute atrioventricular defect causes pressure and volume overload in both the left and right heart: even if it gets closed, CS is a frequent complication, especially in case of pre-procedural biventricular dysfunction. Therefore, the use of pre-procedural MCS like ECPPELLA, through unloading LV and reducing RV preload, or left-atrial-to-systemic MCS (TandemHeart), can prevent biventricular dysfunction. In our opinion, the need for myocardial revascularization should be carefully evaluated and VSD closure postponed until sufficient hemodynamic stability is achieved, avoiding deterioration of biventricular function through pre-procedural placement of an MCS device first as bridge to surgery and then to recovery.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 290 GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) IMAGING MULTI-MODALE/IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

APICAL THROMBOSIS IN MID-VENTRICULAR HYPERTROPHIC CARDIOMYOPATHY WITH GENETIC VARIANT OF UNCERTAIN SIGNIFICANCE: A CASE REPORT

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(a) UNIVERSITÀ DI MESSINA; (b) UNIVERSITÀ DI CATANIA, DIPARTIMENTO CHIRMED

Introduction: Hypertrophic cardiomyopathy (HCM) is a genetically heterogeneous heart muscle disease, characterized by unexplained left ventricular hypertrophy (LVH), with histopathological findings including myocyte enlargement and imbalance and myocardial fibrosis. In recent decades, HCM has been considered a sarcomere's disease, and typically as an autosomal dominant disorder with variable expressivity and incomplete penetrance.

We present the case of a 70-year-old patient with a history of arterial hypertension, dyslipidemia, and sporadic palpitations, diagnosed with unspecified HCM in 2008 following an echocardiographic evaluation for frequent palpitations, despite relative clinical well-being.

Case description: In July 2023, the patient was admitted to the Cardiology Department for episodes of chest pain. During her hospitalization, she underwent an echocardiogram that showed severe LVH affecting the middle segments, in particular the septum (max 22 mm), with apical dyskinesia (segment 17), and a large thrombotic formation (23x30 mm) attached; there was also slightly reduced global contractile function (EF 45%) and severely dilated left atrium (LAV 97 ml). CMR imaging confirmed the echo finding "compatible with initial aneurysmal dilatation of the apex of the LV, with extensive apical thrombosis, in a patient with marked asymmetric LVH with prevalent mid-ventricular localization and diffuse myocardial fibrosis". In addition, the patient underwent coronary angiography, which ruled out significant stenoses, and then was discharged with VKA, INR 2.5-3.5. In August 2023, the patient

underwent a follow-up CMR which showed "persistence of LV apical thrombotic stratification, unchanged for DT (28 mm) but slightly reduced in thickness (from 13 to 8 mm), with aneurysmal fibrotic apical evolution".

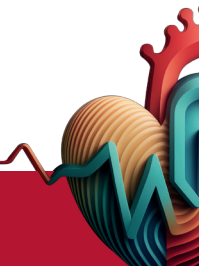
The patient was referred to our clinic for a more precise and complete phenotype evaluation. The ECG showed a complete RBBB and the color Doppler echocardiogram confirmed a marked asymmetrical hypertrophy, affecting the middle segments, with a max thickness at the middle septum (24 mm) which in systole completely obliterates the middle ventricular cavity, causing a complete absence of apical flow. Dyskinesias with thinning of the apex and extensive thrombotic formation have also been observed. The patient was referred for genetic consultation, aiming to investigate genes related to genetic thrombophilia and HCM using a NGS panel. The analyses conducted did not show any mutations related to thrombophilia, while no pathogenic and/or likely pathogenic variants were found for the HCM genes analyzed, highlighting only the presence of the variant c.1291G>A p.(Asp431Asn) in the MYBPC3 gene, expressed in heterozygosity, classified as a variant of uncertain significance (VUS).

In February 2024, the patient underwent a follow-up RMC with a HCM pattern substantially unchanged in morphology, with a further slight reduction in the size of the thrombotic formation in the apical site and a slight increase in left atrial volume.

Conclusions: This case highlights the importance of careful echocardiographic evaluation in the diagnosis and management of HCM, as there may be particular forms of obstruction that can cause complex clinical

pictures. The etiopathogenetic cause of the case remains uncertain, considering the purely hypertrophic phenotype extremely latent; we wonder if this genetic

variant, classified as a VUS, could in the future be identified as a clearly pathogenetic cause of the disease.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 385 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) SINCOPE (ARITMIE) ELETTROSTIMOLAZIONE (ARITMIE)

SUBCUTANEOUS FAT TISSUE OF CARDIAC DEVICE POCKET AS SCREENING BIOPSY FOR DETECTING AMYLOID DEPOSITION IN ELDERLY PATIENTS IMPLANTING PERMANENT CARDIAC DEVICES

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Background: Amyloidosis is usually diagnosed via Congo red staining of a biopsy from a clinically affected organ but may also be diagnosed through a so-called 'screening biopsy' of abdominal fat. Abdominal fat pad fine needle aspiration is a simple, inexpensive and low-risk procedure that is currently the most widely used screening biopsy technique. Deep subcutaneous fat can be easily obtained through intraprocedural biopsy from a cardiac device pocket in patients with conduction system disease requiring permanent cardiac device implantation. In this population, cardiac amyloidosis has been reported in a proportion ranging from 2% to 9% of cases.

Objective: The aim of the study is to evaluate the clinical impact of subcutaneous fat biopsy of a cardiac device pocket as "screening biopsy" for diagnosing amyloidosis in elderly patients requiring permanent cardiac device implantation.

Methods: This is a prospective study on a consecutive cohort of unselected patients aged ≥ 70 years or older who underwent clinically-indicated permanent cardiac device implantation. Subcutaneous adipose tissue was collected during the creation of the device pocket and subsequently analysed with Congo red staining

to detect amyloid deposition. All patients enrolled entered into a protocolized program including clinical assessment, laboratory tests and echocardiography.

Results: A total of 50 consecutive patients consented to participate and were enrolled in the study: mean age was 81 ± 6 years, 25% (n=25) were female, 46% (n=23) had a history of heart failure, and 12% (n=6) had a serum monoclonal protein. Table shows the characteristics of patients at the time of cardiac device implantation. Clinical indications for device implantation were a) paroxysmal or permanent AV block (56%, n=28), b) sinoatrial (SA) block or tachy-brady syndrome (20%, n=10), c) AF with symptomatic low heart rate (12%, n=6), d) syncope with documented asystolic pause/s > 3 s (2%, n=1), and e) other reasons (10%, n=5).

All subcutaneous fat tissue samples were suitable for histological analysis. Histological analysis of subcutaneous fat obtained from a device pocket with Congo red stained did not identify amyloid deposition in any sample.

A total of 12 patients (24%) had suspicion of cardiac amyloidosis based on clinical features, laboratory tests and echocardiography (≥ 2 red flags). They are currently being assessed for the presence of cardiac amyloidosis.

Parameters	Study population (n=50)
Age (years)	81 ± 6
Female sex	25 (50%)
BMI (kg/m ²)	27 ± 5
Carpal tunnel syndrome:	
Unilateral	1 (2%)
Bilateral	1 (2%)
Hypertension	44 (88%)
Diabetes	16 (32%)
Ischemic heart disease	13 (26%)
History of atrial fibrillation	21 (42%)
History of Heart Failure	26 (52%)
Serum monoclonal protein	6 (12%)
NYHA class:	
I	7 (14%)
II	15 (30%)
III	3 (6%)
IVS, mm	12 ± 3
PW, mm	10 ± 2
LVEF, %	55 ± 14
Moderate-severe AS	10 (20%)
Pericardial effusion	2 (4%)
Granular sparkling	3 (6%)
Implanted device:	
PM	45 (90%)
ICD	2 (4%)
CRT-P	1 (2%)
CRT-D	2 (4%)

Table 1

Conclusions: Subcutaneous fat biopsy of a cardiac device pocket is not a cost-effective “screening biopsy” for diagnosing amyloidosis among unselected older patients with a clinical indication to permanent cardiac device implantation.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 914
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)**

**OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY ASSOCIATED WITH PHOSPHOLAMBAN P.LEU39*
VARIANT**

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Hypertrophic cardiomyopathy (HCM) is the most common subtype among hereditary cardiomyopathies, and it is defined as the presence of increased left ventricular wall thickness or mass not entirely explained by abnormal loading conditions. In about half of cases, HCM is caused by a monogenic disease-causing variant, mostly in the cardiac sarcomere protein genes. We report the case of a 67-year-old woman with familial history of HCM (mother). In 2022 she started complaining of dyspnea on moderate exertion. A cardiologic examination was performed. ECG showed sinus rhythm with non-specific ST-T changes. On echocardiogram, asymmetric hypertrophy of the left ventricle was found, together with left ventricle outflow tract obstruction (LVOTO) (resting maximal gradient 65 mmHg, maximal gradient after Valsalva maneuver 105 mmHg). She performed a cardiac magnetic resonance imaging, which showed mild asymmetric hypertrophic cardiomyopathy (maximal thickness 15 mm at anterior and inferior basal septum), with signs of edema in T2-STIR sequences and subepicardial late gadolinium enhancement (LGE) in distal inferior wall and mid-wall LGE in basal anterior and basal inferior septum. A 24 hours Holter ECG showed rare ventricular premature complexes. Medical therapy was optimized firstly with the introduction of disopyramide and later of nadolol. After six months a new echocardiogram confirmed signs of severe provoked LVOTO (resting maximal

gradient 18 mmHg, maximal gradient after Valsalva maneuver 114 mmHg), with complete systolic anterior movement (SAM) of the anterior mitral leaflet and mild-to-moderate mitral regurgitation. Patient was still symptomatic for dyspnea on moderate exertion. Genetic testing was performed and showed a pathogenetic variant on the phospholamban (PLN) gene (c.116T>G, p.Leu39*). The patient was enrolled in the MAPLE-HCM trial, a phase 3, randomized, double-blind trial comparing myosin inhibitor aficamten with metoprolol succinate. Three months after inclusion in the study patient's symptoms improved. On echocardiography a slight reduction in LVOTO was found. However, the ECG showed a significant increase in heart rate, with the appearance of frequent premature ventricular complexes.

In this article we illustrated the case of a woman with obstructive HCM caused by p.Leu39* variant on PLN gene. PLN is a membrane protein that plays an essential role in regulating cardiac contractility and relaxation given its strict association with the sarcoplasmic/endoplasmic reticulum Ca²⁺-ATPase (SERCA), an enzyme responsible for the handling of intracellular calcium and for maintaining its homeostasis in the myocytes. Only a small percentage of HCM patients show a PLN-disease-causing variant. On the other side, although the phenotype of p.Leu39* variant carriers in the PLN gene has been shown to vary considerably,

recent studies demonstrated that it is more frequent hypertrophic with a potential to evolve towards a dilated phenotype. Moreover, it has been showed that patients with HCM and p.Leu39* variant on PLN gene are at greater risk for ventricular arrhythmias compared with the most common variants associated

with HCM. Our patient was diagnosed at an advanced age with a relatively mild degree of hypertrophy. Nevertheless, patient was symptomatic and LVOTO on echocardiography was severe. These findings reinforce the need to routinely include PLN in the panel of genes tested in HCM patients.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 459 MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO) RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)

MIOCARDITE FULMINANTE DI LYME SENZA ALTRI SEGNI DI MALATTIA SISTEMICA

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Giulia Ceccotti (a, b, c), David Mecali (a, b, c), Marco Giuranna (a, b, c), Erberto Carluccio (a, c),
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M. di 45 anni accede in PS per dispnea ingravescente e ortopnea. Nei 15 gg precedenti febbre e tonsillite trattate con amoxicillina/ac.clavulanico senza beneficio. Anamnesi: familiarità per cardiopatia ischemica, senza ulteriori elementi di rilievo. Alla valutazione in PS: grave ipotensione (PA 65/40), segni di ipoperfusione periferica e di congestione venosa polmonare e sistemica. All'ECG: tachicardia sinusale, PR nella norma. All'ETT: severa riduzione della funzione sistolica del ventricolo sinistro (FE 20%). Veniva posta diagnosi di shock cardiogeno, si trasferiva il paziente in UTIC e si impostava terapia inotropica e diuretica ev. Alla coronarografia: assenza di stenosi significative; veniva posizionato IABP come supporto al circolo. Al successivo ETT di controllo presenza di trombosi intraventricolare multipla sinistra per cui si impostava terapia anticoagulante con warfarin. Venivano effettuati esami sierologici mirati alla ricerca di cause infettive di miocardite con riscontro di positività alle IgM anti-Borrelia Burgdorferi, per cui veniva aggiunta terapia specifica con ceftriaxone con immediato beneficio clinico. La RMN cardiaca eseguita a condizioni cliniche stabilizzate, confermava la diagnosi di miocardite per riscontro di edema intramiocardico a livello di SIV, parete inferiore e anteriore e di estese e parzialmente confluenti aree di LGE a distribuzione mesocardica a livello del SIV medio-basale, della parete anteriore ed infero-laterale; ulteriore area di LGE a livello della parete libera del ventricolo destro nel tratto basale. Al momento della dimissione, dopo adeguata terapia antibiotica, svezzamento progressivo dai farmaci inotropi e progressiva risoluzione del quadro di congestione sistemica e polmonare, si assisteva ad un parziale

completo della funzione contrattile del ventricolo sinistro e alla scomparsa della trombosi intraventricolare. In considerazione delle estese aree di LGE alla RMN cardiaca e alle numerose aritmie ventricolari (TVNS) registrate durante la degenza nonostante la titolazione della terapia betabloccante, veniva applicato defibrillatore indossabile (Life-Vest) in vista della dimissione. Ai successivi controlli ambulatoriali, si evidenziava un completo recupero della funzione sistolica del ventricolo sinistro, per cui dopo 3 mesi in assenza di aritmie ventricolari, si rimuoveva Life-Vest. Le RMN cardiaca di controllo effettuate a 6 e 12 mesi di distanza dall'evento acuto, mostravano una progressiva riduzione, seppur non completa, delle aree di LGE precedentemente descritte.

La malattia di Lyme è un'infezione trasmessa dalle zecche e causata dalla spirocheta *Borrelia* spp.

Le manifestazioni cardiache della malattia si verificano nell'8% dei pazienti e sono tipicamente rappresentate da anomalie della conduzioni atrio-ventricolare e, più raramente, miocardite.

Sono tuttavia descritti in letteratura rari casi in cui la miocardite fulminante da *Borrelia* può rappresentare la prima e unica manifestazione della malattia, anche senza i tipici segni sistemici e senza le classiche manifestazioni bradiaritmiche. Questo caso dimostra come le manifestazioni della malattia di Lyme possano essere atipiche e sottolinea la difficoltà di valutazione e comprensione della cardite di Lyme. Tuttavia, la diagnosi tempestiva è fondamentale, perché se la malattia viene trattata secondo le attuali linee guida, la prognosi è altamente favorevole. Attualmente, non vi sono chiare prove di un'associazione tra borreliosi e CMP dilatativa.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 597

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) MIOCARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

MIOCARDITE RICORRENTE: RED FLAG DI UNA SOTTOSTANTE CARDIOMIOPATIA?

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Uomo di 16 anni. Giunge in Pronto Soccorso per dolore toracico retrosternale di tipo oppressivo, subcontinuo e irradiato all'arto superiore sinistro insorto nella notte. Riferisce episodio febbrile circa tre giorni prima efficacemente trattato al domicilio con Ibuprofene.

Alla visita: parametri vitali nei limiti della norma.

In anamnesi: pregressa miocardite acuta (2 anni prima).

Pre-eccitazione ventricolare tipo WPW. Pregressa attività sportiva agonistica (Rugby).

Non assume terapia domiciliare. Non familiarità per CAD o morte improvvisa.

Agli esami ematici: PCR 57.26 mg/L (v.n. 0 - 5.0), Troponina T 1872 pg/mL (v.n. 0 - 14.0), NTproBNP 759 pg/mL (v.n. < 450).

All'ECG: R/s a 74 bpm, sopraslivellamento del tratto ST in sede infero-laterale, BBDx, alcuni battiti pre-eccitati.

All'Ecocardiogramma: Ventricolo sinistro di dimensioni e spessori nei limiti. Funzione sistolica globale nei limiti (FE 55%) con ipocinesia medio-basale della parete inferiore e medio-apicale della parete infero-laterale. Lieve IM. Sezioni destre nei limiti. Minimo scollamento pericardico ed aspetto iperrifrangente dei foglietti pericardici.

Seguiva ricovero in UTIC per sospetta recidiva di miocardite acuta e si impostava terapia con Pantoprazolo 20 mg 1 cp; SF 500 ml a 42 ml/h; Indometacina 50 mg 1 cp x 3; Ivabradina 5 mg ½ cp x 2.

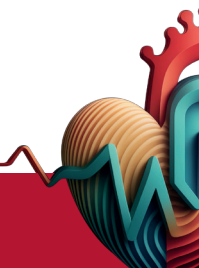
Durante la degenza si assisteva ad un progressivo miglioramento della sintomatologia e ad una lenta riduzione degli indici di miocardiocitonecrosi e degli indici di flogosi fino a normalizzazione.

Veniva eseguita una RM cardiaca che evidenziava una lieve riduzione della funzione contrattile biventricolare ed estesi aspetti di delayed enhancement (DE) a distribuzione subepicardica ed intramurale con interessamento pressoché circonferenziale del ventricolo sinistro in parte associato a fenomeni di edema miocardico. In tali sedi il reperto sarebbe congruo con il sospetto di miocardite ma la presenza di DE negli altri segmenti, la progressione del quadro rispetto all'esame eseguito durante il primo episodio di miocardite, nonché la concomitante lieve riduzione della funzione contrattile biventricolare e la ricorrenza degli episodi ponevano il sospetto di una sottostante cardiomiopatia.

Eseguita a due mesi di distanza una RM cardiaca di controllo che, rispetto al precedente esame, confermava la lieve riduzione della FE nonché una lieve riduzione delle aree di edema miocardico con persistenza degli aspetti estesi di DE.

Nel sospetto che tali episodi ricorrenti di miocardite fossero delle "hot phases" di una sottostante cardiomiopatia aritmogena, il paziente veniva sottoposto a test genetico per il momento in corso di analisi.

La cardiomiopatia aritmogena dovrebbe essere presa in considerazione nelle forme ricorrenti di miocardite. Tali "myocarditis-like episodes", infatti, possono essere la presentazione iniziale della cardiomiopatia aritmogena (nello specifico della DSP-Cardiomyopathy, associata a mutazione del gene che codifica per la desmoplachina) ed entrare in diagnosi differenziale con la miocardite acuta.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 270
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MULTI-MODALE/IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL
PERICARDIO)

EARLY ECHOCARDIOGRAPHIC AND CMR PREDICTORS OF CARDIAC AMYLOIDOSIS IN PATIENTS
WITH PERUGINI SCORE 0-1

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Background: Cardiac amyloidosis (CA) is a significant contributor to cardiac conditions due to amyloid fibril accumulation, and can be diagnosed through typical echocardiographic, scintigraphy, or CMR findings. In patients with a grade 1 Perugini score, the likelihood of ATTR cardiac amyloidosis is low. CMR can highlight cardiac involvement, while scintigraphy has limitations due to tracer uptake variability in certain ATTRv mutations. In CA, atrial enlargement is common. Late gadolinium enhancement (LGE) CMR aids atrial evaluation but may underestimate involvement due to patchy LGE and nulling issues. Left atrial strain via speckle tracking echocardiography is an early diagnostic marker, outperforming left ventricular and clinical parameters.

Objectives: The aim of the study is to evaluate echocardiographic parameters, including left atrial strain and left ventricular GLS along with cardiac magnetic resonance imaging in patients who were assessed for suspected cardiac amyloidosis but had a negative scintigraphy result (Perugini score 0-1). We aimed to identify a predictor that can provide early detection of transthyretin (TTR) cardiac amyloidosis focusing on atrial involvement. By targeting atrial changes, potentially preceding ventricular involvement, it seeks to improve early diagnosis and treatment efficacy. We aimed to

assess atrial involvement as early marker of cardiac amyloidosis in Perugini score 1 patients both with speckle tracking, but also with feature tracking by CMR, in order to enhance left atrial strain evaluation with the higher spatial and temporal resolution of this technique.

Methods: We retrospectively included 19 patients who had a Perugini score of 0-1 and had undergone comprehensive cardiac evaluation including echocardiography for suspected amyloidosis. The patients underwent both echocardiography and cardiac MRI to identify those who, despite having a Perugini score of 0-1, tested positive for amyloidosis on cardiac MRI.

Results: In total, 19 patients were included in the study. The average age was 73 ± 13 years old, with only 20% (n=4) being female. All these patients had previously undergone a total body bone scintigraphy that yielded negative results for amyloidosis (Perugini score 0-1). Subsequently, all patients underwent cardiac MRI, with 35% (n=7) testing positive for amyloidosis. The average EF was $50.7 \pm 13\%$, and the average IVS was 14.5 ± 1.5 mm. The average left atrial volume was 93 ± 33 ml, the average left atrial area was 25 ± 5 mm², the average septal interatrial thickness was 9 ± 1.7 mm, and the average right ventricular free wall thickness was $8.7 \pm$

1.9 mm. The RVFAC was $43 \pm 10\%$, the average GLS was $-13 \pm 4\%$, and the average NT-proBNP was 2915 ± 3914 ng/l. The group with positive cardiac MRI for amyloidosis exhibited a higher E/e' ratio (15 ± 5 vs 12 ± 7) and thicker posterior wall dimensions (14 ± 0.7 mm vs 12 ± 2 mm), without reaching statistical significance.

Conclusions: Our study revealed that a portion of individuals who initially tested negative on MRI

subsequently tested positive after several years. Although a higher E/e' ratio and greater lateral wall thickness were observed in the group that developed the disease, none of the analyzed parameters showed statistically significant correlations with the progression of the disease, likely due to the small sample size. Future studies are necessary to determine if echocardiographic or MRI parameters can predict disease progression effectively.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 948
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MULTI-MODALE/IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
ASPETTI GENETICI DELLE ARITMIE (ARITMIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)**

PROLASSO MITRALICO E ARITMIE VENTRICOLARI: POSSIBILE ROULO DI UNA CARDIOMIOPATIA ASSOCIATA

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Presentiamo il caso di un uomo di 39 anni, senza fattori di rischio cardiovascolare, noto per un episodio di fibrillazione atriale (FA) insorto durante attività sportiva all'età di 27 anni sottoposto a cardioversione farmacologica. In quell'occasione, mediante gli accertamenti eseguiti in PS, veniva inoltre fatta diagnosi di prolasso mitralico bilembo con insufficienza mitralica di grado moderato.

Nei successivi anni, eseguiva regolare follow up cardiologico mediante Holter ECG delle 24 ore seriati che mostravano mantenimento stabile del ritmo sinusale e frequenti battiti ectopici ventricolari (BEV), talora in coppia, per cui eseguiva test ergometrico negativo per ridotta riserva coronarica.

Inquadro inizialmente come prolasso mitralico aritmogeno (AMVP), eseguiva di recente risonanza magnetica (RMN) cardiaca con evidenza di lieve dilatazione ventricolare sinistra in presenza di LGE subepicardico dei segmenti basali della parete infero-laterale ed inferiore ed LGE mesocardico giunzionale in sede inferiore. Giungeva alla nostra attenzione per rivalutazione dell'entità della valvulopatia mitralica ed eventuale valutazione cardiocirurgica.

All'ecocardiografia transtoracica si confermava la presenza di dilatazione ventricolare sinistra, associata inoltre a sfumate alterazioni della cinesi regionale e riduzione degli indici di global longitudinal strain (GLS), nel contesto tuttavia di una valvulopatia di entità lieve-moderata, ritenuta incapace di spiegare da sola i suddetti reperti strumentali.

In considerazione della storia di FA giovanile, della presenza ad ECG basale di BAV di I grado, emiblocco anteriore sinistro, l'assenza di inversione delle onde T nelle derivazioni inferiori e dei reperti ecocardiografici e alla RMN cardiaca, si poneva il sospetto di cardiomiopatia dilatativa (DCM) associata a prolasso mitralico.

Si avviava dunque a test genetico, risultato a distanza di mesi positivo per una mutazione di classe IV a carico del gene *TTN* compatibile con il sospetto di DCM.

L'AMVP è ad oggi un'entità clinica di rilevante interesse scientifico, ma di difficile gestione clinica, specie nel giovane adulto, a causa dell'assenza di algoritmi o score che ci permettano di stratificare adeguatamente il rischio aritmico in prevenzione primaria.

Tuttavia, data l'elevata prevalenza del prolasso mitralico nella popolazione generale, non sempre la causa di fenotipi aritmici è da riferire alla presenza di prolasso mitralico. Questo caso mette in mostra come la presenza di possibili red flags cardiomiopatiche vada ricercata, e qualora presente come possa essere meritevole di approfondimento mediante test genetico, poiché la diagnosi di cardiomiopatia associata a prolasso mitralico può avere un impatto nel follow up e nella gestione clinica del paziente. L'associazione fra cardiomiopatia e prolasso mitralico è un ambito ancora non esplorato, e la possibilità della correlazione di una componente cardiomiopatica in pazienti con prolasso mitralico a fenotipi aritmico è un'ipotesi da considerare e che apre a nuovi scenari di ricerca.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 927

PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

IMAGING MULTI-MODALE/IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

PERICARDITE COSTRITTIVA DALLA PRESENTAZIONE AMBIGUA: WORK-UP DIAGNOSTICO E IMAGING MULTI-MODALE

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Introduzione: La pericardite costrittiva è una rara condizione che limita il riempimento diastolico cardiaco a causa dell'ispessimento e della perdita di elasticità del pericardio. La diagnosi può risultare complessa a causa della varietà e dell'ambiguità dei sintomi clinici, come dolore toracico e segni di scompenso cardiaco destro, che possono essere attribuibili a diverse altre patologie cardiovascolari. Presentiamo il caso di un paziente con sospetta pericardite costrittiva e l'iter diagnostico che ha portato alla diagnosi definitiva.

Caso Clinico: Un uomo di 41 anni, originario del Togo, iperteso e dislipidemico, si presenta in PS per episodi recidivanti di dolore toracico e dispnea da sforzo, culminati in un episodio sincope. L'ECG mostrava onde T negative in sede laterale e inferiore, e gli esami di laboratorio, inclusi BNP e troponina, risultavano nella norma. Il paziente è stato ricoverato con il sospetto clinico di angina instabile. L'ecocardiogramma ha evidenziato un ventricolo sinistro lievemente ipertrofico

con FE 50% e con un movimento anomalo del setto interventricolare ("septal bounce"), suggestivo di interdipendenza ventricolare. L'inversione dell'annulus (e' laterale < e' mediale), i valori estrapolati dallo strain longitudinale (ridotti a livello delle pareti libere e conservati a livello del setto ventricolare) (Figura A) e la presenza di ispessimento pericardico con calcificazioni diffuse hanno ulteriormente rafforzato il sospetto di pericardite costrittiva. La coronarografia ha escluso una patologia coronarica significativa, mentre il cateterismo cardiaco ha mostrato un pattern emodinamico caratteristico, con equalizzazione diastolica delle pressioni ventricolari e segno del "dip and plateau" (Figura B). La successiva TC torace ha rilevato ispessimento e calcificazioni pericardiche diffuse (spessore massimo 12 mm) (Figura C) e la valutazione infettivologica, dopo l'esecuzione di esami di laboratorio specifici, ha confermato la presenza di un'infezione latente da *Mycobacterium tuberculosis*.

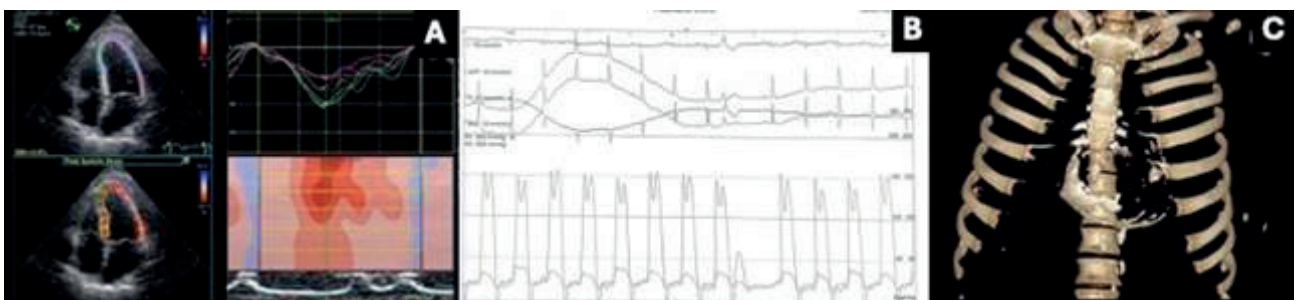
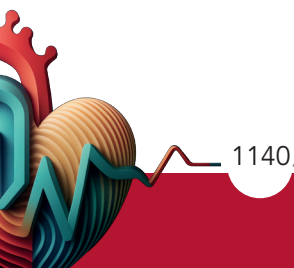


Figure 1



Discussione: La pericardite costrittiva si manifesta con segni clinici spesso sfumati, richiedendo una diagnosi differenziale accurata e il riconoscimento di specifiche "red flags" per alimentarne il sospetto clinico. Gli esami strumentali, tra cui ecocardiografia, TC e cateterismo

cardiaco, sono fondamentali per confermare la diagnosi. In questo caso, l'origine tubercolare del processo infiammatorio, con successiva cronicizzazione, ha portato alla calcificazione pericardica. La pericardiectomia è stata indicata come trattamento definitivo.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 209 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE) PROGNOSI (SCOMPENSO CARDIACO)

LEFT ATRIAL STRAIN IN PATIENTS WITH TAKOTSUBO SYNDROME: A LONGITUDINAL PROSPECTIVE STUDY

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(a) CARDIOLOGY UNIT, UNIVERSITY OF FOGGIA, ITALY

Background: Takotsubo Syndrome (TTS) is featured by transient left ventricular systolic dysfunction. Recent studies showed that a subset of patient after the acute event could develop a persistent, long-term heart failure phenotype. However, data on long-term atrial function are scarce.

Aim: evaluate left atrial function through echocardiographic parameters in patients with TTS after complete functional recover.

Methods and results: 35 patients with TTS were matched with 35 controls. There were no differences in term of age, sex and cardiovascular risk factors between groups. Among TTS patients, majority were female (94.2%) and median age was 70.2 ± 13.1 years. Left ventricular ejection fraction was preserved in both cohorts. Between groups, there no differences

in term of antero-posterior Left atrial diameter (36.7 ± 5.3 vs 36.6 ± 5 mm $p=0.43$) and global left ventricular longitudinal strain (-18.5 ± 3.1 vs $-18.6 \pm 6.7\%$ $p=0.64$).

However, all phases of LA mechanics were more impaired among TTS patients vs control (LA strain reservoir: 31.9 ± 11 vs $40.3 \pm 15\%$, $p = 0.01$). At long term follow-up 4 out of 35 patient (11.4 %) experienced cardiovascular re-hospitalization. At multivariable analysis including age, gender, LV strain and LA reservoir strain, age and LA reservoir strain were independent predictors of cardiovascular re-hospitalization.

Conclusion: patients with takotsubo syndrome have at long-term an impaired left atrial function. This parameter was able to identify those at risk for cardiovascular re-hospitalization.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 565
TUMORI CARDIACI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)**

HEART OR LIVER? THAT IS THE DILEMMA. A RARE CASE OF METASTATIC POORLY DIFFERENTIATED ANGIOSARCOMA

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Case report: A 75-year-old women presented to the ED with ADHF and fast A-Fib. Past medical history included a recent breast cancer (Luminal B, pT1c pN0 M0; radical surgical + adjuvant HT). CT scan was performed revealing an incidental irregular mass in the right atrium (32x28x23 mm) with early contrast enhancement and rapid wash-out (F.1). Additionally, there were multiple hepatic focal hypodensity lesions with early periferical nodular contrast enhancement and hyperechoic target-like appearance at US-completion (F.2). TTE (F.3) and TEE (F.4) revealed an isoechogenic,

protruding, lobulated mass at right atrium wall near the cava veins, as confirmed by CMR demonstrating isointense signal in T1 sequences, inhomogeneous hyperintensity in EGE sequences, inhomogeneous enhancement in LGE sequences and with high native intralesional T1 mapping values (1700 ms), suggesting a solid lesion (F5).

PET-CT confirmed the neoplastic nature (SUV max 19.6), while a CEUS-guided liver biopsy (BEM controindicated), revealed a high-grade poorly differentiate malignant angiosarcoma (Vim+, ERG+,

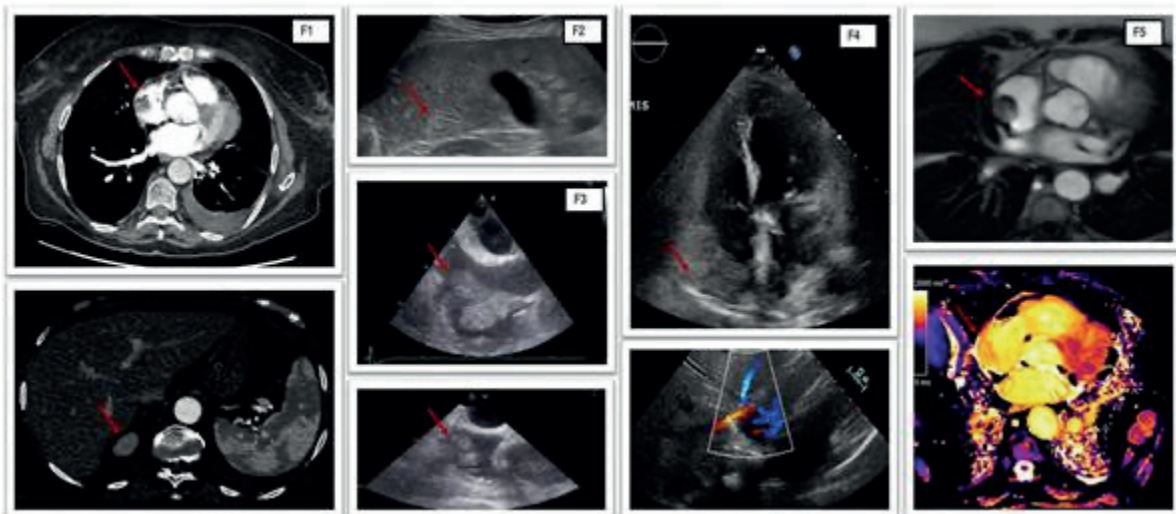
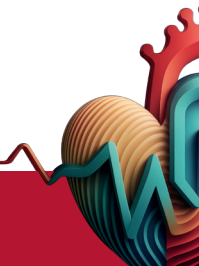


Figure 1

CD34+, FVIII+/-, Glyp3-, GATA 3-, Ki67>65%). The patient was referred for palliative chemotherapy (Gem).

Discussion: The most frequent cardiac malignant tumors are metastasis. Among primary tumors, the most common are those of mesenchymal origin, including angiosarcoma (CA). CA typically appear as lobulated mass in the right atrium, with pericardial extension. At CMR it has a typical cauliflower appearance (T1) with areas of necrosis and hemorrhage (T2), high vascularization (EGE) and heterogeneous enhancement

(LGE). Glyp3 - GATA-3 - (typically + in hepatic and breast tumors) and ERG + suggest a cardiac origin, while the hepatic lesions' features are typical of primary hepatic angiosarcoma. In literature there are few cases of CA with liver metastasis, although the cardiac metastasis of a primary hepatic angiosarcoma are even rarer. A clear definition of the etiological nature in our case is not possible, though a primary cardiac origin is probable despite the lacking of direct pericardial involvement. This case highlights the importance of tissue characterization with multimodality imaging and molecular biology in cardiac masses.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 956
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
SINCOPE (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)**

**RECURRENT SYNCOPE: WHAT IF IT WAS THE ARRHYTHMOGENIC RIGHT VENTRICULAR
CARDIOMYOPATHY?**

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Giuseppe Leggio (a), Danilo Puccio (a), Giorgio De Michele (a), Gianfranco Ciaramitaro (a),
Giuseppe Coppola (a), Alfredo Ruggero Galassi (a), Giuseppina Novo (a), Egle Corrado (a)
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Case presentation: We present the case of a 36-year-old man, smoker and with a family history of sudden death of his father at the age of 45. He had a clinical history of recurrent syncopal episodes since he was young. He was admitted to the hospital for a syncopal episode preceded by vertigo. On the examination patient was conscious, oriented and without neurological deficits. In the blood tests D-dimer was 1389 ng/ml (normal value < 500 ng/ml). Therefore, in the suspicion of pulmonary embolism, chest CT angiogram was performed, with negative result. In the suspicion of cardiogenic syncope, a cardiological evaluation was performed. Initial ECG suggested sinus bradycardia, first degree AV block, right bundle branch block, epsilon wave in right precordial leads, negative T waves from V1 to V5 and in DII, DIII, avF, low voltages in the periferial leads. Color Doppler echocardiogram revealed normal endocavitary dimensions and wall thicknesses of left ventricle. Preserved left ventricular ejection fraction (LVEF 55%). Severely dilated right ventricle with systolic-diastolic D-shape, right ventricular basal diameter 75 mm, TAPSE 19 mm, reduced right ventricle radial function (FAC 25%). Presence of apical hypertrabeculation. No evidence of wall aneurysms. Severe tricuspid insufficiency with multiple regurgitant jets among the entire coaptation rim. A diagnosis of arrhythmogenic right ventricular cardiomyopathy was made according to the criteria of the 2010 International Task Force: presence of two major criteria (regional right ventricular dyskinesia

associated with RVOT PLAX 55 mm, RVOT PSAX 38 mm and epsilon waves in the right precordial leads) and one minor criterion (negative T waves from V1 to V5 in the presence of RBBB). Patient was admitted to the intensive care unit to continue monitoring and diagnostic-therapeutic work-up. During the hospital stay, various episodes of non-sustained ventricular tachycardia (NSVT) occurred. Cardiac magnetic resonance was performed which confirmed the diagnosis and showed severe right ventricular dilatation (EDVi251 ml/m², ESVi 231 ml/m²), reduced right ventricular ejection fraction (RVEF 8%), diffuse right ventricular dys-hypokinesia. Subsequently, a dual-chamber implantable cardioverter-defibrillator (ICD) was implanted for primary prevention of sudden cardiac death.

Discussion and conclusion: Arrhythmogenic right ventricular cardiomyopathy (ARVD) is a genetic disease characterized by the progressive loss of myocardium and its replacement with fibro-adipose tissue. The diagnosis is multiparametric and the main aim of therapy is the prevention of arrhythmic sudden death (SD). Implantation of a defibrillator (ICD) is the only effective therapy for the prevention of SD. This therapy should be reserved for patients with a history of cardiac arrest and those with major risk factors, including unexplained syncope (not vasovagal), non-sustained ventricular tachycardia and moderate-severe right ventricular dysfunction.

MALATTIE DEL MIOCARDIO E DEL PERICARDIO 6 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA (ASSISTENZA CARDIACA IN ACUTO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

ALCOHOL-RELATED DILATED CARDIOMYOPATHY: CLINICAL PATHOPHYSIOLOGY, SCREENING AND DIAGNOSTIC CRITERIA

Pasquale De Luca (a), Vito Sollazzo (a), Angelo Benvenuto (a), Antonio De Luca (a)
(a) OSPEDALE "T. MASSELLI-MASCIA" - SAN SEVERO ASL FG

Background: Caused by chronic alcohol consumption, characterized by ventricular dilation and impaired cardiac function; It is a major cause of non-ischemic dilated cardiomyopathy.

Clinical case: A thirty-year-old romanian man comes to the emergency room suffering from chest pain and palpitations. Medical history: smoking, dyslipidemia, alcoholism. Vital parameters are discreet. Physical examination: exertional dyspnea, sloping edema and asthenia. Blood tests: macrocytic anemia, impaired hepato-renal function, increased BNP and troponin. ECG: sinus tachycardia, left ventricular hypertrophy. Chest x-ray: chronic bronchitis, cardiomegaly, bibasal pleural effusion. Echocardiogram: hypertensive heart disease with dilated evolution, ejection fraction 40%. Abdominal ultrasound: liver stasis. The patient presents a sudden loss of consciousness, the ECG shows sustained ventricular tachycardia for which he is defibrillated and subjected to a haemodynamic study (negative for coronary artery disease). Targeted treatment for heart failure, ICD implantation and discharge.

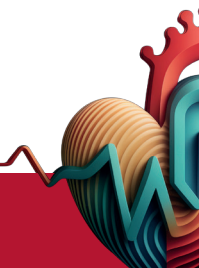
Conclusions: Long-term cardiotoxicity of alcohol is a recognized cause of non-ischemic cardiomyopathy. Pathogenesis: alcohol toxicity on mitochondria and induction of oxidative stress, apoptosis, structural modifications of actin and myosin and alterations of calcium homeostasis; this causes an increase in mitochondrial fragmentation due to an increase in the

levels of reactive oxygen species in myocytes, with oxidation of lipids, proteins and DNA. Consequences: activation of compensatory mechanisms in response to cardiac dysfunction, such as the renin-angiotensin-aldosterone system and the increase in sympathetic signaling and brain natriuretic peptides, which in turn would be responsible for an increase in preload, dilation of the left ventricle and decreased cardiac output.

Clinical: orthopnea and/or paroxysmal nocturnal dyspnea, heart palpitations, syncopal episodes due to tachyarrhythmia, muscle atrophy, asthenia, peripheral edema, etc. Possible: liver disease, folate deficiency, increased risk of bleeding from liver failure, malnutrition, peripheral neuropathy, and neurologic conditions such as Wernicke-Korsakoff syndrome.

Diagnosis: history of alcoholism. Average corpuscular volume and liver function are indicative of alcohol use. ECG: atrial/ventricular extrasystoles, supraventricular tachycardias, atrioventricular blocks, bundle branch blocks, QT prolongation, nonspecific changes in the ST-T segment, abnormal Q waves. Chest x-ray: cardiomegaly, hilar congestion, pleural effusion. Echocardiogram: dilated cardiomyopathy, with hypokinetic, dilated cardiac cavities in the absence of primary valvular disease; left ventricular end-diastolic dimension 2 standard deviations greater than normal; left ventricular ejection fraction < 50%.

Therapy: stop alcohol! Useful diuretics, ACE inhibitors/sartans, beta-blockers. Consider implanting a pacemaker or ICD.



MALATTIE DEL MIOCARDIO E DEL PERICARDIO 675
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
ARITMIE VENTRICOLARI (ARITMIE)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)

ACUTE RESPIRATORY DISTRESS AND CARDIOGENIC SHOCK IN 80 YEAR OL FEMALE: A CASE REPORT ON THE DIFFERENTIAL DIAGNOSIS BETWEEN EOSINOPHILIC MYOCARDITIS AND TAKOTSUBO SYNDROME

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(a) POLICLINICO UMBERTO I - UOC CARDIOLOGIA E ANGIOLOGIA B

Takotsubo Syndrome (TTS), also known as stress-induced cardiomyopathy, can mimic acute coronary syndromes but is usually triggered by emotional or physical stress. Differentiating TTS from other forms of myocarditis, such as eosinophilic myocarditis, is crucial given the differences in management and prognosis. This case involves an elderly female with a complex medical history who developed severe cardiopulmonary symptoms after an NSAID-triggered allergic reaction, presenting a significant diagnostic challenge.

This case discusses an 80-year-old female from Australia, with a history of paroxysmal atrial fibrillation, bronchial asthma, and multiple anaphylactic reactions to acetylsalicylic acid and NSAIDs. No known cardiovascular risk factors were present.

After a long flight to Italy, the patient developed a headache and took ibuprofen, despite her known NSAID allergy. Shortly after, she experienced dyspnea and wheezing. Upon arrival at the Emergency Department, the patient was critically ill, somnolent, and with pink frothy sputum —suggesting pulmonary edema. However, the acute onset following NSAID ingestion also raised the possibility of anaphylactic shock with pulmonary involvement. The presence of frothy sputum, acute hypercapnic respiratory failure, and evidence of cardiac dysfunction (low ejection fraction and congestive signs) pointed towards acute cardiogenic pulmonary edema. The sudden respiratory symptoms following known allergen exposure were consistent with an anaphylactic event, potentially complicated by bronchospasm and pulmonary edema. Given the overlap in clinical

features, the immediate treatment approach included managing both potential causes with corticosteroids, bronchodilators, and diuretics. The ecg revealed sinus rhythm at 90 bpm, no acute ischemic changes, but global hypokinesia (EF 20%) on echocardiography suggested cardiogenic involvement. Lab Results revealed slightly elevated troponin levels, with an initial Tnl of 0.029 µg/L, rising to 0.47 µg/L. Chest X-ray indicated interstitial edema, consistent with pulmonary congestion. Coronary angiography showed no significant stenosis, ruling out an acute coronary syndrome. Ventriculography showed a globally dilated ventricle, non specific for Takotsubo syndrome. The patient experienced recurrent non-sustained ventricular tachycardia (NSVT), necessitating the use of lidocaine infusion.

As the acute respiratory and hemodynamic issues were stabilized, the diagnostic focus shifted to understanding the underlying cardiac dysfunction. The patient's history of asthma and multiple allergies raised the suspicion of eosinophilic myocarditis, a rare form of myocarditis that can present with similar cardiac dysfunction. Despite normal eosinophil counts, the clinical context and the absence of coronary artery disease kept this as a differential. The context of significant emotional and physical stress (long flight, allergic reaction), the new onset of inverted T waves in the precordial leads and prolonged QT, the echocardiographic findings of global hypokinesia with a mid-ventricular pattern suggested TTS. The absence of typical wall-motion abnormalities (like apical ballooning) complicated the diagnosis, making it atypical for classic Takotsubo Syndrome.



Ultimately, the patient underwent a Cardiac MRI which showed mid-ventricular TTS with a preserved basal and apical function, an ejection fraction of 40%, diffuse myocardial edema, and no late gadolinium enhancement, effectively ruling out eosinophilic myocarditis. Over the next several days, the patient's condition improved, with gradual recovery of left ventricular function (EF increased to 45% by discharge). She was discharged on 15/07 with instructions to remain in Italy for two more weeks for close follow-up and to undergo repeat cardiac MRI in 3-6 months to monitor recovery and rule out any residual cardiac dysfunction.

This case highlights the diagnostic challenges in differentiating between TTS and eosinophilic

myocarditis, both of which can present with similar clinical features in a patient with a complex medical history. The patient's rapid clinical improvement and the absence of eosinophilic infiltration on MRI supported the final diagnosis of mid-ventricular Takotsubo Syndrome. The case underscores the importance of considering a broad differential diagnosis in patients with acute heart failure and a history of severe allergic reactions.

This case underscores the complexity of diagnosing cardiac conditions with overlapping clinical presentations. Through careful evaluation and advanced imaging, Takotsubo Syndrome was identified as the underlying cause of this patient's acute cardiac event, with a favorable outcome following appropriate treatment.



**MALATTIE DEL MIOCARDIO E DEL PERICARDIO 886
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
ARITMIE VENTRICOLARI (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO
E DEL PERICARDIO)**

**PSYCHOLOGICAL STRESS AS A CONTRIBUTING FACTOR TO VENTRICULAR TACHYCARDIA IN
ARRHYTHMOGENIC CARDIOMYOPATHY: A CASE REPORT**

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(a) OSPEDALE SAN CARLO BORROMEO, MILANO; (b) UNIVERSITÀ DEGLI STUDI DI MILANO

Introduction: In literature it is known that catecholamine release, particularly related to physical exercise, can trigger ventricular arrhythmias in patients with arrhythmogenic cardiomyopathy. However, the implications of emotional stress on these arrhythmias are less well understood. We present the clinical case of a patient who experienced recurrent ventricular tachycardias during three hospital admissions.

Case description: The patient, a 58-year-old woman with a known mixed anxiety-depressive syndrome, began experiencing short episodes of palpitations with visual disturbances in January 2024. The patient underwent cardiological investigations, which yielded negative results, as well as an ultrasound of the supra-aortic trunks, which revealed critical carotid stenosis. During an initial hospitalization while awaiting carotid endarterectomy (CEA), the patient exhibited wide QRS tachycardia with a heart rate > 200 bpm, associated with hypotension and diaphoresis, which spontaneously reverted to sinus rhythm. She was transferred to cardiology, where coronary angiography showed no significant stenosis, and electrophysiological study did not induce supraventricular or ventricular arrhythmias. A Loop Recorder was implanted, and the patient was discharged on metoprolol 50 mg bid.

A month later, during another hospitalization for CEA, the Loop Recorder detected four episodes of nighttime ventricular tachycardia (VT), the longest lasting 4 minutes with a maximum heart rate of 200 bpm, which

were reviewed by our team a few days after discharge. The patient was contacted and promptly readmitted to Cardiology.

During this subsequent hospitalization, a recurrence of sustained ventricular tachycardia, symptomatic with palpitations, was documented via a 12-lead ECG, showing a heart rate of 200 bpm, left bundle branch block morphology, and an upper axis. The arrhythmia was terminated with intravenous bolus of amiodarone followed by oral amiodarone for antiarrhythmic prophylaxis. Cardiac MRI diagnosed arrhythmogenic cardiomyopathy with predominant involvement of the right ventricle. The following day, a single-chamber ICD was implanted, and the Loop Recorder was removed without complications.

Discussion: The documentation of ventricular arrhythmias only during hospital admissions and never during remote monitoring at home clearly highlights how psychological and environmental stress can be a trigger for ventricular arrhythmias in a patient with arrhythmogenic cardiomyopathy.

CONCLUSIONS In conclusion, while effective management of arrhythmias through continuous monitoring, antiarrhythmic therapy, and implantable devices is essential, further studies are needed to fully understand how psychological stress contributes to the manifestation of ventricular arrhythmias in arrhythmogenic cardiomyopathy.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

MISCELLANEA

MISCELLANEA 182

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
DISFUNZIONE DEL MICROCIRCOLO (CARDIOPATIA ISCHEMICA)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

CHRONOBIOLOGICAL VARIATION IN TAKOTSUBO SYNDROME: AN UPDATED SYSTEMATIC REVIEW AND META-ANALYSIS

Andreina Carbone (a, e), Maria Elena Flacco (b), Nicola Lamberti (b), Salvatore Rega (a), Eduardo Bossone (a), Rodolfo Citro (f), Lamberto Manzoli (c), Filippo Pigazzani (d), Roberto Manfredini (b)

(a) UNIVERSITA' FEDERICO II, NAPOLI; (b) UNIVERSITA' DI FERRARA; (c) UNIVERSITA' DI BOLOGNA; (d) UNIVERSITY OF DUNDEE, UK; (e) UNIVERSITA' DELLA CAMPANIA, LUIVI VANVITELLI, NAPOLI; (f) UNIVERSITA' DEL MOLISE

Background: Takotsubo syndrome (TTS) might exhibit a particular chronobiological pattern in its onset, characterized by variations according to time of the day, day of the week, and month of the year.

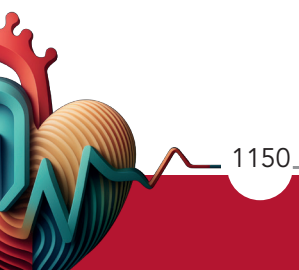
Aim: To explore the temporal pattern (circadian, weekly or seasonal) in the onset of TTS.

Methods: A systematic review and meta-analysis of literature were conducted for studies (2006-2024) reporting the temporal pattern (circadian, weekly or seasonal) in the onset of TTS. Twenty studies (including >64,000 subjects) fulfilled all eligibility criteria. Data were aggregated used random effects model as pooled risk ratio and the attributable risk (AR), and the population attributable risk (PAR) were assessed.

Results: The proportion analysis (including 8 studies; n=853) showed a decreasing pattern of the pooled rates of TTS shifting from the morning to the night (pooled TTS rates: 34.0%; 32.1%; 21.7%; 12.7% in the morning, afternoon, evening and night, respectively). The same pattern was observed stratifying by type of preceding stressful factor or event, considering physical stressors (pooled rates in the morning and night: 37.6% and 9.8%, respectively), and also in

case no event could be identified. The pooled rates of TTS onset peaked on Monday and Tuesday (17.3% and 18.4%), then declined during the week, reaching the lowest rates on Friday and Saturdays (10.6% and 10.8%, respectively), with no differences between the sexes. Also, TTS onset reached the highest values on summer, and the lowest in winter (27.9% versus 21.7% in summer and winter, respectively). The morning peak of TTS accounted for almost 33% of all the registered events, with a RR of 1.46 (95% CI: 1.38-1.54) and RR above 1: 1.26 (1.16-1.35) in the week-based analyses and 1.04 (1.04-1.05) in the season-based analyses.

Conclusion: TTS onset exhibits a specific chronobiological pattern, characterized with a peak in the morning, both considering stressor or not, and on Monday and Tuesday, declining during the week. Differing from other cardiovascular disease (e.g acute myocardial infarction, acute aortic dissection), TTS onset reached the highest values on summer. The information provided may be of help on tailoring related management and preventive strategies. However further studies are needed to fully understand underlying pathophysiological mechanisms.



MISCELLANEA 561
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO
(IPERTENSIONE ARTERIOSA)
MECCANISMI DELLE ARITMIE (ARITMIE)

ELECTROCARDIOGRAM AS A MARKER OF SEVERITY AND CARDIOVASCULAR RISK IN OBSTRUCTIVE SLEEP APNEA SYNDROME: A RETROSPECTIVE ANALYSIS.

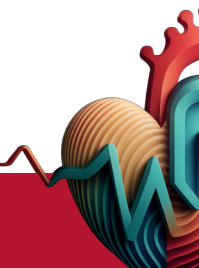
Simone Pasquale Crispino (a), Andrea Segreti (a, b), Daniele Valente (a), Emiliano Guerra (a, c), Martina Ciancio (a), Antonio Moffa (d), Manuele Casale (d), Gian Paolo Ussia (a), Francesco Grigioni (a)

(a) DEPARTMENT OF CARDIOVASCULAR SCIENCES, FONDAZIONE POLICLINICO UNIVERSITARIO CAMPUS BIOMEDICO DI ROMA; (b) DEPARTMENT OF MOVEMENT, HUMAN AND HEALTH SCIENCES, UNIVERSITY OF ROME "FORO ITALICO"; (c) CARDIOLOGY UNIT, DEPARTMENT OF BIOMEDICAL, METABOLIC AND NEURAL SCIENCES, UNIVERSITY OF MODENA AND REGGIO EMILIA; (d) UNIT OF INTEGRATED THERAPIES IN OTOLARYNGOLOGY, FONDAZIONE POLICLINICO UNIVERSITARIO CAMPUS BIO-MEDICO DI ROMA

Introduction: Obstructive Sleep Apnea Syndrome (OSAS) is a prevalent disorder characterized by repetitive episodes of upper airway obstruction during sleep, leading to significant cardiovascular risks. Despite its high prevalence and health burden, OSAS remains underdiagnosed. Cardiovascular alterations are common in OSAS patients, making the electrocardiogram (ECG) a potential non-invasive tool to identify individuals at increased cardiovascular risk due to OSAS.

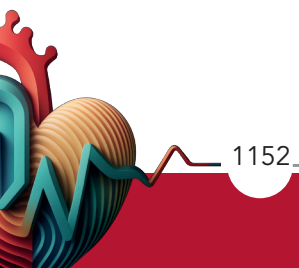
Methods: This retrospective investigated the association between OSAS severity and ECG metrics in patients scheduled for OSAS surgical treatment. Data were collected from patient records at a single university hospital. The study enrolled 152 patients, aged 18 years and older, all diagnosed with OSAS and awaiting surgical correction. The ECG characteristics analyzed included heart rate, PR segment, QRS morphology and intraventricular conduction defects, QT interval, and axis measurements. Polysomnographic evaluations provided data on sleep apnea severity, including the Apnea-Hypopnea Index (AHI) and the Oxygen Desaturation Index (ODI). The primary objective was to correlate OSAS severity (AHI and ODI) with ECG alterations.

Results: The study identified significant correlations between OSAS severity and various ECG metrics. The PR interval showed a modest yet significant positive correlation with AHI ($r=0.228$, $p=0.036$), indicating that increased sleep apnea severity may be associated with prolonged atrioventricular conduction time. Additionally, the P wave axis demonstrated a significant negative correlation with AHI in the supine position ($r=-0.670$, $p=0.024$), suggesting an impact of sleep position on atrial electrical orientation. The Respiratory Disturbance Index (RDI) also showed a significant negative correlation with the P wave axis ($r=-0.578$, $p=0.024$). A notable inverse correlation was found between oxygen saturation (SpO₂) and the PR interval ($r=-0.306$, $p=0.011$), indicating that as oxygen saturation decreases, the PR interval lengthens. No significant correlations were observed between AHI and the QRS duration ($r=0.179$, $p=0.114$), QT interval ($r=0.140$, $p=0.202$), or QTc interval ($r=0.068$, $p=0.536$), suggesting that sleep apnea severity does not significantly affect ventricular depolarization and repolarization in this study population. Moreover, the QRS and T wave axes did not show significant correlations with AHI, indicating no direct influence of sleep apnea severity on ventricular depolarization or repolarization orientation.



Conclusions: This study confirms the significant association between OSAS and various electrocardiographic alterations. These ECG changes suggest that OSAS severity is likely linked to atrial electrical remodeling and prolonged atrioventricular conduction, emphasizing the importance of

cardiovascular clinical and electrocardiographic monitoring in OSAS patients. Early detection and management of OSAS could potentially reduce its cardiovascular impacts. Further prospective studies are needed to explore the underlying mechanisms and therapeutic strategies.



MISCELLANEA 138
 SINCOPE (ARITMIE)
 MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
 (CARDIOPATIA ISCHEMICA)
 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

TAKOTSUBO SYNDROME ASSOCIATED WITH NEURALLY MEDIATED REFLEX SYNCOPE: A METASUMMARY OF CASE REPORT AND LITERATURE REVIEW - SINDROME DI TAKOTSUBO ASSOCIATA A SINCOPE RIFLESSA NEUROMEDIATA: METASUMMARY DI CASE REPORT E REVISIONE DI LETTERATURA

Vincenzo Russo (a), Angelo Comune (a), Erika Parente (a), Gerardo Nigro (a)

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Background: Neurally mediated reflex syncope (NMRS) has been recently described as a possible trigger of Takotsubo syndrome (TTS). Data about this association are lacking in the literature.

sudden orthostatism and emotional stress, mainly with a cardioinhibitory response, seems to be a possible

Methods: In the present meta-summary, 7 case reports describing patients who experienced TTS following a NMRS episode were included. Patients' characteristics, triggers and type of syncope were collected.

Results: A total of 8 patients with median age of 65 years (IQR: 55.5 – 75.5) were examined; 75% were females, mainly on menopausal state (85.7). The TTS triggers were: vasovagal syncope in 7 patients (87.5%) and situational syncope in 1 patient (12.5%). 3 patients underwent comprehensive evaluation of syncope and 2 of them showed a cardioinhibitory response.

Conclusions: NMRS due to

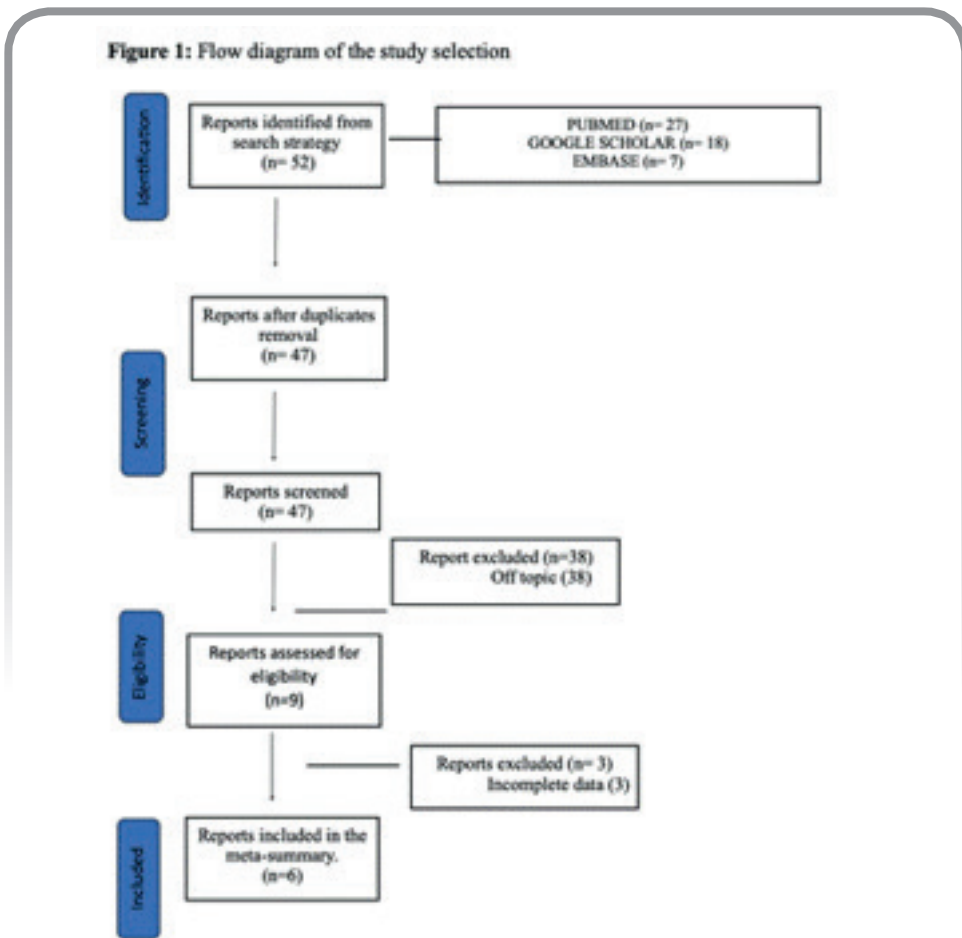
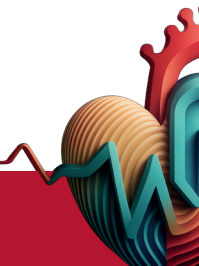
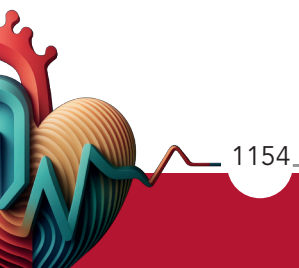


Figure 1



trigger of TTS, in particular among female patients in menopausal state. The marked increase in circulating epinephrine associated to vasovagal syncope may

represent the pathophysiological link between NRMS and TTS.



MISCELLANEA 686

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO (IPERTENSIONE ARTERIOSA) PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

AMILOIDOSI CARDIACA DA TRANSTIRETINA WILD TYPE E IPERTENSIONE ARTERIOSA SISTEMICA: IL RUOLO DEL POSTCARICO

Alessandro Lupi (a), Cinzia Zuchi (a), Anna Mengoni (a), Stefano Sforza (b), Chiara Belardinelli (a), Giuliana Bardelli (a), Rosanna Lauciello (a), Erberto Carluccio (a), Giuseppe Ambrosio (a)

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L'amiloidosi rappresenta una patologia sistemica causata dal deposito extracellulare di fibrille insolubili composte da proteine malripiegate. Tale accumulo può estrinsecarsi in maniera locale o sistemica, configurando quadri clinici eterogenei e complessi. Esistono molteplici tipi di proteine amiloidogeniche, ma nelle forme ad interessamento cardiaco quelle principali sono le catene leggere delle immunoglobuline e la transtiretina. La formazione di fibrille amiloidogeniche da transtiretina (TTR) può essere causata da mutazioni genetiche che alterano la struttura proteica (transtiretina mutata o TTRv), ma può avvenire anche a partire da tetrameri originariamente normali che attraverso meccanismi non noti si disgregano in monomeri che vanno a depositarsi prevalentemente a livello cardiaco (transtiretina wild-type o TTRw). Quest'ultima forma viene anche definita amiloidosi senile, in quanto correlata al processo di invecchiamento.

Nonostante non si conosca il meccanismo di tale disturbo, molteplici studi epidemiologici offrono interessanti osservazioni. Fra queste, rilevante è l'associazione fra stenosi aortica ed amiloidosi da transtiretina wild type, tanto che tra i pazienti riferiti per sostituzione valvolare aortica 1 su 8 risulta essere affetto da TTRw quando viene eseguito lo screening di malattia. Su questa correlazione sono state formulate diverse ipotesi; la più interessante è che l'aumento del postcarico indotto dalla stenosi aortica favorisca la deposizione delle fibrille di transtiretina nell'interstizio cardiaco.

Materiali e Metodi: Dal 2018 ad oggi abbiamo registrato i dati clinici, laboratoristici e strumentali dei pazienti con diagnosi di amiloidosi cardiaca afferenti al nostro centro. In questo studio abbiamo confrontato le caratteristiche della nostra popolazione di pazienti TTRw con quelle della popolazione generale di pari età e con i pazienti affetti da scompenso cardiaco a frazione d'eiezione conservata (HFpEF), valutando eventuali differenze con possibile ruolo fisiopatologico.

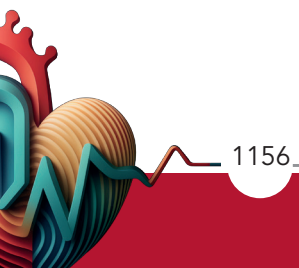
Risultati: Dal 2018 ad oggi sono state effettuate 96 diagnosi di TTRw nel nostro centro. L'età media dei pazienti è di 78 anni. Dall'analisi delle caratteristiche della popolazione è emerso come l'89% dei pazienti presenta storia di ipertensione arteriosa, il 19% è affetto da diabete mellito, il 18% riferisce abitudine tabagica attiva o pregressa, il 22% presenta coronaropatia nota, il 38% ha una diagnosi di tunnel carpale bilaterale, il 21% è portatore di pacemaker, il 40% presenta storia di fibrillazione atriale o flutter atriale. La prevalenza di ipertensione arteriosa risulta essere notevolmente superiore sia a quella della popolazione generale con età >65 anni che si attesta intorno al 60%, che a quella riportata nelle casistiche di pazienti affetti da HFpEF, che risulta essere fra il 60 e l'80%. Tale dato suggerisce che l'ipertensione arteriosa, la cui prevalenza aumenta con l'aumentare dell'età, sia correlata con la deposizione di fibrille di transtiretina wild type a livello cardiaco. L'ipertensione arteriosa, in maniera simile alla stenosi aortica, condiziona un cronico e continuo



aumento del post carico cardiaco, configurando probabilmente un setting favorente il deposito di transtiretina wild type. La nostra osservazione necessita di essere confermata in casistiche più ampie di TTRw a livello multicentrico.

Conclusioni: Possiamo quindi ipotizzare come

tutte quelle condizioni che comportino un aumento cronico del post carico, in primis l'ipertensione arteriosa sistemica, possano contribuire al deposito di transtiretina wild type a livello cardiaco e come un trattamento farmacologico più aggressivo e precoce dell'ipertensione arteriosa potrebbe evitarne o rallentarne il progressivo accumulo.



MISCELLANEA 367

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE) ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE) PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)

ANALISI ECOCARDIOGRAFICA STANDARD ED AVANZATA NEL PAZIENTE CON ASMA GRAVE

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(a) DIPARTIMENTO DI BIOTECNOLOGIE MEDICHE, DIVISIONE DI CARDIOLOGIA, UNIVERSITA' DI SIENA; (b) DIPARTIMENTO DI SCIENZE MEDICHE, CHIRURGICHE E NEUROSCIENZE, UNIVERSITA' DI SIENA

Background: Asthma is considered a chronic inflammatory disease. Recent treatments targeting IL-5, IL-4, and IL-13 offer clinical benefits for severe asthma. Limited research is available describing severe asthma effects on cardiac function. Objective: to describe cardiac size and function in patients with severe asthma and compare it to healthy controls.

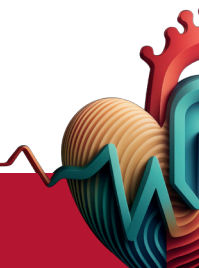
Methods: A population of adult patients with severe asthma referred to our echo lab for a cardiological evaluation before biological treatment were screened for the study. Comprehensive cardiac assessments, including 2-dimensional imaging, M-mode analysis, tissue Doppler examinations, and speckle tracking echocardiography (STE) analysis, were performed in all participants on the same day just before starting biological therapy for asthma. Exclusion criteria were previous cardiac surgery, coronary or non-coronary artery disease, more than moderate left heart valvular regurgitation, atrial fibrillation, active pacemakers, sub-optimal acoustic window. A population of sex- and age-matched healthy subjects was included as reference group. Kolmogorov-Smirnov test was used to verify

normal distribution of variables. Continuous variables were compared using the unpaired t test for normally distributed variables and the nonparametric Mann-Whitney U test for non-normally distributed variables.

Results: A total of 34 patients diagnosed with severe asthma (mean age 58 ± 13 years, 58% female) were included in the study. All the population had preserved left ventricular systolic and diastolic function. RV dimension, standard RV functional parameters (e.g tricuspid annular plane systolic excursion and S') and all the deformation indices of LV and RV were similar between cases and controls. Interestingly, left atrial volumes were higher in asthmatic population

Parameter	Asthma patients (N=34)	Healthy controls (N=34)	p
Left Ventricular Ejection Fraction (%)	59.3±3.2	60.9±2.9	0.080
Right ventricular End Diastolic Diameter (mm)	27.9±3.1	28.3±3.6	0.450
RvFAC (%)	51.3±8.3	49.8±4.7	0.410
Right Ventricular s' TDI	0.14±0.03	0.13±0.02	0.048
TAPSE (mm)	22.5±3.0	23.0±3.8	0.950
sPAP (mmHg)	26.6±4.9	25.3±4.9	0.320
Left Atrial volume (ml)	53.9±19.0	46.6±9.4	0.012
E/a'	7.9±2.9	7.6±2.1	0.046
Global Longitudinal Strain (%)	-18.2±2.3	-19.0±1.4	0.910
Left Peak atrial Longitudinal Strain (%)	32.2±10.6	39.2±11.2	0.019
Free Wall Longitudinal Strain (%)	-24.6±5.4	-25.9±1.9	0.305
Global Right Ventricular Longitudinal Strain (%)	-21.0±3.8	-22.5±1.6	0.108
3D right ventricular ejection fraction (%)	54.8±6.7	55.1±3.9	0.420

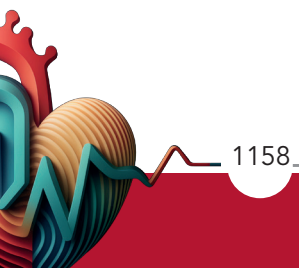
Figure 1



with reduced longitudinal deformation, described by lower peak atrial longitudinal strain (see Table).

Conclusions: in this monocentric pilot study, severe asthma seemed to have influence on some left atrial function and dimension but not on RV size

or longitudinal function. These results, requiring further validation, can be consequence of a systemic inflammatory status and gives insights into the potential role of echocardiography in the asthmatic population.



MISCELLANEA 938

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

DISCRIMINATIVE POWER OF GLOBAL LONGITUDINAL STRAIN AND HEART RATE VARIABILITY IN DIFFERENTIATING ISCHEMIC HEART DISEASE FROM DILATED CARDIOMYOPATHY IN PATIENTS WITH MILDLY REDUCED LEFT VENTRICULAR EJECTION FRACTION

Laura Munaretto (a, d), Katerina Iskra (b), Aleksandar Miladinovic (c), Jacopo Giulio Rizzi (a), Agostino Accardo (b), Milos Ajcevic (b), Marco Merlo (a), Gianfranco Sinagra (a)

(a) AZIENDA SANITARIA UNIVERSITARIA GIULIANO ISONTINA, DIPARTIMENTO CARDIO-TORACO-VASCOLARE, TRIESTE, ITALIA; (b) DIPARTIMENTO DI INGEGNERIA E ARCHITETTURA, UNIVERSITÀ DI TRIESTE, ITALIA; (c) IRCCS MATERNO INFANTILE BURLO GAROFOLO; (d) AZIENDA SANITARIA FRIULI OCCIDENTALE, S.C. CARDIOLOGIA, PORDENONE, ITALIA

Background: Ischemic heart disease (IHD), characterized by obstructive coronary artery disease, is the primary cause of mortality in industrialized nations. Dilated cardiomyopathy (DCM) is a primary myocardial disorder resulting in ventricular dilatation. Distinguishing between IHD and DCM is critical in patients with mild left ventricular dysfunction, as both conditions can present similarly in early stages. Both conditions exhibit dysregulated cardiac autonomic function, suggesting Heart Rate Variability (HRV) as a potential distinguishing tool alongside subclinical contractility impairment detectable via reduced global longitudinal strain (GLS) on echocardiography.

Aim of the study: This study aims to evaluate the discriminative power of GLS and HRV parameters in interpretable machine learning models for distinguishing between DCM and IHD patients with left ventricular ejection fraction between 40% and 50%.

Methods and results: In this retrospective observational study we selected 122 DCM and 110 IHD patients with LVEF 40-50% who had a close (< 3 months) 24h Holter ECG and no recent acute CV events.

GLS quantification was performed offline using TomTec Arena v2.0 software. The final cohort comprised 97 DCM patients (63M/34F, aged 57 ± 15 years, LVEF: 44.5 ± 3.1) and 91 IHD patients (73M/18F, aged 71 ± 11

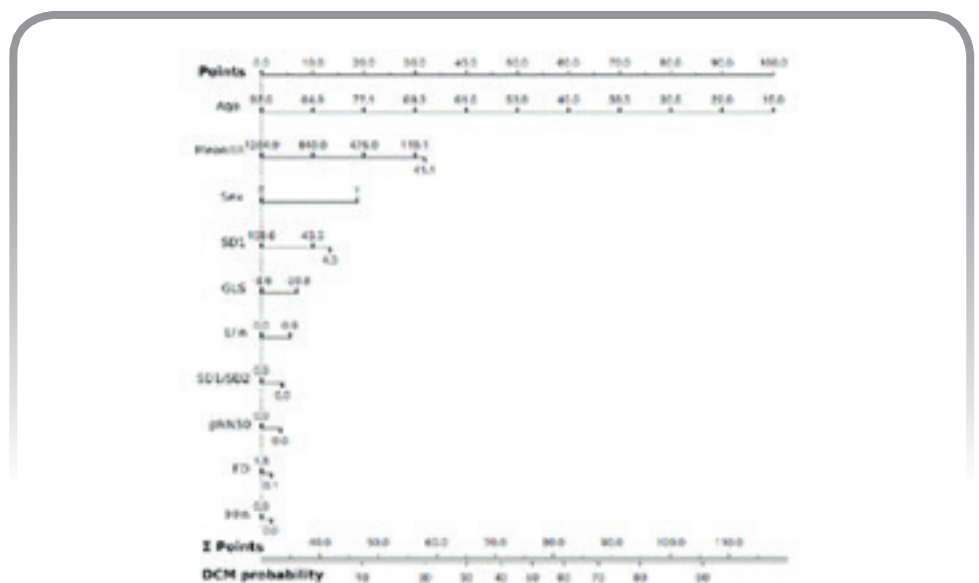
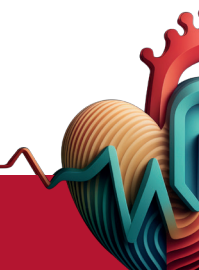


Figure 1. Nomogram for logistic regression classifier for the DCM patients.

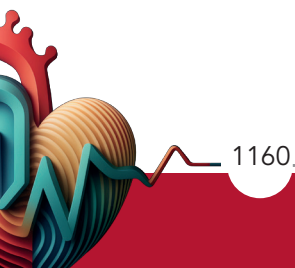
Figure 1



years, LVEF: 45.2 ± 3.1). Most HRV parameters showed statistically significant differences between groups; then, using ReliefF method for feature selection we identified 10 key features, including Sex, Age, MeanRR, FD, HFn, GLS, pNN50, SD1/SD2, SD1. Logistic regression outperformed other models, yielding 76% classification accuracy (CA) and 83% area under the curve (AUC) for the nomogram created with the

selected features (**Fig. 1**).

Conclusions: This study demonstrates the potential of HRV features, known parameters of autonomic balance and vagal tone modulation, GLS, and machine learning in differentiating between DCM and IHD in patients with mildly reduced LVEF suggesting the potential for pathophysiological correlation.



MISCELLANEA 769
ARTERITI (MALATTIE DEI VASI)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)

STEMI, A RARE AND POTENTIALLY LIFE-THREATENING COMPLICATION OF COGAN'S SYNDROME

Tiziana Cristina Minopoli (b), Emilia Grimaldi (b), Carlo Di Mario (b), Bernardo Pasquale (a)

(a) *CARDIAC INTENSIVE CARE UNIT, CAREGGI UNIVERSITY HOSPITAL, FLORANCE, ITALY*; (b) *DEPARTMENT OF CLINICAL AND EXPERIMENTAL MEDICINE, CAREGGI UNIVERSITY HOSPITAL, FLORENCE, ITALY*

Background: Cogan's syndrome is a rare autoimmune disease that mainly affects the eyes and ears through an abnormal immune response that leads to the production of autoantibodies directed against inner ear and corneal antigens, resulting in interstitial keratitis and sensorineural hearing loss. In certain cases, the immune reaction can trigger a systemic vasculitis involving medium to large vessels and leading to cardiovascular complications in around 10% of cases.

Case report: We report a 34-year-old woman patient with Cogan's Syndrome diagnosed in 2006 after developing bilateral sensorineural hearing loss, which progressively worsened, leading to complete bilateral deafness. Later, she also experienced severe scleritis, necessitating treatment with peribulbar steroid injections, and second-line immunosuppressive drugs. In March 2024, the patient began experiencing intermittent episodes of self-limiting chest pain, which she did not investigate further, along with fatigue and shortness of breath. However, on April 7th, she presented to the Emergency Department with worsening chest discomfort and a syncopal event. An ECG revealed an anterior STEMI and coronary angiography documented a sub-occlusion at the ostium of the left main artery, successfully treated with angioplasty and drug-eluting stent (DES) implantation. The post-procedural echocardiogram showed a significantly reduced left

ventricular ejection fraction (LVEF 38%), with evidence of apical akinesia and hypokinesia of the anterior and anterolateral walls. Given the suspicion of vasculitis with coronary involvement, high-dose corticosteroids were initiated. Two weeks later after the discharge, she was readmitted due to another episode of chest pain. A CT coronary angiography revealed no changes in the coronary arteries. Additionally, a CT scan of aorta was performed, which showed hypodensity of the isthmus and the descending aorta. Given the likely inflammatory nature of this finding, immunosuppressive therapy was intensified with the addition of cyclophosphamide, leading to a resolution of symptoms and a gradual LVEF improvement which eventually returned to normal.

Conclusion: Our case highlights a rare manifestation of Cogan's syndrome affecting the coronary arteries, an uncommon life-threatening complication that demands careful attention. It is crucial to promptly recognize early warning signs, such as the recurrent chest pain experienced by our patient, which was initially underestimated. Accurate diagnosis is equally essential to guiding effective treatment, which must extend beyond interventional procedures and often involves a multidisciplinary approach, including immunosuppressive therapies, to comprehensively manage the systemic aspects of the disease.



MISCELLANEA 161
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)

A COMPLEX CLINICAL SCENARIO IN A 43 YO MALE WITH DEVICE RELATED COMPLICATIONS

Saverio Zarra (a), Giulio Zucchelli (a), Raffaele De Caterina (a)
 (a) AOUP

A 43-year-old male presented with an exposed pocket of his implantable cardioverter-defibrillator (ICD). Notably, the patient exhibited complete exposure of the ICD generator in the right prepectoral and axillary region, along with total exposure of the lead electrodes up to the fixation sleeves.

Medical History: The patient, a known carrier of double-outlet right ventricle, underwent surgical correction in 1981, resulting in residual subaortic ventricular septal defect (VSD) and mild left-to-right shunt atrial septal defect (ASD). At the age of one (1982), he received a dual-chamber pacemaker in the left prepectoral region due to complete atrioventricular block. Due to recurrent sustained ventricular tachycardias, the patient underwent two unsuccessful radiofrequency substrate ablation attempts (in 2000 and 2004). Subsequently, an ICD was implanted in the right prepectoral region, with removal of the left-sided pacemaker and concurrent abandonment of the ventricular pacing lead. In July 2019, he was admitted elsewhere for a mechanical pocket erosion, leading to repositioning the generator in the right subpectoral region. In October 2019, he was readmitted for a recurrence of pocket erosion, revealing endoprosthetic vegetations on the atrial and ventricular leads by transesophageal echocardiogram (TEE) and increased uptake on positron emission tomography (PET) in the pocket and leads. Device extraction was proposed but declined by the patient. In May 2023, he presented to the emergency department with device shock during ventricular tachycardia, revealing electrode exposure and purulent material.

Subsequently, he was referred to our institution for device removal.

Initial Workup: Upon admission, the patient underwent: TTE revealing EF 38%. TEE, revealing endocarditis on both atrial and ventricular leads. Venography, in anticipation of lead extraction, showed patent venous access on the left and occlusion on the right at the subclavian vein ostium. ICE documented multiple formations consistent with vegetations, atrial involvement, and ventricular thickening

2 - Diagnosis and Management: After heart team discussion, the patient was offered a transvenous lead extraction, with potential cardiothoracic surgical intervention if transvenous extraction proved to be challenging. On September 12, 2023, a transvenous lead extraction was attempted successfully up to the superior vena cava, where an adhesive complex attachment necessitated subsequent cardiothoracic surgery. The procedure proceeded without complications, and the leads were released from adhesions up to the superior vena cava. However, there was an adhesion point at this location that was not overcome by mechanical dilation, representing a known complex adhesion between the lead wires. Due to this limitation, a few days later, a cardiothoracic surgical intervention was performed to complete the lead wires' extraction using an invasive approach. In this context, a cardiac resynchronization device (CRT-P because of totale AVB, expected stimulation percentage greater than 20% and EF 38%) was reimplanted in the left prepectoral region with



epicardial electrodes. Simultaneously, a reconstruction of the right atrioventricular junction was carried out, and closure of the atrial septal defect (DIA) was performed. Microbiological analysis of extracted material revealed *Pseudomonas aeruginosa* multisensitivity. Specific antibiotic therapy was initiated, including piperacillin/tazobactam, ceftolozane, daptomycin, and later ciprofloxacin.

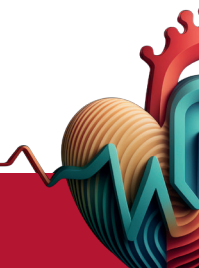
On October 4, the patient underwent submuscular subclavian implantation of a subcutaneous implantable cardioverter-defibrillator (SCID) with concomitant removal of necrotic tissue from a dehiscence wound in the right subclavicular region. The patient was discharged afebrile and oral antibiotic therapy.

3 - Follow-up: On November 17, the patient presented with a new pocket erosion of the CRT-P accompanied by fever. Considering the high infection risk and patient fragility, despite his young age, it was therefore decided to implant a leadless device following electroanatomic mapping of the right ventricle, as

there were surgical patches in the septal region. This approach aimed to identify the optimal anchoring site for the device. Subsequently, he underwent extraction of the generator of the CRT-P device

The decision to forgo biventricular stimulation was made, taking into account the elevated infectious risk.

4 - Conclusion: Complications associated with implantable devices pose an increasingly significant challenge in managing young patients with cardiac arrhythmias. Cooperation among specialists, including cardiologists, electrophysiologists, vascular surgeons, emerges as a crucial element to ensure integrated and personalized management of device-related complications. In conclusion, this case underscores the need for synergistic collaboration among specialists in the field of cardiology to successfully address challenges related to devices in young patients. Only through an integrated approach and proactive sharing of knowledge and expertise can we significantly improve clinical outcomes and the quality of life for this increasingly relevant population.



MISCELLANEA 50
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)

PARITÀ DI GENERE NELLE SCUOLE DI SPECIALIZZAZIONE IN CARDIOLOGIA: ANALISI E PROSPETTIVE

Fabio Barbieri (a, b), Jonathan Rosero Morales (a, b), Elisa Lodi (a, b), Maria Grazia Modena (a, b)

(a) UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA; (b) CENTRO P.A.S.C.I.A. (PROGRAMMA ASSISTENZIALE SCOMPENSO CARDIACO, CARDIOPATIE DELL'INFANZIA E A RISCHIO), AOU POLICLINICO DI MODENA

Introduzione: La parità di genere in medicina rappresenta una tematica fondamentale per garantire l'equità nell'accesso alle cure, lo sviluppo di una ricerca scientifica inclusiva e una rappresentanza equilibrata dei generi tra i professionisti sanitari.

Promuovere la parità di genere in ambito medico implica la necessità di riconoscere e affrontare tali sfide, assicurando che tutti i pazienti ricevano cure di alta qualità e che i professionisti sanitari, indipendentemente dal genere, godano di pari opportunità di carriera e sviluppo. La nostra analisi si propone di esplorare questa tematica in un contesto specifico, ovvero quello delle scuole di specializzazione italiane in cardiologia.

Materiali, metodi e risultati: Abbiamo raccolto dati sulle scuole di specializzazione in cardiologia mediante una revisione sistematica dei siti web delle università e contattando direttamente i direttori tramite e-mail. La nostra indagine si è focalizzata sulla distribuzione di genere sia tra i direttori delle scuole che tra i medici in formazione specialistica. Inoltre, abbiamo somministrato un questionario anonimo agli specializzandi per valutare le loro percezioni riguardo al gender gap all'interno delle rispettive istituzioni.

Attualmente, tra le 41 scuole di specializzazione in cardiologia analizzate, solo 4 sono dirette da donne, mentre i restanti 37 direttori sono uomini. Relativamente ai medici in formazione specialistica, i dati disponibili per 10 scuole evidenziano una prevalenza di uomini: su un totale di 723 specializzandi, il 60% è costituito da

uomini e il 40% da donne, con una stabilità dei valori percentuali negli ultimi quattro anni. Il questionario anonimo, compilato da 49 specializzandi, ha rivelato che il 24% degli intervistati percepisce un gender gap all'interno della propria scuola.

Conclusioni: Questa ricerca rappresenta una prima esplorazione di un contesto che richiede ulteriori approfondimenti e discussioni, con l'obiettivo di sensibilizzare l'opinione pubblica su una questione critica per l'equa formazione degli specializzandi, indipendentemente dal genere, e per garantire una rappresentanza adeguata delle donne nella cardiologia clinica e accademica.

I dati raccolti evidenziano in modo particolarmente rilevante la disparità di genere nella direzione delle scuole di specializzazione, con una presenza femminile significativamente inferiore rispetto a quella maschile. Sebbene il numero di risposte al questionario anonimo somministrato agli specializzandi sia limitato, le risposte forniscono spunti di riflessione significativi, suggerendo che la questione non si limita a una semplice differenza numerica, ma include anche disparità relative alla qualità formativa e lavorativa sperimentata dai medici in formazione specialistica.

Il raggiungimento della parità di genere in medicina costituisce una sfida complessa, che richiede un impegno collettivo per creare un sistema sanitario equo, inclusivo e in grado di rispondere adeguatamente alle esigenze di tutti i pazienti e dei professionisti sanitari.

MISCELLANEA 274
INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
MICROCIRCOLAZIONE E COLLATERALI
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

MACRO- AND MICROVASCULAR INVOLVEMENT IN ANDERSON-FABRY DISEASE: RELATION BETWEEN CAPILLAROSCOPIC PATTERNS AND GENETIC MUTATIONS IN A PILOT STUDY

Denise Cristiana Faro (c), Francesco Lorenzo Di Pino (c), Luca Costanzo (a), Margherita Stefania Rodolico (b), Luigi Di Pino (c), Ines Paola Monte (c)

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Introduction: Fabry disease (FD), a genetic disorder caused by α -galactosidase-A gene mutations, disrupts lysosomal functioning, leading to macro and microvascular complications. Lyso-Gb3 storage in arterial wall upregulates adhesion molecules, decreases endothelial nitric oxide synthesis, induces reactive oxygen species production, leading to fibrotic thickening and endothelial dysfunction, with muscular hypercontractility, vasospasm and pro-thrombotic phenotype. FD patients exhibit increased intima-media thickness (IMT) and reduced flow-mediated dilation (FMD), indicative of heightened CV risk. Nailfold capillaroscopy (NFC) has shown potential in diagnosing and monitoring microcirculatory disorders in FD, but still remains underexplored in current research.

Purpose: Our research investigates NFC's efficacy in identifying morphological and functional vascular alterations in FD patients, examining the relationship with specific GLA variants and sex-differences, with the aim to determine the role of capillaroscopy in early identification of individuals with multiorgan vascular involvement

Methods: This is a retrospective study on 25 FD patients from AOU "Policlinico G. Rodolico-San Marco" in Catania, spanning 2020-2023. Patients underwent a comprehensive multidisciplinary assessment with

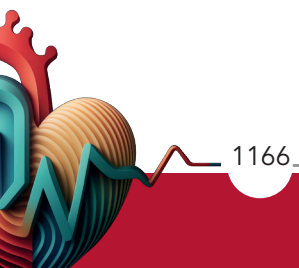
genetic profiling, regular enzyme activity and Lyso-GB3 assessment, and NFC evaluation, focusing on angiotectonic disorder, vascular areas, capillary density, and IMT.

Results: Patients (n=25, 11 M and 14 F) were categorized by GLA variant type (classic, late-onset, variant of uncertain significance [VUS]). Classic variant carriers exhibited reduced capillary length, erythrocyte aggregation, and dilated subpapillary plexus. Late-onset variant carriers showed 20-50% capillary tortuosity, while VUS carriers displayed a lack of angiotectonic irregularities. Notably, the classic FD variant patients showed increased right carotid IMT (0.89 mm). No direct association between α -galactosidase levels and NFC parameters was found, but Lyso-Gb3 levels correlated with capillary length ($\rho=0.453$; $p=0.059$). Sex-specific analysis revealed differences in neoangiogenesis, more prevalent in women, and average capillary length, more altered in men, with each sex demonstrating different but equally severe capillaroscopic alterations. Capillaroscopic alterations correlated with cardiac and macro-/microvascular manifestations: erythrocyte aggregation phenomena and loops with tortuosity $> 20\%$ were significantly observed in patients with hearing loss and cardiac hypertrophy, while giant capillaries were present only in patients with hypertrophy.



Conclusion: Our findings endorse NFC's instrumental role in FD's diagnostic and management framework, especially in relation to specific GLA variants. It underscores NFC's potential in early FD detection and

ongoing patient monitoring, although further studies with broader and more varied cohorts are essential for comprehensive validation.



MISCELLANEA 697
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MIOCARDICO-PERICARDICO
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

UN ATIPICO ECG PER UNA TIPICA TAKO-TSUBO

Alessandro Lupi (a), Manuel Freschini (a), Stefano Sforna (b), Alessandro Aimi (b), Claudia Castellani (b)
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Introduzione: la sindrome di Tako-Tsubo rappresenta una condizione patologica che spesso mima un quadro clinico analogo alla sindrome coronarica acuta. Si caratterizza per una disfunzione ventricolare transitoria, coinvolgente nella maggioranza dei casi la porzione medio-apicale del ventricolo sinistro. La sua peculiare caratteristica è rappresentata, nella maggior parte dei casi, dal completo recupero della funzione sistolica entro le prime 2-6 settimane.

Caso clinico: uomo, 76 anni, centralizzato in emergenza con elisoccorso presso centro Hub per dolore toracico oppressivo ed evidenza all'ECG di pattern "De Winter". In anamnesi cardiopatia ischemica cronica sottoposta 20 anni prima a duplice bypass di LIMA su D1 e RIMA

su IVA, ipertensione arteriosa sistemica. Il paziente veniva sottoposto a coronarografia che mostrava assenza di occlusioni significative e successivamente a ventricolografia la quale evidenziava un aspetto tipico per "apical ballooning". Alla valutazione ecocardiografica si confermava la moderata disfunzione ventricolare sinistra per acinesia dei segmenti medio-apicali e ipercontrattilità di quelli basali, inducente ostruzione dinamica a livello di LVOT e insufficienza mitralica moderata. Agli esami laboratoristici si riscontrava un basso picco troponinico in rapporto all'estesa area ventricolare disfunzionante, associato ad elevati valori di NT pro BNP. Il monitoraggio ECG ha evidenziato un progressivo allungamento del QT associato a negativizzazione di onde T profonde. Il controllo

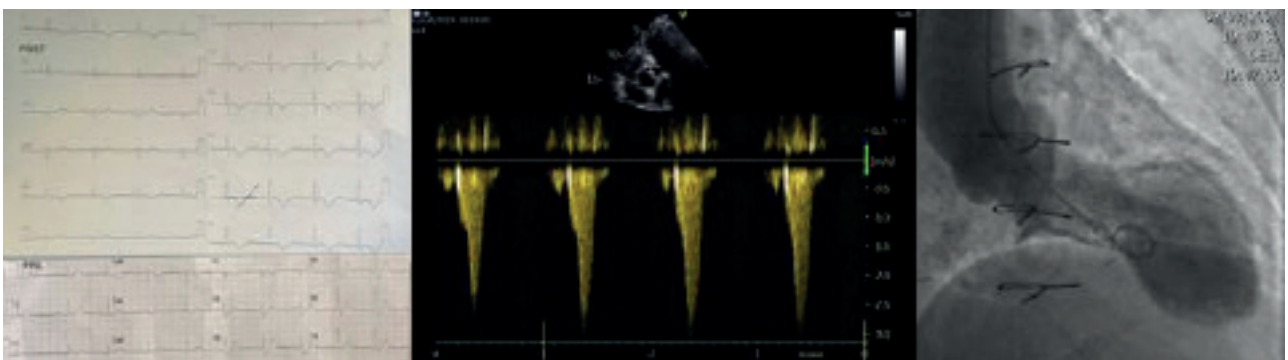


Figura 1

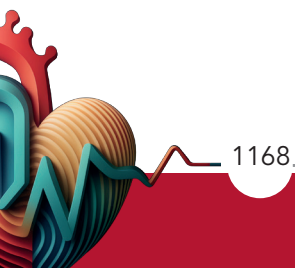


ecocardiografico ha progressivamente evidenziato un miglioramento della contrattilità miocardica, associato alla scomparsa del gradiente dinamico in LVOT ed alla riduzione contestuale dell'entità del rigurgito mitralico.

Discussione: la sindrome di Tako-Tsubo è un'entità patologica dalla diagnosi talvolta difficile perché il quadro clinico di presentazione (sintomi, ECG ed indici di danno miocardico) è in larga parte sovrapponibile a quello della sindrome coronarica acuta. La peculiarità di questo caso clinico è rappresentata dalla iniziale

manifestazione con un pattern elettrocardiografico "De Winter", elemento di presentazione piuttosto atipico, associato a dolore toracico oppressivo, che ha richiesto l'esecuzione di una coronarografia in emergenza per escludere un infarto miocardico.

Conclusioni: Le modalità di presentazione clinica della sindrome di Tako-Tsubo sono molteplici. Questo caso ha mostrato una particolare associazione con un pattern "De Winter" all'ECG.



MISCELLANEA 558

ELETTROSTIMOLAZIONE (ARITMIE) TERAPIA DI RESINCRONIZZAZIONE (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE)

CLOSED LOOP STIMULATION (CLS) IN CIED PATIENTS WITH SLEEP APNEA: A SINGLE-SITE EXPERIENCE

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(a) U.O.C. CARDIOLOGIA-UTIC-EMODINAMICA-CARDIOSTIMOLAZIONE P.O. "FERRARI" DI CASTROVILLARI ASP COSENZA; (b) U.O.C. CARDIOLOGIA-UTIC-CARDIOSTIMOLAZIONE P.O. "GIANNETTASIO" DI ROSSANO ASP COSENZA

Introduction/Background: Sleep apnea syndrome is a common disorder in CIED patients with an impact on cardiovascular morbidity and mortality. Cardiac pacing has been observed to reduce the sleep apnea burden through the stabilization of cardiac output during sleep. Closed Loop Stimulation (CLS) appears promising in contrasting sleep apnea as it has been shown to regulate cardiac output efficiently also in absence of patient's movement.

Objectives: We aimed to assess the effect of CLS activation to reduce the apnea/hypopnea episodes in CIED patients with sleep-disordered breathing (SDB).

Methods: Patients with standard indication for dual-chamber pacemaker (PM) or defibrillator (ICD) equipped with CLS (Biotronik, Berlin, Germany) were administered with the NoSAS (Neck circumference, obesity, Snoring, Age, and Sex score), the ISI (Insomnia severity Index) and the ESS (Epworth Sleepiness Scale) questionnaires for SDB screening. Subsequently, high-risk SDB patients (based on NoSAS, ISI and ESS questionnaires) underwent a standard polysomnography for baseline assessment of the Apnea – Hypopnea Index (AHI). All patients with an AHI ≥ 15 episodes per hour performed a two-stage home sleep study with the WatchPAT ONE device (Zoll/Ithamar, Caesarea, Israel): first with the CLS OFF (DDD-50bpm pacing mode) and then with the CLS

activated (DDD-CLS 50bpm/120bpm pacing mode). The AHIs measured with the WatchPAT ONE device were compared before and after the CLS activation.

Results: We analyzed 7 patients (mean age, 74 ± 9.2 years; male gender, 71.4%; mean BMI, 26.8 ± 4 kg/m²) who had received CIEDs (43% PM; 43% ICD; 14% CRT-D) for standard indications (14% cardiac resynchronization therapy; 14% high-degree atrioventricular block; 29% syncope; 43% other disease of conduction system). The most frequent comorbidity was hypertension in 66.7% of cases. Patients were at high-risk of SDB according to NoSAS, ISI and ESS scores (13 ± 5 , 18.7 ± 3.2 and 10.7 ± 7 points, respectively). Mean AHI from baseline polysomnography was 37.4 ± 13.9 episodes/h. A statistically significant reduction of mean AHI was observed with CLS activation (49.6 ± 26.2 episodes/h CLS OFF vs 33.4 ± 22 episodes/h CLS ON, $p=0.018$). Minimum oxygen saturation was $81.8 \pm 6\%$ with CLS OFF as compared with $84 \pm 4.8\%$ with CLS ON ($p=0.15$).

Conclusions: In CIED patients with sleep-disordered breathing, the physiologic CLS pacing algorithm significantly reduces the apnea/hypopnea burden measured with a home sleep apnea testing device. Further studies with a larger population are needed to confirm our results.



MISCELLANEA 778

MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
PROGNOSI (SCOMPENSO CARDIACO)

ROLE OF ALEXITHYMIA IN TAKOTSUBO SYNDROME

Maria Francesca Marchetti (a), Giulia Mura (a), Francesca Deaina (a), Nicola Piredda (a), Marco Licciardi (a), Giacomo Boi (a), Giuseppe Ilari (a), Bianca Maria Noli (a), Beatrice Vezzani (a), Roberta Montisci (a)
(a) CARDIOLOGIA-UTIC, POLICLINICO DI MONSERRATO, AOU CAGLIARI, UNIVERSITÀ CAGLIARI

Background: Takotsubo Syndrome (TTS), also known as stress cardiomyopathy, is a clinical syndrome characterized by acute reversible myocardial damage due to transient systolic dysfunction of the left ventricle typically following acute emotional or physical stress. Alexithymia is a personality construct characterized by impoverishment of imagination, poor capacity for symbolic thinking and difficulty in experiencing and verbally expressing emotions. The Toronto Alexithymia Scale (TAS 20) is a self-assessment questionnaire consisting of 20 items which aims to measure different areas of the alexithymia construct and is the most used and widespread instrument in the clinical setting. Several studies show that alexithymia is associated with various medical conditions, various mental disorders and psychopathological syndromes. The aim of our study is to evaluate the level of alexithymia in patients suffering from TTS, then study the correlation between stress cardiomyopathy and this personality construct.

Materials and methods: From January 2007 to May 2023, 134 patients with TTS were admitted to our CCU mean age 71.1 ± 11 . All the patients enrolled in this study met International Expert Consensus on Takotsubo Syndrome for the diagnosis of TTS. We analyzed the TAS scale in the last 52 patients admitted.

Results: The mean value of the TAS-20 score was 51.1 ± 14.8 with a range of 20-81. 14 patients (26.9%) obtained a score ≥ 61 , indicative of a high degree of alexithymia (AL group), 73.1%, 38 patients, were instead found to have low or intermediate levels of alexithymia (noAL

group). We found no differences in terms of age (73.6 ± 8.9 vs 68.6 ± 10.8 , $p=0.10$) and sex (female 14/14, 100% vs 36/38, 94.7%, $p=0.53$) and cardiovascular risk factors among AL and non-AL groups. Instead, we found a statistically significant difference in relation to the prevalence of psychiatric pathologies (35.7% vs 2.6%, $p=0.004$), pneumological pathologies (50% vs 18.4%, $p=0.003$) and neoplastic pathologies (42.9% vs 10.5%, $p=0.04$). AL patients presented more frequently with dyspnea at onset (64.3% vs 26.3%, $p=0.021$) and greater impairment of systolic function ($EF 42.2\% \pm 10.4$ in AL vs 48.8 ± 10.7 noAL group, $p=0.046$). We found no difference regarding the presence of stress as a trigger factor and the type of stress (physical or emotional) between the two groups. AL patients had a slightly longer hospital stay 12.4 ± 9.8 vs 9.9 ± 4.7 , $p=0.42$ although not in a statistically significant way, but the stay was complicated more frequently by acute pulmonary edema, which occurred in 3/14 AL patients, 21.4% vs 2.6% in noAL patients, $p=0.047$. 80.8% (42 pts) of patients who underwent the TAS-20 questionnaire were followed up for a median of 52 months. We found a higher incidence of relapses in non-alexithymic patients (9.1% vs 0%, $p=0.38$), but patients with high degrees of alexithymia had a higher mortality rate (21.4% vs 17.5%, $p=0.54$), although without statistically significant differences. Even in the analysis of the Kaplan-Meier survival curves, although the two curves tend to diverge, we did not find statistically significant differences (log Rank, chi square 0.51, $p=0.47$).ed.

Conclusions: In our preliminary study the prevalence

of alexithymia in TTS patients seems much higher than what is described in the general population. The higher prevalence of comorbidity in patients with AL could justify this finding. AL patients present a clinical characteristics at onset and a more severe hospital course than noAL patients. We did not find statistically significant differences in outcome, although AL patients seem to have a higher mortality and a lower

incidence of TTS relapses, but the data will have to be confirmed by a larger case study and a longer follow-up. Our preliminary study suggests the possible usefulness of determining the level of alexithymia in patients with TTS through the administration of TAS-20 to identify patients with more complex TTS and at risk of unfavorable outcome and possible relapses.



MISCELLANEA 95
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
ARTERITI (MALATTIE DEI VASI)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)

ISOLATED COMMON ILIAC ANEURYSM AND DILATED LEFT VENTRICLE: KILL TWO BIRDS WITH ONE STONE?

Francesco Natale (a), Achille Solimene (a, b), Ettore Luisi (a, b), Luigi Marotta (a, b), Carmine Gentile (a, b), Rosa Franzese (a, b), Noemi Mollo (a, b), Francesco S. Loffredo (a, b), Enrica Pezzullo (a), Francesco Ciaramella (a), Paolo Golino (a, b), Giovanni Cimmino (b, c)

(a) *CARDIOLOGIA VANVITELLI, OSPEDALE MONALDI, NAPOLI*; (b) *DIPARTIMENTO DI SCIENZE MEDICHE TRASLAZIONALI, SEZIONE DI CARDIOLOGIA, UNIVERSITÀ DEGLI STUDI DELLA CAMPANIA LUIGI VANVITELLI, NAPOLI*; (c) *CARDIOLOGIA, AOU LUIGI VANVITELLI, NAPOLI*

A 46-year-old Sudanese immigrant man was admitted to the emergency department because of diarrhea and new onset of dyspnea on exertion. Lab tests were unremarkable except for an increase of N-terminal pro b-type natriuretic peptide levels and leukopenia with a relative increase of eosinophil count. An abdominal ultrasound revealed a left common iliac artery aneurysm (36 mm, Figure A). An echocardiography showed a dilated cardiomyopathy (Left Ventricle end diastolic diameter 65 mm, Figure B-C) with reduced ejection fraction (LVEF 20%). A computed tomographic angiography was performed confirming the isolated common iliac aneurysm (Figure D-F). A stool polymerase chain reaction for parasites detected the presence of *Strongyloides stercoralis*. *Strongyloides* antibodies were also present. *Strongyloidiasis* is an infection caused by the parasitic worm *Strongyloides stercoralis*. It lives in contaminated soil and infects humans through the skin. Some infections become chronic, lasting for years. *Strongyloidiasis* can cause life-threatening illness

when associated to immunodeficiency. It has also been reported that the infection by *Strongyloides stercoralis* might result in eosinophilic myocarditis and vasculitis. Although clinical presentation, laboratory tests and cardiac magnetic resonance did not suggest a clinically suspected myocarditis, a chronic process can also be associated to the development of dilated cardiomyopathy. Furthermore, the presence on the CT scan of thickening of the periaortic adipose tissue together with multiple swollen lymph nodes suggests chronic vasculitis that may have led to an aneurysm.

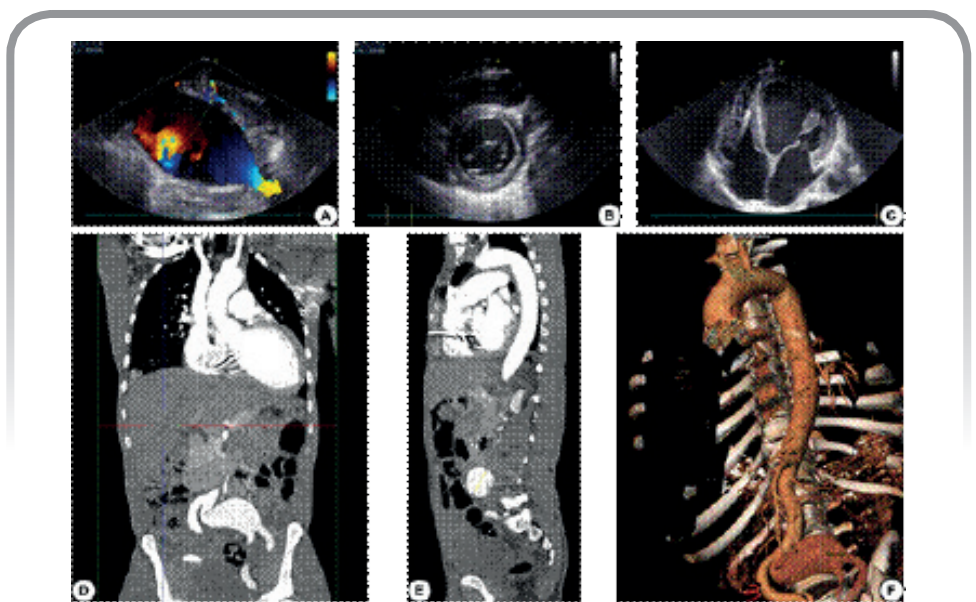


Figure 1

MISCELLANEA 540

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE) MECCANISMI DELLE ARITMIE (ARITMIE) ARITMIE VENTRICOLARI (ARITMIE)

PAINFUL LEFT BUNDLE BRANCH BLOCK SYNDROME: A CASE REPORT

Andrea Duca (b), Iacopo Piciotti (b), Nicola Iacobucci (b), Yari Valeri (b), Giulia Stronati (b), Michele Alfieri (b), Antonio Dello Russo (a, b), Federico Guerra (a, b)

(a) CARDIOLOGY AND ARRHYTHMOLOGY CLINIC, MARCHE UNIVERSITY HOSPITAL, ANCONA, ITALY; (b) DEPARTMENT OF BIOMEDICAL SCIENCES AND PUBLIC HEALTH, MARCHE POLYTECHNIC UNIVERSITY, ANCONA, ITALY

Patient presentation: A 48 years-old male amateur cyclist presented to our cardiology ambulatory because of a “painful large non sustained QRS tachycardia with left bundle branch block (LBBB) morphology” during an ergometric test, while heart rate was around 140 bpm; ischaemic ECG changes during exercise were not found and the ECG monitoring reported sinus rhythm for the entire duration. A second ergometric test concluded with the same result. The patient referred the same chest pain during a cycling training approximately 3-4 years before, while heart rate was around 140 bpm. A previous Holter ECG monitoring did not find abnormalities. His cardiovascular risk factors were a previous tobacco use, hypertension and dyslipidaemia. Since our ambulatory evaluation he used to assume atorvastatin 10 mg/die; ezetimibe 10mg/die and nebivolol 5 mg/die.

Case summary: during our cardiology ambulatory evaluation standard ECG reported Sinus bradycardia (58/min), normal atrio-ventricular and intraventricular conduction and normal ventricular repolarization. A Coronary-CT, a CMR were suggested; and a recovery was planned in order to perform coronary angiography. Coronary-CT reported a diffuse, non-calcific CAD determining a maximum stenosis of 40% on LAD. CMR did not report

abnormal findings or fibrosis areas. Then the patient was hospitalized and a coronary angiography was performed, reporting similar results to those found in coronary-CT. The abrupt onset of chest pain coinciding with QRS widening with LBBB morphology, the resolution of symptoms simultaneously with LBBB resolution and normal 12-lead ECGs before and after LBBB in addition to new-onset LBBB criteria (low precordial S/T wave ratio: 1.6) and inferior QRS axis suggested a case of painful LBBB. A diagnosis of “painful left bundle branch block” was made.

Conclusions: Painful left bundle branch block syndrome is defined as the presence of typical chest pain with LBBB, in the absence of myocardial ischaemia. The etiopathogenesis is still unknown, although it seems to be related to the alteration of the wave-front and the consequent myocardial contraction dyssynchrony. This clinical scenario seems to often be frequency related, as seen in our case.

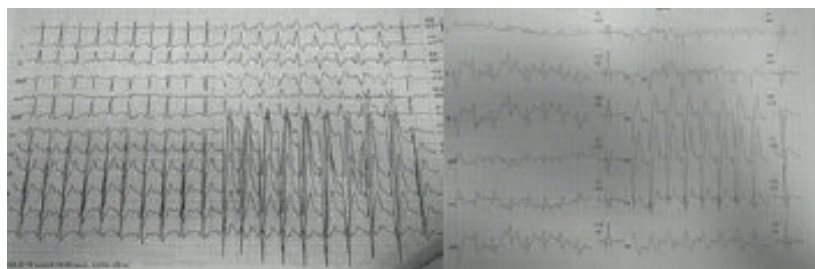
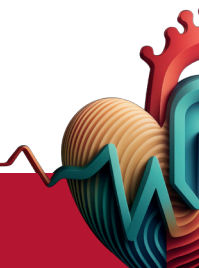


Figure 1



MISCELLANEA 153
TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)
INFIAMMAZIONE E IMMUNITÀ (ATEROTROMBOSI)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

UN CASO DI SINDROME DA ANTICORPI ANTIFOSFOLIPIDI VARIANTE CATASTROFICA CON SEVERA DISFUNZIONE VENTRICOLARE SINISTRA E TROMBOSI ENDOVENTRICOLARE

Laura Rotondo (a), Samuela Carigi (b), Roberta Campana (b), Fabio Mascella (c), Filippo Ottani (b)

(a) AZIENDA OSPEDALIERO-UNIVERSITARIA DI FERRARA; (b) U.O. CARDIOLOGIA, OSPEDALE INFERMICI DI RIMINI, AUSL DELLA ROMAGNA; (c) U.O. MEDICINA INTERNA I, OSPEDALE INFERMICI DI RIMINI, AUSL DELLA ROMAGNA

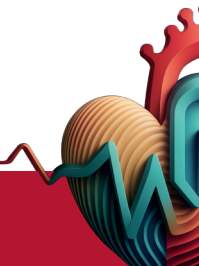
Presentiamo il caso di una donna di 46 anni, con pregresso carcinoma ovarico sieroso ad alto grado, che accedeva in pronto soccorso per porpora cutanea con successivo riscontro di insufficienza renale acuta ed evidenza alla biopsia renale di un quadro di severa e diffusa vasculopatia necrotizzante con trombosi obliterativa vascolare, ischemia glomerulare massiva e necrosi emorragica cortico-midollare. Alla TC total body con mezzo di contrasto veniva riscontrata la presenza di trombosi endoluminale del ventricolo sinistro, aree ischemiche epatiche ed infiltrati polmonari suggestivi per infarti polmonari. La paziente veniva ricoverata in UTIC dove alla prima ecocardiografia si riscontrava un ventricolo sinistro non dilatato con severa disfunzione sistolica (EF 30%) e multiple voluminose trombosi endoventricolari sinistre. Dopo 7 giorni, il quadro era progredito con comparsa di severa e diffusa ipocinesia e con un peggioramento della funzione sistolica (EF 18%). Si confermava la presenza di due formazioni trombotiche endoventricolari rispettivamente di 25x15mm e di 29x11mm. Si associava una lieve disfunzione del ventricolo destro in assenza di trombosi al suo interno con insufficienza tricuspoidale moderato-severa ed ipertensione polmonare. Agli esami ematochimici eseguiti per indagare il profilo coagulativo ed autoimmunitario era emerso come unico parametro alterato una positività a titolo medio per anticorpi anti- $\beta 2$ glicoproteina. Discusso il caso con i colleghi reumatologi e posto il sospetto di sindrome da anticorpi antifosfolipidi variante catastrofica, la

paziente veniva posta in terapia steroidea ed eparinica e sottoposta a cicli di plasmaferesi terapeutica. Ai successivi controlli ecocardiografici seriatim si riscontrava un miglioramento della funzione sistolica ventricolare sinistra (EF 38%) e netta riduzione delle formazioni trombotiche (8x12mm e 5x5mm). Nonostante l'iniziale miglioramento, il quadro clinico è stato complicato dall'insorgenza di insufficienza respiratoria in corso di polmonite pneumococcica, in seguito alla quale è avvenuto il decesso.

In conclusione, la paziente presentava segni clinici, radiologici ed istopatologici compatibili con il coinvolgimento trombotico simultaneo di quattro organi (cuore, rene, fegato, polmone) e positività agli anticorpi anti- $\beta 2$ glicoproteina per cui è stata posta diagnosi di sindrome catastrofica da anticorpi antifosfolipidi. La sindrome da anticorpi antifosfolipidi variante catastrofica (CAPS) è una sindrome clinica ad eziologia autoimmune che si caratterizza per lo sviluppo di trombosi multiple in un breve lasso di tempo che può determinare disfunzione di multipli organi vitali e che può essere correlata a stati pro-trombotici o a fattori precipitanti come infezioni, chirurgia o neoplasie. I meccanismi fisiopatologici della CAPS sono correlati sia all'ostruzione trombotica di grossi vasi sia al coinvolgimento di piccoli vasi con manifestazioni microangiopatiche. Tra i criteri diagnostici ci sono l'evidenza del coinvolgimento di tre o più organi, sistemi o tessuti; la simultaneità delle manifestazioni; l'evidenza istopatologica di occlusione

trombotica di piccoli vasi in almeno un organo o tessuto; l'evidenza laboratoristica di positività agli anticorpi antifosfolipidi. Il management clinico prevede il trattamento con steroidi, eparina e plasmaferesi terapeutica. La paziente presentata è stata trattata con questa triplice associazione con beneficio clinico

ed evidenza di miglioramento del quadro cardiaco. Tuttavia, la prognosi dei pazienti affetti da questa sindrome rimane severa, con una mortalità del 37% nei pazienti sottoposti a triplice terapia completa, ma che può arrivare fino al 75% nei pazienti non sottoposti a terapia.



MISCELLANEA 518
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
FISIOLOGIA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

LEFT VENTRICULAR HYPERTROPHY WITH REDUCED EJECTION FRACTION IN THE SETTING OF CONGENITAL ANATOMY DEFECT: SOLITARY CORONARY OSTIUM

Francesco Schiavone (a), Gennaro Giliberti (a), Benedetta Anselmi (a), Giuseppe Ciliberti (a), Paolo Compagnucci (a), Martina Apicella (a), Nicolò Schicchi (c), Amabile Valotta (d), Gaudenzi Tommaso (a), Domenico Lorusso (a), Michela Casella (b), Alessandro Maolo (e), Federico Guerra (a), Tommaso Piva (e), Antonio Dello Russo (a)

(a) *CARDIOLOGY AND ARRHYTHMOLOGY CLINIC, UNIVERSITY HOSPITAL "OSPEDALI RIUNITI", ANCONA, ITALY;* (b) *DEPARTMENT OF BIOMEDICAL SCIENCES AND PUBLIC HEALTH, MARCHE POLYTECHNIC UNIVERSITY, ANCONA, ITALY;* (c) *DEPARTMENT OF RADIOLOGICAL SCIENCES, CARDIOVASCULAR RADIOLOGICAL DIAGNOSTICS, UNIVERSITY HOSPITAL "OSPEDALI RIUNITI", ANCONA, ITALY;* (d) *DIVISION OF CARDIOLOGY, ISTITUTO CARDIOCENTRO TICINO, LUGANO, SWITZERLAND;* (e) *INTERVENTIONAL CARDIOLOGY, CARDIOLOGY DIVISION, OSPEDALI RIUNITI DI ANCONA, ANCONA, ITALY*

A 76-year-old truck driver was referring for medical consultation for his driving licence. Clinical examination was normal, an electrocardiogram (ECG) showed sinus rhythm with left anterior fascicular block, and one Ventricular Premature Beats (VPB) with inferior axis and some runs of non-sustained ventricular tachycardia type right branch block with inferior axis (Figure 1).

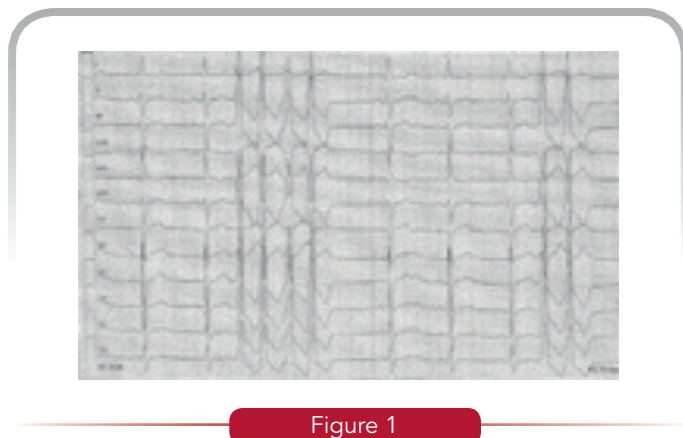


Figure 1

He was sent to the emergency department. The patient blood sample revealed scarce control of lipid profile with 217 mg/dl of total cholesterol, 52 mg/dl of HDL cholesterol, and 79 mg/dl of triglycerides and

calculated LDL 149.2 mg/dL. Also, glucose was over normal at 121 mg/dl. NT-proBNP was 3952 pg/ml and Lipoprotein (a) lower than 7 nmol/L and Troponin I high sensitivity dosage was 57 ng/L.

The patient was on hypertension drugs taking 10 mg of perindopril 2,5 mg of indapamide and 5 mg of amlodipine with poor blood pressure control. Comorbidity was obesity, sleep apnea, hyperthyroidism treated with metimazole, and a knee arthroplasty six years before.

The patient was transferred to our ward for further investigations and treatments.

Echocardiography showed concentric left ventricular hypertrophy (LVH) with reduced ejection fraction (LVEF 40%).

The patient was taken to the catheterization laboratory for coronary angiography. Coronary angiograms only revealed mild coronary atherosclerosis, without obstructive lesions but with a coronary anomaly (Figure 2). Nuclear Magnetic Resonance showed LV concentric hypertrophy and a reduced systolic function with hypokinesia and hypo-akinesia at the basal and posterior-basal free wall of the LV. The late gadolinium enhancement (LGE) shows a subendocardial ischemic pattern in these areas. NMR also shows other areas of

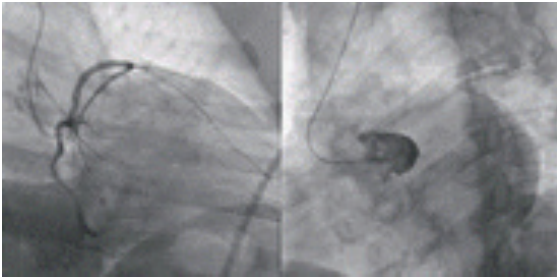


Figure 2

non-ischemic pattern in a ring-like LGE in the mid-para-apical free wall, at the posterior junction, and at the interventricular septum.

We evaluated the coronary intramural course and its length also a coroTC scan (Figure 3) was performed. It shown a normal coronary course.

Pharmacological therapy was started with beta-blockers and SGLT2 inhibitor. We calculated the

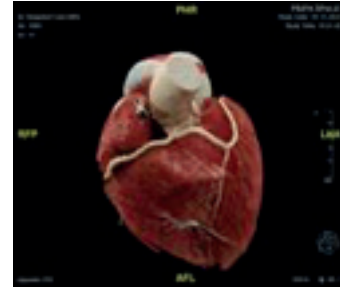


Figure 3

HCM Risk-SCD 2,82%. With this risk ICD is generally not indicated, however, the presence of ring-like LGE on cardiac magnetic resonance is associated with an increased risk of major arrhythmic events. We decided to implant an ICD in primary prevention.

Identification of adult patients with coronary anomalies (AAOCA) who are at risk for SCD, and for whom surgery provides benefit at adult age, requires further research.



MISCELLANEA 382
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

TRATTAMENTO NON CHIRURGICO DELLA MEDIASTINITE CRONICA DA STAFILOCOCCO AUREO

Carlo Vignati (a, b), Alessandra Pietragalla (a, c), Maria Elisabetta Mancini (a), Gianfranco Didevitiis (d), Piergiuseppe Agostoni (a, b)

(a) CENTRO CARDIOLOGICO MONZINO, IRCCS; (b) DIPARTIMENTO DI SCIENZE CLINICHE E DI COMUNITA', UNIVERSITA' DEGLI STUDI DI MILANO; (c) SCUOLA DI SPECIALIZZAZIONE IN MEDICINA INTERNA, UNIVERSITA' DEGLI STUDI DI MILANO; (d) UO MALATTIE INFETTIVE 2, OSPEDALE LUIGI SACCO, MILANO

Background: La mediastinite è un'infezione rara ma grave del mediastino, spesso con esito fatale se non trattata tempestivamente. Le cause comuni includono infezioni profonde della ferita sternale, perforazioni esofagee e mediastinite necrotizzante discendente. Tuttavia, la diffusione ematogena da un'infezione remota è una causa rara, poco documentata in letteratura, con gestione non standardizzata. Questo case report descrive la gestione non chirurgica della mediastinite acuta causata da *Staphylococcus aureus* meticillina-sensibile (MSSA) in un paziente non candidabile a cardiocirurgia.

Caso clinico: Un uomo di 79 anni con una storia clinica complessa, inclusi molteplici fattori di rischio cardiovascolare e plurimi interventi cardiocirurgici precedenti (intervento per dissezione aortica tipo A, sostituzione valvolare aortica con protesi meccanica, valvuloplastica mitralica percutanea), si presentava alla nostra attenzione con dispnea e febbre elevata (39°C). Previa esecuzione di emocolture, è stata iniziata la terapia antimicrobica con levofloxacina. Dopo isolamento di MSSA nelle emocolture, il trattamento è stato modificato introducendo vancomicina. La comparsa di una tumefazione arrossata e dolente vicino al manubrio sternale ha portato all'esecuzione di una TC del torace, che ha rivelato un ascesso periaortico di 29x22 mm. Nonostante l'ascesso si estendesse dalla radice della valvola aortica all'arteria anonima, l'opzione cardiocirurgica è stata esclusa per l'elevato

rischio chirurgico. È stata quindi intrapresa una terapia antimicrobica mirata con rifampicina e oxacillina, supportata dalla terapia a pressione negativa (VAC). Miglioramenti clinici e laboratoristici sono stati osservati gradualmente, con riduzione della tumefazione e normalizzazione degli indici infiammatori. Dopo sei settimane, una TC di controllo ha mostrato la completa risoluzione dell'ascesso.

Tuttavia, cinque mesi dopo, il paziente è stato nuovamente ricoverato per recidiva dell'ascesso. È stata avviata nuovamente terapia antimicrobica con gentamicina e daptomicina, successivamente cambiata in oxacillina a causa di rhabdmiolisi correlata alla daptomicina. Nonostante i miglioramenti iniziali, l'ascesso non si è risolto completamente, portando alla necessità di una terapia antimicrobica prolungata con linezolid e successivamente con trimetoprim-sulfametossazolo.

Due mesi dopo, il paziente è stato nuovamente ricoverato per segni di scompenso cardiaco acuto, trattato con diuretici e levosimendan; vista la stabilità del quadro infettivo la terapia antimicrobica cronica è stata continuata indefinitamente. Il paziente ha mostrato una buona tolleranza alla terapia, senza recidive infettive o effetti collaterali dopo quasi sei anni di trattamento.

Discussione e conclusioni: Questo caso dimostra che la gestione non chirurgica della mediastinite acuta da MSSA può essere efficace in pazienti non idonei alla

chirurgia, utilizzando una combinazione di terapia antimicrobica cronica e VAC. I dati in letteratura sono scarsi, e ulteriori ricerche sono necessarie per stabilire

linee guida più precise per il trattamento di questa condizione clinica complessa e insidiosa.



MISCELLANEA 607

**ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
IPERTENSIONE ARTERIOSA E COVID-19 (IPERTENSIONE ARTERIOSA)
FARMACI ANTIARITMICI (ARITMIE)
TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE
ARTERIOSA)**

CARDIOPSYCONEUROLOGY. NEUROPSYCHIC DISORDERS AND CARDIOVASCULAR RISK FACTORS.GENDER DIFFERENCES AND PROGNOSTICS PERPECTIVESS.REAL LIFE SURVAY EXPERIENCE

Flavio Acquistapace (a, b, c), Davide Girola (a), Massimo D'accunzio (a), Homar Moscaggiura (a),
Laura Alba Acquistapace (a)

(a) CARDIOCARE CENTRO MEDICO CARDIOLOGICO LUGANO SWITZERLAND ; (b) SWISS MEDICAL NETWORK ARS MEDICA CLINIC LUGANO ; (c) GVM CARE&RESEARCH ROME LECCO CARDIOVASCOLARE UNIT

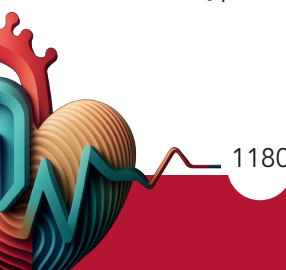
Stress effects appears in society with psychosomatic and physiopathological implications and symptoms involving the cardiovascular sphere. The anxiety and depression tract are recognized as independent cardiovascular risk factors. How much the clinical manifestations accidents in the cardiovascular health and diagnostic therapeutic paths has not been well defined in the clinical reality, although the cardiologist is more often the first person called to answer these clinical necessities.

Aims: To the purpose a real life report of the neuropsychological implications and therapeutic cardiac pathways in the territorial clinical relationship.

Methods: Cardiology outpatient analysis (pts) without major cardiovascular event in the history. Analysis and verification of risk factors, cardiovascular diagnosis, anamnestic and clinical presence of anxious depressive tract stress and frank depressive psychosis; ECG assessments, heart rate therapies Observational Period 2010 - open 2022 5800 pts observed Results 2500 Primary evaluations (without major cardiovascular event) were analyzed: M 1000 (40%); F 1500 (60%) Risk factors: hypertension 1650 (65%): m 830 (50%), f 850

(50%) , dyslipidemia: 1150 (45%) m 400 (35%); f 750 (65%) diabetes 500 (20%),m 300 (60%),f 200 (40%). Anxiety Syndrome Depression (ADS) 1500 (60%) m 450 (30%); f 1150 (70%), Depressive Psychosis 200(8%):m 95 (48%),f 105 F (52%), Smoking 500 (20%),m 215 (43%),f 285 (57%) sedentary lifestyle 1350 (54%) m 405 (30%) , f 945 (70%). The Average Heart Rate (AHR) detected is 85 / min. 75 for m. 90 for f. 1100 pts (70%) of the pts with SAD correlates with the presence of hypertension, 1300 pts (87%) has Symptoms Cardiopalmus / Hypertension / Tachycardias / Tachyarrhythmia (TSV) f 1050 (80%) vs 250 (20%) m , 200 (15%) associated with supraventricular tachyarrhythmia (T35): f. 165 (83%) vs 35(17%) male . Therapy taken : Antihypertensive in 60% (900) with SAD, m. 650 (70%), f 250(30%). Only 200 pts (12%) (65) with SAD taked anxiolytic or antidepressive therapy.

Conclusion: Stress and SAD have clinical and cardiological relevance in cardiovascular health with implications in diagnostic and therapeutic appropriateness, quality of life and in the cardiovascular prognosis. The woman has higher cardioneuropsychological incidence regardless fertile or menopausal period and less cardiovascular therapeutic adherence.



MISCELLANEA 526

MECCANISMI DELLE ARITMIE (ARITMIE)

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

ISCHEMIA, STUDI SPERIMENTALI (CARDIOPATIA ISCHEMICA)

REVERSIBLE T-WAVE CHANGES DURING ACUTE ASTHMA

Valeria Luberto (a, b), Stefano Buratti (b), Marco Guazzi (a, b)

(a) UNIVERSITÀ DEGLI STUDI DI MILANO; (b) ASST SANTI PAOLO E CARLO MILANO

A 19-year-old man of Moroccan descent presented at the ER of our Institution with chest tightness, exacerbated by deep inspiration and associated with cough and pharyngodynia. He denied palpitations and syncope/presyncope. He reported a recent history of otitis media treated with oral antibiotic and corticosteroids. Vital parameters were normal, except for tachycardia and a low-grade fever. Wheezing was noted at lung auscultation; the rest of the physical examination was unremarkable. He was non-smoker and had no history of alcohol or drug abuse. There was no personal history of cardiac disease, nor family history of coronary artery disease, cardiomyopathies or sudden death. He didn't suffer of any medical condition and he was not on any chronic medication. He reported allergies to mites, dog hair and pollen.

ECG showed sinus tachycardia with T-wave inversion in inferior leads and in leads V4-V6 (fig. 1). Blood tests revealed slightly elevated white blood cell count and C-reactive protein. High-sensitivity troponin I was completely negative on two serial samples. Toxicological blood and urine tests were negative. Chest x-ray was normal. Transthoracic echocardiography showed normal biventricular function, no valvular disease and absence of pericardial effusion. Figure 1 Figure 2

The patient was admitted to Cardiology Ward to rule out cardiac involvement, due to the ECG changes and the presence of chest symptoms. Over the next few days of observation, the patient reported gradual improvement of the chest tightness. Serial blood tests showed normalization of inflammatory indices and persistently

negative indices of myocardial cytolysis, even after discontinuation of anti-inflammatory therapy, that was administered for a brief period. Since admission, serial ECGs showed normal sinus rhythm with non-specific repolarization abnormalities, substantially unchanged during the rest of the hospital stay (fig.2). No arrhythmic events were recorded during continuous telemetry monitoring. A coronary CT scan showed normal coronary anatomy; cardiac MRI showed no signs of myocardial edema, pericardial inflammation, adipose infiltration, or fibrosis. Given clinical and instrumental findings, suspecting an episode of acute asthma in a polyallergic patient, we scheduled a spirometry with methacholine bronchoconstriction test which resulted positive for obstructive deficit and confirmed the diagnosis of bronchial asthma.

Conclusions: Reversible electrocardiographic changes (including ST-segment and T-wave abnormalities)

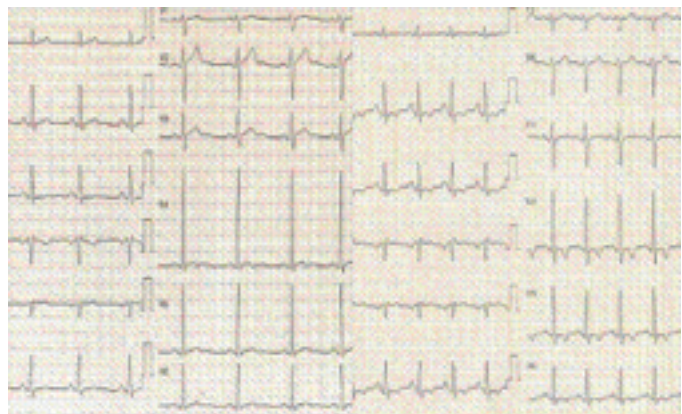
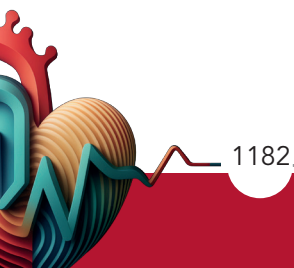


Figura 1



associated with acute asthma episodes have been described in the literature and may be attributable to factors other than myocardial ischemia, such as adrenergic stimulation, hyperventilation or transient right ventricular strain. Our clinical case, with a confirmed

diagnosis of bronchial asthma, and thorough ruling out of cardiac involvement, represents an example of such reversible ECG changes associated with asthmatic episodes.



MISCELLANEA 785

MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

VARIAZIONI DEI PARAMETRI ECOCARDIOGRAFICI ED ELETTROCARDIOGRAFICI IN PAZIENTI CON OBESITA' PATOLOGICA SOTTOPOSTI AD INTERVENTO DI CHIRURGIA BARIATRICA

Renata Petroni (a, b), Carlotta Chisci (a), Alessio Borrelli (b, c), Antonio Scara' (b, c), Leonardo Pignalosa (a, c), Federico Zanin (c), Silvio Romano (a), Luigi Sciarra (a, b)
(a) UNIVERSITA' DEGLI STUDI DI L'AQUILA; (b) CASA DI CURA DI LORENZO, AVEZZANO (AQ);
(c) SAN CARLO DI NANCY, ROMA

Scopo dello studio: Indagare le variazioni di parametri cardiovascolari elettrocardiografici ed ecocardiografici in un gruppo di pazienti obesi sottoposti ad intervento di chirurgia bariatrica.

Materiali e metodi: Sono stati arruolati in questo studio prospettico 12 pazienti consecutivi riferiti al nostro ospedale, da settembre a novembre 2023, a causa di obesità patologica. L'età media era di $42 \pm 5,3$ anni, 8 (66,7%) femmine e 4 (33,3%) maschi; Il BMI medio era $37,0 \pm 6,2$. Tutti i pazienti sono stati valutati da un team multidisciplinare per l'idoneità all'intervento bariatrico (gastrectomia a manica, Roux laparoscopico e bypass gastrico a Y, fascia lap). I pazienti sono stati tutti sottoposti ad esame ecocardiografico. Sono stati inoltre raccolti i fattori di rischio cardiovascolare (ipertensione, diabete, ipercolesterolemia, abitudine al fumo). I pazienti studiati sono stati sottoposti ad una valutazione ecocardiografica di buona qualità al basale e dopo 5 mesi di follow-up.

Risultati: Dopo un follow-up abbiamo ottenuto un notevole miglioramento del profilo di rischio cardiovascolare con sospensione della terapia antiipertensiva e antidiabetica in tutti i pazienti e della terapia ipolipemizzante in 1 paziente su 2. La riduzione del BMI è stata statisticamente

significativa, così come la riduzione del peso. I parametri ecocardiografici del ventricolo sinistro mostrano: riduzione significativa del diametro diastolico del ventricolo sinistro ($P=0,0022$), del diametro atriale sinistro ($p<0,001$), del volume atriale sinistro ($p=0,001$), del volume diastolico ventricolare sinistro ($p<0,001$).

I parametri ecocardiografici del ventricolo destro mostrano: miglioramento della funzione diastolica ($p<0,001$), dell'area ventricolare sistolica e diastolica ($p<0,005$), dei volumi ventricolari sistolici e diastolici, del diametro trasverso medio del ventricolo destro, del diametro longitudinale e dell'area dell'atrio destro ($p<0,005$).

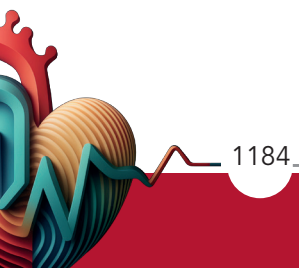
Il global longitudinal strain migliora in tutti i pazienti e scompare l'alterazione che all'inizio riguardava l'86% dei soggetti studiati ($p<0,001$). La durata media iniziale del QTc è stata di $417,8 \pm 13,6$ ms, notevolmente diminuita al follow - up ($404,1 \pm 10,6$ ms $P<0,0001$). La durata media del QRS si è significativamente ridotta, l'asse elettrico non ha subito variazioni importanti, la depressione del tratto ST, che era presente in tre pazienti

Pre-chirurgia	$12,5 \pm 2,3$	$103,9 \pm 3,9$	-0,72
Post-chirurgia	$23,5 \pm 2,9$	$94 \pm 4,8$	-0,29

Figure 1

prima dell'intervento, scompare completamente dopo 5 mesi. Prima dell'intervento chirurgico esiste una correlazione inversa tra durata del QRS e GLS: ovvero, all'aumentare della durata del QRS si riduce il Global Longitudinal Strain. Dopo l'intervento chirurgico la durata del QRS si riduce significativamente ed il valore di GLS aumenta sempre in maniera significativa.

La chirurgia bariatrica determina una significativa riduzione del peso corporeo a breve termine e tale riduzione è associata ad un miglioramento significativo dei volumi ventricolari ed atriali, della funzione diastolica, dei parametri elettocardiografici e del global longitudinale strain.



MISCELLANEA 484
ARITMIE VENTRICOLARI (ARITMIE)
MECCANISMI DELLE ARITMIE (ARITMIE)
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
MINOCA (MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERIES)
(CARDIOPATIA ISCHEMICA)

VENTRICULAR ARRHYTHMIAS, BIZARRE T WAVE MORPHOLOGY AND HYPERTENSIVE STATUS IN A POST-TRAUMATIC PATIENT: WHAT IS THE EXPLANATION?

Stefano Marzorati (a), Elisa Tavano (b, c), Irene Franzoni (b, c), Vruyr Balian (b, c), Andrea Galli (a)
 (a) UNIVERSITA' DEGLI STUDI DELL'INSUBRIA; (b) ASST VALLE OLONA; (c) OSPEDALE DI BUSTO ARSIZIO

A 56y.o. man came to medical attention after some days of asthenia, stubborn constipation and incoercible emesis. Two weeks earlier underwent a shoulder prosthesis implantation due to a post-traumatic multi-fragmentary right humeral head fracture. The ECG was consistent with sinus tachycardia with no remarkable alterations. A thoraco-abdominal CT scan evidenced subsegmentary pulmonary embolism, distension of intestinal loops as bowel occlusion occurred, and a blurred margins left adrenal swelling, consistent with a post-traumatic hemathoma. The following echocardiography revealed apical hypokinesia and preserved LVEF, non significant valvular defects and no pericardial effusion. Blood tests evidenced severe hypokaliemia, slight troponin discrepancy, Nt-proBNP and D-dimer increase.

The patient was admitted to the intensive care for clinical/multiparametric monitoring, pulmonary embolism treatment and bowel occlusion resolution. In the following days a cardiologic consultancy was requested due to a paroxysm of non typical RBBB morphology tachycardia and the evidence of lateral diphasic T waves after restoration of sinus rhythm. In the suspicion of coronary embolism, coronary angiography was

performed: tortuous coronary arteries and no epicardial stenosis and/or occlusions were found.

During subsequent monitoring in cardiology, large diffuse negative T waves and an up to 640 msec QTc prolongation, in absence of such a severe hypokaliemia, appeared. Upon mobilisation, emesis with blood pressure increase and beta-blockers responsive sustained/non sustained VT occurred. While no echocardiographic variations took place, a slight troponin T discrepancy associated with a remarkable increase of Nt-proBNP and a dynamic change in T waves morphology and QTc interval were observed. Therefore an adrenal hemathoma-related catecholamine release was suspected. Further clinical

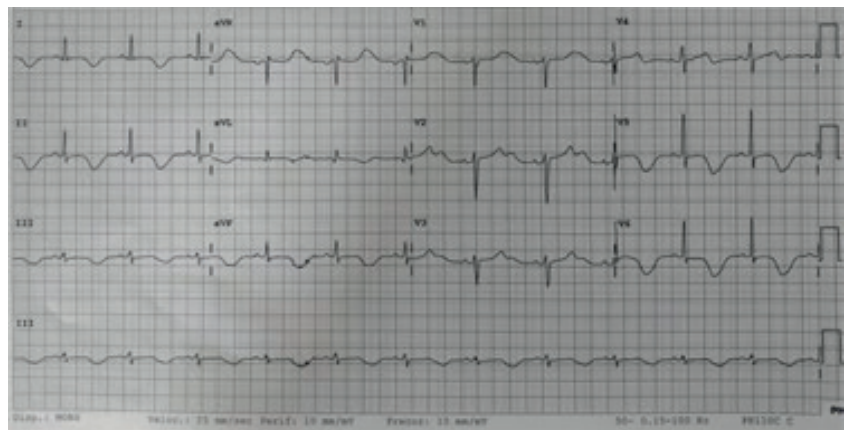
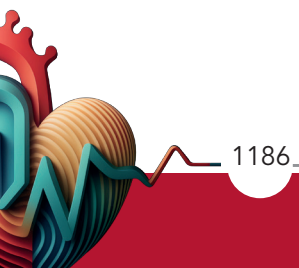


Figure 1



investigations showed normal serum cortisol, renin, aldosterone and not pathological urinary sodium and potassium levels. Conversely, to support the diagnostic hypothesis, urinary adrenaline and noradrenaline values appeared significantly increased.

Finally, after clinical stabilization of the adrenal hemathoma, the progressive ECG normalization and the resolution of ventricul arrhythmias even after mobilization, the patient was moved to the medical unit to complete the monitoring.



MISCELLANEA 634
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
ASSISTENZA CARDIACA IN ACUTO NEL DIPARTIMENTO DI EMERGENZA
(ASSISTENZA CARDIACA IN ACUTO)

PERCUTANEOUS RETRIEVAL OF A SUBCUTANEOUS CONTRACEPTIVE DEVICE MIGRATED IN THE PULMONARY CIRCULATION

Ciro Pollio Benvenuto (a), Luigi Cappanoli (a), Carlo Trani (a), Francesco Burzotta (a)
(a) UNIVERSITÀ CATTOLICA DEL SACRO CUORE

A 37 y/o young lady with no previous relevant medical history was admitted to our Emergency Department after the detection of a foreign body inside one of the branches of the left pulmonary artery, that was recognized as the contraceptive subcutaneous device implanted months before in the medial part of her left arm and finally migrated in the pulmonary circulation through the venous system. The patient was asymptomatic; a computed tomography (CT) was performed just because she could no longer detect the device under her skin. Percutaneous retrieve of the foreign body thorough right femoral vein as access site was the treatment of choice. Combining CT scans and 3D reconstruction with fluoro-angiographic images, the exact position of the foreign body was assessed and the branch of the left pulmonary artery where the disposal was stuck was engaged with a 0.035' metallic

wire. A snaring device was then advanced, crossed the right heart and reached the device, which after several attempts was finally captured. Caution was needed during the retrieve of the snared foreign body from the right ventricle into the right atrium, in order to avoid tricuspid valve damage that might have led to severe regurgitation. Lastly, the foreign body was unable to pass through the sheath, and forcing the retrieval caused its bending and fracture, sticking it inside the sheath. Luckily, by removing the sheath, the disposal was extracted as well. The procedure was completed without any complication and the patient, after a transthoracic echocardiogram, was discharged on second day. This case highlights one of the possible complications related to subcutaneous contraceptive devices, never described before, suggesting echoguidance for their implant.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

PREVENZIONE E RIABILITAZIONE

PREVENZIONE E RIABILITAZIONE 847
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)

ADDRESSING THERAPEUTIC INERTIA IN SECONDARY CARDIOVASCULAR PREVENTION: EVALUATING THE ROLE OF PERCENTAGE DISTANCE FROM LDL TARGETS. PRELIMINARY RESULTS FROM THE ITALIAN ITACARE-P NETWORK.

Andrea Faggiano (b), Anna Gualeni (a), Lucia Barbieri (b), Laura Garau (b), Grancesco Giallauria (g), Marco Ambrosetti (c), Matteo Ruzzolini (h), Elio Venturini (f), Gianfrancesco Mureddu (i), Francesco Maranta (e), Massimiliano Ruscica (b), Stefano Carugo (b), Francesco Fattirolli (d), Pompilio Faggiano (a)

(a) FONDAZIONE POLIAMBULANZA, BRESCIA; (b) POLICLINICO DI MILANO; (c) CARDIOLOGIA RIABILITATIVA RIVOLTA D'ADDA; (d) OSPEDALE CAREGGI, FIRENZE; (e) SAN RAFFAELE, MILANO; (f) OSPEDALE DI CECINA, LIVORNO; (g) UNIVERSITA' FEDERICO II, NAPOLI; (h) OSPEDALE ISOLA TIBERINA, ROMA; (i) OSPEDALE SAN GIOVANNI, ROMA

Objective: This study aimed to assess the proportion of patients in a secondary cardiovascular prevention setting who achieved low density lipoprotein (LDL) cholesterol targets as recommended by the 2019 ESC/EAS Guidelines on dyslipidemias. Additionally, we evaluated whether lipid-lowering therapies (LLT) were adjusted in patients not meeting the target levels and analyzed the likelihood of these modifications achieving the recommended targets.

Methods: A multicenter, cross-sectional observational study was conducted, retrospectively analyzing medical records of 1909 ambulatory outpatients evaluated in 9 Italian cardiac rehabilitation/secondary cardiovascular prevention clinics from January 2023 to June 2024. Inclusion criteria included a prior history of atherosclerotic cardiovascular disease (ASCVD) and recent LDL cholesterol levels. Data collected included demographics, ASCVD presentation, lipid profiles, and LLT. Patients were considered at very high cardiovascular risk, with LDL cholesterol

targets of ≤ 55 mg/dL, or ≤ 40 mg/dL for those with recurrent events within two years. For patients not at target, the clinician's approach to LLT modification was recorded. The efficacy of LLT changes was estimated using established reduction percentages for different therapies.

Results: Among 1909 patients, 41.3% achieved the LDL cholesterol target. Multivariate analysis identified

Predictor	Reaching LDL Target	Therapeutic Modification
Male Gender	I Positive	—
Cardiac Rehabilitation	I Positive	I Positive
Recent ACS (Acute Coronary Syndrome)	I Positive	I Positive
Diabetes Mellitus	I Positive	—
Triple Therapy (Statin + Ezetimibe + PCSK9)	I Positive	—
Target LDL ≤ 40 mg/dL	I Negative	I Negative
Absence of Therapy	I Negative	—
Monotherapy (Statin or Ezetimibe)	I Negative	—
Advanced Age	—	I Negative
Greater Percentage Distance from LDL Target	—	I Positive

Figure 1



male gender, cardiac rehabilitation participation, recent acute coronary syndrome, diabetes mellitus, and triple therapy (statin + ezetimibe + PCSK9 inhibitors) as predictors of achieving LDL targets. Conversely, a target level of ≤ 40 mg/dL, absence of therapy, and monotherapy were negative predictors. Among 1074 patients not at target, 48.6% had LLT modifications proposed. Positive independent predictors for LLT modification included recent ASCVD events, participation in cardiac rehabilitation, and a greater percentage distance from the LDL target, while advanced age and an LDL target of ≤ 40 mg/dL were

negative predictors. Despite therapy modifications, only 42.3% were predicted to be appropriate and to achieve their LDL targets.

Conclusion: Despite the diffusion of 2019 ESC/EAS guidelines, a significant proportion of high-risk patients still did not achieve LDL cholesterol targets, and proposed LLT modifications were often insufficient to reach the desired levels. More aggressive or optimized therapy adjustments are necessary to improve outcomes in this population.

PREVENZIONE E RIABILITAZIONE 645

RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

INCIDENCE, DETERMINANTS AND LONG-TERM PROGNOSTIC VALUE OF POSTOPERATIVE ATRIAL FIBRILLATION DURING CARDIAC REHABILITATION

Giovanna Cacciola (a), Davide Lazzeroni (a), Valentina Ziveri (a), Umberto Camaiora (a), Simone Geroldi (a), Lorenzo Brambilla (a), Valerio Brambilla (a), Sean Rastelli (c), Giampaolo Niccoli (b), Matteo Bini (a)

(a) U.O. PREVENZIONE E RIABILITAZIONE CARDIOVASCOLARE FONDAZIONE DON GNOCCHI PARMA; (b) DIPARTIMENTO DI CARDIOLOGIA, UNIVERSITA' DI PARMA; (c) MEDICINA E CHIRURGIA, UNIVERSITA' DI PARMA

Background: Postoperative atrial fibrillation (POAF) represents a common complication after cardiac surgery. The most common POAF, defined as early, occurs in the first few days after surgery, while a second peak of incidence, occurs in cardiac rehabilitation (CR), defined as late. Late POAF's long-term prognostic value remains not well understood.

AIM The study aimed to assess the incidence, determinants and long-term prognostic value of late POAF in a cohort of consecutive patients who undergo CR after cardiac surgery.

Methods: A consecutive registry of patients admitted

to our CR after cardiac surgery represents the present study. All patients were day-by-day monitored with a continuous 12-lead ECG. Late POAF was defined as any episode of atrial fibrillation (AF) occurring during CR. Long-term hard endpoints were: cardiovascular (CV) mortality and major adverse cardiovascular and cerebrovascular events (MACCEs).

Results: 1.720 patients were included, mean age was 67 years and male gender was prevalent (73.2%). CR post-coronary artery bypass graft (CABG) was the indication of CR in 59% of patients, cardiac valve surgery in 30%, while 8% underwent CR after CABG plus valve

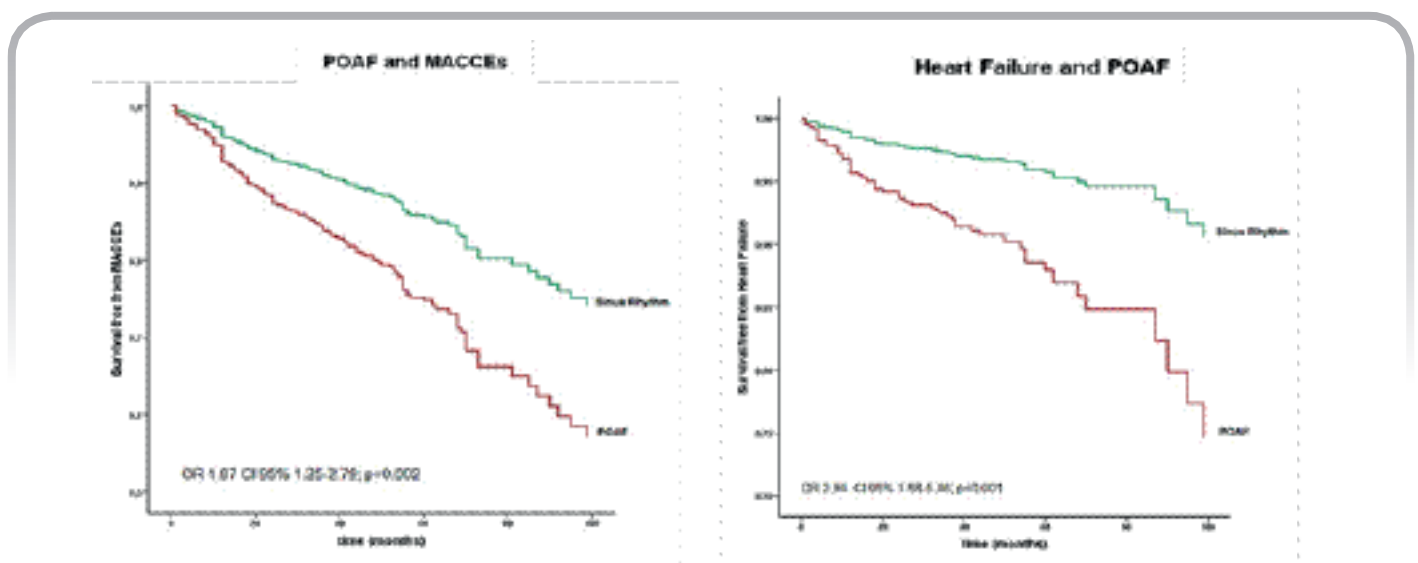


Figure 1



surgery. All patients were followed for a mean of 50 months. POAF was found in 193 patients (9.5%). POAF was more prevalent in patients who underwent cardiac valve surgery (51%). Only ECG data at admission were able to predict POAF during cardiac rehabilitation, in particular PR-interval (OR = 1.008; $p < 0.0001$) showed the highest predictive value. Late POAF was associated with higher rates of MACCEs (SR 12.4% vs POAF 18.1%; $p = 0.027$), mainly driven by higher rate of heart failure hospitalization (SR 3.7% vs POAF 7.8%; $p = 0.007$) and stroke (SR 2.1% vs POAF 4.7%; $p = 0.028$).

Conclusions: POAF represents a common complication during CR, occurring in 1 patient out of 10, and is more prevalent after cardiac valve surgery. ECG variables at admission are able to predict POAF during CR. POAF during CR is associated with long-term higher risk of MACCEs, both for cardioverted and non-cardioverted POAF, regardless of the type of cardiac surgery, mainly driven by a higher rate of heart failure hospitalization and stroke.

PREVENZIONE E RIABILITAZIONE 429
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE (ATTIVITÀ FISICA E
CARDIOLOGIA DELLO SPORT)

RIABILITAZIONE CARDIOLOGICA: VALUTAZIONE ERGOSPIROMETRICA DELLA CAPACITÀ FUNZIONALE OTTENUTA CON UN PROGRAMMA DI TRAINING DI ALTÀ INTENSITÀ AMBULATORIALE E AUTOGESTITO

Alberto Boveri (a), Lorenzo Di Filippo (a), Marcello Napoli (a), Martina Solimano (a), Cristina Barbara (b), Annalisa Porcile (b), Piero Clavario (b), Marco Canepa (a), Italo Porto (a)

(a) IRCCS OSPEDALE POLICLINICO SAN MARTINO GENOVA; (b) RIABILITAZIONE CARDIOLOGICA ASL 3 GENOVA

Introduzione: La riabilitazione cardiologica determina una significativa riduzione degli eventi cardiaci e un miglioramento della qualità della vita. Tuttavia, è necessario continuare l'attività fisica indefinitamente per mantenere i benefici ottenuti.

Scopo: Valutare l'efficacia di un programma ambulatoriale di 8 settimane di training di alta intensità seguito da 8 settimane di training autogestito dal paziente.

Metodi: Sono stati arruolati 28 pazienti con età media 63 anni, 79% maschi, 21% femmine, 43% ischemici, 22% con scompenso cardiaco ischemico, 14% con scompenso cardiaco non ischemico, 14% valvolari, 7% con ipertensione polmonare (PAH). Al momento dell'arruolamento, i pazienti hanno effettuato un test ergospirometrico (CPET) massimale su cicloergometro per la prescrizione del programma di training. Il programma, della durata di 8 settimane, includeva: training su cicloergometro con il 90% del volume di esercizio a intensità moderata (80% LT1) e il 10% ad alta intensità (95% VO2 di picco); training di forza al 40% della ripetuta massima (1RM) nel primo mese e al 75% nel secondo mese; training dei muscoli respiratori con incentivatore di

volume (COACH®). Al termine del programma è stato ripetuto il CPET massimale ed è stata effettuata una sessione educativa per il proseguimento del training in autonomia. A due mesi dalla dimissione è stato effettuato un CPET di controllo per valutare la capacità cardiorespiratoria e di esercizio.

Risultati: Tutti i pazienti hanno completato il protocollo di studio. L'intervento riabilitativo proposto ha dimostrato una efficacia significativa con un aumento della capacità di consumo di ossigeno (VO2 peak) dell'8,5% e della capacità di esercizio (Watt peak) del 17,2%. La riduzione del rischio stimabile in una popolazione di cardiopatici con capacità cardiorespiratoria ridotta, come quella in studio, è stimabile nell'ordine di grandezza del 10%. I risultati relativi ai test ergospirometrici sono riassunti in tabella.

Conclusioni: Il nostro studio ha dimostrato che un intervento educativo sulle modalità di effettuazione di un programma di training autogestito dal paziente è efficace nel mantenere invariati a due mesi i risultati ottenuti nella fase di training supervisionato nella palestra riabilitativa.



PRE: CPET pre-avvio training riabilitativo ambulatoriale

POST: CPET dopo 8 settimane di training riabilitativo ambulatoriale

CONTROLLO: CPET dopo 2 mesi di training autogestito

	PRE (1)	POST (2)	CONTROLLO (3)	p 1 vs 2	p 1 vs 3	p 2 vs 3
VO² peak	1285,84	1402,23	1456,50	< 0,05	< 0,05	ns
VO²/Kg peak	17,61	19,15	19,61	< 0,05	< 0,05	ns
VO² % pred	68,45	74,81	77,2	< 0,05	< 0,05	ns
Watt peak	106,01	124,32	129,33	< 0,05	< 0,05	ns
VE/VCO² slope	40,71	39,05	37,85	< 0,05	< 0,05	ns
VO²/HR	10,41	11,05	11,48	< 0,05	< 0,05	ns

Tabella 1

PREVENZIONE E RIABILITAZIONE 41
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO
(IPERTENSIONE ARTERIOSA)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)

THE "WOMEN AND HEART IN MENOPAUSE" PREVENTION PROGRAMME

Maria Teresa Caputo (a), Mojgan Azadegan (b), Federica Marchetti (b), Stefano Taddei (c)

(a) UO MEDICINA 1 UNIVERSITARIA, OSPEDALE S. CHIARA, AZIENDA OSPEDALIERO-UNIVERSITARIA PISANA, PISA, ITALY; (b) DIREZIONE SANITARIA, AZIENDA OSPEDALIERO-UNIVERSITARIA PISANA, PISA, ITALY; (c) UO MEDICINA 1 UNIVERSITARIA, DIPARTIMENTO SPECIALITA' MEDICHE E CHIRURGICHE, PISA, ITALY

Objective: The incidence of cardiovascular disease (CVD) in women significantly increases after menopause. The atypical presentation and limited awareness of this evidence often lead to late diagnosis and worse prognosis. Therefore, early screening and proactive prevention programmes might have a substantial impact on this population. This study aimed to assess the prevalence of subclinical manifestations of CVD in asymptomatic post-menopausal women to inform future prevention approaches.

Design and methods: A one-day program of CVD screening and prevention was offered to all asymptomatic post-menopausal woman accessing the UO Medicine I of our Hospital. Each subject underwent a full cardiovascular (cv) risk assessment, including screening comorbidities, assessment of cardiovascular risk factors and ECG recording. A trans-thoracic echocardiographic and US doppler carotid studies were also performed to identify subclinical evidence of organ damage. All patients were subsequently reviewed by a cardiologist to receive a final diagnosis, optimize therapies and plan adequate follow-up. In case of provided evidence of CVD, other specialist tests were scheduled according to clinical guidelines and performed in the following days.

Results: Between 2018 and 2024, 357 post-

menopausal women attended the program. None had previous history of cv events. The diagnostic tests revealed that 129 women were hypertensives, 53 smokers, 114 had dyslipidaemia, 37 were obese, 14 had impaired glucose tolerance and 10 diabetes. Among all patients the screening for subclinical organ damage revealed: 114 women with carotid mid-intimal thickening, 62 with carotid atherosclerotic plaque while, among patients with hypertension, revealed 43 women with left ventricular eccentric hypertrophy, 8 with left ventricular concentric hypertrophy and 8 with left ventricular concentric remodeling. Notably, 70% of the women included in the analysis were not aware of having cv risk factors or subclinical organ damage.

Goals: Methods of carrying out the service (dedicated staff, set days and times, central diagnostic tests, time and cost optimization) - Promoting greater awareness of incidence of cv risk factors and cv disease among women - High index of appreciation by our patients.

Conclusions: Our results reveal a high prevalence of cv risk factors and subclinical organ damage in post-menopausal women, unaware of their high or very high risk of CVD. This emphasizes the importance of adopting proactive prevention programs and screening for CVD in this population, which could substantially reduce the burden of CVD worldwide.



PREVENZIONE E RIABILITAZIONE 644
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
TRATTAMENTO DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)
TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA)

DISCREPANCY BETWEEN ESTIMATED CARDIOVASCULAR RISK AND INDIVIDUAL RISK PERCEPTION: INSIGHTS FROM A CARDIOVASCULAR PREVENTION CENTER SURVEY

Valentina Ziveri (a), Davide Lazzeroni (a), Davide Coppa (c), Giovanna Cacciola (a), Umberto Camaiora (a), Simone Geroldi (a), Eleonora Guazzi (a), Enrica Ponzi (a), Giuseppina Granato (a), Claudio Stefano Centorbi (a), Luca Moderato (a), Giampaolo Niccoli (b), Matteo Bini (a)

(a) U.O. PREVENZIONE E RIABILITAZIONE CARDIOVASCOLARE FONDAZIONE DON GNOCCHI PARMA; (b) DIPARTIMENTO DI CARDIOLOGIA, UNIVERSITA' DI PARMA; (c) MEDICINA E CHIRURGIA UNIVERSITA' DI PARMA

Background: The recently updated European Society of Cardiology Scores offer an accurate cardiovascular risk estimation. However, a gap between perceived and calculated risk may strongly interfere in healthy lifestyle changes as well as in cardioprotective drugs adherence.

AIM The aim of the present study was to evaluate and quantify the above-mentioned gap.

Methods: A cohort of subjects referred to our Cardiovascular Prevention Center were included in the

present study. Cardiologists assessed each traditional and emerging risk factor in terms of presence or absence, severity, distance from target, and the cardiovascular risk was calculated using appropriate ESC scores. Each subject filled out a questionnaire in which they were asked to declare their perceived cardiovascular risk and to report, among all the traditional and emerging cardiovascular risk factors, which ones they believed to have greater impact on their individual risk. Moreover, a Machine learning analysis was performed in order to assess cluster of under- and over-estimation.

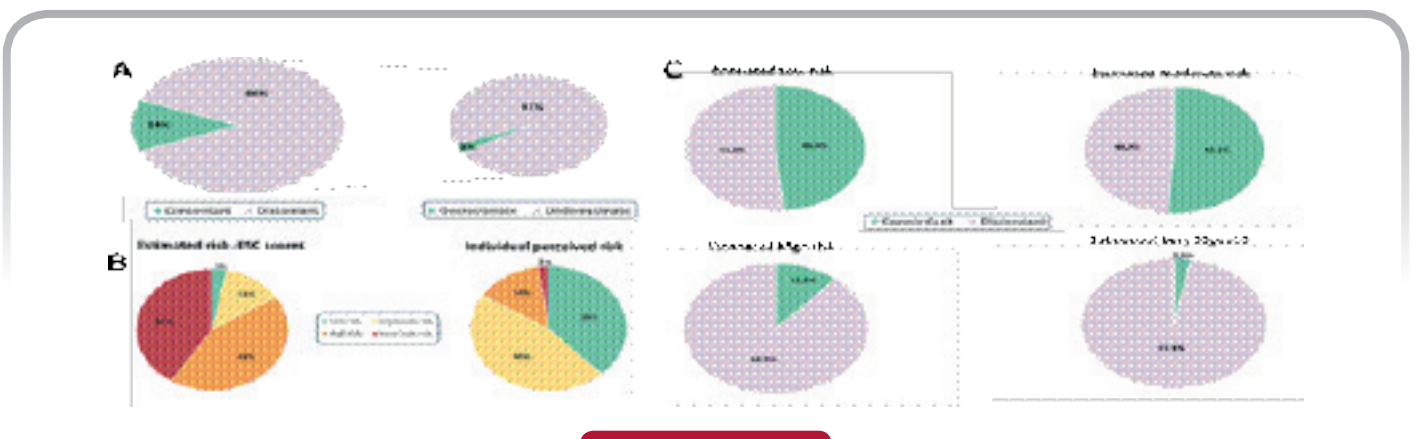


Figure 1

Results: 1.015 consecutive subjects were included, 72,9% in primary prevention and 26,1% with atherosclerotic cardiovascular disease, mean age was 65 years, male gender was prevalent (55%), arterial hypertension (AHT) was found in 77,8% (41,9% uncontrolled), dyslipidaemia in 93,2% (82% not at target), diabetes in 17,2% (43,6% uncontrolled), smokers were 14,6% and 24,5% had obesity. A concordance between estimated and perceived risk was found in 14,1% while a discordance in 85,9%; 96,3% underestimate their risk, while 3,7% only overestimate it (figure panel A). A significant higher rate of discordance was found with the progressive increase of the risk ($p < 0.0001$), since 41% had very high estimated risk while 2% only perceived it as very high (figure panel B). There was a different perceived cardiovascular risk among each

estimated classes of risk: only 11,1% of high risk and 2,9% of very high risk were concordant in their risk perception (figure panel C). A cluster of overestimation was found in young, female and anxiety subjects, while a cluster of underestimation in older, male and subjects with dyslipidaemia

Conclusions: A high rate of subject underestimate its cardiovascular risk; the higher the risk, the higher the gap between perceived and estimated risk. This risk gap represents a "risk within the risk". For these reasons it is necessary to increase all efforts towards a more effective health education in the field of cardiovascular prevention in order to reinforce patient's awareness and physician-patient alliance.



PREVENZIONE E RIABILITAZIONE 60
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
DIABETE E MALATTIE CARDIOVASCOLARI
(DIABETE E MALATTIE DEL METABOLISMO)
FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA
(IPERTENSIONE ARTERIOSA)

DISPARITA ETNICHE NEL RISCHIO E NEL CONTROLLO CARDIOVASCOLARE NELLE DONNE AL CENTRO
P.A.S.C.I.A. DI MODENA

Elisa Lodi (a, b), Maria Luisa Poli (a, b), Eleonora Rodighiero (a, b), Letizia Reggianini (a, b), Francesco Pugnaghi (a, b),
Maria Grazia Modena (a, b)

(a) CENTRO P.A.S.C.I.A. (PROGRAMMA ASSISTENZIALE SCOMPENSO CARDIACO, CARDIOPATIE DELL'INFANZIA E A RISCHIO) - AOU POLICLINICO DI MODENA; (b) UNIVERSITA' DEGLI STUDI DI MODENA E REGGIO EMILIA - DIPARTIMENTO CHIMOMO

Objective: This study aims to evaluate the differences in cardiovascular risk profiles and risk factor control among women of diverse ethnic backgrounds. Cardiovascular diseases (CVDs) are the leading cause of mortality among women globally, yet ethnic disparities in risk profiles and management remain under-explored.

Methods: A cross-sectional analysis was conducted on a cohort of 102 women aged 37-81, representing various ethnic groups: White (39%), Black (21%), Hispanic (20%), and Asian (20%). Data were extracted from records of the healthcare system of an outpatient clinic Policlinico di Modena collected during screening day ONDA over two years (2022-2023). Cardiovascular risk factors assessed included hypertension, diabetes, hyperlipidemia, smoking habit, obesity and family history of CVD. Control of these risk factors was evaluated based on adherence to established clinical guidelines: blood pressure <140/90 mmHg, LDL cholesterol <100 mg/dL, and HbA1c <7% for diabetics.

Results: Significant variations in cardiovascular risk profiles were observed across ethnic groups. Black women had the highest prevalence of hypertension (58%), followed by Hispanic (47%), White (40%), and

Asian women (33%) ($p < 0.001$). Obesity was most prevalent among Hispanic women (52%), followed by Black (45%), White (37%), and Asian women (25%) ($p < 0.001$). Diabetes prevalence was highest among Hispanic (22%) and Asian women (20%), compared to Black (18%) and White women (12%) ($p < 0.001$). Smoking rates were lowest in Asian women (5%) and highest in White women (18%) ($p < 0.001$). Control of risk factors varied significantly: only 48% of Black women had controlled blood pressure compared to 65% of White women ($p < 0.01$). LDL cholesterol control was lowest among Hispanic women (55%) and highest in White women (68%) ($p < 0.05$). Diabetes control was least effective in Hispanic women (42%) and most effective in Asian women (63%) ($p < 0.01$).

Conclusion: The study highlights substantial ethnic disparities in cardiovascular risk profiles and management among women. Black and Hispanic women are disproportionately affected by hypertension and obesity, while control of these risk factors is less effective compared to White and Asian women. These findings underscore the need for tailored interventions and culturally competent care to address ethnic disparities in cardiovascular health among women.

PREVENZIONE E RIABILITAZIONE 534

PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) COAGULAZIONE E COVID-19 (COVID-19) SARS-COV-2 (COVID-19)

IL RICORSO AL PRONTO SOCCORSO PER MALATTIE CEREBROVASCOLARIA PRIMA E DOPO LA PANDEMIA COVID-19: STUDIO RETROSPETTIVO

Valerio Di Nardo (a, b), Andrea Petralla (b), Veronica Ricciardi (a), Iacopo Iachettini (a), Federica Festuccia (a), Marco Castronuovo (a)

(a) AZIENDA OSPEDALIERA "S. MARIA" DI TERNI; (b) UNIVERSITÀ DEGLI STUDI DI PERUGIA

ANNO DI RIFERIMENTO	2019	2022
430: Emorragia subaracnoidea	17	25
431: Emorragia intracerebrale	138	137
432: Altre emorragie intracraniche	49	75
433: Occlusione e stenosi delle arterie precerebrali	7	16
434: Occlusione dell'arteria cerebrale	112	82
435: Attacco ischemico transitorio e sindrome correlata	200	171
436: Malattia cerebrovascolare acuta	0	4
437: Altre malattie cerebrovascolari	62	68
438: Effetti tardivi della malattia cerebrovascolare	355	44
TOTALE	940	617

Tabella 1

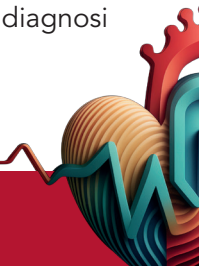
Introduzione: Le malattie cerebrovascolari sono patologie del sistema nervoso centrale provocate da alterazioni della circolazione sanguigna. La prevenzione è l'arma più importante per contrastare l'insorgenza e la progressione di tali patologie. Le principali raccomandazioni per la loro prevenzione sono: adottare e mantenere stili di vita salutari; riconoscere precocemente e monitorare eventuali fattori che aumentano il rischio di insorgenza di malattie cardiovascolari, quali ipertensione arteriosa, dislipidemie e diabete mellito (Ministero della Salute, 2022). La pandemia da Sars-Cov-2, oltre agli effetti diretti del virus sulle popolazioni, ha avuto e continuerà ad avere effetti indiretti sulla morbilità e sulla mortalità (Banerjee et al. 2020). Tra gli impatti indiretti vi sono stati: prestazioni sanitarie cancellate o rimandate; l'evitamento dei servizi sanitari per il trattamento di condizioni acute e per la gestione di condizioni croniche

sottostanti (Sharma et al., 2021) con conseguenti ritardi nelle diagnosi (Spadea et al., 2021). L'impatto indiretto sulla salute non ha interessato esclusivamente le malattie croniche, ma anche le patologie tempo-dipendenti, in particolar modo quelle cardiovascolari (Giustino et al., 2020) quali ictus (Kansagra et al. 2020; Zhao et al., 2020) e infarto miocardico (De Rosa et al. 2020).

Obiettivo: Descrivere l'evoluzione del ricorso al Pronto Soccorso (PS) dell'Azienda Ospedaliera di Terni per malattie cerebrovascolari tramite gli accessi registrati nel 2019 (pre pandemia) e nel 2022 (post pandemia).

Materiali e metodi: Sono stati richiesti e ottenuti gli accessi totali al PS registrati negli anni 2019 e 2022. Da questi sono stati estrapolati gli accessi per malattie cerebrovascolari (Codici 430-438), identificati secondo il Sistema di codifica ICD-9-CM.

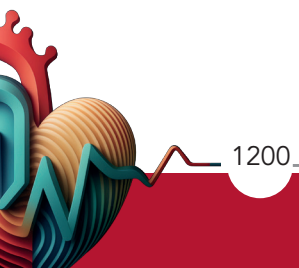
Risultati: Gli accessi al PS sono stati 44833 nel 2019 e 41024 nel 2022. Le malattie cerebrovascolari hanno rappresentato il 2,09% degli accessi nel 2019 (n. 940) e l'1,5% nel 2022 (n. 617). Nella tabella sono riportati i dati stratificati per singola diagnosi e anno di riferimento. Sebbene il numero di accessi per malattie cerebrovascolari sia diminuito nel 2022, è da osservare che tale dato è in controtendenza per alcune diagnosi



specifiche quali 430: Emorragia subaracnoidea, 432: Altre emorragie intracraniche, 433: Occlusione e stenosi delle arterie precerebrali, 436: Malattia cerebrovascolare acuta.

Conclusioni: Nel territorio di riferimento non risulta essersi registrato un incremento del ricorso al PS per malattie cerebrovascolari. Tuttavia alcune delle patologie acute hanno registrato un aumento in termini assoluti, tale da suggerire di contrastare una eventuale riduzione degli accessi alla diagnosi precoce e ai follow-

up (Spadea et al. 2021) come avvenuto durante la pandemia. Meritevole di approfondimento la diagnosi "438: Effetti tardivi della malattia cerebrovascolare" che passa dai 355 casi nel 2019 ai 44 nel 2022, non in linea con quanto riportato in letteratura. Indagini simili, ripetute in contesti differenti, possono fornire informazioni utili a valutare l'efficacia dei servizi sanitari nelle diverse regioni (Di Nardo et al. 2023), ma anche per progettare interventi di prevenzione e promuovere nuovi modelli organizzativi.



PREVENZIONE E RIABILITAZIONE 465

DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)

PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI

(PREVENZIONE E RIABILITAZIONE)

FARMACI CARDIOVASCOLARI

(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

EFFECT OF INCLISIRAN ON LDL-C ACCORDING TO BACKGROUND THERAPY: RESULTS FROM THE DAMAGE REGISTRY

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Background: Globally, hypercholesterolemia causes about 42% of coronary heart disease deaths and 9% of stroke deaths amounting to 4.3 million deaths every year.

Prevention, defined as a coordinated set of actions either at the population or individual level aimed at eliminating or minimizing the impact of cardiovascular disease and related disabilities, should be achieved

by promoting a healthy lifestyle and by targeting cardiovascular risk factors such as LDL cholesterol levels, blood pressure levels, smoking habit, potus, high BMI and sedentary life-style.

More patients are surviving their first cardiovascular event and are at high risk of recurrence.

Aims: This multicenter, retrospective study aims to

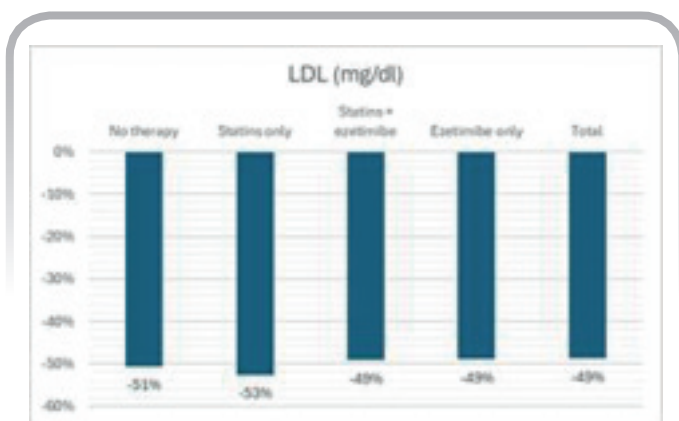


Figure 1

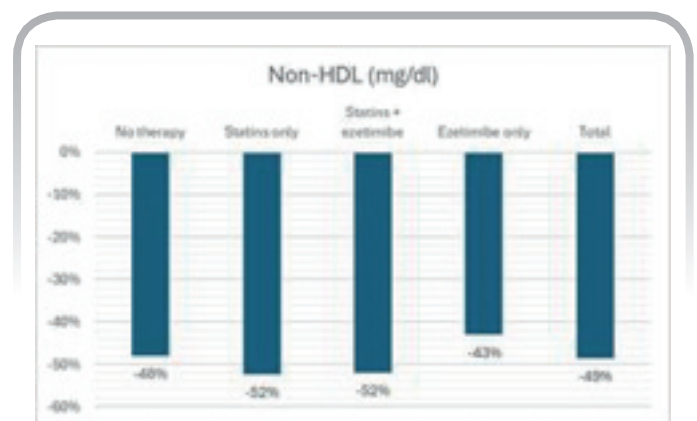
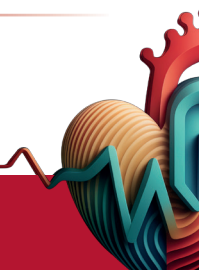


Figure 2



evaluate the efficacy of hypolipidemic therapy in reducing LDL cholesterol levels by comparing statin and/or ezetimibe combination therapy with inclisiran versus single siRNA treatment. All consecutive patients starting inclisiran therapy according to national and European guidelines were enrolled from eight different centres in the Marche Region. The primary endpoint was the difference in LDL-reduction after inclisiran therapy according to background LDL-lowering drugs.

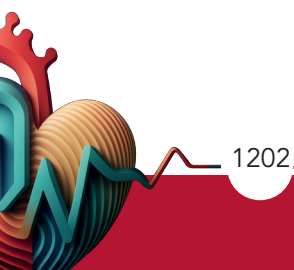
Methods: 112 patients starting inclisiran therapy were consecutively enrolled (68% males, mean age 63 +/- 10 years) and divided according to their background therapy (56% statins + ezetimibe, 18% only statins, 8% only ezetimibe, 18% no therapy). 76% of the population were on secondary prevention (67% previous myocardial infarction, 9% previous stroke/TIA). 26% of all patients

were defined as "statin-intolerant" according to EAS guidelines.

Results: During a median follow-up time of 9 months, LDL-c reduction in the whole population was 49%, with no significant differences between the different groups (Figure 1, $p=0.882$).

Similar results were reported when non-HDL cholesterol was analyzed (Figure 2; $p=0.381$).

Conclusion: The reported LDL reduction of inclisiran in real life is very close to the reduction derived from the phase-III clinical trials and is consistent regardless of the different LDL-lowering background therapies. A similar efficacy of inclisiran can be expected regardless of its use as a "on-top" or as a stand alone therapy for dyslipidaemia.



PREVENZIONE E RIABILITAZIONE 780 TRATTAMENTO POST-INFARTO (CARDIOPATIA ISCHEMICA) DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA) INFARTO STEMI (CARDIOPATIA ISCHEMICA)

RISCHIO RESIDUO DOPO SINDROME CORONARICA ACUTA:IL CONTROLLO DEI LIVELLI DI LEDL

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Premessa: Numerosi studi prospettici hanno evidenziato che la presenza di alte concentrazioni sieriche di LDL-C rappresenta uno dei principali fattori di rischio per malattia coronarica ed è ormai ampiamente documentato che la riduzione dei valori ematici di LDL-C riduce il rischio di eventi cardiovascolari maggiori ed è, pertanto, il target principale delle strategie terapeutiche ipolipemizzanti. Soprattutto le LDL-C hanno un ruolo fondamentale nel rischio residuo post SCA perché possono determinare la progressione della malattia aterosclerotica e quindi facilitano le recidive e pertanto la terapia ipolipemizzante è uno dei cardini della terapia della prevenzione secondaria post SCA, con la consapevolezza che tanto più bassi sono i livelli di LDL tanto è meglio. I pazienti affetti da SCA sono pazienti ad alto ed altissimo rischio e pertanto si raccomanda il raggiungimento di livelli di LDL per lo meno rispettivamente <55 mg/dl e <40 mg/dl. Purtroppo i dati della letteratura mostrano come i pazienti post SCA siano sottotrattati e solo una percentuale di pazienti molto bassa, (tra il 20 e il 24% secondo gli studi Santorini e Davinci), raggiunge un valore di LDL<55 mg/dl. Lo scopo del nostro studio è stato quello di: verificare se nei pazienti dimessi con diagnosi di SCA il nostro operato in termini di terapia ipolipemizzante e di controllo della colesterolemia era in linea con le attuali linee guida; verificare quanti pazienti a distanza di 1-6 mesi dalla dimissione proseguono la terapia ipolipemizzante e quanti pazienti sono a target per quanto riguarda i valori di colesterolo; confrontare i nostri risultati con i dati della letteratura.

Materiali e metodi: abbiamo arruolato 232 pazienti consecutivi ricoverati nel reparto di Cardiologia-UTIC del Policlinico Universitario di Monserrato-AOU Cagliari da novembre 2023 ad aprile 2024 con diagnosi di SCA, 178 uomini (76.7%) e 54 donne (23.2%), età media di 66.2 ± 11.6 anni (range 40-93). I pazienti sono stati sottoposti, entro 24-48 ore, al dosaggio dei valori plasmatici di colesterolo totale, colesterolo LDL, colesterolo HDL, trigliceridi.

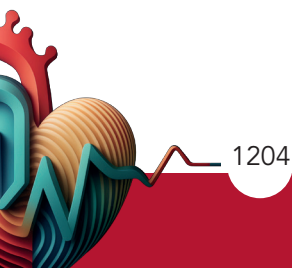
Risultati: All'ingresso, i valori medi di colesterolo totale erano 174.2 ± 41.9 mg/dl (range 65-343 mg/dl), di colesterolo LDL 108 ± 40.5 mg/dl (range 27-266 mg/dl), di colesterolo HDL 42.7 ± 12.4 mg/dl (range 14-84 mg/dl) e di trigliceridi 114.3 ± 68.9 mg/dl (range 36-369 mg/dl). Al momento del ricovero solo 15 pazienti (6.4%) avevano valori di LDL a target secondo le linee guida ESC/ESA (< 55 mg/dl), mentre 217 (93.6%) avevano valori superiori. Al momento del ricovero, 149 pazienti (64.2%) non assumevano alcuna terapia ipolipemizzante, a 45 pazienti (19.4%) veniva somministrata una terapia con statina, 33 pazienti (14.2%) erano in trattamento con statina ed ezetimibe, 4 pazienti (1.7%) assumevano solo ezetimibe, ed 1 paziente (0.43%) assumeva una terapia con statine, ezetimibe e alirocumab. Dei 232 pazienti della popolazione in studio, 64 (27.6%) sono stati dimessi con la sola statina, 132 (56.9%) con statina associata ad ezetimibe; 2 (0.9%) solo con ezetimibe, un paziente assumeva oltre a statina ed ezetimibe l'acido bempedoico. A 32 pazienti (13.7%) è stata prescritta una terapia con inibitori del PCSK9, più precisamente:



13 pazienti (6.5%) assumevano statina, ezetimibe e alirocumab, 7 pazienti (3%) statina, ezetimibe ed evolocumab, mentre 11 pazienti con inclisiran. A 229 pazienti è stata prescritta una statina ad alta potenza: di questi 146 pazienti sono stati dimessi con atorvastatina con dosaggio medio di 72 ± 17 mg, 80 pazienti con rosuvastatina con dosaggio medio di 22.1 ± 7.5 mg e 3 pazienti sono stati dimessi con simvastatina 40 mg. In media dopo 35.4 ± 21.5 giorni, 135 pazienti (58.2%) sono stati sottoposti a nuovo controllo clinico e dosaggio dei valori plasmatici di colesterolo totale, colesterolo LDL, colesterolo HDL, trigliceridi. È stata osservata una riduzione significativa dei valori di colesterolo totale prima e dopo l'inizio del trattamento: si è passati da valori di 174.17 ± 42.8 mg/dl a 112.3 ± 41.2 mg/dl, ($p=0.0001$), di LDL da 110.5 ± 40.6 mg/dl a 53 ± 29.5 mg/dl ($p=0.0001$), i valori di trigliceridemia sono passati da 115.5 ± 75.2 mg/dl a 97.9 ± 40.87 mg/dl ($p=0,019$). Si è osservato che i pazienti con valori di LDL a target sono significativamente aumentati: al momento della dimissione solo 9 pazienti (6.6%) presentava valori di LDL <55 mg/dl, mentre al follow-up sono 76, il 56%

($p=0.0001$), un valore nettamente superiore rispetto ai dati dello studio Santorini e DaVinci (rispettivamente il 20% e il 24%). Abbiamo riscontrato una correlazione statisticamente significativa tra tipo di terapia e il raggiungimento dei valori target di LDL <55 mg/dL (valori di $R=0.31$ e $p=0.0001$).

Conclusioni: Tutti i pazienti alla dimissione avevano in terapia statine ad alto dosaggio in associazione con ezetimibe e/o inibitori del PCSK9/Inclisiran, in accordo con le linee guida ESC/EAS. Con adeguata terapia ipolipemizzante i pazienti che hanno raggiunto il target sono significativamente aumentati, in correlazione a un regime terapeutico più intenso, quindi questi obiettivi terapeutici andrebbero attentamente perseguiti con la consapevolezza dei benefici che i pazienti possono trarne. È evidente il potere ipolipemizzante degli inibitori del PCSK9/siRNA, per cui è auspicabile la possibilità di renderli di prima scelta per un numero maggiore di pazienti a rischio alto e molto alto come i paziente post SCA.



PREVENZIONE E RIABILITAZIONE 305
CARDIOLOGIA DELLO SPORT
(ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT)
IDONEITA' SPORTIVA (ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT)

STEP TEST E RISPOSTA PRESSORIA DA SFORZO IN ATLETI ADOLESCENTI E PREADOLESCENTI

Gian Luca Ragazzoni (a), Luna Cavigli (a), Sofia Capparuccia (a), Elisa Pucci (a), Maria Concetta Pastore (a), Giulia Elena Mandoli (a), Marta Focardi (a), Matteo Cameli (a), Flavio D'ascenzi (a)

(a) *DIPARTIMENTO DI BIOTECNOLOGIE MEDICE, DIVISIONE DI CARDIOLOGIA, UNIVERSITÀ DEGLI STUDI DI SIENA*

Introduzione: Numerosi studi hanno dimostrato come i test da sforzo possono rivelare una risposta ipertensiva allo sforzo e come questa sia associata a un aumento del rischio cardiovascolare e della mortalità negli adulti. Nei pazienti pediatrici non sono però stati definiti chiari valori di riferimento. Inoltre, la letteratura scientifica si concentra principalmente sui valori di pressione arteriosa durante test da sforzo su tapis roulant o cicloergometro, trascurando lo step test, che è il metodo utilizzato in Italia in ambito di valutazione per l'idoneità sportiva agonistica dei giovani sportivi.

Obiettivo: Valutare il burden aritmico, la risposta pressoria e di frequenza cardiaca durante lo sforzo e definire i valori di riferimento della pressione arteriosa da sforzo nei bambini e negli adolescenti, stratificati per età e divisi per sesso, durante lo step test effettuato in occasione delle visite di idoneità sportiva agonistica.

Metodi: Sono stati inclusi tutti gli atleti che non presentavano ipertensione arteriosa a riposo di età compresa tra i 7 e i 17 anni che si sono sottoposti a screening medico sportivo con step test tra settembre 2023 e maggio 2024. È stata rilevata la pressione arteriosa (PA) tramite metodo auscultatorio e sono stati registrati i dati ECG a riposo, al picco dello sforzo e a due minuti di recupero. Inoltre, sono state raccolte informazioni anamnestiche riguardo il tipo di sport praticato, gli anni di pratica, il volume di allenamento e la familiarità. Sono stati definiti dei cut-off di PA da sforzo divisi per sesso e fasce d'età (7-10aa, 11-14aa,

15-17aa) sulla base dei valori presenti in letteratura. I pazienti con PA superiore al cut-off sono stati sottoposti a visita cardiologica e test da sforzo al tapis roulant.

Risultati: Sono stati inclusi 646 soggetti (51% maschi) con età media 13 ± 2 aa con un volume di esercizio medio di 5 ± 2 ore a settimana. La FC a riposo media era pari a 81 ± 17 bpm; la % dell'FC massima teorica raggiunta, utilizzando la formula di Tanaka è stata dell' $85\% \pm 7$. La PA al picco dello sforzo è stata pari a $128 \pm 14 / 60 \pm 8$ mmHg. I maschi hanno mostrato valori di PA significativamente maggiori ($p < 0,05$) sia a riposo che durante lo sforzo. Al contrario la FC è risultata significativamente maggiore nelle femmine rispetto ai maschi. La PA e l'FC hanno mostrato una correlazione statisticamente significativa non solo con l'età e il sesso ma anche con il volume settimanale di allenamento. Solo due pazienti hanno mostrato aritmie durante lo sforzo, entrambi di tipo comune ed in assenza di cardiopatia strutturale. Nessuno degli atleti ha evidenziato valori di PA da sforzo superiori ai cut-off precedentemente individuati.

Conclusioni: I valori di PA ed FC correlano non solo con il sesso e l'età ma anche con il volume di allenamento settimanale. Lo step test non elicitava un numero elevato di aritmie ventricolari. Questo tipo di test non sembra però efficace nello slatentizzare una risposta ipertensiva da sforzo; pertanto, la pratica clinica attuale che non prevede il monitoraggio pressorio continuo è corretta.



PREVENZIONE E RIABILITAZIONE 609
NUTRACEUTICI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

**CARDIOMETABOLISMO. PROBIOTICI RISCHIO CARDIOVASCOLARE STRESS OSSIDATIVO E SALUTE DI
 GENERE, STUDIO OSSERVAZIONALE NELLA PRATICA CLINICA**

Flavio Acquistapace (a, c), Homar Moscaggiura (a), Davide Giorla (a), Laura Alba Acquistapace (a), Debora Boi (a)
 (a) *CARDIOCARE CENTRO MEDICO CARDIOLOGICO LUGANO SWITZERLAND* ; (b) *CLINICA MALCANTONESE
 EOC SERVIZIO DI MEDICINA E RIABILITAZIONE CARDIOVASCOLARE CASTELROTTO TICINO SWITZERLAND* ; (c)
SWISS MEDICAL NETWORK ARS MEDICA CLINIC LUGANO SWITZERLAND

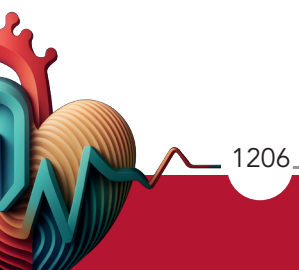
Background: Diversi studi che dimostrano la concausa del microbiota alla predisposizione e allo sviluppo di disturbi e fattori di rischio degenerativi: patologie cardiovascolari, obesità, sindrome metabolica e diabete. L'importanza di definire il "probiotico" e sviluppare le conoscenze e la ricerca clinica, ovvero valutare i risultati nella pratica clinica reale, è basilare

Scopo: Lo studio, che abbiamo condotto nella pratica clinica, è di tipo osservazionale, outcome primario e' que valutare l'impatto di una integrazione nutriceutica con probiotici sui fattori di rischio markers infiammatori e metabolici e secondario la capacità funzionale e la percezione della salute psicofisica.

Metodi: Su 7150 pazienti seguiti sono stati selezionati e valutati 110 pazienti per caratteristiche di omogeneità e aderenza. Caratteristiche seguenti di elegibilità: profilo di rischio, familiarità per malattie cardiovascolari, turbe disendocrine, sovrappeso e obesità, ipertensione,

diabete, ipercolesterolemia, ipertrigliceridemia, sindrome da fatica, distonia neurovegetativa. La valutazione è stata effettuata mediante percezione psicofisica dello stato di salute, tramite Questionario SF-36, capacità funzionale mediante il test di capacità fisica (Six Minute Walking Test 6MWT o Test della Marcia), esami ematici: PCR, Vitamine, profilo lipidico. Lo schema nutriceutico consiste nell'assunzione di 2cps dopo colazione e 2 cps dopo cena di Enterelle, nell'arco della prima settimana. Bifiselle, seconda settimana, Ramnoselle terza settimana Serobrain 1 cps dopo colazione quarta settimana. Serobioma, una compressa al giorno, per 3 mesi: fase di mantenimento.

Risultati e conclusioni: Lo studio ha indicato un'efficacia del trattamento nutriceutico probiotico sui pazienti riguardo riduzione del profilo di rischio ,miglioramento della percezione della salute capacità funzionale, stabilizzazione dei livelli di vitamine (vit B e D).



PREVENZIONE E RIABILITAZIONE 11
FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO
(IPERTENSIONE ARTERIOSA)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

LONG TERM CARDIOVASCULAR RISK AND MATERNAL HISTORY IMPLICATIONS IN PREECLAMPSIA: A POSTMENOPAUSAL STUDY

Maria Maiello (a), Francesca Amati (b), Pierpaolo Caretto (b), Marco Matteo Ciccone (b), Pasquale Palmiero (a, c)
(a) *CARDIOLOGY EQUIPE, DSS1, ASL BRINDISI, BRINDISI, ITALY*; (b) *CARDIOVASCULAR DISEASE SECTION, UNIVERSITY OF BARI, BARI, ITALY*; (c) *MEDICAL SCHOOL, UNIVERSITY OF BARI, BRINDISI SITE, ITALY*

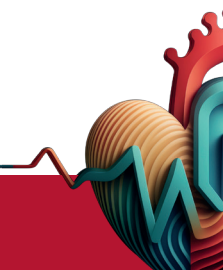
Introduction: Preeclampsia (PE) is associated with changes in the morphology and function of the maternal heart. While there are many studies on its short-term consequences, there are few on its long-term effects. Our study aims to evaluate whether experiencing preeclampsia during the reproductive period predisposes women to a higher risk of developing cardiac diseases secondary to arterial hypertension in the postmenopausal period. Another objective of our study is to assess the prevalence of preeclampsia in mothers within the group of menopausal women who experienced preeclampsia and to determine whether a history of maternal preeclampsia should prompt specific monitoring during a potential pregnancy in their daughters.

Methods: We enrolled 108 consecutive postmenopausal hypertensive women who had experienced preeclampsia during their reproductive years, characterized by elevated blood pressure during pregnancy associated with proteinuria, according to the criteria of the International Society for the Study of Hypertension in Pregnancy. None of the women had hypertension before pregnancy, and all returned to normal blood pressure within three months postpartum. The exclusion criteria were preexisting chronic hypertension, chronic kidney disease, type 1 or type 2 diabetes mellitus, autoimmune diseases such as systemic lupus erythematosus or antiphospholipid

syndrome, and pregnancies achieved through assisted reproductive therapy. All the women developed hypertension and required antihypertensive therapy only after entering menopause.

Results: Women affected by PE, compared with unaffected women, showed a higher prevalence of eccentric left ventricular hypertrophy (40 [37%] vs 23 [23%], $p < 0.02$, Chi-Square 4.8, Odds Ratio 1.9), left ventricular diastolic dysfunction (56 [51%] vs 39 [39%], $p < 0.003$, Chi-Square 13.2, Odds Ratio 2.6, and obesity (52 [39%] vs 28 [28%]), although this did not reach statistical significance, $p < 0.09$, Chi-Square 2.7, Odds Ratio 1.6. There was also a higher prevalence of mothers affected by arterial hypertension (59 [55%] vs 26 [26%], $p < 0.003$, Chi-Square 8.4, Odds Ratio 2.3. No difference was found in the prevalence of an enlarged left atrium (24 [22%] vs 15 [15%], $p < 0.1$, Chi-Square 1.8, Odds Ratio 1.6.

Conclusions: PE is an early marker of cardiac disease, and echocardiography plays a crucial role in guiding the detection and management of this condition. It can identify cardiac disease in the asymptomatic phase, having a hypertensive mother increases the likelihood of developing cardiac disease. Additionally, this condition recommends more intensive modification of risk factors in these women.



PREVENZIONE E RIABILITAZIONE 98
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE
(ATTIVITÀ FISICA E CARDIOLOGIA DELLO SPORT)
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

SCHOOL NURSE AND PRIMARY PREVENTION OF CARDIOVASCULAR DISEASE: INTEGRATIVE REVIEW

Milena Giovanna Guarinoni (a), Paolo Carlo Motta (a)
 (a) UNIVERSITA' DEGLI STUDI DI BRESCIA

Background: Cardiovascular disease (CVD) is a leading cause of morbidity and premature mortality in the world. Data indicate that atherosclerotic-CVD processes begin early in childhood and are influenced over the life course also by environmental exposures and potentially modifiable risk factors. The primary prevention beginning early in childhood that are acquisition and maintenance of healthy behaviors, including patterns of dietary intake and physical activity and avoidance of tobacco. Nurses, especially school nurses, are key players in community-wide and individual efforts to promote cardiovascular health and reduce the risk of CVD among children. The aim of this work is to find studies aimed to verify the effectiveness of primary prevention interventions implemented by nurses within the school setting and aimed to reduce behaviors that increase the probability to develop CVD.

Method: Integrative review of the literature. The search in database took place between February and May 2024. We consulted the following databases: Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, CINAHL and Web of Science. We also revised bibliographies of all the studies included. Time limit from 1999 (there is a past review of 1999). Two authors, independently, conducted screening of titles, abstracts and full texts to verify the inclusion criteria. We also did a critical evaluation of the included studies.

Results: Of the 99 articles screened, 5 were included in the review. Only one study (Harrell et al, 1999) was an RCT, it divided the population into 3 groups: intervention on the class group (received targeted lessons twice a week for 8 weeks), intervention on children at greater risk (nutrition courses, physical activity and "don't start smoking ") and control (no interventions). Through outcomes blood pressure, serum cholesterol, submaximal predicted aerobic power, skinfolds, and BMI, the study demonstrated that both classroom and risk-based approaches can improve cardiovascular risk profiles. One study (MacDonaldhad, 1999) an increase in knowledge as the only outcome, the intervention consisted of seven 45-minute health education lessons and it demonstrate that the participation in the lectures had a positive impact on knowledge of cardiovascular health. The only study conducted on adolescents (McCormick Covelli, 2006) had outcomes to increase knowledge, increase daily exercise and intake of fruits and vegetables and maintain normal blood pressure levels. The 9-week intervention program consisted of two 90-minute classes per week to provide health promotion concepts, nutrition, and exercise. In 2011 (Hawthorne et al) a pre-post research with outcomes BMI, Waist Circumference, progressive aerobic fitness the intervention was to walk for 1/4 di mile 3 days per week for 16 weeks, cardio-respiratory fitness increased by 37.1% over baseline in the entire sample ($p < .01$). In the newest research (Montelpare et al, 2018) the

intervention was laboratory experience and multimedia classroom presentation to demonstrate strategies to adopt a healthy lifestyle. The results indicated that there was a noticeable influence on the students' level of knowledge and their change in health attitude as result of participation in the program.

Conclusions: School nurse is a resource to increase students' knowledge about the prevention of CVD and the importance of adopting a regimen of quality daily physical activity while maintaining a balanced diet and avoiding tobacco products.



**PREVENZIONE E RIABILITAZIONE 32
DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E
NUTRACEUTICI)**

MULTIDRUG RESISTANT DYSLIPIDEMIA: A CASE REPORT

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Introduction: Recently introduced lipid-lowering agents (PCSK9-i, bempedoic acid) can efficiently treat statin-intolerant patients, who couldn't reach LDL target before. Nonetheless, there are still cases where the pharmacological management may have strong limitations.

Case report: A 71 year-old woman, with multiple cardiovascular risk factors (diabetes, hypertension and familial dylipidemia, LDL-C 276) underwent heart transplantation for a hypertrophic cardiomyopathy with an evolution towards a dilated phenotype in 2005. Before the transplant, she was on low-dose statin treatment (pravastatin 10 mg/die) that was suspended years later owing to hyper-CKemia (600 U/L), despite her being totally asymptomatic.

A second attempt with simvastatin/ezetimibe 40/10 mg resulted again in elevation of CK levels, associated with significant muscular pain. Thus, just ezetimibe was continued.

In 2020, 15 years after the transplant, the patient underwent a coronary angiography showing a moderate coronary allograft vasculopathy (ISHLT CAV2). Specifically, a sub occlusive ostial left main coronary artery lesion was treated by percutaneous

angioplasty and stent implantation.

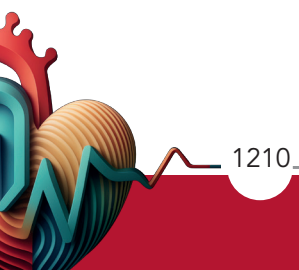
Since a lower LDL target was needed (LDL-C 55 mg/dL), Alirocumab was introduced.

However, 6 months later, no significant LDL levels reduction had been observed. The shift to evolocumab led to the same result, although the patient reported full therapeutic compliance.

In the suspicion of anti-drug antibodies development, we opted for Inclisiran without achieving a significant decrease in LDL-C levels.

In parallel with the search for genetic mutations in the PCSK9 gene and other genes involved in cholesterol metabolism (including LDLR, APOB, and LDLRAP1 and resulting positive only for common variants in LDLR receptor), therapy with bempedoic acid was initiated, again without substantial benefit (LDL-C 118 mg/dL).

Conclusion: Despite cholesterol management has been simplified by the introduction of new drugs, it may still be complex in patients requiring very low LDL-C levels in some specific cases. Drugs with a LDL receptor-independent mechanism of action (e.g., evinacumab) may allow the achievement of therapeutic goals suggested by clinical guidelines.



PREVENZIONE E RIABILITAZIONE 695

PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE) TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

VALUTAZIONE DELLA IDONEITÀ ALLA DONAZIONE DI SANGUE ATTRAVERO LO STUDIO ELETTROCARDIOGRAFICO IN UNA POPOLAZIONE OVER 50

Isabel Bianca Santo (a), Paola Persichella (b), Giuseppe Diaferia (b), Leonardo Santo (d), Emanuele Tato' (c), Marina D'alagni (a)

(a) SERVIZIO IMMUNOTRASFUSIONALE PO BARLETTA ASL BT; (b) U.O.C. CARDIOLOGIA PO BARLETTA, ASL BT; (c) U.O.C. DIREZIONE MEDICA PO BARLETTA, ASL BT; (d) A.V.I.S. BARLETTA

Premessa: Il DM 02/11/2015 stabilisce che la donazione di sangue intero da parte di donatori periodici con età compresa tra 65-70 anni può essere consentita previa valutazione clinica dei principali fattori di rischio età correlati. I requisiti per la selezione del donatore interni al SIT Barletta lasciano al giudizio medico l'esecuzione di indagini utili a stabilire l'idoneità alla donazione con esecuzione di ECG e visita cardiologica ai donatori con ipertensione non controllata, alla 1a donazione con età >60anni e ai donatori periodici oltre i 65 anni. Lo scopo del nostro lavoro è valutare le principali alterazioni elettrocardiografiche in una popolazione di donatori periodici con età >50anni ai fini del giudizio di idoneità alla donazione di sangue od emocomponenti.

Metodi: Abbiamo selezionato 200 donatori periodici di età compresa fra 50 e 68 anni (età media 59 anni) di cui 60(30%) femmine e 140(70%) maschi che, tra Giugno 2023 e Giugno 2024, in collaborazione con una delle associazioni di volontariato della donazione di sangue più rappresentative del territorio, l'A.V.I.S. Barletta, hanno effettuato mediante personale qualificato un esame ECG presso la sede dell'associazione. I dati ECG sono stati inviati, telematicamente, alla U.O.C. di Cardiologia del P.O. Barletta, refertati e condivisi con il SIT Barletta dove sono stati registrati nella cartella clinica del donatore.

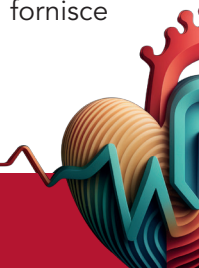
Le anomalie elettrocardiografiche riscontrate sono state stratificate in 3 classi di rischio: classe di rischio 0,

1 e 2. Gli ECG normali o con lievi alterazioni (alterazioni aspecifiche del recupero, deviazione assiale sx., blocco di branca incompleto) sono stati ritenuti compatibili con la donazione e inseriti in classe di rischio 0. Per le alterazioni di classe 1 (blocco atrio ventricolare I grado, extrasistolia ventricolare, emiblocco anteriore sx, ipertrofia ventricolare sx, Blocco di Branca completo) si è resa necessaria una visita cardiologica per l'idoneità alla donazione, mentre la presenza delle alterazioni di classe di rischio 2 (ischemia e/o necrosi) hanno determinato un giudizio di sospensione permanente dallo status di donatore di sangue.

Risultati: dei 200 donatori selezionati e sottoposti ad ECG,

- 155 (78%) donatori rientrano in classe di rischio 0; di questi 105 (53%) erano Maschi e 50(25%) femmine.
- 43 (22%) donatori rientrano in classe di rischio 1 cui fanno parte anomalie del ritmo e della conduzione; di questi 34 erano maschi (17%) e 9(5%) erano femmine.
- 2 (1%) donatori (uno per ciascun genere) rientrano in classe 2 con alterazioni incompatibili con la prosecuzione della donazione.

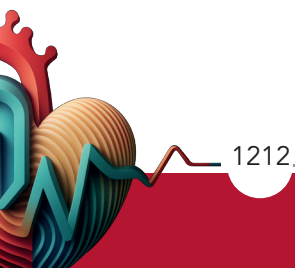
Conclusioni: Il nostro studio dimostra l'utilità della valutazione elettrocardiografica nel giudizio di idoneità alla donazione di sangue ed emocomponenti, in una coorte di donatori di sangue periodici over 50, a maggior rischio di eventi cardiovascolari e fornisce



un'indicazione utile ai medici trasfusionisti sulla valutazione delle alterazioni elettrocardiografiche.

Bibliografia: Ministero della Salute Decreto 2 novembre

2015. Disposizioni relative ai requisiti di qualità e sicurezza del sangue e degli emocomponenti. <https://www.gazzettaufficiale.it/eli/gu/2015/12/28/300/so/69/sg/pdf>



PREVENZIONE E RIABILITAZIONE 33

PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE) DISLIPIDEMIE (DIABETE E MALATTIE DEL METABOLISMO) PLACCA VULNERABILE (ATEROTROMBOSI)

EFFECT OF ANTI - PCSK9 ANTIBODIES ON ARTERY STRUCTURE AND FUNCTION: A SINGLE CENTRE EXPERIENCE

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Background: PCSK9 inhibitors antibodies (PCSK9-i) are a valid option to reduce LDL cholesterol in patients who failed to reach therapeutic target with maximized lipid-lowering therapies or in patient with statins intolerances. These antibodies reduce the frequency of new cardiovascular events, however if this effect is due only to LDL reduction or also to an improvement in arterial function and structure is yet to be proved. Our study aim was to evaluate aortic stiffness (Pulse Wave Velocity - PWV), carotid's Intima-Media Thickness (IMT) and endothelial function (brachial Flow Mediated Dilatation - FMD) in patients treated with Alirocumab and Evolocumab.

Methods: This is a monocentric prospective longitudinal study on patients who received PCSK9-i administrations in our Cardiovascular Rehabilitation and Prevention unit. They underwent 3 evaluations of PWV, FMD and IMT (T0 the same day of the first

injection, T1 after 6 months and T2 after 12 months of therapy).

Results: 439 patients concluded the 12 months period. The group average age is 66.8 ± 7.6 years, most of them were male (64.1%). LDL cholesterol average levels were significantly reduced by the therapy (128.3 ± 27.7 vs 44.7 ± 29.3 mg/dL, $p < 0.001$), however, there were no significant changes in PWV (10.2 ± 3.0 vs 10.6 ± 2.5 m/s, $p = 0.404$), FMD (8.6 ± 7.0 vs 8.9 ± 7.4 %, $p = 0.560$) and IMT (768.7 ± 175.4 vs 733.5 ± 147.2 μ m, $p = 0.270$) values.

Conclusions: It was not possible to prove a significant effect of PCSK9-i on vascular properties, however, the stability of these indexes may suggest a deceleration of the atherosclerotic disease which it could have worsen in this population, especially considering the risk factors of our patients.



CardioSic



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Roma, 12-15 dicembre 2024

SCOMPENSO CARDIACO

SCOMPENSO CARDIACO 786

CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

LA RELAZIONE TRA LA DEBOLEZZA DEI MUSCOLI RESPIRATORI E IL COMPORTAMENTO TEMPORALE DEL RESPIRO PERIODICO (EOV) NEI PAZIENTI CON HFrEF AL TEST DA SFORZO CARDIOPOLMONARE

Pietro Palermo (a), Marlus Karsten (a), Mauro Contini (a), Massimo Mapelli (a), Piergiuseppe Agostoni (a)
(a) CENTRO CARDIOLOGICO MONZINO - IRCCS MILANO

Introduzione: La ventilazione oscillatoria da sforzo (EOV) è comune nei pazienti con insufficienza cardiaca (HF) avanzata (CUNHA, 2023; ROVAI, 2019), con un valore prognostico negativo nei pazienti con HF con frazione di eiezione ridotta (HFrEF) e in quelli con frazione di eiezione media (HFmrEF).

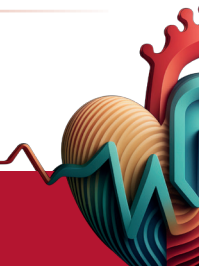
Metodi: abbiamo analizzato i dati di 98 pazienti ambulatoriali HFrEF clinicamente stabili con presenza di EOV almeno all’inizio del CPET, quest’ultimo eseguito e analizzato con un approccio standard,

come precedentemente descritto (MAGRI, 2023). La pressione inspiratoria massima (MIP) e la pressione espiratoria massima (MEP) sono state valutate (MicroRPM, Vyaire GmbH, Germania) come la più alta di cinque misurazioni consecutive (BRUSCHI, 1992) a riposo e subito dopo la fine del CPET. La debolezza muscolare inspiratoria (IMW) è stata identificata anche quando i valori di MIP a riposo erano uguali o inferiori a 70 o 80 cmH2O per donne o uomini, rispettivamente (LAVENEZIANA, 2019).

Feature	Variabile	ALL N=98	D-EOV N=56	P-EOV N=42	P value
	Workload (watt)	56 (45;83)	66.5 (51.5;93.5)	47 (38;59)	<.001
	VO2 (mL.Kg.min-1)	12.4 (10.6;14.7)	13.4 (12.1;16.0)	10.8 (9.3;12.7)	<.001
	VE/VCO2 slope	37.1 ± 8.5	34.5 ± 7.7	40.4 ± 8.5	.001
	VE (Lpm)	50.4 ± 13.5	53.3 ± 13.8	46.5 ± 12.1	.013
MIP	Rest (cmH2O)	87.5 ± 31.6	97.8 ± 30.9	73.9 ± 27.3	<.001
	Predicted (%)	86 ± 28	93 ± 27	76 ± 25	<.001
Inspiratory weakness	Equation (Bruschi)	33 (33.7%)	12 (21.4%)	21 (50%)	.003
	Statement (ERS)	45 (45.9%)	19 (33.9%)	26 (61.9%)	.006
MEP	Rest (cmH2O)	124.8 ± 41.6	136.3 ± 39.6	109.4 ± 39.6	.001
	Predicted (%)	93 ± 28	100 ± 27	83 ± 25	.002
Expiratory weakness	Equation (Bruschi)	13 (13.3%)	4 (7.1%)	9 (21.4%)	.039

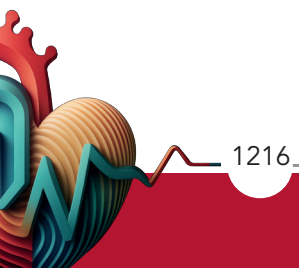
: exercise oscillatory ventilation disappearance; P-EOV: exercise oscillatory ventilation persistence; VO2: oxygen uptake; VE/VCO2 slope: minute ventilation/carbon dioxide production slope.

Tabella 1



Risultati: Il risultato principale di questo studio è l'associazione della persistenza dell'EOV durante l'esercizio con una peggiore forza muscolare respiratoria. I nostri risultati confermano inoltre che la persistenza dell'EOV caratterizza un gruppo con risposte metaboliche, emodinamiche e ventilatorie peggiori

all'esercizio massimale e una capacità funzionale inferiore. È interessante notare che una sottoanalisi ha mostrato che i pazienti con P-EOV e IMW erano più magri e avevano prestazioni peggiori rispetto alle loro controparti con forza muscolare respiratoria normale.



SCOMPENSO CARDIACO 210
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

ADDITIONAL VALUE OF LEFT ATRIAL STRAIN TO HFA-PEFF AND H2FPEF SCORES FOR THE DIAGNOSIS OF HEART FAILURE WITH PRESERVED EJECTION FRACTION

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 (a) DEPARTMENT OF MEDICAL BIOTECHNOLOGIES, DIVISION OF CARDIOLOGY, UNIVERSITY OF SIENA, SIENA, ITALY

Background: Heart failure with preserved ejection fraction (HFpEF) represents a worsening global health issue due to high rehospitalization rate and poor outcome if not treated. Its increasing prevalence and the presence of new therapies makes timely diagnosis of HFpEF pivotal for its management. However, the diagnostic process of HFpEF is still challenging. Two scores have been proposed by American heart association (AHA) and heart failure association (HFA) of the European society of Cardiology (ESC), both including clinical and echocardiographic parameters. However, none of these two scores consider left atrial strain by speckle tracking echocardiography (STE), which has been proven to be an important diagnostic marker in HFPEF and has been included in the multimodality imaging diagnostic algorithm for the diagnosis of HFpEF by the European association of cardiovascular imaging (EACVI).

Objectives: the aim of this study was to assess the additional value of global peak atrial longitudinal strain (PALS) by STE for the diagnosis of HFpEF over the HFA-PEFF score and H2FPEF score.

Methods: patients with dyspnoea with efforts referred to our ambulatories for cardiologic visits were enrolled. Patients with reduced left ventricular ejection fraction (LVEF < 50%), previous cardiac surgery, cardiomyopathies and prosthetic valves were excluded. Patients undergo clinical and echocardiographic

evaluation completed by STE. Then, it was divided into two groups based on the presence of HFpEF according to current ESC guidelines or presence of lung disease. The diagnostic value of PALS for HFpEF was tested in this population with receiver operating characteristic (ROC) curves. Then, HFA PEFF and H2FPEF scores were applied in patients with HFpEF and the potential additive value of applying PALS was tested in patients with negative results of HFA PEFF and H2FPEF scores.

Results: out of 242 patients (mean age 75±12 years, 50% female), 125 had HFpEF and 88 had lung disease. With ROC curves, global PALS showed a good

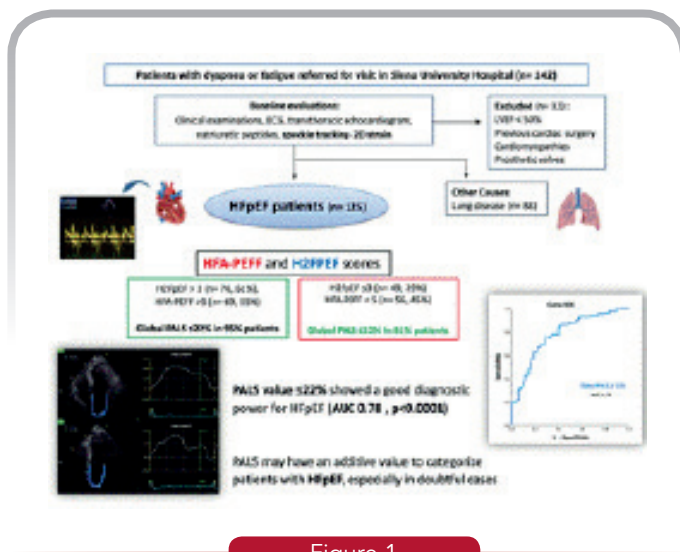


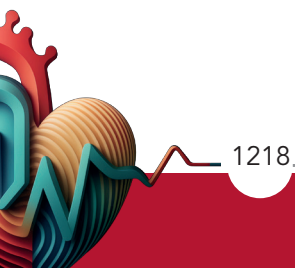
Figure 1



diagnostic power for HFpEF (AUC 0.78 , $p < 0.0001$) with an optimal cutoff value $\leq 22\%$. Among patients with HFpEF (mean age 78 ± 10 years, 55% female), 61% ($n=76$) had H2FpEF > 3 (which was estimated to carry a probability of HFpEF $> 60\%$), 55% ($n=69$) had HFA-PEFF > 5 (which entails certain diagnosis of HFpEF). Analyzing patients with H2FpEF ≤ 3 and with HFA-PEFF

< 5 , global PALS was $\leq 22\%$ in 80% ($n=39$) and 82% ($n=40$) of patients , respectively (Fig.1).

Conclusions: global PALS may provide additive value to categorize patients with HFpEF compared to the HFA and AHA proposed diagnostic scores, particularly in doubtful cases.



SCOMPENSO CARDIACO 926 PROGNOSI (SCOMPENSO CARDIACO) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

SEX RELATED DIFFERENCES IN ELDERLY PATIENTS WITH HEART FAILURE WITH MILDLY REDUCED OR PRESERVED EJECTION FRACTION: A GENDER-BASED ANALYSIS FROM OPPORTUNITIES REGISTRY

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Introduction: Heart Failure with Preserved and Mildly Reduced Ejection Fraction (HFp/mrEF) is increasingly recognized for its rising prevalence and significant impact on morbidity and mortality, particularly among elderly populations. Women are more frequently affected than men, yet gender-specific differences in clinical course and outcomes remain underexplored.

Methods: This retrospective, observational study analyzed a population of patients with chronic heart failure, aged ≥ 65 years, and an ejection fraction $> 40\%$, from the OPPORTUNITIES registry at Papa Giovanni XXIII Hospital, Bergamo, Italy, from January 2017 to June 2023. Follow-up continued for one year, with the registry concluding in June 2024. Data on demographics, comorbidities, clinical outcomes, and laboratory findings were analyzed. The primary outcome was a composite of all-cause mortality, urgent heart transplantation, hospitalization and emergency department visits for decompensated heart failure. Univariate and multivariate Cox regression models were used to identify independent predictors of adverse outcomes.

Results: A total of 2,263 heart failure patients were enrolled, with 971 HFp/mrEF included in the study. Of these, 56.8% were men, and the mean age was 79.2

years. Men had a higher prevalence of cardiovascular risk factors, such as diabetes (35.3% vs. 24.8%, $p < 0.001$), obesity (18.1% vs. 11.9%, $p = 0.008$), and coronary artery disease (40% vs. 22.7%, $p < 0.001$). Men also had higher rates of acute myocardial infarction (25.5% vs. 11.9%, $p < 0.001$) and percutaneous coronary interventions (34.7% vs. 17.9%, $p < 0.001$). Univariate analysis indicated that men had a 19% higher risk of the composite outcome (HR 1.19, CI 95% 1.00-1.41, $p = 0.048$). Multivariate analysis identified male sex, older age, higher NYHA class, severe valvular disease, anemia, and chronic kidney disease (CKD) as independent risk factors for adverse outcomes. Specifically, male patients had a 40% increased risk of the composite outcome, while those over 80 years had nearly double the risk compared to those aged 60-69. Severe valvular disease was associated with a 39% higher risk, anemia with a 25% higher risk, and CKD with an 84% higher risk.

Conclusions: This study highlights significant gender disparities in elderly patients with HFp/mrEF, with men exhibiting a higher burden of adverse outcomes. Given the higher prevalence of women in this population, these findings emphasize the need for gender-specific management strategies to enhance outcomes in elderly heart failure patients.



SCOMPENSO CARDIACO 340 TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

IMPLEMENTAZIONE DELLA TERAPIA FARMACOLOGICA SECONDO LINEE GUIDA IN PAZIENTI AFFETTI DA SCOMPENSO CARDIACO CON FRAZIONE DI EIEZIONE RIDOTTA: DATI DAL REGISTRO "OPTIMIZATION OF THERAPY IN THE ITALIAN MANAGEMENT OF HEART FAILURE (OPTIMA-HF)"

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Obiettivi: Le linee guida europee sulla gestione dello scompenso cardiaco raccomandano nei pazienti con frazione di eiezione ridotta (HFrEF) un approccio farmacologico basato su quattro classi di farmaci fondamentali, da implementare rapidamente per modificare la progressione della malattia ed impattare favorevolmente sulla prognosi a lungo termine. L'obiettivo del Registro Optimization of Therapy in the Italian Management of Heart Failure (OpTIMa-HF) è stato quello di raccogliere dati su pazienti affetti da scompenso cardiaco cronico con un focus specifico, in questa analisi, sui modelli di prescrizione della terapia guidata dalle linee guida nell'HFrEF.

Metodi: OPTIMA-HF è un registro osservazionale, multicentrico, condotto in ambulatori ospedalieri ed in servizi ambulatoriali del territorio. Lo studio ha compreso una fase T0 – Raccolta dati retrospettiva (gennaio-ottobre 2022), una fase di Attività Educative, e una fase T1 – Raccolta dati prospettica (settembre-novembre 2023). Nella presente analisi descriviamo la fase T0 focalizzandoci sulla prescrizione di farmaci per l'HFrEF, su tipologia e dose dei farmaci prescritti,

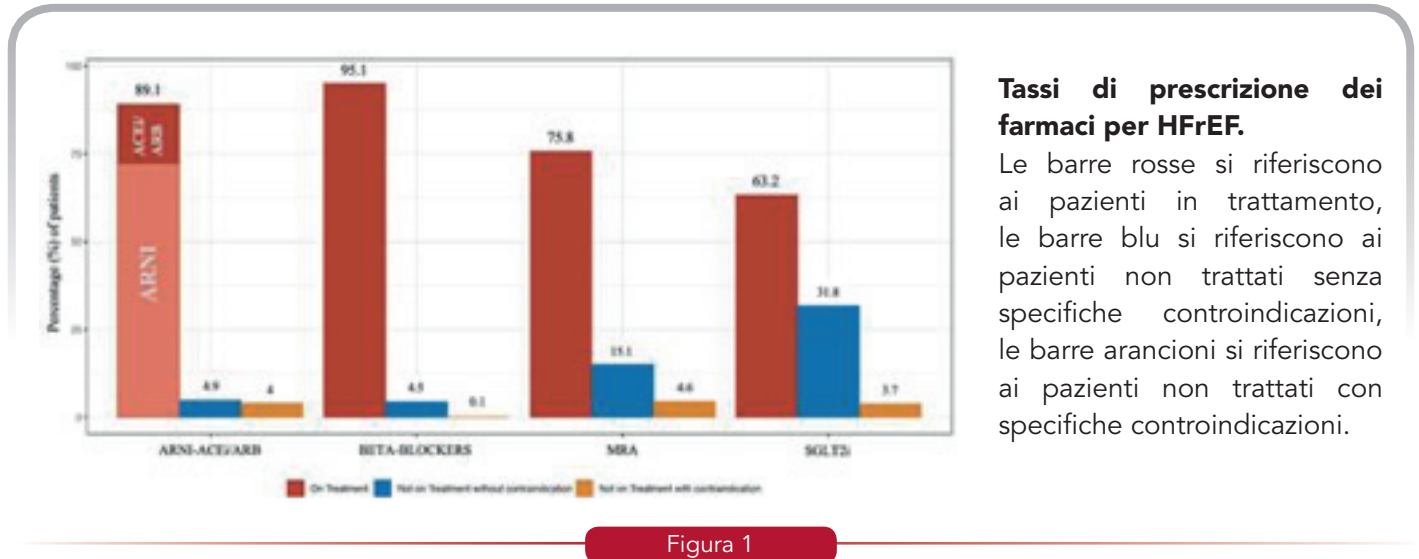
sulle terapie di combinazione e sulla presenza di controindicazioni.

Risultati: Ventinove centri hanno arruolato 2110 pazienti con scompenso cardiaco, di cui 1390 (65,9%) con HFrEF (69,5±11,9 anni, 76,2% maschi, 4,1 anni dalla diagnosi di HF, EF mediana 33%); l'89,1% era in trattamento con RAASi/ARNI (72% ARNI, 17,1% RAASi), il 95,1% con beta-bloccanti, il 75,8% con MRA e il 63,2% con gliflozine (Figura 1). Tra i pazienti non trattati, un numero non trascurabile non aveva controindicazioni, in particolare il 16% dei pazienti non trattati con ARNI ed il 31,8% dei pazienti non trattati con gliflozine non aveva alcuna controindicazione classica al trattamento. I pazienti che assumevano tutte le quattro le classi di farmaci erano il 46,9% e la maggior parte era trattata con una dose bassa o intermedia.

Conclusioni: Il Registro OPTIMA-HF dimostra che una buona performance dei servizi ambulatoriali italiani nella prescrizione dei singoli farmaci fondamentali per l'HFrEF; tuttavia, meno del 50% dei pazienti riceve una terapia di combinazione ottimizzata e un

numero trascurabile riceve dosi target secondo quanto raccomandato dalle linee guida. Tali dati supportano la necessità di strategie per migliorare l'implementazione

della terapia farmacologica nella pratica clinica al fine di migliorare gli outcome a lungo termine e rallentare la progressione della malattia.



SCOMPENSO CARDIACO 909

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

PROGNOSI (SCOMPENSO CARDIACO)

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

EFFETTI DEL VERICIGUAT IN PAZIENTI CON RECENTE EPISODIO DI WORSENING HF: DATI DAL MONDO REALE

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Obiettivi: Vericiguat appartiene alla classe farmacologica degli stimolatori della guanilatociclastasi solubile, ed agisce ripristinando il deficit di attivazione della via biologica dell'ossido nitrico e della guanosina monofosfato ciclica, che è compromessa nei pazienti con insufficienza cardiaca. Nello studio VICTORIA è stato dimostrato come il vericiguat riduca la mortalità per cause cardiovascolari e le ospedalizzazioni per scompenso cardiaco. L'uso di vericiguat è stato recentemente approvato dalle autorità regolatorie per il trattamento dei pazienti con insufficienza cardiaca a frazione di eiezione ridotta, sintomatici nonostante terapia medica ottimale e con recente episodio di riacutizzazione. Pertanto, dati sull'utilizzo di vericiguat nel mondo reale sono limitati. Scopo del registro è quello di raccogliere dati su pazienti affetti da scompenso cardiaco e con recente episodio di riacutizzazione.

Metodi: A partire da gennaio 2024 il registro ha arruolato 12 pazienti, che iniziavano vericiguat in seguito ad un recente episodio (entro 30 giorni) di riacutizzazione di scompenso cardiaco a ridotta frazione di eiezione trattato con terapia diuretica endovenosa in regime di day hospital. Il farmaco è stato iniziato con dosaggio di 2,5 mg/die e successivamente titolato a 5 e a 10 mg/die. Ad ogni titolazione del farmaco è stata effettuata una valutazione di follow-up. I pazienti arruolati, hanno effettuato un follow-up clinico a 3 e a 6 mesi.

Risultati: I pazienti arruolati avevano un'età media di $74,7 \pm 9,4$ anni e la maggioranza era di sesso maschile (83,3%). La maggior parte dei pazienti era in classe NYHA III-IV (83,3%), la frazione di eiezione media era di $31,5 \pm 11,8$ e il valore mediano di NT-proBNP era di 4738 pg/ml. Tutti i pazienti arruolati erano affetti da ipertensione e dislipidemia; 8 (66,7%) presentavano diabete mellito di tipo 2, 5 (41,7%) erano obesi, 10 (83,3%) erano affetti da insufficienza renale cronica, 7 (58,3%) da cardiomiopatia dilatativa post ischemica e 5 (41,7%) da fibrillazione atriale. I pazienti erano trattati in accordo con le attuali linee guida per lo scompenso cardiaco; in particolare, 4 (33,3%) erano in terapia con ARNI, 10 (83,3%) con betabloccanti, 9 (75%) con MRA e tutti erano in terapia con diuretici. Dei pazienti arruolati, 8 (66,7%) hanno dovuto aggiornare la dose di diuretico. Tutti i pazienti hanno iniziato terapia con vericiguat al dosaggio di 2,5 mg/die e solo 2 (16,7%) hanno raggiunto la dose target di 10 mg/die. Inoltre, un paziente ha interrotto il trattamento per ipotensione e diarrea. Prima dell'inizio della terapia con vericiguat i valori mediani di pressione sistolica e diastolica erano 123 ± 14 e 71 ± 14 , rispettivamente, e tali valori non variavano al follow-up. Infine, il trattamento con vericiguat induceva un miglioramento della classe NYHA, con il 36,4% dei pazienti in classe NYHA I-II e il 63,6% in classe NYHA III-IV, al follow-up. Nessuno dei pazienti al follow-up a 6 mesi era stato nuovamente

ospedalizzato per peggioramento dello scompenso cardiaco.

Conclusioni: Le caratteristiche della popolazione inserita nel registro rispecchiano l'epidemiologia dello scompenso a ridotta frazione di eiezione.

Vericiguat migliora la sintomatologia del paziente e riesce a controllare nuovi episodi di riacutizzazione al follow-up. Dati più estesi di real-life sono necessari per valutare l'impiego del farmaco nella pratica clinica.



SCOMPENSO CARDIACO 552
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)

TRICUSPID REGURGITATION IS A BARRIER TO GUIDELINE-DIRECTED MEDICAL THERAPY IMPLEMENTATION IN PATIENTS WITH ACUTE DECOMPENSATED HEART FAILURE AND REDUCED EJECTION FRACTION

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Background And Objectives: Guideline-directed medical therapy (GDMT) demonstrated to reduce mortality in chronic heart failure with reduced ejection fraction (HFrEF). However, multiple barriers prevent the correct implementation of these treatments. We sought to evaluate 1) the association between the severity of tricuspid regurgitation (TR) and the probability of 1-year GDMT implementation in a cohort of patients admitted for acute decompensated heart failure (ADHF) with reduced ejection fraction (rEF); 2) the association of GDMT optimization with outcomes according to the severity of TR.

Methods And Results: In the present study, we enrolled 858 patients with a 12-month follow-up reevaluation among 1184 admitted to our Centre with ADHF and rEF. At 12 months, patients prescribed $\geq 50\%$ target dose (TD) were 51%, 47%, and 29% considering renin-angiotensin system inhibitors/angiotensin receptor-

nepriylsin inhibitors (RASi/ARNi), mineralocorticoid receptor antagonists (MRAs), and beta-blockers, respectively. Patients who achieved $\geq 50\%$ of the TD were younger, more frequently had other heart failure (HF) aetiology rather than ischemic, and showed less renal impairment together with higher levels of haemoglobin at laboratory analysis. At multivariable analysis, moderate-severe TR was inversely associated with successful up-titration of RASi/ARNi and beta-blockers (OR=0.485, $p=0.033$, and OR=0.460, $p=0.043$, respectively). Moderate-severe TR was not associated with MRA optimization. Other predictors of GDMT optimization were lower systolic blood pressure (SBP), absence of chronic kidney disease (CKD), lower natriuretic peptides (NPs), and usage of diuretics. RASi/ARNi and beta-blockers therapy at $\geq 50\%$ of the TD was associated with a reduced risk of 2- and 5-year all-cause mortality, in both patients with recent onset of HF and longer history of chronic HF, and regardless of

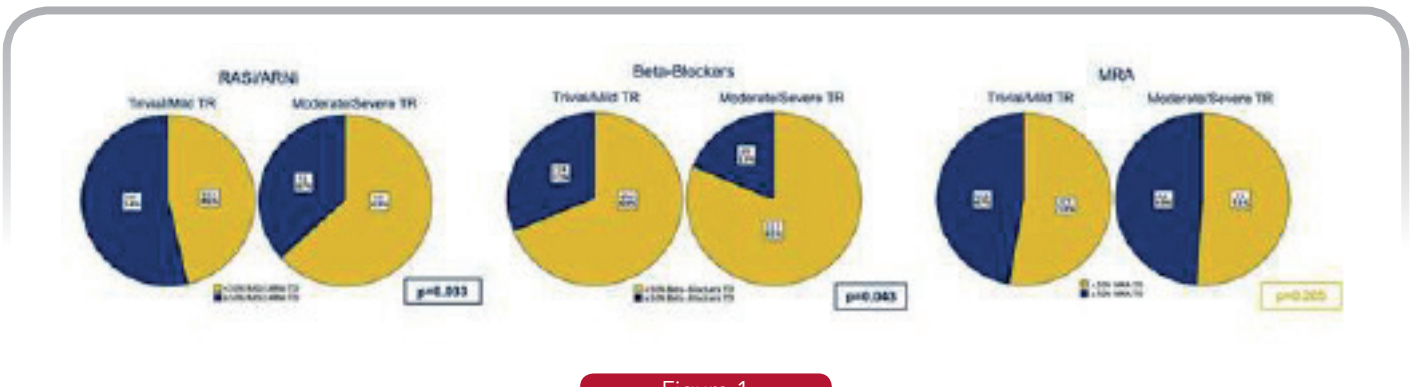
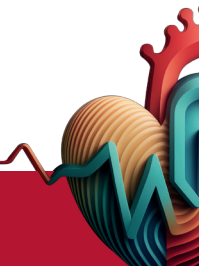


Figure 1

the presence of trivial-mild TR or moderate-severe TR. In this study we did not find any significant association between MRA optimization and outcome.

Conclusions: The severity of TR is a determinant of poor implementation of medical treatment, although the effectiveness of treatments was not influenced by TR.



SCOMPENSO CARDIACO 725 TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) ECMO (ASSISTENZA CARDIACA IN ACUTO) SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO) PROGNOSI (SCOMPENSO CARDIACO)

HEART TRANSPLANTATION IN CARDIOGENIC SHOCK RECIPIENTS BRIDGED WITH EXTRACORPOREAL MEMBRANE OXYGENATION

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Purpose: heart transplantation (HT) remains the gold standard treatment of advanced heart failure (HF). Patients (PT) admitted with cardiogenic shock (CS) may require veno-arterial extracorporeal membrane oxygenation (VA-ECMO) as a bridge to HT. Controversial data is reported about post-transplant outcome of these PT. We therefore evaluated our population in a retrospective cohort study.

Methods: among 454 PT who underwent HT at our institution between 2008 and 2021, we compared the outcome of 42 (9.2%, 10 females) transplanted on VA-ECMO support with that of 48 (10.5%, 22 females) control PT, matched for age and anthropometric characteristics. The median of follow-up was 1660 days [1-5332 days].

Results: baseline characteristics were similar. Most common diagnosis of control group was chronic HF followed by admissions for clinical worsening requiring inotropic therapy (35.4%) and intra-aortic balloon pump (IABP 8.3%); ICD and CRT carriers were frequent. VA-ECMO group had worse values of natriuretic peptides (median NTproBNP 6867 vs 2674, p=0.0004), markers of organ damage and blood count at HT; waiting list time was shorter. Donor related variables were similar but ischemia time was longer in VA-ECMO group. Post-operative ICU stay was more complicated (more need of prolonged mechanical ventilation, renal replacement therapy, IABP, higher rate of infections

	No ECMO n. 48	ECMO n. 42	p value		No ECMO n. 48	ECMO n. 42	p value
Baseline Characteristics				Post-operative			
Age at HT	47 (2) (22.84)	43.45 (24.05)	0.212	IABP	6 (12.5)	20 (47.6)	0.001
Gender (Female)	22 (45.8)	10 (23.8)	0.050	Inotropic therapy > 72 h	10 (20.8)	10 (23.8)	0.517
BMI	22.64 (3.43)	22.91 (2.99)	0.580	Renal Replacement Therapy	4 (8.3)	16 (38.1)	0.007
Hypertension	7 (14.6)	4 (9.5)	0.714	Mechanical ventilation (>7days)	1 (2.1)	17 (40.5)	<0.001
Dyslipidemia	10 (20.8)	6 (14.3)	0.430	Treated Infection	22 (45.8)	10 (23.8)	0.002
Diabetes	4 (8.3)	1 (2.4)	0.458	Surgical Revision due to Bleeding	2 (4.2)	10 (23.8)	0.018
COPD	2 (4.2)	2 (4.8)	1.000	Treated Rejection	11 (22.9)	6 (14.3)	0.306
Peripheral Artery Disease	0 (0.0)	4 (9.5)	0.389	In Hospital Stay	27.8 (32.2)	37.7 (39.2)	0.005
Cardiovascular Disease	9 (18.8)	4 (9.5)	0.170	1 year Follow Up			
Diagnosis				1 year Follow Up			
Myocarditis	0 (0.0)	2 (4.8)		Treated Rejection	10 (20.8)	10 (23.8)	0.596
Myocardial infarction	3 (6.2)	6 (14.3)		Creatinine	1.28 (0.49)	1.30 (0.49)	0.875
Post-Cardiomyopathy	0 (0.0)	9 (21.4)		Ejection Fraction	61.53 (9.46)	61.87 (2.7)	0.828
Graft Failure	0 (0.0)	2 (4.8)		Last Follow Up			
ADHF	13 (27.1)	16 (38.1)		Treated Rejection	1 (2.1)	1 (2.4)	0.948
LVAD complications	3 (6.2)	3 (7.1)		CMV	4 (8.3)	22 (52.4)	<0.001
Other	6 (12.5)	4 (9.5)		Treated AMR	1 (2.1)	3 (7.1)	0.530
Idiopathic CM	16 (33.3)	0 (0.0)		Creatinine	1.38 (0.50)	1.67 (2.50)	0.219
Ischemic Heart Disease	7 (14.6)	0 (0.0)		Ejection Fraction	59.71 (8.83)	58.24 (7.5)	0.721
History				Last Follow Up			
Previous Cardiac Surgery	4 (8.3)	18 (42.9)	<0.001	Treated Rejection	1 (2.1)	1 (2.4)	0.948
ICD	47 (97.9)	30 (71.4)	<0.001	CMV	4 (8.3)	22 (52.4)	<0.001
CRT	30 (62.5)	1 (2.4)	0.004	Treated AMR	1 (2.1)	3 (7.1)	0.530
Days on waiting list	440.8 (249.8)	402.3 (243.8)	0.001	Creatinine	1.38 (0.50)	1.67 (2.50)	0.219
Blood test at HT				Donor Characteristics			
Creatinine	1.10 (0.37)	1.48 (0.74)	<0.001	Weight	72.38 (25.5)	77.35 (23.8)	0.104
Hemoglobin	12.86 (3.42)	13.89 (2.25)	<0.001	Age	42.51 (25.0)	40.7 (23.2)	0.513
Platelets	225.9 (86.41)	185.5 (98.94)	<0.001	Gender (Female)	16 (33.3)	9 (21.4)	0.388
BUN	46.58 (28.54)	51.31 (43.89)	<0.001	HT ischemia time	174.3 (45.1)	209.8 (56.3)	0.005
Bilirubin	0.89 (0.70)	2.76 (2.84)	<0.001				

Abbreviations: ECMO extracorporeal membrane oxygenation, HT heart transplantation, BMI body mass index, COPD chronic obstructive pulmonary disease, AMR acute myocardial infarction, LVAD left ventricular assist device, CM cardiomyopathy, ICD implanted cardioverter defibrillator, CRT cardiac resynchronization therapy, BUN blood urea nitrogen, IABP intra-aortic balloon pump, CMV cardiomyopathy, AMR antibody-mediated rejection, LVAD cardiac allograft vasculopathy. Continuous variables are expressed as mean (standard deviation), categorical variables as number (percentage).

Figure 1

and surgical revisions) with longer in-hospital stay. VA-ECMO group had worse one-year ($p=0.015$) and long-term ($p=0.029$) survival at Kaplan-Meier analysis; VA-ECMO wasn't associated to higher mortality at the multivariate analysis. Long-term post-HT complications were similar between the two groups.

Conclusions: VA-ECMO-bridged PT had worse survival

after HT, but most of the difference occurred shortly after surgery (severe pre- and post-operative clinical conditions, longer ischemia time); afterwards the rate of death and post-HT complications was similar. VA-ECMO support itself didn't predict increased mortality. Larger studies are needed to identify predictors of bad outcome in VA-ECMO PT that could advise against HT in selected high risk PT.

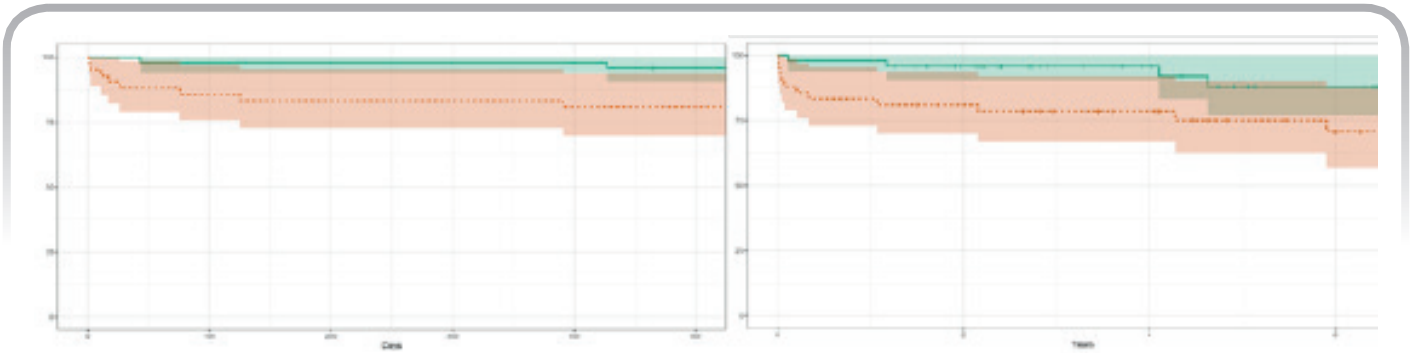


Figure 2



SCOMPENSO CARDIACO 525 TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

SGLT2 INHIBITORS PRESCRIPTION IN HEART FAILURE PATIENTS WITH REDUCED EJECTION FRACTION: A REAL-WORLD ANALYSIS ON RENAL FUNCTION

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Background and Aim of the Study: Real-world data on changes in estimated glomerular filtration rate (eGFR) in heart failure patients with reduced ejection fraction (HFrEF) after the prescription of SGLT2 inhibitors (SGLT2i) are needed. We analyzed a contemporary cohort of HFrEF ambulatory patients on top of guideline-directed medical therapy (GDMT).

Methods: eGFR was estimated using the CKD-EPI formula at 6 months and one year after SGLT2i prescription. CKD was defined by an eGFR < 60 ml/min, with classes divided according to KDIGO classification. We evaluated differences in eGFR at baseline, 6 months, and one year to describe renal function variations.

Results: A total of 226 patients were included, median age 68 years [IQR 59-75], 21.9% female, median LVEF 32% [IQR 29-35], and median NYHA class 2 [IQR 2-3]. Patients were treated with ACEi/ARB (42.1%), ARNI (57.9%), BB (97.4%), MRA (88.4%), and diuretics (84.0%) and the 58.7% were in full GDMT. Seventy-seven patients (34.1%) had CKD with a median eGFR of 49.5 [IQR 42.0-55.5], while 149 patients (65.9%) without CKD had a median eGFR of 75.9 [IQR 67.3-89.7]. In the total cohort, renal function significantly decreased at 6

months and one year compared to baseline, although there was no significant difference between 6-month and one-year eGFR values ($p=0.887$). At 6 months, among CKD classes, the 2% of non-CKD and 7% of CKD patients with eGFR between 30-60 ml/min showed an eGFR reduction below to 30 ml/min and above 20 ml/min, without drug withdrawal (Figure). eGFR significantly decreased in non-CKD patients compared to baseline ($p<0.001$), but not in the CKD group, with values of 69.4 [IQR 56.8-79.9] and 44.8 [IQR 39.0-53.1], respectively (Table). At one year, eGFR in CKD patients improved compared to 6 months, reaching 46.2 [IQR 40.8-52.8], though not significantly, while it slightly reduced in non-CKD patients to 68.9 [IQR 60.3-81.0].



Figure 1

Conclusions: In a contemporary cohort of fully treated HFrEF patients, around 4% of those with an eGFR > 30 ml/min experienced renal function worsening without drug withdrawal at 6 months post- SGLT2i prescription. In CKD patients, eGFR did not significantly decrease from baseline and showed a slight increase after

one year vs 6 months values. Conversely, non-CKD patients had a significant slight decrease in eGFR with stabilization at 6 months. This analysis confirms the potential effect of SGLT2 inhibitors on CKD progression in a real-world setting.



SCOMPENSO CARDIACO 681 PROGNOSI (SCOMPENSO CARDIACO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO) BIG DATA (TELECARDIOLOGIA ED E-HEALTH)

CHARACTERISTICS AND OUTCOMES OF PATIENTS HOSPITALIZED WITH HEART FAILURE AND/OR DEMENTIA: SIMILAR ENTITIES

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Introduction: heart failure (HF) and dementia (DEM) are two relevant chronic diseases, resulting in a significant burden of morbidity and mortality. The association of these two entities is steadily rising due to the aging of the population and shared risk factors.

Methods: We performed a retrospective cohort study based on electronic medical records of a tertiary hospital in Genova, Italy. Data from hospital admissions between January 2018 and December 2022 of patients with a discharge diagnosis of HF treated with loop diuretic therapy and/or DEM were extracted from two administrative databases. From the overall study sample 3 different cohorts were generated: patients with HF without DEM (HF only), DEM without HF (DEM only), and HF and DEM (HF & DEM). Comorbidities and primary diagnosis, using ICD-9-CM codes, as well department of hospital admission were collected, and

their prevalence compared. Outcomes included length of hospitalization and in-hospital mortality. Moreover, a specific analysis stratified according to the ward of admission and treatment, compared patients admitted to departments specific with those admitted to internal medicine wards. Univariable and multivariable binary logistic regressions assessed independent predictors of all cause in-hospital mortality.

Results: the final populations consisted of 5649 HF only, 2890 DEM only and 582 HF & DEM. The HF only group had the lowest age (79.3 ± 10.9), followed by DEM (83.7 ± 7.5) and HF & DEM (85.9 ± 6.7). The first ones were more often males (52.7%), while in the other groups there was a prevalence of women (60.3% and 63.9%). HF only patients had more often coronary artery disease, atrial fibrillation, as well kidney disease and cancer. The crude rate of all-cause in-hospital mortality was 13.9% for HF, 14.1% for DEM and 11.3% for HF

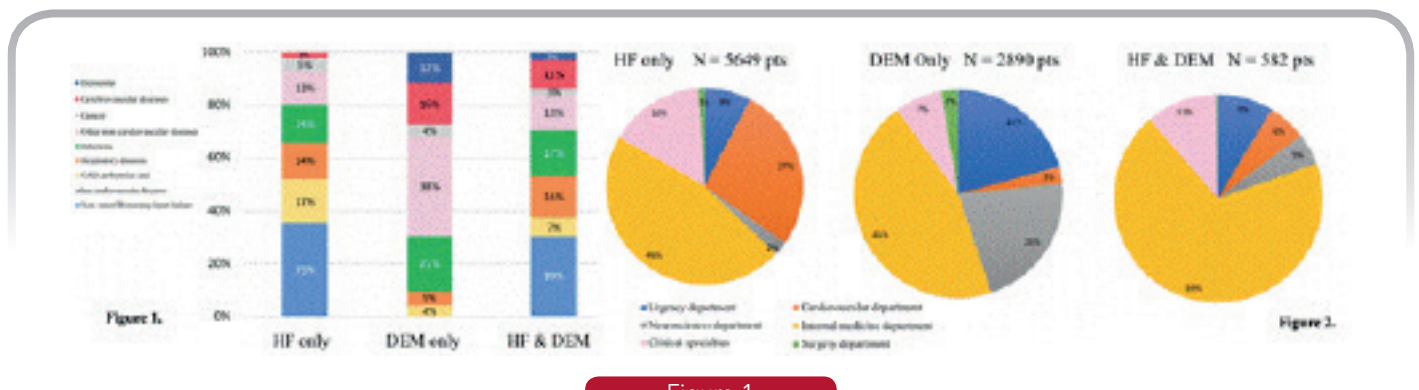
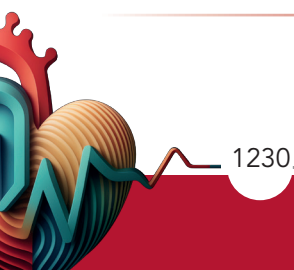


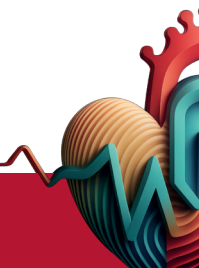
Figure 1



& DEM ($p = 0.203$). The length of index admission was longer for HF & DEM (15, 10-24) followed by HF (14, 8-22) and by DEM (12, 6-21) ($p < 0.001$). At the multivariable analysis, cancer resulted an independent predictor of in-hospital death (OR 2.031, IC 1.635-2.523, $p = 0.001$) just in HF only. Kidney disease was independently associated to higher mortality for both HF (OR 1.366, 1.152-1.619, $p < 0.001$) and DEM (OR 2.021, 1.552-2.633, $p < 0.001$). In the sub-analysis by department, in-hospital mortality was twice as high in internal medicine than in each specialty department,

both in HF only (12.8% vs. 6.4%), DEM only (15.2% vs. 8.4%) and HF & DEM (11.4% vs. 6.3%).

Conclusions: heart failure and dementia share some risk factors and the same in-hospital all-cause mortality. The associations of these two entities presents a long hospital stay, and therefore a significant increase in healthcare costs, but without in-hospital prognostic difference. The admission to specialty departments presents a lower rate of in-hospital all-cause death than internal ward.



SCOMPENSO CARDIACO 872

DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

EXERCISE PERFORMANCE IN HEART FAILURE PATIENTS WITH IMPAIRED IRON TRANSPORT

Jeness Campodonico (a), Alice Bonomi (a), Beatrice Pezzuto (a), Carlo Vignati (a, b), Massimo Mapelli (a, b), Irene Mattavelli (a), Elisabetta Salvioni (a), Piergiuseppe Agostoni (a, b)

(a) CENTRO CARDIOLOGICO MONZINO; (b) UNIVERSITA' DEGLI STUDI DI MILANO

Background: Iron deficiency (ID) is frequently observed in heart failure (HF). Among HF-ID patients those with impaired iron transport (IIT) (Transferrin saturation (TSAT) <20%) have the worst ID phenotype. In HF exercise limitation is mainly related to abnormality in oxygen delivery and utilization and/or to ventilation inefficiency.

Methods: We evaluated whether it is possible to indicate as the leading cause of exercise limitation in IIT-HF patients, oxygen delivery abnormalities, ventilation inefficiency, or whether both are concomitant. We retrospectively analysed 1043 (66±14 years, females 519, 49.8%) consecutive hospitalized HF patients who underwent cardiopulmonary exercise test shortly before discharge.

Results: We observed that: a) four-hundred-thirteen HF-IIT patients had a worse functional capacity compared to non IIT cases: reduced peak VO₂ (15±3 vs. 16±6 ml/min/kg, p <0.0001) and higher VE/VCO₂

slope (38±9 vs. 33±8, p<0.0001); b) VE/VCO₂ values retained significant differences in IIT vs. non IIT cases after adjusting for confounding variables including peak VO₂; differently peak VO₂ after adjusting also for VE/VCO₂ slope, resulted not different in IIT compared to non IIT HF cases; c) patients with both low peak VO₂ (<14 ml/min/kg) and high VE/VCO₂ (≥34) had a higher BNP, lower TSAT and higher MECKI score compared to patients with high peak VO₂ and low VE/VCO₂. An intermediate position on TSAT, BNP and MECKI score was observed for patients with low peak VO₂ and VE/VCO₂ or high peak VO₂ and VE/VCO₂.

Conclusions: A high VE/VCO₂ slope is directly associated to IIT independently from peak VO₂ suggesting a pivotal role of ventilation inefficiency in exercise impairment in IIT-HF patients. HF patients with the worst exercise performance had low TSAT, high BNP and the highest MECKI score, the latter suggestive of a worst prognosis.

SCOMPENSO CARDIACO 873

DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

HOW IMPAIRED IRON TRANSPORT INFLUENCES EXERCISE PERFORMANCE AND PROGNOSIS IN CHRONIC HEART FAILURE

Jeness Campodonico (a), Alice Bonomi (a), Marina Alimento (a), Anna Apostolo (a), Arianna Piotti (a), Irene Mattavelli (a), Elisabetta Salvioni (a), Massimo Mapelli (a, b), Carlo Vignati (a, b), Paola Gugliandolo (a), Piergiuseppe Agostoni (a, b)
(a) CENTRO CARDIOLOGICO MONZINO; (b) UNIVERSITA' DEGLI STUDI DI MILANO

Background: Iron deficiency (ID) is frequent in chronic heart failure (HF). Among HF-ID patients those with impaired iron transport (IIT) (Transferrin saturation (TSAT) <20%) have the worst prognosis. In HF survival is strictly related to exercise limitation but the link between IIT, exercise limitation and survival is at present undefined.

Methods: We evaluated in 999 consecutive survived patients hospitalized for worsening HF whether IIT affects prognosis through the two main cardiopulmonary exercise test (CPET) parameters: peak oxygen uptake (VO₂) and ventilation vs. carbon dioxide (VE/VCO₂) relationship slope. In all patients at stabilization iron metabolism and maximal CPET were performed. All patients underwent clinical follow-up. Survival was assessed as the composite of cardiovascular death, urgent heart transplant or LVAD implantation. The causal relationship between survival and IIT, peak

VO₂ and VE/VCO₂slope was assessed applying an advanced statistical method (path analysis).

Results: At monovariate and multivariate analysis a correlation between survival and VO₂, VE/VCO₂slope and TSAT was observed; at Kaplan-Myer survival analysis lower peak VO₂, higher VE/VCO₂slope and lower TSAT showed a worst survival; at path analysis IIT showed both an important effect on survival independent from peak VO₂ and VE/VCO₂slope (48%) and an effect on survival mediated by VE/VCO₂slope and peak VO₂ (52%), both VE/VCO₂slope and peak VO₂ similarly and independently contributed to the IIT negative effect on survival.

Conclusions: The adverse impacts of low TSAT on prognosis are in part direct and in part mediated by mechanisms related to reduced peak VO₂ and increased VE/VCO₂slope.



SCOMPENSO CARDIACO 404
RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING
CARDIOVASCOLARE)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
PROGNOSI (SCOMPENSO CARDIACO)

CMR PREDICTORS OF ACUTE RIGHT HEART FAILURE AFTER LVAD PLACEMENT

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(a) UNIVERSITY MEDICAL CENTRE UTRECHT, HEART AND LUNG DIVISION, CARDIOLOGY DEPARTMENT;
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ARRHYTHMOLOGY CLINIC - AZIENDA OSPEDALIERO UNIVERSITARIA DELLE MARCHE; (d) MARCHE POLITECHNIC
UNIVERSITY; (e) CARDIOLOGY UNIT, CARDIAC THORACIC AND VASCULAR DEPARTMENT, IRCCS AZIENDA
OSPEDALIERO UNIVERSITARIA BOLOGNA ; (f) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES - DIMEC -
UNIVERSITY OF BOLOGNA; (g) DEPARTMENT OF RADIOLOGY - OSPEDALE UNIVERSITARIO MAGGIORE DELLA
CARITA DI NOVARA

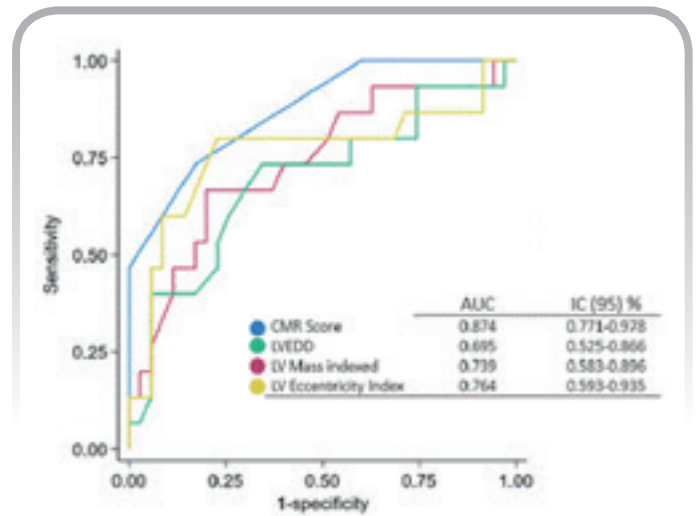
Background: Acute right ventricular failure (RHF) is a dangerous complication after placement of left ventricular assisted device (LVAD) with a significant impact on prognosis. Even though right ventricular evaluation with hemodynamical and echocardiographic measurements is a key aspect prior to LVAD implantation, prediction of RHF remains a challenge in clinical practice.

With this study we aim to identify cardiac magnetic resonance (CMR) predictors of RHF after LVAD placement.

Methods: We retrospectively enrolled patients referred to our centre for LVAD implantation who also underwent CMR scan prior to the procedure. Acute RHF was defined according to MRC-ARC criteria. Baseline characteristics, preoperative laboratory, echocardiographic, right heart catheterization (RHC) and CMR parameters were obtained. Patients were divided into two groups based on the development of acute RHF. The variables showing significant differences between the two groups were analysed with the ROC to find the best cut-offs and then combined into a risk score.

Results: We enrolled 54 patients who underwent continuous-centrifugal flow LVAD implantation from 2013 to 2021 in whom a CMR within median time of 30 days pre-implantation was available. Four patients were excluded due to low quality images. Among the final cohort of 50 patients, 15 (28%) developed acute RHF. Patients who developed RHF showed worse INTERMACS class, worse renal and liver function, higher CVP at RHC, worse TAPSE at echocardiography and overall smaller left ventricles at the CMR analysis when compared to those who had not RHF. No CMR derived right ventricle parameters nor moderate to severe tricuspid regurgitation at echocardiography was different among the two groups. We found that CMR-derived LV mass indexed $< 65 \text{ g/m}^2$, left ventricular end diastolic diameter (LVEDD) $< 70 \text{ mm}$, and LV eccentricity index $> 1,12$ were independent predictors of acute RHF. A CMR-derived score with these three parameters was built (1 point for each). This CMR score has shown to be an independent predictor of acute RHF at multivariate analysis with an odds ratio of 7,084 (CI 95%1.614-37.734) when corrected for other clinical and instrumental predictors of acute RHF.

Conclusions: Our study proposes a simple scoring system based on three CMR derived parameters (LVEDD, LV mass indexed and LV eccentricity index) to screen for acute RHF prior LVAD implantation. This score shows promise to be an independent predictor of acute RHF, even when adjusted for other known predictors of RHF.



ROC curve of the CMR score and the parameters in the score.

Figure 1



SCOMPENSO CARDIACO 252

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

PROGNOSI (SCOMPENSO CARDIACO)

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

OTTIMIZZAZIONE PRECOCE DELLA TERAPIA NELL'INSUFFICIENZA CARDIACA ACUTA E FOLLOW-UP A 12 MESI: LO STUDIO PENTA-HF

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Introduzione: L'insufficienza cardiaca è la prima causa di ospedalizzazione nei pazienti con più di 65 anni. Il rischio di riospedalizzazione e mortalità cardiovascolare è particolarmente alto durante i primi mesi dopo il ricovero per insufficienza cardiaca acuta, considerati per questo la fase più vulnerabile. Per questo motivo, la gestione dei pazienti nel contesto acuto e nel periodo immediatamente post-ricovero è cruciale e rappresenta una sfida. L'uso precoce dell'inodilatatore Levosimendan può favorire una più rapida stabilizzazione emodinamica dei pazienti. Questa stabilizzazione è essenziale per iniziare una strategia di rapida ottimizzazione nella fase di pre-dimissione della terapia per insufficienza cardiaca con frazione di eiezione ridotta (HFrEF).

Obiettivo: Confrontare un approccio di ottimizzazione precoce della terapia per l'insufficienza cardiaca basato sulla somministrazione in acuto di Levosimendan, seguito dalla rapida introduzione della terapia per HFrEF nella fase di pre-dimissione, con un approccio convenzionale basato su altri tipi di inotropi/vasopressori e un inizio e titolazione sequenziale dei quattro farmaci. L'endpoint composito primario è rappresentato dall'insieme di ospedalizzazione per insufficienza cardiaca e di mortalità cardiovascolare.

Gli endpoint secondari sono rappresentati dai singoli eventi inclusi nell'endpoint primario.

Materiali e metodi: In questo studio monocentrico, prospettico e osservazionale sono stati arruolati un totale di 214 pazienti ricoverati per insufficienza cardiaca acuta, di cui solo 192 hanno completato il follow-up di un anno. Tra questi, 96 pazienti, trattati con una strategia basata sulla somministrazione di Levosimendan seguita da una rapida ottimizzazione della terapia per HFrEF, hanno costituito il gruppo 1 (G1); gli altri 96 pazienti, trattati nella fase acuta con approcci convenzionali basati su vari inotropi/vasopressori, seguiti da un approccio di titolazione sequenziale classico, hanno costituito il gruppo 2 (G2). Il confronto tra i due gruppi è stato effettuato al follow-up di 12 mesi.

Risultati: L'analisi di sopravvivenza di Kaplan-Meier non ha mostrato una differenza statisticamente significativa tra i due gruppi in termini di endpoint composito primario ($p=0.286$). Tuttavia, è stata rilevata una differenza statisticamente significativa in termini di ospedalizzazione per insufficienza cardiaca a favore del G1 ($p<0.001$) (**Figura 1**). Al contrario, non è stata osservata una differenza statisticamente significativa in

termini di mortalità cardiovascolare ($p=0.257$).

Conclusioni: La somministrazione del Levosimendan nel setting acuto, seguita da una rapida ottimizzazione

di BB, SGLT2i, ACEi/ARNI e MRA, determina una riduzione del rischio di ospedalizzazioni per insufficienza cardiaca nella fase vulnerabile post-dimissione.

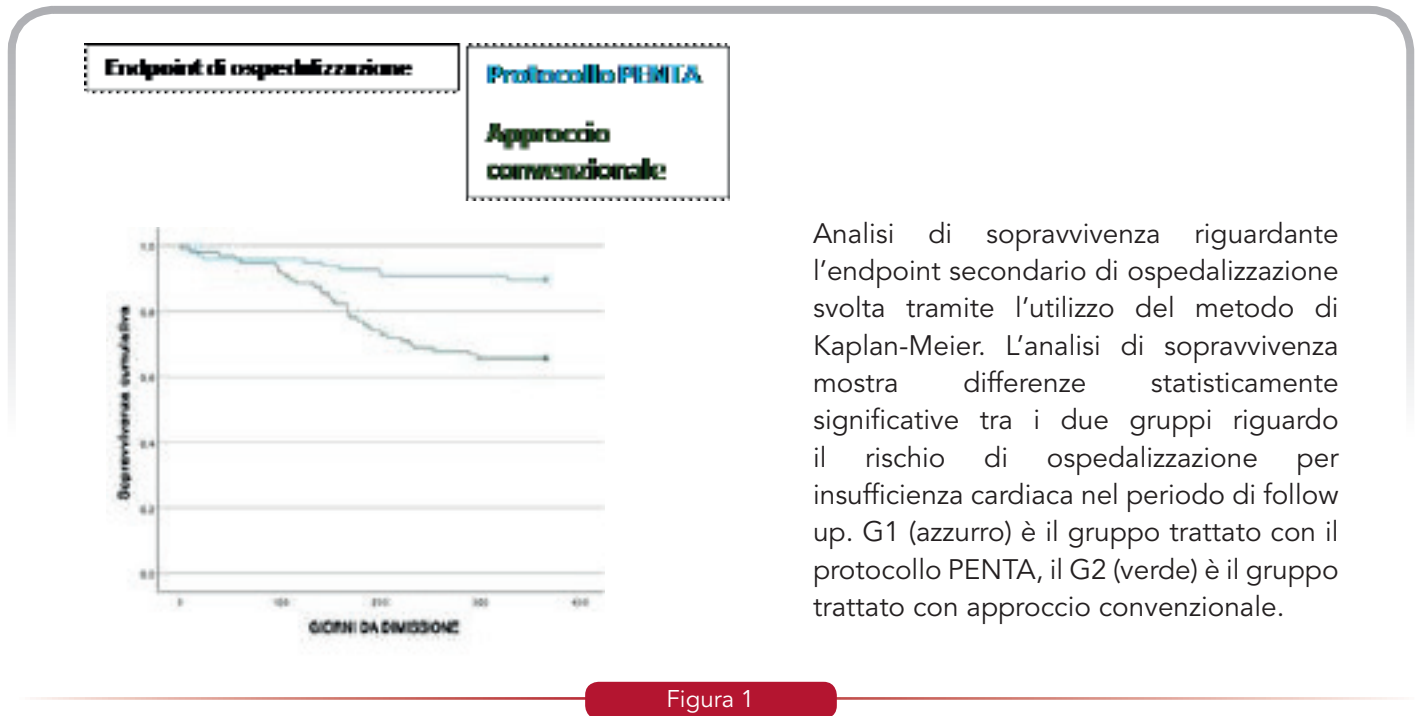


Figura 1



SCOMPENSO CARDIACO 599
IPERTENSIONE POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL
CIRCOLO POLMONARE)
PROGNOSI (SCOMPENSO CARDIACO)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

THE ROLE OF PULMONARY HYPERTENSION ACCORDING TO THE 2022 DEFINITION IN PATIENTS WITH ADVANCED HEART FAILURE WHO ARE CANDIDATES TO HEART REPLACEMENT THERAPY

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(a) AFFILIAZIONE UNIVERSITA' DI BOLOGNA

Purpose: Pulmonary hypertension (PH) due to left heart disease is a common complication in heart failure (HF) and is associated with increased mortality. The 2022 ESC Guidelines updated the hemodynamic definition of PH lowering the threshold to mean pulmonary artery pressure (mPAP) >20 mmHg. The relevance of this classification has not been fully explored in the setting of advanced heart failure. The aim of this study was to investigate epidemiology and clinical outcomes of PH according the 2022 definition in patients with advanced HF candidate to heart replacement therapy (HRT).

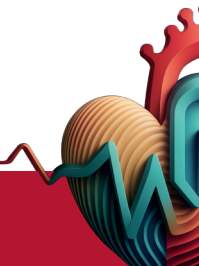
Methods: This study is a retrospective analysis of all adult (> 18 years old) ambulatory patients with advanced HF that underwent HRT evaluation at a tertiary referral centre from 2003 to 2022. Inclusion criteria were the presence of HLA typing as a proxy for HRT evaluation and an available right heart catheterization within 6 months. Patients were divided into groups based on the values of mPAP < 20 mmHg, 21-24 mmHg or > 25 mmHg and pulmonary vascular resistances (PVR) < 2, 2-3 and > 3 WU. The 2022 definition of PH was applied to investigate association with prognosis. Study endpoint was the 5-years survival free from death, urgent HTx or LVAD implantation.

Results: The study included 611 patients with mean age of 54±10 years, 78% were male and the vast

majority (87%) presented with HF with reduced left ventricular ejection fraction (HFrEF) and a mean LVEF of 28%. Principal causes of HF were dilated cardiomyopathy (39%) and ischemic heart disease (38%). With the threshold of mPAP > 20 mmHg, 445 patients (73%) had PH as compared to 358 (59%) with the previous definition, leading to reclassification of 14% of patients. PVR > 2 WU were found in 25% of patients with mPAP < 20 mmHg, 46% 21-24 mmHg and 79% > 25 mmHg (p<0.001). In the latter group, 43% of patients exhibited PVR > 3 WU. Survival was significantly lower in patients with mPAP > 25 mmHg (49%) as compared to those without PH (70%) [OR 2,4 (1,5-3,8); p< 0,001], while this difference was borderline significant with patients with mPAP 21-24 mmHg (55%) [OR 1,8(0,99-3,4); p=0.05]. 123 (20%) patients had isolated pC-PH, 315 (51%) combined pC-PH and 7 (1%) pre-capillary PH. Combined pC-PH was associated with worse survival [47%; OR 2,6(1,6-4,1); p< 0,001] as compared to both groups without PH (70%) and isolated pC-PH [66%; OR 1,6(1,01-2,7); p=0.04]. In the combined PH group, 50% of patients had PVR > 3 WU and experienced significantly worse survival [42% vs 51%; OR 1,5 (1,02-2,4), p=0.038] compared to those with PVR 2-3 WU. In a multivariable analysis including age, renal function, NYHA class and LVEF, mPAP > 20 mmHg [OR 1,8 (1,02-3,2), p=0.04] and PVR > 3 WU [OR 2,07 (1,2-3,5), p=0.008] were independent predictors of study outcome.

Conclusion: In a large population of patients with advanced HF evaluated for HRT, the 2022 hemodynamic definition reclassified PH in 14% of patients. Survival was lower in patients with $mPAP > 20$ mmHg. As compared to patients without PH, combined pC-PH

was associated with lower survival whereas isolated pC-PH was not associated with different outcomes. Both in general population and patients with combined PH, $PVR > 3$ WU identifies a subgroup with increased risk of events. In advanced HF, this threshold may retain better prognostic value than the revised one.



SCOMPENSO CARDIACO 891 TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) INFARTO STEMI (CARDIOPATIA ISCHEMICA) INFARTO NSTEMI (CARDIOPATIA ISCHEMICA)

LA SOMMINISTRAZIONE INTRA-OSPEDALIERA DI SACUBITRIL/VALSARTAN NELL'INFARTO MIOCARDICO ACUTO ED INSUFFICIENZA CARDIACA A FRAZIONE D'IEIEZIONE RIDOTTA: UNA METANALISI

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La metanalisi in esame si propone di approfondire e chiarire le evidenze inerenti la somministrazione intra-ospedaliera di sacubitril/valsartan (ARNI) in pazienti con insufficienza cardiaca a ridotta frazione d'ieiezione (HFrEF) post-sindrome coronarica acuta.

Metodi: L'outcome primario è stato rappresentato dall'insorgenza di accidenti cardiovascolari maggiori. Tutte le altre restanti cause di mortalità, cardiache e non cardiache, hanno rappresentato endpoints secondari.

Risultati: Per l'analisi quantitativa sono stati scelti 9 studi, per un totale di 6597 pazienti reclutati. La mediana del follow-up è stata di 6 mesi. I pazienti a cui veniva somministrato ARNI avevano una riduzione dei MACEs (OR 0.45, IC95% 0.32-0.63, $p < 0.0001$) e un tasso inferiore di riospedalizzazione per episodi di insufficienza di circolo (OR 0.40, IC95% 0.26 – 0.62, $p < 0.0001$), rispetto a una terapia standard. Inoltre,

anche i volumi del ventricolo sinistro conoscevano la medesima variazione (LVEDV, MD 11.48 mL, IC95% 6.10-16.85, $p < 0.0001$; LVESV: MD 7.09 mL, IC95%: 2.89-11.29, $p = 0.0009$), con una significativa riduzione della frazione d'ieiezione (MD 3.07, IC95% 1.61–4.53, $p < 0.0001$). Non sono state invece osservate differenze statisticamente significative in termini di altre cause di mortalità e concentrazione dell'NT-proBNP.

Conclusioni: In pazienti con HFrEF post-sindrome coronarica acuta, la somministrazione intraospedaliera di ARNI è stata associata a una riduzione dei MACEs e delle ri-ospedalizzazioni per insufficienza cardiaca stessa. Inoltre, pur impattando positivamente sul rimodellamento cardiaco, ha determinato tassi più frequenti di episodi ipotensivi (OR 1.42, IC95% 1.26-1.60, $p < 0.00001$), se posta a confronto con la somministrazione di terapia standard.

SCOMPENSO CARDIACO 226

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

ECOSTRESS (IMAGING CARDIOVASCOLARE)

PROGNOSI (SCOMPENSO CARDIACO)

LUNG DIFFUSING CAPACITY FOR CARBON MONOXIDE AS A PREDICTOR OF LUNG FLUID ACCUMULATION AND VENTILATORY EFFICIENCY IN HFPEF PATIENTS DURING STRESS ECHOCARDIOGRAPHY AND CARDIOPULMONARY EXERCISE TEST

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 Francesca Bursi (a), Marco Guazzi (a)
 (a) OSPEDALE SAN PAOLO - MILANO

Heart Failure with Preserved Ejection Fraction (HFpEF) is considered a clinical syndrome characterized by elevated risk of mortality and hospitalization. The role of lung diffusing capacity for carbon monoxide (DLco) as a marker of fluid retention is unexplored. Methods: DLco was measured in 22 stable HFpEF subjects (age = 73 ± 8 ; BMI = $31 \pm 2,3$ kg/m²) and in healthy controls at rest and peak exercise with parallel assessment of lung B lines during combined Stress Echocardiography and Cardiopulmonary Exercise Test (ESE-CPET). B-Lines evaluation of both hemithorax was realized at rest and immediately after combined ESE-CPET. HFpEF exhibited lower DLco and alveolar-capillary membrane conductance (Dm) at rest compared with controls combined with higher lung fluid accumulation during

exercise with a significant correlation observed for HFpEF group but not for controls (Picture 1 DLCO: $R = -0,78$, $P < 0,001$; Dm: $R = -0,67$, $P < 0,001$). We found also a good correlation between DLco and VE/VCO₂ slope and E/e' at peak of stress test in HFpEF group (Picture 2, A and B; respectively $R = -0,6$, $P < 0,001$ and $R = -0,76$, $P = 0,05$) expression of ventilatory/perfusion mismatch due to increase of lung extravascular water and elevation of left ventricular filling pressure during exercise. In conclusion, HFpEF patients could have a chronic impairment of alveolar-capillary membrane function; a variable that predicts gas exchange impairment due to excessive lung extravascular water during effort.

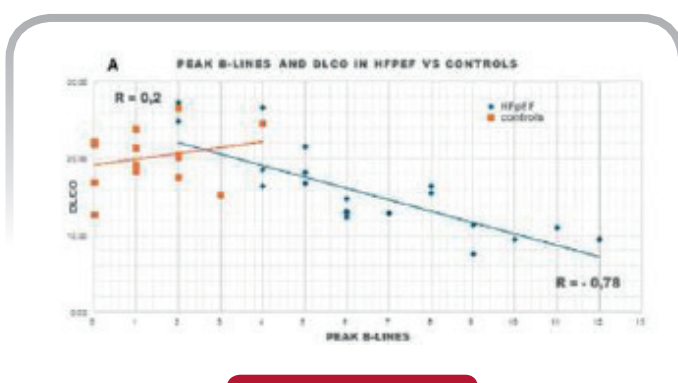


Figure 1

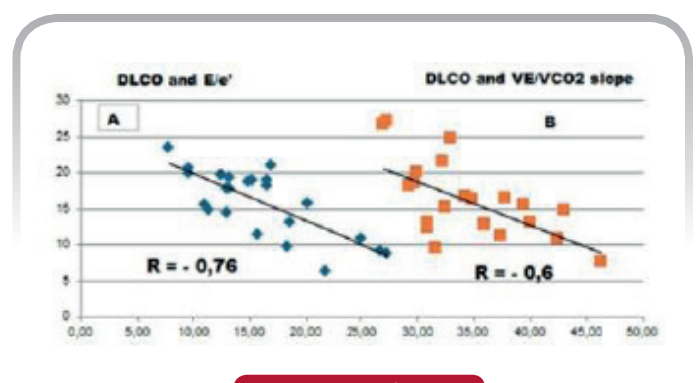
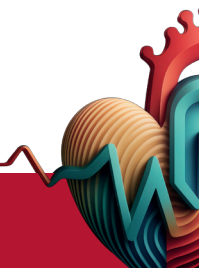


Figure 2



SCOMPENSO CARDIACO 589

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)

MYOCARDIAL WORK: DIFFERENCES BETWEEN TRANSPLANTED HEARTS AND POST-CARDIAC SURGERY HEARTS

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Figure 1

Background: The transplanted heart (HTX) has pathophysiological differences compared to standard hearts, still only partially understood. Early detection of grafts complications (e.g. cellular or immune-mediated rejection, coronary artery vasculopathy) by advanced echocardiography can significantly improve management and prognosis of HTX patients. Speckle tracking-derived global longitudinal strain (GLS) and myocardial work (MW) values were demonstrated to be lower in healthy HTX patients compared to healthy general population. If these abnormalities can be dependent on the surgical procedure itself is not known yet. Aim: to compare MW values in stable patients after HTX and in patients after other cardiac surgical

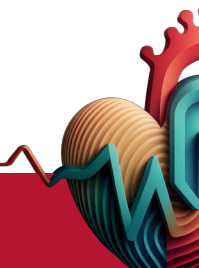
procedures to evaluate possible different impact of surgery on heart function.

Methods: in a monocentric study, we screened stable post-operative patients with a preserved left ventricular (LV) ejection fraction who underwent surgery at our hospital for elective coronary artery bypass graft CABG (group 1), aortic valve replacement, AVR, for severe aortic stenosis (group 2), mitral valve replacement, MVR, for severe primary regurgitation (group 3) and HTX (group 4). We excluded patients with other previous cardiac surgery, active pacemakers, BMI > 30, abnormal LV global function, more than mild regurgitation and/or stenosis, major post-operative complications absent informed consent. None of the HTX patients had previous history of rejection or coronary artery disease. All the surgical procedures required a median sternotomy and on-pump approach. All echocardiograms were performed between the 5th and the 12th postoperative day or within 2-3 months after HTX, usually needed for graft stabilization. For all patients, data regarding standard echo, GLS and MW parameters were collected and compared. One-way analysis of variance (ANOVA) and Bonferroni post-hoc tests were used to compare the variables among groups. Any independent predictor was tested to MW values reduction.

Results: Final population included 202 patients (137 males, 67%) with median age of 62 [50-86] years: 82 HTX, 40 AVR, 42 MVR and 40 CABG. All the population had a preserved left ventricular ejection fraction (EF), higher in HTX group. MW-derived global work index (GWI), global constructive work (GCW) and global work efficiency (GWE) were significantly lower in group 1, 2 and 3 compared to HTX patients while having comparable global wasted work (GWW) (Table 1). Multivariate regression analysis showed significant relationship between all MW indices and GLS and blood pressure, as expected. GWI was also related to E/e' ratio ($b=0,131$ $p=0,033$), GCW and GWW with LV

end-diastolic volume, end-diastolic volume (EDV) ($b=-0,177$ $p=0,012$ and $b=-0,261$ $p=0,030$ respectively), GWE with EF ($b=0,245$ $p=0,009$) and EDV ($b=0,210$ $p=0,027$).

Conclusions: GLS and MW indices are lower after HTX than healthy general population. However, the transplanted heart has better MW indices compared to other post-operative patients. These preliminary results can suggest that the impact of surgical procedure on transplanted hearts might be only partially related to the abnormal deformation and needs further characterization.



SCOMPENSO CARDIACO 656 DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE) PROGNOSI (SCOMPENSO CARDIACO)

MYOCARDIAL WORK IMPACT IN THE EVALUATION OF THE ADVANCED HEART FAILURE

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(a) UNIVERSITÀ DEGLI STUDI DI SIENA; (b) AOU SENESE; (c) UMEA UNIVERSITY

Introduction: Advanced heart failure (AdvHF) is described as a condition of symptoms and signs persistence despite maximum tolerated therapy. We aimed, to assess the impact of myocardial work (MW), a new semiautomated technique derived from speckle tracking echocardiography (STE) in stratifying a group of patients with AdvHF, according to their exercise capacity.

Materials and methods: We studied 58 patients with AdvHF referred for work-up screening for heart transplantation or assist device insertion. All patients had detailed echocardiographic examination with myocardial work evaluation, cardiopulmonary exercise test (CPET), and right heart catheterization (RHC). We also analyzed 62 healthy controls using the same protocol, except RHC. Relevant statistics were applied.

Results: Left ventricular global work index (LVGWI) and global constructive work (LVGCW) were mainly

related with peak atrial longitudinal strain (PALS) ($R=0.517, p<0.001$; $R=0.479, p<0.001$, respectively). Peak oxygen consumption (pVO_2) correlated mainly with LVGWI ($R=0.320, p=0.014$), and LVGWE ($R=0.328, p=0.012$). Also, theoretical oxygen consumption ($\%VO_2$) correlated with LVGWI ($R=0.403, p=0.002$), LV GCW ($R=0.339, p=0.009$), and LV GWE ($R=0.320, p=0.014$). The strongest correlations were between LVGWI ($R=-0.601, p<0.001$), LV GCW ($R=-0.467, p<0.001$), LVGWW ($R=0.501, p<0.001$), and LVGWE ($R=-0.500, p<0.001$) and VAC, and between LVGWI ($R=0.719, p<0.001$), LVGCW ($R=0.695, p<0.001$), and LVGWE ($R=0.458, p<0.001$) and Ees.

Conclusions: MW is feasible to evaluate in AdvHF patients but it fails to show specific differences in explaining patients limited exercise capacity. It however, correlates closely with coupling and Elastance aortic function, irrespective of severity of LV dysfunction.

SCOMPENSO CARDIACO 487

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

PROGNOSI (SCOMPENSO CARDIACO)

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

IN-HOSPITAL IMPROVED EJECTION FRACTION IN ACUTE HEART FAILURE

Daniele Cocianni (a), Davide Barbisan (a), Maria Perotto (a), Stefano Contessi (a), Giulio Savonitto (a), Jacopo Giulio Rizzi (a), Eugenio Zocca (a), Enrico Brollo (a), Elisa Soranzo (a), Marco Merlo (a), Gianfranco Sinagra (a), Davide Stolfo (a)
 (a) UNIVERSITÀ DI TRIESTE, AZIENDA SANITARIA UNIVERSITARIA GIULIANO-ISONTINA (ASUGI)

Background: Left ventricular (LV) ejection fraction (LVEF) trajectories during hospitalization for acute heart failure (AHF) have never been investigated. We sought to explore the prevalence and prognostic implications of heart failure with improved LVEF (HFimpEF) in AHF.

Methods: We retrospectively enrolled patients admitted for AHF with ≥ 2 in-hospital echocardiographic evaluations of LVEF (at admission and before discharge). In patients with LVEF $< 40\%$ at admission, HFimpEF was defined as LVEF $> 40\%$ at discharge, plus an improvement in LVEF $\geq 10\%$. Study population was divided into three groups: HFmrEF/HFpEF (LVEF $\geq 40\%$ at admission and before discharge), HFimpEF, and HFrEF (LVEF $\leq 40\%$ at discharge, or LVEF increasing from $\leq 40\%$ to $> 40\%$ but with improvement $< 10\%$).

Results: 1048 patients were included. At admission, 30% had LVEF $> 40\%$ and 70% had LVEF $\leq 40\%$. According to LVEF trajectory, 269 (27%) had HFmrEF/HFpEF, 663 (63%) had HFrEF and 116 (11%) had HFimpEF. Valvular heart disease, in-hospital coronary revascularization, in-hospital valvular surgery/repair, low LV volumes and absence of right ventricular dysfunction (RVD) were independent predictors of HFimpEF. Patients with HFimpEF had higher increase in LVEF but also a more evident decrease in prevalence of RVD and mitral regurgitation (MR) before discharge. At survival analysis, presence of systolic dysfunction (LVEF $\leq 40\%$) was not associated with different outcomes. After adjustment, HFimpEF was associated with a lower risk of 1-year (HR=0.335, $p=0.022$) and 5-years all-cause mortality (HR=0.571, $p=0.031$) compared to HFrEF.

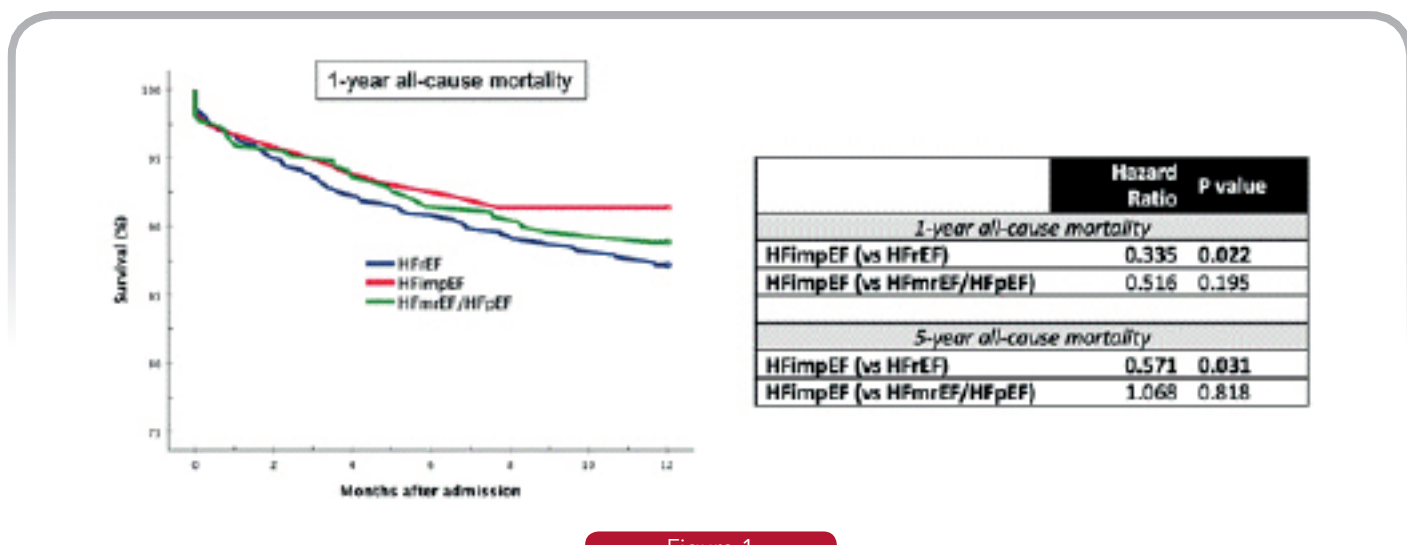


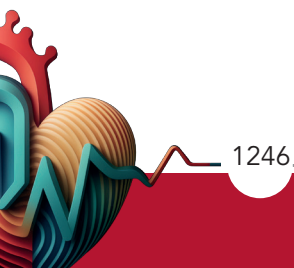
Figure 1



The association of HFimpEF with the primary endpoint was consistent across all subgroups according to the in-hospital trajectory of RVD and MR.

Conclusions: In patients hospitalized for ADHF, 11%

had HFimpEF at LVEF reassessment before discharge. Reversible causes of HFrEF and less severe structural impairment were associated with higher likelihood of HFimpEF. Patients with HFimpEF had a 3465% and 3440% 1-year and 5-year mortality risk reduction.



SCOMPENSO CARDIACO 331

GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE) ELETTROSTIMOLAZIONE (ARITMIE) TERAPIA DI RESINCRONIZZAZIONE (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

TAUROPACE REDUCES INFECTIONS IN PATIENTS WITH HEART FAILURE AND REDUCED EJECTION FRACTION AFTER CARDIAC ELECTRONIC IMPLANTABLE DEVICE PROCEDURE

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(a) UNIVERSITÀ DEGLI STUDI DI NAPOLI "FEDERICO II"; (b) UNIVERSITÀ DEGLI STUDI DELLA CAMPANIA "LUIGI VANVITELLI"; (c) OSPEDALE SAN PIETRO FATEBENEFRAPELLI DI ROMA

Background: Infections associated with implantable cardiac electronic devices (CIEDs) pose a significant health risk and can lead to fatal outcomes. In response to the increasing of their incidence, the importance of novel therapeutic interventions has recently been emphasized. In this context, TauroPace™, an innovative taurolidine-containing solution specifically designed to eliminate microbial contamination on the surfaces of CIEDs, could represent a promising solution. Currently, there are no data evaluating the efficacy of taurolidine in preventing CIED infections.

Methods: This prospective cohort study enrolled consecutive patients with heart failure and an ejection fraction $\leq 35\%$, who were referred to the University of Naples Federico II, University of Campania "Luigi Vanvitelli", Monaldi Hospital and University of Rome, Fatebenefratelli San Pietro Hospital, Italy, to receive de novo, replacement or upgrading Implantable Cardioverter Defibrillator (ICD) or Cardiac Resynchronization Therapy with defibrillator (CRT-D). Participants with prior history of CIED infection were excluded. In all procedures, the pocket was irrigated with taurolidine. Based on the main risk factors for developing CIED-related infections identified in the literature (including individuals with heart failure, diabetes, chronic kidney disease, and individuals

who underwent defibrillator implantation, especially upgrades or revisions), we performed a meta-analysis and meta-regression to assess the relationship between the magnitude of treatment effect and various predictors. To estimate the incidence of CIED infections in high-risk subgroups, we used the percentage of patients with diabetes, chronic renal failure, or those who underwent an upgrade, replacement or revision procedure in our cohort, along with other risk factors for CIED infections, as continuous variables, and we were able to modify our comparison parameters based on the actual percentage of risk factors we obtained (refers to clinicaltrials.gov, NCT05175937 protocol).

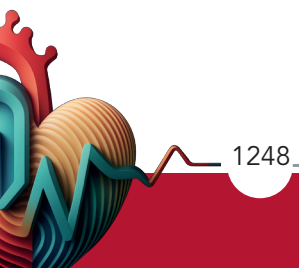
Aims: To investigate the ability of taurolidine to reduce CIED infections up to 12 months after surgery in high-risk patients with heart failure.

Results: The study included 150 consecutive patients (77% males, 60% with ischemic heart disease; median [IQR] age at implantation: 70 [63-78] years). The main risk factors were distributed as follows: 53 (35%) diabetics, 60 (40%) patients with chronic renal failure, 39 (33%) with atrial fibrillation in anticoagulants. Overall, 75 (50%) received ICD and the other CRT-D, with 66 (44%) replacement procedures, 7 (5%) upgrades, and 77 (51%) de novo implantations. During the one-year



follow-up period, only 1 patient developed an infection (five months after CRT-D replacement procedure, diabetic, 60 years-old). By comparing our risk factors to compare the infection rate from the literature, we estimate an incidence rate of 4.5%, significantly higher than our cohort (z-score -2.26, p value = 0.023).

Conclusions: Taurolidine has shown promising results, demonstrating a lower incidence rate of infections within our cohort of high-risk patients compared to those reported in the literature. Further data are needed to validate and confirm these initial findings.



SCOMPENSO CARDIACO 371

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

EFFECTS OF DAPAGLIFLOZIN ON EXERCISE CAPACITY, VENTRICULAR REMODELING, CARDIAC BIOMARKERS, FLUID RETENTION, RENAL AND PULMONARY FUNCTION IN A PROSPECTIVE COHORT OF HFREF. NOT AS GOOD AS EXPECTED? XPECT

Irene Mattavelli (a), Massimo Mapelli (a), Elisabetta Salvioni (a), Nicolò Capra (a), Valentina Mantegazza (a), Anna Garlaschè (a), Alessandro Nepitella (b), Rebecca Caputo (a), Paola Gugliandolo (a), Filippo Maria Rubbo (c), Manuela Muratori (a), Piergiuseppe Agostoni (a)

(a) CENTRO CARDIOLOGICO MONZINO IRCCS, MILANO; (b) UNIVERSITÀ DI CAGLIARI; (c) UNIVERSITÀ DI TRIESTE

Background: Sodium-glucose co-transporter-2 inhibitors (SGLT2-i) are standard therapy for heart failure (HF). We performed a holistic evaluation of dapagliflozin effects on exercise, left ventricle (LV) reverse remodelling, cardiac biomarkers, fluid retention, renal and pulmonary function.

Methods: We enrolled HF reduced ejection fraction (LVEF) outpatients eligible for SGLT2-i and performed cardiopulmonary exercise tests (CPET), pulmonary function tests, bioelectrical impedance vector analysis (BIVA), laboratory and echocardiographic assessments at baseline (T0) and 6 months of treatment (T2). Blood samples and BIVA were repeated also after 2-4 weeks (T1).

Results: Our population comprised 67 HF patients (age 66 [56-73]) who completed the evaluation at 6 months (T2) of whom 5 did not perform the safety evaluation at 2-4 weeks (T1). At enrollment, 100% of patients were taking either ACE inhibitors (n=6, 9%), ARBs (n=7, 10.4%), or Sacubitril/Valsartan (n=54, 80.6%). Additionally, 64 patients (95.5%) were taking a β -blocker, 56 (83.6%)



Figure 1

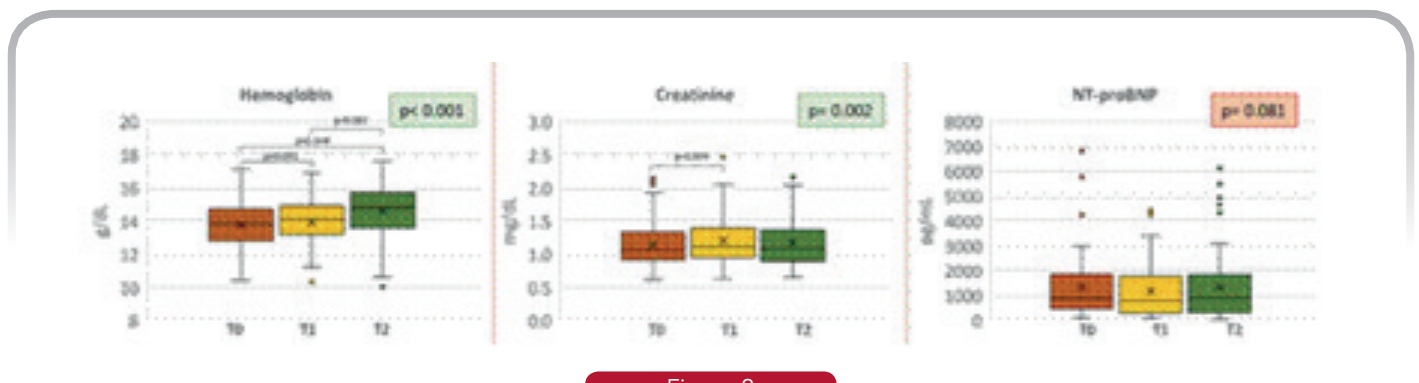


Figure 2



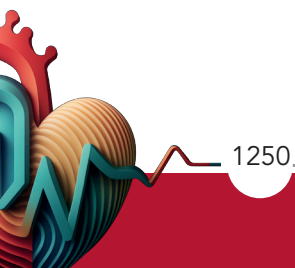
were MRA, and 35 (52.2%) a loop diuretic. None of the patients interrupted SGLT2-i for adverse events. At T2 LVEF increased (from 34.6 ± 7.8 to $37.5 \pm 9.2\%$; $p < 0.001$) while end-diastolic (EDV) and end-systolic (ESV) volumes reduced ($186 [145-232]$ vs. $177 [129-225]$ mL, and $113 [87-163]$ vs. $110 [76-145]$ mL respectively; $p < 0.001$).

Peak oxygen intake was unchanged ($p = 0.297$), while ventilatory efficiency (VE/VCO₂ slope) improved (from $34.2 [31.1-39.2]$ to $33.7 [30.2-37.6]$, $p = 0.006$), Fig. 1. Haemoglobin increased (from 13.8 ± 1.5 to 14.6 ± 1.7 g/dL, $p < 0.001$), while renal function did not change after a transient worsening at T1 (Fig.2). NT-proBNP, ST-2,

and hs-TNI did not change as overall body fluids and quality of life assessed by KCCQ.

NYHA class improved (p -value=0.002), paralleled by a decrease of MECKI (Metabolic Exercise test data combined with Cardiac and Kidney Indexes) score, from $3.3\% [1.9-8.0]$ to $2.8\% [1.2-5.7]$, suggestive of a positive impact on 2 years prognosis (p -value < 0.001).

Conclusions: Dapagliflozin induced positive LV remodelling, improvement of exercise ventilatory efficiency, and NYHA class, but without peakVO₂ fluid status and cardiac biomarkers changes.



SCOMPENSO CARDIACO 520
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E
NUTRACEUTICI)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

HYPERKALEMIA IN HEART FAILURE PATIENTS WITH REDUCED EJECTION FRACTION TREATED ACCORDING TO GUIDELINE-DIRECTED MEDICAL THERAPY: A REAL WORLD ANALYSIS IN A CONTEMPORARY PATIENT COHORT

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 (a) UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Background and Aim of the Study: Hyperkalemia (HK) is a common side effect of pharmacological therapy in heart failure patients (HFrEF) with reduced ejection fraction. Currently, there are limited real-world data on the determinants of HK events, particularly concerning renal function and therapies. This study provides a descriptive analysis of a contemporary cohort of HFrEF ambulatory patients receiving guideline-directed medical therapy (GDMT).

Methods: An HK event is defined by a serum potassium level (K^+) ≥ 5.0 mEq/L, even in the absence of clinical deterioration. We conducted a binary logistic analysis to identify the determinants of HK events. The glomerular filtration rate (GFR) was estimated using the CKD-EPI formula. Full GDMT was defined as the concurrent prescription of ARNI/ACEi/ARB, beta-blockers, MRAs, and SGLT2 inhibitors.

Results: The study included 391 patients with a median age of 68 years (IQR 59.0-75.0), 20.2% female, median LVEF of 32% (IQR 29-35), and median NYHA class of 2 (IQR 2-3). Full GDMT was prescribed in 58.8% of patients.

Over a median follow-up of 830 days (IQR 343-1628), 101 patients (25.8%) experienced an HK event, with 8

patients (7.9%) experiencing at least two separate HK events. The median K^+ value at the time of the first HK event was 5.2 mEq/L (IQR 5.0-5.3), and the median eGFR was 51.7 mL/min/1.73 m² (IQR 44.8-54.7).

At baseline, patients who experienced an HK event had higher values of serum K, more reduced renal function and a higher prescription of ARNI compared to those without HK. Multivariable binary logistic regression analysis revealed that lower eGFR and ARNI prescription were significant determinants of HK events, with odds ratios of approximately 3 and 4, respectively.

In response to HK events, therapeutic actions included reducing MRA dosage in 57 patients (56.4%), with a median K^+ of 5.2 mEq/L (IQR 5.1-5.3). Prescription of the drug Patiromer was done in 14 patients (13.8%) with a median K^+ of 5.6 mEq/L (IQR 5.4-5.6). No active intervention, but just monitoring was applied to 22 patients (21.8%) with a median K^+ of 5.2 mEq/L (IQR

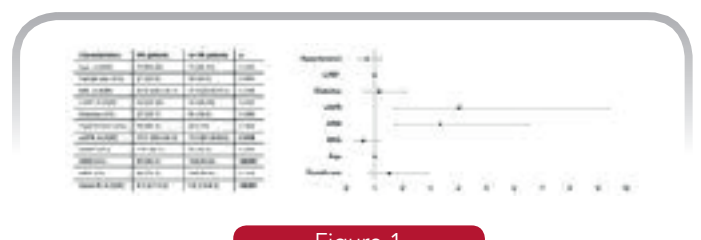
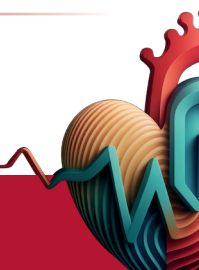


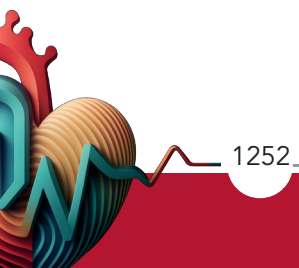
Figure 1



5.0-5.2). Eight patients (7.9%) temporarily discontinued MRA, but none interrupted ARNI/ACEi/ARB therapy. With patiomer (8.4-16.8 gr daily) serum K⁺ was reduced from a median of 5.6 mEq/L (IQR 5.4-5.6) to a median of 4.8 mEq/L (IQR 4.6-4.9).

Conclusions: In this contemporary cohort of HFrEF patients on comprehensive GDMT, HK events occurred in 25% of patients over a median follow-up

of 2 years, with 8% experiencing recurrent events. The primary determinants of HK were ARNI prescription and lower eGFR. Most HK events were mild, and the drug Patiomer was prescribed when serum K⁺ levels exceeded 5.5 mEq/L. About 20% of HK events resolved spontaneously without intervention. Adjusting MRA dosage or temporarily discontinuing MRA were common management strategies.



SCOMPENSO CARDIACO 524

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

PROGNOSI (SCOMPENSO CARDIACO)

BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

FULL GUIDELINE-DIRECTED MEDICAL THERAPY IN HEART FAILURE WITH REDUCED EJECTION FRACTION: A REAL-WORLD ANALYSIS ON SACUBITRIL/VALSARTAN AND SGLT2 INHIBITORS PRESCRIPTION IN OLDER PATIENTS WITH OUTCOME IMPLICATIONS

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(a) CARDIOLOGY DIVISION, DEPARTMENT OF BIOMEDICAL, METABOLIC AND NEURAL SCIENCES, ITALY UNIVERSITY OF MODENA AND REGGIO EMILIA, POLICLINICO DI MODENA, MODENA, ITALY; (b) CLINICAL AND EXPERIMENTAL MEDICINE PHD PROGRAM, UNIVERSITY OF MODENA AND REGGIO EMILIA, MODENA, ITALY

Background and Aim of the Study: There is a need for real-world data on the treatment with ARNI and/or SGLT2 inhibitors (SGLT2i) on top of the guideline directed medical therapy (GDMT) in older patients with heart failure with reduced ejection fraction (HFrEF). This study focuses on changes in estimated glomerular filtration rate (eGFR) and left ventricular ejection fraction (LVEF), and their association with cardiovascular outcomes in a contemporary cohort of ambulatory HFrEF patients.

Methods: Older patients were ≥ 75 years old, and younger patients were < 75 years old. eGFR was estimated using the CKD-EPI formula. GDMT included ACEi/ARB/ARNI, BB, MRA, and SGLT2i. We evaluated clinical outcomes (all-cause death or heart failure hospitalization, HFh, and as separated outcomes) in older versus younger patients and performed a survival analysis.

Results: A total of 391 patients were included (median age 68 years [IQR 59.0-75.0], 20.2% female, median LVEF 32% [IQR 29-35], median NYHA class 2 [IQR 2-3]), with a GDMT prescription rate of 58.8%. Older patients were 108 (27.6%) with a median LVEF of 32 [IQR 30-35] and a median eGFR of 62.5 [51.6-73.7], while 283 (72.4%) were younger with a median LVEF of 32 [IQR

30-35; $p=0.446$] and a median eGFR of 76.5 [63.0-92.8; $p<0.001$].

After a median follow-up of 760 days [700-852], eGFR significantly increased at follow-up versus baseline in both older ($p=0.012$) and younger patients ($p=0.026$). LVEF improved in both groups ($p<0.001$), with a median increase of 5% in older and 4% in younger patients. There were 17 deaths (19.8%) in older patients versus 16 (6.9%) in younger patients ($p=0.021$); 12 HFh (11.1%) in older patients versus 31 (11.0%) in younger patients ($p=0.965$). The composite outcome showed no significant difference ($p=0.150$). Survival analysis indicated older patients had a higher cumulative hazard for the composite outcome [Figure] and death (Log-Rank, $p<0.001$), but not for HFh (Log-Rank, $p=0.207$).

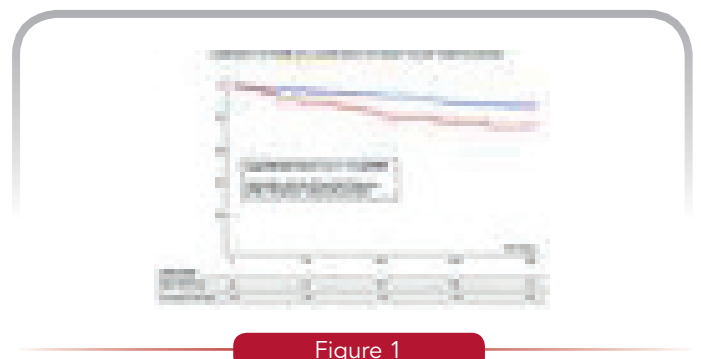
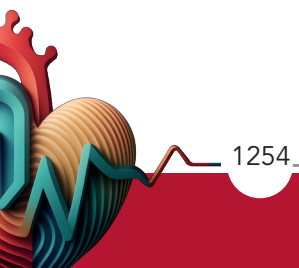


Figure 1

The full adjusted multivariable Cox regression analyses showed older age independently associated with death (HR 5.17; 95%CI: 2.13-12.5, $p < 0.001$), but not with death or HFh [Figure] and not with HFh (HR 1.13; 95%CI: 0.52-2.47, $p = 0.745$).

Conclusions: In a contemporary cohort of HFrEF

patients receiving full medical therapy with ARNI and/or SGLT2i, older patients had higher occurrences of death, not for HFh or death and HFh compared to younger patients. Older age was independently associated with death, not with other outcomes. LVEF and eGFR improved similarly in both groups.



SCOMPENSO CARDIACO 723 ELETTROSTIMOLAZIONE (ARITMIE) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)

STUDIO DEI MECCANISMI D'AZIONE DELLE GLIFLOZINE NELL'INSUFFICIENZA CARDIACA ATTRAVERSO L'ANALISI METABOLOMICA DI SANGUE ARTERIOSO, VENOSO CENTRALE E PERIFERICO PRELEVATO DA PAZIENTI TRATTATI

Gianmarco Arabia (a), Paolo Fornaro (a), Maria Giulia Bellicini (a), Angelica Cersosimo (a), Anna Giulia Damato (a), Filippo Mariotti (a), Emiliano Calvi (a), Antonino Mesi (a), Alessandro Macchia (a), Cecilia Micheletti (a), Chiara Medori (b), Matteo Bertelli (b), Manuel Cerini (a), Savina Nodari (a), Antonio Curnis (a)
(a) UNIVERSITÀ DEGLI STUDI DI BRESCIA; (b) MAGI GROUP

Background: Circa il 30% dei paziente affetti da scompenso cardiaco a frazione di eiezione ridotta non risponde alla attuale terapia medica ottimizzata (farmacologica e di resincronizzazione elettrica). Recenti studi randomizzati e controllati hanno dimostrato un significativo beneficio prognostico degli inibitori del SGLT2 (gliflozine) nei pazienti con insufficienza cardiaca (HF). Gli effetti degli inibitori SGLT2 si sono dimostrati coerenti nei pazienti con o senza diabete. Gli effetti cardiovascolari ed i pathways metabolici delle gliflozine non sono attualmente del tutto conosciuti.

Scopo: Questo studio valuta l'impatto del trattamento con gliflozina nei pazienti con insufficienza cardiaca a frazione di eiezione ridotta (HFr) sui metaboliti del metabolismo energetico, con particolare attenzione al passaggio dal metabolismo glucidico a quello lipidico. L'identificazione di nuovi biomarcatori e la comprensione delle loro associazioni con i pathways metabolici legati all'azione di SGLT2 potrebbe offrire preziose informazioni per la diagnosi, il monitoraggio e il trattamento delle cardiomiopatie.

Inoltre, è noto come la concentrazione di sodio nei cardiomiociti sia aumentata in molte forme di insufficienza cardiaca e potrebbe contribuire ad alterare la gestione del calcio, che a sua volta potrebbe portare ad alterazioni della contrazione cardiaca e all'insorgenza di aritmie. Gli inibitori del SGLT2 riducono l'attività dello scambiatore sodio-idrogeno sarcolemmale,

della corrente di sodio tardiva verso l'interno della cellula, e della proteina chinasi II calcio-calmodulina-dipendente, che compromette la contrazione e il rilassamento dei cardiomiociti. Tale effetto potrebbe ridurre la percentuale di non responder alla terapia di resincronizzazione cardiaca.

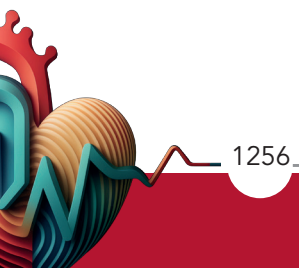
Materiale e metodi: Lo studio è prospettico, osservazionale e randomizzato. Sono stati arruolati pazienti candidati a terapia di resincronizzazione cardiaca: nel braccio trattamento pazienti non diabetici con HFrEF sottoposti a terapia con gliflozina da più di 3 mesi (empagliflozin e dapagliflozin); nel braccio controllo pazienti affetti da HFrEF non diabetici in terapia medica ottimizzata per scompenso cardiaco non ancora trattati con gliflozine. I campioni di sangue sono stati raccolti dal circolo venoso periferico, venoso centrale ed arterioso. Tutti i pazienti sono stati sottoposti ad ecocardiogramma con valutazione della frazione di eiezione ventricolare sinistra (LVEF) e sui campioni ematici è stata effettuata un'analisi metabolomica mediante spettrometria di massa. Sono previste valutazioni in follow up a 3-6-12 mesi con rivalutazione dell'LVEF e prelievo ematico venoso a 6 mesi.

Risultati: I risultati preliminari dell'analisi dei campioni di siero hanno rivelato alterazioni significative dei metaboliti associati a varie vie metaboliche nei



pazienti trattati con gliflozina rispetto ad individui non trattati. È stata riscontrata una sovraespressione degli intermedi del ciclo dell'acido tricarbossilico, del beta-idrossibutirrato e delle carnitine a catena corta, associati al cambiamento metabolico. Al contrario è stata riscontrata una riduzione delle carnitine a catena lunga nei pazienti trattati. I polioli e le ceramidi (associati allo stress cardiovascolare) hanno mostrato livelli ridotti di espressione.

Conclusioni: Lo studio fornisce approfondimenti sugli effetti metabolici delle gliflozine nei pazienti HFrEF non diabetici, identificando potenziali biomarcatori e definendo nuovi approcci diagnostici terapeutici per le cardiomiopatie. Lo studio ed i risultati ottenuti potrebbero inoltre migliorare la comprensione dei meccanismi di azione delle gliflozine, in particolare sui canali ionici e sull'attività elettrica del cardiomiocita per una migliore definizione prognostica e di risposta alla terapia di resincronizzazione cardiaca.



SCOMPENSO CARDIACO 699 ABLAZIONE TRANSCATETERE (ARITMIE) PROGNOSI (SCOMPENSO CARDIACO) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

EFFECTS OF ATRIAL FIBRILLATION ABLATION IN PATIENTS WITH HEART FAILURE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Discordant effects of catheter ablation (CA) of atrial fibrillation (AF) have been described in patients with heart failure (HF).

Purpose: We performed a systematic review and meta-analysis of the studies evaluating CA of AF in HF.

Methods: The MEDLINE, Embase and Cochrane databases were searched for RTCs and prospective studies of CA in patients with HF and AF, published from Jan. 2000 to Mar. 2023 and with ≥ 6 months of follow-up. The primary endpoint was AF recurrence. Secondary endpoints were changes in left ventricle ejection fraction (LVEF), 6-minutes walking distance (6MWD) and quality of life, as quantified by the Minnesota Living with Heart Failure Questionnaire (MLWHF) score; cardiovascular (CV) death; and all-cause hospitalization. For these endpoints, we calculated the incidence rate ratios (IRR) or mean differences between the CA and medical therapy (MT) arms along with 95% confidence intervals (95%CI). The analyses were repeated after dividing patients with reduced or preserved LVEF (HFrEF and HFpEF, respectively), as defined in the relevant publications. Additional sensitivity analyses were carried out according to type of study, length of follow-up, drop-outs, publication date and LVEF quantification method. Heterogeneity was assessed by Q test I² statistics, and risk of bias by following the Agency for Healthcare Research and Quality recommendations.

Results: We selected 17 RCTs and 6 prospective

studies accounting for 4289 patients: 3044 underwent CA and 1245 received MT for rate or rhythm control. The RCTs included 2632 patients (1493 allocated to CA and 1139 to MT). 2354 patients (16 RCTs) had HFrEF and 278 had HFpEF (4 RCTs). Heterogeneity was high. CA was associated with a significant reduction in AF recurrence (IRR 0.51 [95%CI 0.39-0.66]), which was greater in patients with HFrEF than with HFpEF (IRR 0.46 [95%CI 0.36-0.58] vs IRR 0.79 [95%CI 0.65-0.97]; $p=0.005$).

Changes in LVEF, 6MWD and MLWHF score were reported for 10, 6 and 5 studies, respectively (1578, 1170 and 894 patients). Compared to MT, CA significantly improved LVEF by 6.5% (95%CI 4.1-8.8) and 6MWD by 17.8 m (95%CI 7.4-28.2) but not quality of life (mean difference in MLWHF score -2.8 [95%CI -6.0, 0.4]).

The findings were similar when HFrEF and HFpEF were considered separately (p 0.95, p 0.30 and p 0.84, respectively). Data about CV death were available for 7 studies (2154 patients) and indicated a risk reduction with CA (IRR 0.59 [95%CI 0.44-0.80]). Based on 5 studies with 1912 patients, hospitalizations were also less frequent among patients undergoing CA (IRR 0.73 [95%CI 0.53, 0.99]). Distinction between HFrEF and HFpEF was not feasible for these endpoints. Sensitivity analyses confirmed the main results.

Conclusions: CA appears to be beneficial in subjects with HF, especially HFrEF. However, the current evidence is limited by a small number of HFpEF patients and substantial heterogeneity.



SCOMPENSO CARDIACO 916

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

NON-INVASIVE ASSESSMENT OF ACUTE HEMODYNAMIC EFFECTS OF SODIUM-GLUCOSE COTRANSPORTER-2 INHIBITORS IN HEART FAILURE

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(a) DEPARTMENT OF EXPERIMENTAL AND CLINICAL MEDICINE, MAGNA GRAECIA UNIVERSITY, CATANZARO, ITALY; (b) DEPARTMENT OF MEDICAL AND SURGICAL SCIENCES, UNIVERSITY MAGNA GRAECIA OF CATANZARO, CATANZARO, ITALY

Background: Recent randomized clinical trials have shown that adding sodium-glucose cotransporter-2 inhibitors (SGLT2i) to optimal medical therapy significantly reduces heart failure (HF) hospitalizations and cardiovascular mortality, regardless of left ventricular ejection fraction (EF). While the precise mechanisms behind this cardioprotective effect are not fully understood, evidence suggests that positive hemodynamic changes and favorable cardiac remodeling may contribute. This study aims to explore the impact of SGLT2i treatment on hemodynamic parameters and cardiac function using a non-invasive hemodynamic monitoring system.

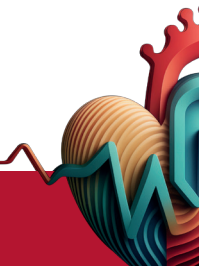
Methods: We conducted a prospective, observational, single-center study involving consecutive patients with chronic HF who received SGLT2i in addition to their standard HF treatment between June 2024 and September 2024. Transthoracic echocardiography and non-invasive hemodynamic assessments using a whole-body impedance-based device (NICaS, NI Medical Ltd, Ra'anana, Israel) were performed for each patient at baseline and 4 weeks after initiating SGLT2i therapy. The NICaS system, which uses two surface limb electrodes in a wrist-to-ankle configuration, measured whole-body bioimpedance changes throughout the cardiac cycle, reflecting variations in thoracic blood flow. Using a proprietary algorithm, the device provided indirect measurements of hemodynamic parameters such as cardiac output (CO), stroke

volume (SV), total peripheral resistance (TPR), and TPR index (TPRi). Clinical, echocardiographic, biometric, and hemodynamic data at baseline and follow-up were included in a prespecified dataset for analysis. Continuous variables are presented as median with interquartile ranges (IQR), and comparisons were made using either the paired Student's t-test or appropriate nonparametric tests.

Results: The median age of the enrolled patients was 75 years [IQR 64-84]. Of these, 57% had HF with preserved EF, 29% had HF with mildly reduced EF, and 14% had HF with reduced EF. After a median follow-up of 32.5 days, there were significant reductions in body weight (from 72.2 kg [IQR 60.2-99.2] to 69.9 kg [IQR 57-97], $p=0.014$) and systolic blood pressure (from 130.4 mmHg [IQR 125-141.5] to 118.5 mmHg [IQR 110-140], $p=0.011$), while NT-proBNP levels remained unchanged. Impedance cardiography revealed improvements in hemodynamic parameters, with an increase in SV index (from 29.0 ml/m² [IQR 18.9-41.0] to 31.8 ml/m² [IQR 23.2-49.3], $p=0.062$) and a significant decrease in TPRi (from 3677 dynes·sec·cm⁻⁵/m² [IQR 2911-5024] to 3246.5 dynes·sec·cm⁻⁵/m² [IQR 2400-4684], $p=0.034$). No significant changes were observed in conventional echocardiographic parameters at follow-up, except for a significant reduction in the left atrial volume index (from 42.80 ml/m² [IQR 63-27] to 40.20 ml/m² [IQR 62.9-24], $p=0.006$).

Conclusions: The addition of SGLT2i to HF therapy is associated with significant improvements in hemodynamic status, as assessed by a non-invasive system, over a short-term observation period. These

findings highlight the effectiveness of non-invasive hemodynamic assessment in evaluating therapeutic response and guiding heart failure management.



SCOMPENSO CARDIACO 256

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

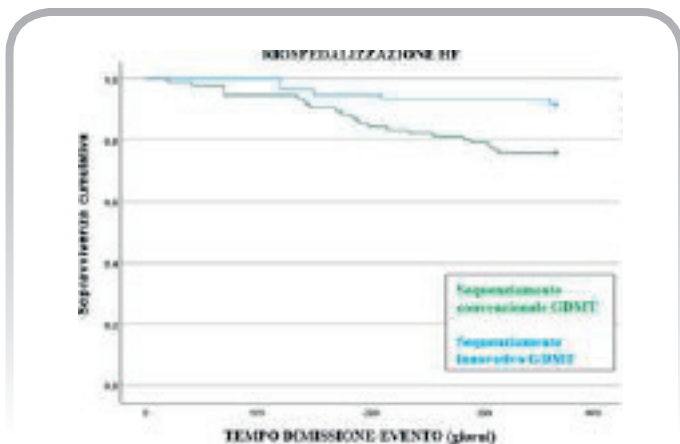
PROGNOSI (SCOMPENSO CARDIACO)

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

ESPERIENZA MONOCENTRICA DELL'INTRODUZIONE E TITOLAZIONE DELLA TERAPIA CON I QUATTRO PILASTRI DELLO SCOMPENSO CARDIACO

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(a) DIPARTIMENTO DI SCIENZE CLINICHE, INTERNISTICHE, ANESTESIOLOGICHE E CARDIOVASCOLARI, SAPIENZA UNIVERSITÀ DI ROMA, VIALE DEL POLICLINICO 155, ROMA, ITALIA; (b) DIPARTIMENTO DI CARDIOLOGIA, OSPEDALE FABRIZIO SPAZIANI, 03100 FROSINONE, ITALIA; (c) SAN RAFFAELE CASSINO, 03043 CASSINO, ITALIA



Analisi del tasso di riospedalizzazione per HF nel gruppo con sequenziamento innovativo vs gruppo con sequenziamento convenzionale ottenuto con metodo di Kaplan-Meier

Figura 1

Introduzione: Lo scompenso cardiaco (HF) è una sindrome clinica complessa con un alto tasso di mortalità e un alto tasso di ospedalizzazione. Le ultime linee guida della Società Europea di Cardiologia per l'HF raccomandano l'uso di quattro diverse classi di farmaci: Inibitori del Recettore dell'Angiotensina/Neprilisina (ARNI), Beta Bloccanti (BB), Antagonisti del Recettore dei Mineralcorticoidi (MRA) e Inibitori del

Cotrasportatore di Sodio e Glucosio-2 (SGLT2i). Tuttavia non è chiara la giusta strategia per l'ottimizzazione della Terapia Medica Guidata dalle Linee Guida (GDMT). Attualmente, l'approccio più convenzionale si basa sull'introduzione graduale dei quattro farmaci, risultando in un ritardo nell'ottimizzazione completa del trattamento, nonostante diverse evidenze dimostrino come questi farmaci agiscano entro poche settimane (da 2 a 8 settimane) dall'inizio del trattamento.

Obiettivi: Confrontare la strategia convenzionale graduale con la nostra sequenza precoce di GDMT, basata sulla rapida introduzione di BB, SGLT2i, ARNI e MRA. L'endpoint primario è un evento composto di morte cardiovascolare (CV) e riospedalizzazione per HF. Gli endpoint secondari sono i singoli eventi costituenti l'endpoint primario.

Materiali e Metodi: Questo studio monocentrico, prospettico, osservazionale ha incluso 240 pazienti consecutivi giunti alla nostra osservazione presso l'ambulatorio per lo scompenso cardiaco o presso il reparto di Cardiologia con una diagnosi di HFrEF non acuta. 192 pazienti hanno completato il follow-up di 12 mesi. Sono stati divisi in base alla strategia di trattamento e sono stati abbinati attraverso il propensity score matching. 96 pazienti, trattati con la sequenza convenzionale graduale di GDMT, costituivano il

gruppo 1 (G1). 96 pazienti, trattati con la nostra nuova sequenza rapida di GDMT, costituivano il gruppo 2 (G2). Il confronto tra i due gruppi è stato effettuato al follow-up di 12 mesi.

Risultati: I due gruppi erano comparabili in termini di caratteristiche di base. Non sono state osservate differenze significative per l'outcome composito primario (p-value = 1) e per la mortalità CV (p-value = 0.07) tra i due gruppi. Il rischio di riospedalizzazione per HF era significativamente inferiore nel gruppo G2 rispetto al gruppo G1 (p-value = 0,003) (**Figura 1**).

Conclusioni: Non vi sono differenze significative tra

le due strategie di trattamento per quanto concerne l'endpoint primario e l'evento di morte cardiovascolare al follow-up di 12 mesi. Pertanto, indipendentemente dalla strategia adottata, viene ribadita la necessità di utilizzare tali farmaci in quanto si sono dimostrati efficaci nel ridurre la mortalità in questa classe di pazienti. Risulta rilevante con la nostra proposta di sequenza rapida di GDMT, prontamente avviata e implementata entro 4 settimane, la significativa riduzione del rischio di riospedalizzazione per HF rispetto alla strategia graduale convenzionale. Questo rappresenta bene il concetto di "the earlier, the better", da tenere in considerazione nella gestione dei pazienti affetti da HF.



SCOMPENSO CARDIACO 774 TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) PROGNOSI (SCOMPENSO CARDIACO)

LONG TERM EFFICACY AND SAFETY OF SACUBITRIL/VALSARTAN IN CHRONIC HEART FAILURE PATIENTS WITH REDUCED EJECTION FRACTION: A PROSPECTIVE REAL-WORLD STUDY

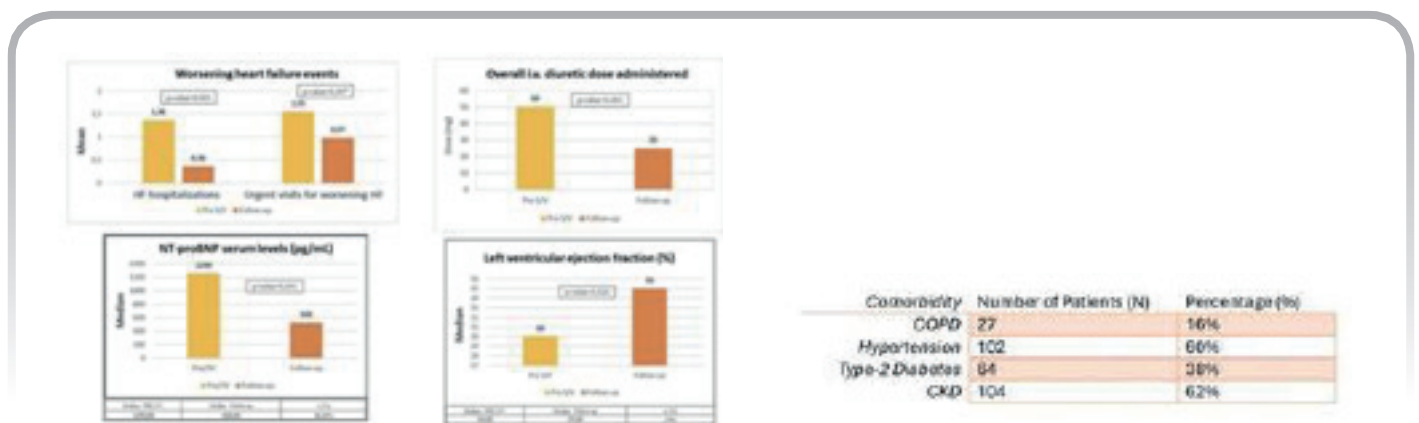
Francesco Fioretti (a), Maria Grazia De Angelis (a), Angelica Praderio (a), Angelica Rizzello (a), Giulia Togni (a), Antonio Maria Sammartino (a), Luca Assoni (a), Mattia Amarante (a), Benedetta Fabiani (a), Savina Nodari (a)
(a) CARDIOLOGY SECTION - DEPARTMENT OF CLINICAL AND SURGICAL SPECIALITIES; UNIVERISTY AND SPEDALI CIVII HOSPITAL OF BRESCIA

Background: Sacubitril/valsartan (ARNI) is one of the four pillars of the pharmacotherapy of HFrEF patients (pts), strongly recommended by international guidelines for its benefit on cardiovascular death and hospitalization for HF. However, European and American registries show it to be largely underused without intolerance or contraindication.

Aim: to evaluate the long-term use efficacy and safety of ARNI in an outpatient real-world setting of HFrEF pts before the introduction of SGLT2i.

Methods: we performed a prospective monocentric observational study, in which chronic stable HFrEF pts were enrolled consecutively from January 2017 to September 2022. Demographical, clinical, laboratory and instrumental data were collected at baseline visit and at periodic follow-up visits.

Results: 169 pts were enrolled. The median follow up was 3.4 years. Mean age of participants was 63 + 12 years. Only 24 (14.2%) were female. Comorbidities are shown in Table 1. Overall, 135 pts (79.3%) were treated



ARNI efficacy endpoint.

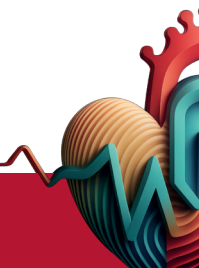
HF = heart failure; NT-proBNP = N-terminal-pro-natriuretic peptide type B; S/V = sacubitril/valsartan
Table 1 Main comorbidities of HFrEF patients enrolled COPD= Chronic Obstructive Pulmonary Disease;
CKD = Chronic Kidney Disease.

Figura 1

with maximum ARNI tolerated dose for the entire duration of follow up, and among them it was well tolerated, without a significant increase in creatinine serum levels and in clinical relevant hypotension events. Treated patients exhibited a significant reduction in HF urgent visits and hospitalizations, decreasing from a mean of 1.55 to 0.97 ($p = 0.07$) for urgent visits, and from 1.36 to 0.36 ($p < 0.001$) for hospitalizations. The mean dose of intravenous diuretic was reduced from 50 to 25 mg ($p < 0.001$). Median NT-proBNP levels decreased from 1250 to 520 pg/mL ($p < 0.001$). Additionally, the median ejection fraction increased from 30% to 35% ($p = 0.28$). (Figure

1). During the follow up 10 pts (7.4%) died due to CV causes. The remaining 34 pts who discontinued ARNI during follow-up due to intolerance or contraindication (symptomatic hypotension, $eGFR < 30$ ml/min etc...) showed a statistically significant increase in the number of CV events after ARNI discontinuation (0.97 during ARNI vs 1.56 after discontinuation, p -value < 0.001).

Conclusions: our results confirm the long-term efficacy and safety of ARNI in a real-world cohort of HFrEF patients, highlighting the importance of implementing the guideline's recommendations.



SCOMPENSO CARDIACO 617 PROGNOSI (SCOMPENSO CARDIACO) BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

PALLIATIVE CARE NEEDS ASSESSMENT IN A POPULATION OF WORSENING AND ADVANCED HEART FAILURE: CORRELATION WITH PROGNOSTIC, BIO-HUMORAL AND FUNCTIONAL PARAMETERS, AND PREDICTION OF SHORT-TERM EVENTS

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(a) UNIVERSITÀ MILANO-BICOCCA; (b) OSPEDALE PAPA GIOVANNI XXIII; (c) UNIVERSITÀ DEL PIEMONTE ORIENTALE; (d) UNIVERSITÀ DI SASSARI; (e) OSPEDALE SAN CARLO

Background: Worsening Heart Failure (WHF) is marked by the exacerbation of Heart Failure (HF) symptoms, necessitating intensified treatment and frequent hospitalizations. Palliative Care (PC) uses a multidisciplinary approach to meet the needs of these patients, aiming to improve their Quality of Life (QoL) irrespective of prognosis. Despite this, PC involvement in WHF remains suboptimal, with referrals often delayed due to the unpredictable clinical course and lack of well-established criteria. To our knowledge, data on the appropriateness and timing of PC referrals for WHF patients in outpatient settings are limited.

Purpose: The primary objective of this study was to assess PC needs in a cohort of WHF patients using the "Palliative Care Need Assessment Tool (PCNAT)" questionnaire. The secondary objective was to evaluate the correlation of PCNAT with validated HF prognostic scores (MAGGIC and 3C-HF score), functional and QoL parameters (Gait Speed, Kansas City Cardiomyopathy Questionnaire (KCCQ)), and bio-humoral markers (NT-proBNP, soluble-ST2). Additionally, we aimed to assess PCNAT's ability to predict short-term Palliative Cardiac Events (PACE).

Methods: WHF patients admitted for outpatient recurrent diuretic and/or inotropic infusion were recruited from October 2023 to April 2024. At baseline,

the PCNAT questionnaire was administered, and each patient also underwent an echocardiogram, blood tests, and an evaluation of functional parameters. PACE events, including all-cause death, hospitalization, Emergency Room visits, referral to PC specialists, and treatment intensification (defined as short-term (<10 days) recurrent outpatient diuretic infusion), were recorded over a 90-day follow-up period.

Results: A total of 125 WHF patients were enrolled, with 34 (27%) meeting the HFA criteria for advanced HF. The mean age was 76.5 ± 9 years, and 64% were male. The mean PCNAT score was 8.15 ± 3.4 , and 30 (19.2%) patients were identified as having a high need for PC (PCNAT >10). Among these, 11 (36%) received a PC consultation. PCNAT showed positive correlations with the 3C-HF score ($r=0.587$, $p<0.001$), MAGGIC score ($r=0.351$, $p<0.001$), NT-proBNP ($r=0.337$, $p<0.001$), and sST2 ($r=0.330$, $p<0.001$), and negative correlations with Gait Speed ($r=-0.510$, $p<0.001$) and KCCQ ($r=-0.547$, $p<0.001$). No correlation was found between the PCNAT score and Left Ventricle Ejection Fraction (LVEF) ($r=0.048$, $p=0.591$). During the 90-day follow-up, 43 (34%) patients developed a PACE. The PCNAT AUC for detecting PACE was 0.68, compared to 0.516 and 0.51 for BNP and KCCQ, respectively. In the Cox regression model, PCNAT had an OR of 1.17 (1-1.33) for predicting 90-day PACEs. Patients with a

PCNAT score above the 50th percentile had an OR of 3.15 (1.21-9.18) for developing PACEs.

Conclusions: Our data suggest that PC referrals for WHF remain limited to a small percentage of patients actually in need. PCNAT correlates positively with prognostic HF scores and natriuretic peptides while showing an inverse correlation with functional

parameters. Comorbidities, rather than LVEF, appear to impact the PCNAT score and consequently influence WHF patient prognosis. Our study indicates that the PCNAT score could predict PACE more effectively than established bio-humoral and functional parameters, suggesting that PC needs assessment might be a valuable tool for better managing and stratifying WHF patients.



SCOMPENSO CARDIACO 278
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)
ELETTROSTIMOLAZIONE (ARITMIE)

L'EFFETTO DELLA TERAPIA CON SACUBITRIL/VALSARTAN E GLIFLOZINE NEI PAZIENTI PORTATORI DI RESINCRONIZZATORE CARDIACO: RISULTATI DI UN'ANALISI TEMPO-DIPENDENTE

Pasquale Visconti (a), Valerio Pergola (a), Daniele Faccenda (a), Alfonsomaria Salucci (a), Giuseppe Ammirati (a), Aldo Marrese (a), Gianluigi Comparone (a), Alessandro Volpe (a), Luigi Cocchiara (a), Celeste Fonderico (a), Emanuele Parlato (a), Benedetta Brescia (a), Dario Cittadini (a), Teresa Strisciuglio (a), Antonio Rapacciuolo (a)
 (a) UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

Background: Sebbene Sacubitril/Valsartan, gliflozine e terapia di resincronizzazione cardiaca (CRT) siano ormai considerate pietre miliari della terapia dei pazienti con scompenso cardiaco a ridotta frazione d'eiezione (HFrEF), evidenze robuste a conferma di un'efficacia della loro combinazione nel lungo termine rimangono ancora elusive. I pochi dati a supporto di un effetto sinergico di queste classi di farmaci in aggiunta alla CRT non hanno rigorosamente considerato le differenze del timing della loro introduzione, portando a potenziali bias di selezione, poiché solo i pazienti con una sopravvivenza iniziale abbastanza lunga hanno potuto iniziare questa terapia. Di conseguenza, la letteratura attualmente manca di una dimostrazione comprensiva del beneficio aggiuntivo sulla sopravvivenza conferito da ARNi e SGLT2i in aggiunta alla sola CRT nei pazienti affetti da HFrEF.

Obiettivi: L'obiettivo del nostro studio è valutare l'impatto della terapia di ARNi e SGLT2i sulla riduzione della mortalità nei pazienti affetti da HFrEF e sottoposti ad impianto di CRT-D.

Metodi: Abbiamo retrospettivamente arruolato pazienti affetti da HFrEF sottoposti ad impianto di CRT-D dal 2015 al 2023 presso il nostro centro. I pazienti sono stati divisi in quattro gruppi in base all'assunzione o meno di terapia con ARNi e SGLT2i. Il trattamento con ARNi e gliflozine è stato considerato come una

variabile tempo-dipendente, così da considerare le differenze tra i pazienti che hanno iniziato o interrotto la terapia durante il follow-up.

Risultati: La nostra coorte include 183 pazienti affetti da HFrEF (61.7% ad eziologia ischemica, età media 73 anni); al baseline 18 pazienti erano in terapia con ARNi e SGLT2i (10%), 5 con solo SGLT2i (3%) e 39 (21%) con solo Sacubitril/Valsartan (Figura 1). Alla fine del follow up 78 pazienti erano in terapia con ARNi+SGLT2i (43%), 13 con solo SGLT2i (7%), e 33 con solo ARNi (18%). Si è quindi dimezzato il gruppo di pazienti che non praticava terapia né con ARNi né con SGLT2i (da 121 a 59 pazienti). In un follow-up medio di 7.1 anni, 73 pazienti (39.9%) sono morti, dei quali 54 (73.4%) per morte cardiovascolare associata allo scompenso cardiaco. Nello specifico, 47 pazienti (di cui il 78.7% per morte CV associata allo scompenso cardiaco) sono morti nel gruppo "terapia no" mentre 22 (63% per morte CV associata allo scompenso cardiaco) nel gruppo in terapia con ARNi e 12 (di cui 83% per morte CV associata allo scompenso cardiaco) nel gruppo in terapia con SGLT2i (Figura 2).

All'analisi statistica ottenuta tramite il Poisson Test sulla differenza tra tassi di mortalità la terapia con ARNi ha dimostrato una riduzione statisticamente significativa della mortalità cardiovascolare associata allo scompenso cardiaco ($p=0.046$), mentre la terapia con SGLT2i ha dimostrato una tendenza verso la



diminuzione della mortalità cardiovascolare, senza però raggiungere la significatività statistica (Figura 2). Nessuno dei due farmaci ha invece dimostrato una riduzione statisticamente significativa della mortalità per tutte le cause rispetto alla sola CRT.

Conclusioni: Nonostante i benefici riconosciuti nella terapia dello scompenso cardiaco a frazione d'iezione ridotta, ARNi e gliflozine non hanno dimostrato un solido beneficio sulla sopravvivenza a lungo termine

rispetto alla terapia con solo defibrillatore biventricolare nei pazienti con HFrEF, sottolineando come la corretta selezione dei pazienti potenzialmente responder alla CRT ha un impatto dominante sull'outcome di questi pazienti. Ulteriori studi saranno necessari per confermare o smentire quest'ipotesi, con periodi prolungati di follow-up e con maggiori numerosità campionarie, anche valutando come l'esatto timing della loro introduzione potrebbe modificare la sopravvivenza.

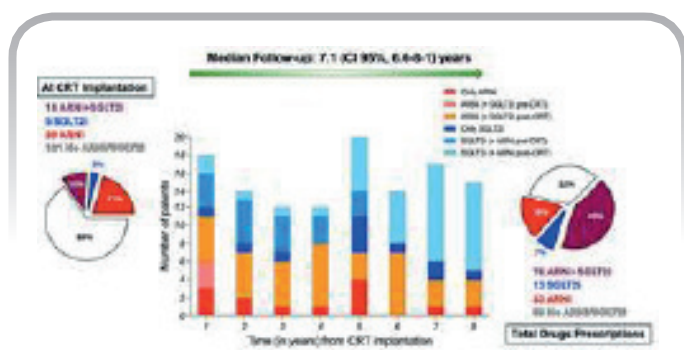


Figura 1

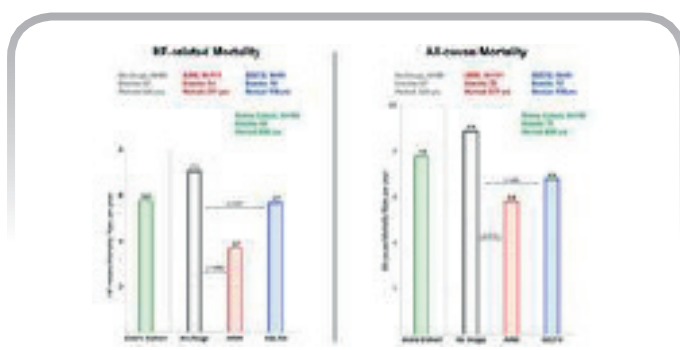


Figura 2



SCOMPENSO CARDIACO 343
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E
NUTRACEUTICI)
PROGNOSI (SCOMPENSO CARDIACO)

CLINICAL IMPACT OF A COMPREHENSIVE ASSESSMENT IN PATIENTS DIAGNOSED WITH TRANSTHYRETIN CARDIAC AMYLOIDOSIS - THE ROLE OF FRAILITY, MALNUTRITION AND DISABILITY ON AGEISM AND OUTCOME

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Background: The prevalence of transthyretin cardiac amyloidosis (ATTR-CA) among older adults is increasing. Whether age and geriatric syndromes bear any impact on the management and outcomes in ATTR-CA is poorly understood.

Methods: In a prospective, multicenter cohort study, 256 patients diagnosed with ATTR-CA from March 2021 to March 2024 underwent comprehensive geriatric assessment (CGA). The study evaluated the prevalence and clinical associations of CGA items across different disease stages, (i.e. National Amyloidosis Centre (NAC)

stage). Key CGA items included disability, malnutrition, depression, frailty, short physical performance battery (SPPB) and cumulative deficits (sum of the single CGA items). Association of these items with disease-modifier prescription (stabilizer or silencer) and overall mortality were analyzed.

Results: Median age was 82 years (men: 87%, variant 19, 7.4%). A total of 129 (50.3%) patients were referred to DMD. Those >85 years had significantly lower odds (OR 0.125, 95% C.I. 0.033-0.299, $p < 0.001$) of receiving DMD even after adjusting for disability, frailty, and cumulative deficits. Over a median follow-up of 1.7 years, 44 (17.2%) patients died. After adjustment for NAC stage, diuretics and disease-modifiers, disability, malnutrition, depression, SPPB, frailty and number of deficits, but not age (Hazard Ratio 1.350, 95% C.I. 0.598-2.091, $p = 0.571$), were significantly associated with mortality. CGA items improved NAC prognostic accuracy.

Conclusion: In a national prospective cohort of ATTR-CA patients, older age limited access to disease modifiers, even among fit individuals. However,

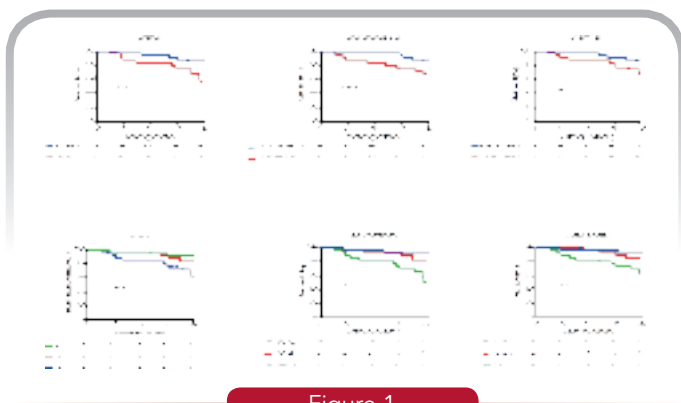
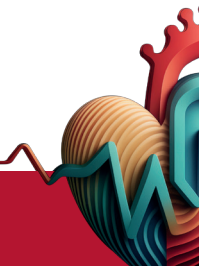


Figure 1

when adjusted for CGA, age was not associated with outcome, indicating potential risk of ageism. Since some geriatric syndromes may be modifiable, a CGA

could enhance risk stratification, reduce age-related bias, and improve outcomes.



SCOMPENSO CARDIACO 590 PROGNOSI (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO) DIAGNOSTICA INVASIVA INTRAVASCOLARE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

RUOLO DELL'INDICE DI PULSATILITÀ DELL'ARTERIA POLMONARE SULL'OUTCOME A BREVE E MEDIO TERMINE DOPO TRAPIANTO DI CUORE

Andrea Golfetto (a), Arianna Calonaci (a), Francesco Putortì (a), Mattia Coriano' (a), Vincenzo Tarzia (a), Annalisa Angelini (a), Antonio Gambino (a), Chiara Tessari (a), Marny Fedrigo (a), Nicola Pradegan (a), Giuseppe Toscano (a), Sabino Iliceto (a), Gino Gerosa (a), Francesco Tona (a)

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Background: La valutazione emodinamica mediante cateterismo cardiaco destro permette di stratificare il rischio di sopravvivenza post-trapianto cardiaco (TC) nei pazienti affetti da scompenso cardiaco avanzato. Allo stato dell'arte, elevati valori di pressione media in arteria polmonare (PAPm) e di resistenze vascolari polmonari (RVP) rappresentano i parametri più associati ad un outcome sfavorevole. Al contrario, non è chiaro il ruolo dell'indice di pulsatilità dell'arteria polmonare (PAPi) sulla prognosi a breve e medio termine post-trapianto cardiaco.

Obiettivo: Lo scopo di questo studio è determinare l'utilità prognostica del PAPi pre-TC valutato mediante cateterismo cardiaco destro nel predirne la sopravvivenza a breve e medio termine post-TC.

Metodologia: in questo studio retrospettivo è stata valutata la coorte storica di pazienti sottoposti a TC presso il nostro istituto. Sono stati inclusi tutti i pazienti maggiorenni sottoposti a cateterismo cardiaco destro nell'anno precedente il TC. Sono stati collezionati dati circa: pressione di incuneamento capillare, PAP, pressione ventricolare destra telediastolica, pressione atriale destra (PAD). Il PAPi è stato ricavato mediante la seguente formula: $(PAPs - PAD) / PAD$. L'endpoint valutato è stato la mortalità per tutte le cause a 5 anni. Il cut-off con massima accuratezza predittiva di outcome del PAPi è stato valutato mediante metodo di analisi della "receiving operating curve" (ROC). La coorte è stata quindi suddivisa in due gruppi, la cui differenza di sopravvivenza è stata riportata mediante le curve di Kaplan-Meier, la cui significatività è stata analizzata

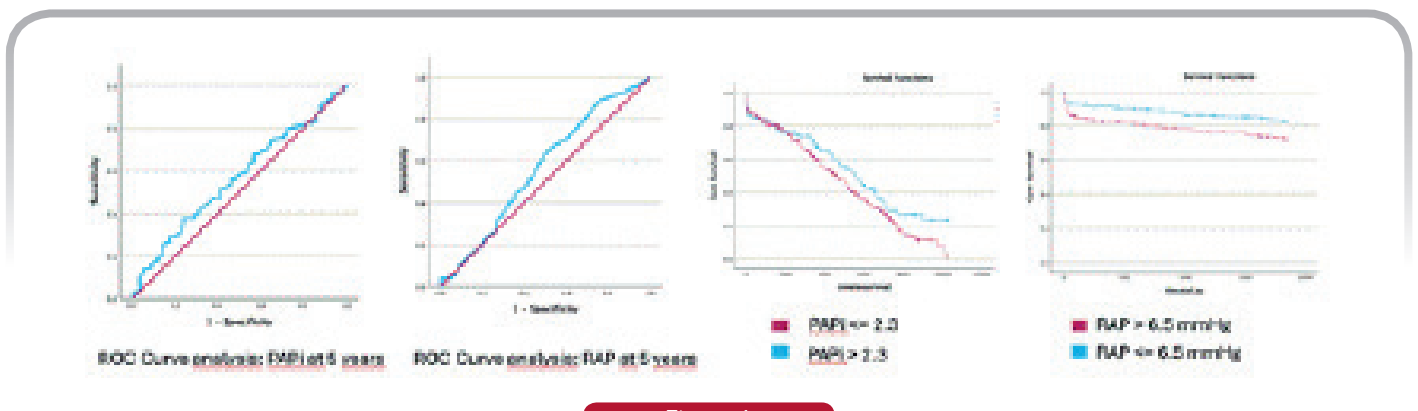


Figura 1

mediante il LogRank test. Una analisi univariata è stata impiegata per valutare l'associazione tra i vari parametri emodinamici e l'outcome.

Risultati: Tra i 1985 ed il 2015 sono stati effettuati 830 trapianti cardiaci. Dopo aver escluso 346 pazienti per assenza di dati di cateterismo destro, la coorte finale consisteva di 484 pazienti. Tale coorte era composta per il 17% da femmine, con età media di 53 anni. La principale causa di trapianto cardiaco era cardiomiopatia dilatativa (42%), seguita da cardiopatia ischemica (38.6%) e da valvulopatie (6.4%). Riguardo i parametri emodinamici, il valore medio di PAPm, RAD, RVP e PAPI era 31.7mmHg, 8.5mmHg, 5.3WU, e 5.16 rispettivamente. Dopo un tempo medi di

follow-up di 5 anni, 285 pazienti erano deceduti. PAPI è risultato associato, all'analisi univariata, in maniera statisticamente significativa ad un peggiore outcome a 1, 2 e 5 anni ($p=0.001, 0.05, 0.05$). Inoltre, a 5 anni, anche la RAP è risultata significativa ($p=0.05$). Dopo analisi della ROC, il valore di PAPI di 2.3 ha evidenziato una massima accuratezza predittiva con specificità di 0.68 e sensibilità di 0.72 nel predire l'endpoint ($AUC = 0.61$). La differenza di sopravvivenza tra i pazienti con $PAPi > 2.3$ e $PAPi \leq 2.3$ è risultata significativa a 5 anni.

Conclusioni: nella nostra coorte storica di pazienti sottoposti a TC, un valore di $PAPi > 2.3$ è risultato associato ad un maggiore rischio di mortalità per tutte le cause a XX anni.



SCOMPENSO CARDIACO 366 ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE) PROGNOSI (SCOMPENSO CARDIACO) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

PREDICTORS OF RIGHT VENTRICULAR FAILURE AFTER LVAD IMPLANTATION: THE PREFER LVAD STUDY

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Parameter	0	1-3m	6-9m	12m
INTERPHAS 0	0.227	1.255	0.259-0.265	0.796
INTERPHAS 4	-0.892	0.410	0.007-1.726	0.224
INTERPHAS 6	0.280	26.370	0.208-91.647	0.430
IS	1.176	1.223	0.936-16.376	0.204
ACQUARE	0.872	0.391	0.267-21.477	0.436
FW	1.268	0.869	0.460-21.869	0.159
Paraspheric	0.476	1.619	0.189-14.431	0.471
Integrates	0.571	1.776	0.196-15.836	0.470
ISAP	-1.693	-0.249	0.047-2.965	0.027
IS	0.419	1.016	0.740-1.977	0.493
PCT	-0.201	0.209	0.979-1.978	0.386
Overstrain	1.419	4.133	0.272-25.494	0.126
vPTE	-0.208	0.263	0.911-1.217	0.177
SI gradDF	0.201	1.001	0.359-1.201	0.009

Parameter	0	1-3m	6-9m	12m
LAD	-0.612	0.966	0.006-1.428	0.440
LVIDM	-0.800	0.907	0.006-1.205	0.463
LVIDP	0.690	1.001	0.912-1.211	0.480
Em	0.007	1.001	0.000-1.707	0.004
RV ESO	-0.027	0.970	0.004-1.009	0.029
RVH	0.161	1.174	0.009-13.070	0.040
vPAP	0.027	1.026	0.071-1.001	0.200
TAPSE	-0.001	0.941	0.701-1.210	0.471
V-TO	-11.840	0.001	0.001-101.102	0.200
RVFAC	0.012	1.012	0.010-1.026	0.023
RVFWLS	0.010	1.016	0.003-1.100	0.020
CI	0.008	1.000	0.000-4.002	0.004
EVP	0.076	1.070	0.040-1.201	0.263
PCMP	-0.003	0.977	0.006-1.000	0.006
COMPMP	0.001	10.000	1.427-270.281	0.006
FWL	0.006	1.000	0.007-1.100	0.102

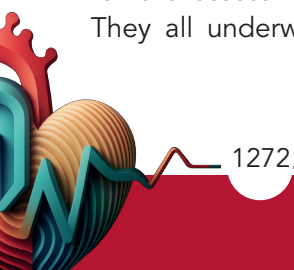
Figure 1

Background: The use of left ventricular assist devices (LVAD) is increasing in advanced heart failure (AHF) population, especially as destination therapy, considering the lack of cardiac donors for transplantation. Right ventricular (RV) post-implantation failure, major bleedings and infective events remain the principal adverse events in LVAD patients, thus an accurate selection of candidates is needed. Aim: to identify among clinical, laboratory, standard and advanced (Speckle Tracking, STE) echocardiographic and right heart catheterization (RHC) indices, the best predictors of outcome after LVAD implant.

Methods: We screened in our third-level center 30 patients with AHF, from May 2013 to February 2022, for the assessment of LVAD implantation suitability. They all underwent a complete cardiological history

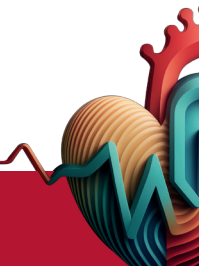
collection, electrocardiography, standard and STE left ventricular (LV) and left atrial (LA) size and function assessment. SIENA score parameters, including RV sphericity index, RV free wall longitudinal strain (fwRVLS), RV fractional area change (RVFAC), and 3D ejection fraction were used for exclude RV dysfunction. RHC was performed on the same day of echocardiography. Follow-up was made at 1, 3, 6, 9 and 12 months repeating all the assessments, for the occurrence of RV failure, all-causes mortality, hemorrhagic events and re-hospitalization for AHF. By univariate and multivariate statistical analysis, we went to test among all the parameters the possible predictors of outcome.

Results: The final population consists of 29 patients (93% male, mean age 63±11 years), in NYHA class III or IV and with a severe reduction of LV ejection fraction (EF), in whom arterial hypertension and smoking, present or previous, were present in 58% and 65% of cases, respectively. The population was divided into two groups according to the occurrence of at least one cardiovascular event. 11 major events were recorded: including 4 hemorrhagic events, 3 all-causes mortality and 4 hospital admission for HF. No RV failure occurred in the first 12 months of follow-up. No differences were identified between the two groups in terms of echocardiographic indices and RV function, including RVFAC or fwRVLS. At univariate analysis (see Table),



the only parameter able to predict major CV events was central venous pressure (CVP)/pulmonary capillary wedge pressure (PCWP) ratio, obtained by RHC, an index of balance between right and left heart filling pressure.

Conclusions: A careful application of SIENA score before LVAD implantation can significantly reduce the incidence of post-operative RV failure, as demonstrated in our small population. Our results also confirmed the paramount role of RHC in the diagnostic work up of AHF.



**SCOMPENSO CARDIACO 779
ECOSTRESS (IMAGING CARDIOVASCOLARE)
MICROCIRCOLAZIONE E COLLATERALI
(MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)**

HEART FAILURE AND MICROCIRCULATION: POSSIBLE THERAPEUTIC TARGET FOR GLIFLOZINS

Maria Francesca Marchetti (a), Antonio Di Luca (a), Marco Licciardi (a), Luca Fazzini (a), Elena Utzeri (a), Giacomo Boi (a), Beatrice Arianna Planu (a), Luca Pascalis (a), Anna Laura Vacca (a), Roberta Montisci (a)
(a) *CARDIOLOGIA-UTIC POLICLINICO DI MONSERRATO,AOU CAGLIARI, UNIVERSITÀ DI CAGLIARI*

Background: Evaluation of coronary flow velocity reserve (CFVR) is the physiological approach to assess the severity of coronary stenosis and microvascular dysfunction. Microvascular dysfunction is frequent in patients with heart failure with reduced (HPrEF) and preserved ejection fraction (HPpEF) and preserved CFVR has a prognostic role in HF patients. Sodium-glucose co-transporter 2 inhibitors (SGLT2i) have recently been included as first-line drugs in the treatment of HF, both in HPrEF and HPpEF where these drugs have been shown in clinical trials to reduce hospitalization and mortality. The aim of this study was to evaluate the impairment of the coronary microcirculation in patients with HFpEF and HFReEF and evaluate the impact of

gliflozin therapy on coronary microcirculation.

Methods: CFVR in left anterior descending coronary artery was assessed by adenosine transthoracic echocardiography in 16 patients admitted at our Department with acute HF after stabilization of symptoms and without obstructive coronary artery disease. Subsequently, gliflozin (9 pts dapagliflozin and 7 pts empagliflozin) was introduced in addition to the heart failure therapy and after a mean of 52±22 days of therapy with Gliflozin CFVR was repeated.

Results: The mean CFR values calculated with peak diastolic velocities were 1,64±0,34, range 1- 2.68. 14

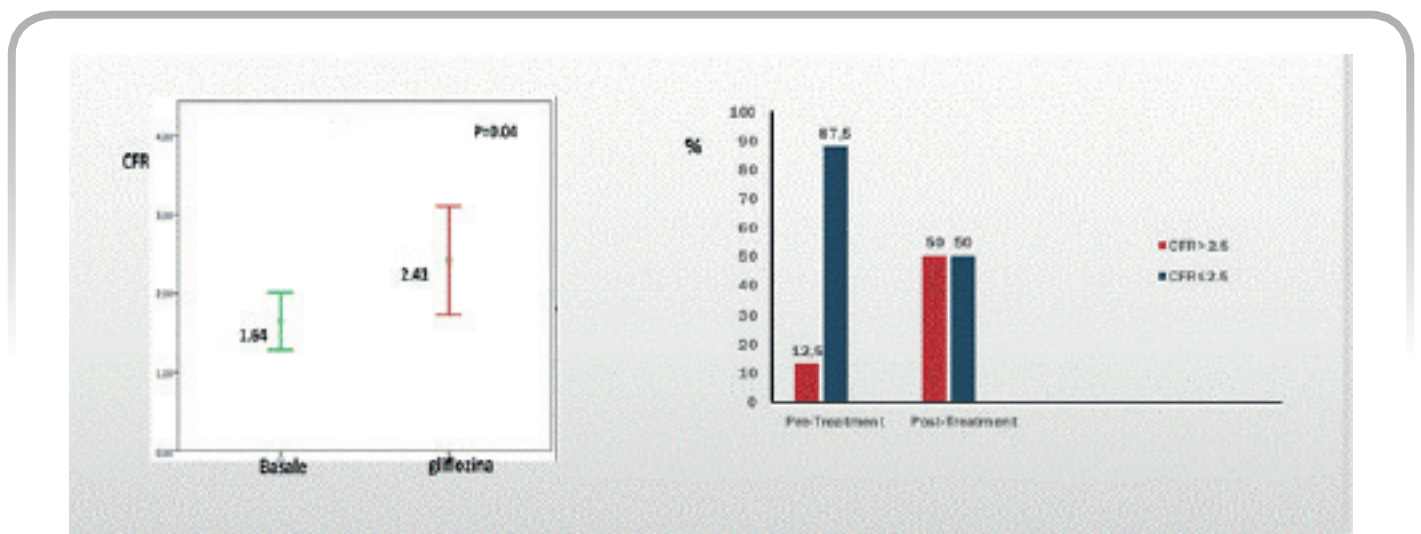
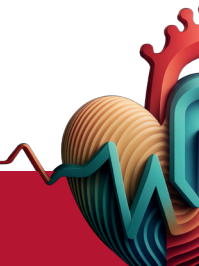


Figure 1

patients had a $CFR < 2.5$ (indicative of microcirculatory dysfunction). After at least one month of therapy with gliflozin, we observed a significant increase in CFR values calculated from $1,64 \pm 0,34$ to $2,41 \pm 0,82$, $p = 0.004$. Excluding 2 patients, all patients showed a significant improvement in CFR values (figure).

Conclusions: Microcirculatory dysfunction is a highly

represented condition in patients with both HFpEF and HFrEF. Treatment with Gliflozin has proven useful in significantly improving microcirculatory function in the patients analyzed. In addition to improving CFR values in an absolute sense, treatment with Gliflozin has allowed the physiological CFR values to be re-established in a good number of patients.



SCOMPENSO CARDIACO 316
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

REVERSE REMODELING AND PREDICTION OF CLINICAL OUTCOME AFTER THERAPY WITH SGLT2i: INSIGHTS FROM DISCOVER SGLT2i MULTICENTER ITALIAN STUDY

Maria Concetta Pastore (a), Andrea Stefanini (a), Paolo Sciarrone (b), Alberto Giannoni (b), Giulia Elena Mandoli (a), Anas Khalil (b), Claudia Taddei (b), Federico Guerra (l), Giulia Stronati (l), Ciro Santoro (m), Raffaele Carluccio (m), Riccardo Inciardi (c), Maria Giulia Bellicini (c), Giuseppina Novo (g), Fabio Balasus (g), Salvatore Milazzo (g), Giovanni Benfari (d), Jessica Pizzini (d), Matteo Lisi (e), Giovanni Andrea Luisi (e), Michele Correale (j), Michele Granatiero (j), Antonio Vitullo (j), Pietro Mazzeo (k), Eugenio Stabile (k), Anna Degiovanni (f), Giuseppe Patti (f), Concetta Zito (h), Cesare De Gregorio (h), Rodolfo Citro (o), Michele Ciccarelli (o), Annalisa Pasquini (i), Erberto Carluccio (n), Paolo Severino (p), Cristina Demattè (q), Francesco Bandera (r), Frank Lloyd Dini (s), Matteo Cameli (a)

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Background: Sodium-glucose cotransporter type 2 inhibitors (SGLT2i) are one of the four pillars for the treatment of heart failure (HF) with reduced ejection fraction (HFrEF) and have shown beneficial effects on diastolic function and reverse remodelling. Speckle tracking echocardiography (STE) is an accurate technique to quantify functional and structural modifications of all cardiac chambers and provides more sensitive markers of left ventricular (LV) systolic and diastolic function. The aim of this analysis from the multicenter register DISCOVER-SGLT2i was to describe the changes in conventional and advanced echocardiographic parameters assessed by STE, in patients with HFrEF after treatment with SGLT2i.

Methods: the prospective, multi-center, Italian study DISCOVER-SGLT2i (ClinicalTrial.gov identifier: NCT 05344963) enrolled patients with acute or chronic HFrEF

receiving therapy with dapagliflozin or empagliflozin in adjunction to optimal guideline-directed therapy for HF from 19 italian centers. Clinical, biochemical and echocardiographic evaluation were performed at baseline and after 6 months and 12 months follow up. The primary endpoints were the presence of an improvement of left ventricular (LV) systolic and

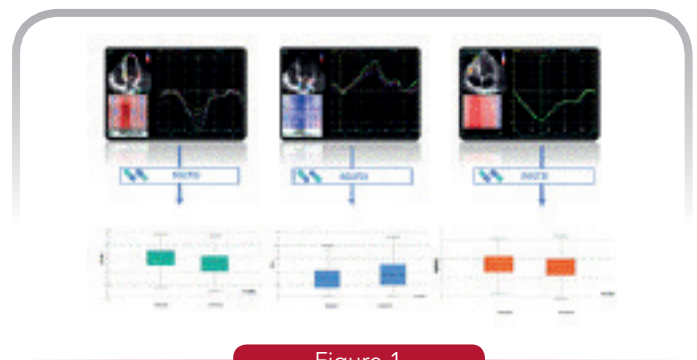


Figure 1

diastolic function assessed by STE at 6 months after treatment with SGLT2i, and of LV reverse remodeling (RR), defined as LV end-systolic volume reduction and ejection fraction (EF) improvement >10% at 6 months follow up. As secondary endpoints, the predictors of a composite clinical endpoint (including all-cause or cardiovascular death, HF hospitalization, heart transplantation, left ventricular assist device (LVAD) implant and defibrillator shocks) and of improvement of HF symptoms (NYHA class) were assessed.

Results: Overall, 504 patients were enrolled (mean age: 67 ± 12 , mean LVEF = $30 \pm 9\%$). At 6 months follow-up, cardiac dimensions and function, including all STE parameters of all cardiac chambers improved (Fig.1). Furthermore, 199 patients (39,5%) reached early LVRR, of which 52 (26%) had early incomplete response (LVRR with LVEF < 35%), 147 (74%) had early complete response (LVRR with LVEF > 35%). Baseline LV volumes, LVEF, LV global longitudinal strain (GLS) and free wall right ventricular longitudinal strain (fwRVLS) showed significant differences between the groups ($p < 0.002$).

Overall, 151 patients (30%) reached the composite clinical outcome [4 deaths, HF hospitalizations, 2 heart transplantation, 2 LV assist device implantations and 6 defibrillator shocks] With multivariate Cox Hazard model including age, creatinine, NT-proBNP, E/E' ratio, systolic pulmonary artery pressure (sPAP), left atrial volume index (LAVI), LV GLS, global peak atrial longitudinal strain (PALS), only LAVI and LV GLS were independent predictors of the combined endpoint at follow up. Overall, 279 patients (55%) had an early NYHA class improvement at follow up. In a multivariate model, only age and global PALS were independent predictors of NYHA improvement at follow up.

Conclusions: the results of our analysis suggest potential effects of early reverse remodelling of all cardiac chambers after therapy with SGLT2i in patients with HFrEF assessed on a multicenter basis. STE may be useful to predict response to treatment in patients undergoing SGLT2i in terms of LV RR, reduction of clinical events and improvement of HF symptoms.



SCOMPENSO CARDIACO 925 BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

PROFILO MARZIALE, CARENZA DI FERRO E ANISOCITOSI NEI PAZIENTI OSPEDALIZZATI PER SCOMPENSO CARDIACO: DATI REAL- LIFE DA UN CENTRO OSPEDALIERO DI III LIVELLO

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Valentina Micheluzzi (a), Gavino Casu (a), Giuseppe Damiano Sanna (a)
(a) CARDIOLOGIA CLINICA E INTERVENTISTICA, AOU SASSARI

Introduzione: L'anemia e la carenza di ferro sono comuni nei pazienti con scompenso cardiaco, associandosi a una ridotta capacità di esercizio, maggiori ospedalizzazioni e un aumento della mortalità. Le linee guida raccomandano uno screening dell'anemia e del profilo marziale, indicando il trattamento con carbosimaltoso ferrico (FCM) per coloro con frazione di eiezione ventricolare sinistra < 50% e carenza di ferro. Tuttavia, vi sono pochi dati sulla gestione della carenza di ferro e sull'aderenza alle linee guida nella *real-life*. Inoltre, non è chiaro il ruolo di parametri come l'ampiezza di distribuzione dei globuli rossi (RDW), proposti come indici surrogati per valutare un trasporto del ferro alterato (IIT). Infine, resta incerto l'impatto del trait beta talassemico, prevalente in alcune aree geografiche, sui parametri che definiscono lo stato marziale dei pazienti.

Metodi: Sono stati inclusi i pazienti ricoverati per scompenso cardiaco nel 2022 presso un Centro Ospedaliero di III livello, di età superiore ai 18 anni. Per l'inclusione nello studio dei pazienti è stato effettuato un primo screening basato sui codici DRG (*Diagnosis Related Groups*). L'arruolamento definitivo nello studio era previsto unicamente per quei pazienti nei quali lo scompenso cardiaco rappresentasse la causa principale dell'ospedalizzazione, o nei quali vi fosse un esordio o riacutizzazione diagnosticati durante una ospedalizzazione per altra causa, in base a quanto riportato sulle lettere di dimissione. L'anemia è stata definita secondo i criteri dell'Organizzazione Mondiale della Sanità (emoglobina <13 g/dl negli uomini e <12

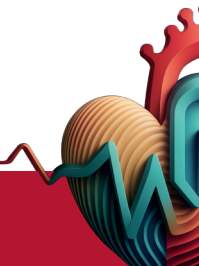
g/dl nelle donne), mentre la carenza di ferro è stata definita come una concentrazione della ferritina sierica <100 ng/ml, oppure da una ferritina compresa tra 100 e 299 ng/ml con concomitante saturazione della transferrina (TSAT) <20%. Nei pazienti con un profilo marziale completo sono stati analizzati i parametri dell'emocromo, compreso l'RDW. La presenza del trait beta talassemico è stata definita in base ai dati anamnestici ricavati contattando telefonicamente i pazienti ed ai *record* elettronici.

Risultati: Dei 529 pazienti inclusi, il 33% è stato ricoverato nei reparti del Dipartimento Cardiovascolare, il 67% in altri reparti, prevalentemente internistici. L'età mediana dei pazienti era di 81 anni. L'anemia è stata riscontrata nel 58% degli uomini e nel 65% delle donne al momento del ricovero. Nel 31% dei pazienti è stato valutato il profilo marziale completo. Di questi, il 60% è risultato ferro-carente. Il trattamento con FCM è stato somministrato nel 29% dei casi, con un utilizzo più frequente nei reparti cardiologici rispetto a quelli internistici (87% vs 16%, $p < 0.001$). Il trait beta talassemico è stato riscontrato nel 12% dei pazienti con profilo marziale valutato, mentre per il 39% non è stato possibile determinare la presenza del trait. L'RDW non ha mostrato differenze significative tra i pazienti con e senza carenza di ferro, e non ha dimostrato una correlazione con la saturazione della transferrina.

Conclusioni: L'anemia e la carenza di ferro sono frequenti nei pazienti ospedalizzati per scompenso cardiaco, ma la valutazione del profilo marziale viene eseguita solo in

pochi casi e il trattamento con carbosimaltoso ferrico (FCM) rimane limitato. L'RDW non è un indicatore affidabile per identificare questa condizione, rendendo essenziale un'analisi completa del profilo marziale. Sono emerse differenze significative nella gestione dei

pazienti tra i reparti cardiologici e internistici, rivelando una scarsa aderenza complessiva alle raccomandazioni, non limitata alla sola terapia farmacologica dello scompenso cardiaco ma anche delle comorbidity, come la carenza marziale.



SCOMPENSO CARDIACO 904
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)
CARDIOPATIE CONGENITE NELL'ADULTO (CARDIOPATIE CONGENITE E
MALATTIE DEL CIRCOLO POLMONARE)

VALUTAZIONE DI CAPACITA' FUNZIONALE E FRAGILITA' NEI PAZIENTI CON SCOMPENSO CARDIACO AVANZATO: INTERAZIONE TRA SIX MINUTE WALKING TEST E INDICI DI FRAILITY

Maria Chiara Sacconi (a), Mario Sabatino (a), Laura Giovannini (a), Laura Borgese (a), Valentina Sacchetti (a), Greta Zagni (a), Luciano Potena (a)

(a) HEART FAILURE AND TRANSPLANT UNIT, IRCCS AZIENDA OSPEDALIERO-UNIVERSITARIA DI BOLOGNA

Contestualizzazione: Lo scompenso cardiaco avanzato (SC) è una condizione patologica ad elevata morbi-mortalità e che porta a un netto peggioramento della qualità di vita dei pazienti. La valutazione strutturata della capacità di esercizio e della fragilità fisica e cognitiva dei pazienti può risultare di notevole importanza per migliorare l'assistenza al malato.

Obiettivo: Lo studio si propone di esaminare la correlazione tra dati clinico-strumentali e valutazione multiparametrica della fragilità, due aspetti complementari dello SC il cui esame però risulta complesso nella pratica clinica.

Materiali e metodi: In questo studio prospettico sono stati arruolati pazienti affetti da SC riferiti per valutazione trapiantologica, in lista di attesa per trapianto cardiaco o portatori di LVAD. E' stata eseguita una valutazione multiparametrica finalizzata a valutare la capacità all'esercizio fisico e il grado di fragilità avvalendosi di strumenti validati, quali Short Physical Performance Battery (SPPB), test del cammino dei 6 minuti (6MWT), screening della depressione e del decadimento cognitivo (PHQ-9 e Mini-COG), Kansas City Cardiomyopathy Questionnaire (KCCQ), valutazione delle attività quotidiane (ADL). La fragilità è stata valutata sulla base della proposta di HFA Frailty Score, identificando 4 domini: clinico, psico-cognitivo, funzionale e sociale. I risultati della valutazione multiparametrica della fragilità sono stati correlati con i dati clinico-strumentali.

Risultati: La popolazione comprende 89 pazienti con età media di 54 anni, di cui 70 uomini (79%), per il 69% in classe NYHA II e 21 portatori di LVAD. La valutazione funzionale ha evidenziato una limitazione di grado moderato al 6MWT (distanza media 412 ± 82 metri) e sufficienti valori di forza muscolare misurati con dinamometro (media 34 ± 10 kg). I test psico-cognitivi hanno mostrato che 13 pazienti (15%) sono risultati positivi allo screening per demenza e che 48 (54%) presentano uno stato depressivo di diverse entità. Il 91% dei pazienti risultava autonomo nelle ADL. Per 51 pazienti (57%) si può accertare una condizione di frailty, definita dalla presenza di almeno due domini secondo HFA Frailty Score. E' emersa una correlazione tra fragilità e diminuzione della frazione d'eiezione ($p = 0.03$), numero di comorbidità ($p < 0.001$) e diagnosi di SC superiore ai 5 anni ($p < 0.01$), ma non la distanza percorsa al 6MWT. La qualità di vita, valutata mediante il KCCQ, è risultata peggiore nei pazienti fragili con un aumento rilevante dei pazienti che riferiscono uno stato di salute scarso.

Conclusioni: Lo stato di fragilità non è una condizione prettamente geriatrica ed è frequente nei pazienti affetti da SC. La fragilità non è legata unicamente alla capacità funzionale ma alla durata di malattia e al complesso delle comorbidità, impatta sulla qualità di vita ed è correlata anche alla percezione di malattia del paziente. La sua valutazione è pertanto multiparametrica e complessa, ma di grande importanza perché si associa a un aumento delle ospedalizzazioni e della mortalità.

E' pertanto necessario un approccio olistico diretto ad intervenire sul paziente attraverso diversi piani paralleli con l'obiettivo di migliorare la prognosi e la qualità di vita.

Parole chiave: heart failure, capacità funzionale, 6MWT, Hand grip test, HFA Frailty Score, frailty.



SCOMPENSO CARDIACO 831 BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

RISK CALCULATOR OF MULTIMORBID RISK OF REHOSPITALISATION AND DEATH FROM HEART FAILURE - INCLUDING THE CONTRIBUTION OF THE GUT MICROBIOME

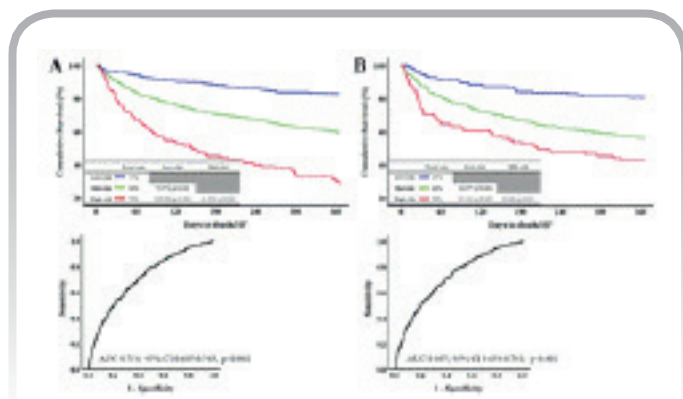
Andrea Salzano (d, e), Muhammad Zubair Israr (d), Hong Zhan (a), Adrian A Voors (b), Leong L Ng (d), Toru Suzuki (c, d)
(a) TELGEN CORPORATION, SHANGAI, CHINA; (b) DEPARTMENT OF CARDIOLOGY, UNIVERSITY OF GRONINGEN, UNIVERSITY MEDICAL CENTER GRONINGEN, NETHERLANDS; (c) THE INSTITUTE OF MEDICAL SCIENCES, THE UNIVERSITY OF TOKYO, TOKYO, JAPAN; (d) DEPARTMENT OF CARDIOVASCULAR SCIENCES, UNIVERSITY OF LEICESTER, UK; (e) DEPARTMENT OF TRANSLATIONAL MEDICAL SCIENCES, FEDERICO II UNIVERSITY, NAPLES, ITALY

Background and aims: The elucidation of the contributory role of multimorbidity to heart failure (HF) including the gut-heart axis has added a new dimension to our understanding of HF pathophysiology which is not reflected in currently available risk scores. The present investigation aimed to develop and validate a novel risk score model of multimorbidity for HF risk stratification.

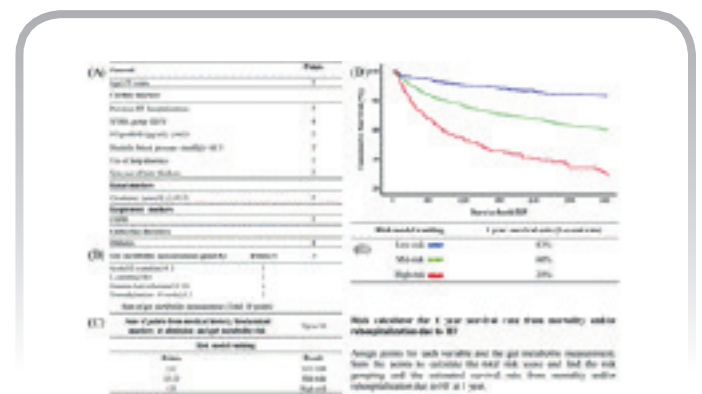
Methods: A risk model was developed based on

the contribution of markers associated with HF multimorbidities on outcomes of mortality and/or rehospitalization due to HF (death/HF) at one year. Two independent HF cohorts were combined and randomly split 70:30 using a split-sample validation approach for training and validation cohorts which were not significantly different for investigated variables. Backward logistic regression was used to develop the risk model with a further scoring system to create a simple risk calculator.

Results: A final 11-variable risk model (age, previous



Kaplan-Meier survival curves (top) and ROC curves (bottom) using the clinical risk model on (A) training cohort and (B) validation cohort for outcomes of death and/or rehospitalisation due to HF at 1 year.



Risk calculator for 1 year survival rate from mortality and/or rehospitalization due to HF

Figure 1

Figure 2

HF hospitalization, NYHA group III/IV, NT-proBNP, diastolic blood pressure, loop diuretic use, beta-blocker non-use, creatinine, COPD, diabetes, and combined gut metabolites) showed a diagnostic performance of 0.71 in the training cohort (C-statistic validation cohort, 0.70, $p < 0.001$) – Figure 1. A risk score/calculator was further developed based on this model with categorization into three (low-, mid- and high) and two (low and high) risk groups, with both

approaches demonstrating increased incidence of death/HF in patients at the highest risk ($p < 0.001$) – Figure 2.

Conclusion: A novel risk model and score were derived, showing for the first time the contribution of comorbidities including the added value of the gut-heart axis on risk stratification of HF patients on rehospitalization and death.



SCOMPENSO CARDIACO 206
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)
MALATTIE DEL METABOLISMO (DIABETE E MALATTIE DEL METABOLISMO)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

**IMPACT OF BARIATRIC SURGERY ON CARDIAC STRUCTURE AND FUNCTION IN SEVERELY OBESE PATIENTS:
 A RETROSPECTIVE COHORT STUDY**

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Background: Severe obesity is strongly associated with increased risk of comorbidities and significant alterations in cardiac structure and function. This study aimed to investigate cardiovascular (CV) risk factors and ventricular remodeling in a cohort of obese individuals scheduled for bariatric surgery. A secondary objective was to assess changes in anthropometric, clinical-laboratory, and echocardiographic parameters 12 weeks post-surgery compared to baseline.

Methods: We conducted a retrospective observational cohort study on patients from a single bariatric surgery center. The study included 35 patients (mean age 41.5 ± 10.3 years; BMI 43.4 ± 6.6 kg/m²). Of these, 12 had a family history of coronary artery disease (CAD), 2 had a previous history of CAD, 8 had essential hypertension, 4 had mixed dyslipidemia, 7 were smokers, and 3

were former smokers. Baseline echocardiographic assessments revealed that approximately 57% of patients had concentric left ventricular remodeling and 14% had grade I diastolic dysfunction.

Results: Twelve weeks post-surgery, with an average weight reduction of 25 kg and a BMI decrease of 8.5 kg/m², the prevalence of concentric left ventricular remodeling decreased to 14%, and the prevalence of grade I diastolic dysfunction decreased to 11%.

Conclusions: Bariatric surgery significantly improves cardiac function and structure over time, primarily through substantial weight loss. This study underscores the importance of early intervention in severely obese patients to mitigate cardiovascular risk and enhance cardiac remodeling.



SCOMPENSO CARDIACO 416 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

MULTIDISCIPLINARY MANAGEMENT AND DIAGNOSTIC CHALLENGES IN MIXED CARDIOMYOPATHY: A CASE OF CARDIAC AMYLOIDOSIS

Michela Boromei (a), Giovanni Rubino (a), Domenico Filomena (a), Roberto Badagliacca (a), Carmine Dario Vizza (a)
(a) LA SAPIENZA UNIVERSITÀ DI ROMA

Introduction: Cardiac amyloidosis (CA) has historically been underdiagnosed, but it is now recognized as more common than previously, especially since invasive endomyocardial biopsy is no longer required for diagnosis. As the frequency of CA diagnoses increases, we anticipate a rise in the prevalence of mixed cardiomyopathy. Managing patients with multifactorial cardiomyopathy poses several treatment challenges, emphasizing the necessity of a multidisciplinary approach to customize their care effectively.

Clinical presentation: A 77-year-old male with multiple cardiovascular risk factors and a history of paroxysmal atrial fibrillation and left bundle branch block (LBBB) presented with symptoms indicative of complex cardiomyopathy. In 2012 initial evaluations showed normal cardiac size and function, but subsequent developments included left ventricular systolic dysfunction and significant coronary artery disease, necessitating coronary intervention and aggressive heart failure management since 2017. Despite optimized medical therapy and the implantation of a cardiac resynchronization therapy device, the cardiac function improved but patient's symptoms persisted with high levels of NT-proBNP. In 2023 we noticed

that increasing in cardiac function, associated with thickening of the left ventricular walls and minimal changes in medications, could be highly suspicious for a storage disease. Six months later, a diagnosis of transthyretin cardiac amyloidosis (ATTR) was confirmed via technetium-99 pyrophosphate scintigraphy, serum and urine immunofixation, and genetic testing, leading to the initiation of Tafamidis as a disease-modifying treatment.

Conclusion: This case highlights several features: a rare occurrence of combined ischemic, amyloid and electrical disorder-induced cardiomyopathy, a successful multidisciplinary approach to heart failure treatment, and the importance of considering CA even when an alternative diagnosis has been established. It emphasizes the necessity of considering CA in patients with overlapping cardiomyopathies and the importance of early diagnosis and intervention in improving patient outcomes. The unique presentation and progressive nature of CA necessitate vigilant monitoring and the use of advanced diagnostic techniques to ensure comprehensive care and better prognoses for affected patients.



SCOMPENSO CARDIACO 417
IPERTENSIONE POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

HEMODYNAMIC EVALUATION AND CHALLENGES IN THE DIAGNOSIS OF COMBINED POST-CAPILLARY PULMONARY HYPERTENSION (CPC-PH) IN A PATIENT WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION (HFPEF)

Michela Boromei (a), Giovanni Rubino (a), Domenico Filomena (a), Roberto Badagliacca (a), Carmine Dario Vizza (a)
 (a) LA SAPIENZA UNIVERSITÀ DI ROMA

Introduction: Hemodynamic assessment is pivotal in managing pulmonary hypertension (PH) within the spectrum of heart failure with preserved ejection fraction (HFpEF), specifically in distinguishing between Combined Post-Capillary PH (CpC-PH) and Pulmonary Arterial Hypertension (PAH). We present a case of a 62-year-old male with HFpEF who underwent detailed hemodynamic evaluation for being eligible in a clinical trial. During assessments, he was initially classified as CpC-PH based on elevated pulmonary artery wedge pressure (PAWP) and mean pulmonary artery pressure (PAPm), but subsequent assessments revealed discordant PAWP values, prompting consideration of PAH.

Clinical Presentation: A 62-year-old Caucasian male presented with new-onset dyspnea on mild-to-moderate exertion (WHO FC II-III) and multiple comorbidities,

including systemic arterial hypertension, hyperuricemia, chronic kidney disease, and microcytic anemia. NT-proBNP levels were 467 pg/ml. Echocardiography revealed features suggestive of HFpEF and elevated right ventricular systolic pressure. Treatment followed heart failure guidelines, including beta-blockers, antihypertensives, and diuretics (Furosemide 25 mg twice daily, increased to thrice daily). Initial right heart catheterization indicated mean PAP 44 mmHg, PAWP 18 mmHg, and PVR 5 WU, diagnosing Cpc-PH. Subsequent catheterization, with minimal therapeutic changes, showed mean PAP 38 mmHg, PVR 5.25 WU, and PAWP 10 mmHg, with LVEDP borderline at 15 mmHg, rendering the patient ineligible for a clinical trial based on PAWP criteria. The case underscores the complexity of hemodynamic assessment in distinguishing Cpc-PH from other phenotypes like PAH, particularly in patients with multiple cardiac

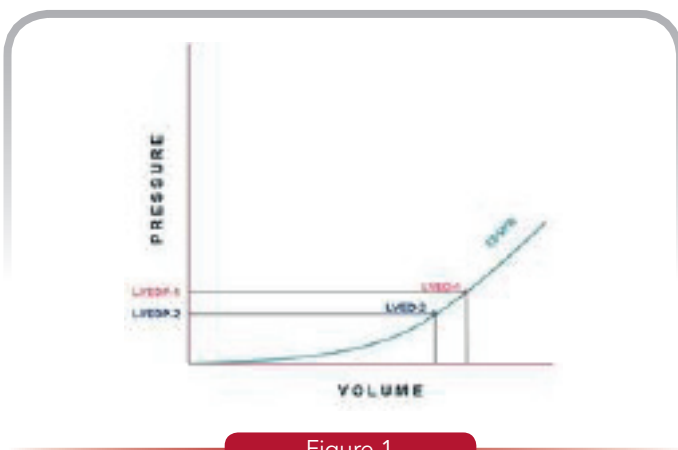


Figure 1

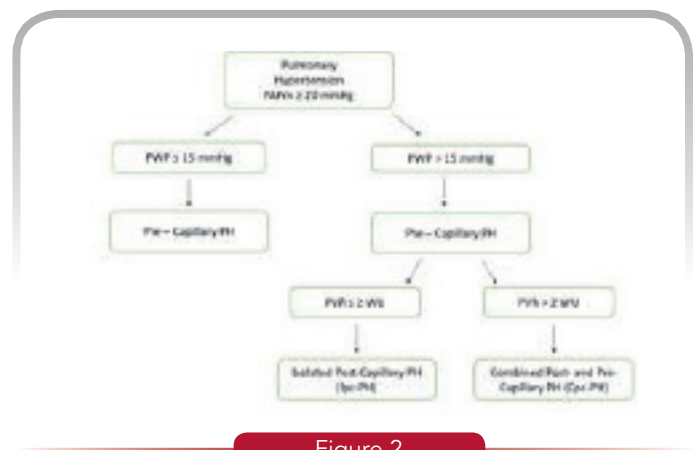


Figure 2

comorbidities. Clinical decision-making often favors PAH-specific therapy post-diuretic optimization, despite potential hemodynamic masking, highlighting the need for refined management strategies in such cases.

Conclusions: Accurate differentiation between CpC-PH

and PAH in HFpEF is critical for tailored management strategies. Standardized hemodynamic protocols are essential to guide targeted medical therapies effectively in these complex patient subgroups. Further investigation is needed to refine diagnostic algorithms and optimize management strategies for improved patient outcomes.



**SCOMPENSO CARDIACO 374
GRAVIDANZA E CARDIOPATIA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)**

ENHANCING RECOVERY IN PERIPARTUM CARDIOMYOPATHY WITH VERICIGUAT

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(a) DEPARTMENT OF CARDIOLOGY "A. CARDARELLI" HOSPITAL - NAPLES, ITALY; (b) POST-GRADUATE SCHOOL OF EMERGENCY MEDICINE "L. VANVITELLI" UNIVERSITY - NAPLES, ITALY; (c) CHAIR OF INTERNAL MEDICINE "L. VANVITELLI" UNIVERSITY - NAPLES, ITALY

Introduction: Peripartum cardiomyopathy (PPCM) is a rare but severe form of heart failure that typically occurs in the last month of pregnancy or within five months postpartum. It is defined as an idiopathic cardiomyopathy presenting with heart failure secondary to left ventricular systolic dysfunction toward the end of pregnancy or in the months following delivery, where no other cause of heart failure is identified. The diagnostic echocardiographic criteria include a left ventricular ejection fraction (LVEF) of <45%, with or without left ventricular dilation.

Case report: A 32-year-old woman presented to the Heart Failure Clinic with symptoms of heart failure, including dyspnea on mild exertion, orthopnea, and peripheral edema. Symptoms began mildly in the last months of pregnancy and worsened progressively postpartum. She had no previous cardiac history or significant cardiovascular risk factors but experienced significant weight gain and fatigue during pregnancy. Physical examination revealed signs of congestive heart failure, including jugular venous distension, a third heart sound (S3), bilateral lung crackles, and lower extremity edema. Her vital signs showed tachycardia and blood pressure of 100/70 mmHg. Laboratory tests revealed elevated NT-proBNP (10312 pg/ml), low serum iron (12 mcg), and mild anemia (Hb 9.7 g/dl). Transthoracic

echocardiography showed left ventricular dilation (Fig. 1A), severe systolic dysfunction with an LVEF of 27% (Fig. 2A) and reduced right ventricular function (TAPSE 17 mm) (Fig. 3A), confirming PPCM.

The patient was started on optimal medical therapy for heart failure, including bisoprolol, ramipril, furosemide, empagliflozin, and canrenone, along with intravenous ferric carboxymaltose to replenish iron stores. Despite two months of standard treatment, significant left ventricular dysfunction persisted. Vericiguat was introduced at an initial dose of 2.5 mg, titrated to 5 mg due to hypotension. Over six months, the patient showed significant improvement in heart failure symptoms and echocardiographic parameters, with NT-proBNP reducing to 618 pg/ml, LVEF increasing to 49% (Fig. 1B and 2B), and TAPSE improving to 22 mm (Fig. 3B). She became asymptomatic and resumed normal daily activities without limitations.

Discussion: PPCM is a rare but potentially devastating form of heart failure. Its multifactorial etiology and overlap with other conditions complicate diagnosis. The standard management follows heart failure guidelines, but some patients exhibit insufficient response, necessitating additional treatments. Vericiguat, an sGC stimulator, has shown promise in improving heart failure with reduced ejection fraction

(HFrEF) by enhancing the NO-cGMP pathway, leading to vasodilation and improved myocardial function. In this case, vericiguat addition led to significant clinical and echocardiographic improvement, suggesting its potential in PPCM management.

Conclusion: PPCM requires prompt diagnosis and aggressive management to improve outcomes. While

standard heart failure therapies form the treatment cornerstone, some patients may need additional interventions. Vericiguat demonstrated significant benefits in this case, indicating its potential as an adjunctive therapy in PPCM. Further research is needed to confirm its efficacy and safety in this population and establish clear guidelines for its use in clinical practice.



SCOMPENSO CARDIACO 570

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

PROGNOSI (SCOMPENSO CARDIACO)

TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

DIFFERENZE DI GENERE NEL TRAPIANTO CARDIACO

Arianna Calonaci (a), Andrea Golfetto (a), Francesco Putuortì (a), Mattia Corianò (a), Vincenzo Tarzia (a), Annalisa Angelini (a), Antonio Gambino (a), Chiara Tessari (a), Fedrigo Marny (a), Nicola Pradegan (a), Giuseppe Toscano (a), Sabino Iliceto (a), Gino Gerosa (a), Francesco Tona (a)

(a) DIPARTIMENTO DI SCIENZE CARDIO-TORACO-VASCOLARI E SANITÀ PUBBLICA, OSPEDALE UNIVERSITARIO DI PADOVA, ITALIA

Introduzione: nell'ambito del trapianto cardiaco (TC) si evidenziano differenze di genere, in termini di proporzione donatori-riceventi, caratteristiche cliniche ed outcome.

Obiettivo: il nostro studio si pone l'obiettivo di valutare le differenze di genere in termini di caratteristiche cliniche, emodinamiche e di outcome nella coorte storica di pazienti del nostro centro.

Materiali e metodi: in questo studio retrospettivo è stata valutata la coorte storica di pazienti sottoposti a TC presso il nostro istituto. Sono stati inclusi tutti i pazienti maggiorenni sottoposti a cateterismo cardiaco destro nell'anno precedente il TC. L'endpoint primario considerato è stato la mortalità per tutte le cause cardiovascolari a 1, 2 e 5 anni.

Risultati: 843 pazienti sono stati sottoposti a TC tra il 1985 ed il 2015. Sono stati esclusi 403 pazienti per incompletezza dei dati. La coorte finale è risultata di 440 pazienti, di cui il 17.7% donne con età media di 52 ± 12 anni. Raggruppando i pazienti in funzione del sesso, i due gruppi differivano significativamente per BMI (uomini 23.5 vs 21.8 donne, $p=0.006$), PHM (uomini 169 vs 119 donne, $p=0.03$), PCWP (uomini 22.98 vs 21.13 donne, $p=0.01$). In merito all'eziologia, abbiamo

osservato una maggior prevalenza di cardiopatia ischemica negli uomini (44%), mentre la principale eziologia per le donne è stata la cardiomiopatia dilatativa (43%). La distribuzione dei trapiantati di sesso femminile negli anni ha registrato un incremento del 96% tra il quinquennio 1985-1990 e il 2010-2015, inoltre abbiamo osservato un trend di incremento dell'età media al momento del trapianto per le donne da 44.9 anni a 53 anni pur non statisticamente significativo ($p=0.09$). Per quanto riguarda l'analisi di sopravvivenza post-TC, dopo 9.1 ± 0.72 anni 285 pazienti sono deceduti; confrontando la mortalità tra i due sessi, le donne presentavano una peggiore sopravvivenza a 5 anni ($p=0.049$).

Andando a stratificare i pazienti secondo il BMI, i pazienti con $BMI < 25$ presentavano un outcome migliore rispetto agli altri gruppi, mentre un $BMI > 30$ risultava associato ad un peggiore outcome. Stratificando la coorte in funzione del mismatch donatore-ricevente, non si sono identificate differenze in termini di sopravvivenza ($p=0.2$).

Conclusioni: dal nostro studio emerge come una proporzione inferiore di donne venga sottoposta a TC, la cui sopravvivenza a lungo termine risulta ridotta rispetto al sesso maschile.

SCOMPENSO CARDIACO 848 ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO (ASSISTENZA CARDIACA IN ACUTO) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

EFFETTI DEL SODIO NITROPRUSSATO SULL'ACCOPIAMENTO VENTRICOLO-ARTERIOSO DEL VENTRICOLO SINISTRO IN PAZIENTI AFFETTI DA SCOMPENSO CARDIACO ACUTO

Francesco Catagnano (a), Alessandro Fasolino (b), Stefania Guida (b), Rita Camporotondo (b)

(a) OSPEDALE PAPA GIOVANNI XXIII - BERGAMO (BG); (b) FONDAZIONE IRCCS POLICLINICO SAN MATTEO - PAVIA (PV)

Gli scopi di questo studio sono:

- 1) indagare riguardo la sicurezza e l'efficacia del sodio nitroprussato nel contesto clinico dello scompenso cardiaco acuto;
- 2) comprendere quali siano i pazienti responder e non responder al sodio nitroprussato, in termini di aumento della gittata sistolica, sulla base della valutazione dell'accoppiamento ventricolo-arterioso del ventricolo sinistro;
- 3) ricercare parametri diversi dalla pressione arteriosa sistolica per individuare i pazienti che possono giovare dalla somministrazione della terapia vasodilatatoria endovenosa nello scompenso cardiaco acuto come approccio terapeutico iniziale.

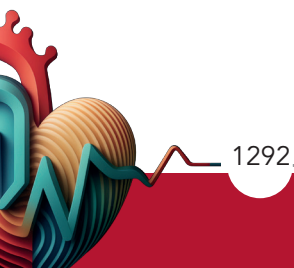
Materiali e metodi: sono stati arruolati sedici pazienti (età media 62 anni, 81% uomini), ricoverati in Unità di Terapia Coronarica con diagnosi di scompenso cardiaco acuto. È stata realizzata la valutazione non invasiva dell'elastanza arteriosa (Ea), dell'elastanza telesistolica ventricolare sinistra (Ees) e della loro relazione, l'accoppiamento ventricolo-arterioso del ventricolo sinistro (VAC), al basale e a 24 ore dall'inizio di infusione del sodio nitroprussato. L'endpoint primario di efficacia dello studio è stato definito come un aumento > 6% della gittata sistolica a 24 ore dall'inizio della terapia endovenosa con sodio nitroprussato, con lo scopo di individuare pazienti "responder" e "non responder". L'endpoint primario di efficacia (aumento > 6% della gittata sistolica a

24 ore dall'inizio dell'infusione di nitroprussato) si è verificato in 10 su 16 pazienti; la proporzione di successo del trattamento è stata del 62,5% (pazienti "responder"). Confrontando i pazienti "responder" con i pazienti "non responder", i primi presentavano un disaccoppiamento ventricolo-arterioso al basale (VAC mediano 2,00; range interquartile 1,88-3,03), mentre i pazienti "non responder" manifestavano un normale accoppiamento ventricolo-arterioso in basale (VAC mediano 1,09, range interquartile 1,02-1,56) ($p = 0,009$). È stata, poi, evidenziata una correlazione statisticamente significativa ($p = 0,008$) tra i pazienti con risposta positiva al trattamento e i pazienti con disaccoppiamento ventricolo-arterioso; in sostanza, i pazienti con risposta emodinamica positiva al sodio nitroprussato presentavano un valore di accoppiamento ventricolo-arterioso anormale in basale. Ad un'analisi successiva della popolazione di pazienti con disaccoppiamento ventricolo-arterioso in basale ($n = 10$), a 24 ore dall'inizio dell'infusione di sodio nitroprussato, si è evidenziato un incremento della gittata sistolica statisticamente significativo [da 37,9 (28,5-44,3) mL a 52,1 (39,5-58,9) mL, $p = 0,03$], determinato da una riduzione dell'elastanza arteriosa (Ea) statisticamente significativa [da 2,94 (2,53-3,1) mmHg/mL a 2,08 (1,66-2,5) mmHg/mL, $p = 0,01$]. Infine, la curva ROC ha evidenziato che un valore di $VAC \geq 1,56$ predice con buona sensibilità (90%) e specificità (83%) la risposta positiva, in termini di gittata sistolica, al sodio nitroprussato ($AUC = 0,9$, $p < 0,001$);



l'associazione di un $VAC \geq 1.56$ con una risposta emodinamica favorevole era confermato dall'analisi logistica univariata ($p = 0,0025$). Anche un valore di frazione d'eiezione basale $\leq 25\%$ ha predetto, con buona accuratezza, una risposta emodinamica positiva al farmaco in esame (sensibilità 80%, specificità 83%,

$AUC = 0.858$, $p < 0,001$) e anche la presenza di un disaccoppiamento ventricolo-arterioso in basale (sensibilità 90%, specificità 100%, $AUC = 0,98$, $p < 0,0001$).



SCOMPENSO CARDIACO 349
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
INTERVENTISTICA CORONARICA
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
CARDIOTOSSICITA' DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITA')

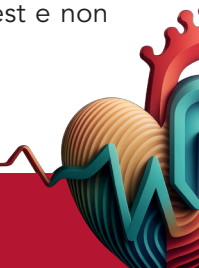
HEART FAILURE: L'IMPORTANZA DI UNA TERAPIA MEDICA RAPIDAMENTE OTTIMIZZATA

Giulia Ceccotti (a, b), Marco Dell' uomo (a, b), Caterina Scapicchi (a, b), Marco Giuranna (a, b), David Mecali (a, b), Alessandro Mostarda (a, b), Marco Mengoni (a, b), Vincenzo Pace (a, b), Andrea Scarpignato (a, b), Erberto Carluccio (b, c), Giuseppe Ambrosio (a, b, c)

(a) AZIENDA OSPEDALIERA SANTA MARIA DI TERNI; (b) UNIVERSITA' DEGLI STUDI DI PERUGIA; (c) AZIENDA OSPEDALIERA SANTA MARIA DELLA MISERICORDIA PERUGIA

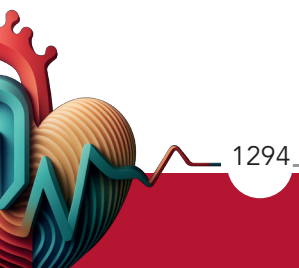
Uomo di 40 aa, giunto in PS per comparsa di senso di oppressione antero-toracica e dispnea per sforzi lievi da circa 15 gg. Anamnesi: LH a 14 aa trattato con CT (6 cicli di Adriamicina, Bleomicina, Vinblastina e Dacarbazina) associata a RT, in FU fino ai 20 aa. Fumatore. Nonno paterno deceduto all'improvviso all'età di 50aa. No terapia domiciliare. Ultimo ETT effettuato due anni prima, nella norma. Il pz era ortopnoico, PA 135/85 mmHg, SpO₂ 84% in aa. EO: SSIM 2/6; III tono, crepitii inspiratori medio-basali bilaterali all'auscultazione del torace; IVG > 13-14 cmH₂O ed edemi periferici improntabili fino al III medio di gamba. Rx torace: addensamento parenchimale in sede perilare inferiore destra. ETT: Vsn dilatato con FE 25% per ipocinesia diffusa. IM funzionale di grado almeno moderato da tethering simmetrico. Disfunzione diastolica III grado con aumentate pressioni di riempimento e segni di congestione venosa polmonare e sistemica. Diagnosi: scompenso cardiaco acuto de novo a FE severamente ridotta, precipitato da un processo infettivo polmonare, in paziente giovane. Ricovero in UTIC e impostata terapia diuretica ev in infusione, ciclo di inodilatatore, O₂-terapia e terapia antibiotica empirica ev. Il giorno successivo è stata effettuata coronarografia che evidenziava stenosi del 50% nel tratto distale del TC coinvolgente la triforcazione; stenosi critica (90%) dell'IVA ostiale;

stenosi critica (75%) del ramo intermedio ostiale. Stenosi subcritica della circonflessa ostiale. Dopo discussione in Heart Team, veniva posta indicazione a rivascolarizzazione per via percutanea, procedura eseguita con ausilio di Impella, su TC non protetto/IVA prossimale. Terapia alla dimissione: Entresto 49/51 bid, Metoprololo 100mg die e Canrenone 50mg die, DAPT con ASA e Ticagrelor ed Atorvastatina/Ezetimibe. E' stato inoltre applicato un LifeVest come bridge al recupero o al successivo eventuale impianto definitivo di un ICD. La rapida ottimizzazione della terapia medica, associata ovviamente ad una efficace rivascolarizzazione, ha determinato un rapido miglioramento del quadro clinico e laboratoristico. Infatti, sulla base dello studio STRONG-HF, si raccomanda l'avvio e la rapida titolazione delle terapie orali ed uno stretto FU nelle prime 6 settimane dopo la dimissione, per ridurre il rischio di riospedalizzazione per scompenso o di morte per tutte le cause. Al FU a 15 gg, veniva ulteriormente titolato l'Entresto a dosaggio massimale e il metoprololo a 200 mg die. Al controllo ETT a 3 mesi: Vsn ancora dilatato ma con un parziale recupero della funzione contrattile ed insufficienza mitralica di grado lieve. Viene a questo punto introdotto in terapia l'SGLT2i. Da questo momento il pz si trova in OMT per lo l'HF rEF. Viene rimosso il LifeVest e non



sussistono attuali indicazioni all'impianto di ICD. A distanza di 1 anno dal ricovero, all'ETT si osserva una normalizzazione della silhouette del Vsn, che risulta di normali dimensioni e volumi indicizzati e con funzione sistolica nei limiti della norma (FE Simpson biplana 58%). Pertanto, l'introduzione dell'SGLT2i non solo ha determinato un ulteriore miglioramento della FE, ma anche un rimodellamento inverso del ventricolo sinistro. In definitiva, quello presentato è un caso abbastanza tipico di scompenso cardiaco

acuto in un pz con sindrome coronarica cronica, che ci può fornire però un importante spunto di riflessione sull'importanza del raggiungimento dei 3 obiettivi cardine della terapia dello scompenso: La riduzione della mortalità; la prevenzione delle riospedalizzazioni; miglioramento della qualità della vita. Ciò, avviene, ad oggi, sempre più efficacemente grazie alla rapida introduzione e titolazione di nuovi farmaci, strategia basata sull'applicazione dei risultati di grandi studi multicentrici.



SCOMPENSO CARDIACO 262

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

PROGNOSI (SCOMPENSO CARDIACO)

DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

HLM SCORE E PROGNOSI NELLO SCOMPENSO CARDIACO AD EZIOLOGIA ISCHEMICA: UNO STUDIO PILOTA

Paolo Severino (a), Andrea D'amato (a, b), Massimo Mancone (a), Marco Valerio Mariani (a), Silvia Prospero (a), Lorenzo Colombo (a), Vincenzo Myftari (a), Claudia Cestiè (a), Aurora Labbro Francia (a), Rosanna Germanò (a), Nicola Pierucci (a), Francesca Fanisio (d), Stefanie Marek-iannucci (a), Andrea De Prisco (a), Gianmarco Scoccia (a), Lucia Ilaria Birtolo (a), Giovanna Manzi (a), Carlo Lavalle (a), Gennaro Sardella (a), Roberto Badagliacca (a), Francesco Fedele (a), Carmine Dario Vizza (a)

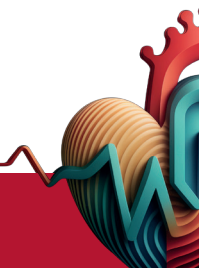
(a) DIPARTIMENTO DI SCIENZE CLINICHE, INTERNISTICHE, ANESTESIOLOGICHE E CARDIOVASCOLARI, SAPIENZA UNIVERSITÀ DI ROMA, 00161 ROMA, ITALIA; (b) DIPARTIMENTO DI CARDIOLOGIA, OSPEDALE FABRIZIO SPAZIANI, 03100 FROSINONE, ITALIA; (c) SAN RAFFAELE CASSINO, 03043 CASSINO, ITALIA; (d) DIPARTIMENTO DI CARDIOLOGIA, POLICLINICO CASILINO, 00169 ROMA, ITALIA

Background: Ischemic heart disease (IHD) represents the main cause of heart failure (HF). A prognostic stratification of HF patients with ischemic etiology, particularly those with acute coronary syndrome (ACS), may be challenging due to the variability in clinical and hemodynamic status. The aim of this study is to assess the prognostic power of the HLM score in a population of patients with ischemic HF and in a subgroup who developed HF following ACS.

Methods: This is an observational, prospective, single-center study, enrolling consecutive patients with a diagnosis of ischemic HF. Patients were stratified according to the four different HLM stages of severity, and the occurrence of CV death, HFH, and worsening HF events were evaluated at 6-month follow-up. A sub-analysis was performed on patients who developed HF following ACS at admission.

Results: The study included 146 patients. HLM stage predicts the occurrence of CV death ($p = 0.01$) and CV death/HFH ($p = 0.003$). Cox regression analysis confirmed HLM stage as an independent predictor of CV death (OR: 3.07; 95% IC: 1.54-6.12; $p = 0.001$) and CV death/HFH (OR: 2.45; 95% IC: 1.43-4.21; $p = 0.001$) in the total population of patients with HF due to IHD. HLM stage potentially predicts the occurrence of CV death ($p < 0.001$) and CV death/HFH ($p < 0.001$) in patients with HF following ACS at admission.

Conclusions: Pathophysiological-based prognostic assessment through HLM score is a potentially promising tool for the prediction of the occurrence of CV death and CV death/HFH in ischemic HF patients and in subgroups of patients with HF following ACS at admission.



**SCOMPENSO CARDIACO 703
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)
BIG DATA (TELECARDIOLOGIA ED E-HEALTH)**

CHALLENGES IN HEART FAILURE ESC GUIDELINES IMPLEMENTATION - INSIGHTS FROM A REAL WORLD REGISTRY.

Maria Grazia De Angelis (a), Angelica Praderio (a), Angelica Rizzello (a), Giulia Togni (a), Francesco Fioretti (a), Luca Assoni (a), Benedetta Fabiani (a), Mattia Amarante (a), Savina Nodari (a)

(a) *CARDIOLOGY SECTION - DEPARTMENT OF CLINICAL AND SURGICAL SPECIALITIES; UNIVERSITY AND SPEDALI CIVILI HOSPITAL OF BRESCIA*

Background: ARNIs and, more recently, SGLT2i inhibitors have become part of the cornerstone of the treatment of heart failure garnering in the latest HF guidelines a Class I recommendation for patients with heart failure and reduced ejection fraction ($\leq 40\%$). Alongside with renin-angiotensin-aldosterone system inhibitors and beta-blockers, they are recognized as "disease-modifying" drugs which should be promptly initiated in HF patients. Despite the evident benefits demonstrated by these drugs, their utilization in clinical practice remains limited.

Purpose: The aim of this study was to evaluate the implementation and the uptitration of heart failure "disease-modifying" drugs in the real world, as well as the eligibility rate of the study population for these treatments.

Methods: Our data derive from an observational study enrolling 165 consecutive ambulatory patients with heart failure regardless of ejection fraction. The study comprises several phases: 1) a T0 phase involving a retrospective analysis of several anamnestic, clinical, laboratory and echocardiographic parameters collected within one to seven months before study initiation; 2) a T1 phase prospectively evaluating the same patient characteristics over a period extending from the fifth to the seventh month following specific educational initiatives regarding HF-GMDT implementation.

Results: 165 consecutive patients were enrolled in our center during phase T0: 90% of them were in treatment with a beta-blocker; 73% were receiving an ARNI/ACEi/ARB and 62% an MRA with main causes of underprescription in HFrEF patients being kidney dysfunction, hyperkalaemia, hypotension and bradycardia; 85% of our HFrEF patients were in treatment with SGLT2i and recurrent urinary tract infections and kidney dysfunction were the main reasons for underprescription. Only a small portion of our patients wasn't receiving disease modifying therapies because of unknown reasons (0,04% - 0,2% and 0,05% respectively for ACE/ARNI/ARB - MRA and BB). Nevertheless target doses were attained in a minority of the patients (29% - 10% and 36% respectively for ARNI - MRA and BB).

Conclusion: While a satisfactory proportion of our patients were on heart failure medications, the majority of them did not attain target dosages, suggesting a potential gap between guideline recommendations and clinical practice. The prospective phase of our study (T1) holds the promise of assessing whether the implementation of specific educational initiatives might contribute to heightened awareness regarding the efficacy and safety of these "disease modifiers" therapies, thus facilitating their integration into clinical practice.

SCOMPENSO CARDIACO 165

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE) PROGNOSI (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

COMPARATIVE PROGNOSTIC VALUE OF MYOCARDIAL WORK INDICES AND GLOBAL LONGITUDINAL STRAIN IN STABLE PATIENTS WITH CHRONIC HFREF

Federico Fortuni (a), Paolo Biagioli (a), Stefano Sforza (a), Anna Mengoni (a), Cinzia Zuchi (a), Rosanna Lauciello (a), Sandra D'addario (a), Giuliana Bardelli (a), Giuseppe Ambrosio (a), Erberto Carluccio (a)

(a) CARDIOLOGY AND CARDIOVASCULAR PATHOPHYSIOLOGY, S. MARIA DELLA MISERICORDIA HOSPITAL, UNIVERSITY OF PERUGIA

Background: Non-invasive myocardial work (MW) indices can be estimated from pressure-strain loops obtained by integrating left ventricular global longitudinal strain (LVGLS) with brachial systolic blood pressure (SBP) and cardiac event timings. Compared to LV GLS, MW indices allow correcting myocardial performance for LV afterload and dyssynchrony. The aim of this study was to assess whether MW indices could provide additional prognostic value in a contemporary cohort of stable outpatients with chronic heart failure with reduced ejection fraction (HFrEF) on optimal medical and device therapy, with controlled afterload and no dyssynchrony.

Methods: We retrospectively analyzed 307 patients

(mean age 65.6 ± 12.7 years, 78% males) with reduced LV ejection fraction (LVEF $< 50\%$). Linear regressions were performed to assess the relationships between MW indices and LVGLS, SBP, and parameters of inter- and intra-ventricular dyssynchrony. The study endpoint was a composite of all-cause death/HF-hospitalization. Multivariable models including each MW index once at a time [global work index (GWI), global constructive work (GCW), global wasted work (GWW) and global work efficiency (GWE)] were compared with the model including LVGLS by C-statistics.

Results: Mean LVEF was $32 \pm 9\%$, mean LV GLS was -9 ± 3 and mean GWI was 800 ± 378 mmHg%. The majority of patients (84%) had SBP < 130 mmHg (mean

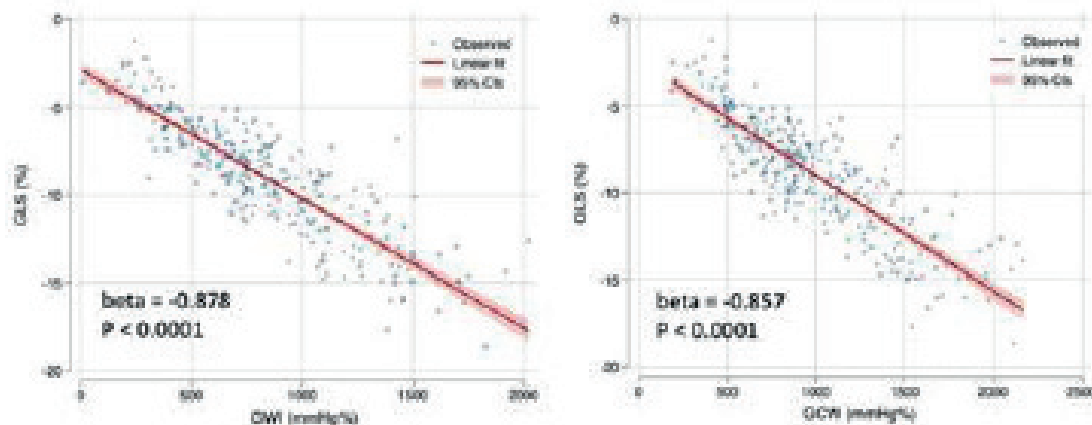


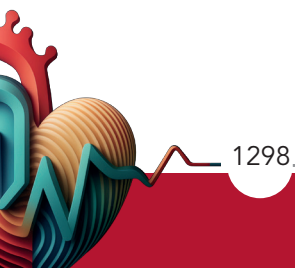
Figure 1



117±16 mmHg), and had no inter- (71%) and (68%) intra-ventricular dyssynchrony. Over a median follow-up of 20 months (IQR: 11-34), 82 patients reached the study endpoint. After multivariable adjustment for MAGGIC score, natriuretic peptide levels, LV end-diastolic volume index, left atrial volume index, E/e' ratio, and TAPSE/PASP ratio, both GWI and GCW were independently associated with adverse outcomes, with identical goodness of fit compared to the model including LVGLS (C-index 0.75 for all). On the contrary, both GWW and GWE were not independently

associated with outcomes. While GWI and GCW were strongly correlated with LVGLS (B coefficient<-0.85; Figure), their association with SBP was modest and there was no significant association between them and parameters of intra- and inter-ventricular dyssynchrony.

Conclusions: In a cohort of stable chronic HFrEF patients on optimal medical and device therapy, with controlled afterload and without dyssynchrony, MW indices showed similar prognostic value to LVGLS.



SCOMPENSO CARDIACO 728

BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

POST-DISCHARGE FOLLOW-UP IN DAY HOSPITAL OF PATIENTS WITH HEART FAILURE: HOSPITAL-TERRITORY INTEGRATED MANAGEMENT

Daniela Biondi (a), Roberto Furloni (a)

(a) DAY HOSPITAL UO MEDICINA INTERNA OSPEDALE VALLECAMONICA ESINE-ASST VALCAMONICA

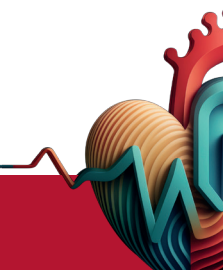
Background: heart failure constitutes a significant health problem given its high prevalence, the frequency of rehospitalizations and the serious disability, which often entail high social cost. For patients hospitalized for heart failure, the transition from inpatient to outpatient care has long been recognized as a high risk period. The day-hospital for heart failure, allows the structuring of a rehabilitation project, at ensuring the multidisciplinary nature and continuity of care. Hospital readmission, that occur within 30 days of the initial hospital, stay are costly and potentially avoidable. Studies have shown that in addition to patients' discharge instructions and education, follow-up calls post-discharge can significantly reduce readmission that occurs within 30 days of the initial hospital stay.

Methods: in the period 12/30/2022-12/31/2023 we enrolled 160 patients, diagnosed with heart failure in day hospital, in follow-up after hospitalization at our Internal Medicine Unit (observational retrospective registry). An initial evaluation was carried out at 30 days and subsequently integrated management with general practitioners. At the day hospital, the patient is examined by a cardiologist; carries out electrocardiogram, echocardiography, blood chemistry and natriuretic peptide tests. The general practitioner and district nurse can activate direct access day hospital if heart failure worsens (24-72 hours visit).

Results: mean age 79.7 ± 8.5 ; males (58%), females (42%). Hb: 11.9 ± 0.4 ; creatinine 1.4 ± 0.3 ; CrCl $43.8 \pm$

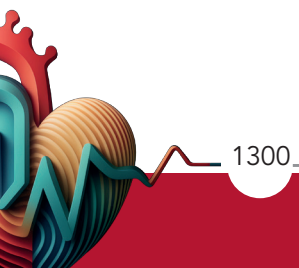
12.5 ; K. 4.0 ± 0.8 ; SBP $122.3 \pm$; DBP 70.9 ± 9.6 ; BMI 24.7 ± 4.7 . HFrEF 44.3% (EF% 35.5 ± 2.5). HFmrEF 13.7% (EF% 46.4 ± 2.1). HFpEF 43.1% (EF% 62.2 ± 5.0); BNP at baseline and 30 days (551.3 vs 271.9 $p < 0.001$); NT-proBNP at baseline and 30 days (1352.9 vs 853.2 $p < 0.001$). The mean \pm SD length of hospital stay was 12.2 ± 6.5 . Patients had a high level of comorbidity as illustrated by a mean \pm SD CCI 4.5 ± 2.5 ; 88% of patients had at least one comorbidity on top of heart failure. Ischemic and hypertensive heart disease were the leading cause of HF. Comorbidities: CAD (32.5%), CKD (48.5%), COPD (27.5%), Anemia (40.3%), Diabetes (33.1%), Hypertension (62.5%), AF (35%), Depressive disorder (10%), Cognitive impairment (15%), prior CABG (8%), prior device implantation: PM (4.0%), ICD (1.2%), CRT (2.0%) (tab 1). Treatment: ACE/ARB/ARNI (89.9%), BB (86.3%), MRA (48.5%), Diuretics (87.5%), Digitalis (12.5%), Amiodarone (22.0%), TAO/NAO (33.6%).

Discussion: the european guidelines encourage multidisciplinary care management programmes in patients with heart failure (class recommendation I, level of evidence A), which might be difficult to achieve in primary care. The management of heart failure should include a network providing adequate follow-up of older patients and implement the continuity of care from hospital to territory. As a result of our intervention in day hospital, we were able to reduce the 30-days all cause readmission rate for our heart failure patients to 11% (50% reduction).



Conclusion: day hospital follow-up approach, after discharge in patients with congestive heart failure, can improve long-term prognosis. The results, do not seem to depend on any adjustment of the drug. Natriuretic peptides (NPs) represent one potentially appealing

strategy, to personalize the approach. Targeted interventions such a patients education and ensuring scheduled follow-up are effective tools that reducing readmission rate.



SCOMPENSO CARDIACO 112
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
FARMACI CARDIOVASCOLARI
(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)
FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)

USE OF DAPAGLIFLOZIN AND CHANGES IN ECHOCARDIOGRAPHIC PARAMETERS IN ITALIAN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION: REAL-WORLD INSIGHTS FROM EVOLUTION-HF ITALY

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Backgrounds: Dapagliflozin, a sodium–glucose cotransporter-2 inhibitor (SGLT2i), is approved for the treatment of heart failure (HF), and reimbursed by the Italian National Health system for HF with reduced ejection fraction (HFrEF) since 2021 and for HF regardless of ejection fraction since 2024. Echocardiography is widely used for the assessment and monitoring of patient with HF, but the effect of dapagliflozin on changes in cardiac function and is not yet completely understood. EVOLUTION-HF Italy is a study aimed to collect Real-World Data on treatment

of HF; data collection included also echocardiographic parameters. The study is part of a global program with studies in 13 European countries.

Purpose. The main objective of this study is to characterise patients who begin treatment with dapagliflozin for HFrEF in Italy, including an assessment of changes in echocardiographic parameters.

Methods: EVOLUTION-HF Italy is an observational, longitudinal study with a descriptive intent that enrolled 256 patients in 11 Italian sites between April 2022



and April 2023. Inclusion Criteria were age > 18 years old, no previous use of any SGLT-2 inhibitor, initiation of dapagliflozin according to the local approved HFREF (LVEF < 40%) label. Patient affected by type 1 diabetes were excluded. In order to ensure that the decision to prescribe dapagliflozin was independent from participation in the study, patients were enrolled between 14 and 45 days after dapagliflozin initiation (study index date). Data were collected after three, six, and twelve months from study index date. The present abstract shows results of the second planned interim analysis, which was conducted at completion of six months of follow-up.

Results: Mean age was 68.5 ± 11.5 years and 23.8% were females. Among the 250 patients with available echocardiography data at baseline, mean ejection fraction at baseline was $32.3 \pm 6.2\%$; 41.6% and 21.1%

of patients had at least a moderate mitral and tricuspid regurgitation, respectively. The majority of patients (69.2%) were in NYHA class II. Follow-up visits at Month 6 were completed by 211 patients. At 6 months, when compared with baseline, mean LVEF value increased from $32.3 \pm 6.2\%$ to $36.3 \pm 8.5\%$, median E/e' value decreased from 11 (IQR 7) to 8 (IQR 4) and systolic pulmonary artery pressure decreased (35.2 ± 10.4 mmHg vs. 32.8 ± 9.6 mmHg).

Conclusion: In a contemporary HFREF population treated with dapagliflozin (in addition to other medications), echocardiographic parameters showed a favourable change. These results, combined with other functional and laboratory data and improvements in quality of life, confirm the role of dapagliflozin implementation in the HFREF patient population.

SCOMPENSO CARDIACO 897
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E
NUTRACEUTICI)
PROGNOSI (SCOMPENSO CARDIACO)

EFFECTS OF DAPAGLIFLOZIN ON BIVENTRICULAR FUNCTION IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION

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Background: left ventricular dysfunction with reduced ejection fraction (HFrEF) is a clinical condition characterised by reduced life quality and elevated morbidity and mortality. Recent studies have demonstrated that introduction of Sodium-Glucose Transport Protein 2 Inhibitors (SGLT2i) significantly improve incidence of hospitalizations and mortality for cardiovascular causes. However, further evidence is needed to confirm these effects in daily clinical practice.

Materials and methods: this is observational, longitudinal prospective study aimed at investigating the efficacy of dapagliflozin in HFrEF patients through echocardiographic parameters collected on 12 months follow up at UOC Cardiologia I dell'Ospedale di Varese. During follow up we collected the main echocardiographic parameters necessary for the evaluation of biventricular function in particular: indexed end-diastolic volume (VTDi), ejection fraction (EF), fractional area change (FAC), tricuspid annulus plane systolic excursion (TAPSE), and TAPSE/PAPs ratio.

Results: 49 consecutive patients attending the clinic for the treatment of heart failure were enrolled in this study: 79.6% completed the 12-month follow-up; the

average age was 66.46 years, with a male predominance (82%). After 12 months, significant improvements were observed in some key echocardiographic parameters. In particular, regarding the left ventricle, the VTDI reduced significantly, going from 83 ml/m² (IQR: 70-101 ml/m²) to 75 ml/m² (IQR: 68-96 ml/m²), with $p=0.013$; EF increased from 34% (IQR: 31-38%) to 39% (IQR: 34-43%) with $p=0.001$. Right ventricular function also showed significant improvements, with an increase in FAC from 37% (IQR: 32-42) to 45% (IQR: 38-50%), with $p=0.007$; TAPSE improved from 19 mm (IQR: 16-21 mm) to 21 mm (IQR: 18-23) with a $p=0.040$; TAPSE/PAPs ratio showed a significant improvement, going from 0.63 (IQR: 0.45-0.79) to 0.71 (IQR: 0.45-0.96), with $p=0.016$.

Only 3 hospitalizations were recorded, 2 of which were due to cardiovascular causes. There were 2 deaths not due to cardiovascular causes.

Conclusions: The implementation of dapagliflozin in the therapy of patients with HFrEF has brought significant benefits in our cohort, improving left and right ventricular function, reducing ventricular volumes and optimizing global cardiac function. These findings, in line with existing literature, strengthen the role of SGLT2i in the management of HFrEF.



SCOMPENSO CARDIACO 767 FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

SACUBITRIL/VALSARTAN IN PAZIENTI CON DISTROFIA MUSCOLARE DI DUCHENNE E DISFUNZIONE CONTRATTILE VENTRICOLARE SINISTRA ASINTOMATICA

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Introduzione: La distrofia muscolare di Duchenne (DMD) è una malattia neuromuscolare a trasmissione recessiva legata al cromosoma X, causata da mutazioni nel gene della distrofina Xp21. Questa condizione provoca una degenerazione progressiva e precoce dei muscoli scheletrici, della muscolatura liscia e del muscolo cardiaco conducendo a perdita della deambulazione, insufficienza respiratoria e cardiomiopatia dilatativa. Nell'ultima decade diversi studi clinici hanno dimostrato l'efficacia di ACE inibitori (ACE-I) o bloccanti dei recettori dell'angiotensina (ARBs) nel rallentare la progressione della cardiomiopatia nei pazienti affetti da DMD. Di conseguenza, le linee guida per il trattamento della DMD raccomandano che uno di questi farmaci venga iniziato entro i 10 anni di età o prima. D'altro canto attualmente non esistono raccomandazioni riguardo alla terapia della disfunzione ventricolare sinistra e i principali farmaci utilizzati nell'insufficienza cardiaca non sono stati testati nei pazienti con DMD. La scarsità di dati in letteratura, unita alla complessità della gestione terapeutica in pazienti con compromissione multiorgano di varia entità, spesso impedisce l'implementazione di una terapia ottimale per lo scompenso cardiaco in questa popolazione.

Scopo dello studio: Valutare se il trattamento con sacubitril/valsartan (S/V) sia ben tollerato ed efficace nei

pazienti con DMD e disfunzione sistolica asintomatica del ventricolo sinistro.

Materiali e metodi: Dal 2018 al 2022 abbiamo arruolato 22 pazienti non deambulanti con DMD (età compresa tra 20 e 35anni) e frazione d'eiezione ventricolare sinistra (LVEF) inferiore al 40% all'ecocardiogramma, senza sintomi di insufficienza cardiaca. Tutti i pazienti erano in terapia medica con Ace-I o ARBs, Beta bloccante e Anti-aldosteronico alla dose massima tollerata. A tutti i pazienti, in accordo con le linee guida, è stato somministrato sacubitril/valsartan (S/V). Dopo adeguata sospensione della terapia con Ace-I e ARB, in considerazione dei bassi valori pressori di tutti i pazienti esaminati, il trattamento con S/V è stato avviato con una dose iniziale molto bassa di 12/13 mg al giorno, procedendo con una titolazione lenta, fino alla dose massima tollerata. Un follow-up clinico ed ecocardiografico è stato effettuato a 3, 6, 12 mesi e 18 mesi.

Risultati: Alla valutazione basale la frazione di eiezione media del ventricolo sinistro (LV) era del 31%. Un miglioramento significativo della LVEF è stato osservato dopo 3 mesi (36%; $p < 0,05$), ed è stato mantenuto a 6 mesi (38%; $p < 0.005$), a 12 mesi (39%; $p < 0.0001$) e a 18 mesi (41%; $p < 0.0001$). In nessun caso è stato necessario sospendere S/V per ipotensione, mentre l'insorgenza di

insufficienza renale ne ha reso necessaria l'interruzione in un singolo paziente.

Conclusioni: I nostri dati preliminari suggeriscono che, nei pazienti con Distrofia muscolare di Duchenne

e cardiomiopatia con ridotta frazione di eiezione, la terapia con Sacubitril-Valsartan può migliorare la funzione del ventricolo sinistro, con soddisfacente profilo di sicurezza.



**SCOMPENSO CARDIACO 178
CARDIOLOGIA PEDIATRICA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
GRAVIDANZA E CARDIOPATIA
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)**

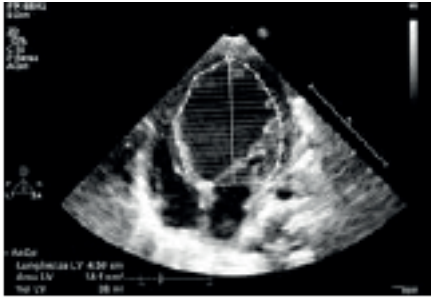
HEART FAILURE SECONDARY TO HYPOCALCEMIA CAUSED BY MATERNAL VITAMIN D DEFICIENCY: A CASE REPORT

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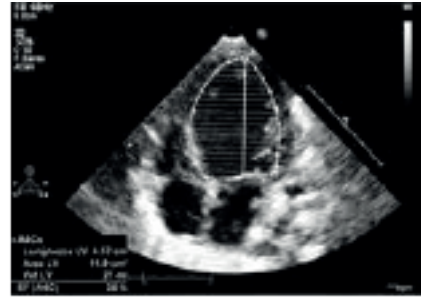
We describe a case of a Bangladeshi infant, born full-term with a birth weight of 2.800 kg, who was hospitalized at 3 months old due to breathing difficulties while feeding. The child exhibited bradycardia and a prolonged corrected QT-interval of 0.51 seconds on an electrocardiogram. He presented with a severe congestive heart failure, and echocardiogram showed dilated left ventricle with depressed left ventricular function (EF 25%) causing general organ hypoperfusion (figure 1-2). The infant was breastfed exclusively, and both the mother and the child had low levels of 25-hydroxyvitamin D in their blood (5 ng/ml for the mother and 8 ng/ml for the child). Additionally, the child had low serum calcium (1.30 mmol/l) and high phosphate (2.9 mmol/l) levels. Treatment involved calcium and phosphorus infusions, traditional heart failure therapy, and calcitriol, followed by cholecalciferol for 8 weeks. The child responded well to treatment, showing significant improvement shortly after initiation.

Biochemical levels normalized within 6 days, but the left ventricle remained dilated and contractility was still decreased after 6 weeks. However, by 10 weeks, echocardiography revealed a normal heart size and restored left ventricular function (figure 3-4), allowing medication to be discontinued. Neonatal heart failure due to hypocalcemia is rare, with this case attributed to maternal vitamin D deficiency. The child's myocardial function improved rapidly with calcium treatment, but full recovery took longer, possibly due to prolonged and severe hypocalcemia. Low calcitriol levels may have also contributed to cardiac insufficiency, as calcitriol directly affects myocardial function. At 10 months old, the child no longer requires medication and has normal heart function. The transient heart failure was likely a result of severe vitamin D deficiency and hypocalcemia, probably exacerbated by maternal vitamin D deficiency. Therefore, pregnant women at risk of deficiency should receive vitamin D supplementation.



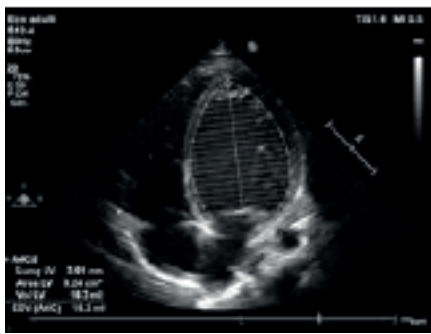
dilated LV.

Figure 1



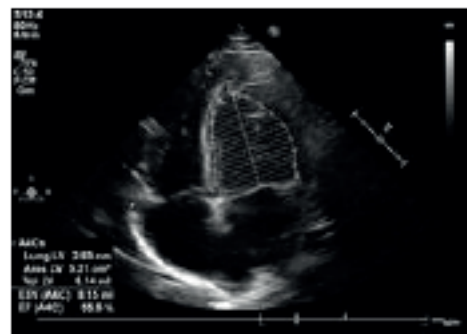
EF 25%.

Figure 2



normal LV.

Figure 3



EF 55%.

Figure 4



SCOMPENSO CARDIACO 185 ABLAZIONE TRANSCATETERE (ARITMIE) ARITMIE SOPRAVENTRICOLARI (ESCLUSA FA) (ARITMIE) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

IL RUOLO DELLA PRE-ECCITAZIONE VENTRICOLARE NELLA DISFUNZIONE VENTRICOLARE SISTOLICA

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(a) UOC CARDIOLOGIA, AZIENDA OSPEDALIERO-UNIVERSITARIA DI FERRARA

Introduzione: La pre-eccitazione ventricolare asintomatica rappresenta una sfida sia dal punto di vista diagnostico che terapeutico. I segni ECG-grafici tipici (tratto PR accorciato, onda Delta con QRS allargato, alterazioni secondarie della ripolarizzazione ventricolare) si possono accompagnare a segni secondari che, anche in relazione al contesto clinico, possono condurre a diagnosi errate, tra cui la pregressa necrosi miocardica. La gestione terapeutica dei quadri asintomatici si basa sulla stima del rischio aritmico. Alcune evidenze dimostrano una correlazione tra pre-eccitazione ventricolare e disfunzione sistolica sinistra. L'utilità dell'ablazione di via accessoria, in contesto di disfunzione sistolica non giustificata da altre cause, è ancora oggetto di dibattito.

Caso clinico: Riportiamo il caso di un paziente di 62 anni, con multipli fattori di rischio cardiovascolare (diabete, fumo, obesità di I grado), che accedeva in Pronto Soccorso per scompenso cardiaco acuto con riferita dispnea ingravescente e dolore toracico intermittente da una settimana. In anamnesi veniva riportata una nota pre-eccitazione ventricolare con onde Q nelle derivazioni inferiori, in assenza di pregressi episodi aritmici. Agli esami ematici si evidenziava troponina con valori a plateau (hs-TnI 22-23 ng/ml). Alla valutazione cardiologica veniva confermata la

presenza di pre-eccitazione ventricolare ed onde Q in sede inferiore, con alterazioni della ripolarizzazione da sovraccarico. All'esame ecocardiografico: cardiopatia ipocinetica di nuovo riscontro (FE VSn 45%) in assenza di franchi deficit di cinetica regionali, lieve ipertrofia, normali dimensioni biventricolari, non valvulopatie di rilievo, non versamento pericardico.

In considerazione della presentazione clinica e dei multipli fattori di rischio, il caso veniva inquadrato come angina instabile e si candidava a coronarografia che, tuttavia, non mostrava stenosi significative.

Previa discussione collegiale del caso, nel sospetto di disfunzione sistolica da pre-eccitazione ventricolare, è stato eseguito uno studio elettrofisiologico endocavitario, che ha confermato la presenza di via accessoria atrio-ventricolare in sede postero-settale sinistra, sottoposta ad efficace ablazione.

A 3 mesi dalla procedura è stata eseguito un ecocardiogramma di controllo che ha documentato un miglioramento della funzionalità sistolica ventricolare sinistra (FE 62%).

Conclusioni: Questo caso clinico mette in luce come, in determinate circostanze, la pre-eccitazione ventricolare non sia solo una potenziale causa di complicanze aritmiche ma vada ipotizzato anche il suo ruolo nella disfunzione sistolica ventricolare.

SCOMPENSO CARDIACO 505

TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

IMPROVEMENT OF VENTRICULAR-ARTERIAL COUPLING IN PATIENT WITH HEART FAILURE WITH REDUCED EJECTION FRACTION AFTER SGLT-2I THERAPY DURING 12 MONTHS OF FOLLOW-UP

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Background: sodium-glucose cotransporter -2 inhibitors (SGLT-2i) are recommended therapy for patients with Heart Failure with Reduced Ejection Fraction (HFrEF). Cardiovascular (CV) outcome trials have shown that in patients with HFrEF the treatment with sodium-glucose cotransporter -2 inhibitors (SGLT-2i) reduce the risk of cardiovascular disease and prevent HF hospitalizations. The CV protection is probably mediated largely by improving the hemodynamic parameters and vascular structure and function, and reducing plasma volumes, as well their direct beneficial effects on cardiac metabolism and function. It is known that interaction between the heart and the arterial system (ventricular-arterial coupling- VA) is an important determinant of cardiovascular performance. However, data about the effects of SGLT-2i on VA coupling are scarce.

Aims of the Study: To assess 1) changes in VA after SGLT-2i; 2) interactions between VA and LV functions, 3) predictive factors influencing VA change.

Methods: Fifty patients with HFrEF (aged 65,95 ±8,51, NYHA ≥ II, LV ejection fraction (LVEF) ≤40%), underwent Doppler echocardiography, clinical and laboratory assessment before and after 6 and 12 months of SGLT-2i. VA coupling was calculated as end-systolic pressure

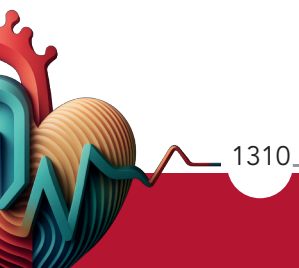
(Ea)/ end-systolic left ventricle (LV) elastance (Ees) ratio. As the measuring of central aortic pressure was not possible, we calculated Ea from the values of systolic brachial blood pressure. According to the available literature, the optimal range for VA coupling is from 0.5 to 1.2

Results: VA improved after 6 months of SGLT-2i in patients with HFrEF. Values of Ea significantly decreased from 2.79±2.39 to 1.70±0,60 p<0.001, resulting in a VA level close to the optimal range i.e. from 2,76±1,35 to 1,46±0,76, p<0.001. VA and Ea continue to improve over time although there is no statistical significance between 6 and 12 months. There was no significant interaction between the most frequent risk factors, the presence of coronary artery disease and other medical therapy for HFrEF on VA change during SGLT-2i therapy. After 6 months of treatment, left ventricle endsystolic volume (LVESD) decreased with reverse LV remodeling (lower EDV and ESV), otherwise global longitudinal strain, left ventricle ejection fraction (LVEF) and stroke volume (SV) significantly increased (p=0,008, p<0,001 and p= 0,004 respectively), while diastolic LV parameters were similar before and after SGLT-2i treatment. The correlation analyses showed a significant negative correlation between VA change after SGLT-2i and LVEF change (r=-0,09038; p<0,001)



and GLS change ($r = -0,0039$; $p = 0,004$) and positive correlation between VA change and NT-proBNP change ($r = 0,3141$; $p = 0,001$). The strongest predictor of VA coupling alteration during SGLT2 was the improvement in global LVEF after 6 months of SGLT-2i treatment

Conclusion: SGLT-2i therapy significantly improved ventriculo-arterial coupling in patients with HFrEF, these changes were consensual with favorable effects on left ventricle remodeling and systolic function.



SCOMPENSO CARDIACO 467

DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

MECCANISMI DELLE ARITMIE (ARITMIE)

AMILOIDOSI CARDIACA DA TRANSTIRETINA COMPLICATA DA ARITMIE IPERCINETICHE ED IPOCINETICHE: UNA SFIDA PER IL CARDIOLOGO

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(a) UO CARDIOLOGIA - P. O. F. FERRARI - CASARANO

Presentiamo il caso di una donna di 75 anni giunta alla nostra attenzione per dispnea ingravescente. In anamnesi si segnala cardiopatia ipertensiva e fibrillazione atriale in trattamento con anticoagulanti orali. All'esame obiettivo si rilevano edemi declivi e fini crepitii ad entrambe le basi polmonari. All'ECG: fibrillazione atriale normofrequente (80 bpm), extrasistole ventricolare isolata e bassi voltaggi del QRS nelle derivazioni periferiche. Gli esami di laboratorio individuano un marcato aumento del Pro-BNP (11 740 pg/ml). L'ecocardiogramma transtoracico evidenzia severa ipertrofia del ventricolo sinistro (SIV di 25 mm) con aspetto granular sparkling, conservata funzione contrattile biventricolare, disfunzione diastolica di II grado e dilatazione biatriale. Dato il sospetto di amiloidosi cardiaca si esegue scintigrafia con tracciante osseo che mostra una intensa fissazione del radiofarmaco in ambito cardiaco (score di Perugini 3). Pertanto si pone diagnosi di amiloidosi cardiaca da transtiretina complicata da scompenso cardiaco

a frazione di eiezione preservata. Il trattamento con diuretici e l'ottimizzazione della terapia medica porta ad un graduale miglioramento del quadro emodinamico. Inoltre, all'ECG dinamico secondo Holter si registrano numerose extrasistoli ventricolari, ripetitive in coppie, triplette ed una tachicardia ventricolare non sostenuta di 4 battiti. Per tale motivo e per monitorare l'insorgenza di eventuali aritmie si impianta un sistema di monitoraggio sottocutaneo (Loop Recorder). Al monitoraggio remoto del dispositivo, dopo 3 mesi dall'impianto, non si rilevano aritmie ipercinetiche ventricolari ma si segnalano episodi di fibrillazione atriale a bassa risposta ventricolare, prevalentemente notturni, con RR massimo di 2,2 sec. L'analisi genetica non rileva mutazioni a carico del gene della transtiretina ma sorprendentemente evidenzia una mutazione patogenetica di tipo nonsense, in eterozigosi, del gene PKP2(p.Q707X). Questavariante è associata in letteratura a cardiomiopatia aritmogena del ventricolo destro. In conclusione, l'amiloidosi cardiaca da transtiretina è un

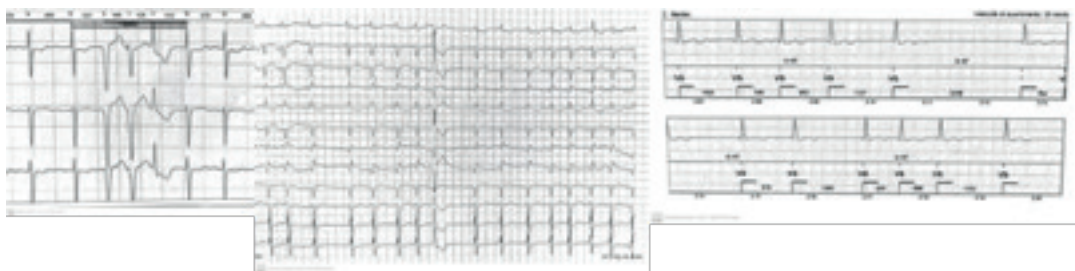
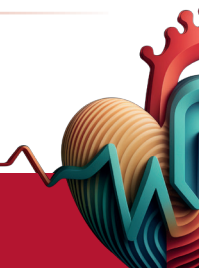
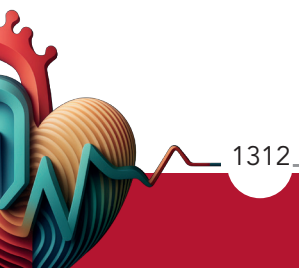


Figura 1



patologia considerata rara ma oggi giorno sempre più frequente ed una diagnosi precoce è importante per la corretta gestione della terapia medica. Inoltre questa patologia spesso si associa a fibrillazione atriale ed in alcuni casi il quadro aritmico è complicato da aritmie ipercinetiche ventricolari, come nella nostra paziente. Pertanto la gestione farmacologica del burden

aritmico, che potrebbe essere influenzato da mutazioni genetiche legate a differenti patologie cardiovascolari, rappresenta una vera sfida per i cardiologi. Dato il labile equilibrio riscontrato nei pazienti affetti da amiloidosi cardiaca, per guidare e personalizzare la terapia antiaritmica, è certamente utile l'impiego del loop recorder come sistema di monitoraggio.



SCOMPENSO CARDIACO 554 CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)

A RARE CASE OF HEREDITARY AMYLOIDOSIS

Rossi Davide (a), Roberta Magnano (b), Silvio Saraullo (a), Claudio Scollo (a), Laura Pezzi (b), Alberto D'allea (b), Piergiusto Vitulli (b), Daniele Forlani (b), Fabrizio Ricci (a), Giulia Renda (a), Massimo Di Marco (b), Sabina Gallina (a)
(a) UNIVERSITA DEGLI STUDI "GABRIELE D'ANNUNZIO" CHIETI-PESCARA;
(b) OSPEDALE CIVILE "SANTO SPIRITO" PESCARA

A 56-year-old Caucasian woman presented to the ED with signs and symptoms of ADHF. Her cardiac history was unremarkable except for a case of sudden cardiac death in her mother. Her past medical history included paresthesias, neurogenic pain, and diarrhea. ECG showed sinus rhythm and signs of left ventricular hypertrophy (Peguero-Lo Presti with $SD + SV4 = 40$ mm). Echocardiogram revealed severely hypertrophic left ventricle (IVSd 18 mm) with moderately reduced systolic function (EF 45%), right ventricular hypertrophy with systolic longitudinal and radial dysfunction, moderate mitral and tricuspid regurgitation. The patient was admitted to the Cardiac Intensive Care Unit. Coronary angiography showed no significant stenosis in the epicardial coronary circulation. Blood chemistry tests revealed no monoclonal component, a normal serum K/L ratio, and absence of proteinuria. In agreement with a neurologist, there was a suspicion of amyloidosis with neuropathy and severe cardiac involvement. Cardiac amyloidosis was confirmed by endomyocardial biopsy, and genetic testing identified in the TTR gene, transcript NM_000371.4, a pathogenic c.325G>C variant resulting in a p.Glu109Gln amino acid substitution (missense mutation). The patient was subsequently discharged with appropriate heart failure therapy and tafamidis. Unfortunately, one year later, the patient suffered a fatal ischemic stroke. Genetic testing of her daughter revealed the same mutation. She had no morpho-functional cardiovascular abnormalities but only paresthesias and episodes of diarrhea, and was referred to the neurology colleagues. Transthyretin

(ATTR) amyloidosis with polyneuropathy (PN) is a progressive systemic disease in which the transthyretin protein misfolds to form amyloid fibrils deposited in the endoneurium and myocardium. ATTR with familial PN is the most severe hereditary polyneuropathy with adult onset (>50 years). It derives from a hereditary mutation in the TTR gene and can involve the peripheral nervous system and the heart. It involves length-dependent small fibres neuropathy with autonomic dysfunction, sensory disturbances, weight loss, cardiac rhythm disturbances, vitreous opacities, gastrointestinal disorders, and renal abnormalities. In our case, there is a rare pathogenic mutation with few cases described in the literature. This clinical case describes how it is common for hereditary amyloidosis, which has never shown cardiological symptoms but only neurological symptoms, to present with significant cardiac involvement. It is a difficult disease to recognize in the initial stages due to its multisystem and non-specific manifestations. Therefore, it is essential to suspect it in those patients with neurosensory symptoms and the above red flags, given the close correlation between amyloidotic polyneuropathy and cardiac amyloidosis. An early diagnosis is also important due to the recent approval of new therapies for slowing the progression of neuropathy and cardiac involvement, and for correct antithrombotic therapy given the high pro-coagulant risk. Central roles include adequate patient information, multidisciplinary collaboration, early diagnosis, and aiming for genotype-phenotype correlation given the multiple facets that make this pathology a great mimic.



SCOMPENSO CARDIACO 370 PROGNOSI (SCOMPENSO CARDIACO) BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

REVEALING THE PROGNOSTIC ACCURACY OF DIFFERENT GLOMERULAR FILTRATE RATE FORMULAS IN HEART FAILURE PATIENTS WITH REDUCED EJECTION FRACTION AND VARIOUS DEGREES OF KIDNEY FAILURE: THE RENAL MECKI STUDY

Massimo Mapelli (a), Elisabetta Salvioni (a), Nicola Cosentino (c), Francesca Romana Pluchinotta (c), Arianna Galotta (a), Michele Emdin (b), Massimo Piepoli (d), Gianfranco Sinagra (e), Marco Metra (f), Federica Mescia (f), Giancarlo Marenzi (a), Piergiuseppe Agostoni (a)

(a) CENTRO CARDIOLOGICO MONZINO IRCCS, MILANO; (b) FONDAZIONE GABRIELE MONASTERIO, PISA; (c) ASTRAZENECA, MILANO; (d) POLICLINICO SAN DONATO, SAN DONATO MILANESE; (e) UNIERSITÀ DI TRIESTE; (f) SPEDALI CIVILI, BRESCIA

Background: Appropriate interpretation of kidney function is essential for clinical and therapeutic management of heart failure (HF). In HF patients, chronic kidney disease plays a critical role and impacts prognosis. In this study we aimed at evaluating the prognostic accuracy of five glomerular filtration rate (GFR) estimation formulas in HF patients with reduced

ejection fraction (HFrEF) and their impact on the Metabolic Exercise test data combined with Cardiac and Kidney Indexes (MECKI) score.

Methods: We retrospectively analyzed 6,933 patients enrolled in the Metabolic Exercise Cardiac Kidney Indexes (MECKI) score database. GFR was estimated

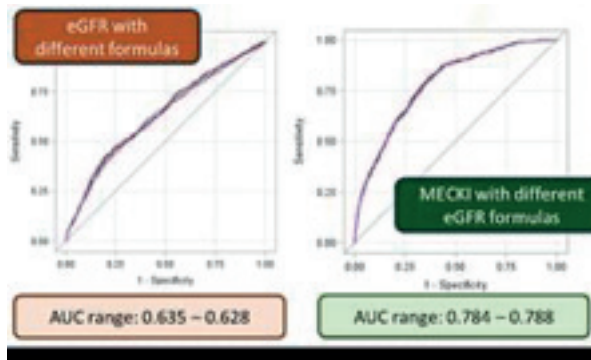


Table 1. Baseline characteristics of the study population (N = 6933).

Males, No. (%)	5659 (81.62%)
Age, mean (SD), years	61.95±12.58
LVEF, mean (SD), %	33.25±10.24
BNP, median (IQR), pg/mL	247.85(98.647)
Creatinine, mean (SD), mg/dL	1.2±0.58
VO ₂ peak, mean (SD), % pred	56.5±17.5
VE/VCO ₂ slope, mean (SD)	33.2±7.9
Hemoglobin, mean (SD), m/dL	13.5±1.66
Na ⁺ , mean (SD), mmol/L	139.47±3.22
MDRD, median (IQR)	70.58(54.63-86.35)
CKD-EPI, median (IQR)	69.6(52.35-87.06)
CG, median (IQR)	72.87(53.48-95.65)
CGm, median (IQR)	68.28(50.97-88.25)
MDRDm, median (IQR)	66.12(51.18-80.96)
MECKI with MDRD, median (IQR)	0.051 (0.022-0.119)
MECKI with CG, median (IQR)	0.048 (0.019-0.116)
MECKI with CGm, median (IQR)	0.052 (0.021-0.122)
MECKI with MDRDm, median (IQR)	0.055 (0.023-0.125)
MECKI with CKD-EPI, median (IQR)	0.052 (0.022-0.121)
AF, No. (%)	1214(17.54%)
ICD, No. (%)	2408(34.76%)
CRT, No. (%)	1015(14.77%)
ARBs, No. (%)	1369(20.74%)
ACEI, No. (%)	4804(70.13%)
Diuretics, No. (%)	5478(80.26%)
MRA, No. (%)	3650(53.95%)
Sacubitril/Valsartan, No. (%)	196(11.67%)
Beta-blockers, No. (%)	6019(87.49%)
Statin, No. (%)	3289(49.16%)

Figure 1

using five different formulas: the Modification of Diet in Renal Disease (MDRD); the MRDR modified (MRDRm); the Cockcroft-Gault (CG), the CG modified (CGm); and the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI). The primary endpoint of the study was the composite of cardiovascular death, left ventricular assist device implantation, and urgent heart transplantation at 2 years.

Results: Table 1 shows the main characteristics of the population. The median follow-up was 4.2 years (IQR 1.8-7.6). Each GFR estimation demonstrated similar but moderate prognostic capacity (AUC range: 0.6278-0.6351), with the MDRD equation showing the best performance (Figure 1, left). Employment of eGFR

according to the 5 different formulas in the MECKI score calculation did not significantly alter its prognostic power (AUC ranging from 0.7841 to 0.7883), Figure 1, right.

Conclusions: While GFR estimation methods exhibit moderate prognostic capacity with only slight variations existing in the prognostic performance of different GFR estimation methods, the MECKI score remains a reliable tool for risk prediction in HFrEF, facilitating individualized treatment decisions in HF management. Individualized risk assessment based on patient-specific characteristics should inform clinical decision-making in HF management, warranting further exploration and validation in future studies in risk stratification.



**SCOMPENSO CARDIACO 100
ASSISTENZA INTENSIVA CARDIOVASCOLARE IN ACUTO
(ASSISTENZA CARDIACA IN ACUTO)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
IPERTENSIONE POLMONARE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)**

RIGHT VENTRICLE TO PULMONARY ARTERY COUPLING IN ACUTE HEART FAILURE PATIENTS AND ITS IMPLICATIONS IN ICCU

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(a) SAPIENZA UNIVERSITA' DI ROMA (POLICLINICO UMBERTO I); (b) UNIVERSITA' DEGLI STUDI DI PADOVA

Introduction: Heart failure is the inability of the heart to provide sufficient cardiac output to meet the metabolic needs of the body under normal ventricular filling pressures, needing hospitalization. It is a major cause of hospitalization in individuals over 65 and it is associated with high rates of in-hospital and post-discharge mortality and readmission. The prognostic significance of right ventricular (RV) dysfunction, alongside left ventricular dysfunction, age, and mean systolic pressure, remains unclear. Evaluating the coupling between the right ventricle and the pulmonary artery (RV-PA coupling) using the echocardiographic TAPSE/PAPS ratio may be prognostically important in these patients, although it is not fully engaged in acute heart failure and in cardiological intensive care.

Study Objectives: This study aims at evaluating the prognostic role of right ventricular function assessed by means of the TAPSE/PAPS ratio in acute heart failure patients, investigating its correlation with in-hospital mortality, six-month follow-up mortality, the need for inotropic support or mechanical circulatory support (MCS) during hospitalization, and readmission due to heart failure exacerbation within six months post-discharge.

Materials and Methods: This prospective study evaluated 100 consecutive acute heart failure patients

admitted to the cardiological intensive care unit. Patients were evaluated at admission, discharge, and after six months, using clinical, laboratory, and echocardiographic assessments. Echocardiographic parameters (LVEF, RVEDD, SV, S', TAPSE, TAPSE/PAPS) were analyzed to investigate correlations with mortality and the use of inotropic drugs or MCS.

Results: The study population included 62 men and 38 women, with an average age of 71 ± 12.5 years. Patients generally were slightly overweight condition ($BMI 25 \pm 3.2$), with 56% being smokers and presenting various comorbidities such as hypertension (66%), hyperlipidemia (66%), diabetes (37%), COPD (23%), and chronic kidney disease (21%). Analyzing in-hospital mortality, significant correlations were found with mean arterial pressure ($p = 0.03$), stroke volume ($p = 0.038$), S' ($p = 0.016$), and TAPSE/PAPS ($p < 0.001$), but not with LVEF ($p = 0.091$). There was a significant association between the TAPSE/PAPS ratio and mortality in patients treated with inotropes and MCS ($p = 0.018$ and $p = 0.013$, respectively). TAPSE/PAPS was also a significant prognostic marker for post-discharge mortality ($p = 0.033$).

Conclusions: The study suggests that RV-PA coupling, assessed by TAPSE/PAPS at admission, is a significant prognostic factor for in-hospital mortality and is



associated with the need for inotropic support during hospitalization. A reduced TAPSE/PAPS ratio at discharge is a negative prognostic indicator for post-discharge mortality. Thus, RV-PA coupling could be

used as an additional prognostic tool in cardiological intensive care for heart failure patients. These findings should be validated by a larger multicentric cohort and longer follow-up.



SCOMPENSO CARDIACO 547
TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

THE ALLIANCE BETWEEN CARDIOMEMS AND LEVOSIMENDAN IN PATIENTS WITH ADVANCED HEART FAILURE

Valeria Visco (a), Cristina Esposito (b), Antonella Rispoli (b), Paola Di Pietro (a), Francesco Loria (a), Nicola Virtuoso (b), Alessia Bramanti (a), Carmine Vecchione (a, b), Michele Ciccarelli (a)

(a) DEPARTMENT OF MEDICINE, SURGERY AND DENTISTRY - UNIVERSITY OF SALERNO; (b) CARDIOLOGY UNIT - UNIVERSITY HOSPITAL "SAN GIOVANNI DI DIO E RUGGI D'ARAGONA", SALERNO

Background: We report the results of a real-world study based on heart failure (HF) patients' continuous remote monitoring strategy using the CardioMEMS system to assess the impact of this device on healthcare outcomes, costs, and patients' management and quality of life.

Methods: We enrolled seven patients (69.00 ± 4.88 years; 71.43% men) with HF, implanted with CardioMEMS, and daily remote monitored to optimize both tailored adjustments of home therapy and/or hospital infusions of levosimendan. We recorded clinical, pharmacological, biochemical, and echocardiographic parameters and data on hospitalizations, emergency room access, visits, and costs.

Results: Following the implantation of CardioMEMS, we observed a 50% reduction in the total number of hospitalizations and a 68.7% reduction in the number of days in the hospital. Accordingly, improved patient quality of life was recorded with EQ-5D (pre 58.57 ± 10.29 vs. 1 year post 84.29 ± 19.02 , $P = 0.008$).

Echocardiographic data show a statistically significant improvement in both systolic pulmonary artery pressure (47.86 ± 8.67 vs. 35.14 ± 9.34 , $P = 0.022$) and E/e' (19.33 ± 5.04 vs. 12.58 ± 3.53 , $P = 0.023$). The Quantikine® HS High-Sensitivity Kit determined elevated interleukin-6 values at enrolment in all patients, with a statistically significant reduction after 6 months ($P = 0.0211$). From an economic point of view, the net savings, including the cost of CardioMEMS, were on average €1580 per patient during the entire period of observation, while the analysis performed 12 months after the implant vs. 12 months before showed a net saving of €860 per patient. The ad hoc analysis performed on the levosimendan infusions resulted in 315 days of hospital avoidance and a saving of €205 158 for the seven patients enrolled during the observation period.

Conclusions: This innovative strategy prevents unplanned access to the hospital and contributes to the efficient use of healthcare facilities, human resources, and costs.



SCOMPENSO CARDIACO 894
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO)

IMPACT OF GUIDELINE-DIRECTED THERAPY ON LOOP DIURETIC DISCONTINUATION AND MORTALITY IN HFrEF: A RETROSPECTIVE COHORT STUDY

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Introduction and aims: Since the introduction of angiotensin receptor neprilysin inhibitor (ARNI), a tendency toward reduced loop diuretic (LD) doses has been observed among patients with heart failure and reduced ejection fraction (HFrEF). This trend has three possible explanations: the diuretic effect of neprilysin inhibition, ARNI hemodynamic effect, and a propensity to reduce diuretics due to ARNI blood pressure-lowering effect. SGLT-2 inhibitors (SGLT2i) may also influence diuresis and, thereby, LD use. This study aimed to assess the association between guideline-directed medical therapy (GDMT) use and diuretic dose reduction in tertiary-level cohort of HFrEF patients.

Methods and results: We retrospectively analyzed the data of 470 HFrEF outpatients at their first visit at our HF ambulatory between 2014 and 2023. 76% were male, 12.4% in NYHA class III-IV, 43.8% had ischemic etiology of HF, 41.3% had moderate or severe mitral regurgitation (MR), 11.7% had an ICD, and 5.1% had

been treated with CRT-D/P. These subjects were followed until last visit, death or end of the study, with the median follow-up (FUP) being 34.5 months (IQR 20-52.8). Initially, 74.7% of patients were on LD, decreasing to 56.4% at the last FUP ($p < 0.001$), although high-dose LD use (i.e., more than 50 mg of furosemide equivalent) remained unchanged. Conversely, the proportion of patients on ARNI increased from 14.6% to 46.4% ($p < 0.001$), with a corresponding decrease in ACE inhibitor prescription (58.5% to 31.5%, $p < 0.001$). Beta-blocker (BB) and mineralocorticoid receptor antagonist (MRA) use increased slightly (93.4% to 96.4%, $p = 0.006$ and 63.8% to 68.7, $p = 0.44$). Of 351 patients on LD at the first visit, 110 had discontinued this therapy at last FUP. They were younger (62.8 ± 10.6 vs 69.6 ± 11 years, $p < 0.001$), more often had non-ischemic etiology (68.2% vs 49.8%, $p = 0.001$) and a lower percentage of them had chronic kidney disease (19.1% vs 32.8%, $p = 0.008$) than those who maintained LD. Moreover, at last follow up they had better NYHA class (NYHA class

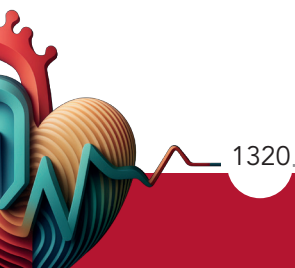


Figure 1

I 67.3% vs 41.2%, $p < 0.001$) and LVEF ($44.5 \pm 9.2\%$ vs $36.8 \pm 11\%$, $p < 0.001$), with 40.4% achieving a LVEF $> 50\%$ (vs 17.6%, $p < 0.001$), less often had moderate to severe MR (14.5% vs 33.6%, $p < 0.001$), and were more likely to be on ARNI, SGLT-2i, and quadruple therapy (68.2% vs 33.6%, 50% vs 24.5%, 41.8% vs 19.5%; $p < 0.001$). Mortality was lower in those who

discontinued LP (10% vs 39.4%, $p < 0.001$), confirmed by Kaplan Meier analysis (Figure 1a). The correlates of LD discontinuation at FUP are shown in Figure

Conclusion: LD discontinuation identifies a subset of HFrEF patients with favorable disease trajectory and lower risk of mortality.



**SCOMPENSO CARDIACO 576
ELETTROSTIMOLAZIONE (ARITMIE)
TERAPIA DI RESINCRONIZZAZIONE (ARITMIE)
ENDOCARDITI (VALVULOPATIE)
GESTIONE DELLA COMPLICANZE PM / ICD (ARITMIE)**

WHEN "LESS IS MORE": FROM CARDIAC RESYNCHRONISATION TO LEFT BUNDLE BRANCH PACING

Carla Zannelli (a), Henri Xhakupi (a), Paolo Sartori (b), Italo Porto (a, b), Stefano Giovinazzo (b)

(a) *DIPARTIMENTO DI MEDICINA INTERNA (DI.M.I.), UNIVERSITÀ DI GENOVA, 16132 GENOVA, ITALIA;* (b) *CLINICA DI MALATTIE DELL'APPARATO CARDIOVASCOLARE, DIPARTIMENTO CARDIO-TORACO-VASCOLARE (DICATOV), IRCCS OSPEDALE POLICLINICO SAN MARTINO, 16132 GENOVA, ITALIA*

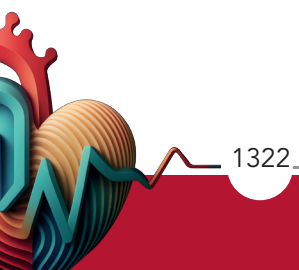
The first implantation of a cardiac defibrillator (ICD) on human occurred 44 years ago thanks to the doggedness of Professor Mirowski. The prevalence of heart failure patients carrying an implantable device, whether placed in primary prevention, secondary prevention or for exclusive resynchronization need, has progressively increased hand in hand with their problems. The present case focuses on a 65-year-old caucasian man, active smoker with a history of prior alcohol abuse. In 1986, the patient has received an implantation of Bjork-Shiley No. 23 aortic prosthesis and mitral valve repair; in 1993 he underwent implantation of Bicarbon No. 29 mitral prosthesis. Since then the patient had performed occasional cardiological checkups. In 2017, at the first evaluation at our centre, a severe left ventricular dysfunction (EF 35%), increased pulmonary pressures and signs of aortic prosthesis malfunction have been found. The last one was damaged by a fibrous cloth above and below the disc and was repaired by the removal of the cloth. Prior to the surgery, the patient's coronary arteries have been studied with evidence of non-significant atherosclerotic disease and the right heart catheterization showed a combined pre- and post-capillary pulmonary hypertension (PAP 65/31/39 mmHg- WP 25 mmHg). In 2022, due to evidence of pauses up to 7 seconds, in presence of permanent atrial fibrillation (AF) with incomplete left bundle branch block (LBBB), and to the persistence of depressed EF despite optimised medical therapy, CRT-D implantation was performed in another centre. A subsequent (9/2023)

routinary cardiological examination revealed a 2-3 cm granulomatous skin lesion at the level of the defibrillator pocket with secretion of purulent material, in the absence of other symptoms. The patient was admitted to the Cardiology ward, with negative inflammatory indices (PCR 4 mg/L, GB 6000/mL), serial blood cultures and transthoracic echocardiogram also negative for signs of infections. In particular, the echocardiography documented a partial improvement in EF (40%). A transesophageal echocardiogram (TEE) was performed on 19/09, which showed mobile material attached to the aortic valve prosthesis (15 mm) and the atrial portion of the lead (5 mm). Empirical antibiotic therapy with daptomycin and ceftriaxone was started and on 20/09, the device was removed and the VR endurity temporary external PM was implanted due to absence of spontaneous rhythm. At TEE on 06/10 the probable infectious involvement of the aortic valve persisted, with no evidence of infectious localisation on the lead. Following the infectious disease specialist indications, the incubation period of the culture specimens was extended and blood cultures on 27/09 were positive for *Propionibacterium acnes*, a slow-growing anaerobic Gram-positive bacterium sensitive to penicillin G. Antibiotic therapy was then continued with ceftriaxone (then amoxicillin 4 g/day). On 16/10 the Biotronik Enitra 4 SR MRI single-chamber PM was implanted with left bundle branch area pacing (LBBAP). The decision to reduce the number of intraventricular catheters was dictated by the patient's very high infectious risk. At



the same time, the patient didn't have any ventricular arrhythmic events and, thanks to resynchronisation therapy, had experienced an improvement on both EF and heart failure symptoms. Based on these premises, the LBBAP strategy appeared to be the best solution. This strategy has recently emerged as an alternative

to conventional CRT. By stimulating the cardiac conduction system in a physiological manner, LBBAP promotes a more homogeneous contraction and relaxation of the left ventricle.



SCOMPENSO CARDIACO 215

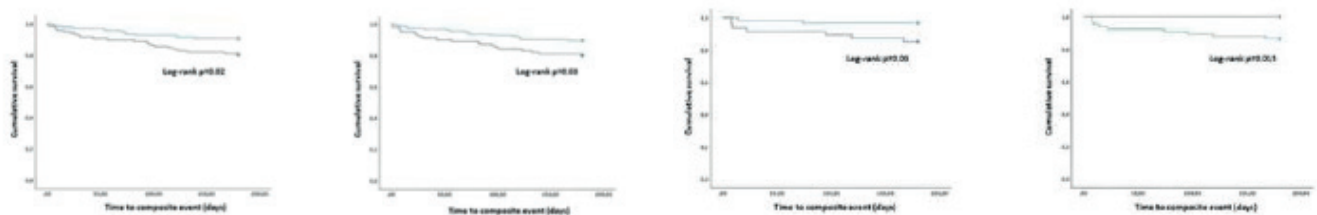
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO) FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

THE ROLE OF HIGH-SENSITIVITY TROPONIN T REGARDING PROGNOSIS AND CARDIOVASCULAR OUTCOME ACROSS HEART FAILURE SPECTRUM

Andrea D'amato (a, b), Paolo Severino (a), Silvia Prosperi (a), Marco Valerio Mariani (a), Rosanna Germanò (a), Andrea De Prisco (a), Vincenzo Myftari (a), Claudia Cestiè (a), Aurora Labbro Francia (a), Stefanie Marek-iannucci (a), Leonardo Tabacco (a), Leonardo Vari (a), Silvia Luisa Marano (a), Gianluca Di Pietro (a), Carlo Lavalle (a), Gennaro Sardella (a), Massimo Mancone (a), Roberto Badagliacca (a), Francesco Fedele (c), Carmine Dario Vizza (a)
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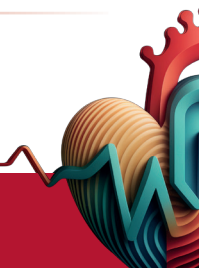
Background: Cardiac troponin release is related to the cardiomyocyte loss occurring in heart failure (HF). The prognostic role of high-sensitivity cardiac troponin T (hs-cTnT) in several settings of HF is under investigation. The aim of the study is to assess the prognostic role of intrahospital hs-cTnT in patients admitted due to HF.

Methods: In this observational, single center, prospective study, patients hospitalized due to HF have been enrolled. Admission, in-hospital peak, and discharge hs-cTnT have been assessed. Patients were followed up for 6 months. Cardiovascular (CV) death, HF hospitalization (HFH), and worsening HF (WHF)



Survival analysis regarding the occurrence of the composite of cardiovascular (CV) death and heart failure hospitalization (HFH) in patients with an admission high-sensitivity T troponin (hs-cTnT) value below the median (blue line) and admission high-sensitivity T troponin value above the median (green line) in the overall population (A). Survival analysis regarding the occurrence of the composite of CV death and HFH in patients without significant in-hospital hs-cTnT increase (blue line) and with significant hs-cTnT increase (green line) in the overall population (B). Survival analysis regarding the occurrence of the composite of CV death and HFH in patients with an admission hs-cTnT value below the median (blue line) and admission hs-cTnT value above the median (green line) in the chronic HF subgroup (C). Survival analysis regarding the occurrence of worsening HF events and admission hs-cTnT values below the median (blue line) and above the median (green line) in the HFmrEF/HFpEF subgroup (D).

Figure 1



(i.e., urgent ambulatory visit/loop diuretics escalation) events have been assessed at 6-month follow up.

Results: 253 consecutive patients have been enrolled in the study. The hs-cTnT median values at admission and discharge were 0.031 ng/mL (IQR 0.02–0.078) and 0.031 ng/mL (IQR 0.02–0.077), respectively. The risk of CV death/HFH was higher in patients with admission hs-cTnT values above the median ($p = 0.02$) and in patients who had an increase in hs-cTnT during hospitalization ($p = 0.03$). Multivariate Cox regression analysis confirmed that hs-cTnT above the median (OR: 2.06; 95% CI: 1.02–4.1; $p = 0.04$) and increase in hs-cTnT during hospitalization (OR:1.95; 95%CI: 1.006–

3.769; $p = 0.04$) were predictors of CV death/HFH. In a subgroup analysis of patients with chronic HF, hs-cTnT above the median was associated with increased risk of CV death/HFH ($p = 0.03$), while in the subgroup of patients with HFmrEF/HFpEF, hs-cTnT above the median was associated with outpatient WHF events ($p = 0.03$) (**Figure 1**).

Conclusions: Inpatient hs-cTnT levels predict CV death/HFH in patients with HF. In particular, in the subgroup of chronic HF patients, hs-cTnT is predictive of CV death/HFH; while in patients with HFmrEF/HFpEF, hs-cTnT predicts WHF events.

SCOMPENSO CARDIACO 259

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

PROGNOSI (SCOMPENSO CARDIACO)

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

RUOLO DELLA STIMOLAZIONE DELLA GUANILATO CICLASI SOLUBILE NELLO SCOMPENSO CARDIACO WORSENING: FOCUS SU PARAMETRI CLINICI E BIOMARCATORI

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Background: Lo scompenso cardiaco è una sindrome clinica complessa che si annovera tra le principali cause di morbilità e mortalità a livello globale, impattando significativamente sulla qualità della vita dei pazienti. I progressi terapeutici permettono una stabilizzazione della patologia e della condizione clinica dei pazienti; tuttavia, sono frequenti episodi di worsening. In questo setting di pazienti, l'aggiunta del Vericiguat alla terapia ottimizzata ha dimostrato di apportare benefici, migliorando le condizioni cliniche di pazienti con HFrEF.

Obiettivo dello studio: Gli obiettivi principali dello studio sono quelli di valutare, a 3 mesi dall'inizio della terapia con Vericiguat, l'andamento dei parametri clinici e l'aderenza alla terapia, in pazienti con HFrEF dopo un episodio di worsening.

Materiali e metodi: Lo studio ha valutato una popolazione di 14 pazienti con HFrEF il cui regime terapeutico, secondo le ultime linee guida, è stato implementato con il Vericiguat. In questi pazienti sono stati raccolti parametri clinici e sono state somministrate scale per la valutazione della qualità di vita e dell'aderenza alla terapia.

Risultati: Sono stati arruolati 14 pazienti con HFrEF, di genere maschile nel 78.6% dei casi, con un'età mediana di 74.5 anni e che hanno avuto un episodio di worsening. A 3 mesi è emerso un miglioramento significativo della classe NYHA (da III [IQR: 2;3] a II [IQR:2;2.5], p-value=0.021) e della Borg Scale (da 4 [IQR: 1;5] a 1 [IQR: 1;2.8], p value=0.02). Relativamente alla terapia, si è osservata una riduzione statisticamente significativa della dose dei diuretici dell'ansa somministrata (da 60 mg [IQR: 50; 175] a 32.5 mg [IQR: 25;93.4], p-value=0.04), mentre tra gli esami ematochimici non si sono osservate variazioni significative per la maggior parte dei parametri, compreso l'NT-proBNP che è rimasto stabile; dato, quest'ultimo, la cui rilevanza risiede nel fatto che, come da criteri di inclusione, si tratta di pazienti che hanno recentemente avuto un episodio di worsening.

Conclusioni: Lo studio suggerisce il potenziale impatto positivo del Vericiguat sullo scompenso cardiaco, in termini di riduzione significativa del dosaggio dei diuretici somministrati, miglioramento degli score clinici e stabilizzazione del valore di NT-pro BNP rilevabile.



SCOMPENSO CARDIACO 276
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

ELIGIBILITY FOR VERICIGUAT IN OUTPATIENTS WITH HEART FAILURE IN A REAL-WORLD SETTING: A NEW ACE IN THE HOLE?

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 (a) UNIVERSITA' DEGLI STUDI DI BARI "ALDO MORO"

Background: Vericiguat is a soluble guanylate cyclase (sGC) stimulator with a potential role in the therapeutic management of Heart Failure (HF), remodeling the critical NO-sGC-cGMP pathway, often impaired in this clinical syndrome. The phase III randomized VICTORIA trial pointed out a reduction of cardiovascular (CV) mortality and HF hospitalizations in patients treated with Vericiguat as compared to placebo. Thus, the latest European guidelines on HF, included this novel drug as a potential resource in the therapeutic scenario of HF in selected high-risk patients.

Purpose: the aim of this study was to evaluate the theoretical candidacy to Vericiguat in outpatients with chronic HF in a real-world setting according to eligibility criteria of the VICTORIA trial.

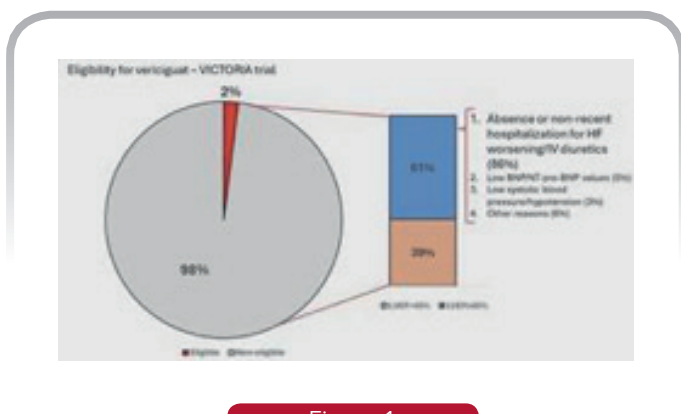


Figure 1

Methods: an observational, retrospective, monocentric study was conducted by the screening of 350

outpatients of our HF clinic in a tertiary referral hospital, from January 2023 to December 2023. For each patient, anamnestic, clinical, echocardiographic and laboratory data were retrieved. The identification of the theoretical candidacy for Vericiguat was performed independently by two cardiologists adequately trained in HF management. Any disagreement was resolved through discussion and consensus or adjudication from a third senior cardiologist.

Results: the mean age of our sample was 67 ± 12 years with a high prevalence of male sex (77% of cases). CV risk factors are well represented, in particular arterial hypertension and dyslipidaemia (66% and 63%, respectively). Approximately one-third of the population was obese. Chronic Kidney Failure (CKF) was a prevailing comorbidity (35% of cases). Of these, only a low percentage (1.4%) were on dialysis. Nearly one-third of cases (27%) had a recent hospitalization for heart failure (HHF) or intravenous (IV) infusion of diuretics. Regarding clinical evaluation, the majority of patients were in NYHA class II and III (80%) and in a relevant rate of cases were observed signs of vascular congestion (26%). Loop diuretics for symptom control were adopted in 70% of patients. Applying all the criteria of the VICTORIA trial to our population, it emerged that only a small percentage of individuals were eligible for Vericiguat (2% of patients). The most important reason for non-eligibility was the presence of a $LVEF \geq 45\%$. In those eligible for LVEF, a frequent cause (39%) of exclusion was the absence of a recent (<6 months) HHF or use of IV diuretics (<3 months).

In about 12% of cases was observed a HHF or the treatment with IV diuretics, although beyond the time limits set by the trial. Other important causes were the presence of BNP/NT-pro-BNP values below the cut-off adopted in the trial and the presence of low systolic blood pressure (3% and 2%, respectively).

Conclusions: in a real-world setting the rate of HF patients with a potential candidacy to Vericiguat seems low according to VICTORIA trial criteria. Further studies are needed to expand its prescription in a wider HF population. In the near future, the achievement of an optimized medical therapy with all the 5 pillars of HF therapy may not be only a utopia but a concrete reality.



SCOMPENSO CARDIACO 283
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
PROGNOSI (SCOMPENSO CARDIACO)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

OMECAMTIV MECARBIL: ONLY A METEOR OR A RISING STAR? A REAL WORLD ELEGIBILITY ANALYSIS

Alessio Falagario (a), Paolo Basile (a), Nicolò Amodio (a), Francesco Monitillo (a), Daniela Santoro (a), Maria Cristina Carella (a), Vincenzo Ezio Santobuono (a), Cinzia Forleo (a), Marco Matteo Ciccone (a), Andrea Igren Guaricci (a)
 (a) UNIVERSITA' DEGLI STUDI DI BARI "ALDO MORO"

Background: cardiac myosin activators are a recent class of myotropes that improve cardiac contractility. Omecamtiv mecarbil (OM) may have a potential role in the therapeutic management of Heart Failure (HF) by selectively binding to cardiac myosin, thus increasing the number of force generators that can bind to the actin filament and initiate a power stroke at the start of systole. The GALACTIC-HF study assessed its efficacy and safety in HFrEF in both the inpatient and outpatient settings.

Purpose: the aim of this study was to evaluate the theoretical candidacy to OM in outpatients with chronic HF in a real-world setting according to eligibility criteria of the GALACTIC-HF study.

Methods: an observational, retrospective, monocentric study was conducted by the screening of 350 outpatients of our HF clinic in a tertiary referral hospital, from January 2023 to December 2023. For each patient, anamnestic, clinical, echocardiographic

and laboratory data were retrieved. The identification of the theoretical candidacy for OM was performed independently by two cardiologists adequately trained in HF management. Any disagreement was resolved through discussion and consensus or adjudication from a third senior cardiologist.

Results: the mean age of our sample was 67 ± 12 years with a high prevalence of male sex (77% of cases). CV risk factors are well represented, in particular arterial hypertension and dyslipidaemia (66% and 63%, respectively). Approximately one-third of the population was obese. Chronic Kidney Failure (CKF) was a prevailing comorbidity (35% of cases). Of these, only a low percentage (1.4%) were on dialysis. Nearly one-third of cases (27%) had a recent hospitalization for HF or intravenous (IV) infusion of diuretics. Regarding clinical evaluation, the majority of patients were in NYHA class II and III (80%) and in a relevant rate of cases were observed signs of vascular congestion (26%). Loop diuretics for symptom control were adopted in 70% of patients. The eligibility for OM was assessed considering the inclusion and exclusion criteria of the GALACTIC HF trial. The percentage of patients eligible for this drug was low (4%). The most relevant cause, found in 67% of patients, was the presence of LVEF > 35%. Another important reason was the absence of HFrEF/IV diuretics, found in 17% of cases. In 6% of cases, they were beyond the time limits set by the trial. Other uncommon causes were the presence of BNP/NT-pro-BNP values below the cut-offs predicted and the presence of a non-optimized guidelines directed medical therapy (2% and 1% of cases, respectively).

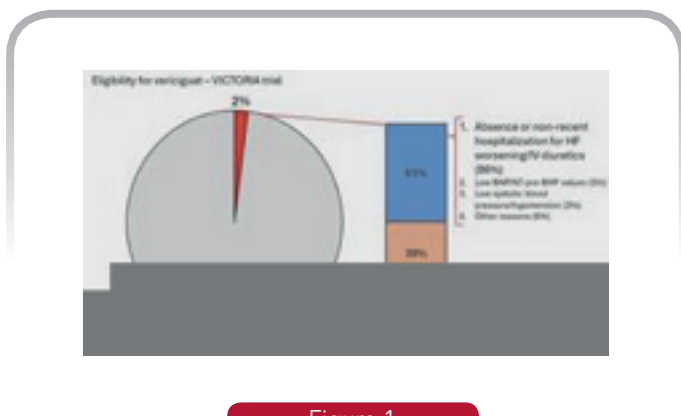


Figure 1

Conclusions: the identification of medicines that increase cardiac performance has been a goal of HF therapeutics for centuries. OM is a cardiac myosin activator, still not approved for use in clinical practice, capable to increase myocardial contractility binding the catalytic S1 domain of cardiac myosin. In this context, for the first time we provide data on potential eligible

patients for this drug.

In a real-world setting the percentage of HF out-patients with a potential candidacy to OM seems non-negligible according to GALACTIC-HF study criteria. However further studies may be able to make it prescribable in addition to standard therapy for HFrEF.



SCOMPENSO CARDIACO 793 FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

EFFETTI DEL VERICIGUAT NELLA CARDIOMIOPATIA DILATATIVA NON ISCHEMICA

Domenico Mario Giamundo (a), Weili Marco Xu (a), Valerio Malandrucolo (a), Lucy Barone (a), Domenico Sergi (a),
Massimo Marchei (a), Francesco Barillà (b)

(a) CARDIOLOGIA-POLICLINICO TOR VERGATA; (b) CATTEDRA DI CARDIOLOGIA-UNIVERSITA' DEGLI STUDI DI
ROMA TOR VERGATA

Introduzione: La cardiomiopatia dilatativa - tra le principali cause di scompenso cardiaco cronico. I pazienti affetti da insufficienza cardiaca con frazione di eiezione ridotta sono ad alto rischio di mortalit  e ospedalizzazione e presentano un elevato carico di sintomi che incidono sulla loro funzione e sulla loro qualit  di vita. Le ultime linee guida dell'ESC (European Society of Cardiology) sul trattamento dello scompenso cardiaco raccomandano di considerare (classe IIb) la terapia con vericiguat nei pazienti con scompenso cardiaco a frazione di eiezione ridotta in classe NYHA II-IV e con un recente episodio di riacutizzazione dello scompenso cardiaco nonostante una terapia con antagonisti del sistema renina-angiotensina, betabloccanti e antialdosteronici. In letteratura ci sono diversi studi che dimostrano che il vericiguat sia in grado di ridurre mortalit  e re-ospedalizzazioni nei pazienti con scompenso cardiaco cronico ma, ad oggi, non ci sono studi che correlano il vericiguat ad un miglioramento della funzione sistolica ventricolare sinistra.

Caso clinico: Paziente di 49 anni, affetto da ipertensione arteriosa e fibrillazione atriale parossistica in trattamento con Rivaroxaban. Non familiarit  per malattie cardiovascolari. A dicembre 2023 angina instabile (NYHA III) per cui eseguiva studio coronarografico documentante albero coronarico esente da stenosi angiograficamente significative. Durante la degenza eseguiva ecocardiogramma c/D documentante cardiomiopatia dilatativa ipocinetica (non nota in precedenza) e agli esami ematochimici il valore di NT-Pro-BNP era di 768 pg/ml.

Successivamente si sottoponeva a cine-RM cardiaca documentante cardiomiopatia a fenotipo dilatativo, FEVS ridotta (30%), LGE focale di tipo patchy con pattern non ischemico della parete infero-settale e con distribuzione intramurale di tipo mild-wall a livello medio-settale. Il paziente veniva dimesso con diagnosi di cardiomiopatia dilatativa ipocinetica e veniva ottimizzata terapia medica con sacubitril/valsartan 24/26 mg 1 cp/die, bisoprololo 3.75 mg 1 cp/die, empagliflozin 10 mg 1 cp/die, eplerenone 50 mg 1/4 cp/die e vericiguat 5 mg 1 cp/die. A Luglio 2024 nuova rivalutazione presso i nostri ambulatori cardiologici e all'ecocardiogramma c/D la FEVS risultava pari a circa il 48% (importante incremento dal 30% risalente al ricovero), il paziente riferiva un netto miglioramento della sintomatologia dispnoica (NYHA I-II) ed inoltre i livelli di NT-Pro-BNP erano dimezzati (364 pg/ml).

Conclusioni: Il caso clinico da noi riportato induce a ritenere che il trattamento con vericiguat, on top alla terapia con i famosi 4 pilastri solitamente utilizzati nei pazienti con scompenso cardiaco,   una terapia efficace che pu  essere associata anche in pazienti in terapia medica ottimale, che non hanno segni di riacutizzazione di malattia. Questa strategia terapeutica potrebbe essere presa in considerazione non solo per migliorare la sintomatologia e la prognosi nei pazienti con fasi di riacutizzazione della malattia, ma anche per un recupero della funzione sistolica ventricolare sinistra in pazienti con FE borderline e soprassedere temporaneamente all'impianto di defibrillatore (ICD) in prevenzione primaria.

SCOMPENSO CARDIACO 113

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

FARMACI CARDIOVASCOLARI

(FARMACI CARDIOVASCOLARI E NUTRACEUTICI)

FARMACI ANTI-DIABETICI (DIABETE E MALATTIE DEL METABOLISMO)

USE OF DAPAGLIFLOZIN FOR HEART FAILURE WITH REDUCED EJECTION FRACTION IN ITALIAN REAL-WORLD PRACTICE (EVOLUTION-HF ITALY)

Stefano Carugo (a), Pietro Ameri (b, c), Alice Damele (b), Andrea Di Lenarda (d), Giulia Ferrante (a), Massimo Iacoviello (e), Riccardo M. Inciardi (f), Ciro Indolfi (g), Andrea Mortara (h), Matteo Oldani (h), Stefania Paolillo (i), Eleonora Poletti (j), Rosanna Pugliese (e), Barbara Sposato (k), Andrea Ungar (j), Francesca Verga (j), Massimo Volpe (l), Maurizio Volterrani (k, m), Maurizio Ceracchi (n), Valentina Granelli (n), Francesca Pluchinotta (o), Daniela De Serio (o), Andrea Merlo (o), Nicola Cosentino (o), Francesca Mastromauro (p), Marco Gnesi (p), Giuseppe Rosano (k), Marco Metra (f), Pasquale Perrone Filardi (i)

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Background: Dapagliflozin, an inhibitor of the sodium-glucose cotransporter-2 (SGLT2i), is approved for the treatment of heart failure (HF). Following its adoption in the Italian clinical practice for the treatment of HF with reduced ejection fraction (HFrEF) in 2021, the study EVOLUTION-HF Italy was launched with the aim of exploring use of dapagliflozin in real-world patients; the study is part of a program involving studies in 13 European countries.

Purpose: The main goal of this study is to profile patients who begin treatment with dapagliflozin for HFrEF in Italy and to detail the patterns of their treatment. Additionally, the study aims to evaluate, as secondary outcome, the Kansas City Cardiomyopathy Questionnaire (KCCQ) to assess health-related quality of life, the Medication Adherence Report Scale 5

Items (MARS-5) to assess adherence to HF medication prescriptions, and the 6-Minutes Walking Test.

Methods: EVOLUTION-HF is an observational, longitudinal, descriptive study. Inclusion Criteria were: age ≥ 18 years old, no previous use of any SGLT2i, initiation of dapagliflozin according to the local approved HFrEF label (LVEF $< 40\%$). Patient affected by type 1 diabetes were excluded. Patients were enrolled between 14 and 45 days after dapagliflozin initiation (study index date). The follow-up period was scheduled up to 1 year, with data collection at three, six, and 12 months after index date.

Results: Between April 2022 and April 2023, 256 participants were enrolled in 11 Italian sites. Most participants were male (76.2%) and mean age was



68.5±11.5 years. The present abstract reports results of a planned midterm analysis (six months follow-up).

At baseline, 18.1% of participants had type 2 diabetes and 57.1% had arterial hypertension. Most participants were in NYHA class II (69.2%) and ischemic heart disease was the leading cause to HF (55.7% of patient). Almost a third of the patients (32.0%) was hospitalised for HF in the previous year. Of 236 patients with ECG data, 24.3% had atrial fibrillation.

Regarding pharmacological treatments for HF, 66.8% of patients were receiving the four guidelines directed medical treatments at baseline (ARNI or ARB or ACEi, BB, MRA, SGLT2i). Follow-up visits at Month 6 were completed by 211 patients. At 6 months, when compared with baseline, left ventricle ejection fraction

values were higher (32.3±6.2% versus 36.3±8.5%), and systolic pulmonary artery pressure was lower (35.2±10.4 mmHg vs 32.8±9.6 mmHg). Clinical status improved, as highlighted by the median KCCQ Total Symptom score increasing from 85.5 (IQR 29.5) to 92 (IQR 21). Patients were highly adherent to HF therapies (median MARS-5 score 25).

Conclusion: HFrEF patients showed clinical improvement and better quality of life after six months from dapagliflozin initiation. Follow-up is now concluded, and final data have the potential to describe outcomes in HFrEF patients treated with dapagliflozin in addition to other pharmacological treatments.

SCOMPENSO CARDIACO 413 FARMACI CARDIOVASCOLARI (FARMACI CARDIOVASCOLARI E NUTRACEUTICI) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

SHORT-TERM EFFECTS OF DAPAGLIFOZIN ON VENTILATORY EFFICIENCY DURING EXERCISE IN PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION

Lorenzo Guarino (a), Ilaria Cavallari (a), Andrea Segreti (a), Daniele Valente (a), Francesco Piccirillo (a), Gian Paolo Ussia (a), Francesco Grigioni (a)

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Background: SGLT-2 inhibitors are considered a pivotal therapy for heart failure (HF) across the entire spectrum of left ventricular ejection fraction (EF). However, little is known regarding the impact of SGLT-2 inhibitors on cardiopulmonary exercise testing (CPET) parameters, which is the gold-standard to evaluate functional capacity in HF.

Purpose: To evaluate the short-term effects of SGLT-2 inhibitors on ventilatory efficiency, functional capacity and quality of life in a population of patients with HF with reduced EF.

Methods: This observational study enrolled patients with HF with reduced EF able to perform moderate physical exercise. To be included in the study, patients were required to be on optimal guideline-directed triple therapy, if tolerated, stable for at least 4 weeks. Patients were evaluated at baseline and after 1 month of dapagliflozin administration. Baseline and follow-up visits included clinical evaluation, CPET and assessment of quality of life (Kansas City Cardiomyopathy Questionnaire [KCCQ]). Primary

outcome of the study was the impact of dapagliflozin on ventilatory efficiency, measured as the ventilation to carbon dioxide production (VE/VCO₂) slope, at 1 month. Secondary outcomes included the evaluation of the acute effects induced by dapagliflozin on peak oxygen consumption (pVO₂) and quality of life.

Results: A total of 20 patients with a mean age of 69.3±11.5 years and a median EF of 31% (IQR: 29;38) were enrolled. The median value of VE/VCO₂ slope at baseline was 37.6. After 1 month of treatment with dapagliflozin, there was a significant reduction in VE/VCO₂ slope (median of differences -1.4; 25:75% -5.4:0.3, p=0.0036). No differences were observed in peak VO₂ (p=0.43) and VO₂/WR (p=0.34). In addition, there was a significant improvement in KCCQ score (median of differences +9; 25:75% 0:15.8; p=0.0003).

Conclusions: In patients with stable HF with reduced EF, the addition of dapagliflozin on maximally tolerated guideline-directed medical therapy resulted in a short-term increase in ventilatory efficiency during exercise and improved quality of life.



SCOMPENSO CARDIACO 368
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

CARDIAC DEFORMATION ANALYSIS IN HEART FAILURE WITH MID-RANGE AND REDUCED EJECTION FRACTION: COMPARISON BETWEEN GENDERS

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Introduction: the incidence of heart failure (HF) with reduced ejection fraction (HFrEF) and with mildly reduced EF (HFmrEF) is globally lower in female patients worldwide and women are underrepresented in clinical trials. A deeper knowledge of possible gender differences in HF would be useful for a better management. Purpose: to evaluate left (LV) and right ventricular (RV) and left atrial (LA) longitudinal deformation by speckle tracking echocardiography

(STE) in a population of patients with HF and ejection fraction (EF) <50%, to describe possible gender differences.

Methods: we retrospectively enrolled patients from 7 different Italian centers, referred to high experience echocardiographic laboratories for stable chronic HF. We excluded patients with preserved LV ejection fraction, recent admission for acute HF, previous cardiac surgery, and absent informed consent. All patients underwent complete standard and advanced echocardiography, including STE-derived LV, RV and LA strain. Kolmogorov-Smirnov test was used to verify normal distribution of variables. Continuous variables were compared using the unpaired t test for normally distributed variables and the nonparametric Mann-Whitney U test for non-normally distributed variables.

Parameter	Male (n=407)	Female (n=237)	p
IVS (mm)	10.8±2.4	11.2±2.1	Ns
LV mass (g)	269.1±37.2	182.4±27.2	p<.001
LV EDD (mm)	63.1±10.0	56.4±10.4	p<.001
LV EF (%)	32.1±9.3	35.1±9.2	p<.001
LA volume (ml)	99.4±9.2	90.5±7.5	p=0.005
DT (msec)	177.4±39.5	175.8±37.2	Ns
E/a' ratio	13.0±6.0	12.9±6.0	Ns
RV EDD (mm)	33.9±6.3	31.1±6.9	p<.001
TAPSE (mm)	18.2±4.9	18.6±4.4	Ns
S' (cm/sec)	11.1±0.6	11.2±0.3	Ns
sPAP (mmHg)	35.7±12.5	34.0±11.6	Ns
Global PALS (%)	16.1±7.9	16.5±8.4	Ns
LV GLS (%)	-9.6±3.7	-9.9±3.3	Ns
Fw RVLS (%)	-18.2±6.2	-16.9±5.6	Ns

EF = ejection fraction; IVS = interventricular septum; Ns = not significant; LA = left atrial; LV = left ventricular; EDD = left ventricular end diastolic diameter; DT = peak atrial longitudinal strain; RV = right ventricular; sPAP = systolic pulmonary arterial pressure; TAPSE = tricuspid annular plane systolic excursion.

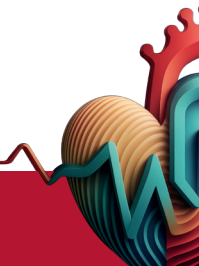
Figure 1

Results: a multicentric population of 644 patients (mean age 66.8±11.4, 237 female,

37%) was included in the study. The population had a globally severely reduced systolic function (mean LVEF $33.4 \pm 9.7\%$, mean LV global longitudinal strain (GLS) $-9.7 \pm 3.5\%$) with abnormal RV longitudinal deformation (mean free wall RVLS $-17.6 \pm 6.1\%$), increased pulmonary pressures (sPAP 35.1 ± 12.0 mmHg) and diastolic dysfunction (LA strain was $16.3 \pm 8\%$, mean E/e' ratio 12.2 ± 3.6). Analyzing the female population with HF (see Table), women had lower LV and RV mass and diameters. The LA was smaller, but they had similar diastolic indices compared to man. Interestingly,

deformation analysis revealed comparable LV, LA, and RV longitudinal strain in the two genders.

Conclusion: female HF population with rEF and mrEF has similar cardiac longitudinal dysfunction compared to men. It could be then credible to expect similar therapeutic response to HF drugs in the two genders. Further studies are needed to evaluate different echocardiographic prognostic parameters across gender in HFrEF and HFmrEF.



SCOMPENSO CARDIACO 362 FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

NIRS ANALYSIS OF PERIODIC BREATHING: UNREVEALING VENTILATION-PERFUSION DYNAMICS

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Table 1.

	n	Counterphase (n=13)	In-phase (n=7)	p	
Age (years)	13	68.8 ± 11.8	7	64.0 ± 10.4	0.334
Weight (kg)	13	74.4 ± 10.7	7	78.9 ± 14.0	0.433
Ischemic etiology (n, %)	13	7 (53%)	7	2 (29%)	
LVEF (%)	13	21.5 ± 4.4	6	16.2 ± 11.7	0.002
VTD (ml)	13	291 ± 69	6	225 ± 66	0.065
VTS (ml)	13	230 ± 61	6	150 ± 64	0.018
peak VO ₂ (ml/min/kg)	9	11.74 ± 2.80	7	12.77 ± 4.68	0.592
peak VO ₂ (% pred)	9	41.20 ± 10.20	7	45.30 ± 16.70	0.547
peak HR (bpm)	9	100.6 ± 11.9	7	97.6 ± 9.4	0.595
Peak Load (Watt)	9	72.11 ± 21.23	7	79.71 ± 41.21	0.638
VE/VCO ₂ slope	9	50.7 ± 14.0	7	52.4 ± 15.3	0.824
VE/VCO ₂ slope (%)	8	1.79 ± 39	7	1.99 ± 53	0.432
Creatinine (mg/dL)	13	1.27 [1.11-2.22]	7	1.07 [0.98-1.90]	0.832
Hemoglobin (mg/dL)	13	13.15 ± 2.75	7	14.39 ± 1.88	0.304
BNP (ng/mL)	11	1436 [738-33342]	7	231 [189-497]	0.008
MIRCI SCORE	9	0.33 [0.19-0.99]	6	0.08 [0.05-0.14]	0.050

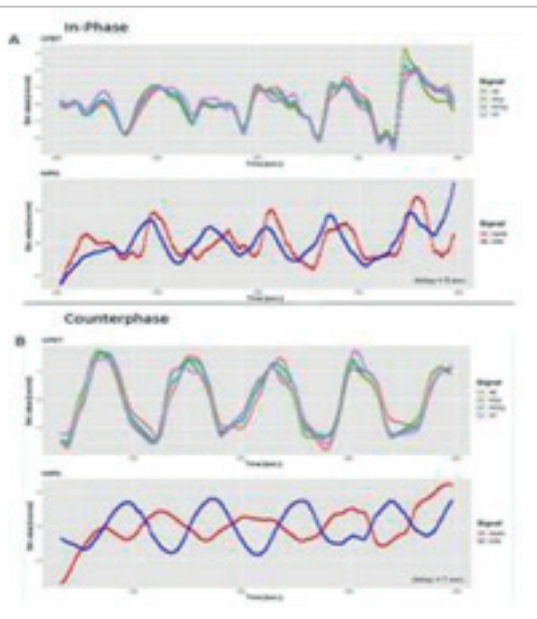


Figure 1

Background: Periodic breathing (PB) during exercise involves cyclic fluctuations in minute ventilation, oxygen uptake (VO₂), and carbon dioxide elimination (VCO₂). It may persist throughout exercise or only appear initially and is linked to poor prognosis in heart failure (HF) patients, especially when concurrent with sleep-related PB. The effect of PB on muscle oxygen availability is unknown. Near-infrared spectroscopy (NIRS) monitors changes in total, oxygenated, and deoxygenated hemoglobin concentration and has been used to assess muscle oxygenation in HF.

Methods: We enrolled HF patients with PB identified during hospitalization or ambulatory cardiopulmonary exercise testing (CPET). NIRS was performed 1-2 days after PB observation, measuring continuously and simultaneously ventilation, gas exchange, heart rate, O₂ saturation, and oxygenated/deoxygenated hemoglobin content in the quadriceps. Data from spirometers and NIRS were integrated.

Results: Of 28 enrolled patients, 4 were excluded for technical reasons and 4 for absence of PB during NIRS evaluation. The remaining 20 patients were all male, 67±11 years old, with an LVEF of 26±11%. Oscillations in respiratory gases were paralleled by oscillations in oxygenated (HbO₂) and deoxygenated hemoglobin (HHbO₂). In 13 patients (Figure 1, B), HbO₂ oscillated counterphase to HHbO₂, while in 7 patients (Figure 1, A), both traces oscillated concordantly, with total Hb almost constant. Table 1 shows differences between in-phase and counter-phase patients. Six of

the 13 counterphase patients died within 6 months, averaging 192 days survival, compared to 2 deaths in the concordant group.

Conclusions: Two distinct NIRS patterns were identified. Counterphase oscillations of HbO₂ and HHbO₂ may indicate ventilation/perfusion mismatch,

while concordant oscillations might suggest cardiac output-related periodicity. Counterphase patterns were associated with more severe clinical status. Further research is needed to understand the mechanisms and clinical implications of these patterns, potentially improving interventions and prognosis in HF patients.



SCOMPENSO CARDIACO 550 PROGNOSI (SCOMPENSO CARDIACO) BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

VARIABILI CLINICHE, EMATOCHIMICHE ED ECOCARDIOGRAFICHE ASSOCIATE A WORSENING HEART FAILURE

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Introduzione: L'insufficienza cardiaca (HF) è una delle principali sfide sanitarie mondiali, rappresentando il 10% dei ricoveri ospedalieri in pazienti sopra i 65 anni e avendo una prognosi del 50% circa a 5 anni. È quindi cruciale identificare i fattori prognostici che possono guidare le decisioni terapeutiche, oltre a individuare elementi chiave nel prevenire il fenomeno del worsening heart failure (WHF). Il WHF si riferisce all'aggravamento dei sintomi e dei segni in pazienti con HF già diagnosticata, nonostante la stabilità della terapia di base, che necessitano di una cura farmacologica intensificata.

Obiettivo: Questo studio mira a identificare nuovi parametri che possano prevedere e prevenire il WHF tra i pazienti ospedalizzati per HFrEF. Inoltre, l'obiettivo del lavoro è analizzare l'efficacia e la prevalenza della terapia farmacologica ottimizzata per HFrEF nella pratica clinica.

Materiali e metodi: È stato condotto uno studio osservazionale retrospettivo su un campione di 266 pazienti ricoverati per HFrEF presso le UOC di Cardiologia dell'Ospedale Santa Maria Goretti di Latina e dell'Ospedale ICOT di Latina, da Gennaio 2017 ad Aprile 2024. Sono stati esaminati parametri antropometrici, anamnestici, ematochimici, radiologici e la terapia farmacologica all'ingresso e alla dimissione.

È stata inoltre monitorata nel tempo la necessità di ricovero ospedaliero per riacutizzazione di HF in seguito alla dimissione.

Risultati: Lo studio ha coinvolto 266 pazienti affetti da HFrEF (FE $29 \pm 8\%$), con un'età media di 69 anni e una predominanza di sesso maschile (78%). Il 29% dei pazienti aveva un'anamnesi positiva per HF, di cui il 14% aveva già necessitato di un'ospedalizzazione. Il 13% dei pazienti ha necessitato di un successivo ricovero per HF nonostante la terapia farmacologica ottimizzata. Livelli maggiori di brain natriuretic peptide (BNP) all'ingresso, una minore FE e volumi ventricolari maggiori del ventricolo sinistro sono risultati significativamente correlati con ospedalizzazioni precedenti e successive per HF. Focalizzandoci sulla terapia della nostra popolazione, solo 3/266 pazienti beneficiavano all'ingresso di una terapia farmacologica ottimizzata con i quattro pilastri per HFrEF e 11/266 con tre pilastri su quattro. Infine, l'analisi di sopravvivenza di Kaplan-Meier ha mostrato una differenza significativa nei tassi di sopravvivenza dei pazienti trattati con 3 o 4 farmaci per HFrEF rispetto ai pazienti con terapia farmacologica minore.

Conclusioni: La terapia farmacologica ottimizzata per HFrEF non è comune nei pazienti affetti da tale sindrome. Questo comporta un aumento delle

ospedalizzazioni e della mortalità nella popolazione studiata. Risulta fondamentale quindi seguire i pazienti nel tempo, titolando al meglio la terapia, sfruttando le nuove evidenze a disposizione.

All'ingresso ospedaliero inoltre, livelli più alti di BNP, minore FE e aumentati volumi del ventricolo sinistro sono risultati correlati con un aumentato rischio di WHF, anche nel gruppo di pazienti con terapia farmacologica

ottimizzata. Risulta quindi fondamentale una stratificazione del rischio dei pazienti alla dimissione, che può essere guidata da questi parametri, per organizzare la tempistica delle visite di follow-up, che deve essere più stringente e attenta per i pazienti più fragili.



SCOMPENSO CARDIACO 510 ABLAZIONE TRANSCATETERE (ARITMIE) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) PROGNOSI (SCOMPENSO CARDIACO)

TREATMENT OF TACHYCARDIOMIOPATHIES: PROGNOSIS OF CATHETER ABLATION VS PHARMACOLOGICAL RHYTHM CONTROL

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Background: Tachycardiomyopathy (TCM) is an underestimated cause of reversible left ventricle dysfunction. In terms of treatment of the underlying arrhythmias, while it has been proven that a lower heart rate at discharge allows for fewer recurrences, rhythm control strategies include both pharmacological therapy and radiofrequency ablation, which is recommended in class IA by current guidelines. The aim of this study was to assess overall prognosis and survival rate of patients treated with RFA when compared to those treated with medical therapy.

Methods: Prospective observational study enrolling all patients admitted with a diagnosis of de novo acute HF with reduced EF between January 2012 and

2023. Patients with EF decline due to arrhythmia were suspected of TCM. Those showing improvement in at least one NYHA class and 5 points of LVEF during follow-up were diagnosed with TCM. Patients were further classified into pure or impure TCM based on the presence of underlying heart disease. The primary endpoint was overall survival in TCM patients treated with RFA compared to medical therapy. The secondary endpoint was time free from hospitalization.

Results: 201 patients were enrolled (34% female; mean age 68 ± 11 years) and followed up for a median of 5.5 years. Mean LVEF during the acute phase was $36 \pm 10\%$, and median NT-proBNP was 2476 ng/L (526-4919 ng/L). Overall, 135 patients (67%) had pure TCM out of which 71 (35%) underwent RFA (20% for atrial fibrillation, 14% for atrial flutter, 2% for frequent ventricular ectopic beats). RFA patients had better survival rates than those on pharmacological rhythm control (75% vs. 39% at 10 years, $p=0.01$). Similar results were found when taking into consideration those with "pure" subgroup (75% vs. 39% at 10 years, $p=0.04$). RFA showed a non-significant improvement in LVEF (+20% vs. +17%; $p=0.061$) and NT-proBNP (-1459 ng/l vs. -853 ng/l; $p=0.057$), when compared to rhythm control, while NYHA improvement was similar in both

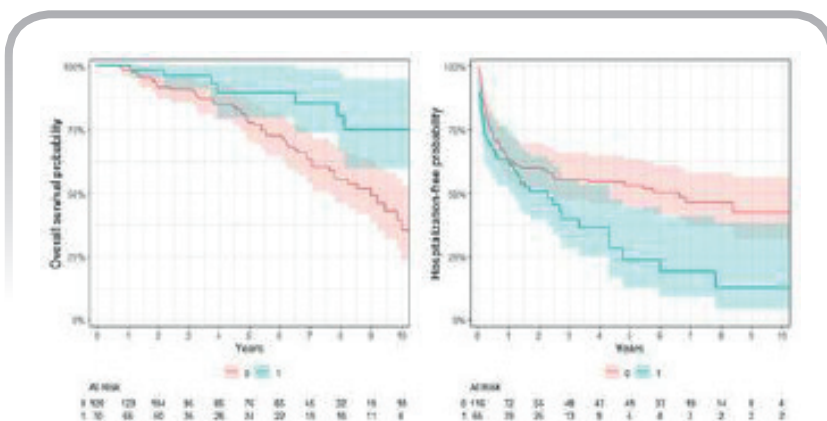
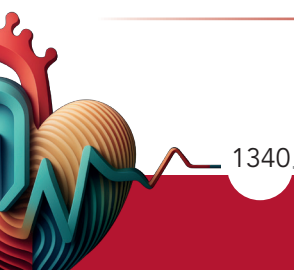
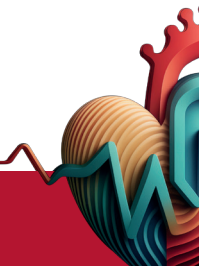


Figure 1



groups. Hospitalizations were higher in RFA patients (83% vs. 43%; $p=0.001$), mainly due to planned procedures, with unplanned hospitalizations similar between groups (32% vs. 29%; $p=NS$).

Conclusions: RFA is associated with an increased long-term survival over a 10 years follow-up when compared to pharmacological rhythm control. The association is confirmed in patients without coexistent structural heart disease (i.e., "pure" TCM).



**SCOMPENSO CARDIACO 541
 PROGNOSE (SCOMPENSO CARDIACO)
 INTELLIGENZA ARTIFICIALE (TELECARDIOLOGIA ED E-HEALTH)
 BIG DATA (TELECARDIOLOGIA ED E-HEALTH)**

USING GENETIC PROGRAMMING TO PREDICT WORSENING HEART FAILURE WITHOUT GROPING AROUND IN THE DARK

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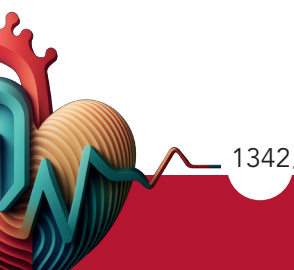
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Heart Failure (HF) poses a challenge for our health systems, and early detection of Worsening HF (WHF), defined as a deterioration in symptoms and clinical and instrumental signs of HF, is vital to improving prognosis. Predicting WHF in a phase that is currently undiagnosable by physicians would enable prompt treatment of such events in patients at a higher risk of WHF. Although the role of Artificial Intelligence in cardiovascular diseases is becoming part of clinical practice, physicians are often reluctant to make decisions based on unjustified results and see these models as black boxes.

Precisely, this study aims to develop a novel diagnostic model capable of predicting WHF while also providing an easy interpretation of the outcomes. We have created datasets by analyzing the registry of our HF Clinic, and collected the baseline clinical and echocardiographic data (first visit) of 519 HF patients who had or did not have WHF after 12 months.

We propose a threshold-based binary classifier built

on a mathematical model derived from the Genetic Programming approach. This model clearly indicates that WHF is closely linked to creatinine, PAP, and CAD, even though the relationship of these variables and WHF is almost complex. However, the proposed mathematical model allows for providing a 3D graphical representation, which medical staff can use to better understand the clinical situation of patients. Experiments have demonstrated the effectiveness of our model, surpassing even the most prominent Machine Learning-based algorithms. Indeed, the proposed GP-based classifier achieved a 96% average score for all considered evaluation metrics and fully supported the controls of medical staff. This is the first mathematical model that analyzes WHF as codified by the latest guidelines. Our solution has the potential to impact clinical practice for HF by identifying patients at high risk of WHF and facilitating more rapid diagnosis, targeted treatment, and a reduction in hospitalizations.



SCOMPENSO CARDIACO 614 DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO) PROGNOSI (SCOMPENSO CARDIACO)

AWARENESS ON CARDIAC AMYLOIDOSIS AMONG GENERAL PRACTITIONERS

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Background: Recent studies have indicated a rising incidence of cardiac amyloidosis (CA) due to the progressive aging of the population, improvement of diagnostic capabilities, and increased disease awareness. Studies on CA awareness have been conducted among cardiologists, internal medicine specialists, and geriatricians, and have identified major gaps in physician knowledge about the epidemiology, clinical presentation, referral and treatment of CA. Considering that general practitioners (GPs) are often gatekeepers for the generation of clinical suspicion, they may prompt timely initiation of diagnostic work-up. However, little is known about the involvement of GPs and how they tackle CA.

Aim: This study aims to investigate the awareness of the epidemiology, red flags, clinical presentation, referral, treatment, and follow-up of cardiac amyloidosis among GPs.

Methods: Semi-structured interviews will be conducted through video conferencing and audio-recorded with GPs currently practicing in various healthcare settings

in Italy, recruited through professional networks. An interview guide has been developed consisting of open-ended questions designed to elicit in-depth responses. Key topics are articulated in 18 open-ended questions. Interviews will be transcribed verbatim and analyzed using thematic analysis using the six steps model of Braun and Clarke. .

Expected Findings: With this project we intend to assess the awareness of CA among GPs, identify knowledge gaps on epidemiology, red flags, clinical presentation, referral, current pathways, treatment, and follow-up of CA and identify the role of GPs in patients' management and knowledge needs, to improve early diagnosis and quality of care. This study could also represent the basis for the larger national study, supporting the creation of an inter-regional consortium for the study of cardiac amyloidosis and including GPs into multidisciplinary teams. Once the results will be fully finalized, reflections on the educational needs of GPs towards amyloidosis will be needed to set up tailored interventions.



SCOMPENSO CARDIACO 179
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
ECOSTRESS (IMAGING CARDIOVASCOLARE)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)
PROGNOSI (SCOMPENSO CARDIACO)

EXERCISE RIGHT VENTRICULAR TO PULMONARY CIRCULATION UNCOUPLING AND NT-PROBNP LEVELS CORRELATIONS IN HEART FAILURE

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Aim: Right ventricle to pulmonary circulation (RV-Pc) uncoupling represents a mainstay in staging progression of heart failure (HF), being an independent predictor of mortality. In addition, N-terminal pro-B-type natriuretic peptide (NT-pro-BNP) is a well-established diagnostic and prognostic serum biomarker. In lack of clear clinical evidences on the relationship between exercise levels of NT-proBNP and RV-Pc uncoupling, this represents the aim of our investigation.

Methods and results: A cohort of 13 HF stable patients (mean age 71.6 ± 8.1 ; 48% female, mean left ventricular ejection fraction $57 \pm 13\%$) underwent maximal exercise

stress echocardiographic and cardiopulmonary exercise testing (iCPET) with RV 3D-imaging analysis and were compared with a control population. Natriuretic peptides levels were obtained at rest and peak exercise. RV-Pc coupling was addressed by using the length-force relationship TAPSE/PASP ratio (tricuspid annular plane systolic/excursion pulmonary arterial systolic pressure). As expected, HF patients exhibited a higher level of NT-pro-BNP compared to controls (mean 831 ng/ml vs 131 ng/ml, at rest; mean 793.3 vs 138 ng/ml at peak). In HF, TAPSE/PASP at peak exercise decreased compared to rest (0.73 ± 0.19 vs 0.47 ± 0.15 respectively) with an inverse correlation between NT-pro-BNP and TAPSE/PASP exercise ($r=0.60$, $p<0.01$). See figure.

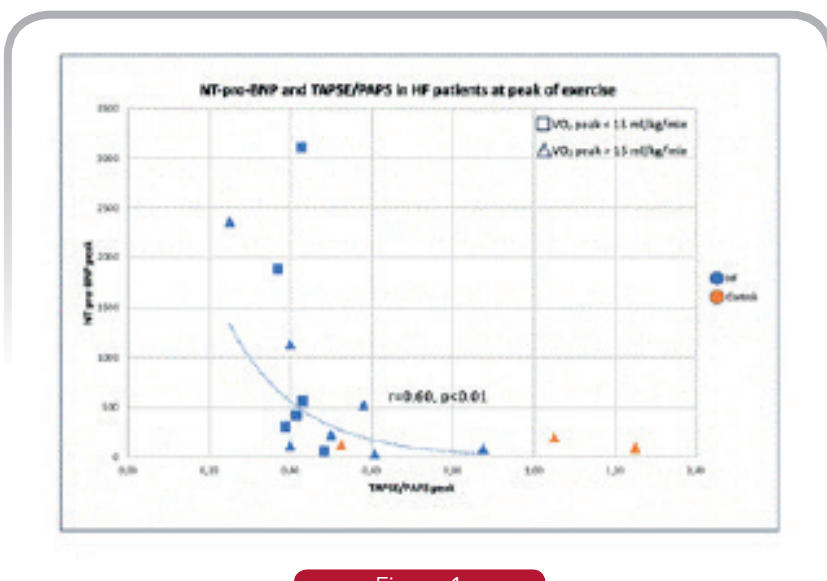
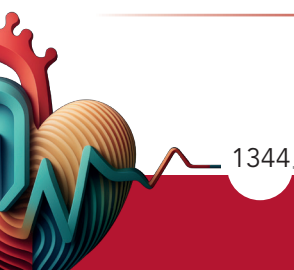


Figure 1

Conclusion: Our investigation demonstrates a parallel trend between peak TAPSE/PASP and peak NT-pro-BNP. These findings suggest that natriuretic peptide may serve as a surrogate of underlying RV to Pc uncoupling and the right heart plays a crucial role in the biomarker activity during maximal exercise in advanced HF.



SCOMPENSO CARDIACO 225

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

PROGNOSI (SCOMPENSO CARDIACO)

FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

RUOLO DEL VERICIGUAT NELLA FISIOPATOLOGIA CARDIOPOLMONARE DELL'INSUFFICIENZA CARDIACA: VALUTAZIONE DEI PARAMETRI ECOCARDIOGRAFICI A TRE MESI

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Introduzione: Lo scompenso cardiaco rappresenta una delle principali cause di morbidità e mortalità a livello globale, con significative implicazioni per la qualità della vita dei pazienti. Nonostante i progressi terapeutici, la gestione dei pazienti con scompenso cardiaco rimane una sfida clinica, soprattutto per coloro che sperimentano frequenti episodi di riacutizzazione. In questo contesto, il Vericiguat ha mostrato potenziali benefici nel migliorare gli esiti clinici dei pazienti con scompenso cardiaco a frazione di eiezione ridotta (HFrEF) che sperimentano un episodio di "worsening".

Obiettivo dello studio: L'obiettivo principale del presente studio è quello di valutare l'impatto fisiopatologico cardiopolmonare del Vericiguat in pazienti affetti da scompenso cardiaco con frazione di eiezione ridotta (HFrEF) dopo un episodio di "worsening". Questa valutazione viene effettuata monitorando l'andamento dei parametri di funzione ventricolare e atriale attraverso l'ecocardiografia transtoracica, a 3 mesi dall'inizio della terapia con Vericiguat. Lo studio si proponeva, inoltre, di valutare la correlazione tra le variazioni delle concentrazioni dei biomarcatori dell'HF e l'eventuale miglioramento ecocardiografico della funzione cardiaca dopo l'aggiunta del farmaco.

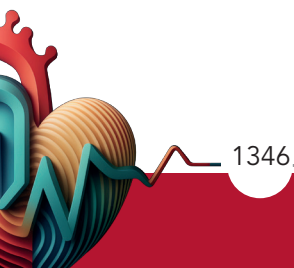
Materiali e metodi: Lo studio ha valutato una popolazione di pazienti affetti da HFrEF a cui è stata introdotta terapia con Vericiguat secondo le ultime linee guida. I pazienti sono stati sottoposti a una valutazione basale al T0, in cui è stato introdotto il Vericiguat, e a un controllo a 3 mesi: in entrambe le visite i pazienti sono stati sottoposti a studio ecocardiografico (dimensioni di ventricolo sinistro e ventricolo destro, spessore di parete, funzione sistolica globale e regionale, indici di funzione diastolica, presenza e grado di malattie valvolari) e sono stati raccolti i dati riguardanti i parametri biochimici, in particolare l'NT-proBNP.

Risultati: Sono stati arruolati 14 pazienti con HFrEF che hanno avuto un episodio di "worsening", di genere maschile nel 78.6%, con un'età mediana di 74.5 anni. A 3 mesi sono stati osservati cambiamenti significativi per il GVT (da 45 mmHg [IQR: 30;51] a 22 mmHg [IQR: 15;39], p-value=0.03), per la PAPs (da 45 mmHg [IQR: 37;49.8] a 25 mmHg [IQR: 21.5;46], p-value=0.04) e per il rapporto E/e' (15 [IQR: 5.8;18.5] a 10 [IQR: 6;18], p-value=0.04). Per quanto riguarda i parametri biochimici non ci sono state variazioni significative nei valori dell'NT-proBNP.



Conclusioni: Lo studio suggerisce che nei pazienti con HFrEF che abbiano avuto un episodio di worsening, l'aggiunta alla terapia ottimizzata del Vericiguat ha un impatto clinico positivo, dal punto di vista cardiorespiratorio, migliorando a 3 mesi di follow-

up la PAPs, il GTT e il rapporto E/e'. La mancata variazione significativa nei livelli di NT-proBNP nel corso del follow-up suggerisce che il Vericiguat ha effetti benefici indipendentemente dai livelli dell'NT-proBNP.



SCOMPENSO CARDIACO 834 TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) ELETTROSTIMOLAZIONE (ARITMIE)

HOME MONITORING AS A NEW TOOL TO PREVENT HEART FAILURE WORSENING: OUR EXPERIENCE WITH TRIAGEHF

Sofia Del Gigante (a), Chiara Carabotta (a), Lucy Barone (a), Domenico Sergi (a), Francesco Barillà (a)
(a) POLICLINICO TOR VERGATA

Introduction: Heart failure (HF) is a serious cardiovascular condition and the leading cause of hospitalization among patients over 65 years old. In Italy, approximately 1 million people are currently affected by heart failure, contributing to healthcare costs that account for up to 2.4% of the entire national budget. The mortality rate for heart failure is alarmingly high, with 50% of patients dying within five years from diagnosis. Moreover, the global prevalence of heart failure is projected to increase by about 46% by 2030. Therefore, early diagnosis, enabling outpatient management, could significantly reduce morbidity, mortality, and healthcare costs. New diagnostic tools have been developed in the last few years, in the attempt to expand home monitoring usage and improve HF management. TriageHF is a multiparametric algorithm that can predict heart failure worsening in the following 30 days, giving us the opportunity to change HF course if supported by a codified path that provides an early medical contact and a clinical evaluation if needed.

Aim: The aim of this preliminary analysis is to characterize our population to improve the management of patients with heart failure in a time and cost effective way.

Method: In our hospital, patients with ICD and CRT devices are subjected to ambulatory follow-up every six months. Some of them also have remote monitoring that allows us to check battery status, device

dysfunction or a clinical event mandating an ambulatory visit such as new onset atrial fibrillation or ventricular sustained arrhythmias. TriageHF is an integrated diagnostic algorithm that provides an overall heart failure risk assessment combining the information from multiple device parameters (Optivol fluid index, patient activity, AT/AF burden, ventricular rate during AT/AF, night ventricular rate, heart rate variability, ventricular pacing percentage, treated VT/VF, shocks). The risk assessment analyzes the diagnostic data from the previous 30 days to calculate the probability of a heart failure event in the next 30 days. The high-risk group had a 10x increase of hospitalization in 30-day follow-up compared to low-risk patients. We have collected data from patients with ICD and CRTD with TriageHF

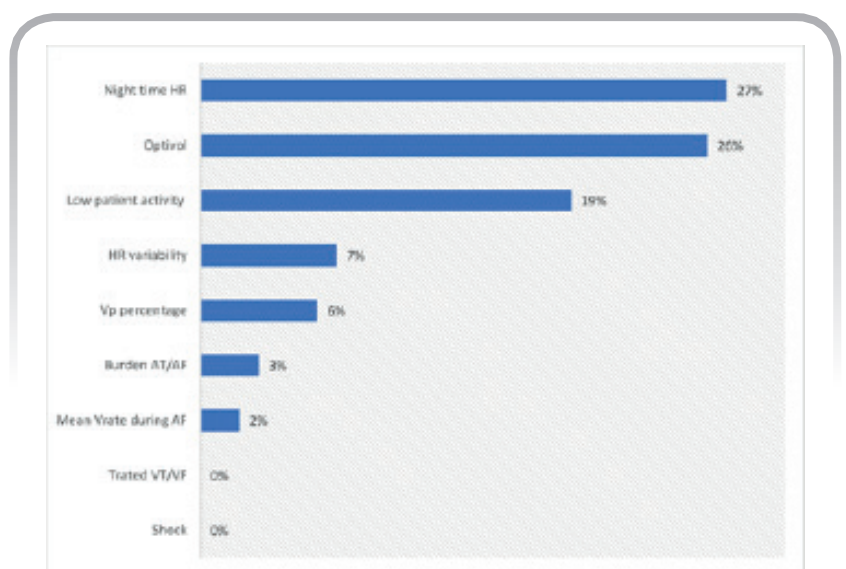


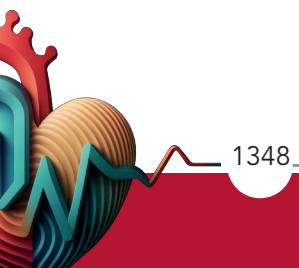
Figure 1



algorithm in a six month period from Medtronic home monitoring online platform.

Results: We had transmissions from 42 patients, 7 women (16,6%) and 35 men (83,3%) with an average age of 74,3 y. The total number of transmissions received was 211, TriageHF indicates low risk of Heart failure in 83 (39,3%), medium risk in 95 (45,0%), high risk in 31 (14,7%). In 2 transmissions Triage HF algorithm wasn't available. In total 8 patients (19,0%) had high risk transmissions during follow up, thus identifying a frailer segment of our population. Among the nine parameters included in the TriageHF algorithm some of them were over threshold more frequently than others as seen in the chart below.

Conclusions: This technology has allowed us to identify critical patients who have shown in a six month follow up a greater number of Triage HF high risk alerts. Those patients need further evaluation to establish whether their propensity in HF worsening is related to modifiable factors such as poor therapeutic adherence or wrong lifestyle that could benefit from a health education intervention, or if possible, a therapeutic enhancement. Otherwise the early identification of HF progression, prior to any clinical evidence, can still prevent hospitalizations and reduce morbidity and mortality. Given these promising data our purpose is to increase the number of patients with home monitoring in the near future and validate a protocol to manage them.



SCOMPENSO CARDIACO 307

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) DIABETE E MALATTIE CARDIOVASCOLARI (DIABETE E MALATTIE DEL METABOLISMO)

COME SI MODIFICANO I PARAMETRI ECOCARDIOGRAFICI NELL'OBESITA'? REGISTRO TOSCO UMBRO DI UN FATTORE DI RISCHIO INDIPENDENTE DI MALATTIA CARDIOVASCOLARE

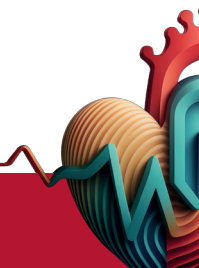
Marta Focardi (a), Giuseppe Vergaro (c), Francesco Cappelli (d), Giulia Elena Mandoli (a), Alberto Giannoni (c), Erberto Carluccio (e), Riccardo Liga (b), Michele Emdin (c), Matteo Cameli (a), Carlo Di Mario (d)

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Background e razionale: L'obesità rappresenta ad oggi un problema di rilevanza mondiale; infatti, è una condizione invalidante, non solo dal punto di vista fisico ma anche psicologico. Secondo l'Organizzazione Mondiale della Sanità la prevalenza dell'obesità nei soggetti adulti a livello mondiale è quasi raddoppiata rispetto al 1990 e triplicata rispetto al 1975. Nel 2022 il numero totale di soggetti con età superiore a 18 anni ammontava a 2.2 miliardi, circa il 43% della popolazione adulta mondiale a fronte del 25% della popolazione adulta mondiale riscontrata nel 1990. L'aumento di peso non è soltanto un fattore socialmente debilitante, ma rappresenta un fattore di rischio di morte ed è chiaramente correlato a patologie quali l'ipertensione arteriosa, il diabete ed il cancro. E' stato dimostrato che l'obesità rappresenta un fattore di rischio indipendente di ipertrofia ventricolare, malattia coronarica e scompenso cardiaco. A livello cardiaco gli effetti di tale patologia si manifestano sia come conseguenze del sovraccarico volumetrico che come conseguenza di alterazioni proprie del miocardio: fattori ormonali ed alti livelli di insulina possono essere responsabili dell'ipertrofia ventricolare sinistra. Diversi studi hanno dimostrato la presenza disfunzione sistolica e diastolica in soggetti obesi e come la riduzione del peso possa

portare ad un miglioramento di tali parametri. Gli studi condotti fino ad ora si sono basati su metodiche ecocardiografiche standard per l'analisi della funzione sistolica e diastolica del ventricolo sinistro. L'utilizzo di metodiche ecocardiografiche più innovative come la Speckle Tracking Echocardiography (STE) potrebbe fornire dati più precisi e riproducibili sulla funzione ventricolare ed atriale sinistra.

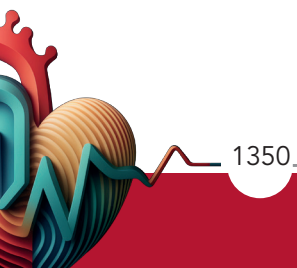
Scopo dello studio: Lo scopo dello studio è di creare un registro di variabili cliniche, di laboratorio e di imaging ecocardiografico di pazienti obesi che si recano presso gli ambulatori cardiologici dei principali Ospedali dell'area Tosco-Umbra; tali pazienti verranno valutati con parametri clinici (con attenta valutazione dei fattori di rischio e della qualità della vita ed attività fisica), dati di laboratorio (compreso dosaggio NT-proBNP), ECG, ed ecocardiografia standard ed avanzata sia al basale che dopo riduzione del peso corporeo ottenuto con terapia dietetica, farmacologica o chirurgica a seconda del percorso stabilito per ogni soggetto. Nei pazienti con età > 45 anni (e con ulteriori fattori di rischio cardiovascolare) verrà eseguita TC coronarica per escludere ATS coronarica significativa ed in un sottogruppo di paziente verrà eseguita una valutazione con polisinnografia.



Disegno dello studio: Il presente è uno studio osservazionale (retrospettivo e) prospettico multicentrico di natura non interventistica con finalità no-profit.

Materiali e Metodi: Verranno arruolati pazienti affetti da obesità (BMI >30 kg/m²) che si presentano presso gli ambulatori Cardiologici dei principali Ospedali dell'area Tosco-Umbra; i soggetti verranno sottoposti a visita cardiologica basale, esame elettrocardiografico ed ecocardiografico standard ed avanzata al basale e con follow up a 3,6 e 12 mesi.

Risultati attesi: grazie a questo registro sarà possibile avere un database di parametri clinici, di laboratorio e di imaging dei soggetti obesi che afferiscono agli ambulatori dei principali centri delle regioni Toscana ed Umbria e quindi evidenziare le caratteristiche di questa popolazione che risulta soggetta a sviluppare scompenso cardiaco, malattia coronarica, ipertensione arteriosa e diabete mellito sia al basale che dopo riduzione del peso corporeo.



**SCOMPENSO CARDIACO 584
PROGNOSI (SCOMPENSO CARDIACO)
DEFIBRILLATORE IMPIANTABILE (ARITMIE)
CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
GENETICA CARDIOVASCOLARE (GENETICA E BIOLOGIA MOLECOLARE)**

**MYOCLONIC EPILEPSY WITH RAGGED RED FIBERS CARDIOMYOPATHY: A CASE REPORT AND MINI-REVIEW
OF LITERATURE**

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(a) HUMANITAS UNIVERSITY

Background: Myoclonic Epilepsy with Ragged Red Fibers (MERRF) is a rare mitochondrial disease that can affect various organs, including the heart. We present a case report and mini-review of the literature with the aim of exploring the progression of cardiac involvement in patients with MERRF.

Case Presentation: A 65-year-old male with a history of MERRF, first diagnosed at age 55 with interventricular septum hypertrophy, presented with acute heart failure. The patient's clinical course over ten years demonstrated a transition from a hypertrophic to a dilated cardiomyopathy phenotype, contrasting earlier findings suggesting rapid progression in younger patients. Despite optimized heart failure therapy, the patient experienced a progressive decline in ventricular function with frequent ventricular arrhythmias, ultimately

requiring implantable cardioverter-defibrillator (ICD) placement.

Discussion: This case supports the hypothesis that MERRF-related cardiac involvement may progress more slowly when onset occurs later in life, leading to a gradual transition from hypertrophic to dilated cardiomyopathy. An accurate cardiac diagnostic workup is essential for early detection and timely intervention in such patients.

Conclusion: The natural history of cardiac involvement in MERRF can vary significantly based on the age of onset, highlighting the importance of personalized diagnostic and therapeutic approaches in managing this rare mitochondrial disorder.



SCOMPENSO CARDIACO 551 DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO) EMBOLIA POLMONARE (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE) FISIOPATOLOGIA DELL'IPERTENSIONE ARTERIOSA (IPERTENSIONE ARTERIOSA)

SCOMPENSO CARDIACO ED EMBOLIA POLMONARE IN UNA GIOVANE DONNA: UN INSOLITO INTRECCIO DIAGNOSTICO

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PADOVA, ITALIA

Introduzione: A differenza della popolazione anziana, i giovani sviluppano solitamente scompenso cardiaco (SC) per cause non ischemiche. Sebbene lo SC rappresenti un importante fattore di rischio per l'embolia polmonare (EP) negli anziani, non è una causa comune nei pazienti più giovani. Di seguito riportiamo un caso raro di una giovane donna con una presentazione contemporanea di SC e EP.

Riassunto del caso: Una donna di 24 anni, con anamnesi muta e recente viaggio in Egitto, si è presentata al pronto soccorso con severa dispnea. L'ecocardiografia transtoracica ha mostrato una severa disfunzione e dilatazione biventricolare, mentre la tomografia computerizzata (CT) ha rivelato un'EP bilaterale. La risonanza magnetica cardiaca ha confermato la severa

disfunzione e dilatazione dei ventricoli, mostrando minimi segni di fibrosi subepicardica in assenza di edema. La paziente è stata sottoposta a biopsia e coronarografia, entrambe negative. Anche lo screening della coagulazione è risultato negativo. A causa di valori pressori moderatamente elevati nonostante la terapia per lo scompenso e per meglio inquadrare una massa surrenalica riscontrata in un'ecografia addominale eseguita per rialzo degli enzimi epatici, la paziente è stata sottoposta a CT addominale. La CT ha confermato la presenza della massa, ponendo il sospetto di feocromocitoma. Questa diagnosi è stata supportata da aumentati livelli urinari di normetanefrina e noradrenalina e caratteristiche morfologiche e di segnale suggestive alla risonanza magnetica. La paziente è stata quindi sottoposta a surrenectomia. Un ecocardiogramma di controllo a un mese dall'intervento ha evidenziato la normalizzazione della funzione biventricolare, consentendo il decalage e la sospensione della terapia per lo scompenso.

Discussione: Il feocromocitoma, rilasciando un eccesso di catecolamine, causa alterazioni nella struttura e nella funzione del miocardio. La patogenesi coinvolge uno squilibrio tra l'offerta e la richiesta di

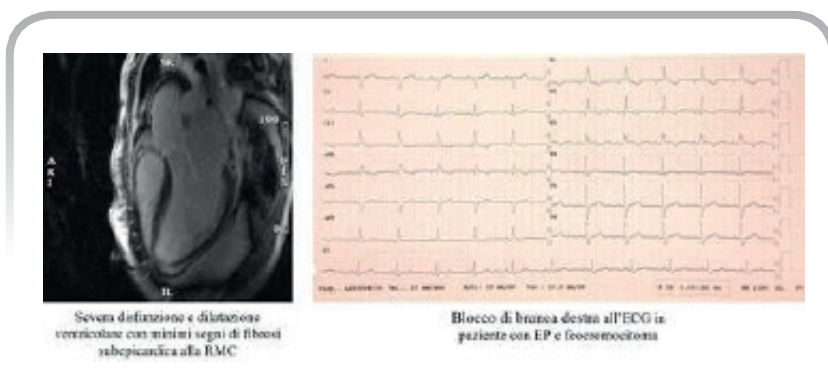


Figure 1

ossigeno dovuto a tachicardia, aumentato inotropismo e vasospasmo catecolamino-indotto, e causa inoltre un effetto tossico miocardico diretto. Il feocromocitoma si associa, anche se raramente, a trombosi venose per

induzione di uno stato ipercoagulativo, il che potrebbe spiegare la comparsa di EP in una paziente altrimenti priva di fattori di rischio.



SCOMPENSO CARDIACO 928 TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

LA SINDROME DA ANTICORPI ANTIFOSFOLIPIDI (APS) E LA TROMBOSI ENDOVENTRICOLARE IN UN PAZIENTE CON INSUFFICIENZA CARDIACA A RIDOTTA FRAZIONE D'EIEZIONE (HFREF): LA COMPLESSA GESTIONE TERAPEUTICA NELLA PRATICA CLINICA

Antonio Lattanzio (a), Claudia Cestie' (a), Giovanna Manzi (a), Viviana Maestrini (a), Paolo Severino (a), Carmine Dario Vizza (a)

(a) DIPARTIMENTO DI SCIENZE CLINICHE INTERNISTICHE, ANESTESIOLOGICHE E CARDIOVASCOLARI - UNIVERSITA' DEGLI STUDI DI ROMA - LA SAPIENZA

La gestione dell'insufficienza cardiaca (HF) sta diventando sempre più complessa nella pratica clinica, soprattutto per le comorbidità che frequentemente complicano il quadro clinico dei pazienti. È così che il trattamento di un paziente con cardiomiopatia dilatativa ipocinetica a frazione di eiezione severamente ridotta e riscontro di formazioni trombotiche biventricolari può porre il clinico in grossa difficoltà se, ad arricchire il bagaglio anamnestico del paziente, c'è la sindrome da anticorpi antifosfolipidi (APS). Vi presentiamo a tal proposito il caso di un uomo di 58 anni, ricoverato per riacutizzazione di HFrEF. All'ingresso, l'ECG documentava fibrillazione atriale già nota in anamnesi per cui il paziente, con anche diagnosi di APS, era in terapia con warfarin. L'ecocardiogramma mostrava, per altro, in aggiunta al quadro noto di cardiopatia ipocinetico-dilatativa, un'immagine di plus iperecogena, flottante, adesa all'elettrocattetero ventricolare destro e un'ulteriore immagine di plus iperecogena, stratificata,

a livello dell'apice del ventricolo sinistro: si decideva pertanto di effettuare terapia anticoagulante. Al follow-up effettuato a distanza di un mese, l'esame ecocardiografico documentava la presenza di un'ulteriore formazione trombotica in sede apicale ventricolare sinistra, flottante e pedunculata. Quale strategia terapeutica migliore dovrebbe adottare il clinico di fronte ad un caso così complesso? Ripetere la somministrazione di eparina, considerare l'intervento cardiocirurgico o pensare ad effettuare uno switch a NAO?

In conclusione, il nostro caso mostra come la gestione ottimale dell'insufficienza cardiaca possa rendersi complessa in presenza di altri fattori inerenti la sindrome stessa, o di altra natura, quali comorbidità o sociali. Questo suggerisce che, in questi casi selezionati, dovrebbe essere considerato un approccio di follow-up serrato e multidisciplinare alla malattia.



SCOMPENSO CARDIACO 806 TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) PROGNOSI (SCOMPENSO CARDIACO)

TOLERABILITY AND HEMODYNAMIC IMPACT OF SACUBITRIL/VALSARTAN IN PATIENTS WITH LEFT VENTRICULAR ASSIST DEVICES: INSIGHTS FROM A SINGLE-CENTER STUDY IN ITALY

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(a) SAN RAFFAELE UNIVERSITY HOSPITAL, MILAN, ITALY

Background: Recent guidelines recommend sacubitril/valsartan (S/V) for HFrEF patients, but data on its use in LVAD patients are limited.

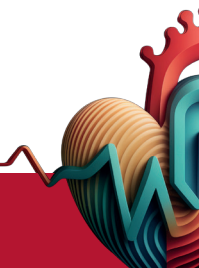
Aims: This study assessed the tolerability of S/V in LVAD patients and its effects on hemodynamics.

Methods: We reviewed LVAD patients at our center from 2016 to 2022, identifying those prescribed S/V. We evaluated the timing and duration of S/V therapy over a 24-month follow-up (FUP) and clinical, hemodynamic, and laboratory parameters at initiation and discontinuation of therapy. We compared these variables between patients who discontinued S/V (Group 1) and those who continued therapy (Group 2) at the 24-month FUP.

Results: Of 56 LVAD patients, 7 (12.5%), all male with a mean age of 68.7 ± 4.2 years and 71.4% with ischemic heart disease, were prescribed S/V. Its initiation occurred at various times post-LVAD implantation: 1 patient (14.2%) at discharge, 1 (14.2%) at 15 months, 1 (14.2%) at 21 months, 3 (42.8%) at 24 months, and 1 (14.2%) at 52 months. Initial hemodynamic parameters were as follows: MAP 76 ± 8.4 mmHg, creatinine 1.9 ± 0.54 mg/dL, NT-proBNP 1466 ± 948 pg/mL, TAPSE 13.3 ± 4.31

mm, PAPs 29 ± 4 mmHg, CVP 6 ± 2 mmHg. Concurrent medications included beta-blockers (71.4%), MRAs (42.8%), diuretics (85.7%), and sildenafil (71.4%); no patients were on SGLT2 inhibitors. Mean S/V treatment duration was 14 ± 11 months. Three patients (42.8%) discontinued treatment before the 24-month FUP (Group 1), while 4 (57.1%) continued therapy (Group 2). In Group 1, creatinine and PAPs were significantly higher at discontinuation compared to start values ($p=0.030$, $p=0.02$). In Group 2, clinical variables did not significantly change at 24-month FUP (overall $p>0.05$). At S/V initiation, there were no significant differences between groups in MAP, creatinine, NT-proBNP, TAPSE, PAPs, CVP, or concurrent medications (overall $p>0.5$), except for higher age in the discontinuation group ($p=0.002$). At the last FUP, patients who discontinued S/V had significantly higher creatinine ($p=0.001$) and a trend towards lower MAP ($p=0.079$) compared to those who continued therapy.

Conclusions: S/V was primarily initiated several months post-LVAD implantation in hemodynamically stable patients. Some did not tolerate prolonged administration, mainly due to worsening renal function. The discontinuation group was significantly older at treatment start compared to the continuation group.



SCOMPENSO CARDIACO 952
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

HEART FAILURE WITH PRESERVED AND MILD REDUCED EJECTION FRACTION: A SINGLE CENTER EXPERIENCE

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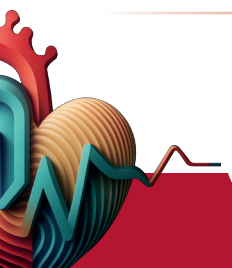
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Heart failure (HF) with preserved ejection fraction (HFpEF) and mildly reduced ejection fraction (HFmrEF) present unique challenges in diagnosis and management. Understanding the clinical characteristics and outcomes of patients with these forms of heart failure is crucial for improving treatment strategies. This study aims to describe the clinical characteristics, treatment approaches, and outcomes of patients with HFpEF and HFmrEF in a single center setting. We conducted a retrospective analysis of patient records from our cardiology department over a 1-year

period. The study cohort included patients diagnosed with HFpEF (ejection fraction $\geq 50\%$) and HFmrEF (ejection fraction 40-49%). We reviewed clinical data, including demographics, comorbidities, treatment regimens, and outcomes. Our study cohort comprised 76 patients, with 32 (62.5%) diagnosed with HFpEF and 46 (37.5%) with HFmrEF. The mean age was 77.8 ± 8.6 years for HFpEF patients and 71.8 ± 11.3 years for HFmrEF patients. Comorbidities such as hypertension (81.3% vs. 71.7%) and diabetes mellitus (25.0% vs. 28.3%) were prevalent

Characteristics	Overall (n=76)	HFpEF (n=32)	HFmrEF (n=46)
Age – yr.	74 ± 10,7	78 ± 8,6	72 ± 11,3
Male sex – n (%)	51 (67,1)	24 (75)	29 (63)
Body weight – kg	79 ± 18	81 ± 17	77 ± 18,5
BMI	28 ± 5,5	29 ± 5,2	27 ± 5,7
Systolic blood pressure - mmHg	135 ± 21,7	142 ± 21,7	131 ± 20,6
Diastolic blood pressure — mm Hg	79,2 ± 11	78 ± 9,8	81 ± 11,8
Pulse – beats/min	77 ± 24	77 ± 24,2	76 ± 24,2
NYHA - n (%)			
Class I	20 (26,7)	6 (19,4)	14 (31,1)
Class II	30 (40)	9 (29)	22 (48,9)
Class III	20 (26,7)	11 (35,5)	9 (20)
Class IV	5 (6,7)	5 (16,1)	0 (0)

Tabella 1



in both groups. HFpEF patients were more likely to have atrial fibrillation (62.5%) compared to HFmrEF patients (47.8%).

In terms of treatment, patients with HFpEF were predominantly managed with diuretics (68.8% vs 54,3%) and ACE inhibitors (19.0% vs 11.0%), whereas those with HFmrEF were more frequently prescribed beta-blockers (97.8% vs 87,5%) and mineralocorticoid receptor antagonists (71.7% vs 68,8%). Despite similar treatment strategies, HFmrEF patients had higher rates of hospital readmissions (17.4% vs. 15.6%) and a lower

overall functional status compared to HFpEF patients. Our single center experience underscores the distinct clinical profiles and treatment challenges associated with HFpEF and HFmrEF. While both groups exhibit significant comorbidities, HFmrEF patients demonstrate a higher incidence of hospital readmissions and poorer functional outcomes. These findings highlight the need for tailored management strategies and further research to optimize treatment for patients with mildly reduced ejection fraction.



**SCOMPENSO CARDIACO 920
PERICARDITI (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)
CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)
DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)
IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)**

A CASE OF HEART FAILURE WITH PRESERVED EJECTION FRACTION: COMBINATION OF SEVERE CORONARY DISEASE AND CONSTRICTIVE PERICARDITIS

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Introduction: constrictive pericarditis is a rare disorder responsible of Heart Failure with preserved ejection fraction. The association of chronic calcific pericarditis and coronary disease is uncommon.

Aim: we report the case of a 65-year-old male, without CV risk factor, without history of smoke or alcohol assumption, with probable occupational exposure, affected by dyspnea on moderate exertion associated with systemic congestion (peripheral edema, pleuric and abdominal effusion), who require several hospitalizations in the last year. He was evaluated in our Division of Geriatrics in July 2024.

Methods: transthoracic echocardiography, abdominal echography, thoraco-abdominal-CT, cardio-CT and coronary angiography were performed. In previous months he underwent thoracentesis, PET scan and MR cholangiopancreatography, with negative results.

Results: laboratory exams documented a mild increase of NT-proBNP (352 pg/ml), transaminases, total bilirubin, and inflammation index. Autoimmune causes were excluded. Abdominal echography showed pleuric effusion (especially on the right side) and hepatic alteration (dilated suprahepatic veins, modest abdominal effusion), confirmed by thoraco-abdominal CT. Echocardiography showed a normal ventricle with preserved ejection fraction (56% Simpson), with the following characteristics: side $e' < \text{septal } e'$; septal

bounce; dilation of IVC without respiratory excursions; $E/A > 1$; $E/e' > 6$; mitral wave variability more than 15%; $GLS -14.8\%$; thickened pericardium. In the hypothesis of constrictive pericarditis, cardiac-CT was executed, with evidence of disconnection of pericardial leaflets with diffuse thickening (6-7 mm) and calcification, but also unexpected high calcium score index (1624.4) with severe atherosclerotic three-vessel coronary disease, confirmed by coronary angiography. So, he underwent pericardiectomy and bypass cardiac surgery (LIMA to LAD; SVG seq OM – PDA artery). During the procedure, the pericardium appeared severely fibrotic with adhesions. Post-operative course was good.

Conclusions: Constrictive pericarditis should be considered in all cases of unexplained heart failure, particularly when symptoms and signs are predominantly right-sided (edema, pleural effusion, liver disease) and when the ejection fraction is preserved. Multimodality imaging plays an essential role in the diagnosis. Complete surgical pericardiectomy remains the only effective treatment for patients with chronic symptomatic constriction. There are few studies in literature about pericardial calcification and coronary atherosclerotic disease. The presence of both of these diseases in one patient is rare and it is not known whether the two phenomena are related to each other. Patient follow-up will be useful to assess complete resolution of symptoms.

SCOMPENSO CARDIACO 688
PROGNOSI (SCOMPENSO CARDIACO)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)
TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)
BIOMARCATORI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

EFFETTI SUI PARAMETRI CLINICI ED ECOCARDIOGRAFICI DEL TRATTAMENTO COMBINATO CON SGLT2-I E ARNI IN PAZIENTI CON SCOMPENSO CARDIACO POST-ISCHEMICO DEL VENTRICOLO SINISTRO

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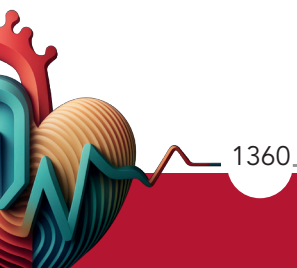
La gestione dell'HFrEF si è tradizionalmente concentrata sulla modulazione neuro-ormonale con l'uso di beta-bloccanti, ACEi/ARB ed MRA. Tuttavia, negli ultimi anni l'introduzione degli inibitori del co-trasportatore sodio-glucosio 2 (SGLT2i) e della combinazione sacubitril/valsartan ha rivoluzionato il panorama terapeutico dell'HFrEF, fornendo benefici clinici e prognostici significativi. Sebbene i meccanismi d'azione di questi farmaci siano stati già ampiamente descritti, i loro effetti sul rimodellamento ventricolare negativo, e quindi sulla sua funzione, non sono stati ancora chiariti completamente. Il rimodellamento maladattativo del ventricolo sinistro è uno dei principali meccanismi alla base della progressione della malattia nei pazienti con HFrEF, e il grado di riduzione di questo fenomeno rappresenta un aspetto importante da un punto di vista clinico e prognostico. In questo studio osservazionale retrospettivo, a singolo centro, sono stati inclusi 32 pazienti affetti da HFrEF ad eziologia post-ischemica, in terapia stabile con beta bloccanti, ACEi/ARB e MRA alla massima dose tollerata da almeno 6 mesi, che sono stati inviati presso il nostro centro e che hanno iniziato una terapia con Empaglifozin 10 mg/die ed eseguito switch da ACEi/ARB a Sacubitril/Valsartan con dosaggio di 24/26 mg due volte/die. In nessuno dei pazienti è stato possibile titolare ulteriormente la dose dell'ARNI a causa di effetti avversi, principalmente ipotensione sintomatica. Sono state raccolte

informazioni anamnestiche e misurati parametri clinici, ecocardiografici e laboratoristici al tempo 0 (T0) e a 6 mesi dalla terapia (T6). L'età media del campione era 73 anni (± 7.74); il 70% di sesso maschile; il 46% era affetto da diabete tipo II; l'84% aveva una pregressa SCA; il BMI medio era 29.88 kg/m² (± 1.77). L'Endpoint primario dello studio è stato di valutare gli effetti della terapia combinata di ARNI e SGLT2i sulla LVEF, sul rimodellamento cardiaco (valutato mediante i volumi ventricolari e atriale sinistro), sui livelli di NT-Pro-BNP, funzionalità renale, Classe NYHA e severità delle insufficienze valvolari. A 6 mesi, il trattamento con SGLT2i e ARNI ha comportato una riduzione del GFR da 51.36 (± 8.77) a 45.38 (± 9.28) mL/min/m² [$p < 0.05$]; un aumento della TAPSE da 18.52 (± 1.78) mm a 19.46 (± 1) mm [$p < 0.001$]; una riduzione della PAPs da 44.62 (± 4.93) a 38.45 (± 10.17) mmHg [$p < 0.001$]; una riduzione dei livelli di NT-Pro-BNP da 791.19 (± 185) a 358.63 (± 147) pg/ml [$p < 0.001$]; un aumento significativo della LVEF da 32.05% (± 3.27) a 39.51% (± 3.03) [$p < 0.001$]; una riduzione dei volumi del LVEDVi da 98.58 (± 12.80) a 86.06 (± 13.47) mL/m² e del LVESVi da 67.04 (± 10.53) a 52.07 (± 8.57) mL/m² [$p < 0.001$]; una riduzione del LAVI da 44.85 (± 6.70) a 41.35 (± 6.76) mL/m² [$p < 0.001$]. Le dimensioni del VD, RVD1 e RVD2, sono diminuite rispettivamente da 38.45 (± 3.08) a 36.53 (± 3.16) mm e da da 33.41 (± 2.58) a 31.47 (± 2.80) mm [$p < 0.05$]. Al tempo T0 era prevalente una insufficienza mitralica



in forma moderata/grave (50% e 25%), mentre al T6 erano prevalenti forme lievi/moderate (75% e 22%). Un andamento simile è stato rilevato per la tricuspide [entrambe $p < 0.05$]. Il 50% dei pazienti a T0 era in classe NYHA II/III, mentre a T6 il 70% era in classe II e 27% in classe III [$p < 0.05$]. I dati del nostro studio, ancora

limitato ad un campione basso di pazienti, dimostrano che l'uso combinato di SGLT2i e ARNI si associa ad un miglioramento funzionale del VS, ad un rimodellamento cardiaco inverso e ad un netto beneficio clinico come dimostrato dal miglioramento della classe NYHA e dalla riduzione dei valori di NT-Pro-BNP.



SCOMPENSO CARDIACO 611 TERAPIA DI RESINCRONIZZAZIONE (ARITMIE) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) CARDIOMIOPATIE (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

UNA CERTEZZA PER LO SCOMPENSO CARDIACO CRONICO: CARDIAC CONTRACTILITY MODULATION: A CASE REPORT

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Introduction : La terapia di resincronizzazione cardiaca (CRT) riduce le ospedalizzazioni e la mortalità nei pazienti con insufficienza cardiaca avanzata e durata QRS prolungato. Nei pazienti con un complesso QRS stretto, la CRT non è riuscita a ridurre il tasso di morte o di ospedalizzazione per insufficienza cardiaca e può addirittura aumentare la mortalità. Pertanto, vi è la necessità di trattamenti alternativi (device) per i pazienti con sintomi persistenti nonostante la terapia medica ottimale (OMT). La Cardiac contractility modulation (CCM) è una nuova tecnica basata su dispositivi elettrici proposta per migliorare la contrattilità ventricolare del miocardio ridotta indipendentemente dalla sincronia della contrazione miocardica. La modulazione della contrattilità cardiaca (CCM) è pertanto una tecnica relativamente nuova basata su dispositivi elettrici proposta per migliorare la forza contrattile ventricolare del miocardio indebolito indipendentemente dalla sincronia della contrazione miocardica. In questo lavoro presentiamo l'uso della terapia CCM in un paziente anziano con cardiomiopatia dilatativa non ischemica senza indicazione alla CRT, dimostrando il beneficio clinico di questa nuova terapia per lo scompenso device-based.

Case Report: Presentiamo un caso di un paziente di 72 anni pereso e una storia di insufficienza cardiaca cronica (HF) secondaria a cardiomiopatia non ischemica con grave disfunzione sistolica ([LVEF] :30%). Per il

persistere della dispnea (classe NYHA III/IV) nonostante la OMT (bisoprololo 5 mg/die, sacubitril/valsartan 49/51 mg bis die, inibitori SGLT2 ed eplerenone 25 mg/die), il valore NT-proBNP era 1300 pg/mL e il punteggio del Minnesota Living with Heart Failure Questionnaire (MLHFQ) era di 80 punti, il paziente è stato indirizzato a impianto di CCM come prima indicazione di una terapia con device. Il paziente non soddisfaceva i criteri per la terapia di resincronizzazione cardiaca (CRT) a causa del QRS stretto. Al follow-up di 3 mesi, il paziente presentava miglioramenti significativi in termini di qualità della vita con un punteggio MLWHFQ di 20 e una diminuzione del BNP a 600 pg/mL. Inoltre, non è stata osservata alcuna ospedalizzazione correlata allo scompenso cardiaco. Al follow-up a 12 mesi, non si sono verificate riospedalizzazioni per scompenso cardiaco e il paziente aveva una classe NYHA II stabile, una LVEF del 40% (un aumento della funzione sistolica del ventricolo sinistro utilizzando il metodo Simpson biplano), un punteggio MLWHFQ di 6, un Valore NT-proBNP di 300 pg/m² e funzione renale stabile.

Conclusioni: in questo report, il CCM si dimostra un dispositivo HF utile e sicuro per la terapia con HF rEF non idoneo all'impianto di CRT, ha portato a un miglioramento della qualità di vita e una riduzione delle ospedalizzazioni correlate a HF .



SCOMPENSO CARDIACO 693 TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) ELETTROSTIMOLAZIONE (ARITMIE) RIABILITAZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

DALLO SCOMPENSO CARDIACO REFRAATTARIO ALLA PRESCRIZIONE DELL'ESERCIZIO FISICO

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Premessa: lo scompenso cardiaco è una condizione patologica grave che mostra una prevalenza in aumento nel corso degli ultimi decenni. Nonostante l'ampliamento degli strumenti farmacologici a disposizione e lo sviluppo di sistemi per la resincronizzazione biventricolare, un numero non trascurabile di pazienti purtroppo non trae beneficio dalle cure⁽¹⁾.

Una nuova frontiera nel trattamento dello scompenso cardiaco è rappresentato dalla CCM (Cardiac Contractility Modulation), che trova indicazione nei pazienti con insufficienza cardiaca sistolica (FE<45%), QRS stretto (<130 msec) e sintomi refrattari nonostante terapia medica ottimizzata⁽²⁻³⁾.

Caso clinico: riportiamo il caso di un paziente di 76 anni, affetto da obesità viscerale (BMI 32) ipertensione arteriosa, diabete mellito, cardiopatia ischemica cronica (pregressa PTCA su IVA nel 2021), costretto a ricorrenti ospedalizzazioni per scompenso cardiaco riacutizzato (3 ricoveri in due mesi). Il paziente presentava una moderata disfunzione ventricolare sinistra (FE 40%), QRS stretto ed era già in terapia medica ottimizzata con sabutril/valsartan, betabloccante, spironolattone, glifozine. All'ingresso il paziente si presentava marcatamente dispnoico (Classe NYHA III-IV), con edemi colonnari e versamento pleurico bibasale. Dopo stabilizzazione del quadro clinico

mediante potenziamento della terapia diuretica, si è deciso di procedere all'impianto di un dispositivo CCM (Optimizer Smart - Impulse Dynamics). L'intervento è stato effettuato in anestesia locale e sedazione profonda, in assistenza anestesiológica. La tecnica di impianto è consistita nel posizionamento di due elettrocatteteri classici da elettrostimolazione a livello del setto interventricolare, connessi successivamente al dispositivo CCM, collocato in una tasca sottocutanea pettorale sinistra.

Follow-up: il paziente, dopo un giorno dall'intervento, è stato messo in piedi, con l'aiuto di fisioterapista dedicato ha iniziato percorso riabilitativo intraospedaliero di due settimane (mobilizzazioni attive, camminata con deambulatore, cyclette senza carico), per poi tornare al proprio domicilio, con indicazione ad eseguire attività fisica aerobica con cadenza bisettimanale, della durata di 40 minuti (marcia, cyclette), con la raccomandazione di non superare i 100 bpm (70% della FTM). Il paziente, è stato sottoposto ad un primo controllo clinico ad un mese con evidenza di stabilità funzionale (Classe NYHA II), in seguito al quale è stata data indicazione a proseguire l'attività fisica aerobica, con le medesime modalità, ma con frequenza trisettimanale.

Al follow-up successivo (3 mesi dall'intervento), è stata confermata la stabilità del quadro clinico-sintomatologico (Classe NYHA II), senza riacutizzazioni

di scompenso cardiaco. All'ecocardiogramma è stato documentato un significativo miglioramento della frazione di eiezione (FE 50%).

Conclusioni: lo scompenso cardiaco recidivante è una condizione morbosa grave spesso non compatibile

con la vita o una buona qualità della stessa. Nel caso clinico descritto, la personalizzazione della terapia "farmacologica ed elettrica", ha tuttavia consentito un miglioramento sensibile dello stato clinico del paziente, consentendo anche la ripresa di un'attività motoria aerobica insperabile al momento del ricovero.



SCOMPENSO CARDIACO 964

DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

PROGNOSI (SCOMPENSO CARDIACO)

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

OTTIMIZZAZIONE DELLA TERAPIA FARMACOLOGICA NEI PAZIENTI CON SCOMPENSO CARDIACO E FRAZIONE DI EIEZIONE PRESERVATA: DATI DAL REGISTRO MULTICENTRICO ITALIANO OPTIMA-HF

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Obiettivi: I pazienti affetti da scompenso cardiaco a frazione di eiezione preservata (HFpEF) e lievemente ridotta (HFmrEF) rappresentano un'entità clinica per i quali esistono ancora perplessità in merito all'approccio terapeutico e poche opportunità terapeutiche con una forte classe di raccomandazione.

L'obiettivo del Registro Optimization of Therapy in the Italian Management of Heart Failure preserved (OptIMa-HF preserved) è stato quello di raccogliere dati su pazienti affetti da HFpEF e HFmrEF con un focus specifico sulle caratteristiche della popolazione e sulla valutazione dello stato di prescrizione dei farmaci raccomandati dalle Linee Guida ESC 2023, nella real-life di pazienti italiani in setting ambulatoriale.

Metodi: OptIMa-HF preserved è un registro osservazionale, multicentrico, condotto in ambulatori ospedalieri ed in servizi ambulatoriali del territorio. Nella presente analisi sono stati arruolati pazienti con HFpEF e HFmrEF, caratterizzati per variabili demografiche, cliniche, laboratoristiche, strumentali.

Risultati: Sono stati arruolati 352 pazienti affetti da HFpEF e HFmrEF (età media 72,4 anni; 56,8% maschi; FE mediana 55%), prevalentemente ad eziologia non ischemica (66,5%) e in classe NYHA II (53,7%). Il valore mediano di NT-proBNP era di 660,00 pg/ml [IQR 332,00; 1272,00].

La popolazione arruolata presentava un'alta prevalenza di comorbidità e fattori di rischio cardiovascolare, tra cui ipertensione (70,7%), diabete (31,6%), dislipidemia (58,2%) e malattia renale cronica (31,2%). Dei 352 pazienti arruolati, il 26,7% era in trattamento con inibitori di SGLT2 (60,6% con dapaglifozin e 39,4% con empaglifozin). Inoltre, il 12,5% era in trattamento con ARNI, il 30,4% con ACEi, il 27% con ARB, il 73,3% con beta-bloccanti e il 31,2% con MRA. Il 55,1% dei pazienti arruolati era in trattamento con diuretici.

Conclusioni: Le caratteristiche della popolazione inserita nel registro rispecchiano l'epidemiologia dello scompenso cardiaco a frazione di eiezione preservata e lievemente ridotta. I risultati preliminari del registro OptIMa-HF preserved mostrano una discreta performance nella prescrizione dei farmaci

inibitori di SGLT2, per i quali esiste una più chiara classe di raccomandazione da parte delle linee guida. Tali dati supportano l'importanza degli studi di real-life per definire l'approccio terapeutico alla patologia e supportano altresì la necessità di

strategie per migliorare l'implementazione della terapia farmacologica nella pratica clinica al fine di migliorare gli outcomes a lungo termine e rallentare la progressione della malattia.



SCOMPENSO CARDIACO 965

DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

PROGNOSI (SCOMPENSO CARDIACO)

TERAPIA FARMACOLOGICA (SCOMPENSO CARDIACO)

IMPLEMENTAZIONE TERAPEUTICA NEI PAZIENTI CON DIAGNOSI DI SCOMPENSO CARDIACO DE NOVO: DATI DAL REGISTRO MULTICENTRICO ITALIANO OPTIMA-HF

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Obiettivi: I pazienti affetti da scompenso cardiaco di nuova diagnosi (de novo) rappresentano un'entità clinica in continua crescita dal punto di vista epidemiologico e per i quali esistono ancora poche evidenze scientifiche in merito all'approccio terapeutico iniziale ed alla sequenza di inserimento dei farmaci disease modifiers. L'obiettivo del Registro Optimization of Therapy in the Italian Management of Heart Failure de novo (OpTIMa-HF de novo) è stato quello di raccogliere dati su pazienti affetti da scompenso cardiaco di nuova diagnosi con un focus specifico sui modelli di prescrizione della terapia raccomandata dalle linee guida europee.

Metodi: OpTIMa-HF de novo è un registro osservazionale, multicentrico, condotto in ambulatori ospedalieri ed in servizi ambulatoriali del territorio. Nella presente analisi sono stati arruolati pazienti con nuova diagnosi di scompenso cardiaco, indipendentemente dal fenotipo, caratterizzati per variabili demografiche, cliniche, laboratoristiche, strumentali e con una raccolta dati dedicata alla terapia farmacologica prescritta al momento della diagnosi e nelle visite precoci di follow-up.

Risultati: Quattordici centri distribuiti sul territorio italiano hanno arruolato 453 pazienti con nuova diagnosi di scompenso cardiaco (età mediana 73,5 anni; 64,5% maschi; frazione di eiezione mediana 43%), di cui 225 (49,7%) con scompenso cardiaco a frazione di eiezione ridotta (HFrEF), 97 (21,4%) con scompenso cardiaco a frazione di eiezione lievemente ridotta (HFmrEF), 131 (28,9%) con scompenso cardiaco a frazione di eiezione preservata (HFpEF).

Dei 453 pazienti arruolati, al momento della diagnosi di scompenso cardiaco de novo, il 28,9% è in trattamento con ARNI, il 28% con ACEi, il 23,8% con ARB, l'82,6% con beta-bloccanti e il 66,2% con SGLT2i. Stratificando ulteriormente la popolazione in base alla frazione di eiezione, al momento della diagnosi, si osserva una maggiore prescrizione di ARNI nell'HFrEF (50,7%) e nell'HFmrEF (16,5%) e di SGLT2i, indipendentemente dalla frazione di eiezione. Inoltre, si osserva una quota molto alta di prescrizione di beta-bloccanti, in tutte le forme di scompenso, ma soprattutto nell'HFrEF (88,9%) e nell'HFmrEF (90,7%). Tuttavia, solo il 51,6% dei pazienti con HFrEF assumeva tutte le quattro classi di farmaci.

Al momento dell'analisi, dei 453 pazienti arruolati, 115

avevano effettuato una seconda rivalutazione, ad un follow-up mediano di 2,6 mesi.

Conclusioni: I risultati preliminari del registro OptIMA-HF de novo mostrano una discreta performance nella prescrizione dei singoli farmaci raccomandati per le varie forme di scompenso cardiaco e nella terapia di combinazione a 4 farmaci, prescritta in più della metà

dei pazienti con diagnosi di HFrEF. Tali dati supportano l'importanza degli studi di real-life per definire l'approccio terapeutico in patologie scarsamente supportate da evidenze scientifiche e supportano altresì la necessità di strategie per migliorare l'implementazione della terapia farmacologica nella pratica clinica al fine di migliorare gli outcomes a lungo termine e rallentare la progressione della malattia.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

TELECARDIOLOGIA ED E-HEALTH

TELECARDIOLOGIA ED E-HEALTH 661

INTELLIGENZA ARTIFICIALE (TELECARDIOLOGIA ED E-HEALTH) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

ATTIVITÀ FISICA E PREVENZIONE CARDIOVASCOLARE (ATTIVITA' FISICA E CARDIOLOGIA DELLO SPORT)

UNMET NEEDS IN CARDIOVASCULAR MEDICINE: AN UMBRELLA REVIEW LEVERAGING CHATGPT

Giuseppe Biondi-zoccai (b), Vassilios Vassiliou (a), Sebastiano Sciarretta (b), Mattia Galli (b), Marco Bernardi (b), Luigi Spadafora (b), Giacomo Frati (b), Francesco Versaci (c)

(a) UNIVERSITY OF EAST ANGLIA, NORWICH, UK; (b) SAPIENZA UNIVERSITÀ DI ROMA, LATINA, ITALY; (c) S. MARIA GORETTI HOSPITAL, LATINA, ITALY

Background: Cardiovascular medicine continues to grapple with numerous unmet needs, particularly in managing comorbid conditions and optimizing patient outcomes. This ChatGPT-based umbrella review compiles evidence on various unmet needs within this field, aiming to provide a comprehensive overview and highlight critical areas requiring further research and intervention.

Methods: We conducted a systematic literature review searching MEDLINE/PubMed for systematic reviews on unmet needs in cardiovascular medicine, using

the following string: unmet AND need* AND (arter* OR cardiac OR cardiovasc* OR coronary OR heart OR vascular) AND systematic[*sb*] (last updated on August 5, 2024). Few-shot prompting was used to guide evidence analysis and synthesis by means of ChatGPT 4o (OpenAI, San Francisco, CA, USA).

Results: A total of 18 reviews encompassing 189 studies and involving over 300,000 patients were included in this umbrella review. The main unmet needs belonged to the following domains: a) research and implementation gaps in pharmacologic therapy

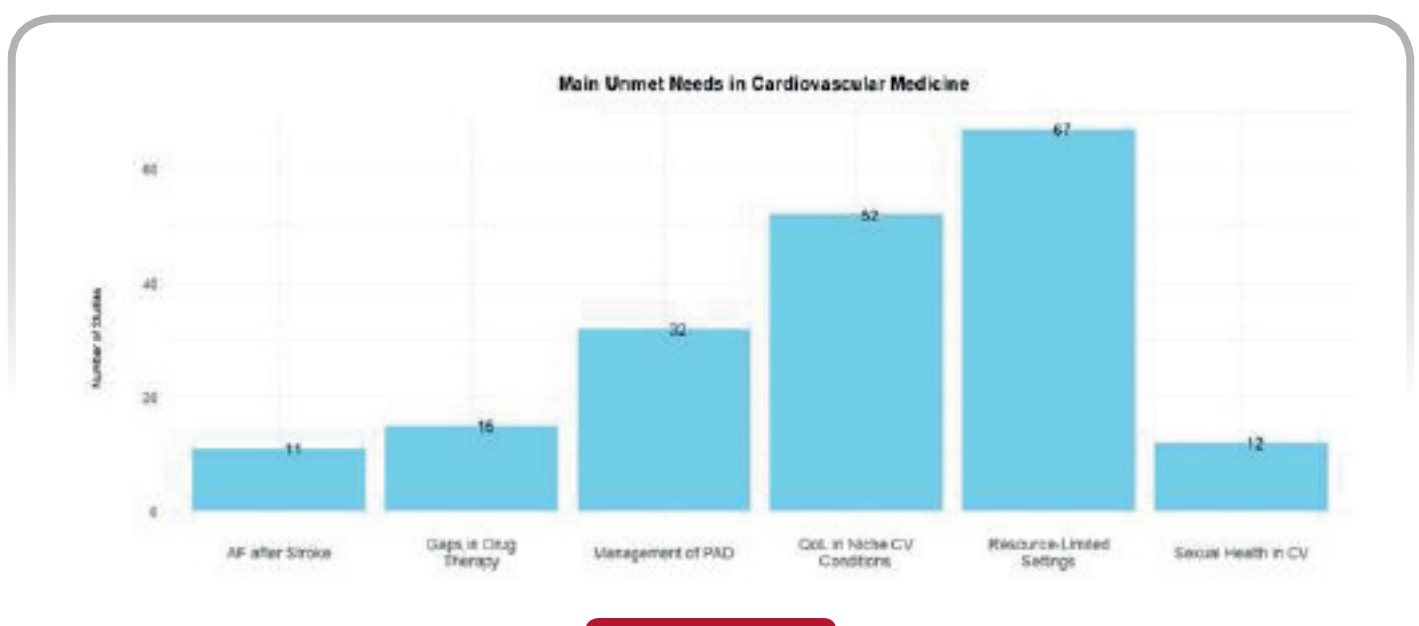
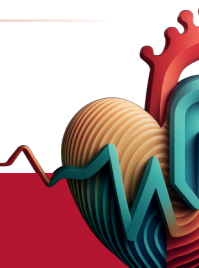
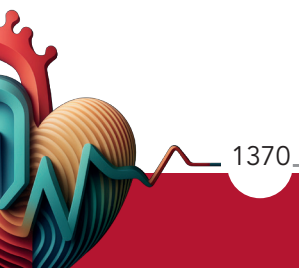


Figure 1



for cardiovascular disease; b) management of atrial fibrillation in patients with recent stroke; c) quality of life in specific cardiovascular conditions such as hypertrophic cardiomyopathy and aortic dissection; d) sexual health in patients with established cardiovascular disease; e) cardiovascular therapeutics in resource-limited settings; and f) management of peripheral artery disease, including Raynaud phenomenon and digital ulcers.

Conclusion: Significant gaps exist in the management of cardiovascular diseases, particularly in providing holistic and multidisciplinary care. Addressing these unmet needs requires novel therapeutic strategies, improved patient education, and enhanced support systems to improve outcomes across various cardiovascular conditions. Future research should focus on developing and implementing effective interventions tailored to these identified gaps.



TELECARDIOLOGIA ED E-HEALTH 888

CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA)

TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

INTELLIGENZA ARTIFICIALE (TELECARDIOLOGIA ED E-HEALTH)

BIG DATA (TELECARDIOLOGIA ED E-HEALTH)

APPS IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

HOW PATIENT FEEL WITH TELEMEDICINE DEVICES AS AN ENABLING FACTOR FOR PERSONALIZED MEDICINE

Fabiola Boccuto (a), Patrizia Vizza (a), Salvatore De Rosa (a), Giuseppe Tradigo (a), Giovanni Lico (a), Riccardo Rasheed Ahmad (a), Francesca Sinopoli (a), Antonella Ielpo (a), Bruno Nistico' (a), Cristian Servidio (a), Pierangelo Veltri (b), Daniele Torella (a), Pietro Hiram Guzzi (a)

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Background: Telemonitoring tools represent fundamental resources for chronic disease home management supporting early detection of clinical worsening with great reduction of hospitalization costs. Therefore, the investigation of the patient compliance is a key enabling point. We aim to assess how patients with chronic coronary syndromes evaluate a telemonitoring device meant for ongoing health monitoring.

Methods: from a database of 800 young (less than 50 years) patients with myocardial infarction, 66 patients were enrolled. After gathering informed consensus, we conducted a thorough assessment of their medical history, physical examination, electrocardiogram, and evaluation of their hemodynamic compensation. At the end of the visit, we applied and instructed patients to wear the Sidly telemonitoring device for seven days, which allows remote monitoring of their health status via a web-based platform. After a week, 41 out of 66 patients filled a detailed questionnaire consisting of different sections. The introductory section examined the patient's age, gender, and education level. The second section evaluated the patient's knowledge of informatics using a self-assessment scale from poor to excellent skills. The third section investigated on a scale from 1 to 10

how important the patient considered the use of the telemonitoring system. Finally, it was assessed whether the device feedback had improved the patient's health state and whether they would prefer automatic feedback (e.g., based on artificial intelligence) or feedback generated by medical personnel.

Results: most patients were aged between 41 and 50 years (56,1 %), male (85,4 %) and with a middle school diploma (39 %). We highlighted a good ability to use games and/or recreational apps, television apps, video calling and video conferencing systems, social

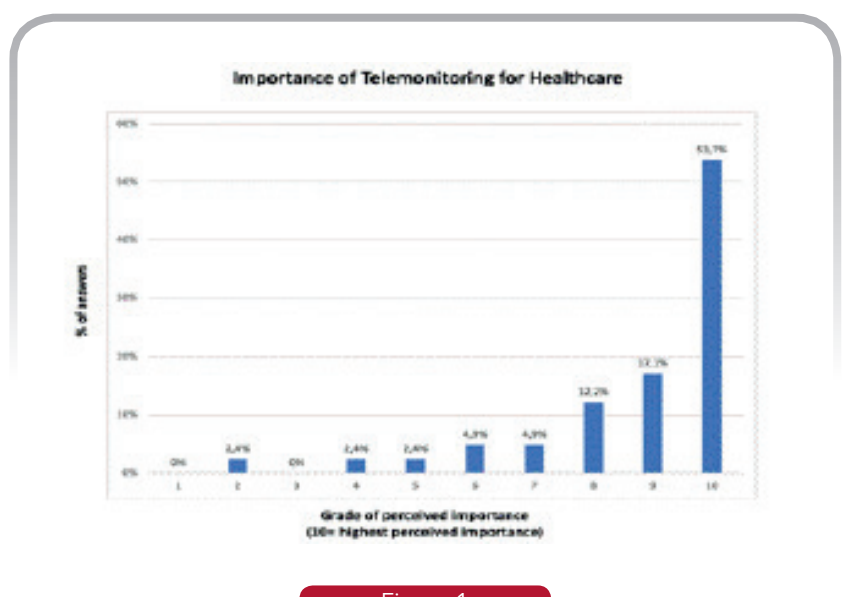


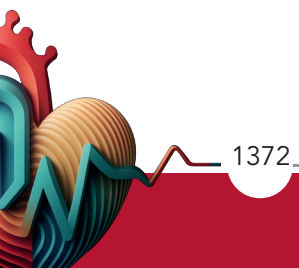
Figure 1



networks and Messaging Systems. 48,8 % of patients thought telemonitoring is fundamental for improving both healthcare system and health status of patients, preferring a smartwatch-based monitoring system (73,2 %) with automatic update (87,8 %). Patients preferred a device system connected to remote team of healthcare professionals (68,3 %) and desired a telemonitoring device reimbursed by healthcare systems (90,2 %). Most patients believed it is important to a continuous vital parameters monitoring (61 %) and to have device feedback on health state (53,7 %) preferably with feedback generated by medical personnel rather than

from artificial intelligence system (90,2 %).

Conclusions: this study highlights the potential of telemonitoring technologies to advance personalized medicine, particularly through the use of Sidly wristband devices for patient monitoring. Our investigation found that the majority of participants, who were mostly men aged between 41 and 50 years with a middle school education level, displayed varying degrees of proficiency in using digital technologies. This emphasizes the importance of user-friendly telemonitoring solutions.



TELECARDIOLOGIA ED E-HEALTH 741

BIG DATA (TELECARDIOLOGIA ED E-HEALTH)

TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

ELETTROCARDIOGRAFIA/ CARDIOVERSIONE/ DEFIBRILLAZIONE (ARITMIE)

ADMISSIONS IN CCU FROM EMERGENCY DEPARTMENT DUE TO LIFE-THREATENING ARRHYTHMIAS IN A LARGE EMRAM 4 ACADEMIC HOSPITAL IN THE SOUTH OF ITALY

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Background: Symptoms of cardiovascular diseases span from typical chest pain to dizziness. Beside ST-segment elevation on the electrocardiogram (ECG), continuous ECG monitoring can unveil life-threatening brady- and tachy-arrhythmias. Advanced healthcare information technology implementation using Electronic Medical Record Adoption Model, EMRAM, improve quality and safety of hospital care and is useful for medical research purposes.

Aim. Therefore, we wanted to evaluate if intensive ECG assessment through Digital health transformation could avoid inappropriate rule-out decisions from the emergency department (ED).

Methods: The clinical data of 163 consecutive patients were analyzed, comparing the outcomes of the current year before and after the new ED division was opened. Subjects below 18 years, elective admissions transfers and patients directed to critical care were excluded. Results were expressed as percentage for categorical data and as mean±standard deviation for continuous data. Statistical analysis was performed with SPSS.

Results: Baseline characteristics of the study groups were: 70±14 years of age, n=55 (34%) females, systemic hypertension, n=95 (58%), dyslipidemia, n=48 (29%), smoking habit, n=27 (16%), diabetes, n=41 (25%), chronic kidney disease, n=14 (8%) and did not differ significantly between the two cohorts. The most common symptoms at presentation were

atypical chest pain (58%), syncope (17%), dyspnea (14%), palpitations (7%), and fatigue (4%). The mean left ventricular ejection fraction (LVEF) was 51±2% (17% had LVEF≤40%, 68% had LVEF≥50%, in 15% cases LVEF was in the range 41-49%). Digital health transformation improved continuous electrocardiographic monitoring in all patients, allowing an increased number of arrhythmias detected during the admission into ED; patients were transferred timely to the coronary care unit for further evaluations, and total time of ED occupation was dramatically reduced compared to before technologic implementations. Figure shows outcome of ECG alterations diagnosis per month in the cases assessed. Indications to pacemaker implantations raised of 371% (p<0.001); implanted cardioverter defibrillators and cardiac resynchronization therapy implantations observed a reduction of 57,1% and 50% (p=0.28), respectively); atrial fibrillation detection

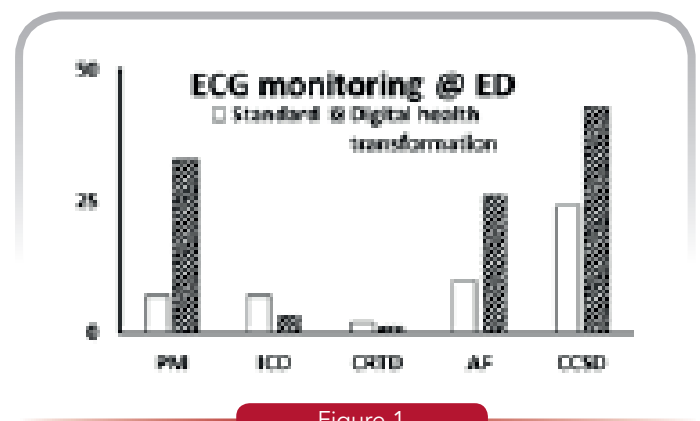
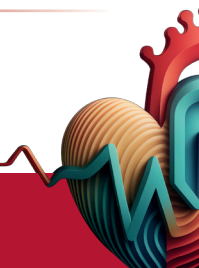
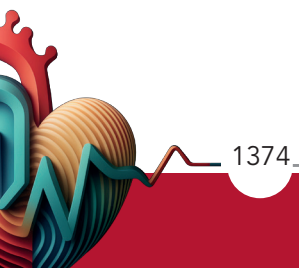


Figure 1



increased of 160% ($p < 0.001$); diagnosis of cardiac conduction system disorders experienced a gain of 79% ($p < 0.001$), since intermittent left bundle branch block (14 cases), left anterior hemiblock (23 cases), left posterior hemiblock (2 cases), and prolonged QT segment (4 cases) were unexpectedly found.

Conclusions: According to digital health transformation, our hospital agreed in applying electronic medical record adoption model equipped with computerized physician order entry and clinical decision support; such process increased significantly the yield of ECG monitoring. Further investigations after the opening of the new ED are needed.



TELECARDIOLOGIA ED E-HEALTH 701 TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH) BIG DATA (TELECARDIOLOGIA ED E-HEALTH) PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

ROLE OF A TELEMEDICINE NETWORK PROVIDED BY LOCAL PHARMACIES IN THE PREVENTION AND EARLY MANAGEMENT OF CARDIOVASCULAR EVENTS

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(a) CARDIOLOGY SECTION-DEPARTMENT OF CLINICAL AND SURGICAL SPECIALITIES; UNIVERSITY AND SPEDALI CIVILI HOSPITAL OF BRESCIA; (b) HEALTH TELEMATIC NETWORK BRESCIA (HTN); (c) FEDERFARMA; (d) ITALIAN NATIONAL INSTITUTE OF HEALTH (ISS)

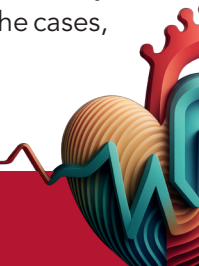
Background: Cardiovascular diseases (CVD) remain the leading cause of morbidity and mortality, imposing a substantial economic burden on national healthcare systems (HCS) worldwide.

Purpose: The aim of our study was to assess the feasibility and effectiveness of a telemonitoring network involving local pharmacies and to evaluate its impact on the primary and secondary prevention of cardiovascular events in both chronic and acute settings.

Methods: Our Department of Cardiology, in collaboration with our National Association of Pharmacists (Federfarma) and the Italian National Institute of Health, has created a telematic network currently involving 7,056 pharmacies distributed throughout the country and connected to a single telemedicine platform (Health Telematic Network - HTN). In these pharmacies, 12-lead ECG, ABPM, and Holter ECG were performed using standardized and uniform equipment, either upon a doctor's referral for routine check-ups or when a patient presented with suspected cardiac symptoms (dyspnea, palpitations, chest pain, lipothymia, or syncope). For each case, demographic and clinical data were collected through a standardized questionnaire, transmitted to the platform, and analyzed by a cardiologist in real-time. After the evaluation, if ECG abnormalities were

detected, subjects were referred for further diagnostic investigations or clinical evaluation by the general practitioner or cardiologist, or to the emergency department (ED) in cases of life-threatening conditions. We analyzed all the ECGs performed from February 2022 to February 2023, totaling 266,602 exams; we then conducted a retrospective analysis to assess the appropriateness of the ED referrals and a cost-effectiveness analysis to evaluate the actual savings for HCS.

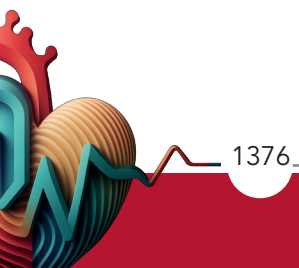
Results: Of the 266,602 ECGs analyzed, 89% were performed for routine check-ups, 2.6% for chest pain, 0.5% for dyspnea, 1.4% for palpitations, and 6.5% for other symptoms. In 4,600 cases (1.6% of the total), ECG abnormalities requiring further investigation were detected, and 1,937 patients (0.7%) were referred to the ED. Among patients with atrial fibrillation (AF), 986 were referred to the ED due to symptomatic high-rate AF or because of newly diagnosed AF in patients not receiving anticoagulant therapy. Among the patients with chest pain, 588 (8.3%) were referred to the ED due to clear ischemic ECG abnormalities or when an inconclusive ECG interpretation was found in a patient with a very high cardiovascular risk. The retrospective analysis showed a correct symptom/disease correlation in 71.2% of the cases; specifically, 50% of the patients referred to the ED were diagnosed with acute coronary syndrome (ACS) (STEMI/NSTEMI). In 13.6% of the cases,



an ACS was ruled out, but another cardiac condition causing chest pain, such as myocarditis or pericarditis, was diagnosed. In 7.6% of the referred patients, additional diagnostic investigations were needed to rule out a cardiac origin for the symptoms. Finally, the cost-effectiveness analysis revealed that the pharmacy telemonitoring system had been able to prevent 6,505 potentially inappropriate ED visits (91.7% of the overall total of 7,093 visits), which would have cost the hospital

nearly €950,000, given the average cost of €152 per each chest pain diagnostic work-up in the ED.

Conclusion: Our findings demonstrate a significant impact of a pharmacy-based telemonitoring network in both chronic and acute care settings, enhancing the appropriateness of ED access, reducing healthcare costs, and minimizing pressure on hospital facilities.



TELECARDIOLOGIA ED E-HEALTH 265

CARDIOLOGIA PEDIATRICA (CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)

INTELLIGENZA ARTIFICIALE (TELECARDIOLOGIA ED E-HEALTH)

PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

IL PAZIENTE AUTISTICO NEL LABORATORIO DI CARDIOLOGIA PEDIATRICA: L'AIUTO DAI ROBOT SOCIALI

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Introduzione: Bambini con disturbo dello spettro autistico presentano interessi ristretti, azioni ripetitive, una compromissione di grado variabile nell'interazione sociale e possibile disabilità intellettiva; non sorprende che si orientino di buon grado verso oggetti quali i robot, che sono per loro più prevedibili, stereotipati e facili da capire.

Presentazione del caso: Giungevano presso l'ambulatorio di Cardiologia quattro bambini autistici (5-12 anni), i quali in passato durante le visite avevano sempre dimostrato notevole distress ed oppositività. La conseguenza di ciò era: in primis, l'esperienza emotiva negativa del bambino, nonché dei caregivers, inoltre, ECG ed ecocardiografie risultavano di più difficile interpretazione a causa di più frequenti artefatti da movimento. Tramite l'impiego del Nao Robot - guidato in parte dall'intelligenza artificiale ed in parte dal clinico tramite facilitatori di utilizzo creati ad hoc da ingegneri del Dipartimento Ingegneria Enzo Ferrari - con favole, suoni, balli e movimenti è stata canalizzata l'attenzione dei bambini, che, come conseguenza, sono stati più disponibili nell'esecuzione delle indagini diagnostiche e di screening. Lo stress dei bambini alla fine delle visite è stato valutato nullo dai genitori a cui è stata somministrata una likert scale validata per il parametro stress. La qualità delle ecocardiografie, analizzata da

un operatore esterno, è stata ottimale: punteggio 13-14/14, valutata secondo lo score proposto dal gruppo ACPC dell'American College of Cardiology.

La durata della visita si è attestata sui 9-14 minuti, per cui l'impiego del Nao ha permesso da un lato di non sospendere gli esami prima del tempo per oppositività, senza al contempo costare tempo extra al clinico e al paziente per il suo utilizzo.

Conclusioni: I Robot sociali rappresentano una risorsa interessante per alleviare lo stress e migliorare la compliance di pazienti autistici durante le visite. I bambini autistici devono potenzialmente sottoporsi a molteplici visite cardiologiche durante la vita perché presentano un più alto rischio di cardiopatie congenite a causa di una base genetica condivisa, per assunzione di farmaci che allungano il QT o anche per screening generale, per cui è indicato individuare strumenti che favoriscano una migliore qualità delle indagini cardiologiche nella gestione di questi pazienti. Per dimostrare la superiorità dei Nao robot rispetto alle tradizionali distrazioni saranno necessari studi RCT in cui dovranno essere considerati parametri di stress aggiuntivi quali ad esempio heart rate variability, temperatura corporea, conduttanza cutanea e cortisolo salivare.



TELECARDIOLOGIA ED E-HEALTH 801 ARITMIE VENTRICOLARI (ARITMIE) DEFIBRILLATORE IMPIANTABILE (ARITMIE) TELEMEDICINA IN CARDIOLOGIA (TELECARDIOLOGIA ED E-HEALTH)

UN CASO INTERESSANTE: QUANDO LA TELEMEDICINA AIUTA NELLA DIAGNOSI DELL'INFARTO

Marco Scicchitano (a), Giulia Impeduglia (a), Veronica Rizzo (a), Maria Luisa Loricchio (a), Renzo Iulianella (a), Silvia Perna (a), Carlos Centurion (a), Valentina Schirripa (a), Bruno Albano (a), Antonino Granatelli (a)
(a) ASL ROMA 2 OSPEDALE SANDRO PERTINI

Paziente di 68 aa maschio affetto da BPCO, cardiopatia ischemica cronica, obeso, iperteso, portatore di ICD bicamerale. Device da tempo monitorato col sistema di monitoraggio merlin.

Nel periodo di capodanno 2022 viene ricevuta la trasmissione del suddetto paziente con un intervento notturno del defibrillatore per una fibrillazione ventricolare.

Il paziente una volta contattato non lamenta nessun sintomo, accetta tuttavia il ricovero.

Durante la degenza viene sottoposto a coronarografia per verificare la condizione delle arterie cardiache. L'esame evidenzia una lesione sub-occlusiva del tratto prossimale/medio della arteria interventricolare anteriore. Il vaso viene trattato con angioplastica, come testimoniano le immagini sottostanti. Si può notare la lesione e il successivo trattamento.

Questo caso rappresenta come l'utilizzo della metodica del controllo remoto possa essere di grande aiuto nella diagnosi precoce di importanti complicazioni

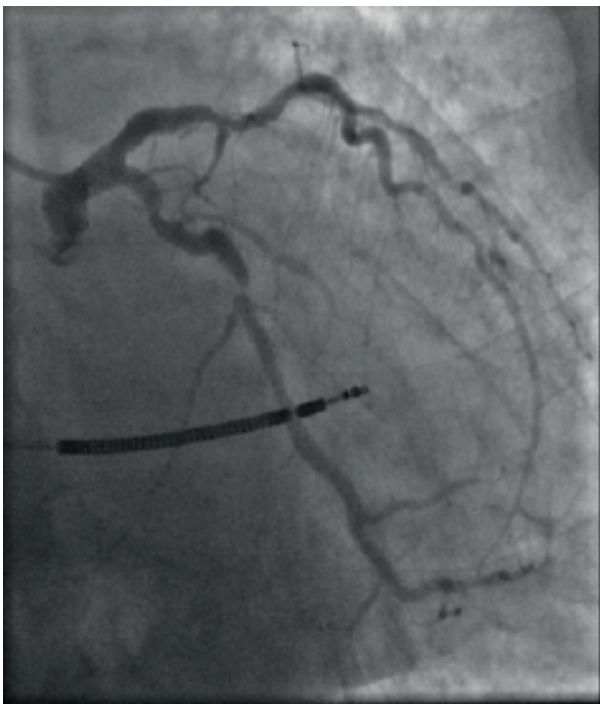


Figura 1

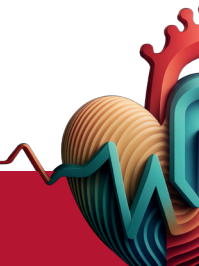


Figura 2

cardiovascolari. Nel caso di specie in assenza di questo presidio, essendo stato asintomatico l'evento, l'evento sarebbe passato inosservato e la lesione avrebbe potuto peggiorare ulteriormente, determinando possibili ulteriori episodi aritmici che avrebbero posto a serio rischio la salute e la prognosi del paziente. L'evento invece è stato tempestivamente visto ed

un altrettanto rapido ricovero ha permesso di fare la diagnosi, il tutto senza che il paziente si accorgesse dell'evento scatenante.

Questo caso, come molti altri, è solo uno dei modi in cui questo tipo di tecnologia possa venire incontro ai pazienti e ai sanitari che li hanno in cura.



CardioSic



85° CONGRESSO NAZIONALE SIC
Roma, 12-15 dicembre 2024

VALVULOPATIE

VALVULOPATIE 721

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

CLINICAL AND PATHOPHYSIOLOGICAL ROLE OF PULMONARY VENOUS FLOW IN PATIENTS WITH AORTIC VALVE STENOSIS

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Background: Aortic valve stenosis is the most common valvular heart disease requiring intervention and represents a critical health burden as a significant cause of morbidity and mortality, particularly in the elderly. In this pressure overload state, a refined echocardiographic approach, focused on both valvular and extravalvular features, is key to proper patient referral. Pulmonary vein flow can be easily measured and may serve as a barometric index, but it has been little studied in this context.

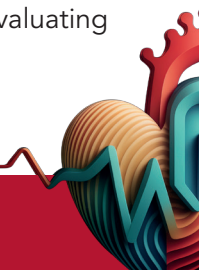
Aim: This study investigates the relationship between the characteristics of pulmonary venous flow systolic wave (PVS), clinical presentation and outcomes in patients with at least moderate aortic valve stenosis.

Methods: Inclusion criteria were a) at least moderate aortic valve stenosis and b) complete pulmonary veins Doppler assessment by transthoracic echocardiography. All the enrolled patients had a transthoracic 2D and Doppler echocardiographic examination and clinical evaluation performed at our institution and all the collected data were recorded and reanalyzed offline using Image Arena TTA2 (TomTec Imaging System). Outcome data included death, heart failure or aortic valve replacement.

Results: A total of 70 consecutive patients met the inclusion criteria (age 77 ± 9 years, 46% Female). Patients with PVS below the mean value of 60 cm/s

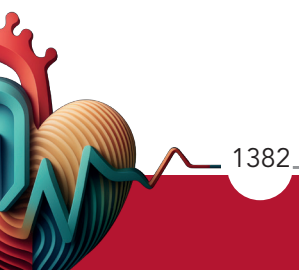
(vs. higher) presented more pronounced features of extravalvular cardiac damage: lower LVEF ($55 \pm 14\%$ vs. $62 \pm 11\%$; $p=0.0211$), lower stroke volume index (43 ± 8 vs 49 ± 12 mL/m²; $p=0.0094$), higher E/e' ratio (15.6 vs 10.7 ; $p=0.0014$) and left atrium volume index (41 ± 2 vs 34 ± 2 mL/m²; $p=0.0418$), lower AVA (0.91 ± 0.05 vs 1.15 ± 0.06 cm²; $p=0.0030$), lower DTI right ventricle S' (11.3 ± 0.5 vs 13.0 ± 1.5 cm/s; $p=0.0249$). Mean follow-up was 5.1 ± 3.7 years during which 55.7% of patients underwent aortic valve replacement and 34 patients had heart failure or died (49%). The event-free rate for PVS below vs. above 60 cm/s at 3 years was $60 \pm 9\%$ vs. $90 \pm 6\%$ and at 6 years $45 \pm 9\%$ vs $76 \pm 8\%$, Log-Rank and Wilcoxon both $p=0,01$. Of note the event-free rate after censoring for aortic valve replacement for PVS below vs. above 60 cm/s at 3 years was $64 \pm 9\%$ vs. $96 \pm 3\%$ and at 6 years $52 \pm 10\%$ vs $84 \pm 7\%$ Log-Rank $p=0,001$ and Wilcoxon $p=0,004$. Pulmonary vein flow was significantly associated with outcome: RR 0.95 (0.92-0.98) $p=0.0005$ unadjusted, and RR 0.93 (0.87-0.98) $p=0.0015$ after comprehensive adjustment for E/e', stroke volume index, systolic blood pressure, DTI right ventricle S' and AVA.

Conclusion: This study is the first exploring the role of PVS wave in aortic valve stenosis and shows that in patients with moderate or severe aortic valve stenosis pulmonary venous flow's systolic wave is associated with cardiac extravalvular damage and independently linked to poor outcome. This suggests that evaluating



pulmonary venous flow and including its assessment in routine echocardiographic exams may offer further

insights into the prognosis of these individual.



VALVULOPATIE 176
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

HEMODYNAMIC FORCES ASSESSMENT IN SEVERE AORTIC STENOSIS UNDERGOING TRANSCATHETER AORTIC VALVE INTERVENTION

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Background: Estimated hemodynamic forces (HDFs) are a novel and validated marker of cardiac function evaluation computed by standard echocardiography. They have been demonstrated to be altered in many cardiac diseases, such as heart failure. However, their application in valvular disease is still not completely known.

Aim: to analyze left ventricular (LV) HDFs in patients with severe aortic stenosis before and immediately after transcatheter aortic valve implantation to reveal whether cardiac changes occur early after the procedure.

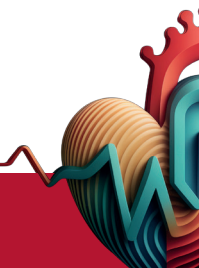
Methods: All the patients with severe aortic stenosis referred to our institution for TAVI with sinus rhythm and a good echocardiographic acoustic window were consecutively enrolled. Transthoracic echocardiography (TTE) was performed before and early after the procedure (within five days). Standard TTE parameters for volume dimension and function were collected along with peak and mean aortic gradients and aortic valve area. TTE cine loops in 3-2 and 4 chambers were analyzed offline with a dedicated speckle tracking echocardiography (STE) software to compute global longitudinal strain (GLS) and HDFs using LV endocardial displacement and the estimated mitral and aortic valve areas as input. HDFs were computed during the entire cardiac cycle, in systole and diastole, in their two main

directions: apex-to-base (AB) and lateral-septal (LS). The LS over AB ratio was also calculated, representing HDFs' distribution into the LV. HDFs were normalized with LV volumes and expressed as a percentage of the force of gravity.

Results: 31 patients undergoing TAVI were enrolled (mean age 82 years \pm 7, 45 % females, Euroscore II $4.2\% \pm 2.1$, 71% history of CAD). Baseline standard and advanced TTE parameters are described in the table. After the procedure, no significant changes in ejection fraction (55 ± 9 vs. 57 ± 10 , $p=0.105$) were observed, while a trend in GLS improvement was observed even without statistical significance (-16.6 ± 9.1 vs -19.1 ± 5.8 , $p=0.63$). HDFs in the entire cycle showed a significant improvement in terms of magnitude, apical-base ($p=0.08$) and lateral septal ($p=0.01$), but no significant changes in the LS/AB ratio were observed, even if there was a slight reduction ($p=0.670$).

A slight improvement in HDFs AB and LS and a reduction in LS/AB ratios were observed in both systole and diastole, even if they were not statistically significant (Table).

Conclusions: Preliminary data suggest that HDFs by TTE, representing advanced LV function evaluation, showed a trend in improvement after acute pressure unloading in TAVI patients. A greater cohort is needed to expand these data.



**PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
CARDIOPATIE CONGENITE NELL'ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)**

QUADRICUSPID AORTIC VALVE: A RARE CONGENITAL ANOMALY DETECTED IN ADULTHOOD FOLLOWING SEVERE AORTIC REGURGITATION

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Background: Quadricuspid aortic valve is a rare congenital malformation, occurring in approximately 0.003 to 0.043% of congenital heart defects. Its embryological origin is unknown and it typically appears as an isolated congenital anomaly, though it can be associated with conditions such as Ehlers-Danlos syndrome, Williams syndrome, and coronary artery anomalies in 10% of cases. Despite being a congenital condition, it often remains undetected until adulthood due to the progressive deterioration of valve function.

Case Presentation: A 54-year-old female patient presented in February 2024 with exertional dyspnoea. Cardiological examination, electrocardiogram,

and transthoracic echocardiography revealed left ventricular enlargement with normal wall thickness (End-Diastolic Diameter 54 mm), preserved systolic function (Ejection Fraction 65%), impaired diastolic function with a relaxation pattern, normal estimated filling pressures, and normal atrial dimensions (Left Atrial Volume 43 ml). Severe central aortic regurgitation was identified (Image B), with normal aortic root and ascending aorta dimensions. A preoperative transoesophageal echocardiography revealed a quadricuspid aortic valve (Image A), classified as type A (Hurwitz and Roberts), characterized by four equal cusps. Computed tomography confirmed this diagnosis (Image C). The patient underwent surgical aortic valve replacement, receiving a 21 mm Inspiris Resilia bioprosthesis via mini-sternotomy. Surgical findings confirmed the quadricuspid nature of the valve (Image D). Postoperatively, the patient was discharged in stable condition with a mean transvalvular gradient of 13 mmHg and no paravalvular leaks.

Conclusions: This case highlights the importance of recognizing congenital anomalies such as quadricuspid aortic valve, which can remain undetected until significant symptoms manifest. A thorough diagnostic approach, including transthoracic and transoesophageal echocardiography and computed tomography, is crucial for accurate diagnosis and appropriate surgical intervention. Despite the rarity of this condition, timely identification and treatment are essential to prevent severe complications and ensure favorable outcomes.

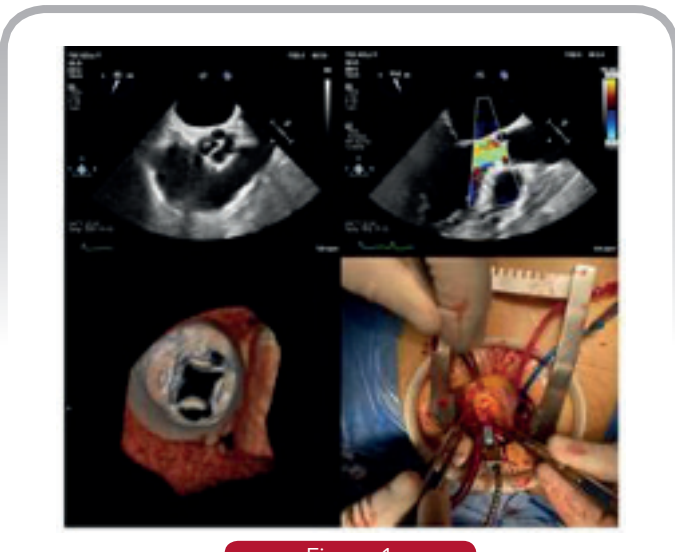


Figure 1

VALVULOPATIE 669
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
ECMO (ASSISTENZA CARDIACA IN ACUTO)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)

**ACUTE ISCHEMIC PAPILLARY MUSCLE RUPTURE TREATED WITH M-TEER:
A GROUNDBREAKING LIFE-SAVING PROCEDURE.**

Valeria Maria De Luca (a, b), Tobias Friedrich Ruf (b), Theresa Gossler (b), Sara Bombace (b), Valeria Cammalleri (a), Gian Paolo Ussia (a), Francesco Grigioni (a), Philipp Lurz (b), Ralph Stephan Von Bardeleben (b)
(a) UNIVERSITY CAMPUS BIOMEDICO ROME; (b) UNIVERSITY MEDICINE MAINZ

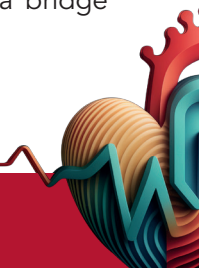
Mitral regurgitation (MR) is a significant complication that occurs in up to 1% of patients following myocardial infarction (MI). The condition is particularly severe when accompanied by papillary muscle rupture (PMR), leading to critical hemodynamic instability that requires urgent intervention. Traditionally, MR due to PMR has been managed through surgical mitral valve (MV) repair or replacement. However, Mitral Transcatheter Edge-To-Edge Repair (M-TEER) offers a promising alternative to surgery for managing acute MR caused by PMR in high-risk patients. This case series includes two instances of acute MR following PMR, complicated by cardiogenic shock, where M-TEER was successfully utilized due to the high surgical risk, highlighting its potential to provide significant hemodynamic improvement and serve as either a bridge to surgery or as destination therapy.

Case 1: A 61-year-old man with a history of non-ST-elevation myocardial infarction (NSTEMI) presented with subacute ST-elevation myocardial infarction (STEMI) complicated by cardiogenic shock and cardiac arrest. Initial evaluation revealed severe respiratory distress and critical hemodynamic instability. Transthoracic echocardiography (TTE) identified severe left ventricular dysfunction and rupture of the posteromedial papillary muscle, leading to severe primary MR. Due to cardiogenic shock, immediate veno-arterial extracorporeal membrane oxygenation (VA-ECMO) was initiated. A transesophageal echocardiogram (TEE) confirmed the diagnosis. Given the prohibitive surgical

risk, M-TEER was performed using three MitraClip G4 XTW devices, resulting in procedural success with mild residual MR and significant hemodynamic improvement. A staged surgical MV replacement was performed three weeks post-stabilization. At three months follow-up, the patient was asymptomatic and had no further cardiovascular events.

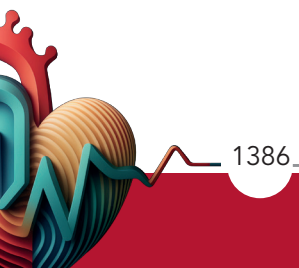
Case 2: An 82-year-old man presented with cardiogenic shock following a posterolateral STEMI, treated with primary percutaneous coronary intervention. Initial TTE and TEE revealed a left ventricular ejection fraction (LVEF) of 35%, posteromedial PMR, and severe MR. Despite ECMO support, the patient remained hemodynamically unstable. Given the high surgical risk, a percutaneous approach with M-TEER was chosen. Three MitraClip XTW devices were successfully deployed, reducing mitral regurgitation and improving hemodynamic parameters. The procedure resulted in moderate residual MR with significant reductions in V-wave pressure and left atrial pressure. Unlike the previous case, in this instance, the M-TEER was the destination therapy, considering the patient's comorbidities and age.

These cases underscore the potential of M-TEER in managing acute MR in critically ill patients. The application of multiple MitraClip devices allowed significant reduction in MR and improvement in hemodynamic parameters. M-TEER can provide a less invasive yet effective intervention for patients with high surgical risk, offering a viable alternative or a bridge



to surgical treatment. The promising results of this case series suggest that M-TEER could play a key role in the treatment of acute MR due to PMR. However, ongoing research and larger clinical trials are necessary

to establish long-term outcomes and to potentially expand guidelines to include the use of M-TEER in acute settings.



VALVULOPATIE 286

ECOSTRESS (IMAGING CARDIOVASCOLARE)

FUNZIONE VENTRICOLARE, RIMODELLAMENTO E DANNO D'ORGANO

(IPERTENSIONE ARTERIOSA)

PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)

EXERCISE STRESS ECHO FOR EVALUATION OF 2-YEAR FOLLOW UP OUTCOMES OF MINIMALLY INVASIVE MITRAL VALVE REPAIR

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Background: Minimally invasive mitral valve repair (MIMVR) has emerged as a favored choice over traditional sternotomy for addressing severe degenerative mitral regurgitation (MR), thanks to its early advantages such as reduced morbidity, faster recovery, and cost savings, in low-risk asymptomatic patients with preserved LVEF and significant left atrial dilation. Exercise stress echocardiography (ESE) plays a crucial role in detecting dynamic changes in MR, assessing symptoms and exercise capacity for risk stratification, and guiding treatment strategies and timing.

Purpose: This study aims to evaluate the hemodynamic impacts and clinical outcomes of MIMVR as assessed by exercise stress echocardiography, two years post-treatment.

Methods: In a retrospective cohort study, we compared 13 patients (mean age 56.6 years) who underwent MIMVR from 2020 to 2021 with 13 age-similar healthy individuals. Between May 2022 and July 2023, stress echocardiograms were performed using a semi-supine bicycle ergometer, according to the Bruce and SIECVI protocols for mitral regurgitation exercise stress-echo. Evaluated metrics included left ventricular (LV) volumes and ejection fraction, left atrial volume index (LAVi), systolic pulmonary arterial pressure (sPAP), E/e' ratio, vena contracta width, regurgitant jet area and to left atrium area ratio, alongside exercise-induced symptoms, arrhythmias, and tolerance (double product, METs).

Results: Preoperatively, the majority of subjects were categorized as NYHA class II and III, with a notable shift to class I by the two-year mark post-surgery. ESE demonstrated under exertion a significant rise in EF (from 61.4% to 73.5%, $p < 0.001$), a decrease in LV filling pressure (E/e' ratio from 14.4 to 10.1, $p=0.01$) and an increase of both LAVi and sPAP (from 17 ± 6.9 to 20.5 ± 8.3 ml/sqm, $p=0.03$, and from 23.4 ± 9.3 mmHg to 36.3 ± 12.8 mmHg, $p = 0.001$, respectively, while still remaining within the normal range), with a similar behavior as the control group. Patients displayed reduced heart rate and double product during physical stress, with no notable change in MR assessment parameters (vena contracta, MR jet area and between-areas ratio). Neither stress-induced ischemia nor significant arrhythmias were observed in any group.

Conclusions: MIMVR patients exhibited marked improvements in cardiac morphology and function at rest and under stress after two years, paralleling the condition of healthy individuals, likely through a mechanism of positive reverse remodeling. ESE proved effective in evaluating postoperative cardiac adaptation and the success of hemodynamic recovery, highlighting the benefit of timely surgical intervention. The evident symptoms improvement and enhancement of overall cardiovascular health at two-years post-procedure underscore the mitral valve apparatus's robust response to stress.



VALVULOPATIE 913
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
PROGNOSI (SCOMPENSO CARDIACO)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

ASSOCIATION OF FRAILITY, DISABILITY AND MALNUTRITION AND 1-YEAR MORTALITY IN OLD PATIENTS REFERRED TO TRANSCATHETER AORTIC VALVE IMPLANTATION

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Background. Transcatheter aortic valve implantation (TAVI) is an established therapeutic option in older patients with aortic stenosis (AS) not amenable for open heart surgery. Despite more than two decades of experience, incidence of mortality and functional decline at 1 year is, however, still high. Whether the comprehensive geriatric assessment (CGA) may help stratify short term mortality and functional gain is currently unresolved.

Purpose: To assess the association of the CGA with all-cause mortality and worsening functional capacity at 1 year and derive a score to predict outcome.

Methods: Consecutive patients referred to TAVI from January 2019 to January 2022 at two high volume tertiary care hospitals were prospectively screened for frailty through a CGA based on physical function and eight key domains for frailty assessment (functional and cognitive status, nutrition, mobility, and risk of pressure sores, multimorbidity, polypharmacy and co-habitation).

Disability at 1 year was defined as loss of >2 basic activities of daily living (BADL). Patients were also analyzed by STS score. All patients were prospectively interviewed at 1 year. The primary outcome was development and validation of a score to predict mortality and a composite of mortality at functional decline at 1 year.

Results: Overall, 495 patients were enrolled over

3 years (mean age 83+4 years, women 59%). Average STS score was 4.23+2.68% (low risk: 62%; intermediate: 29%, high risk: 9%). Sixty (12%) patients died at 1 year and 79 (16%) either died or reported functional decline. At multivariable logistic regression analysis, while the STS score was not associated with outcome ($p=0.376$), BADL (OR: 0.499, 95% CI [0.416-0.599], $p=0.001$), malnutrition (OR: 0.833, 95% C.I. 0.612-0.947, $p=0.007$), glomerular filtration rate (GFR, OR: 0.901, 95%CI [0.791-0.965], $p=0.008$), sPAP (OR: 1.190, 95% CI [1.084-1.156], $p<0.001$) and atrial fibrillation (AF, OR: 5.063, 95%CI [1.296-19.778], $p=0.019$) were all associated with all-cause mortality. Similar results were obtained for the composite endpoint.

After dividing the cohort in a derivation (66%) and validation (33%) group, a score was built using age, GFR, BADL, malnutrition, sPAP and heart rhythm. AUCs were 0.886 and 0.866 for derivation and validation cohorts, respectively, significantly higher than STS (AUC: 0.592, $p<0.001$). Specificity for the final score was 91.8% [95% CI 86.1% 95.7%]. Adding this model to the STS significantly increased the predictivity of the STS (Likelihood Ratio Test, $p<0.001$; Harrel C Statistic: $p<0.001$).

Conclusions: In a prospectively enrolled cohort of old TAVI candidates, frailty, disability, malnutrition, and kidney function could identify patients at increased risk of futility at 1-year mortality irrespective of STS risk score.

VALVULOPATIE 219

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

A NOVEL STAGING SYSTEM OF CARDIAC DAMAGE IN AORTIC STENOSIS BASED ON MULTI-CHAMBER MYOCARDIAL DEFORMATION

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Background: In patients with moderate-to-severe aortic stenosis (AS), the assessment of extravalvular cardiac damage has improved risk stratification and identify candidates for early intervention.

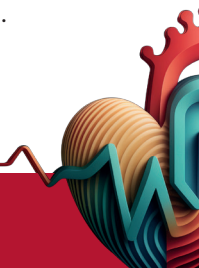
Objectives: To evaluate whether multi-chamber myocardial deformation analysis by speckle tracking echocardiography (STE), could improve the existing staging systems for patients with moderate-to-severe AS.

Methods: We analyzed 2D, Doppler, and STE data obtained from two cohorts: derivation (654 patients, median age: 82 years; 51% men) and validation (237 patients, median age: 77 years; 55% men) with at least moderate AS (aortic valve area ≤ 1.5 cm²). The receiver operator characteristic curve analysis resulted in the following optimal cut-off values associated with outcomes: 15% for left ventricular global longitudinal strain (LVGLS), 13% for peak atrial longitudinal strain (PALS), and 19% for right ventricular free-wall strain (RVFWS). Patients have been divided into five stages: Stage 0 - no left-side damage (LVGLS $\geq 15\%$ and PALS $\geq 13\%$); Stage 1 - partial left-side damage (LVGLS $\leq 15\%$ or PALS

$\leq 13\%$); Stage 2 - definite left-side damage, (LVGLS $\leq 15\%$ and PALS $\leq 13\%$); Stage 3, no right-side damage (RVFWS $\geq 19\%$); and Stage 4, right-side damage (RVFWS $\leq 19\%$).

Results: In a multivariable Cox regression analysis, the new staging scheme remained independently associated with an increased risk of all-cause death (adjusted hazard ratio [aHR]: 1.28; 95%CI: 1.10–1.48; $p=0.001$). The new staging classification showed incremental value to conventional 2D echocardiographic variables and exhibited a significantly higher predictive power (ROC AUC: 0.67; 95%CI: 0.62-0.73) compared to those proposed by Généreux et al. (AUC 0.62; 95% CI 0.56-0.67; $p=0.002$) and Tastet et al. (AUC 0.64; 95% CI 0.58-0.70; $p=0.041$) at 2-years for all-cause death in the derivation cohort. Similar results were obtained in the validation cohort.

Conclusions: Our staging system for detecting cardiac damage, incorporating multi-chamber myocardial deformation, exhibits a stronger association with outcomes than previously validated systems.



VALVULOPATIE 426

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI (PREVENZIONE E RIABILITAZIONE)

UNRAVELING GENDER DISPARITIES AND PROGNOSTIC INSIGHTS IN MODERATE AORTIC STENOSIS: A RETROSPECTIVE STUDY

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Aims: Aortic stenosis (AS) is the most prevalent valvular heart disease in developed countries, associated with reduced survival if severe AS remains untreated. Recent reports note unfavorable outcomes in moderate AS patients, challenging optimal intervention timing. Variations in pathophysiology linked to sex differences, involving sex hormones, activation of the renin-angiotensin-aldosterone system, and dysregulation in collagen synthesis, have been observed. Yet, limited data exists on sex-specific differences in moderate AS outcomes. This single-center, retrospective study included 150 patients (median age being 79 ± 13 years, female sex 48%) diagnosed with moderate AS who underwent comprehensive echocardiography in IRCCS Fondazione Ca' Granda Ospedale Maggiore Policlinico of Milan from July 2022 to October 2023. Clinical data, encompassing demographics details and therapy, were obtained via record reviews and phone interviews. Death verification relied on the 'Sistema Informativo Socio-Sanitario Regione Lombardia' database. Echocardiographic records were digitally stored and post-processed by four independent investigators using Medimatic ComPACS workstation. Men were significantly younger than women (75 ± 10 vs 79 ± 9.7 years, $p = 0.016$). They exhibited lower left

ventricular ejection fraction, larger left ventricular end-systolic volume and stroke volume compared to women ($54 \pm 7\%$ vs $59 \pm 10\%$; $p = 0.028$. 55 ± 36 ml vs 31 ± 13 ml; $p < 0.001$. 83 ± 18 ml vs 75 ± 18 ml; $p = 0.030$). Men had significantly smaller aortic valve area index to body surface area (0.6 ± 0.09 cm²/m² vs 0.7 ± 0.1 cm²/m²; $p < 0.001$) and lower doppler velocity index (0.32 ± 0.07 vs 0.38 ± 0.11 ; $p < 0.001$) than women. Coronary artery disease and smoking were more frequent in men (53.3% vs 46.7% ; $p = 0.002$. 52.6% vs 47.4% ; $p < 0.001$). At survival analysis, male sex was independently associated with the composite outcome (all-cause mortality and aortic valve replacement) at a mean follow-up time of 200 ± 133 days, median survival being 244 ± 16 vs 255 ± 15 days, $p = 0.025$. At multivariable analysis including relevant clinical variables (hemoglobin and aortic valve index to BSA value), male sex remained independently associated with the composite outcome (hazard ratio: 2.01; CI 1.0-4.17; $p = 0.05$). Women diagnosed with moderate AS exhibited a lower incidence of aortic valve replacement and all-cause mortality. These findings may suggest the existence of different clinical and echocardiographic phenotypes among patients with AS.

VALVULOPATIE 957
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

A CASE REPORT OF CARDIOGENIC SHOCK IN POLYVALVULAR CARDIOPATHY EFFECTIVELY TREATED WITH EMERGENCY AORTIC VALVULOPLASTY IN THE ACUTE SETTING

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Background: A 75-year-old woman, with a history of hypertension, was admitted to a Spoke hospital's ED (Gorizia) for cardiogenic shock in the context of atrial flutter with slow ventricular response in previously unknown severe polyvalvular cardiopathy (BP 60/40 mmHg, HR 58 bpm). At her presentation the patient had initial signs of multiple organ dysfunction (arteriosus lac 5.4 mmol/l (n.v. < 2.2), TnI 1088 ng/l, Cr 2.01 mg/dl, SGOT/SGPT 123/49 U/l) and was promptly started on Noradrenaline and Dobutamine therapy.

Trans-thoracic echocardiography showed a normally shaped and functioning left ventricle (EF 60%), a right ventricle with severe dilation and dysfunction, severe aortic valvular stenosis (transvalvular max/mean gradient: 98/56 mmHg), severe mitral regurgitation with prolapse of the posterolateral leaflet and evidence of a mitral cord rupture, and severe tricuspid regurgitation with severe pulmonary hypertension (SPAP 75 mmHg). The CT thoracic angiography showed minor acute bilateral pulmonary embolism and bilateral pleural effusion.

As the patient was not responding to high dosage of inotropes and vasopressors, the shared decision of transferring her to our cardiac ICU was taken. Urgent coronary angiography showed no critical coronary disease and right heart catheterization demonstrated a post-capillary pulmonary hypertension and a reduction of the cardiac index- mPAP 48 mmHg, PCWP 35 mmHg, PVR 3 UW, CI 1.1 L/min/m²).

After an intra-aortic balloon pump (IABP) was positioned, an emergency balloon aortic valvuloplasty was performed. The procedure was partially effective in the reduction of transaortic gradients (81/50 mmHg), but it enabled the weaning from noradrenaline and IABP.

Heart Team discussion took place and nine days after admission the patient underwent a combined intervention of bioprosthetic aortic valve replacement, plastic repair of the mitral valve, with the implant of Goretex neochords on the Posterior Leaflet, plastic repair of the tricuspid valve and closure of the left auricle. A bicameral PM was implanted in the postoperative course due to a complete atrioventricular block.

At discharge, trans-thoracic echocardiography demonstrated normal ventricular morphology and systolic function, correctly positioned aortic bioprosthetic valve with no leaks and physiologic gradients, repaired mitral valve with mild regurgitation, tricuspid valve with evidence of annuloplasty and mild regurgitation and mild pulmonary hypertension (SPAP 41 mmHg).

In conclusion, the combination of IABP placement and emergency aortic valvuloplasty allowed for good hemodynamic stabilization of this acute patient, facilitating a safer cardiac surgery involving all the affected valves.



VALVULOPATIE 787
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
ANGINA INSTABILE (CARDIOPATIA ISCHEMICA)

MANAGEMENT OF SEVERE AORTIC STENOSIS AND COMPLEX, HIGH-RISK PERCUTANEOUS CORONARY INTERVENTION: INSIGHTS FROM AN INTERNATIONAL REGISTRY

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Background: There is a lack of evidence to guide treatment of patients with concomitant indication to Transcatheter Aortic Valve Implantation (TAVI) and complex, high-risk percutaneous coronary intervention (PCI).

Aims: We aimed to assess different strategies of PCI timing in this high-risk TAVI cohort

Methods: The ASCoP registry retrospectively included patients with a clinical indication to both TAVI and PCI with at least 1 criterion of high-risk or PCI

complexity. The primary endpoint was a composite of all-cause death and unplanned rehospitalization for cardiovascular causes. The secondary endpoint was a composite of all-cause death, stroke, acute myocardial infarction, major bleeding, major vascular complication and unplanned revascularization. Multivariable analysis was used to adjust for possible confounders.

Results: A total of 519 patients were included; 363 (69.9%) underwent staged procedures and 156 (30.1%) concomitant TAVR and PCI. After 441 (182

– 824) days the primary endpoint occurred in 151 (36.5%) cases, without any significant difference in the 2 groups ($p=0.98$), while the secondary endpoint occurred more frequently in the concomitant group ($n=36$; 25.8% vs. $n= 57$; 17.4%; $p=0.014$). When considered separately, staged PCI after TAVR was independently associated with a significantly higher rate of primary (60.0% vs. 34.9%; $p=0.007$) and secondary (37.3% vs. 16.2%; $p=0.011$) endpoints compared to other strategies.

Conclusions. In patients undergoing TAVI and complex/high-risk PCI, a concomitant strategy is associated with higher adverse events and procedural risk. Among those scheduled for staged procedures, PCI after TAVR was also associated with worse outcome.

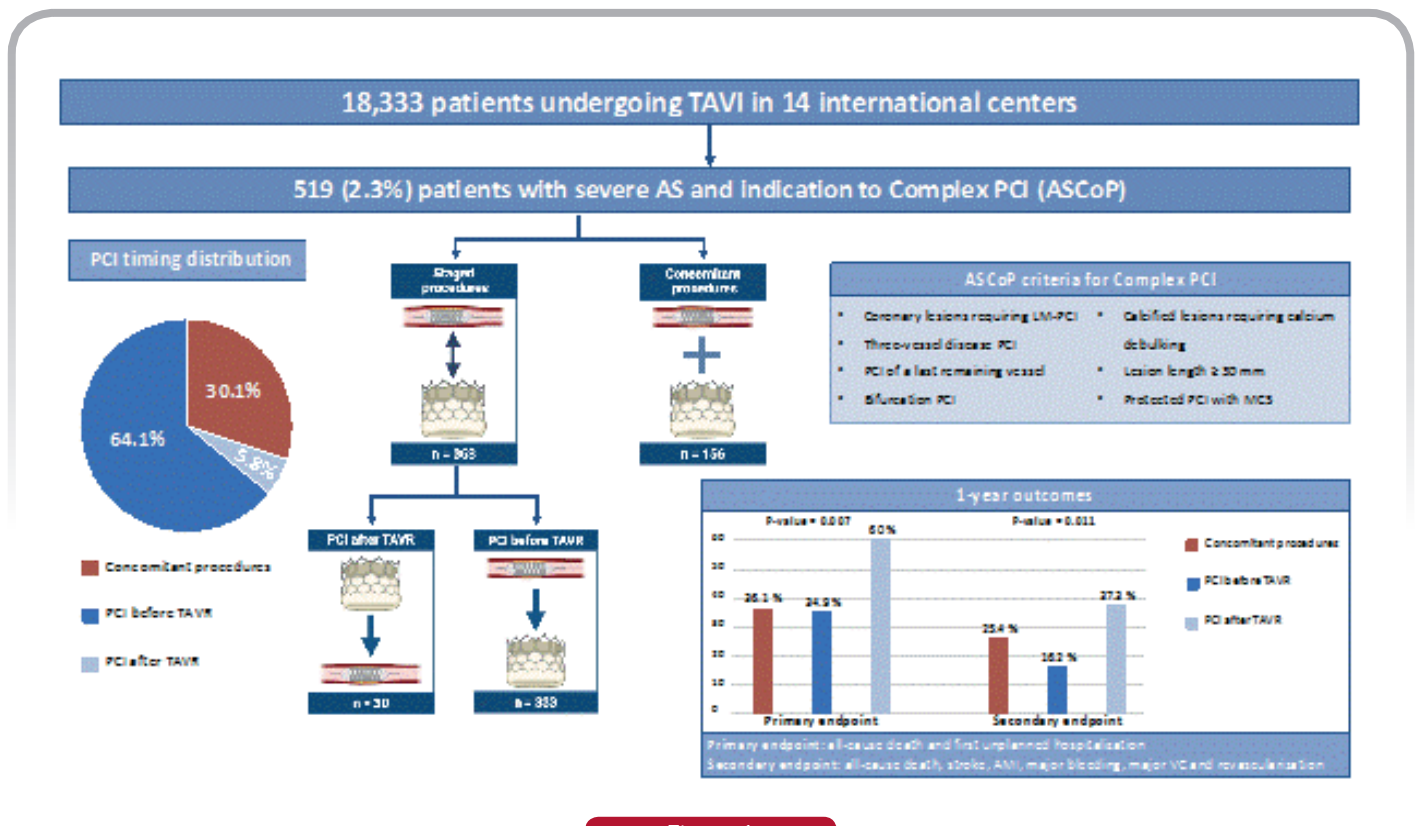


Figure 1



VALVULOPATIE 231

PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

DYNAMIC CHANGES OF MYOCARDIAL FUNCTION EARLY AND LONG-TERM AFTER MITRAL VALVE SURGERY DETECTED BY SPECKLE TRACKING ECHOCARDIOGRAPHY

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Background. It is known that mitral valve surgery produces an early reduction of hemodynamic overload after the procedure. However, several authors described a reduction of left ventricular (LV) ejection fraction (EF) after mitral valve surgery, despite normal values at baseline, which may persist over long-term follow-up. Speckle tracking echocardiography (STE) has shown to provide more sensitive indices of cardiac performance in several clinical settings, among which MR. Myocardial work (MW) allows for the assessment of LV performance by considering the effect of LV afterload. The aim of this study was to describe acute and late postoperative changes of cardiac function and

hemodynamics using basic echocardiography, STE and MW indices in patients with primary MR and to find preoperative predictors of improvement of NYHA class at long-term follow up.

Methods. Consecutive patients with severe MR and preserved LV EF undergoing surgical treatment (mitral valve repair or replacement) were prospectively enrolled. Exclusion criteria were atrial fibrillation at the time of enrolment, previous cardiac surgery, concomitant aortic or coronary surgery, poor acoustic window. Patients underwent clinical, biochemical and echocardiographic evaluation before and within one week after surgery during the hospitalization period. STE and MW were performed offline by experienced operators blinded to other data. Then, 31 of them underwent a new echocardiographic exam, completed by MW, at long-term follow up

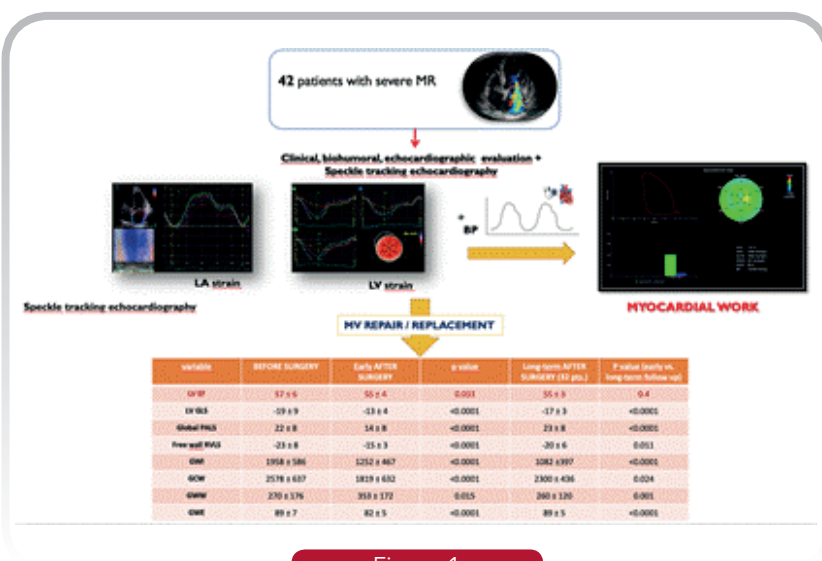


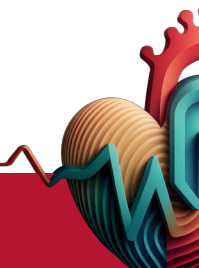
Figure 1

Results. A relevant proportion (60%) of ARVC patients was anti-DSG2-positive, and both ARVC (p=0.003) and myocarditis/DCM patients (p=0.009) had higher anti-DSG2-ab levels than controls (Figure 1). Anti-DSG2-ab titer was not different between ARVC and myocarditis/DCM patients (p=0.6). AIDA positivity by ELISA and anti-DSG2-ab positivity by IFL were correlated (p=0.039 for OD, p=0.023 for U/L). In

ARVC, AIDA-positive patients had higher probability of being AHA positive ($p < 0.001$), presenting pre-syncope ($p = 0.025$) and abnormalities in cardiac rhythm ($p = 0.03$) than ARVC-AIDA negative patients, while anti-DSG2-ab positivity did not have clinical correlates.

Conclusions. Advanced echocardiography offers a more accurate and load-independent assessment of

LV performance after surgery in patients with primary MR. After an initial decline, LV function raises long after mitral valve surgery, parallel to a reduction in symptoms, as shown by STE indices. Therefore, these indices might provide additional value for long-term follow up of patients undergoing mitral valve repair/replacement.



VALVULOPATIE 181
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)

IMPACT OF RIGHT VENTRICULAR FUNCTION ON OUTCOME IN LOW-RISK SECONDARY TRICUSPID REGURGITATION TO EFFECTIVE REGURGITANT ORIFICE AREA

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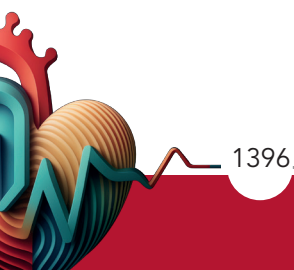
Background: The threshold value of the effective regurgitant orifice area (EROA) that identifies patients with secondary tricuspid regurgitation (STR) at high risk of events during follow-up remains unclear. **PURPOSE:** Our study aimed to identify the threshold value of the EROA defining patients with STR at high-risk of events during follow-up and to evaluate the impact of right ventricular (RV) remodeling in modulating the outcome of low-risk STR patients according to EROA.

Methods: 513 consecutive outpatients with STR were included. Using the threshold value derived by spline curves, we divided our cohort into two groups: low- (EROA ≤ 0.47 cm²) and high- (EROA > 0.47 cm²) risk STR patients. The endpoint was a composite of heart failure hospitalization and death.

Results: At 18 ± 15 months from enrolment, 195 patients (38%) reached the endpoint. The Kaplan-Meier curves demonstrated a higher rate of events for high-risk patients (54 ± 6% vs 30 ± 7%, p < 0.0001). EROA > 0.47 cm² was associated with a 2-fold increased risk of experiencing the outcome (Hazard Ratio [HR]: 2.08,

95% Confidence Interval [CI] 1.56-2.77, p < 0.0001). Patients with atrial STR had a significantly lower threshold value (0.44 cm²) than patients with ventricular STR (0.49 cm²). In multivariate Cox regression analysis, EROA remained independently associated with the composite endpoint (adjusted HR: 1.01, 95% CI 1.00-1.02, p < 0.0001) both in the entire cohort and in high-risk patients. Patients with low-risk STR were associated with a dismal prognosis only if they had dilated or dysfunctioning RV. In patients with EROA ≤ 0.47 cm², the event rate at two years for RV end-diastolic volume > 90 mL/m², RV end-systolic volume (RV ESV) > 46 mL/m², RV ejection fraction < 45% and RV forward stroke volume/RV ESV < 0.40 were respectively: 42 ± 4%, 51 ± 4%, 44 ± 4%, and 47 ± 4%.

Conclusions: Our results refine the independent association between STR severity assessed by EROA and outcomes. In patients with low-risk STR, the assessment of RV function and RV-PA coupling may improve the patient's risk prediction, demonstrating a clinically relevant link between STR severity and RV geometry and function.



VALVULOPATIE 660
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO
(ETE) (IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

EDGE-TO-EDGE REPAIR FOR TRICUSPID VALVE REGURGITATION: 1 YEAR FOLLOW UP AND CLINICAL IMPLICATIONS FROM THE TR-INTERVENTIONAL STUDY

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(a) FONDAZIONE POLICLINICO CAMPUS BIOMEDICO

Background: Tricuspid regurgitation (TR) affects 7% of the population, contributing significantly to heart failure-related hospitalizations. Traditional treatments have several limitations, prompting the exploration of innovative interventions.

Purpose: The present study aims to investigate the efficacy of tricuspid valve transcatheter edge-to-edge repair (T-TEER) in real-world patients with severe and symptomatic TR deemed at high surgical risk. The primary objectives focus on assessing T-TEER efficacy and its impact on the right-side chamber. Secondary objectives include assessing functional status, quality of life, and residual TR throughout the 12-month follow-up.

Methods: The TR-Interventional study (TRIS) is a prospective, single-arm study. From March 2021 to December 2023, we enrolled 44 symptomatic patients with at least severe TR referred for TEER. Echocardiographic follow-up was performed at 1 and 12 months after the enrollment. Clinical status was assessed using the NYHA functional class and the Kansas City Cardiomyopathy Questionnaire.

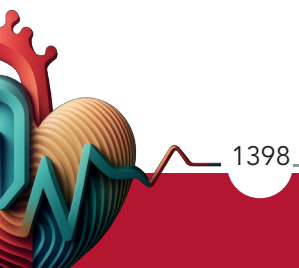
Results: The study cohort had a mean age of $78.3 \pm$

7 years with a median TRISCORE 5.4% (IQR 3.5-9.0). Seventeen patients (38.6%) had massive, 7 (15.9%) had torrential, and 20 (45.5%) patients had severe TR. Etiologies included functional (40.9%), degenerative (13.64%), lead-induced (15.9%), and mixed (29.54%) origin. The primary efficacy endpoint, which assesses the successful implantation and performance of the device at 30 days, was attained in 82.9% of patients. The stability of TR reduction at 12 months was achieved in 82.3% of patients. Furthermore, a significant reduction in TR grade occurred immediately after the procedure with durable results at 30 days and one-year follow-up ($p < 0.001$) (Figure 1 A). Thirty-day TTE underscored notable improvements in right heart chamber sizes. Effects on RV remodeling also became apparent at one-year follow-up, including reductions in the median RV end-diastolic basal diameter from 44 mm to 40 mm ($p < 0.01$), medium diameter from 38 mm to 36.5 mm ($p = 0.04$), and in TA septal-lateral diameter from 43 mm to 37.5 mm ($p < 0.01$). Significant reduction in vena contracta median width (9 mm to 3 mm; $p < 0.01$), regurgitant volume (58 ml to 30 ml; $p < 0.01$), and effective regurgitant orifice area (0.6 cm² to 0.3 cm²; $p < 0.01$), occurred between baseline and one-year follow-up (Figure 2). The secondary object includes the evaluation of clinical outcomes. As



for, the percentage of patients categorized as NYHA class III-IV decreased from 83% at baseline to 17% at one year ($p < 0.05$) (Figure 1B). The KCCQ mean value exhibited valuable improvement, ranging from 66 ± 9.4 at baseline to 74.5 ± 10.5 at one year after T-TEER ($p < 0.0001$) (Figure 1C). One year after the procedure, the all-cause mortality rate was 0%.

Conclusion: TRIS suggests that T-TEER is a valuable and effective therapeutic option in contemporary practice. The enduring nature of TR reduction at one year correlates with sustained clinical benefits and reverse structural remodeling of the right ventricle.



VALVULOPATIE 490 INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE) ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

LEFT ATRIAL THROMBUS: A COMPLEX CASE OF MITRAL VALVULOPLASTY

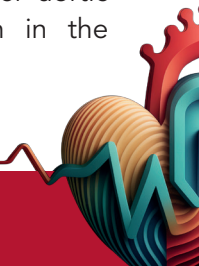
Consolato Mesiani (a), Michele Strosio (a), Francesco Putorti (a), Andrea Bertolini (a), Andrea Panza (a), Federico Arturi (a), Tommaso Fabris (a), Francesco Cardaioli (a), Luca Nai Fovino (a), Giulia Masiero (a), Chiara Fraccaro (a), Massimo Napodano (a), Giuseppe Tarantini (a)
(a) UNIVERSITÀ DEGLI STUDI DI PADOVA

Introduction: Percutaneous mitral commissurotomy (PMC) is the preferred treatment for patients with severe symptomatic mitral valve rheumatic stenosis, unless contraindicated. Anatomical contraindications to PMC include left atrial (LA) thrombus, significant mitral regurgitation, severe bicommissural calcifications, and lack of commissural fusion. This case report details a patient with severe symptomatic rheumatic mitral valve stenosis and a LA thrombus undergoing PMC, supported by the TriGuard deflection filter for cerebral embolic protection.

Case Report: A 74-year-old woman presented to the Emergency Department in July 2024 with acute heart failure. Her medical history included rheumatic heart disease, percutaneous coronary revascularization in 2011, type 2 diabetes mellitus, and permanent atrial fibrillation on warfarin. After stabilization, a transthoracic echocardiogram showed severe rheumatic mitral stenosis with a transvalvular mean gradient of 17 mmHg, a non-dilated hypertrophic left ventricle, and a preserved ejection fraction. A transesophageal echocardiogram (TEE) revealed a dilated mitral valve annulus with thickened leaflets, a non-mobile posterior leaflet due to posterior commissural fusion, and anterior leaflet doming (Wilkins Score of 8), with a 3D area of 1.1 cm². TEE also identified a 6x8 mm iso-echogenic mass attached to the LA side of the atrial septum, consistent with a thrombus. Right/left heart catheterization showed no critical coronary stenosis and confirmed severe mitral valve stenosis (mean gradient 14 mmHg). Serial echocardiograms

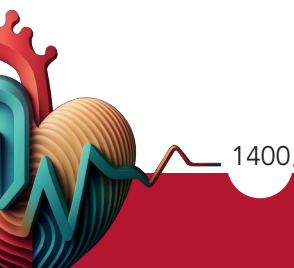
documented the persistence of the thrombus despite optimal antithrombotic therapy. After discussion, the Heart Team scheduled PMC with a cerebrovascular embolic protection device. Under conscious sedation, an 8Fr femoral artery sheath was used to deploy the TriGuard, a temporary, retrievable, single-use, self-expanding deflection filter with a radiopaque Nitinol frame and polymer mesh (pore size 115–145 μm) covering all three major aortic arch vessels. A standard Inoue Kit was used for PMC. A Brockenbrough trans-septal needle was advanced through an 8Fr femoral venous Mullins catheter to perform a trans-septal puncture under TEE guidance to avoid the thrombus. After confirming the correct position, a coiled-tip guidewire was placed into the LA. Following atrial septum dilation with a 14Fr dilator, a 28 mm Inoue Toray balloon was advanced over the wire. Three inflations (24-26-28 ml) were successfully performed, resulting in a residual invasive mean transvalvular gradient of 4.5 mmHg. The TriGuard system was retrieved without complications, and the LA thrombus persisted on the interatrial septum post-procedure. A pre-discharge transthoracic echocardiogram showed mild residual mitral stenosis and mild mitral regurgitation. The patient was discharged in good condition without cerebrovascular events.

Conclusion: Historically, the presence of an LA thrombus is an absolute contraindication for PMC. Recent use of cerebral embolic protection devices, such as the TriGuard system, in transcatheter aortic valve implantation has shown a reduction in the



risk of clinically overt stroke. However, no data are available for their use in PMC. This is the first case report demonstrating the feasibility and safety of using the TriGuard system for PMC in a patient with an LA thrombus. The device was successfully delivered,

deployed, and retrieved, providing comprehensive cerebral embolic protection throughout the PMC procedure, allowing it to be performed despite a classical absolute contraindication.



VALVULOPATIE 458 ENDOCARDITI (VALVULOPATIE) PROGNOSI (SCOMPENSO CARDIACO) DIAGNOSI DELLO SCOMPENSO (SCOMPENSO CARDIACO)

IMPACT OF EMBOLIC EVENTS AND ACUTE HEART FAILURE ON THE PROGNOSIS OF PATIENTS WITH INFECTIVE ENDOCARDITIS UNDERGOING VALVE SURGERY

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(a) DEPARTMENT OF CLINICAL AND EXPERIMENTAL MEDICINE, UNIVERSITY OF MESSINA, 98100 MESSINA, ITALY; (b) CARDIOLOGY UNIT, HEART CENTRE, FONDAZIONE GABRIELE MONASTERIO-REGIONE TOSCANA, 54100 MASSA, ITALY; (c) DIVISION OF ADULT CARDIAC SURGERY, FONDAZIONE TOSCANA GABRIELE MONASTERIO, 54100 MASSA, ITALY; (d) HEALTH SCIENCE INTERDISCIPLINARY CENTER, SCUOLA SUPERIORE SANT'ANNA, PISA, ITALY

Background: Infective endocarditis (IE) is marked by a heightened risk of embolization, uncontrolled infection, or heart failure (HF). Cardiac surgery is recommended to enhance both survival and symptoms management.

Methods: Patients with IE from North-West Tuscany referred to our Center for surgery were retrospectively enrolled, from October 2015 to December 2018. The primary endpoint consisted of a composite of major adverse events (MAEs) including all-cause death, hospitalizations, and IE relapses. The secondary endpoint was all-cause death.

Results. 102 patients (66 ± 14 years) were admitted for IE with indication to surgery: 50 % of them had an IE on prosthesis, 33% presented with IE associated heart failure (IE-aHF), 38.2% showed Embolic Events (EE). IE-aHF and EE were independently associated to MAE (HR 1.9, 95% CI 1.1-3.4, $p = 0.03$ and HR 2.1, 95% CI 1.2-3.6, $p = 0.01$, respectively) and Kaplan-Meier survival curves confirmed a strong difference in MAE-free survival of patients with EE and IE-aHF ($p < 0.01$ for both). IE-aHF (HR 4.3, 95% CI 1.4-13, $p < 0.01$), CRP at admission (HR 5.6, 95% CI 1.4-22.2, $p = 0.01$), LVEF (HR 0.9, 95% CI 0.9-1, $p < 0.05$), Abscess (HR 3.5, 95% CI 1.2-10.6, $p < 0.05$) and prosthetic detachment

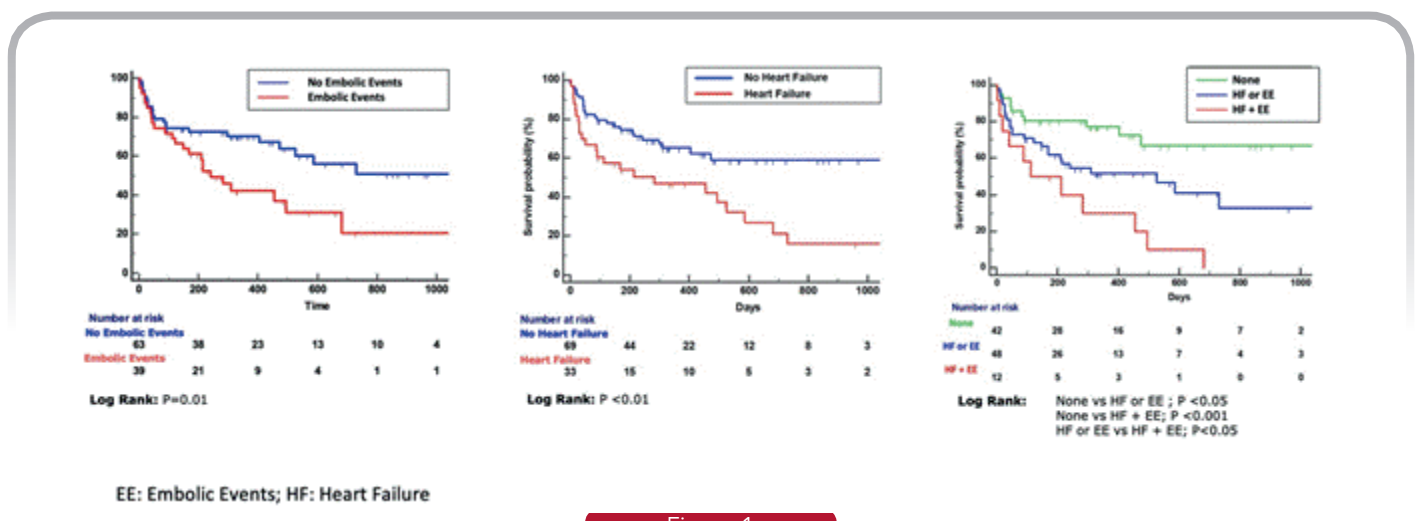
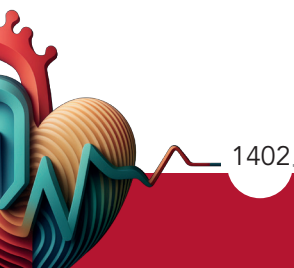


Figure 1

(HR 4.6, 95% CI 1.5-14.1, $p < 0.01$) are independently associated to all-cause death endpoint.

Conclusions: IE-aHF and EE are independently associated with MAE. IE-aHF was also associated to the secondary endpoint of all-cause death as well as levels

of CRP at admission, procalcitonin peak, LVEF, abscess and prosthetic detachment.



VALVULOPATIE 773
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

STROKE VOLUME VARIATION AFTER AORTIC VALVE REPLACEMENT IN PATIENTS WITH LOW-FLOW SEVERE AORTIC STENOSIS: IMPLICATIONS FOR OUTCOMES

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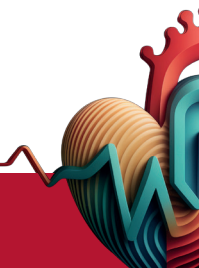
Background. Little is known about stroke volume index (SVi) change and its prognostic implication in patients with low-flow aortic stenosis (LFAS) undergoing aortic valve replacement (AVR) and conflicting results are present in literature. The aim of this study was to evaluate the postoperative change in SVi and its impact on outcomes in patients with low-flow severe AS undergoing AVR.

Methods. Retrospective, observational monocentric study including consecutive patients with diagnosis low-flow (SVi ≤ 35 mL/m²) severe aortic stenosis who underwent AVR (either surgical or transcatheter) with available comprehensive pre- and post-AVR echocardiographic assessment. Post-AVR SVi improvement was defined as an increase $>15\%$ from baseline, while SVi normalization was defined as post-AVR SVi >35 mL/m². A up to 36-month follow-up was conducted and the study primary endpoint was the composite of all cause-mortality and hospitalizations for heart failure.

Results. One-hundred-fifty-one patients (mean age 80 ± 8 years, 53.6% female) were included. After AVR, SVi

improved by $>15\%$ in 51 (33.8%) and normalized in 51 (33.8%) patients. The only independent predictor of SVi improvement was an absolute delta EF $>10\%$. At a median follow-up of 17 (7 – 32) months, 62 (52.6%) patients reached the primary composite endpoint. SVi improvement, but not SVi normalization, was associated with better survival free from the primary endpoint (log rank $p=0.02$ and 0.056 , respectively). Multivariate analysis confirmed that both SVi improvement and its absolute change per mL/m² unit carried a better prognosis (adj. HR 0.51 [0.28–0.91, $p=0.02$] and 0.97 [0.94–0.99], $p=0.016$, respectively). The reproducibility analysis of LVOT VTI measurement showed an excellent level of inter-rater agreement with a percentage variability of 4.4%, an ICC of 0.95 and a Pearson's r coefficient of 0.95, all $p<0.001$.

Conclusions. In patients with low-flow AS undergoing AVR, any improvement (or, by contrary, worsening) of stroke volume plays a central role in the prognosis. No single pre-AVR predictor, including the specific etiology of low-flow, was associated with a higher likelihood of SVi improvement, while post-AVR LVEF improvement $> 10\%$ was.



VALVULOPATIE 360
**INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**
**PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)**
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
PROGNOSI (SCOMPENSO CARDIACO)

**A NOVEL SCORE FOR IDENTIFYING MODERATE AORTIC STENOSIS PATIENTS AT RISK OF ADVERSE
CARDIOVASCULAR OUTCOME**

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(c) POLICLINICO SAN MATTEO, PAVIA

Background: Observational studies have shown that patients with moderate aortic stenosis (AS) present a higher rate of cardiovascular (CV) events when compared to the general population. The present study aimed to identify the predictors of adverse CV outcomes in patients with moderate AS and to combine them in a new scoring system suitable for clinical practice.

Methods: We retrospectively enrolled consecutive moderate AS patients from 2019 to 2023 from three Italian centers. Baseline and follow-up data were retrieved from electronic health records and telephone interviews. We defined the primary endpoint as a composite of CV death or heart failure (HF) hospitalization. We censored patients who developed severe AS during follow-up.

Results. Our study included 520 patients (mean age 77.8 ± 9.5 years; 46% female) with a mean follow-up of 2.0 ± 1.2 years. During follow-up, 59 patients

(12%) experienced the primary endpoint. The independent predictors of the primary endpoint at follow-up were (1) Hb < 13 mg/dL (HR 1.94, 95% CI 1.01-3.79, $p = 0.049$), (2) eGFR < 45 mL/min (HR 1.87, 95% CI 1.07-3.27, $p = 0.028$), (3) LVEF < 50% (HR 3.39, 95% CI 1.98-5.81, $p < 0.001$), (4) Lateral E/e' > 14 (HR 4.35, 95% CI 2.63-7.7; $p < 0.001$), and (5) PASP > 40 mmHg (HR 1.99, 95% CI 1.17 - 3.39, $p = 0.011$). A new scoring system, the SPARK score, was developed and internally validated based on these variables (High- vs. Low-risk SPARK score: HR: 7.3; 95% CI 4.4-12.3; $p < 0.001$).

Conclusions: This study identified the predictors of adverse CV outcomes in patients with moderate AS and combined them in a new scoring system. The present score could be useful for clinical practice (i.e., more frequent active clinical surveillance) and serve as a benchmark for future clinical studies and trials.

**VALVULOPATIE 782
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)
ENDOCARDITI (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)
CARDIOTOSSICITA' DA FARMACI
(CARDIO-ONCOLOGIA E CARDIO-TOSSICITA')**

**A CASE OF TRICUSPID ENDOCARDITIS IN A PATIENT WITH MULTIPLE SCLEROSIS ON BETAFERON THERAPY:
BALANCING IMMUNOMODULATION AND INFECTIOUS RISK**

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Giorgia Maniscalco (c), Giuseppina Dell'aversano Orabona (d), Federico Cacciapuoti (e)

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CARDARELLI" HOSPITAL - NAPLES, ITALY; (d) DEPARTMENT OF RADIOLOGY "A. CARDARELLI" HOSPITAL -
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Introduction: Multiple Sclerosis (MS) is a chronic neurological disorder characterized by demyelination, inflammation, and damage to the central nervous system (CNS), affecting the myelin sheath and leading to a range of symptoms. Disease-modifying therapies (DMTs), such as Betaferon (Interferon beta-1b), are used to manage relapsing forms of MS by modulating the immune response to reduce relapse frequency and slow disease progression. However, the immunomodulatory effects of Betaferon may increase the risk of infections. Tricuspid endocarditis (TE), an infection of the heart's tricuspid valve, is a serious condition often seen in immunocompromised individuals, including those with chronic illnesses like MS.

Case Presentation: We present a case of a 48-year-old male with a history of MS, treated with Betaferon and cyclic corticosteroids, who developed TE. The patient presented with fever, chills, and shortness of breath. Initial examination revealed tachycardia, tachypnea, and a holosystolic murmur. Imaging showed multiple pulmonary consolidations and echocardiography identified large vegetations on the tricuspid valve. Laboratory tests indicated severe thrombocytopenia, anemia, and elevated inflammatory markers. Blood cultures confirmed

methicillin-sensitive *Staphylococcus aureus* (MSSA), and the patient was treated with intravenous Cefazolin.

Outcome: Despite initial improvement, the patient developed multiple septic and thrombotic emboli in the right pulmonary artery, leading to death after 16 days of hospitalization. This case underscores the complex interplay between MS, immunomodulation, and the risk of severe infections.

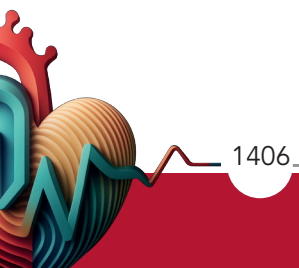
Discussion: This case highlights the need for a delicate balance between managing MS with DMTs and monitoring for potential infectious complications. While Betaferon aims to control MS progression by modulating the immune system, its effects can inadvertently increase infection risk. The development of TE in this patient emphasizes the importance of vigilant monitoring for signs of infection in individuals receiving immunomodulatory therapy. The management of infective endocarditis in immunocompromised patients requires prompt diagnosis, aggressive antibiotic therapy, and consideration of surgical intervention.

Conclusion: The case illustrates the challenges in treating MS patients who are at increased risk of



infections due to immunomodulatory therapies. Personalized care plans that balance the benefits of DMTs against the risk of infections are essential. Healthcare providers must maintain a high level of

awareness for early signs of infection and implement collaborative care strategies to optimize patient outcomes in complex clinical scenarios.



VALVULOPATIE 696
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X
(CT) (IMAGING CARDIOVASCOLARE)

PREDICTORS OF TAVI THROMBOSIS: A META-ANALYSIS

Valeria Maria De Luca (a, b), Sara Bombace (b), Giorgio Antonelli (a), Tobias Friedrich Ruf (b), Valeria Cammalleri (a), Gian Paolo Ussia (a), Francesco Grigioni (a), Martin Geyer (b), Philipp Lurz (b), Ralph Stephan Von Bardeleben (b)

(a) UNIVERSITY CAMPUS BIOMEDICO ROME; (b) UNIVERSITY MEDICINE MAINZ

Background: Transcatheter aortic valve implantation (TAVI) has emerged as a viable treatment option for patients with severe aortic stenosis who are at high or prohibitive surgical risk. While TAVI has demonstrated favorable outcomes, concerns about valve thrombosis have prompted further investigation. Thrombosis of the transcatheter aortic valve can lead to impaired valve function, increased transvalvular gradients, and adverse clinical outcomes.

Aim: This meta-analysis aimed to evaluate the incidence, risk factors, and clinical outcomes associated with thrombosis following TAVI.

Methods: A systematic search of the MEDLINE, ISI Web of Science, and SCOPUS databases was conducted to identify studies reporting data on subclinical leaflet thrombosis (SLT) after TAVI detected by cardiac CT scan, published up to June 2024. The study design followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Results: Out of 232 studies screened, 27 met the inclusion criteria, enrolling a total of 6,855 subjects with a mean age of 80.6 ± 5 years. The mean EUROSCORE was 6.5 ± 5 . The overall incidence of SLT was 8% ($I^2 = 96.4\%$, 95% Confidence Interval [CI]: 5% to 13%). SLT incidence was reported to be 13% (95% CI: 7% to 23%, $p < 0.0001$) in patients

taking only antiplatelets, and 4% (95% CI: 2% to 8%, $p < 0.0001$) in patients discharged on oral anticoagulants. Although SLT is relatively common, its clinical manifestations are not associated with an increased risk of cerebrovascular accidents. Despite anticoagulation appearing to reduce the risk of SLT, the current evidence does not support routine computed tomography after TAVI or the prophylactic use of anticoagulants.

Conclusion: SLT is a notable concern following TAVI, particularly in patients on antiplatelet therapy alone. While oral anticoagulants may reduce the risk of SLT, routine post-TAVI CT scans or prophylactic anticoagulation cannot be recommended based on current evidence. Further research is needed to refine post-TAVI management strategies to mitigate the risk of valve thrombosis and optimize patient outcomes.



VALVULOPATIE 746
CARDIOPATIE CONGENITE NELL' ADULTO
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
IMAGING DELLE CARDIOPATIE CONGENITE
(CARDIOPATIE CONGENITE E MALATTIE DEL CIRCOLO POLMONARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

VALVOLA AORTICA QUADRICUSPIDE: UNA RARA PATOLOGIA ASSOCIATA AD ALTRE CARDIOPATIE

Manuel Freschini (a), Francesca De Angelis (b), Federica Pesce (a), Alessandro Lupi (a), Ketty Savino (a)
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 (b) *STRUTTURA COMPLESSA DI CARDIOLOGIA, AZIENDA OSPEDALIERA "S. MARIA DELLA MISERICORDIA", PERUGIA*

Introduzione: La quadricuspidia aortica è un'anomalia congenita rara caratterizzata dalla presenza di quattro cuspidi di varie dimensioni possibili. Nei casi sintomatici si manifesta, di solito, con un'insufficienza valvolare progressiva, talvolta tale da richiedere la sostituzione valvolare. Può associarsi a difetti cardiaci congeniti aggiuntivi, generalmente rappresentati da anomalie coronariche.

Caso clinico: Donna, 28 anni, giunta in ambulatorio cardiologico per essere sottoposta ad ecocardiogramma in seguito ad un ictus ischemico cerebellare sinistro, insorto in assenza di apparenti fattori di rischio cardiovascolare e/o cause plausibili. L'esame

transtoracico integrato con il transesofageo evidenziava: quadricuspidia aortica di tipo B secondo la classificazione di Hurwitz e Roberts e di tipo II secondo quella di Nakamura (A), con conservato movimento d'apertura (B) ed assenza di rigurgito valvolare significativo. La variante aortica si associava ad una valvola polmonare con lembi ispessiti, stenosi di grado lieve (C) con Gmax transvalvolare di 22 mmHg, da correlare alla co-esistenza di una membrana sopra-valvolare, ed insufficienza di grado lieve-moderata; ad un'ectasia del tratto distale del tronco della polmonare (37 mm) e del tratto prossimale delle arterie polmonare; e soprattutto ad un aneurisma del setto inter-atriale (D), destro-convesso (1R), associato

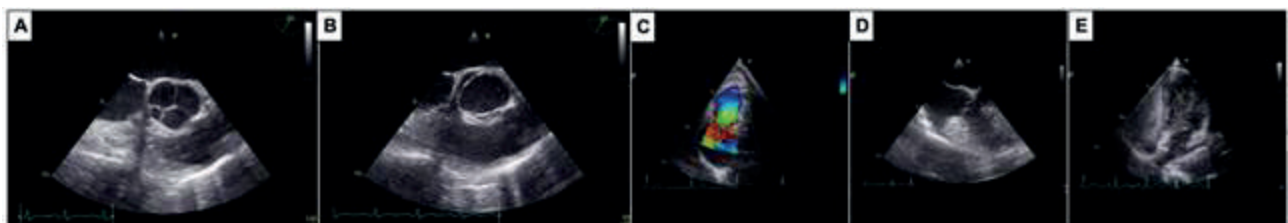


Figura 1

a valvola di Eustachio e rete di Chiari prominenti, ed evidenza di FOP con ampio shunt dx-sx al test alle microbolle in seguito a manovra di Valsalva (E). Gli altri reperti ecocardiografici risultavano nella norma. In considerazione dell'assenza di altre ipotesi eziologiche atte a determinare l'ictus ischemico e del RoPE score calcolato pari a 10, il FOP ad alto rischio risultava la causa più probabile e, pertanto, la paziente veniva sottoposta ad un intervento di chiusura dello stesso tramite dispositivo Amplatzer. È stato inoltre iniziato un percorso di follow-up ecocardiografico per valutare eventuali segni di progressione delle valvulopatie aortica e polmonare e dell'ectasia del tronco della polmonare.

Discussione: La quadricuspidia aortica è una variante anatomica congenita rara che, nel 18% dei casi circa, può manifestarsi insieme ad altre anomalie cardiache congenite. La peculiarità di questo caso clinico è rappresentata dal fatto che si è associata ad una valvulopatia polmonare determinante stenosi di grado lieve, ad un'ectasia del tronco della polmonare e ad un aneurisma del SIA con annesso FOP ad alto rischio, probabile causa di un ictus ischemico.

Conclusione: L'imaging ecocardiografico ha consentito un'accurata diagnosi di quadricuspidia aortica associata ad altre anomalie congenite ed ha indirizzato ad un corretto approccio terapeutico.



VALVULOPATIE 128
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

ANALISI DELLE DIFFERENZE DI GENERE NELL'INSUFFICIENZA AORTICA MODERATA: RISULTATI DI UNO STUDIO RETROSPETTIVO

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Introduzione: L'insufficienza aortica (IAo) è una malattia valvolare complessa che necessita di una valutazione approfondita, che includa sia aspetti clinici che di imaging. Studi recenti evidenziano l'importanza dei fattori che influenzano gli outcome, anche nei casi di IAo moderata, suggerendo la necessità di nuovi criteri per determinare il timing dell'intervento chirurgico. Si ipotizza che ci siano differenze di genere nella fisiopatologia dell'IAo, in particolare nei meccanismi di rimodellamento del ventricolo sinistro. Tuttavia, i dati limitati sull'impatto del genere negli outcome dell'IAo moderata suggeriscono la necessità di ulteriori approfondimenti.

Scopo dello studio: Questo studio retrospettivo si propone di indagare eventuali differenze specifiche di genere negli outcome tra i pazienti diagnosticati con IAo moderata, fornendo approfondimenti sui fenotipi clinici ed ecocardiografici.

Metodi: Il nostro gruppo ha condotto un'analisi retrospettiva monocentrica su un campione di 94 pazienti, con età mediana di 76 anni (percentili 25°-75°: 62-90), di cui il 40% erano donne, tutti diagnosticati con IAo moderata pura. I pazienti sono stati sottoposti ad ecocardiografia completa

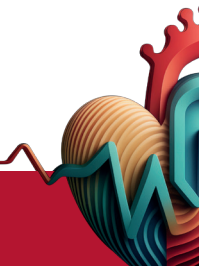
nel periodo compreso tra luglio 2022 e febbraio 2024. I dati clinici e le informazioni sugli interventi terapeutici sono stati raccolti attraverso la revisione delle cartelle cliniche o con interviste telefoniche. L'endpoint primario dello studio era un outcome composito che includeva ricoveri ospedalieri per insufficienza cardiaca, mortalità per tutte le cause e necessità di chirurgia sulla valvola aortica. La validità dei dati relativi ai decessi è stata verificata tramite incrocio con il database del 'Sistema Informativo Socio-Sanitario'. I dati ecocardiografici sono stati archiviati digitalmente e successivamente analizzati da operatori senza accesso alla storia clinica dei pazienti.

Risultati: Nel nostro studio abbiamo osservato differenze significative di genere. Gli uomini e le donne mostrano profili ecocardiografici distinti. Gli uomini presentano una frazione di eiezione significativamente più bassa rispetto alle donne (55,7% (50,1-63,3) vs 58,3% (48,7-67,9), $p=0,031$), un volume telesistolico indicizzato maggiore (28,5 ml/mq (16,1-40,9) vs 22,2 ml/mq (12,4-32), $p<0,001$), e un volume telediastolico indicizzato maggiore (66,8 ml/mq (48,4-85,2) vs 51,8 ml/mq (27,9-75,7), $p<0,001$). Inoltre, gli uomini mostrano un diametro della radice aortica indicizzato medio maggiore



($2,18 \pm 0,3$ mm/m² vs $2,01 \pm 0,3$ mm/m², $p=0,014$). Dei 74 pazienti con dati di follow-up disponibili (durata mediana del follow-up di 277 giorni (36-518)), il 16,2% ha raggiunto l'outcome composito. L'analisi della sopravvivenza ha evidenziato che il genere maschile è indipendentemente associato a un rischio quasi 8 volte superiore rispetto alle donne di raggiungere l'outcome composito (HR 7,7, log rank $p=0,021$).

Conclusioni: Il vantaggio della mappaggio del torace appare evidente, determinando un sensing dell'onda R significativamente migliore e una frequenza di allarmi falsi positivi significativamente più bassa. L'esecuzione dell'EAM è molto veloce, facile, efficace e riproducibile, imprescindibile dal nostro punto di vista, soprattutto dinanzi ad anatomie complesse del torace.



VALVULOPATIE 739
ENDOCARDITI (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)

UN RARO CASO DI ENDOCARDITE DA CORYNEBACTERIUM STRIATUM SU VALVOLA NATIVA IN PAZIENTE EX-TOSSICODIPENDENTE

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Introduzione: L'endocardite infettiva è una condizione tutt'oggi associata ad un'elevata mortalità.

I microorganismi responsabili variano in base al sito di infezione causa della batteriemia ma, nel complesso, Streptococchi e Staphylococchi causano la maggior parte dei casi. Le specie *Corynebacterium* sono bacilli Gram-positivi anaerobi che costituiscono la normale flora della cute e delle mucose umane. Essi risultano raramente causa di endocardite, sebbene ad oggi siano considerati tra gli agenti nosocomiali emergenti implicati in tali infezioni.

Descrizione del caso: paziente di 61 aa, ex tossicodipendente. In anamnesi cardiopatia ischemica cronica, AOP, DM tipo II complicato da piede diabetico

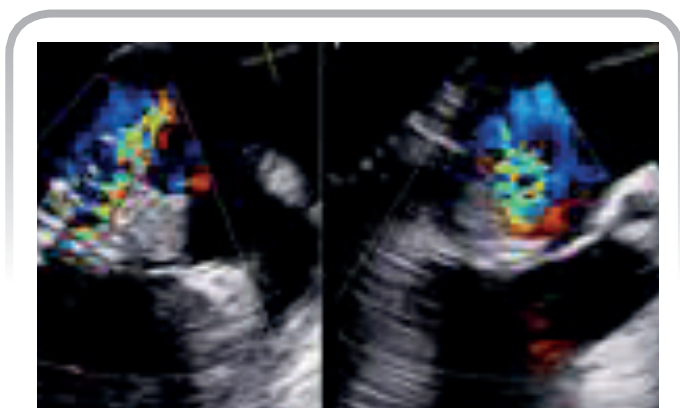


Figura 1

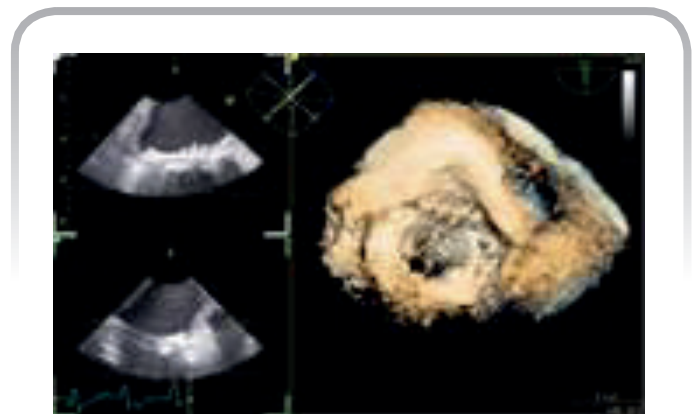


Figura 2

e pregressa amputazione parziale di piede sinistro per osteomielite, si presentava al PS per l'insorgenza di astenia, dispnea e febbre da alcuni giorni. All'esame obiettivo erano evidenti segni di congestione sistemica e polmonare, nonché un soffio sistolico mitralico di intensità 4/6. Veniva pertanto eseguita valutazione ecocardiografica transtoracica e transesofagea che riscontravano la presenza di una voluminosa formazione di circa 3 cm a livello dello scallo P2 del lembo posteriore mitralico inducente steno-insufficienza di grado moderato-severo, ascrivibile in prima ipotesi a vegetazione endocarditica, per cui veniva ricoverato. La terapia diuretica e con vasodilatatore (NTP-Na) endovenosa associata a ciclo di NIV ha determinato un progressivo decongestionamento e ripristino di



Figura 3

un relativo compenso emodinamico. A conferma diagnostica sono state prelevate delle emocolture, risultate positive per la presenza di *Corinebacterium striatum*, stesso patogeno riscontrato anche a livello di un tampone prelevato dalla lesione del piede destro, sede di osteomielite. E' stata inoltre prelevata, in tale sede una biopsia ossea, risultata positiva per la presenza di *Pseudomonas Aeruginosa*. Veniva iniziata

terapia antibiotica mirata con vancomicina, imipenem, cilastatina e relebactam per garantire una copertura su entrambe le specie patogene isolate. Durante la degenza il paziente ha presentato un improvviso rallentamento ideomotorio, associato ad agitazione psicomotoria, per cui, nel sospetto di una complicanza embolica, sono state effettuate TC ed RM encefalo che hanno mostrato molteplici lesioni emboliche, corticali e sottocorticali, in assenza di chiare immagini riferibili ad aneurismi micotici. A completamento diagnostico è stata effettuata una coronarografia che non ha evidenziato stenosi critiche. Dopo discussione collegiale in Endocarditis Team è stato ritenuto opportuno sottoporre il paziente ad intervento cardiocirurgico di sostituzione di valvola mitralica e pertanto è stato sottoposto a impianto di bioprotesi Medtronic Hancock 29. L'esame microbiologico del campione asportato ha confermato l'infiltrazione da parte di *Corynebacterium striatum*.

Conclusioni: L'obiettivo di questo case è di porre l'accento sulle specie *Corynebacterium*, che risultano una causa rara di endocardite infettiva su valvole native, e di sottolineare l'importanza di una diagnosi precoce delle complicanze ad essa associate, cruciali nella scelta dell'approccio terapeutico e della prognosi dei pazienti.



**VALVULOPATIE 946
 ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
 (IMAGING CARDIOVASCOLARE)
 PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
 ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)**

**MITRAL REGURGITATION RECURRENCE DUE TO POST-SURGICAL PERICARDIAL RING DETACHMENT:
 INSIGHTS FROM 3D TEE IMAGING**

Dario Grassini (a, b), Paolo Spontoni (b), Marco De Carlo (a, b), Alessandro Fiocco (a)
 (a) UNIVERSITA' DI PISA; (b) AZIENDA OSPEDALIERA UNIVERSITARIA PISANA LABORATORIO DI EMODINAMICA

An 88-year-old patient was referred to our Institution for mitral regurgitation (MR) recurrence after previous cardiac surgery. Three-dimensional (3D) transesophageal echocardiography (TEE) reconstruction showed an atrial stick arch crossing the valvular orifice, from A2 to P2 annular insertion. In 2001 he underwent mitral valve repair (MVR) by mean of autologous pericardial hemi-anuloplasty and coronary artery bypass grafting. The combination of the 2D/3D TEE findings and the clinical history of the patient led to the diagnosis of a post-surgical detachment of the pericardial ring, involving the portion between the anterior commissure and P2 insertion, and subsequent displacement. The described post-surgical detachment and displacement of pericardial mitral ring is extremely rare, being reported in anecdotal cases in literature¹; however, the described mechanism should be considered in the differential diagnosis of MVR failure. Preoperative 3D TEE reconstruction was of paramount importance in the diagnosis, representing a unique tool during MR recurrence evaluation, allowing for a clear diagnosis even in extremely rare findings. The patient

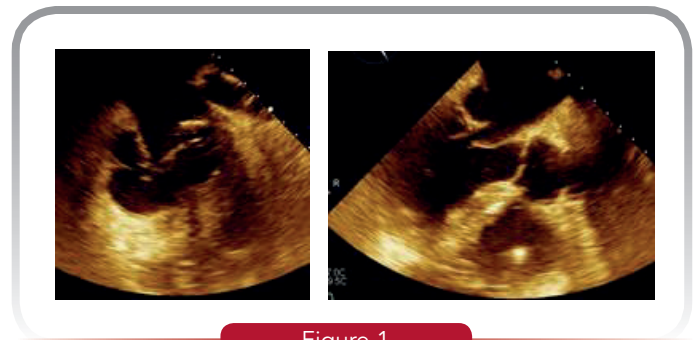


Figure 1

underwent heart-team discussion and is currently under screening for transcatheter mitral valve replacement (TMVR). The reported finding of partial detached pericardial ring is a current issue for TMVR, representing a relevant matter of debate concerning the procedural feasibility and the optimal device to be implanted.

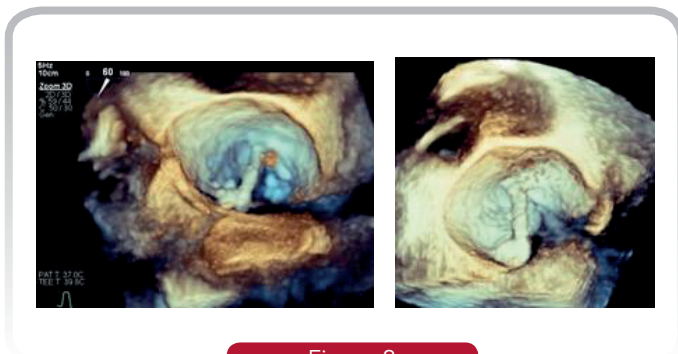


Figure 2

VALVULOPATIE 160

PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE) TERAPIA NON FARMACOLOGICA (SCOMPENSO CARDIACO) VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

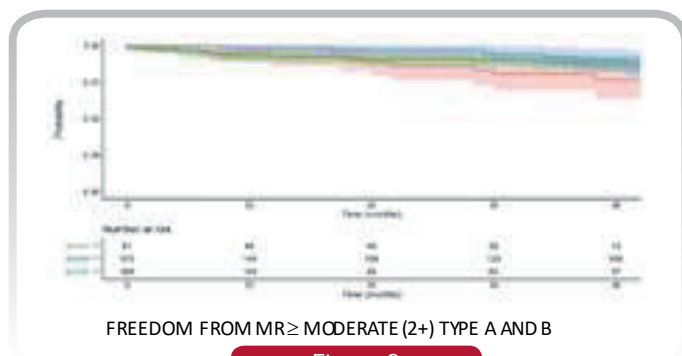
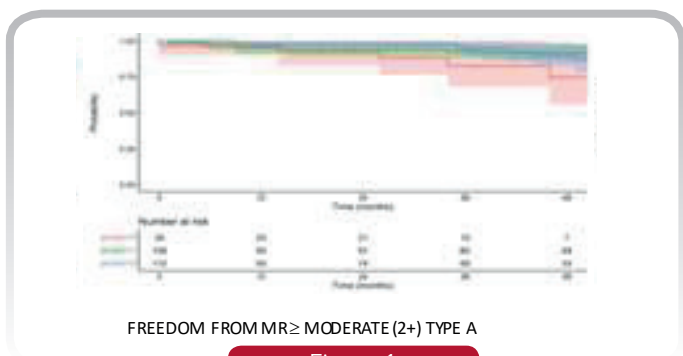
FROM CONVENTIONAL TO MICRO-INVASIVE: FROM REPAIR/RESECT TO RESTORE, A VISIONARY APPROACH TO MITRAL VALVE REPAIR

Florinda Mastro (a), Marco Solinas (b), Augusto D’onofrio (a), Giulia Lorenzoni (c), Tea Lena (a), Donato Mele (c), Sara Michelotti (a), Gino Gerosa (a)

(a) CARDIAC SURGERY, UNIVERSITY HOSPITAL OF PADUA;

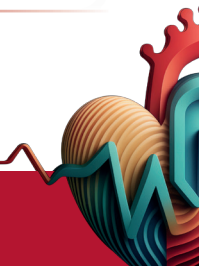
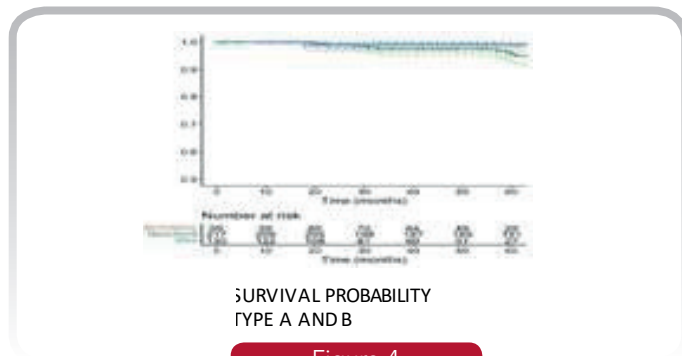
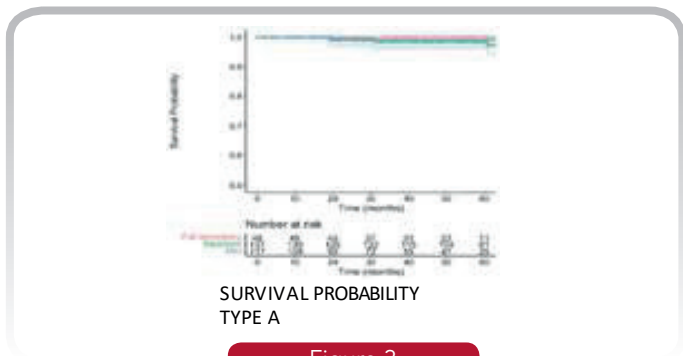
(b) DEPARTMENT OF ADULT CARDIAC SURGERY, PASQUINUCCI HEART HOSPITAL, MASSA;

(c) CARDIAC THORACIC AND VASCULAR SCIENCES UNIVERSITY OF PADUA



Background: Open heart surgery (CS) is the gold standard treatment for patients affected by degenerative mitral valve regurgitation with leaflets prolapse/flail. Minimally invasive approach is the preferred option whenever possible: excellent outcomes with the same efficacy of conventional approach have been demonstrated. Endoscopic mini-thoracotomy (eMT), with improved visualization, allows to further reduce

invasiveness. Micro-invasive cardiac surgery defines procedures performed off-pump, on the beating heart. Transapical NeoChordae Implantation (NC) allows microinvasive mitral valve repair. No data are available to compare these approaches: mitral valve repair with CS versus NC vs eMT. Aim of this multi-center, retrospective study, was to evaluate early and mid-term outcomes of CS vs NC vs eMT in patients with severe

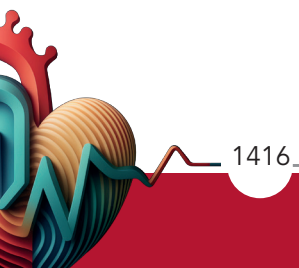


degenerative mitral valve regurgitation (DMR) due to leaflet prolapse/flail. We considered TYPE A and B patients with DMR who underwent: CS and NC at our Institution and eMT at the other Center from 2010 to 2018. We considered NC from the very first patient.

Methods: The primary outcome was overall all-cause mortality. Secondary outcomes were: freedom from MR ($\geq 2+$) results in isolated P2 prolapse/flail (Type A). Weighted regression models and Kaplan Meier curves were used to assess outcome differences between groups. Weighted Cox Proportional Hazard models were employed for time-to-event outcomes. Results were reported as Hazard Ratio (HR), 95% (CI), and p-value. Median follow up was : 37 (21-47) months for CS, 56 (32-79) months for NC, 35 (19-49) months for eMT, respectively.

Results and conclusion: Patients who underwent NC and eMT procedures had significantly better freedom from MR $\geq 2+$ than patients who underwent CS; there

were no statistically significant differences in terms of overall survival among groups. Considering only patients with type A anatomy we observed: better freedom from MR $\geq 2+$ in both NC and eMT than CS group; similar overall survival among groups. Minimally invasive approaches show excellent outcomes in mid and long term outcomes in selected patients; even though the preoperative selection of patients (lower surgical risk, no previous cardiac surgery) plays a key role for the definite analysis of results. NC provides satisfactory outcomes in patients with DMR due to leaflet prolapse when compared to conventional surgery. Data from ongoing randomized studies will enable a better understanding of the results of this relatively new procedure.



VALVULOPATIE 662
PATOLOGIA DELLA VALVOLA POLMONARE (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)

CARCINOID PULMONARY VALVE STENOSIS: MULTIMODALITY IMAGING AND TRANSCATHETER VALVE IMPLANTATION WITH PRE-STENTING TECHNIQUE

Mariagrazia Piscione (a), Valeria Cammalleri (a), Valeria Maria De Luca (a), Giorgio Antonelli (a), Dario Gaudio (a), Myriam Carpenito (a), Francesco Grigioni (a), Gian Paolo Ussia (a)
(a) FONDAZIONE POLICLINICO CAMPUS BIOMEDICO

Case presentation: A 51-year-old female patient was admitted to our hospital with the diagnosis of torrential tricuspid regurgitation (TR), symptomatic for dyspnea on mild exertion. The NYHA Functional Class was III and the KCCQ was 48. Medical history included an ileal neuroendocrine tumor with lymphonodal and hepatic metastases diagnosed two years before and previously treated with chemotherapy. In-hospital transthoracic echocardiogram (TTE) confirmed preserved left ventricular ejection fraction (EF=56%), dilated right ventricle (RV, 55 mm, 38 mm/m²) and preserved RV function (tricuspid annular plane excursion TAPSE, 20 mm, S' wave 17 cm/sec). The tricuspid leaflets were thickened with restricted motion both in systole and diastole. The pulmonary valve (PV) had a severe stenosis. Diagnostic right heart catheterization showed pressure equalization in right heart chambers (mean right atrium pressure 12 mmHg, end diastolic RV pressure 12 mmHg) and confirmed the severe low-flow low-gradient PV stenosis due to reduced cardiac index (peak to peak gradient 28 mmHg, cardiac index 1.46 L/min/m²) secondary to torrential TR. Since the surgical risk was estimated as prohibitive for Euroscore II of 10.27% and the concomitant carcinoid heart disease (CHD), it was opted for a transcatheter pulmonary valve implantation (TPVI).

The right heart anatomy was assessed with a cardiac

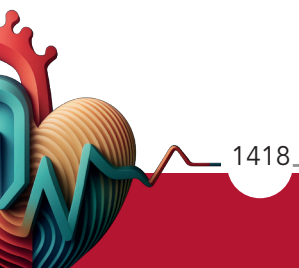
computed tomography, which confirmed the PV stenosis suitable for TPVI and the enlarged right heart chambers. The procedure was conducted under vigil sedation with fluoroscopic guidance. A Melody PV 22 mm (Medtronic, USA) was placed inside the previous CP stent, final angiography showed a well-positioned valve. The post procedural TTE demonstrated trivial residual regurgitation and reverse remodeling of the RV. The cCT scan, performed eight days after the procedure, confirmed the reduction in right heart chambers volume. The patient had improvement in dyspnea and fatigue (NYHA II) at 30 days of follow up, KCCQ 65 and the chemotherapy with Oxaliplatin and Capecitabine (XELOX) was restarted 2 weeks after the procedure. At 30 days of follow-up the TTE demonstrated a torrential TR in spite of the reduction of the CD, the CL and the TA (respectively 15 mm, 14 mm and 3.4 cm² TR will be evaluated for an orthotopic valve surgical replacement.

Discussion: PTVI represents a valid option to correct PV stenosis but a pre-operative planning is necessary before the implantation of the PV. In our case, cCT has been used to have a correct estimation of the PV annulus dimensions and both RVOT and pulmonary trunk anatomy for the safe positioning of the valve. Moreover, since the PV annulus results a compliant



structure without calcium, the pre stenting and the flaring of the proximal stent edge inside the RVOT stabilized the CP stent so that it resulted in a precise implant of the Melody PV and reduce the risk of valve frame fracture; significant right cardiac chambers reverse remodeling was documented with TTE and cCT. Anyway, the pre-procedural planning in patients with multivalvular vices must also involve the right heart catheterization with an accurate estimation of

pressures so that priorities in valve treatment can be assumed. In conclusion TPVI in carcinoid valvulopathy is feasible and safe with an accurate pre-procedural multimodality imaging planning. Pre-stenting PV annulus and subvalvular portion of the RVOT is recommended in order to ensure the integrity of the valve and to obtain a stable positioning of the valve inside the native anatomy.



VALVULOPATIE 65 INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE) TROMBOSI E COAGULAZIONE (ATEROTROMBOSI)

LONG-TERM OUTCOMES OF TRANSCATHETER VS SURGICAL AORTIC VALVE REPLACEMENT: META-ANALYSIS OF RANDOMIZED TRIALS

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(a) U.O.C. CARDIOLOGIA CLINICA ED INTERVENTISTICA, AZIENDA OSPEDALIERO-UNIVERSITARIA DI SASSARI; (b) THE CHRIST HOSPITAL AND LINDNER RESEARCH CENTER, CINCINNATI, OHIO, USA; (c) DEPARTMENT OF CARDIOVASCULAR SURGERY, HOUSTON METHODIST HOSPITAL, HOUSTON, TEXAS, USA; (d) REPUBLICAN CLINICAL HOSPITAL, DEPARTMENT OF CARDIOLOGY, AZERBAIJAN MEDICAL UNIVERSITY, DEPARTMENT OF FAMILY MEDICINE, BAKU, AZERBAIJAN; (e) CENTER FOR DIGITAL CARDIOVASCULAR INNOVATIONS, DIVISION OF CARDIOVASCULAR MEDICINE, MILLER SCHOOL OF MEDICINE, UNIVERSITY OF MIAMI, MIAMI, FLORIDA, USA; (f) CEDARS-SINAI HEALTH SYSTEM, LOS ANGELES, CALIFORNIA, USA; (g) SECTION OF CARDIOVASCULAR MEDICINE, DEPARTMENT OF INTERNAL MEDICINE, YALE SCHOOL OF MEDICINE, NEW HAVEN, CONNECTICUT, USA; (h) MCGILL UNIVERSITY HEALTH CENTER, MONTREAL, QUEBEC, CANADA; (i) U.O.C. CARDIOCHIRURGIA, AZIENDA OSPEDALIERO-UNIVERSITARIA DI SASSARI

Background: We aimed to perform a meta-analysis of randomized trials comparing long-term outcomes of patients undergoing transcatheter aortic valve replacement (TAVR) vs surgical aortic valve replacement (SAVR) for severe aortic stenosis. The short-term efficacy and safety of TAVR are proven, but long-term outcomes are unclear.

Methods: We included randomized controlled trials comparing TAVR vs SAVR at the longest available follow-up. The primary end point was death or disabling stroke. Secondary end points were all-cause mortality, cardiac mortality, stroke, pacemaker implantation, valve thrombosis, valve gradients, and moderate-to-severe paravalvular leaks. The study is registered with PROSPERO (CRD42023481856).

Results: Seven trials (N = 7785 patients) were included. Weighted mean trial follow-up was 5.76 ± 0.073 years. Overall,

no significant difference in death or disabling stroke was observed with TAVR vs SAVR (HR, 1.02; 95% CI, 0.93-1.11; P = .70). Mortality risks were similar. TAVR resulted in higher pacemaker implantation and moderate-to-severe paravalvular leaks compared to

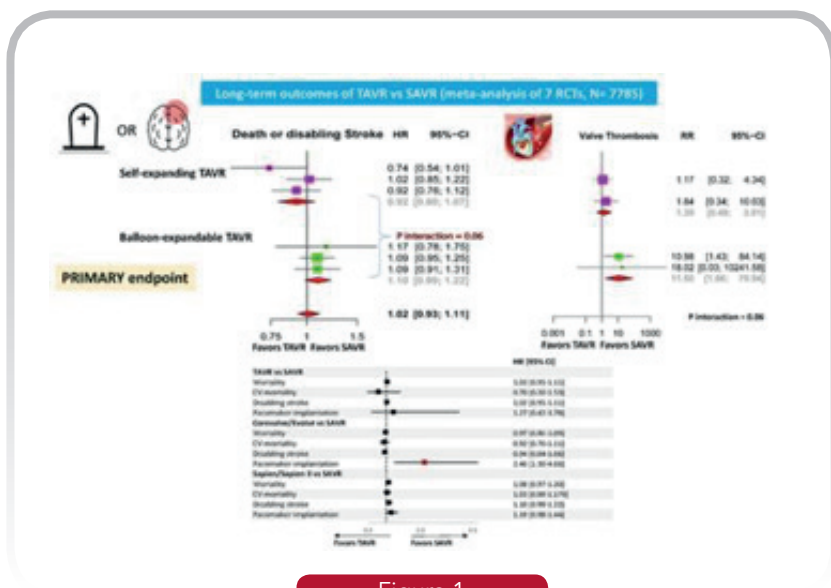
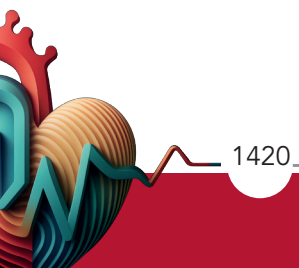


Figura 1

SAVR. Results were consistent across different surgical risk profiles. As compared to SAVR, self-expanding TAVR had lower death or stroke risk (P interaction = .06), valve thrombosis (P interaction = .06), and valve gradients (P interaction < .01) but higher pacemaker implantation rates than balloon-expandable TAVR (P interaction < .01).

Conclusions: In severe aortic stenosis, the long-term mortality or disabling stroke risk of TAVR is similar to SAVR, but with higher risk of pacemaker implantation, especially with self-expanding valves. As compared with SAVR, the relative reduction in death or stroke risk and valve thrombosis was greater with self-expanding than with balloon-expandable valves.



ARITMIE 398

ABLAZIONE TRANSCATETERE (ARITMIE) FIBRILLAZIONE ATRIALE (FA) (ARITMIE) STUDI ELETTROFISIOLOGICI INVASIVI (ARITMIE)

ABLATION WITH ELECTROPORATION FOR PAROXYSMAL OR PERSISTENT ATRIAL FIBRILLATION: PILOT EXPERIENCE ON PULSESELECT AND FARAPULSE TECHNOLOGIES

Jacopo Francesco Imberti (a), Matteo Martella (a), Andrea Gollé (a), Francesco Tritto (a), Marco Vitolo (a), Niccolò Bonini (a), Luigi Gerra (a), Federico Bertuglia (a), Erminio Mauro (a), Vincenzo Turco (a), Edoardo Casali (a), Davide Antonio Mei (a), Giuseppe Boriani (a)

(a) UNIVERSITA' DEGLI STUDI DI MODENA E REGGIO EMILIA - U.O. CARDIOLOGIA - POLICLINICO

Background. In recent years, pulsed field ablation (PFA) has emerged as an alternative to thermal ablation energy sources for pulmonary vein isolation (PVI) in patients with atrial fibrillation (AF). At present, only two single-shot PFA catheters have been commercialized (FARAPULSE, Boston Scientific, 2021, and PulseSelect, Medtronic, 2023). Their comparative performance has not been investigated yet.

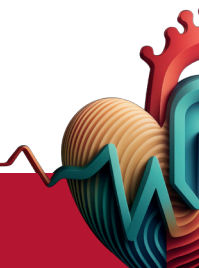
Purpose: To describe the clinical characteristics of patients undergoing PFA and to describe potential differences in the procedural aspects and procedure-related complications between two PFA technologies.

Methods: This is a single-center, prospective, observational registry enrolling consecutive patients undergoing PFA for AF treatment. Data were collected during the hospital stay for the index ablation procedure. Data included patient demographics, AF type, CHA2DS2-VASc, HAS-BLED, and EHRA scores, 3D-echocardiographic parameters, peri-procedural information (total procedure duration, left atrial [LA] dwell time, electrical cardioversion after the procedure, and total number of lesions), and peri-procedural complications. LA dilation was defined as LA volume indexed > 44 ml/m² and reduced LA performance was defined as peak atrial longitudinal strain $< 24\%$. Results are reported as count and percentages or as median and interquartile range (IQR). Comparisons were conducted by chi-square test and the Mann-Whitney U test. A p -value < 0.05 was considered statistically significant.

Results: Between November 2023 and July 2024, 49 patients were enrolled, of whom 12 underwent PFA using the PulseSelect technology and 37 using FARAPULSE. Baseline patient characteristics were similar between the groups. Median age was 62.5 (54.7-64.2) vs 60.0 (53.0-67.0) years, median CHA2DS2-VASc score was 1.5 (1.0-2.0) vs 1.0 (1.0-2.0), 33.3% vs 21.6% of patients were female and 50% vs 35.1% had persistent AF, respectively (Table 1). Both groups presented a similar proportion of patients with LA dilation (75% vs 50%) and reduced LA performance (66.7% vs 47.1%). All P -values > 0.05 (Table 1).

Total procedure duration was 60.0 (53.2-70.0) minutes in the PulseSelect group and 55.0 (50.0-65.0) minutes in the FARAPULSE group ($p=0.527$). LA dwell time was slightly higher in the PulseSelect group [(30.0 (25.0-31.2) minutes vs 20.0 (18.5-25.0) minutes respectively, $p=0.003$]. Total lesion number was similar 32 (32-32) vs 32 (32-32) ($p=0.619$) (Table 1). Overall, 16 (32.6%) patients underwent electrical cardioversion at the end of the procedure. We observed a total of 4 (8.5%) peri-procedural complications, including 1 pericardial tamponade, 1 groin hematoma, and 2 asystole during electroporation, with no difference between groups ($p=0.561$) (Table 1).

Conclusions. In a contemporary pilot experience including paroxysmal and persistent AF patients undergoing PVI isolation with electroporation, PulseSelect and FARAPULSE showed similar procedural characteristics and safety.



VALVULOPATIE 732
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT)
(IMAGING CARDIOVASCOLARE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

IMPIANTO DI PROTESI MITRALICA CON TECNICA VALVE-IN-RING IN CARDIOMIOPATIA IPERTROFICA

Eugenio Trovarelli (a), Giuliana Bardelli (a), Francesca Lisi (a), Manuel Freschini (a), Alessandro Lupi (a), Rosanna Lauciello (a), Cinzia Zuchi (a), Anna Mengoni (a), Sandra D’addario (a), Salvatore Notaristefano (b), Rocco Sclafani (b), Erberto Carluccio (a), Giuseppe Ambrosio (a)

(a) *CARDIOLOGIA E FISIOPATOLOGIA CARDIOVASCOLARE, OSPEDALE SANTA MARIA DELLA MISERICORDIA, UNIVERSITÀ DEGLI STUDI DI PERUGIA, ITALIA; (b) STRUTTURA COMPLESSA DI CARDIOLOGIA, OSPEDALE SANTA MARIA DELLA MISERICORDIA, PERUGIA, ITALIA*

Introduzione: riportiamo il caso clinico di una paziente affetta da cardiomiopatia ipertrofica con mutazione sul gene MYBPC3 sottoposta ad impianto di protesi biologica su pregressa anuloplastica mitralica mediante tecnica valve-in ring.

Caso clinico: donna di 69 anni, sottoposta nel 2015 a miectomia secondo Morrow e anuloplastica mitralica mediante anello completo CE Physio Il n°34 per rigurgito mitralico severo funzionale, prevalentemente da dilatazione anulare; successivo graduale peggioramento della funzione sistolica ventricolare sinistra (FE 30%) e ricomparsa del

rigurgito mitralico trattati nel 2017 con impianto di CRT-D, non seguito da recupero della FE del ventricolo sinistro. Negli anni successivi ripetuti ricoveri per scompenso cardiaco associato a peggioramento dell’insufficienza mitralica. Ultimo ricovero a giugno 2024 per scompenso cardiaco congestizio in corso di tachicardia ventricolare e fibrillazione atriale trattata con ablazione del nodo atrio-ventricolare. Durante la degenza, dopo stabilizzazione del ritmo e del quadro emodinamico mediante vasodilatatori ed inotropi, l’ecocardiogramma transtoracico (ETT) evidenziava: ridotta funzione sistolica ventricolare sinistra (FE 30%), insufficienza mitralica di grado severo in esiti di

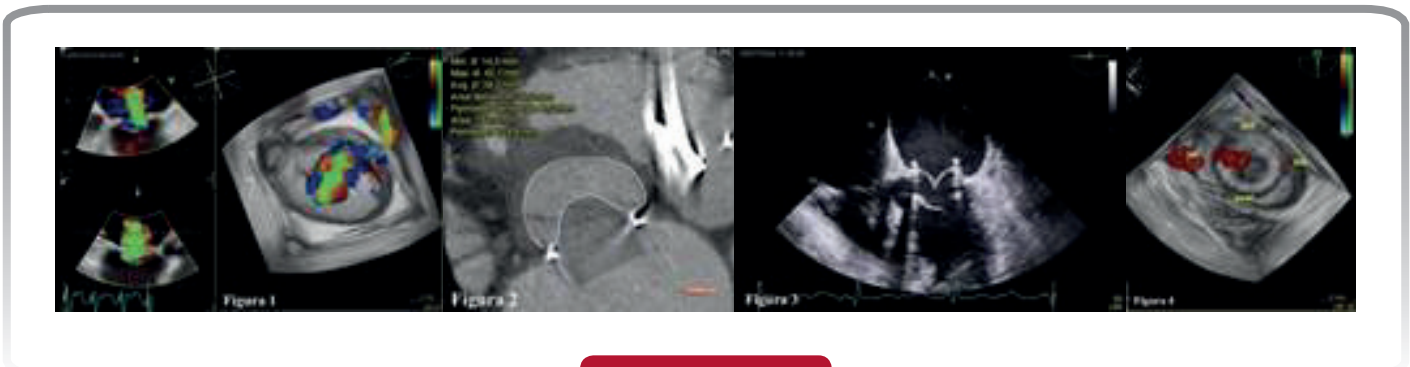
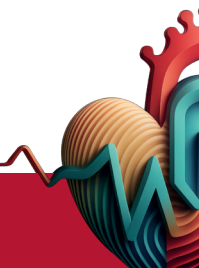


Table 1

anuloplastica mitralica con jet centrale da tethering bilembo ed insufficienza tricuspidalica moderato-severa con elevate pressioni polmonari. Il successivo ecocardiogramma transesofageo (ETE) ha confermato la severità del rigurgito mitralico funzionale (EROA 3D 0,7 cmq, VC 2D 8 mm) in presenza di ampio tethering dei lembi, prevalente per il lembo posteriore, più piccolo jet para-anulare, in corrispondenza di A2, da verosimile lacerazione (VC 2D 3 mm) (fig.1). Dopo discussione collegiale, alla luce dei reperti ecocardiografici, della angio-TC aorta con studio del neo-LVOT (fig.2), della sintomatologia clinica, delle frequenti riacutizzazioni di scompenso cardiaco congestizio, e dell'elevato rischio cardiocirurgico (Euroscore 23,64 %) è stata posta indicazione a tentativo percutaneo di impianto di protesi valvolare Edwards Sapiens Ultra 29 mm mediante tecnica Valve-in Ring. All'ETE post-procedurale la protesi valvolare mitralica risultava ben posizionata (fig.3) in assenza di ostruzione in LVOT e ben funzionante

(G medio 2 mmHg, area PHT 3,6 cmq) con minimo leak peri protesico mediale, minimo rigurgito intra-protesico (fig.4) e modesto residuo shunt sn-dx in sede di puntura transettale.

Discussione: la recidiva di rigurgito mitralico rilevante in pregressa anuloplastica mitralica con anello si verifica fino al 30 % dei pazienti a 10 anni dalla procedura e in molti casi rende necessario il re-intervento. Seppure il gold-standard terapeutico sia rappresentato dal re-intervento chirurgico, questo è gravato da rischio operatorio elevato, soprattutto in presenza di funzione sistolica ventricolare sinistra ridotta ed eventuali patologie associate. In questi pazienti un'alternativa è rappresentata dall' impianto di protesi biologica per via percutanea mediante tecnica valve-in-ring, utilizzando anche protesi nate per la sostituzione valvolare aortica percutanea con validi risultati.



VALVULOPATIE 670
PATOLOGIA DELLA VALVOLA POLMONARE (VALVULOPATIE)
ENDOCARDITI (VALVULOPATIE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE)
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
INTERVENTISTICA STRUTTURALE
(CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

UNCOMMON TERRITORY: MANAGING RARE PULMONARY VALVE ENDOCARDITIS

Federico Vannini (a), Raffaella Mistrulli (a), Emanuele Barbato (a)
 (a) UNIVERSITÀ LA SAPIENZA, AZIENDA OSPEDALIERA SANT'ANDREA

We present a 64-year-old male patient with type 2 diabetes mellitus, coronary artery bypass graft, chronic total occlusion of the right coronary artery, and significant stenosis of the superior mesenteric artery. A smoker with a 40 pack-year history, he also had chronic obstructive pulmonary disease (GOLD II/B) and was alcohol-dependent. He arrived exhibiting general weakness, a 20 kg weight loss, chills, and fever. Upon arrival, his temperature was 37.7°C, blood pressure 110/62 mmHg and heart rate 89 bpm. The patient, weighing 55 kg, showed an early diastolic murmur at the left upper sternal border, reduced breath sounds and no peripheral edema. Blood tests indicated elevated white blood cell count, C-reactive protein, iron-deficiency anemia, mildly elevated liver enzymes and increased N-terminal pro b-type natriuretic peptide. A chest CT revealed a large consolidation with air bronchogram in the right upper lobe, bilateral subpleural consolidations in the lower lobes and bilateral pleural fluid. Pulmonary embolism was absent.

Empiric antibiotics with amoxicillin-clavulanic acid were initiated for suspected pneumonia. Blood cultures identified *Enterococcus Faecalis*, leading to a switch to high-dose amoxicillin and ceftriaxone, followed by echocardiography.

Transthoracic echocardiography revealed large, mobile masses on the pulmonary valve prolapsing into the right ventricular outflow tract, with severe

pulmonary regurgitation indicated by Doppler findings. The right ventricle was severely dilated with normal systolic function, and the tricuspid valve showed mild regurgitation.

Transesophageal echocardiography confirmed these findings. The endocarditis and heart team decided to exclude malignancy before considering surgical repair. The patient had no intravenous drug use, normal urine tests, and a recent history of enteritis, suggesting gastrointestinal bacterial translocation. Colonoscopy removed two small polyps, and PET-CT after one week of antibiotics showed increased uptake in pulmonary consolidation zones and mediastinal lymph nodes, but no valve hyperenhancement. Coronary CT angiography confirmed patent bypass grafts.

Heart surgery was performed four weeks after starting IV antibiotics, revealing massive vegetations on the pulmonary valve cusps with extensive destruction but an intact annulus. A bioprosthetic pulmonary valve replacement was completed.

Postoperative complications included pneumonia, COPD exacerbation, and delirium. The pulmonary bioprosthesis functioned normally. The patient was transferred to a standard ward on the tenth postoperative day to continue IV antibiotics, with intraoperative cultures remaining negative. The patient was discharged home 18 days post-surgery, after a total hospital stay of 50 days.



VALVULOPATIE 917

PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)

IMAGING MULTI-MODALE / IMAGING IBRIDO (IMAGING CARDIOVASCOLARE)

ENDOCARDITI (VALVULOPATIE)

AN UNUSUAL IMAGE ON THE MITRAL VALVE: A CHALLENGING DIFFERENTIAL DIAGNOSIS

Francesca Ileana Adamo (a), Luca Arcari (b), Giovanni Camastra (b), Luca Cacciotti (b), Giulia De Blasis (c), Paolo De Orchi (a), Fabio Miraldi (a), Silvia Papa (a), Roberto Badagliacca (a), Carmine Dario Vizza (a)

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Case Presentation: An 83-year-old woman was admitted to the emergency department because of dyspnea since the morning. Blood tests showed an increase of NT-pro-BNP (2581 ng/L) and C-reactive protein. Electrocardiogram revealed 2:1 atrioventricular block; transthoracic echocardiogram showed two echo-dense images at the level of the anterior mitral annulus: one of about 8 mm attached to the ventricular side, between the mitro-aortic junction and the lateral commissure (A3); and the second one, pedunculated, of approximately 13 mm, attached to the atrial side with wide systo-diastolic mobility. Extensive sclerocalcific degeneration of the posterior mitral valve ring was present; only a minimal - mild insufficiency was documented. Biventricular function was normal and no further valvular diseases were present. In the suspicion of endocarditis, blood cultures were performed, though the results were negative. A few days later a transesophageal echocardiogram no longer showed the plus image on the atrial side of the mitral annulus but only a small formation consistent with remnants following embolization. A CT scan revealed ischemic lesions affecting the spleen. To better characterize the valve lesions, a cardiac magnetic resonance imaging (MRI) was performed but, given the small size and motility of the nodular formation, it did not allow tissue characterization. Considering of the embolic event, patient was transferred to undergo cardiac surgery. The histological examination revealed fibrin-necrotic and calcific material surrounded by lymphohistiocytic

inflammation with numerous multinucleated giant cells and neutrophils. No connective tissue lined by endothelium was found, excluding fibroelastomas. A non-bacterial thrombotic endocarditis (NBTE) seems to be the final diagnosis.

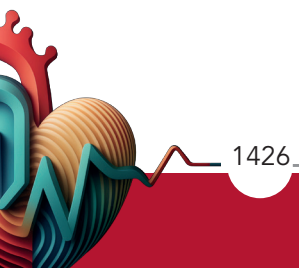
Discussion: Once infective endocarditis was ruled out with microbiological tests, there were still several possible diagnostic alternatives. An intracardiac thrombus would have been unlikely as patient did not have a dilated and dysfunctional ventricle neither atrial fibrillation nor valve abnormalities. Despite patient's sclerocalcific degeneration of the posterior mitral valve ring, the lesions on the anterior ring did not have imaging features compatible with calcification. Given non-invasive multimodality imaging appearance, the most likely hypotheses were fibroelastoma and NBTE. Fibroelastomas, papillary lesions of the endocardium, are generally located on the surface of cardiac valves and appear as pedunculated free-moving mass at echo with embolic potential but without any valvular destruction. At MRI they might be not easily visualized due to the small size, as in this case. NBTE usually affects patients with cancer (marantic endocarditis) and systemic lupus erythematosus (Libman-Sacks endocarditis), diseases that the patient did not appear to have from the tests performed. Finally, histological examination revealed findings consistent with NBTE.

Conclusion: This case report addresses the problem



of differential diagnosis in case of imaging-detected valves abnormalities. It shows the fundamental role of clinical correlation and comparison of multimodality imaging to get the closest possible to the diagnosis.

Surgical excision and histological examination, especially in doubtful cases and when embolization is present, remains an appropriate treatment and the the gold standard to establish the correct etiology.



VALVULOPATIE 718

PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE) SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)

TEER IN URGENZA: STRATEGIA DI SVOLTA PER UNO SHOCK CARDIOGENO REFRATTARIO

Ginevra Assandri (a), Italo Porto (a, b), Roberta Della Bona (a)

(a) IRCCS OSPEDALE POLICLINICO SAN MARTINO; (b) UNIVERSITÀ DEGLI STUDI DI GENOVA

Il signor S.L. di anni 62, giungeva presso il DEA del nostro policlinico per epigastralgia persistente da circa 2 giorni. L'ECG mostrava sopraST in anteriore con contestuale onda q; data la persistenza della sintomatologia si eseguiva coronarografia urgente con evidenza di occlusione trombotica di IVA ostiale (malattia monovasale). Si eseguiva PCI primaria con multiple tromboaspirazioni e POBA, ottenendo parziale ripresa di flusso (TIMI1-2); per elevata pressione telediastolica V_{sin} si posizionava contropulsatore (IABP). All'ecocardiografia in acuto frazione di eiezione (FE) 25% e insufficienza mitralica (IM) lieve-moderata. Nei successivi giorni si otteneva una discreta stabilizzazione del quadro clinico, si eseguiva infusione di Levosimendan e si rimuoveva IABP.

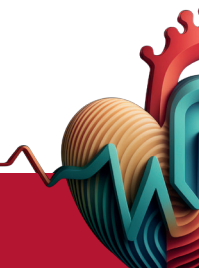
La degenza veniva poi complicata da artrite gottosa, infarto splenico, episodio infettivo polmonare, edema polmonare acuto (EPA) e ipotensione, con evidenza all'ecocardiografia di rimodellamento V_{sin} con FE 15% e un peggioramento dell'IM, diventata di grado moderato-severo (++++/+++++). Tale quadro richiedeva il supporto ventilatorio non invasivo mediante c-PAP e supporto farmacologico con difficoltà di svezzamento dall'infusione continua di inotropi (dobutamina) e venodilatatori (nitroprussiato) ad alte dosi. Il cateterismo cardiaco destro (CCD) mostrava un quadro di ipertensione polmonare post-capillare (PAPm 30 mmHg, PWC 29 mmHg, PVR 0,28 WU) e indice cardiaco ridotto (IC 1,8 l/min/m²). A questo punto si configurava un quadro di shock cardiogeno refrattario e bisognava pensare ad una 'exit-strategy'

tra cui il trapianto cardiaco in urgenza. In considerazione dell'età del paziente e delle condizioni generali, dopo discussione collegiale, si optava per una riparazione percutanea mitralica mediante tecnica edge-to-edge (TEER) che veniva eseguita, previo ecocardiogramma transesofageo e in supporto con IABP, mediante posizionamento di dispositivo Mitralclip XTW in sede centrale e ottenendo una riduzione del rigurgito da ++++/++++ a ++/++++.

Il successivo decorso risultava minato da ulteriori complicanze, tra cui un ematoma in fossa iliaca sinistra rifornito da arteria femorale comune distale, trattato con iniezione di trombina e plurime trasfusioni. Nonostante ciò, si assisteva ad un graduale e progressivo miglioramento dello stato emodinamico che consentiva lo svezzamento dal supporto inotropo. Il CCD di controllo mostrava miglioramento dei parametri emodinamici con PWC 25 mmHg e IC 2,5 l/min/m².

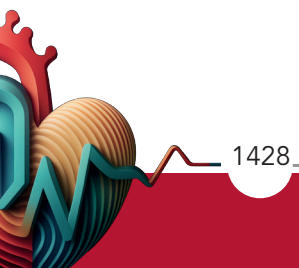
Si inseriva terapia anti-rimodellamento e si dimetteva il paziente avviandolo a percorso riabilitativo, previa applicazione di Life-Vest, procrastinando l'impianto di defibrillatore (ICD). Venticinque giorni dopo si procedeva all'impianto di ICD in prevenzione primaria. Il CCD evidenziava ulteriore miglioramento dei parametri (PAPm 29 mmHg, PWC 24 mmHg, PVR 0.8 WU, IC 2.8 l/min/m²).

In questo caso l'esecuzione di TEER in urgenza ha costituito una valida exit-strategy dalla fase acuta permettendo lo svezzamento dagli inotropi,



l'inserimento di terapia cardioattiva e un successivo percorso riabilitativo, assumendo il ruolo di bridge ad eventuale trapianto cardiaco. Bisogna tuttavia ricordare che gli esiti di tale procedura in urgenza sono ancora

altamente operatore-dipendenti e che non esistono ampie evidenze circa i risultati a lungo termine.



VALVULOPATIE 878
**INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
**COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA
INTERVENTISTICA, CORONARICA E STRUTTURALE)**

NEXT DAY DISCHARGE AFTER TAVR IN AN ALL-COMER NONANGERIAN POPULATION

Alessandro Comis (b), Giuliano Costa (b), Valentina Frittitta (b), Elena Dipietro (b), Mariachiara Calì (b), Sofia Sammartino (b), Luigi La Rosa (b), Marco Barbanti (a)

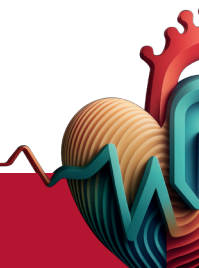
(a) UNIVERSITA' DI ENNA; (b) POLICLINICO DI CATANIA/UNIVERSITA' DI CATANIA

Aims: The aim of this study was to evaluate the safety of next-day discharge following transcatheter aortic valve replacement (TAVR) in nonagenarians.

Methods and results: For the purpose of this analysis, consecutive TAVR nonagenarian patients enrolled in the local, prospective REPLACE registry were considered. From November 2011 to May 2024, a total of 104 nonagenarian patients underwent transfemoral TAVR. Three patients died after TAVR during the index hospitalization. Among survived patients, 32 patients (31.7%) were discharged the day after TAVR. Five patients (15.7%) underwent urgent procedure for heart failure, and most patients (93.7%) received a self-expandable transcatheter heart valve (THV). Next-day discharge (NDD) patients were compared to patients discharged later. Primary outcomes were 30-day clinical events and re-hospitalizations. Despite higher rates in patients discharged on day 2 or after, no statistical

differences of in-hospital complication were reported (major vascular complications 0.0% vs. 8.7%; $p=0.2$; major cerebrovascular events 0.0% vs. 1.5%. $p=1.0$; acute kidney injury 6.3% vs. 7.3%, $p=1$; permanent pacemaker implantation 0.0% vs. 5.8%, $p=0.3$) among study groups. At 30-day, no difference in all-cause death (0.0% vs. 4.5%, $p=0.5$), major cerebrovascular events (0.0% vs. 0.0%, $p=1$), permanent pacemaker implantation (0.0% vs. 0.0%, $p=1$) and rehospitalizations (0.0% vs. 0.0%, $p=1$) were reported between next-day discharged patients and those discharged after day 1.

Conclusions: Next-day discharge after TAVR in an all-comer nonagenarian population deemed suitable for the procedure by Heart Team evaluation, was safe and effective with no difference in 30-day clinical events of re-hospitalization compared to patients discharged after day 1. Propensity-score adjusted analysis will be presented during the meeting.



VALVULOPATIE 844
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)

PERCUTANEOUS MITRAL VALVE REPAIR WITH THE PASCAL SYSTEM IN AN ELDERLY PATIENT WITH DISLOCATED ANNULOPLASTY RING: THE FIRST CASE IN ITALY

Marco Fabio Costantino (a), Luisiana Stolfi (a), Francesca Cortese (b), Gianpaolo D’addeo (a), Filippo Prestipino (a), Agostino Lopizzo (a), Giampaolo Luzi (c)

(a) DIPARTIMENTO CARDIOVASCOLARE - AZIENDA OSPEDALIERA REGIONALE "SAN CARLO" POTENZA;

(b) UNITÀ DI CARDIOLOGIA - OSPEDALE "MADONNA DELLE GRAZIE" - MATERA; (c) UNITÀ OPERATIVA CARDIOCHIRURGIA E TRAPIANTI DI CUORE - AZIENDA OSPEDALIERA "SAN CAMILLO FORLANINI" - ROMA

Background: An 82-year-old female with a history of hypertension, type 2 diabetes, chronic kidney disease, myocardial infarction treated with stenting, and atrial fibrillation presented with worsening dyspnea and lower extremity edema. Her cardiovascular history, including reduced left ventricular function and atrial fibrillation, put her at high risk for heart failure exacerbation. Past interventions and her comorbidities made her a complex case for further treatment.

Case Presentation: The patient was tachycardic (110 bpm) and hypertensive (145/85 mmHg) on examination, with signs of fluid overload including jugular venous distention, bilateral crackles, and pitting edema. Echocardiography revealed severe mitral regurgitation with a central jet, left ventricular dilation with an ejection fraction of 35%, and mild tricuspid regurgitation (Image A). B-type natriuretic peptide (BNP) levels were elevated, confirming heart failure exacerbation. Due to her multiple comorbidities and poor ventricular function, the heart team deemed her high-risk for conventional mitral valve surgery and recommended a less invasive approach.

The patient underwent a successful percutaneous mitral valve repair with two MitraClip devices (Image B), reducing the mitral regurgitation to mild. She was extubated in the operating room and monitored in the

cardiac care unit, showing significant improvement in symptoms over the next few days (Image C).

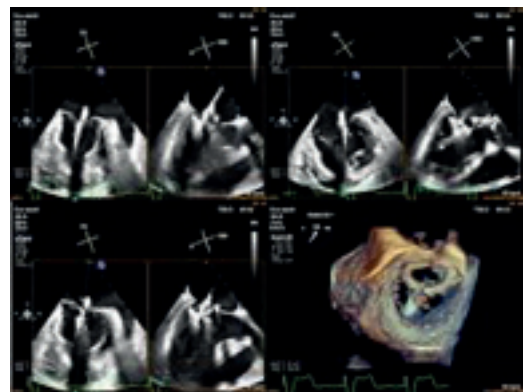


Figure 1

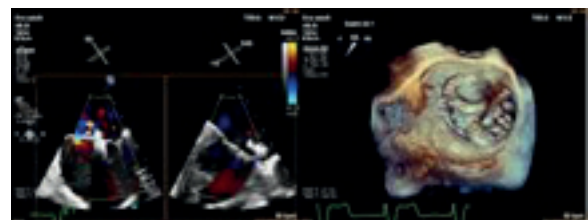


Figure 2

Conclusions: This case highlights the effectiveness of the MitraClip device in managing severe mitral regurgitation in a high-risk elderly patient with multiple comorbidities. The percutaneous procedure provided a less invasive alternative to surgery, resulting in symptomatic improvement and stabilization of her cardiac function. The patient was discharged with optimized heart failure management and continued to do well at the one-month follow-up, demonstrating the potential of the MitraClip device for patients unsuitable for open surgery.

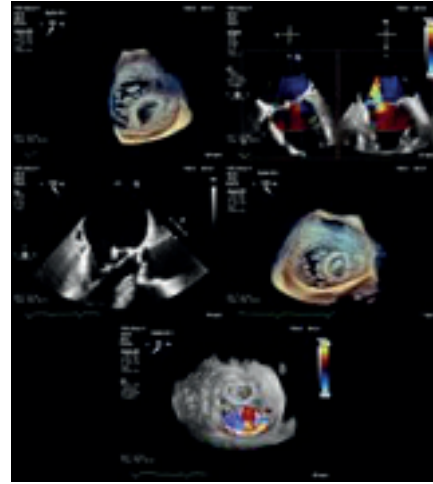


Figure 3



VALVULOPATIE 29

VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE)

PREDITTORI ECOCARDIOGRAFICI DI OUTCOME CLINICO IN PAZIENTI CON INSUFFICIENZA AORTICA MODERATA

Paolo Fabio D'andria (a), Giacomo Gamberini (a), Filippo Fazzini (a), Chiara Giordano (a), Luca Donisi (a), Andrea Faggiano (a), Francesca Bursi (c), Gloria Santangelo (b), Stefano Carugo (a, b)

(a) UNIVERSITÀ DEGLI STUDI DI MILANO; (b) FONDAZIONE IRCCS CA' GRANDA OSPEDALE POLICLINICO; (c) ASST SANTI PAOLO E CARLO - PRESIDIO OSPEDALIERO SAN PAOLO

Background: L'insufficienza aortica (IA) è una patologia valvolare relativamente rara e spesso riceve meno attenzione rispetto ad altri vizi valvolari. Mentre la necessità di intervento chirurgico nell'IA severa è ben documentata, la gestione clinica dell'IA moderata rimane meno definita a causa della possibile evoluzione verso una forma severa.

Obiettivo: Indagare se specifici parametri ecocardiografici possano predire eventi clinici avversi come mortalità, ospedalizzazione per insufficienza cardiaca e necessità di intervento chirurgico sulla valvola cardiaca in pazienti con IA moderata.

Metodi: Abbiamo condotto un'analisi retrospettiva degli ecocardiogrammi di 94 pazienti diagnosticati con IA moderata presso il nostro centro. I criteri ecocardiografici di IA moderata includevano: vena contracta (VC): 4 (3,5-4,5) mm; tempo di dimezzamento della pressione (PHT): 457 (399-515) msec; area effettiva dell'orifizio rigurgitante (EROA): $0,188 \pm 0,05$ cm²; frazione di eiezione (EF): 57% (53-61). Abbiamo escluso i pazienti con difetti valvolari significativi concomitanti o endocardite per concentrarci esclusivamente sui casi di IA pura. Il periodo di follow-up è stato in media di 277 (157-396) giorni, durante i quali abbiamo monitorato un endpoint composito di ricovero ospedaliero per

insufficienza cardiaca, mortalità cardiovascolare o intervento chirurgico sulla valvola aortica. Sono stati esclusi dallo studio i pazienti sottoposti ad interventi chirurgici sulla valvola aortica entro 65 giorni dalla valutazione ecocardiografica per eliminare i bias preoperatori.

Risultati: Dei 94 pazienti iniziali, 20 sono stati persi al follow-up, lasciando 74 pazienti per l'analisi finale. Durante il periodo di follow-up, 12 pazienti (16,2%) hanno raggiunto l'endpoint composito. L'analisi multivariata ha identificato due predittori significativi dell'endpoint composito: la frazione di eiezione ridotta (EF \leq 50%): HR 6,91 (1,43-33,51), $p=0,016$; la morfologia della valvola bicuspidale: HR 16,30 (1,27-208,73), $p=0,032$. Tra questi, la EF ridotta è emersa come il più significativo predittore di esiti avversi ($p=0,001$) (vedi immagine).

Conclusioni: Nella stratificazione del rischio dell'insufficienza aortica moderata, la frazione di eiezione ridotta rimane il fattore prognostico più importante. I pazienti con IA moderata e ridotta frazione d'eiezione (FE \leq 50%) potrebbero beneficiare di un follow-up più stretto e di un approccio correttivo più precoce rispetto a quanto consigliato dalle attuali linee guida.

VALVULOPATIE 763
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

**IL RUOLO DELL'IMAGING ECOCARDIOGRAFICO NELLA DIAGNOSI DELLE COMPLICANZE POST-
CHIRURGICHE: UN CASO DI DISTACCO PARZIALE D'ANULOPLASTICA**

Manuel Freschini (a), Giuliana Bardelli (a), Alessandro Lupi (a), Eugenio Trovarelli (a), Francesca Lisi (a), Rosanna Lauciello (a), Cinzia Zuchi (a), Anna Mengoni (a), Sandra D'addario (a), Francesco Notaristefano (b), Erberto Carluccio (a), Giuseppe Ambrosio (a)

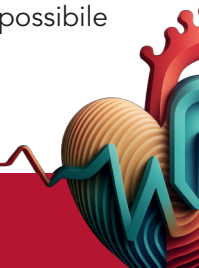
(a) *CARDIOLOGIA E FISIOPATOLOGIA CARDIOVASCOLARE, UNIVERSITÀ DEGLI STUDI DI PERUGIA*; (b) *STRUTTURA COMPLESSA DI CARDIOLOGIA, AZIENDA OSPEDALIERA "S. MARIA DELLA MISERICORDIA", PERUGIA*

Introduzione: L'anuloplastica è una delle principali tecniche di riparazione valvolare mitralica per il trattamento dell'insufficienza severa sintomatica. Una delle sue possibili complicanze è il distacco dell'anello protesico, con conseguente ricomparsa/peggioramento del rigurgito.

Caso clinico: Uomo, affetto da Sindrome di Marfan, sottoposto all'età di 15 anni a: anuloplastica mitrale per rigurgito severo in presenza di malattia di Barlow; intervento di sostituzione dell'aorta ascendente con tubo protesico, associato a risospensione delle cuspidi valvolari aortiche e reimpianto degli osti coronarici secondo la tecnica di David, per dilatazione aneurismatica del bulbo con rigurgito valvolare severo; chiusura di PFO. All'età di 20 anni all'ETT e successivo ETE-2D riscontro di distacco dell'anello protesico mitralico nella sua porzione mediale, con recidiva di insufficienza complessivamente moderata (A) ed evidenza di jet che subito dopo l'origine si divideva in una componente mediale, tesa tra l'anulus nativo e quello protesico, ed una più centrale (B). L'insufficienza era infatti contenuta dalla porzione beante della protesi stessa che limitava il movimento sistolico dei lembi valvolari ridondanti i quali, altrimenti, avrebbero determinato un rigurgito di maggior grado. Per questo

motivo, in accordo con i cardiocirurghi, si decideva di soprassedere ad un re-intervento ed iniziare un percorso di stretto follow-up. Sempre in tale occasione veniva esclusa anche una possibile pregressa endocardite alla base del distacco, attribuito piuttosto alla lassità del tessuto connettivo tipico dei pazienti affetti da Marfan. Con l'avvento della tecnologia 3D, all'ETE di follow-up si confermava la presenza di un ampio distacco della porzione mediale dell'anello protesico, che si disponeva a ponte al di sopra della valvola nativa e ne determinava: in diastole un aspetto a doppio orifizio (C, D), mentre in sistole conteneva il movimento dei lembi prolassanti limitando il grado di insufficienza valvolare (E). Negli anni a venire il rigurgito mitralico permaneva di grado moderato, mentre peggiorava quello aortico, fino a divenire severo. Pertanto, all'età di 30 anni, per la comparsa di dispnea da sforzo in associazione ad iniziale dilatazione e riduzione della funzione sistolica ventricolare sx, il paziente veniva sottoposto a sostituzione valvolare mitro-aortica con protesi meccaniche. All'ETT di controllo a 3 mesi dall'intervento riscontro di normalizzazione sia delle dimensioni che della FE del ventricolo sx.

Discussione: Il distacco dell'anello protesico mitralico con recidiva del rigurgito è una rara, ma possibile



complicanza, che non sempre richiede un intervento immediato. Sebbene per la diagnosi possa essere sufficiente l'ecocardiografia 2D, la tecnologia 3D rappresenta oggi una preziosa risorsa in quanto, mostrando un'immagine completa ed in movimento di tutta l'area valvolare, consente di ottenere una migliore caratterizzazione anatomica-funzionale e, quindi, di contribuire anche ad una corretta diagnosi differenziale da altre patologie, come un'endocardite infettiva.

Conclusioni: L'imaging ecocardiografico 2D e 3D ha permesso di fare un'accurata diagnosi ed ha indirizzato

al corretto approccio terapeutico. Diagnosed with severe AS and 14 (18%) with moderate AS. Among the physical examination parameters, the absence of the second heart sound (S2) demonstrated the highest diagnostic accuracy, with an AUC of 0.65 (95% CI: 0.52-0.79; $p = 0.041$), 74% sensitivity, and 57% specificity. Excluding the 13 patients with low-flow low-gradient AS increased the accuracy of this sign to an AUC of 0.70 (95% CI: 0.55-0.85; $p = 0.016$), with 80% sensitivity and 58% specificity. The inter-observer reliability for the absence of S2 was nearly perfect (McNemar $p = 0$

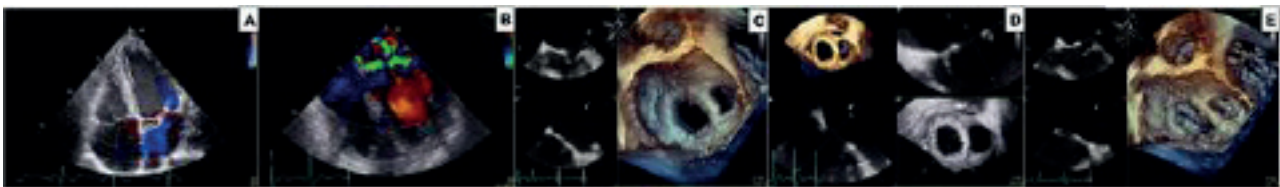


Figura 1

VALVULOPATIE 657

VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

SEX DIFFERENCES IN SEVERE AORTIC STENOSIS UNDERGOING SURGICAL VALVE REPLACEMENT

Giorgia Panichella (a, b), Manuel Garofalo (a, b), Francesca Bonanni (a, b), Andrea Grasso Granchietti (a, b), Martina Berteotti (a, b), Valentina Tozzetti (a, b), Noemi Cenni (a, b), Marta Bandini (a, b), Chiara Servoli (a, b), Giulio Grandi (a, b), Sabina Cacioli (b), Stefano Del Pace (b)

(a) UNIVERSITÀ DI FIRENZE; (b) AZIENDA OSPEDALIERA UNIVERSITARIA CAREGGI, FIRENZE

Background: Aortic stenosis (AS) is the most common valvular heart disease in developed countries. Sex differences have been described in AS pathophysiology and left ventricular (LV) remodelling, as well as clinical presentation and response to therapies (1). However, sex differences in LV function parameters, namely global longitudinal strain (GLS), have been scarcely explored so far.

Purpose: To investigate sex differences, taking into account GLS, in patients with severe AS referred to surgical aortic valve replacement (SAVR).

Methods: The study population was from a single centre, prospective registry of patients with severe native valve AS who were referred for SAVR between June 2020 to October 2022. Severe AS was defined by standard guideline criteria (2). All patients underwent

an echocardiogram immediately before and at least 3 months after surgery.

Results: Table 1 recapitulates sex differences in our population (n=119, 43% women). No differences in age or cardiovascular (CV) risk factors were noted. Clinical presentation and AS etiology were also similar. At baseline, women had lower EuroSCORE (p=0.039), creatinine (p <0.001), and haemoglobin levels (p=0.001). The echocardiogram showed a higher mean aortic valve gradient in women (Gmean, 62 vs. 50 mmHg, p=0.002). Women also had higher relative wall thickness (RWT, 0.49 vs. 0.42, p=0.037), despite lower LV mass index (124.9 vs. 136.6 g/m², p=0.037). Regarding LV function, women showed higher EF (64% vs. 60%, p=0.002) and GLS (16.5% vs. 14.6%, p=0.006) values. This is partially explained by the higher prevalence of concomitant coronary artery disease (CAD) in men,

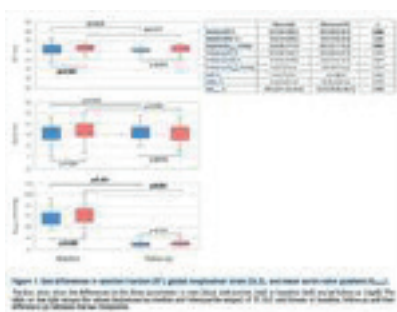


Figure 1

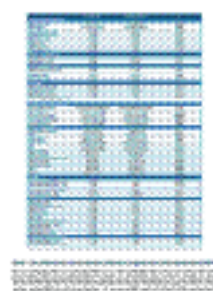
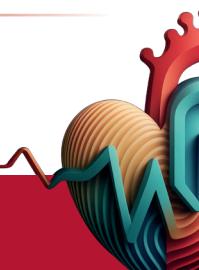


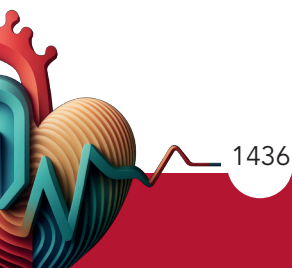
Figure 2



more frequently subjected to a concomitant coronary artery bypass graft than women (CABG, 38% vs. 8%, $p < 0.001$). Post-operative complications had similar rates in men and women. After a median follow-up of 16 (6-18) months, death from any cause (6.0% vs. 1.5%, $p=0.186$) and rehospitalization for CV causes (14.0% vs. 4.0%, $p=0.055$) tended to be more frequent among women. When considering patients with severe AS alone ($n=89$), women had higher Gmean (64 vs. 53 mmHg, $p=0.035$) and EF (65% vs. 62%, $p=0.045$) but similar GLS (16.9% vs. 16.6%, $p=0.230$) as compared to men (Figure 2). At follow-up, EF and GLS failed to improve in both sexes and no differences were noted

between women and men (EF 60% vs. 60%, $p=0.476$; GLS 15.9% vs. 16.0%, $p=0.976$).

Conclusions: In a population of all-comers patients with severe AS undergoing SAVR, women showed higher Gmean, EF, and GLS values. This is partially due to the higher prevalence of a concomitant CAD in men. When considering patients with AS alone, women still had higher EF and Gmean than men, despite a similar GLS. Future larger prospective studies with longer follow-up are needed in order to further characterize such differences and correlate them with specific outcomes.



VALVULOPATIE 623
**INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)
**VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)**

**TRATTAMENTO EDGE-TO-EDGE DELL'INSUFFICIENZA TRICUSPIDALICA: L'IMPORTANZA DI UNA
ADEGUATA PREPARAZIONE DEL PAZIENTE PER GARANTIRE IL SUCCESSO PROCEDURALE**

Claudia Prota (a), Federica Ilardi (a), Federica Carusone (a), Dalila Nappa (a), Giulia Sgherzi (a), Rosa De Vivo (a), Maddalena Immobile Molaro (a), Rachele Manzo (a), Andrea Mariani (a), Domenico Simone Castiello (a), Ciro Santoro (a), Anna Franzone (a), Carmen Spaccarotella (a), Giovanni Esposito (a)
(a) UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

Introduzione: La riparazione edge-to-edge transcateretere della valvola tricuspide (T-TEER) rappresenta una valida opzione terapeutica per il trattamento dell'insufficienza tricuspidalica (IT) severa sintomatica nei pazienti ad elevato rischio chirurgico. Questa tecnica ha dimostrato infatti di essere sicura ed efficace nel ridurre in modo significativo il grado di IT. Il successo procedurale, tuttavia, è strettamente legato alle caratteristiche anatomiche e funzionali della valvulopatia e del grado di disfunzione sistolica del ventricolo destro (VD) associata.

Caso clinico: Si presenta alla nostra attenzione un paziente, maschio, di anni 82, affetto da sindrome coronarica cronica per pregresso NSTEMI trattato mediante angioplastica ed impianto di uno stent medicato su ramo circonflesso di arteria coronaria sinistra, scompenso cardiaco a frazione di eiezione ridotta già sottoposto ad impianto di ICD monocamerale in prevenzione primaria, fibrillazione atriale permanente, arteriopatia polidistrettuale ed insufficienza renale cronica stadio IIIb. Il paziente, in terapia medica ottimizzata per lo scompenso cardiaco, riferiva dispnea per sforzi lievi. All'esame obiettivo presentava segni di stasi, con edemi declivi e, all'auscultazione del torace, crepitii basali bilaterali. Al controllo ecocardiografico si evidenziava una severa disfunzione del ventricolo sinistro, insufficienza mitralica di grado lieve, severa

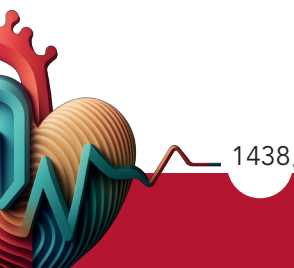
dilatazione delle camere destre, con riduzione della funzione sistolica longitudinale del VD (TAPSE 14 mm, S' 7 cm/s) ed IT di grado torrenziale. Inoltre, la vena cava inferiore appariva dilatata e ipocollassante (diam espiratorio 33 mm, diam inspiratorio 29 mm) con riscontro di reflusso nelle vene sovraepatiche. Al fine di valutare la fattibilità dell'intervento di T-TEER il paziente veniva sottoposto ad esame ecocardiografico transesofageo che confermava la diagnosi di IT funzionale di grado torrenziale, con dilatazione dell'annulus tricuspidalico (47 mm) ed ampio gap di coaptazione (11 mm in commissura antero-settale e 17 mm in posizione centrale). Alla luce dell'ampio gap di coaptazione, che controindica la procedura di T-TEER, e dello stato di congestione del paziente, si optava per un potenziamento della terapia diuretica. Dopo alcune settimane di terapia diuretica orale ed infusiva veniva effettuata una nuova rivalutazione ecocardiografica che mostrava un miglioramento della funzione longitudinale del VD, una riduzione dello stato di congestione e del gap di coaptazione. In considerazione della persistenza dell'IT significativa, della sintomatologia dispnoica e dell'elevato rischio chirurgico, veniva posta indicazione ad eseguire T-TEER. Durante la procedura, confermata la riduzione del gap di coaptazione (8 mm a livello antero-settale) si impiantavano due triclip G4 XTW in posizione antero-settale con una insufficienza tricuspidalica residua di grado moderato. La procedura



decorreva in assenza di complicanze.

Discussione: un gap di coaptazione $>8,5$ mm ed una severa disfunzione del ventricolo destro rappresentano dei predittori di insuccesso procedurale che potrebbero controindicare l'esecuzione della T-TEER. Il nostro caso clinico dimostra come un adeguato screening,

insieme ad una ottimizzazione della terapia medica siano fondamentali al fine di individuare i pazienti che possano beneficiare di questa procedura e prepararli in modo adeguato per garantire il successo della procedura stessa.



VALVULOPATIE 658
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE
(IMAGING CARDIOVASCOLARE)

TRANS-CATETHER EDGE-TO-EDGE REPAIR OF MITRAL REGURGITATION AFTER LEFT VENTRICLE UNLOADING THROUGH THE IMPELLA PUMP: A CASE SERIES.

Mariagrazia Piscione (a), Valeria Cammalleri (a), Valeria Maria De Luca (a), Giorgio Antonelli (a), Dario Gaudio (a), Myriam Carpenito (a), Nino Cocco (a), Francesco Grigioni (a), Gian Paolo Ussia (a)
(a) FONDAZIONE POLICLINICO CAMPUS BIOMEDICO

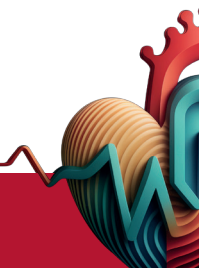
Background: Functional mitral regurgitation in patients with severely reduced ejection fraction is frequently considered unsuitable for surgical intervention. Actually, patients with reduced EF develop heart failure due to a reduction in the cardiac output, caused by a large proportion of blood pumped retrogradely instead of thorough the aortic valve. This leads to an important increase in atrial volume and pressure, causing pulmonary oedema. The chronic condition of congestion, if accompanied with acute hypoperfusion, may lead to cardiogenic shock, so that it may be necessary left Impella support (Abiomed, Danver, USA). What we will discuss in this case series is if the use of this unloading pump may be an useful support to MitraClip (Abbott, Abbott Park, Illinois) implantation procedure.

Methods: We examine three different patients. Only one of them presented with de novo acute heart failure. All patients underwent coronary angiography with percutaneous coronary intervention. The trans-thoracic echocardiogram showed pre and post procedural severity of MR. All patients receives Impella support before the hemodynamic procedure of

revascularization, but the pump was removed before the implantation of the MitraClip.

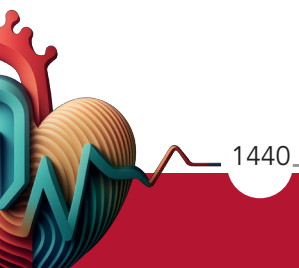
Results: The procedure was successfully performed in all the cases with a reduction of the MR from a severe degree to a mild- moderate degree. The combination of mechanical support plus MitraClip procedure in two different times determined a reduction in the pulmonary wedge pressure of about 15 mmHg. There were no device complications and procedure complications. All the patients survived to discharge and had improved symptoms with stability at one month follow-up.

Conclusion: According to literature, Impella during high-risk edge-to-edge transcatheter repair procedures may prevent hemodynamic deterioration and intra-procedural complications. Moreover, in patients with advanced LV dilation, the large coaptation gap makes it challenging to grasp both valve leaflets adequately so that Impella support allows for a better chance of procedural success. Anyway, we think that the alteration of the cardiac output may miscalculate the entity of the MR and a pre-operative planning may not be sufficient to make a correct estimation of the



valvular regurgitation. Besides, the presence of the Impella pump alters the ventricular conformation and the space available for the operator. Moreover, the reduction of the coaptation gap causes a higher risk of tearing the valve leaflets when, after the deployment of the clips, the LV resumes its original shape. Least but not last, as all MCS devices, Impella pump has associated complications such as bleeding, anemia,

hemolysis and stroke so that its use must be limited in time especially in frail patients. Our cases may serve as a proof of concept to demonstrate that the use of Impella may be convenient before the procedure but not during itself, since this device is able to unload the LV. Actually, its effect ensures a positive remodeling of the LV without completely altering the geometry of the valve and the anatomy of the ventricle.



VALVULOPATIE 874

PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE) PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE) VALUTAZIONE ECOCARDIOGRAFICA DELLA FUNZIONE VENTRICOLARE (IMAGING CARDIOVASCOLARE) VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

EARLY RIGHT HEART REMODELING IN PATIENT WITH MITRAL VALVE PROLAPSE

Federica Barbara Beatrice Testerini (a, b), Dario Donia (a, b), Kamil Stankowski (a, b), Martina Maria Ruffo (b), Lorenzo Cambini (a), Silvana Di Maio (b), Riccardo Mantovani (b), Carlo Andrea Pivato (a, b), Carlo Maria Dellino (b), Giulio Giuseppe Stefanini (a, b), Renato Maria Bragato (b), Gianluigi Condorelli (a, b), Stefano Figliozzi (b)

(a) DEPARTMENT OF BIOMEDICAL SCIENCES, HUMANITAS UNIVERSITY, VIA RITA LEVI MONTALCINI, 4, 20090, PIEVE EMANUELE, MILANO, ITALY; (b) IRCCS HUMANITAS RESEARCH HOSPITAL, VIA ALESSANDRO MANZONI, 56, 20089, ROZZANO, MILANO, ITALY

Purpose: Mitral valve prolapse (MVP) has been associated with left heart remodeling. This study explored cardiac remodeling in patients with MVP without significant regurgitation, focusing on the right heart.

Methods: This single-center study enrolled consecutive patients referred to trans-thoracic-echocardiography (TTE) with MVP, excluding those with significant regurgitation or known cardiovascular or pulmonary diseases. A control group of healthy volunteers was included.

Results: Forty-nine patients with MVP and 54 controls were finally selected (mean age of 62, 52-71; 52% males) and echocardiographic parameters were compared among groups. Twenty-nine (41%) patients with MVP showed tricuspid valve prolapse (TVP). Patients with MVP, irrespective of TVP, showed greater tricuspid annulus (systolic annulus: 31 ± 6 mm vs. 32 ± 5 mm vs. 27 ± 3 mm for MVP+/TVP-, MVP+/TVP+, and controls, respectively; all $p < 0.01$) and greater minimum right atrial volume indexed ($13, 12-15$ ml/m² vs. $15, 12-20$ ml/m² vs. $11, 10-14$ ml/m²; all $p < 0.05$). Right ventricular dimensions and systolic indexes did not differ among groups, except TAPSE, which was significantly greater in MVP+/TVP+ patients compared to controls (25 ± 4 vs. 22 ± 3 mm, $p = 0.004$). A significant correlation ($\rho = 0.43$; $p < 0.001$) and an independent association at multivariate analysis ($\beta = 0.28$; 95% CI 0.09-0.47; $p = 0.004$) was observed between end-systolic tricuspid diameter and TAPSE.

Conclusion: In patients with MVP with less-than-moderate mitral or tricuspid regurgitation, dilation of the right atrium and tricuspid annulus was found. The latter finding was associated with increased values of TAPSE, which should then be discouraged when assessing the systolic function of these patients.

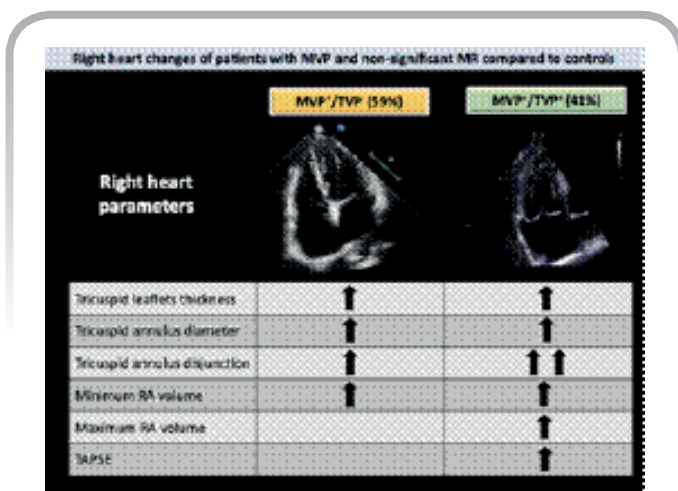


Figure 1



VALVULOPATIE 448
ARITMIE VENTRICOLARI (ARITMIE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
IMAGING MIOCARDICO-PERICARDICO (MALATTIE DEL MIOCARDIO E DEL PERICARDIO)

ARRHYTHMIC RISK OF MITRAL ANNULAR DISJUNCTION IN A PATIENT WITH MITRAL VALVE PROLAPSE

Giulia Antonelli (a), Valentina Bernardini (a), Andrea Mangiameli (a)
 (a) HUMANITAS GAVAZZENI

Valvuloplasty and arrhythmic risk of Mitral Annular Disjunction in a patient with Barlow disease related mitral prolapse

Background: Mitral valve prolapse (MVP) is a common cause of primary mitral regurgitation (MR). Despite there is strong evidence that a subgroup of patients affected by MVP are at higher risk of ventricular arrhythmias, the precise correlation is unknown yet. Mitral annular disjunction (MAD) is frequently associated to both MVP and sudden cardiac death due to ventricular arrhythmias.

Case report: A 40-years-old man was referred to our institution for moderate-to severe MR and arrhythmic palpitations. A previous 12-leads Holter electrocardiogram (ECG) registered 7200 premature ventricular contractions (PVCs) with a QRS axis that identifies the posterior papillary muscle as the possible origin. Bisoprolol 5 mg die had recently been started. Pre-operative trans-thoracic echocardiography (TTE) revealed Barlow disease with severe MR (EROA 50mm² and vena contracta width 0,7cm) and annular dilation (51 mm). Ventricular systolic function was preserved with an ejection fraction (EF) of 61%. Subsequently, cardiac magnetic resonance was performed confirming MVP-related severe MR and revealing systolic MAD (10 mm) and late-gadolinium enhancement (LGE) in the posterior papillary muscle and the inferior-lateral wall (figure). Mitral valvuloplasty through mini-thoracotomy was performed to treat the mitral valve dysfunction and no surgery-related complications were recorded. Post-procedural (TTE) revealed preserved ventricular function (EF 51%) and no residual MR. The patient was subsequently discharged with a reduced dosage of bisoprolol (2.5 mg die). Two months later, a 12-lead Holter ECG revealed a significantly reduction of the arrhythmic burden (only 13 PVCs over 24 hours).



Figure 1

Learning points: The connection between MVP, MAD and ventricular arrhythmias are strongly documented but the mechanism is not completely understood yet. MVP correction through surgical repair may reduce the ventricular arrhythmic burden.

**VALVULOPATIE 717
ENDOCARDITI (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)
TOMOGRAFIA COMPUTERIZZATA A RAGGI X (CT) (IMAGING
CARDIOVASCOLARE)
SHOCK CARDIOGENO (ASSISTENZA CARDIACA IN ACUTO)**

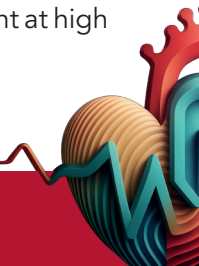
THE HIDDEN THREAT THAT TURNED TO BE FATAL

Bianca Maria Gattari (a), Paola Pantano (b), Alberto Nese (b), Davide Barbisan (b), Federico Marin (b), Fabio De Conti (c), Ivan Calcara (b), Antonio Pantaleo (b), Giuseppe Minniti (b), Carlo Cernetti (b)

(a) AZIENDA OSPEDALE UNIVERSITÀ DI PADOVA; (b) OSPEDALE CA' FONCELLO TREVISO; (c) OSPEDALE CIVILE DI MONTEBELLUNA

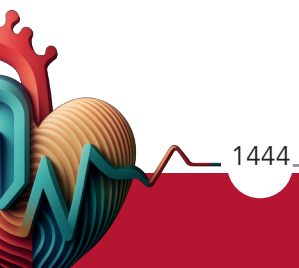
A 68-year-old man has been followed up since 2021 at our Center for asymptomatic aortic insufficiency. At the December 2023 check-up, progression of the valve defect was observed, leading to the indication for elective hospitalisation for preoperative assessments. The angiographic study excluded critical stenosis of the coronary arteries; the transesophageal echocardiogram (TEE) confirmed the presence of severe aortic valve insufficiency in a tricuspid valve, with partial fusion of two coronary cusps, in a dilated left ventricle with mildly reduced ejection fraction. At admission to the cardiac surgery department, the patient had a fever (up to 38°C), leading to blood cultures and urine cultures, which were later found negative; prophylactic antibiotic therapy with Piperacillin/tazobactam was initiated. A few days after the febrile event, at the end of February 2024, the patient underwent aortic valve replacement with a 27 mm Magna Ease bioprosthesis, without complications. The postoperative transthoracic echocardiogram confirmed the good positioning and functioning of the aortic bioprosthesis. During the postoperative course, microbiological examination of bronchial aspirate revealed *Pseudomonas aeruginosa* multi-sensitive, in an asymptomatic and afebrile patient, for which empirical antibiotic therapy with Piperacillin/tazobactam was initiated but was discontinued shortly after due to a skin rash. Therefore, the patient was transferred to a rehabilitation hospital,

where the normalisation of inflammatory markers was documented. From April 2024, the patient experienced multiple febrile episodes ($T_c > 38^\circ\text{C}$) with a slight increase in inflammatory markers and the appearance on the electrocardiogram of a first-degree atrioventricular block (AVB) and left bundle branch block. Despite this, no therapy was provided. At the end of the month, the patient was admitted to another Center due to high temperature. Here, blood cultures were performed, which were positive for methicillin-resistant *Staphylococcus epidermidis*, leading to intravenous antibiotic therapy with Daptomycin and Ceftriaxone. The TEE documented moderate aortic insufficiency likely due to endocarditis. After evaluation by cardiac surgeons, no indications for emergency surgery were made. On the 1st of May, 2024, the patient again complained of fever, shaking chills, and the appearance of advanced atrioventricular block, leading to his transfer to our Center. The patient arrived in cardiogenic shock, requiring inotropic support and placement of a temporary pacemaker. Another TEE documented an aortic valve bioprosthesis with markedly thickened cusps, a slight increase in transvalvular gradients and partial detachment of the annulus with severe intraprosthetic and paraprosthetic regurgitation; and evidence of a pseudoaneurysm near the mitral-aortic junction, appearing isoechogenic and thinned, suggestive of endocarditic involvement at high



risk of rupture. Therefore, a cardiac CT was performed, confirming the presence of a pseudoaneurysm about 3x2 cm at the aortic annulus, medially to the origin of the left main coronary artery, extending caudally towards the mitral-aortic junction, with suspected involvement of the adjacent mitral leaflet. In light of these findings and the precarious clinical condition of

the patient, the case was discussed by the Heart Team, leading to the indication for emergent cardiac surgery, which unfortunately resulted in the patient's death. Microbiological investigations performed on tissue fragments and the aortic bioprosthesis confirmed the presence of *Staphylococcus epidermidis* at this site.



VALVULOPATIE 792
**INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)**
**VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)**
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

**ONE YEAR FOLLOW UP OUTCOMES IN PATIENTS UNDERGOING TAVI FOR SEVERE AORTIC STENOSIS:
CORRELATION BETWEEN COMORBIDITIES AND MAJOR ADVERSE CARDIAC EVENTS**

Domenico Mario Giamundo (a), Marcello Marchetta (a), Weili Marco Xu (a), Valerio Malandrucolo (a), Lucy Barone (a),
Domenico Sergi (a), Massimo Marchei (a), Francesco Barillà (b)

(a) *CARDIOLOGIA-POLICLINICO TOR VERGATA*; (b) *CATTEDRA DI CARDIOLOGIA-UNIVERSITA' DEGLI STUDI DI
ROMA TOR VERGATA*

One-Year Follow-Up Outcomes in Patients Undergoing TAVI for Severe Aortic Stenosis: Correlation Between Comorbidities and Major Adverse Cardiac Events

Introduction: Transcatheter Aortic Valve Implantation (TAVI) is a well-established therapeutic option for patients with severe aortic stenosis, particularly those at high surgical risk. However, the presence of comorbidities such as chronic kidney disease (CKD), diabetes mellitus (DM), and active malignancies may negatively impact long-term outcomes. This study aims to evaluate the correlation between these comorbidities and the occurrence of major adverse cardiac events (MACE) one year after TAVI.

Methods: Seventy-four patients who underwent TAVI at Policlinico Tor Vergata in 2023 were included in this study. The one-year follow-up assessed the occurrence of MACE, including rehospitalizations and mortality. Clinical data were analyzed to identify potential

correlations between the presence of CKD, DM, and malignancies and the incidence of MACE

Results: At one-year follow-up, 11 patients (14.9%) experienced MACE. Of these, 6 patients were rehospitalized for cardiac reasons, and 5 patients died. Among those rehospitalized, 3 (50%) had CKD (eGFR <60 ml/min), and 2 (33.3%) had DM. Among the deceased, 2 (40%) had CKD, and 1 (20%) had an active malignancy. The incidence of MACE was significantly higher in patients with CKD, DM, and malignancies compared to those without these comorbidities.

Conclusions: Our study suggests that the presence of chronic kidney disease, diabetes mellitus, and active malignancies is associated with an increased risk of major adverse cardiac events one year after TAVI. These findings underscore the importance of careful and personalized clinical management in patients with comorbidities to improve post-TAVI outcomes.



VALVULOPATIE 624

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE) VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE) INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

UTILIZZO DELL'IMPIANTO TRANSCATETERE VALVOLARE AORTICO (TAVI) IN PAZIENTE CON INSUFFICIENZA AORTICA SEVERA SINTOMATICA

Rosa De Vivo (a), Federica Ilardi (a), Giulia Sgherzi (a), Dalila Nappa (a), Federica Carusone (a), Maddalena Immobile Molaro (a), Andrea Mariani (a), Domenico Simone Castiello (a), Claudia Prota (a), Carmen Spaccarotella (a), Plinio Cirillo (a), Anna Franzone (a), Giovanni Esposito (a)
(a) UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

Abstract: l'impianto transcaterete della valvola aortica (TAVI) per il trattamento della stenosi aortica severa sintomatica rappresenta oggi una procedura ben stabilita e raccomandata in tutti i soggetti ad elevato rischio chirurgico. L'utilizzo della TAVI per i pazienti ad alto rischio con insufficienza aortica severa, invece, rappresenta ancora un intervento off-label specie in presenza di una valvola poco calcifica o di un anulus aortico di dimensioni elevate.

Caso clinico: Un uomo di 65 anni con anamnesi di linfoma di Hodgking trattato con chemio e radioterapia, sindrome coronarica cronica, diabete mellito e dislipidemia si ricovera presso il reparto di cardiologia per dispnea ingravescente. All'esame obiettivo, soffio sistolico 3/6 Levine su tutti i focolai. Gli esami di laboratorio risultavano nella norma, eccetto che per il riscontro di creatinina 1,33 mg/dl (eGFR 56 ml/min). L'ECG mostrava ritmo sinusale con BAV I grado, EAS, scarsa progressione dell'onda R nelle derivazioni anteriori e anomalie della ripolarizzazione ventricolare. Il paziente veniva sottoposto ad ecocolor Doppler cardiaco, che mostrava un ventricolo sinistro dilatato con lieve riduzione della funzione sistolica globale (frazione d'eiezione Simpson biplano 45%), insufficienza mitralica funzionale di grado severo e valvola aortica sclerotica con stenosi di grado lieve ed insufficienza di grado severo (velocità di picco transaortico 2,88 m/s, gradiente medio 21 mmHg,

PHT 235 ms). Il paziente eseguiva quindi una angio-TC del torace che mostrava una valvola aortica tricuspide con una ridotta componente calcifica delle cuspidi. In considerazione della severità della malattia valvolare aortica a prevalente insufficienza, della disfunzione ventricolare sinistra e della sintomatologia del paziente veniva posta indicazione alla sostituzione valvolare ed il caso veniva discusso in Heart Team. Nonostante la giovane età del paziente, la storia di radioterapia precludeva la possibilità dell'intervento chirurgico. Si optava pertanto per la procedura di TAVI, effettuata utilizzando una bipotesi balloon expandable Edwards Sapien 3 (29 mm). Dopo la procedura, al controllo ecocardiografico si riscontrava buon funzionamento della biopotesi in assenza di leak peri o intrapotesici. Nel corso della degenza, il paziente veniva inoltre sottoposto ad impianto di pacemaker bicamerale per evidenza di un ritardo della conduzione HV allo studio elettrofisiologico. Al controllo clinico dopo 30 giorni si osservava buon risultato dell'impianto in assenza di complicanze, ed uno miglioramento clinico del paziente (classe NYHA II).

Conclusioni: in pazienti con insufficienza aortica severa su valvola nativa con controindicazione a sostituzione chirurgica, la TAVI con impianto di valvola balloon expandable si è dimostrata una alternativa sicura ed efficace, anche in pazienti con anulus poco calcifico.

VALVULOPATIE 242
ENDOCARDITI (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
INFARTO STEMI (CARDIOPATIA ISCHEMICA)
INTERVENTISTICA CORONARICA (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)

CORONARY EMBOLISM IN LEFT-SIDED INFECTIVE ENDOCARDITIS. A RETROSPECTIVE ANALYSIS FROM A HIGH-VOLUME SURGICAL CENTRE

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Background: Septic embolization is a common and potentially life-threatening complication of infective endocarditis, with an embolic prevalence of 22-50%. While acute coronary syndrome secondary to septic embolism is rare, it poses significant risks.

Aims: This study examines coronary embolism in left-sided IE, comparing clinical characteristics and outcomes.

Methods: We retrospectively analyzed 649 patients with non-device-related infective endocarditis treated between January 2013 and December 2023. Coronary embolism was diagnosed via ECG, clinical and laboratory signs of acute coronary syndrome, and confirmed by coronary angiography or magnetic resonance imaging. All patients were treated according to current European Society of Cardiology guidelines. Propensity score matching was used to adjust for baseline differences.

Results: Coronary embolism occurred in 8 (1.2%) patients. Surgery was performed in 514 (80%) patients, with 93 undergoing valve repair and 421 valve replacement. Median follow-up was 4.7 years. A statistically significant association between coronary and cerebral embolism was found initially (post-hoc power 87.8%), but not after propensity score matching. No other significant differences in baseline characteristics or mortality rates were observed. The mortality rate among CE patients was 25%.

Conclusion: Coronary embolism is a rare but severe complication of infective endocarditis, significantly associated with cerebral embolism. Early recognition and treatment are crucial to improve patient outcomes. Multicenter studies with larger patient populations are needed to further elucidate risk factors and enhance prognosis for coronary embolism in infective endocarditis patients.



VALVULOPATIE 386
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)
ECOCARDIOGRAFIA 3-D (IMAGING CARDIOVASCOLARE)

3-D DOPPLER ECHOCARDIOGRAPHY: UNVEILING THE PATHOPHYSIOLOGY OF CHORDAE TENDINEAE AND PAPILLARY MUSCLE RUPTURES

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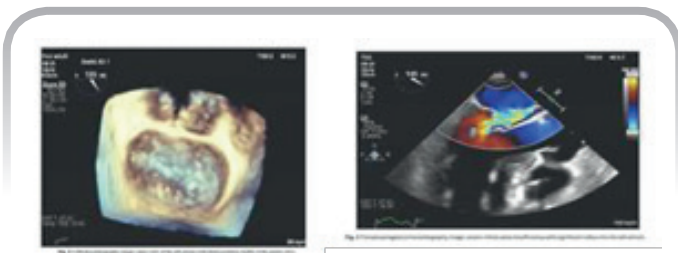


Figure 1

Introduction: 3-D Doppler Echocardiography (3-DEcho) offers detailed analysis of cardiac ventricles and structures like chordae tendineae (CTs), papillary muscles (PMs), and atrioventricular valves (AVs). However, its clinical utility remains underappreciated. Better understanding of the pathophysiology can enhance clinical applications.

Study Methods and Patient Enrollment: This retrospective study examined data from 2020-2023, focusing on patients with trans-thoracic 3-DEcho and two or more ruptured CTs, indicating AV valve and PM diseases. The study involved 36 male patients aged 45-60 without myocardial ischemia, grouped by CT ruptures, and 10 patients with ischemic CT ruptures and PM pathology. A control group of 10 healthy

men helped delineate ischemic pathology's role. Key echocardiographic parameters included left and right ventricular ejection fraction, end-systolic volume, and end-diastolic volume.



Figure 2

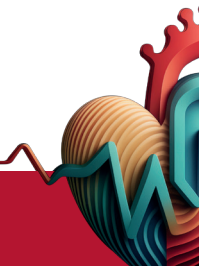
Results: The study found a significant link between multiple CT ruptures and AV insufficiency, often associated with ischemic PM disease. 3-DEcho revealed that ventricular dilation impacts CT function and AV annulus dynamics. Notably, second-order CT ruptures often led to significant AV insufficiency and ischemic PM changes.

Discussion: The research used an inductive and deductive approach to analyze 3-DEcho data,

emphasizing the interrelated nature of cardiac structures. The findings highlight the functional unity of AV leaflets, annuli, CTs, and PMs, sharing a common coronary blood supply. The study also noted that ischemic PMs could lead to arrhythmias, and significant MV annulus mobility may indicate severe arrhythmias.

Conclusions: Understanding 3-DEcho data pathophysiology is vital for diagnosing and treating

heart diseases. Advances in imaging, like contrast enhancement and 4-D reformatting, promise better hemodynamic data. Future uses could include pre-operative simulation for interventions, improving outcomes. Integrating artificial intelligence and stress echocardiography could further enhance diagnostic and therapeutic strategies for complex cardiac conditions.



**VALVULOPATIE 310
ENDOCARDITI (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)**

LA SUBDOLA PRESENTAZIONE DI UN'ENDOCARDITE COMPLICATA

Rosi Vrenozaj (a), Davide Carino (a), Giampaolo Niccoli (a), Sergio Suma (a)
(a) UNIVERSITÀ DEGLI STUDI DI PARMA

Presentazione del paziente: Trattasi di una donna di 83 anni ipertesa e dislipidemica, affetta da crioglobulinemia mista essenziale di tipo II (HCV-negativa). La stessa accedeva nell'Aprile 2024 presso il nostro ospedale per anemia e perdita di peso in paziente con febbricola diarrea e astenia presenti da ormai qualche giorno.

Relativamente alla sua storia cardiologica, la paziente è portatrice di pace-maker (dal 2021) per blocco atrio-ventricolare sintomatico per astenia e pre-sincope. Pochi mesi dopo, per riscontro di fibrillazione atriale parossistica avviava terapia anticoagulante orale (CHA2DS2-VASc score 4).

All'ultimo ecocardio-transtoracico (tt) veniva diagnosticata una cardiopatia ipertensiva con preservata cinetica ventricolare.

Work-up iniziale: All'obiettività, dolorabilità addominale in paziente con globuli bianchi 5080/uL, PCR 88,5 mg/L.

Veniva quindi sottoposta a radiografia addominale, con riscontro di distensione delle anse ilieali. Alla successiva ecografia addominale veniva rilevata diverticolosi intestinale.

Seguiva pertanto Tc addome. Alla luce delle immagini documentanti la presenza di una piccola lesione ischemica (3mm) a livello splenico è stato ipotizzata una genesi emboligena della lesione stessa a partenza

da un possibile focolaio endocarditico. A supporto di tale ipotesi, venivano prelevati campioni per le indagini emocolturali, risultate positive per colonizzazione batterica.

Diagnosi e gestione: Al fine di avvalorare il sospetto diagnostico, la paziente veniva sottoposta ad ecocardio-tt che permetteva di descrivere lesioni fortemente sospette per processo endocarditico a carico di due valvole: aortica e mitrale.

Seguiva ecocardio-transesofageo (te) che confermava il sospetto di endocardite, aggiungendo dettagli circa le complicanze collegate a tale processo, ovvero la presenza di un ascesso con evoluzione aneurismatica a livello della giunzione mitro-aortica.

La paziente veniva quindi trasferita presso l'unità di cardiocirurgia, al fine di sottoporsi ad intervento urgente di rimozione della lesione.

Follow-up: La paziente è deceduta durante l'intervento cardiocirurgico di rimozione della lesione endocarditica.

Conclusioni: L'endocardite infettiva è una patologia subdola che spesso si manifesta con sintomi blandi che ne determinano una mancata diagnosi tempestiva. Risulta fondamentale aumentare la consapevolezza a livello della popolazione (nonché dei medici) relativa

a presentazione e complicanze correlate, così da ridurre quanto più la latenza tra infezione e diagnosi e permettere l'avvio tempestivo di terapie target che possano prevenire lo sviluppo di complicanze che possono anche portare alla morte.

Risulta di fondamentale importanza il supporto di un adeguato team endocardite nella gestione di pazienti tanto complessi e delicati.



VALVULOPATIE 81

PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE) CARDIOPATIA ISCHEMICA CRONICA (CARDIOPATIA ISCHEMICA) COMPLICANZE DELLE PROCEDURE DI INTERVENTISTICA (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

TAVI TROUBLES UNFOLDED: MANAGEMENT OF A TRICKY SELF-EXPANDABLE BIO-PROSTHESIS DEPLOYMENT

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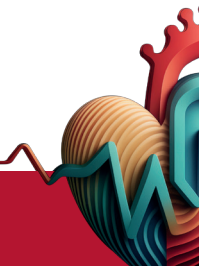
(b) CARDIOLOGIA, DIPARTIMENTO CARDIO-TORACO-VASCOLARE (DICATOV); IRCCS OSPEDALE POLICLINICO SAN MARTINO, GENOVA, ITALIA

Infolding during transcatheter aortic valve implantation (TAVI) is a rare occurrence, specific to self-expandable prothesis. Usually related to high native-valve calcium burden and larger bio-prothesis, it can have significant clinical impact and its management must be carefully planned. We present the case of a 70-years-old man with recent left main (LM) – left anterior descending (LAD) – circumflex (CFx) percutaneous coronary intervention (PCI) and stenting [T and small protrusion (TAP) technique], who also had a severe aortic stenosis treated with TAVI, complicated by bio-prothesis infolding during deployment. Valve disease management was deemed urgent after the patient experienced a resuscitated cardiac arrest in a non-shockable rhythm, angiographic evaluation was performed and showed a great result of the recent LM-LAD-CFx PCI. Despite being relatively young, a transcatheter approach was chosen for this patient due to his previous thoracic radiotherapy (RT) exposure for a Hodgkin Linfoma, the recent and extensive coronary stenting involving the LM bifurcation requiring DAPT, and patient's preference. After pre-procedural cardiac CT evaluation, a balloon-expandable valve (BEV) was excluded because significant calcification extended from the sinotubular junction (SJT), through the aortic valve, and down to the left ventricle outflow tract (LVOT) making safe deployment impossible. An Evolut PRO PLUS 34 mm was selected for this patient. The procedure was performed through a right femoral

arterial access (16 Fr, additional 5Fr secondary left femoral arterial access), pre-procedural fluoroscopic prothesis check showed no significant valve infolding in the delivery system. After a first partial deployment, the valve was recaptured and repositioned to then be fully deployed at the proper height; it was immediately evident that the valve was not correctly expanded. In this condition the bio-prothesis cannot work properly, leading to significant valve regurgitation and shortened valve life span. After repeated and ineffective post-dilation with a 25 x 40 mm balloon, the main options considered in the cathlab were to: purposefully embolize the valve to implant a new one; implant a BEV into the self-expanding valve (SEV); post-dilate with higher pressure/larger balloons. The cardiac CT images were reviewed and compared with the angiographic projections, revealing that the extended calcification, initially thought to be in the location of the infolded valve segment, was in fact on the opposite side. This made it not only feasible to more aggressively post-dilate the valve but even safer because the calcification would give support to the balloon pushing it against the infolded section. An additional 4ml of water-contrast media solution were added in the balloon allowing a proper SEV expansion and resolution of the infolding. The patient remained hemodynamically stable during the whole procedure but experienced complete atrioventricular block requiring permanent pacemaker implantation. Valve infolding is an alarming

complication, and transcatheter management can be challenging if not impossible. Cardiac TC plays a leading role in TAVI planning, but its importance extends beyond that. In this case, a thorough imaging review allowed a targeted and aggressive post-dilation

strategy, leading to a successful resolution of the infolding.



VALVULOPATIE 288
ENDOCARDITI (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)

ENDOCARDITE INFETTIVA DA S.INFANTARIUS SU VALVOLE NATIVE CON FISTOLIZZAZIONE DI PSEUDOANEURISMA PERIVALVOLARE AORTICO E DI ANEURISMA MICOTICO DEL LEMBO POSTERIORE/ ANELLO MITRALICO TRATTATA CON DOPPIA SOSTITUZIONE VALVOLARE

Elia Capicchioni (a), Samuela Carigi (b), Silvia Amati (b), Fabio Zucchetta (c), Filippo Ottani (b)
 (a) AZIENDA OSPEDALIERO-UNIVERSITARIA DI FERRARA; (b) UNITÀ OPERATIVA DI CARDIOLOGIA, OSPEDALE INFIRMI DI RIMINI, AUSL ROMAGNA; (c) MARIA CECILIA HOSPITAL, DEPARTMENT OF CARDIAC SURGERY, GVM CARE&RESEARCH, COTIGNOLA (RA), ITALY

L'endocardite infettiva, una patologia considerata di raro riscontro, ha visto cambiare nel tempo la sua epidemiologia passando da giovani pazienti con febbre reumatica a pazienti anziani con multicomorbidità. L'aumento della frequenza di utilizzo dell'antibiotico-terapia nella pratica clinica e la conseguente antibiotico-resistenza ha favorito il proliferare di germi atipici e/o miceti e ad un aumentato ricorso alla cardiocirurgia. Tra questi vi è il complesso Streptococco Bovis/Streptococco Equinus (SBSEC) che comprende diverse specie che abitano il tratto gastro-intestinale tra cui lo S. Infantarius. Viene presentato il caso di un paziente di 75 anni con molteplici fattori di rischio cardiovascolare (ipertensione arteriosa, diabete mellito ed obesità) e una pregressa infezione da COVID19. Dopo essersi recato dal proprio medico curante per dispnea da sforzo insorta da qualche mese, il paziente veniva ricoverato presso il reparto di medicina interna con diagnosi di scompenso cardiaco. Durante il ricovero, a seguito dell'insorgenza di febbre, venivano eseguite emocolture con riscontro di positività per lo S. Infantarius per cui veniva somministrata terapia antibiotica con ceftriaxone ed eseguito un ecocardiogramma transtoracico che tuttavia non risultava diagnostico per la scarsa finestra acustica del paziente. Dopo circa una settimana, data la non responsività al trattamento diuretico somministrato e il riscontro alla ripetizione dell'ecocardiogramma di un'insufficienza aortica severa, il paziente veniva trasferito presso l'UTIC

di Rimini dove veniva incrementata la terapia per lo scompenso e veniva fornito supporto respiratorio. Si eseguiva quindi un'ecocardiogramma transesofageo che mostrava due formazioni ipoecogene sessili della valvola aortica compatibili con vegetazioni (una a livello dell'LVOT della cuspidi non coronarica e l'altra a livello della cuspidi sinistra) con insufficienza aortica severa caratterizzata da multipli jet ed era inoltre presente un pseudoaneurisma perivalvolare aortico con fistolizzazione verso il ventricolo sinistro e un aneurisma micotico del lembo posteriore/anello mitralico con fistolizzazione verso l'atrio sinistro associato ad insufficienza valvolare mitralica moderata. Alla luce del referto di tale esame veniva allertato l'Endocarditis Team dell'ospedale e il cardiocirurgo di riferimento con indicazione a intervento cardiocirurgico d'urgenza. Il giorno successivo il paziente è stato sottoposto a intervento di sostituzione valvolare mitralica con bioprotesi Medtronic Hancock 25, sostituzione valvolare aortica con bioprotesi Hancock 23 ed esclusione di ascessi detersi a livello aortico e mitralico. L'esame colturale di sala è in seguito risultato negativo per la crescita di microrganismi. La successiva degenza è decorsa in assenza di complicanze. Al termine del trattamento antibiotico della durata di quattro settimane, l'ecocardiogramma transesofageo post-operatorio mostrava l'assenza di nuove immagini riferibili a vegetazioni ed una sola lieve riduzione della funzione sistolica di pompa. In conclusione, il paziente

presentava un quadro di scompenso cardiaco refrattario a terapia medica a seguito dell'alterazione anatomico-funzionale della struttura cardiaca causata dal proliferare di un germe atipico (*S. Infantarius*) in doppia sede valvolare. Tale condizione risulta rara: nel registro EURO-ENDO solo il 18.2% dei pazienti presentava l'infezione contemporanea di due o più valvole, mentre

la presenza di ascessi o pseudoaneurismi si fermava al 13.9%. Il tempestivo intervento cardiocirurgico di bonifica del sito di infezione con doppia sostituzione valvolare (aortica e mitrale) con protesi biologica, come descritto in letteratura, ha considerevolmente migliorato la prognosi del paziente.



VALVULOPATIE 472
PATOLOGIA DELLA VALVOLA TRICUSPIDE (VALVULOPATIE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)

SEVERE TRICUSPID REGURGITATION POST-CHEST TRAUMA: IMPORTANCE OF DETAILED MEDICAL HISTORY AND ECHOCARDIOGRAPHIC EVALUATION

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 CARDIOVASCOLARE - AZIENDA OSPEDALIERA “SAN CARLO” - POTENZA

Background: Tricuspid regurgitation (TR) is characterized by the backward flow of blood from the right ventricle to the right atrium through the tricuspid valve, typically occurring during systole. TR is a relatively common condition in adults and can be classified as primary, involving intrinsic structural changes in the tricuspid valve leaflets, or secondary, arising from deformation of the tricuspid valve apparatus without structural abnormalities. This case is unique due to the identification of severe tricuspid regurgitation stemming from a previously unreported chest trauma

incident. It underscores the significance of detailed medical history in diagnosing valvular heart conditions.

Case presentation: This case report details a 62-year-old patient who presented with right atrial and ventricular dilation and tricuspid valve regurgitation detected during a routine check-up. Echocardiographic evaluation, including transthoracic and transesophageal echocardiography, revealed severe TR with a prolapsed posterior leaflet and significant annular dilation. Despite no initial history of trauma, a detailed medical history later uncovered a chest trauma incident from a car accident a year prior, suggesting myxomatous degeneration of the valve.

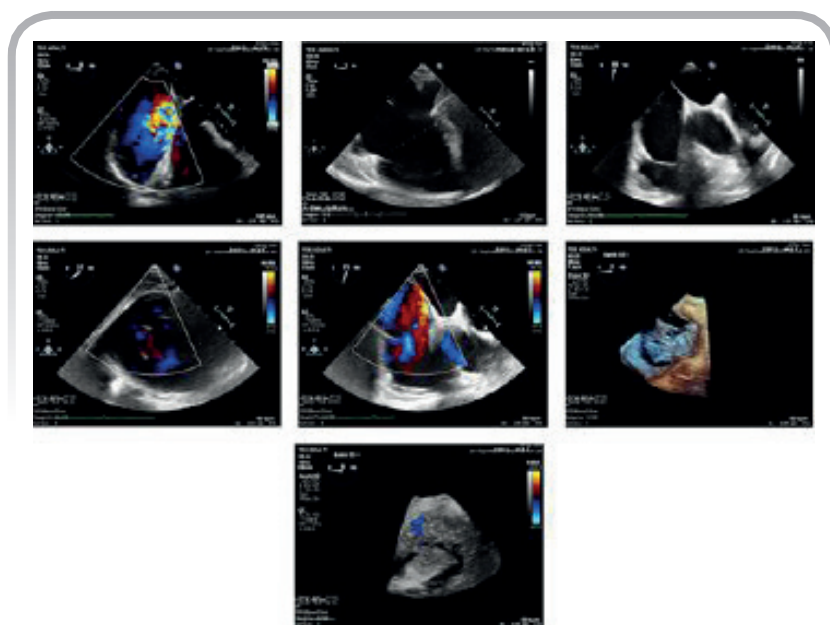


Figure 1

Conclusions: The patient’s case highlights the importance of a multiparametric approach to accurately assess TR severity and the potential for underestimating its clinical impact. Severe TR can lead to progressive right ventricular dilation and dysfunction, contributing to a cycle of worsening regurgitation and adverse outcomes. The case underscores the need for thorough patient history and echocardiographic evaluation, particularly following significant chest trauma, to ensure timely intervention and prevent severe complications.

VALVULOPATIE 639
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA,
CORONARICA E STRUTTURALE)
FISIOPATOLOGIA E CLASSIFICAZIONE (SCOMPENSO CARDIACO)

MITRACLIP E PASCAL: IL RUOLO DELL'INFERMIERE IN EMODINAMICA

Emanuele Marchione (a)
(a) *POLICLINICO UMBERTO I*

L'insufficienza mitralica è una patologia molto frequente che può verificarsi a qualsiasi età. Dopo la **stenosi aortica**, la **insufficienza mitralica** è la seconda più frequente patologia valvolare riscontrata nei Paesi occidentali, rappresentando, secondo recenti stime europee, circa un terzo dei vizi valvolari acquisiti che interessano le cavità sinistre del cuore. Si sta affermando sempre più la riparazione della

mitrale per via percutanea, un contesto che apre un ventaglio di possibilità a livello di dispositivi e competenze: i più comuni sono Mitraclip e Pascal, la cui gestione può essere sostenuta anche da un infermiere di emodinamica. Si propone quindi una revisione della letteratura e vari esempi di montaggio/gestione dei sistemi di rilascio Mitraclip/Pascal.



VALVULOPATIE 604
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)
PREVENZIONE CARDIOVASCOLARE: INTERVENTI E RISULTATI
(PREVENZIONE E RIABILITAZIONE)

THE PREVASC STUDY: PROSPECTIVE REGISTRY OF EPIDEMIOLOGY OF VALVE DISEASE IN ASYMPTOMATIC ITALIAN ELDERLY SUBJECTS

Nazario Carrabba (a), Mattia Alexis Amico (a), Matteo Vannini (a), Busi Gherardo (a), Salvatore Fortunato (b), Luciano Arcari (b), Emilio Di Lorenzo (c), Giampaolo Luzi (d), Francesco Clemenza (e), Francesco Amico (f), Giuseppe Pes (g), Marco Merlo (h, i), Gianfranco Sinagra (h, i), Giovanbattista Desideri (j), Francesco Vetta (k), Alessandro Mugelli (l), Niccolo Marchionni (l), Alessandro Boccanelli (m)

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Aims: Valvular heart disease (VHD) is the third most common cause of cardiovascular morbidity, and its incidence and impact on public health is expected to rise substantially. This study explores an unconventional perspective of VHD epidemiology focusing on elderly subjects living in rural areas, emphasizing this evolving landscape.

Methods: We conducted a multicenter, observational, cross-sectional study, enrolling subjects without a previous history of VHD, aged ≥ 65 y and living in 10 small villages in Italy. Subjects were divided into three groups according to age (65-69y; 70-74y; ≥ 75 y) and underwent a comprehensive evaluation including a Quality of Life questionnaire (QoL) and ESC guidelines-driven echocardiography assessment focusing on presence and grading of VHD between the groups.

Results: Among 1113 subjects, the prevalence and the severity of VHD increased with age ($p > 0.0001$).

The most common cause was degenerative. Notably, 94% of subject ≥ 75 y had at least one valvular defect, with 22.5% exhibiting moderate or severe valvulopathy and high prevalence of moderate or severe aortic valve stenosis and mitral regurgitation (4.8% and 7.5%, respectively). Right-sided valvulopathies mirrored similar trends (71.9% of the elderly). The results of the QoL showed a good perceived health status (mean 77 ± 16).

Conclusions: This study's rural perspective challenges urban biases, exploring a less medicalized environment where early medical contact is less common. The observed correlation between age and presence and severity of VHD underscores the need for a reassessment of the public health importance of VHD, highlighting the necessity for focused awareness campaigns, preventive measures, and intervention efforts, especially among aging populations.

VALVULOPATIE 308

PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE)

VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE (IMAGING CARDIOVASCOLARE)

ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING CARDIOVASCOLARE)

INTERVENTISTICA STRUTTURALE (CARDIOLOGIA INTERVENTISTICA, CORONARICA E STRUTTURALE)

CLIP MITRALICHE IN ANATOMIE VALVOLARI COMPLESSE: UN CASE REPORT

Rosi Vrenozaj (a), Giampaolo Niccoli (a), Sergio Suma (a)
(a) UNIVERSITÀ DEGLI STUDI DI PARMA

Presentazione del paziente: Trattasi di una paziente di 83 anni ipertesa con nota fibrillazione atriale. Nel 2022, la paziente si è sottoposta a ecocardiogramma trans-toracico (tt), il quale rivelava malattia di Barlow con prolasso bilembo condizionante un rigurgito moderato-severo. Da allora, sottoposta a regolari follow-up per la valvulopatia fino al gennaio 2024, quando è stata ricoverata presso il nostro reparto per scompenso cardiaco. All'obiettività, crepitii bibasali e murmure sistolico.

Work-up iniziale: In sede di ricovero veniva sottoposta ad ECG documentante fibrillazione atriale a rapida risposta ventricolare, tuttavia, al monitoraggio telemetrico risultavano episodi bradicardici che permettevano di diagnosticare una sindrome braditachi.

Inoltre, veniva sottoposta a ecocardiogramma-tt che documentava cinetica biventricolare preservata, severa dilatazione biatriale e i noti aspetti mitralici contestuali a malattia di Barlow; tuttavia, l'entità del rigurgito risultava aumentata (insufficienza mitralica severa) secondariamente a rottura cordale.

Seguiva quindi ecocardiogramma trans-esofageo (te), con riscontro di rigurgito severo a doppio jet (il primo per flail di P2, il secondo per prolasso bilembo a livello di A2-P2).

A completamento diagnostico, la paziente veniva

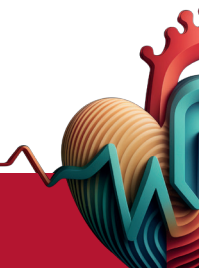
sottoposta a coronarografia, che escludeva malattia coronarica di rilievo.

Diagnosi e gestione: La paziente veniva prima di tutto sottoposta a impianto di pace-maker bicamerale, in modo da permettere la gestione della condizione aritmica anche previa titolazione della terapia beta-bloccante.

Relativamente alla gestione della valvulopatia, previa discussione in sede di Heart-Team, si propendeva per riparazione percutanea previo posizionamento di clips a livello della valvola mitralica. Questa scelta derivava dal ponderare sintomatologia e severità del vizio valvolare in paziente ad elevato rischio operatorio e assenza di futilità.

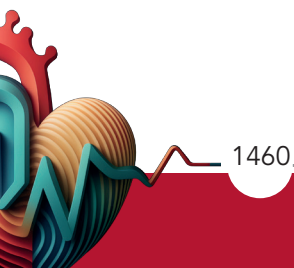
La complessità dell'anatomia valvolare ha portato a posizionare ben due clips in sede di A2 e P2: una in sede laterale, la seconda (di minori dimensioni) in sede mediale. A fine procedura residuava un rigurgito lieve conseguente alla creazione di tre orifici con Gradiente anterogrado di entità borderline tra lieve e moderata (4-5 mmHg).

Follow up: Ai controlli successivi la paziente si è mantenuta asintomatica per dispnea. All'ecocardiogramma, stabili i reperti a carico della valvola mitrale descritti a fine procedura.



Conclusioni: Nei pazienti con insufficienza mitralica primaria severa ad elevato rischio chirurgico, la riparazione percutanea trova il suo spazio come strategia correttiva atta al miglioramento dei sintomi.

Ad oggi, grazie all'avanzamento delle tecniche procedurali nonché dell'imaging peri e intra è possibile estendere l'applicabilità di tale opzione al fine di correggere anche le anatomie più complesse.



VALVULOPATIE 312
PATOLOGIA DELLA VALVOLA AORTICA (VALVULOPATIE)
PATOLOGIA DELL' AORTA (MALATTIE DEI VASI)
VALUTAZIONE ECOCARDIOGRAFICA DELLE VALVOLE CARDIACHE
(IMAGING CARDIOVASCOLARE)
ECOCARDIOGRAFIA TRANS-ESOFAGEO (ETE) (IMAGING
CARDIOVASCOLARE)

ANEURISMA DI CUSPIDE AORTICA: UN CASE REPORT

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Presentazione del paziente: Trattasi di un uomo di 42 anni senza fattori di rischio cardiovascolare noti. In anamnesi, una nota dilatazione della radice aortica in follow-up (all'ultima Tc aorta, diametro 54mm)

Work-up iniziale: Nel Maggio 2024, in corso di visita cardiologica di routine, riferiva dispnea da sforzo. All'obiettività cardiaca, un soffio diastolico 3/6L sul focolaio aortico. All'ECG: ritmo sinusale a 80 bpm, ritardo di conduzione destro e emblocco anteriore sinistro.

Diagnosi e gestione: Veniva quindi sottoposto ad ecocardio-transtoracico, con evidenza di dilatazione della radice aortica (54 mm) conseguente ad aneurisma della cuspidi coronarica destra, con conseguente insufficienza aortica almeno moderata. Nella norma i reperti relativi a cinetica e funzione biventricolare e il restante apparato valvolare. Seguiva pertanto approfondimento mediante ecocardio-transesofageo (te) che confermava l'aneurisma della cuspidi destra e quantificava l'insufficienza come moderato-severa (EROA 0.24

cmq); inoltre, il diametro della radice aortica veniva rimisurato risultando pari a 55mm.

Il caso veniva quindi discusso in sede di Heart Team, con indicazione a correzione chirurgica previa ripetizione di Angio-Tc torace.

Follow-up: Il paziente è stato sottoposto alla nova Angio Tc richiesta, che confermava l'indicazione chirurgica. È ora in attesa di intervento.

Conclusioni: Uno stretto follow-up in pazienti giovani con dilatazione aortica risulta fondamentale al fine di individuare e correggere modifiche morfologiche prima che possano determinare un peggioramento clinico anche drammatico.

L'ecocardiogramma (sia transtoracico che transesofageo) risulta imprescindibile per oggettivare caratteristiche e gravità di un determinato problema anatomico, favorendo la scelta della migliore strategia terapeutica.



VALVULOPATIE 674

RISONANZA MAGNETICA CARDIOVASCOLARE (CMR) (IMAGING CARDIOVASCOLARE)

PATOLOGIA DELLA VALVOLA MITRALE (VALVULOPATIE) ARITMIE VENTRICOLARI (ARITMIE)

IL PROLASSO VALVOLARE MITRALICO ARITMOGENO: PREDITTORI ELETTROCARDIOGRAFICI DI CICATRICE VENTRICOLARE SINISTRA

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Introduzione: Il prolasso valvolare mitralico (PVM) è una patologia valvolare molto diffusa ed a prognosi generalmente favorevole. L'evento più temibile nella storia clinica è comunque la morte cardiaca improvvisa che ha un'incidenza molto bassa, ma non trascurabile. Negli anni recenti è stato osservato che la presenza di cicatrici non ischemiche nel ventricolo sinistro (CNIVS) costituiscono un fattore predittivo di arresto cardiaco in pazienti con prolasso valvolare mitralico. La risonanza magnetica cardiaca (RMC) è uno strumento molto efficace per rilevare aree cicatriziali, ma dati anche gli elevati costi non è applicabile su larga scala soprattutto in percorsi di screening. Alcune anomalie elettrocardiografiche potrebbero correlarsi alla presenza di scar ventricolare sinistra in pazienti con PVM anche se le evidenze in letteratura sono molto scarse.

Scopo dello studio: confrontare parametri elettrocardiografici in due gruppi di pazienti affetti da PVM con o senza evidenza di CNIVS alla RMC.

Metodi e risultati: 32 pazienti (età mediana 52 anni; range 27-74 anni; 17 maschi) con PVM ed evidenza di aritmie ventricolari all'Holter ECG 24 ore sono stati inclusi nello studio. Tutti i pazienti sono stati sottoposti a valutazione clinica, ECG 12 derivazioni,

ecocardiogramma CD, test da sforzo, ECG Holter 24 ore e RMC. Sulla base della RMC sono stati identificati 2 gruppi di pazienti: 15 pz con CNIVS e 17 senza CNIVS. I due gruppi sono risultati essere sovrapponibili per età e sesso. Alcune variabili ECG sono state confrontate tra i due gruppi: ritmo, frequenza, PR, asse del QRS, disturbi di conduzione intraventricolare, onde Q patologiche, bassi voltaggi del QRS nelle periferiche, scarsa progressione onda R nelle precordiali; T negative inferiori o anterolaterali o nelle precordiali destre. Anomalie definite sulla base di un nostro recente lavoro (Sciarra L, et al. Eur J Prev Cardiol. 2024;31:486-495). La presenza di bassi voltaggi del QRS è stata rilevata nel 73% dei pz con CNIVS e in nessun paziente del gruppo senza CNIVS ($p < 0.0001$). Un emblocco anteriore sinistro era presente nel 33% dei pz con CNIVS ed in nessuno del gruppo senza CNIVS ($p = 0.015$). Gli altri parametri ECG non risultavano differire significativamente tra i due gruppi.

Conclusioni: un'attenta lettura dell'ECG di superficie in pazienti con PVM sembra avere un ruolo promettente nel porre il sospetto di CNIVS. Questo potrebbe essere estremamente utile anche per selezionare i pazienti da inviare a metodiche più complesse e costose come la RMC.

