20° CONGRESSO NAZIONALE AIAC

ARITMOLOGIA TRASLAZIONALE: DALLA GENETICA ALLA DIAGNOSI E TRATTAMENTO DELLE ARITMIE

ABSTRACT BOOK

Bologna
18-20 settembre 2024
Bologna Congress Center

AIAC
Associazione Italiana Aritmologia e Cardiostimolazione

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INDICE

HIGHLIGHTS

HIGHLIGHTS - DEVICE IMPIANTABILI

VENERDI' 20 SETTEMBRE

SALA ITALIA

12:00-13:00

HIGHLIGHTS
DEVICE IMPIANTABILI

Moderatori: Vittorio Aspromonte (Catanzaro), Antonio Ruocco (Napoli)

HL.01.01
FIRST EUROPEAN EXPERIENCE OF TLE FACILITATED BY SHOCKWAVE INTRAVASCULAR LITHOTRIPSY: A JOINT PROCEDURE OF EPS AND INTERVENTIONAL CARDIOLOGISTS

Giulia Nardi, Luca Checchi, Alessio Mattesini, Giuseppe Ricciardi, Laura Perrotta, Mira Stolcova, Francesco Meucci, Carlo Di Mario, Paolo Pieragnoli
AOU Careggi, Firenze, ITALY

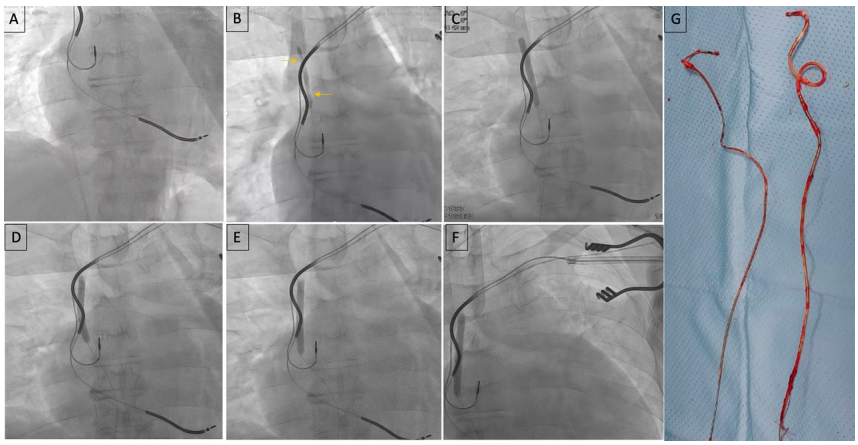
Background: Cardiovascular Implantable Electronic Device (CIED) infection is a common indication for CIED lead extraction (TLE). However, the TLE procedure is still challenging with high complication risk due to several factors. In particular, a long dwelling time is usually associated with the presence of dense fibrosis and calcifications encasing the pacing leads, thus increasing the complexity and the risk of TLE. Great improvements in TLE techniques have occurred in recent years with the development of new advanced tools and devices. The Shockwave intravascular lithotripsy (IVL) system is a balloon-based technology recently introduced to treat severe coronary and peripheral calcification with high procedural success and very low rates of vascular complications. The data of its role in TLE are scarses.

Purpose: To assess feasibility and efficacy of Shockwave IVL pretreatment during extraction of long dwell time pacemaker and defibrillator leads.

Methods: Data were obtained from consecutive patients undergoing TLE with IVL pre-treatment at our centre, from July 2023 and April 2024. TLE was performed in a hybrid surgical operating room under GA with immediate surgical assistance available. A temporary transvenous pacing through femoral vein was placed. The pocket site was conventionally prepared and the device disconnected. All leads were then prepared using lead locking stylets. After initial assessment, due to extensive adhesions and calcifications IVL pre-treatment was performed through a 7Fvenous femoral sheath advancing a 8.0 x 60 mm M5 plus lithotripsy balloon to the SVC over a BMW 0.014 inch guidewire supported by a Terumo multi-purpose catheter. The system was then advanced to the axillary vein and positioned adjacent to the leads. Once the balloon location was confirmed optimal, it was inflated up to 4 atm and a series of 150 pulses delivered. After deflation, it was drawn down toward the SVC and another series of 150 pulses was delivered. Once in the SVC, the guiding sheath was used to help maintain adequate proximity of the balloon to the leads. Following IVL pretreatment, leads were extracted using mechanic dilator sheaths

Results: IVL pretreatment was performed in 4 patients (3M; mean age: 63 years) referred to our centre for TLE in CIED infection: 2 dual-chamber ICDs, 1 CRT-D device and 1 dual-chamber pacemaker for a total of 3 RA passive fixation leads, 1 RA active fixation lead, 2 dual coil passive fixation leads, 1 single coil active fixation ICD lead, 1 RV passive fixation lead, 1 CS lead. Dwell time was extremely long ranging between 10 and 24 years. TLE following IVL was successful in all cases, without any residuals. No complications occurred. Post-procedural echocardiography demonstrated no pericardial effusion with normal tricuspid valve function.

Conclusions: To the best of our knowledge, this is the first European experience of challenging transvenous lead extractions facilitated by IVL to fracture calcified tissue around pacing leads. In presence of long dwell time leads with dense calcifications, IVL may represent a safe and adjunctive measure to ease TLE, reducing procedural complexity, times and complications.



HL.01.02

IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR THERAPY IN BRUGADA SYNDROME: A 30-YEAR SINGLE-CENTER EXPERIENCE

Cinzia Monaco, Maria Cespon, Alvise Del Monte, Luigi Pannone, Domenico Della Rocca, Mark La Meir, Gian Battista Chierchia, Pedro Brugada, Carlo De Asmundis
HRMC UZ Brussel, Brussel, BELGIUM

Background: Brugada syndrome (BrS) continues to pose clinical complexities, even with three decades of dedicated research and therapeutic progress. The pivotal role of implantable cardioverter-defibrillator (ICD) therapy in safeguarding high-risk BrS patients from sudden cardiac death due to ventricular arrhythmias is undeniable. Yet, the discourse on risk stratification and the primary preventive role of ICDs remains open.

Objectives: The objective of this study was to investigate clinical features, management, and long-term follow-up of ICD therapy in patients with Brugada syndrome. Our thirty-years journey, collecting more than 300 patients treated with an ICD since the very first description of the syndrome to present, being the longest reported follow-up of BrS patients, reveals the inherent complexities of BrS management and underscores the crucial role of longitudinal data in shaping clinical practice.

Methods: BrS-diagnosed patients were prospectively registered into the UZ Brussel BrS cohort. Inclusion parameters included a Brugada type 1 ECG pattern, either spontaneous or drug induced, ICD implantation, and consistent follow-up at our center. We stratified risk based on previous arrhythmic events and utilized the multiparametric Brussel risk score since 2017. From 2016, high-risk patients underwent a video-thoracoscopic epicardial ablation. The ICD implantation methodology evolved over time, with decisions driven by patients' clinical and demographic characteristics.

Results: Between 1992 and 2022, 306 BrS patients received an ICD at our institution. Of these, 60.8% were male with an average age of 41.0 years-old. Genetic testing, conducted on 68.3% of the patients, identified SCN5A mutations in 28.7%. From the total cohort, 16% of the ICDs were implanted in secondary prevention and 83.9% in primary prevention. A higher proportion of patients were classified as high-risk in the first decades, although secondary prevention implantations and asymptomatic patient proportions remained stable. Over an average follow-up of 113.7 months, 23.9% of the patients experienced ventricular arrhythmias (VAs) after ICD implantation, and 15.4% of the patients experienced at least one inappropriate ICD shock. Patients with secondary prevention ICDs showed a higher VA incidence than those with primary. Older age and male gender were associated with an increased all VAs incidence. Among high-risk patients, those who underwent thoracoscopic epicardial ablation showed significantly fewer VAs than those who didn't. Mortality rate was 5.88%, with cardiac reasons accounting for 22.2% of these deaths. Over the 30 years, 2 patients underwent heart transplantation.

Conclusion: This research delineates the evolution of ICD implantation approaches in Brugada patients across thirty years, underlining shifting strategies and resultant outcomes. The findings accentuate the enduring challenges and emerging solutions in BrS management, providing a comprehensive overview that can inform and optimize future patient care.

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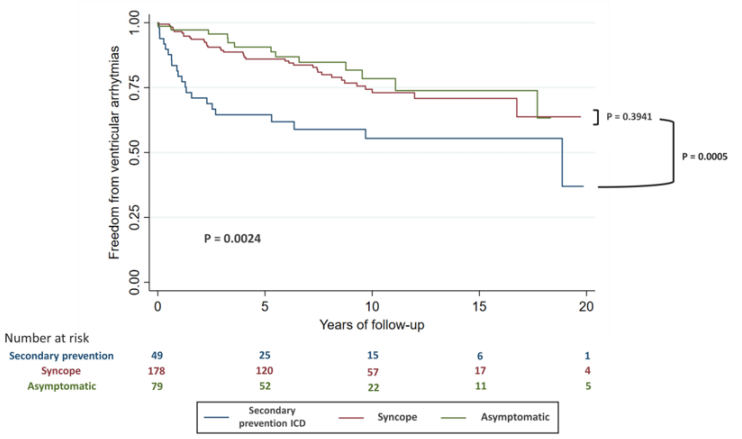

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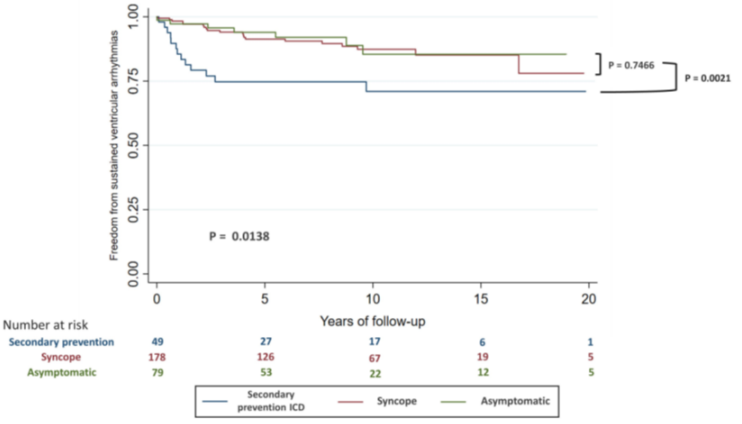

HL.01.03

ANTITHROMBOTIC THERAPY, POCKET HEMATOMA AND INFECTIVE COMPLICATIONS IN PATIENTS UNDERGOING CIED SURGERY: LONG TERM FOLLOW-UP DATA FROM HEMATOMA NO MORE STUDY

Mirco Lazzeri [1], Mauro Biffi [1], Valerio Zaca' [2], Amato Santoro [2], Matteo Bertini [3], Maurizio Mazzetti [4], Matteo Iori [5], Pasquale Notarstefano [6]
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Background: the number of cardiac implantable electronic devices (CIEDs) implants and replacements keep on growing worldwide; the undoubted benefits of these devices are in part offset by implant-related complications like pocket hematoma, a well-known cause of prolonged hospitalization and infective complication. The aging of population brings to such interventions patients with comorbidities that often require antithrombotic therapy, with not negligible bleeding risk.

Purpose: to assess the rate of pocket hematoma and their correlation with infective complications in patients undergoing CIED surgery in a real-world setting.

Methods: HEMATOMA NO MORE was an observational, prospective, multicenter, cohort study designed to enroll patients operated in 6 Italian centers with standard indications to CIED implantations/replacements; patients included were taking no antithrombotic therapy (control group), single antiplatelet therapy (SAPT), dual antiplatelet therapy (DAPT), oral anticoagulant therapy (OAT = warfarin or new oral anticoagulant (NOAC), combined therapy (SAPT+OAT, DAPT+OAT) or low molecular weight heparin (LMWH) as bridging therapy after temporary suspension of OAT. Long term follow-up data were achieved to correlate pocket bleeding and infective complication.

Results: the study included 1448 patients, mean age at time of procedure was 78±13 yrs. A total of 1059 (73%) patients received first CIED implantation, while the others underwent substitution (337, 23%) or upgrade (52, 4%) procedure. The control group counted 223 (15.4%) patients, 601 (41.5%) were on SAPT, 94 (6.5%) were on DAPT, 394 (27.2%) were on OAT, 76 were on combined therapy (63, 4.3% with SAPT + OAT; 13, 0.9% DAPT + OAT) and 60 (4.1%) were taking LMWH.
A clinically significant hematoma occurred in 32 (2.2%) patients. The incidence of pocket hematomas was significantly higher in patients taking DAPT, combined therapy (OAT + SAPT or OAT + DAPT) or LMHW when compared to patients in the control group ($p < 0.005$) (Table 1).
After a follow up of at least 3 years, CIED-related infection occurred in 8 patients (0.55%). Notably, 3 infections occurred in patients with pocket hematoma: 1 with NOAC (rivaroxaban) suspended 24 h before the procedure, 1 with SAPT (acetylsalicylic acid) and 1 with combined therapy, namely DAPT + NOAC (acetylsalicylic acid, clopidogrel and dabigatran suspended 48 h before the procedure), for a total of 9.4% infective complication in patients with previous wound bleeding. Only five patients without previous pocket hematoma had CIED-related infective complication (0.35%). The median time between CIED surgery and CIED related infections was 4 months. Seven infections occurred within 6 months of the related procedure, the other case developed the infection 20 months after the surgery. One patient died for septic complication related to CIED-infection, 6 months after the index procedure.

Conclusions: the overall incidence of CIED-related infective complications is low in our population, but the risk increase dramatically for patients who develop pocket hematoma: strategies personalized to reduce bleeding menace must be considered at the time of surgery to minimize the risk of adverse events, as most of infections occur early after the procedure.

	Total (n = 1448)	Control group (n = 223)	SAPT (n = 601)	DAPT (n = 94)	OAT (n = 394)	OAT+SAPT (n = 63)	OAT+DAPT (n = 13)	LMWH (n = 60)
Hematoma (n, %)	32, 2.2%	1, 0.4%	5, 0.8%	8, 8.5%	8, 2%	3, 4.7%	3, 23.1%	3, 5%

Table 1: Incidence of pocket hematomas in different patient groups.

HL.01.04

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

Francesco Vitali, Michele Malagù, Nicola Bianchi, Martina De Raffele, Federico Gibiino, Alberto Boccadoro, Giorgia Azzolini, Cristina Balla, Matteo Bertini
UO di Cardiologia, Università di Ferrara, Ferrara, ITALY

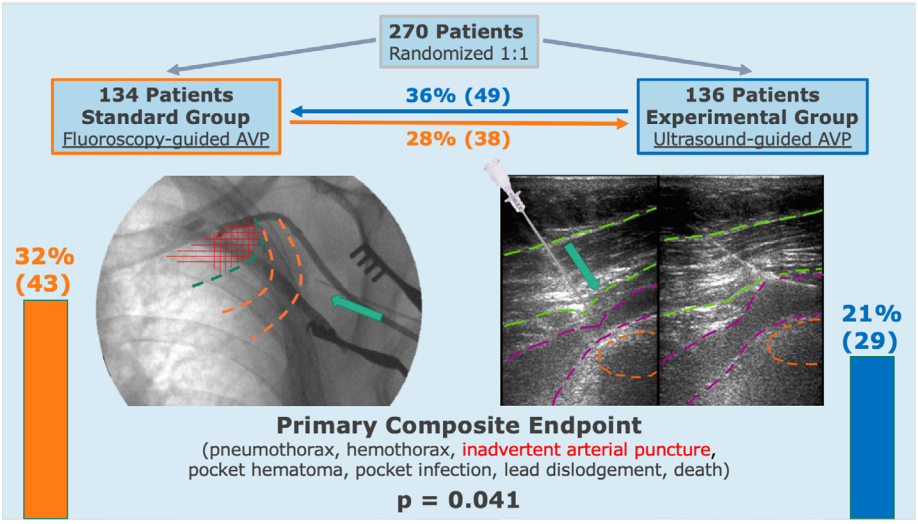
Background: Axillary vein puncture (AVP) and cephalic vein surgical cutdown are recommended in international guidelines because of their low risk of pneumothorax and chronic lead complications. Directly visualizing and puncturing the axillary vein under ultrasound guidance reduces radiation exposure, 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 The purpose of this study was to assess the efficacy and safety of ultrasound-guided axillary venous access during cardiac lead implantation for pacemakers (PMs) 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 2 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 groups. The median age of the patients was 81 years, with women comprising 41% of the population. The majority of patients received single- and dual-chamber PMs (87% vs 88%; P 1.00), and slightly over 10% in both groups received ICDs (13% vs 12%; P 0.85). In total, we placed 357 leads in PMs 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 used as a vascular access. The composite outcome was lower in the ultrasound group according to intention-to-treat analysis (OR: 0.57; 95% CI: 0.33-0.99; 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 (10,344 mGy cm2 vs 7,119 mGy cm2; P 0.002) while achieving the same rate of success at the first attempt (61% vs 69%; P 0.375).

Conclusions: Ultrasound-guided AVP is safer than the fluoroscopy-guided approach because 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.

Ultrasound Guided Axillary - Access vs Standard Fluoroscopic -Technique for Cardiac Lead Implantation



HL.01.05

LEADLESS PACEMAKER IMPLANTATION THROUGH THE INTERNAL JUGULAR VEIN: A CASE REPORT

Antonio Strangio [1], Francesco Cropanese [1], Domenico Le Pera [1], Lucia Ferrise [1], Gennaro Prestinice [1], Jessica Ielapi [2], Isabella Leo [2], Jolanda Sabatino [2], Salvatore De Rosa [3], Daniele Torella [2], Fabio Megna [1]

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[2] *Department of Experimental and Clinical Medicine, Magna Graecia University, Catanzaro, ITALY*

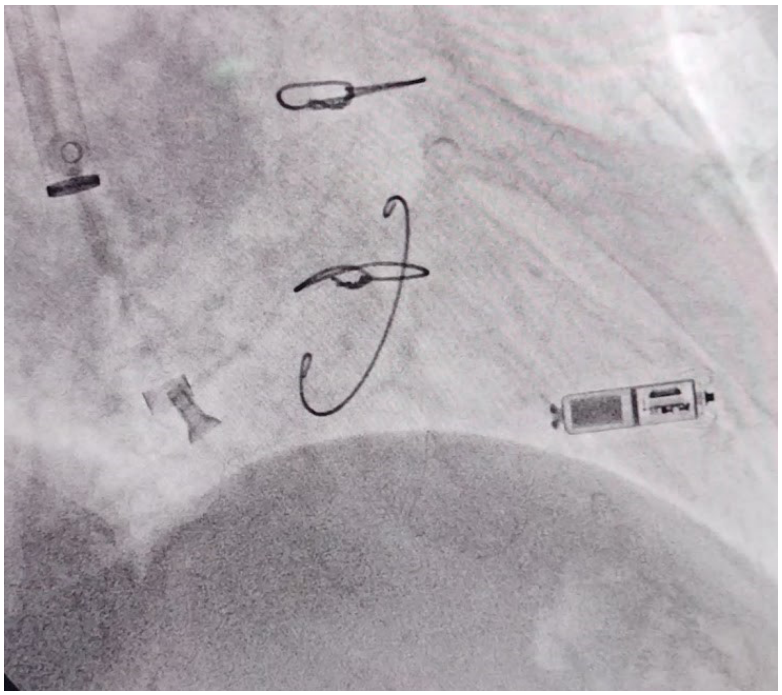
[3] *Department of Medical and Surgical Sciences, Magna Graecia University, Catanzaro, ITALY*

Introduction: Leadless pacemaker implantation (LPI) has fewer device complications and reduced chance of infection compared to transvenous pacemakers. For this type of intervention, the standard access is the femoral vein. However, the use of the internal jugular vein (IJV) is emerging as a novel possible alternative. We report rare a case of LPI through IJV.

Case description: an 84-year-old man was admitted to our hospital for recurrent syncope. He had a history of permanent atrial fibrillation (AF), type 2 diabetes (T2D), stage 4 chronic kidney disease (CKD), RBBB and previous ascending aorta replacement and mitral valvuloplasty. During ECG monitoring evidence of pathological pauses (>6 s). The patient was candidate for PM leadless implantation. Due to the finding of unfavourable femoral venous access bilaterally we decided to proceed via the right internal jugular vein (IJV). The vein access was obtained in ultrasound-guided way, then a 8-Fr sheath was placed in the right IJV, a stiff guide wire (Amplatz Super Stiff guide wire, Boston Scientific) was guided down into inferior vena cava (IVC), dilation of the entry site was performed using sequentially increasing diameter dilators (16 and 20 Fr). Under fluoroscopic guidance the introducer system (27 Fr) was advanced through the IJV and into the RA, after that the Micra delivery system was advanced through the introducer. The Micra VR device (Medtronic Inc., Minneapolis, Minnesota, USA) was advanced in the RA and then, after crossing the tricuspid valve, was implanted on the mid interventricular septum on the first attempt. Final electrical parameters were pacing threshold of 0.25 V @ 0.24 msec, ventricular sensing 6.2 mV, impedance 640 ohm.
The patient reported no pain or discomfort during the procedure and reaching the interventricular septum was easier for the operator. Immediate after the implantation the patient was able to walk.

Discussion: The use of IJV as access to perform a leadless PM implantation is generally considered as a bail-out strategy in patients in whom it is not possible to use the femoral veins. However, multiple case reports and an observational study in which 82 patients were implanted through the IJV showed multiple potential advantages of this novel approach for leadless pacing: absence of vascular complications, non-apical positioning of leadless PM becomes easier without having more deployment attempts, the possibility of walking right after the procedure reducing back pain and avoidance of deep venous thrombosis, same-day discharge could be possible.

Conclusion: The jugular approach seems to be as safe as the femoral approach and therefore could be considered an alternative implantation method for leadless pacing.



HIGHLIGHTS - ELETTROFISIOLOGIA

VENERDI' 20 SETTEMBRE

SALA BIANCA

12:00-13:00

HIGHLIGHTS
ELETTROFISIOLOGIA

Moderatori: Valentino Ducceschi (Napoli), Antonio Frontera (Milano)

HL.02.01
EFFICACY AND SAFETY OF ULTRASOUND GUIDED STELLATE GANGLION BLOCK BEYOND ELECTRICAL STORM: DEVELOPING NEW CLINICAL INDICATIONS

Arianna Morena [1], Filippo Angelini [2], Carol Gravinese [2], Simone Frea [2], Guglielmo Gallone [1], Giulia De Lio [2], Pier Paolo Bocchino [2], Paolo Boretto [2], Francesco Bruno [2], Stefano Pidello [2], Andrea Saglietto [2], Federico Ferraris [2], Davide Castagno [1], Mario Matta [2], Matteo Anselmino [1], Antonio Toscano [3], Anna Trompeo [3], Mauro Rinaldi [4], Gaetano Maria De Ferrari [1], Veronica Dusi [1]

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Background: Percutaneous stellate ganglion block (PSGB) is recommended by the latest European guidelines for patients with drug and ventricular tachycardia (VT) ablation refractory electrical storm (ES). Yet, due to the strong antiarrhythmic potential, combined with the good safety profile, we've recently used it for to the prophylaxis of ventricular arrhythmias (VAs) in high-risk patients and the prophylaxis/treatment of atrial arrhythmias in patients with acute heart failure (HF).

Purpose: to describe our single-center experience with PSGB usage outside the conventional indication of ES.

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

Results: 56 patients (87% male, mean age 64 ± 12 years) received a total of 91 PSGB performed with the lateral, ultrasound (US) guided technique. Most of the procedures consisted of a single bolus anesthetic injection of lidocaine plus ropivacaine, 27% in an additional continuous infusion, mainly with ropivacaine. All procedures except for 3 in a single patient who had previously received left cardiac sympathetic denervation, were performed on the left side. Most of the patients (61%) suffered ischemic cardiomyopathy (CMP), including 11 with an acute coronary syndrome; the rest had non-ischemic CMP. 63 PSGB (69%) were performed in patients with impending or manifested cardiogenic shock (SCAI classification B or more). Mean LVEF was 26 ± 13%. Most of the procedures (n=80, 88%) were performed due to ongoing refractory VAs, yet 6 (6%) aimed to prevent major VAs in high-risk patients, mostly in the setting of recent ES (within 1 month) and need for Levosimendan to support cardiac output, in one case due to recent stereotactic VT ablation, to prevent early VAs in the phase of acute radiation induced microvascular damage. All 6 were effective in preventing clinically significant VAs. Additionally, 5 single bolus PSGBs (5%) were performed due to atrial arrhythmias with high ventricular rate despite intravenous drugs in the setting of acute HF. Specifically, 3 patients had atrial fibrillation (AF), 1 patient runs of ectopic atrial tachycardia (AT) and 1 patient 2:1 atrial flutter. Left-sided PSGB significantly reduced (>=25% reduction) ventricular rate during AF and AT but not during the single case of 2:1 atrial flutter, in 2/3 AF cases a cardioversion into sinus rhythm occurred within 40 minutes from PSGB. Only 1 (1%) major complication occurred (respiratory arrest), that was quickly and effectively treated with lipid emulsion, while minor complications were observed in 11% of PSGBs (mostly transient left arm weakness).

Conclusions: Our data suggest that US-guided PSGB usage, thanks to its feasibility at bed-side and good safety profile, may expand, beyond ES, to not only VAs prevention in high-risk settings, but also to prophylaxis/treatment of atrial arrhythmias in critically ill patients with acute heart failure requiring concomitant inotropic support.

HL.02.02

IMPACT OF DIFFERENT DOSE REDUCTION CRITERIA ON DOSE ASSIGNMENT OF CURRENT DOACS AND RELATED OUTCOMES: AN ANALYSIS FROM 4-YEAR DATA OF THE ETNA-AF EUROPE PROGRAMME

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Background: Direct oral anticoagulants (DOACs) are the standard treatment for stroke prevention in patients with atrial fibrillation (AF). Several studies reported frequent use of non-recommended doses of DOACs associated with worse clinical outcomes, especially in frail patients. Notably the dose reduction criteria for each DOAC are different leading to the possibility that several patients could receive either a low-intensive regimen or a high-intensive regimen depending on which DOAC prescribed. Data from real-world studies, such as the edoxaban Treatment in routiNe clinical prActice (ETNA)-AF, may help assessing the size of this phenomenon and its impact on clinical outcomes.

Purpose: To evaluate the distribution of dose reduction criteria and explore associated outcomes in a large, unselected, real-world population using 4-year data from the ETNA-AF EU study.

Methods: The ETNA-AF EU is a prospective, observational, study to evaluate the safety and effectiveness of edoxaban in patients with AF from Europe. All the patients with available data regarding the dose reduction criteria as per European SmPC of the four currently available DOACs were enrolled. We excluded all subjects with a creatinine clearance <30 mL/min. Patients were subsequently classified by dose reduction criteria (i.e., full dose for all [FULL], reduced dose for all [REDUCED], full dose of one DOAC and reduced dose for another [INTERMEDIATE]).

Results: We included 12866 patients from the ETNA-AF Europe study. According to the SmPC dose reduction criteria, the percentage of patients eligible for dose reduction was highly heterogeneous across different DOACS: apixaban (5.7%), rivaroxaban (16.8%), edoxaban (23.8%) and dabigatran (52.9%). Among the 11003 assignable patients, 42.4% would receive a full dose for any DOAC, 5.1% would receive a low dose for any DOAC and the largest percentage, 52.5%, was in the INTERMEDIATE group ,that would receive either a full or reduce dose of DOAC depending on the selected agent. 65.2% of the patients included in the INTERMEDIATE group received a full dose of edoxaban, while 31, 0% received a low dose. Interestingly, the INTERMEDIATE group included the vast majority of patients known to be at risk of adverse events: very elderly (i.e., >/= 85 yrs; 76.5%), frail (73.3%), history of previous stroke (60.4%) or history of bleeding (61.3%). Clinical outcomes at four years were significantly worse in both the INTERMEDIATE and the REDUCED groups with respect to patients that would receive full dose of any DOAC, with the only exception of haemorrhagic stroke. In the INTERMEDIATE GROUP, patients who received a full dose had a better prognosis than that who received a low dose, in absence of differences in bleeding and ischaemic events (Table 1).

Conclusions: according to SmPC dose reduction criteria of currently available DOACs, the majority of patients could receive either a full or reduced dose depending on the agent chosen by the physician, who is more worried about the haemorrhagic than the ischaemic risk. This population is at increased risk of events (overall mortality, cardiovascular mortality, ischaemic stroke).

	Statistics	Edoxaban 60mg intermediate (N=3765)	Edoxaban 30mg intermediate (N=1790)
Overall Mortality	HR [95% CI]	1	1.82 [1.599; 2.063]
	p-value (vs. Edoxaban 60mg intermediate)	n.a.	<0.0001
CV Mortality	HR [95% CI]	1	1.63 [1.262; 2.114]
	p-value (vs. Edoxaban 60mg intermediate)	n.a.	0.0002
Major Bleedings	HR [95% CI]	1	1.03 [0.769; 1.378]
	p-value (vs. Edoxaban 60mg intermediate)	n.a.	0.8475
Major or CRNM Bleedings	HR [95% CI]	1	0.97 [0.769; 1.216]
	p-value (vs. Edoxaban 60mg intermediate)	n.a.	0.7738
Intracranial Hemorrhage (ICH)	HR [95% CI]	1	0.67 [0.332; 1.367]
	p-value (vs. Edoxaban 60mg intermediate)	n.a.	0.2742
Any stroke or SEE	HR [95% CI]	1	1.14 [0.813; 1.597]
	p-value (vs. Edoxaban 60mg intermediate)	n.a.	0.4474
Ischemic Stroke	HR [95% CI]	1	1.03 [0.695; 1.530]
	p-value (vs. Edoxaban 60mg intermediate)	n.a.	0.8795
Hemorrhagic Stroke	HR [95% CI]	1	0.86 [0.306; 2.405]
	p-value (vs. Edoxaban 60mg intermediate)	n.a.	0.7699
Permanent discontinuation of edoxaban**	HR [95% CI]	1	1.37 [1.231; 1.521]
	p-value (vs. Edoxaban 60mg intermediate)	n.a.	<0.0001

HL.02.03

TRANSCATHETER ABLATION OF ECTOPIC ATRIAL TACHYCARDIA DURING PREGNANCY: A SINGLE CENTER CASE SERIES EXPERIENCE

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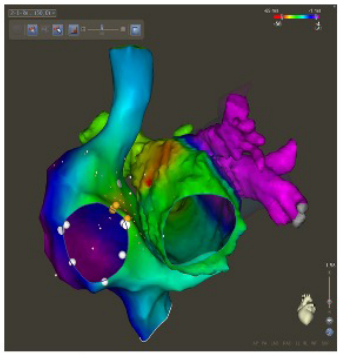
Background: Arrhythmias during pregnancy may be a first presentation or an exacerbation of a pre-existing cardiac condition, with potential impairment of maternal health and fetal development. The treatment of tachyarrhythmias during pregnancy is based on several factors, including the severity of symptoms, the frequency and duration of the arrhythmia, and the available treatment options, considering the effect on the developing fetus. In patients without history of previous tachyarrhythmias, persistent Ectopic Atrial Tachycardia (EAT) is a common presentation, which can negatively impact maternal and fetal health. Transcatheter ablation (TCA) of the arrhythmic substrate during pregnancy has been successfully performed in selected patients, limiting maternal and fetal radiation exposure using novel electroanatomic mapping (EAM) system. Nowadays, there are limited experience on the subject. We present a case series of 4 consecutive pregnant patients undergoing transcatheter EAT ablation in Cardinal Massaia Hospital Electrophisiology Laboratory (EP Lab), Asti, Italy.

Matherials and methods: During a 14 years EP Lab experience, 5 patients with tachyarrhythmias during pregnancy were referred to our center with indication to electrophysiologic study (EPS) and TCA. Of 5 patients, 4 patients presented with EAT with indication of TCA and 1 patient with right ventricular infundibular tachycardia. Clinical and procedural data of the patients were consecutively collected and analyzed in the present work.

Results: 4 patients with EAT were enrolled in the present case-series study. The first case was a 29-years old woman at 25th pregnancy week who referred to our center for incessant EAT at 160 bpm resistant to pharmacological therapy presenting sings of tachycardiomyopathy. EPS underlined the presence of EAT of left atrial anterior wall. TCA was successfully performed, with minimal use of fluoroscopy (41 seconds) for the transeptal puncture guidance. The second case was a 39-years old woman at 26th pregnancy week presenting persistent hemodynamically tolerated EAT at 180 bpm with initial signs of worsening cardiac function (EF 40%). EPS showed the origin from the right atrial crista terminalis medial portion; TCA was successfully performed without the use of fluoroscopy. The third case was a 29-years old woman at 26th gestation week with relapsing remittent EAT e initial signs of worsening cardiac function (EF 50%). EPS underlined the origin of the arrhythmia at the insertion area of the crista terminalis to the tricuspid anulus. TCA was successfully performed without the use of fluoroscopy. Finally, the fourth and last case was a 43-years old woman at 16th gestation week, with incessant high penetrance EAT, symptomatic for palpitations. EPS showed the origin in the right atrium in the inferior portion of the crista terminalis. TCA was successfully performed without the use of fluoroscopy. In all the cases, no relapses were recorded after the ablation

Conclusion: In persistent EAT during pregnancy, TCA is a safe and effective option in rhythm control, when performed in a high experience EP Lab. The use of EAM system allows to minimize the fluoroscopy exposure, especially in right atrial origin tachycardia, reducing the potential connected risks for the pregnant patient and the fetus.

CASE N.1



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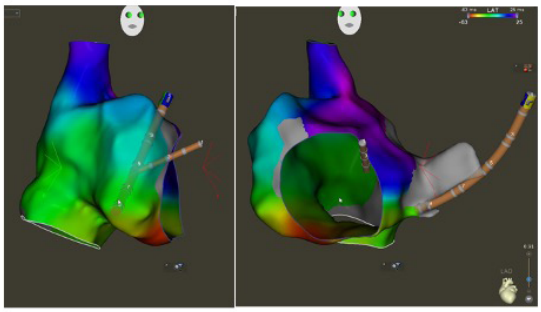

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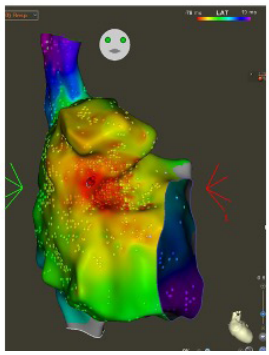

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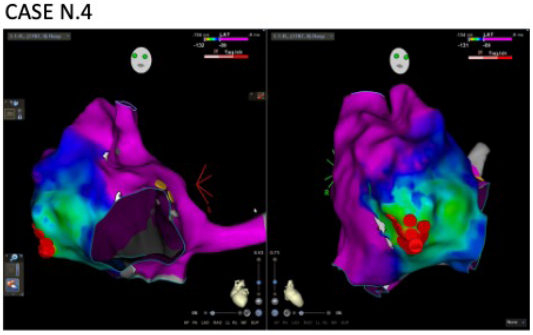

HL.02.04

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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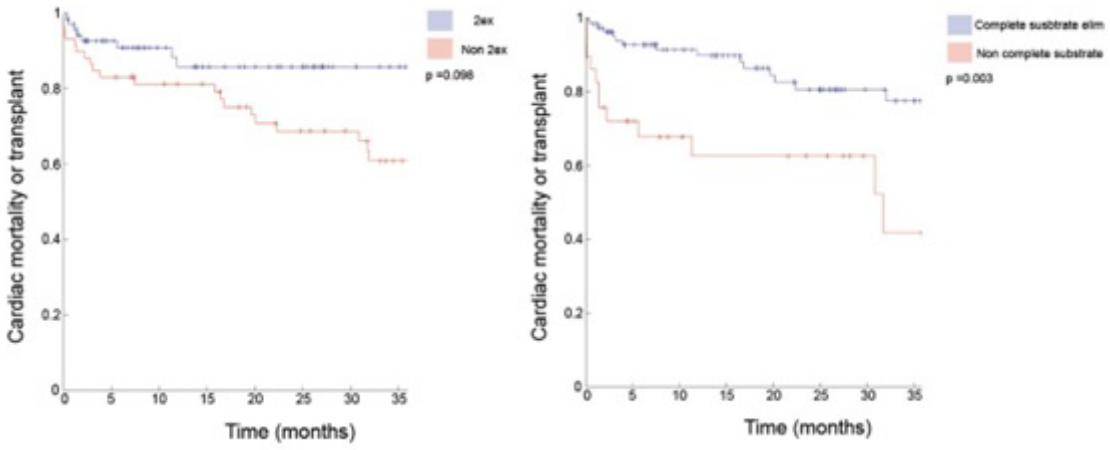
Aims: there is no consensus about the need for an implantable cardioverter-defibrillator (ICD) after catheter ablation of ventricular tachycardia (VT) in patients with preserved or slightly depressed left ventricular ejection fraction (LVEF). This study aims to investigate predictors of VT-free survival 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%. 65% of the cohort had ischemic heart disease, 9% had dilated cardiomyopathy, 3% had arrhythmogenic left ventricular cardiomyopathy, 4% had hypertrophic cardiomyopathy, 5% had hypertensive cardiomyopathy, and the remaining patients had other forms of structural heart disease involving the LV.
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 of 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. Incomplete procedural success and ablation failure were considered when a non-clinical sustained monomorphic VT and the clinical VT remained inducible after ablation, respectively. Induction of polymorphic VT or ventricular fibrillation was not considered clinically relevant.
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; incompletely successful in 25 (19%) patients and unsuccessful in 9 patients (7%).
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 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 fullfilled 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.



HL.02.05

L'INTELLIGENZA ARTIFICIALE DEGLI ICM RIDUCE DRAMMATICAMENTE I FALSI ALLARMI DI FIBRILLAZIONE E PAUSE

Andrea Madeo [1], Sofia Capocci [2], Massimiliano Maines [3], Giulio Molon [4], Davide Sandrini [5], Michele Gulizia [6], Giuseppe Carullo [7], Antonio Curcio [8], Gaetano Senatore [9], Andrea Zorzi [10], Franco Zoppo [11], Fabio Quartieri [12], Antonio Pangallo [13], Roberto Ceravolo [14], Amir Koll [15], Fabrizio Ammirati [16], Giovanni Bisignani [1]

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[14] *ASP Catanzaro Ospedale di Lamezia, Lamezia Terme, ITALY*
[15] *ASL Rieti Ospedale San Camillo De Lellis, Rieti, ITALY*
[16] *ASL Roma3 Ospedale G.B. Grassi, Ostia, ITALY*

Introduzione: I monitor cardiaci iniettabili (ICM) sono in grado di rilevare gli episodi di fibrillazione atriale (FA) e pause con elevata sensibilità, ma generano anche trasmissioni su falsi allarmi che il personale ospedaliero deve rivedere con conseguente carico di lavoro aggiuntivo. E' stato infatti pubblicato che il tempo per la gestione di ogni allarme che non prevede azioni cliniche è in media 11.3 minuti.
L'intelligenza artificiale (AI) AccuRhythmTM è stata disegnata e validata per eliminare sul cloud i falsi episodi di FA e pausa trasmessi dal controllo remoto, mantenendo elevata la sensibilità del rilevamento.

Obiettivo: Valutare l'impatto di AI nella pratica clinica dei centri Italiani in cui è stata introdotta, in termini di riduzione degli allarmi per falsa FA e pausa e il risparmio di risorse necessarie per la revisione.

Metodi: Dal Settembre2023 tutti i centri che hanno pazienti con Medtronic LinQII ICM e AI in controllo remoto possono ricevere un report periodico di questa popolazione del loro centro contenente sia il numero allarmi di FA e pausa filtrati da AI perché falsi, sia il numero di allarmi che AI non ha classificato e sono stati inviati al personale ospedaliero in revisione. Questa analisi include i dati de-identificati di tutti i pazienti con LINQ II in controllo remoto in 16 centri Italiani, in cui AI è stata introdotta. Abbiamo valutato la riduzione percentuale degli allarmi di FA e pausa ed effettuato una stima delle ore di lavoro risparmiate dal personale ospedaliero dall'introduzione di AI nel Maggio 2022 fino al 31 Gennaio 2024.

Risultati: 2049 pazienti, che hanno ricevuto un LINQII ICM per sincope (40,7%), ictus criptogenetico (20,5%), gestione dell'FA (24,6%), tachicardie ventricolari (4,7%) o altro (9,6%), sono seguiti in controllo remoto. Nei 21 mesi d'osservazione questi pazienti hanno avuto un totale di 23319 allarmi di FA e 8615 di pausa che sarebbero stati inviati per revisione al personale ospedaliero. L'AI ha però eliminato il 34% degli allarmi di FA (min – max: 3% - 63%) e l'81% degli episodi di pausa (min – max: 40%-100%). Questo ha permesso di risparmiare in totale 2818 ore di lavoro del personale ospedaliero (1652 ore/anno), che equivalgono al lavoro di 8,8 persone full time/anno.

Conclusioni: L'AI riduce significativamente i falsi allarmi, liberando il personale ospedaliero dal lavoro di revisione non necessario e portando ad una più efficace gestione delle risorse ospedaliere.

AIAC
Associazione Italiana Aritmologia e Cardiostimolazione

COMUNICAZIONI ORALI

SESSIONI NON ACCREDITATE ECM

COMUNICAZIONI ORALI 01

MERCOLEDI' 18 SETTEMBRE

AUDITORIUM

18:30-19:30

SESSIONE DI COMUNICAZIONI ORALI: ARITMOLOGIA CLINICA

Moderatori: Paolo Sabbatani (Forlì-Cesena), Giovanni Licciardello (Augusta-SR)

CO.01.01

STORM ARITMICO: RIPOLARIZZAZIONE PRECOCE E LOPERAMIDE UN COCKTAIL QUASI FATALE

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Background: Il Loperamide è una sostanza di sintesi antidiarroica che agisce rallentando la motilità intestinale mediante un'azione diretta sulla muscolatura liscia e interagendo con i neuroni vegetativi intrinseci. A concentrazioni associate al sovradosaggio, il loperamide può essere responsabile dell'innesco di aritmie cardiache conseguenti all'inibizione dei canali del potassio (hERG) e del sodio.

Clinical case: D.A. è un uomo di 40 anni, senza storia anamnestica di rilievo che si è presentato in DEA a seguito di un arresto cardiaco. La moglie riferisce durante la notte comparsa di respirazione agonica "gasping" per cui chiamava 118 e iniziava RCP. Per evidenza di ritmo da Fibrillazione ventricolare, D.A veniva sottoposto a 3 shock con bolo di adrenalina con successivo ROSC. In DEA: ECG iniziale: RS con J wave con aspetto notch in sede infero-laterale. Ecocardio-TT: FE 50% diffusa ipocinesia, più marcata a carico del setto medio-apicale. Per escludere un'embolia polmonare veniva eseguita TC torace, negativa. Durante la TC il paziente per due volte presentava ritmo da FV con necessità shock.
Eseguito studio coronarografico in emergenza che evidenziava un albero coronarico indenne da lesioni. Il paziente veniva ricoverato in Rianimazione dove veniva proseguita la sedazione per ridurre lo stimolo adrenergico e si iniziava infusione di amiodarone e magnesio. Dopo circa 48 ore, con paziente stabile senza nuovi eventi aritmici, si procedeva a estubazione e trasferimento in UTIC. Nel ricovero in UTIC veniva sospesa l'infusione di amiodarone per riscontro di marcato allungamento del QT e si procedeva a titolazione della terapia betabloccante. Al monitoraggio ECG continuo e all'HolerECG 24 h non eventi aritmici ma evidenza di andamento dinamico del ST infero-laterale. A completamento diagnostico si eseguiva RMN cuore che non evidenziava alterazioni strutturali cardiache e veniva eseguiti esami tossicologici risultati negativi.
Il paziente interrogato, riferiva il giorno prima dell'arresto di aver assunto 4 cp di Loperamide (2 mg x 4 ovvero 8 mg; dosaggio terapeutico massimo descritto in letteratura 16 mg/die).
Dopo discussione collegiale abbiamo eseguito un prelievo per la valutazione genetica del nostro paziente (tuttora in corso) e abbiamo impiantato un ICD sottocutaneao con monitoraggio remoto.
A distanza di cinque mesi non sono stati registrati episodi aritmici.

Conclusions: Riportiamo questo caso di storm aritmico in un paziente con segni ECGgrafici di ripolarizzazione precoce perché riteniamo si sia presentato a dose terapeutica di loperamide un gravissimo effetto avverso, da noi segnalato.

CO.01.02

CHOOSING WISELY - DECISION MAKING ON DRUG USE IN BRUGADA SYNDROME

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ASL TO3, Pinerolo, ITALY

36-year-old male with a history of hypoxic ischemic encephalopathy of the newborn. During childhood he presented with global developmental delay and mental retardation. Reaching adult age, he presented with behavioral disturbances. After starting therapy with risperidone he managed to have acceptable social relationships in his life. In addition, he was asymptomatic from a cardiological point of view, never having experienced syncope or significant palpitations, there is no family history of cardiological diseases or sudden death.

But then a routine electrocardiogram (ECG) was performed in March 2014. It showed a regular sinus rhythm with a heart rate of 80 beats per minute, with a normal PR-interval, slight (right) ventricular conduction delay, and a type-1 Brugada ECG pattern (figure 1).

Cognizant of the ability (and probably one of the working mechanisms) of risperidone to block neurological sodium channels (Nav 1.6), including use dependency, we formulated the hypothesis that our patient's type-1 Brugada ECG was possibly due to risperidone's effects on his cardiac sodium channels (Nav1.5).

Structural heart disease was excluded with an echocardiogram.

After discussing the clinical scenario with the patient and his family, and following his psychiatrist's guidance, we decided to stop risperidone in order to verify its effects on the ECG. The ECG after risperidone's wash out is shown in figure 2. We can observe a sinus rhythm with a heart rate of 70 beats per minute, left axis deviation, normal conduction times, and a type-2 Brugada pattern in lead V2 placed in the third intercostal space.

We performed an ajmaline test under sedation using midazolam. To verify the effects of each drug on the ECG we performed an ECG after midazolam, which was not significantly different from the basal ECG. Then we performed an ajmaline provocation test according to our institution's protocol. The test was prematurely interrupted when a type-1 Brugada pattern emerged after the injection of 40mg of ajmaline (figure 3). There were no relevant side effects during the test.

At this point we made the diagnosis of drug induced Brugada syndrome, with a possible causative role of risperidone.

Subsequently, his psychiatrist tried to treat him with haloperidol, then with quetiapine, but both were suspended because they appeared ineffective for his behavioral disturbances.

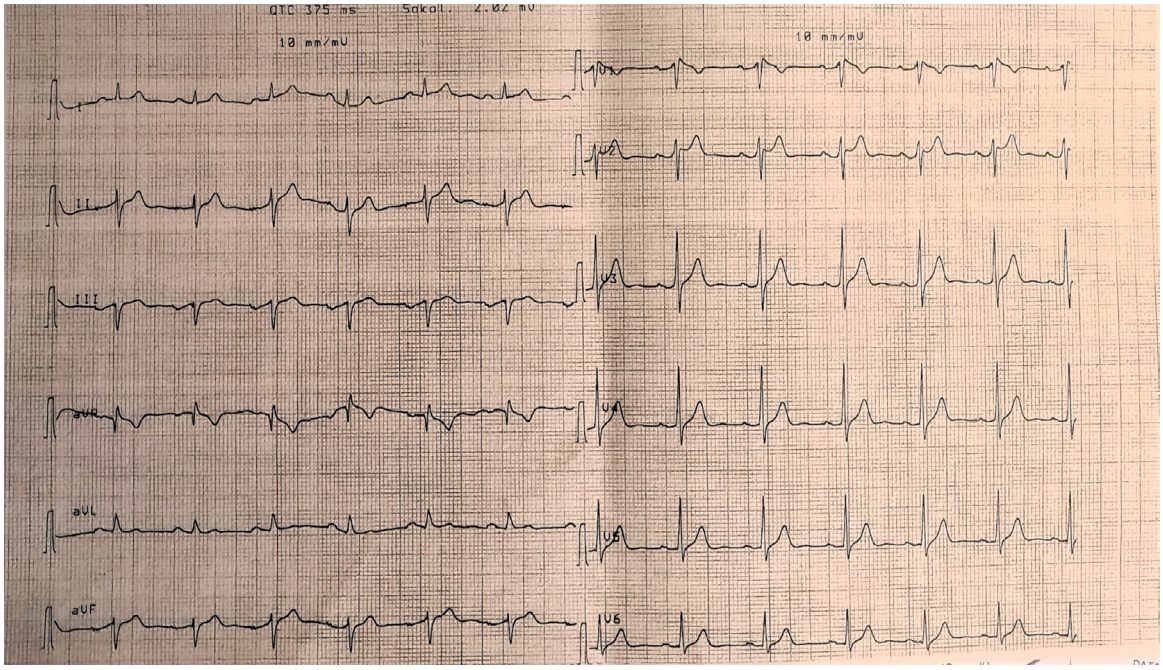
In 2015, without any medical therapy, an ECG was performed and a spontaneous type-1 Brugada pattern was documented.

Meanwhile, genetic testing limited to SCN5A, did not uncover a mutation. However, cascade screening in the family revealed also an ajmaline induced type-1 Brugada pattern in his mother, further confirming inheritable Brugada syndrome.

Electrophysiological testing to further stratify the patient's risk for arrhythmias was discussed with the patient and family but not accepted.

Because the behavioral disturbances were very limiting for the patient and his surroundings, it was agreed that he would restart risperidone accompanied by anti-arrhythmic drug therapy in the form of low dose quinidine (450mg/day).

After 9 years of follow up the patient remained asymptomatic, and always presents with a type-1 Brugada pattern on regular out-patient visits.



CO.01.03
L'UTILIZZO DEGLI SCORE DI RISCHIO ARITMICO NELLA SINDROME DI BRUGADA

Luca Canovi, Giorgia Azzolini, Anita Merani, Francesco Vitali, Matteo Bertini, Cristina Balla
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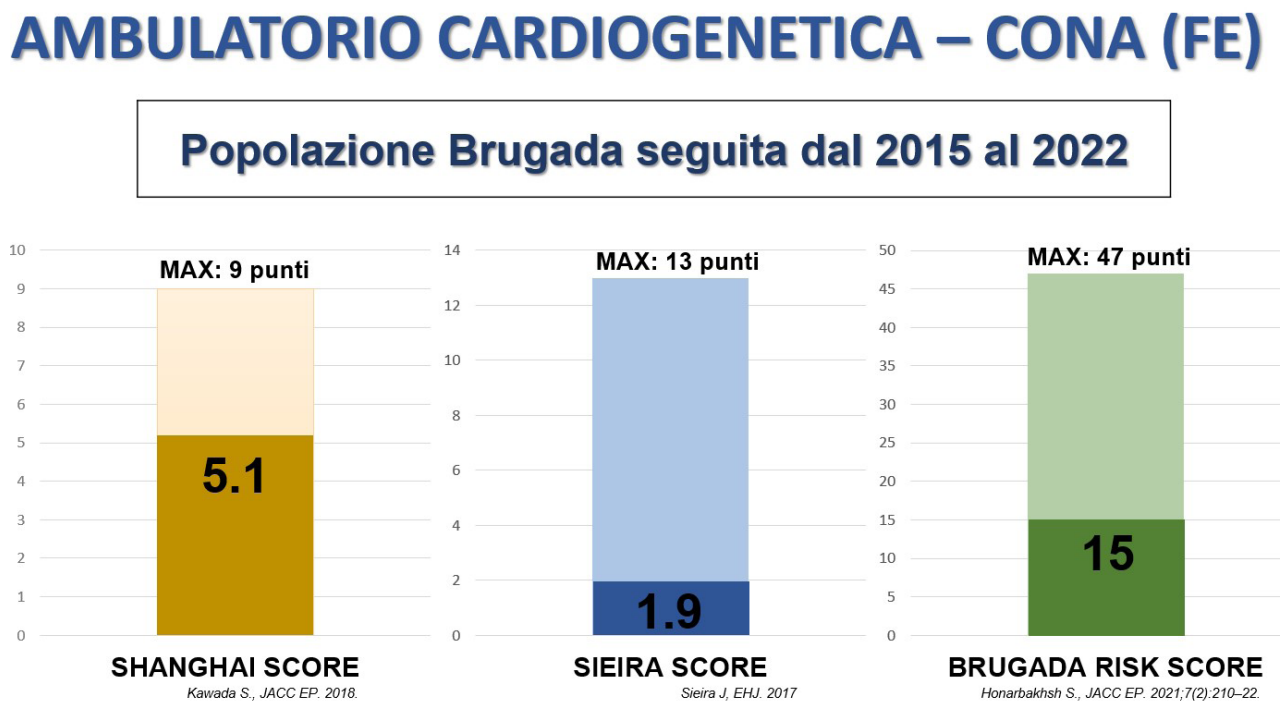
Background: La sindrome di Brugada è una patologia insidiosa dal punto di vista diagnostico e prognostico. Nell'ultimo decennio, sono stati creati e validati diversi score di rischio aritmico, che tuttavia mostrano ancora un utilizzo limitato nella gestione clinica del paziente. Obiettivo dello studio: Analizzare i principali score di rischio aritmico validati nella Sindrome di Brugada, applicandoli alla nostra Popolazione.

Materiali e metodi: Sono stati arruolati tutti i pazienti valutati presso la UOC di Cardiologia dell'Arcispedale Sant'Anna di Ferrara tra Gennaio 2014 e Dicembre 2022 per sospetta Sindrome di Brugada. Di ogni paziente sono stati raccolti dati anamnestici, strumentali ed effettuata analisi genetica. Sono stati calcolati Brugada risk score, Sieira risk score e Shangai score per ciascun paziente e, in base al punteggio, suddivisi in gruppi di rischio aritmico.

Risultati e discussione: È stata analizzata una popolazione di 154 individui, con età media di 51 anni e di cui il 73% maschi. Il 73% dei Pazienti presentava un pattern Brugada di
tipo 1 spontaneo. L'analisi genetica è risultata positiva per mutazione del gene SCN5A nel 25% dei pazienti. Il 24% della popolazione ha riportato un evento aritmico, nello specifico il 21% è stato vittima di sincope aritmica e il 9% di arresto cardiaco. Sono stati effettuati 33 studi elettrofisiologici endocavitari (SEF) per stratificare il rischio aritmico, di cui il 42% è risultato positivo per induzione di fibrillazione ventricolare. Complessivamente sono stati impiantati 37 defibrillatori. Il punteggio medio di Shanghai score (da 0 a 21 punti) è risultato essere 5 punti e sono stati registrati eventi aritmici solo nei Pazienti con punteggio maggiore o uguale a 4 punti. Per quanto riguarda il Sieira score (da 0 a 13 punti), il punteggio medio è stato di 2 punti e non sono stati registrati eventi nei pazienti con punteggio inferiore a 2. Infine, il Brugada risk score medio è stato di 15 punti (da 0 a 47 punti), con un'evidente frequenza di eventi aritmici nei Pazienti con punteggio uguale o superiore a 26 punti.

Conclusioni: I principali score di rischio aritmico nella Sindrome di Brugada possono essere un valido elemento diagnostico e di stratificazione del rischio in una patologia insidiosa con un vasto spettro di profili clinici. Ulteriori studi potranno validarne l'utilità anche dal punto di vista prognostico.



CO.01.04

EVALUATION OF CARDIAC AUTONOMIC FUNCTION IN PATIENTS WITH PRIMARY FOCAL HYPERHIDROSIS UNDERGOING THORACOSCOPIC SYMPATHETIC CHAIN CLAMPING

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Background: Heart rate variability (HRV) is the variability in the beat-by-beat heart period. It is the result of the opposite effects of the orthosympathetic and parasympathetic branches of the autonomic nervous system (ANS) on the heart. Primary focal hyperhidrosis (PFHH) is a complex disease, characterized by excessive sweat production, beyond physical needs, strongly affecting social life and activity of daily living. The pathophysiology of this disorder is still controversial, but several authors define this chronic condition as a dysautonomic disorder, mainly driven by exaggerated sympathetic activity.

Purpose: This study aims to evaluate a possible systemic autonomic nervous dysfunction in PFHH pathophysiology, by measuring HRV in patients undergoing a two-phase thoracoscopic sympathetic chain clamping.

Methods: This non-randomized, observational, controlled trial enrolled patients with a confirmed clinical diagnosis of severe facial and/or axillary PFHH with a history of failing to control the disorder despite multiple medical or topical approaches, undergoing thoracoscopic sympathetic chain clamping. Before surgery, ECG was obtained using KardiaMobile 6L (AliveCor®) device with a four-minute supine recording and HRV was analyzed using Kubios HRV Premium (Kubios©) software. After surgery, patients were given a satisfaction questionnaire to assess their quality of life and the occurrence of compensatory hyperhidrosis. The primary outcome of the study was the baseline difference in autonomic nervous activity, using mean RR interval, SDNN, RMSSD and pNN50, between the two groups. Secondary outcomes were differences in frequency-domain analysis peaks and absolute powers, LF/HF ratio, PNS and SNS indexes, mean HR and its maximum and minimum, ECG features and the occurrence of dysautonomic disorders after surgery.
Results. 114 patients with PFHH (case group) were compared to 222 healthy subjects (control group). Mean age was similar among both groups (30.4 ± 10.35 vs 31.94 ± 11.87 years). No statistical differences were seen in HRV analysis between the two groups at baseline. However, when comparing patients before the first surgical procedure and before the second one, the former showed significantly larger SDNN (p=0.03), RMSSD (p=0.02) and mean RR (p=0.03). In addition, significant differences were seen in PNS and SNS indexes (p=0.01 and p=0.02 respectively). No significant association between compensatory hyperidrosis and the development of systemic dysautonomic disorders was seen.

Conclusions: This study shows that in PFHH patients there is not a significant difference in HRV parameters compared to healthy people, suggesting that the autonomic nervous system derangement is merely peripheral, rather than central. More large-scale prospective studies are needed.

CO.01.05

NEW STRATEGIES FOR THE IDENTIFICATION OF HEART FAILURE PATIENTS WITH REDUCED EJECTION FRACTION AT HIGH RISK OF SUDDEN CARDIAC DEATH: INSIGHTS FROM CARDIAC MAGNETIC RESONANCE AND WEARABLE DEFIBRILLATOR

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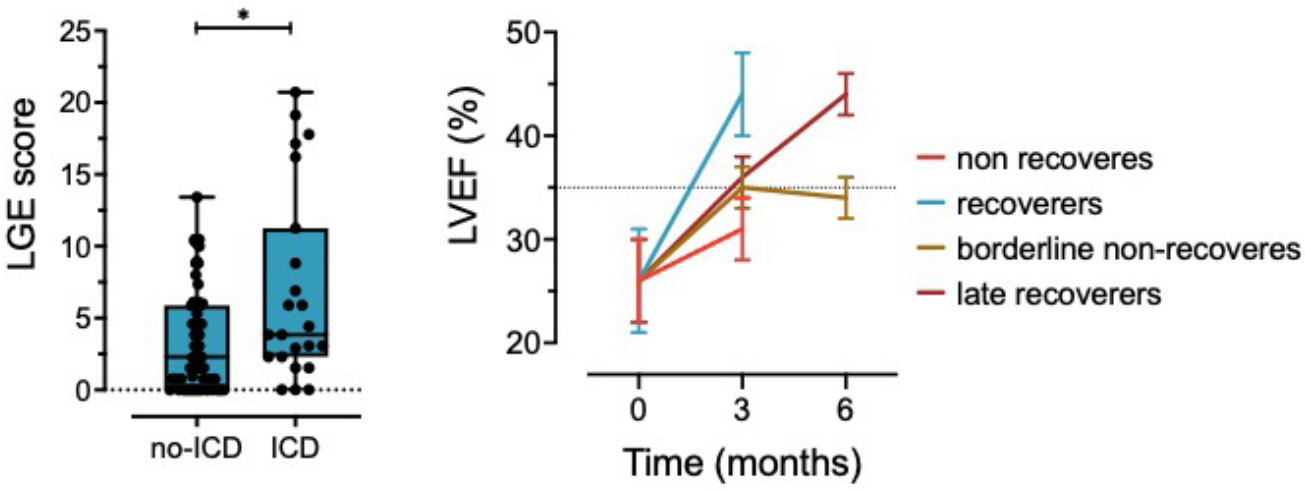
Background: Reduced left ventricular ejection fraction (LVEF) is associated with an increased risk of sudden cardiac death (SCD) with an indication for an implantable cardioverter-defibrillator (ICD) after 3 months of guidelines-directed optimal medical therapy (GDOMT). During this interval, it is not clear how to prevent SCD and how to distinguish patients with a transient SCD risk from those with an early indication for ICD therapy.

Methods: Patients with newly diagnosed heart failure with reduced LVEF underwent a comprehensive baseline characterization including coronary angiography and cardiac magnetic resonance imaging (CMRi) with late gadolinium enhancement (LGE). Discharged with a wearable defibrillator (WCD), all patients received GDOMT and underwent clinical and echocardiographic follow-up for 3 months to identify those with an indication for ICD. Patients with LVEF 33-38% at 3 months underwent an extended follow-up. We compared the patients meeting definitive indication for ICD therapy to the ones experiencing LVEF recovery. Multivariable models were built to identify the predictors of the need for ICD therapy.

Results: A total of 121 patients with average LVEF 27±8%were included in the analysis, of which 43 (36%) with ischemic etiology and 78 (67%) with non-ischemic cardiomyopathy. Patients undergoing ICD implantation in primary prevention were 31 (26%). No SCD was observed. No life-threatening ventricular arrhythmia was recorded. With respect to those who recovered LVEF, patients undergoing ICD implantation displayed a higher prevalence of ischemic etiology (53 vs 30%), diabetes, and chronic kidney disease (all $p<0.05$), with comparable age, sex prevalence, LVEF, and coronary artery anatomy. CMRi revealed higher indexed left ventricular end-diastolic volume index (LV-EDVi) and higher fibrosis burden at LGE (LGE score 6.9 (0.8-9.1) vs 4.1 (0-4.6) Figure, left panel). A subgroup of 33 (26%) patients with borderline LVEF at 3 months were followed-up for 1-3 extra months, allowing the detection of LVEF recovery in 30 (90%) - figure, right panel. The predictors of the need for ICD were LV-EDVi, presence of diabetes, LGE score, and kidney function.

Conclusions: Baseline CMRi indices of fibrosis and remodeling (LGE, LV-EDVi), diabetes, and kidney function can help identify patients with an early indication for ICD therapy. Longer follow-up might avoid untimely ICD therapy in late recoverers. This strategy can help reduce the use of definitive ICD with better quality of life and reduced healthcare costs.



CO.01.06

CONTINUOUS LEFT STELLATE GANGLION BLOCK DURING VENTRICULAR TACHYCARDIA ABLATION TO IMPROVE ABLATION OUTCOME

Arianna Morena [1], Federico Ferraris [2], Matteo Anselmino [1], Mario Matta [2], Davide Castagno [2], Simone Frea [2], Carol Gravinese [2], Filippo Angelini [2], Paolo Boretto [2], Andrea Saglietto [2], Giulia De Lio [2], Pier Paolo Bocchino [2], Giuseppe Giannino [1], Paolo Berruquier [1], Guglielmo Gallone [1], Gaetano Maria De Ferrari [1], Veronica Dusi [1]

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[2] *AOU Città della salute e della scienza, Ospedale Molinette, divisione di Cardiologia, Torino, ITALY*

Introduction: Perioperative management of advanced patients with indication to ventricular tachycardia (VT) ablation is complex. A PAINESD score >= 15 was proposed to identify those who might benefit from pre-emptive mechanical cardiopulmonary support (MCS). We present a case successfully managed with continuous percutaneous left stellate ganglion block (C-PLSGB).

Case: A 71-year-old diabetic man with severe post-ischemic cardiomyopathy (LVEF 24%, NYHA Class III) and chronic pulmonary disease was admitted for electrical storm with multiple ICD shocks due to poorly tolerated monomorphic VT (MMVT) at 176 bpm resistant to anti-tachycardia pacing (ATP), despite ongoing chronic oral therapy with amiodarone and carvedilol. Poorly tolerated and ATP-resistant MMVTs at 170-180 bpm recurred despite intravenous (iv) amiodarone and lidocaine (20 mcg/kg/min) and oral propranolol. Ultrasound guided C-PLSGB was therefore started; lidocaine was chosen for the continuous infusion due to the short half-life, at the initial dose of 10 mg/h; 6 hours later, his poorly tolerated MMVT recurred at 167 bpm. Initially iv lidocaine was increased to 30 mcg/kg/min, but the arrhythmia relapsed; then we increased C-PLSGB at 37.5 mg/h and decreased iv lidocaine to 20 mcg/kg/min due to neurological symptoms. With this treatment, the patient remained in sinus rhythm for 2 hours, then the clinical VT recurred at a slower cycle (130 bpm), with minimal hemodynamic impact and ATP-response. C-PLSGB infusion was increased to 75 mg/h, with no more VT recurrence. Endocardial VT ablation was planned. Despite a very high PAINESD score (31) we decided to avoid pre-emptive MCS. We stopped lidocaine (both iv and as C-PLSGB) 2 hours before ablation. In the EP room, prior to vascular access, the clinical MMVT recurred at 133 bpm. C-PLSGB was then resumed (initially at 100 mg/h for 30 minutes, then at 37.5 mg/h). The MMVT then spontaneously recurred at the same cycle: it was mapped and ablated in the medio-apical anterior wall, with VT interruption during radiofrequency. A second VT morphology was mapped and ablated at a more basal site. C-PLSGB was then stopped and no more VT occurred nor were induced 1 hour later. At 8 months the patient is still alive and experienced no more VT recurrence.

Conclusion: C-PLSGB with individually tailored infusion rates could be used during VT ablation as a mean to reduce VT cycle length and allow for mapping without MCS.

COMUNICAZIONI ORALI 02

MERCOLEDI' 18 SETTEMBRE

SALA ITALIA

18:30-19:30

SESSIONE DI COMUNICAZIONI ORALI: DEVICE IMPIANTABILI

Moderatori: Michele Malagù (Ferrara), Vincenzo Tavoletta (Napoli)

CO.2.01

STIMOLAZIONE HISSIANA VS AREA DELLA BRANCA SINISTRA VS CONVENZIONALE: CONFRONTO DI ATTIVAZIONE MIOCARDICA MEDIANTE UTILIZZO DELL'IMPEDENZA TRANSVALVOLARE

Cosimo Mandurino, Michele Scolletta, Alessio Angelini, Carla Volpe, Giovanna Rodio, Leonardo Di Gregorio, Giovanni Luzzi
P.O.C. SS. Annunziata Asl Taranto, Taranto, ITALY

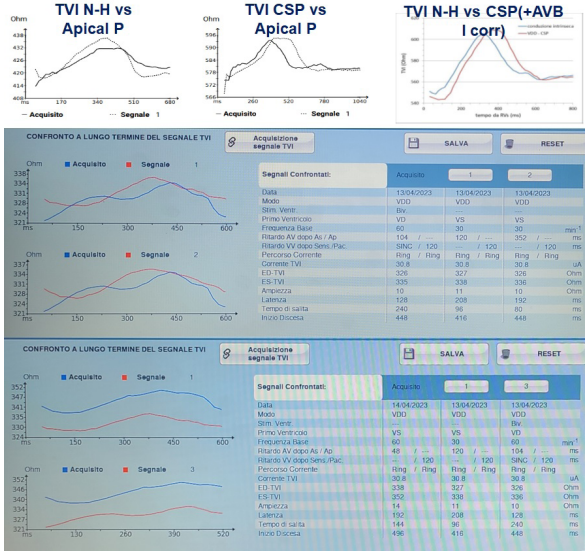
Background: il crescente diffondersi in cardiostimolazione delle metodiche di stimolazione del sistema di conduzione (HBP o LBBAP) pongono l'interessante quesito circa l'effettiva fisiologicità dell'attivazione ventricolare (LBBAP) e l'impatto che essa abbia sulla efficienza della meccanica cardiaca rispetto alla stimolazione convenzionale apicale.

L'impedenza trans-valvolare (TVI), rilevata tra l'atrio ed il ventricolo destro, rappresenta un affidabile e consolidato metodo di misurazione delle variazioni di impedenza elettrica cardiaca che si realizzano a seguito delle modificazioni strutturali e geometriche che si realizzano durante il ciclo cardiaco . Tali variazioni periodiche dell'impedenza possono essere utilizzate come indice della forza di contrazione ventricolare e della gittata sistolica.

Obiettivo dello studio: confrontare le variazioni di impedenza elettrica durante il ciclo cardiaco conseguente a conduzione intrinseca AV, ad HBP, a LBBAP ed a stimolazione apicale

Materiali e metodi: sono stati arruolati 18 pazienti (11U, 7 D, età 78±7) consecutivi con indicazione ad impianto di pacemaker per blocco AV di alto grado (conservata competenza cronotropa), impiantati con device tricanale collegato ad un elettrocatetere con sensore atriale e punta in apice ventricolare ed un elettrocatetere CSP (8 HBP e 10 LBBAP). E' stato effettuato follow-up di 1 anno di questi pazienti con raccolta dei dati di TVI (percorso Ring-Tip) in corso di conduzione NH intrinseca (quando possibile), in corso di stimolazione CSP (HBP o LBBAP) ed in corso di stimolazione apicale.

Risultati: il follow-up eseguito ha evidenziato una curva di andamento del TVI nel corso del ciclo cardiaco che, in caso di HBP, era perfettamente sovrapponibile come andamento e valori numerici a quella di conduzione intrinseca ed in corso di LBBAP era perfettamente sovrapponibile come andamento temporale (pattern a lenta salita fino al picco di impedenza con successiva lenta discesa e basso secondo picco tardivo) alla conduzione intrinseca, con valori numerici differenti in maniera non statisticamente significativa ed in 3 pazienti addirittura migliori, pur senza significatività) a seguito di ottimizzazione dell'intervallo AV). In corso di stimolazione apicale, l'andamento delle variazioni di impedenza elettrica si è rivelato significativamente differente, sia per andamento temporale sia per valori numerici, con picco precoce e discesa repentina con appiattimento della curva durante il resto del ciclo cardiaco. L'impatto di tali variazioni sulla meccanica cardiaca è stato valutato mediante indice di dispersione di contrattilità fra setto e parete laterale, ecocardiograficamente misurato, con valori in corso di stimolazione apicale costantemente superiori a 60 ms ed invece costantemente inferiori in corso di conduzione intrinseca e CSP.



Conclusioni: l'impedenza transvalvolare si è rivelato uno strumento utile per identificare un pattern di attivazione fisiologica (sia spontanea sia elettroindotta) signifcativamente differente da quello di attivazione indotta da stimolazione endocardica apicale. Tale differenza corrisponde ad una differenza di sinergia meccanica ventricolare e potrebbe efficacemente essere utilizzata per evidenziare eventuali transizioni di cattura. Ulteriori studi su una popolazione più ampia sono necessari per confermare tale risultato, oltre a verificarne la corrispondenza anche in caso di percorso di misurazione TVI differente (ring-ring su setto ad esempio), permettendo di eliminare l'elettrocatetere apicale.

20° CONGRESSO NAZIONALE AIAC
Associazione Italiana Aritmologia e Cardiostimolazione

CO.2.02

LONG-TERM OUTCOMES IN ICD: ALL-CAUSES MORTALITY AND FIRST APPROPRIATE INTERVENTION IN ISCHEMIC AND NONISCHEMIC ETIOLOGIES

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Background: Real life data comparing the long-term outcome in patients with different heart diseases carrying an Implantable Cardioverter Defibrillator (ICD) are scarce.

Objective: To compare the long-term risk of first appropriate ICD intervention and overall survival in patients with ICD and heart disease of different etiologies.

Methods: Patients with an ICD implanted between January 1st, 2010 and December 31st 2022 followed in our Center were included. Study outcomes were all-cause mortality and first appropriate ICD intervention. A comparison between ischemic heart disease (IHD) and nonischemic heart disease (NIHD) was performed. In NIHD different etiologies of dilated cardiomyopathy (DCM) were analyzed. A schematic illustration of the population is depicted in Figure 1.

Results: 1184 patients (592 IDH - 592 NIHD) were included. Baseline characteristics are reported in Table 1 and Table 2. During a median follow-up of 53 months all-cause death occurred in 399 (34%) patients while first-appropriate ICD intervention occurred in 320 (27%). Several predictors of mortality were identified: secondary prevention, age, main cardiovascular risk factors and other comorbidities and right axial deviation of QRS on surface ECG; predictors of appropriate ICD intervention were male gender and anamnestic arrhythmic expressiveness such as secondary prevention, sustained ventricular tachycardia and ventricular fibrillation an history of non-sustained ventricular tachycardia (Table 3). All-cause mortality was significantly higher in IHD vs NIHD patients (60% vs 43%; p<0.0001) but no differences in appropriate ICD intervention rate at 10-years (34% vs 40%; p=0.125) were observed (Figure 2). Among NIHD higher 10-year mortality rate were found in valvular heart disease, rctDCM and hypertensive DCM. Hypertrophic cardiomyopathy, alcoholic DCM (alcDCM) and post-radio/chemotherapy DCM (rctDCM) were the least arrhythmic phenotypes among NIHD (Figure 3). Of note, inappropriate interventions in alcDCM and rctDCM were higher than appropriate ones (Table 4).

Conclusions: Rate of ICD appropriate interventions and mortality is different according to the etiology of heart disease and cardiovascular risk profile; this should be taken into consideration in the prognostic stratification of these patients at the time of implantation.

Table 1 Baseline patients and devices characteristics in ischemic and nonischemic heart disease

	All patients (n=1184)	IHD (n=592)	DCM (n=407)	HCM (n=44)	ACM (n=32)	VHD (n=43)	Other (n=66)
Clinical data							
Sex, male	962 (81%)	529 (89%)	307 (75%)	25 (57%)	19 (59%)	35 (81%)	47 (71%)
Age, yrs	68 [58; 75]	71 [63; 78]	63 [54; 72]	55 [27; 65]	45 [35; 67]	71 [65; 78]	69 [48; 78]
LVEF, %	32 [27; 38]	31 [27; 35]	30 [25; 34]	65 [51; 70]	57 [48; 63]	33 [28; 45]	53 [40; 60]
Devices							
ICD, n	778 (66%)	448 (77%)	215 (53%)	26 (59%)	23 (72%)	18 (42%)	48 (73%)
CRT-D, n	350 (30%)	33 (23%)	175 (43%)	8 (18%)	1 (3%)	22 (51%)	11 (17%)
S-ICD, n	56 (4%)	11 (2%)	17 (4%)	10 (23%)	8 (25%)	3 (7%)	7 (11%)
Primary prevention, n	877 (74%)	414 (70%)	357 (88%)	36 (86%)	15 (47%)	28 (65%)	25 (38%)
Clinical data							
NYHA class I, n	213 (18%)	57 (10%)	66 (16%)	22 (50%)	27 (84%)	7 (16%)	34 (52%)
NYHA class II, n	726 (61%)	370 (63%)	284 (70%)	13 (30%)	4 (13%)	28 (65%)	27 (41%)
NYHA class III, n	228 (19%)	155 (26%)	50 (12%)	9 (21%)	1 (3%)	8 (19%)	5 (8%)
NYHA class IV, n	15 (1.3%)	9 (0.8%)	6 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Cardiac arrest, n	156 (13%)	102 (17%)	20 (5%)	2 (5%)	7 (22%)	7 (16%)	18 (27%)
NSVT, n	659 (56%)	290 (49%)	253 (62%)	32 (73%)	25 (78%)	22 (51%)	37 (56%)
SVT, n	221 (19%)	145 (25%)	36 (9%)	3 (7%)	11 (34%)	7 (16%)	19 (23%)
VF, n	136 (12%)	92 (16%)	15 (4%)	2 (5%)	4 (13%)	5 (12%)	18 (27%)
Comorbilities							
Hypertension, n	701 (59%)	435 (74%)	186 (46%)	13 (30%)	9 (25%)	25 (58%)	34 (52%)
Hypercholesterolemia, n	748 (63%)	467 (79%)	202 (50%)	15 (34%)	12 (38%)	23 (54%)	29 (44%)
Diabetes, n	346 (29%)	232 (39%)	84 (21%)	4 (9%)	3 (9%)	7 (16%)	16 (24%)
COPD, n	160 (14%)	92 (16%)	47 (12%)	2 (5%)	2 (6%)	8 (19%)	9 (14%)
CKD, n	307 (26%)	211 (36%)	71 (18%)	1 (2%)	1 (3%)	11 (26%)	12 (18%)
Cancer, n	127 (11%)	58 (10%)	50 (12%)	2 (5%)	1 (3%)	9 (21%)	7 (11%)
Medications							
Beta-blocker, n	989 (84%)	485 (82%)	370 (91%)	34 (77%)	29 (91%)	33 (77%)	38 (58%)
ACEi, n	691 (58%)	353 (60%)	269 (66%)	10 (23%)	11 (34%)	18 (42%)	30 (46%)
ARB, n	175 (15%)	83 (14%)	64 (16%)	6 (14%)	4 (13%)	10 (23%)	8 (12%)
ARNi, n	129 (11%)	68 (12%)	55 (14%)	0 (0%)	0 (0%)	2 (5%)	4 (6%)
MRA, n	651 (55%)	333 (56%)	255 (63%)	13 (30%)	4 (13%)	21 (49%)	25 (38%)
SGLT2i, n	48 (5%)	37 (6%)	10 (3%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)
Diuretics, n	810 (69%)	451 (76%)	276 (68%)	13 (30%)	7 (22%)	34 (79%)	29 (44%)
Amiodarone, n	364 (31%)	205 (35%)	115 (28%)	4 (9%)	3 (10%)	16 (37%)	21 (32%)
VKA/DOACs, n	400 (34%)	317 (37%)	109 (27%)	11 (25%)	5 (17%)	26 (61%)	32 (49%)
Antiplatelet medications, n	684 (58%)	524 (89%)	114 (28%)	8 (19%)	5 (16%)	16 (37%)	17 (26%)
Statins, n	775 (66%)	550 (93%)	163 (40%)	12 (27%)	6 (19%)	21 (49%)	23 (35%)

Continuous variables were expressed as median and interquartile range [Q1; Q3]

ACEi: Angiotensin Converter Enzyme Inhibitors; **ACM**: Arrhythmogenic Cardiomyopathy; **ARBs**: Angiotensin Receptor Blockers; **ARNi**: Angiotensin receptor/neprilysin inhibitor; **CKD**: Chronic Kidney Disease; **COPD**: Chronic Obstructive Pulmonary Disease; **CRT-D**: Cardiac Resynchronization Therapy-Defibrillator; **DCM**: Dilated Cardiomyopathy; **DOACs**: Direct Oral Anticoagulants; **HCM**: Hypertrophic Cardiomyopathy; **ICD**: Implantable Cardiac Defibrillator; **IHD**: Ischemic Heart Disease; **LVEF**: Left Ventricle Ejection Fraction; **MRA**: Mineralocorticoid Receptor Antagonist; **NSVT**: Non Sustained Ventricular Tachycardia; **NYHA**: New York Heart Association; **SGLT2i**: Sodium-Glucose cotransporter-2 inhibitors; **S-ICD**: Subcutaneous Implantable Cardioverter Defibrillator; **SVT**: Sustained Ventricular Tachycardia; **VF**: Ventricular Fibrillation; **VKA**: Vitamin K Antagonist; **VHD**: Valvular Heart Disease.

Table 2 Baseline patients and devices characteristics in nonischemic dilated cardiomyopathy

	DCM (n=407)	iDCM (n=222)	postmDCM (n=39)	rctDCM (n=20)	alcDCM (n=10)	htnDCM (n=116)
Clinical data						
Sex, male	307 (75%)	160 (72%)	29 (74%)	7 (35%)	9 (90%)	102 (88%)
Age, yrs	63 [54; 72]	59 [50; 67]	54 [47; 60]	68 [57; 72]	62 [60; 65]	74 [68; 77]
LVEF, %	30 [25; 34]	30 [25; 34]	33 [29; 40]	29 [24; 33]	34 [30; 35]	30 [24; 33]
Devices						
ICD, n	215 (53%)	128 (58%)	26 (67%)	8 (40%)	6 (60%)	47 (41%)
CRT-D, n	175 (43%)	84 (38%)	10 (26%)	12 (60%)	4 (40%)	65 (56%)
S-ICD, n	17 (4%)	10 (4%)	3 (8%)	0 (0%)	0 (0%)	4 (3%)
Primary prevention, n	357 (88%)	203 (91%)	27 (69%)	20 (100%)	10 (100%)	97 (84%)
Clinical data						
NYHA class I, n	66 (16%)	41 (19%)	14 (36%)	0 (0%)	2 (20%)	9 (8%)
NYHA class II, n	284 (70%)	152 (69%)	23 (59%)	11 (55%)	8 (80%)	90 (78%)
NYHA class III, n	50 (12%)	25 (11%)	2 (5%)	8 (40%)	0 (0%)	15 (13%)
NYHA class IV, n	6 (1%)	3 (1%)	0 (0%)	1 (5%)	0 (0%)	2 (2%)
Cardiac arrest, n	20 (5%)	6 (3%)	5 (13%)	0 (0%)	0 (0%)	9 (8%)
NSVT, n	253 (62%)	163 (89%)	29 (74%)	10 (50%)	6 (60%)	55 (47%)
SVT, n	36 (9%)	14 (8%)	9 (23%)	0 (0%)	0 (0%)	13 (11%)
VF, n	15 (4%)	4 (2%)	4 (10%)	0 (0%)	0 (0%)	7 (6%)
Comorbilities						
Hypertension, n	186 (46%)	63 (29%)	11 (28%)	6 (30%)	3 (30%)	103 (89%)
Hypercholesterolemia, n	202 (50%)	94 (43%)	16 (41%)	9 (45%)	4 (40%)	79 (68%)
Diabetes, n	84 (21%)	33 (15%)	8 (21%)	7 (35%)	0 (0%)	36 (31%)
COPD, n	47 (12%)	19 (5%)	4 (10%)	2 (10%)	0 (0%)	22 (19%)
CKD, n	71 (18%)	26 (12%)	1 (3%)	3 (15%)	1 (10%)	40 (35%)
Cancer, n	50 (12%)	16 (7%)	1 (3%)	20 (100%)	1 (10%)	12 (10%)
Medications						
Beta-blocker, n	370 (91%)	208 (94%)	38 (97%)	16 (80%)	90 (90%)	99 (85%)
ACEi, n	269 (66%)	145 (65%)	28 (72%)	16 (80%)	9 (90%)	71 (61%)
ARB, n	64 (16%)	28 (13%)	5 (13%)	3 (15%)	1 (10%)	27 (23%)
ARNi, n	55 (14%)	37 (17%)	2 (5%)	0 (0%)	0 (0%)	16 (14%)
MRA, n	255 (63%)	149 (67%)	18 (46%)	14 (70%)	6 (60%)	68 (59%)
SGLT2i, n	10 (3%)	5 (2%)	0 (0%)	0 (0%)	0 (0%)	5 (4%)
Diuretics, n	276 (68%)	140 (63%)	16 (41%)	20 (100%)	7 (70%)	93 (82%)
Amiodarone, n	115 (28%)	53 (24%)	12 (31%)	6 (30%)	2 (20%)	42 (36%)
VKA/DOACs, n	109 (27%)	45 (20%)	7 (18%)	7 (35%)	4 (40%)	46 (40%)
Antiplatelet medications, n	114 (28%)	52 (24%)	9 (23%)	5 (25%)	2 (20%)	46 (40%)
Statins, n	163 (40%)	75 (34%)	9 (23%)	5 (25%)	4 (40%)	70 (60%)

Continuous variables were expressed as median and interquartile range [IQR] [Q1; Q3]

alcDCM: post-alcoholic DCM; **DCM**: Dilated Cardiomyopathy; **htnDCM**: post-hypertensive DCM; **iDCM**: Idiopathic/Genetic/Familiar DCM; **postmDCM**: post-myocarditic DCM; **rctDCM**: post-radio/chemotherapy DCM. Other abbreviation as in Table 1.

Table 3 Primary and Secondary endpoints

	Ischemic and nonischemic heart disease						
	All patients (n=1184)	IHD (n=592)	DCM (n=407)	HCM (n=44)	ACM (n=32)	VHD (n=43)	Other (n=66)
Primary endpoints							
All causes-death, n	320 (27%)	150 (25%)	109% (27%)	4 (9%)	4 (13%)	17 (40%)	21 (32%)
Appropriate interventions, n	399 (34%)	244 (41%)	125 (31%)	5 (11%)	11 (34%)	11 (26%)	18 (27%)
Secondary endpoints							
Type of intervention							
Shock, n	153 (48%)	76 (51%)	55 (44%)	3 (60%)	6 (54%)	6 (54%)	7 (39%)
ATP, n	167 (52%)	74 (49%)	70 (56%)	2 (40%)	5 (46%)	5 (46%)	11 (61%)
Non-appropriate, n	54 (5%)	17 (3%)	22 (5%)	3 (7%)	5 (16%)	4 (9%)	3 (5%)
Complication, n (all)	60 (7%)	37 (6%)	30 (7%)	0 (0%)	2 (6%)	4 (9%)	7 (11%)

	Nonischemic dilated cardiomyopathy				
	iDCM (n=222)	postmDCM (n=39)	rctDCM (n=20)	alcDCM (n=10)	htnDCM (n=116)
Primary endpoints					
All causes-death, n	35 (16%)	4 (10%)	12 (60%)	3 (30%)	55 (47%)
Appropriate interventions, n	76 (34%)	17 (44%)	1 (5%)	2 (20%)	29 (25%)
Secondary endpoints					
Type of intervention					
Shock, n	36 (48%)	8 (47%)	0 (0%)	1 (50%)	10 (35%)
ATP, n	40 (53%)	9 (53%)	1 (100%)	1 (50%)	19 (65%)
Non-appropriate, n	12 (5%)	2 (5%)	2 (10%)	3 (30%)	3 (3%)
Complication, n (all)	16 (7%)	1 (3%)	0 (0%)	0 (0%)	13 (3%)

Abbreviation as in Table 1 and 2.

Table 4 Survival: Univariable and Multivariate Cox-Model

First ICD-intervention	Unadjusted HR (95% CI)	p	Adjusted HR (95% CI)	p
Sex, male	1.811 [1.362 - 2.682]	<0.0001	2.091 [1.383 - 3.139]	<0.0001
Secondary prevention, n	2.572 [2.054 - 3.220]	<0.0001	2.394 [1.585 - 3.618]	<0.0001
NSVT, n	2.224 [1.748 - 2.830]	<0.0001	1.876 [1.403 - 2.509]	<0.0001
Sinus rhythm, n	0.668 [0.493 - 0.903]	0.009	0.422 [0.225 - 0.792]	0.007
LVH (Sokohe-Lyon), n	0.610 [0.413 - 0.899]	0.013	0.627 [0.400 - 0.959]	0.031
All-causes death	**Unadjusted HR (95% CI)**	**p**	**Adjusted HR (95% CI)**	**p**
Age, yrs	1.077 [1.065 - 1.090]	<0.0001	1.069 [1.051 - 1.086]	<0.0001
Secondary prevention, n	1.323 [1.066 - 1.642]	0.011	1.546 [1.003 - 2.381]	0.048
NYHA class I, n	0.348 [0.244 - 0.497]	<0.0001	0.336 [0.136 - 0.829]	0.018
NYHA class II, n	0.754 [0.610 - 0.919]	0.005	0.426 [0.196 - 0.924]	0.031
Hypercholesterolemia, n	1.705 [1.404 - 2.217]	<0.0001	1.529 [1.122 - 2.075]	0.007
Diabetes, n	1.896 [1.549 - 2.319]	<0.0001	1.336 [1.035 - 1.725]	0.026
COPD, n	2.196 [1.727 - 2.793]	<0.0001	1.378 [1.015 - 1.870]	0.040
CKD, n	2.949 [2.411 - 3.609]	<0.0001	1.567 [1.199 - 2.040]	0.001
Cancer, n	1.692 [1.285 - 2.228]	<0.0001	1.605 [1.165 - 2.212]	0.004
Beta-blocker, n	0.417 [0.333 - 0.522]	<0.0001	0.706 [0.520 - 0.961]	0.027
Statins, n	1.601 [1.277 - 2.008]	<0.0001	0.692 [0.485 - 0.988]	0.043
Right axial deviation (+91° to -91°)	2.065 [1.577 - 2.703]	<0.0001	1.847 [1.148 - 2.971]	0.011

CI: Confidence Interval; **HR**: Hazard Ratio; other abbreviation as in Table 1 an 2.

Figure 1

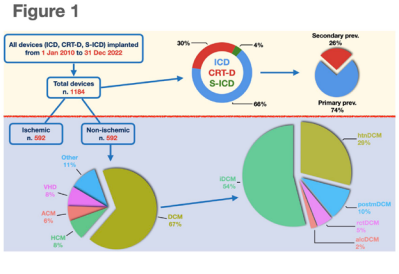


Figure 2

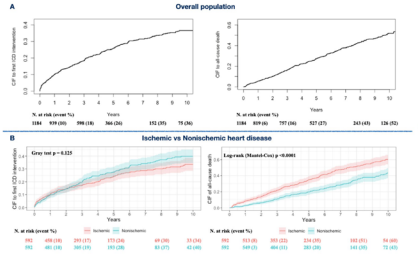
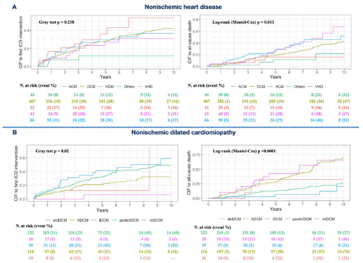


Figure 3



CO.2.03

SUBCUTANEOUS VERSUS TRANSVENOUS IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR AMONG DRUG-INDUCED TYPE-1 ECG PATTERN BRUGADA SYNDROME: A PROPENSITY SCORE MATCHING ANALYSIS FROM IBRYD STUDY

Alfredo Caturano [1], Federico Guerra [2], Federico Migliore [3], Giuseppe Mascia [4], Andrea Rossi [5], Martina Nesti [6], Vincenzo Ezio Santobuono [7], Emilio Attena [8], Gianfranco Tola [9], Luigi Sciarra [10], Giulio Conte [11], Alessandro Paoletti Perini [12], Pietro Francia [13], Gregory Dendramis [14], Zefferino Palamà [15], Stefano Albani [16], Leonardo Calò [10], Enrico Baldi [17], Antonio D'Onofrio [18], Vincenzo Russo [19]

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No real-world data are available about the complications rate in drug-induced type 1 Brugada Syndrome (BrS) patients with an implantable cardioverter-defibrillator (ICD). Aim of our study is to compare the device-related complications, infections, and inappropriate therapies among drug-induced type 1 BrS patients with transvenous- ICD (TV-ICD) versus subcutaneous-ICD (S-ICD). Data for this study were sourced from the IBRYD (Italian BRugada sYnDrome) registry which includes 619 drug-induced type-1 BrS patients followed at 20 Italian tertiary referral hospitals. For the present analysis, we selected 258 consecutive BrS patients implanted with ICD. 198 patients (76.7%) received a TV-ICD, while 60 a S-ICD (23.4%). And were followed-up for a median time of 84.3 [46.5-147] months. ICD inappropriate therapies were experienced by 16 patients (6.2%). 14 patients (7.1%) in the TVICD group and 2 patients (3.3%) in S-ICD group (log-rank P = 0.64). ICD-related complications occurred in 31 patients (12%); 29 (14.6%) in TV-ICD group and 2 (3.3%) in S-ICD group (log-rank P = 0.41). ICD-related infections occurred in 10 patients (3.88%); 9 (4.5%) in TV-ICD group and 1 (1.8%) in S-ICD group (log-rank P = 0.80). After balancing for potential confounders using the propensity score matching technique, no differences were found in terms of clinical outcomes between the two groups. In a real-world setting of drug-induced type-1 BrS patients with ICD, no significant differences in inappropriate ICD therapies, device-related complications, and infections were shown among S-ICD vs TV-ICD. However, a reduction in lead-related complications was observed in the S-ICD group. In conclusion, our evidence suggests that S-ICD is at least non-inferior to TV-ICD in this population and may also reduce the risk of lead-related complications which can expose the patients to the necessity of lead extractions.

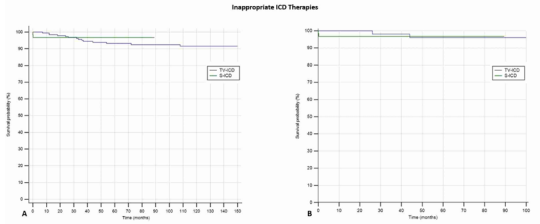

Figure 1: Kaplan-Meier curve comparing survival from inappropriate ICD therapies among S-ICD vs TV-ICD groups in unmatched (*Panel A*) and matched (*Panel B*) cohorts

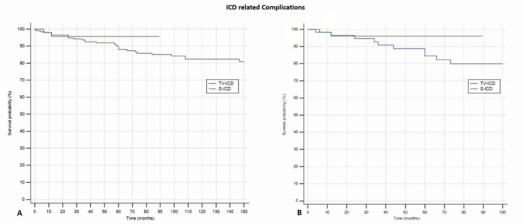

Figure 2: Kaplan-Meier curve comparing survival from ICD-related complications among S-ICD vs TV-ICD groups in unmatched (*Panel A*) and matched (*Panel B*) cohorts

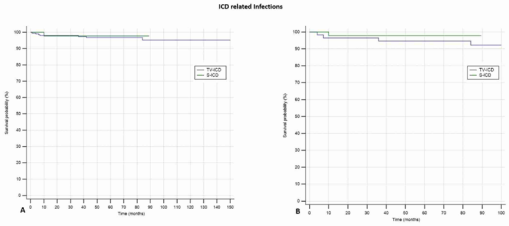

Figure 3: Kaplan-Meier curve comparing survival from ICD-related infections among S-ICD vs TV-ICD groups in unmatched (*Panel A*) and matched (*Panel B*) cohorts

CO.2.04

COMPARATIVE ASSESSMENT OF MYOCARDIAL WORK PERFORMANCE DURING SPONTANEOUS RHYTHM, HIS BUNDLE PACING, AND LEFT BUNDLE BRANCH AREA PACING: INSIGHTS FROM THE EMPATHY STUDY

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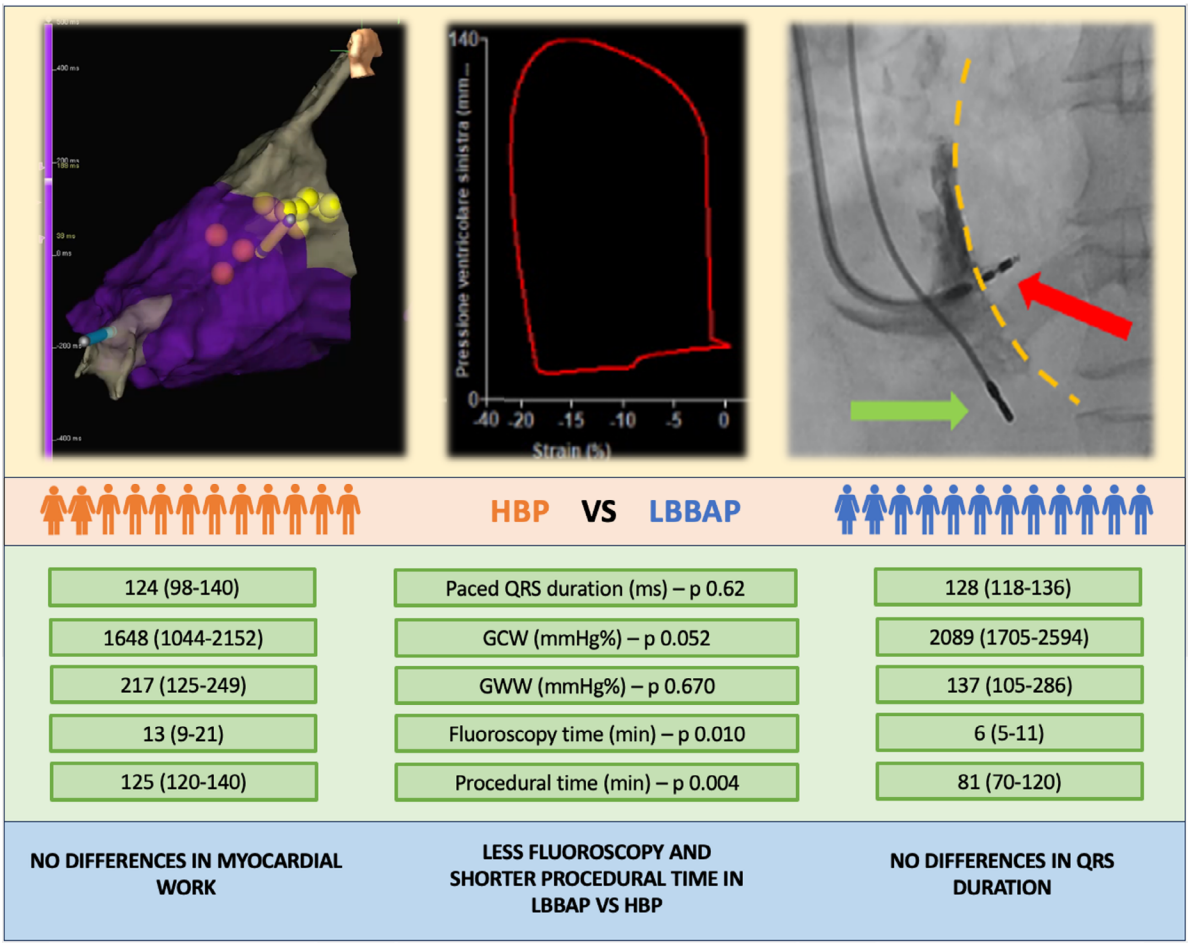
Background: Physiological pacing has gained significant interest due to its potential to achieve optimal hemodynamic response. This study aimed to assess left ventricular performance in terms of electrical parameters, specifically QRS duration, and mechanical performance, evaluated as myocardial work. We compared His Bundle Pacing (HBP) and Left Bundle Branch Area Pacing (LBBAP) to evaluate their effects.

Methods: Twenty-four patients with class I or IIa indications for pacing were enrolled in the study, with 12 patients undergoing HBP implantation and another 12 patients undergoing LBBAP implantation. A comprehensive analysis of myocardial work was conducted.

Results: Our findings indicate that there were no major differences in terms of spontaneous and HBP activation in myocardial work, except for global wasted work (217 mmHg% vs. 283 mmHg%; p 0.016) and global work efficiency (87 mmHg% vs. 82 mmHg%; p 0.049). There were no significant differences observed in myocardial work between spontaneous activation and LBBAP. Similarly, no significant differences in myocardial work were found between HBP and LBBAP.

Conclusions: Both pacing modalities provide physiological ventricular activation without significant differences when compared to each other. Moreover, there were no significant differences in QRS duration between HBP and LBBAP. However, LBBAP demonstrated advantages in terms of feasibility, as it achieved better lead electrical parameters compared to HBP (threshold@0.4 ms 0.6 V vs. 1 V; p=0.045. Sensing 9.4 mV vs. 2.4 mV; p<0.001). Additionally, LBBAP required less fluoroscopy time (6 min vs. 13 min; p=0.010) and procedural time (81 min vs. 125 min; p=0.004) compared to HBP.



CO.2.05

UPGRADING DA ICD MONOCAMERALE A LOT CRT D IN PAZIENTE CON STENOSI DELLA SUCCLAVIA. UN CASO COMPLESSO

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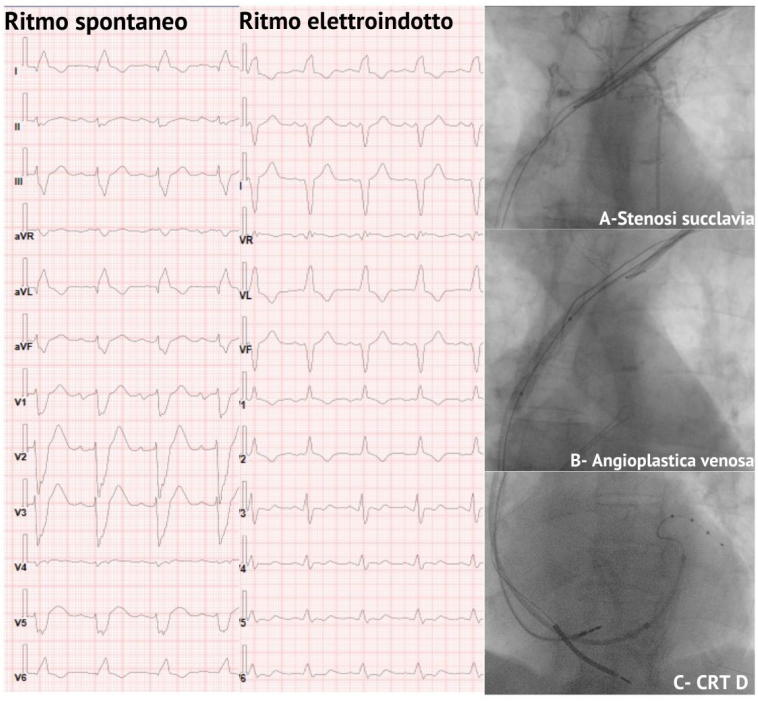
Introduzione: Le stenosi della vena succlavia rappresentano uno dei principali ostacoli alla procedura di upgrading, mentre l'impianto della LOT CRT non fornisce la funzione di defibrillazione con i generatori DF4, risultando di difficile applicazione nei pazienti che necessitano di defibrillatore oltre che di risincronizzazione .
Presentiamo di seguito un caso di upgrading in cui siamo riusciti a superare entrambe le problematiche.

Caso clinico: Paziente di 62 anni con storia di IMA anteriore e conseguente severa riduzione della FE nel 2009.
Nel 2010 effettuava impianto in prevenzione primaria di ICD DF 1 single coil monocamerale, mentre nel 2022 veniva ospedalizzato per scompenso cardiaco su FE severamente ridotta (15%) e blocco di branca sinistra per cui veniva candidato ad LVAD.
Nello stesso ricovero veniva effettuato tentativo inefficace di upgrading a CRT D per mancanza di rami visualizzabili del seno coronarico.
A Febbraio 2024 si ricovera presso la nostra UTIC per recidiva di scompenso cardiaco congestizio in corso di terapia medica già ottimizzata e comprensiva dei cardini della terapia per lo scompenso (diuretici, glifozine, MRA, Beta bloccanti, ARNi).
In considerazione della severa depressione della FE, della recidiva di scompenso in terapia medica massimale e del notevole ritardo di conduzione sinistra secondo Strauss con QRS di 234 msec, si decide di effettuare nuovo tentativo di upgrading a LOT CRTD.
Si esegue venografia con mancato passaggio di mezzo di contrasto in succlavia.
Si decide comunque di effettuare tentativo infruttuoso di passaggio di introduttori in succlavia (immagine A).
Con l'ausilio del collega emodinamista si effettua angioplastica venosa tramite Pallone Mustang 8.0X40X135-39171-08041 (immagine B).
Si riesce ora ad avanzare sistema di delivery in CS e a cannulare tramite subselettore ramo anterolaterale di buon calibro, al cui interno viene inserito catetere quadripolare.
Si posiziona dunque elettrocatetere Solia S 60 tramite delivery Selectra 65-42 a livello del setto interventricolare sinistro (LVSP) e catetere a fissaggio passivo a livello atriale (immagine C).
Si connettono elettrocateteri al generatore; canale di shock connesso a connettore di shock DF1 del catetere precedentemente impiantato (si abbandona e si incappuccia IS1 di pacing e sensing) canale di pacing e sensing connesso ad EC Solia S 60, canale LV connesso a catetere quadripolare in seno coronarico, connettore atriale connesso ad EC atriale.
Si imposta programmazione BIV VD Vs con un ritardo di 35 msec, ottenendo restringimento del QRS da 240 a 180 msec.

Conclusioni: L' upgrading effettuato dimostra come si possano superare problematiche comuni come la stenosi della succlavia grazie al lavoro in team con i colleghi emodinamisti;
L'utilizzo di un generatore DF 1 ha permesso di utilizzare il catetere di shock precedentemente posizionato in apice garantendo comunque il massimo della risincronizzazione biventricolare possibile tramite la stimolazione LOT CRT e sfruttando dunque la tecnologia DF1 a vantaggio del paziente.



COMUNICAZIONI ORALI 03

MERCOLEDI' 18 SETTEMBRE

SALA BIANCA

18:30-19:30

SESSIONE DI COMUNICAZIONI ORALI: ELETTROFISIOLOGIA

Moderatori: Cristina Esposito (Salerno), Domenico Pecora (Brescia)

CO.03.01

STEREOTACTIC RADIOABLATION FOR SEPTAL VENTRICULAR TACHYCARDIA

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[2] *UOC Radioterapia Ospedale Fatebenefratellli San Pietro, Roma, ITALY*

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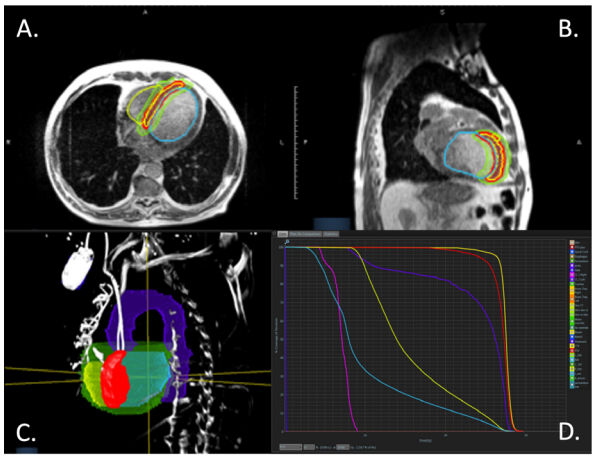
[4] *Dipartimento di Aritmologia - IRCSS San Raffaele, Milano, ITALY*

Background: Intramural septal substrate represents a major challenge in patients undergoing Ventricular Tachycardia (VT) ablation because the septal thickness could make difficult for radiofrequency to achieve transmural lesions. Although novel approaches have been proposed to treat septal VT, about half of patients experience VT recurrence and the risk of peri-procedural complications including Atrioventricular Block (AVB) remains high. Stereotactic Arrhythmia Ablation (STAR) is introduced to treat VT refractory to catheter ablation nevertheless no data are available in the setting of septal VT.

Aim: to evaluate the VT burden after STAR and its effect on conduction tissue.

Methods: We included all patients with VT originating from the septum. We targeted arrhythmogenic scar regions by combining anatomical with electrophysiological imaging. Patients were treated with a single fraction of 25 Gy adopting Magnetic Resonance Imaging (MRI) guided STAR consisting of acquisition of a sagittal cine MRI during the whole delivery time, real tracking of left ventricular and automated-gating. All patients were followed up clinically every three months and additionally when clinically required and all implantable cardiac device were remote monitored. The primary efficacy outcome included any recurrence of sVT beyond the 6 weeks blanking-period following STAR. The secondary efficacy outcome was the reduction of Implantable Cardioverter Defibrillator (ICD) therapy. The safety outcome was the incidence of adverse events and AVB after STAR.

Results: We enrolled 11 patients with septal VT [median age 68 yrs (IQR: 64.5–78 yrs); 100% male]. Underlying cardiomyopathy was non-ischemic in 54.5% of them (n=6) and the median Left Ventricular Systolic Function (LVEF) was 38% [IQR: 33.5-42%]. Clinical presentation was electrical storm for 8 (72.7%) patients and sustained VT in the remaining 3 cases (27.3%). A previous catheter ablation was performed in six (54.4%) patients ranged from one to three per patient; the index septal VT cycle length was 370 ms [IQR: 296.25 – 446.5 ms]. All patients underwent STAR treatment and no complications occurred; six (54.5%) of them were discharged the same day. During a median follow-up of 11.5 months (IQR: 7.7 - 17.4 months), the efficacy outcome occurred in three (27.3%) patients. A significative reduction of ICD therapy (24.6 ICD therapy/patient before STAR vs 0.8 ICD therapy/patient after STAR, p-value: <0.001; 2.9 ICD shocks/patient before STAR vs 0.1 ICD shocks/patient after STAR, p-value: 0.01) was observed. LVEF increased significantly after STAR treatment [38% (IQR: 33.5-42%) before STAR vs 43.8% (IQR: 35–47%) after STAR; p-value: 0.04]. No adverse effects were observed in ICD system performance, lead thresholds, or lead impedances at any point after treatment. In the seven patients with preserved AV conduction, no AVB or left/right branch block were reported after STAR. No difference in the percentage of ventricular pacing was described before and after STAR [3.5% (IQR:2.75-4%) before STAR vs 4.5% (IQR: 3.25–5.5%) after STAR; p-value: 0.24].



Conclusions: STAR represents a safe and effective strategy for the treatment of septal VT.

CO.03.02

COMPARATIVE EVALUATION OF FUOR ENERGY SUORCES FOR ATRIAL FIBRILLATION ABLATION

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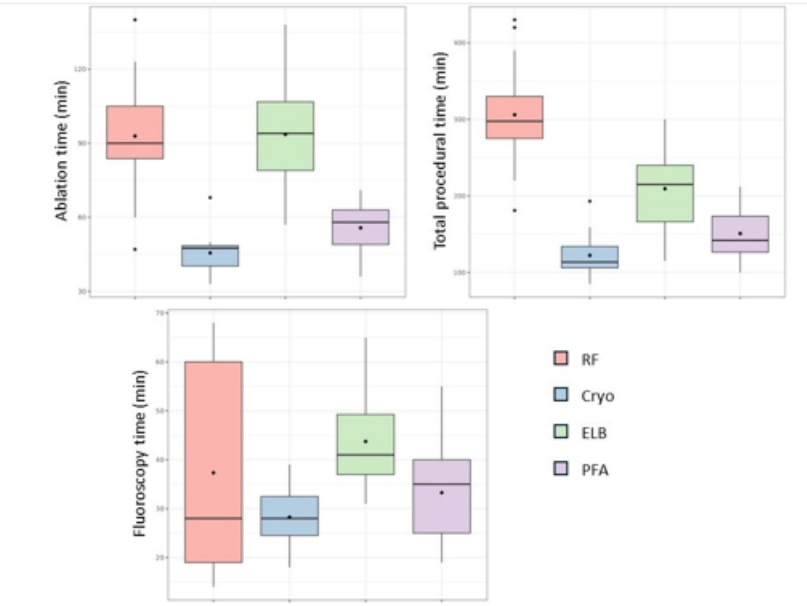
Background: Pulsed-field ablation (PFA) emerges as a promising alternative to established methods like radiofrequency (RF), cryoballoon (Cryo), and endoscopic laser balloon (ELB) for atrial fibrillation (AF) ablation. Sharing the single-shot approach with Cryo, PFA potentially shortens ablation times compared to RF and ELB. However, the need for deeper sedation in PFA might extend overall procedure room occupancy. This study investigates the procedural times associated with PFA in a new user at a major medical center, comparing them to established ablation methods.

Methods: Data on ablation time, fluoroscopy time, and total procedural time were collected for the first 15 consecutive patients treated with each of the four ablation methods (RF, Cryo, ELB, and PFA) at the center. Statistical analysis (ANOVA) was employed to identify significant differences between groups. If significant differences were found, Bonferroni multiple comparison tests were performed for further analysis.

Results: The first 15 patients in each group (RF, Cryo, ELB, and PFA) showed no significant differences in demographics (sex, age) or clinical characteristics. PFA demonstrated significantly shorter ablation times (56 ± 11 minutes) compared to RF (93 ± 26 minutes, p<0.01) and ELB (94 ± 23 minutes, p<0.01). However, there was no significant difference between PFA and Cryo (46 ± 9 minutes, p=n.s.). When considering total procedural times, PFA (151 ± 39 minutes) again showed significant reduction compared to RF (306 ± 75 minutes, p<0.01) and ELB (209 ± 58 minutes, p<0.01). PFA remained statistically similar to Cryo (122 ± 31 minutes, p=n.s.). Notably, fluoroscopy times did not differ significantly between PFA (33 ± 11 minutes) and the other methods (RF: 37 ± 22 minutes, Cryo: 28 ± 6 minutes, ELB: 44 ± 10 minutes). Importantly, no immediate or delayed complications were reported with any energy source used for pulmonary vein isolation (PVI).

Conclusions: The study confirms the safety of AF ablation procedures, even for inexperienced users. One-shot ablation strategies, like PFA, Cryo and ELB offer an advantage by reducing procedural times from the outset. This likely reflects the user-friendliness of single-shot systems, leading to time savings even for less experienced operators. Notably, ablation times achieved with PFA were comparable to Cryo. This is remarkable considering the deeper sedation in PFA, as evidenced by no significant difference in total procedural duration.



CO.03.03
CONFRONTO TRA CRIOABLAZIONE E PALLONE A RF

Massimiliano Manfrin, Livio Bertagnolli, Federica Torri, Matthias Unterhuber
Ospedale Regionale di Bolzano, Bolzano, ITALY

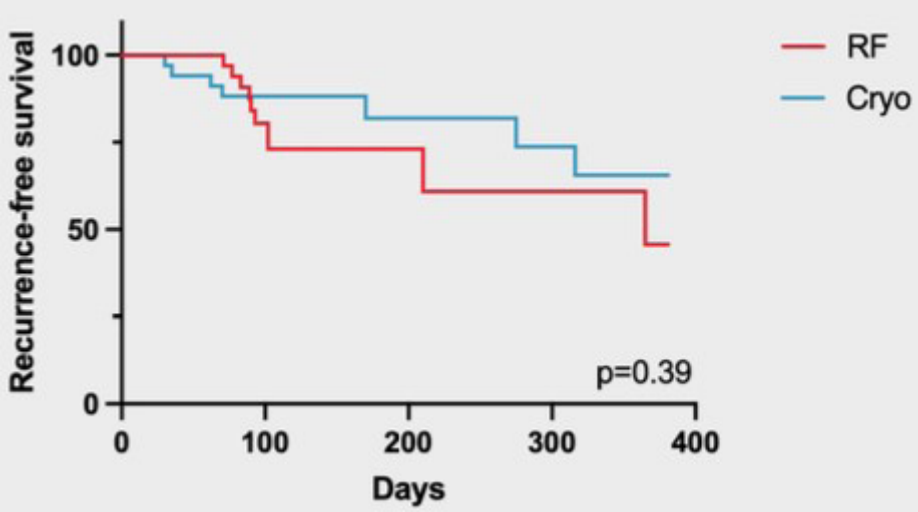
Introduzione: L'isolamento delle vene polmonari (PVI) è la prima strategia durante l'ablazione della fibrillazione atriale. L'efficacia a breve e a lungo termine e la durata della procedura sono parametri importanti durante l'ablazione. Sono stati compiuti nuovi sforzi per trovare una maggiore efficacia, un basso rischio della procedura e una procedura più breve.

Scopo: Scopo del nostro studio è confrontare i due metodi 'one shot' con pallone (pallone a radiofrequenza 'RFB' e criopallone 'CB') in termini di velocità, efficacia e sicurezza.

Metodi: Studio prospettico, randomizzato, controllato, monocentrico, comprendente 104 pazienti consecutivi con fibrillazione atriale parossistica, persistente o persistente di lunga durata, sottoposti per la prima volta ad ablazione delle vene polmonari tra dicembre 2022 e gennaio 2024. I pazienti sono stati randomizzati con rapporto 1:1 (52 pazienti nel gruppo RF e 52 pazienti nel gruppo Crio) in base al tipo di fibrillazione atriale, al sesso, all'ipertensione arteriosa, alla frazione di eiezione ventricolare sinistra e al volume atriale sinistro in ablazione con pallone a radiofrequenza multi-elettrodo Heliostar o in un'ablazione con Criopallone Arctic Front Advance. Entrambi i gruppi avevano caratteristiche cliniche comparabili (tabella 1).

Risultati: Rispetto al gruppo RFB, il gruppo CB ha mostrato un tempo di procedura più breve [60 minuti (55-70) vs. 70 minuti (60-90) (P = 0,01)]. Il DAP (prodotto dose-area) è risultato inferiore nel gruppo RFB [6,23 Gy*cm2 (4,4-8,2) vs. gruppo CB 9,18 (7,1-12,3), p<0,001].
Dopo un follow-up mediano di 9 mesi, vi è una tendenza a favore della crioablazione in termini di libertà dalla fibrillazione atriale (grafico 1) e in termini di minori complicanze (tabella 2).

Conclusioni: L'isolamento delle vene polmonari con criopallone rispetto al pallone a radiofrequenza ha tempi procedurali più brevi, ma con un'esposizione ai raggi X più elevata. Vi è una tendenza a favore della crioablazione in termini di libertà dalla fibrillazione atriale. Le complicanze sono state maggiori nel gruppo RF.



20° CONGRESSO NAZIONALE AIAC
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CO.03.04

TERAPIA DI RESINCRONIZZAZIONE CARDIACA GUIDATA DAL RITARDO DI CONDUZIONE INTERVENTRICOLARE: COME SCEGLIERE TRA STIMOLAZIONE BIVENTRICOLARE O STIMOLAZIONE DEL SISTEMA DI CONDUZIONE

Maurizio Collantoni [1], Carmine Marallo [1], Luca Martini [1], Federico Landra [1], Simone Taddeucci [1], Stefano Lunghetti [2], Claudia Baiocchi [2], Daniele Menci [2], Antonio Pagliaro [3], Massimo Fineschi [2], Amato Santoro [2]
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Background: La stimolazione biventricolare (BIV) è lo standard di riferimento per la terapia di resincronizzazione cardiaca (CRT). Circa il 30% dei pazienti non risponde alla CRT. La stimolazione del sistema di conduzione (CSP) rappresenta un'alternativa valida. Il ritardo di conduzione interventricolare (IVCD), come marcatore di dissincronia elettrica, è un predittore di risposta alla CRT. Lo scopo di questo studio è stato determinare l'incidenza dei responders alla CRT selezionando il miglior approccio tra BIV e CSP basato sulla misurazione intraoperatoria di IVCD nei pazienti con HFrEF e LBBB.

Metodi: Novantasei pazienti sono stati assegnati casualmente in un rapporto 1:1 a un gruppo BIV standard (gruppo di controllo, CG) o a un gruppo in cui l'approccio CRT è stato determinato in base alla valutazione di IVCD (gruppo di studio, SG). Se l'intervallo "elettrogramma ventricolare destro (RVs) - elettrogramma ventricolare sinistro (LVs)" era maggiore o uguale a 100 ms, il catetere è stato lasciato nella sua posizione originale; in caso contrario, il catetere LV è stato rimosso ed è stata eseguita la CSP. Le caratteristiche cliniche, ECG ed ecocardiografiche sono state valutate pre e 6 mesi post-impianto. Sono stati valutati parametri di risposta ecocardiografici e clinici.

Risultati: 37% dei pazienti nello SG hanno ricevuto la CSP, secondo l'algoritmo operativo. L'incidenza di responders alla CRT è stata significativamente più alta nello SG (criterio ecocardiografico: 92,5% vs 69,8%, p: 0,009; criterio clinico 87,5% vs 62,8%, p: 0,014). Lo SG ha mostrato una differenza significativamente maggiore nell'EF tra pre e post-impianto, così come ridotti volumi sistolici e diastolici finali. L'analisi di regressione univariata e multivariata ha indicato che l'iscrizione allo SG era l'unico fattore associato alla risposta alla CRT.

Table 4. Comparison between responder	STUDY GROUP (N=37)	CONTROL GROUP (N=30)	P-VALUE
Clinical features			
NYHA class post CRT	1,2 ± 0,4	1,5 ± 0,5	0,02
ΔNYHA class	-1,1 ± 0,7	-0,9 ± 0,8	0,22
Electrocardiogram			
QRS width (ms)	115 ± 12	112 ± 18	0,54
ΔQRS width (ms)	-37 ± 17	-38 ± 17	0,87
Biventricular pacing (n)	22	30	
Conduction System Pacing (n)	15	-	
His Bundle Pacing (n)	6	-	
Selective-HBP (n)	2	-	
Non-selective-HBP (n)	4	-	
Left Bundle Branch Area Pacing (n)	9	-	
Biventricular pacing (%)	98 ± 2,2	97,3 ± 2,8	0,91
Echocardiography			
EF (%)	40,2 ± 9,4	41 ± 10,7	0,77
ΔEF (%)	15,2 ± 9,6	12,9 ± 8,2	0,33
EDVi (ml)	72,2 ± 29,1	93,8 ± 34,8	0,05
ESVi (ml)	47,7 ± 23,8	68,9 ± 38,4	0,08
ΔEDVi (ml)	-23,3 ± 24,2	-10,2 ± 21,3	0,32
ΔESVi (ml)	-39,9 ± 26,2	-10 ± 3,7	0,18

Table 1. Population characteristics	STUDY GROUP (N=40)	CONTROL GROUP (N=43)	P-VALUE
Anthropometrics, demographic, clinical features			
Age (years)	67,48 ± 13,8	69,02 ± 8,9	0,56
Female (n/%)	14/42,4	12/27,9	0,19
BSA (m^2)	1,89 ± 0,3	1,89 ± 0,2	0,95
Ischemic etiology (n/%)	8/24,2	17/39,5	0,16
NYHA class	2,18 ± 0,5	2,26 ± 0,5	0,51
Electrocardiogram			
QRS width (ms)	152,7 ± 14,9	146,2 ± 18,5	0,15
Echocardiography			
EF (%)	25,5 ± 8,3	28,1 ± 6,7	0,14
EDVi (ml/m^2)	104,3 ± 30,3	106,3 ± 40	0,88
ESVi (ml/m^2)	88,8 ± 23,5	76,1 ± 38,2	0,39
Medical Therapy			
Beta-blockers (n/%)	20/51,5	29/67,4	0,28
ACEi-ARB (n/%)	19/39,4	22/51,2	0,25
ARNI (n/%)	14/33,3	10/23,3	0,30
SGLT2i (n/%)	5/15,2	5/11,6	0,62
Loop diuretics (n/%)	23/69,7	36/83,7	0,22

Table 2. Procedural results	STUDY GROUP (N=40)	CONTROL GROUP (N=43)	P-VALUE
Clinical features			
NYHA class	1,2 ± 0,5	1,5 ± 0,6	0,02
ΔNYHA class	1 ± 0,4	0,8 ± 0,7	0,37
Electrocardiogram			
QRS width (ms)	115,5 ± 12,1	114,7 ± 17,4	0,68
ΔQRS width (ms)	-37,0 ± 17,1	-38,2 ± 15,5	0,81
Biventricular pacing (n)	25	43	
Conduction System Pacing (n)	15	-	
His Bundle Pacing (n)	6	-	
Selective-HBP (n)	2	-	
Non-selective-HBP (n)	4	-	
Left Bundle Branch Area Pacing (n)	9	-	
Echocardiography			
EF (%)	39,8 ± 9,3	37,2 ± 11	0,29
EDVi (ml)	72,2 ± 29,1	96,2 ± 32,2	0,02
ESVi (ml)	47,7 ± 23,8	69,3 ± 33,9	0,04
ΔEDVi (ml)	-23,3 ± 24,2	-5,5 ± 20,1	0,10
ΔESVi (ml)	-39,9 ± 26,2	-4,9 ± 9,2	0,07
ΔEF (%)	14,2 ± 10	9,1 ± 9	0,02
Responders (n/%)	37/92,5	30/69,8	0,01

Table 3.	Univariate analysis		Univariate analysis		Multivariate analysis		Univariate analysis		Multivariate analysis	
	Combined responders (echo AND clinical)	p value	Clinical responders	p value	Clinical responders	p value	Echo responders	p value	Echo responders	p value
Ischemic aetiology	0.53 (0.20 – 1.43)	0.211	0.49 (0.17 – 1.40)	0.184			0.48 (0.15 – 1.52)	0.210		
QRS duration	0.99 (0.95 – 1.02)	0.429	0.97 (0.93 – 1.01)	0.138			0.98 (0.95 – 1.04)	0.880		
Female	3.04 (0.99 – 9.37)	0.053	0.15 (0.03 – 0.70)	0.016	0.16 (0.03 – 0.79)	0.025	0.65 (0.18 – 2.27)	0.494		
ARNI assumption	4.53 (0.86 – 23.93)	0.075	2.62 (0.49 – 14.11)	0.263			4.91 (0.55 – 43.53)	0.153		
SGLT2 assumption	2.80 (0.52 – 15.22)	0.233	4.30 (0.48 – 38.36)	0.191			1.23 (0.22 – 7.02)	0.815		
BSA	0.77 (0.03 – 20.99)	0.876	3.28 (0.06 – 171.63)	0.556			0.51 (0.01 – 30.35)	0.748		
SG enrolment	5.35 (1.74 – 16.45)	0.003	4.30 (1.28 – 14.47)	0.019	3.89 (1.11 – 13.64)	0.034	6.12 (1.40 – 32.32)	0.017	5.36 (1.07 - 26.84)	0.041

20° CONGRESSO NAZIONALE AIAC
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CO.03.05

TRANS-CATHETER CRYOABLATION OF PARAHISIAN ACCESSORY PATHWAYS: A SINGLE CENTRE EXPERIENCE

Fabio Brogni [1], Laura Perrotta [1], Giuseppe Ricciardi [1], Luca Checchi [1], Giulio Porcedda [2], Luciano De Simone [2], Davide Ciliberti [1], Cristiano Zaccaria [1], Antonio Michelucci [1], Paolo Pieragnoli [1]
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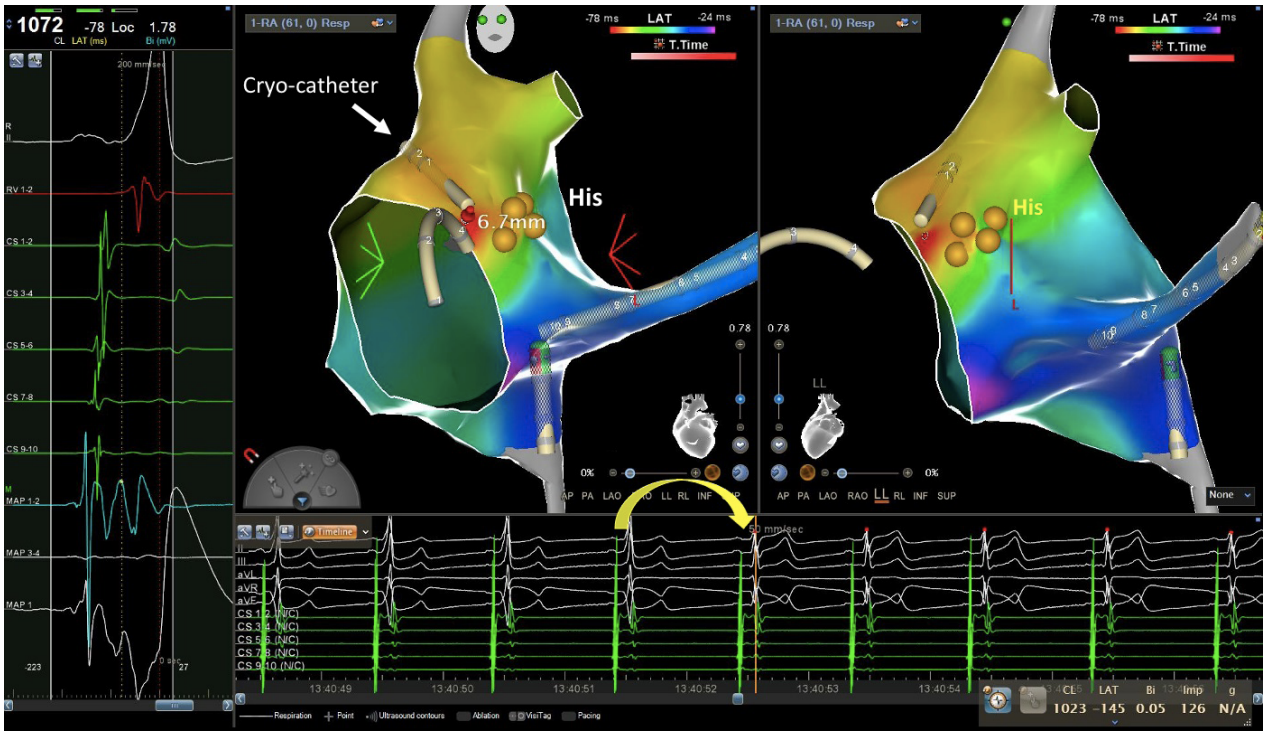
Introduction: Transcatheter radiofrequency (RF) ablation of perinodal accessory pathways (parahisian/midseptal APs) is still challenging especially in young patients due to a high risk for inadvertent atrioventricular block (AVB) requiring permanent pacing. Recently, cryo-ablation (CA) has evolved as an RF alternative, thanks to a safer profile and a better catheter stability.

Purpose: To evaluate the safety, efficacy and outcomes of CA in patients with parahisian/midseptal APs.

Methods: 73 pts undergoing a first ablation of septal APs at our institution were retrospectively analyzed. Among these, we selected 20 patients with a diagnosis of para-hisian/midseptal AP confirmed by EP study (EPS) and 3D-electro-anatomic mapping (EAM), ablated using cryoenergy. Before delivering CA, a cryomapping (CM) at the target AP site was performed at - 30°C using a 6- mm-tip catheter. Successful CM was defined as: (1) loss of delta wave in case of manifest pre-excitation, (2) termination of a sustained AVRT, (3) retrograde conduction block through the AP during ventricular pacing in case of concealed AP. CA was initiated following successful CM, at a temperature of - 75°C for 300 s with an additional 'bonus' CA application (300s). Acute procedural endpoint was permanent complete abolition of AP conduction; long-term clinical endpoint was defined as no recurrence of delta wave or AVRT on serial ECG monitoring at follow-up (1, 6, 12 months).

Results: Fifty-five % were pediatric patients, only 3/20 presented a structural HD. Up to 90% of the patients experienced a symptomatic AVRT, while delta-wave was present at baseline ECG in 19/20 patients. EPS combined with 3D-EAM showed a para-hisian AP in 80% and a mid-septal AP in 20%. Mean distance between His bundle electrogram and AP site was 5.72 mm (4-6.8 mm, Fig. 2). Orthodromic AVRT was induced in all the 20 pts. Mean procedural and fluoroscopy times were, respectively, 103.4 ± 26.4 and 3.15± 1.76 min .
Acute success was achieved in 20/20 patients (100%) with AP block of conduction obtained within few seconds (<10s) after a mean CM number of 3.3 ± 1.2 (Fig. 1). Two patients developed transient 2:1 AV block and 1 patient transient RBBB during CM, with immediate recovery within 20s from CM termination. No peri-procedural complications or permanent AV block were observed. One patient had an early AP re-conduction (6 hours later) and was successfully re-ablated the following day.
During a mean FU of 361 ± 34 days, only two patients (10%) experienced an AVRT recurrence and underwent a second successful CA.

Conclusions: Cryoablation of parahisian and midseptal APs is a safe and effective alternative to RF, resulting in a low risk of recurrence over 12-months-follow-up with no incidence of permanent AV block. A near-zero fluoroscopy approach combining CA and 3D-EAM is feasible and should be considered especially in very young patients with parahisian APs.



20° CONGRESSO NAZIONALE AIAC
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CO.03.06

VERY HIGH POWER SHORT DURATION TRANSCATHETER ABLATION OF ATRIAL FIBRILLATION AND ATYPICAL FLUTTER: PROCEDURAL SAFETY AND EFFICACY ANALYSIS

Enrico Guido Spinoni, Alberto Battaglia, Andrea La Manna, Domenico Caponi, Natascia Cerrato, Marco Gagliardi, Francesco Geuna, Marco Scaglione
SC Cardiologia, Laboratorio di Elettrofisiologia, Asti, ITALY

Background: Pulmonary vein isolation (PVI) represents the cornerstone of atrial fibrillation (AFib) transcatheter ablation. Lately, the very high-power short-duration (vHP-SD) radiofrequency (RF) ablation has been introduced, with the aims for safer, more effective, and faster procedures. The value of vHP-SD in the treatment of left atrial arrhythmias (Paroxysmal and Persistent AFib and left atrial atypical flutter, AtypicalFL), in both first and re-do procedures, have not been yet investigated. 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 ablation of AFib and AtypicalFL from 06/2022 to 12/2023 at Cardinal Massaia Hospital Electrophysiology Laboratory. Electroanatomical mapping of the left atrium was carried out using CARTO3 EAM system (Biosense Webster) using a mapping catheter (Pentaray, Biosense Webster). Ablation was performed according to the patient profile (PVI, PVI + left atrial linear lesions, PVI + cavo-tricuspid isthmus ablation), using QMOD+ for PVI for the whole procedure or for the posterior PV regions, according to the physician choice. Procedural safety and efficacy data were prospectively collected and analyzed.

Results: 264 patients undwerent AFib and AtypicalFL ablation in our EP Laboratory, of which 79 (31.1%) patients underwent vHP-SD ablation and were consecutively enrolled. Mean age was 61.6 years (± 12.2). Main clinical characteristics are summarized in Table 1. 57 patients (72.1%) had history of Paroxysmal AFib, 18 (22.8%) patients of Persistent AFib and 5 (5.1%) of Atypical Flutter. 66 patients had history of previous AFib transcatheter ablation. 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). Before the procedure, cardiac imaging by Cardiac Magnetic Resonance was performed in 63 patients (79.8%). Main procedural data are summarized in Table 2. 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. 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 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. No major procedural adverse events were recorded. Two (0.03%) minor procedural adverse events were recorder (pericarditis without pericardial effusion), with complete resolution after 5 days from the procedure.

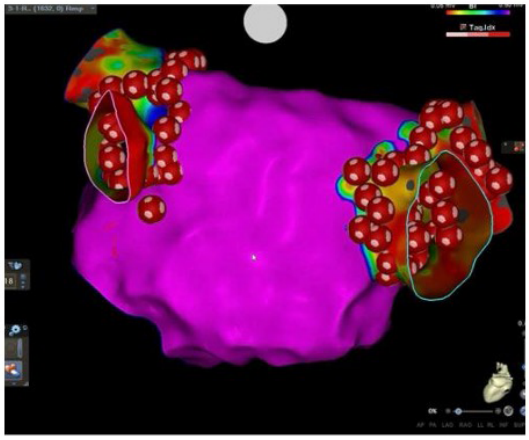
Conclusion: Atrial fibrillation and atypical flutter ablation using vHP-SD technology showed high procedural success rate (100% of PVI), short procedural time (mean skin to skin procedure time 85 minutes) and high safety profile (no major adverse events, 2 minor adverse event).

Table 1

CLINICAL DATA	Patients (n=79)
Age	61.6 ± 12.2
Gender (male)	55 (70.5%)
AFib type - Paroxysmal - Persistent	 - 57 (72.1%) - 18 (22.8%)
Left Atrial Atypical Flutter	5 (5.1%)
Typical Flutter	14 (17.7%)
Re-do Ablation Procedure	13 (16.5%)
Hypertension	41 (52.6%)
Cardiopathy - Ischemic Heart Disease - Valvular - Dilatative	 - 7 (8.9%) - 7 (9.0%) - 4 (5.1%)
Diabetes Mellitus	13 (16.7%)
Ejection Fraction (%)	60.4 ± 9.0

Table 2

PROCEDURAL DATA	Patients (n=79)
Imaging (CMR)	63 (79.8%)
LA volume	80 ± 24.4
Isolated PV at the end of the procedure	79 (100%)
Accessory PV	2 (2.6%)
Sinus Rhythm at the procedure	61 (78.2%)
Electrical cardioversion at the end	4 (5.1%)
Sedation - Deep Sedation - Conscious Sedation - General Anesthesia	 - 11 (13.9%) - 54 (74.7%) - 9 (11.4%)
Procedure time (skin to skin) (minutes)	85 ± 17
Fluoroscopy time (minutes)	2.2 ± 1.0
DAP (median, 25-75% IQR)	5.1 (2 – 9)
Fluoroless procedure	9 (11.5%)



COMUNICAZIONI ORALI 04

MERCOLEDI' 18 SETTEMBRE

SALA ROSSA 2

18:30-19:30

SESSIONE DI COMUNICAZIONI ORALI: TECNOLOGIA

Moderatori: Valeria Carinci (Bologna), Carmelo La Greca (Brescia)

CO.04.01

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

Gianmarco Arabia, Manuel Cerini, Emiliano Calvi, Mariagiulia Bellicini, Raffaele Falco, Paolo Fornaro, Francesca D'Altilia, Antonino Mesi, Anna Giulia Damato, Luca Bontempi, Gianfranco Mitacchione, Antonio Curnis
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Background: The rates of cardiac device-related infection have increased substantially over the past years. Transvenous lead extraction is the standard therapy for such cases. In some patients, however, the procedure cannot be completed through the transvenous route alone. A hybrid surgical and transvenous approach may provide the solution in such cases.

Methods: We present three cases who underwent hybird transvenous and surgical extraction for coronary sinus leads due to infection of CRT-D systems. One patient had an Attain Starfix lead implanted in the coronary sinus. The procedures were performed under local anaesthesia 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), Tightrail hand-powered mechanical sheaths (Spectranetics) and/or Glidelight Excimer Laser sheaths (Spectranetics) were used. The coronary sinus lead could not be retrieved due to extensive fibrosis after utilizing locking stylets and mechanical dilator sheaths in all 3 cases, in addition to rotational mechanical sheaths and Laser sheaths in one case, so the so the patients were referred to surgery. Two patients underwent left mini-thoracotomy and one patient underwent midline sternotomy to extract the remaining CS lead. The target vein was identified and ligated, then the fibrosis around the lead was dissected, this was followed by lead retrieval through the surgical incision. The patient who underwent sternotomy suffered from mediastinitis, which required reoperation and mediastinal lavage. There were no complications in the other two patients. All three patients were reimplanted with a new CRT-D device on the contralateral side after the resolution of infection.

Conclusion: A hybrid surgical and transvenous approach can be complementary in case the transvenous route alone fails to completely extract the coronary sinus lead. The transvenous approach can be used to free the proximal part of the lead, while the distal adhesions can be removed surgically, preferably though a limited thoracic incision.

Keywords: hybrid lead extraction, coronary sinus lead, cardiac resynchronisation therapy defibrillator

CO.04.02

LEADLESS ULTRASOUND-BASED CARDIAC RESYNCHRONIZATION SYSTEM IN HEART FAILURE RESULTS FROM THE SOLVE-CRT RANDOMISED SUB-STUDY AND THE PRIMARY POPULATION PATIENT COHORT

Elisabetta Montemerlo [1], Giovanni Rovaris [1], Christian Butter [2], Christopher Aldo Rinaldi [3-4], Prashanthan Sanders [5], Spencer H Kubo [6], Simon James [7], Imran K. Niazi [8], Tim R Betts [9], Emad Aziz [10], Mauro Biffi [11], Angelo Auricchio [12], Michael R Gold [13], JoAnn Lindenfeld [14], Mary Norine Walsh [15], Jagmeet P. Singh [16]

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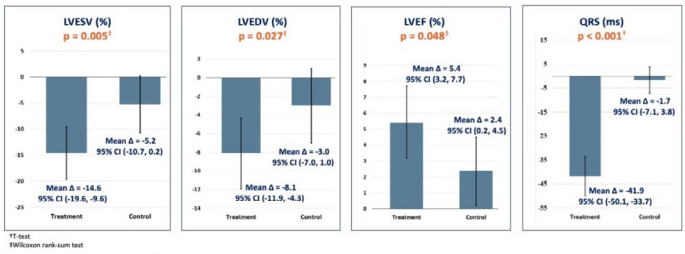
Background: Despite the well-established role of CRT in heart failure, major limitations of CRT include an occasional incidence of unsuccessful coronary sinus (CS) lead placement, one third non-responders in conventional CRT patients and higher complications risk in CRT upgrade procedures. The WiSE® CRT System (EBR Systems, Inc) is designed to overcome these limitations. Prior non-randomized studies with the WiSE System have shown high implant success rates and improvement in LV remodeling and heart failure symptoms.

Objectives: The pivotal SOLVE-CRT study is comprised of two parts: a randomized part and the subsequent single-arm part enrolled during the pandemic. The primary safety endpoint is freedom from Type I (device & procedure-related) complications through 6 months and primary efficacy endpoint is the mean relative (%) change in left ventricular end systolic volume (LVESV) from baseline to 6 months.

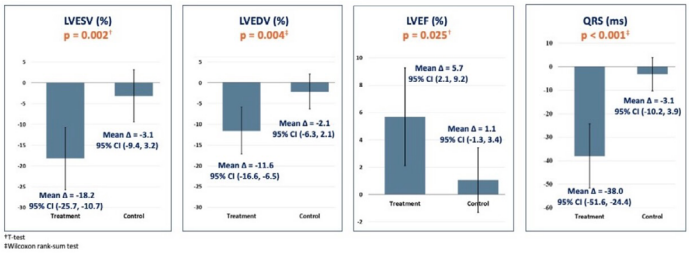
Method: Between Jan. 2018 and Mar. 2020 the randomized part enrolled 108 participants for three indications: non-responders (NR), previously untreated, including acute and chronic lead failures (PU), and high-risk upgrades (HRU). All underwent device implantation and were then randomized in 1:1 ratio to Treatment (system turned ON) or Control (system turned OFF) groups. In the single arm, 75 participants had been enrolled within two indications: PU and HRU. The efficacy analysis of the entire randomised cohort included 99 participants (PU, HRU, NR). For the primary indication sub-population, 57 participants (PU, HRU) were analysed.

Results: Randomized Group: Results were available for 91 of the 99 patients. Significant improvements were seen between the Treatment and Control groups with a mean reduction in LVESV (-14.6% vs -5.2%, p=0.005), mean reduction in LVEDV (-8.1% vs -3.0%, p=0.027), mean increase in LVEF (5.4% vs 2.4%, p=0.048) and mean reduction in QRS (- 41.9ms vs -1.7ms, p=0.001).
Primary Indication Sub-Population Group:
The primary indication sub-population also saw significant improvements between
Treatment and Control group with a mean reduction in LVESV (-18.2% vs -3.1%, p=0.002), mean reduction in LVEDV (-11.6% vs -2.1%, p=0.004), mean increase in LVEF (5.7% vs 1.1%,p=0.025) and mean reduction in QRS (-38.0ms vs -3.1ms, p<0.001).

Conclusion: This pivotal SOLVE-CRT trial demonstrates that leadless, ultrasound-based endocardial pacing for heart failure is feasible and efficacious showing evidence of left ventricular remodelling and electrical response after 6 month in the primary population as well as in the sub-study group.



Graph 1: Efficacy entire randomised population



Graph 2: Efficacy primary indications population

CO.04.03

FEASIBILITY AND EFFICACY OF DEFIBRILLATION LEAD DEFINITIVE IMPLANTATION IN LEFT BUNDLE BRANCH AREA FIRST WORLDWIDE EXPERIENCE

Cosimo Mandurino [1], Michele Scolletta [1], Alessio Angelini [1], Carla Volpe [1], Giovanna Rodio [1], Leonardo Di Gregorio [1], Giovanni Luzzi [1]
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Background: Left bundle branch area (LBBA) pacing is an innovative cardiac pacing technique, that provides physiological stimulation, useful in patients affected by atrioventricular block, and could be an alternative strategy to traditional cardiac resynchronization therapy. Recently, Huybrechts et al. have reported the feasibility of just positioning a standard high-voltage (HV) lead by manually pre-shaped delivery systems to achieve LBBAD. No follow-up data were available.

Aim of the study: This study aimed to assess the feasibility of definitively implanting a traditional HV lead using three-dimensional delivery systems to stimulate the LBBA and the lead performance in 3-month follow-up.

Materials and methods: The study population consisted of consecutive patients referred for an ICD. LBBAD was attempted by exploiting three-dimensional delivery systems to reach the target transseptal location. Acute pacing measurements were collected after HV lead positioning, and defibrillation testing was performed using either patient-tailored (DeFT Response) or fixed-tilt waveform. Speckle tracking evaluation was also performed. A 3-month follow-up was planned to verify electrical parameters. LBBAD was performed in 9 consecutive patients (mean age 69±11 years, 56% male).

Results: The HV lead was successfully implanted in 100% of patients, reaching LBBA in 6 patients at the first attempt and in 3 at the second attempt. LBBA pacing exhibited a mean QRS duration and V6 R-wave peak time of 128±9 ms and 64±12 ms. Acute LBBA pacing threshold, R-wave amplitudes, and pacing/shock impedances were 0.88±0.22 V at 0.5 ms, 8.4±2.8 mV, and 637±210 ohm/ 75±20 ohm. The defibrillation test was successful in 8 patients (test aborted in 1 patient due to respiratory issues during sedation). The mean peak strain dispersion of 31.7ms confirmed global synchrony during pacing. No lead-related complications or alterations in electrical measurements were observed at follow-up.

Conclusion: This study proves the feasibility and efficacy of using three-dimensional delivery tools and traditional HV leads for LBBAD. A larger and long-term evaluation is needed to evaluate the performance of LBBAD implants.

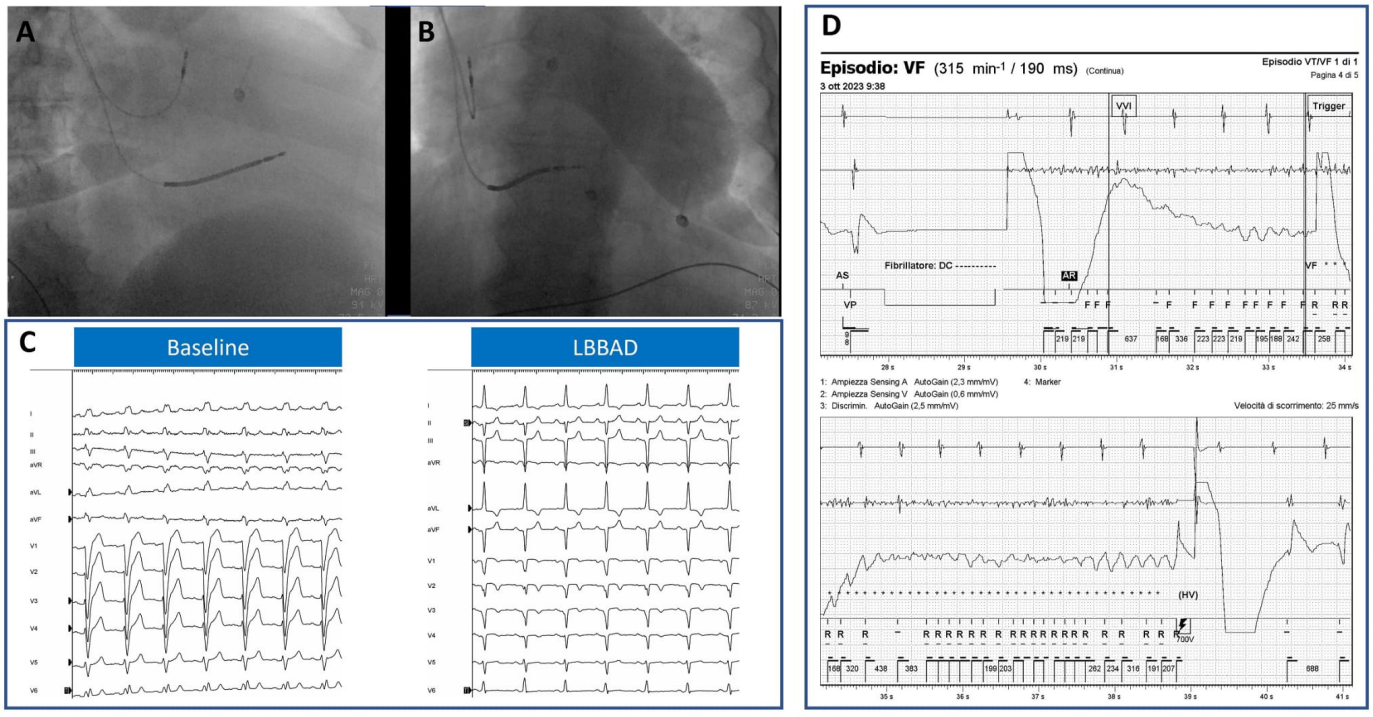

Figure 1: Fluoroscopic angiography, ECGs of the patient #8 **(A,B,C)** and defibrillation testing of the patient #1 **(D)**. **(A, B)** Right anterior oblique (RAO) and left anterior oblique (LAO) lead implantations (left bundle branch area defibrillator [LBBAD]). **(C) (Left)** Baseline ECG with evidence of left bundle branch block (LBBB) and broad QRS (186 ms). **(C) (Right)** ECG during LBBAD pacing with evidence of LBBB correction and QRS narrowing (116 ms). **(D)** Ventricular fibrillation was induced by delivering a single 8 Volt direct current pulse through the high-voltage electrode. The arrhythmia was correctly detected and sinus node rhythm was restored by delivering a single shock at 700 V levering on patient-tailored waveform programming (DeFT Respose).

CO.04.04

APPLICAZIONE DELL'INTELLIGENZA ARTIFICIALE NELLA PREVISIONE DI EVENTI ARITMICI MAGGIORI SULLA BASE DI DATI CLINICI E DI MAPPAGGIO ELETTRO-ANATOMICO DEL VENTRICOLO SINISTRO

Yari Valeri [1], Giovanni Volpato [1], Paolo Compagnucci [2], Quintino Parisi [2], Laura Cipolletta [2], Leonardo D'Angelo [1], Francesca Campanelli [1], Agostino Misiani [2], Antonio Dello Russo [2], Michela Casella [1]
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Introduzione: L'intelligenza artificiale (IA) è una nuova ed emergente frontiera per l'analisi di dati complessi, anche in ambito medico. L'IA può essere utilizzata per analizzare sistematicamente i dati numerici, estratti direttamente dal software, derivanti dal mappaggio elettro-anatomico (EAM).

Obiettivo: L'obiettivo primario del progetto è quello di utilizzare il "machine learning" per identificare potenziali correlazioni tra variabili cliniche, procedurali e di mappaggio del substrato cardiaco con eventi cardiaci aritmici maggiori durante il follow-up.

Materiali e metodi: È stato utilizzato ed analizzato mediante "machine learning" un database di dati clinici e procedurali di 220 pazienti sottoposti a EAM endocardico del ventricolo sinistro. A partire dalle 223 variabili clinico-procedurali l'analisi è stata condotta per le 61 più interessanti e sono stati estrapolati, a partire dal softaware del sistema di mappaggio, i dati numerici dell' EAM.
Sono state esplorate combinazioni di 4 e 5 variabili, ottenendo rispettivamente 487.635 e 5.461.512 combinazioni. I risultati ottenuti da tutte le combinazioni e dai diversi metodi sono stati valutati calcolando l'AUC (parametro che indica la probabilità che la predizione sia nell'ordine corretto). Per ogni paziente sono stati valutati i dati numerici estratti dai file dell'EAM, con particolare attenzione a:
1. L'estensione e la dispersione dei potenziali tardivi (%LatArea).
2. La differenza punto-punto tra il potenziale bipolare e quello unipolare, identificando regioni con elevate differenze tra i due tipi di potenziali (%UniBip).
3. Aree di decelerazione, caratterizzate da potenziali molto precoci e molto tardivi all'interno di un breve intervallo (GradVal).

Risultati: Analizzando i migliori sei modelli di regressione logistica a 4 variabili, notiamo che le variabili più frequentemente correlate con un evento aritmico maggiore durante il follow-up sono "classe NYHA', 'PAPs' e 'GradVal' (AUC dei migliori modelli: 0,96; 0,94; 0,91; 0,90; 0,90; 0,90).
Analizzando i migliori sei modelli di regressione logistica a 5 variabili emerge che le variabili più frequentemente correlate con un evento aritmico maggiore durante il follow-up sono 'NYHA class', 'PAPs', 'GradVal', 'Arrhythmic Storm', 'TAPSE' e '%UniBip' (l'AUC dei migliori modelli: 0,97; 0,93; 0,92; 0,92; 0,92; 0,92).
I dati dell'EAM aggiunti ai dati clinici aumentano il numero di variabili di regressione e la complessità del modello; 'GradVal' e '%UniBip' sembrano avere maggiore rilevanza.

Conclusioni: Lo studio utilizza con successo algoritmi di "machine learning" per l'identificazione di variabili per la previsione di eventi aritmici maggiori durante il follow-up. L'analisi dei dati numerici estratti dai software ingegneristici attraverso l'intelligenza artificiale consente la stratificazione del rischio aritmico e permettere un'analisi più approfondita dei dati dell'EAM. L'applicazione dell'intelligenza artificiale consente di analizzare una grande quantità di dati informatici che non sarebbero analizzabili dalle sole capacità umane. Il continuo perfezionamento e l'espansione del campione possono migliorare le capacità predittive dei modelli per le applicazioni cliniche.

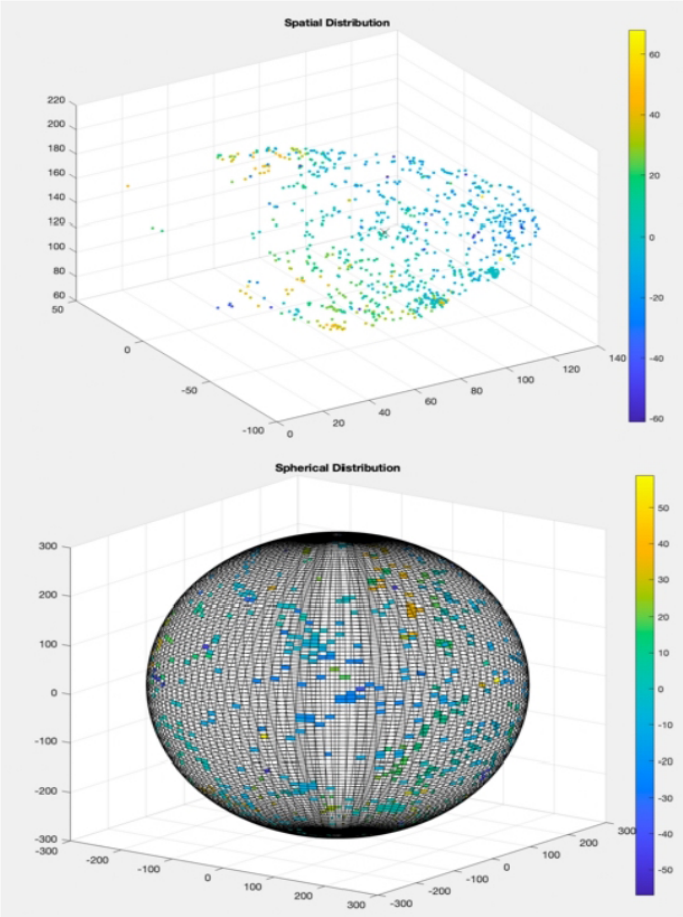

Fig. Distribuzione spaziale e sferica dei punti dell'EAM ricavati direttamente dall'analisi dei dati numerici del software

CO.04.05

GRADIMENTO DEI PAZIENTI SULL'UTILIZZO DELLA SMARTPHONE APP PER LA GESTIONE REMOTA DEL PAZIENTE CON SCOMPENSO E DISPOSITIVO CARDIACO IMPIANTABILE

Matteo Ziacchi [1], Simone Taddeucci [2], Jacopo Imberti [3], Daria Liberto [4], Giulio Molon [5], Luigina Viscardi [6], Miguel Viscusi [7], Mauro Biffi [1], Amato Santoro [2], Martina Omati [4], Alessandro Costa [5], Luca Bontempi [6], Agostino Mattera Iacono [7], Giuseppe Boriani [3]
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Introduzione: Nei pazienti con scompenso cardiaco (SC) e dispositivo cardiaco impiantabile (DCI) la raccolta di informazioni riguardanti la sintomatologia e l'aderenza alla terapia, insieme ai parametri fisiologici registrati dai DCI, può risultare preziosa al fine di individuare precocemente un deterioramento clinico e prevenire il ricovero. Un'applicazione per smartphone (APP) disegnata per consentire ai pazienti con SC l'invio settimanale di informazioni sulla loro sintomatologia e sulla compliance alla terapia, è stata proposta a 495 pazienti real-world, e si è rivelata uno strumento utilizzabile e accettato dalla maggioranza, anche se con una diminuzione dell'aderenza all'utilizzo nel tempo.

Obiettivi: Valutare il gradimento del paziente o del suo caregiver (nel caso in cui il paziente non sia in grado di usarla da solo) relativamente all'utilizzo dell'APP.

Metodi: Dei 10 ospedali italiani che tra Gennaio2021- Dicembre2023, hanno proposto ai pazienti con SC e DCI l'utilizzo dell'APP, 7 hanno aderito alla valutazione del gradimento dell'utilizzatore. Tra Dicembre2023 e Marzo2023 i pazienti (o i loro caregiver) che avevano ricevuto la APP da almeno 3 mesi sono stati intervistati tramite utilizzo di un questionario di 17 domande somministrato per via telefonica o durante le visite di follow-up ambulatoriale programmate.

Risultati: Dei 319 pazienti con SC e DCI (67±9 anni, 80% maschi, 26% NYHA III-IV, FEVS 35±10%) che avevano ricevuto la APP ed erano ancora nel progetto a Dicembre 2023, 250 (78%) hanno risposto al questionario o hanno fatto rispondere il loro caregiver utilizzatore della APP. Tra coloro che hanno scaricato e attivato l'APP in autonomia, l'89% concorda che sia semplice farlo. L'84% ritiene che sia semplice utilizzare la APP e il 78% che il tempo necessario all'invio settimanale dei diari sia accettabile. Le notifiche automatiche che ricordano l'invio settimanale dei dati sono ritenute utili per il 75% di chi le riceve. Benché l'89% ritenga di aver ricevuto sufficienti informazioni sulla App e il suo utilizzo, solo il 78% ha capito effettivamente a cosa serva. Il 68% degli intervistati ritiene l'APP utile, ma solo per il 50% di essi si sono sentiti più sicuri grazie all'utilizzo dell'APP. Il 55% degli intervistati ad un certo punto si è dimenticato di avere la APP, mentre il 40% la ritiene un peso. Il 41% dei pazienti ha bisogno di supporto dal caregiver per usare l'APP e al 49% di loro non piace doverlo fare. Ad ogni modo, il 66% degli intervistati è d'accordo a continuare ad utilizzare la APP settimanalmente.

Conclusioni: Per i pazienti con SC e DCI o i loro caregiver l'utilizzo di un'APP per inviare informazioni sulla sintomatologia e sulla compliance alla terapia prescritta è semplice e, per la maggioranza, utile, tanto che il 66% è disposto a continuare ad utilizzarla. L'aderenza all'utilizzo della APP può diminuire col tempo e le notifiche introdotte recentemente per ovviare a questa problematica sono ritenute utili dalla maggioranza.

CO.04.06

EVALUATING SLEW RATE AS A PREDICTOR FOR OPTIMAL LEAD FIXATION IN TRANSVENOUS CARDIAC IMPLANTABLE DEVICES: A PROSPECTIVE MULTICENTER STUDY

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[2] *UOS di Aritmologia Interventistica, Cardiologia, Arcispedale Santa Maria Nuova, Reggio Emilia, ITALY*
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Background: With the increasing use of active fixation leads in transvenous pacemaker and implantable cardioverter-defibrillator (ICD) implantations, selecting the optimal pacing site remains crucial. Standard electrical testing, including capture thresholds, sensing amplitude, and lead impedance, serves as the primary approach. Confirming the adequacy of active fixation lead placement should also involve assessing the presence of current of injury (COI), which, however, has shown limited utility in predicting long-term lead performance. Another important electrical parameter dependent on the quality of the lead/myocardium interface is the slew rate (SR), which has been poorly investigated. Our aim is to explore the association of acute SR of active fixation leads with 12-month sensing amplitude and to investigate its predictive value for long-term lead-related complications. A similar analysis will also be performed for COI measured during implantations.

Study Design: The Slew Rate Registry is a multicentric prospective observational study enrolling patients who underwent pacemaker, ICD with or without cardiac resynchronization function implantation in four Italian centers (Ospedale di Fidenza, Ospedale Sant'Anna Ferrara, Arcispedale Santa Maria Reggio Emilia, and Ospedale di Piacenza). During the placement of active fixation leads, all electrical parameters, including SR, will be measured before and after lead screwing. COI parameters will also be assessed after lead fixation. Acute measurements will be performed with the 2290 PSA module of the Encore 29901 Medtronic programmer.
Standard electrical parameters will then be measured at 1-month and 12-month follow-up visits. Throughout the study, all lead-related complications will be collected. A total of 568 patients will be enrolled in the study. The target sample size was calculated to test a significant correlation between acute SR and 12-month sensing amplitude with a type I error of 0.05, an 80% statistical power, and a 10% drop-out rate, using a linear regression model.

Study status: Enrollment commenced in September 2022, and as of March 2024, a total of 243 patients have been enrolled. Enrollment completion is expected by September 2025. An interim analysis for the primary study objective will be performed at half of the target sample size (June 2024). The enrolled cohort so far has a mean age of 77±12 years with a 31% prevalence of women. The mean left ventricle ejection fraction is 51%±13%, with atrial fibrillation present in 20% of patients. The main indications for device implantation are atrioventricular block (36%), sick sinus syndrome (15%), primary prevention of sudden cardiac death (14%), and atrial fibrillation (13%). Thirty-four percent of patients were diagnosed with hypertensive heart disease, while 33% had a structurally normal heart. Additionally, 22% were found to have ischemic heart disease, 11% had dilated cardiomyopathy, and 2% were diagnosed with a genetic disease.

Conclusions: The Slew Rate registry is a multicentric prospective observational study aimed at exploring the role of SR measured during pacemaker/ICD implantation in predicting the chronic performance of active fixation leads. Preliminary observations are expected by June 2024.

COMUNICAZIONI ORALI 05

GIOVEDI' 19 SETTEMBRE

AUDITORIUM

17:30-18:30

SESSIONE DI COMUNICAZIONI ORALI: ARITMOLOGIA CLINICA

Moderatori: Aniello Viggiano (Napoli), Paolo Zappulla (Catania)

CO.05.01

CLINICAL PROFILE OF PATIENTS UNDERGOING PERCUTANEOUS STELLATE GANGLION BLOCK FOR ELECTRICAL STORM AND ASSOCIATION WITH ANTIARRHYTHMIC EFFICACY

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[3] *AOU Città della salute e della scienza, Ospedale Molinette, dipartimento di anestesia, Torino, ITALY*

[4] *Università di Torino, dipartimento di scienze chirurgiche, cardiochirurgia, Torino, ITALY*

Background: Percutaneous stellate ganglion block (PSGB) usage for patients with refractory ventricular arrhythmias (VAs) in form of electrical storm (ES) in quickly expanding. The clinical profile of patients and the potential association with the antiarrhythmic efficacy of the procedure are mostly unexplored.

Purpose: to better characterize clinical profile and potential association with antiarrhythmic efficacy of patients undergoing PSGB for ES.

Methods: Patients undergoing PSGB for ES in our Center from 2/2021 to 2/2024 were enrolled; all the dynamic variables were evaluated in a per procedure analysis.

Results: 45 patients (93% male, 64 ± 10 years) received a total of 80 PSGB performed with the lateral, ultrasound (US) guided technique; most PSGB consisted of a single bolus anesthetic injection (lidocaine+ropivacaine), 26% in an additional continuous infusion, mostly with ropivacaine. All procedures except for 3 in a single patient who had previously received left cardiac sympathetic denervation, were performed on the left side. Most of the patients (60%) suffered ischemic cardiomyopathy (CMP), including 10 with an acute coronary syndrome; the rest had non-ischemic CMP; 60% had an ICD. The type of VAs was ventricular tachycardia (VTs) only in 86% of the procedures (cycle length 404 ± 143 msec), VT and VF in 10% and VF only in 3 (4%). Most PSGB (81%) were performed in the setting of impending or manifest cardiogenic shock (SCAI classification B or more), including 20% with sepsis. Cardiac US performed before (within 12 hours) each PSGB showed a severely depressed left ventricular (LV) function (mean LVEF 22 ± 10%, mean LV outflow tract velocity time integral 12 ± 4 cm), calculated at a mean heart rate of 81 ± 16 bpm. Mean LVEDV was 252 ± 104 ml, 79% had mitral regurgitation (MR) >= 2+/4+ (including 39% severe MR), 50% had >= moderate diastolic dysfunction, 29% had right ventricular dysfunction (mean fractional areal change 33 ± 7%). Most cases (75%) experienced a complete VAs suppression (sustained or treated) in the 12 hours after PSGB; only 3/80 cases required additional urgent antiarrhythmic strategies (intra-aortic ballon pump in one case, urgent pacing in another one, urgent revascularization in the last one). None of the assessed clinical or echocardiographic characteristics was significantly associated with VT cycle length or the response to PSGB. Only 1 (1%) major complication occurred (respiratory arrest), that was quickly and effectively treated with lipid emulsion.

Conclusions: PSGB in our Center was mostly performed in the setting of primary impending or manifest cardiogenic shock with severely impaired cardiac function, with an excellent safety profile. None of the assessed clinical or echocardiographic variables were associated with response to PSGB. Our data, despite preliminary and requiring confirmation, suggests always considering PSGB in the urgent/emergent setting independently from patients' characteristics.

CO.05.02

THE TRIGGERS OF SITUATIONAL SYNCOPE DO NOT INFLUENCE THE HUTT RESPONSE AND PROGNOSIS

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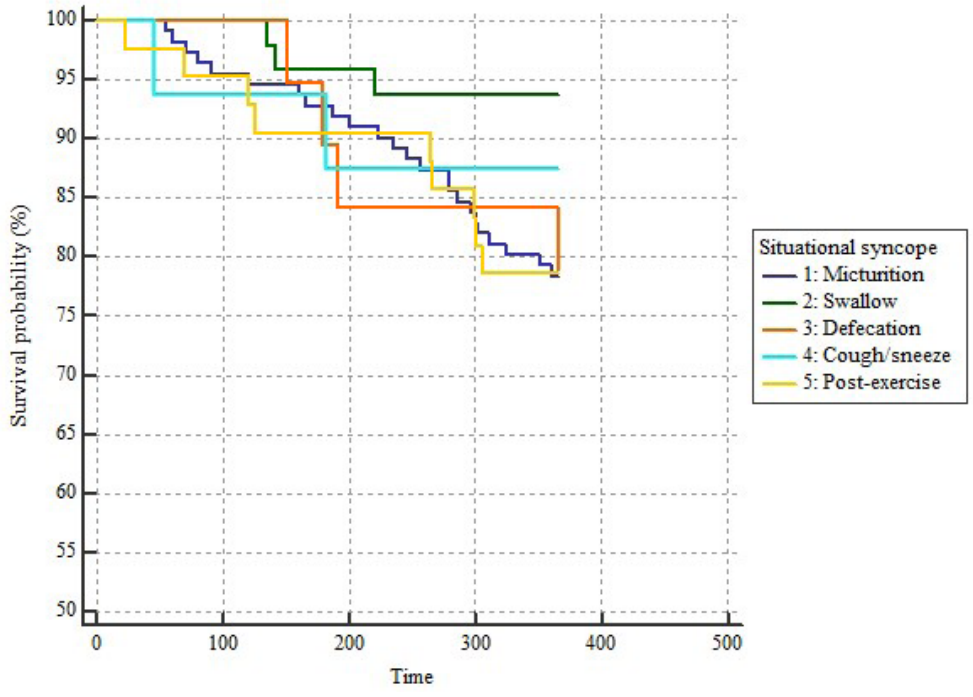
Situational syncope (SS) is a form of reflex syncope following specific triggers/circumstances (micturition, swallow/defecation, cough/sneeze, post-exercise, laughing, brass instrument playing). The head-up tilt test (HUTT) has high sensitivity, about 71.1%, among patients with SS; moreover, it is useful 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.
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. The study population consists of 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). In conclusion, SS is a homogeneous syndrome with different triggers. We previously showed that the type of response and positivity rate of HUTT in patients with SS is like that observed in patients with vasovagal syncope (2). In this paper we showed that there was also no difference among the different types of SS. Putting together the results of the 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.



CO.05.03

TO PACE OR TO ABLATE, THAT IS THE QUESTION: UN CASO DI SINCOPE CARDIOINIBITORIA TRATTATO CON CARDIONEUROABLAZIONE.

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La cardioneuroablazione (CNA) offre una strategia terapeutica per pazienti giovani, selezionati, con anamnesi di severe sincopi vaso vagali cardioinibitorie. La procedura è una ablazione con radiofrequenza dei plessi localizzati nel grasso epicardico atriale, individuati mediante il caratteristico potenziale. Le attuali indicazioni alla CNA sono le bradiaritmie funzionali dovute a ipertonia vagale con sintomi refrattari al trattamento medico.

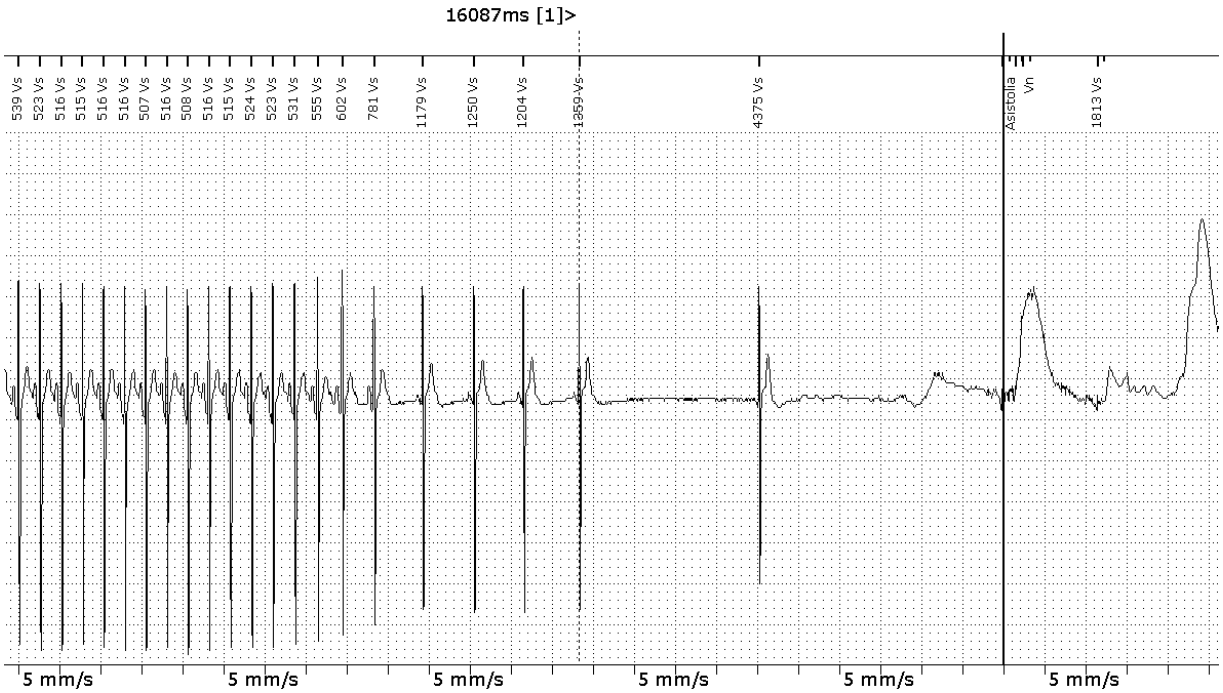
La paziente oggetto del caso ha 16 anni. Afferisce al nostro ambulatorio di aritmologia per sincopi ricorrenti (5 nell'ultimo anno). Gli episodi sono stati tutti preceduti da brevi prodromi vagali ma l'ultimo, il più brutale per clinica, è esitato in un trauma cranico.

L'anamnesi personale e familiare è muta. L'elettrocardiogramma e l'ecocardiogramma sono normali. E' stata sottoposta studio elettrofisiologico endocavitario con evidenza di normale automatismo sinusale e del nodo atrioventricolare, assenza di tachiaritmie inducibili in basale e dopo infusione di isoprenalina. E' stata quindi sottoposta ad impianto di Loop recorder. Pochi mesi dopo ha avuto due episodi sincopali ravvicinati, entrambi nel passaggio dalla posizione supina a quella eretta. Interrogato il device si evidenziavano episodi di asistolia della durata di 9 e 12 secondi.

Dopo ampio e dettagliato colloquio la giovane paziente e i familiari sono stati edotti circa le indicazioni alla CNA (attualmente off lable), il beneficio atteso e le possibili complicanze annesse. Sono state inoltre presentate le ulteriori opportunità terapeutiche disponibili come il pacing definitivo. Abbiamo quindi sottoposto la paziente alla CNA.

E' stato eseguito mappaggio elettroanatomico ad alta densità dell'atrio sinistro (raggiunto mediante cateterismo transettale) e delle vene polmonari mediante catetere multielettrodo. Evidenza di potenziale a quadruplice componente indicativo di presenza di ganglio parasimpatico nei pressi delle vene polmonari, nelle sedi abituali (4). In particolare a livello del ridge anteriore ed inferiore della vena polmonare superiore di sinistra, il ridge anteriore della vena polmonare inferiore di sinistra, il ridge anteriore della vena polmonare inferiore di destra. Erogando sui gangli si otteneva un rallentamento della frequenza cardiaca. Le erogazioni puntiformi di radiofrequenza sono state guidate da indice di lesione (Impedence drop > 20 ohmm). Al termine si è ottenuto uno stabile incremento della frequenza cardiaca. Ad un anno di follow-up la paziente non ha avuto recidive ed il controllo del loop recotder non ha evidenziato ulteriori episodi bradiaritmici.

La CNA è un potenziale approccio per i sintomi associati all'ipervagotonia. Va considerato che la maggior parte degli studi hanno FUP brevi, protocolli di ablazione ed endopoint differenti fra loro. Tuttavia, il dato concorde è la significativa riduzione della sintomatologia a breve-medio termine, soprattutto nei pazienti<50 aa. (5)



CO.05.04

UNA STRATEGIA DI CONTROLLO DEL RITMO SI ASSOCIA AL MIGLIORAMENTO DELLE PRESTAZIONI FISICHE NEI PAZIENTI ANZIANI CON FIBRILLAZIONE ATRIALE PERSISTENTE

Camilla Cagnoni [1], Giulia Spanalatte [1], Emanuele Santamaria [1], Riccardo Franci Montorzi [1], Elisa Berni [1], Agostino Virdis [2], Igor Diemberger [3], Claudia Di Serio [1], Arianna Tariello [1], Elisa Catalano [1], Andrea Taddei [1], Cristina Contiello [1], Michele Biagioli [1], Giada Alla Viligiardi [1], Andrea Ungar [1], Niccolò Marchionni [1], Stefano Fumagalli [1]

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Introduzione: La Fibrillazione Atriale (FA) è un marker di fragilità cardiovascolare ed è associata alla progressione della disabilità. Le evidenze attuali suggeriscono che la terapia anticoagulante orale può aiutare a prevenire il declino cognitivo e alcune delle alterazioni che portano alla perdita di autonomia e alla riduzione dell'omeostasi. Non si sa molto sugli effetti di una strategia di controllo della frequenza o del ritmo della FA per ridurre le alterazioni che portano, attraverso una diminuzione delle prestazioni fisiche, alla fragilità e alla disabilità.

Obiettivi: Lo scopo di questo studio è stato quello di valutare gli effetti funzionali della cardioversione elettrica (CVE) in pazienti anziani con FA persistente.

Metodi: Tutti i soggetti sono stati valutati al basale e al follow-up (FU) utilizzando la Valutazione Multidimensionale Geriatrica, che consiste in una misura delle prestazioni cognitive (Mini-Mental State Examination - MMSE), dei sintomi depressivi (Geriatric Depression Scale - GDS) e delle prestazioni fisiche (Short Physical Performance Battery - SPPB). L'SPPB è espressione anche di una condizione di fragilità ed esplora tre diversi ambiti: equilibrio, velocità di cammino e la resistenza-forza. Il punteggio varia da 0 a 4 (migliore prestazione) per ciascuno dei compiti, con un punteggio totale che va da 0 a 12.

Risultati: Complessivamente, sono stati arruolati 113 pazienti (età: 77±7 anni; uomini: 65,3%; CHA2DS2-VASc: 3,8±1,5). Al FU (durata mediana: 6 mesi; 25-75 percentile: 2,4-10,8 mesi), il ritmo sinusale (RS) è stato osservato in 66 casi (58,4%). La persistenza del RS era direttamente associata alla terapia con amiodarone (p=0,019) ed inversamente al diabete (p<0,001) e alla pressione arteriosa sistolica basale (B) (p=0,040). Non sono state osservate differenze correlate al ritmo per quanto riguarda l'età, il sesso e i valori basali di MMSE, GDS e SPPB. Tuttavia, l'andamento del punteggio totale SPPB differiva in base al ritmo al FU, con i pazienti in RS che ottenevano risultati significativamente migliori rispetto a quelli con una recidiva di FA (RS - B: 9,3±2,4 vs. FU: 10,2±1,9; FA - B: 8,9±2,5 vs. FU: 9,0±2,6; p per l'effetto ritmo=0,012). All'analisi multivariata, la persistenza della RS era indipendentemente associata a un aumento del punteggio SPPB di 0,70±0,27 (p=0,010). La rigidità arteriosa, la terapia con statine e insulina e l'uso di Ca-antagonisti erano negativamente correlati al miglioramento delle prestazioni fisiche.

Conclusioni: Al FU, nei pazienti anziani con FA persistente al basale, il mantenimento della RS dopo CVE è stato associato a un aumento di SPPB, una misura della performance fisica inversamente correlata alla fragilità. Di conseguenza, nei pazienti sintomatici una strategia di controllo del ritmo potrebbe rivelarsi uno strumento utile per ostacolare la progressione della disabilità associata allo sviluppo di aritmie.

CO.05.05

ATRIAL FIBRILLATION, SLEEP AND DAILY ACTIVITIES IN OLDER PATIENTS

Michele Biagioli [1], Emanuele Santamaria [1], Giulia Spanalatte [1], Camilla Cagnoni [1], Arianna Tariello [1], Cristina Contiello [1], Elisa Catalano [1], Claudia Di Serio [1], Elisa Berni [1], Giada Alla Viligiardi [1], Agostino Virdis [2], Igor Diemberger [3], Niccolò Marchionni [4], Stefano Fumagalli [1]
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Background: Atrial fibrillation (AF) is a very common condition among older patients. A connection between the arrhythmia and disability has recently been shown. Therefore, there is a close link between AF and the central nervous system. It's becoming increasingly evident how adequate sleep physiology is a crucial element for optimal cardiovascular and global health. In older patients, sleep disorders are very common due to an alteration of its structure and the increased prevalence of several associated diseases. The aim of this study was to evaluate the duration of daily activity and sleep periods in older patients with persistent AF undergoing electrical cardioversion (ECV).

Methods: All the 105 subjects undergoing elective ECV were evaluated using Geriatric multidimensional assessment to evaluate neurocognitive performance (Mini-Mental State Examination), depressive symptomatology (Geriatric Depression Scale) and functional performance (Short Physical Performance Battery). IL-6 concentrations were determined by ELISA techniques. A poly-parametric recording lasting at least 4 days was made using RootiRx, which captured ECG data, arterial pressure values, daily and nocturnal activities, with sleep duration and its structure. Specifically, we considered the time spent standing in the 24 hours (TS), the total time spent in bed (TBT), the total time spent sleeping (TST) and its efficiency, the duration of light, deep and REM sleep, the length of latency and of micro-awakenings-WASO, and, finally, the number of times the subject got up during the night.

Results: TS was 8:47 hours. In contrast, TBT was 9:24 hours. TST was 7:50 hours, similar to that of the general population of the same age. Light sleep duration was longer than expected (68.4+2.1 vs. 50-55%, $p<0.001$), while deep sleep and REM sleep were significantly shorter (REM sleep: 13.7+7.0 vs. 20%; $p<0.001$; Deep sleep: 17.7+8.1 vs. 25%; $p<0.001$). In multivariable analysis, sleep efficiency (TBT/TST; 83.9 +7.0%) was inversely correlated with its latency, WASO, presence of COPD, Ankle Brachial Index values, and iron concentrations. Light sleep and deep sleep, but not REM sleep, were associated with overall sleep efficiency. REM sleep was longer in patients with diabetes, taking psychotropic drugs, and inversely related to time spent standing. The number of times a patient got up during the night (3.0+2.7 times), a variable potentially correlated with the incidence of falls, decreased with increasing light sleep and increased with the duration of WASO, with the use of psychotropic drugs, and with a higher performance on the SPPB balance test.

Conclusions: In elderly patients with persistent AF, sleep is qualitatively different from what is usually observed in older subjects of the same age. Its efficiency correlates with some specific components such as latency and micro-awakenings, and some diseases and markers of the inflammatory profile. The number of times a subject gets up over the course of the night is associated with the duration of light sleep and micro-awakenings as well as with the use of some drugs and with the functional performance. Specific studies are needed to evaluate the effects of strategies for the treatment of AF on daily activities and sleep length with its phases.

CO.05.06

MAGNETIC RESONANCE-CONDITIONAL CARDIAC IMPLANTABLE ELECTRONIC DEVICES: AN ITALIAN PERSPECTIVE ON THE PREVALENCE OF MIXED-BRAND SYSTEMS OVER TIME

Davide Saporito [1], Eduardo Celentano [2], Claudia Amellone [3], Gabriele Zanotto [4], Matteo Baroni [5], Gennaro Miracapillo [6], Mauro Biffi [7], Valeria Calvi [8], Lorenzo Spighi [1], Antonio Curnis [9], Carmine Ennio Pisano' [10], Giovanni Rovaris [11], Gaetano Senatore [12], Fabrizio Caravati [13], Francesca Notarangelo [14], Massimiliano Marini [15], Irene Baldassarre [16], Daniele Giacopelli [16], Alessio Gargaro [16], Massimo Giammaria [3]

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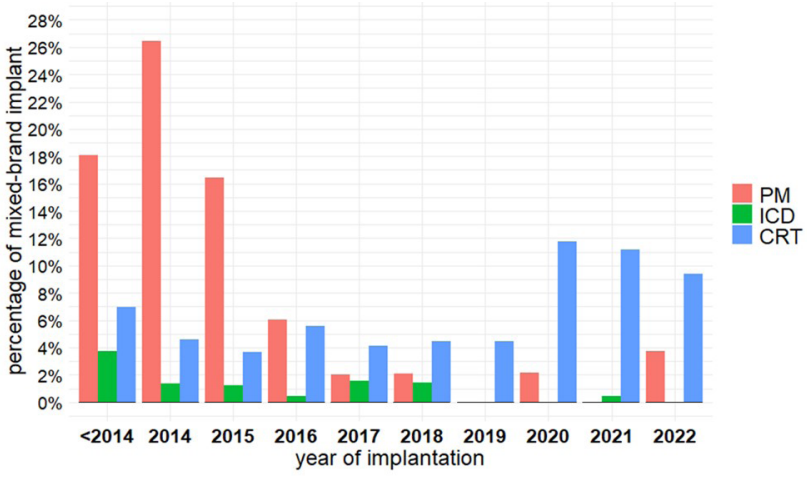
Introduction: The historical restriction of magnetic resonance imaging (MRI) for patients with cardiac implantable electronic devices (CIEDs) has been lifted by certified MRI-conditional systems in recent years. Mixed-brand CIED systems consisting of a generator from one manufacturer and at least one lead from another manufacturer are not certified for MRI. We evaluated the temporal trend in the prevalence of mixed-brand systems in the era of MRI-conditional systems.

Methods: Data were analyzed on 5853 CIEDs implanted de novo between 2012 and 2022 in 81 Italian centers linked to the nationwide Home Monitoring Expert Alliance network. The percentage of mixed-brand implants was calculated by device type (pacemaker, implantable cardioverter-defibrillator [ICD], cardiac resynchronization therapy [CRT] device) and over time.

Results: A mixed-brand system was implanted in 4.1% (95% CI, 3.6%-4.6%) of analyzed patients or, by device type, in 4.5% (3.5%-5.7%) of pacemaker patients, 1.1% (0.7%-1.7%) of ICD patients, and 6.8% (5.7%-7.9%) of CRT pacemaker/defibrillator patients ($p<0.001$). Prevalence of mixed-brand implants exhibited significant temporal fluctuations, first declining from 6.6% (2012-2014) to 1.3% (2019), and then increasing to 5.1% (2022). Temporal changes (Figure) were statistically significant for pacemakers ($p<0.001$) and CRT devices ($p=0.001$), but not for ICDs ($p=0.438$).

Conclusions: In the decade between 2012 and 2022, mixed-brand CIED systems were more prevalent in patients treated with pacemakers and CRT devices than in ICD recipients. A decline in the prevalence of mixed-brand systems was observed after the introduction of MRI-conditional systems, reaching a minimum in 2019, followed by a progressive increase in the subsequent years.



COMUNICAZIONI ORALI 06

GIOVEDI' 19 SETTEMBRE

SALA ITALIA

17:30-18:30

SESSIONE DI COMUNICAZIONI ORALI: DEVICE IMPIANTABILI

Moderatori: Antonino Mignano (Palermo), Miguel Viscusi (Cesena)

CO.06.01

NON SOLO FIBRILLAZIONE ATRIALE, RISCONTRO DI BRADIARITMIE IN PAZIENTI CON ICTUS CRIPTOGENETICO PORTATORI DI LOOP RECORDER IMPIANTABILE

Paola Paffoni, Stefano Maffè, Luca Bergamasco, Emanuela Facchini, Eleonora Prenna, Sara Ariotti, Stefano Ticozzi, Annamaria Paino, Pierfranco Dellavesa
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Background: I registratori ECG loop recorder impiantabili (ILR) possono essere usati per rilevare la fibrillazione atriale occulta (AF) in pazienti con ictus criptogenetico e in particolare nell' ictus embolico di origine indeterminata (ESUS). La collaborazione tra cardiologo e neurologo e' diventata sempre più stretta. Sono in corso studi e registri per la valutazione della presenza di AF o altre aritmie. In letteratura l'incidenza di AF e' di circa il 8-28% con rischio di recidiva di ictus in corso di terapia antiaggregante del 4,5% ad un anno. ESUS è un ictus fortemente invalidante con alto tasso di mortalità. Non è stata stabilita alcuna pratica standard per quanto riguarda la durata del monitoraggio ECG continuato in questi pazienti e sono in corso studi sull'utilizzo di terapia anticoagulante versus antiaggregante.

Materiali e metodi: In collaborazione con la Divisione di Neurologia abbiamo valutato e sottoposto a impianto di ILR i pazienti affetti da ictus criptogenico o ESUS da gennaio 2022 a marzo 2024 per il rilevamento di AF occulta o altre aritmie e li abbiamo seguiti in follow-up con monitoraggio remoto. Prima dell'impianto tutti i pazienti erano stati sottoposti ai protocolli raccomandati per l'individuazione delle cause dell'ictus mediante tomografia computerizzata o risonanza magnetica cerebrale; vi era assenza di stenosi > 50% dei vasi extra e intracranici, assenza di fonti cardioemboligene maggiori (AF o flutter, trombosi ventricolare, grave disfunzione ventricolare sinistra con frazione d'eiezione < 30%, endocardite infettiva) arterite, dissezione vascolare, vasospasmo.

Risultati: Sono stati sottoposti a impianto di ILR 30 pazienti di cui 17 uomini e 13 donne, età media 70 ±11 anni, 26 stroke e 4 TIA. Il follow-up medio è stato di 20 ± 11 mesi. Sono state rilevate tachiaritmie atriali in 9 pazienti (30 %). In 13 pazienti (43%) sono stati registrati episodi di arresto sinusale di cui 8 (26%) hanno mostrato pause diurne > 6 secondi che hanno richiesto impianto di pacemaker permanente bicamerale; 3 dei pazienti cui è stato impiantato un pacemaker avevano anche AF (10%). In 3 pazienti le pause erano brevi e notturne e sono rimasti in follow-up. Non sono state rilevate aritmie ventricolari. In 6 pazienti (20 %) e' stata avviata terapia anticoagulante orale visto il riscontro di episodi di fibrillazione atriale di lunga durata o di elevata frequenza.

Conclusioni: Il monitoraggio con ILR si conferma utile nello studio del paziente con ictus criptogenico. La nostra casistica con il limite della numerosità e del follow-up non molto lungo mostra dati in linea con quelli presentati in letteratura. Sovrapponibile l'incidenza di AF ma decisamente piu' alta l'incidenza di bradiaritmie che hanno richiesto impianto di pacemaker per malattia aritmica atriale bradi-tachi o arresto sinusale. Il dato è interessante e molto utile nel percorso terapeutico del paziente e per ridurre il rischio di recidiva di ictus che appare una problematica di grande rilievo visto impatto personale, economico e sociale.

CO.06.02

OUTCOMES OF LEADLESS PACEMAKER IN CHRONIC KIDNEY DISEASE PATIENTS: REAL-WORLD DATA FROM THE I-LEAPER REGISTRY

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Background: Chronic kidney disease (CKD) represents a major risk factor for patients requiring transvenous pacemaker (TV-PM), resulting in a high rate of operative complications and PM-related infection rate (21.9% and 12.5%, respectively), with both complications proportioned to the severity of CKD. Moreover, TV leads represent an important concern for end-stage CKD patients, often needing vascular access patency for renal replacement therapy. In this setting leadless pacemakers (LPMs) represent an attractive alternative for the lower device-related infection rate and the absence of TV leads. To date, limited data on LPM safety and efficacy profile in CKD patients are available.

Purpose: to assess operative and long-term safety and efficacy of LPMs implantation across different stage of CKD patients in the real-world setting.

Methods: Consecutive patients who underwent LPM implantation in 12 European and USA centers joining the i-LEAPER registry were retrospectively enrolled. CKD stage was assessed according to CKD-EPI equation for eGFR. Patients with CKD stage G3a/G3b (N=245) and stage G4/G5 (N=67) were compared with patients with normal kidney function (NKF) (N=867). The primary safety endpoint was LPM-related major complications rate at implant and during follow-up (FU). Additionally, the rate of patients showing high pacing threshold (pacing threshold [PT] >1V@0.24ms) was compared between groups.

Results: 1179 patients were enrolled and followed for a median of 33 [IQR 24-47] months. When compared with the NKF group, patients with CKD stage G3a/G3b and CKD stage G4/G5 showed a higher burden of cardiovascular comorbidities. The choice of a LPM was mainly due to vascular concern in the CKD stage G4/G5 group, while a perceived highest infective risk was reported in CKD stage G3a/b group (Table 1). Major complication rate at implant and during FU did not differ between groups, regardless of renal impairment stage (Table 2). All-cause mortality incidence resulted higher in CKD stage G4/G5 group when compared with NKF group (17.9% vs 6.8%; HR 4.24; 95%CI 4.25-7.94, p<0.001) (Figure 2). The rate of patients with PT>V1@0.24ms during FU did not differ between groups, not exceeding 13.8%, and therefore remaining consistent with historical data for LPM (Figure 1).

Conclusion: In the real-world setting, LPM showed a remarkable safety and efficacy profile in CKD patients regardless of renal impairment stage that was comparable to NKF population. This result is significant considering that patients with advanced stages of CKD are at high risk for adverse events related to conventional PMs. LPM should be considered as first choice in CKD patients requiring a PM

Table 1

	NKF N=867	CKD Stage G3a/b N=245	P †	CKD Stage G4/G5 N=67	P §
Male, N (%)	604 (69.7)	115 (46.9)	**<.001**	39 (58.2)	*0.056*
Age-Y, median [IQR]	79 [72-84]	82 [78-87]	**<.001**	80 [74-85]	*0.130*
Age≥65 Y, N (%)	724 (83.5)	231 (94.3)	**<.001**	62 (92.5)	*0.055*
BMI (Kg/m²)	25.0 [23.0-27.0]	25 [23.1-28]	*0.066*	26.6 [23.3-30]	**0.013**
Obesity (%)	65 (7.5)	41 (16.7)	**<.001**	18 (26.9)	**<.001**
Diabetes, N (%)	181 (20.9)	71 (29.1)	**0.009**	29 (43.3)	**<.001**
Hypertension, N (%)	415 (48.0)	200 (81.6)	**<.001**	54 (80.6)	**<.001**
CAD, N (%)	225 (26.1)	53 (21.7)	*0.181*	21 (31.3)	*0.388*
Valvular diseuse, N (%)	198 (22.9)	68 (28.0)	*0.126*	22 (32.8)	*0.073*
Cardiac surgery, N (%)	95 (11.0)	56 (23.0)	**<.001**	18 (26.9)	**<.001**
CABG, N (%)	52 (6.0)	25 (10.2)	**0.032**	7 (10.4)	*0.185*
LVEF %, median [IQR]	57 [53-61]	55 [50-60]	**<.001**	55 [49-57.5]	**<.001**
HF	64 (7.4)	46 (18.9)	**<.001**	15 (22.4)	**<.001**
Dialysis, N (%)	-	-		49 (73)	
LPM indication, N (%)					
Infective risk	570 (65.7)	178 (73.0)	**0.031**	36 (53.7)	*0.062*
Previous TLE (infection)	*113 (13.0)*	*41 (16.8)*	*0.143*	*11 (16.4)*	*0.453*
Vascular Issues	137 (15.8)	28 (11.5)	*0.103*	20 (29.9)	**0.006**
Patient choice	83 (9.6)	5 (2.0)	**<.001**	7 (10.4)	*0.829*
Other	77 (8.9)	33 (13.5)	**0.039**	4 (6.0)	*0.506*

P †: CKD G3a/b vs NKF; P §: CKD G4/G5 vs NKF

Table 2

	NKF N=867	CKD Stage G3a/b N=245	P †	CKD Stage G4/G5 N=67	P §
Implant duration min, Med [IQR]	50 [40-61]	50 [34.5-70]	*0.629*	50 [43-90]	**0.009**
Fluoroscopy time, min Med [IQR]	6.2 [4.0-9.0]	6.0 [3.2-9.0]	**0.023**	7.0 [5.6-9.7]	*0.091*
LPM complications, N (%)	37 (4.3)	12 (4.9)	*0.724*	4 (6.0)	*0.529*
Pericardial effusion	*5 (0.6)*	*1(0.4)*	*1.0*	*0*	*1.0*
Cardiac tamponade	*2 (0.2)*	*0*	*1.0*	*0*	*1.0*
LPM dislodgement	*2(0.2)*	*0*	*1.0*	*0*	*1.0*
Battery depletion	*2 (0.2)*	*1 (0.4)*	*0.526*	*1 (1.5)*	*0.200*
Peri-procedure stroke	*0*	*1(0.4)*	*0.220*	*1 (1.5)*	*0.072*
Femoral artery injury	*10 (1.2)*	*3(1.2)*	*1.0*	*0*	*1.0*
Groin hematoma	*16(1.8)*	*4 (1.6)*	*1.0*	*1 (1.5)*	*1.0*
Systemic/LPM infection	*0*	*2 (0.8)*	**0.048**	*1 (1.5)*	*0.072*
Major complications, N (%)	15 (1.7)	7 (2.9)	*0.297*	3 (4.5)	*0.133*
Minor complications, N (%)	22 (2.5)	5 (2.0)	*0.816*	1 (1.5)	*1.0*
All cause of death, N (%)	59 (6.8)	17 (7.0)	*1.0*	12 (17.9)	**0.003**

P †: CKD G3a/b vs NKF; P §: CKD G4/G5 vs NKF

Figure 1

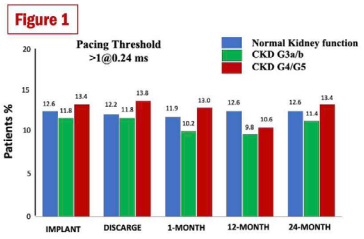
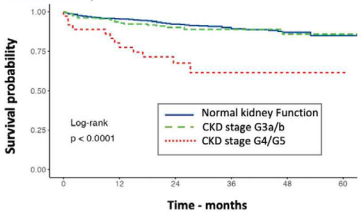


Figure 2

Kaplan-Meier survival estimates



CO.06.03

MIGLIORAMENTO EMODINAMICO PRECOCE CON TERAPIA CCM IN PAZIENTI CON SCOMPENSO CARDIACO A FE RIDOTTA: ESPERIENZA DI UN SINGOLO CENTRO

Andrea Madeo [1], Anna Lucia Cavaliere [1], Antonio Mazziotti [1], Silvana De Bonis [2], Giovanni Bisignani [1]
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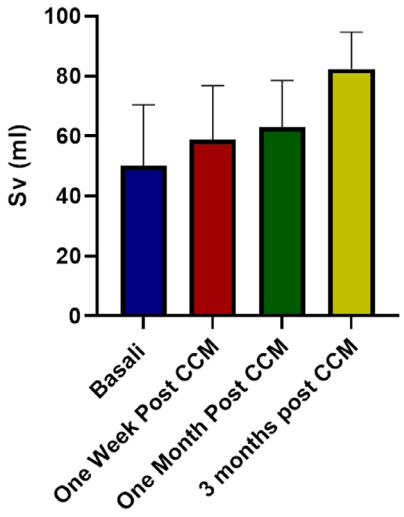
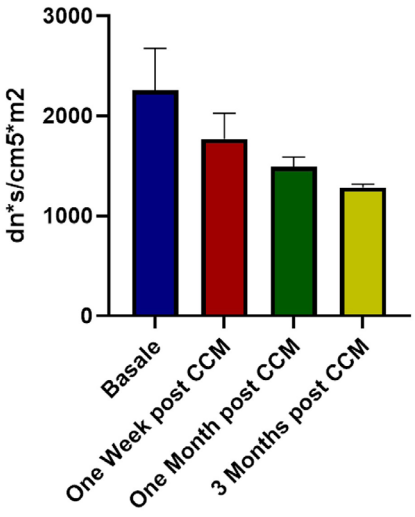
Introduzione: La terapia CCM rappresenta una potente arma terapeutica nei pazienti con insufficienza cardiaca a frazione di eiezione (EF) compresa tra il 25% e il 50%, in III e IV classe funzionale NYHA nonostante terapia medica ottimizzata. La CCM determina un miglioramento dei sintomi legati allo scompenso cardiaco (dispnea ed astenia) e conseguentemente della qualità di vita. I trials clinici randomizzati condotti con la CCM hanno dimostrato un miglioramento statisticamente significativo della EF, del consumo d'ossigeno e della distanza coperta nel test del cammino in sei minuti. Tali effetti solitamente si verificano dopo almeno sei mesi dall'impianto. Pertanto, abbiamo deciso di valutare gli effetti acuti della terapia CCM su una serie di pazienti con diagnosi di scompenso cardiaco ad FE ridotta utilizzando un sistema di monitoraggio emodinamico non invasivo basato sulla bioimpedenziometria, il NICaS.

Materiali e metodi: Da Maggio 2020, abbiamo effettuato impianto di CCM su 29 pazienti con scompenso cardiaco cronico ad FE ridotta. Età Media 72 anni (65 -79), con una prevalenza di sesso maschile (20% Donne, 80 % Uomini), tutti in terapia medica ottimizzata e diretta dalle linee guida ai tempi dell'impianto (GDMT) e ancora sintomatici per scompenso cardiaco al momento dell'impianto (Classe NYHA III). All'ecocardiogramma la FE media è risultata del 28% (21 - 39). L'eziologia dello scompenso era per la maggior parte rappresentata dalla cardiopatia ischemica (68%) e per il restante (32%) da cardiomiopatia dilatativa (su base ipertensiva, post-miocarditica e primitiva). Tutti già portatori di device per la morte cardiaca improvvisa tranne uno: 4 CTR-D non-responder, 9 ICD monocamerali, 5 S-ICD, 10 ICD bicamerali. Inoltre, abbiamo applicato il NICaS, attraverso il semplice posizionamento dei sensori sugli arti superiori del paziente, 24 ore prima, sette giorni dopo, un mese dopo e per 12 pazienti siamo a 3 mesi di follow up valutati con il sistema NIcaS. . Ogni misurazione emodinamica della bioimpedenza è stata ripetuta sette volte dal sistema con un valore medio finale visualizzato per ciascun parametro.

Risultati: Prima di erogare la terapia CCM, le misurazioni effettuate dal NICaS hanno confermato l'instabilità emodinamica dei pazienti mostrando bassi valori di stroke volume e gittata cardiaca. Sui 12 pazienti con follow up a 3 mesi, si è registrato un progressivo miglioramento dei parametri emodinamici, in particolare, dello stroke volume (SV) e delle resistenze periferiche totali (Figura 1). Per l'analisi statistica è stato usato il test t non parametrico sia di Mann-Whitney che di Kolmogorov-Smirnov, entrambi sono test non parametrici per confrontare due gruppi di dati non accoppiati. Le relazioni sono risultate significative per entrambe le variabili (p value 0.0069 per lo SV e p value 0.0009 per le TPR).



SV = Stroke Volume



TPR = Total Peripherical Resistance

CO.06.04

EFFECTS OF DIRECT IRRADIATION ON CARDIAC IMPIANTABLE ELECTRONIC DEVICES

Gianmarco Arabia, Manuel Cerini, Emiliano Calvi, Mariagiulia Bellicini, Paolo Fornaro, Raffaele Falco, Francesca D'Altilia, Anna Giulia Damato, Filippo Mariotti, Gianfranco Mitacchione, Luca Bontempi, Antonio Curnis
Università degli studi di Brescia, Spedali civili di Brescia, Brescia, ITALY

Introduction: cardiac implantable electronic devices (CIEDs) may sustain damages during a courseof radiation therapy, especially when the beam is directed onto the pulse generator, with deviceelectrical reset and/or sudden battery drain. 2010 HRS/ASA expert consensus, and all CIEDs manufacturers, recommend to avoid devices direct irradiation with an accumulated dose that exceed 5 grays (Gy). In our prospective study we tested the effects of direct irradiation on CIEDs with different radiation doses, also higher than 5 Gy.

Methods: 124 CIEDs of Medronic, Abbott, Biotronik, Boston Scientific, were collected during system upgrading or lead extraction procedures. All devices were considered if they had at least 80% of residual battery capacity. All CIEDs were programmed with same default electrical parameters. Depending by CIED type, pacing mode was configured in VVI, VVIR, VDDR or DDDR, and biventricular stimulation was activated, if present. ICDs electrical therapies were set-up with a pre-determined configuration. All devices were singularly placed in a 30 cm x 30 cm plastic bowl containing 2 Lt of deionized water that was placed over 5 cm Rockwool to simulate the backscatter and irradiated by a linear accelerator (Elekta Synergy). CIEDs were divided into two groups depending on irradiation dose delivered: 5 Gy and 10 Gy.

Results: No significant differences in battery drainage were observed after irradiation respect to baseline in 5 Gy as well 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) (Figure). Moreover, all CIEDS saved the baseline program setting, without device reset events (Table).

Conclusions: Our data confirm that CIEDs direct irradiation of 5 Gy is safe, of note, direct irradiation up to 10 Gy seems to be similarly safe concerning the risk of CIEDs electrical reset and/or unexpected battery drain.

CO.06.05

SEX DIFFERENCES AMONG PATIENTS IMPLANTED WITH S-ICD: A MULTICENTER, INTERNATIONAL, PROPENSITY-MATCHED ANALYSIS FROM THE I-SUSI PROJECT

Marco Schiavone [1], Alessio Gasperetti [2], Paolo Compagnucci [3], Julia Vogler [4], Mikael Laredo [5], Alexander Breitenstein [6], Simone Gulletta [7], Lukas Kaiser [8], Pietro Palmisano [9], Elisabetta Montemerlo [10], Giovanni Rovaris [10], Gianfranco Mitacchione [11], Antonio Curnis [12], Carlo Lavalle [13], Jurgen Kuschyk [14], Mauro Biffi [15], Roland Tilz [4], Luigi Di Biase [16], Claudio Tondo [1], Giovanni Forleo [11]

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[9] *Card. G. Panico Hospital, Tricase, ITALY*
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[11] *Luigi Sacco University Hospital, Rome, ITALY*
[12] *Spedali Civili, Brescia, ITALY*
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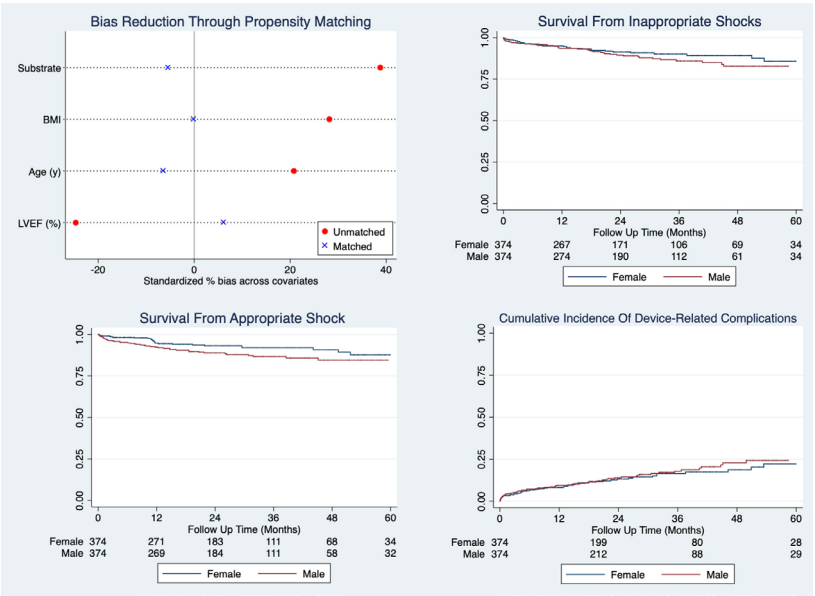
Background: Women have been historically underrepresented in implantable cardioverter defibrillator (ICD) trials, despite sex differences in the epidemiology and presentation of ventricular arrhythmias (VAs). No data on sex differences among subcutaneous-ICD (S-ICD) recipients have ever been described.

Objective: To investigate sex-related differences in patients undergoing S-ICD implantation.

Methods: Consecutive patients enrolled in the multicenter i-SUSI registry were analyzed. Comparisons between sexes were performed using an adjusted analysis with 1:1 propensity matching for age, body mass index (BMI), left ventricular function and substrate. The primary outcome was the rate of appropriate shocks during follow-up. Inappropriate shocks and other device-related complications were deemed secondary outcomes.

Results: A total of 1698 patients were extracted from the iSUSI registry, of which 399 (23.5%) were female. After propensity matching, two cohorts of 374 matched patients each were enrolled for this analysis, similar in baseline characteristics. Despite similar procedural characteristics and a matched BMI, female S-ICD had a lower rate of patients at a low-risk of failure conversion as per PRAETORIAN score (73.4% vs 81.3%, p=0.049). Over a median follow up time of 26.5 [12.7–42.5] months, without differences between the cohorts, n=68 (9.1%) patients experienced appropriate shocks and n=105 (14.0%) patients experienced a device-related complication, 75 (10.3%) of which had an inappropriate shock (Figure1). Appropriate shocks were more common in the male cohort (rate/y 3.4% vs 1.7%; log-rank p=0.049), while no significant differences in device-related complications (rate/y: 6.3% vs 5.8%; log-rank p=0.595) and inappropriate shocks (rate/y: 4.3% vs 3.1% log-rank p=0.375) were observed. At multivariate analysis, male sex remained significantly associated with the primary outcome (aHR 1.591 CI 0.975–2.595, p=0.063).

Conclusion: In a propensity-matched cohort of S-ICD recipients, women are less likely to experience appropriate ICD therapy, while not showing higher risk of device related-complications.



CO.06.06

LEADLESS PACEMAKER IMPLANTATION CLINICAL OUTCOMES AFTER CARDIAC SURGERY: A MULTICENTER, REAL-WORLD ANALYSIS

Marco Schiavone [1], Alessio Gasperetti [2], Gianfranco Mitacchione [3], Fabrizio Tundo [1], Alexander Breitenstein [4], Elisabetta Montemerlo [5], Cinzia Monaco [6], Simone Gulletta [7], Pietro Palmisano [8], Paolo Compagnucci [9], Giovanni Rovaris [5], Gaetano Fassini [1], Mauro Biffi [10], Antonio Dello Russo [9], Massimo Moltrasio [1], Carlo De Asmundis [11], Antonio Curnis [12], Luigi Di Biase [13], Claudio Tondo [1], Giovanni Forleo [3]

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[13] *Montefiore Medical Center, New York, USA*

Introduction: Pacemaker implantation is common after cardiac surgery. Leadless pacemakers (LPMs) have emerged as a useful alternative to transvenous pacemakers (TV-PMs), especially in selected patients. Little is known about LPMs' clinical outcomes after cardiac surgery.

Objective: To investigate whether patients implanted with LPMs after cardiac surgery present differences compared to naïve patients.

Methods: This observational study included consecutive patients who received a Micra VR or Micra AV (Medtronic Inc.) at 12 EU centers. Patients were divided into two groups: post-surgical (PS) with an LPM implanted following cardiac surgery for coronary artery bypass grafting (CABG), heart valve intervention, or congenital heart disease (CHD) vs surgical-naïve patients. Device performance during long-term follow-up (FU) was the primary outcome. Periprocedural complications and the need for conversion to TV-PMs were secondary outcomes.

Results: Among the 1154 patients enrolled, n=166 (14.4%) represented the PS cohort (n=78 CABG, n=81 valvular intervention, n=7 CHD). No significant differences were found regarding median age (PS 79 [74-84] vs naïve 80 [74-85] years, p=0.362) or female sex (PS n=53, 31.9% vs naïve n=360, 36.5%, p=0.262). The AV-LPM implantation rate was significantly higher in the PS group (n=31, 21.1% vs n=75, 7.6%, p<0.001). After a median FU of 25 [24–39] months (no differences among groups), no significant differences in long-term device performances were detected among groups: n=2 (1.2%) patients with very-high-pacing threshold (>2V@0.24 ms) in the PS group vs n=17 (1.7%) in the naïve group, p=0.629. Receiving a LPM after a surgical intervention did not predict high-pacing threshold development during FU (OR 0.696, 95% CI 0.159-3.043, p=0.630), periprocedural complications (OR 1.184, 95% CI 0.544-2.575, p=0.6698), or the need for conversion to TV-PM (OR 1.176, 95% CI 0.484-6.523, p=0.387). While the mean right ventricle pacing (RVP) burden at the first FU was comparable among groups (PS RVP 39.1%±36.1% vs. naïve RVP 34.8%±33.7%, p=0.198), at the last FU, the mean RVP was higher in the PS group (48.3%±37.4% vs 37.7%±33.8%, p=0.012).

Conclusion: Leadless pacemakers (LPMs) offer a useful and safe alternative to transvenous pacemakers (TV-PMs) after cardiac surgery. Surgical patients were more likely to be implanted with an AV-LPM device compared to a naïve cohort. Previous surgical heart interventions were not predictors of either high pacing threshold or conversion to TV-PMs over medium-term follow-up (FU).

COMUNICAZIONI ORALI 07

GIOVEDI' 19 SETTEMBRE

SALA BIANCA

17:30-18:30

SESSIONE DI COMUNICAZIONI ORALI: ELETTROFISIOLOGIA

Moderatori: Valerio De Sanctis (Milano), Corrado Tomasi (Ravenna)

CO.07.01

IMPACT OF DIFFERENT ABLATION STRATEGIES DURING VERY HIGH POWER SHORT DURATION ABLATION: INSIGHTS FROM THE MULTICENTRIC AIR HPSD REGISTRY

Giorgio Spiniello [1], Sara Poggi [1], Teresa Strisciuglio [2], Antoine Lepilier [3], Massimo Grimaldi [4], Marco Scaglione [5], Giulio Zucchelli [6], Saverio Iacopino [7], Luca Rossi [8], Roberto Mantovan [9], Claudio Pandozzi [10], Andrea Giomi [11], Giuseppe Stabile [1], Francesco Solimene [12]

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Background: The very high power short duration ablation by mean of the QDOT Micro catheter was demonstrated to be safe and effective to achieve pulmonary vein isolation (PVI) in atrial fibrillation (AF) patients. Data from large multicentric registries are still lacking.

Purpose: We sought to investigate whether different ablation approaches may impact procedural outcomes. First, the hybrid approach (Qmode+, 90 W for 4 sec, at the posterior wall of the left atrium and Qmode modality AI-guided at the anterior wall) was compared to the ablation performed exclusively with the Qmode+ modality. Second, we investigated the impact of the type of anesthesia.

Methods: The AIR HPSD registry is a multicentric real world data registry including patients undergoing AF ablation by mean of the QDOT Micro catheter. The ablation modality (hybrid/ Qmode+) and the type of anesthesia were left to operators' preference.

Results: Overall, 330 patients were enrolled, 67% males, 71% had paroxysmal AF, the mean age was 61±11. Pulmonary vein isolation was reached in 100% regardless of the ablation modality or the anesthesia used. As for the first pass isolation (FPI) there was a trend toward higher rates in the hybrid group compared to the Qmode+ group (85% vs 74%, p=0.1). No differences in FPI were found between the general anesthesia/deep sedation group and the conscious sedation group (83% vs 81%, p=0.8), however when considering the Qmode+ group solely, the FPI was significantly higher in the general anesthesia/deep sedation group (84% vs 56%, p=0.006). As for the procedural time, this was significantly shorter in the general anesthesia/deep sedation compared to conscious sedation (82±21 vs 97±35 min, p<0.01), as well as in the Qmode+ group compared to the hybrid group (80±31 vs 102±30 min, p<0.01). Minor complications were observed in 1% of patients with no significant differences between groups.

Conclusions: The PVI can be safely and effectively obtained with both approaches, hybrid or Qmode+ solely, however the rate of FPI seems higher with the hybrid one. When adopting solely the Qmode+ modality the general anesthesia increases the rate of FPI.

CO.07.02

EFFICACY OF INTRAVENOUS NITRATES FOR THE PREVENTION OF CORONARY ARTERY SPASM DURING PULSED FIELD ABLATION OF THE MITRAL ISTHMUS

Roberto Menè [1], Serge Boveda [2], Domenico Giovann Della Rocca [3], Vasileios Sousonis [2], Giampaolo Vetta [3], Sarah Zeriouh [2], Ioannis Doundoulakis [3], Andres Betancur [2], Mohamed Benadel [2], Nicolas Combes [2], Andrea Sarkozy [3], Gian Battista Chierchia [3], Carlo de Asmundis [3], Jean Paul Albenque [2], Stephane Combes [2]

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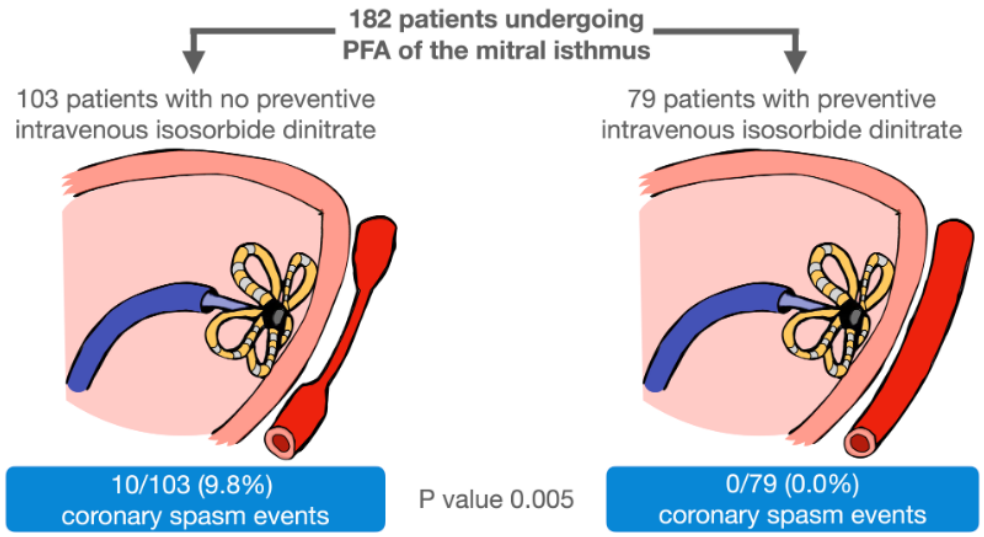
Pulsed field ablation (PFA) is a promising strategy for the treatment of cardiac arrhythmias but carries a considerable risk of coronary artery spasm (CAS) when targeting anatomical structures adjacent to the coronary arteries, such as the mitral isthmus (MI). This complication could hinder the use of PFA for persistent atrial fibrillation or atrial flutters, where MI applications are often necessary. Aim of this study was to evaluate the efficacy of intravenous nitrates in preventing CAS during PFA of the MI.

Starting from 11/2022 we enrolled all patients undergoing PFA of the MI at two centers. Two minutes before the first application on the MI, 1-2 mg (depending on blood pressure) of isosorbide dinitrate (ISDN) were administered intravenously. Occurrence of procedural CAS was monitored and compared between this group (ISDN+ group) and a historical cohort of consecutive patients (11/2021-11/2022) not pretreated with prophylactic nitrates (ISDN- group). CAS was defined as ST-segment changes during applications on the MI, resolving after nitrates administration or spontaneously within 5 minutes, in the absence of other causes of ischemia. All procedures were performed with the Farapulse system (5 biphasic pulses of 2.0 kV per application). Data were compared with Fisher's exact, chi-square and t-test as appropriate (SPSS 29.0). P value<0.05 was considered significant.

A total of 182 patients (age 68±10 years; 29% females) were included. Baseline characteristics in both groups (ISDN+, n=79 and ISDN-, n=103) were similar, including history of coronary artery disease (22.3% vs 13.9%; p=0.149) and angioplasty (12.6% vs. 8.9%; p=0.421). Successful isolation of pulmonary veins and posterior wall was achieved in 180/180 (100%) and 179/179 (100%) cases respectively, while a bidirectional MI block was documented in 179/182 (98.3%) patients. More applications were delivered on the MI in the ISDN+ group (14 [IQR 11-39] vs. 12 [IQR 8-28]; p=0.018).

All cases of CAS occurred in the ISDN- (10/103 patients, 9.7%) compared to none in the ISDN+ group (0/79 patients, 0%; p=0.005). Two patients developed significant hypotension and nine required administration of ISDN to resolve the ischemia. Patients developing CAS were more frequently hypertensive (100% vs. 67%; p=0.013). Complications other than CAS were rare and were only observed in the ISDN- group before the first PFA application on the MI. These included coronary artery air embolism (n=1), cardiogenic shock (n=1), NSVT (n=1) and oxygen desaturation (n=1). Of note, no drug-related hypotension or allergic reactions following ISDN administration were seen in the total 87 (MI+CTI groups) pretreated patients.

We presented the largest published cohort of CAS following PFA and the first report on the efficacy of prophylactic ISDN in preventing this complication. Our study has two main findings. First, our data suggest that CAS occurs at a non-negligible rate during PFA of the MI. Secondly, in our cohort, prophylactic ISDN administration was safe and effectively reduced the risk of this complication so that its administration may be considered as a routine preventive strategy in all cases of PFA of the MI.



CO.07.03

PULSED FIELD ABLATION VERSUS CRYOBALLOON AND RADIOFREQUENCY ABLATION FOR ATRIAL FIBRILLATION: AN EFFICIENCY ANALYSIS

Cristian Martignani, Alberto Spadotto, Martina Amadori, Lorenzo Bartoli, Giulia Martini, Federica Locchi, Jennifer Oppimitti, Andrea Angeletti, Giulia Massaro, Igor Diemberger, Matteo Ziacchi, Mauro Biffi
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Background: Pulsed-field ablation (PFA) offers a promising single-shot approach for atrial fibrillation (AF) ablation compared to traditional techniques like radiofrequency (RF) and cryoballoon (Cryo). However, unlike RF and Cryo, standard PFA procedures require general anesthesia due to patient discomfort during energy delivery. This raises concerns about PFA's efficiency in terms of Electrophysiology Laboratory occupation time (EP-lab OT) compared to the other two methods.

Methods: We considered the Ep-lab OT for the first 15 consecutive patients (73% male, mean age 60.1±10.1 years) who underwent PFA ablation of paroxysmal (54%) or persistent (46%) drug-resistant AF at our hospital.
Efficiency is calculated as the percentage of standard Ep-lab OT/actual EP-lab OT [(standard Ep-lab OT/actual EP- lab OT) x 100], where standard Ep-lab OT is considered the mean EP-lab OT either for RF and Cryo derived from the German sub-analysis of the FREEZE Cohort study and respectively 160.3 ± 53.5 min and 122.2 ± 39.4 min, and actual EP-lab OT is the mean PFA procedural time recorded at our hospital.

Results: All patients received general anesthesia or deep sedation under the supervision of anesthesiologists. PFA ablation was performed successfully in all patients using selective pulmonary vein angiography with a main delivery catheter. Each pulmonary vein received four energy applications using either a basket configuration or flower configuration catheter. The average procedural time for PFA was 150.8 ± 38.5 minutes. The mean dwelling time for the ablator catheter was 37.5 ± 8.3 minutes, and the average fluoroscopy time was 33.3 ± 10.7 minutes. Compared to RF, PFA demonstrated higher efficiency (106.6%). Conversely, PFA efficiency was lower compared to Cryo (81.3%).

Conclusions: This study at a high-volume tertiary center demonstrates the effectiveness of PFA for AF ablation even in the initial stages of its implementation. Notably, PFA ablation appears to be more efficient (in terms of EP-lab OT) compared to the standard RF approach used in high-volume referral centers. However, PFA efficiency was lower than Cryo due to the time required for anesthesia induction and recovery, leading to a procedural delay.

CO.07.04

HIGH POWER SHORT DURATION E VERY-HIGH POWER SHORT DURATION: CONFRONTO TRA DUE PROTOCOLLI EFFICACI PER L'ABLAZIONE TRANSCATETERE DELLA FIBRILLAZIONE ATRIALE TRAMITE RADIOFREQUENZA

Riccardo Grandin, Leonardo D'Angelo, Giovanni Volpato, Paolo Compagnucci, Laura Cipolletta, Quintino Parisi, Silvano Molini, Enrico Rita, Yari Valeri, Giacomo Castellucci, Francesco Cardinali, Francesca Campanelli, Filippo Pirani, Lara Luciani, Michela Casella, Antonio Dello Russo
Università Politecnica delle Marche, Ancona, ITALY

Introduzione: La Radiofrequenza (RF) è la modalità più diffusa al mondo per l'ablazione transatetere della fibrillazione atriale (FA). Al fine di ottenere un duraturo isolamento delle vene polmonari, una riduzione dei tempi procedurali e una minimizzazione degli effetti collaterali di natura prevalentemente termica, sono stati sviluppati due protocolli: l'High Power Short Duration (HPSD) e il very-HPSD (v-HPSD). Tali tecniche sfruttano l'utilizzo di cateteri di ultima generazione: rispettivamente il Tactiflex nell'HPSD e il QDOT nel v-HPSD.

Scopo: Lo scopo dello studio è quello di confrontare i protocolli HPSD e v-HPSD nell'ablazione transcatetere della fibrillazione atriale, cercando di individuare il setting migliore in termini di profilo di sicurezza ed efficacia.

Metodi: E' stato condotto uno studio retrospettivo includendo 200 pazienti, dei quali 138 affetti da FA parossistica e 62 da FA persistente. 100 pazienti sono stati trattati col protocollo HPSD, nel quale la radiofrequenza è stata applicata a 40 W fino a 20 secondi a livello dei segmenti anteriori delle vene polmonari (PV) e 50 W fino a 10 secondi in corrispondenza dei segmenti posteriori delle vene polmonari e della parete posteriore (PW). 100 pazienti sono stati trattati col protocollo v-HPSD, in cui i polsi di radiofrequenza sono stati applicati a 50 W con un Ablation Index (AI) pari a 500 nei segmenti anteriori delle vene polmonari e 90 W fino a 4 secondi nei segmenti posteriori delle vene polmonari e nella parete posteriore. Il profilo di sicurezza e l'efficacia sono stati valutati durante la procedura, durante il ricovero e per un follow-up medio di 9 mesi.

Risultati: Tra i due gruppi non sono state individuate differenze rilevanti in termini clinici ed ecocardiografici. L'isolamento delle vene polmonari e della parete posteriore è stato ottenuto con successo in tutti i casi. Nel gruppo v-HPSD è stato osservato un maggiore First Pass Isolation (FPI), minori tempi procedurali, minori tempi di applicazione di RF e un minor Dose-Area-Product (DAP). Il gruppo HPSD ha mostrato invece un maggior Impedance Drop (ID), supportato da una Contact Force (CF) più elevata. Durante un follow-up medio di 9 mesi, nei due gruppi non sono state osservate differenze statisticamente significative in termini di ricorrenza di FA.

Conclusioni: L'assenza di complicanze procedurali sottolinea l'elevato profilo di sicurezza di entrambi i protocolli. Il maggior FPI osservato nel gruppo v-HPSD risulta indicativo di una maggiore efficacia in fase acuta; tuttavia è fondamentale evidenziare la maggiore percentuale di pazienti già sottoposti ad almeno una procedura di ablazione di FA nel gruppo HPSD.
Il maggior ID rilevato nel gruppo HPSD potrebbe essere correlato alla maggior componente conduttiva del calore, determinante lesioni più profonde. D'altra parte, la minor durata dei polsi di RF applicati nel gruppo v-HPSD contribuisce a ridurre i tempi procedurali e l'esposizione a radiazioni ionizzanti.
Nonostante le differenze, il follow-up dimostra una bassa percentuale di recidiva aritmica nei due gruppi, enfatizzando l'efficacia di entrambi i protocolli nel trattamento transcatetere della fibrillazione atriale.

	HPSD	v-HPSD	P-Value
Età	60 [53-67]	67 [59-72]	0.42
Sesso maschile	74/100	80/100	0.31
BMI	26 [24-29]	26 [24-29]	0.39
FA persistente	20/100	62/100	< 0.01
CHA_2DS_2-VASC	1 [0-2]	2 [1-3]	0.47
Precedente ablazione di FA	42/100	6/100	< 0.01
FEVS	60 [55-63]	56 [51 -60]	0.62
iLAV	35 [26-44]	39 [33-48]	0.35
ID	17 [17-18]	9 [9-10]	< 0.01
CF	11 [11-13]	9 [8-10]	< 0.01
Tempo totale di RF	430 [345-540]	381 [340-416]	< 0.01
Tempo procedurale	111 [100-130]	103 [80-135]	0.04
DAP	1156 [525-2200]	758 [217-1500]	< 0.01
FPI	94% [377/400]	98% [395/400]	< 0.01

BMI = Body Mass Index; FA = Fibrillazione Atriale; FEVS = Frazione d'Eiezione del Ventricolo Sinistro; iLAV= Volume indicizzato dell'Atrio Sinistro; ID = Impedance Drop; CF = Contact Force; RF = Radiofrequenza; DAP = Dose-Area Product; FPI = First-Pass Isolation.

CO.07.05

ABLAZIONE A CAMPO PULSATO CON NUOVA PIATTAFORMA VARIPULSE: ESPERIENZA INIZIALE MONOCENTRICA SU EFFICACIA E SICUREZZA PROCEDURALE DELLE PRIME CASISTICHE ITALIANE

Giacomo Castellucci, Yari Valeri, Paolo Compagnucci, Laura Cipolletta, Quintino Parisi, Silvano Molini, Giovanni Volpato, Leonardo D'Angelo, Francesca Campanelli, Riccardo Grandin, Francesco Cardinali, Lara Luciani, Filippo Pirani, Giulia Santarelli, Giovanna Perrotta, Michela Casella, Antonio Dello Russo
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Introduzione: L'ablazione a campo pulsato è una modalità innovativa di ablazione trans-catetere per il trattamento della fibrillazione atriale (FA), che determina l'elettroporazione e quindi l'apoptosi selettiva dei cardiomiociti, mediante impulsi elettrici ad elevato voltaggio e della durata di pochi millisecondi.

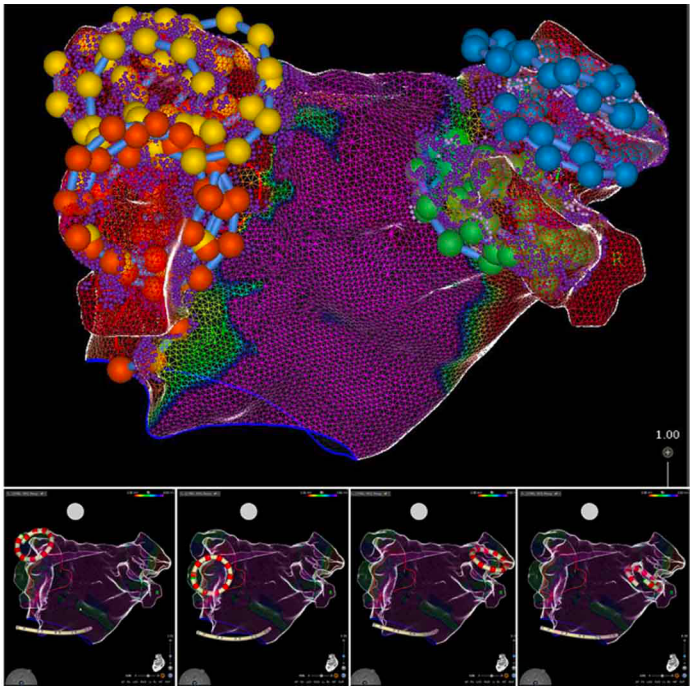
Obiettivo: Valutare la sicurezza, i dati procedurali e l'efficacia acuta nei pazienti sottoposti ad ablazione transcatetere con piattaforma VARIPULSE per il trattamento della fibrillazione atriale parossistica.

Metodi: Descriviamo l'esperienza iniziale e preliminare del nostro centro con la nuova piattaforma di elettroporazione VARIPULSE, utilizzata per l'ablazione di FA parossistica in 11 pazienti. Per ogni paziente sono state effettuate 4 erogazioni per ogni vena polmonare, di cui due lesioni ostiali e due lesioni antrali. A discrezione dell'operatore venivano eseguite eventuali ulteriori additional lesions. Il catetere VARIPULSE, integrato al sistema di mappaggio CARTO3, consente di effettuare il mappaggio elettroanatomico e di valutare, mediante modulo TPI, il contatto catetere-endocardio, validato in ogni paziente con sonda ICE. Per tutti i pazienti sono stati collezionati i dati clinici, i tempi e i dati procedurali. L'end-point primario di sicurezza era rappresentato dalle complicanze nelle prime 48 ore.

Risultati: Sono stati inclusi nell'analisi 11 pazienti; le caratteristiche cliniche di base sono riassunte in Tabella 1.

CARATTERISTICHE DEI PAZIENTI IN STUDIO (11)	
ETÀ (ANNI) – media ± SD	62 ± 9
SESSO MASCHILE – n (%)	6 (54)
IPERTENSIONE ARTERIOSA – n (%)	6 (54)
DIABETE MELLITO TIPO 2 – n (%)	1 (9)
EGFR < 45 ML/MIN – n (%)	1 (9)
SINDROME CORONARICA CRONICA – n (%)	1 (9)
DISLIPIDEMIA – n (%)	4 (36)
TERAPIA ALL'INGRESSO: - BETA-BLOCCANTI - FLECAINIDE - AMIODARONE	 6 (54) 5 (45) 2 (18)
BMI – media ± SD	25 ± 2
CHA_2DS_2-VASc score – media ± SD	2 ± 1
FA parossistica – n (%)	11 (100%)
FE (%) - (media ± SD)	64 ± 4
VTSASi ml/m² – mediana [IQR]	26 [18-38]
ATC prima linea terapeutica – n (%)	2 (18%)

Tabella 1: BMI = body mass index; FA = fibrillazione atriale; FE = frazione di eiezione del ventricolo sinistro; VTSASi = volume telesistolico dell'atrio sinistro, indicizzato; ATC = ablazione transcatetere



Il tempo medio skin-to-skin è stato di 69 ± 14 minuti, limitatamente ai primi casi effettuati e alla learning-curve degli operatori. Il tempo medio in atrio sinistro, compreso il tempo di mappaggio pre-ablazione e il mappaggio post-ablazione è stato di 34 ± 11 minuti. Il tempo di fluoroscopia medio è stato di 12,2 ± 6,2 minuti. Il numero totale di erogazioni (ognuna della durata di 21 secondi, comprendente 3 micro-erogazioni di pochi millisecondi) medio è stato di 22 ± 2. Il first pass isolation è stato raggiunto, al mappaggio elettroanatomico e alle manovre di pacing in entrata e uscita, nel 100% delle vene polmonari.
Non si sono verificate complicanze maggiori o minori durante la procedura e nel periodo di osservazione di 48 ore.

Conclusioni: Limitatamente all'esperienza preliminare, alla learning curve degli operatori e al campione limitato, l'elettroporazione VARIPULSE sembra essere sicura ed efficace nell'isolamento immediato delle vene polmonari, confermata mediante mappaggio elettro-anatomico integrato post-procedurale.

CO.07.06

ECHOCARDIOGRAPHIC AND INVASIVE EVALUATION OF LEFT ATRIAL PRESSURE IN PATIENTS UNDERGOING CATHETER ABLATION FOR ATRIAL FIBRILLATION

Gianmarco Arabia, Manuel Cerini, Emiliano Calvi, Mariagiulia Bellicini, Paolo Fornaro, Raffaele Falco, Francesca D'Altilia, Antonino Mesi, Alessio Nicolai, Lorenzo Veronelli, Gianfranco Mitacchione, Luca Bontempi, Antonio Curnis
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Aims: Estimation of left ventricle (LV) filling pressure is one of the most important parameters to provide information in clinical practice. However, the challenging in investigating this parameter through invasive methods makes it difficult to be used.
The study aims to investigate the association between cardiac structure and function derived by transthoracic echocardiography (TTE) and left atrial (LA) invasive pressure (LAP).

Methods: The study was a multi-center prospective study enrolling 73 patients (mean age 65 ± 8, 27% female) undergoing primary catheter ablation for AF. Patients were evaluated and enrolled from June 2021 to April 2022. Complete TTE assessing measures of LV, LA and right ventricle (RV) structure and function including speckle tracking echocardiography, was performed at baseline.
Echocardiographic data have been assessed the same day of the invasive measurement of the LAP during AF ablative procedure. Linear regression analysis has been performed to assess the relationship between measures of cardiac structure and function and LAP. Logistic regression analysis assessed the parameters associated with elevated LAP (greater than 15mmHg).

Results: Baseline clinical characteristics of the study population did not differ according to elevated LAP vs. non-elevated LAP. Patients with elevated LAP showed instead abnormal measures of LV global longitudinal strain, measures of LA structure and function, except for LA maximal volume, and RV structure and function. After multivariable adjustment, including demographic factors and comorbidities, E/e` (p = 0,024), LA minimal volume (p = 0,009), LA emptying fraction (LAEF) (p = 0,012), LA Reservoir (p = 0,039), TAPSE (p= 0,010) and RV free wall strain (p= 0,028), but not LA maximal volume (p=0,11), were significantly associated with LAP. Similarly, these measures, but nor LA maximal volume, were significant determinants of elevated LAP. Overall, LA minimal volume and LAEF showed the best diagnostic accuracy to predict elevated LAP (AUC 0.72 and 0.73, respectively).

Conclusions: Novel measures of LA structure and function, but not standard assessment by LA maximal volume, were significantly associated with LAP in patients affected by AF. These measures, along with measures of LV and RV function may be used in the diagnostic assessment of filling pressure in ambulatory settings.

COMUNICAZIONI ORALI 08

GIOVEDI' 19 SETTEMBRE

SALA ROSSA 2

17:30-18:30

SESSIONE DI COMUNICAZIONI ORALI: DEVICE IMPIANTABILI

Moderatori: Alessandro Corzani (Cesena), Andrea Campana (Salerno)

CO.08.01

CONDUCTION-SYSTEM PACING ITALIAN NETWORK GROUP (C-SING): INSIGHTS FROM A NATIONWIDE MULTICENTER OBSERVATIONAL STUDY

Gabriele Dell'Era [1], Pietro Palmisano [2], Matteo Bertini [3], Massimo Magnano [4], Mario Volpicelli [5], Matteo Baroni [6], Umberto Startari [7], Paolo Donateo [8], Alessandro Paoletti Perini [9], Luca De Mattia [10], Giovanni Rovaris [11], Luca Tomasi [12], Luca Poggio [13], Antonio Rapacciuolo [14], Giuseppe Patti [1]

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Background/Introduction: Conduction system pacing (CSP), encompassing His bundle pacing (HBP) and left bundle branch area pacing (LBBAP), has gained prominence in treating bradycardia and heart failure in recent years. Despite its increasing utilization, data on real-world adoption of CSP are limited.

Purpose: The C-SING study aimed at assessing patient characteristics, implant success, procedural details, and safety of CSP when performed in routine clinical practice.

Methods: Periprocedural data from 27 experienced CSP centers across Italy were collected on patients undergoing CSP implantation for various indications between January 2021 and January 2024.

Results: The study comprised 1,317 patients (median age 78 years [interquartile range, 71-83], male 66.2%). Leading indications included atrioventricular (AV) block (40.8%), sinus node dysfunction (12.1%), atrial fibrillation with bradycardia (9.7%), AV node ablation (9.5%), and heart failure (12.5%). Pacemakers were implanted in 77.3% of patients, cardiac resynchronization devices in 21.7%, and implantable cardioverter defibrillators in 1.0%. Stylet-driven and lumenless CSP leads were utilized in 64.7% and 35.3% of procedures, respectively. Final 12-lead ECG assessment revealed LBBAP capture in 88.7% patients, HBP in 8.4% (selective 4.2%, non-selective 4.2%), and no CSP capture in 3.0%, resulting in a 97.0% CSP lead implantation success rate. In patients with LBBAP, predominant capture types were left bundle branch pacing (19.6%), left posterior fascicular pacing (19.2%), and left septal fascicular pacing (14.8%). Comparing HBP to LBBAP, the latter showed shorter procedural time (60 minutes [45-80] vs. 70 minutes [60-95], p=0.003), but similar fluoroscopy time (6.0 minutes [3.3-10.8] vs. 6.1 minutes [4-10], p=0.735). Paced QRS duration was longer in LBBAP (118 ms [105-130]) compared to HBP (110 ms [101-122], p<0.001). LBBAP showed lower capture thresholds (0.6 V [0.5-0.9] @0.4 ms vs. 0.8 V [0.5-1.5] @1.0 ms, p<0.001) and higher R-wave sensing (10.7 mV [8-16] vs. 4.5 mV [2.4-9.9], p<0.001). The rate of periprocedural complications was higher in patients with LBBAP than HBP (7.3% vs. 1.8%, p=0.03), with the most frequent events being intraprocedural perforation into the left ventricular cavity during lead screwing (2.6%) and CSP lead dislodgment before hospital discharge (1.4%). These occurrences necessitated lead repositioning without additional complications.

Conclusion: CSP demonstrated feasibility as a primary pacing strategy for various indications in a real-world, multicenter setting. LBBAP, more frequently used than HBP, exhibited shorter procedural time and superior acute electrical parameters. LBBAP revealed a higher rate of minor procedural complications than HBP. Further investigations, supported by additional long-term outcome data, are essential to comprehensively assess CSP performance.

CO.08.02

LONG TERM PROGNOSIS FOLLOWING TRANSVENOUS LEAD EXTRACTION: INSIGHT FROM A SINGLE CENTER REGESTRY

Gianmarco Arabia, Manuel Cerini, Emiliano Calvi, Raffaele Falco, Paolo Fornaro, Mariagiulia Bellicini, Francesca D'Altilia, Antonino Mesi, Anna Giulia Damato, Filippo Mariotti, Luca Bontempi, Gianfranco Mitacchione, Antonio Curnis
Università degli studi di Brescia, Spedali civili di Brescia, Brescia, ITALY

Objective: The purpose of this analysis was to investigate the long-term prognosis following transvenous lead extraction (TLE).

Materials and methods: We retrospectively studied all consecutive CIED patients who underwent TLE between January 2014 and January 2016 followed in our institution. The primary outcome was the composite endpoint of time to death or repeated TLE stratified by the presence of infection; secondary outcomes included individual components.

Results: Of the 191 patients (85% male, median age 70 years) who underwent TLE, 96 (50%) had infection and 95 (50%) were extracted for a different reason. 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, infectious indication was associated with a significantly lower event-free survival (67% vs 83%; adjusted hazard ratio [aHR] 1.97, 95% confidence interval [CI] 1.02–3.81, P=0.04). The difference was significant also considering the death component (30% vs 10%, log-rank P<0.01); while the rate of re-repeated TLE was similar (4% vs 7%, P=0.62).
In the infectious group, the presence of vegetation (aHR 2.56; 95% CI 1.17–5.63, P=0.02) and positive blood coltures (aHR 2.64; 95% CI 1.04–6.70, P=0.04) were independently associated with the primary outcome.

Conclusion: Our long-term data showed a higher combined death or repeated TLE endpoint for patients who underwent TLE with infectious compared to those with a different indication. In the subgroup of infectious patients, the presence of vegetation and positive blood coltures were associated with poor prognosis despite an uncomplicated extraction and appropriate therapy.

CO.08.03

ABLATE AND PACE WITH CONDUCTION SYSTEM PACING: CONCOMITANT VERSUS DELAYED ATRIOVENTRICULAR JUNCTION ABLATION

Antonio Parlavecchio [1], Matteo Ziacchi [2], Gabriele Dell'Era [3], Paolo Donateo [4], Lorenzo Bartoli [2], Giuseppe Patti [3], Jacopo Senes [4], Mauro Biffi [2], Michele Accogli [5], Giovanni Coluccia [5], Pietro Palmisano [5]

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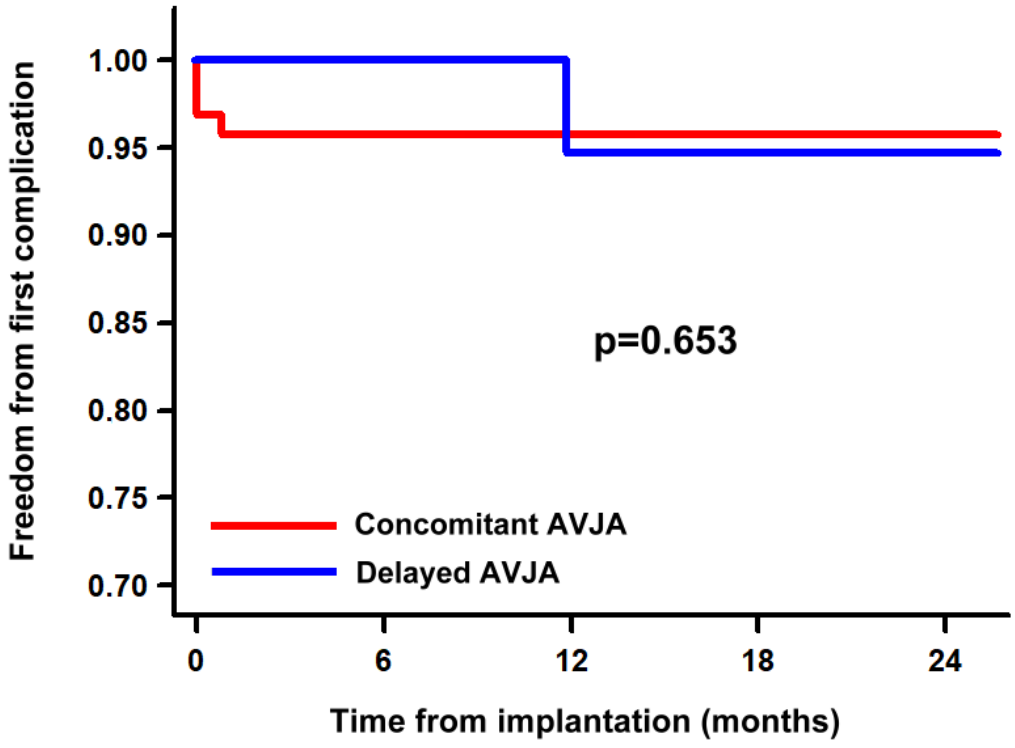
Aims: Conduction system pacing (CSP) and atrioventricular junction ablation (AVJA) improve outcomes in patients with symptomatic, refractory atrial fibrillation (AF). In this setting, AVJA can be performed simultaneously with implantation, or in a second procedure, a few weeks after implantation. Comparison data on these two alternative strategies are lacking.

Methods: Prospective, multicentre, observational study, enrolling consecutive patients with symptomatic, refractory AF undergoing CSP and AVJA performed in a single procedure, or in two separate procedures. Data on long-term outcome and healthcare resource utilization were prospectively collected.

Results: A total of 147 patients were enrolled: in 105 CSP implantation and AVJA were performed simultaneously (concomitant AVJA), in 42 AVJA was performed in a second procedure, a mean of 28.8±19.3 days from implantation (delayed AVJA). After a mean follow-up of 12 months, the rate of procedure-related complications was similar in both groups (3.8% vs. 2.4%; p=0.666, Figure). Concomitant AVJA was associated with a lower number of procedure-related hospitalizations per patient (1.0±0.1 vs. 2.0±0.3; p<0.001), and with a lower number of hospital treatment days per patient (4.7±1.8 vs. 7.4±1.9; p<0.001).

Conclusion: Concomitant AVJA resulted as safe as delayed AVJA, and was associated with a lower utilization of healthcare resources.



CO.08.04

ARTERIOVENOUS FISTULA: AN UNEXPECTED COMPLICATION OF TRANSVENOUS LEAD EXTRACTION

Gianmarco Arabia, Manuel Cerini, Emiliano Calvi, Mariagiulia Bellicini, Paolo Fornaro, Antonino Mesi, Francesca D'Altilia, Alberto Carrozza, Anna Giulia Damato, Filippo Mariotti, Luca Bontempi, Gianfranco Mitacchione, Antonio Curnis
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We report the case of a 59-year-old man who was admitted to the Cardiac Department for pocket decubitus.
He has a diagnosis of dilated cardiomyopathy in 2002 with an Ejection Fraction 20 %.
For this reason he implanted a bicameral ICD for primary prevention in the same year and subsequent upgrading to ICD-BIV in January 2021.
In October 2021 he was admitted to our Cardiac Department for pocket decubitus. On physical examination he had blood pressure 100/70 mmHg, heart rate 60 bpm. The electrocardiogram showed induced rhythm.
Blood tests revealed normal white cell count; while blood coltures were positive for Staphylococcus aureus.
In the suspicion of endocarditis, a Transesophageal Echocardiogram (TEE) was performed and showed a 1 cm filamentous mobile mass adhering to the right ventricular lead compatible with vegetation. Left ventricular function was several reduced (ejection fraction, EF 20%).
Moreover, we decided to perform a leads extraction.
Before that, a venous angiography was performed and showed patency of the anonymous-subclavian-right caval venous axis and total occlusion of the left one with collateral circulation.
In October 20th (2021) lead extraction was performed. The coronary sinus lead was manually removed.
Therefore, during remotion of the passive fixation double coil right ventricular lead (using 13 Fr Tight Rail and Laser method 16 Fr at 80 Hz) there was an evidence of profuse bleeding at sheat removal. A second angiography showed an arteriovenous fistula between the subclavian vein and the left internal mammary artery.
The patient remained hemodynamically stable, with no signs of hemothorax.
The lead extraction procedure was abandoned and in the same time he was evaluated by vascular surgeon and resuscitator who have decided not to intervene on the fistula in consideration of the patient's hemodynamic stability.
Patient was therefore transferred to the intensive care unit where he was monitored.
An angiocomputed tomography (angioCT) was performed during the following 24 hours and highlighted a spontaneous closure of the fistula, so an embolization of it was not required.
A secondo angioCT on November 16 revealed the persistence of resolution of the fistula without further complications.
On November 23th a complete lead extraction was performed without complications.
On December 14th was implanted an ICD-BIV from the right side. No complications occurred.

CO.08.05

ECONOMIC BURDEN EVALUATION IN PATIENTS WITH ICD AND CRT-D THERAPY BY ETIOLOGY AND SEVERITY

Massimiliano Marini [1], Lodovica Videsott [1], Andrea Francesconi [2], Eleonora Bonvicini [1], Silvia Quintarelli [1], Alessio Coser [1], Paolo Moggio [1], Simone Bilato [3], Lorenzo Di Spazio [4], Annalisa Campomori [4], Giuliano Mariotti [5], Roberto Bonmassari [1], Giuseppe Boriani [6]

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Background: Management of acute cardiovascular diseases is constantly improving, which leads to a progressive increase of life expectancy, and consequently, to an increase of disease prevalence and cost of care. From 2011, the Electrophysiology Department of the Trento Cardiology Unit (Santa Chiara hospital, Italy) has been systemically collecting information of adult patients treated with either implantable cardioverter-defibrillators (ICDs) or cardiac resynchronization defibrillators (CRT-Ds) with the aim of measuring clinical and economic outcomes, assessing services costs and cost-effectiveness.

Purpose: The purpose of this retrospective analysis was to estimate direct cost of care for adult heart failure patients treated with ICDs or CRT-Ds and analyse the main cost drivers, under two different perspectives: payer (Local Healthcare Service) and provider perspective (hospital).

Methods: The study population consisted of adult patients, who received either ICD or CRT-D therapy, were discharged alive from the hospital after implantation, and could be followed up for at least 3 years (study period) or died before the end of the study period. Patient observation started at device implantation date (index date). Direct costs were analysed in the overall population, and by subgroup of disease severity (e.g., presence of comorbidities, morbidity scores, etc.).

Results: Between January 2011 and December 2019, N=860 patients met the inclusion criteria and were included in the analysis (N=519 patients, 60% followed through standard monitoring; N=341 patients, 40% followed through remote monitoring). N=497 (58%) received ICD and N=363 (42%) received CRT-therapy. N=320 patients died before the end of the study period. Overall direct cost was 5,794 euro(standard error, se: 398) in the payer perspective and 7,068 euro (se: 574) in the provider perspective. Costs tended to increase according to many causes, for example (payer perspective): NYHA class (2,989 euro for class I; 6,285 euro for class II; 7,087 euro for class III), prior diagnosis of diabetes (7,105 euro vs 5,488 euro), arterial hypertension (euro 6,462 vs 4,826 euro), stroke or transient ischemic attack (6,690 euro vs 5,791 euro), myocardial infraction (6,762 euro vs 5,206 euro), venous thromboembolism (7,283 euro vs 5,751 euro), atrial fibrillation (5,022 euro vs 8,187 euro if persistent), reduced ejection fraction (3,061 euro if >55% vs 7,160 euro if between 35-44%), aortic stenosis (5,884 euro if absent vs 10,859 euro if severe). The main driver of cost increase was higher hospitalization rate associated to disease severity and comorbidity burden, despite follow-up days were generally lower in these groups because of earlier death.

Conclusion: This analysis confirms that the economic burden of patients carrying CIED is significant in both payer and provider perspectives. Overall, costs increase significantly with increasing disease severity and burden of comorbidities, highlighting the importance of preventing cardiac complications through efficient patient monitoring.

Subgroups	Mean direct costs, €	
	Payer perspective	Provider perspective
Overall population	5,794	7,068
New York Heart Association (NYHA) class		
I	2,989	3,602
II	6,285	7,349
III	7,087	10,323
Diabetes		
No	5,488	6,625
Yes	7,105	8,890
Arterial hypertension		
No	4,826	6,691
Yes	6,462	7,414
Stroke or transient ischemic attack		
No	5,791	7,017
Yes	6,690	8,682
Myocardial infraction		
No	5,206	5,998
Yes	6,762	8,778
Venous thromboembolism		
No	5,751	7,155
Yes	7,283	6,926
Atrial fibrillation		
No	5,022	6,357
Paroxysmal	6,597	8,573
Persistent	8,187	9,250
Chronic	7,788	8,155
Ejection fraction		
>55%	3,061	3,064
45-54%	5,541	4,818
35-44%	7,160	9,786
<35%	6,194	7,745
Aortic stenosis		
Absent	5,884	7,034
Mild/moderate	5,562	8,738
Severe	10,859	21,610

CO.08.06

COMPLICATIONS OF LEFT BUNDLE BRANCH AREA PACING COMPARED WITH BIVENTRICULAR PACING IN CANDIDATES FOR RESYNCHRONIZATION THERAPY: RESULTS OF A MULTICENTER REGISTRY

Pietro Palmisano [1], Gabriele Dell'era [2], Federico Guerra [3], Ernesto Ammendola [4], Matteo Ziacchi [5], Mattia Laffi [6], Paolo Donateo [7], Alessandro Guido [1], Chiara Ghiglieno [2], Antonio Parlavecchio [8], Antonio Dello Russo [3], Gerardo Nigro [4], Mauro Biffi [5], Germano Gaggioli [6], Jacopo Senes [7], Giuseppe Patti [2], Michele Accogli [1], Giovanni Coluccia [1]

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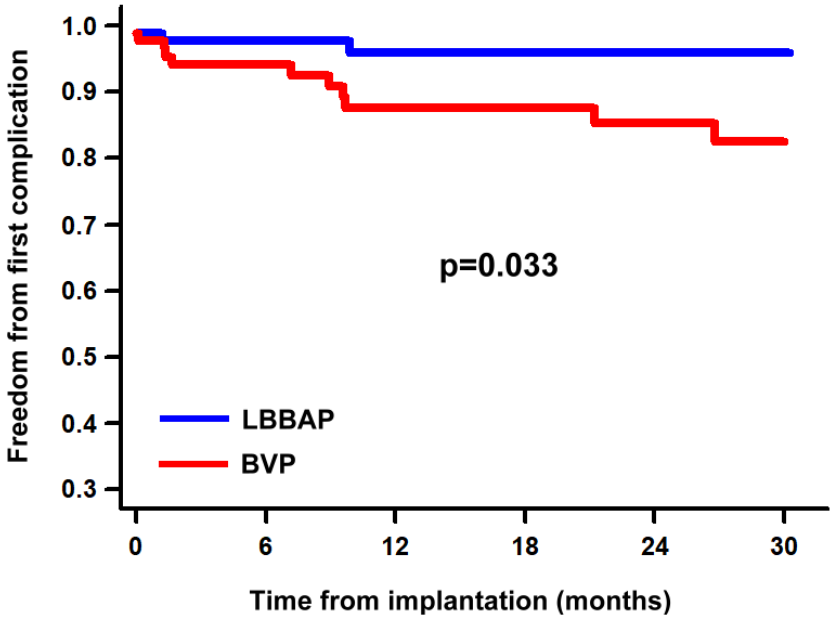
Background: Cardiac resynchronization therapy (CRT) with biventricular pacing (BVP) is a well-established therapy in patients with reduced left ventricular ejection fraction (LVEF), heart failure, and left bundle branch (LBB) block. LBB area pacing (LBBAP) has recently been shown to be a feasible and effective alternative to BVP. Comparative data on the risk of complications between LBBAP and BVP among patients undergoing CRT are lacking.

Objective: The aim of this study was to compare the long-term risk of procedure-related complications between LBBAP and BVP in a cohort of patients undergoing CRT.
Methods. Prospective, multicenter, observational study enrolling 668 consecutive patients (71.2±10.0 years, 52.2% male, 59.4% NYHA class >II), with LVEF 33.4±4.3% who underwent BVP (n=560) or LBBAP (n=108) for Class I or II indications for CRT. Propensity matching for baseline characteristics yielded 90 matched pairs. Rate and nature of procedure-related complications occurring during follow-up were prospectively collected and compared between the two groups.

Results: During a mean follow-up of 18 months, procedure-related complications were observed in 14 patients: 11 in BVP (12.2%), and in 3 in LBBAP (3.3%) (p=0.026). Compared to LBBAP patients, BVP patients showed a lower complication-free survival (p=0.033, Figure). On multivariable analysis, BVP resulted an independent predictive factor associated with greater risk of complications (hazard ratio, 3.224, p=0.028). Complications related to coronary sinus lead were most frequently observed in BVP patients (54.5% of all complications).

Conclusions. LBBAP was associated with a lower long-term risk of device-related complications compared with BVP in patients with CRT indications.



COMUNICAZIONI ORALI 09

GIOVEDI' 19 SETTEMBRE

AUDITORIUM

18:30-19:30

SESSIONE DI COMUNICAZIONI ORALI: ARITMOLOGIA CLINICA

Moderatori: Mirko Luparelli (Palermo), Valerio De Sanctis (Milano)

CO.09.01

THE ROLE OF TOMM40 IN CARDIOVASCULAR MORTALITY AND CONDUCTION DISORDERS

Nicolò Soldato, Giuseppe Di Stolfo, Sandra Mastroianno, Raimondo Massaro, Paola Siena, Giovanni De Luca, Francesca Miscio, Domenico Potenza
Fondazione IRCCS Casa Sollievo della Sofferenza, San Giovanni Rotondo, ITALY

Aims: TOMM40 single nucleotide polymorphism (SNP) RS2075650 consists in allelic variation c.275-31A > G and it has been linked to Alzheimer disease and cholesterol levels and other risk factors. However, data on its role in cardiovascular disorders are lacking.
The first aim of the study is to evaluate mortality according to TOMM40 genotype in a cohort of selected patients affected by advanced atherosclerosis. Second aim was to investigate the relationship between Xg and AA alleles and the presence of conduction disorders and implantation of defibrillator (ICD) or pacemaker (PM) in our cohort.

Materials and methods: We enrolled 276 patients (mean age 70.16 ± 7.96 years) affected by advanced atherosclerosis. We divided the population into two groups according to the genotype (Xg and AA carriers). We evaluated several electrocardiographic and echocardiographic parameters including heart rate, rhythm, presence of right and left bundle branch block (LBBB and RBBB), PR interval, QRS duration and morphology, QTc interval, and left ventricular ejection fraction (LVEF). We followed these patients for 82.53 ± 30.02 months and we evaluated the incidence of cardiovascular events, number of deaths and PMs/ICDs implantations.

Results: We did not find a difference in total mortality between Xg and AA carriers (16.3 % vs 19.4 %; p=0.62). However, we found a higher mortality for fatal cardiovascular events in Xg carriers (8.2 % vs. 4.4%; HR = 4.53, 95% CI 1.179-17.367; p = 0.04) respect to AA carriers.
We noted a higher percentage of LBBB in Xg carriers (10.2% vs 3.1%, p= 0.027) which was statistically significant. Presence of right bundle branch block (RBBB) was also higher in Xg (10.2% vs 4.4%, p=0.10, not statistically significant. We did not observe significant differences in other parameters.
At the time of enrolment, we observed a tendency for device implant in Xg carriers at a younger age compared to AA carriers (58.50 ± 0.71 ys vs 72.14 ± 11.11 ys, p=0.10). During the follow-up we noted no statistical difference of new device implantations in Xg respect to AA carriers (8.2% vs 3.5% ; HR = 2.384, 95% CI 0.718-7.922; p = 0.156). The tendency to implant Xg at a younger age compared to AA patients was confirmed during follow-up, (69.50 ± 2.89 ys vs 75.63 ± 8.35 ys, p=0.074). Eventually, we pointed out that Xg carriers underwent device implantation 7.27 ± 4.43 years before AA (65.83 ± 6.11 years vs 73.10 ± 10.39 years, p=0.049) when we considered all patients, at the time of enrollment and after follow-up.

Fig. 1 Kaplan-Meier estimates of cardiac device implants according to TOMM40 genotype during follow up

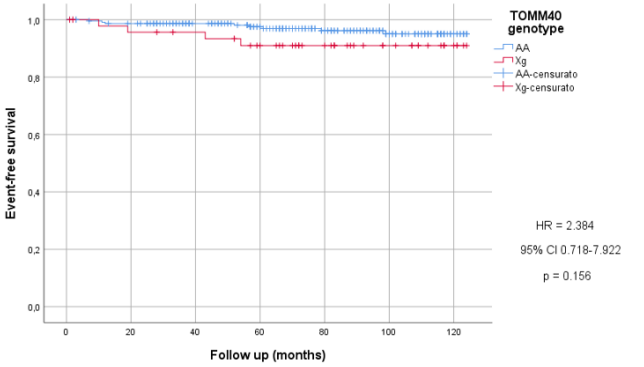
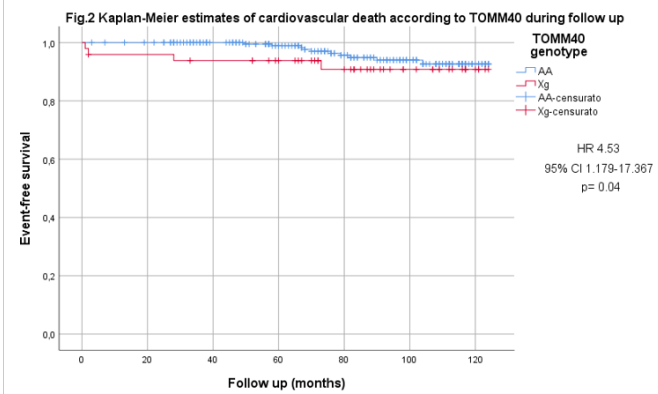


Fig.2 Kaplan-Meier estimates of cardiovascular death according to TOMM40 during follow up



Conclusion: In our study we observed that TOMM40 Xg patients affected by advanced atherosclerosis have a higher incidence of developing fatal cardiovascular events, higher incidence of LBBB and an earlier age of PM or ICD implantation, as compared to AA carriers. Further studies will be needed to evaluate the genomic contribution of TOMM40 SNPs to cardiovascular deaths and cardiac conduction diseases.

CO.09.02

CLINICAL IMPACT OF SMOKING ON ATRIAL FIBRILLATION RECURRENCE AFTER PULMONARY VEIN ISOLATION

Andrea Bernardini [1], Alessandro Paoletti Perini [1], Davide Ciliberti [2], Margherita Padeletti [1], Massimo Milli [1], Cristiano S. Zaccaria [2], Andrea Giomi [1]

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[2] *Area Cardiovascolare, Azienda Ospedaliera Universitaria Careggi, Firenze, ITALY*

Background: The clinical impact of cigarette smoking on atrial fibrillation (AF) recurrences after pulmonary vein isolation (PVI) is unknown in a European population and has contradictory results in other studies, performed only on Asian populations.

Methods and aim: patients who underwent a first radiofrequency PVI for symptomatic AF in a single-center Hospital between February 2021 and October 2023 were enrolled. Smoking habits and other cardiovascular factors were assessed. Recurrences of AF were assessed by ambulatory visits, phone follow-up contacts, and the use of Holter EKG or implantable loop recorders as deemed. The study aimed to assess the clinical impact of smoke and other cardiovascular factors on AF recurrences after PVI in a contemporary European cohort of patients

Results: The population of this retrospective study included 186 patients (135 males [72.6%]) with a mean age of 63.4±9.7 years. Patients active smokers were 29 (15.7%); only one (0.5%) patient ceased smoking after PVI. No statistically significant baseline differences were detected between active smokers and non-smokers. After a follow-up of 418 ± 246 days, AF recurrence was higher in active smoking patients vs. non-smoker patients, the latter intended as a combination between previous smokers and never smokers (34.5% vs. 14% p=0.01, Figure 1). The previous smoking habit was not associated with an increased risk of AF recurrence when compared with patients that never smoked (13.2% vs. 14.6%, p=0.23), while contrarily, active smoking impacted on AF recurrence in comparison with previous smokers (p=0.01) and never smokers (p=0.04). The increased incidence in AF recurrence in active smokers was consistent also considering only paroxysmal (31.4% vs 9.6%, p=0.012) or persistent (50% vs 31.2%, p=0.03) forms of AF. At Cox regression analysis, smoking (HR =2.96 95% CI 1.32 – 6.64) and persistent AF (HR =2.64 95% CI 1.22-5.7) resulted in independent predictors of AF recurrence after PVI.

Conclusion: cigarette smoke increases the risk of AF recurrences after PVI, regardless of the AF form (paroxysmal or persistent).

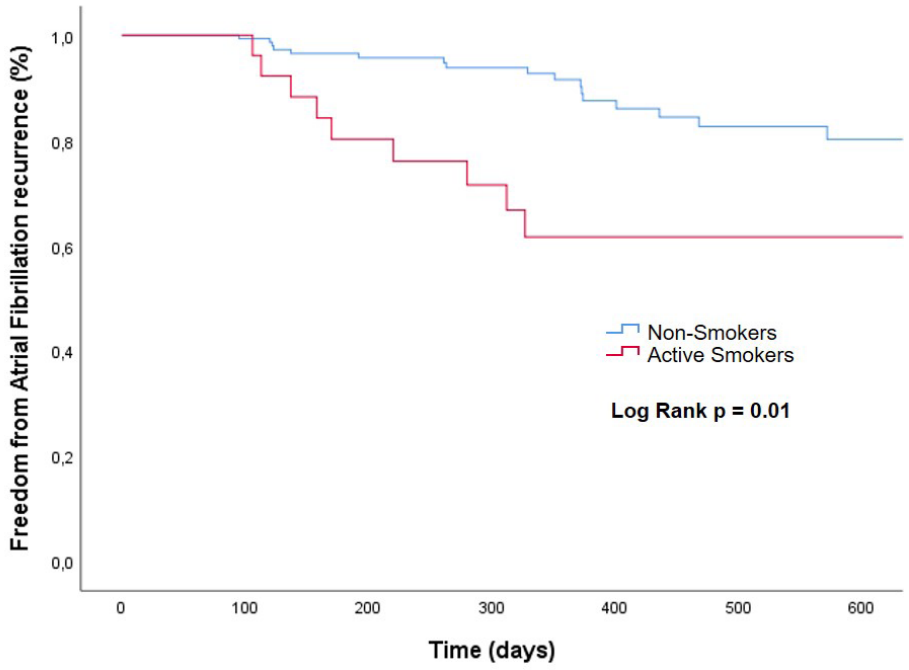

Figure 1: Kaplan Meier analysis of freedom from atrial fibrillation after pulmunary vein isolation in the global population. The analysis time starts after 3 months of blanking period

CO.09.03

ADVANCED INTERATRIAL BLOCK ACROSS THE SPECTRUM OF THE RENAL FUNCTION

Marco Marano [1], Erika Parente [2], Luigi Senigalliesi [1], Rossella Cocola [1], Mariarosaria Fontana [1], Vincenzo Russo [2]
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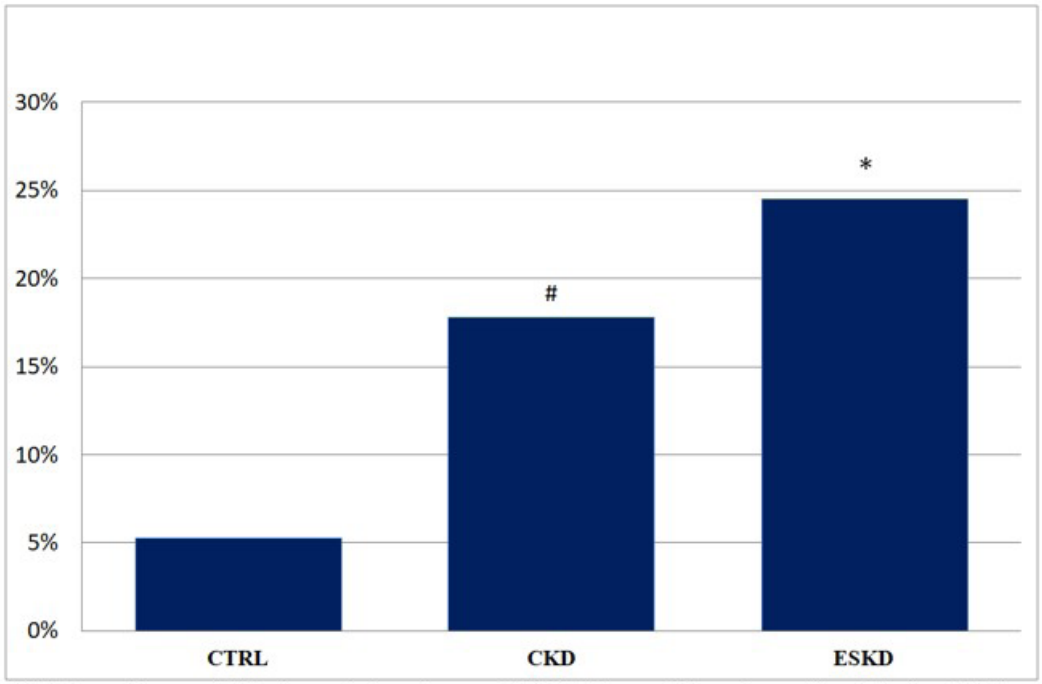
[2] *Università degli studi della Campania L. Vanvitelli, Napoli, ITALY*

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 cardiomyophaty , 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-IABand ad-vanced-IAB among different stage 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 patient 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 preva-lence of advanced-IAB. Advanced-IAB may be sign of the uremic cardiomyopathy and suggest further evaluation with long-term follow-up to investigate its prognostic significance in chronic kidney disease.



CTRL: Control group; CKD: chronic kidney disease; ESKD: End stage kidney disease (#: p=0.04; *: p=0.005)

CO.09.04

A NOVEL VARIANT IN SCL4A3 GENE ASSOCIATED WITH FAMILIAR SHORT QT SYNDROME, SUDDEN DEATH AND EPILEPSY

Antonino Micari [1], Giuseppe Dattilo [1], Lilia Oreto [2], Francesco De Luca [2], Pasquale Crea [1]
[1] *Università degli Studi di Messina, UOC Cardiologia, Messina, ITALY*
[2] *Università degli Studi di Messina, UOS Cardiologia Pediatrica, Messina, ITALY*

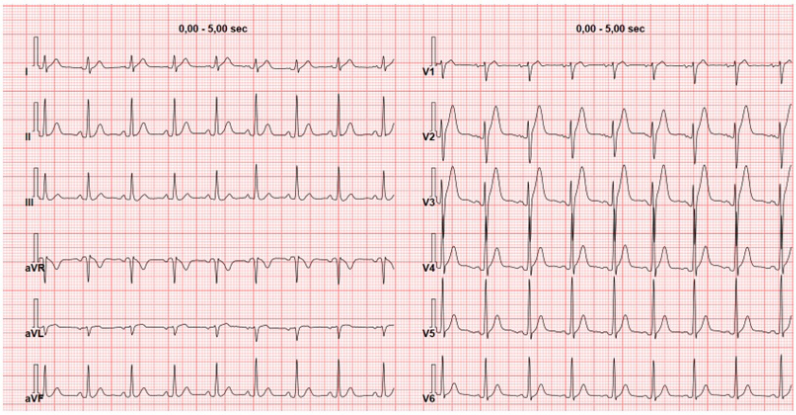
Short QT syndrome (SQTS) is a rare, genetically determined, heart rhythm disorder with a high risk of ventricular fibrillation (VF) and sudden cardiac death (SCD). A short QT interval on surface electrocardiogram is particularly rare in the pediatric population, with a prevalence of 0.05%. Nine genes have been previously implicated as a potential cause of SQTS, however only four of them, according to a recent study, have an adequate causal relationship with the syndrome. SCL4A3, a sodium bicarbonate exchanger, is one of the genes whose loss-of-function can be responsible of SQTS.

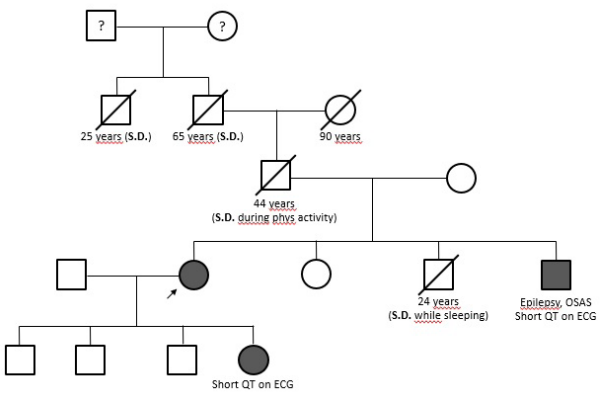
We report the story of a family with a story of sudden death and short QT interval. The proband is a 13-year-old girl who came to our attention after a routine ECG showing a reduced QT interval(QTb 345 ms) and tall T waves in precordial leads. Neither the father nor the three brothers showed any abnormality of the ventricular repolarization, however the ECG of the mother showed a short QT interval, with a QTb of 350 msec. The woman also suffered from an epileptic syndrome, kept under control by medical therapy, and apparently has never had syncopal episodes of cardiac origin. We collected the family history from her, and we discovered four cases of sudden death. Therefore, we asked for genetic test for the mother and the daughter, which identified a novel missense mutation of the gene SLC4A3 (NM_201574.2) in heterozygosity in both. This mutation c.1157G>T p.Gly386Val hasn't ever been described in literature and it's not present in the Genome Aggregation database. Andaccording to three prediction tools (Align-GVGD, SIFT, PolyPhen-2) it is responsible of a loss-of-function effect on the protein which causes shortening of the action potential. We attempted to prolong the repolarization by giving quinidine to mother and daughter. However, the QT interval remained essentially unchanged.

Since currently known genetic mutations explain only a part of SQTS, other genes are probably associated with the development of this disease. Recently, Thorsen et al. and Christiansen et al. identified the same variant (p.Arg370His) resulting in a loss-of-function of the SCL4A3 gene, as a cause of SQTS in distinct families.

Anion exchanger 3, expressed in brain and heart extrudes intracellular HCO(3)(-) in exchange for extracellular Cl(-). The SLC4A3 gene encodes two variants of AE3, brain or full-length AE3 and cardiac AE3. In vitro and zebrafish models showed that SCL4A3 loss-of-function can lead to intracellular alkalinization and a reduction in intracellular chloride. These conditions can lead to an increase in the activity of delayed rectifier potassium channels such as KCNQ1 and a reduction of the activity of slow calcium channels, resulting in a reduction in the duration of the action potential and a shortening of the QT interval. Moreover, the SLC4A3 gene mutation has been associated with the development of idiopathic generalized epilepsy, which accounts for approximately 30% of all epilepsies.

We showed the first documented missense mutation p.Gly386Val of the SLC4A3 gene in a family with short-QT, sudden death and epilepsy, with a probable causal role.





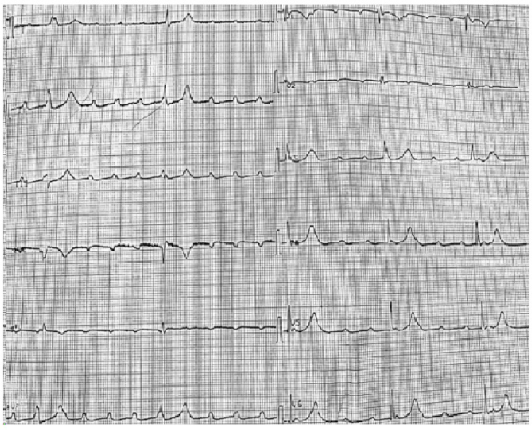
CO.09.05

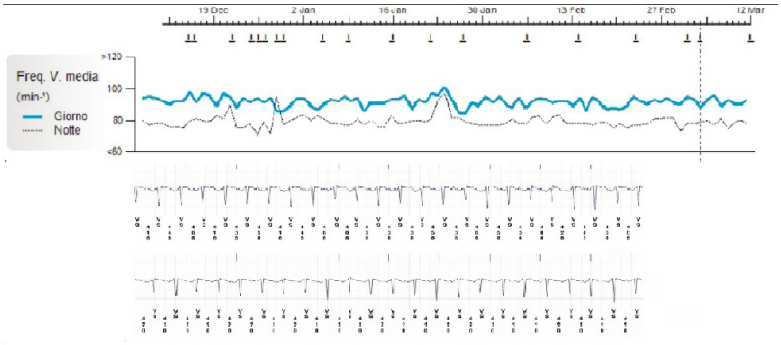
UN CASO DI BLOCCO ATRIO-VENTRICOLARE COMPLETO REVERSIBILE IN GIOVANE ETÀ. IL RUOLO EZIOLOGICO DEGLI ANTICORPI ANTI-RO/SSA

Nicola Ferrara [1], Pietro Enea Lazzerini [3], Viola Salvini [3], Riccardo Accioli [3], Mirco Lazzeri [2], Irene Scimè [1], Carmine Marallo [2], Pasquale Notarstefano [2]

[1] *Dipartimento di medicina clinica e sperimentale - Università degli studi di Messina, Messina, ITALY*
[2] *Dipartimento cardio-toraco-neuro-vascolare - Ospedale San Donato, Arezzo, ITALY*
[3] *Dipartimento di scienze mediche - Università di Siena, Siena, ITALY*

Il corretto inquadramento diagnostico del blocco atrio-ventricolare (BAV) è di cruciale importanza nei giovani adulti, in cui un percorso diagnostico-terapeutico tailored potrebbe evitare l'impianto di un pacemaker definitivo.
Nuove evidenze riconoscono l'autoimmunità come emergente meccanismo coinvolto in un certo numero di casi di insorgenza di BAV. In particolare, la presenza di anticorpi anti-Ro/Sjogren's-Syndrome-related antigen A (anti-Ro/SSA)-52kD, tipici di patologie autoimmuni come la Sindrome di Sjogren, ma riscontrabili anche in soggetti apparentemente sani, possono rappresentare un fattore eziologico responsabile dell'insorgenza di BAV in giovani al di sotto dei 50 anni in una percentuale non trascurabile di casi. Ciò perché questi autoanticorpi sono dotati della capacità di legare e inibire i canali del calcio di tipo L CaV 1.2/1.3, implicati nella genesi del potenziale d'azione nelle cellule nodali calcio-dipendenti.
Una donna di 49 anni senza precedenti clinici di rilievo giungeva in Pronto Soccorso per astenia, dispnea da sforzo e presincope. All'ECG veniva evidenziato BAV di III grado con ritmo di scappamento a QRS stretto a frequenza di 30-35 b/min. L'ecocardiogramma risultava nella norma. La paziente veniva ricoverata in UTIC e sottoposta a posizionamento di un pacemaker temporaneo. Gli esami ematochimici di routine ed gli indici di flogosi risultavano nella norma. In anamnesi da segnalare familiarità per sindrome di Sjogren (madre); emergeva inoltre che la paziente era stata punta circa un mese addietro da una zecca e nei giorni successivi aveva presentato un eritema alla nuca e artralgie agli arti. Veniva quindi avviata terapia antibiotica con ceftriaxone ed eseguiti esami sierologici per identificazione di Borrelia, risultati negativi. In aggiunta, nel sospetto della presenza di una componente autoimmune in diagnosi differenziale con la malattia di Lyme, veniva eseguito anche uno screening auto-anticorpale e iniziata terapia con corticosteroidi ad alte dosi per via endovenosa. Dopo poche ore dall'inizio della terapia steroidea si assisteva a ripristino della normale conduzione atrioventricolare e completa scomparsa della sintomatologia. Il giorno successivo veniva rimosso il pacemaker temporaneo.
Nel corso della successiva degenza veniva effettuata RM cardiaca, risultata nella norma, e studio elettrofisiologico, che mostrava normali parametri conduttivi (AH 100 msec; HV 45 msec).
Data la stabilità clinica e del quadro elettrocardiografico, non si poneva indicazione a impianto di pacemaker e si optava per il posizionamento di loop recorder. La paziente veniva dimessa in terapia con prednisone 75 mg/die, cui veniva associata precocemente idrossiclorochina (400 mg/die) a scopo "steroid-sparing". Durante il follow up veniva confermata la negatività della sierologia anticorpale per Borrelia Complex, mentre è stata dimostrata la positività della paziente (e confermata quella della madre) agli anticorpi anti-Ro/SSA-52kD. All'ECG e ai controlli seriati del loop recorder persiste normale conduzione atrio-ventricolare a distanza di 8 mesi dall'evento, in corso di progressivo decalage di terapia con prednisone (attualmente 6,25 mg/die), con mantenimento di idrossiclorochina a dosaggio pieno (400 mg/die).
In conclusione, l'identificazione di anticorpi circolanti anti-Ro/SSA-52kD e la risposta positiva alla terapia corticosteroidea ha consentito di identificare il BAV di questa giovane donna come una manifestazione di un disordine autoimmune e di trattarne la causa farmacologicamente, evitando l'impianto di un pacemaker definitivo.





COMUNICAZIONI ORALI 10

GIOVEDI' 19 SETTEMBRE

SALA ITALIA

18:30-19:30

SESSIONE DI COMUNICAZIONI ORALI: DEVICE IMPIANTABILI

Moderatori: Ernesto Ammendola (Napoli), Elia De Maria (Modena)

CO.10.01

ORAL FLECAINIDE THERAPY AND MYOCARDIAL PACING: PRELIMINARY DATA FROM A PROSPECTIVE MULTICENTER REGISTRY

Francesco Paolo Niglio [1], Francesco Santoro [1], Pietro Palmisano [2], Domenico Gianfrancesco [3], Ilaria Ragnatela [1], Pier Luigi Pellegrino [1], Girolamo D'Arienzo [1], Giovanni Coluccia [2], Francesco Bartolomucci [3], Natale Daniele Brunetti [1]

[1] *Cardiologia Universitaria, Ospedali Riuniti di Foggia, Foggia, ITALY*

[2] *Ospedale Cardinale G. Panico, Tricase, ITALY*

[3] *Ospedale L. Bonomo, Andria, ITALY*

Background: 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±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±16% to 5±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 ± 2.1mV 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±0.61V@0.4ms vs 0.80±0.42V@0.4ms p=0.01; 0.80±0.53V @0.4ms vs 0.83±0.33V @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.

CO.10.02

PROGNOSIS AFTER LEAD EXTRACTION FOR CARDIAC IMPLANTABLE ELECTRONIC DEVICE INFECTIONS: THE IMPORTANCE OF AETIOLOGICAL AGENT AND CLINICAL PATTERN

Giulia Massaro [1], Renato Pascale [2], Mauro Biffi [3], Cristian Martignani [3], Matteo Ziacchi [3], Andrea Simeono [1], Raimondo Pittorru [4], Manuel De Lazzari [4], Federico Migliore [4], Igor Diemberger [1]

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[2] *Infectious Diseases Unit, IRCCS Azienda Ospedaliero-Universitaria di Bologna, Bologna, ITALY*
[3] *UOC di Cardiologia, IRCCS Azienda Ospedaliero-Universitaria di Bologna, Dipartimento Cardio-toraco-vascolare, Bologna, ITALY*
[4] *Department of Cardiac, Thoracic, Vascular Sciences and Public Health, University of Padova, Padova, ITALY*

Background: Cardiac implantable electronic devices infections (CIEDI) are associated with poor survival despite the improvement in transvenous lead extraction (TLE). Aetiology and systemic involvement are driving factors of clinical outcomes. The aim of this study was to explore their contribute on overall mortality.

Methods: A prospective study was performed between 2011 and 2021, including all TLE candidates at our regional referral University hospital for CIEDI with microbiological confirmed aetiology. Considering significant predictors of mortality at multivariate Cox regression analyses, a 5-point BOP2D score was developed, and it was validated with a prospective cohort from the Padua University.

Results: 157 patients were enrolled (mean age 71.3±12.3 years, 81.5% male). S. aureus was isolated in 32.5% of patients, and it was more associated with valvular heart disease, systemic infection, and chronic kidney disease. CIEDI pattern was associated with 1-year mortality, with a significantly worse outcome in patients with "cold closed pocket" (CCP). The developed BOP2D score presented a 0.807 AUC (95%CI 0.703-0.910, p<0.001) and a good predictive value (OR 2.355, 95%CI 1.754-3.162; p<0.001), and was associated with a progressive increase in mortality with a score >2. The score validation with the registry from the Padua University (135 patients) retrieved a C-statistic of 0.746 (95%CI 0.613-0.879; p=0.002).

Conclusion: Both CCP and S. aureus were confirmed as risk factors for mortality in CIEDI patients. This study supports the hypothesis that the infectious process may occur through different mechanisms associated with different infection patterns, and high-risk patients should be considered for specific and aggressive approaches.

CO.10.03

INFEZIONI ACUTE CORRELATE A DISPOSITIVI ELETTRONICI IMPIANTABILI CARDIACI IN GERMANIA NEL 2016

Benito Baldauf [1], Marzia Giaccardi [2], Roberto Cemin [3], Kerstin Bode [4], Hendrik Bonnemeier [1]
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[2] *Ospedale Santa Maria Annunziata, Bagno a Ripoli, ITALY*
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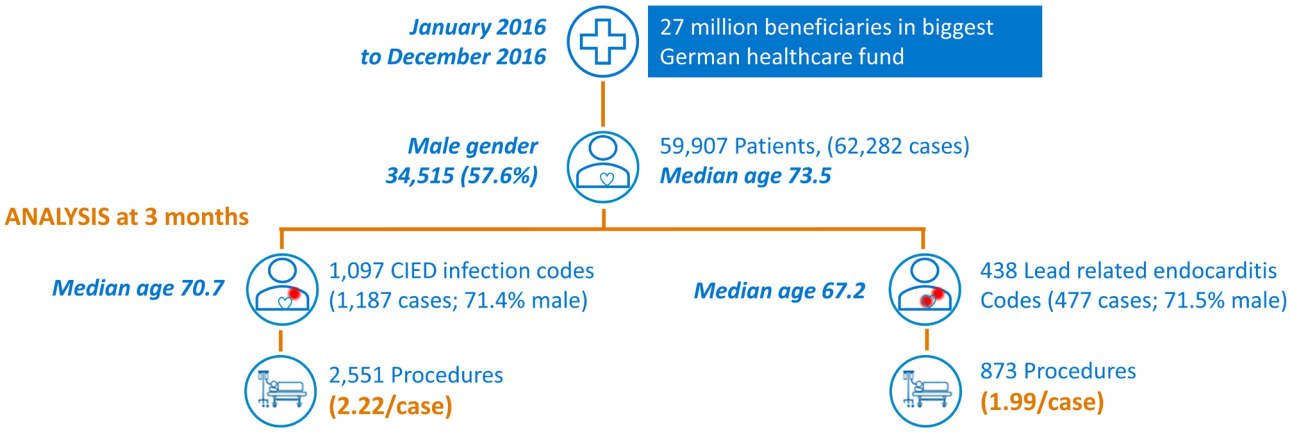
Premessa: In tutto il mondo, il rischio di infezione da dispositivi elettronici impiantabili cardiovascolari (CIED) è in aumento. Mancano pubblicazioni di dati contemporanei sulle infezioni da CIED. Questa indagine fornisce i tassi di procedure correlate ai CIED, i ricoveri ospedalieri per infezione da CIED e la relativa mortalità in Germania.

Metodi: I dati del più grande fondo di assicurazione sanitaria sono stati analizzati per le procedure CIED, tra cui il posizionamento, la revisione con scopo di up- o downgrade, la sostituzione del generatore, la revisione anticipata e l'estrazione parziale o completa utilizzando codici di procedura specifici per il rimborso in Germania nel 2016. Tra la popolazione totale di beneficiari sottoposti a procedure CIED, sono stati utilizzati i codici della Classificazione internazionale delle malattie, decima revisione tedesca, e i codici operativi e procedurali per la rimozione parziale o completa dell'hardware per identificare le infezioni CIED e le endocarditi correlate agli elettrocateteri.

Risultati: Nel 2016, 59.907 pazienti (57,6% maschi) sono stati sottoposti a una procedura CIED. 1097 (1,83%) sono stati ricoverati per infezione localizzata da CIED o hanno sviluppato un'infezione localizzata entro 3 mesi dalla procedura. L'infezione localizzata del CIED ha aumentato il tasso di mortalità all'8,0%.
438 (0,73%) pazienti sono stati ricoverati in ospedale per endocardite correlata all'elettrocatetere o hanno sviluppato un'endocardite correlata all'elettrocatetere del CIED entro 3 mesi dalla procedura indice. L'endocardite correlata all'elettrocatetere ha aumentato il tasso di mortalità al 16,0%.
I pazienti che presentavano un'infezione della tasca del CIED e un'endocardite correlata all'elettrocatetere erano più giovani (70,7 e 67,2 vs 73,5 anni) e più spesso di sesso maschile (71,4 e 71,5 vs 57,6%).
L'infezione della tasca ha comportato 2,21 procedure aggiuntive per caso. L'endocardite da elettrocatetere ha comportato 1,99 procedure aggiuntive per caso.

Conclusioni: In sintesi, i nostri dati dimostrano che l'infezione acuta da CIED ha una prevalenza maggiore di quanto riportato in precedenza e che l'aderenza alle linee guida non raggiunge lo standard che offre ai nostri pazienti le migliori possibilità di guarigione.



CO.10.04

IDIOPATHIC VENTRICULAR FIBRILLATION IN DONOR HEARTS: THE ROLE OF S-ICD IN RECIPIENTS

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Introduction: Nowadays, orthotopic heart transplantation (OHT) is a well-established therapy in case of end-stage heart disease. Sudden cardiac death (SCD) affects a non-negligible proportion of patients after OHT, due to the onset of malignant arrhythmias. Implantable cardioverter defibrillator (ICD) plays a pivotal role in the prevention of SCD before OHT. Instead, the role of these devices in the post- transplantation period should be further explored. To the best of our knowledge, this case report represents the first experience of a subcutaneous ICD (s-ICD) implantation in the short-term post- OHT due to previous idiopathic life-threatening arrhythmias in the living donor.

Case report: A 70-year-old male patient was admitted to our institution for OHT screening. He had a history of smoking, hypertension, diabetes mellitus type 2, dyslipidemia, severe renal impairment and permanent atrial fibrillation. The patient was affected by an end-stage heart failure (HF) related to a severe ischemic cardiomyopathy with a 5 INTERMACS profile (Interagency Registry for Mechanically Assisted Circulatory Support). He received an ICD in primary prevention, then upgraded to cardiac resynchronization therapy with defibrillator (CRT-D). He also suffered from several acute HF exacerbations complicated by episodes of acute kidney injury and respiratory failure. Getting on the national transplant waiting list, the patient was called for OHT after few weeks. His 40-year-old donor experienced idiopathic ventricular fibrillation (VF) episodes treated by DC shocks and cardiopulmonary resuscitation (CPR). Before OHT, no underlying structural heart disease was identified in the donor. In the post- operative time and the rehabilitation period neither major complications nor malignant arrhythmias were observed in the patient. After 4 months from OHT a s-ICD was implanted.

Discussion: In our case, the donor experienced life-threatening arrhythmias before OHT. According to current guidelines, ICD implantation may be considered in selected patients with cardiac allograft vasculopathy (CAV) or treated rejection. In our case these conditions were not observed in the follow up. Moreover, malignant arrhythmias were not registered after OHT. Consequently, our case should be collocated in a grey area, not considered by current guidelines. Given the idiopathic arrhythmogenic substrate of the transplanted heart, we decided to protect the receiver from SCD with an ICD. A s-ICD was preferred to transvenous devices due to the absence of pacing requirement and to avoid lead-related complications such as infections caused by the immunosuppressed state after OHT.

Conclusions: CPR donors are an expanding group of potential, yet presently underutilized, heart donors. Recent guidelines are supporting their utilization. The evidence of previous life-threatening arrhythmias in
living donor may require the need of ICD implantation in the post-OHT to protect the recipient from SCD. S-ICD appears to be a valid alternative to the conventional transvenous system after OHT.
From the point of view of the donor the ICD implantation should be considered as secondary prevention procedure. From the perspective of the recipient, it occurred as primary prevention.

CO.10.05

ASSESSMENT OF LONG-TERM CONDUCTION SYSTEM CAPTURE BY REMOTE MONITORING IN PATIENTS WITH CSP

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Background: During implantation and follow-up (FU) control in conduction system pacing (CSP), electrocardiographic demonstration of conduction system capture is essential. We attempted to assess the feasibility of comparing remote device FU EGM recordings with EGM recordings at baseline as a method to ensure a long-term correct CSP.

Methods: Ninety-six consecutive patients underwent to CSP (90 LBBAP, 6 HBP) with a Solia S (Biotronik) and 3830 Select Secure lead (Medtronic, Inc) at 2 centers between October 2021 and October 2023. The Near Field V-EGM morphology (NF EGM) and Near Field V-EGM time to peak (NFTime to peak), were recorded while pacing the conduction system with simultaneous 12-lead ECG rhythm strips one day post implant (Base-EGM). These EGM parameters at remote FU were analyzed and compared to Base-EGM in patients who showed changes at in office FU 12-lead ECG due to dislodgment or threshold modification and in patients with still-present conduction system capture confirmed by 12-lead ECG.

Results: Indications for CSP were sinus node dysfunction, atrioventricular conduction disease, and cardiac resynchronization therapy in 20 (20.8%), 60 (62.5%), and 16 (16.7%) patients, respectively. Baseline QRSd was 125±38 ms with QRSd >120 ms in 67 (83.9%) patients. During FU, NF EGM and NFTime to peak (>40 ms) did not differ from Base-EGM in patients in whom in-office 12-lead ECG confirmed conduction system capture. They were highly sensitive (93% and 90%, respectively) and specific (98% and 96%) for CSP irrespective of basal QRSd. Change in EGM parameters at remote FU correlates with change in 12-lead ECG in patients with loss of conduction system capture. In the 11 patients with modified 12-lead ECG at FU, changes in NF EGM and NFTime to peak (>40 ms) were observed in 11 and 10 patients, respectively, resulting highly sensitive and specific in predicting loss of conduction system capture.

Conclusions: in patients with CSP the EGM monitoring results accurate in assessing long -term capture of the conduction system. This study paves the way for future studies to evaluate algorithms of dedicated CSP devices

CO.10.06
A RARE CASE OF LEAD EXTRACTION

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Aims: Poor data exist about the leadless PM implantation through a bioprosthetic tricuspid valve.
Bioprosthetic tricuspid valve has traditionally represented a relative contraindication to transvenous right ventricular pacing for possible tricuspid bioprosthetic valve damage and dysfunction. Therefore, epicardial pacing is usually preferred to transvenous right pacing through a bioprosthetic tricuspid valve for the deleterious effect of permanent pacing leads on tricuspid bioprosthetic valve function and regurgitation.

Methods: Our case focuses on a 62-year-old woman with mechanical mitral and biological tricuspid prosthesis due to rheumatic disease since 2007 and with a PM-DDDR for a postsurgical complete atrioventricular block. A lead was implanted in right atrium while another lead was implanted in the coronary sinus (CS) instead of in the right ventricle following the presence of a biological tricuspid prosthesis. In February 2022, she did a replacement of pacemaker (PM) generator to another hospital due to initial battery depletion. In March she described pain at the device pocket and consequent appearance of pocket infection. For this situation she was admitted to our cardiac department. A transesophageal echocardiography (TEE) was performed and showed normal biventricular size and function (LVEF 55%), normal function of valve prostheses and absence of vegetations both on the valves and atrial lead.
Subsequently an angiography was performed and revealed little patency of the anonymous-caval-subclavian left axis. We made a diagnosis of pocket infection and decided to extract leads in March.
We proceded through debridement of leads and removal of the PM generator. After placing Spectranetics (Philips) Lead Locking Device n.2 (LLD2) along the 2007 right atrial lead, we removed it through the use of a mechanical extractors (Cook 7-8.5 Fr). Then after placing Spectranetics (Philips)Lead Locking Device E (LLDE), the CS lead was completely removed through the use of a mechanical extractors (Cook 7-8.5 Fr) and specific delivery.The procedure was well tolerated and uneventful. Following the negative result of the post-extraction blood cultures, cultures of lead tips and pocket swab, together with the normalization of inflammation indices (WBC and CRP) and to the end of antibiotic therapy, we decided to reimplant the device. For the presence of valve prostheses and the patient's high infectious risk, we decided to implant a leadless PM.

Results: At the beginning of April we performed a leadless Micra AV PM implantation through 23-F Micra TPS delivery catheter across a tricuspid bioprosthetic valve in the right ventricular apex instead of the middle septum due to implantation difficulties for the concomitant presence of the bioprosthetic valve. The procedure was well tolerated and uneventful too. She was discharged after 72h in good conditions.

Conclusions: We present an unusual case of lead extraction for the second infection of the device pocket in a patient with mechanical mitral and biological tricuspid prostheses and a lead in coronary sinus for the presence of biological tricuspid prosthesis.
Leadless PM implantation represents a new technology by eliminating the risks connected with the presence of the lead across the bioprosthetic valve.

COMUNICAZIONI ORALI 11

GIOVEDI' 19 SETTEMBRE

SALA BIANCA

18:30-19:30

SESSIONE DI COMUNICAZIONI ORALI: ELETTROFISIOLOGIA

Moderatori: Quintino Parisi (Campobasso), Luca Rossi (Piacenza)

CO.11.01

PULSED FIELD ABLATION VERSUS VERY HIGH POWER SHORT DURATION RADIOFREQUENCY ABLATION IN ATRIAL FIBRILLATION

Francesca Campanelli [1], Paolo Compagnucci [2], Giovanni Volpato [2], Quintino Parisi [2], Laura Cipolletta [2], Silvano Molini [2], Agostino Misiani [2], Yari Valeri [1], Leonardo D'Angelo [1], Lara Luciani [1], Michela Casella [1], Antonio Dello Russo [2]

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Background: The newly introduced nonthermal pulsed field ablation (PFA) is a promising technology for catheter ablation (CA) of atrial fibrillation (AF) with high acute success rates and good safety features. However studies have shown that very high power short duration (VHPSD) ablation is also highly effective and fast with potentially less arrhythmia recurrence compared to conventional radiofrequency ablation.

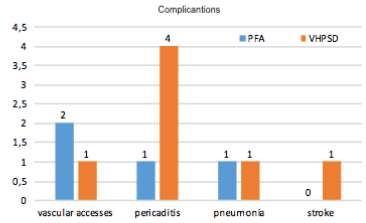
Objective: The aim of this study is to compare two source of energy used for CA of AF in terms of procedural, clinical and outcome data.

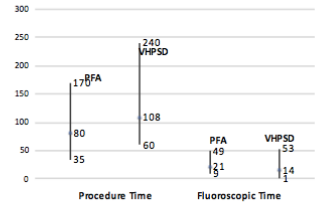
Methods: We conduced a retrospective observational study enrolling patients (pts) from september 2021 to may 2023 who underwent CA of AF with PFA system and VHPSD. In the PFA group pulmonary veins isolation (PVI) was obteined using 2KV with eight application each vein, posterior wall isolation (PWI) of left atrium (LA) was obtain with application in the flower configuration of the catheter and then addictional lesion were deployed at the operator's discretion. In the VHPSD group the encircling of PV was obteined with 90W for 4 seconds radiofrequency pulses in posterior portions of the LA (including LA PW), whereas 50W with ablation index target of 500 was used in the anterior portions of the PV and additional lesions.

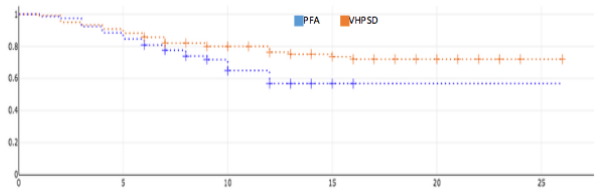
Results: A total of 205 pts were included, n = 86 (42%) in the PFA group and N = 119 (58%) in the VHPSD group: paroxysmal (n = 62[72%], N = 64[54%]), persistent (n = 19[22%], N = 43[36%]), long standing persistent (n = 5[5%], N = 10[8%]). PVI was successsful in all pts and additional lesions were delivered in n = 26 (30%) in PFA group and N = 76 (64%) in HVPSD group, mostly at the PW (n = 24[92%]; N = 50[66%]). The PFA group revealed a shorter procedura duration (80 ± 29 min vs 108 ± 39 min; p = 0,00001) but longer fluoroscopic time (21 ± 8 min vs 14 ± 10 min; p = 0,00001). The VHPSD group revealed more complicans (N = 7[6%] vs n = 3[3%]) but without statistically significant difference (p = 0,43), the most frequent in the PFA group was vascular access complications instead in the VHPSD group was post-procedural pericarditis. Only one patient in VHPSD group had major complication with a post-procedural stroke but without residual neurological deficits. After median of 14 (26-6) months, n = 61 pts in the PFA group (71%) and N = 91 in the VHPSD group (76%) were free from atrial arrhythmia (p = 0,79). In both group 7 pts recurrenced as atypical atrial flutter (n = 7[28%] PFA; N = 7[25%] VHPSD; p = 0,061).

	PFA group	VHPSD group
Tot pts (205)	86 (42%)	119 (58%)
paroxysmal	62 (72%)	64 (54%)
persistent	19 (22%)	43 (36%)
long standing persistent	5 (5%)	10 (8%)

	PFA group	VHPSD group
PW	24 (28%)	50 (42%)
CTI	0	14 (12%)
LAA	2 (2%)	11 ((9%)
SCV	1 (1%)	3 (2%)
Roof	0	7 (6%)
MI	0	5 (4%)
SCV	0	14 (12%)







Conclusion: PFA and VHPSD are effective and safe to CA of AF with comparable arrhythmia recurrenses. However procedure duration with PFA is significantly shorter and therefore may be of potential benefit in particular for elderly and frail pts. Further research, including randomized controlled trials, is needed to validate and compare these techniques more comprehensively

CO.11.02

ANATOMICAL ISTHMUSES AND RIGHT VENTRICULAR ELECTROPHYSIOLOGIC EVALUATION IN PATIENTS WITH REPAIRED TETRALOGY OF FALLOT BEFORE PULMONARY VALVE REPLACEMENT

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Introduction: Adults with repaired tetralogy of Fallot (rToF) are prone to develop ventricular tachycardia (VT) in adulthood, due to reentry related to slowly conducting anatomical isthmuses (SCAI). Pulmonary valve replacement (PVR) in patients without history of VT, may lead to obliteration of unrecognized SCAI with subsequent catheter ablation failure; electrophysiologic study is thus recommended before PVR. A systematic evaluation of the topology of SCAI in this population is, however, scant.

Methods: Consecutive rToF patients undergoing PVR were studied with pre-PVR EPS. Electroanatomical mapping with systematic evaluation of all possible anatomical isthmuses (AI; pacemapping, activation mapping in sinus/paced rhythm and bipolar voltage mapping) was performed (AI1: anterior scar/patch to tricuspid annulus; AI2: anterior scar to pulmonary annulus; AI3: pulmonary annulus to ventricular septal defect – VSD- patch; AI4: VSD to tricuspid annulus). Conduction velocity (CV) across all documented AI was calculated (ratio between the distance among the nearest point with bipolar voltage >1.5 mV and their difference in activation timing). Ventricular programmed stimulation was performed at 2 sites with three extrastimuli until refractoriness or induction, during baseline and isoproterenol infusion. Radiofrequency catheter ablation (RFCA) was performed in all patients with inducible VT and/or SCAI, aiming at conduction block across the SCAI validated with differential pacing.

Results: Between May 2023 and April 2024, 11 patients with rToF, 1 double outlet right ventricle and 1 pulmonary atresia were studied (73% males, age 46±10 years; 54% with a previous shunt, 46% with a previous transannular patch, 27% pulmonary valvotomy and infundibular boring; median age at surgery 4 years, interquartile range 3-6). EPS was positive for inducible VT in 4 patients (mean cycle length 297 ms, 3 with left bundle branch morphology and 1 right bundle branch morphology, all inferior axis) and polymorphic VT in 1. AI1 was present in 5 patients, AI2 in 5, AI3 in 7, AI 4 in 2. At least 1 SCAI was present in 7 patients (64%), 2 SCAI in 3 patients (43% of patients with SCAI; in every patient SCAI3+SCAI2 in 2 and SCAI 4 in 1 patient). There were no SCAI1; there were 3 SCAI 2 (mean CV 0.43 m/s), 4 SCAI 3 (mean CV 0.3 m/s), 1 SCAI 4 (CV 0.4 m/s). RFCA was performed in 8 patients; acute success was achieved in all patients, achieving bidirectional conduction block across treated SCAI and non-inducibility of VT.

Conclusions: SCAI are often present in rToF candidate to PVR and without clinical history of spontaneous VT, involving prevalently SCAI3 and SCAI2. Inducible VT is not sufficient as a marker of arrhythmic risk and SCAI should be better sought for.

CO.11.03

PULSED FIELD ABLATION IN PERSISTENT ATRIAL FIBRILLATION ABLATION. A SINGLE CENTER EXPERIENCE

Marco Polselli [1], Michele Magnocavallo [1], Antonio Bisignani [1], Filippo Maria Cauti [2,1], Luigi Iaia [1], Pietro Rossi [1], Stefano Bianchi [1]
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[2] *Ospedale San Raffaele, Milano, ITALY*

Introduction: Pulsed Field Ablation (PFA) is a safe and effective treatment for paroxysmal Atrial Fibrillation (AF). The use of this kind of energy in Persistent Atrial Fibrillation (PeAF), however, is less documented and lacks large and specific clinical experience.

Aim: Evaluate the arrhythmia-free survival in patients with PeAF treated with PFA.

Methods: We consecutively enrolled all patients referred to our center (Isola Tiberina Hospital – Gemelli Isola, Rome, Italy) for ablation of PeAF. Adjunctive lesions [Left Atrial Posterior Wall (LAPW), LA Roof, Mitral Isthmus (MI)] beyond pulmonary veins isolation (PVI) were performed as per operator choice. A follow-up visit was performed every 3 months or when deemed clinically necessary, and each participant achieved a minimum follow-up of 6 months. The primary efficacy endpoint was freedom from AF/Atrial Flutter (AFL)/ Atrial Tachycardia (AT) beyond a blanking period of 3 months. The safety endpoint was the rate of major periprocedural complications.

Results: Between July 2022 and October 2023, 85 patients underwent PFA for PeAF; mean age was 63±9 years and twenty (23.5%) of them were females. The mean CHA2DS2-Vasc score was 2.4 ± 0.7, while the HAS-BLED was 1.3 ± 0.6.
All the procedures were conducted under general anesthesia. First pass isolation was achieved in all patients. Mean procedural time, fluoroscopy time and LA dwell time was respectively 72 ± 14 min, 18 ± 11 min, and 27 ± 16 min.
Additional lesions were performed in five patients (5.9%). Either LA Roof or MI ablation was performed in three (60%) patients while in two (40%) was performed LAPW isolation.
Six patients had a previous AF ablation: three of them (50%) were previously treated with RF, two (33.3%) with PFA and one (16.7%) with cryoablation. At index procedure, we observed reconnection of 18/24 veins. Three patients (50%) had 4/4 reconnected veins, one (16.7%) patient 3/4, one (16.7%) 2/4 and one (16.7%) 1/4.
No major periprocedural complication occurred while three (3.5%) patients experienced minor complications (one pseudoaneurysm with conservative treatment and two groin hematoma). No patient suffered from acute coronary vasospasm.
After a mean follow-up of 13 ± 4 months, 52 patients (61.2%) were free from arrhythmic recurrence of AF/AFL/AT. In the group of patients which experienced arrhythmic recurrence, 28 cases (84.9%) consisted of AF while the remaining (n=5; 15.1%) of AFL.

Conclusions: PFA is a safe and effective approach in the treatment of patients with PeAF.

CO.11.04

PROCEDURAL EFFICIENCY AND OUTCOMES IN ATRIAL FIBRILLATION ABLATION: INSIGHTS FROM A COMPARATIVE STUDY OF HIGH-POWER-SHORT DURATION VS. LOW-POWER-LONG DURATION TECHNIQUES

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Background: Radiofrequency (RF) catheter ablation (CA) remains the predominant technique utilized for treating atrial fibrillation (AF) in clinical practice. High-power-short duration (HPSD) RF ablation generates shallower and wider lesions compared to low-power-long-duration (LPLD) ablation, thereby reducing potential adverse effects while maintaining procedural efficacy. The novel TactiFlex Ablation Catheter, Sensor Enabled (TFSE), which integrates a flexible tip with fiber optic-based contact force sensing, can deliver HPSD RF and thereby improving the procedural workflow and outcomes compared to the LPLD RF ablation performed by the Tacticath catheter (TCSE).

Objective: This study aims to determine whether the acute procedural success achieved with TFSE results in a lower rate of AF recurrence.

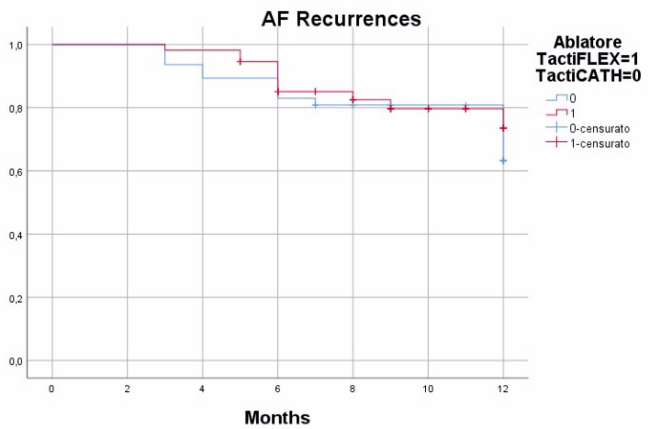
Method: We conducted a single-center retrospective study involving 110 consecutive patients admitted to our hospital for paroxysmal or persistent AF CA. Patients were randomly assigned to two groups based on the ablation modality utilized: 55 subjects underwent HPSD ablation using TFSE [58 (52-66) years, 76% male]; and 55 patients underwent LPLD ablation using TCSE [61 (54-67) years, 66% male]. In the HPSD group, RF applications were delivered at 50W for up to 10 seconds with a contact force (CF) index ranging from 5g to 20g. Conversely, in the TCSE group, lesions were applied utilizing power settings ranging from 35 to 40 watts until the desired lesion size index was attained: specifically, 5-5.5 for the anterior segments of veins and 4-4.5 for the posterior ones. Patients were followed up for a minimum of 12 months, during which AF recurrence was evaluated through electrocardiographic (ECG) monitoring, 24-hour Holter monitoring, and structured telephone interviews.

Results: No statistically significant differences were found in baseline characteristics, echocardiographic parameters, or clinical profiles between the two groups. PVI was achieved in 100% of patients, and no periprocedural complications were recorded. In the TFSE group, the first-pass PVI rate was significantly higher compared to the TCSE group, along with a greater impedance drop (ID). Although procedural times and total RF duration were significantly shorter in the TCSE group, this did not correlate with a reduction in fluoroscopy time. At both 6 and 12 months, patients in the TFSE group exhibited a lower rate of AF recurrence; however, this finding did not reach statistical significance [n=11, 20% vs. n=16, 33%; p=0.548].

Conclusions: The TFSE catheter and its HPSD protocol streamlined the AF CA, resulting in reduced procedural times and ensuring, if not enhancing, acute efficacy compared to TCSE with the LPLD protocol, as demonstrated by the higher first-pass PVI rate and greater ID. Unfortunately, this procedural optimization did not lead to a lower rate of AF recurrence at both 6 and 12 months follow-up. Nonetheless, our findings necessitate confirmation through larger-scale studies.

	TFSE (N= 55)	TCSE (N=55)	P VALUE
Age	58 (25-66)	61 (54-67)	P=0.418
Male gender	42 (76%)	36 (66%)	P=0.294
LVEF (%)	60 (55-64)	60 (56-63)	P=0.918
LAVi (ml/m2)	35 (28-44)	33 (25-39)	P=0.196
$CHADS_2VA_2SC$	1 (0-2)	1 (0-2)	P=0.367
AF REDO	20 (36%)	15 (27%)	P=0.413
Impedance drop	17,13 (2)	15,78 (1,5)	P=0.003
Procedural time (min)	108 (91-120)	175 (142 – 187)	P=0.076
Total RF time (min)	8:40 (7:08 – 10:40)	42 (30:30 – 52:30)	P=0.048
Total fluoroscopy time (min)	15 (10-19)	18 (13-26)	P=0.263

Table 1 - Values are count, mean (standard deviation) ore median (first quartile, third quartile). LVEF = Left Ventricle Ejection fraction; LAVi = Left Atrial Volume indexed; AF = Atrial Fibrillation; RF= Radiofrequency



CO.11.05

ELETTROPORAZIONE VERSUS RADIOFREQUENZA VERY HIGH-POWER SHORT-DURATION NELLA FIBRILLAZIONE ATRIALE PERSISTENTE: UN'ESPERIENZA MONOCENTRICA

Francesco Cardinali [1], Francesca Campanelli [1], Giovanni Volpato [2], Paolo Compagnucci [2], Quintino Parisi [2], Agostino Misiani [2], Laura Cipolletta [2], Silvano Molini [2], Riccardo Grandin [1], Giacomo Castellucci [1], Yari Valeri [1], Filippo Pirani [1], Lara Luciani [1], Leonardo D'Angelo [1], Michela Casella [1], Antonio Dello Russo [1]

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Premessa: L'ablazione mediante elettroporazione (PFA) è recentemente emersa quale strategia di trattamento per pazienti con fibrillazione atriale (FA): i primi studi mostrano dati procedurali promettenti ed un isolamento delle vene polmonari (VP) duraturo. D'altra parte, l'ablazione mediante radiofrequenza very high-power short-duration (vHPSD) si caratterizza per una buona efficacia ed ottimi risultati a medio termine, e solamente pochi lavori hanno confrontato queste due tecniche, in particolare nei pazienti con FA persistente.

Obiettivo: Il nostro obiettivo è comparare queste differenti modalità di ablazione transcatetere in pazienti con FA persistente, concentrandoci su alcuni aspetti legati alla procedura, alla sicurezza ed all'efficacia.

Metodi: Abbiamo condotto uno studio osservazionale restrospettivo arruolando consecutivamente tutti i pazienti con FA persistente sottoposti ad ablazione transcatetere con PFA o vHPSD da Settembre 2021 a Maggio 2023. Nel primo gruppo, l'isolamento delle VP è stato ottenuto attraverso impulsi di 2 kV (FARAWAVE) con 8 applicazioni in ciascuna vena, 4 per ogni configurazione, mentre l'isolamento della parete posteriore dell'atrio sinistro (PP) per mezzo della sola configurazione "flower"; lesioni aggiuntive sono state poi effettuate a discrezione dell'operatore. Nel secondo gruppo invece, sono stati applicati impulsi di radiofrequenza a 50 W (QDOT MICRO) puntando ad un indice di ablazione di 500 nei segmenti anteriori delle VP e 90 W per 4 secondi nei segmenti posteriori delle VP e PP; ulteriori lesioni sono state quindi aggiunte a discrezione dell'operatore. Tutti i pazienti sono stati sottoposti ad anestesia generale o sedazione profonda con Fentanil e Dexmedetomidina.

Risultati: Sono stati inclusi in totale 79 pazienti, n = 24 (30%) nel gruppo PFA e N = 55 (70%) nel gruppo vHPSD: FA "early persistent" (n= 2 [8,3%]; N = 7 [12,7%]), FA persistente (n= 17 [70,8%]; N = 36 [65,5%]), FA persistente di lunga durata (n= 5 [20,8%]; N = 12 [21,8%]). Le due popolazioni mostravano simili caratteristiche cliniche: CHA2DS2VASc (mediana: 3 [0-6] in PFA vs 2 [0-6] in vHPSD), volume atriale sinistro indicizzato (media: 42,6 ml/m² in PFA vs 42,4 ml/m² in vHPSD) e FEVS (media: 55,4% in PFA vs 54,8% in vHPSD). L'isolamento delle VP è stato raggiunto con successo in tutti i pazienti. In particolare, il gruppo PFA ha registrato un più breve tempo procedurale (92,1 ± 36,9 vs 134,2 ± 36,1 min) ma un maggiore tempo di scopia (25,5 ± 9,3 vs 17,4 ± 11,5 min). Inoltre, esso ha mostrato un minor tasso di complicanze (n = 1 [4,2%] vs N = 3 [5,5%]), sebbene eventi avversi gravi non siano stati osservati. Dopo un follow-up mediano di 13 [9-17] mesi, n = 19 (79.2%) pazienti nel gruppo PFA e N = 43 (78.2%) pazienti nel gruppo vHPSD risultavano liberi da aritmie atriali.

Conclusioni: L'ablazione tramite PFA permette procedure più rapide, rappresentando un considerevole vantaggio per l'operatore e per il paziente, il quale risulta a minor rischio di complicazioni peri-procedurali. D'altra parte, la vHPSD appare correlata a tempi di scopia più brevi, riducendo l'esposizione alle radiazioni ionizzanti. Infine, le due tecniche mostrano un'efficacia a medio termine simile in termini di libertà da recidive.

Tabella 1	PFA (n = 24)	vHPSD (N = 55)	*P*
Età (anni)	64,75 ± 10,11	63,49 ± 9,93	0,61
Sesso (maschile)	19 (79%)	43 (78%)	0,92
FA «early persistent» (< 3 mesi)	2 (8%)	7 (13 %)	0,58
FA persistente (3-12 mesi)	17 (71%)	36 (65%)	0,65
FA persistente di lunga durata (> 12 mesi)	5 (21%)	12 (22%)	0,92
BMI (kg/m^2)	28,53 ± 3,89	27,87 ± 4,74	0,55
VTSASi (ml/m^2)	42,58 ± 8,36	42,36 ± 12,75	0,94
FEVS (%)	55,42 ± 7,28	54,78 ± 8,08	0,74
CHA_2DS_2VASc	3 [0-6]	2 [0-6]	0,22
CAD	4 (17%)	6 (11%)	0,49
IA	17 (71%)	41 (75%)	0,74
DM	5 (21%)	7 (13%)	0,36
Antiaritmici	21 (88%)	49 (89%)	0,84
Tempo di scopia (min)	25,46 ± 9,29	17,44 ± 11,50	< 0,01
Tempo procedurale (min)	92,08 ± 36,95	134,18 ± 36,10	< 0,01
Complicanze	1 (4%)	3 (5%)	0,81
Libertà da aritmie atriali dopo 13 [9-17] mesi	19 (79%)	43 (78%)	0,92

CO.11.06

COMPARATIVE EFFECTIVENESS AND SAFETY OF HYBRID CONVERGENT ABLATION VERSUS ENDOCARDIAL PULSED FIELD ABLATION OF PULMONARY VEINS AND POSTERIOR WALL FOR THE TREATMENT OF PERSISTENT ATRIAL FIBRILLATION

Lorenzo Bianchini [1], Marco Schiavone [1,2], Giulia Vettor [1], Elio Zito [3], Francesca De Lio [1], Benedetta Majocchi [1], Fabrizio Tundo [1], Massimo Moltrasio [1], Gaetano Fassini [1], Stefania Riva [1], Claudio Tondo [1,3]

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[3] *Università degli Studi di Milano, Milano, ITALY*

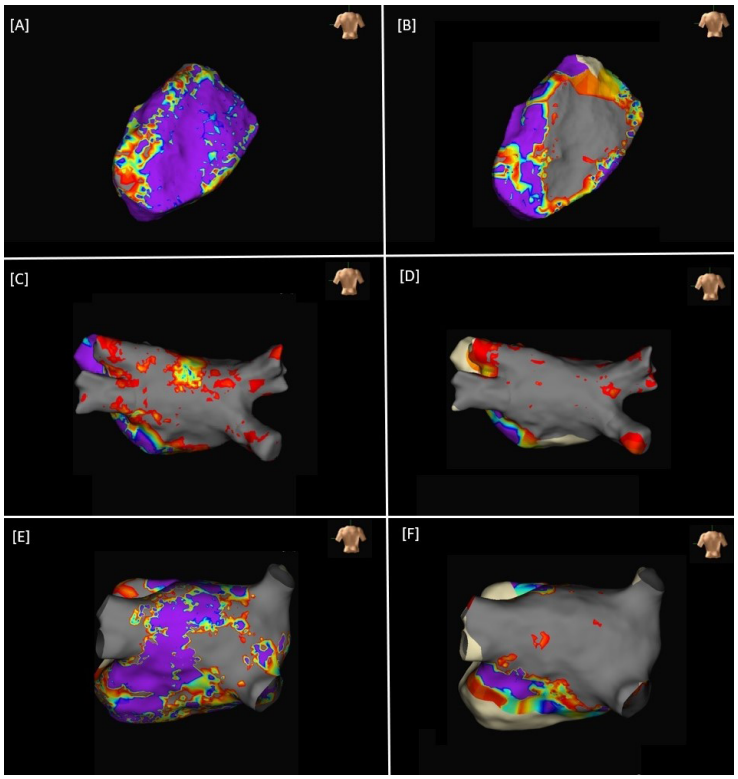
Objective: This study aimed to compare the efficacy and safety of the hybrid-convergent radiofrequency (RF) vs pulsed field ablation (PFA) of pulmonary veins (PVs) and left atrial posterior wall (LAPW) for the treatment of long-standing persistent AF (LSPAF).

Background: Hybrid-convergent RF ablation, combining a staged epicardial and endocardial approach to target PVs and LAPW, has shown better arrhythmic outcomes than an endocardial-only RF strategy, despite a higher rate of complications. PFA has recently gained growing interest for its efficacy and safety profile in PVs and LAPW endocardial ablation. A direct comparison between the two procedures in the treatment of LSPAF is lacking.

Methods: Ninety-three consecutive LSPAF patients, treated with two-steps hybrid-convergent RF ablation (Hybrid-group, n=49) or with PFA of PVs and LAPW (PFA-group, n=44) were enrolled. Primary efficacy endpoint was defined any atrial tachyarrhythmias (ATA) recurrence after the 3-month blanking period (BP), over a follow-up time of 12-months. Periprocedural adverse events and late complications during follow-up were deemed primary safety outcomes.

Results: PFA and Hybrid groups had similar baseline characteristics (mean age Hybrid=63 [59- 69] vs PFA=68 [60-72] years; p=0.105). Most patients were male (Hybrid-group 81.6% vs PFA-group 79.6% p=0.799). BMI and LA volume were similar in both groups (27.1 [24.3-31.0] kg/m 2 Hybrid-group vs 27.2 [24.0-31.2], p=0.945; 45 [38-57] ml Hybrid-group vs 45.5 [36.5-57.5] ml PFA-group, p=0.926, respectively). PVs and LAPW ablation were acutely successful in all patients. Step1-Hybrid-epicardial procedures were longer than PFA (166 [140-205] vs 107.5 [82.5- 12] mins; p<0.01). At 12-month follow-up, there was no difference in ATA recurrences between groups (Hybrid=36.7% vs PFA=40.9%; p=0.680 – log-rank at survival analysis p=0.539). After adjusting for confounders, a larger LA volume and recurrences during the BP were predictors of ATA recurrences after ablation, regardless of procedural technique employed. A total of 6 (12.2%) major periprocedural complications occurred in the study cohort, all within the Hybrid-group: one instance of hypotensive shock leading to early termination of the procedure, two cases of pneumothorax managed conservatively, one post-procedural hemothorax necessitating thoracentesis, and two pericardial effusions–one resulting from cardiac perforation and treated with sternotomy surgical repair, and the other caused by delayed inflammatory response and managed conservatively. No major peri-procedural complications were reported in the PFA group (p=0.028 for overall complications comparison).

Conclusions: Hybrid and PFA strategies showed no significant differences in terms of arrhythmic outcomes. PFA procedures were faster and technically simpler when compared to the 2-steps hybrid-convergent ablation, showing a better safety profile with a lower rate of major periprocedural complications. After adjusting for confounders, the only two predictors of ATA recurrences after ablation were a larger LA volume and recurrences during the BP, regardless of the procedural technique used and duration of AF.



COMUNICAZIONI ORALI 12

GIOVEDI' 19 SETTEMBRE

SALA ROSSA 2

18:30-19:30

SESSIONE DI COMUNICAZIONI ORALI: ELETTROFISIOLOGIA

Moderatori: Gregorio Covino (Napoli), Gennaro Miracapillo (Grosseto)

CO.12.01

PRELIMINARY RESULTS OF THE NON-INVASIVE CARDIAC RADIOABLATION FOR VENTRICULAR TACHYCARDIA STUDY; A DOSIMETRIC COMPARISON OF PHOTON VS. PROTON RADIOTHERAPY FOR THE TREATMENT OF VENTRICULAR ARRHYTHMIAS

Luca Vicini Scajola [1], Leonardo Pignalosa [1], Alessandro Vicentini [1], Antonio Sanzo [1], Simone Savastano [1], Barbara Petracci [1], Enrico Baldi [1], Adele Valentini [2], Viviana Vitolo [3], Laura Mantovani [2], Luca Maria Colombo Gomez [2], Roberto Rordorf [1]

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Background: Stereotactic arrhythmia radio-ablation (STAR) has been proposed as an alternative treatment for refractory ventricular arrhythmias (VA) in patients who are unsuitable or refractory to standard catheter ablation (CA). It consists in the application of external beam radiotherapy in a single dose of 25 Gy to the target areas. Most of the STAR treatments performed so far used photon radiotherapy. As compared to photons, particle therapy with protons, based on its dosimetric physical selectivity, might have the potential to reduce the dose to surrounding healthy tissues thus lowering the risk of side effects.
Purpose: The purpose of this in silico simulation study was to evaluate the feasibility of STAR with protons in patients with VA and to compare the doses at the organs at risk (OARs) with the use of photon vs. proton treatment plans.

Methods: 14 patients (11 males) candidates to standard CA for VA were enrolled. ECG gated CT scans in expiratory breath-hold, and standard electroanatomical mapping (CARTO 3) were performed in each patients to reconstruct a 3D bipolar voltage map and identify the ablation target. Based on the information obtained by the contouring of the ablation target three treatment plans were simulated: one with photons, and two with protons - with and without cardiac gating- to assess the doses at the OARs.

Results: The median age was 68.5 (63.25-71.5), all patients had a history of recurrent VA and the indication for treatment with CA. 7 patients had an ischemic cardiomiopathy, 4 an idiopathic cardiomyopathy and 3 ventricular ectopic beats without structural heart disease. The mean left ventricular ejection fraction was 40±11% and 8 out of 14 patients were ICD carriers.
Both photons and protons treatment plans reached the goals for target coverage (25 Gy on 98% of the target area). A statistically significant reduction in the mean maximum dose (Dmax) to some OARs was observed in proton compared to photon plans; (see table 1) specifically, the Dmax delivered to the mitral valve, vena cava, descending aorta, esophagus and to the lungs have been largely reduced with the proton plans. However, in some specific cases, a higher maximum dose in the proton plan was observed for structures close or overlapping with the target, mainly due to the need of additional margins for proton range uncertainties in the treatment plan The use of cardiac gating did not show a significant dose reduction to OARs compared to the non-gated proton plan.

Organ At Risk	Dmax Photon (Gy)	Dmax Proton with cardiac gating (Gy)	Dmax Proton without cardiac gating (Gy)
Ascending Aorta (D_{max})	7,4±8,3	6,4±9,4	7,0±10,5
Descending Aorta (D_{max})	**9,5±7,0	**5,3±7,6	5,8±7,8
[1]LAD (D_{max})	8,2±8,5	7,8±7,7	7,9±7,7
[2]LMCA (D_{max})	3,5±8,0	2,8±8,0	3,6±8,1
Circumflex Coronary (D_{max})	6,6±9,1	6,2±9,9	6,7±10,2
Superior Vena Cava ($D_{50\%}$)	0,8±1,3	0,0±0,0	0,0±0,0
Inferior Vena Cava (D_{max})	***6,1±5,3	***1,1±3,8	1,2±3,9
Aortic Valve (D_{max})	4,7±5,7	4,0±7,9	5,0±8,6
Mitralic Valve (D_{max})	*9,6±9,2	*7,0±8,3	7,5±8,5
Left Atrium (D_{max})	10,7±8,8	10,1±8,7	10,2±8,8
Oesophagus (D_{max})	**6,6±4,7	**3,6±6,2	3,2±4,8
Whole Lungs ($D_{5\%}$)	***5,3±2,5	***1,9±3,0	1,9±3,0
Whole Lungs ($D_{50\%}$)	***0,3±0,2	***0,0±0,1	0,0±0,0
Bronchial Tree (D_{max})	***0,6±0,5	***0,0±0,1	0,1±0,1
Skin (D_{max})	13,0±6,1	13,4±3,9	13,6±3,9
ICD (D_{max})	0,1±0,0	0,0±0,0	0,0±0,0

[1]*Left anterior descendant artery*
[2]*Left main coronary artery*
**p < 0,05 photon vs proton*
***p < 0,01 photon vs proton*
****p < 0,001 photon vs proton*

Conclusion: The preliminary results of our in silico simulation study suggest that STAR therapy with the use of proton might be associated with a significant dose reduction to the surrounding organs. Nevertheless, the choice of the best treatment should be evaluated on a case by-case strategy since some specific cases may be better suitable for photon treatment.

CO.12.02

ATRIAL VOLTAGE ANALYSIS FOLLOWING VEIN OF MARSHALL ETHANOL INFUSION AND ITS IMPLICATIONS IN MITRAL LINE BLOCK

Simone Taddeucci [1], Silvia Garibaldi [2], Martina Nesti [2], Federico Landra [1], Umberto Startari [2], Luca Panchetti [2], Gianluca Mirizzi [2], Vincenzo Lionetti [2], Marcello Piacenti [2], Procolo Marchese [3], Andrea Rossi [2]

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Background: The vein of Marshall (VoM) is a promising therapeutic target for the atrial fibrillation (AF) treatment, fitting perfectly with the "Coumel triangle" as it contains triggers of focal activities and stable reentries, autonomic parasympathetic and sympathetic connection and it implicates substrate for perimitral flutters. Lateral mitral line (ML) represents a fundamental part of the anatomical ablation setup for the treatment of AF but its bidirectional block is difficult to achieve by endocardial ablations. Ethanol infusion into the VoM (VOM-EI) has demonstrated high effectiveness in facilitating ML block. Newly-formed bipolar lesion after VOM-EI is considered an index of effectiveness of alcoholization procedure. Voltage analysis assessment after VOM-EI in predicting ML block is poorly investigated.

Purpose: To compare unipolar and bipolar low-voltage areas (LVAs) along VOM trajectory after VOM-EI, and their role in predicting ML block.

Methods: We enrolled 59 patients undergoing catheter ablation for persistent AF. A high-density map of LA has been performed before and after VOM-EI. The low-voltage area width difference was obtained and defined as delta-LVA considering a normal bipolar voltage cutoffs at 0.50 mV in case of sinus rhythm or 0.29 mV in case of AF. Unipolar cutoffs were set at 2.7 mV in sinus rhythm and 1.1 mV in AF, respectively. The anatomical ablation lesions set included wide antral PVI, ablation of cavotricuspidal isthmus, linear lesion for dome and ML isthmus following the newly-formed lesion after the VOM-EI. Systematic lines block validation was performed. Bidirectional ML block was obtained in case of coronary sinus (CS) electrograms sequence inversion (septal-to-lateral) during left atrial appendage pacing. In case of residual conduction gaps, RF applications into the CS/great cardiac vein were done to target residual epicardial gaps. Ablation times to obtain ML block (AblTime-ML) were described.

Results: Fifty-six out of fifty-nine (56/59) patients (94,5%) achieved mitral isthmus block. Bipolar and unipolar low voltage areas after VOM-EI were 9,9 ± 6,9 cm2 and 12,2 ± 5,9 cm2, respectively. Bipolar delta-LVAs were significantly lower compared with unipolar delta-LVA (8,2 ± 6,5 cm2 vs 9,4 ± 6,0 cm2; p= 0.03). A strong linear correlation between AblTime-ML and bipolar delta-LVA (R: 0.76) and a significant correlation between AblTime and unipolar delta-LVA (R: 0.6) were found. Patients requiring RF applications into the CS to reach ML block (13/59, 22%) presented lower delta-LVAs at logistic regression both at bipolar (p<0.01) and unipolar (p=0,03) analysis.

Conclusions: VOM-EI induces unipolar LVAs wider than bipolar into the LA as it produces a primarily epicardial/ intramyocardial lesion. Wider VOM-EI-induced unipolar and bipolar LVA predicts a shorter time in bidirectional ML block achievement and a higher likelihood to avoid targeting epicardial gaps via the CS musculature.

Data	Mean	% or ± SD
Baseline characteristics		
Patiens (n)	59	100%
Age	66	± 7.2
Males	43	72%
Valvular Heart Disease	4	6.7 %
Ischaemic Cardiomyopathy	8	13.5%
Hypertrophic Cardiomyopathy	2	3.4%
Dilated Cardiomyopathy	3	5.1%
AF induced Cardiomyopathy	7	11.9%
Arterial Hypertension	37	62.7%
Years from first episode	5.8	± 4.7
Echo Data		
LA Volume Index (ml/mq)	34.8	± 10.1
LA enlargement (n)	49	83.0%
LV end diastolic volume (ml)	49.8	± 5.1
Left Ventricular Ejection Fraction (%)	59.6	± 9.1
Antiarrhythmic Drugs		
Class Ic	27	45.7%
Amiodarone	8	13.5%
Beta Blockers	46	78%
Sotalol	3	5.1%
AF type		
Early persistent (<3 months)	8	13.6%
Persistent	20	33.9%
Long standing (>12 months)	17	28.8%
Rhythm Presentation		
Sinus Rhythm	28	47.5%
Atrial Fibrillation	21	35.6%
Atrial Flutter / Atrial Tachycardia	10	16.9%

Table 1: Baseline characteristics of the population. Data are expressed as mean ± standard deviation or mean and percentage (%)

Data	Mean	% or ± SD
Procedural Data		
Ablation time (min', sec")	15'3"	± 11'42"
RF applications (n)	19.8	± 12.2
Mitral block obtained (n)	56	94.5%
Suboptimal VOM EI (n)	4	6.8%
Low Voltage Areas		
Mean Bipolar Low Voltage Areas pre-VOM Etho (cm^2)	1.6	± 3.5
Mean Bipolar Low Voltage Area post-VOM Etho (cm^2)	9.9	± 7
Global Bipolar Delta Low Voltage Areas (cm^2)	8.2	± 6.5
Mean Unipolar Low Voltage Areas pre-VOM Etho (cm^2)	2.9	± 5.4
Mean Unipolar Low Voltage Areas post-VOM Etho (cm^2)	12.3	± 6.9
Global Unipolar Delta Low Voltage Areas (cm^2)	9.3	± 6.0
Catheter Ablation		
Endocardial only RF (n)	32	54.4%
Coronary sinus applications (n)	28	47.5%
Anchoring applications (n)	27	52.6%
Free Wall applications	13	22%
Periprocedural complications		
Pericardial Effusion (n): 2 (3.3%)	2	3.3%
Cardiac Tamponade (n): 0 (0%)	0	0%
VOM dissection (n): 8 (13.5%)	8	13.5%
VOM perforation (n): 3 (5.1%)	3	5.1%

Table 2: Procedural Data.
Data are expressed as mean ± standard deviation or mean and percentage (%)

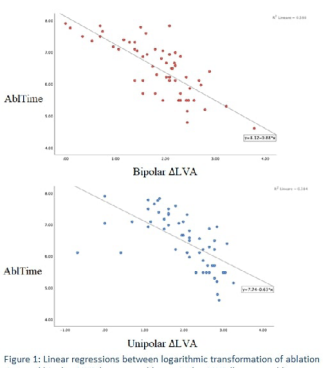

Figure 1: Linear regressions between logarithmic transformation of ablation time and bipolar ΔLVA (upper graph) or unipolar ΔLVA (lower graph).

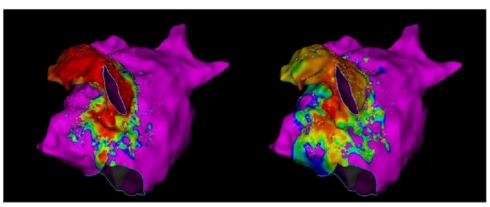

Figure 2: Voltage analysis of the same patient Post VOM EI. On the left: bipolar voltage analysis (filtered 0.05 - 0.5 mV). On the right: Unipolar voltage analysis with 2.7 mV cutoff shows a wider newly formed lesion in the same area.

CO.12.03

PULMONARY VEIN ISOLATION DURABILITY IN PATIENTS UNDERGOING VERY HIGH-POWER SHORT-DURATION TEMPERATURE-CONTROLLED ABLATION

Giovanni Marano [1], Sara Poggi [2], Vincenzo Schillaci [1], Assunta Iuliano [2], Alberto Arestia [1], Giorgio Spiniello [2], Gergana Shopova [1], Alessia Agresta [3], Armando Mariano Salito [1], Cosimo Damiano Dicandia [4], Tommaso Infusino [4], Antonio De Simone [3], Francesco Solimene [1], Giuseppe Stabile [1,2,3,4]

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[3] *Casa di Cura San Michele, Maddaloni (CE), ITALY*
[4] *Anthea Hospital, Bari, ITALY*

Background: The very high-power short-duration (90W for 4 s) temperature-controlled ablation (vHPSD) improves the efficiency of pulmonary vein (PV) isolation procedures. However, atrial fibrillation (AF) recurrences directly related to PV reconnections are still a concern.
Purpose. The purpose of the current study was to assess PV lesion durability in patients undergoing a reablation procedure.

Methods: From September 2020 to July 2023, 327 patients with paroxysmal and persistent AF underwent first ablation aiming at PVI using vHPSD. During a mean follow-up of 25±11 months, 48 patients (14.7%) had an AF recurrence. Patients with reablation procedures were retrospectively consented and enrolled.
Results. Eighteen patients were included in this study. A PV reconnection was observed in 15/72 (21%) PVs, with a mean number of reconnected PV per patient of 0.8 ±0.7. In 7 patients no PV reconnection was observed, one PV reconnected was observed in 9 patients and 2 PVs in 3 patients. A PV reconnection was observed in 8/18 (44%) left superior PV, 1/18 (6%) left inferior PV, 3/18 (17%) right superior PV, and 3/18 (17%) right inferior PV (p=0.03).

Conclusions: PV isolation performed with vHPSD is highly effective and is associated with a low rate of late PV reconnection. A higher percentage of PV reconnection was observed in the left superior PV.

CO.12.04

ACUTE IMPACT OF VEIN OF MARSHALL ETHANOL INFUSION COMBINED WITH ANATOMICAL ABLATION VALIDATED BY PACING IN REDO ABLATION OF PERSISTENT ATRIAL FIBRILLATION

Martina Nesti, Silvia Garibaldi, Umberto Startari, Gianluca Mirizzi, Luca Panchetti, Alessandro Valleggi, Marcello Piacenti, Andrea Rossi
Fondazione Toscana Gabriele Monasterio, Pisa, ITALY

Background: Catheter ablation with radiofrequency in persistent atrial fibrillation (PeAF) has limited success and a significant proportion of patients requires redo ablation. The vein of Marshall ethanol infusion (VoM-EI) is a promising therapeutic target and several trials showed that addition of Vom-EI to catheter ablation, compared with catheter ablation alone, increases the possibilities of remaining free of AF or atrial tachycardia. No data are available about the effect on VoM-EI in Pe-AF patients that undergo a redo ablation.

Purpose: We evaluated acute impact on lesion formation post-VoM-EI and the mitral line block validation after a methodical approach including VoM-EI and check of pulmonary vein isolation (PVI), roof-line, mitral line (ML) and cavo-tricuspid isthmus line in a population of PeAF patients undergone redo ablation. We also reported procedural outcomes after a short follow-up.

Methods: Consecutive patients undergoing redo ablation for PeAF were enrolled. All patients underwent check of PVI, left atrium (LA) roofline and cavotricuspid isthmus line and, if necessary, ablation was completed. In all patients, after a detailed electroanatomical map of the LA (filter at 0.05-0.5 mV if the patient was in sinus rhythm or 0.05-0.3 mV in the case of AF), we proceeded with the VoM-ETHO. LA map was repeated to assess the extension of the newly-formed low voltage area (LVA). According to the newly-formed LVAs, the validation of mitral line was obtained by the evidence of bidirectional block and was performed in sinus rhythm with a diagnostic catheter positioned in the coronary sinus (CS) and a catheter in the left atrial appendage during pacing at 600 msec. In case of presence of conduction through the mitral line also after endocardial revision, we proceeded to mapping and ablating in the CS searching for epicardial gaps in the "anchored wall" or in the "free-wall"of the great cardiac vein (GCV).

Results: Twenty consecutive patients (64 ± 8 years and 65% male) undergone redo ablation for AF with VoM-EI were included in this study. All patients underwent PVI in the previous procedure but only in 11 roof line has been performed. In eleven patients (55%) reconnection of PV was observed. In 4/11 roof line was not complete. The medium value of basal LA-LVAs was 3.38±5.27 cmq and the newly-formed LVAs after the VoM-EI procedure was 9.21±5.63 cmq. All patients achieved bidirectional block validated across ML: in 8/20 after epicardial gaps ablations into the anchored wall of GCV and in 6/20 after ablation in the free wall of GCV. The ML procedural time was 18.82±12.79minutes. The number of radiofrequency was 20.11±10.56. No major complications occurred. Five patients had VOM dissection without consequences. During a short follow-up period (6±5 months), only one patient had AF recurrences after a one-month blanking period.

Conclusions: VoM ethanol ablation added to PVI and linear lesions in the context of a methodical and anatomical approach seems to have promising results during redo ablation of PeAF patients. This strategy seems to be safe and reproducible. Longer follow-up is needed to understand the role of this approach in redo ablation.

CO.12.05
UN NUOVO ALGORITMO PER LA DIAGNOSI DIFFERENZIALE DELLE TACHIARITMIE CARDIACHE: IL PROTOCOLLO TEIERA

Paolo Orselli, Luigi Addonisio, Francesco De Sensi, Gennaro Miracapillo, Ugo Limbruno
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La diagnostica differenziale delle tachiaritmie cardiache richiede l'attivazione di ogni risorsa conoscitiva, dall'anamnesi del paziente fino alla risposta alle manovre di stimolazione endocavitaria. La diagnosi però non è sempre di immediata intuizione e oltre alla variabilità dell'operatore vi sono da considerare variabili intrinseche del paziente e variabili legate alla tachicardia.
Si comprende come un protocollo semplice, che riduca la dispersione ed il consumo di tempo legate a queste variabili, unificando le manovre diagnostiche in un unico albero decisionale rappresenti la nostra risposta a questa esigenza pragmatica.

Il Teapot Protocol (dall'inconfondibile conformazione dei cateteri in proiezione LAO 45®) si compone di 5 step sequenziali:

1) Esecuzione ecoguidata di tre accessi venosi e posizionamento di due cateteri decapolari, uno in seno coronarico con l'estremo prossimale a livello dell'ostio, uno sul tetto-parete libera dell'atrio destro, con ripiegamento a U rovesciata e polo distale in basso e laterale e quello prossimale a livello del nodo seno atriale ed infine il terzo catetere, un ottopolare dedicato, a livello hisiano con il polo distale sul setto del ventricolo destro.

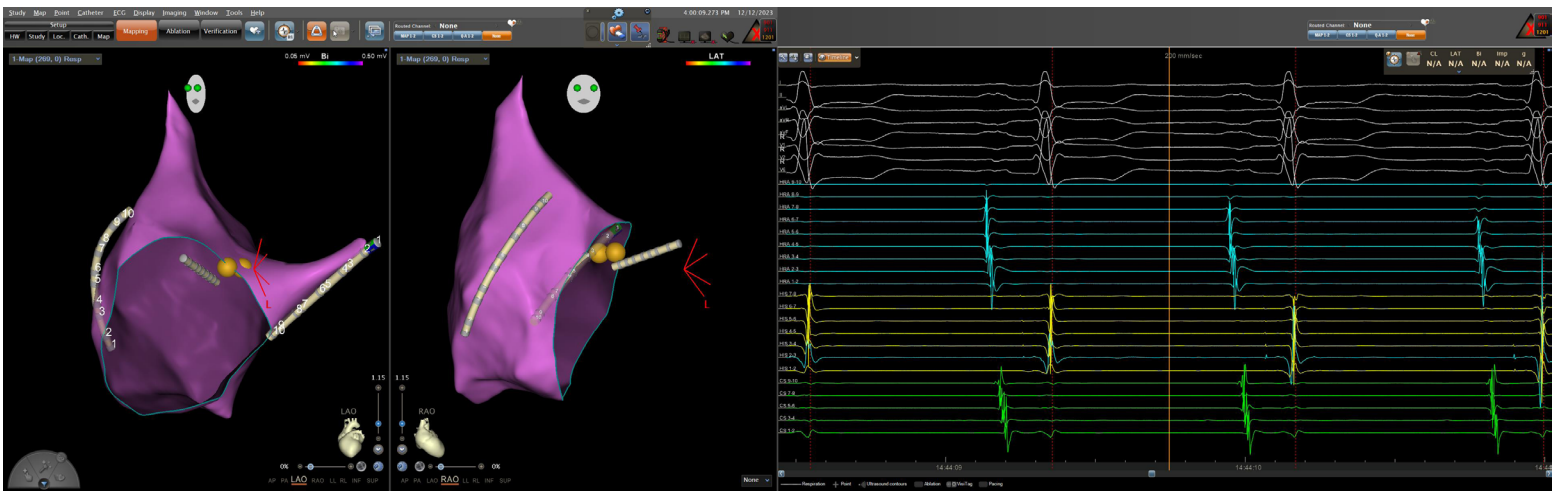
2) Misurazione dell'intervallo HV in ritmo sinusale che si confronterà poi con l'HV in tachicardia. Il catetere hisiano andrà posizionato in modo che si osservino sul segnale amplificato unipolare almeno due segnali di his distanziati da un polo (es 7-5) per valutarne correttamente l'attivazione (in anterogrado o in retrogrado). Inoltre dovrà essere sempre visibile almeno un far field atriale su un polo prossimale, mentre il polo distale deve avere solo segnale ventricolare.

3) Si effettuano due manovre di stimolazione in ritmo sinusale. Il pacing parahisiano per studiare le caratteristiche di retroconduzione ed evidenziare eventuali vie accessorie settali ed il blocco di branca destro retrogrado con VH jump, più sensibile nell'individuazione di vie accessorie atipiche o sinistre.

4) Induzione della tachicardia, indirizzamento sulla tipologia di forma aritmica concentrandosi sull'attivazione del segnale hisiano, sull'eventuale variazione dell'intervallo HV rispetto al basale, sul rapporto atrio-his-ventricolo ed infine sulla risposta alle manovre di pacing.

5) Nei casi di non immediata discriminazione si effettuerà posizionamento dei cateteri decapolari vicino al circuito coinvolto per valutare in maniera più accurata il meccanismo dell'aritmia, confermare la diagnosi e favorire la successiva ablazione.

Ci sono quindici possibili tachicardie che (con la sola eccezione delle tachicardie giunzionali ectopiche) possono essere divise in due gruppi in base all'attivazione hisiana (retrograda o anterograda). Il passo successivo è valutare come si presenta l'attivazione atriale e ventricolare, in che rapporto sono tra di esse ed infine la risposta alle manovre di pacing. La copertura geografica strategica del Teapot Protocol nella nostra casistica ha consentito una riduzione del tempo totale procedurale con un netto vantaggio diagnostico nelle forme di tachicardie non comuni e nelle forme non sostenute.



CO.12.06

OUTCOMES OF VENTRICULAR TACHYCARDIA SUBSTRATE ABLATION FACILITATED BY PREPROCEDURAL CARDIAC IMAGING-DERIVED SCAR CHARACTERIZATION. A PROSPECTIVE MULTICENTER INTERNATIONAL REGISTRY

Sebastiano Carli [1], Diego Penela Maceda [1,2], Giulio Falasconi [1,2], Alessia Chiara Latini [1], Juan Fernández-Armenta [3], Massimo Vito Tritto [1], Antonio Berruezo [2]

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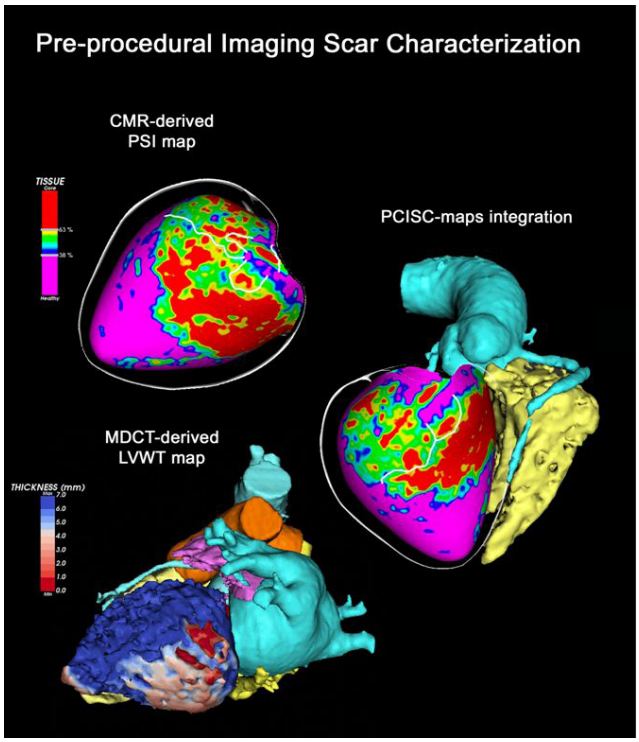
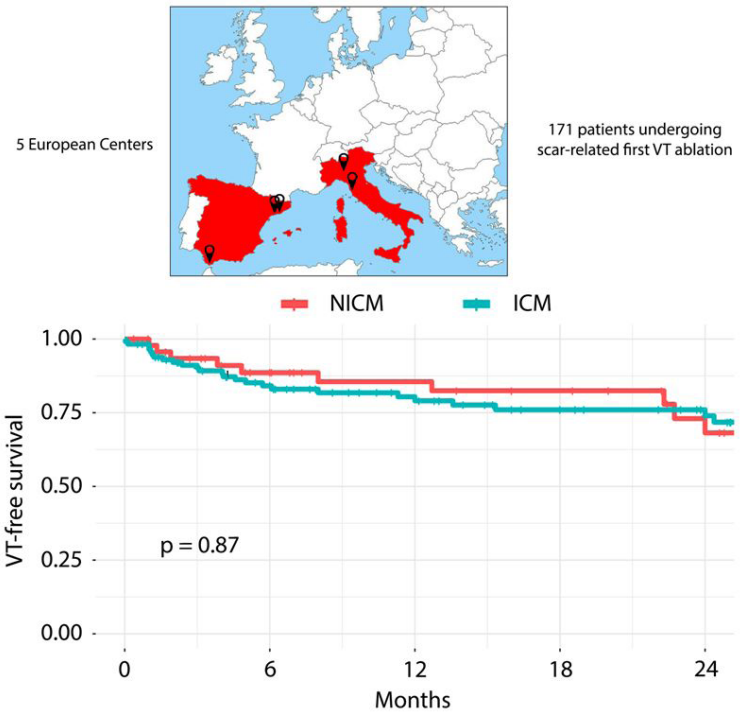
Background: Preprocedural noninvasive scar characterization (NSC) can facilitate scar-related ventricular tachycardia (VT) ablation, although only limited data have been reported.

Objectives: This prospective multicenter registry sought to analyze safety, efficiency and outcomes of VT ablation facilitated by the integration of NSC into the navigation system.

Methods: Consecutive patients referred for scar-related left VT were prospectively enrolled. Preprocedural cardiac magnetic resonance (CMR)-derived scar maps and/or multi-detector computed tomography (MDCT)-derived wall thinning maps of the left ventricle (LV) were obtained and integrated into the navigation system. An endocardial or endo-epicardial approach was chosen based on scar distribution on the NSC. A NSC-aided ablation was considered when a detailed electro-anatomical map (EAM) of the LV was obtained, while a NSC-guided ablation was considered when the procedure was totally performed without obtaining an EAM of the LV.

Results: 171 patients (71% with ischemic cardiomyopathy) were included. CMR was performed in 159 (93%), MDCT in 113 (66%) and both in 101 (59%) patients. After a follow-up of 14 (4-18) months, overall survival and VT recurrence-free survival were 91% and 74.4%, respectively. Compared with a NSC-aided, a NSC-guided approach significantly reduced procedure (159±78 vs 210±69 minutes, p<0.001), radiofrequency (13.6±9 vs 18.3±12 minutes, p=0.01), and fluoroscopy time (12.8±9 vs 17.7±10 minutes, p=0.003) while achieving similar VT recurrence-free survival (log rank=0.31).
Conclusions. In a multicenter experience, guiding VT substrate ablation by NSC proved to be safe and more efficient while maintaining the same long-term clinical outcomes.





COMUNICAZIONI ORALI 13

GIOVEDI' 19 SETTEMBRE

SALA TEATRO

18:30-19:30

SESSIONE DI COMUNICAZIONI ORALI: ALLIED PROFESSIONAL

Moderatori: Consiglia Altomare (Milano)

CO.13.01

LE INFEZIONI DI TASCA: UN PROBLEMA SEMPRE PIÙ ATTUALE

Alessia Dentico, Ilenia Pastore, Domenico Maria Carretta
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Introduzione: Le linee guida definiscono l'infezione di tasca come un'infezione limitata esclusivamente alla tasca del generatore. Questa è clinicamente associata a segni locali di infiammazione. Spesso però l'infezione coinvolge anche gli elettrocateteri che costituiscono una porta d'ingresso per l'infezione a livello cardiaco e sistemico. L'infezione di tasca costituisce un grande rebus per il tipo di approccio da adottare, conservativo o aggressivo? Il nostro studio vuole individuare i criteri predittivi significativi per elaborare uno score che individui i pazienti più a rischio di endocardite e sepsi.

Materiali e Metodi: Sono stati arruolati 66 pazienti sottoposti ad estrazione per infezione di tasca. Tutti i pazienti prima dell'estrazione sono stati sottoposti ad indagini strumentali e di laboratorio per ricercare vegetazioni o positività colturale.

Risultati: Dei 66 pazienti, 61 hanno presentato vegetazioni e/o positività all'esame colturale dei cateteri. L'analisi statistica ha permesso di assegnare ad ogni segno e/o sintomo un punteggio (si veda tabella) con la creazione di uno score con un cut-off massimo di 5. I 61 pazienti positivi avevano uno score maggiore/uguale a 5. Lo score così strutturato ha dimostrato una predittività del 92,4%, risultando positivo in 61 pazienti su 66.

Conclusione: Nei pazienti con infezione di tasca l'individuazione di uno score altamente predittivo di endocardite o sepsi su leads permette al clinico di individuare facilmente i pazienti a più alto rischio da avviare rapidamente a centri di terzo livello per il trattamento più idoneo della situazione clinica senza dover effettuare esami particolari, spesso di difficile esecuzione (PET/TAC), e consente all'elettrofisiologo, che dovrà effettuare la procedura di estrazione, di avere un'indicazione precisa in classe I. Lo studio da noi avviato è uno studio preliminare che ha il limite della numerosità dei pazienti arruolati. Ci riproponiamo di aumentare il numero dei pazienti grazie alla collaborazione con altri centri che effettuano estrazioni. Tuttavia questo studio, in base ai dati finora ottenuti, potrebbe essere una guida alla gestione dei pazienti con infezione di tasca che spesso creano imbarazzo decisionale sulla terapia da adottare anche per poca chiarezza delle linee guida.

SEGNI E/O SINTOMI	Punteggio
Tasca aperta	5
Tasca chiusa	1
Emocolture + con antibiotico	3
Emocolture + senza antibiotico	2.5
Emocolture - con antibiotico	2
Emocolture - senza antibiotico	1
Rossore	2
Calore	2
Tumefazione	2
VES	1
PCR	3
PCT	2.5
Presepsina	1
WBC	1
Sepsi	3
Febbre	1

CO.13.02
STRATIFICAZIONE POST-HOC DEL RISCHIO DI INFEZIONE IN PAZIENTI ESTRATTI

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Introduzione: L'infezione rappresenta una delle complicanze più diffuse e temute delle procedure di impianto di CIED. Il più delle volte questa potrebbe evolvere persino in endocardite su elettrocateteri o shock settico, a tal punto che l'unica terapia salvavita diventa l'estrazione transvenosa di elettrocateteri. Per questo spesso ci si pone il problema di prevenire tali quadri infettivi realizzando una valutazione del rischio infettivo prima dell'impianto così da non incorrere nel tempo in queste complicanze. Questo studio si pone l'obiettivo di stratificare post-hoc il rischio infettivo dei pazienti estratti nel nostro centro così da avvalorare l'introduzione e l'utilizzo di score per la valutazione pre-impianto del rischio infettivo.

Metodi: Sono stati valutati 163 pazienti sottoposti ad estrazione transvenosa di elettrocateteri, di cui 130 per infezione di tasca/endocardite su elettrocateteri o sepsi. In questi pazienti è stata fatta una valutazione post-hoc del rischio di infezione secondo lo score UPCM, score ideato dall'Università di Pittsburgh. Un valore di score maggiore o uguale a 7 individua i pazienti maggiormente predisposti a sviluppare nel tempo un'infezione. Questo score tiene conto di fattori di rischio come: reintervento precoce, tipo di dispositivo impiantato (CRTD vs ICD/PM), presenza di più di 2 cateteri in loco, sostituzione o revisione del dispositivo, utilizzo di pacing temporaneo, assunzione di corticosteroidi o anticoagulanti orali, funzionalità renale, febbre nelle 24 ore prima dell'impianto, presenza di diabete o scompenso cardiaco, genere maschile. Particolare attenzione abbiamo poi rivolto ai pazienti sottoposti a procedura di upgrade o a coloro che hanno subìto per due volte una procedura di estrazione.

Risultati: Dei 130 pazienti del nostro centro sottoposti ad estrazione per infezione, 112 hanno uno score maggiore o uguale a 7; 18 sono invece coloro con uno score minore di 7. Il valore medio è risultato essere 22,9.

Conclusioni: L'individuazione di uno score valutabile prima della procedura di impianto di CIED può risultare un ottimo aiuto nell'individuazione di pazienti fragili che a lungo o breve termine potrebbero incorrere in quadri di infezione. Così facendo si potrebbero valutare ulteriori alternative all'impianto transvenoso, come ad esempio l'impianto di pacemaker leadless o ICD sottocutaneo in pazienti non PM dipendenti elegibili a ciò.

ODDS RATIO PER LO SVILUPPO DI UN'INFEZIONE CIED

PROCEDURE PAZIENTE	
Reintervento Precoce[1]	15.04
CRT-D vs ICD/PM[2]	7.57
> 2 Cateteri in Loco[3]	5.41
Sostituzione/Revisione Dispositivo[4]	3.67
Pacing Temporaneo[1]	2.46
FARMACI	
Utilizzo di Corticosteroidi[3]	13.90
Utilizzo di Anticoagulanti Orali[4]	2.82
CARATTERISTICHE DEL PAZIENTE	
Dialisi-Dipendente[5]	13.39
Renal Failure (GFR <60 ml/min)	11.97
Febbre <24h Prima dell'Impianto[1]	5.83
Insufficienza Renale[6] (Cr ≥ 1.5mg/dl)	5.46
Diabete[7]	3.50
Insufficienza Cardiaca Congestizia[7]	2.57
Genere Maschile[7]	2.23

[1] Klug D et al. Circulation. 2007;116(12):1349-1355.
[2] Margey R et al. Europace. 2010;12(1):64-70.
[3] Sohail MR et al. Clin Infect Dis. 2007;45(2):166-173.
[4] Lekkerkerker JC et al. Eur Heart J. 2009;95(9):715-720
[5] Romeyer-Bouchard et al. Eur Heart J. 2010;31(2):208-210.
[6] Bloom H et al. Pacing Clin Electrophysiol. 2006;29(2):142-145
[7] Herce et al. Europace. 2013;15(1):66-70

CO.13.03

CLASSIFICAZIONE ECOGRAFICA DELLA DISTRIBUZIONE ANATOMICA DEI VASI DELLA FOSSA DI MOHRENHEIM COME GUIDA ALL'ACCESSO VENOSO ASCELLARE IN PROCEDURE DI IMPIANTO DI CIED

Katia Brunzin, Katiuscia Pettenuzzo, Franco Zoppo, Renè Nnangah Suh, Giovanni Turiano
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Introduzione: L'accesso venoso centrale è parte delicata e cruciale di una procedura di impianto di dispositivo impiantabile (CIED). Gli approcci oggi utilizzati sono:
1) approccio in vena cefalica a cielo aperto
2) approccio in vena succlavia a cielo chiuso
3) approccio in vena succlavia a cielo aperto
4) approccio in vena ascellare a cielo aperto RX-guidato
5) approccio in vena ascellare a cielo chiuso RX-guidato
6) approccio in vena ascellare eco-guidato a cielo chiuso.
L'incidenza di PNX è la complicanza più comune che si osserva durante questo tipo di procedure con utilizzo dell'approccio in succlavia. Proprio per questo, le nuove linee guida suggeriscono l'approccio in vena cefalica o vena ascellare come prima scelta.
Nel nostro centro il personale tecnico/infermieristico di sala si occupa della valutazione pre-operatoria dei parametri vitali e della valutazione degli accessi venosi, utilizzando l'ecografia toracica per classificare l'anatomia ed il decorso del vasi venosi nella Fossa di Mohrenheim.

Metodi: Sono stati valutati tutti i pazienti sottoposti ad impianto di CIED nel periodo compreso tra maggio 2022 e marzo 2024. Nel nostro centro utilizziamo come prima scelta l'approccio in vena ascellare eco.-guidato e l'approccio in vena ascellare Rx-guidato a cielo aperto. I dati sono raccolti prospetticamente nel registro operatorio.
Per gli scopi dello studio sono stati valutati i seguenti parametri:
1) rapporti anatomici tra arteria ascellare/succlavia e vena ascellare.
2) distanza dei vasi rispetto al piano pleurico.
Scopo dello studio (osservazionale) è di classificare la variabilità anatomica dei rapporti dei vasi ascellari arteriosi e venosi nel loro decorso pre-clavicolare nella Fossa di Mohrenheim.

Risultati: Nel periodo di valutazione, 273 pazienti sono stati consecutivamente sottoposti ad impianto di CIED con strategia di accesso venoso in ascellare sx con tecnica eco-guidata.
In 4 pazienti (1.5%) si è proceduto ad accesso in vena succlavia sx per fallito accesso ascellare.
Si è registrato un unico caso di PNX (0.3%).
I pazienti sottoposti ad impianto CIED utilizzando l'accesso venoso in vena ascellare RX-guidato sono stati esclusi dalla valutazione.
Abbiamo identificato tre variazioni anatomiche del decorso arterioso e venoso:
Tipo 1: vena ascellare medialmente ed arteria ascellare lateralmente sullo stesso piano riscontrata in 255 pazienti (93.4 %)
Tipo 2A: vena ascellare al di sotto della arteria ascellare riscontrata in pazienti (2.2 %)
Tipo 2B: vena ascellare al di sopra della arteria ascellare riscontrata in pazienti (4.4 %)

Conclusioni: Rispetto alla tecnica RX guidata, la puntura venosa ascellare con tecnica eco-guidata pre-operatorio fornisce importanti indicazioni sui rapporti anatomici e può indirizzare la strategia di accesso venoso durante procedura di impianto CIED.

CO.13.04

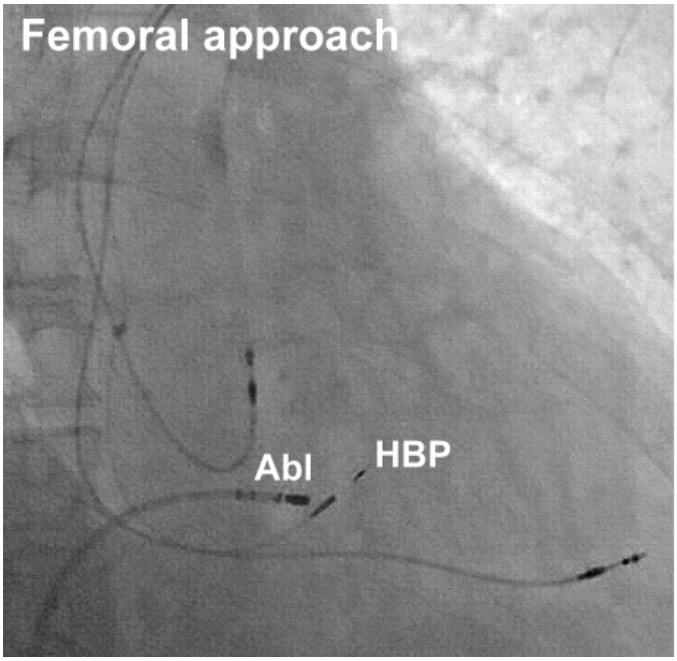
IMPATTO SUL CARICO DI LAVORO INFERMIERISTICO DELL'ABLAZIONE DEL NODO AV ESEGUITA SIMULTANEAMENTE ALLA CSP UTILIZZANDO UN APPROCCIO SUPERIORE DALLA TASCA RISPETTO ALL'APPROCCIO FEMORALE CONVENZIONALE

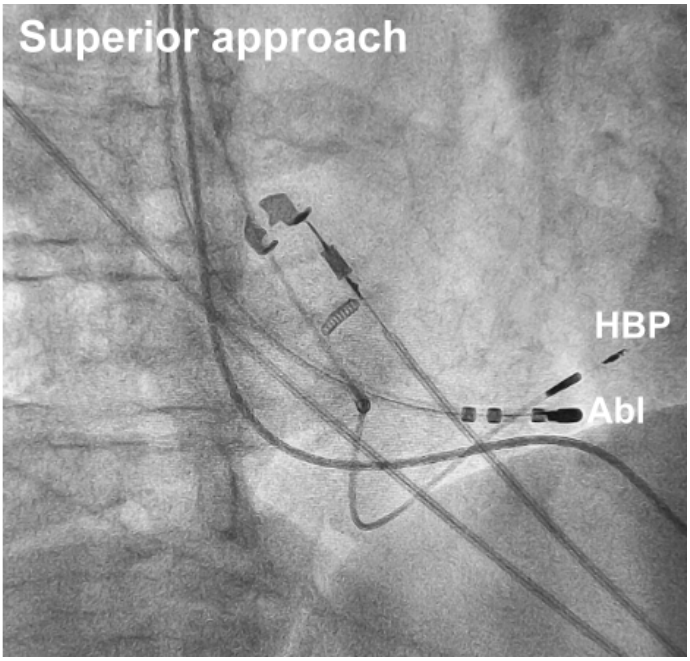
Raffaele Mauro, Cesario Sergi, Vincenzo Panico, Marco Valerio Chiarillo, Maria Domenica Chiuri, Maria Lucia Martella, Gianluca Stefanelli, Deborah Martella, Maria Antonietta Ponzetta, Antonio Parlavecchio, Michele Accogli, Giovanni Coluccia, Pietro Palmisano
Azienda Ospedaliera Card. Giovanni Panico, Tricase, ITALY

Obiettivi: La stimolazione del sistema di conduzione (CSP) associata all'ablazione della giunzione atrioventricolare (AVJA) (strategia di ablate and pace) migliorano l'outcome dei pazienti con fibrillazione atriale ad alta risposta ventricolare, sintomatica, refrattaria a tutte le strategie per il controllo del ritmo ed ai farmaci per il controllo della frequenza. Nei pazienti sottoposti a questa strategia la procedura di AVJA viene spesso eseguita simultaneamente alla procedura di impianto. L'approccio superiore (AS) dalla tasca del pacemaker, tramite vena ascellare o succlavia, è stato recentemente proposto come alternativa all'approccio venoso femorale convenzionale (AF) per eseguire AVJA (Figura). In questo studio abbiamo confrontato l'impatto di questi approcci alternativi sul carico di lavoro infermieristico (NWL) e sulla soddisfazione dei pazienti.

Metodi: Studio prospettico osservazionale, che ha arruolato pazienti consecutivi sottoposti simultaneamente a CSP e AVJA. Il NWL del Laboratorio di Elettrofisiologia (EP Lab) è stato calcolato con un modello sviluppato autonomamente. Il NWL in reparto (Ward NWL) è stato calcolato utilizzando la scala validata MIDENF®. La soddisfazione dei pazienti è stata raccolta utilizzando il questionario Hospital Consumer Assessment of Healthcare Provider Systems (HCAHPS).

Risultati: Sono stati arruolati in totale 119 pazienti: in 50 l'AVJA è stata eseguita con l'AS, in 69 con l'AF. Rispetto all'AF, l'AS era associato a un EP Lab NWL significativamente inferiore (169,8±26,7 vs. 202,7±38,9 minuti; p<0,001) e a un Ward NWL significativamente inferiore (474,5±184,8 vs. 808,6±289,9 minuti; p<0,001). L'analisi multivariata ha identificato l'AS come un predittore indipendente di più basso EP Lab NWL (hazard ratio 4,60; p = 0,001) e di un più basso Ward NWL (hazard ratio 45,13; p <0,001). Rispetto all'AF, l'AS era associato a una valutazione più alta riferita dal paziente riguardo all'esperienza durante la degenza ospedaliera (p=0,035) e alla valutazione ospedaliera complessiva (p=0,026).





CO.13.05

IMPATTO DELL'ISTITUZIONE DEL MONITORAGGIO REMOTO DEI DISPOSITIVI CARDIACI IMPIANTABILI IN UN CENTRO AD ALTO VOLUME

Nadì Mangiaracina, Francesca Casucci, Paolo Pieragnoli, Laura Perrotta, Luca Checchi, Giuseppe Ricciardi, Beltrami Matteo
Azienda Ospedaliero Universitaria Careggi, Firenze, ITALY

Introduzione: Il controllo dei pazienti con dispositivi cardiaci impiantabili (CIED) quali pacemaker (PM), defibrillatori (ICD), dispositivi per la resincronizzazione cardiaca (CRT-D e CRT-P), loop recorder (ILR) rappresenta un carico di lavoro considerevole per le strutture sanitarie, creando talvolta difficoltà organizzative e gestionali.
L'introduzione della telemedicina mediante monitoraggio remoto (HM) ha consentito di ridurre il numero di visite ambulatoriali; tuttavia necessita di personale specializzato dedicato.

Obiettivi: Descrivere l'impatto dell'istituzione di un percorso di HM gestito da tecnici di fisiopatologia cardiocircolatoria e perfusione cardiovascolare (TFCPC) coadiuvati da personale medico presso un Centro ad alto volume. (numero di impianti CIED/anno: ±1100)

Metodi: Da Novembre 2024 è stato istituito un servizio di HM presso la SOD Aritmologia dell'AOU Careggi (Firenze). Due TFCPC sono stati precedentemente formati mediante corsi professionalizzanti e formazione sul campo in presenza di personale medico altamente specializzato. I TFCPC hanno individuato e progressivamente arruolato nella clinica virtuale HM pazienti portatori di CIED afferenti all'unità operativa.
In base al protocollo, salvo diverse esigenze cliniche, per i portatori di ILR è stato impostato controllo in modalità remota a cadenza mensile, per i portatori di ICD o CRT-D a cadenza trimestrale.

Risultati: I pazienti arruolati sono stati in totale 269 di cui 52 ILR, 18 S-ICD, 197 ICD, 2 Micra AV. In 4 mesi di attivazione dell'HM sono stati riscontrati i seguenti eventi clinici che hanno consentito tempestiva gestione: fibrillazione atriale di nuova insorgenza nell'8% dei pazienti, terapie antitachicardiche inappropriate nello 0,5 % dei pazienti portatori di ICD, tachicardie ventricolari riconosciute e trattate correttamente nel 2%, indicazione a impianto di pacemaker nel 2% dei pazienti portatori di ILR, indici di evoluzione verso lo scompenso cardiaco nel 3% dei pazienti, esaurimento batteria CIED nel 3%. Tali eventi sono stati tempestivamente trattati mediante introduzione od ottimizzazione della terapia farmacologica o anticoagulante orale, programmazione di impianto o sostituzione di CIED, riducendo eventuali accessi in pronto soccorso o ospedalizzazioni.

Conclusioni: La telemedicina ha permesso la valutazione precoce delle trasmissioni ricevute garantendo una tempestività ottimale sia nella rivalutazione del paziente, clinica, della terapia farmacologica, sia delle impostazioni del CIED riducendo in maniera significativa le visite ambulatoriali programmate e gli accessi ospedalieri non programmati.

AIAC
Associazione Italiana Aritmologia e Cardiostimolazione

SESSIONI E-POSTER

SESSIONI NON ACCREDITATE ECM

E-POSTER 1

GIOVEDI' 19 SETTEMBRE

AREA E-POSTER

17:30-18:30

SESSIONE E-POSTER 1
DEVICE

Moderatori: Paolo Gallo (Acerra-NA), Danilo Ricciardi (Roma)

EP.01.01
CLINICAL PRACTICE AND OUTCOME OF S-ICD REPLACEMENT: RESULTS FROM THE MULTICENTER RHYTHM DETECT REGISTRY

Valter Bianchi [1], Pietro Francia [2], Giuseppe Ricciardi [3], Stefano Viani [4], Gerardo Nigro [5], Mauro Biffi [6], Paolo De Filippo [7], Luca Ottaviano [8], Federico Migliore [9], Alessandro Vicentini [10], Mariolina Lovecchio [11], Sergio Valsecchi [11], Antonio D'Onofrio [1], Pietro Palmisano [12]

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Background: Subcutaneous implantable cardioverter defibrillator (S - ICD) therapy is expanding rapidly. However, there are few data on the S-ICD replacement procedure.
Objective: The aim of this analysis was to describe the procedure and outcome of S-ICD replacement in clinical practice.

Methods: From 2013 to 2022, consecutive patients undergoing de-novo implantation of an S-ICD were enrolled at 66 Italian centers of the Rhythm Detect Registry. We analyzed consecutive patients who required S-ICD replacement.

Results: 319 S-ICD generators (49 Cameron, 270 Emblem) were replaced for battery depletion. All the procedures were performed in electrophysiology laboratories, by one or two expert operators. In 118 (37%) cases, the replacement was performed as outpatient procedure. The procedure was performed under local anesthesia with or without conscious sedation in 297 patients (93%). The previous S-ICD generator was in an intermuscular pocket in 195 (61%) patients, and in a subcutaneous pocket in the remaining 124 (39%). 39 (31%) generators were shifted from subcutaneous to intermuscular pocket, and their PRAETORIAN score improved from 43±20 to 34±13 (p=0.007). In most cases (308 (97%)), the defibrillation test was not performed after replacement, but the overall PRAETORIAN score was very low (37±28). The S-ICD system was successfully replaced in all patients and no complications were reported; the procedure duration was 39±16 min and was comparable in the case of generator re-implanted in the same pocket or in case of shift to a new pocket. Within 12 months following replacement, 5 infections requiring surgical intervention occurred in 4 (1.3%) patients, which compares favorably with the reported rate of 4.4% after the replacement of transvenous ICDs.

Conclusions: S-ICD replacement was safe and easy to perform, with low rate of peri- and post- operative complications. In clinical practice the replacement procedure is often an opportunity to optimize the position of the generator

EP.01.02

PACING NEEDS IN CLIP'S ERA: HIS-BUNDLE PACING AFTER TRICUSPID TRANSCATHETER EDGE-TO-EDGE REPAIR (TEER)

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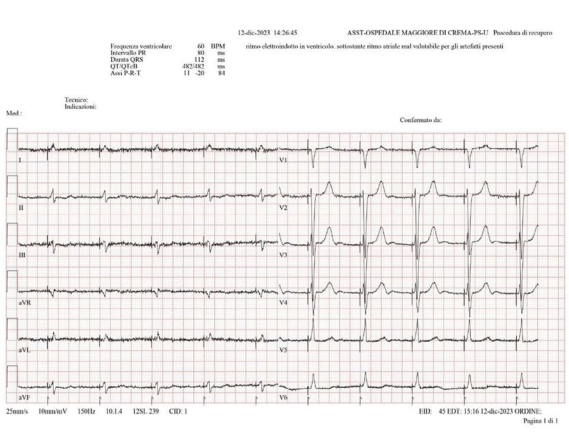
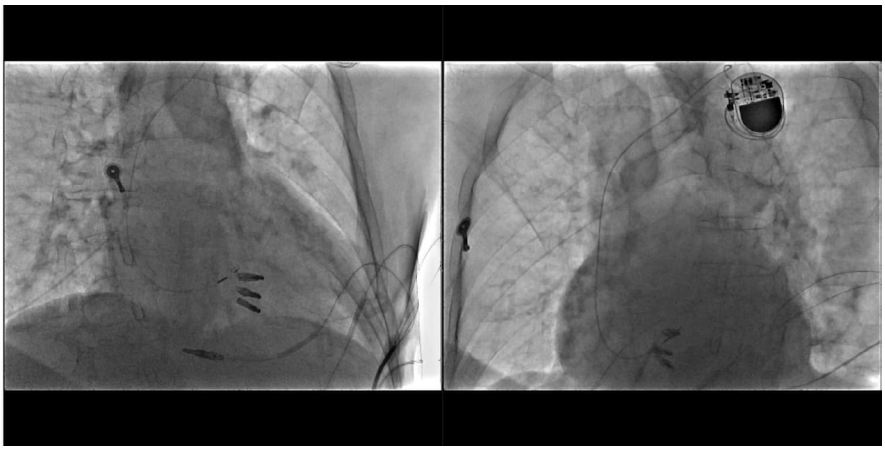
An 85 years-old man with permanent atrial fibrillation and previous inferior wall and right ventricle myocardial infarction treated with percutaneous primary angioplasty in 2013, was referred to our attention due to extremely low ventricular rate, daytime pauses of 6 seconds symptomatic for dizziness found in a ECG Holter registration. Permanent pacemaker implantation was indicated. Previous medical history includes: severe chronic obstructive pulmonary disease and obstructive sleep apnea syndrome, arterial hypertension and dyslipidemia. During the follow-up he developed a severe tricuspid regurgitation owing to annular dilatation from adverse right ventricular remodeling and became symptomatic for exertional dyspnea and experienced two episodes of acute right heart failure despite diuretic therapy. In 2022 the patient was successfully treated with percutaneous transcatheter implantation of three TriClip NT devices on posteroseptal, anteroseptal and anteroposterior commissures of tricuspid valve. ECG showed a low ventricular rate atrial fibrillation (avg 45 bpm). Echocardiography-guided insertion of ventricular and atrial leads was previously described. Transesophageal echocardiography can describe very well cardiac anatomy and can help to identify real time lead position, so echo-guidance could represent a useful tool in difficult cases. We were not able to use a transesophageal echocardiography owing to very high anesthetic risk. We decided to implant a non-conventional pacemaker ventricular lead mainly for two reasons: the presence of three tricuspid clips would have made it very difficult to advance a ventricular pacing catheter through the neo-orifices of the valve and the high risk of clip displacement during catheter maneuvering across the valve plane physiologic pacing, so His-bundle pacing seemed more appropriate given the need for high rate of ventricular pacing, in order to avoid further worsening of ventricular function. We performed fluoroscopy-guided left axillary vein puncture. A Medtronic 3830 ventricular lead was inserted through the His-dedicated Medtronic deflectable sheat (SelectSite C304-HIS) and in right anterior oblique fluoroscopic view the lead was advanced into the right atrium and we looked for a His bundle potential. We decided to use the deflectable introducer in order to reach the Koch's triangle with fine and precise movements without even accidentally interfering with the clips. The lead tip was screwed to the antero-septal edge of Koch's triangle, showing optimal parameters of sensing, impedance, and pacing thresholds. Paced QRS was narrow as spontaneous QRS and a selective His-bundle paced QRS was seen on 12-leads ECG.
Electronic control of pacemaker after 24 hours confirmed optimal sensing, impedance, and pacing threshold parameters. At the 1-month and 6-months visits all the pacing parameters was in the normal range and optimal His-bundle pacing treshold.
The implantation of cardiac electronic devices in patients with previous operations involving the tricuspid annulus or tricuspid valve leaflets represents an emerging challenge for the electrophysiologist. Several approaches have been reported such as epicardial leads, standard endocardial leads, or coronary sinus leads. Our case report represents, to the best of our knowledge, the first description of His-bundle pacing in a patient with a complex transcatheter edge-to-edge tricuspid valve repair. We found that the procedure was feasible and safe.





EP.01.03

COMPLICATIONS IN THE USE OF SUBCUTANEOUS DEFIBRILLATOR IN A PATIENT WITH A LOW BODY MASS INDEX: A CLINICAL CASE OF A PATIENT WITH LONG QT SYNDROME AND CHEST PAIN SECONDARY TO SIGNIFICANT WEIGHT LOSS

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Patient presentation: A 51-year-old woman, carrying a biventricular transvenous defibrillator implanted in 2014 for secondary prevention of long QT syndrome type 3.
In 2020 she was hospitalized for multiple device shocks due to the fracture of the ventricular lead due to subclavian crash syndrome. During the hospitalization, the transvenous ICD was removed and replaced with a single-chamber pacemaker with AAIR pacing. Additionally, a subcutaneous defibrillator was implanted in the left mid-axillary region. However, from september 2021, she began to experience an anxious depressive syndrome with a progressive weight loss, losing up to 14 kg. In the early months of 2022, she started complaining of a stabbing pain in the left submammary region.

Initial workup: The patient visited the ED multiple times in March 2022 due to persistent pain in the submammary region, treated with paracetamol with little relief. Due to the persistence of the symptom, which also affected her sleep quality, she sought care at the reference Arrhythmology center. On physical examination, the lead course was noted for the presence of minimal subcutaneous tissue with no skin ulceration or superficial signs of inflammation (Fig. 1) Palpation of the chest evoked pain along the entire left sixth rib, which was exacerbated with digital pressure in the midclavicular area on the left, in the absence of cutaneous signs of inflammation. Due to the persistent pain, the patient was admitted, and opioid therapy was initiated.

Diagnosis and management: A posteroanterior and lateral chest X-ray was performed to assess the course of the subcutaneous defibrillator lead and its relationship with the ribs (Fig. 2), revealing excessive proximity between the lead and the anterior arch of the sixth rib. It was proposed to remove the defibrillator and the subcutaneous lead and replace them with a new transvenous defibrillation and the replacement of the pacemaker with a bicameral defibrillator. The patient agreed to the procedure, which was carried out by first obtaining the axillary access and adjusting the device pocket in the left subclavicular region. The procedure was completed with the placement of the defibrillation lead with the distal end in the mid-interventricular septum and the connection of this lead and the atrial lead to the new device. Subsequently, the subcutaneous generator was removed through a small incision at the base of the sternum in left parasternal line, a modest traction resistance of the lead was found in the parasternal area.. The chest X-ray performed prior to discharge showed a normal course of the implanted lead with no mechanical complications (Fig. 3). In the days following the procedure, the patient reported a progressive total disappearance of the pain symptoms.
At the 6-month follow-up, the patient had regained approximately 4 kg of weight and resumed light aerobic activity. She currently takes no medication other than Nadolol and has regained a good quality of life.

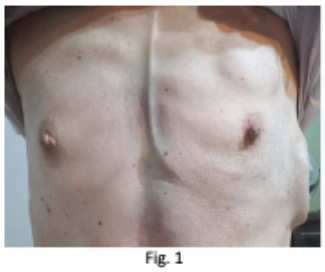
Fig. 1

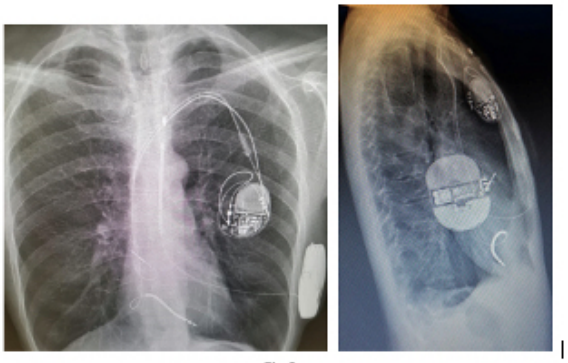
Fig.2

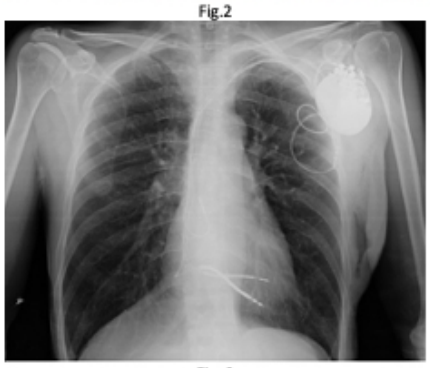
Fig. 3

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EP.01.04

IMPORTANZA DELL'OTTIMIZZAZIONE AV IN PAZIENTI CON STIMOLAZIONE DELLA BRANCA SINISTRA

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Introduzione: L'ottimizzazione dell'intervallo atrio-ventricolare (AV) nei pazienti sottoposti a pacing dell'area della branca sinistra (LBBAP) è finalizzata a preservare o ristabilire la fisiologica sequenza di attivazione elettrica del cuore sincronizzando la stimolazione dell'area della branca sinistra con l'attivazione intrinseca del nodo atrio-ventricolare e della branca destra. Sebbene l'ottimizzazione dell'intervallo AV viene comunemente eseguita al momento dell'impianto sulla base della durata del QRS, essa non tiene conto della dinamicità della conduzione AV intrinseca (es. in corso di tachicardia sinusale o assunzione di farmaci cronotropi negativi). Non è noto, inoltre, se vi sia una correlazione tra i valori di intervallo AV che determinano una minor durata del QRS e i parametri emodinamici.

Obiettivo: Scopo del nostro studio-pilota è verificare se l'ottimizzazione dell'intervallo AV eseguita mediante la valutazione ECG-grafica corrisponda alla migliore configurazione dal punto di vista emodinamico.
Metodi. Da dicembre 2023 a marzo 2024 sono stati arruolati, presso il nostro Centro, 9 pazienti sottoposti a LBBAP. Le caratteristiche demografiche dei pazienti sono descritte nella tabella 1.
Tutti i pazienti sono stati sottoposti, in sede di impianto, ad ottimizzazione ECG-guidata dell'intervallo AV (OPT AVI) sulla base della durata e dell'asse del QRS. A distanza di un follow-up medio di 3,8 mesi tutti i pazienti sono stati sottoposti ad ecocardiogramma transtoracico standard e protocollo di ottimizzazione dell'intervallo AV mediante la valutazione del Doppler Pulsato del flusso trans-mitralico e dell'integrale velocità tempo (VTI) campionato nel tratto di efflusso del ventricolo sinistro. In particolare, tali valutazioni ecocardiografiche sono state eseguite per i valori di intervallo AV ritenuto ottimale in sede di impianto (OPT AVI) e per valori di intervallo AV corrispondenti a OPT AVI -20 ms, OPT AVI -40 ms, OPT AVI +20 ms, OPT AVI +40 ms. Per ogni configurazione è stata inoltre analizzata la durata del QRS.

Risultati: Nel 55.6% dei pazienti è stata riscontrata una correlazione tra l'intervallo OPT AVI e i parametri ecocardiografici (Figura 1). Nel 33,3% dei pazienti, la migliore configurazione è stata OPT AVI ± 20 ms (figura 2).
Si è notata una correlazione intra-paziente tra il VTI e la durata del QRS, a titolo esemplificativo viene riportato un caso in figura 3. I valori di VTI e durata del QRS sono riporati in figura 4 e 5 per ciascun paziente.

Conclusione: I risultati preliminari del nostro studio-pilota possono essere interpretati secondo due possibili ipotesi: 1) che la programmazione dell'intervallo AV al momento dell'impianto può necessitare di ulteriori ottimizzazioni nel corso del tempo e 2) che i valori ottimali dell'intervallo AV possono differire in base al tipo di ottimizzazione eseguita (ECG o ECO-guidata). Uno studio prospettico appropriatamente dimensionato potrebbe far luce su queste ipotesi.

Tabella 1 Caratteristiche demografiche della popolazione di studio.

Parametro	N=9
Maschi n (%)	7, (78%)
Età media ±DS (anni)	76±7
Indicazioni Impianto n (%)	
CRT	4 (44%)
AVB	4, (44%)
MNS	1 (12%)
FE (%)	44±16
QRS spontaneo (ms)	151±20
PR (ms)	214±76

SD=deviazione standard; CRT= terapia di resincronizzazione cardiaca; AVB=blocco atrioventricolare; MNS=malattia del nodo senoatriale; FE=frazione di eiezione;

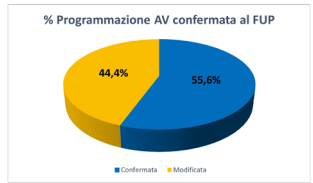

Figura 1. Percentuale pazienti con programmazione intervalli AV confermata al follow-up.

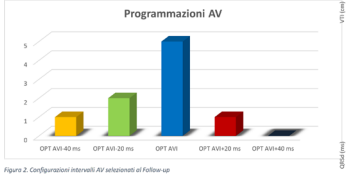

Figura 2. Configurazioni intervalli AV selezionati al Follow-up

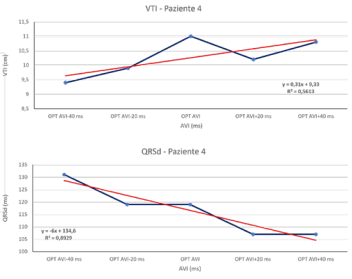

Figura 3 Caso esemplificativo di correlazione tra VTI e durata QRS a differenti intervalli AV.

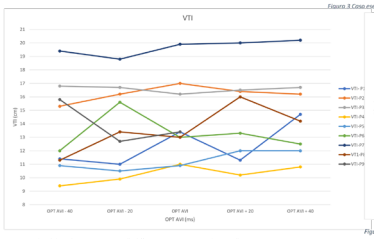

Figura 4. Valori del VTI di ciascun paziente alle differenti programmazioni di intervallo AV.

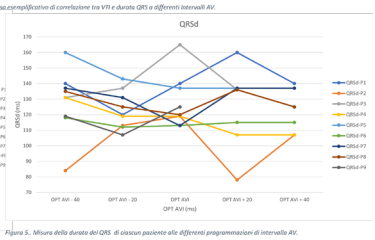

Figura 5.. Misura della durata del QRS di ciascun paziente alle differenti programmazioni di intervallo AV.

EP.01.05

DEVICE PROGRAMMING AND SMART PASS ALGORITHM ACTIVATION IN SUBCUTANEOUS IMPLANTABLE DEFIBRILLATOR PATIENTS: DATA FROM A REMOTE MONITORING DATABASE

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Background: The programming of subcutaneous implantable cardioverter-defibrillators (S-ICD) in clinical practice has been little studied, as the activation status of the SMART Pass filter, that was implemented to reduce inappropriate shocks.

Purpose: We assessed device programming during follow-up and the rate of detected arrhythmias in consecutive S-ICD recipients.

Methods: We analyzed data from 670 S-ICD patients followed on the remote network at 17 Italian centers for a median of 31 months (25th-75th percentile: 16-51). The enhanced SMART Pass version, introduced in October 2022, was expected to reduce unintentional deactivation rate.

Results: At the latest remote data transmission, the median conditional zone cut-off was set to 210bpm (25th-75th percentile: 200-220), the shock zone cut-off was 250bpm (25th-75th percentile: 240-250), and the SMART Pass was enabled in 586 (87%) patients. During follow-up, 194 automatic deactivation events were reported in 118 (18%) patients. Shocks were delivered in 129 (19%) patients, and untreated arrhythmias were recorded in 136 (20%) patients. The rate of shocks was lower when SMART Pass was enabled – 0.12/patient-year (95% CI: 0.10-0.14) versus 0.20 (95%CI: 0.15-0.26) (p=0.002), as it was the rate of untreated arrhythmias – 0.12/patient-year (95% CI: 0.11-0.14) versus 0.23 (95%CI: 0.18-0.30) (p=0.001). The enhanced SMART Pass version was associated with a lower rate of deactivations – 0.04/patient-year (95%CI: 0.02-0.05) versus 0.14 (95%CI: 0.12-0.16) (p<0.001), and with a reduction in treated and untreated arrhythmias (Incidence rate ratios: 0.40 (95%CI: 0.28-0.53) and 0.40 (95%CI: 0.30-0.55), respectively (p<0.001)).

Conclusions: Centers tend to program devices to detect high ventricular rates for arrhythmia detection, to minimize inappropriate shock occurrences. SMART Pass activation is associated with lower rates of detected and treated arrhythmias. The enhanced SMART Pass version seems associated with lower deactivation rate, and with further decrease in treated arrhythmias.

EP.01.06

QRS PIU' LARGO MA MIGLIORE FUNZIONE EMODINAMICA DOPO STIMOLAZIONE DEL FASCIO DI HIS AD ALTA INTENSITA' NEI PAZIENTI CON INSUFFICIENZA CARDIACA E QRS STRETTO: UN PARADOSSO O UN NUOVO CONCETTO?

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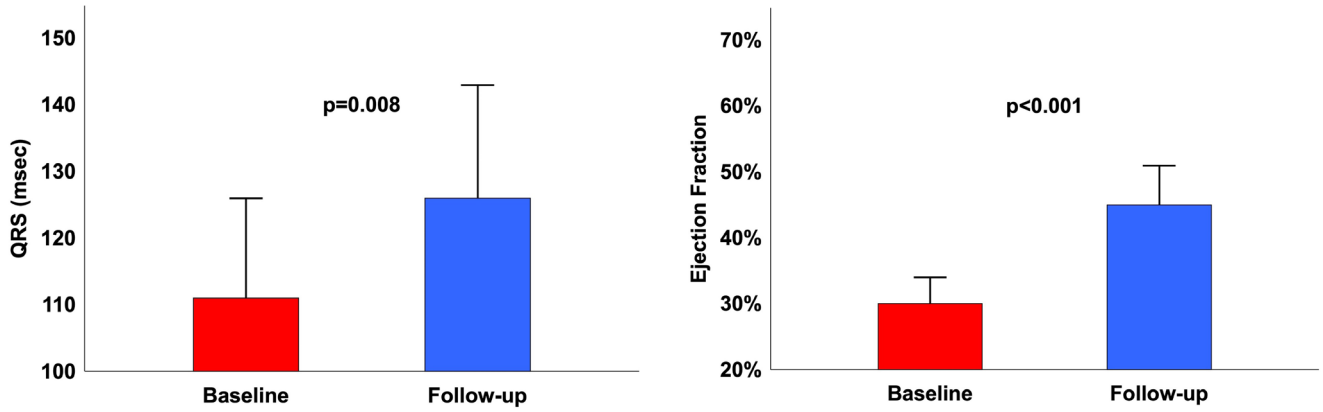
La durata del QRS è un fattore importante nel determinare la risposta alla terapia di resincronizzazione cardiaca (CRT) e un utile surrogato per la dissincronia elettromeccanica. Tuttavia, non abbiamo studi che confermino tale concetto nella stimolazione del sistema di conduzione.

Scopo: Abbiamo eseguito stimolazione del fascio di His (His Bundle Pacing HBP) con un'elevata uscita (3,5 V/1 msec) in pazienti con scompenso cardiaco con cardiomiopatia dilatativa o ischemica e QRS stretto per valutare il beneficio emodinamico.

Metodi: 14 pazienti con cardiomiopatia dilatativa (7 pazienti) o ischemica (7 pazienti) e QRS stretto (<120 ms) sono stati ricoverati per l'impianto di un defibrillatore. Abbiamo impiantato un sistema ICD-HBP e abbiamo raccolto dati clinici, ecocardiografici ed elettrocardiografici.

Risultati: Abbiamo ottenuto con successo HBP in tutti e 14 i pazienti. Per stimolare il ventricolo con HBP l'intervallo PQ dopo l'impianto è risultato più corto da 172±48 a 143±16 (P=0,048). La durata del QRS è aumentata dopo la stimolazione da 110±15 a 123±16 ms (P=0,008) come misurato dall'analizzatore ECG. Nonostante questo aumento della durata del QRS, la FE basale media è aumentata dal 30±4% al 46±10% (P<0,001) dopo un follow-up mediano di 17 mesi. Il diametro telediastolico ventricolare sinistro e il volume telediastolico ventricolare sinistro sono diminuiti rispettivamente da 62±5 a 57±5mm (P=0,013) e da 195±69a 126±27ml (P<0,001). Il volume telesistolico del ventricolo sinistro è diminuito da 139±58 a 69±27 (P<0,001). Il TAPSE è aumentato da 19±4 a 27±4. La classe NYHA è diminuita di una classe in ogni paziente dopo solo un mese. La soglia dell'HBP era di 1,05 V±0,7/1 msec ed è stata aumentata a 1,33±0,93/1 msec (principalmente a causa di 2 pazienti con soglia molto alta). L'impedenza era di 588±109 e diminuì a 484±69 Ohm. L'onda R all'impianto era di 3,2±1,8 mV. In 2 pazienti su 14, la soglia è aumentata ma era ancora inferiore a 3,5 V/1 msec.

Conclusioni: La stimolazione del fascio di His (HBP) nei pazienti con scompenso cardiaco con cardiomiopatia dilatativa o ischemica e QRS stretto migliora la funzione emodinamica del ventricolo destro e sinistro e diminuisce la classe NYHA. Questo beneficio sembra essere prodotto da una maggiore intensità di stimolazione nonostante un QRS più largo dopo la stimolazione. Escludiamo che un ritardo AV molto breve possa essere favorevole, da perchè abbiamo osservato miglioramenti acuti della frazione di eiezione solo dopo aver aumentato l'uscita di stimolazione e senza modificare il ritardo AV. Per quanto ne sappiamo, questi sono i primi casi di HBP benefico in pazienti con scompenso cardiaco con QRS stretto
±



Even if QRS (measured by ECG analyzer) is larger, EF is higher in patients with high output His Bundle Pacing

EP.01.07

WEARABLE CARDIOVERTER-DEFIBRILLATORS IN PATIENTS AT HIGH ARRHYTHMIC RISK

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Introduction: Wearable cardioverter-defibrillators (WCD) have emerged as a valuable tool in the management of patients at risk for life-threatening arrhythmias. These devices offer a non-invasive and temporary solution, providing continuous monitoring and the potential for prompt defibrillation when needed. In this study, we explore the indications for WCD and evaluate arrhythmic events through comprehensive monitoring.

Methods: From November 2022 to March 2024, we conducted an outpatient follow-up of 41 patients receiving WCD. Regular check-ups and comprehensive echocardiography were performed to optimize therapy based on specific indications for each patient.

Results: Thirty patients completed the follow-up. The average age of the patients was 60.4±16.3 years, with 80% being male. Among the cohort, 58% had hypertension, and the same percentage comprised smokers and individuals with dyslipidemia, while 28% were diabetic. WCD was assigned according to the last ANMCO position paper for appropriate use of WCD and ESC guidelines for ventricular arrhythmias and the prevention of sudden cardiac death: de novo diagnosis of dilated cardiomyopathy with reduced ejection fraction in 18 (60%) patients, recent acute coronary syndrome and ejection fraction < 35% in 8 (27%) patients, cardiac electronic device extraction in 3 (10%) patients and myocarditis with electrical instability in 1 (3%) patient. Patients received optimal medical therapy (OMT) tailored to their specific comorbidities, with 90% on renin-angiotensin-aldosterone system inhibitors, 96% on beta-blockers, 68% on mineralocorticoid receptor antagonists, 68% on sodium-glucose cotransporter-2 inhibitors, and 30% on antiarrhythmic drugs. The average follow-up was 62±38 days according to specific etiology, with a daily wearing time of 22.7±1.3 hours. No device interventions were recorded. At the end of the follow-up period, 13 (43%) patients still required implantable cardioverter-defibrillator (ICD). Among these, 11 patients (36%) underwent ICD implantation, 8 for primary prevention, 3 underwent ICD reimplantation, while notably, 2 (7%) patients, declined the procedure.

Conclusions: The use of wearable cardioverter-defibrillators in the outpatient setting for patients at risk of life-threatening arrhythmias allowed to optimize therapy and limit the indications for ICD preventing inappropriate implantation in our cohort up to 57%, with a good safety profile due to the low incidence of device interventions.

EP.01.08

CLINICAL SIGNIFICANCE AND PROGNOSTIC VALUE OF RIGHT BUNDLE BRANCH BLOCK IN PERMANENT PACEMAKER PATIENTS

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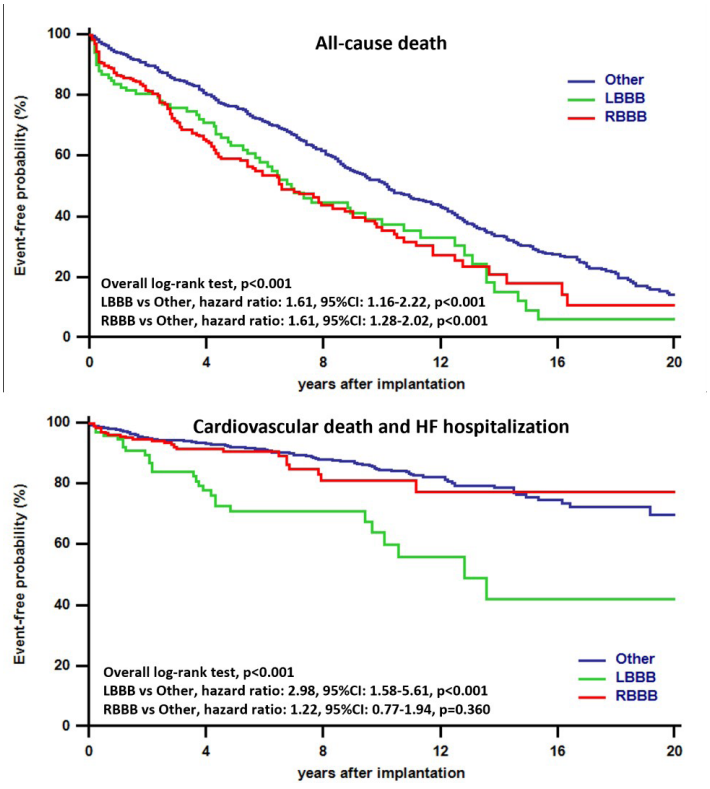
Aim: In patients undergoing pacemaker implantation with no prior history of heart failure (HF), the presence of left bundle branch block (LBBB) has been identified as an independent predictor of HF-related death or hospitalization, while the prognostic significance of right bundle branch block (RBBB) remains uncertain. We aimed to assess the long-term risk of all-cause mortality in patients with a standard indication for permanent pacing and normal or moderately depressed left ventricular function when RBBB is detected at the time of implantation.

Methods: We retrospectively enrolled 1348 consecutive patients who had undergone single- or dual-chamber pacemaker implantation at the study center, from January 1990 to December 2022. Patients with a left ventricular ejection fraction <= 35% or a prior diagnosis of HF were excluded.

Results: The baseline 12-lead electrocardiogram revealed an RBBB in 241 (18%) and an LBBB in 98 (7%) patients. During a median follow-up of 65 [25th-75th percentile: 32-117] months, 704 (52%) patients died. The combined endpoint of cardiovascular death or HF hospitalization was reached by 173 (13%) patients. On multivariate analysis, RBBB was confirmed as independent predictor of death (Hazard Ratio, 1.33; 95% CI, 1.09–1.63; P=0.005). However, when considering the combined endpoint of cardiovascular death and HF hospitalization, this endpoint was independently associated with LBBB (Hazard Ratio, 2.13; 95% CI, 1.38–3.29; P<0.001), but not with RBBB.

Conclusions: In patients with standard pacemaker indications and normal or moderately depressed LV function the presence of basal RBBB was an independent predictor of mortality. However, it was not associated with the combined endpoint of cardiovascular death and HF hospitalization.



EP.01.09

CLOSED LOOP STIMULATION (CLS) IN CIED PATIENTS WITH SLEEP APNEA: A SINGLE-SITE EXPERIENCE

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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 equal to or greater than 15 episodes per hour performed a two-stage home sleep study with the WatchPAT ONE device (Zoll/Itamar, 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±6% with CLS OFF as compared with 84±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.

EP.01.10

COME LA POLIEDRICITA' TECNOLOGICA FAVORISCE SCELTE ALTERNATIVE IN PAZIENTI COMPLESSI

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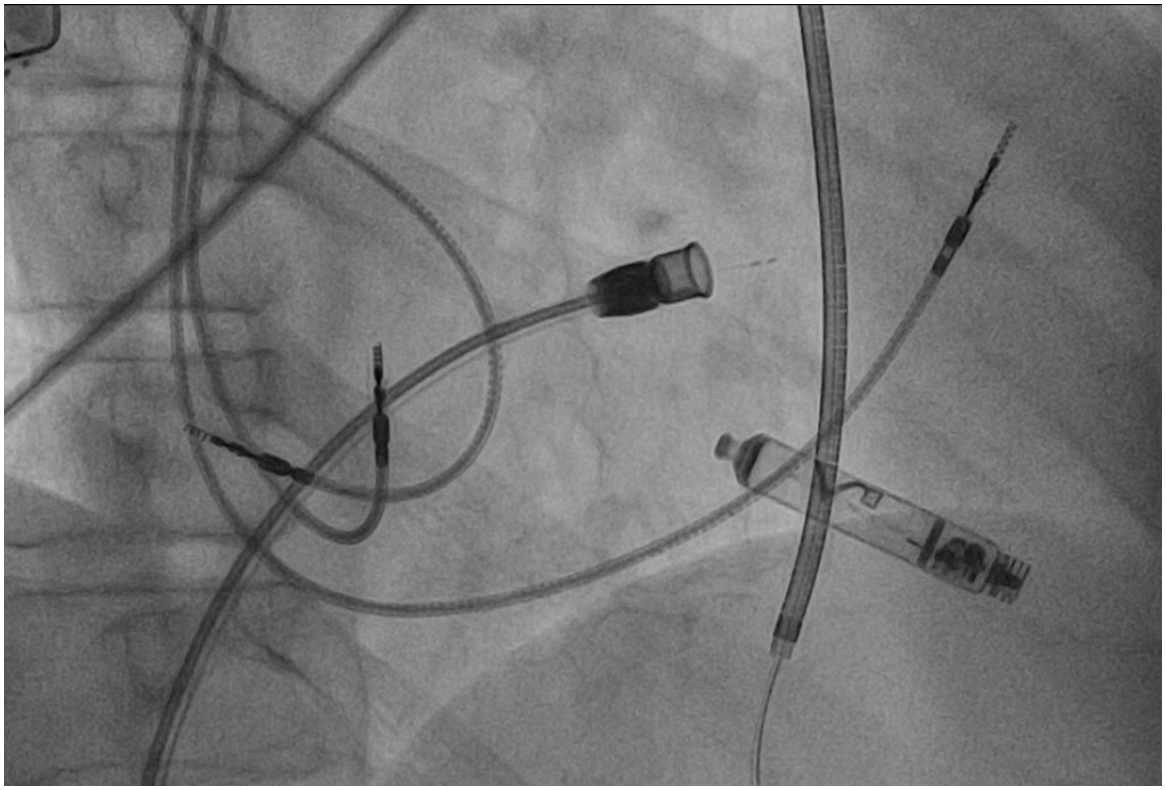
Introduzione: L'impianto di pacemakers (PM) convenzionali consiste nel posizionamento di elettrocateteri transvenosi connessi a un generatore. Tali cataratteristiche espongono al rischio di complicanze relate agli elettrocateteri stessi o alla tasca prepettorale, in termini di infezione o malfunzionamento. Studi osservazionali hanno dimostrato che i PM leadless sono associati in minor misura a tali complicanze. Il PM leadless bicamerale (Aveir, Abbott Medical) con comunicazione bidirezionale e un meccanismo di fissazione attiva si è dimostrato sicuro ed efficace in pazienti con indicazione standard per stimolazione bicamerale. Descriviamo un caso di impianto di PM Aveir (elettrodo ventricolare), in un paziente con malfunzionamento di elettrocatetere ventricolare, già sottoposto a espianto di elettrocatetere e reimpianto controlaterale per trombosi della vena succlavia sinistra.

Caso clinico: Uomo di 53 anni. Portatore di PM monocamerale dal 1994 per malattia atriale bradi-tachi. Nel 2009 tentativo di espianto di elettrocatetere per rottura dello stesso, senza possibilità di estrazione completa: eseguito nuovo impianto di PM bicamerale controlaterale per evidenza di trombosi della vena cava sinistra. Nel 2020 malfunzionamento di elettrocatetetere atriale per cui posizionato nuovo catetere atriale per via succlavia destra. Nel 2023 sottoposto a impianto di S-ICD per tachicardia ventricolare sostenuta. Nel 2024 evidenza di brevi episodi di rumore sul catetere ventricolare con inibizione della stimolazione in paziente con assenza di ritmo spontaneo.
In considerazione della giovane età, dei plurimi episodi di rottura di elettrocateteri, della brevità dell'inibizione e dell'assenza di accessi vascolari percorribili, il paziente è stato sottoposto a impianto di elettrodo ventricolare Aveir Abbott con attuale programmazione VVI 40 bpm in attesa di completamento dell'impianto con elettrocatetere atriale non attualmente disponibile in Europa. Procedura eseguita senza complicanze.
Al controllo predimissione evidenza di corretti interventi del PM leadless all'inibizione del PM transvenoso per malfunzionamento, corretto funzionamento di S-ICD anche con stimolazione del sistema Aveir.

Conclusioni: L'attuale disponibilità di tecnologie ne favorisce l'utilizzo ibrido in pazienti complessi. L'utilizzo combinato del sistema Aveir Abbott può configurarsi come una nuova possibilità terapeutica laddove vi sia un elevato rischio infettivo all'uso di elettrodi transvenosi o in caso di impraticabilità degli accessi vascolari in pazienti con indicazione a stimolazione bicamerale



EP.01.11
UN CASO ATIPICO DI SINDROME DI TAKOTSUBO

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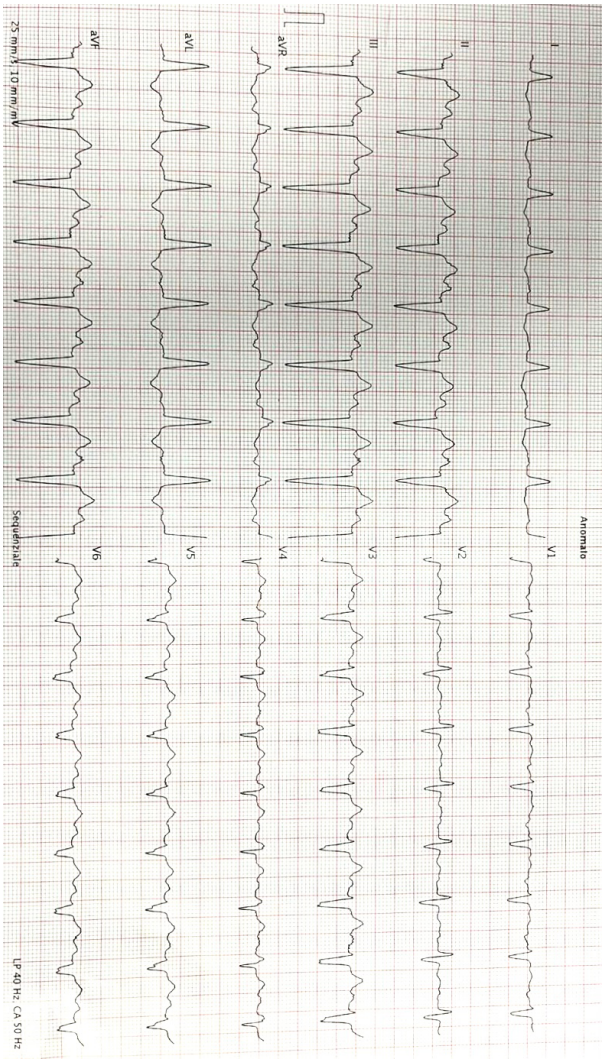
Introduzione: La Sindrome Takotsubo (TTS) è una acuta e transitoria disfunzione ventricolare sinistra che esordisce con caratteristiche cliniche ed elettrocardiografiche che possono simulare una SCA e da un quadro ecocardiografico tipicamente caratterizzato da ipo-acinesia dei segmenti medio-apicali del ventricolo sinistro. Si manifesta dopo un intenso stress fisico o psichico e in assenza di malattia coronarica.

Caso clinico: Donna di 75 anni, ricoverata per impianto di PMK bicamerale a seguito di evidenza all'ECG-Holter delle 24h di BAV di grado avanzato. In anamnesi: ipertensione arteriosa, diabete mellito di tipo 2, BPCO. All'ingresso in reparto paziente asintomatica, parametri vitali nella norma.
ECG: bradicardia sinusale a 41 bpm. BAV di I grado. BBDx. Ecocardiogramma: ventricolo sinistro di normali dimensioni e spessori. Funzione sistolica conservata (FE 70%). Dilatazione biatriale. La paziente veniva sottoposta ad impianto di PMK bicamerale mediante accesso ascellare sinistro ed in anestesia locale con lidocaina. Procedura ben tollerata e decorsa senza complicanze. Eseguita Rx torace che escludeva la presenza di pneumotorace. Dopo circa 10 ore dalla fine della procedura la paziente lamentava dolore epigastrico associato a sudorazione algida e nausea. PA: 175/95 mmHg. All'ECG ritmo sinusale con ventricologramma elettroindotto. Agli esami ematici innalzamento degli indici di miocardiocitonecrosi (TnI <0,012 - 3,09 - 5,07) per cui veniva eseguito ecocardiogramma che mostrava severa disfunzione ventricolare sinistra (FE 30%) con acinesia dell'apice e dei segmenti medi e insufficienza mitralica di grado moderato. Nel sospetto di una sindrome coronarica acuta la paziente veniva sottoposta a studio coronarografico che evidenziava albero coronarico indenne da stenosi emodinamicamente significative. Seguiva ricovero in UTIC per quadro suggestivo di Sindrome di Takotsubo. In considerazione della disfunzione ventricolare sinistra veniva somministrato Levosimendan e avviata terapia diuretica.Seguiva progressivo miglioramento clinico e strumentale. La paziente è stata dimessa dopo una settimana, asintomatica ,con ECG nei limiti e con un ecocardiogramma pre-dimissione che mostrava un netto recupero della funzione sistolica ventricolare sinistra (FE 55%) con circoscritta residua ipocinesia apicale.

Discussione: La TTS è caratterizzata da una disfunzione ventricolare reversibile che può simulare una sindrome coronarica acuta, più frequente nelle donne in post-menopausa e dopo un intenso stress fisico o emotivo. La prognosi è buona, con bassi tassi di mortalità intraospedaliera e con recupero della normale funzione ventricolare sinistra in poche settimane nella maggior parte dei casi.
Anche se non comuni, sono stati descritti in letteratura alcuni casi di TTS post-impianto di PMK, prevalentemente in donne anziane e nella maggior parte dei casi con un buon decorso clinico. Nel caso della nostra paziente l'impianto di pacemaker, nonostante si sia concluso senza nessuna complicanza, è stato l'unico evento stressante identificato ed è stato pertanto considerato l'evento trigger della TTS. I segni ECG-grafici tipici sono stati mascherati dal ventricologramma elettroindotto. Tuttavia, guidati dalla clinica e dalle indagini strumentali, si è giunti prontamente alla diagnosi.

Conclusioni: Il nostro caso clinico sottolinea l'importanza di considerare l'impianto di pacemaker come potenziale evento trigger per la TTS nonostante questo sia avvenuto senza complicazioni.
Consideriamo questo caso clinico come un caso educativo che descrive una rara ma possibile complicanza dell'impianto di pacemaker.



EP.01.12

VALUTAZIONE PROSPETTICA DELLE PRESTAZIONI DEI CRITERI DI DISCRIMINAZIONE MORFOLOGICA NEI DEFIBRILLATORI IMPIANTABILI: RISULTATI DEL REGISTRO MORMAT

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Introduzione: I criteri di discriminazione morfologica (MD) presenti negli attuali modelli di defibrillatori impiantabili cardiaci (ICD) sono cruciali nella discriminazione delle aritmie. Obiettivo di questo registro multicentrico è stimare l'incidenza di terapie inappropriate in una popolazione di pazienti consecutivi impiantati con ICD e con MD attivo.

Metodi: Sono stati analizzati da 10 investigatori esperti elettroffisiologi (EEP) 384 registrazioni di elettrogrammi intracavitari (IEGM) da 219 ICD di tutti i fabbricanti con MD disponibile e programmato secondo le indicazioni derivanti dalle più recenti pubblicazioni. Sono state confrontate le discriminazioni degli ICD con le decisioni degli EEP.

Risultati: Con un follow up medio di 26.3±11.0 mesi sono state analizzate 31 FV, 266 TV e 87 TSV. I pazienti con TV sono stati 31. Delle TV analizzate sono stati identificati 265 ATP erogati su 20 pazienti (efficaci nel ripristino del RS al primo tentativo 84.5%, efficaci nel ripristino RS senza shock 90.6%) e 35 shock erogati su 11 pazienti (efficaci nel ripristino RS al primo tentativo 84.6%, inefficaci 0). I criteri di discriminazione morfologica hanno dimostrato una sensibilità e specificità nel rilevamento delle TV rispettivamente del 94.1% e 88.6%. La discriminazione è stata corretta nel 82.9% delle TSV, 95.0% TV e 87.1% delle FV. L'ATP in zona FV ha evitato l'erogazione di uno shock per l'interruzione dell'aritmia TV veloce o FV nel 55% dei casi. Una riprogrammazione è stata necessaria in 2 pazienti con MD disattivato ed una modifica alla terapia farmacologica in 1 paziente su 7 con interventi inappropriati su SVT. La FA ad alta risposta è il principale motivo di shock inappropriati in zona FV.

Conclusioni: I criteri MD contemporanei con una corretta programmazione dall'impianto consentono di ottenere erogazioni di terapie appropriate su episodi di TV al 96.3%.

EP.01.13

SINUS RHYTHM RESTORATION IN PATIENTS WITH PERMANENT ATRIAL FIBRILLATION WHO UNDERWENT ''ABLATE AND PACE'' WITH CONDUCTION SYSTEM PACING

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Background: Spontaneous sinus rhythm resumption (SRR) in patients with symptomatic permanent atrial fibrillation (AF) undergoing "ablate and pace" (A&P) is a curious phenomenon of great clinical impact (Figure 1A). Data on SRR in patients receiving A&P and conductive system pacing (CSP) are lacking. The aim of this study was to assess the incidence and the predictors of spontaneous SRR in a population of permanent AF patients underwent A&P with CSP.

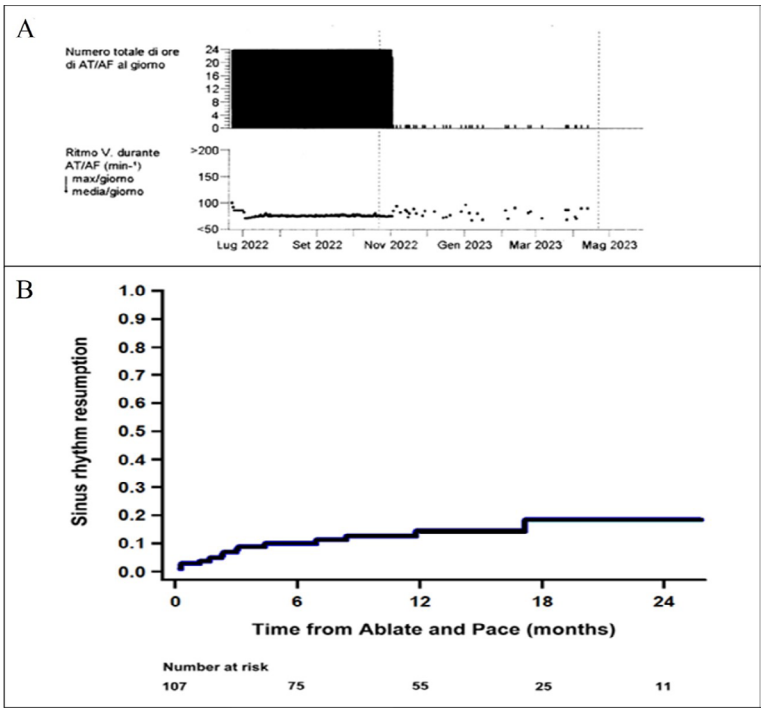
Methods: This study enrolled consecutive patients with symptomatic permanent AF and uncontrolled ventricular rate who underwent A&P with CSP. The incidence and predictive factors of SRR were prospectively evaluated.

Results: A total of 107 patients (79.0±9.1 years, 33.6% male, 56.1% with LVEF <40%, 30.8% with wide QRS, 74.8% with NYHA class III-IV,) were enrolled. After a median of 3 months from A&P (IQR: 1-6; range: 0-17), spontaneous SRR was observed in 14 patients (13.1%) (Figure 1B). Multivariable analysis showed that left atrial volume index (LAVi) <49 mL/m2 and a duration of permanent AF <12 months were independent predictors of SRR. Chronic kidney disease was a negative predictor of spontaneous SRR.

Conclusions: 13% of patients undergoing A&P with CSP spontaneously reverted to sinus rhythm during follow-up. LAVi <49 mL/m2 and permanent AF <12 months appear to be positive predictors of SRR.

Figure 1A: a significant reduction in the burden of atrial fibrillation (from 100% to 2%) recorded by the pacemaker after "ablate and pace".

Figure 1B: Kaplan–Meier estimation of cumulative sinus rhythm resumption.



EP.01.14

THE CURIOUS CASE OF A "RESURRECTED" PACEMAKER. INFORMATION TO KEEP IN MIND IN CLINICAL PRACTICE

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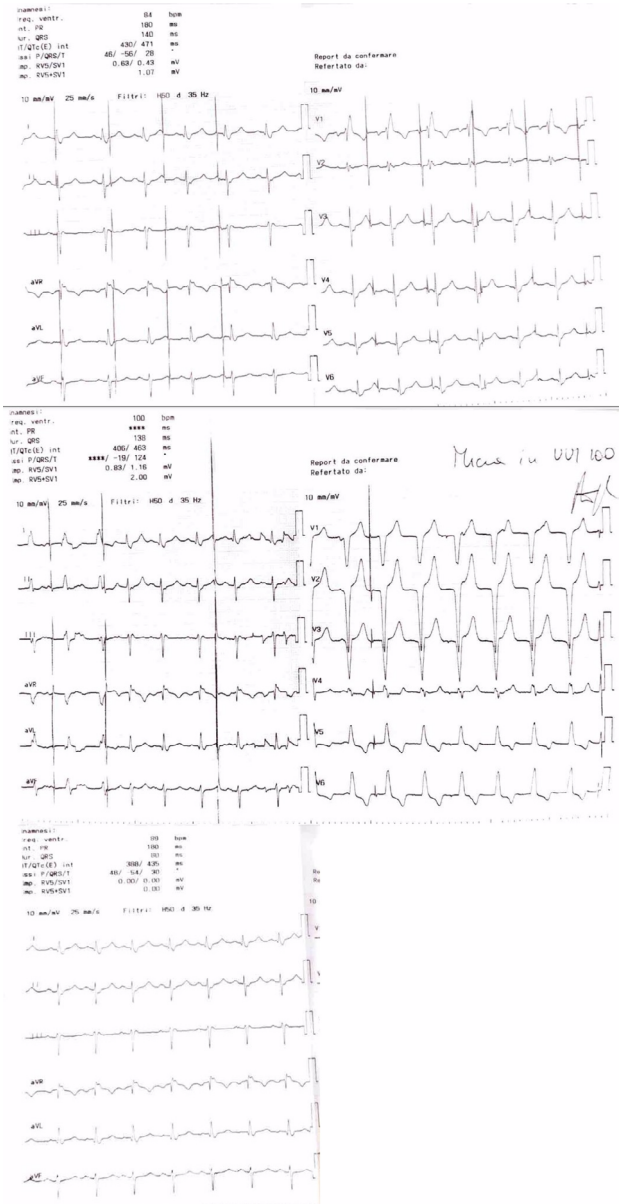
Most cardiovascular implantable electronic devices utilize intravascular leads. These are subject to mechanical stress with risk of fracture, and the extravascular position of the generator constitutes a potential source of infections. Therefore, research has focused on developing devices that do not require leads, leading to the introduction of Leadless pacemaker (LPM) systems.

An 83-year-old woman underwent implantation of a single-catheter dual-chamber PM in 2005 due to symptomatic paroxysmal atrioventricular block. In 2011, evidence of atrial and ventricular sensing deficiency with a high stimulation threshold. Consequently, the patient underwent isolation of the damaged catheter and implantation of a new dual-chamber PM. In 2017 a rupture of the new right ventricular lead was detected. So the patient underwent implantation of an LPM without complications. The transvenous dual-chamber PM was left in place due to technical difficulties associated with the extraction of the broken ventricular catheters and to reduce the risk of infection resulting from subcutaneous pocket opening. It was reprogrammed to OVO mode. In subsequent check-ups, the patient was asymptomatic with good device parameters.
In January 2024, the patient presented to the emergency department for sensation of electrical shock in the diaphragm and left upper limb. An electrocardiogram (ECG) showed sinus rhythm and inappropriate spikes from the PM without ventricular capture (fig. 1). The LPM showed normal electrical parameters and no ventricular capture corresponding to the spikes on ECG. The LPM was therefore programmed to stimulate at a frequency faster then the sinus rhythm (VVI 100/ min), ensuring proper capture and persistence of unipolar pacing spikes (fig. 2). The abandoned dual-chamber PM was then interrogated, revealing, reactivation of safety-mode-stimulation in VVI 65 bpm with an output of 5 mV × 1 ms, attributed to battery end-of-life (EOL). This phenomenon was identified as the cause of the spikes observed on the ECG and of the symptoms reported by the patient. The PM was then reprogrammed by lowering stimulation outputs and maximizing sensitivity threshold, resolving the phenomenon on the ECG (fig. 3). At the subsequent one-month follow-up, both the absence of spike on the ECG and the patient's asymptomatic status were confirmed.
Most PM models, at EOL stage, exhibit loss of rate response and automatically reprogram to VVI mode with a fixed (non-reprogrammable) rate of 65 beats/min (unipolar). The case of our patient is illustrative of this: upon reaching EOL status, the PM automatically reprogrammed itself to VVI 65/min al maximum outputs. This must be kept in mind, especially in patients carrying two devices, both for the potential of interference between them and for differential diagnosis issues, as well as for symptoms. The decision to leave the old device in place, including both leads and generator, was motivated by the complications associated with an additional procedure, infections related, hematoma, or pain. Furthermore, the risks associated with lead extraction cannot be underestimated. In light of this, it is necessary to bear in mind the possibility of automatic reprogramming of the abandoned device leading to interference issues, as well as the onset of symptoms.



EP.01.15

PRELIMINARY DATA ON INCREASED RATE OF MRI-CONDITIONAL CIEDS FOLLOWING REPLACEMENT

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Background: Magnetic resonance imaging (MRI) is an important diagnostic tool across all medical fields with an increased use in daily clinical practice. This trend is critical considering the increasing number of people with Cardiovascular Implantable Electronic Devices (CIEDs), resulting in a significant proportion of CIED patients requiring MRI during their lifetime. However, MRI was previously considered contraindicated for CIED patients due to potential life-threatening interactions, but recently MRI-conditional devices have been introduced allowing to safely perform MRI exams even in CIED patients, provided specific conditions are met. A MRI-conditional CIED system refers to both the generator and the attached leads, which are approved only in a certain combination and the absence of abandoned leads; however, a significant proportion of patients still have a combination of elements not MRI conditional.

Purpose: The aim of our single-centre observational registry is to assess the rate of CIED systems which acquire MRI compatibility at the time of device replacement.

Methods: Consecutive patients undergoing CIED replacement over a 2-months period (January-March 2024) were enrolled at our Institution. Patients were divided into three groups: already MRI-conditional for those who were MRI-conditional before the replacement; new MRI-conditional for systems who became MRI-conditional at the time of the replacement (e.g. by matching MRI leads with new generator), and not MRI-conditional for those who remained not conditional even after the replacement.

Results: Sixty-one patients (39 M; mean age: 75 years), undergoing CIEDs replacement: 39 pacemakers (2 single-chamber and 37 dual-chamber); 22 defibrillators (4 single-chamber, 7 dual-chamber, and 11 CRT-D).
At the time of the replacement up to 22 CIEDs became MRI-conditional (new MRI-conditional), 22 were already MRI-conditional while 17 patients remained not MRI-conditional. The main reasons of MRI incompatibility included the presence of leads from different brands in 7 patients, abandoned leads in 4 patients, and not MRI-conditional leads in 9 patients. The not MRI-conditional group exhibited a significantly longer leads dwell time, with mean durations of 14.9 years versus 9.5 and 10.8 years in the other two groups, respectively.
Excluding the already MRI-conditional CIEDs (22/61), in our series we achieved a new MRI-compatibility in 56% of patients (22/39).

Conclusion: In our single-centre observational registry, we were able to achieve MRI compatibility for 56% (22 out of 39) of systems that were initially not conditional at the time of device replacement. These results underscore the potential for adapting technologies to ensure MRI access to a wider population of patients with CIEDs.

EP.01.16

VALUTAZIONE DEL SEGNALE SONR MISURATO QUOTIDIANAMENTE ATTRAVERSO L'USO DI UN NUOVO SOFTWARE DI INTERFACCIA E CORRELAZIONE CON EVENTI AVVERSI: LA NOSTRA ESPERIENZA PRELIMINARE

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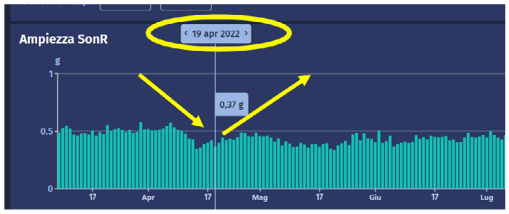
Introduzione: La terapia di resincronizzazione cardiaca (CRT) è efficace nei pazienti con disfunzione ventricolare sinistra e ritardo di conduzione ventricolare; ciononostante, circa il 30% dei pazienti non beneficia di miglioramento clinico post impianto CRT. Nel tentativo di aumentare la quota di non responder alla CRT, alcuni dispositivi impiantabili attuali consentono una ottimizzazione automatica dei ritardi atrioventricolare (AV) e interventricolare (VV). I dispositivi CRT Microport consentono questa ottimizzazione automatica settimanale dei ritardi AV e VV attraverso un sensore emodinamico (SonR), che è risultato essere superiore in termini di aumento del numero dei responder all'ottimizzazione ecoguidata dei ritardi AV e VV (studio Respond). L'utilità del segnale SonR al di là della sola ottimizzazione dei ritardi è tuttora in valutazione. Nella nostra pratica clinica lo adoperiamo per selezionare il vettore di stimolazione sinistro ottimale (bipolo o multipoint) in fase di impianto. Un suo ulteriore utilizzo potrebbe essere in relazione a possibili eventi avversi paziente (aritmia, scompenso, cambio terapia farmacologica). Con il rilascio della nuova interfaccia di programmazione software da parte dell'azienda, si ha la possibilità di valutare giornalmente, e non più settimanalmente, il valore del segnale SonR. In questa esperienza preliminare abbiamo valutato il segnale SonR in relazione ad eventi aritmici.

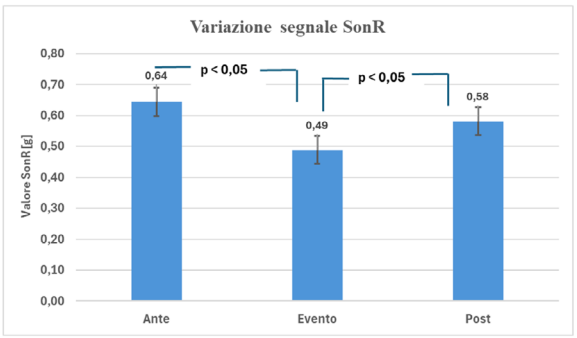
Analisi: Il sensore SonR è integrato nella punta di un elettrocatetere atriale a fissazione attiva dedicato (SonRtip). Durante la contrazione cardiaca vengono generate delle vibrazioni meccaniche che vengono rilevate dal sensore SonR sottoforma di segnale di accelerazione endocardico; l'ampiezza di questo segnale corrisponde al primo tono cardiaco ed è un indice di funzionalità sistolica; a partire da questo valore, il sistema ottimizza anche (settimanalmente) i ritardi AV e VV. Sono stati analizzati retrospettivamente i dati di follow-up (FU) di 125 pazienti impiantati negli ultimi anni nel nostro centro con indicazione alla resincronizzazione secondo le linee guida correnti e dispositivo CRT-SonR.
Questi dati sono stati letti utilizzando la nuova interfaccia di programmazione Microport, che restituisce un valore giornaliero anziché settimanale del segnale SonR. Abbiamo ricercato per ogni paziente il primo evento rilevante (tachicardie ventricolari con o senza ATP/shock, fibrillazione atriale) post impianto. Abbiamo rilevato eventi rilevanti in 37 pazienti. Abbiamo confrontato il valore SonR nel giorno dell'evento con il corrispondente valore medio prima e dopo l'evento (cut-off arbitrario di 15 giorni). Il segnale SonR all'evento è risultato essere inferiore (pari a 0,49 ± 0,21 g) in modo statisticamente significativo ($p<0,05$) sia rispetto alla finestra precedente (0,64 ± 0,24 g) sia rispetto a quella successiva (0,58 ± 0,23 g). La differenza tra le finestre pre e post evento non è risultata invece essere statisticamente significativa.

Conclusioni: Nella nostra casistica, seppur limitata e retrospettiva, il segnale SonR misurato giornalmente risulta variare in modo statisticamente significativo in un periodo sia antecedente sia successivo un evento di rilievo (tachicardia/fibrillazione atriale).
Una casistica più approfondita, prospettica, utilizzando la nuova interfaccia Microport, unita all'analisi di ulteriori parametri, potrebbe risultare in un indice predittivo di un peggioramento del quadro clinico del paziente.

Evento



Andamento giornaliero SonR



EP.01.17

NURSE MANAGEMENT AND SCREENING OF SLEEP APNEA WITH THE WATCHPAT ONE DEVICE IN CIED PATIENTS

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Introduction/Background: Sleep apnea syndrome (SAS) is a common sleep disorder among patients visiting ambulatory for CIED follow-up. Nevertheless, SAS is often undiagnosed and, therefore, untreated. Untreated SAS significantly increases the risk of heart arrhythmias and cardiovascular disease with an impact on the outcomes of patients with CIED. Use of home sleep apnea testing (HSAT) devices may facilitate the identification of CIED patients at high-risk for SAS.

Objectives: To describe the nurse practice in the screening and management of CIED patients with SAS by using the WatchPAT® ONE HSAT device (Zoll/Itamar, Caesarea, Israel).

Methods: Patients were screened for SAS during routine in-office follow-up of CIED. All patients were administered with sleep-disorders questionnaires (i.e. Insomnia Severity Index (ISI), Epworth Sleepiness scale (ESS), and NoSAS) followed by HSAT with the WatchPAT® ONE disposable device. During the same visit, patients suspected with SAS according to ISI, ESS and NoSAS scores were provided with the HSAT device, and the education needed to perform the home sleep study. A team of 2 nurses took care of CIED follow-up and training on the use of the HSAT device. Specifically, one nurse was responsible for CIED follow-up and the other one for patient and HSAT device registration on the CloudPAT® website, PIN provision for HSAT device activation, assistance in downloading of the WatchPAT® ONE application to patient's smartphone and training on the use of the HSAT device. Nurses and physicians were notified via mail at sleep study completion for the interpretation of the recorded data automatically transmitted to the cloud.

Results: A total of 12 patients (mean age, 75.4±8.1 years; men, 66.7%; mean BMI, 27.6±3.7 kg/m2) with CIED (58.3% PM, 33.3% ICD, 8.3% CRT-D), and suspected sleep disorders underwent a home sleep study. Based on administered questionnaires, patients had an excessive daytime sleepiness (mean ESS score, 11.3±6.3 points), a high probability of obstructive sleep apnea (mean NoSAS score, 13.1±4.6 points) and clinical insomnia of moderate severity (mean ISI, 18.9±3.6 points). HSAT device-related activities required a mean time of 4.9±0.8 minutes during CIED follow-up. Home sleep study with HSAT device was performed successfully in 7 cases (58.3%). In the remaining 5 patients, home sleep study failed due to insufficient sleep recording times or equipment failure, and either second attempt was unsuccessful, or patients refused to repeat study. Mean apnea-hypopnea index was 49.6±26.2 episodes per hour confirming moderate to severe SAS in this setting.

Conclusions: Combining CIED follow-up with sleep-disordered breathing screening followed by home sleep study with the WatchPAT® ONE device could be an effective strategy to identify CIED patients at high-risk for SAS. Acceptance of HSAT device from patients was good in most cases and the time impact on a routine CIED follow-up visit length was minimal.

EP.01.18

DISPOSITIVI CARDIACI IMPIANTABILI E RISONANZA MAGNETICA: DATI PROVENIENTI DALL'APPLICAZIONE DI UN PROTOCOLLO AZIENDALE

Davide Saporito, Francesca Fabbri, Lorenzo Spighi, Nicola Trevisi, Cinzia Ronconi, Fabio Sartini, Silvia Damiani, Filippo Ottani
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Nel corso degli ultimi anni la richiesta di accesso ad indagini diagnostiche di risonanza magnetica (RM) da parte di pazienti portatori di dispositivi cardiaci impiantabili (CIEDS) è gradualmente aumentata. Ciò è legato sia alla maggior longevità della popolazione che ai suggerimenti delle linee guida internazionali che invitano il mondo radiologico a superare le perplessità ed i timori nell'esecuzione delle RM nei pazienti portatori di CIEDS.
Nel 2018 l'AUSL Romagna ha elaborato un protocollo operativo con lo scopo di normare l'accesso della popolazione suddetta stabilendo i compiti delle differenti figure professionali che vengono a contatto con il paziente e monitorando eventuali complicanze cliniche o del CIED.

Nel presidio ospedaliero di Rimini sono stati raccolti tutti i dati relativi alle procedure richieste dal gennaio 2019 al dicembre 2023. Tutti i sistemi (generatore ed elettrocateteri) sono stati classificati in tre gruppi: MR-conditional (rispondenti alle caratteristiche tecniche richieste dalle ditte produttrici di device per l'accesso in sicurezza alla RM), MR-unsafe (con elettrocateteri abbandonati o con elevate soglie di stimolazione o generatori/elettrocateteri non classificati come MRI-conditional) e 'non MR-conditional' (cateteri e generatori MR-conditional ma di differenti produttori). Non sono stati inclusi nell'analisi dispositivi loop recorder.
Ad ogni paziente sottoposto ad RM è stato effettuato un controllo prima e dopo l'esecuzione dell'indagine. I parametri valutati (sensing, impedenza e soglia di stimolazione) sono stati confrontati con quelli ottenuti al precedente e successivo controllo ambulatoriale.

E' stata richiesta la valutazione del sistema (device ed elettrocateteri) per 151 pazienti, 16 dei quali sono stati sottoposti a multipli esami. I distretti valutati dalla RM sono stati il cranio (47%), la colonna vertebrale (21%), la mammella (1%), il cuore (3%), l'addome (20%), pla prostata (2%) e gli arti (16%). L'età mediana è stata di 70 anni e la popolazione è stata in maggioranza maschile. Tra i CIEDS il 67% di questi sono stati pacemaker (3 leadless ed 1 CRT-P) e 33% defibrillatori (5 S-ICD e 10 CRT-D). L'85% dei sistemi è stato classificato come MR-conditional, il 3% come MR-unsafe ed il 12% come 'non MR-conditional'. Nessun paziente portatore di sistema classificato come MR-unsafe è stato sottoposto a RM. Non sono state riscontrate complicanze cliniche né a carico del CIED. In particolare la variazione percentuale mediana dei parametri considerati prima e dopo la RM è sovrapponibile a quella dei parametri ottenuti rispettivamente ai controlli precedenti e successivi all'esame.

In conclusione la MR rappresenta una metodica diagnostica effettuabile con sicurezza nei pazienti portatori di CIEDS con sistemi MR-conditional e 'non MR-conditional'. E' necessario un protocollo condiviso che favorisca l'accesso dei pazienti portatori di CIEDS alla RM purché condiviso dai professionisti che hanno in gestione il paziente.

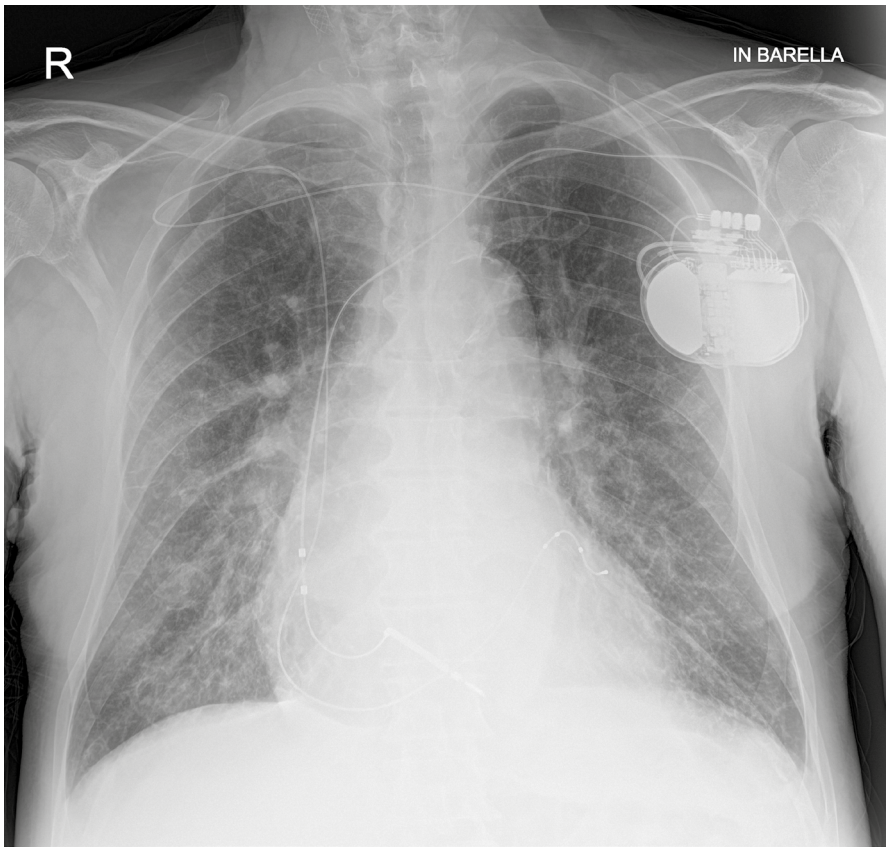
EP.01.19

UPGRADING ICD VVI A CRTD; UTILIZZO OFF LABEL DI ELETTROCATETERE BIOTRONIK PLEXA DX PER PACING ATRIALE

Gianluca Tommasini, Debora Di Maggio, Ilenia Fracchioni, Maria Paola Buzzi, Maurizio Ornaghi, Angela Lesce, Ilaria Passarelli, Camilla Facchini, Simona Pierini
Asst NORD Milano, Sesto S.G. e Cinisello Balsamo, ITALY

Descriviamo il caso di un paziente di 77 anni, portatore di ICD monocamerale con sensore atriale flottante (Biotronic Intica 5 VR-T Dx con elettrocatetere Plexa dx 65/15) in prevenzione secondaria

Nel marzo 2023 recidiva di TV sostenuta, non trattata dal defibrillatore per criteri di FC, avendo la terapia con betabloccante ed amiodarone ridotto la frequenza cardiaca dell'aritmia, al di sotto del cut-off impostato. Dopo risoluzione dell'aritmia si verificava la presenza di una elevata percentuale di stimolazione che costituiva un fattore aggravante di peggioramento funzionale per dissincronia atrioventricolare ed interventricolare.
Veniva posta indicazione ad upgrading a CRTD, ma la vena succlavia sx risultava obliterata. Un tentativo di ricanalizzazione percutanea risultava fallimentare ed il paziente risultava clinicamente non idoneo per estrazione e reimpianto dell'elettrocatetere. Programmavamo un upgrading a CRTD, mediante impianto controlaterale dell'elettrocatetere per il VS Sentus MRI QP L95/49 in una vena posterolaterale quindi tunnellizzato al device preesistente sostituito con CRTD Intica Neo 5 HF-T QP. Stante la mancanza in commercio di un elettrocatetere IS1 bipolare sufficientemente lungo, si decideva di connettere il polo di sensing atriale del catetere defibrillatore nell'alloggiamendo per l'atrio sul CRTD, avendo verificata una sufficiente soglia di stimolazione, stabile su valori di 2.3-2.5 V @ 0.4 ms.
Il paziente veniva successivamente dimesso in soddisfacente compenso emodinamico, quindi inviato ad ablazione transcatetere del substrato aritmico; è seguito ambulatorialmente ed i valori di soglia di stimolazione atriale si sono mantenuti stabili con un range di valori oscillante tra 2.3 e 2.5 V con percentuale di stimolazione atriale dal 67 al 92%)..
I poli flottanti dell'elettrocatetere Biotronik DX sono previsti per il solo sensing dell'attività atriale; nei casi non sia possibile il posizionamento di un ulteriore elettrocatetere e dove sia possibile la stimolazione atriale mediante dipolo flottante con accettabili valori di soglia, questa opzione potrebbe essere presa in considerazione nei pazienti non idonei ad essere sottoposti ad una procedura ad eccessivo rischio procedurale. E' stato possibile un upgrading a CRTD con accettabile rischio periprocedurale e successivo stabile miglioramento clinico

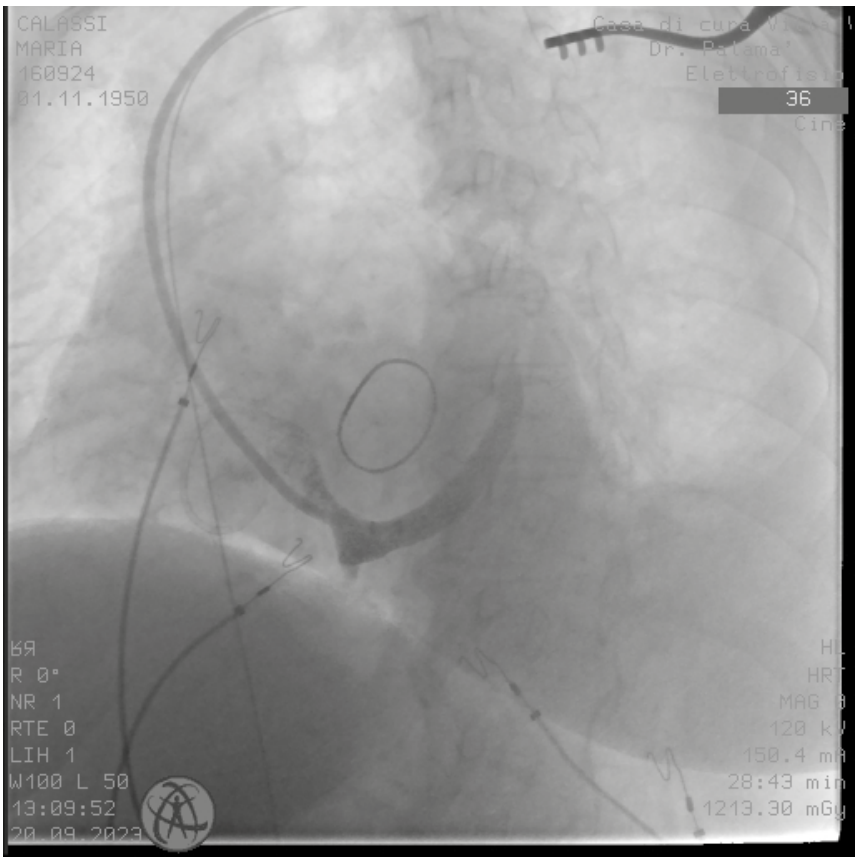


EP.01.20

LEFT BUNDLE BRANCH AREA PACING ATTEMPT IN A PATIENT PREVIOUSLY TREATED WITH TRICUSPID VALVE ANNULOPLASTY DEVICE: A CASE REPORT

Giuseppe Tricarico, Zefferino Palamà, Carlo Carfora, Annarita Schirinzi, Michele Daloia, Luigi My
Casa di cura Villa Verde, Taranto, ITALY

In recent years left bundle branch area pacing (LBBAP) has been proposed as an innovative pacing strategy and an alternative to cardiac resynchronization therapy by biventricular pacing (Biv-CRT). In fact, by exploiting the LBBAP approach, it is possible to achieve better clinical response in HFrEF patients, if compared with BiV-CRT. However It could be argued that this technique is strongly dependent on the cardiac anatomy variability related to HF. Concerning the cardiac anatomy, it can be strongly modified by the implant of some cardiac devices such as tricuspid annuloplasty ones.
A 73-year-old woman with non-ischemic cardiomyopathy, HFrEF, AF, and narrow QRS complex was referred to our electrophysiology department for cardiac resynchronization therapy (CRT) device implantation. The patient was previously treated for tricuspid regurgitation with a valve annuloplasty device. Firstly, we attempted a LBBAP procedure, in order to provide physiologic left ventricle (LV) activation. Nevertheless, the cardiac anatomy was strongly influenced by the annuloplasty device, leading to cardiac rotation. For this reason, the location reached by the three-dimensional catheter in the RV was too posterior. Due to the impossibility to reach the target area for a LBBAP, we decided to perform a BiV-CRT in order to sill guarantee an appropriate therapy. We tried to cannulate the CS by the same three-dimensional catheter. Surprisingly the three-dimensional catheter (CPS Direct 3D, Abbott Laboratories, Sylmar, CA, USA) was effective in cannulating the CS at the first attempt. In our work, we attempted for the first time to reach the target location for LBBAP in a patient with an annuloplasty device. We observed that the cardiac anatomy modification drives the three-dimensional catheter in an extremely anterior/posterior location which is not satisfactory for our purpose. Although, we tried to reach a more septal position, the procedure was unsuccessful. This result demonstrated that a three-dimensional catheter, which is usually effective for LBBAP in normal cardiac anatomy, may be inadequate for patients with valve devices that could affect cardiac anatomy, leading to a lower implant success rate according to the cardiac anatomy. At this point, we performed a BiV-CRT in order to guarantee a CRT therapy to the patient. For this aim, we exploited the same three-dimensional catheter, which is an innovative technique. By retracting the three-dimensional catheter, it was simple to cannulate the CS and the LV lead placement was quite simple as well. By using this approach, we avoided to use a traditional electrophysiology catheter to cannulate the CS. This could suggest that tree-dimensional catheter may be more effective than standard two-dimensional catheters, especially in patients with complex cardiac anatomy. To conclude, we explored the possibility to attempt both a BIV-CRT and LBBAP by operating an unique tool such as the three dimensional catheter. These results may pave the way for new investigation focused on the development of a 2-in-1 technique that does not a priori exclude the LBBAP in patients with complex anatomies and always ensuring appropriate CRT therapy for the patient.



E-POSTER 2

GIOVEDI' 19 SETTEMBRE

AREA E-POSTER

17:30-18:30

SESSIONE E-POSTER 2
ELETTROFISIOLOGIA

Moderatori: Michele Malagù (Ferrara), Antonino Mignano (Palermo)

EP.02.01
LBBAP OR BIVENTRICULAR PACING FOR CARDIAC RESYNCHRONIZATION THERAPY IN PATIENT WITH PERSISTENT LEFT SUPERIOR VENA CAVA? A CASE REPORT

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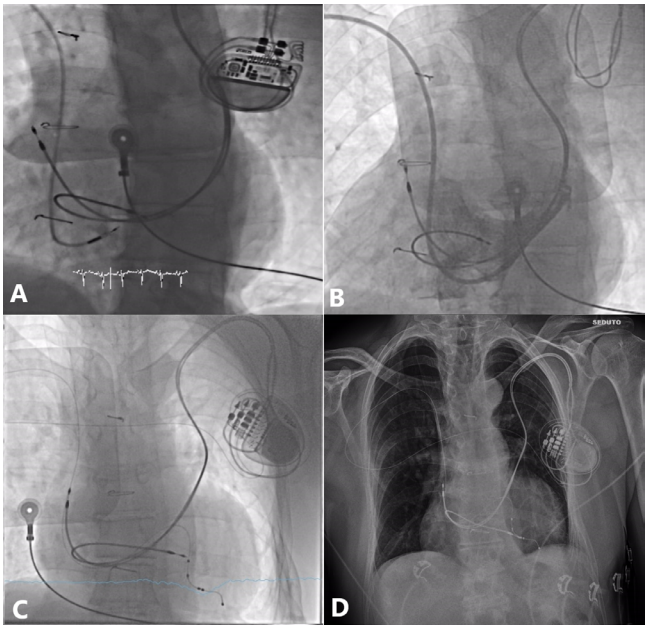
Background: Persistent left superior vena cava (PLSVC) is a rare anatomical variation that could cause procedural issues during pacemaker implantation (PM) and in cardiac resynchronization therapy (CRT). Left bundle branch area pacing (LBBAP) is emerging like a suitable alternative to classic biventricular pacing to correct electromechanical dyssynchrony.

Introduction: We present the case of a 61-year-old man who was admitted to our cardiology unit for incremental exertional dyspnea and evidence of left ventricular systolic dysfunction (LV Vol 190 ml; EF 27%). He underwent cardiac surgery at a young age to correct congenital ventricular septal defect (VSD) and hemodynamic infundibular stenosis with a good long-term clinical outcome (EF 50%). He also had PM implantation in adult age for advanced atrioventricular block with a left-sided dual chamber PM placed through a not previously known PLSVC. Invasive angiography showed absence of coronary stenosis. Presence of ventricular dyssynchrony caused by a 100% RV stimulation led us to schedule PM upgrading to correct pacing-induced cardiomyopathy.

Methods and results: After collegial discussion, we decided to proceed at first with LBBAP to restore physiological conduction. Left-side access was expected to be troubling due to the presence of previous implanted PM and venography confirmed the patency of right superior vena cava (Type IIIb PLSVC). Right extra-thoracic axillary vein access was then obtained and a valved introducer sheath was placed through a guidewire. C315-HIS delivery catheter (Medtronic) is specifically preshaped for left-side approach thereby, in order to reduce torque forces and optimize stability of lumenless lead (Select Secure 3830 Medtronic), we performed a manual 90-degree correction. After many attempts in different areas of interventricular septum following standard LBBAP technique implantation, we reached a near selective LBBB pacing (Figure A) with suboptimal QRS time reduction (LVAT 100 ms). Reasonable, the presence of previous applied pericardium patch for VSD correction represented an obstacle to obtain a deep screwing into the interventricular septum. Consequently, we retracted the 3830 lead and, through the same access, we cannulated the coronary sinus (CS) that was enlarged like expected in PLSVC. Non occlusive CS venography (Figure B) showed a posterolateral vein that was targeted and engaged with the aid of a subselector catheters (Attain Select II). A quadripolar active fixation lead (Attain Stability Quad 4798) was effective conducted into the posterolateral branch (Figure C) with valuable electrical parameters (1.5V@0.4 ms, 418 ohm) and QRS reduction. LV lead was finally tunneled subcutaneously in left prepectoral region and connected with CRT-P pulse generator (Figure D). Patient was discharged two days after intervention without any complication. Mid-term follow up confirmed effective biventricular pacing and clinical follow up demonstrated left ventricular systolic function improvement with reduction in telediastolic volume (EF 45%; LV Vol 160 ml).



Conclusions: LBBAP and biventricular pacing are both valuable alternative to correct pacing-induced cardiomyopathy but anatomical variation like PSLVC can represent potential causes of CRT failure. Currently available delivery tools for lumenless catheter can be reshaped for right sided approach but specific could facilitate LBBAP in complex settings.

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EP.02.02

LIMITS OF PULSED FIELD ABLATION IN ATRIAL FIBRILLATION CATHETER ABLATION: A CASE REPORT ON AN ANATOMICAL VARIANT OF PULMONARY VEINS

Francesca Campanelli [1], Paolo Compagnucci [2], Giovanni Volpato [2], Laura Cipolletta [2], Quintino Parisi [2], Silvano Molini [2], Agostino Misiani [2], Loredana Messano [2], Yari Valeri [1], Leonardo D'Angelo [1], Lara Luciani [2], Jenny Ricciotti [2], Enrico Rita [2], Maurizio Centanni [2], Michela Casella [1], Antonio Dello Russo [2]

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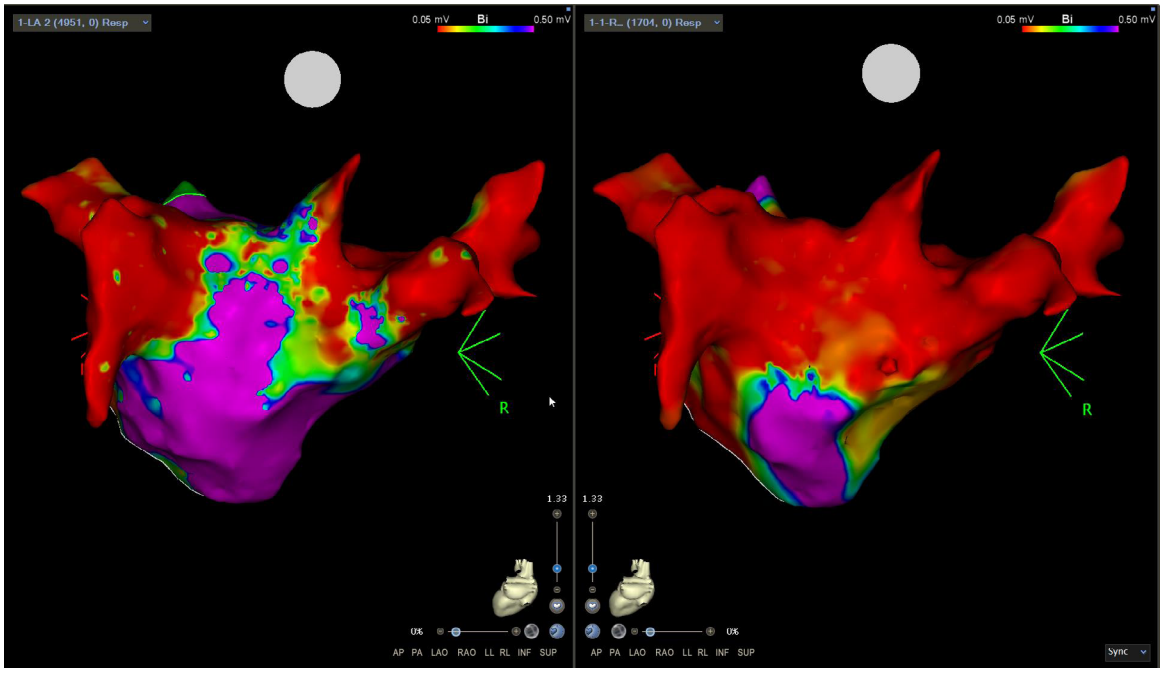
Background: Pulsed field ablation (PFA) is a novel nonthermal cardiac ablation technique using ultra-rapid electrical pulses to induce cell death through irreversible electroporation. It has demonstrated numerous advantages, however it also has limitations, including its reliance on fluoroscopic guidance and the absence of an electroanatomic mapping system. The literature is increasingly documenting cases where this new form of energy is employed for ablative targets beyond pulmonary veins in atrial fibrillation ablation, thereby expanding its potential applications to leverage its benefits. Nevertheless, these instances remain isolated experiences.

Case Report: We present a 59-year-old man with chronic ischemic heart disease, multiple cardiovascular risk factors and peripheral polyvascular disease, referred to our center for catheter ablation of atrial fibrillation following repeated episodes of heart failure reacutisation during atrial fibrillation , already subjected to multiple attempts of electrical cardioversion with poor efficacy in rhythm control with drugs. He underwent atrial fibrillation ablation procedure using PFA with isolation of the pulmonary veins and homogenization of the posterior wall due to the presence of left atrial dilation but returned to our attention after 5 months for arrhythmic recurrence, as atypical atrial flutter causing left ventricular dysfunction with clinical signs of systemic congestion

Methods: The patient underwent a new ablation procedure. We opted for the use of the CARTO mapping system with a high-density mapping catheter (OctareyTM Biosense Webster) and a radiofrequency ablation catheter using high-power short-duration technique (QDOT MICROTM Biosense Webster). The electroanatomic map of the left atrium showed an anatomical variant of the pulmonary veins characterized by the presence of a small-caliber accessory pulmonary vein at the roof of the left atrium, which was partially disconnected as a result of the previous procedure. The activation map revealed early-meets-late activity of the atypical atrial flutter in the anterior portion of the accessory vein, where fragmented low-voltage potentials were observed. This finding was further confirmed by an entrainment maneuver. Radiofrequency pulses were delivered in that area using QMODE modality at 50W power with AI target of 500 between the two superior pulmonary veins, thus completed the isolation of the accessory pulmonary vein. The arrhythmia cycle length was observed to elongate until its interruption. Additionally, some radiofrequency pulses were delivered to the posterior wall to achieve substrate homogenization in QMODE+ modality at 90W power for 4 seconds.

Conclusion: In this case electroanatomic mapping was necessary to identify the anatomical variant and perform ablation which was not feasible during the previous procedure, but PFA was chosen for its rapidity given the patient's fragile and multimorbid condition. PFA has proven to be a safe and effective technology in atrial fibrillation ablation, introducing significant advancements. However, the role of radiofrequency and the utility of electroanatomic mapping remain crucial, especially in circumstances involving anatomical variants as well as in cases of complex arrhythmias such as atypical atrial flutters. We can conclude that the wide array of new technologies introduced in recent years presents us with new choices, and the type of procedure should be personalized based on the patient's individual characteristics.



EP.02.03

DECENNIAL ANALYSIS OF AVNRT ABLATION IN A SINGLE CENTRE

Davide Ciliberti [1], Cristiano Zaccaria [1], Sara Restaino [1], Fabio Brogni [1], Giuseppe Ricciardi [1], Luca Checchi [1], Giulio Porcedda [2], Luciano De Simone [2], Alessio Petrone [1], Marco Fusaroli [1], Antonio Michelucci [1], Paolo Pieragnoli [1], Laura Perrotta [1]
[1] *AOU Careggi, Firenze, ITALY*
[2] *IRCCS Meyer, Firenze, ITALY*

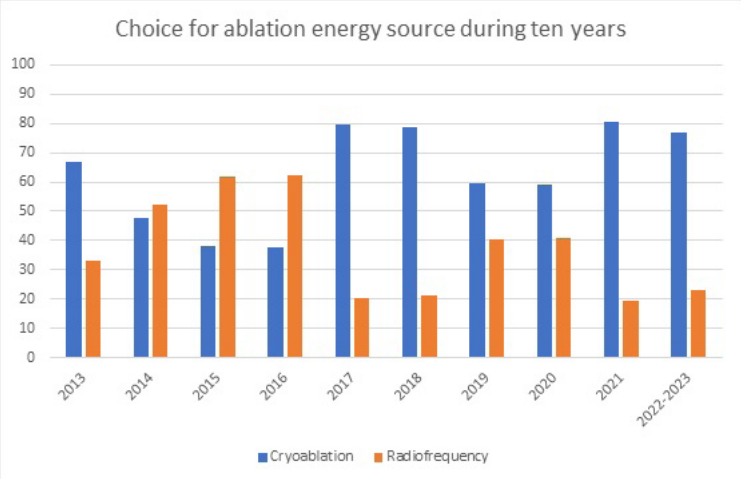
Background: Transcatheter ablation represents the first line therapy for atrio-ventricular nodal re-entrant tachycardia (AVNRT). Both radiofrequency (RF) and cryoablation (CRYO) have been shown to be effective, with a better safety profile for CRYO. Data on very long-term efficacy are scarces.

Purpose: to review our experience in AVNRT ablation performed in the last ten years and evaluate safety, efficacy and very long-term outcome of RF and CRYO.

Methods: We retrospectively analyzed all patients who underwent AVNRT ablation (RF or CRYO) between January 2013 and May 2023 at our centre. The majority of procedures were performed under electro-anatomical mapping (EAM) guidance to reduce radiation exposure. Acute efficacy endpoint was defined as slow pathway ablation, while long-term outcome was defined as the absence of AVNRT recurrence.

Results: A total of 387 consecutive patients (60,5%F; mean age 48 ± 19 years) were included; CRYO was performed in 241 patients (62%), RF in 131 patients (34%), hybrid approach (CRYO+RF) in 15 patients (4%). AVNRT was induced during EPS in 295 cases (76%), in 25,4% after isoprotenerol administration. No significant differences for baseline characteristics were observed between the two groups except for age (CRYO: 42,2 ± 18 years vs RF 57,19 ± 16,5 years p <0.001). In pediatric population CRYO was performed in 93% of procedures.
Figure 1 shows the distribution of RF/CRYO over 10 years at our centre, with a trend of significant increase in CRYO utilizations in the last years.
Acute success was achieved in all 387 cases (100%; delta WP 28,5 ± 23,1 ms, delta AVN ERP 72,4 ± 44,7 ms). No permanent AV block or major periprocedural complications occurred, however transient AH prolongation was observed in 0.8% in CRYO pts vs 2,8% RF pts.
The mean follow-up was 73±45 months, range 12-129 months.
Overall long-term success rate was 93,3%, ranging from 91,3 % in CRYO and 96,6% in RF. Recurrence occurred in 26 cases (6,7%) after a median time of 20 months (4-40months). Recurrent AVNRT were treated with RF in the majority of cases, CRYO in 6 procedures, hybrid in only 1 case.

Conclusions: Transcatheter ablation is a safe and effective therapy for AVNRT. Our very long-term outcome data confirmed very high success rate even after 10 years follow-up. The increasing choice for CRYO may be due to the increasing number of pediatric and young patient referred to our centre.



EP.02.04

PULSED-FIELD ABLATION AND HIGH-POWER SHORT DURATION ABLATION IN ELDERLY AND FRAIL PATIENTS UNDERGOING ATRIAL FIBRILLATION ABLATION: ACUTE EFFICACY AND PROCEDURAL EFFICIENCY

Leonardo D'Angelo [1], Paolo Compagnucci [1], Giovanni Volpato [1], Quintino Parisi [1], Laura Cipolletta [1], Agostino Misiani [1], Silvano Molini [1], Yari Valeri [1], Lara Luciani [1], Francesca Campanelli [1], Francesco Cardinali [1], Francesco Masci [2], Maurizio Malacrida [2], Michela Casella [1], Antonio Dello Russo [1]
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[2] *Boston Scientific, Milan, ITALY*

Background: Within aging and progressively frail population marked by multiple comorbidities, AF stands out as the predominant sustained arrhythmia. Transcatheter pulmonary vein isolation (PVI) may be challenging in this population, due to the associated procedural risk. Despite the advent of new High-Power Short Duration (HPSD) protocols employing radiofrequency, these procedures continue to be associated with prolonged durations and inherent risks. No data have been reported on the efficiency, effectiveness, and safety outcomes for non-thermal ablation, such as electroporation with pulsed-field ablation (Farapulse, PFA).

Objective: Gain an in-depth understanding of which catheter ablation technology is best suited for elderly and frail patients undergoing AF ablation.

Methods: We conducted a retrospective study on elderly and frail patients admitted for AF ablation at our hospital. Inclusion criteria were age>75 and Clinical Frailty Scale>=5. A total of 41 patients were included (22 undergoing PFA and 19 HPSD ablation). The primary ablation endpoint was PVI. In the PFA group, PVI was achieved by delivering 8 pulses of biphasic and bipolar waveforms at 2 kV, alternating basket and flower configurations. In the HPSD group, PVI was achieved through RF delivery (50W for 10 seconds to 90W for 4 seconds).

Results: No differences were reported in terms of age (77[76-79] years for PFA vs 78[76-81] years for HPDS, p=0.597), gender (68% male for PFA vs 68% for HPSD, p=0.626), CHA2DS2VASC score (4[3-5] for PFA vs 4[3-5] for HPSD, p=0.903) and LVEF (61±7% for PFA vs 57±7% for HPSD, p=0.729) whereas persistent AF was more frequent in the HPSD group (9% for PFA vs 54% for HPSD, p=0.002). First pass isolation (FPI) of PV was achieved in all cases after PFA (88/88, 100%), whereas it was reached in 93% of cases after HPSD (71/76, p=0.015). In the PFA group we observed a significant shorter procedural time (70[64-100]min for PFA vs 120[105-165]min for HPSD, p<0.001), whereas there were no significant differences in terms of both fluoroscopy time and dose area product between groups (fluoroscopy time: 22±8.4min for PFA vs 15±10min for HPSD, p=0.776; dose area product: 1320[418-1972]μG*m² for PFA vs 1075[571-2875]μG*m² for HPSD, p=0.573, respectively). PVI was successfully achieved in all patients (100% in both groups) without any periprocedural complications.

Conclusions: In our preliminary analysis of elderly and frail patients undergoing AF ablation, PFA resulted in higher rate of FPI and shorter procedural time compared to HPSD.

EP.02.05

TACHICARDIA VENTRICOLARE SOSTENUTA E SINDROME CORONARICA: CASE REPORT

Lorenzo Frau, Danilo Ricciardi, Paola Liporace, Enrico Crispino, Daniele Valente, Vincenzo Nafisio, Eliana Laura Italiano, Elisabetta Sposito, Marra Chiara D'Amore, Vito Calabrese, Flavio Angelo Gioia, Francesco Picarelli, Francesco Grigioni, Gian Paolo Ussia
Fondazione policlinico universitario Campus Bio-Medico, Roma, ITALY

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. Pertanto veniva eseguita contestualmente angioplastica coronarica con impianto di stent medicati su tronco comune ed arteria discendete 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 relazione 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).

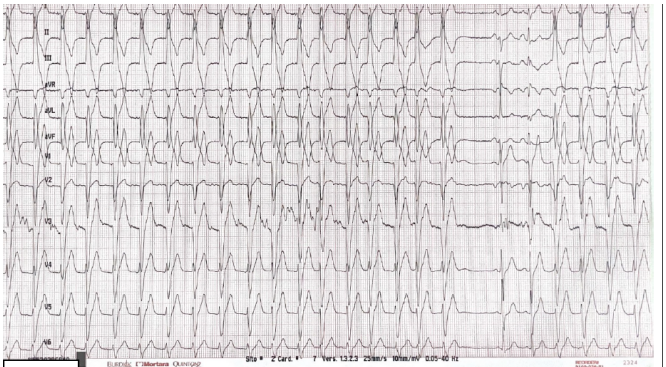
Fig. 1

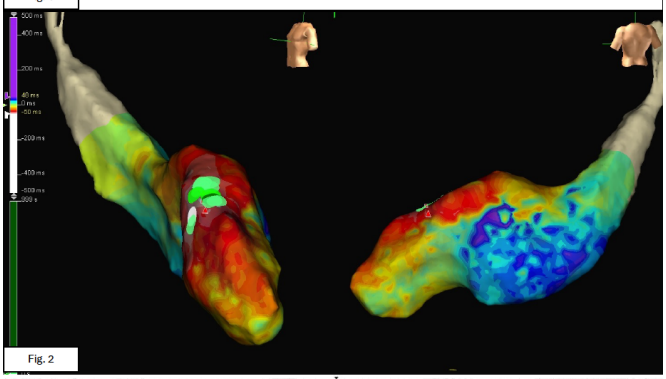
Fig. 2

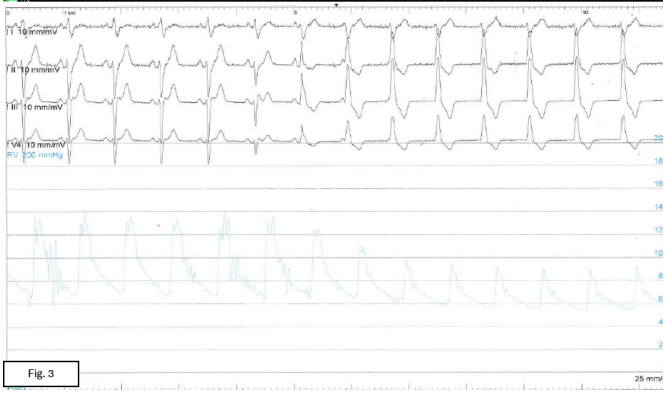
Fig. 3

EP.02.06

A PROPOSED INDEX OF MYOCARDIAL STAINING FOR VEIN OF MARSHALL ETHANOL INFUSION: AN ITALIAN SINGLE CENTER EXPERIENCE

Federico Landra [1], Martina Nesti [2], Silvia Garibaldi [2], Gianluca Mirizzi [2], Umberto Startari [2], Marcello Piacenti [2], Simone Taddeucci [1], Bruno Antonio Formichi [2], Maurizio Stefani [2], Serena Galiberti [2], Vincenzo Lionetti [2], Paolo Solinas [2], Maria Beatrice Levantesi [2], Chiara Italia [2], Andrea Rossi [2]

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Background: Mitral isthmus(MI) conduction block is a fundamental step in anatomical approach treatment for persistent atrial fibrillation(PeAF). However, MI block is hardly achievable with endocardial ablation only. Retrograde ethanol infusion(EI) into the vein of Marshall(VOM) facilitates MI block. Fluorographic myocardial staining(MS) during VOM-EI could be helpful in predicting procedural alcoholization outcome even if its role is qualitatively assessed in the routine. The aim was to quantitatively assess MS during VOM-EI and to evaluate its association with MI block achievement.

Methods: Consecutive patients undergoing catheter ablation for PeAF at Fondazione Toscana Gabriele Monasterio(Pisa, Italy) from February 2022 to May 2023 were considered. Patients with identifiable VOM were included. A proposed index of MS(MSI) was retrospectively calculated in each included patient. Correlation of MSI with low voltage zones(LVZ) extension after VOM-EI and its association with MI block achievement were assessed.

Results: 42 patients out of 49 (85.8%) had an identifiable VOM. MI block was successfully achieved in 35 patients out of 42 (83.3%). MSI was significantly associated with the occurrence of MI block (OR 1.24 (1.03 – 1.48); p = 0.022). A higher MSI resulted in reduced ablation time (p = 0.014) and reduced radiofrequency applications (p = 0.002) to obtain MI block. MSI was also associated with MI block obtained by endocardial ablation only (OR 1.07 (1.02 – 1.13); p = 0.002). MSI was highly correlated with newly formed LVZ extension (r = 0.776; p = 0.001).

Conclusion: In our study cohort, optimal MSI predicts MI block and facilitates its achievement with endocardial ablation only.

EP.02.07

NOVEL CRYO-BALLOON TECHNOLOGY FOR SUCCESSFUL ATRIAL FIBRILLATION ABLATION AND IMPACT OF PULMONARY VEIN VARIANT ANATOMY: COOLING CHARACTERISTICS AND 1-YEAR OUTCOME FROM THE CHARISMA REGISTRY

Carmelo La Greca [1], Claudio Tondo [2], Gemma Pelargonio [3], Massimo Moltrasio [2], Stefano Bianchi [4], Domenico Pecora [1], Saverio Iacopino [5], Alessia Agresta [6], Ruggero Maggio [7], Pietro Rossi [4], Giuseppe Stabile [8], Raffaele Sangiuolo [9], Daniele Nicolis [10], Stefania Riva [2], Anna Ferraro [7], Maria Lucia Narducci [3], Gaetano Fassini [2], Marco Schiavone [2], Maurizio Malacrida [11], Antonio De Simone [6]

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Background: Cryo-balloon (CB) ablation has proved to be an effective and safe approach for achieving pulmonary vein isolation (PVI) in patients with atrial fibrillation (AF). No data have been reported on cooling characteristics and the impact of variant PV anatomy on predicting AF recurrence, for cases involving the POLARx cryoablation system during PVI.

Purpose: To provide insight into cooling characteristics and 1-year outcome of both paroxysmal (pAF) and persistent AF (PsAF) CB ablation from a large, multicenter clinical setting.

Methods: Consecutive patients undergoing AF ablation from the CHARISMA registry at 10 Italian centres were included. Protocol-directed cryoablation was delivered for 180s or 240s according to operator's preference for isolation achieved in <=60s, or 240s if isolation occurred >60s or when time to isolation was not available. The ablation endpoint was PVI. All patients were followed-up for at least 12 months after the procedure.
Results: From 429 patients (pAF: n=358, 83.4%; PsAF: n=71, 16.6%) a total of 2177 CBAs were analyzed. Four (0.9%) transient phrenic nerve palsy were observed, with full recovery in the 48 h post procedure; no major procedure-related adverse events were reported. Twenty-eight (6.6%) patients exhibited an anatomical variant: 17 (4.0%) a common ostium and 11 (2.6%) an adjunctive PV. Nadir temperature, thaw time and total deflation time were different between standard PVs and adjunctive PVs (-56±7°C vs -50±7°C for nadir temperature, p=0.0001;18[15-23]s vs 14[10-16]s for thaw time, p<0.0001; 24[18-36]s vs 20[20-20]s for total deflation time, p=0.0134, respectively) whereas time to nadir temperature was shorter during common ostium CBA than standard PVs (102[68-163]s vs 147[81-177]s, p=0.07). After the blanking period, over a mean of 431±99 days of follow-up, 63 patients (14.7%) suffered an AF/AT recurrence (12.8% with pAF vs 23.7% with PsAF, p=0.026; hazard ratio of 2.02, 95%CI: 1.2. to 3.5, log-rank p=0.0137). Patients with anatomy variant showed a similar AF/AT recurrence rate (5 out 28, 17.9%) than in the standard anatomy group (58 out of 401, 14.5%) with a hazard ratio of 1.43 (0.6 to 3.6, p=0.441).

Conclusion: In this extensive multicenter evaluation, the novel POLARx cryoballoon system demonstrates promising acute and long-term efficacy, along with a safe profile, in both paroxysmal and persistent AF patients, regardless of the presence of variant pulmonary vein anatomy.

EP.02.08

VAGAL RESPONSE DURING PULSED-FIELD ABLATION OF ATRIAL FIBRILLATION: COMPARATIVE EVALUATION OF DIFFERENT STRETEGIES

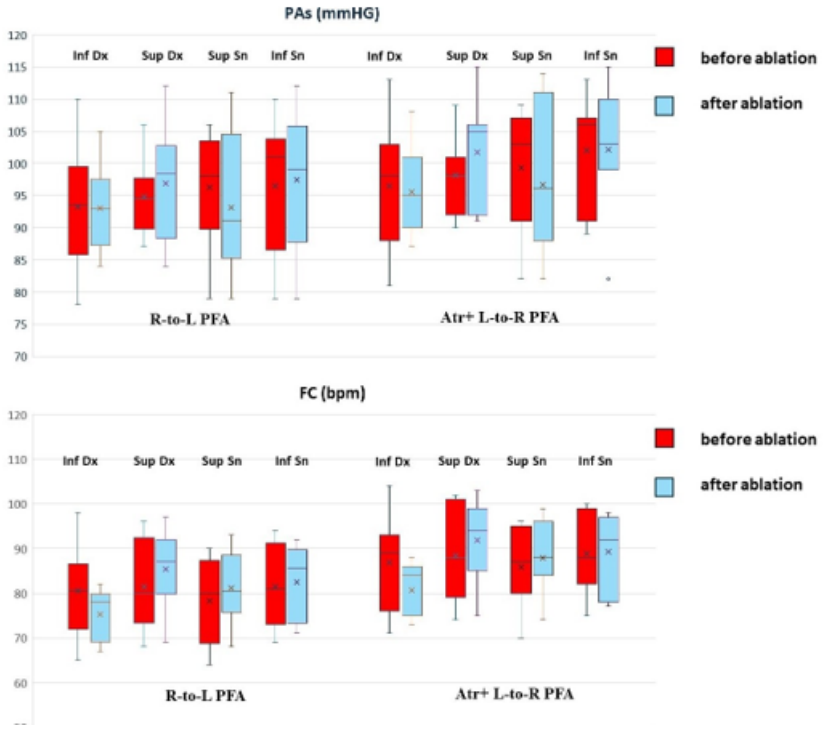
Cristian Martignani, Alberto Spoadotto, Martina Amadori, Lorenzo Bartoli, Giulia Martini, Giulia Massaro, Andrea Angeletti, Igor Diemberger, Matteo Ziacchi, Mauro Biffi
IRCCS-Policlinico di sant'Orsola, Bologna, ITALY

Background: Pulsed fi eld ablation (PFA) is a novel approach for treating atrial fibrillation (AF). During pulmonary vein (PV) isolation, particularly when targeting left PVs, vagal responses can manifest as hypotension and bradycardia. These are often reversible but can complicate the procedure. Pharmacological (atropine) and non-pharmacological strategies, such as prioritizing right PV ablation, have been proposed to mitigate these vagal reactions. The aim of this study was to assess the effectiveness of these approaches in preventing vagal response during PFA.

Methods: The study included 15 consecutive patients (average age: 60.1±10.1 years, 73% male) undergoing PFA for drug-resistant paroxysmal (54%) or persistent (46%) AF. All procedures were performed under deep sedation or general anesthesia, with continuous invasive blood pressure and heart rate monitoring.
Patients were randomized into two groups:
•R-to-L PFA (n=8): Ablation of right PVs followed by left PVs.
•Atr+ L-to-R PFA (n=7): Administration of 1mg atropine before ablation, followed by left PV isolation and then right PV ablation.
A total of 60 PVs were treated.

Results: PFA successfully achieved PV isolation in all patients. Pre- and post-ablation blood pressure and heart rate values remained stable across both groups for each vein (Figure 1). Notably, no significant changes in blood pressure were observed in either group. Mean heart rate, however, was slightly higher in the Atr+ L-to-R PFA group compared to the R-to-L PFA group, even before ablation for each vein. This difference persisted after ablation.

Conclusions: The R-to-L PFA strategy effectively prevented vagal reactions by maintaining stable blood pressure and heart rate throughout PV isolation. Hemodynamic responses in the R-to-L PFA group were comparable to those in the Atr+ L-to-R PFA group. Only a slight, non-significant increase in heart rate was observed with atropine administration. Neither strategy resulted in clinically significant vagal reactions.
These findings suggest that R-to-L PFA may be a valuable technique to minimize vagal response during PV isolation, particularly in cases where atropine is contraindicated.



EP.02.09

INITIAL EXPERIENCE OF A TERTIARY CARE CENTER: EVALUATING EFFICACY AND EFFICIENCY OF PULSED FIELD ABLATION FOR ATRIAL FIBRILLATION

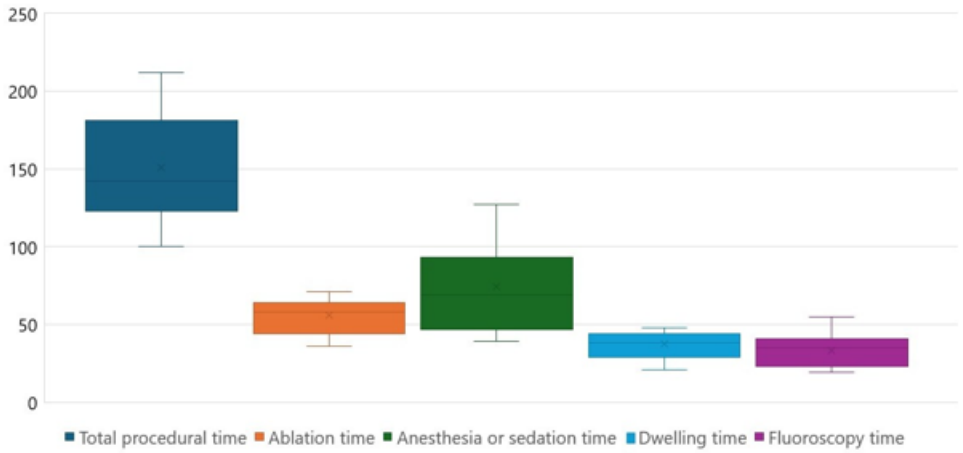
Cristian Martignani, Alberto Spadotto, Martina Amadori, Giulia Martini, Lorenzo Bartoli, Federica Locchi, Jennifer Oppimitti, Andrea Angeletti, Giulia Massaro, Igor Diemberger, Matteo Ziacchi, Mauro Biffi
IRCCS-Policlinico di Sant'Orsola, Bologna, ITALY

Background: Pulsed-field ablation (PFA) is emerging as a promising single-shot approach for atrial fibrillation (AF) ablation, showing encouraging results in terms of efficacy. However, limited data exists regarding efficiency (EP-lab occupancy time) and safety, particularly for new users in a tertiary center setting. This study aimed to assess the efficiency and safety of PFA for AF ablation among new users at a tertiary center.

Methods: The first 15 consecutive patients (average age: 60.1±10.1 years, 73% male) with drug-resistant paroxysmal (54%) or persistent (46%) AF undergoing PFA ablation were included. Patients with contraindications to the procedure (intracavitary thrombus, uncontrolled heart failure), general anesthesia, or deep sedation were excluded.

Results: Selective pulmonary venography (PV) was obtained for all patients. Each PV received four catheter energy deliveries: two in a 'basket configuration' with a 30° angle rotation for the second two applications, and two in a 'flower configuration' following the same angle rotation. Mean procedural time was 150.8 ± 38.5 minutes, with 55.7 ± 10.7 minutes dedicated to ablation and 74.3 ± 31.4 minutes to anesthesia or sedation. The mean dwelling time for the PFA catheter was 37.5 ± 8.3 minutes, and the average fluoroscopy time was 33.3 ± 10.7 minutes.
PFA achieved successful PV isolation in all patients at the time of acute control. Importantly, no common procedural complications associated with AF ablation (pericardial effusion, atrioesophageal fistulas, phrenic nerve palsy, systemic embolization, or femoral access issues) were observed. The only PFA-specific complication was a case of sinus node stunning with junctional rhythm, which resolved spontaneously within 96 hours without intervention.

Conclusions: PFA ablation for AF demonstrated efficacy and a favorable safety profile. No general complications related to AF ablation procedures were encountered, and only one case of a transient PFA-specific adverse event occurred. Notably, workflow efficiency appears high even for initial PFA procedures. These findings suggest that PFA might be a valuable and safe option for AF ablation, even for new users.



EP.02.10

GENERAL ANESTHESIA VERSUS DEEP SEDATION FOR PULSED FIELD ABLATION OF ATRIAL FIBRILLATION: A COMPARATIVE ANALYSIS

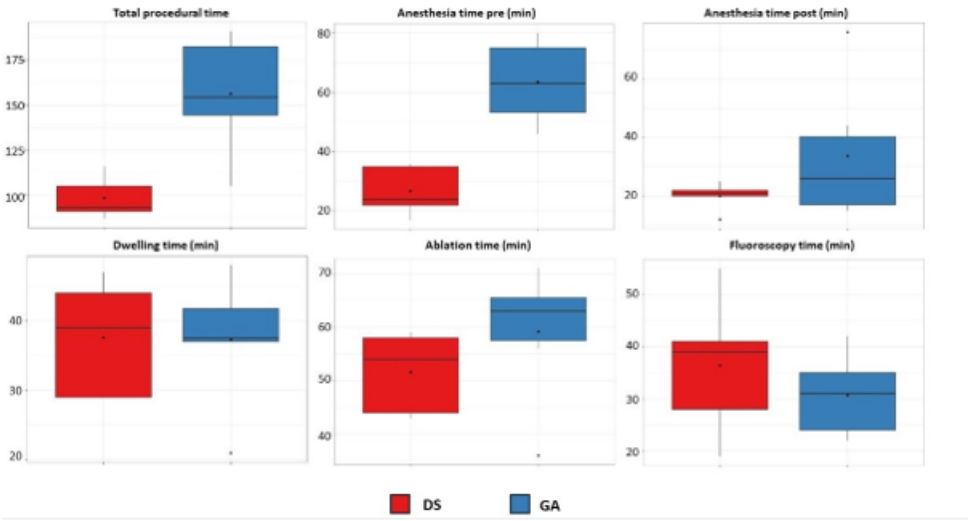
Cristian Martignani, Alberto Spadotto, Martina Amadori, Giulia Martini, Lorenzo Bartoli, Elisa Cerchierini, Chiara Capozzi, Marco Sita, Saverio Pastore, Niccolo' Barbera, Ilenia Mandatori, Carlotta Moretti, Ilaria Turriziani, Giulia Massaro, Andrea Angeletti, Mauro Biffi, Igor Diemberger, Andrea Castelli
IRCSS AOUBO-Policlinico di Sant'Orsola, Bologna, ITALY

Background: Atrial fibrillation (AF) ablation can be performed under various anesthesia modalities, ranging from general anesthesia (GA) to conscious/deep sedation (DS). Pulsed-field ablation (PFA), a novel ablation technique using non-thermal energy, typically requires deeper sedation compared to traditional methods. This study aimed to compare the use of GA and DS during PFA procedures, focusing on procedural times and medication use.

Methods: All consecutive patients undergoing PFA ablation at our center were included in the study. Anesthesiologists were present during all procedures. The choice of anesthesia protocol (GA vs. DS) was based on operator preference, anesthesiologist expertise, and patient suitability. Procedural times, medications administered, and anesthesia-related complications were documented.

Results: Fifteen patients (18% female, average age 60.1±10.1 years) with either paroxysmal (53%) or persistent (47%) AF were included. Six procedures (55%) were performed under GA, and five (45%) under DS.
In GA procedures, patients received midazolam (average total dose 3.0mg) and a continuous infusion of propofol (average total dose 246mg). In DS procedures, midazolam (average total dose 2.7mg) and ketamine (average total dose 80mg) were the primary medications. However, propofol boluses were occasionally used for additional pain control. Both GA and DS procedures utilized fentanyl or remifentanil for analgesia.
Patients undergoing DS experienced significantly shorter total procedural times compared to those under GA (98.4 minutes vs. 156 minutes, p=0.017). This difference was primarily attributed to longer sedation/anesthesia management times in GA, particularly during procedure initiation (26.8 minutes vs. 63.5 minutes, p<0.001) and patient awakening (20.0 minutes vs. 33.7 minutes, p<0.001). Notably, there were no significant differences between GA and DS regarding dwelling time (time the ablation catheter spends within the vein) (37.6 minutes vs. 37.3 minutes, p=n.s.), ablation time (51.6 minutes vs. 59.2 minutes, p=n.s.), or fluoroscopy time (radiation exposure during X-ray imaging) (36.4 minutes vs. 30.7 minutes, p=n.s.). Importantly, no major anesthesia-related complications were reported. PFA achieved successful acute isolation of pulmonary veins in all patients, with a comparable number of energy applications required regardless of the anesthesia method.

Conclusion: Both GA and DS proved to be safe and effective for PFA procedures, even in the initial stages of its use. However, DS resulted in shorter EP-lab occupancy times due to reduced anesthesia management times, without compromising ablation or fluoroscopy times. These findings suggest that DS may be a preferable anesthesia strategy for PFA, particularly when considering EP-lab occupancy times and efficiency.



EP.02.11

IMPORTANZA DELLA MULTIDISCIPLINARIETA' NELLA GESTIONE DELLE COMPLICANZE: UN CASO DI DISLOCAZIONE DI DISPOSITIVO PER LAAC

Elisabetta Montemerlo [1], Ivan Calchera [1], Mirko Casiraghi [2], Sergio De Ceglia [1], Elena Piazzi [1], Mattia Pozzi [1], Giuseppe Trocino [1], Serena Vaghi [1], Giovanni Rovaris [1]
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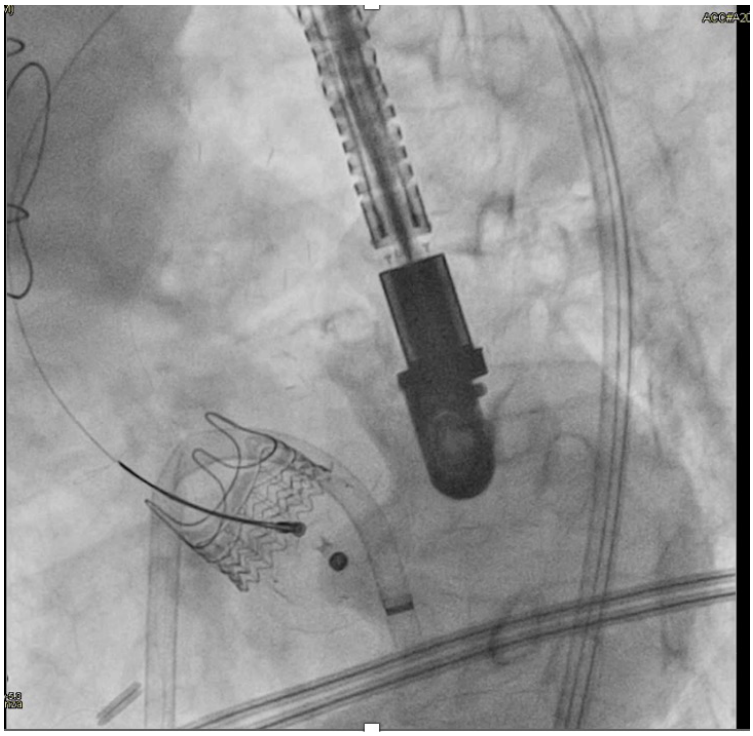
[2] *Università degli Studi di Sassari, Sassari, ITALY*

Introduzione: La chiusura percutanea di auricola sinistra è una valida alternativa alla scoagulazione per la prevenzione dell'ictus nei pazienti con fibrillazione atriale e controindicazione al trattamento anticoagulante. Le complicanze relative all'intervento sono rare, tuttavia è importante costruire un percorso multidisciplinare per la loro eventuale gestione. Descriviamo un caso di dislocazione del dispositivo in ventricolo sinistro con necessità di ricattura percutanea in paziente ad elevato rischio cardiochirurgico.

Caso Clinico: Uomo di 80aa, in esiti di triplice bypass aortocoronarico e sostituzione valvolare aortica con bioprotesi, FAP in TAO e insufficienza renale in emodialisi. Ricoverato per scompenso cardiocircolatorio con riscontro di importante anemizzazione (Hb 6.3 g/dl). Indagini endoscopiche negative. Si decideva pertanto di sottoporre il paziente a chiusura percutanea di auricola sinistra: procedura eseguita con impianto di dispositivo Amulet 22mm, con manovre di stabilità e predistacco favorevoli. Paziente trasferito in UTIC per monitoraggio con rilievo ecocardiografico di dislocazione del device nel tratto di efflusso del ventricolo sinistro. In considerazione dell'elevato rischio operatorio, si è deciso di procedere con ricattura percutanea in monitoraggio ETE in continuo, previo posizionamento di accessi vascolari venoso e arterioso femorali (per eventuale supporto ECMO). In anestesia generale ed in regime di scoagulazione con eparina ev, iniziale tentativo di recupero transettale con catetere orientabile e goose-neck inefficace per recupero diretto del device ma funzionale per la stabilizzazione sottovalvolare del dispositivo che ha reso possibile la ricattura del device per via transaortica, senza complicanze, e garantendo corretto funzionamento della protesi aortica. Chiusura dell'accesso arterioso con doppio Pro-Glide e antagonizzazione dell'Eparina con Solfato di Protamina. In considerazione della stabilità del ritmo sinusale e delle precarie condizioni generali del paziente, è stata decisa collegialmente strategia conservativa con sospensione di TAO, introduzione di EBPM e stretto monitoraggio clinico e dell'emocromo.

Conclusioni: La procedura di chiusura percutanea di auricola sinistra è una procedura efficace e sicura, tuttavia sono descritti rari casi di dislocazione del dispositivo (<0.5%). Il doppio approccio transettale e transaortico consente la stabilizzazione del dispositivo in posizione favorevole per la ricattura del dispositivo con goose-neck
È sempre importante costruire un percorso multidisciplinare in heart team, che consenta di affrontare ogni scenario possibile in caso di complicanza procedurale.



EP.02.12

ACUTE SAFETY AND EFFICACY OF ABLATION FOR PERSISTENT ATRIAL FIBRILLATION IN PATIENTS WITH DILATED LEFT ATRIUM BY MEANS OF PULSED FIELD ABLATION

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Background: Cardiac parameters such as increased left atrial (LA) size in atrial fibrillation (AF) are associated with AF recurrence following ablation. However, limited data exist on electroporation by means of pulsed-field ablation (PFA) in patients with persistent atrial fibrillation and dilated LA.

Purpose: We aimed to analyze the efficacy and safety of PFA in patients with severe LA dilatation (SLAD) (>=50 ml/m²) compared to normal to moderate LA dilatation (NMLAD) (<50 ml/m²) and persistent AF.

Methods: All consecutive patients undergoing AF ablation with the Farapulse system at 10 centers with complete information of LA volume (LAV) and at least 6 months follow up were included. Protocol-directed PVI was delivered using 2 kV with eight applications per vein, that is, four applications each in the basket and flower poses. Additional lesions were performed at the operator's discretion.

Results: Of 127 patients, 24 (18.9%) had long-standing persistent AF, 27 (21.3%) were male, the mean age was 64±8 years and the mean LVEF was 55±10%. The mean LAV was 42.8±13 ml/m², 33 (26%) patients showed SLAD. A 3D mapping system was used in 46 (36.2%) of the cases, a more extensive lesion set than PVI was performed in 101 (79.5%) of cases. Patients with SLAD were older (68±6 years vs 63±9 years, p=0.009) and exhibited a lower LVEF (50±11% vs 55±9%, p=0.23) compared to patients with NMLAD. No differences between groups were found in terms of underlying AF type (long-standing AF: 18.2% vs 19.1%, p=1.00), more extensive lesion set than PVI only (81.8% vs 78.7%, p=0.805) and the use of 3D mapping system (48.5% vs 31.9%, p=0.097). By looking at procedural metrics, no differences were also found between groups in terms of skin-to-skin time (80[70-105] min vs 75[66-85] min, p=0.082), PFA deliveries outside PVs (18[14-26] vs 16[14-20], p=0.217) or total number of PFA deliveries (50[46-59] vs 48[42-52], p=0.133), whereas fluoroscopy time was longer (19[14-31] min vs 15[13-20] min, p=0.019). PVI was achieved in all patients. During a median follow-up of 257[190-370] days, 16 (12.6%) and 7 (5.5%) of patients experienced an arrhythmic recurrence after or during the 90-day blanking period, respectively. The proportion of patient with SLAD who experienced a recurrence was similar to the ones with NMLAD (15.2% for SLAD vs 11.7% for NMLAD, p=0.559); increased LA size (continuous LAV values or LAV >= 50 ml/m²) was not associated to recurrences (hazard ratio=1.02, 95%CI: 0.98 to 1.06, p=0.386 for continuous LAV values; 1.02, 0.36 to 2.9, p=0.969 for LAV >= 50 ml/m²). No major complications occurred in both groups.

Conclusion: In our experience, the use of Farapulse PFA system for persistent AF ablation in patients with severe LA dilatation was rapid, safe and effective, with no differences compared to patient with normal to moderate LA size.

EP.02.13

AN INCIDENTAL FINDING OF UNROOFED CORONARY SINUS DURING ELECTROPHYSIOLOGICAL STUDY CONFIRMED BY CARDIAC CT. A CASE REPORT

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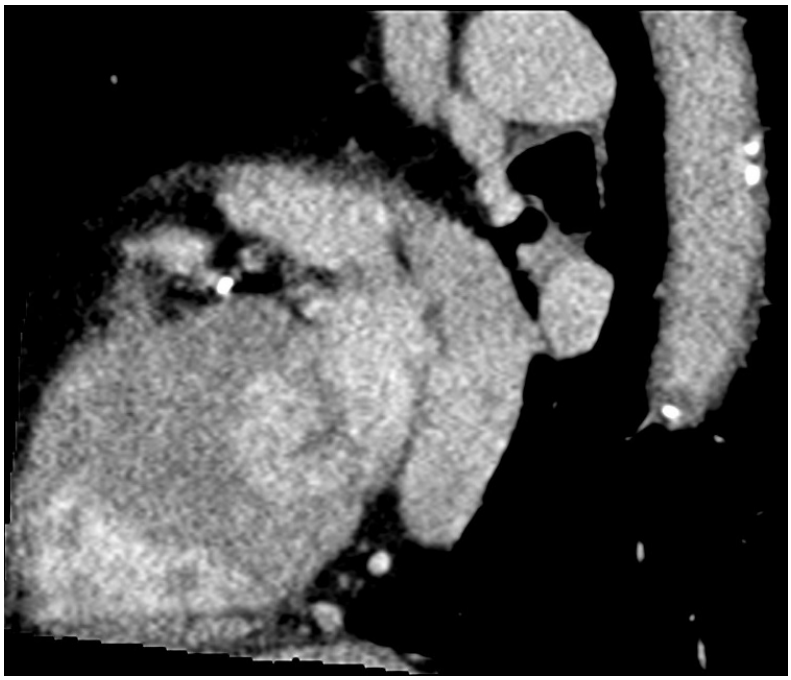
Introduction: Unroofed coronary sinus (UCS) is a rare congenital heart anomaly and the most unusual type of atrial septal defect with nonspecifc clinical manifestations.
This report presents a 73 year-old woman with a history of palpitations. During the electrophysiological study the abnormal movement of the decapolar catheter in the coronary sinus (CS) raises suspicion for an unroofed coronary sinus. The Cardiac CT performed subsequently confirmed the diagnosis.
Keywords: atrial septal defect; unroofed coronary sinus; electrophysiology.

Case Report: A 73 year-old woman presented to the Emergency Department for palpitations and chest pain during an hypertensive crisis.
Medical history: arterial hypertension. History of palpitations and finding of wide QRS tachycardia (left bundle block (LBB) type) awaiting hospitalization for electrophysiological study and eventual ablation. Previous access to the Emergency Room for palpitations with Electrocardiography -evidence of supra-ventricular-tachycardia with LBB, resolved with amiodarone. Subsequent episodes of heart palpitations associated with chest pain for which she performed a 24h Holter ECG which showed sinus rythm (SR) with 7915 supraventricular extrasystoles (SVEs) isolated and in pairs.
Physical examination revealed normal vital signs. The electrocardiogram showed SR with isolated SVEs without signs of ischemia. TnI negative.
Transthoracic echocardiogram: preserved ejection fraction without significant valvular disease. Dilatation of the atria.
The patient therefore underwent an electrophysiological study which showed, in basic conditions, a SR with conduction intervals within normal limits, numerous isolated atrial ectopic beats with distal-proximal activation on the CS (less frequently proximal-distal). Non-inducibility of supraventricular tachycardia or atrial fibrillation. In consideration of the atypical movement of the decapolar catheter in the CS and in the suspicion of an anomaly of this structure, we decided to perform further investigations. A transesophageal echocardiogram showed marked dilation of the coronary sinus. During infusion of microbubbles from the right brachial vein we observed an immediately passage of microbubbles in the left atrium. During infusion from the left brachial vein no cardiac chamber became opaque. Normal origin of the vena cava into the right atrium and apparent integrity of the interatrial septum were observed. At last the patient was subjected to a Cardiac CT documenting the presence of a left accessory vena cava which continues into the coronary sinus. The roof of the CS was absent at the level of the superior-posterior wall and the CS drained into the left atrium. So we made diagnosis of unroofed-coronary sinus.

Discussion: Unroofed coronary sinus is a rare type of atrial septal defect (ASD) that is caused by complete or partial absence of the CS roof, which causes CS connect to LA. It usually involves various anatomical characteristics depending on the location of the unroofed portion of the CS and ASD. This defect accounts for less than 1% of ASDs and is commonly associated with a persistent left superior vena cava (PLSVC) which is present in 75% of unroofed CS cases. It is often difficult to make an accurate diagnosis of unroofed CS with conventional echocardiography. However, preoperative precise detection of unroofed CS is considered essential for the surgical repair to be safely performed.



EP.02.14

POST-INFARCTION VENTRICULAR FIBRILLATION ARRHYTHMIC STORM: THE ROLE OF THE PURKINJE NETWORK

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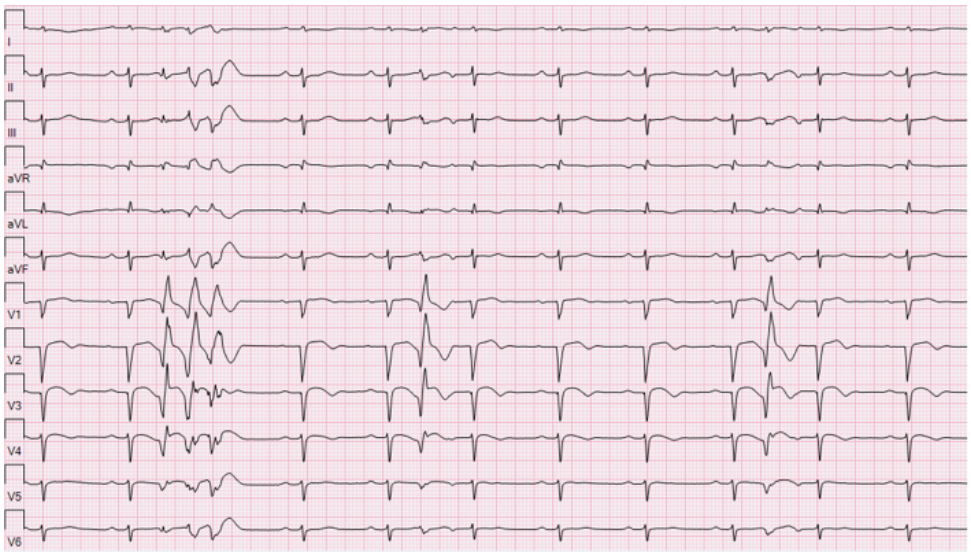
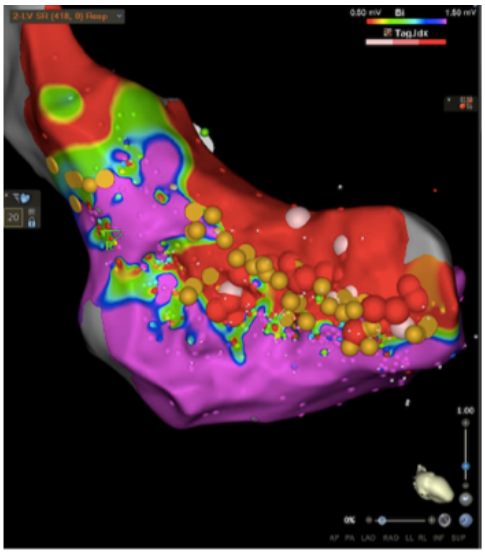
Introduction: Arrhythmic storm is a condition that worsens the prognosis of patients with myocardial infarction, both in the early stages and during the subacute phase, several weeks after the ischemic event. A specific entity that can cause it is represented by ventricular fibrillation triggered by a very early ventricular extrasystole determined by focal triggered activity of a focus within the infarct area. Purkinje fibers play a fundamental pathogenetic role in triggering these arrhythmias, both in the idiopathic and in the post-infarction form of ventricular fibrillation. Medical therapy has been shown to be ineffective in suppressing this type of arrhythmia, both amiodarone and first-class antiarrhythmics have no significant effect on reducing arrhythmic burden. An effective strategy is the modulation of the sympathetic system, particularly through deep sedation and stellate ganglion blockade, especially in the acute phase of arrhythmic storm. However, the most effective strategy, especially in long-term perspective, appears to be the ablation of the extrasystolic trigger, both in the acute and chronic phases of myocardial infarction.

Case report: We present the case of a 55-years-old patient admitted for an arrhythmic storm occurring on the twelfth day following an extensive anterior myocardial infarction. The patient was readmitted due to cardiac arrest with presentation rhythm of ventricular fibrillation while convalescing at a rehabilitation facility. He underwent multiple defibrillator shocks for ventricular fibrillation triggered by early ventricular extrasystoles with R-on-T phenomenon, with right bundle branch block morphology, relatively narrow QRS duration (146 ms) and superior axis, with transition in V4 on the precordial leads, suggesting likely origin from Purkinje fibers. Initially, the patient was treated with amiodarone and lidocaine, ineffective in suppressing arrhythmic recurrences. Deep sedation with orotracheal intubation was subsequently initiated, and bilateral percutaneous stellate ganglion blockade with continuous lidocaine infusion was performed, only partially effective. Considering the refractoriness of arrhythmic episodes to medical therapy, it was agreed to perform ablation of the arrhythmic trigger with mechanical circulatory support (ECMO) in a single combined procedure. During left ventricular electrophysiological mapping a wide area of anterior-septal low voltage consistent with the infarct scar was documented. Subsequently, anatomical conduction pathway reconstruction from the His bundle to the anterior and posterior left bundle fascicles was performed, documenting Purkinje signal with earliest activation relative to clinical ventricular ectopy in the terminal portion of the posterior fascicle. Multiple radiofrequency deliveries were performed in this area with the aim of disconnecting Purkinje fibers and the posterior fascicle from the surrounding myocardium. During the procedure, a torsades de pointes episode was recorded and treated with DC shock, followed by successful termination of ventricular fibrillation with effective radiofrequency delivery. At the end of the procedure, suppression of ventricular extrasystole was documented, and even during isoproterenol infusion and with triple extrastimulus testing, clinical arrhythmia was not induced.

Discussion: Ventricular fibrillation triggered by early ventricular extrasystoles generated by the Purkinje system can represent a complication of acute ischemic events. Given the limited effectiveness of currently available pharmacological therapies, the best strategy appears to be the ablation of the extrasystolic focus.





EP.02.15

FATTIBILITÀ DELL'ISOLAMENTO ELETTRICO DELL'AURICOLA SINISTRA MEDIANTE ELETTROPORAZIONE PER IL TRATTAMENTO DI FIBRILLAZIONE ATRIALE PERSISTENTE: UN SINGOLO CASO CLINICO

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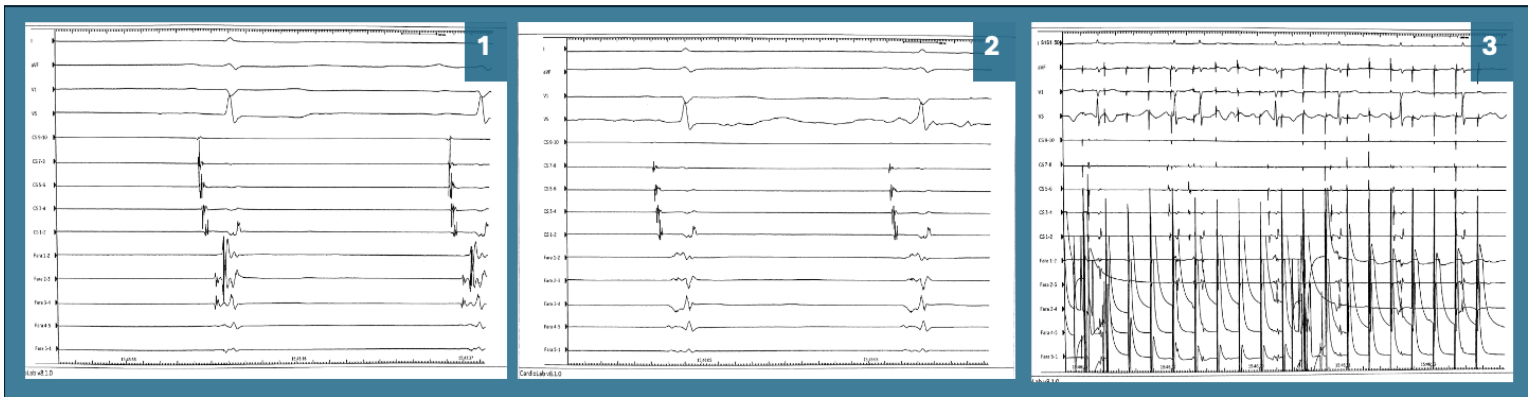
L'auricola sinistra è stata descritta come un possibile trigger della fibrillazione atriale, costituendo quindi un potenziale target del trattamento ablativo. Riportiamo il caso di un paziente di 72 anni affetto da fibrillazione atriale persistente recidivante e
pregresso ipertiroidismo da amiodarone con riduzione della funzione sistolica ventricolare, verosimilmente secondario a tachicardiomiopatia da elevata risposta ventricolare. Durante gli accertamenti si riscontrava una frazione di eiezione lievemente ridotta (FE 43%), una lieve dilatazione ventricolare sinistra e una severa dilatazione atriale (vol max 61 ml/mq). Considerando il quadro di disfunzione ventricolare è stato proposto al paziente una strategia ablativa mediante elettroporazione guidata dall'ecografia intracardiaca (approccio standard adottato nel nostro centro). Dopo cateterizzazione transettale sono state mappate le vene polmonari in corso di fibrillazione atriale con riscontro di assenza di significativi potenziali venosi. Si è quindi proceduto all'isolamento degli antri delle 4 vene e della parete posteriore, rispettivamente con 12 applicazioni di energia in configurazione basket e flower per ciascuna vena (2kW) e 18 applicazioni a livello della parete posteriore. Dopo cardioversione elettrica, vista l'assenza di potenziali a livello delle vene polmonari, si è proceduta all'isolamento dell'auricola sinistra con 8 applicazioni di energia in configurazione flower a livello della porzione prossimale della stessa, ottenendo la scomparsa dei potenziali auricolari. E' stato poi validato l'isolamento delle strutture trattate con stimolazione ad alta energia.



Il paziente è stato dimesso in ritmo sinusale e in assenza di una terapia antiaritmica. La durata della procedura è stata di 65 minuti con un'esposizione fluoroscopica di 14 minuti. Durante il follow di 8 mesi il paziente ha presentato un singolo parossismo aritmico al secondo mese ed è poi rimasto in ritmo sinusale stabile anche alle registrazioni holter. Al controllo ecocardiografico è stato documentato un miglioramento della funzione ventricolare sinistra (FE 53%).
In conclusione, l'isolamento dell'auricola sinistra mediante elettroporazione è risultato fattibile offrendo un ulteriore approccio per il trattamento della FA persistente complicata da tachicardiomiopatia. Ulteriori dati saranno necessari per validarne sicurezza ed efficacia.

EP.02.16

FIBRILLAZIONE ATRIALE NELL'ICTUS CRIPTOGENICO: MECCANISMO EZIOPATOGENETICO O EPIFENOMENO DI MALATTIA ATRIALE?

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Donna di 58 anni, casalinga, di origine venezuelana, residente in Italia, non ipertesa, non dislipidemica, non diabetica, ex fumatrice, con familiarità per malattie cardiovascolari, con storia di pregressi episodi di ischemia cerebrale nel 2014, nel 2016 e nel 2019 con riscontro alla TC di piccola lesione corticale e sottocorticale frontale e laterobasale dx. Riferiva episodi di cardiopalmo e vertigini. Dopo l'ultimo episodio di ischemia cerebrale si sottoponeva a visita cardiologica e neurologica. L' ecocardiogramma evidenziava camere cardiache di normali dimensioni e cinesi, apparati valvolari indenni, assenza di shunts, normale funzione diastolica, l' eco–Doppler dei TSA risultava essere normale e l'Holter cardiaco non mostrava bradi e/o tachiaritmie significative. Le veniva prescritta terapia con asa 100 mg/die, atorvastatina 20 mg/die, nisoldipina 1 cp x 3 al di ed era sottoposta a impianto di loop recorder impiantabile (ILR) al fine di evidenziare eventuali episodi di fibrillazione atriale (FA). Dopo 20 giorni dall'impianto si documentava effettivamente FA. Pertanto si sospedeva asa e veniva prescritto rivaroxaban 20 mg/die. Dopo 3 mesi però inaspettatamente si registrava pausa sinusale di circa 11 secondi tale da porre indicazione ad impianto di pacemaker definitivo (PM). Conclusioni: nella nostra esperienza abbiamo osservato il frequente e inatteso riscontro di episodi bradiaritmici critici, da soli o in associazione a FA, in pazienti (pz) sottoposti a impianto di ILR per ictus criptogenico, pensando inizialmente di dover ricercare la sola FA. La nostra ipotesi è che in tali pz, la FA possa rappresentare un marker di malattia atriale piuttosto che il meccanismo causale degli eventi ischemici cerebrali. Pur se è indiscutibile un legame tra FA subclinica e ictus ischemico, è però probabile che tale correlazione sia molto più complessa e che la FA rappresenti un epifenomeno di malattia atriale ovvero un marker di aumentato rischio tromboembolico e non necessariamente il meccanismo eziopatogenetico responsabile.

EP.02.17

DOES AGE IMPACT ACUTE SAFETY AND EFFICACY DURING PULSED-FIELD ABLATION FOR ATRIAL FIBRILLATION?

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Background: The efficacy of pharmacological treatment for AF in elderly patients is affected by their age. Although thermal ablation is a well-established strategy for AF, there is a paucity of data regarding the efficiency, effectiveness, and safety outcomes of novel pulsed-field ablation (PFA) in this patient population.

Objective: This study aims to determine both safety and efficacy of PFA in elderly (age>=75 years) patients compared to non-elderly (age<75 years) patients indicated for AF ablation.

Methods: We enrolled consecutive patients who had undergone AF ablation with PFA at 10 Italian centers. PFA with the Farapulse system was delivered by a protocol-directed PVI using 2 kV with 8 applications per vein. Additional lesions were performed at the operator's discretion.

Results: A total of 818 patients were included: 80 (9.8%) had >=75years (mean of 77±2 years) whereas 738 (90.2%) had <75 years (61±9 years, p<0.0001). No differences were observed between older and younger patients regarding the underlying AF type (paroxysmal AF: 67.5% vs 68.4%, p=0.899; early persistent AF: 22.5% vs 24.4%, p=0.784; long-standing persistent AF: 10% vs 7.1%, p=0.368). However, elderly patients displayed a more pronounced risk profile compared to their younger counterparts, characterized by a higher burden of comorbidities (hypertension: 61.3% vs 44.4%, p=0.005; cancer history: 18.8% vs 6.5%, p=0.0005; coronary artery disease: 20% vs 7.7%, p=0.001; chronic obstructive pulmonary disease: 7.5% vs 3%, p=0.047; kidney disease: 10% vs 1.2%, p<0.0001). A similar ablation approach was applied in both groups (general anesthesia: 70% vs 64.5%, p=0.387; lesion set beyond PVI: 28.8% vs 23.6%, p=0.335; 3D mapping: 23.8% vs 20.9%, p=0.565 and 32[32-39] vs 32[32-38] PFA spots to achieve PVI, p=0.448), resulting in no differences in terms of procedural metrics (65[53-82]min vs 60[55-80]min for skin-to-skin time, p=0.5; skin-to-skin time<90 min in 76.3% vs 77.9%, p=0.77; 16[12-23]min vs 16[12-21]min for fluoroscopy time, p=0.477; 20[15-25]min vs 20[15-25]min for time to PVI, p=0.476). PVI was achieved in all patients. No major procedure-related adverse events were reported.

Conclusion: Drawing from these findings, employing the Farapulse system for AF ablation in elderly patients demonstrated swift, safe, and effective outcomes, mirroring a comparable pattern observed in younger patients.

EP.02.18

TEN YEARS OF TRANSESOPHAGEAL ELECTROPHYSIOLOGICAL STUDIES IN YOUNGER THAN 40 YEARS PEOPLE WITH A WOLFF-PARKINSON-WHITE SYNDROME

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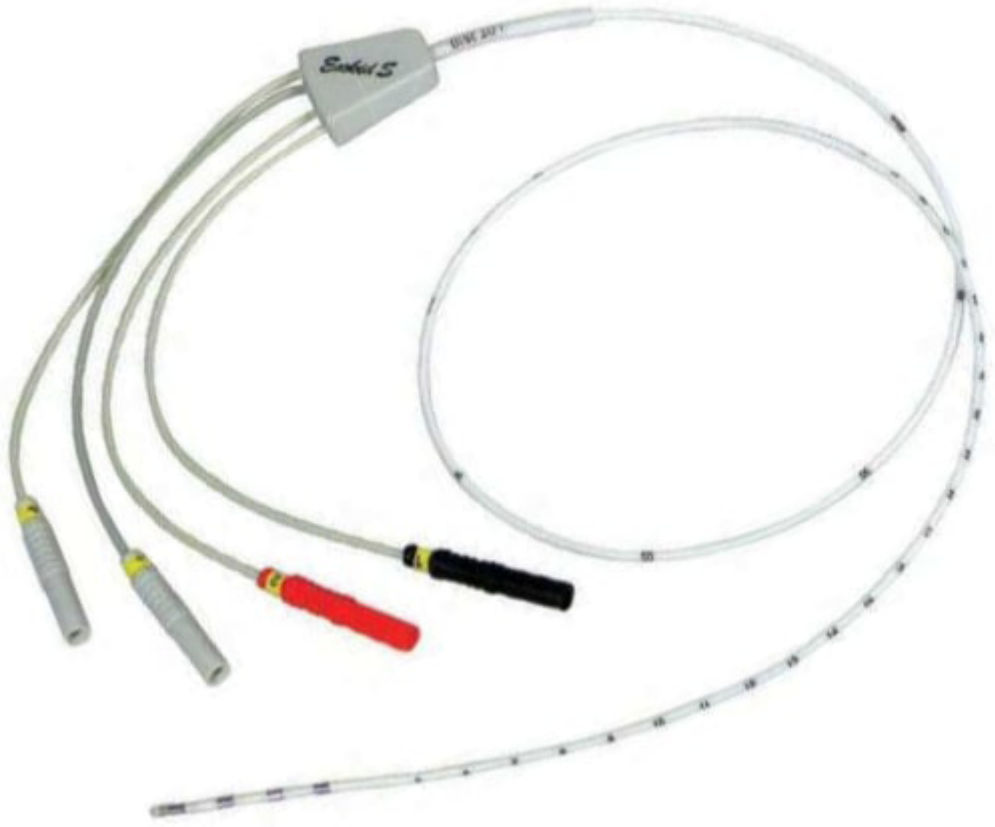
The electrophysiological evaluation of Wolff-Parkinson-White syndrome (WPW) is recommended in people older than five-years to detect the risk of life-threatening arrhythmias. The purpose of this retrospective single-center study was to determine the feasibility of transesophageal electrophysiological study (EPS) in an outpatient setting among young people between 10 and 37 year old and to evaluate its prognostic role.
Methods: Electrophysiological study (EPS) was indicated in 60 consecutive people (48 males, 81%; mean age 19 ± 7 years) between january 2012 and october 2023. The test was indicated for manifest WPW, either for palpitations (n=11, 18.6%), unexplained dizziness (n=1, 1.7%), or for sport eligibility in asymptomatic people (n=47, 79.6%). An accessory pathway (AP) was considered to have a short refractory period and carry an increased risk for sudden cardiac death when the effective refractory period (ERP) was the same or inferior to 240 ms, or if an atrioventricular (AV) reentrant tachycardia precipitating pre-excited atrial fibrillation was induced.
Results: EPS was performed in all but one person, without sedation. The main difficulty lied in passing the catheter through the nose. Programmed atrial stimulation at cycle length of 500 ms with one decremental extrastimulus was performed in all people to determinate the refractory period of the AP and the AV node. Physical activity during the test, or isoproterenol infusion was performed in 45 out of 59 people. The AP ERP was determined in the majority of case (54 out 59 people) and was between 200 and 360 ms (mean 270 ± 34 ms) . Orthodromic reentrant tachycardia was induced in 10 (16.9%) cases, in 5 asymptomatic people and 5 patients with palpitations. Atrial fibrillation was induced in 13 cases. Antidromic tachycardia was never induced. Ten people (16.9%) were deemed at increased risk of life-threatening arrhythmias while 49 (83.1%) patients were deemedat low risk. Eight out of 10 (80%) high risk pts and only 5 out of 49 low risk pts underwent catheter ablation of the AP. After a median follow-up of 57 months, all 49 pts defined at low risk were alive, without syncope or sudden cardiac arrest events.
Conclusions: in young pts with WPW syndrome, transesophageal EPS can be performed in an outpatient setting with an excellent tolerability and shows a high specificity (negative predictive value of 100%) to role out pts at increased risk of life-threatening arrhythmias



EP.02.19

PULSED-FIELD ABLATION OF ATRIAL FIBRILLATION IN PATIENTS WITH MULTIPLE CARDIOVASCULAR COMORBIDITIES: ACUTE SAFETY AND EFFICACY FROM A LARGE NATIONWIDE MULTICENTER EXPERIENCE

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Background: Patients with multiple cardiovascular (CV) comorbidities are increasing users of health care globally. The decision to perform ablation of atrial fibrillation (AF) may be challenging in this population, due to the difficulty in evaluating their life expectancy and the associated procedural risk. In addition, no data have been reported on the efficiency, effectiveness, and safety outcomes for non-thermal ablation, such as electroporation with pulsed-field ablation (PFA).

Purpose: To evaluate procedural workflow and safety for AF ablation in these patients through a novel PFA technology (Farapulse) in a large, nationwide clinical practice.

Methods: Consecutive patients who had undergone PFA of AF from 10 Italian centers were included. Patients were stratified according to the numbers of several comorbidities, assigning 1 point each, including: advanced age (>=80 years), LVEF<=35%, structural heart disease, coronary artery disease, chronic kidney disease, chronic obstructive pulmonary disease, previous stroke/TIA, hyperthyroidism, cancer history, cancer ongoing, severe sleep apnea, diabetes, hypertension, dyslipidemia.

Results: We included 634 patients (age 62±9 years, 73% male, 67% paroxysmal AF, 88% de novo ablation procedure, LVEF 57±8%). Two-hundred-nine (33%) patients had no risk-factors, 179 (28.2%) patients had at least 1, 137 (21.6%) two, 63 (9.9%) patients 3 risk-factors and 46 (7.3%) patients more than 4 comorbidities. Patients with accumulated risk factors (>=4) had a higher percentage of long-standing AF (17.4% vs 5.4%, p=0.005) and more often underwent de novo ablation procedure (93.5% vs 81.3%, p=0.04). In these cases, operators decided to adopt more frequently, albeit not significantly, advanced diagnostic such as 3D mapping system (30.4% vs 21.9%, p=0.20) or intracardiac echocardiography (41.3% vs 29.8%, p=0.13), a general anesthesia sedation strategy (41.3% vs 32.1%, p=0.88) and a more extensive lesion set beyond PVI (i.e. left atrial posterior wall area, 32.6% vs 23.1%, p=0.15). Procedures in which patients with accumulated risk factors are involved required longer support (preparation plus skin-to-skin) time (90[65-120] min vs 72[60-100] min, p=0.02) and skin-to-skin time (70[60-100] min vs 60[55-85] min, p=0.03) compared to patients with <4 risk factors, whereas time to PVI (19[14-25] min vs 20[14-25] min, p=0.81) and total number of PFA deliveries to achieve PVI (32[32-38] vs 32[32-36], p=0.55) were similar. PVI was achieved in all patients. No major procedure-related adverse events were reported.

Conclusion: In this preliminary experience, the use of Farapulse PFA system for AF ablation in patients with accumulated risk factors was safe and effective and resulted in similar and fast time to PVI.

EP.02.20

ENHANCED ACCESS SOLUTIONS AND PULSED-FIELD ABLATION FOR IMPROVING PROCEDURAL EFFICIENCY IN ATRIAL FIBRILLATION ABLATION PROCEDURES

Mario Volpicelli [1], Saverio Ambrosino [1], Antonella Laezza [1], Orlando Munciguerra [1], Pasquale Merone [1], Ciro Pirozzi [1], Luigi Sena [1], Nicoletta Caccavale [1], Maurizio Malacrida [2], Vincenzo Punzo [2], Carmine Nappo [1], Luigi Nunziata [1], Agostino Bonauro [1], Carlo Carbone [1], Luigi Caliendo [1]
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Introduction: There is currently a lack of evidence assessing the impact of radiofrequency (RF) needle for transeptal puncture (TSP) on the efficiency, effectiveness, and safety outcomes in the context of novel pulsed-field ablation (PFA) for atrial fibrillation (AF).

Methods: We included consecutive patients who underwent AF ablation at our center. The initial 20 cases of AF ablation utilizing PFA and the VersaCross device (ADV group) were propensity-matched with patients undergoing a standard RF approach (RF ablation catheter and Swartz/BRK-1, STD group, n=20), and their outcomes were subsequently compared. In all instances, the same 3D mapping system was employed.

Results: The ADV group achieved a 100% success rate with a single attempt, in contrast to the STD group's 60% (p=0.003). The total number of TSP attempts was significantly lower in the ADV group (1[1-1] vs 1[1-2], p=0.0031), resulting in a faster TSP time (1.5±0.6 vs. 6.8±5.1 min, p<0.0001). Furthermore, the ADV group exhibited shorter total procedural, ablation and fluoroscopy times and lower radiation exposure compared to the STD group (procedural time: 71±17 vs 98±11 min, p<0.0001; ablation time: 33.9±11 min vs 55±8 min, p<0.0001; fluoroscopy time: 18.9±3 min vs 21.9±5 min, p=0.034; radiation exposure: 414±106 mGy vs 473±78 mGy, p=0.0098 respectively). No complications related to TSP were reported in both groups.

Conclusion: The integration of an RF wire-based workflow and the Farapulse PFA system with led to expedited and more streamlined procedures in comparison to utilizing a mechanical needle and RF ablation technology during AF ablation procedures.

E-POSTER 3

GIOVEDI' 19 SETTEMBRE

AREA E-POSTER

18:30-19:30

SESSIONE E-POSTER 3
TECNOLOGIA E TELEMEDICINA

Moderatori: Alessia Agresta (Maddaloni-NA), Raffaele Vitale (Mestre-VE)

EP.03.01
FEASIBILITY AND EFFICACY ASSESSMENT OF A NOVEL SIZE-ADJUSTABLE CRYOBALLOON FOR ABLATION OF ATRIAL FIBRILLATION IN A MULTICENTER CLINICAL SETTING

Alessia Agresta [1], Antonio Curnis [2], Antonio De Simone [1], Gemma Pelargonio [3], Marco Schiavone [4], Stefano Bianchi [5], Vincenzo La Rocca [1], Maria Lucia Narducci [3], Domenico Pecora [6], Manuel Cerini [2], Gianluigi Bencardino [3], Massimo Moltrasio [4], Carmelo La Greca [6], Saverio Iacopino [7], Ruggero Maggio [8], Giuseppe Stabile [9], Maurizio Malacrida [10], Claudia Albano [10], Claudio Tondo [4]

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Background: The POLARx-FIT cryoballoon (CB) system introduces a unique feature, allowing the selection of two distinct balloon sizes within a single catheter. This innovation holds promise for treating larger pulmonary veins (PV), providing increased flexibility to achieve optimal occlusions. However, there is a scarcity of clinical data supporting its application in this context.

Purpose: To compare the benefits and safety of the new POLARx-FIT system to those of the existing POLARx system currently in use for PV isolation (PVI) in patients with atrial fibrillation (AF).

Methods: The first 140 consecutive patients who underwent CB-based PVI with the POLARx-FIT system were retrospectively compared with 300 consecutive patients treated with the POLARx system. Protocol-directed cryoablation was delivered for 180 sec or 240 sec according to operator's preference for isolation achieved in <=60 sec, or 240 sec if isolation occurred >60 sec or when time to isolation was not available. The ablation endpoint was PVI as assessed by entrance and exit block. In the POLARx-FIT group the choice of balloon size (28 or 31 mm) was determined during the procedure while attempting to occlude each vein.

Results: Two-thousand one-hundred fifty-five cryo-applications (CBA) from 440 patients were analysed (300, 68.2% POLARx; 140, 31.8% POLARx-FIT). PVI was achieved with cryoablation only in all patients. The mean number of freeze applications per patient was similar between groups (5.0±1.4 in the POLARx-FIT vs 5.3±1.8 in the POLARx group, p=0.207) whereas the number of PVs treated in a single-shot fashion was higher in the POLARx-FIT group (444, 80.7% with one shot; 75, 13.7% with 2 shots; 31, 5.6% with more than 2 shots) than in the POLARx one (1168, 70.2% with one shot, p=0.0002; 294, 17.7% with two shots and 143, 8.6% with more than two shots). Among the POLARx-FIT cases, in 54.2% (n=298) of applications, the 31-mm diameter was employed as a first choice, while in the remaining 45.8% (n=252) of applications, the 28-mm diameter was adopted. A switch to a different balloon diameter was applied in 11.6% of cases. The first pass isolation (i.e. a single shot CBA to achieve PVI) was slightly higher when using a 31 mm diameter (n=250, 83.9%) than a 28 mm diameter (n=194, 77.0%, p=0.05). Three (0.7%) transient phrenic nerve palsy were observed (all in the POLARx group, 0.9%, p=0.554), with full recovery in the 48h post procedure; no major procedure-related adverse events were reported at 30 days post-procedure.

Conclusion: In this first multicentric experience in a clinical practice setting, this novel cryo-balloon system proved to be safe and effective and resulted in a high proportion of successful single-freeze isolation. The intraprocedural flexibility of balloon size contributed to its versatility, leading to a variation in balloon diameter in about 12% of freeze applications.

EP.03.02

IMPACT OF LEFT ATRIAL VOLTAGE DETECTED WITH HIGH-DENSITY MAPPING ON ABLATION OUTCOMES IN PATIENTS WITH PAROXYSMAL ATRIAL FIBRILLATION UNDERGOING PULMONARY VEIN ISOLATION

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Background: Atrial fibrosis alters local impulse conduction and creates the substrate for atrial fibrillation (AF) development. Previous studies have shown that left atrial (LA) low voltage areas (LVA), detected by electroanatomical mapping, may correlate with recurrences mainly in persistent AF patients. Their impact on clinical outcomes in paroxysmal AF patients is still debated.

Objective: We aimed to determine if the presence of LA LVA is predictive of arrhythmic recurrence in paroxysmal AF patients undergoing their first ablation procedure with pulmonary veins isolation (PVI).

Methods: This retrospective observational study included 66 consecutive patients undergoing their first PVI procedure. Intra-procedural high-density electroanatomical voltage LA mapping was performed before PVI, during sinus rhythm (SR), using a high-density multi-electrode catheter. Low-voltage areas were defined as regions where bipolar voltage was <0.50 mV. Patients were divided in two cohorts accordingly: low-voltage areas patients (LVAP: >1% LA surface area <0.50 mV in SR) vs healthy-atrium patients (HAP: <=1% of LA surface area < 0.50 mV in SR).

Results: Sixty-six patients were enrolled. LA LVA were observed in 28 (42.4%) patients. No differences regarding patients age (HAP 59.9±10.3 vs. LVAP 61.2±9.8, p=0.606), sex (females HAPs 21.6% vs. LWAPs 32%, p=0.186), and BMI (HAPs 25.0 [24.0-28.0] vs LWAPs 25.0 [24.0-28.5], p=0.660) were found. Median LA volume (HAP 31.3±7.8 vs LVAP 34.8±10.1 ml/m2) and LVEF (HAP 60.0±5.6 vs 59.9±6.0%) were overall normal in both cohorts, without differences among groups (p=0.128 and p=0.944, respectively). During a median follow-up of 12 [12-18] months (similar in the two cohorts), AF recurrence was observed in n=12 (31.6%) HAP patients and n=12 (42.8%) LVA patients after the first procedure, respectively. AF recurrence rate after a single ablation did not differ among patients with low-voltage areas than without (OR 0.6154, 95 % CI: 0.2232-1.6963 p=0.3480).

Conclusion: The presence of LA LVA in paroxysmal AF patient undergoing PVI is not predictive of arrhythmia recurrence. Further studies with larger sample size and longer follow-up are needed to confirm our findings.

EP.03.03

CLINICAL BENEFITS OF ADVANCED ALGORITHMS IN HEART FAILURE MANAGEMENT IN PATIENTS UNDERGOING CARDIAC CONTRACTILITY MODULATION DEVICE IMPLANTATION

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Patient Presentation: A 71-year-old male with primary dilated cardiomyopathy and severe left ventricular dysfunction (LVEF 20%) but normal right ventricular function, moderate mitral regurgitation, left anterior hemiblock, a history of paroxysmal atrial fibrillation. In early 2019, he was hospitalized twice for heart failure, and in October 2019, he underwent to biventricular defibrillator implantation for primary prevention of sudden cardiac death. After device implantation, he was enrolled in remote device monitoring with the activation of an advanced multiparametric algorithm for heart failure management. At discharge, he was on maximally tolerated medical therapy with a New York Heart Association (NYHA) class II status. Since September 2022, the heart failure synthetic index exceeded the critical threshold, reaching a value of 17, triggering a remote monitoring alert. The patient, who was still mildly symptomatic, was called in for an electrocardiogram, device ambulatory check confirming the findings from remote monitoring, and an echocardiogram that showed an initial reduction in right ventricular contractile capacity (TAPSE 15 mm). His diuretic therapy was titrated up to 150 mg of furosemide, and he was discharged home. In the subsequent months, the patient enjoyed clinical stability until December 2022 when he reported a gradual decline in functional capacity, supported by an increase in the heart failure index.

Diagnosis and Management: Due to the limited benefit of home therapy and progression to NYHA class IV in February 2023, the patient was admitted to the hospital. Echocardiography revealed a continued decline in right ventricular function (TAPSE 12 mm, RV S' TDI 6 m/s), leading to the initiation of biweekly Levosimendan infusion cycles, resulting in a temporary improvement in clinical and echocardiographic parameters. In March 2023, a cardiac contractility modulation device was implanted, with two pacing catheters placed at the basal and mid-interventricular septum levels and the generator positioned subclavicularly on the right side. Before discharge, a chest X-ray confirmed the successful procedure without acute complications.
Follow-Up The patient was reevaluated one month after device implantation, reporting modest improvement, necessitating further optimization of programming. Starting in May 2023, there was a progressive improvement in clinical conditions, as evidenced by a decline in the heart failure index to baseline values observed immediately post-defibrillator implantation (Figure 1). At the Echocardiographic control there was stable left ventricular systolic function over time and a marked improvement in right ventricular functional indices (Figure 2). The patient no longer required Levosimendan infusion therapy and stabilized at NYHA class II.

Discussion: Cardiac contractility modulation is an effective method in patients with heart failure and severe systolic dysfunction, reducing symptoms and preventing hospitalizations, especially in non-ischemic heart failure patients. The method's efficacy is evaluated based on clinical events, often uniparametric, and not continuously assessable in real-time patient monitoring. The benefits associated with the use of these devices are rooted in molecular mechanisms that are not easily assessable in clinical practice. Improvement in patient management extends beyond merely enhancing left ventricular systolic function but often encompasses reductions in volumes and increased contractile capacity of the right ventricle.

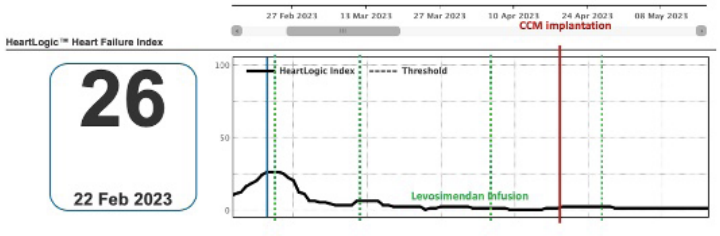

Fig.1

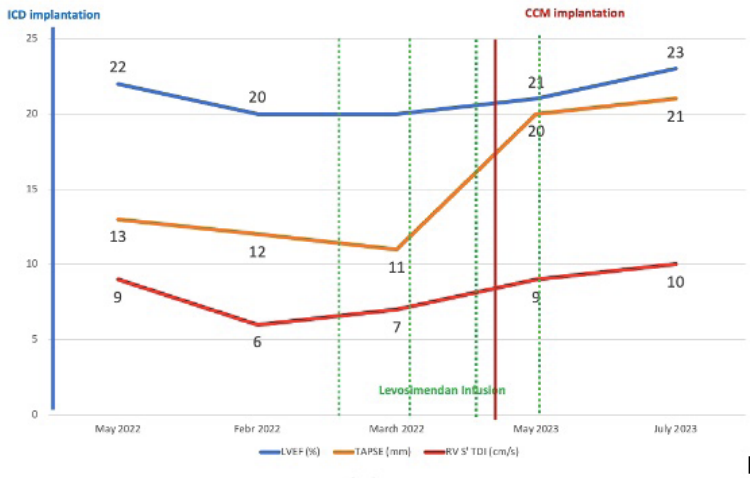

Fig.2

EP.03.04

ACCETTAZIONE E SODDISFAZIONE DEL SISTEMA DI CONTROLLO REMOTO BLUETOOTH E SMARTPHONE APP: RISULTATI PRELIMINARI DEL REGISTRO REACTION

Domenico Gianfrancesco [1], Rita Di Rosa [2], Roberto Rordorf [3], Antonio Rossillo [4], Luca Santini [5], Gianfranca Basiricò [6], Luis Alvarez [7], Giorgios Leventopoulos [8], Pedro Semado [9], Lucio Addeo [10], Antonio Rapacciuolo [10]

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Introduzione: I sistemi di monitoraggio remoto (RM) sono stati introdotti per monitorare in remoto i pazienti con dispositivi elettronici impiantabili cardiaci (CIED). Recentemente la tecnologia Bluetooth® ha collegato i CIED con gli smartphone dei pazienti per trasmettere i dati diagnostici del dispositivo ai medici. Per un'adozione ottimale di questa nuova tecnologia è importante raccogliere dati sulla percezione e prospettva dei pazienti.

Obiettivo: Verificare l'accetazione e soddisfazione dei pazienti portatori di CIED monitorati in remoto con sistema Bluetooth e smartphone App.

Metodi: Il REACTION REGISTRY è uno studio osservazionale, prospettico, no profit, internazionale, multicentrico, progettato per valutare la fattibilità nella pratica clinica della tecnologie Bluetooth e delle applicazioni per smartphone nel follow-up nei pazienti portatori di CIED.
Da settembre 2021 21 dipartimenti di Cardiologia hanno incluso 182 pazienti. Le caratteristiche demografiche sono mostrate nella tabella 1. Sono stati raccolti 66 questionari a 6 mesi sull'accettazione e soddisfazione dei pazienti. E' stato utilizzato il questionario REMASQ (Questionario sull'accettazione e soddisfazione del controllo remoto) che contiene 12 domande volte ad indagare cinque diversi aspetti strettamente legati all'accettazione del paziente e soddisfazione del monitoraggio remoto: (i) rapporto con il proprio ospedale, (ii) facilità d'uso della tecnologia, (iii) aspetti psicologici correlati, (iv) implicazioni sulla salute e (v) soddisfazione generale. Ogni risposta è stata valutata su una scala a cinque punti: da 0 a 4. Il massimo punteggio realizzabile nel questionario è 48.

Risultati: I punteggi medi per ciascuna delle cinque aree del REMASQ sono stati: 3,54±0,87 per relazione con l'ospedale, 3,24±1,09 per facilità d'uso, 2,36±1,73 per aspetti psicologici e 3,61±0,77 per implicazioni cliniche e 3,64±0,73 soddisfazione generale (fig.1). Il punteggio medio al questionario è stato 37,85±7,51. Considerando come positive le risposte con valore > o = a 2, il gradimento totale del sistema di controllo remoto è stato del 98,51%.

Conclusioni: La nuova tecnologia Bluetooth e smartphone App ha soddisfatto globalmente le aspettative dei pazienti. Andrebbero studiate maggiormente le implicazioni psicologiche di tale sistema per i pazienti. I risultati finali dello studio su un numero di pazienti maggiore e un secondo follow-up potrebbero chiarire questo aspetto.

Tabella 1 Caratteristiche demografiche.

Pazienti (182)	
Età	69,02 ± 10,19
Genere	
Femmine	34 (18,68%)
Maschi	148 (81,31%)
Tipo Device	
CRT-D	64 (35,16%)
ICD	118 (64,84%)
Cellulare [160]	
Paziente	94 (58,75%)
Produttore	11 (6,88%)
Caregiver	55 (34,37%)
Ipertensione	113 (61,75%)
Diabete	
Si (non specificato)	11 (18,64%)
Tipo I	8 (13,56%)
Tipo II	40 (67,80%)
Scompenso Cardiaco	115 (62,84%)
Storia Aritmie ventricolari	54 (29,51%)
Storia aritmie atriali	44 (24,04%)
TIA	11 (6,01%)
Ictus	20 (10,93%)

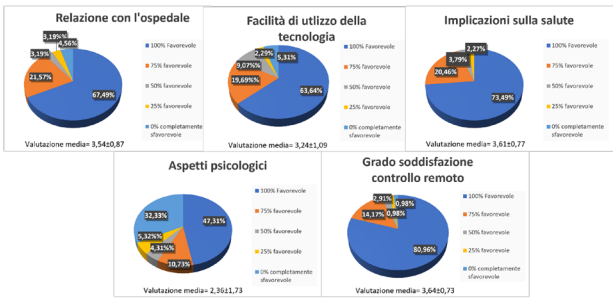

Figura 1 Valutazione media, deviazione standard e percentuali di risposte al REMASQ divisie per area tematica.

EP.03.05

ADVANCED MAPPING TECHNOLOGY FOR SUCCESSFUL PAROXYSMAL ATRIAL FIBRILLATION ABLATION: INSIGHTS FROM THE DELETE AF STUDY

Mario Giannotti Santoro [1], Javier Ramos Maqueda [2], Luca Segreti [1], Vincenzo Schillaci [3], Valerio De Sanctis [4], Andreu Porta-Sanchez [5], Pietro Rossi [6], Ruggero Maggio [7], Miguel Alvarez-Lopez [8], Emerngol Valles-Gras [9], Massimo Mantica [4], Giulio Zucchelli [1], Gergana Shopova [3], Ilaria Meynet [7], Stefano Bianchi [6], Giovanni Marano [3], Maurizio Malacrida [10], Francesco Solimene [3], Ignacio Garcia-Bolao [11]

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Background: Low-voltage activity beyond pulmonary veins (PVs) may contribute to the failure of ablation of atrial fibrillation (AF) in the long term.

Objective: To validate an improved workflow for catheter ablation including the complete abolition of any antral potential achieving electrical quiescence in antral regions.

Methods: DELETE AF is a prospective, single-arm, international post-market cohort study. Consecutive patients who were undergoing radiofrequency ablation of paroxysmal AF were included. The Lumipoint (Boston Scientific) map-analysis tool was used sequentially on each PV component. The ablation endpoint was PV isolation (PVI) and electrical quiescence in the antral region.

Results: One-hundred seventeen patients from 10 centers were enrolled. In 116 cases (99.1%), the procedure adhered to the pre-specified workflow, making them eligible for inclusion in the present analysis. Standard anatomy was present in 100 (86.2%) patients, whereas anatomic variant was found in 16 (13.8%). Procedural metrics were: procedure duration = 58[23-79] min, fluoroscopy time = 13[9-19] min, RF delivery time = 18[12-28] min, number of ablation spots = 76[42-101]) and mean power = 43.5±7W. Seventy-three (63%) patients underwent de novo ablation, while 43 (37%) repeat ablation. After ablation, 5 residual PVGs in 2 (1.7%) patients and a 10 RAPs in 7 (6%) patients were detected after first remapping. At the end of the procedures, all PVs had been successfully isolated and electrical quiescence has been achieved in all study patients except for one that still exhibited a residual low-voltage antral signal after adenosine infusion with no PV conduction. During the 90-day blanking period, among the 86 (74.1%) patients with complete follow-up information, 8 (9.3%) experienced an early recurrence. After the blanking period, over a follow-up of 357[190-380] days, 13 (15.1%) pts suffered an AF recurrence (time to recurrence: 207[144-300] days). No major complications or adverse events occurred.

Conclusion: In this study, the adoption of an enhanced procedural workflow for RF catheter ablation, incorporating consistent high-density mapping and improved guiding diagnostic tools, was safe and effective in treating paroxysmal AF.

EP.03.06

ADVANCED MAPPING AND ABLATION TECHNOLOGIES TO TARGET PULMONARY VEINS GAPS AND RESIDUAL ANTRAL POTENTIALS DURING REPEAT PAROXYSMAL AF ABLATION: ACUTE AND LONG-TERM FOLLOW-UP

Mario Giannotti Santoro [1], Francesco Solimene [2], Luca Segreti [1], Francesco Perna [3], Andrea Giomi [4], Vincenzo Schillaci [2], Ruggero Maggio [5], Gabriele Dell'Era [6], Stefano Bianchi [7], Raimondo Calvanese [8], Giuseppe Mascia [9], Luca Rossi [10], Maria Rosaria Ascione [2], Armando Mariano Salito [2], Gemma Pelargonio [3], Beatrice Stegagno [11], Claudia Albano [11], Maurizio Malacrida [11], Giulio Zucchelli [1]

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Background: A comprehensive understanding of pulmonary vein (PV) reconnection and residual potentials (RAP) within the antral scar during repeat atrial fibrillation (AF) ablation, facilitated by advanced mapping and ablation technologies, is currently lacking. Optimizing radiofrequency (RF) deliveries after failed PV isolation (PVI) may enhance ablation efficiency.
Purpose: This study aims to assess both the acute and long-term outcomes focusing on PV gaps (PVGs) and RAPs, utilizing advanced mapping and ablation technologies during repeat PV ablation in patients (pts) with paroxysmal AF.

Methods: Repeat AF-CHARISMA study, a prospective, single-arm cohort study, included consecutive pts from 13 centers who undergoing repeat ablation of paroxysmal AF. The Lumipoint (Boston Scientific) map-analysis tool was used sequentially on each PV component. All patients were followed-up for at least 12 months after the procedure. The ablation endpoint was PVI and electrical quiescence in the antral region. Long-term outcome was the recurrence of AT/AF over follow-up.

Results: One-hundred pts were included (69% after failed RF procedure, 31% after failed cryoablation procedure). A total of 276 PVGs (192 after RF ablation, 2.8±1.8/pt; 84 after cryoablation, 2.7±1.9/pt, p=0.665 vs RF) and 44 RAPs (43 after RF ablation, 0.6±1.1/pt; 1 after cryoablation, 0.03±0.2/pt, p=0.002 vs RF) were detected. In the majority of cases (75%), only PVGs were present whereas, in 21%, both PVGs and RAPs were detected (2 pts had only RAPs). In 2 pts no PVG nor RAP were identified. PVGs were most common at anterior sites (103, 37.3%), followed by posterior sites (75, 27.2%) and carina sites (49, 17.8%). PVG location sites did not differ between prior ablation approach. Only 1 pt after cryoablation showed a RAP (at carina site), whereas the 44 RAPs after RF were fairly distributed across different sites. Acute procedural success was 100%, with all PVs successfully isolated and RAPs completely abolished in all study pts. After the blanking period, over a follow-up of 480±211 days, 18 pts (18%) suffered an AT/AF recurrence (time to recurrence: 245±80 days). Previous ablation approach (HR=0.66, 95%CI: 0.2 to 2.0 for previous cryoablation, p=0.46), number of PVGs (1.05, 0.8 to 1.3, p=0.67) or number of RAPs (0.41, 0.1 to 1.2, p=0.12) were not associated to AT/AF recurrence. No major complications or adverse events occurred.

Conclusion: A structured ablation workflow for repeat catheter ablation, incorporating consistent high-density mapping and improved diagnostic tools to guide the procedure, demonstrated safety and efficacy in treating paroxysmal AF irrespectively of previous ablation approach. Residual potentials within the antral scar were more frequently detected after RF ablation compared to cryoablation.

EP.03.07

ATYPICAL ATRIAL FLUTTER ABLATION VIA TRANSSEPTAL ACCESS THROUGH AN ATRIAL SEPTAL CLOSURE DEVICE

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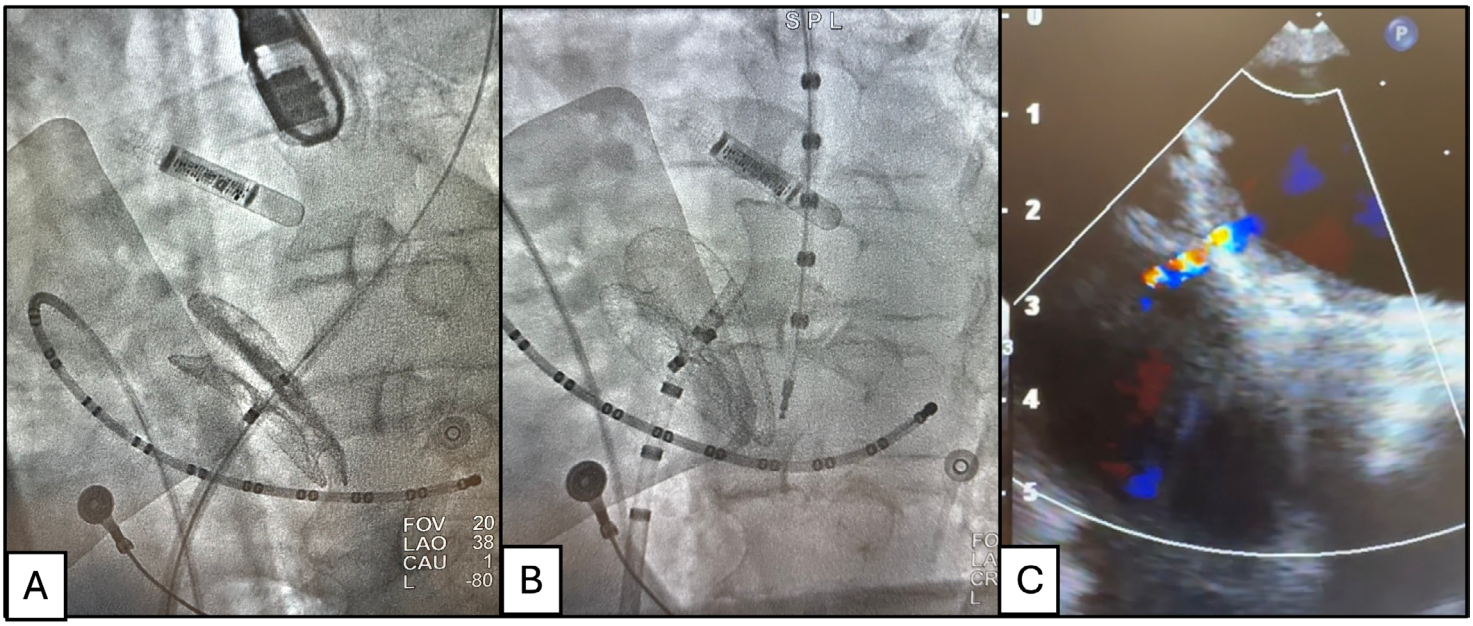
Left atrial ablation can be challenging in patients with prior atrial septal closure devices. We present a clinical case demonstrating a technique for ablating atypical atrial flutter via transseptal access through an atrial septal closure device.

A 63-year-old patient had prior atrial septal defect closure with a 34mm Amplatzer device in 2007. Following an initially successful cavotricuspid isthmus ablation in 2009, the patient developed recurrent, drug-refractory, and highly symptomatic left atrial flutter. Attempts at standard transseptal access to the left atrium were repeatedly aborted over the years due to the inability to locate an uncovered area of the interatrial septum around the Amplatzer device. Moreover the patient underwent surgical thoracoscopic ablation in 2016 and a retrograde transaortic approach in 2020 that involved a partial anterior mitral line lesion which lengthened but did not terminate the arrhythmia.

Under combined fluoroscopic and transesophagic echocardiographic guidance, a transseptal BRK-1XS needle was advanced nearly perpendicular through an atrial septal occluder device into the left atrium using an SL-0 sheath and dilator. Left atrial position was confirmed by contrast injection. The dilator was then advanced over the needle tip, which was subsequently removed. A stiff guidewire was then placed through the dilator into the left superior pulmonary vein. The dilator was exchanged for a larger 12 French dilator, which was carefully pushed across the occluder device into the left atrium over the guidewire. Finally, the SL-0 sheath was advanced into position, followed by placement of an 11 French CARTO VIZIGO® Bi-Directional Guiding Sheathto to gain a better navigation in the left atrium.

The patient showed termination of flutter by creating the superior portion of the left atrial anterior line, which had been previously attempted in 2022. Post-procedural echocardiography revealed a minimal residual shunt across the Amplatzer device. Three-month follow-up echocardiography to reassess the shunt is pending. At present, the patient remains asymptomatic in sinus rhythm without recurrence of the atrial flutter.

The number of patients developing left atrial arrhythmias after undergoing transcatheter atrial septal defect closure with an occluder device is increasing. Further study of novel transseptal approaches is warranted, as these techniques could expand access to potentially curative catheter ablation for patients with large septal occluders in place.



EP.03.08

GESTIONE DEI PAZIENTI PORTATORI DI DISPOSITIVI CARDIACI ELETTRONICI IMPIANTABILI ATTRAVERSO UNA PIATTAFORMA PER IL MIGLIORAMENTO DELLA QUALITÀ

Renzo Iulianella, Maria Luisa Loricchio, Marco Scicchitano, Veronica Rizzo, Carlos Aznaran, Valentina Schirripa, Silvia Perna, Albano Bruno, Laura Chiorazzo, Martina Palazzolo, Antonino Granatelli
Ospedale Sandro Pertini, Roma, ITALY

Introduzione: Negli ultimi anni il concetto di qualità e soprattutto di miglioramento della qualità dell'assistenza sanitaria è diventato sempre più importante per le nostre strutture. Miglioramento sia idal punto di vista del trattamento del paziente che dei processi organizzativi ospedalieri.
L'interesse crescente da parte degli operatori sanitari ad utilizzare una gamma più ampia di conoscenze e tecniche disponibili, anche esterne alla medicina, stanno permettendo di migliorare continuamente gli standard di sicurezza ed efficacia delle terapie dei pazienti sia nella gestione routinaria che in quella di emergenza (eventi clinici significativi, problematiche device).

Obiettivo: Obiettivo del nostro progetto è quello di creare un modello organizzativo che permetta di migliorare il trattamento dei pazienti e ottimizzare le risorse del dipartimento di Cardiologia.
Metodi: Sono stati raccolti dati clinici (caratteristiche demografiche, eventi clinici e informazioni sui dispositivi medici) dei pazienti portatori di device cardiaci elettronici impiantabili (CIEDs) in una piattaforma web-based collegata ai dati del dispositivo attraverso il sistema di controllo remoto. La piattaforma è inoltre disegnata per visualizzare report statistici che permettono di confrontarre la qualità della cura del paziente con dati pubblicati e specifici standard di qualità.

Risultati: Da gennaio 2024 a marzo 2024 presso il nostro dipartimento di Cardiologia sono stati arruolati nella piattaforma CERN QI CRM 99 pazienti (55,56% maschi) portatori di device cardiaci impiantabili (In figura 1 sono presenti i grafici del tipo di device ed indicazioni all'impianto) seguiti con controllo remoto. Ad oggi è stato riportato un solo evento clinico, insorgenza di tachicardia atriale non sostenuta gestita con terapia farmacologica.

Conclusione: L'utilizzo de dati raccolti in maniera sistematica ci permetteranno di avere una visione attenta e dettagliata dei nostri pazienti e i dati estratti o visualizzabili nelle reportistiche a disposizione ci permetteranno di migliorare l'attenzione e la cura rivolta ai poratori di CIEDs del nostro centro.

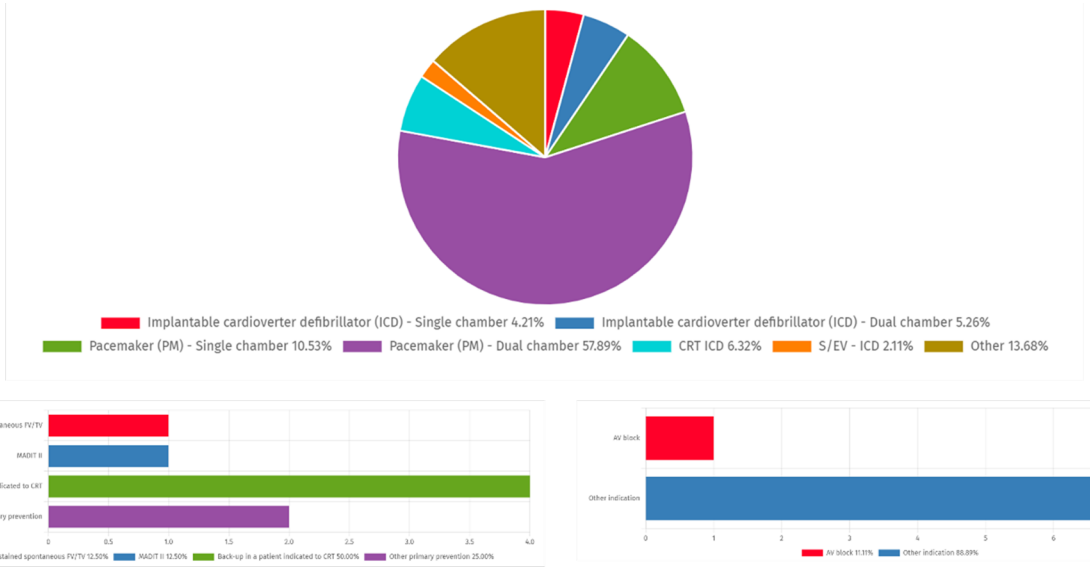


Figura 1 Esemplificazione dei report presenti nella piattaforma web-bsed utilizzata per la gestione routinaria e non dei pazienti poratori di CIEDs.

EP.03.09

FUNCTIONAL SUBSTRATE ANALYSIS IN PATIENTS WITH PERSISTENT ATRIAL FIBRILLATION

Michele Magnocavallo [1], Pietro Rossi [1], Filippo Maria Cauti [2], Marco Polselli [1], Domenico Della Rocca [3], Luigi Iaia [1], Raffaele Quaglione [4], Gianfranco Piccirillo [4], Stefano Bianchi [1]

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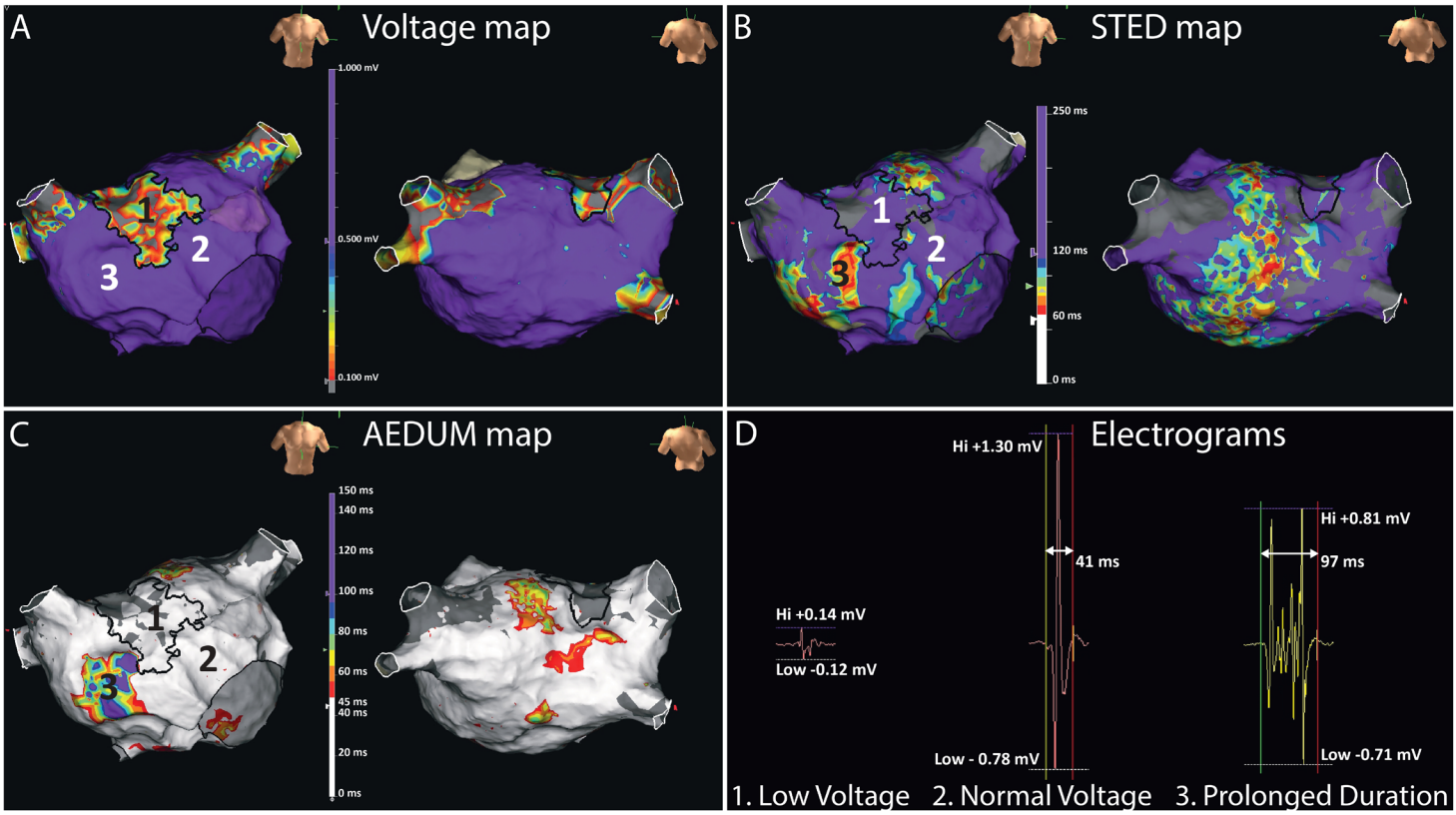
Objectives: The aim of this study was to describe the correlation between Atrial Electrogram Duration Map (AEDUM), Spatiotemporal Electrogram Dispersion (STED) and Low Voltage Areas (LVA) in patients with Persistent Atrial Fibrillation (PsAF).

Background: The degree of Left Atrial (LA) tissue remodelling and augmented anisotropic conduction is one of the major issues related to PsAF ablation outcome.

Methods: This study enrolled consecutive patients with PsAF undergoing pulmonary vein isolation. In all patients, voltage, AEDUM and STED maps were created and was reported the correlation between these three mapping methods.

Results: A total of 40 patients with PsAF were enrolled. The mean age was 62.2 ± 7.4 years and males were 72.5% (n=29). The overall bipolar voltage of the LA was 3.06 ± 1.87mV. All patients had at least one AEDUM area (overall AEDUM area: 21.8 ± 8.2 cm2); the mean longest Electrogram (EGMs) duration was 90 ± 19 ms. STED areas with <120 ms was 46.3 ± 20.2 cm2 which covered 45 ± 22% of the LA surface. AEDUM and STED areas were most frequently reported on the roof, the anterior wall and the septum. The extension of the AEDUM areas was significantly smaller than STED areas with CL <120 ms (21.8 ± 8.2 vs 46.3 ± 20.2; p-value: <0.0001). In 24 patients (60%), AEDUM areas was entirely included in the STED areas with CL <120 ms. In the three (7.5%) patients with LVA, no correspondence with STED and AEDUM was noted.

Conclusion: AEDUM and STED maps allow to identify areas of conductive dysfunction as a possible atrial substrate even if a normal voltage is detected.



EP.03.10

RIDUZIONE DEI TEMPI PERIPROCEDURALI DOPO ABLAZIONE DI FA CON UN NUOVO DISPOSITIVO PER CHIUSURA VASCOLARE

Giosue' Mascioli [1], Tommaso Bignotti [1], Claudio Pratola [1], Giuliana Facchetti [1], Eleonora Baccolo [1], Maurizio Di Silvesto [1], Cesare Mario Fusco [1], Mirko Privitera [1], Fausto Scaldi [1], Erika Sironi [2], Fabio Lissa [2]
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Introduzione: La dichiarazione di consenso degli Esperti EHRA/HRS/APHRS/LAHRS del 2024 sull'ablazione trans-catetere per la fibrillazione atriale ha riconosciuto che la chiusura vascolare venosa basata su dispositivi deve essere ritenuta uno standard per ottenere un'emostasi rapida, ridurre il tempo del paziente in sala elettrofisiologica, abbreviare l'allettamento e ridurre i tempi di dimissione, migliorando così la soddisfazione del paziente.

Obiettivi dello studio: Il nostro studio si è proposto di valutare il tempo alla dimissione dal laboratorio di elettrofisiologia e il tempo alla deambulazione in pazienti sottoposti ad ablazione della FA con radiofrequenza.

Metodi: 10 pazienti, età media 55 ± 7 aa, 50% di sesso maschile, sono stati sottoposti tra il 1° marzo ed il 15 aprile 2024 ad ablazione per FA nella nostra Struttura: questi pazienti costituiscono il gruppo di studio. Al termine della procedura gli accessi venosi vascolari (2 accessi da 8 Fr, ed un accesso da 7Fr) sono stati chiusi mediante sistema VASCADE MVP© (Cardiva Medical, Santa Clara, California, USA). Il sistema è stato studiato e approvato per la chiusura dei siti di accesso venoso femorale a seguito di procedure trans-catetere per introduttori di calibro da 6 a 12 Fr (massimo 15F OD). I dati valutati in questi pazienti sono stati confrontati con la coorte storica dei nostri pazienti sottoposti ad ablazione per FA nei quali gli accessi vascolari sono stati chiusi mediante compressione manuale.

Risultati: La chiusura tramite VASCADE MVP è stata eseguita con successo in tutti i pazienti al termine della procedura. L'ACT medio al momento della chiusura era di 302 ± 75 sec e non è stata utilizzata protamina. Nei 57 pazienti sottoposti a chiusura mediante compressione manuale l'ACT medio al momento della rimozione degli introduttori era di 178 ± 14 sec; in 6 di questi pazienti è stata utilizzata protamina (10.5%). Il tempo medio per raggiungere l'emostasi è stato di 4 ± 1 min nei pazienti del gruppo di studio vs 12 ± 3 min nei pazienti del gruppo di controllo. Il tempo alla dimissione dal laboratorio di elettrofisiologia è stato di 5 ± 3 minuti nei pazienti del gruppo di studio vs 118 ± 23 min nel gruppo controllo. Il tempo alla deambulazione è stato di 120 ± 15 minuti nel gruppo di studio vs 385 ± 27 min nel gruppo controllo. Non abbiamo osservato complicanze vascolari nei pazienti sottoposti a chiusura con VASCADE MVP; 1 paziente del gruppo di controllo è stato sottoposto a ricompressione manuale per un piccolo pseudo-aneurisma femorale.

Conclusioni: L'uso di VASCADE MVP per la chiusura vascolare venosa è fattibile e sicuro. Il sistema garantisce un'emostasi rapida nei pazienti scoagulati e permette di ridurre il tempo di deambulazione. La nostra esperienza preliminare conferma che l'uso di questo sistema riduce i tempi di permanenza nella sala operatoria e il tempo alla deambulazione , consentendo così una dimissione ospedaliera più rapida.

EP.03.11
ELECTROPHYSIOLOGICAL CHARACTERISTICS ASSOCIATED WITH SPONTANEOUS TERMINATION OF VENTRICULAR FIBRILLATION

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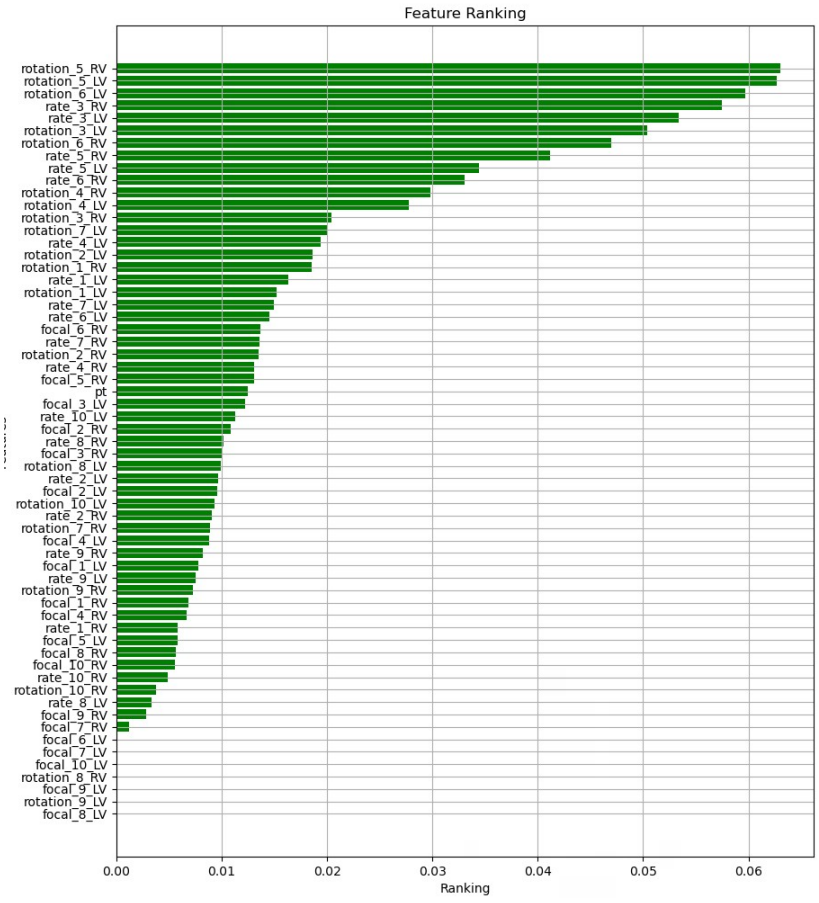
Cardiology hospital Haut Lévêque, CHU Bordeaux, Bordeaux, FRANCE

Background: Ventricular fibrillation (VF) is a major arrhythmia responsible for sudden cardiac death (SCD). In a subset of patients and conditions, VF may revert spontaneously to sinus rhythm (SR). The incidence of this phenomenon remains uncertain, but spontaneous termination of VF is becoming increasingly recognized, also through intracardiac recordings of implantable cardioverter defibrillators (ICDs).
The aim of this study is trying to improve our understanding of spontaneous VF termination by identifying through an endocardial and epicardial combined point of view, using the electrocardiographic imaging (ECGi) its unique electrophysiological features relative to sustained VF.

Methods: Between January 2011 and December 2018, 76 consecutive patients referred to the Hôpital Haut-Lévêque in Bordeaux, France, underwent electrophysiological study (EPS) for SCD risk stratification. Inclusion criteria for this study were: 1) presence of both sustained VF (SVF) and non-sustained VF (NSVF), induced through the EPS in the same patient. Exclusion criteria were: 1) presence of ventricular thrombus, 2) hemodynamic instability precluding a safe induction of VF, 3) ventricular pre-excitation, and 4) non-revascularized clinically significant coronary artery disease. In total, 18 patients met the inclusion and exclusion criteria and were enrolled in this study.We utilized decapolar catheters to record intracardiac electrograms (EGMs) and electrocardiographic imaging (ECGi) for epicardial EGMs and mapping. VF episodes were segmented into 2-second temporal windows (TWs) for an in-depth examination of both temporal (VF cycle lengths [VFCL], rate gradients) and spatial features (focal activities, reentrant activities, wannabe reentry, and reentry collisions).

Results: Forty-six VF episodes were induced, comprising 28 NSVF and 18 SVF. NSVF and SVF had similar VFCLs at the first 2-second time-window (TW), but NSVF exhibited significantly longer CLs in the middle ($p=0.002$) and final TWs ($p<0.001$), irrespective of the induction method. An acceleration of 15 msec from the first to middle TWs was found to be predictive of SVF (AUC= 0.84). Transmural gradients and intraventricular LV to RV gradient greater than 10 msec were associated with SVF ($p<0.001$). Focal activities were more prevalent in the RV but did not significantly differ between NSVF and SVF ($p=0.44$). Reentrant activities covered a higher percentage of VF cycles in SVF compared to NSVF (76% vs 43%, $p<0.01$), particularly in the LV, with a notable increase in rotations in SVF compared to NSVF during the tachycardia ($p<0.001$). Wannabe reentries were more common in NSVF ($p<0.001$), and reentry collisions were observed more frequently in NSVF in the final TWs ($p<0.001$). Supervised machine learning Random Forest algorithm and multivariate analysis identified that VFCL increasing in the 1st-2nd TWs ($p<0.001$; AUC = 0.87) and then in the 4th-5th, leading to an increase of rotations ($p=0.04$; AUC = 0.94),were predictive of SVF continuation.



Conclusion: The study highlights distinct temporal and spatial electrophysiological features between NSVF and SVF. Key predictors of sustained VF include early acceleration of VFCL, a higher percentage of VF cycles covered by reentrant activities, and increased rotations, particularly in the LV. These findings provide insights into the mechanisms of VF termination and maintenance, offering potential avenues for targeted therapeutic interventions and improved ICD programming.

EP.03.12

PRELIMINARY IMPLANTATION EXPERIENCE OF A NOVEL INSERTABLE CARDIAC MONITOR IN EUROPE

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Background: The LUX-Dx (Boston Scientific) is a novel insertable cardiac monitor (ICM) introduced into the European market since October 2022.

Purpose: This study aims to outline the initial experience of LUX-Dx implantation in Europe.

Methods: The system comprises an incision tool and a single-piece insertion tool pre-loaded with the small (1.2 cm3) ICM. The implantation procedure involves incision, creation of a device pocket, insertion of the ICM, verification of sensing, and incision closure. Subsequently, patients receive a mobile device with a preloaded App, connecting to their ICM and transmitting data daily or as necessary to the management system. Data collected at European centers were analyzed at the time of implantation and before patient discharge.

Results: A total of 368 implantation procedures were conducted across 23 centers. Syncope (n = 235, 64%) and cryptogenic stroke (n = 34, 9%) were the most frequent indications for ICM implantation. The majority of procedures (337, 92%) were performed in electrophysiology laboratories by experienced operators. Local anesthesia was utilized in 357 (97%) patients, with systemic or local antibiotics administered before the procedure in 205 (56%) cases. Surface ECG mapping was conducted before 109 (30%) insertions. All ICMs were successfully implanted in the left parasternal region, oriented at 45° in 323 (88%) patients. Repositioning was necessary after sensing verification in 9 (2%) patients. No procedural complications were reported, with a median time from skin incision to suture of 4 minutes (25th-75th percentiles 2-7). Mean R-wave amplitude was 0.39±0.30 mV at implantation and 0.41±0.31 mV before patient discharge (on average after 1 day). P-wave visibility, defined as the ratio of clearly identifiable P-waves to heart cycles during a 10-second ECG with regular 1:1 conduction, was 91±20% at implantation and 91±20% before discharge. No differences in procedural time, R-wave amplitude, and P-wave visibility were observed across various patient characteristics or indications (Table).

Sex	Incision-to-suture time (min)	R-wave amplitude (mV)	P-visibility (%)
Male	5.9±5.3	0.4±0.2	91±20
Female	5.4±5.2	0.4±0.4	89±20
Age (Years)			
<20	6.8±3.2	0.7±0.4	86±13
20-29	6.4±6.4	0.4±0.2	94±16
30-39	5.6±3.8	0.5±0.4	94±12
40-49	4.9±3.7	0.4±0.2	91±15
50-59	6.1±6.2	0.4±0.2	92±16
60-69	6.8±6.5	0.4±0.3	87±26
70-79	5.6±5.2	0.3±0.2	89±23
≥80	5.0±4.9	0.4±0.4	93±16
BMI (Kg/m2)			
<18.5	6.7±5.1	0.4±0.3	90±19
18.5-24.9	6.2±5.2	0.4±0.2	88±22
25.0-29.9	5.6±6.8	0.3±0.2	92±16
≥30	3.1±3.1	0.4±0.7	98±5
Indication			
Syncope	5.4±5.1	0.4±0.2	91±19
Cryptogenic stroke	4.2±3.6	0.4±0.3	90±23
Suspected AF	6.0±3.8	0.5±0.4	87±22
Suspected VT	6.3±5.8	0.4±0.2	87±21
Palpitations	5.9±5.1	0.5±0.7	90±15
Other	8.5±8.5	0.4±0.3	91±15

Conclusions: LUX-Dx implantation appears efficient and straightforward, with favorable post-implantation sensing values across all indications and patient characteristics.

EP.03.13

CLINICAL PREDICTORS OF LEFT ATRIAL LOW-VOLTAGE AREAS IN ATRIAL FIBRILLATION PATIENTS UNDERGOING TRANSCATHETER ABLATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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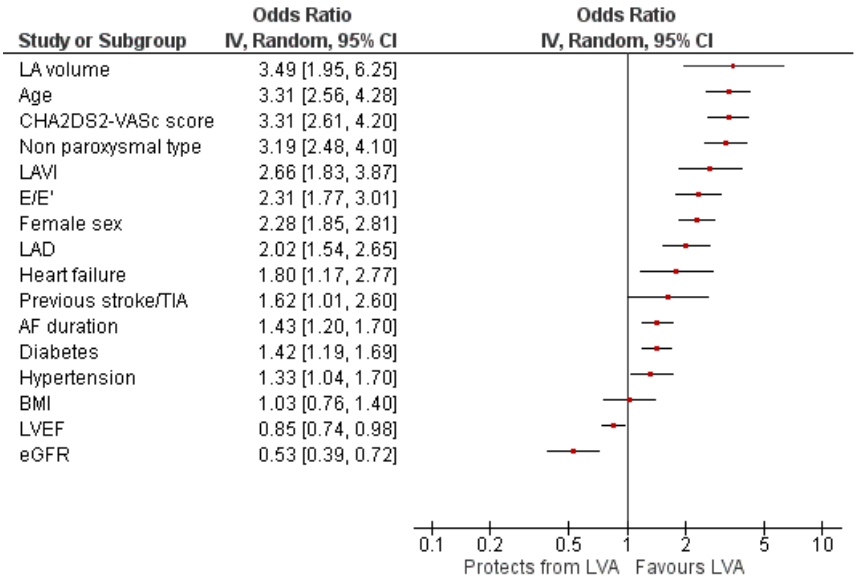
Background: Low voltage areas (LVAs) are a frequent finding during voltage mapping of the left atrium (LA) in atrial fibrillation (AF) patients, mainly in the context of transcatheter pulmonary vein isolation (PVI). They are associated with myocardial remodeling and with arrhythmia recurrence. However, the clinical features that may predict the presence of LVAs are still unclear.

Aim: Thus, the aim of this meta-analysis was to summarize the current evidence on the relationship between the main clinical features and risk factors of AF patients and the presence of LVAs in the left atrium.

Methods: A systematic review of peer-reviewed original research studies published up to March 2023 was conducted using the MEDLINE, Web of Science, Scopus and Cochrane Central databases. The technical requirements for performing a meta-analysis of the main population characteristics associated with the presence with LVAs were met.
Of the 413 results after duplicates removal, 22 articles met the inclusion/exclusion criteria (5250 patients).

Results: We found a significant association between the presence of any low voltage area on voltage mapping and the parameters displayed in Figure 1 (in ascending order, based on odds ratio as a measure of size effect). Significant patient-related predictors were female sex, diabetes mellitus, hypertension, CHA2DS2-VASc score, heart failure; eGFR showed an inverse correlation with LVAs. Among echocardiographic parameters LA volume, LA volume indexed, LA antero-posterior diameter and E/E' ratio were associated with increased risk of LVAs; left ventricular ejection fraction showed an inverse correlation with LVAs. Regarding AF-related characteristics, non-paroxysmal type of AF was identified as a significant predictor of LVAs.

Conclusions: This systematic review and meta-analysis identified consistent associations between readily available clinical characteristics of AF patients and the presence of LVAs in the left atrium. The predictive value of such features can help the clinicians in identifying the best management strategy for AF and those who can benefit from substrate modification therapy.



EP.03.14

ASYSTOLE ON LOOP RECORDER IN PATIENTS WITH UNEXPLAINED SYNCOPE AND NEGATIVE TILT TESTING: AGE DISTRIBUTION AND CLINICAL PREDICTORS

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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.

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

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 diferent 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

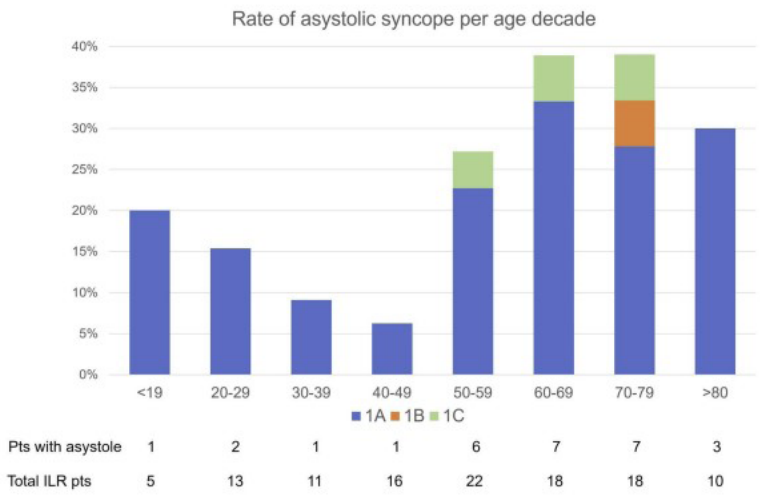
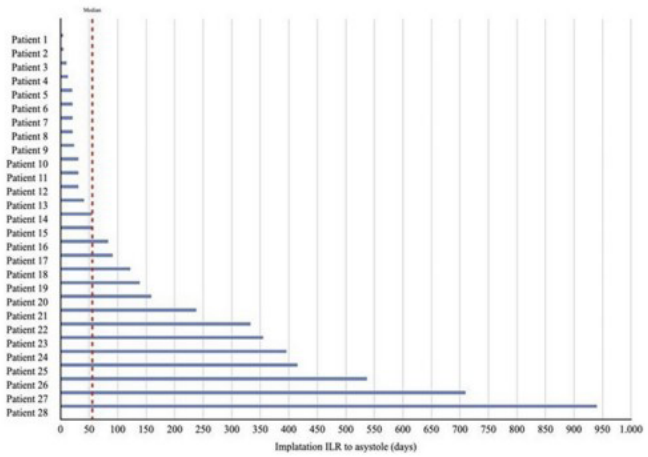


Fig. 1 Age distribution (per decades) of ILR detected asystole during lifespan

Fig. 2 Time from ILR implantation to asystole detection



EP.03.15

ATTIVITÀ ELETTRICA ATRIALE IN ASSENZA DI ONDA P ALL'ECG IN PACING HISSIANO E MIGLIORAMENTO DELLA FUNZIONE DI POMPA VENTRICOLARE SINISTRA. UN CASO DI PARALISI ATRIALE SECONDARIA PARZIALE REVERSIBILE?

Vera Perniciaro [1], Grigorios Katsouras [1], Michele Luca Dadamo [2], Fabrizio Fortunato [3], Maurizio Bizzarro [1], Annalia Semeraro [1], Massimo Grimaldi [1]
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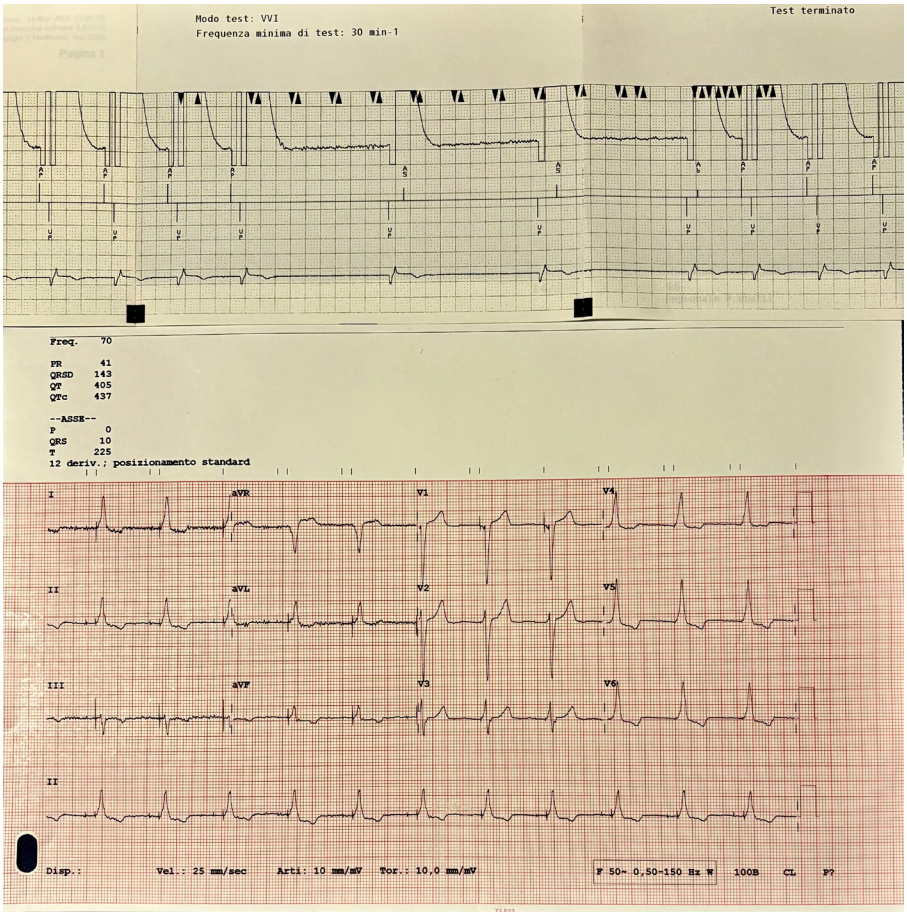
Il caso clinico tratta di un uomo di 80 anni affetto da ipertensione arteriosa e ipercolesterolemia e con cardiopatia valvolare ed ischemica cronica con moderata disfunzione di pompa ventricolare sinistra (FE 45%), sottoposto a plastica dell'anello mitralico e successivamente ad angioplastica coronarica percutanea con impianto di stent medicato su circonflessa al tratto medio. Portatore di pacemaker bicamerale per malattia del nodo del seno con anche episodi di fibrillazione atriale parossistica. Al follow-up documentazione di episodi di tachicardia ventricolare sostenuta registrati dal device e successivo riscontro di peggioramento della cardiopatia per evoluzione dilatativo-ipocinetica con severa disfunzione di pompa ventricolare sinistra (FE 33%) e segni e sintomi di scompenso cardiaco. All'ECG visibile blocco di branca sinistra e non chiara attività elettrica atriale. Il controllo coronarografico ha mostrato buon risultato di pregressa angioplastica.
Per tale motivo è stato eseguito upgrading di pacemaker in ICD-CRT con stimolazione hissiana non selettiva, accertata mediante la prova dell'extrastimolo. Al controllo elettronico del device eseguito otto mesi dopo, è stata eseguita programmazione in modalità VVIR data l'assenza di chiara attività elettrica atriale sull'ECG di superficie.
All'ultimo controllo elettronico del device eseguito 14 mesi dopo l'upgrading ad ICD-CRT è stata documentata attività atriale in estrema bradicardia, visibile all'elettrogramma intracardiaco sebbene sull'elettrocardiogramma di superficie non fosse visibile alcuna attività atriale; la percentuale di stimolazione ventricolare era pari al 99%. Risultavano inoltre buoni valori elettrici (soglia His 0,5/1msec). Il device è stato quindi programmato in modalità DDDR a 70 bpm.
All'ecocardiogramma recupero della funzione di pompa ventricolare sinistra con FE pari al 45% ed assenza di segni clinici di scompenso cardiaco.
Sebbene la paralisi atriale sia una malattia aritmogena rara, questo particolare caso potrebbe essere equiparato alla condizione di paralisi atriale secondaria parziale data l'assenza dell'onda P visibile sull'ECG di superficie a fronte di una attività elettrica registrata dall'elettrocatetere atriale posizionato in auricola destra. Inoltre si riconferma l'efficacia della stimolazione fisiologica (in questo caso del fascio di His) dato il recupero della funzione di pompa ventricolare sinistra e l'assenza di segni clinici di scompenso cardiaco al follow-up; tale efficacia potrebbe trovare anche espressione nella documentazione di una ripresa della attività elettrica atriale non aritmica, come già osservato nella nostra casistica di stimolazione fisiologica.



EP.03.16

NATIONWIDE MULTICENTER EXPERIENCE OF PULSED-FIELD ABLATION TECHNOLOGY FOR ATRIAL FIBRILLATION CATHETER ABLATION

Marco Polselli [1], Massimo Moltrasio [2], Antonio Bisignani [1], Saverio Iacopino [3], Claudio Tondo [2], Vincenzo Schillaci [4], Michele Magnocavallo [1], Antonio Dello Russo [5], Antonio Rossillo [6], Marco Schiavone [2], Andrea Petretta [3], Quintino Parisi [5], Giovanni Marano [4], Mario Volpicelli [7], Matteo Bertini [8], Graziana Viola [9], Stefano Bianchi [1], Michela Casella [5], Maurizio Malacrida [10], Francesco Solimene [4]

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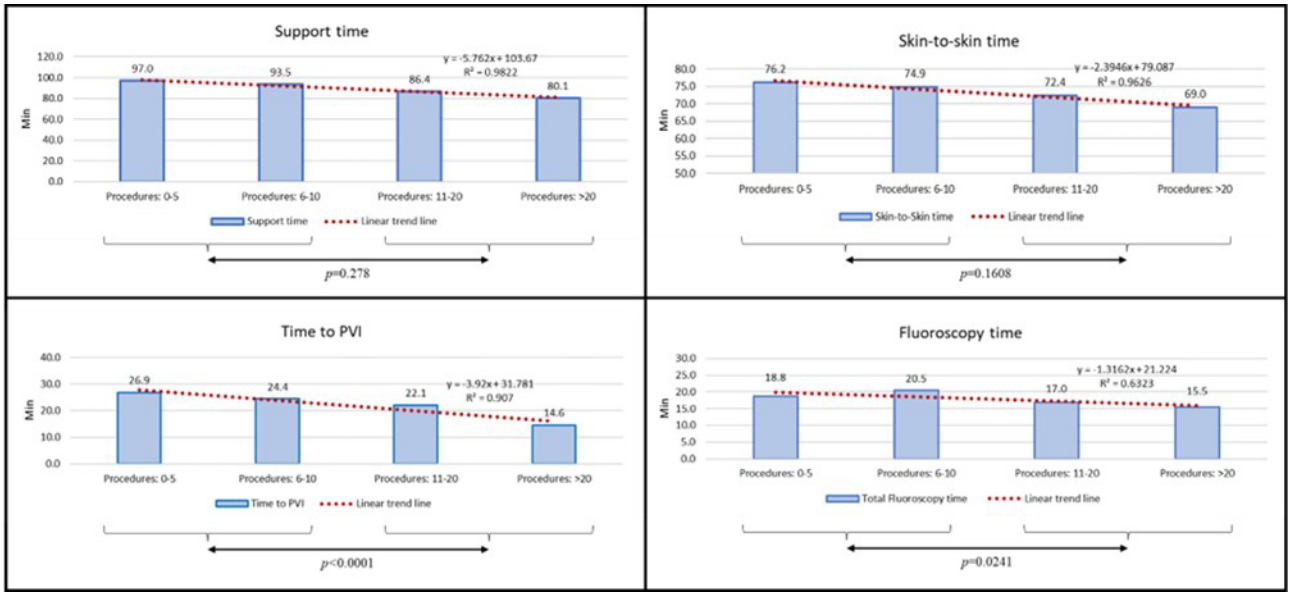
Background: Atrial fibrillation (AF) ablation requires a high level of technical proficiency. It has been observed that new ablation technologies exhibit learning curves both affecting procedural metrics and outcomes.

Purpose: To assess operators' learning curve of the pulsed field ablation (PFA, Farapulse) system for AF ablation from a large real-world nationwide registry.

Methods: All consecutive patients undergoing AF ablation with the Farapulse system in Italy were evaluated. The variation of procedural times, stratified for the operators' learning curve was assessed. For skin-to-skin comparative analysis, a total of 325 cases (175 -54%- RF ablation procedures, 150 -46%- cryoablation procedures) of PVI performed by the same operators in the year prior to the adoption of PFA were considered, based on the operators' primary preferences (i.e., RF or cryo).

Results: A total of 470 procedures were conducted by a primary operator who had successfully completed more than 20 PFA procedures and were consequently included in this analysis. Both time to PVI and fluoroscopy time significantly improved after 10 cases (25.1±10 min vs 16.2±8 for time to PVI, p<0.0001; 19.7±12 min vs 15.9±8 min for fluoroscopy time, p=0.0241, respectively) associated with consistent linear trend towards procedural times reduction (R2 0.98-0.63 across various procedural metrics) Figure 1. The number of procedures performed in less than 90 min was significantly higher when using PFA than thermal energy source: 318/348 (91.4%) cases for PFA vs 196/325 (60.3%) procedures for the historical group, p<0.0001. No major periprocedural complications were found.

Conclusion: In this nationwide prospective multicenter study, the innovative Farapulse PFA system demonstrated a swift learning curve, resulting in shorter procedural times when compared to the traditional consolidated thermal energy approach in historical data.



EP.03.17

INDICATIONS AND OUTCOMES DURING PULSED FIELD ABLATION OF ATRIAL FIBRILLATION: IS THERE A GENDER GAP?

Valentina Ribatti [1], Antonio Dello Russo [2], Saverio Iacopino [3], Stefano Bianchi [4], Francesco Solimene [5], Claudio Tondo [1], Laura Cipolletta [2], Pietro Rossi [4], Anna Ferraro [6], Armando Mariano Salito[5], Sakis Themistoclakis [7], Maurizio Russo [8], Graziana Viola [9], Pasquale Filannino [3], Benedetta Majocchi [1], Mario Volpicelli [10], Beatrice Stegagno [11], Maurizio Malacrida [11], Stefania Riva [1], Michela Casella [2]

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Background: Women are typically underrepresented in randomized clinical trials, including those focused on atrial fibrillation (AF). It is advisable to ensure adequate representation of women in future AF trials and to identify and address sex-specific barriers hindering the implementation of guideline-recommended treatments for AF.

Purpose: The purpose of the study was to look for the influence of gender on indications, clinical data and outcome results of AF ablation through a novel pulsed-field ablation (PFA) technology (Farapulse) in a large, nationwide clinical practice.

Methods: Consecutive patients who had undergone PFA of AF from 10 Italian centers were included. Protocol-directed PVI was delivered using 2000 V with eight applications per vein, that is, four applications each in the basket and flower poses. Additional lesions were performed at the operator's discretion. The ablation endpoint was PVI as assessed by entrance and exit block.

Results: With a median[IQ range] of 82[30-112] patients treated per center, a total of 768 cases were included: mean±SD age of 62±10 years, 545 (71.0%) patients with paroxysmal AF, 557 (72.5%) male. Six-hundred fourteen (79.9%) patients met Class I indications, 112 (14.6%) Class IIa and 42 (5.5%) were classified Class IIb according to current ESC Guidelines for AF. Female patients, as compared with male patients, were older (65±9 vs 61±10 years, p<0.0001), had higher LVEF (60±7 vs 57±8, p=0.0052) but similar paroxysmal AF (73.5% vs 70.0%, p=0.37) and class of indication: 81% vs 79.5% for Class I, p=0.69; 14.2% vs 14.7% for Class IIa, p=0.91 and 4.7% vs 5.8% for Class IIb, p=0.72. Advanced diagnostic was adopted similarly between groups (13.3% vs 19% for 3D mapping system, p=0.07; 27.5% vs 22.3% for intracardiac echocardiography, p=0.13) as well as sedation strategy (69.2% vs 68% for general anesthesia protocol, p=0.79) and ablation target (21.3% vs 21.4% for more extensive lesion set beyond PVI, p=1.0). Procedures in which female patients are involved required similar support (preparation plus skin-to-skin) time (70[60-93] min vs 70[60-96] min, p=0.77), skin-to-skin time (60[55-80] min vs 60[50-80] min, p=0.67), fluoroscopy time (15[11-19] min vs 15[12-20] min, p=0.38), time to PVI (19[13-25] min vs 19[14-25] min, p=0.26) and total number of PFA deliveries to achieve PVI (32[32-36] vs 32[32-38], p=0.63). PVI was achieved in all patients. No major procedure-related adverse events were reported in both groups.

Conclusion: In individuals undergoing AF ablation with the innovative Farapulse system, no notable gender disparities were observed in terms of acute clinical effectiveness, safety events, procedural approach and access to therapy.

EP.03.18

INFLUENCE OF A THREE-DIMENSIONAL MAPPING SYSTEM ON ACUTE SAFETY AND EFFICACY OF PULSED-FIELD ABLATION FOR ATRIAL FIBRILLATION

Roberto Rordorf [1], Francesco Solimene [2], Antonio Dello Russo [3], Claudio Tondo [4], Saverio Iacopino [5], Antonio Rossillo [6], Ruggero Maggio [7], Sakis Themistoclakis [8], Matteo Bertini [9], Graziana Viola [10], Maurizio Russo [11], Mario Volpicelli [12], Paolo China [8], Michele Magnocavallo [13], Paolo Compagnucci [3], Marco Schiavone [4], Gianluca Zingarini [14], Maurizio Malacrida [15], Beatrice Stegagno [15], Stefano Bianchi [13]

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Background: Visualization of the multi-electrode pulsed-field ablation (PFA) catheter within a 3D-mapping system holds the potential to improve catheter maneuverability and enhance ablation outcomes, thereby improving procedural metrics.

Purpose: The aim of our analysis, from a real-world nationwide registry, is to evaluate the impact of 3D-mapping system on acute safety and efficacy in the context of PFA of atrial fibrillation (AF).
Methods: All consecutive patients undergoing de novo AF ablation with the Farapulse system at 13 centers were included. Protocol-directed PVI was delivered using 2kV with 8 applications per vein, that is, 4 applications each in the basket and flower poses. Additional lesions were performed at the operator's discretion. Procedures were stratified according to the use or not of 3D-mapping system to validate the lesions (MAP vs Standard).

Results: Among 1002 patients, 28.3% were females, 28.2% had persistent AF, mean age was 62.9±10 years, mean LVEF was 57.4±8%. A more extensive lesion set than PVI only (PVI plus) was performed in 230 (23.0%) of the cases. A 3D-mapping system was used to validate the lesion set in 201 (20.1%) of the cases, mostly when a more extensive lesion set was applied (40% in PVI plus vs 14.1% in PVI only, p<0.001). Four-thousand forty-five (99.1%) PVs were acutely isolated on first pass (26 patients with at least 1 PVs not isolated at first pass, 2.6%), as confirmed by both entrance/exit block and/or on subsequent 3D-mapping. No differences between MAP and Standard procedures were found in terms of first pass PVI (98.8% vs 99.1%, p=0.416) or number of patients with all PV isolated at first pass (95.5% vs 97.9%, p=0.079). At the end of the procedure PVI was achieved in all patients. By looking at procedural metrics, the total number of PFA deliveries (43±12 vs 39±10, p<0.0001) and PFA deliveries outside PVs (19.6±8 vs 15.1±6, p<0.0001) were higher in the MAP group, whereas the number of PFA deliveries to achieve PVI were lower (34±4 vs 36.4±7, p<0.0001). MAP procedures had longer skin-to-skin time (94[80-120]min vs 60[50-70]min, p<0.0001), time to PVI (20[15-27]min vs 18[14-24]min, p=0.0001) or fluoroscopy time (22[18-29]min vs 14[11-18]min, p<0.0001). The MAP group exhibited increased skin-to-skin time and fluoroscopy time, even when analyzing procedures separately for those involving PVI only and those involving PVI plus. Conversely, the total number of PFA deliveries to achieve PVI (53.8±8 vs 53.3±10, p=0.254) and time to PVI (17.5[14.5-22]min vs 18[12-25]min, p=0.516) were comparable between MAP and Standard groups during PVI plus. No major complications occurred in both groups.

Conclusion: In our real-life experience, the use of Farapulse PFA system for de novo AF ablation was rapid, safe and acutely effective resulting in a very high first-pass isolation rate. 3D-mapping system was used in a minority of patients and was not associated with an increase in acute success-rate.

EP.03.19

TEMPORAL COURSE OF BIOMARKERS INDICATIVE OF MYOCARDIAL INJURY DURING CELLULAR ELECTROPORATION BY MEANS OF PULSED-FIELD ABLATION AND RADIOFREQUENCY ABLATION OF ATRIAL FIBRILLATION

Yari Valeri [1], Paolo Compagnucci [1], Giovanni Volpato [1], Quintino Parisi [1], Laura Cipolletta [1], Agostino Misiani [1], Silvano Molini [1], Leonardo D'Angelo [1], Lara Luciani [1], Francesca Campanelli [1], Gemma Gaggiotti [1], Francesco Masci [2], Maurizio Malacrida [2], Michela Casella [1], Antonio Dello Russo [1]
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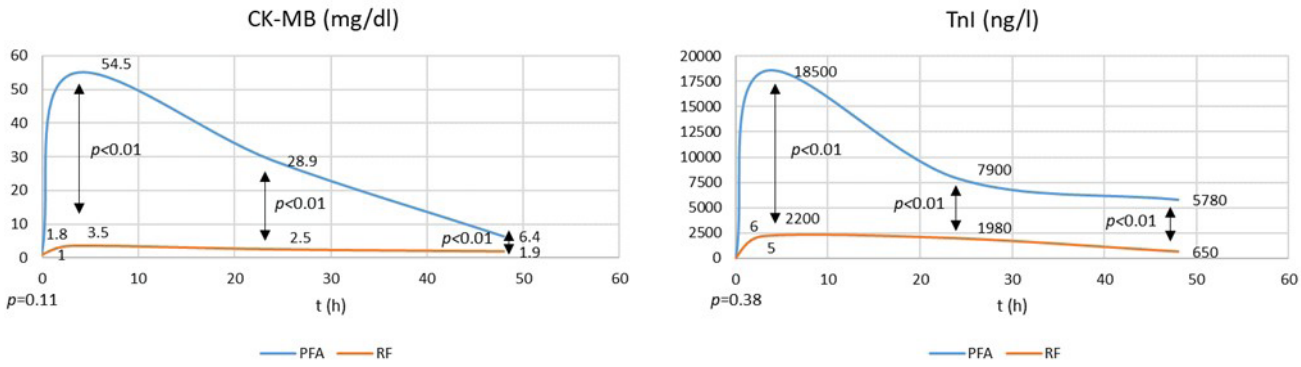
Background: Previous studies have demonstrated that cardiac markers of myocardial injury elevate after both radiofrequency (RF) atrial fibrillation (AF) ablation and non-thermal pulsed-field ablation (PFA, Farapulse) technology based on cells electroporation. However, a comprehensive comparison of peri-procedural temporal trends regarding the precise kinetics of biomarker release has not been conducted.

Objective: To compare acute myocardial injury through cardiac troponin I (TnI, ng/l) and creatinine kinase-MB (CK-MB, mg/dl) variation after pulmonary vein isolation (PVI) performed with different technologies (PFA vs RF).

Methods: Fifty patients undergoing paroxysmal AF ablation with PVI were retrospectively enrolled, 25 treated with PFA and 25 with RF (matched for age, sex, BMI, left atrium size). PFA was delivered by a protocol-directed PVI using 2kV with 8 applications per PV, that is, 4 applications each in the basket and flower poses; during RF ablation, circular lesions were carried out at the antrum of each PV at 40W. Pre- and post-procedure samples of TnI and CK-MB values were collected before PFA ablation and at 3h, 24h and 48h after ablation. Data are reported as median[IQ range].

Results: All patients exhibited TnI and CK-MB values in the normal range and baseline values were homogeneous between PFA and RF groups. Evaluating the kinetic of these cardiac biomarkers, both TnI and CK-MB values significantly rose from baseline to 3h, had a recovery trend after 24h and 48h and were significantly different between groups after PFA/RF at each temporal evaluation step. Temporal trends are depicted in Figure 1. PVI was achieved in all patients (100%) using only PFA or RF. No major procedure-related adverse events were reported in both groups.

Conclusion: Our results showed that both TnI and CK-MB enzyme level increased after PVI by means of both PFA and RF and were higher after cellular electroporation by PFA than RF.



EP.03.20

LEADLESS ULTRASOUND-BASED CARDIAC RESYNCHRONIZATION SYSTEM IN HEART FAILURE. RESULTS FROM THE SOLVE-CRT SINGLE-ARM AND RANDOMIZED COHORTS

Matteo Ziacchi [1], Mauro Biffi [1], Christian Butter [2], Christopher Aldo Rinaldi [3,4], Prashanthan Sanders [5], Spencer H. Kubo [6], Simon James [7], Imran K. Niazi [8], Tim R. Betts [9], Emad Aziz [10], Angelo Auricchio [11], Michael R. Gold [12], JoAnn Lindenfeld [13], Mary Norine Walsh [14], Jagmeet P. Singh [15]

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Background: Despite the well-established role of CRT in heart failure, major limitations of CRT include unsuccessful coronary sinus (CS) lead placement, one third non-responders in conventional CRT patients and higher complications risk in CRT upgrade procedures. The WiSE® CRT System (EBR Systems, Inc) is designed to overcome these limitations. Prior non-randomized studies with the WiSE System have shown high implant success rates and improvement in LV remodeling and heart failure symptoms.

Objectives: The pivotal SOLVE-CRT study is comprised of two parts: a randomized part and the subsequent single-arm part enrolled during the pandemic. The primary safety endpoint is freedom from Type I (device & procedure-related) complications through 6 months and primary efficacy endpoint is the mean relative (%) change in left ventricular end systolic volume (LVESV) from baseline to 6 months.

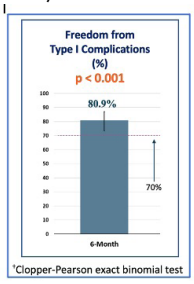
Method: Between Jan. 2018 and Mar. 2020, the randomized part enrolled 108 participants with three indications: non-responders (NR), previously untreated, including acute and chronic lead failures (PU), and high-risk upgrades (HRU). All underwent device implantation and were then randomized in 1:1 ratio to Treatment (system turned ON) or Control (system turned OFF) groups. In the single arm, 75 participants were enrolled within two indications: PU and HRU. The primary safety analysis included all 183 participants. The primary efficacy analysis included 100 participants (PU, HRU) – 75 from the single arm and 25 patients from the randomized part. A secondary efficacy analysis included 99 participants (PU, HRU, NR) from the randomized cohort comparing device ON vs. OFF.

Results - Safety Analysis: The primary safety endpoint was met with an 80.9% rate of freedom from Type I complications measured against a performance goal of 70% (p<0.001).

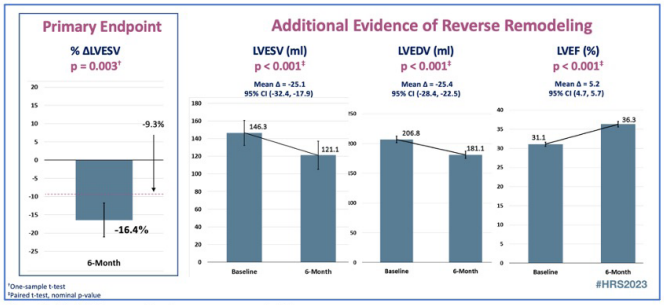
Results – Efficacy Analysis: The primary efficacy endpoint was met with a 16.4% (95% CI, -21.0% to -11.7%) reduction in mean LVESV measured against a performance goal of 9.3% (p=0.003).

Results - Randomized Group: The secondary efficacy analysis showed that the Treatment group had a larger mean reduction in LVESV (14.6% vs 5.2%, p=0.005) compared to the Control group, which confirms the primary efficacy results.

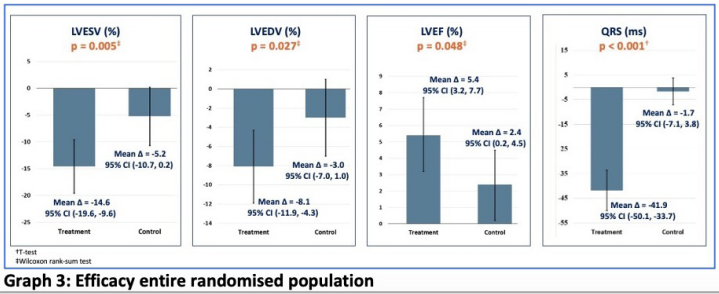
Conclusion: This pivotal SOLVE-CRT trial demonstrates that leadless, ultrasound-based endocardial pacing for heart failure is feasible and efficacious showing evidence of left ventricular remodelling and electrical response after 6 months in both the randomised and single arm cohorts.



Graph 1: Safety analysis entire population



Graph 2: Efficacy single arm population



Graph 3: Efficacy entire randomised population

E-POSTER 4

GIOVEDI' 19 SETTEMBRE

AREA E-POSTER

18:30-19:30

SESSIONE E-POSTER 4
MISCELLANEA

Moderatori: Paolo Compagnucci (Ancona), Davide Mei (Modena)

EP.04.01
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 [1], Manuel Cerini [1], Mariagiulia Bellicini [1], Emiliano Calvi [1], Paolo Fornaro [1], Angelica Cersosimo [1], Filippo Mariotti [1], Anna Giulia Damato [1], Chiara Medori [2], Alessandro Macchia [2], Cecilia Micheletti [2], Matteo Bertelli [2], Luca Bontempi [1], Gianfranco Mitacchione [1], Antonio Curnis [1]
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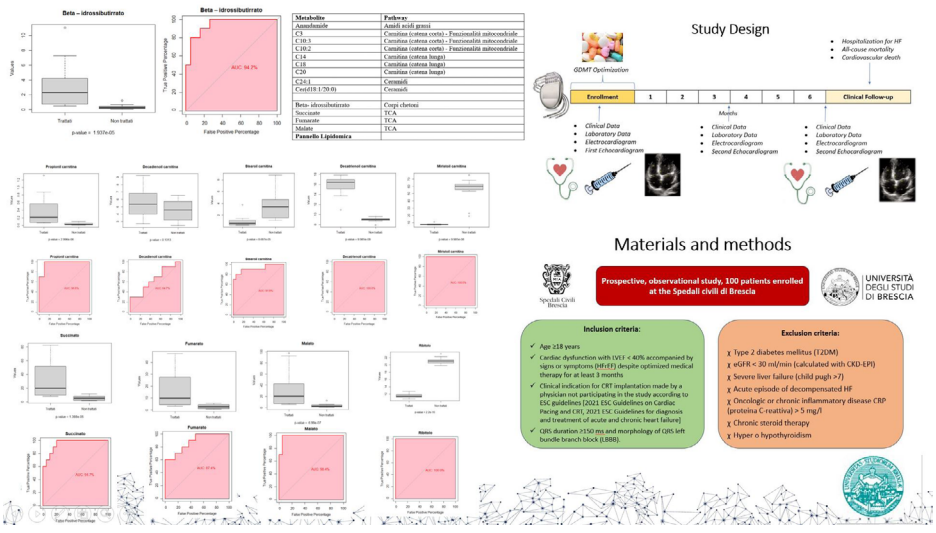
Background: Recenti studi randomizzati e controllati hanno dimostrato un significativo beneficio prognostico degli inibitori del SGLT2 (gliflozine) nei pazienti con insufficienza cardiaca (HF).Nello studio DAPA-HF, dapagliflozin ha ridotto l'outcome primario di peggioramento dell'HF e della morte cardiovascolare del 26%.Lo studio EMPEROR ha confermato risultati simili per empagliflozin, mostrando una riduzione del 21% della morte cardiovascolare o del ricovero per insufficienza cardiaca.Gli effetti degli inibitori SGLT2 si sono dimostrati coerenti nei pazienti con o senza diabete.

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'analisi degli inibitori del SGLT2 e l'individuazione di relazioni tra questi biomarcatori potrebbe fornire ulteriori informazioni sulle loro proprietà metaboliche e sui potenziali effetti benefici. L'identificazione di nuovi biomarcatori e la comprensione delle loro associazioni con gli inibitori del 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, questo aumento potrebbe contribuire ad alterare la gestione del calcio, che a sua volta potrebbe portare ad alterazioni della contrazione e ad aritmie. Gli inibitori del SGLT2 riducono l'attività dello scambiatore sodio-idrogeno sarcolemmale, della corrente di sodio tardiva verso l'interno, e della proteina chinasi II calcio-calmodulina-dipendente, che compromette la contrazione e il rilassamento dei cardiomiociti. Meccanismo che potrebbe ridurre la percentuale di non responder alla CRT.

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 infollowupa3-6-12mesi con rivalutazione dell'LVEF e prelievo ematico venoso a 6mesi.

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 hanno mostrato livelli ridotti;associati allo stress cardiovascolare.



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 CRT.

EP.04.02

BRUGADA-LIKE ECG PATTERN INDUCED BY ENTRECTINIB THERAPY: A NOVEL PHENOCOPY ?

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Background: Entrectinib is a novel tyrosine kinase inhibitor, which may be preferred among its class in patients with metastatic non-small cell lung cancer (NSCLC) due to its favourable brain distribution. Rare cases of early cardiotoxity have been reported, but the full cardiovascular impact is yet to be fully understood.

Case report: A 57-year-old man with no prior cardiovascular disease, affected by ROS1 mutated metastatic NSCLC, was admitted to the emergency department of a spoke hospital for fatigue and dyspnoea. The patient had been on therapy with Entrectinib for 1 week. Electrocardiography (ECG) revealed widespread and severe ST-T segment elevation, suggestive of a Brugada pattern. Troponin I levels were slightly increased, and coronary angiography was negative for epicardial stenosis.
Entrectinib therapy was therefore suspended, in suspicion of cardiotoxicity, leading to gradual improvement of the ECG abnormalities and symptom resolution.
The patient was referred to our hospital to perform serial ECG monitoring during the introduction of Crizotinib, an alternative tyrosine kinase inhibitor. The drug was well tolerated, with no signs of toxicity.
In light of the rare case reports of Brugada pattern and sudden cardiac death associated with Entrectinib therapy, the patient underwent an electrophysiological study, which showed normal conduction parameters and non-inducibility of ventricular arrhythmias. A Flecainide test was performed, and drug-induced Brugada syndrome was ruled out.

Discussion: To the best of our knowledge, the diagnosis of a Brugada pattern in patients undergoing Entrectinib therapy has only been reported in 2 other cases. One patient showed a Brugada pattern and experienced sustained ventricular arrhythmias, leading to sudden cardiac death; the other patient was diagnosed with Brugada phenocopy and vasospastic angina, after a positive acetylcholine provocation test. This is the first case in which a drug test was performed after Entrectinib cardiotoxicity to exclude Brugada syndrome, and our findings support that ECG changes in these patients may be attributed to other phenomena (such as vasospasm, or possibly myocarditis), rather than to Brugada syndrome. However, ECG and symptom monitoring during the introduction of Entrectinib may be advisable to detect early signs of potential cardiotoxicity.

EP.04.03

CARDIOMIOPATIA CATECOLAMMINERGICA ACUTA IATROGENA. UN CASO DI BLOCCO AV TOTALE, APICAL BALLOONING E TROMBOSI VENTRICOLARE SINISTRA IN CORSO DI ISOPRENALINA

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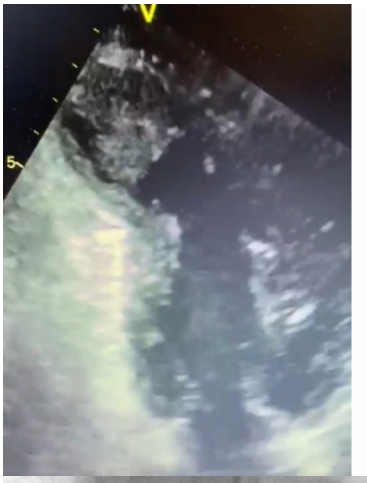
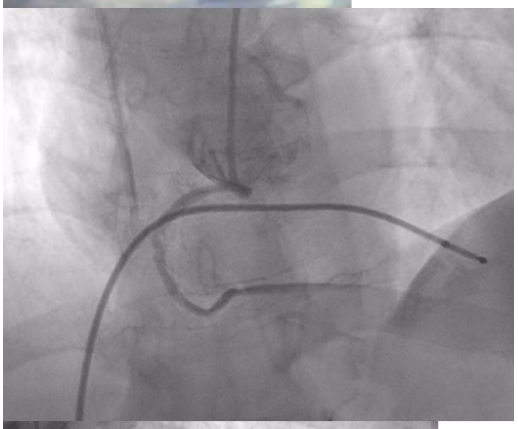
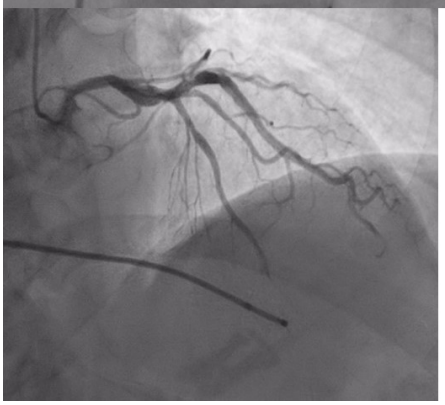
E' noto che i feocromocitomi e i paragangliomi possano provocare cardiopatia catecolamminergica acuta: le catecolammine secrete comprendono noradrenalina, adrenalina, dopamina. Chimicamente l'isoprenalina è sintetizzata in modo analogo all'adrenalina: l'interazione del cloro-3,4-diidrossiacetofene con l'isopropilammina dà luogo al isopropilammino-3,4-diidrossiacetofenone, la cui riduzione del gruppo carbonilico per idrogenazione dà isoprenalina(IPN).
L'iniezione endovenosa di IPN determina aumento della richiesta di ossigeno da parte del miocardio e nel contempo diminuisce la perfusione coronarica con effetto amplificato in caso di sottostante substrato ischemico.
E' possibile, pertanto, che l'infusione di IPN condizioni negativamente la perfusione miocardica regionale anche in contesto angiografico indenne da lesioni coronariche, con un effetto transitorio legato al trattamento.
Viene a seguito descritto un caso di disfunzione ventricolare sinistra transitoria da stunning miocardico catecolamminergico.
Uomo, 55 anni, con riscontro occasionale di blocco di branca sinistra ad ECGramma basale: test provocativi di I e II livello negativi (test da sforzo ed ECostress dobutamina). In corso di esami prericovero per intervento programmato di laparocele documentato BAV totale con BBsx, asintomatico e con compenso cardiocircolatorio. All'ECOcardio ISVsx, FE 55%, lieve insufficienza mitralica e tricuspidale.
Infusa IPN a 0.1 mcg/Kg/min (diluizione 0.2 mg/ml – preparazione 5 fl in 50cc Sol Fis 0.9%) con frequenza ventricolare 50/bpm in persistente dissociazione atrio-ventricolare. Posizionato PM temporaneo da via venosa femorale dx per trasporto protetto in Centro Hub per impianto di pacemaker bicamerale definitivo. Si verificava episodio di insufficienza ventricolare sinistra acuta, responsiva a terapia diuretica endovenosa: riscontro ecocardiografico di estesa acinesia apicale (apical ballooning), non preesistente, con evidenza di apposizione trombotica contestuale occupante l'apice ventricolare.
Eseguita coronarografia: negativa per coronaropatia.
Avviata terapia anticoagulante con eparina: in prima giornata eseguito controllo ecocardiografico con documentata conferma di risoluzione della trombosi apicale e recupero completo della cinetica parietale in tutti i segmenti. Avviato a impianto di pacemaker bicamerale.
In considerazione del quadro angiografico in acuto, del precoce e completo recupero funzionale contrattile globale e la rapida stabilizzazione emodinamica dopo sospensione di isoprenalina, si concludeva per episodio di disfunzione sinistra acuta catecolamminergica iatrogena in corso di infusione di inotropo. In studi di farmacologia e istopatologia eseguiti su topi, la somministrazione di isoprenalina è stata dimostrata indurre disfunzione ventricolare sinistra per infiammazione diretta dei cardiomiociti, con danno relativamente permanente.
Utilizzata in acuto e ad alta dose per il supporto di paziente con blocco di conduzione avanzato, abbiamo documentato l'induzione di stunning regionale transitorio in assenza di sottostante substrato ischemico miocardico e con conservata vascolarizzazione coronarica.







EP.04.04

RISULTATI DELLO STUDIO IMAGE CRT

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La terapia di resincronizzazione cardiaca (CRT) è un trattamento consolidato nei pazienti con insufficienza cardiaca, disfunzione del ventricolo sinistro (LV) e QRS largo. Tuttavia, circa il 40% dei pazienti non risponde alla terapia. In particolare, i pazienti con tempo di conduzione dal ventricolo destro ai siti di stimolazione ventricolare sinistra (RV -to-LV) minore di 80 ms sono stati associati a una bassa risposta alla CRT. Recentemente è stata introdotta la tecnologia di stimolazione multisito (MPP) per migliorare la risposta alla stimolazione CRT da diversi siti del ventricolo sinistro.

Obiettivo: Lo scopo di questo studio è valutare se l'MPP migliora l'esito clinico della CRT in pazienti con RV-to-LV<80ms.

Metodi: IMAGE CRT è uno studio osservazionale, multicentrico, in cieco per il paziente, che ha incluso pazienti con ritardo RV-to-LV<80 ms. La risposta CRT, definita come riduzione relativa del volume telesistolico ventricolare sinistro (LVESV) > o = 15%, è stata confrontata in 2 gruppi paralleli, pazienti con dispositivi CRT con funzione MPP (MPP ON) e pazienti con dispositivi CRT senza funzione MPP (MPP OFF).

Risultati: complessivamente sono stati arruolati 227 pazienti, 62 pazienti nel gruppo MPP ON e 165 pazienti nel gruppo MPP OFF. Le caratteristiche demografiche sono riassunte in Tabella 1. Al follow-up di 6 mesi, la percentuale di pazienti che hanno risposto alla CRT è stata del 58% nel gruppo MPP ON e del 42% nel gruppo MPP OFF (p=0,035). Nel gruppo MPP ON la riduzione relativa media di LVESV è stata del 19,4% mentre nel gruppo MPP OFF 9,9% (p=0,044).

Conclusioni: I nostri risultati suggeriscono che nei pazienti con un ritardo interventricolare ridotto l'uso della stimolazione multisito può migliorare la risposta alla CRT.

1. Tabella 1 Caratteristiche demografiche di base.

Parametro	MPP ON RV-LV<80ms n= 55	MPP OFF RV-LV<80ms n= 165	*Valore p*
Maschi, n (%)	43 (78)	135 (82)	*0.692*
Età, anni	69±9	67±10	*0.318*
NYHA II/III/IV, n (%)	20/35/0 (36/64/0)	43/117/5 (27/71/3)	*0.173*
Durata QRS, ms	144±22	149±29	*0.187*
Durata PR, ms	209±73	182±58	*0.309*
LVEF, %	28±6	27±6	*0.269*
LVESV, ml	147±62	152±55	*0.601*
IHD, n (%)	36 (65)	78 (47)	*0.029*
Diabete, n (%)	16 (29)	51 (31)	0.932
Insufficienza renale, n (%)	7 (13)	38 (23)	0.148
BPCO, n (%)	11 (20)	42 (25)	0.524
Ipertensione, n (%)	21 (38)	87 (53)	*0.580*
Blocco di branca sinistra, n (%)	38 (69)	125 (76)	*0.424*

Tabella 1 Risultati del contributo dell'MPP sulla popolazione

Parametro	MPP ON RV-LV<80ms n= 55	MPP OFF RV-LV<80ms n= 165	*Valore P*
LVEF a 6 mesi, %	37±9	33±9	*0.012*
Responder a 6 mesi, n (%)	32 (58)	69 (42)	*0.035*

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EP.04.05

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

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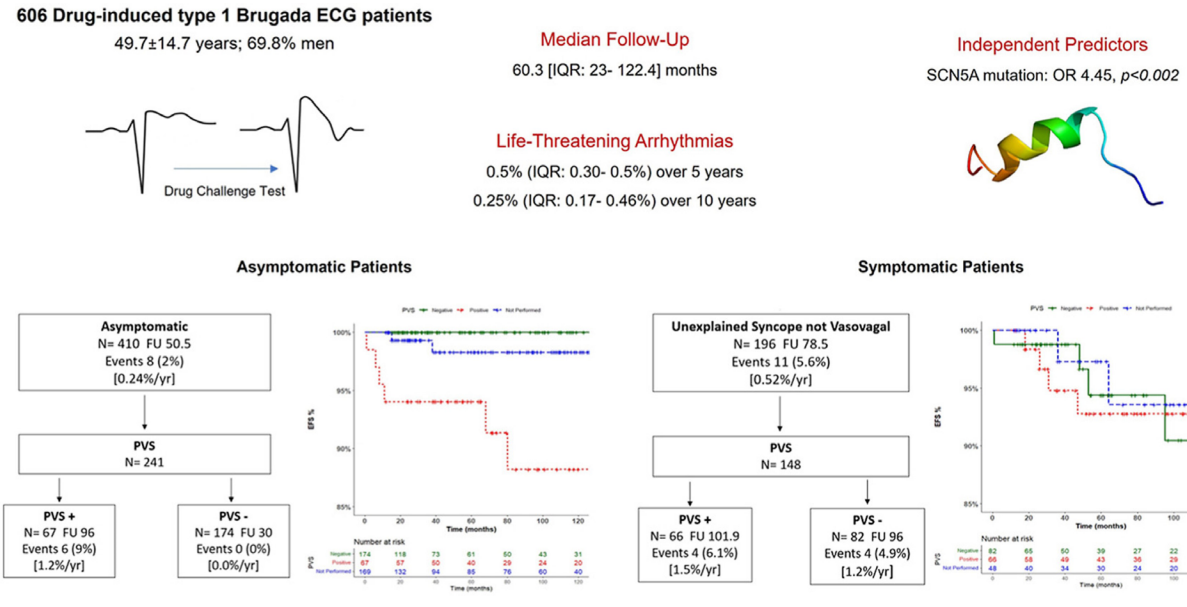
Background: There are limited real-world data on the extended prognosis of patients with drug-induced type 1 Brugada electrocardiogram (ECG).

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.



EP.04.06

TAKOTSUBO SYNDROME ASSOCIATED WITH NEURALLY MEDIATED REFLEX SYNCOPE: A METASUMMARY OF CASE REPORTS AND LITERATURE REVIEW

Angelo Comune, Erika Parente, Filippo Pecori, Nicola Colalillo, Nicola Massimo, Giovanni B. Valentino, Gerardo Nigro, Vincenzo Russo
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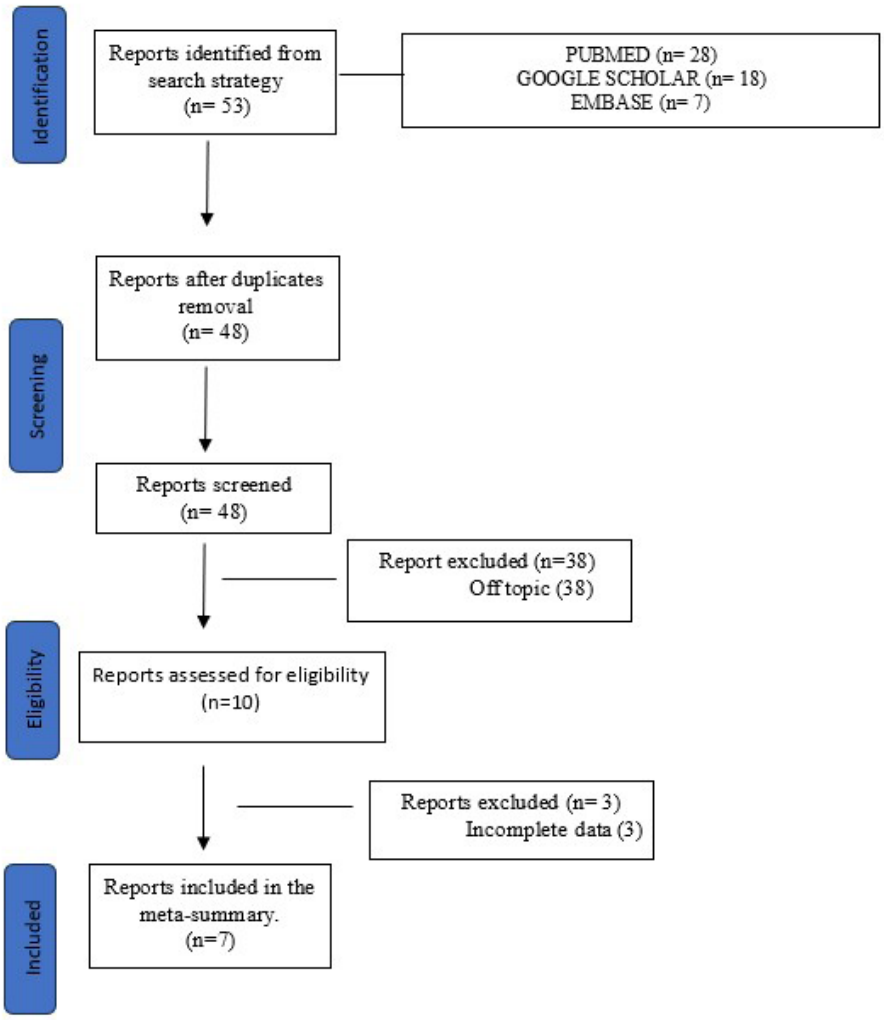
Background: Neutrally mediate reflex syncope (NMRS) has been recently described as a possible trigger of Takotsubo syndrome (TTS). Data about this association are lacking in the literature.

Methods: In the present meta-summary, 7 case reports describing patients who experienced TTS fol-lowing 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 examinated; 75% were females, mainly on menopausal state (85.7). The TTS triggers were: vasovagal syncope in 7 pa-tients (87.5%) and situational syncope in 1 patient (12.5%). 3 patients underwent comprensive evalua-tion of syncope and 2 of them showed a cardioinhibitory response

Conclusions: NMRS due to sudden orthostatism and emotional stress, mainly with a cardioinhibitory response, seems to be a possible 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.



EP.04.07

ECG SCREENING AND SUDDEN CARDIAC DEATH PREVENTION IN ENDURANCE ATHLETES

Enrico Crispino [1], Danilo Ricciardi [1], Paola Liporace [1], Lorenzo Frau [1], Daniele Valente [1], Vincenzo Nafisio [1], Elisabetta Spoto [1], Maria Chiara D'Amore [1], Elisabetta Sanasi [2], Luigi Sanasi [1], Eliana Laura Italiano [1], Gaia Loiacono [1], Vito Calabrese [1], Francesco Picarelli [1], Flavio Gioia [1], Gian Paolo Ussia [1], Francesco Grigioni [1]

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Introduction: Sudden cardiac death (SCD) is the leading cause of mortality in athletes during sport activity. Identifying non-invasive and repeatable risk markers during annual athletes screening remains a goal for the scientific community for the prevention of cardiovascular disease. The ECG, exercise test and spirometry are part of the annual screening program in the sport population. The Heart Rate Variability (HRV) has been shown to be an independent predictor of mortality in populations with cardiovascular disease, but its relationship with SCD has been little explored in those at low risk, including athletes. This study aims to use and evaluate a five-minute electrocardiographic screening in a specific population of athletes practicing endurance sports in addition to the routine clinical practice.

Aim: The primary aim of the study is to assess whether morphological and spectral ECG analysis in endurance athletes by a 5-minute ECG can add information to periodic screening for the prevention of cardiovascular diseases and sudden cardiac death.

Materials and Methods

The study population were selected from Endurance Marathon athletes of some of the main sport clubs in Rome - Italy. A control group was also collected for comparison. The 5 minutes ECG was recorded at rest with an event recorder mobile device that use three electrodes, which allows 6 leads recording. HRV indices were calculated using the Kubios software. A morphological analysis was performed and the HRV parameters were analyzed in the time and frequency domains.

Results: A total of 554 subjects (220 athletes and 334 controls, 58.6% male) were analyzed. A higher incidence of sinus arrhythmias, LAFB, 1st degree AV block, and J point and ST-segment abnormalities in athletes compared to controls was observed ($p<0.05$). Athletes had a significantly shorter QTc than the control group (394.87 +- 30.55 ms vs. 407.01 +-29.09 ms, respectively), a finding suggestive of greater protection from episodes of malignant ventricular arrhythmias. The HRV - PNS (-0.73 +- 1.25 vs -0.21 +- 1.45) and SNS (1.71 +- 1.91 vs 0.58 +-1.43) indices were also suggestive for higher vagal tone. Given the absence of a normality range of standard HRV parameters in the athlete population, values in the normal range of the 5th to 95th percentile were extrapolated from the whole population. thirty-eight patients, 17% of the endurance athletes was identified as "out of the box" athletes and followed up for further evaluation, the study is on-going.

Conclusions: The 5-minute cardiac ECG, combining a more accurate analysis than the 12-lead ECG, allows a greater number of static and dynamic alterations to be detected; moreover, the analysis of HRV could provide even more information, such that it could be considered as a complementary tool during the examination and follow-up of athletes. Long-term prospective studies are needed to correlate alterations in HRV and clinical events.

	Cases	Controls	P-value
PR (ms)	166,32 ± 20,88	154,18 ± 21,45	5,77 x 10^-9
QT (ms)	375,31 ± 26,59	361,43± 25,31	1,71 x 10^-10
QTc (ms)	394,87 ± 30,55	407,01 ± 29,09	8,99 x 10^-7
PNS	-0,21 ± 1,45	-0,73 ± 1,25	56,78 x 10^-6
SNS	0,58 ± 1,43	1,71 ± 1,91	2,66 x 10^-13
Medium RR (ms)	907,67 ± 155,32	795,87 ± 125,12	3,12 x 10^-13
Min HR (bpm)	61,03 ± 9,43	68,63 ± 10,51	9,45 x 10^-19
Max HR (bpm)	78,22 ± 15,67	88,21 ± 14,54	4,44 x 10^-12
Mean HR (bpm)	68,76 ± 12,03	76,98 ± 12,33	6,43x 10^-15
HF peak (Hz)	0,19 ± 0,05	0,22 ± 0,07	5,67 x 10^-8
AF	1	0	0,4
1°degree AVB	15	6	0,005
RBBB	3	6	1
LAFB	30	10	2,9 x 10^-6
VEB	13	13	0,31
SVEB	10	13	0,83
J point elevation	3	1	0,31
ST depression	6	1	0,02
T wave inversion	2	0	0,15

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EP.04.08

ANALISI DEI RISULTATI PRELIMINARI DEL REGISTRO REACTION

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Introduzione: I sistemi di monitoraggio remoto (RM) sono stati introdotti all'inizio degli anni 2000 per seguire a distanza i pazienti con dispositivi elettronici impiantabili cardiaci (CIED). Inizialmente, le trasmissioni di dati dai CIED ai medici venivano eseguite tramite trasmettitori collegati via radiofrequenza ai CIED. Al giorno d'oggi la tecnologia Bluetooth e le applicazioni per smartphone consentono di collegare i CIED con gli smartphone dei pazienti, di eliminare la necessità di trasmettitori aggiuntivi e di trasmettere i dati diagnostici del dispositivo ai medici in tempo reale, quando si verificano eventi aritmici o clinici rilevanti.

Obiettivo: Misurare la compliance del paziente per l'utilizzo della tecnologia Bluetooth e delle applicazioni per smartphone per CIED RM.

Metodi: Il REACTION REGISTRY è uno studio osservazionale, prospettico, no profit, internazionale, multicentrico, progettato per valutare la fattibilità nella pratica clinica della tecnologie Bluetooth e delle applicazioni per smartphone nel follow-up nei pazienti portatori di CIED.

Risultati: A partire da settembre 2021 21 dipartimenti di Cardiologia hanno incluso 182 pazienti Le caratteristiche demografiche sono mostrate nella tabella 1. Su 182 pazienti, 149 (81,87%) sono stati in grado di collegare in maniera autonoma il dispositivo impiantato con il sistema RM. Nei restanti 33 pazienti (18,13%), la connessione RM è stata facilitata dal personale ospedaliero, dagli operatori sanitari o dai team di supporto tecnico del produttore del dispositivo. Su 182 pazienti con connessione RM, 158 (86,81%) sono stati in grado di eseguire trasmissioni di dati del dispositivo.

Conclusioni: I risultati preliminari del nostro registro sul RM di CIED tramite la tecnologia Bluetooth e le applicazioni per smartphone mostrano che la maggior parte (81,87%) dei pazienti è in grado di connettersi ai sistemi RM autonomamente e una volta connessi, la maggior parte (86,81%) dei pazienti è in grado di inviare trasmissioni RM.

Pazienti (182)	
Età	69,02 ± 10,19
Genere	
Femmine	34 (18,68%)
Maschi	148 (81,31%)
Tipo Device	
CRT-D	64 (35,16%)
ICD	118 (64,84%)
Cellulare [160]	
Paziente	94 (58,75%)
Produttore	11 (6,88%)
Caregiver	55 (34,37%)
Ipertensione	113 (61,75%)
Diabete	
Si (non specificato)	11 (18,64%)
Tipo I	8 (13,56%)
Tipo II	40 (67,80%)
Scompenso Cardiaco	115 (62,84%)
Storia Aritmie ventricolari	54 (29,51%)
Storia aritmie atriali	44 (24,04%)
TIA	11 (6,01%)
Ictus	20 (10,93%)

Tabella 1. Caratteristiche demografiche

Compliance con il controllo remoto	
Registrazione APP da parte del paziente	149 (81,87%)
I trasmissione RM effettuata da paziente	158 (86,81%)
Ragione per la quale non è stata effettuata registrazione RM autonomamente:	
Caregiver/familiare ha effettuato registrazione	1 (3,03%)
Paziente non abituato alla tecnologia	10 (30,30%)
Lo staff ospedaliero ha effettuato la registrazione	21 (63,64%)
Problemi di connessione	1 (3,03%)
Ragione per la quale non è stata effettuata la I trasmissione RM autonomamente:	
Paziente non abituato alla tecnologia	7 (29,17%)
Lo staff ospedaliero ha effettuato la I Trasmissione	1 (4,17%)
Lo staff del produttore ha supportato il paziente	16 (66,67%)

Tabella 2. Ragioni della mancata registrazione al controllo remoto e I trasmissione effettuate autonomamente.

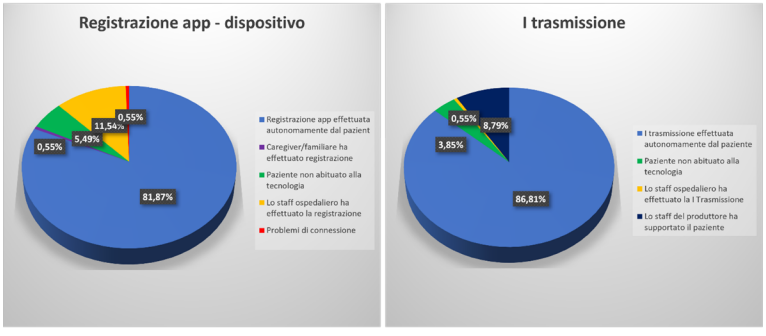

Figura 1 Percentuale registrazione app-dispositivo e prima trasmissione.

EP.04.09
BLOCCO PERCUTANEO DEL GANGLIO STELLATO NEL PREMATURO CON SINDROME DEL QT LUNGO E TACHICARDIA VENTRICOLARE POLIMORFA

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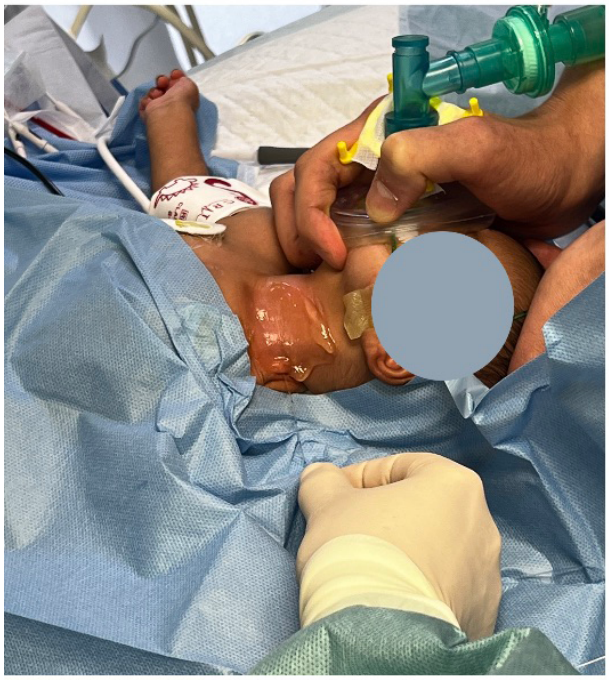
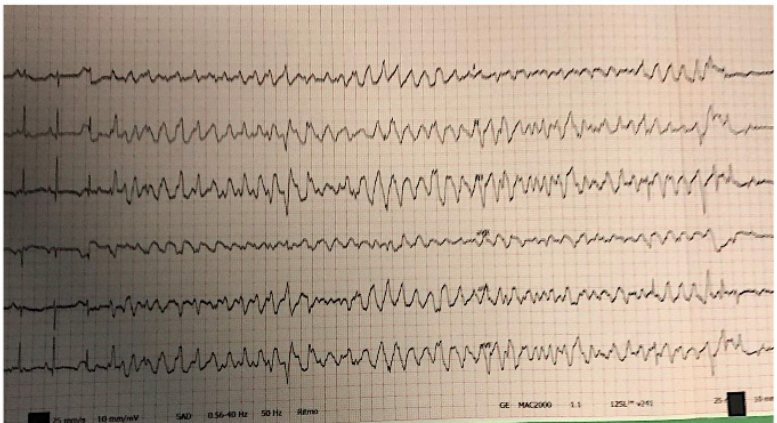
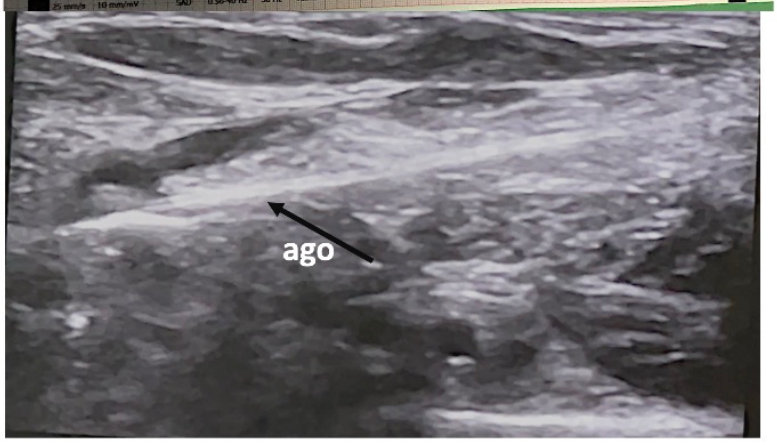
Lo storm aritmico comunemente viene definito come l'evenienza di tre o più episodi separati di tachicardia ventricolare nelle 24 ore, ciascuno dei quali richieda l'interruzione tramite un intervento terapeutico, oppure di una TV incessante della durata di almeno 12h. E' una delle condizioni più difficili da trattare specie nelle sue forme gravi e refrattarie alla terapia antiaritmica. Molto spesso interessa pazienti con cardiopatie strutturali e più raramente pazienti con canalopatie ed incide negativamente sulla prognosi. I farmaci antiaritmici non sono molti, non sempre sono efficaci, tollerati o utilizzabili, dato l'effetto inotropo negativo di alcuni di loro. Tra i rimedi non farmacologici l'ablazione transcatetere ha un ruolo cruciale ma non è fattibile in ogni centro, almeno in urgenza, ed inoltre eseguire l'ablazione in un paziente con storm aritmico in atto aumenta di molto i rischi procedurali: tutto questo nel paziente pediatrico pretermine è enormemente amplificato. Da qui la necessità di altri rimedi, quali il blocco percutaneo del ganglio stellato, che possano permettere di stabilizzare il paziente riducendo il numero di aritmie.

Caso: presentiamo il caso di una neonata di 2400 grammi di peso fatta nascere pretermine con TC alla 33° W per riscontro di tachiaritmie recidivanti in utero alternate a bradicardie significative. L'Ecg alla nascita metteva in evidenza una bradicardia sinusale condotta 2:1, con FC ventricolare di 45 bpm un Q-Tc di 620 ms, ed episodi subentranti di tachicardia ventricolare (TV) con torsione di punta. La neonata è stata trattata con Magnesio solfato e.v. e le è stato impiantato un pacemaker VVI con elettrocatetere epicardico per poter meglio titolare la successiva somministrazione di Propranololo. Ciò nonostante si sono riscontrati nuovamente episodi di torsione di punta per cui è stato eseguito senza complicazioni il blocco percutaneo del ganglio stellato sinistro (PLSGB) con approccio laterale ecoguidato con bolo locale di Ropivacaina 2 mg e posizionamento di catetere da infusione perigangliare con infusione di 1,2 mg del farmaco nelle 24 ore. Il catetere è stato fissato alla cute del collo della neonata con colla chirurgica per evitarne lo sposizionamento . Dopo il PLSGB si è riscontrata una lieve ptosi palpebrale sinistra. Successivamente non si sono più verificati episodi di TV e la paziente ha continuato ad assumere Propranololo 0,70 mg/Kg x 3/die e Mexiletina 3,4 mg/Kg x 3/die. Dopo l'introduzione della Mexiletina, il Q-TC è passato da 620 ms a 540 ms. L'analisi genetica ha confermato la variante c.1882G>A,p.(Gly 628 Ser) nell'esone 7 del gene KCNH2 (C5) diagnostica per LQT2. Al raggiungimento dei 4 Kg di peso la neonata sarà sottoposta a simpaticectomia laterale sinistra.

Conclusioni: Questo caso conferma la validità e l'efficacia del PLSGB ecoguidato nelle TV che si manifestano come storm aritmico ma dimostra anche la fattibilità della metodica nei pazienti pretermine di basso peso.







EP.04.10

BLOCCO PERCUTANEO DEL GANGLIO STELLATO NEL NEONATO CON TACHICARDIA ATRIALE SINISTRA REFRATTARIA

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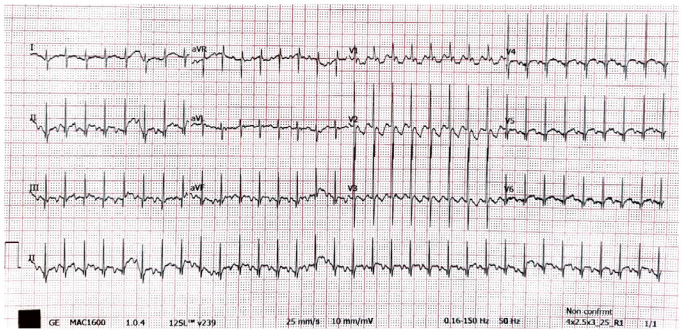
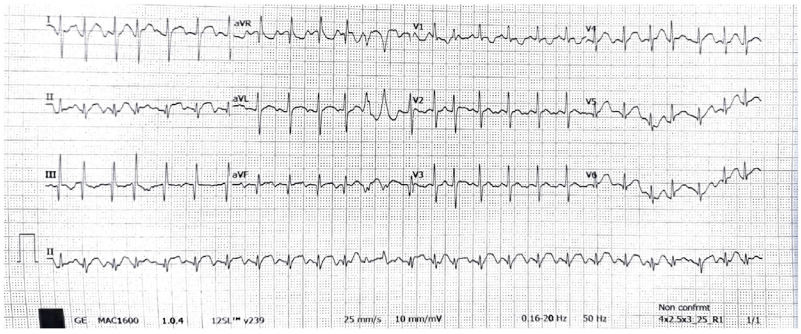
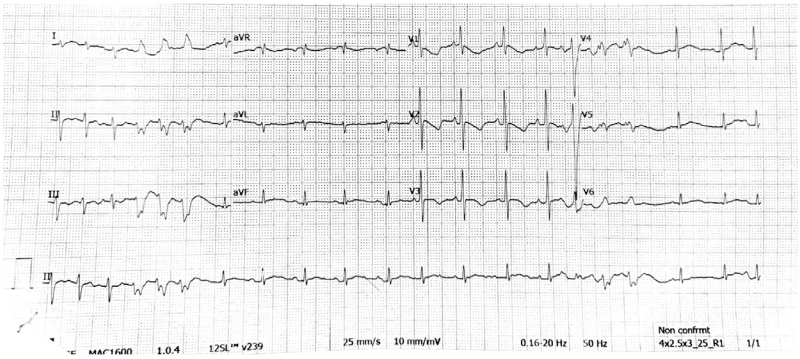
Il blocco percutaneo del ganglio stellato sinistro (PLSGB) è stato recentemente implementato per il trattamento acuto delle aritmie ventricolari refrattarie (VA). L'effetto benefico sulla suscettibilità alle aritmie sopraventricolari e sulla loro risposta ventricolare è ben caratterizzato nei modelli animali, meno nell'uomo e tantomeno nel neonato. I dati disponibili suggeriscono un significativo prolungamento del periodo refrattario atriale, una riduzione dell'inducibilità e della durata della fibrillazione atriale e di tutte le aritmie atriali spontanee intra e postoperatorie dopo chirurgia toracica e cardiaca. Qui descriviamo un caso di PLSGB per tachicardia atriale focale (AT) in un neonato di 4800 grammi di peso. CASO: Presentiamo il caso di un neonato di 4800 grammi e 63 gg di vita nato prematuro con TC elettivo a 35w+3gg per tachiaritmia fetale. L' ECG mostrava episodi molto frequenti e autolimitantisi di tachicardia atriale (AT) con conduzione atrioventricolare (AV) 1:1 e frequenza cardiaca (FC) di 200 bpm. Sono stati documentati anche battiti ventricolari prematuri isolati e ripetitivi (PVB, massimo 4 battiti). Il paziente è stato trattato dopo la nascita senza successo con overdrive atriale transesofageo, cardioversione esterna, Digossina, Flecainide, Sotalolo, Propranololo, Amiodarone, Amiodarone + Propranololo, Amiodarone+Flecainide, Amiodarone+Flecainide+Digossina, con persistenza della AT. A 63 gg di vita per l'iniziale manifestarsi di ipocinesia parietale del ventricolo sinistro, è stato eseguito il blocco percutaneo del ganglio stellato sinistro (PLSGB) con approccio laterale ecoguidato (bolo locale di Ropivacaina 6 mg), senza complicazioni, inducendo una lieve ptosi palpebrale sinistra. Nelle successive 20 ore abbiamo osservato una riduzione del burden giornaliero delle crisi di AT ed alla riduzione della FC media durante l'AT condotta 1:1 (da 200 bpm a 160 bpm) e la scomparsa dei PVB e dell'ipocinesia parietale all'ecocardiogramma. Pertanto successivamente il neonato è stato sottoposto ad infusione continua di Ropivacaina 6 mg/die tramite catetere percutaneo per 10 giorni, fissandolo alla cute del collo con colla chirurgica al fine di evitare il dislocamento accidentale dello stesso, e si è assistito a lunghi periodi di ritmo sinusale condotto 1:1 a FC 120 bpm. Il neonato è stato quindi dimesso con terapia orale: Flecainide 8mg x 3/die e Propranololo 2,5 mg x 4/die.

Conclusioni: Questo caso evidenzia la potenziale efficacia del PLSGB nel trattamento acuto delle aritmie sopraventricolari del neonato refrattarie alla terapia medica. Studi prospettici ci aiuteranno a identificare l'entità, il tempo di insorgenza e la durata del suo beneficio in base al tipo e al meccanismo dell'aritmia sottostante e alle caratteristiche cliniche del paziente.







EP.04.11

REPOLARIZATION GRADIENT CAUSES LOCAL DEPOLARIZATION ABNORMALITIES IN BRUGADA SYNDROME

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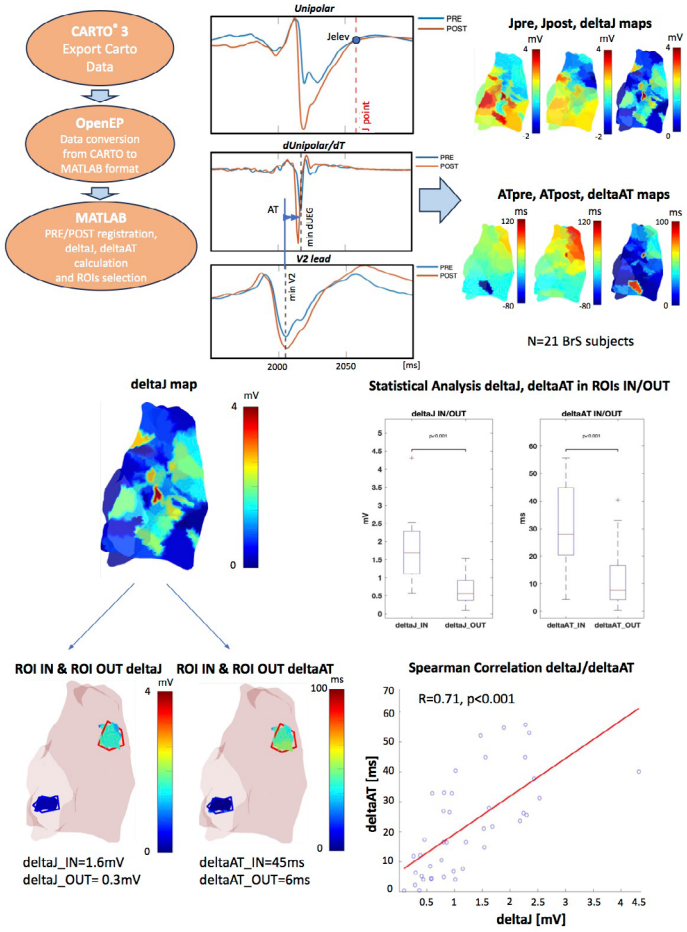
Background: Transmural voltage gradient in right ventricular outflow tract (RVOT) induces diagnostic ECG-phenotype in Brugada syndrome(BrS). Moreover, RVOT depolarization abnormalities have been described as contributors to BrS phenotype and arrhythmogenesis.

Purpose: To investigate the effect of ajmaline administration on J-elevation of RVOT unipolar signals in BrS patients. Moreover, we wanted to assess whether ajmaline-induced unipolar J-point elevation variations induced local depolarization abnormalities.

Methods: 21 BrS patients with spontaneous type-1 ECG pattern were enrolled. Due to the absence of BrS ECG pattern at the study, patients underwent RV endocardial mapping with the CARTO3 system, before (PRE) and after (POST) ajmaline administration. The PRE and POST data were exported from CARTO and converted into Matlab format using OpenEP. J-elevation for each point was calculated as the amplitude of the unipolar signal at J wave with respect to baseline. Activation time (AT) of each point was defined as the difference between local depolarization (minimum dV/dt of the unipolar signal) and surface ECG depolarization (time of the minimum signal on V2). With an automatic algorithm, corresponding PRE and POST points were selected. The difference between POST and PRE of each parameter was calculated to obtain the differential values delta-J and delta-AT. Differential values were then interpolated on the mesh of each subject to obtain 3D maps. The deltaJ map was divided into four intervals based on quartiles. We then selected a ROI 'IN' on a region with the greatest deltaJ variation, and a second ROI 'OUT' on the zone of lowest variation. The same ROIs were applied to the deltaAT map. The mean value of the respective differential parameters was extracted in each ROI.

Results: Greatest delta-J values were found in the RVOT/anterior wall. delta-J in the ROI 'IN' was greater than in the ROI 'OUT' (1.68 [1.11-2.28] vs 0.56 [0.38-0.93] mV, p<0.001). delta-AT in the ROI 'IN' was greater than in the ROI 'OUT' (27.96 [20.39-44.89] vs 7.62 [4.24-16.69] ms, p<0.001). A good correlation was found between delta-J and delta-AT, considering the data for the two ROIs together (Spearman R coefficient=0.71, p<0.001).

Conclusions: Our study shows that the repolarization gradient, evaluated by localized delta-J increase in RVOT, justifies BrS ECG phenotype and local depolarization abnormalities. A strong correlation was present in these RVOT areas between J-elevation variation and slow conducting zones.



EP.04.12

CARDIOVASCULAR PREVENTION USING LONG-TERM ECG SCREENING IN ENDURANCE ATHLETES OVER 40

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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 6L. 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.

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 Arrhytmia (n°)	168	101	2,3 x 10^-4
Sinusal Rythm (n°)	181	172	0,5
AF (n°)	1	0	0,41
1° degree AV Block (n°)	9	2	0,007
RBBB (n°)	3	6	1
LAFB (n°)	28	9	0.0005
Intermittent LAFB (n°)	1	0	0,53
LPFB (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

EP.04.13

PREVALENCE OF BRUGADA ECG PATTERN IN PSYCHIATRIC PATIENTS: A LONGITUDINAL PROSPECTIVE COHORT OF 550 PATIENTS

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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 Decembre 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 these findings.

EP.04.14

UN CASO DI CARDIOMIOPATIA IPERTROFICA OSTRUTTIVA CON ESORDIO ARITMICO E IMPORTANTE GRADIENTE OSTRUTTIVO ALL'EFFLUSSO: WORK-UP DIAGNOSTICO-TERAPEUTICO

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Il caso che presentiamo riguarda un paziente di 52 anni, ex-fumatore, dislipidemico, obeso, noto alla Cardiologia per episodi di scompenso cardiaco congestizio in corso di FA in cuore strutturalmente sano. Dopo un periodo di 12 mesi in condizioni stabili, tornava alla nostra attenzione per episodio di dolore toracico oppressivo irradiato all'arto superiore sinistro e associato a sudorazione.
All'ECG teletrasmesso in UTIC evidenza di tachicardia ventricolare sostenuta a 250/min con morfologia a blocco di branca destra con ripristino spontaneo del ritmo sinusale, paziente emodinamicamente stabile.
All'arrivo in UTIC veniva eseguito ecocardiogramma con riscontro di ventricolo sinistro moderatamente ipertrofico a livello settale, non evidenti difetti di cinetica ed FE nei limiti. Evidenza di SAM con gradiente max a livello dell'LVOT pari a 160 mmHg, IM eccentrica moderata. Veniva eseguito studio coronarografico, con riscontro di coronarie indenni, e ventricolografia con evidenza di significativo gradiente all'efflusso invasivo (da 270 mmHg intraventricolare a 120 mmHg).
Alla RMN cuore si confermava la diagnosi di cardiomiopatia ipertrofica ostruttiva con evidente danno strutturale (LGE) a livello del setto inferiore medio-basale e a carico di entrambi i muscoli papillari.
Veniva poi impiantato defibrillatore monocamerale Biotronik in prevenzione secondaria.
Per il significativo gradiente all'efflusso veniva intrapresa terapia con metoprololo 100 mg BID con persistenza di severo gradiente. Il paziente sarebbe candidato a terapia con mavacanten che verrà rivalutata al primo controllo a un mese. Si eseguivano prelievi per la ricerca genetica (attesi i risultati nel prossimo mese) e consigliati screening con ECG ed ecocardiogramma ai parenti di primo grado.
Discussione: il Mavacamten è il primo inibitore della miosina cardiaca approvato per il trattamento della HCMO, determina una riduzione del gradiente all'efflusso e un miglioramento del riempimento ventricolare agendo sulle basi fisiopatologiche della malattia ed è ben tollerato. Il Mavacamten è di beneficio, nel corto e medio termine, nei pazienti con HCMo che rimangono sintomatici nonostante terapia medica ottimizzata alla massima dose tollerata di beta bloccanti e calcioantagonisti.
Secondo i risultati dello studio VALOR-HCM, il mavacmten potrebbe anche aiutare a posticipare gli interventi di riduzione del setto.

EP.04.15
LA TERAPIA ANTIBIOTICA NEI PAZIENTI POST-ESTRATTI

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Introduzione: Con l'aumentare delle complicanze associate all'impianto di pacemaker e defibrillatori, è aumentato il numero di pazienti che vanno incontro ad estrazione transvenosa di elettrocateteri in seguito ad infezione degli stessi. Spesso, nei pazienti pacemaker dipendenti vi è il problema di dover effettuare un reimpianto precoce dopo l'estrazione. Questo studio si pone l'obiettivo di valutare l'incidenza di reinfezione nei pazienti post-estratti trattati con terapia antibiotica e reimpiantati con un secondo device

Materiali e Metodi di studio: Per dimostrare la riduzione delle recidive di infezione è stato fatto un follow-up di tutti i pazienti estratti nel nostro centro, differenziando tra i pazienti reimpiantati con un secondo dispositivo che sono stati sottoposti ad una terapia antibiotica mirata pre e post intervento ed i pazienti reimpiantati senza copertura antibiotica mirata pre-estrazione per la mancata individuazione di un germe specifico

Risultati dello studio: Sono state considerate 184 procedure di estrazione di device eseguite per infezione nel nostro centro. In 100 pazienti si è presentata la necessità di reimpiantare un secondo device contestualmente alla procedura di estrazione. Tra questi pazienti, 33, in cui era noto il germe dell'infezione, sono stati trattati con terapia antibiotica pre e post procedura, mentre in 24 pazienti non è stata effettuata nessuna terapia antibiotica pre-estrazione in quanto sprovvisti di un antibiotico mirato ed in attesa di positività all'emocolture. 4 pazienti invece sono stati trattati con terapia empirica, aggiornata poi post-estrazione a seguito dei risultati delle analisi del materiale estratto. Successivamente è stato eseguito un follow-up per valutare eventuali recidive di infezioni ed è emerso che: si è presentata una recidiva di infezione nel 6% dei pazienti trattati con antibiotico mirato pre e post estrazione e nel 4% dei pazienti trattati con antibiotico solo post-estrazione. Dei 4 pazienti trattati con terapia antibiotica empirica, in 1 c'è stata una recidiva infezione.

Conclusioni: Da questo studio è stato possibile dimostrare che una terapia antibiotica mirata ha ugualmente permesso di limitare le infezioni a breve e lungo termine anche nei pazienti che, non presentando emocolture positive prima della procedura di estrazione, hanno eseguito la terapia solo a seguito dei risultati ottenuti dal materiale estratto, senza l'utilizzo di una terapia antibiotica empirica.

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EP.04.16

NUOVA VARIANTE NM_004281 P. (SER377ALAFSTER47) DEL GENE BAG3 IN PAZIENTE AFFETTO DA CARDIOMIOPATIA DILATATIVA

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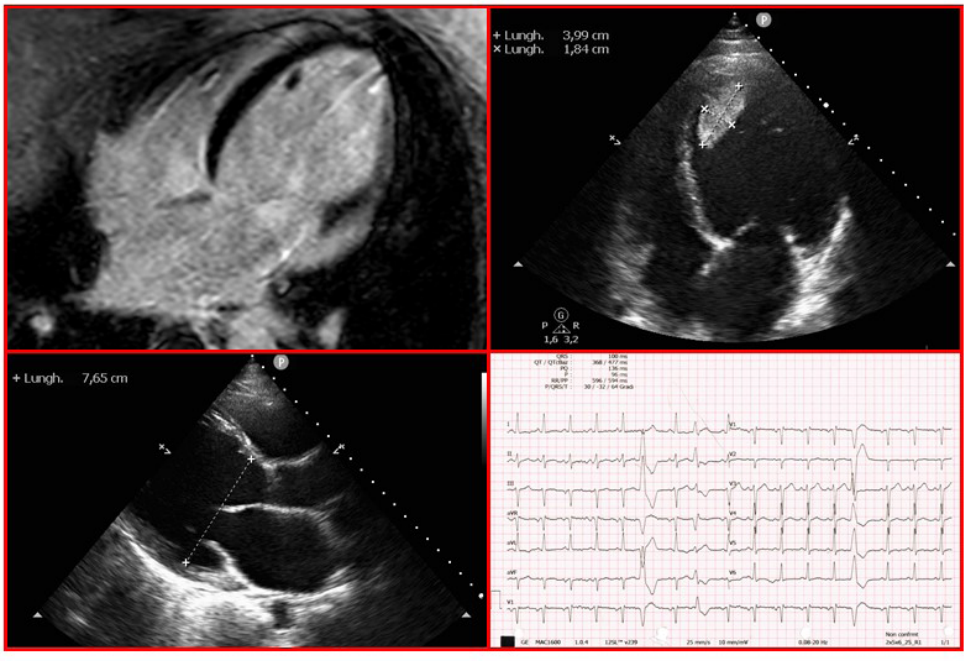
Introduzione: BAG3 è una proteina fondamentale per l'omeostasi proteica cellulare cardiaca, con funzioni di co-chaperone delle proteine da shock termico, inibizione dell'apoptosi, mantenimento dell'integrità strutturale dei dischi Z. Singole mutazioni alleliche a carico del gene BAG3 costituiscono un fattore causativo per le forme familiari di cardiomiopatia dilatativa (CMD), con prevalenza del 2.3-15% nei pazienti affetti. La penetranza è elevata (80%) nei pazienti di età > 40 anni, con rischio elevato di progressione verso lo scompenso cardiaco e un'incidenza di eventi avversi cardiaci del 5%/anno, più frequenti nei maschi con bassa FE e dilatazione ventricolare sinistra.

Case Report: Uomo, 46 anni, familiarità negativa per CMD, seguito dal 2021 per aritmie ventricolari complesse e iniziale forma di CMP ipocinetica senza dilatazione ventricolare sn (FE 45%). Ricovero per scompenso cardiaco acuto nel 04/23, riscontro ecocardiografico di severa dilatazione ventricolare sn, diffusa ipocinesia (FE 21%, DTD 68 mm), IM severa funzionale, presenza di trombo apicale con componente mobile (46x23mm). ECG: Tachicardia sinusale 102 bpm, EAS, BBDx incompleto. Alla TMT: TVNS polimorfe. TC coronarica negativa. RMN cuore: severa disfunzione biventricolare, non aree di edema né LGE. Trattato con coumadin, valsartan, bisoprololo, empaglifozin, furosemide, canrenone. Dimesso con defibrillatore indossabile LifeVest in attesa di un recupero funzionale e del risultato dell'analisi genetica mirata risultata negativa per mutazioni del gene LMNA. Iniziato ARNI. Nel follow-up documentato tramite LifeVest un episodio di fibrillazione atriale parossistica. Nel 07/23, dopo la risoluzione completa del trombo apicale, per la persistenza di severa disfunzione ventricolare nonostante terapia medica ottimale, eseguito impianto S-ICD.
L'analisi genetica completa (metodica NGS, sequenziamento su piattaforma NextSeqTM 550-ILLUMINA) ha individuato una mutazione di tipo frameshift di sequenza nucleotidica in eterozigosi c.1128del, corrispondente alla variazione p.(Ser377AlafsTer47) nell'esone 4 del gene BAG3 (NM_004281). Tale mutazione non ancora descritta in letteratura, introducendo un codone di stop prematuro, è stata considerata di probabile significato patogenetico (ACMG classe 4).

Discussione: Le mutazioni alleliche a carico del gene BAG3 sono responsabili di una quota significativa di CMD.
La mutazione NM_004281 p.(Ser377AlafsTer47), non ancora descritta in letteratura, è stata individuata in un paziente affetto da una severa forma di CMD. Il paziente presenta tutte le caratteristiche cliniche associate ad outcome sfavorevole (sesso maschile, ridotta FE e dilatazione ventricolare sn). Segnaliamo l'esordio clinico caratterizzato da aritmie ventricolari complesse che hanno preceduto sia la comparsa della dilatazione ventricolare che il quadro di scompenso cardiaco. Poiché gli eventi cardiaci avversi sono frequenti (5%/anno) in presenza di fattori clinici prognosticamente sfavorevoli, il paziente è stato trattato con terapia medica ottimizzata e sottoposto ad impianto di S-ICD, preceduto dall'impiego di LifeVest in attesa di escludere una laminopatia e dopo 3 mesi di terapia medica ottimale.

Conclusioni: La mutazione NM_004281 p.(Ser377AlafsTer47) di tipo frameshift è una nuova variazione causativa di CMD a carico dell'esone 4 del gene BAG3 non ancora descritta in letteratura. Il paziente in cui è stata individuata, presenta una severa forma di CMD associata ai principali fattori clinici prognosticamente sfavorevoli. Segnaliamo l'esordio dopo i 40 anni caratterizzato da aritmie ventricolari complesse insorte prima della comparsa di dilatazione ventricolare sn.



EP.04.17

SHOULD UNEXPLAINED LOW VOLTAGE PRECORDIAL QRS ON ECG IN ASYMPTOMATIC SUBJECTS BE DISMISSED AS NORMAL? FURTHERING INTO ABNORMAL CARDIOVASCULAR RISK BIOMARKERS

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Background: Low voltage QRS in precordial leads in asymptomatic subjects has been reported to be associated with increased epicardial fat volume which is a novel cardiovascular risk marker.
The purpose of this study is to examine the prevalence of the abnormal cardiovascular risk biomarkers, such as BNP, CRP and/or microalbumin in asymptomatic subjects, with low voltage QRS complexes in precordial leads on ECG and elevated epicardial fat volume.

Methods: 330 asymptomatic obese subjects were screened for cardiovascular risk assessment using the Early Cardiovascular Disease Risk Scoring System (ESCVDRS) known as Rasmussen Risk Score (RRS), previously reported. The ESCVDRS includes 7 vascular and 3 cardiac tests. Among the additional test, CRP, proBNP, microalbumin were also measured. Coronary calcium score and epicardial fat volume were measured utilizing cardiac CT Siemens Somatom Definition Dual source CT scanner 64x2. Out of the 330 subjects, 55 also underwent measurement of epicardial fat volume on CT. Waist circumference was also measured. The 55 subjects were divided into 2 groups: Group A, 33 subjects with cardio-obesity and low precordial QRS voltage on ECG; Group B, 22 subjects with normal epicardial fat volume and normal ECG.

Results: Results are shown in Table below.

Conclusions:
(1) Unexplained low voltage QRS in precordial leads in asymptomatic subjects should not be dismissed as normal without further evaluation for cardiovascular biomarkers to exclude significant early subclinical cardiovascular disease risk.
(2) Low precordial QRS voltage on ECG, in the lack of other known causes, may be indicative of excess epicardial fat volume, which is significant CV disease risk marker. Excess epicardial fat volume must be treated.1 ounce of early cardiovascular disease prevention is better than pounds of late treatment.

	Low QRS Voltages on ECG and Elevated EFV	Low QRS Voltages on ECG and Elevated EFV (%)	Normal QRS Voltages on ECG and Low EFV	Normal QRS Voltages on ECG and Low EFV (%)	p-Values
	Group A		Group B		
# of subjects	33	60%	22	40%	0.035939
Age	68		69		0.696395
Epicardial Fat	153.24		69.76		0.000000
pro-BNP	188.24		114.23		0.516622
CRP	0.53		0.19		0.260905
Micro-Albuminuria	0.51		0.19		0.038892
ECG Abnormalities	14	42%	6	27%	0.025665
Waist Circumference	43.67		37.26		0.000144

EP.04.18

GENOTYPE EVALUATION OF PATIENTS WITH BRUGADA SYNDROME THROUGH NGS ANALYSIS: PREVALENCE AND CLINICAL FEATURES

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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 life threatening arrhythmias. The mutations recognized to date as causal of BrS involve mainly genes related to ion channel subunits.

Methods: In the present study, in a cohort of 26 patients with BrS, 18 probands were studied through Next Generation Sequencing (NGS). Clinical feature, echocardiographic and electrocardiographic parameters, along with the risk stratification Shanghai score were recorded.

Results: Mean age of patients was 46±14 years (96% men) and 14 out 26 (54%) patient had an ICD. When evaluating probands only, nine out of 18 (50%) patients had a genetic mutation.

Ion channel mutations were found in 8 out of 9 patients (SCN5A, DLG1, KCNQ1 AKAP9, CACNB2, CAV-3, CTNNA3) and a sarcomeric mutation (ACTN2) was found in one patient.

There were no differences in term of age, gender and CV risk factor between patients with positive genetic testing versus negative one. However, patients with positive genetic testing had higher Shangai risk score (5.1±1.3 vs 4.1±1.6, p=0.01) and lower left ventricular global longitudinal strain (-17.1±1.6 vs 19.3±1.5% p= 0.03).

Conclusions: the present patient cohort shows gene heterogeneity in patients with Brugada Syndrome, with a high prevalence of ion channel mutations. Patients with positive genetic testing seem to have a higher arrhythmic risk and slight impairment of left ventricular function.

EP.04.19

FIBRILLAZIONE ATRIALE GIOVANILE E CARDIOMIOPATIE: UN CASE REPORT PER PROPORRE UN NUOVO MODO DI STUDIARE QUESTI PAZIENTI

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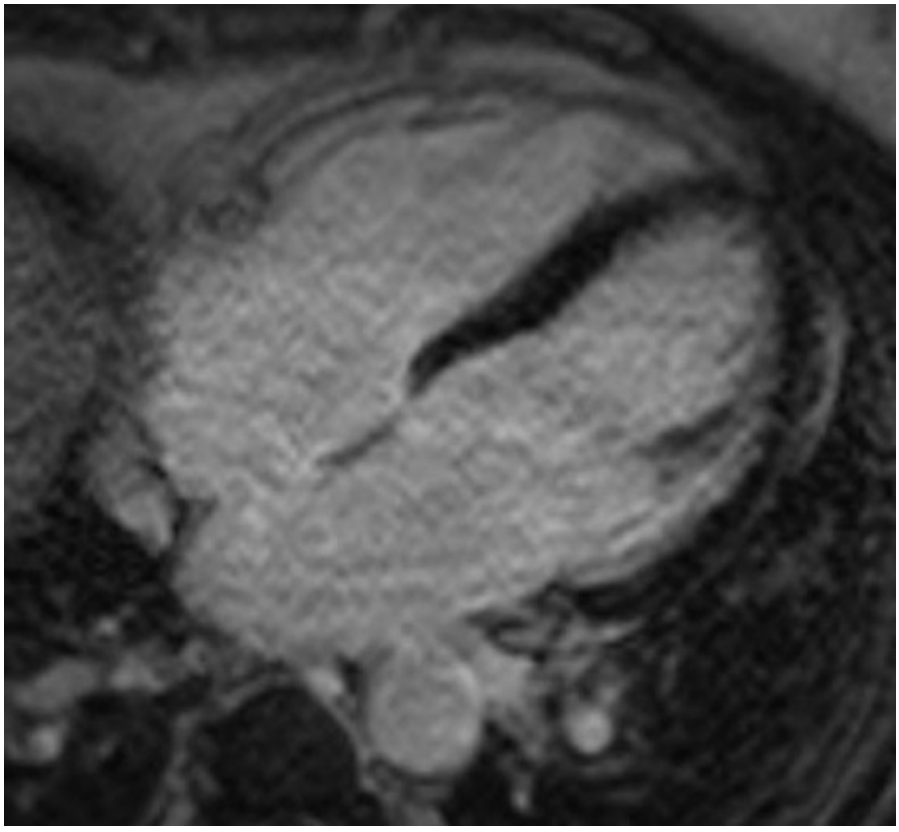
Introduzione: Lo spettro di patologie correlate a mutazioni a carico del gene LMNA è molto ampio, e può spaziare da insorgenza giovanile di fibrillazione atriale, a difetti di conduzione atrio-ventricolari, fino ad un conclamato fenotipo di cardiomiopatia dilatativa. In ogni caso, dalla letteratura emerge che il riscontro di una mutazione a carico di tale gene espone i soggetti ad un aumentato rischio di sviluppare tachiaritmie ventricolari potenzialmente life-threatening.

Caso clinico: Uomo di 40 anni, viene riferito alla nostra U.O. per primo episodio di fibrillazione atriale, complicato da TIA, per cui veniva impostata terapia anticoagulante orale (CHA2DS2-VASc 2). Anamnesi patologica remota e familiare mute; fumo di sigaretta come unico fattore di rischio cardiovascolare. Alla prima ecocardiografia di controllo non evidenza di segni di disfunzione ventricolare. Veniva successivamente programmato ricovero per esecuzione di isolamento transcatetere delle vene polmonari. Nel contesto di tale ricovero veniva eseguito prelievo per l'analisi genetica, successivamente risultato positivo per genotipo eterozigote per variazione missenso (p.Arg545His) a carico del gene LMNA. All'ECG-Holter post-dimissione assenza di recidive aritmiche, ma il paziente riferiva saltuari episodi di recidiva di FA, a risoluzione spontanea, rilevati con smartwatch. Alla luce del risultato dell'analisi genetica veniva programmata RMN cuore, che evidenziava un quadro di NDLVC con presenza di disfunzione biventricolare di grado lieve, in assenza di particolari foci di LGE. Nel contesto dell'ultimo controllo presso il nostro centro di cardiogenetica veniva calcolato lo score di rischio per insorgenza di tachiaritmie ventricolari nei paziente portatori di mutazione del gene LMNA (LMNA risk sore for VTA 13.2%), per cui veniva proposto al paziente impianto di ICD in prevenzione primaria.



Conclusioni: il riscontro in età precoce di fibrillazione atriale (<50 anni) può essere utilizzato come campanello d'allarme per sospettare la presenza di cardiomiopatie primitive misconosciute, che potrebbero giovare dell'esecuzione di un analisi genetica. L'eventuale riscontro, come nel caso da noi riportato, di mutazioni correlate ad aumentato rischio aritmico può potenzialmente fornire indicazioni prognosticamente rilevanti per il probando e per i familiari di I° grado, andando quindi ad impattare sulla storia clinica di queste patologie.

EP.04.20

CARDIAC MOTION IN PATIENTS WITH VENTRICULAR TACHYCARDIA: POTENTIAL IMPLICATIONS FOR THE TREATMENT OF PATIENTS CANDIDATES TO STEREOTACTIC ARRHYTHMIA RADIO-ABLATION

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Background: Stereotactic arrhythmia radio-ablation (STAR) has proven to be a valid alternative treatment for refractory ventricular tachycardia (VT) in patients who are unsuitable to undergo standard catheter ablation (CA). It consists in the application of external beam radiotherapy in a single dose of 25 Gy to the target areas. There is increased research activity on better understanding the complex and fast motion of the heart and on reducing radiation toxicity.

Purpose: In the context of an in silico study to evaluate the feasibility of STAR with protons in patients with VT, the initial findings related to cardiac motion on the first 10 patients are here presented.

Methods: Prior to CA, each patient underwent ECG gated CT scans in expiratory breath-hold, with and without contrast and reconstructed at 30% (systole) and 80% (diastole) of the cardiac R-R cycle. Contouring of the ablation target as a clinical target volume (CTV) for proton treatment planning was performed based on a standard electrophysiological study with 3D eletroanatomical mapping. Two different treatment plans were created: the first with only the diastolic CTV as target (gated treatment), the second including both diastolic and systolic CTVs to create an Internal Target Volume (ITV) in the hypothesis of non-gated treatment. Robust optimization was used to create the Planning Target Volume (PTV).

Results: The target volumes used for treatment planning are given in Table 1. The median CTV was 10.90 (2.93-36.94) cm3 for diastole and 14.26 (1.73-36.31) cm3 for systole. These volumes are somewhat smaller than those reported in patients treated previously with STAR: this difference may be due to the fact that no respiratory motion was included in the target contour and that the study population of patients includes many patients referred for ventricular ectopic beats without structural heart disease, where the ablation target is expected to be smaller as compared to the large ablation targets more typical of patients with VT in structural heart disease.
Despite a small median difference between the diastolic and systolic CTV of 0.53 (0.03-9.61) cm3, the ITV approach resulted in a median increase in volume compared to the largest of the two CTVs of 29 % (1%-44%). When considering the proton range uncertainty and potential errors in patient positioning (PTV), the target is this time enlarged by a factor 2.9 (1.9-3.9).
This data indicates that both cardiac motion and uncertainties in patient positioning before treatment will have a large impact on the treatment volume thus affecting the amount of surrounding tissue exposed to radiation.

Conclusion: Preliminary results indicate that the ablation target contour at systole and diastole are of similar magnitude but their non-overlap results in a large increase in treated volume when radiation delivery is not gated for cardiac motion. Further analysis shall investigate on a case-by-case basis the potential reduction in risk of healthy tissue toxicity when using cardiac-gated proton delivery.

Patient ID	CVT01	CVT02	CVT03	CVT04	CVT06	CVT07	CVT08	CVT09	CVT10	CVT11
CTV_diastole (cm^3)	2.93	7.86	4.59	35.50	3.60	36.94	8.93	15.71	14.40	12.86
CTV_systole (cm^3)	1.73	14.15	4.90	35.91	3.16	36.31	9.06	24.27	14.37	22.47
ITV (cm^3)	3.67	18.69	6.87	36.22	5.18	42.36	10.89	26.08	19.01	30.56
PTV (cm^3)	10.15	41.98	13.70	76.62	14.01	70.86	28.01	53.80	42.10	53.90

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SESSIONE WEB SHARING

SESSIONE NON ACCREDITATE ECM

(Poster senza discussione, consultabili su Totem elettronici per tutta la durata del Congresso)

ARITMIE

WS.01
ARITMIE VENTRICOLARI NELLA FASE FREDDA DELLA MIOCARDITE

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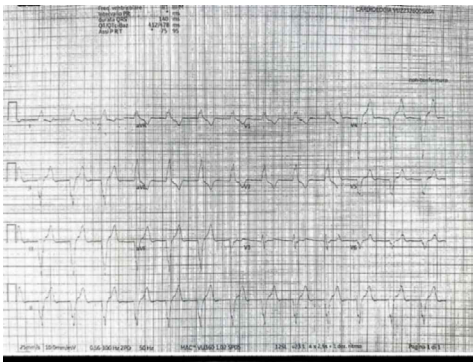
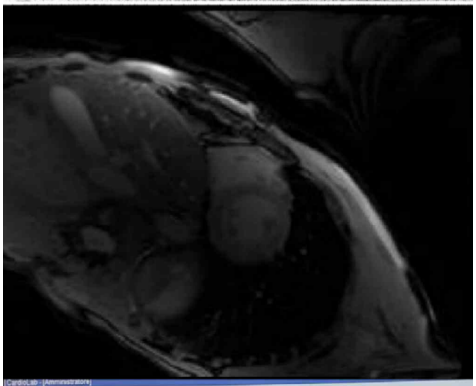
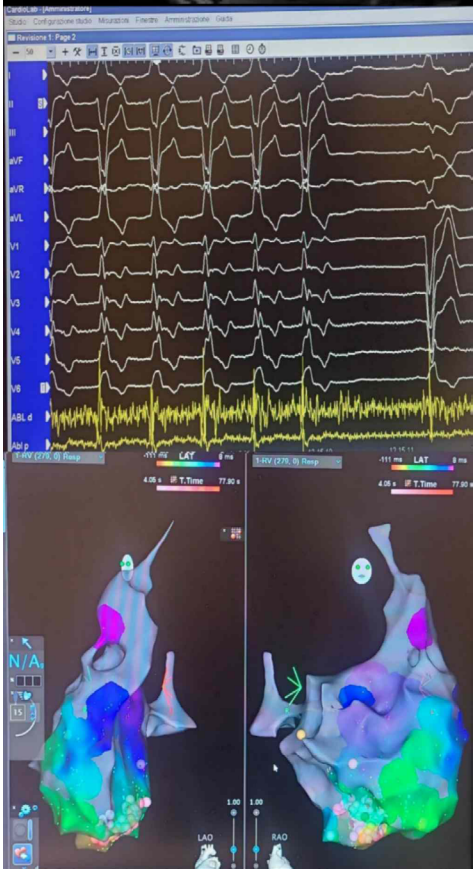
Presentiamo il caso di un paziente di 39 anni che giungeva nel Dipartimento di Emergenza per cardiopalmo, malessere ed ipotensione. All'ECG eseguito in PS riscontro di tachicardia ventricolare lenta (frequenza 90 bpm)
Dalla raccolta dei dati anamnestici emergeva RM cardiaca effettuata 9 anni prima a seguito di riscontro occasionale di episodi di TVNS di breve durata durante ricovero per evento traumatico. In tale occasione la RM cardiaca evidenziava aree di fibrosi non ischemica del miocardio ventricolare sinistro in sede subepicardica ed intramurale della parete antero-laterale, della parete infero-laterale medio-distale e del setto medio inferiore, compatibile in prima ipotesi con esiti di miocardite
Il paziente veniva ricoverato presso UO di Cardiologia. Durante la degenza veniva sottoposto a ECG dinamico delle 24 ore secondo Holter (RIVA quasi costante con frequenza media di 92 bpm con emergenza di ritmo sinusale per frequenze maggiori di 95 bpm, ad Ecococardiogramma bidimensionale color-doppler (FE 46% calcolata con Metodo Simpson biplano per ipocinesia di parete inferiore ed infero-laterale, GLS -14%), test da sforzo al cicloergometro (capacità funzionale ridotta, soppressione del RIVA per frequenze maggiori di 95 bpm). Veniva inoltre eseguita RM cardiaca: strie subepicardiche ed intramiocardiche di late gadolinium enhancement al segmento inferiore ed inferolaterale medio-basale, riferibili a fibrosi intramiocardica, dissincronia del SIV (FE 44%)
Veniva pertanto inviato a centro di II livello per essere sottoposto a SEF ed eventuale ablazione di substrato aritmico.
Prima della procedura veniva eseguita TAC coronarica: assenza di patologia coronarica, Agatston score 0
Si eseguiva studio elettrofisiologico per via femorale destra con identificazione di aree a basso potenziale in corrispondenza della regione inferiore settale basale destra (muscolo papillare), sottoposta a multiple erogazioni di radiofrequenza (max 40 Watt, 40°C, 45 secondi). La lesione veniva estesa fino al piano tricuspidale. Documentate recidive dell'aritmia ma con ciclo più lento e in periodi non sostenuti, in considerazione del raggiunto limite inferiore di sicurezza nella regione delle erogazioni (80 ohm) si è deciso di sospendere la procedura
Al momento della dimissione il paziente era asintomatico, in ritmo sinusale. Veniva posta indicazione ad eseguire Holter dopo 30 giorni







WS.02

LONG-TERM USE OF MEXILETINE IN VENTRICULAR ARRHYTHMIAS: A REAL LIFE, SINGLE CENTRE EXPERIENCE

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Background: Refractory ventricular arrhythmias are a therapeutic challenge for the cardiologic community. Mexiletine is empirically considered useful as on top medical therapy in patients with repeated ICD interventions, ventricular tachycardias or electric storm as a bridge to ablation or as destination therapy, even if evidence in literature is limited. In Italy mexiletine is hardly available as a galenic preparation for serious cardiac arrhythmias or specific neurologic diseases.

Purpose: The study aim is to analyze effectiveness and limiting side effects of mexiletine in a cohort of patients with recurrent ventricular arrhythmias.

Methods: We retrospectively analyzed clinical history, medications, laboratory findings and outcomes of 38 adult patients for whom the Cardiology Unit of our institution has dispensed mexiletine prescription from January 2016 to October 2023. We investigated, in an ambulatory setting, time to first recurrence of ICD appropriate intervention (ATP/shock) or clinical evidence of severe arrhythmias (syncope/ER access /sudden death), hospital admission for cardiovascular reasons and we evaluated tolerance.

Results: Patients baseline characteristics are listed in table 1. Mean age was 70 years old; ischemic heart disease was the most frequent aetiology (63%). Range of mexiletine dosage was 200-600 mg/die according to clinical effect and tolerance. All patients assumed mexiletine alongside with beta-blockers and 20 patients (53%) together with amiodarone. In a 26 months median follow up, 14 patients (37%) had at least a recurrence of ICD appropriate intervention after a median interval of 20 months for ATP and 10 months for shock. Hospital admissions were registered only for 14 patients (37%). A minority of the cohort (32%) underwent an ablation of ventricular arrhythmias. Severe side effects limited mexiletine usage in only 3 patients. (Table 2 for details)

Conclusion: These preliminary data suggest that mexiletine may be a valuable therapeutic support on top of tolerated medical therapy, for long term management of patients with recurrent ventricular arrhythmias or repeated ICD interventions when ablation failed or is not considered reasonable.

Table 1: Baseline clinical characteristics

Number of patients	38
Mean age	70 years old
Sex Male/Female	35 (92%)/3 (8%)
Ischemic heart disease/Non ischemic heart disease	25 (63%) /13 (37%)
ICD/CRT-D/no ICD	26 (68%)/9 (23%)/3 (8%)
Primary prevention/Secondary prevention	16 (46%) / 19 (54%)
Ablation yes/no	12 (32%)/26 (68%)
LVEF mean (range)	35% (range 20-64%)
eGFR	59 ml/min/1,73 mq
Hepatic function normal/impaired	37 (97%)/ 1 (3%)
Hyperthyroidism	10 (26%)
NTproBNP (18/38 pts) mean (range)	2590 (157-10690) ng/L
Concomitant drugs	
Amiodarone	20/38 (53%)
Beta-blockers	38/38 (100%)
ACE-i/ARB/ARNI	15 (40%) / 1 (3%) / 14 (37%)
MRA	24/38 (63%)
Glifozins	7/38 (18%)

LVEF=Left Ventricle Ejection Fraction, ACE-i= Angiotensin-converting enzyme (ACE) inhibitors, ARB= Angiotensin receptor blockers , ARNI= Angiotensin Receptor-Neprilysin Inhibitor , MRA=mineralocorticoid receptor antagonists

Table 2: Results

Mexiletine dose	mean 432 mg (range 200-600 mg)
Follow up lenght	median 26 months (range2-91 months)
Limiting side effects	3/38 (8%)
Neurologic	1
Gastrointestinal	2
Mortality	8 (21%)
Cardiovascular	3
Non cardiovascular	5
Hospital admission	14 (37%)
Arrhymias	7
Heart failure	7
ICD intervention	14 (37%)
ATP (first event)/time to ATP months	8 / median 20 months (range 1-90 months)
Shock (first event)/time to shock	6 / median 10 months (range 2-35)
Clinical evidence of severe arrhythmias for patients without ICD	0

WS.03
THE RECIPE FO THE PERFECT ELECTRICAL STORM

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Introduction: An electrical storm (ES) is a life-threatening condition marked by recurrent ventricular arrhythmias. Its complex etiology includes cardiac, autonomic, and environmental factors, with recent attention to non-cardiac triggers like cocaine. ES management, outlined in 2024 guidelines, emphasizes prompt intervention. This case report highlights a patient with ES, showcasing diverse etiological factors and management strategies. It underscores the need for comprehensive evaluation and tailored therapy.

Case description: A 55-year-old man with a history of hypertension, smoking, and cocaine abuse presented with retrosternal chest pain. Initial findings indicated advanced atrioventricular block, elevated troponin levels, leukocytosis, and hypokalemia. Imaging revealed pneumonia and reduced ejection fraction (EF), leading to a diagnosis of non-ST-segment elevation myocardial infarction (NSTEMI). Urgent percutaneous coronary intervention (PCI) was performed, but on the 1st of April, he experienced retrosternal pain, ST-segment elevation, and atrial fibrillation (AF). Two stents were implanted in the right coronary artery (RC). Complications arose with prolonged QTc interval coinciding with Zithromax therapy, leading to torsades de pointes (TDP) episodes on April 5th. Despite interventions, including a temporary pacemaker and subsequent implantable cardioverter-defibrillator (ICD), TDP persisted. The pacing rate was adjusted to abbreviate the QT interval and reduce the risk of Early Afterdepolarizations (EADs). After a week of surveillance, the patient was discharged with an ICD programmed at 90 bpm. During one-month follow-up, AF with benign ectopic beats (BEVs) was noted, but no TDP recurred. Over six months, the patient reverted to sinus rhythm, and the pacing rate decreased to 70 bpm. Cocaine abstinence was maintained, resulting in improved ventricular function and absence of arrhythmic episodes. This case underscores the challenges of managing ES and highlights the importance of multidisciplinary care and tailored interventions in optimizing outcomes.

Discussion: The case highlights the multifactorial nature of the electrical storm, using Coumel's Triangle to elucidate triggers, substrate, and autonomic modulation. Premature ventricular complexes (PVCs) likely initiated the storm, disrupting normal cardiac conduction and repolarization. Substrate abnormalities, including refractory period dispersion and prolonged QTc interval, provided a conducive environment for arrhythmogenesis. Increased sympathetic tone, exacerbated by underlying cardiovascular risk factors and acute myocardial injury, potentiated arrhythmias, along with Early Afterdepolarizations (EADs) precipitating torsades de pointes (TDP). Cocaine abuse significantly contributed to electrical and structural remodeling, exacerbating arrhythmic substrate. Ischemia further compounded arrhythmic risk, as evidenced by ST-segment elevation and atrial fibrillation. Addressing acute triggers and underlying pathology is crucial, necessitating a multidisciplinary approach. This case underscores the complex interplay of factors in electrical storm etiology, emphasizing the need for comprehensive management strategies tailored to individual patients.

Conclusion: In conclusion, the case underscores the multifactorial nature of the electrical storm, involving various triggers, substrate abnormalities, and systemic pathologies. PVCs, refractory period dispersion, sympathetic tone, and EADs constituted the arrhythmogenic substrate, while cocaine abuse, pneumonia, and ischemia acted as precipitating factors. Successful management required a comprehensive approach addressing acute triggers and underlying cardiac pathology. This emphasizes the importance of recognizing and managing the complex interplay of factors in life-threatening arrhythmias, necessitating a multidisciplinary approach for optimal patient outcomes.

DEVICE

WS.04

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

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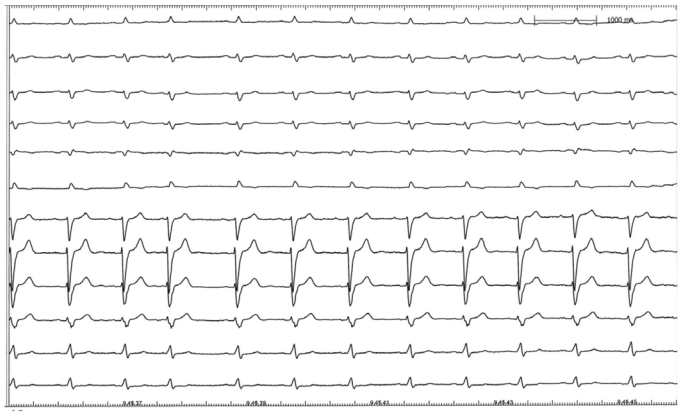
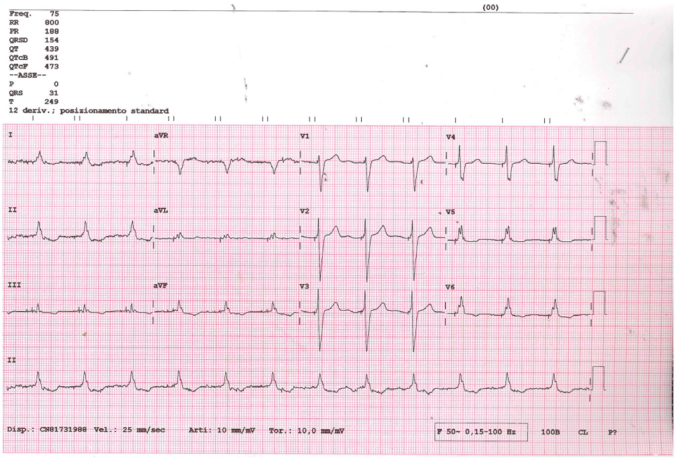
Background: QRS duration is an important factor in determining Cardiac Resynchronisation Therapy (CRT) response and a useful surrogate for electromechanical dyssynchrony. However, we don't have studies confirming this concept in conduction system pacing. We present a case report suggesting that this theory is not probably valid in conduction system pacing.

Methods: A 56 year old patient with diabetes, dyslipidemia, and obesity presented to our hospital. In 2014 he had a diagnosis of primary dilated cardiomyopathy with reduced EF (EF 30%) and intraventricular conduction delay (QRS width 140 msec). In the same year he underwent optimized medical therapy and ICD implantation. Despite pharmacological and electrical therapy for heart failure, he experienced numerous hospitalizations heart failure. In the last hospitalization he underwent ICD extraction for CIED endocarditis and subsequent S-ICD implantation. In May 2022 he also received an appropriate shock on TV by the subcutaneous defibrillator.
The patient came to our attention for dyspnea due to mild exertion and easy fatigue (NYHA class II-III). He presented with typical atrial flutter with variable AV block, NT-pro BNP 758.4 ng/l, severe left ventricular dilatation (EDV 250 ml, 110 ml/m2) with severe reduction in EF (EF 32%).
Subsequently, the patient underwent ablation of typical atrial flutter. During RF erogation on the cavotricuspid isthmus, frequent sinus pauses and type 1 atrioventricular block appeared. We performed an echocardiogram the next day that confirmed the persistence of EF :32%.
In consideration of the persistence of the depressed EF and the need for pacing and electrical therapy for heart failure, 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, with evidence of change in morphology during threshold and PWRT lengthening of >10msec. 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 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 V4 to V6 and V6 R-wave peak time (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.



Pre-implantation ECG, QRS:140msec



Post-implantation ECG, QRS:150msec

WS.05

IL RUOLO DELL'INFERMIERE NELLA GESTIONE DEL PAZIENTE PORTATORE DI DISPOSITIVO OPTIMIZER SMART PER LA TERAPIA CCM

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Introduzione: la terapia CCM rappresenta un presidio terapeutico per il trattamento elettrico dello scompenso cardiaco sistolico a terapia medica ottimizzata. Il dispositivo che eroga tale terapia è l'OPTIMIZER Smart® prodotto da Impulse Dynamics. Il device è alimentato da una batteria che deve essere periodicamente ricaricata posizionando la piattaforma induttiva del caricatore (Mini-Charger) in corrispondenza del dispositivo. Un programmatore dedicato, simile ai comuni programmatori delle aziende CRM, permette di interrogare e programmare il dispositivo

Obiettivi: descrivere il ruolo cruciale del personale tecnico/infermieristico nella fasi post-impianto, al fine di assicurare il corretto funzionamento dell'Optimizer e di conseguenza la giusta erogazione della terapia.

Metodi: la prima fase è equipaggiare il paziente con il Mini-Charger. Alla consegna è opportuno effettuare il training del dispositivo, spiegando come ricaricare l'Optimizer e illustrando le interfacce grafiche presenti sul caricatore. Il paziente deve ricaricare il dispositivo 1 volta a settimana, il processo di ricarica dura 45-80 minuti e può essere seguito sulla colonnina implementata sul Mini-Charger. E' consigliabile suggerire al paziente di effettuare la ricarica sempre lo stesso giorno ed alla stessa ora. Anche il Mini-Charger è alimentato da una batteria, la cui autonomia può sempre essere controllata sull'apposita colonnina. E' importante spiegare al paziente che la ricarica del caricatore non va mai effettuata contemporaneamente a quella dell'Optimizer.
La seconda fase consiste nella gestione del paziente durante i controlli ambulatoriali periodici. La collaborazione del paziente stesso in questa fase è cruciale perché oltre alla funzione di caricatore, il Mini-Charger può anche dare informazioni di natura tecnica sul funzionamento dell'intero sitema (Optimizer ed elettrocateri). Infatti, in caso di un funzionamento anomalo, il paziente riceverà delle notifiche sottoforma di numeri sul dispaly del caricatore durante la ricarica. Riportando queste informazioni al personale tecnico/infermieristico sarà possibile pianficare controlli aggiuntivi interpretando i codici presenti sul dispositivo. I codici sui quali bisogna prestare maggiore attenzione sono 0, 1 e 4. Il codice 0 indica che il dispositivo è stato disattivato. Questo può accadere quando il paziente è portare di pacemaker o defibrillatore perché alcuni programmatori delle aziende CRM hanno un magnete integrato nella testina per interrogare i dispositivi. L'eventuale contatto del magnete con l'Optimizer può causare la disattivazione del dispositivo stesso. Il codice 1 indica che è stata rilevata una variazione dell'impedenza elettrica. Se il dispositivo è stato impiantato recentemente può essere normale avere delle variazioni d'impedenza. In caso contrario, se il codice è notificato dopo due settimane dall'impianto, il paziente deve essere convocato. Il codice 4 indica invece che la quantità di terapia erogata è bassa. In caso di assenza di allarmi del caricatore esterno è consigliato un controllo ogni 6-12 mesi.

Risultati: la corretta gestione di tutte le fasi permette di ottenere una percentuale di erogazione della terapia maggiore o uguale all'80%, col conseguente effetto terapeutico atteso.

Conclusioni: la terapia CCM ha dimostrato di migliorare notevolmente la qualità di vita dei pazienti affetti da scompenso cardiaco e in questo contesto l'infermiere ha un ruolo cruciale sia nella prima fase post-impianto che nel follow up del paziente.

WS.06

IL RUOLO DELL'INFERMIERE NEL MONITORAGGIO EMODINAMICO NON INVASIVO DEI PAZIENTI TRATTATI CON LA TERAPIA DI MODULAZIONE DELLA CONTRATTILITÀ CARDIACA (CCM)

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Introduzione: negli ultimi anni, la Terapia di Modulazione della Contrattilità Cardiaca (CCM) è emersa come una potente arma terapeutica per il trattamento dei pazienti affetti da insufficienza cardiaca di classe NYHA III e IV refrattari alla terapia medica ottimizzata (OMT) e con frazione di eiezione ventricolare sinistra (LVEF) compresa tra il 25% e il 50%. Nonostante la riduzione della dispnea si veda già nelle prime settimane post-impianto, i cambiamenti oggettivi e statisticamente significativi nei parametri quantitativi come LVEF, PvO2 e distanza percorsa nel test dei sei minuti (6MWT) si verificano almeno a sei mesi dall'impianto. Nel tempo sono stati validati sistemi non invasivi basati su misurazioni di bioimpedenza per il monitoraggio dei cambiamenti emodinamici nei pazienti con insufficienza cardiaca. Tra questi vi è il NICaS CS™ (NON Invasive Cardiac System), un sistema a bioimpendenza full body che misura in tempo reale Frequenza Cardiaca, Gittata Sistolica, Gittata Cardiaca, Resistenza Periferica Totale, Indice di Contrattilità Cardiaca, Acqua Corporea Totale, Frequenza Respiratoria, nonché parametri derivati come la contrattilità cardiaca.

Obiettivo: descrivere il ruolo dell'infermiere nello studio emodinamico non invasivo mediante sistema NICaS nei pazienti in terapia CCM

Metodi: il sistema è composto dal dispositivo, i cavi per ICG (cardiografia a impedenza), i cavi per ECG, un cavo USB e il kit di sensori. Una volta collegati i cavi al dispositivo si collega lo stesso alla porta usb del computer. Ci sono cinque sensori da collegare al paziente: due sono la coppia di sensori dell'ICG e tre quelli dell'ECG. Il NICaS è ottimizzato per il collegamento polso – caviglia che permette una stima della gittata sistolica (SV) sulla base del flusso periferico superiore e inferiore. Il collegamento polso-polso viene invece utilizzato in caso di arteropatia periferica degli arti inferiori, edema significativo agli arti inferiori, alte dosi di noradrenalina e grave vasocostrizione. L'infermiere verifica che l'area dove devono essere collocati i sensori sia pulita, asciutta e priva di sudore. Se necessario, verrà pulita la pelle con un panno e alcol al 90% per poi essere asciugata. Gli arti del paziente non devono essere freddi, il polso deve essere palpabile e non ci devono essere oggetti metallici. Una volta collegato il paziente, si apre il programma sul pc, vengono inseriti i dati del paziente e si avvierà la misurazione. Il paziente deve restare immobile per tutta la durata della misurazione. Sono previsti i seguenti criteri di esclusione: stenosi aortica grave, insufficienza mitralica grave, aneurisma o coartazione aortica, polsi periferici flebili o assenti.

Risultati: dalla misurazione viene prodotto un report che indica in rosso i parametri fuori range e una rappresentazione grafica dello stato clinico del paziente, il Navigatore Emodinamico™, utilissimo per valutare i cambiamenti nel tempo dei parametri rilevati, monitorando quindi l'efficacia delle terapie in corso, sia farmacologiche che elettrica mediante CCM.

Conclusioni: lo sviluppo di nuove tecnologie per il monitoraggio emodinamico non invasivo ha portato una grande innovazione nella gestione dei pazienti con scompenso cardiaco; in questo percorso assistenziale è fondamentale l'ausilio di personale infermieristico dedicato.

WS.07

CASO CLINICO PAZIENTE DIABETICO IPERTESO IMPIANTATO CON PACEMAKER LEADLESS

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Background: Le complicanze correlate all'impianto di un dispositivo cardiaco impiantabile sono vicine al 10% nei primi mesi dall'impianto.
Gli elettrocateteri presentano spesso complicanze quali fratture, difetti di isolamento che possono portare ad infezione. Le infezioni dei dispositivi sono anch'essi tra gli eventi cliici più seri. L'intero sistema va rimosso e un nuovo device va reimpiantato quando i segni di infezione non sono più presenti.
Tuttavia per i pazienti espiantati spesso comorbidi e con blocco atrioventricolare (AV) completo attendere non è possibile e i nuovi pacemaker leadless, alternativa ai sistemi di pacing tradizionale , possono rappresentare la soluzione.

Caso Clinico: Paziente iperteso, diabetico con storia di cardiopatia ischemica cronica e giudicato ad alto rischio di infezione. Il 23 ottobre 2019 il paziente ha ricevuto un impianto di pacamaker bicamerale convenzionale per blocco AV di II grado parossistico espiantanto il 24 gennaio 2020 per infezione della tasca. Nella stessa procedura è stato impiantato loop recorder per monitorare lo stato del paziente in attesa del nuovo impianto di pacemaker.
In data 13 febbraio 2024 è stata rilevata al controllo remoto pausa asistolica maggiore di 15 sec asintomatica. Al paziente è stato richiesto di recarsi d'urgenza al pronto soccorso (PS), presso il quale è stato riscontrato all'elettrocardiogramma, PR ai limiti (200 ms), emiblocco anteriore sinistro e blocco di branca destra. All'ecocardiogramma si è rilevato ventricolo sinistro di normali dimensione e frazione di eiezione conservata. Sulla base della storia precdente di infezione e alle comorbidità del paziente è stato deciso di impiantare pacemaker leadless ventricolare upgradabile a bicamerale.
In data 11 marzo 2024 è stato impiantato pacemaker con successo leadless ventricolare AVEIR VR (Abbott, Sylmar,CA,USA) ed espiantato loop recorder.

Conclusione: I pacemaker leadless rappresentano nei pazienti portatori di pacemaker e sottoposti a estrazione per infezione del sistema di cardiostimolazione una efficace alternativa. Soprattutto i dispositivi upgradabili a bicamerale permetteranno a questi pazienti di mantenere inalterata la sincronia atrioventricolare.

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WS.08

VALUTAZIONE DELLA VERSIONE MIGLIORATA DI UN ELETTROCATETERE A FISSAZIONE ATTIVA (VEGA PLUS) IN UNA POPOLAZIONE NON SELEZIONATA PORTATRICE DI PACEMAKER

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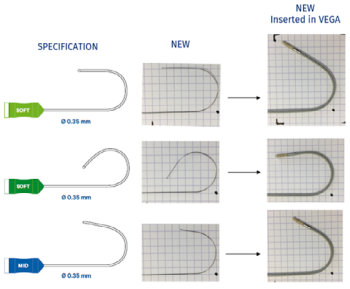
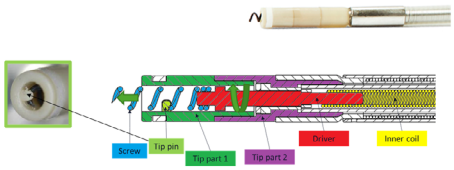
Introduzione: Gli elettrocateteri giocano un ruolo fondamentale nel garantire la corretta terapia di stimolazione tramite pacemaker cardiaco. La loro corretta progettazione richiede di tener conto di stress di diverso tipo, tra cui biodegradazione, compressione, trazione e flessione dovute ai cicli cardiaci.
In particolare, gli elettrocateteri a fissazione attiva sono ormai largamente utilizzati rispetto agli elettrocateteri a fissazione passiva, in quanto consentono di poter scegliere il sito di stimolazione, garantendo inoltre una eventuale, futura, maggiore facilità di estrazione.
L'ettrocatetere a fissazione attiva Vega (Microport, Saluggia) ha dimostrato avere ottime performance elettriche, in acuto, in cronico e in ambiente MRI, come dimostrato dal recente studio Capri.
Di seguito riportiamo la nostra esperienza di impianto di una versione migliorata del catetere (Vega Plus), rilasciata nel 2022.

Metodi: Vega è un catetere 6F in silicone con trattamento Silglide, con vite retrattile da 1,5 mm. La versione Plus ha previsto il miglioramento degli stiletti preformati atriali, aventi ora memoria di forma per un posizionamento semplificato, e del meccanismo di fissazione, con una riduzione della lunghezza dei coil interni, conseguente riduzione della frizione interna e una fuoriuscita della vite in modo graduale e lineare, evitando il fenomeno dell'uscita a scatto improvviso.
Abbiamo analizzato le performance di Vega Plus in acuto e ad un anno tra aprile 2022 e marzo 2023 in 79 pacemaker bicamerali e 13 pacemaker monocamerali (44 % uomini, età media 73 ± 9 anni) impiantati secondo le linee guida correnti.
Il feedback all'impianto, come già per la precedente versione, è risultato positivo in termini di manovrabilità del catetere. I nuovi stiletti atriali, presenti in tre diverse configurazioni come in passato, si sono rilevati più supportivi rispetto alla precedente versione. Per quanto riguarda il meccanismo di fissazione, abbiamo confermato la fuoriuscita graduale della vite, consentendo un buon fissaggio.
Buoni i parametri elettrici (atrio: sensing 2,54 ± 1,81 mV; impedenza 574 ± 110 ohm; soglia 0,74 ± 0,65 V; ventricolo: sensing 8,76 ± 3,52 mV; impedenza 589 ± 150 ohm; soglia 0,86 ± 0,57 V). In particolare, solo in 1 caso (1,08%) abbiamo riscontrato uno sposizionamento in acuto dell'elettrocatetere ventricolare, in 2 casi (2,5%) abbiamo riscontrato una soglia atriale > 2V e in 1 caso (1,08 %) una soglia ventricolare > 2V.
Al controllo ad un anno, le performance elettriche sono risultate stabili (atrio: sensing 3,13 ± 1,61 mV; impedenza 522 ± 127 ohm; soglia 0,87 ± 0,46 V; ventricolo: sensing 9,13 ± 4,25 mV; impedenza 531 ± 136 ohm; soglia 0,98 ± 0,42 V), con 1 solo (1,08%) sposizionamento del catetere ventricolare a 6 mesi post impianto. In 3 pazienti (3,79 %) si è rilevata una riduzione del sensing atriale dovuta a insorgenza di fibrillazione atriale.
Nessuna ulteriore complicanza (perforazione, stimolazione diaframmatica, intolleranza al pacing) è stata riscontrata.

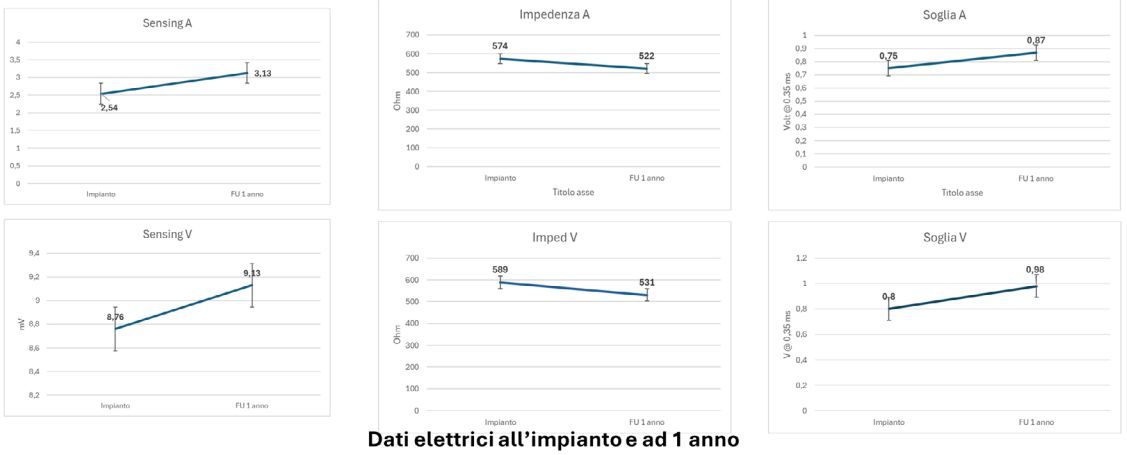
Conclusioni: L'elettrocatetere Vega nella versione Plus risulta essere affidabile in termini di manovrabilità, facilità di impianto, stabilità dei parametri elettrici in cronico e assenza di complicanze ad un anno.



Nuovi stiletti atriali con memoria di forma



Ottimizzazione del meccanismo di fissaggio



Dati elettrici all'impianto e ad 1 anno

WS.09

INNOVATIVE IMPLANTABLE CARDIAC ELECTRONIC DEVICES IN ANATOMICAL ABNORMALITIES OF PERSISTENT LEFT SUPERIOR VENA CAVA: A CASE REPORT

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A male patient aged 76 years, hypertensive, smoker, with chronic bronchitis, came to our attention. He had always been in good health until he underwent a right vocal cord biopsy through a microlaryngoscopy following a diagnosis of oral cavity dyskeratosis. At the end of that procedure, the patient presented lightheadedness and fatigue, with junctional escapement rhythm at the mean ventricular rate of 45 bpm and marked sinus bradycardia unresponsive to therapy (atropine). He was therefore transferred to the cardiology intensive care unit (ICU).On admission , ECG showed no atrial activity with ventricular escapement rhythm at 40 bpm. Color Doppler echocardiogram :mild uniform left ventricular hypertrophy, normal ventricular functionality with 60% LVEF, type 1 diastolic dysfunction, mild left atrial dilation, right sections and aortic root within limits, mitral and aortic valve fibrosis without valvular dysfunction, moderate tricuspid regurgitation with PAPs > 30 mmHg, no pericardial effusion and coronary sinus dilation as per persistence of left superior vena cava (PLSVC).On ECG monitoring, evidence of sporadic and symptomatic sinus pauses lasting up to 4600 msec was found. , on the third day after admission, a pacemaker implant was indicated under ESC 2021 guidelines. Phlebography was done which confirmed PLSVC draining into the CS and no anonymous vein connecting the right and left SVC. Also, right subclavian draining into the PLSVC was documented through right phlebography. Given such evidence and in accordance with ESC 2021 guidelines, we decided to implant a leadless VVI PM.PLSVC is a congenital anomaly due to an abnormal coronary sinus development during early fetal life with an incidence ranging from 0.3% in the general population to 4.3% when associated with other cardiac anomalies. In 8% of cases, it drains into the left atrium causing hemodynamic changes as a left-right shunt. in the vast majority of cases it drains into the coronary sinus and remains asymptomatic. On echocardiogram, coronary sinus enlargement can be documented in 68% of patients. The unexpected presence of a PLSVC can complicate PM implantation, increasing the procedure time or forcing the operator to reinitiate the procedure on the right if a right superior venacava is present. In our case, both right and left venous accesses were abnormal. The patient was a candidate for PM implantation via PLSVC as already demonstrated in the literature. This approach would have used the only upper venous access available, impacting the feasibility of future upgrading procedures, given the contemporary anomalous right subclavian path. An epicardial PM implantation could have been an alternative but this approach was considered anachronistic , we opted for the implantation of a leadless VVI PM. This is recommended by ESC 2021 guidelines in class IIB as an alternative to standard single-lead ventricular pacing,. the patient was a caregiver of a bedridden relative and needed to carry heavy weights as soon as possible after discharge. This choice ensured our patient a minimally invasive implant with the same length of stay as a transvenous PM, low infection risk, and preserved only venous access, albeit abnormal, for potential future procedures.

ELETTROFISIOLOGIA INTERVENTISTICA

WS.10
DISPNEA DA SFORZO IN UNA DONNA

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M. S.
Nata il 02/03/1966 , Peso: 85 kg Altezza: 161 cm BSA:1,89 mq , BMI 32,8
Anamnesi familiare: madre con aneurisma a.basilare e ipertesa, padre con K polmonare
Anamnesi patologica: Ipertensione arteriosa, Insufficienza venosa, Diverticolosi colica, Ipercolesterolemia.
2022- Per dispnea da sforzo ha effettuato visita cardiologica con ECG da sforzo e scintigrafia miocardica risultate negative per ischemia inducibile.
In f-up endocrinologico per micronoduli tiroidei.

TD:
Eutirox 50 mcg/die
Valsartan 160 + 80
Flebofort
Cholecomb 5/10 mg

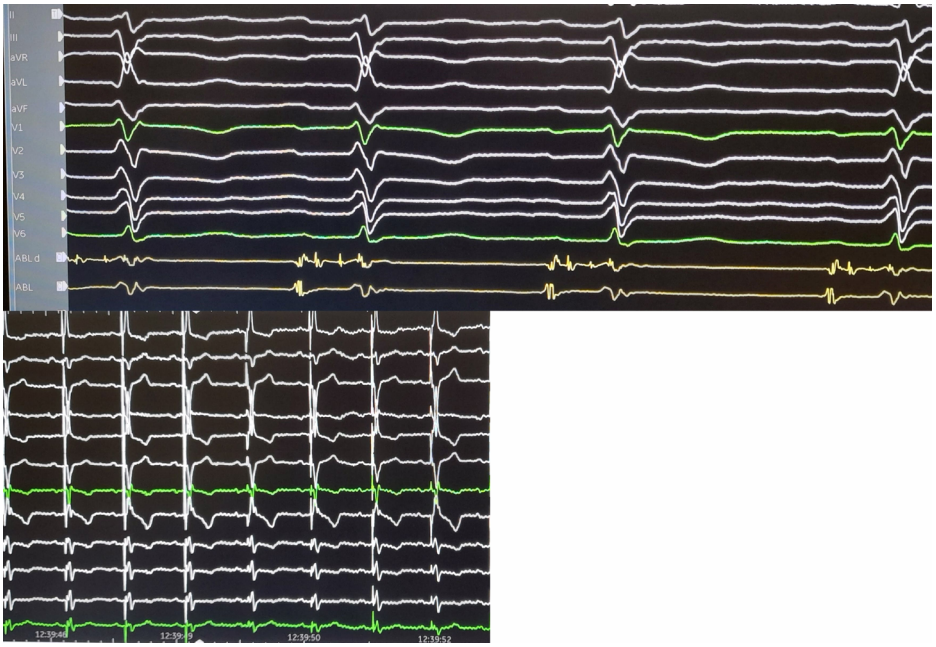
ECG all'ingresso: Ritmo sinusale normofrequente, BAV I con periodismi LW, EAS + BBDx, alterazioni secondarie di ST-T e QTc nei limiti

ECOCARDIOGRAMMA (eseguito presso H di provenienza): ipertrofia parietale concentrica del Vsx (SIV 12 mm); FE 55%, assenza di anomalie della cinetica segmentaria

SEF BASALE
Puntura di vena femorale destra ecoguidata. Avanzamento di catetere CRD2 in scopia. Identificazione di segnale di HIS splittato con blocco intrahissiano (Intervallo AH 70 ms, HH' 90 ms, H'V 40 ms). Registrati blocchi della conduzione AV con presenza di H e blocco su H'. Indicazione a impianto PM.

IMPIANTO DI PACEMAKER CON STIMOLAZIONE FISIOLOGICA
Puntura della succlavia in controllo fluoroscopico, avanzamento di Catetere guida C115 Medtronic in regione di His (quadripolare CRD2 predecentemente posizionato su His come marker anatomico). Avanzamento di elettrocatetere 3830 Medtronic, avvitamento in tale regione di His distale. Ottimi i parametri di sensing e pacing al termine delle rotazioni: Soglia 0.7 V x 05 ms, Sensing 10 mV, Impedenza 870 Ohm, HV 40 ms, QRS finale 115 ms stabile sia in stimolazione unipolare che bipolare. Avanzamento di catetere atriale destro a fissazione attiva in auricola (Soglia 1.5 V x 0.4 ms, sensing 2.6 mV , impendenza 700 Ohm). Rimosso catetere CRD2 ed introduttore femorale. Fissate le sleeve con filo da sutura 2-0 non assorbibile. Collegati i cateteri a dispositivo Astra DR Medtronic, posizionato in tasca preallestita. Sutura su tre strati con filo riassorbibile. Stabili i parametri elettronici al controllo finale.

Discussione: Secondo Narula et al., il BAV II tipo I di solito ha origine nel nodo atrioventricolare (72% dei casi), seguito dall'origine nell'infra-his (21% dei casi) e, meno comunemente, dall'origine intra-his (7% dei casi). Pertanto, il blocco atrioventricolare di secondo grado di tipo I non sempre ha un carattere benigno (intra-nodo AV). La sua individuazione, anche con un complesso QRS stretto in pazienti > 50 anni durante la veglia o dopo un test all'atropina, dovrebbe essere valutata attentamente a causa della possibilità di un'origine intra-e infra-His per il blocco.
Pertanto, in un paziente sintomatico o oligosintomatico con blocco atrioventricolare di secondo grado di tipo I con un rapporto di conduzione A:V di 3:2 o 2:1 durante la veglia, a maggior ragione se il paziente ha più di 50 anni, dovrebbe essere preso in considerazione uno studio elettrofisiologico.



WS.11

CATHETER ABLATION OF ATRIO-VENTRICULAR JUNCTION: A STRATEGY TO IMPROVE EFFICACY WITH HISSIAN CURVE TECHNIQUE

Patrizia Pepi, Daniele Nicolis, Mattia Strazzanti, Cristian Fava, Corrado Lettieri
ASST Mantova, UOC di Cardiologia, Mantova, ITALY

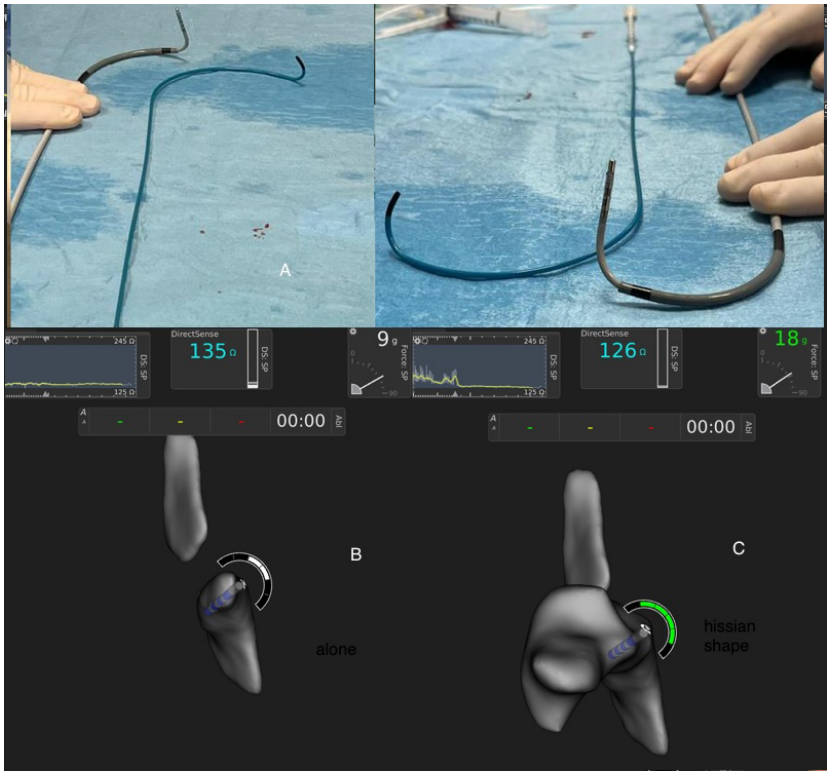
Background: Atrioventricular node ablation is a medical procedure performed to control heart rate in patients unresponsive or intolerant to intensive rate or rhythm control therapy. This procedure is often considered when other treatments, such as medication or catheter ablation targeting specific arrhythmia foci, have been ineffective or are contraindicated. We describe two case reports of patients with atrioventricular junction node ablation failure who are referred in our center to perform a new ablation attempt in the right or in left ventricle.

Objective: conventional ablation techniques often face challenges in achieving optimal lesion formation and efficacy due to the complex anatomical structure of atrioventricular node. The adoption of novel approaches, such as the hissian-shaped curve technique, holds promise in addressing these challenges and improving procedural outcomes.

Methods: We use Boston Scientific RHYTHMIA HDx™ Mapping System to create high-definition map of Koch triangle and check the diversity of the ablation vector weighted in grams with the ablator catheter alone (Intellanav open irrigated, large curve) and with the Hissian curve obtained through a steerable sheath (Agilis™NxT, LRG CURL, Abbott) placed advanced over the tricuspid valve in the right ventricle and the ablation catheter curved toward the interventricular septum.
(Fig. 1a, compared with a C315 Delivery Catheter, preshaped catheter with out-of-plane "His" curve, Medtronic). A more aggressive catheter manipulation with a "his" shape obtained with a long sheath and a curved ablation catheter could obtain a better tip coaxiality compared with conventional manipulation strategy for atrioventricular node ablation in right ventricle.

Results: The first patients was a 72-year-old female with Tachycardia-induced cardiomyopathy, after placing a biventricular defibrillator, performed a failed attempt at right atrioventricular node ablation. In the new ablation attempt performed in our center, we measured the gram-weighted vector of the catheter alone (9 grams. Fig. 1b) and with a hissian curve (18 grams, Fig. 1c) positioned where the his potential was recorded. Then, we provided radiofrequency (40 watt, imp 168, T 2 min) and complete AV block was obtained.
The second patient was a 68-year-old male with ischemic cardiomyopathy with severe reduction in left ventricular systolic function and episodes of heart failure during atrial fibrillation with high ventricular rate. Also in this case we measured the gram-weighted vector of the catheter alone (4 grams) and with a hissian curve (16 grams) positioned where the his potential was recorded. Then, we provided radiofrequency (40 watt, imp 156, T 2 min) and complete AV block was obtained.

Conclusion: The hissian-shaped curve technique represents a promising advancement in atrioventricular junction ablation, offering improved procedural efficacy and safety outcomes potentially preventing the need to perform an ablation in the left ventricle.
Further prospective studies and randomized controlled trials are warranted to validate its long-term efficacy, compare it with conventional ablation approaches, and establish standardized procedural protocols. Implementation of the hessian shaped curve technique has the potential to enhance the management of atrioventricular junction ablation and optimize patient outcomes in clinical practice.



WS.12

CASO DI FLUTTER ATRIALE ATIPICO POST INCISIONALE: CATETERE AD ALTA DENSITÀ E RISOLUZIONE FONDAMENTALE NELL'ANALISI DEL TESSUTO CICATRIZIALE

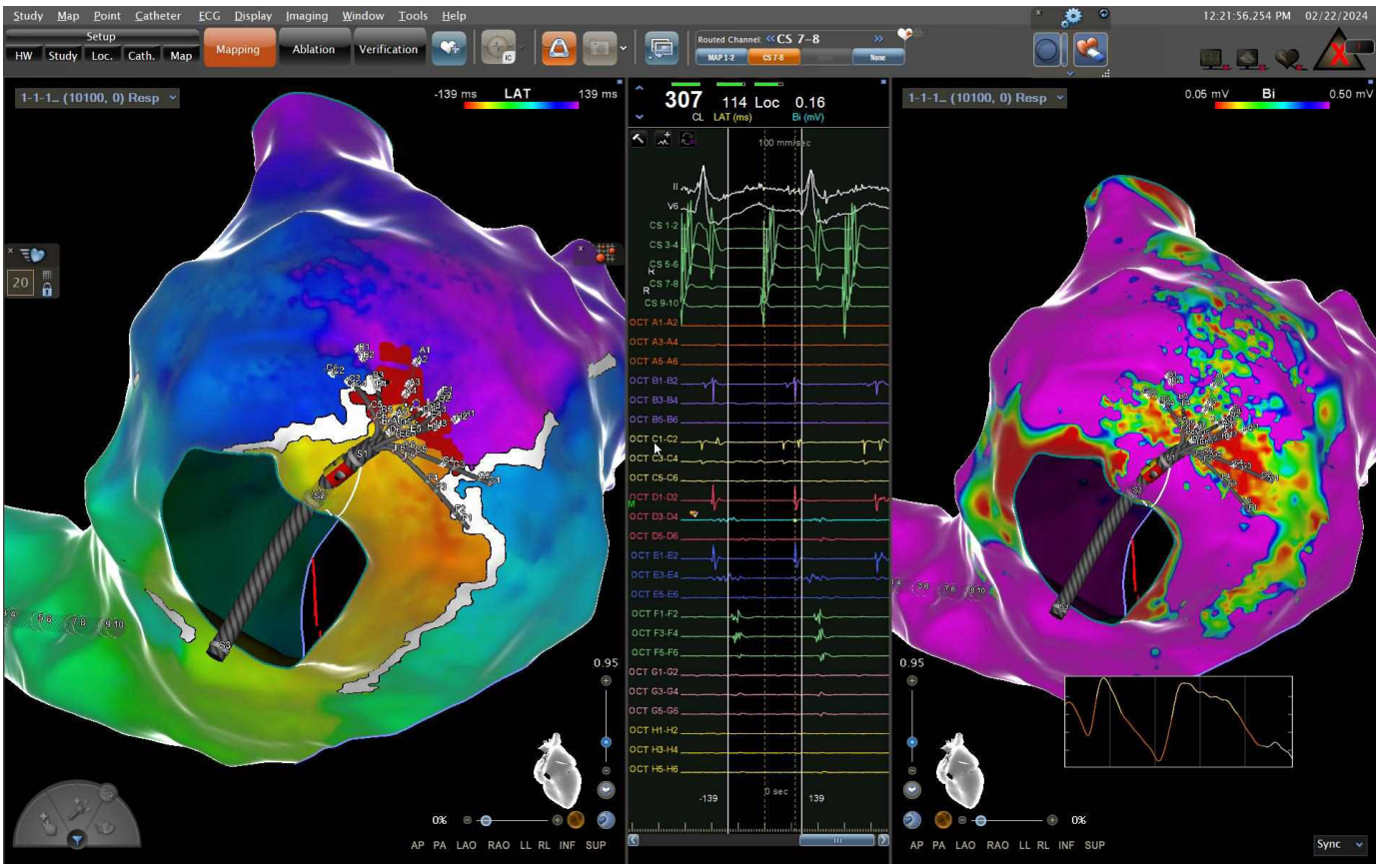
Paolo Sabbatani, Alessandro Corzani, Andrea Santarelli
Ospedale Bufalini, Cesena, ITALY

Anamnesi: paziente di 65 anni con atrio destro severamente dilatato e sottoposto a interventi di chiusura di difetto interatriale tipo ostium secundum con patch e annuloplastica tricuspidalica nel 1989 Nel 2022 frequenti episodi di fibrillazione atriale, cardiovertiti con Amiodarone A gennaio 2024 accesso al pronto soccorso per flutter atriale incardiovertibile
Procedura effettuata in assenza di fluoroscopia tramite sistema di mappaggio Carto® 3 e catetere decapolare Decanav® (Biosense Webster, spacing 2 8 2 mm, curva F) posizionato poi in seno coronarico per osservarne l'attivazione in corso di flutter atriale Si sceglie di eseguire il mappaggio del flutter destro con catetere ad alta risoluzione Octaray ™ (Biosense Webster, spacing 2 5 2 5 2 mm, curva F) considerando la storia clinica del paziente Octaray ™ è un catetere diagnostico con 48 elettrodi di 460 µm per una elevata risoluzione del segnale, posizionati su 8 spline Il catetere, inoltre, dispone dell'innovativa tecnologia TRUEref ™ che permette di utilizzare un reference unipolare alternativo durante il mappaggio riducendo l'impatto dei segnali far field e facendo quindi un'analisi del segnale locale in modo estremamente accurato.

Mappaggio: la mappa di attivazione dell'atrio destro evidenzia segnali mesodiastolici e frammentati in corrispondenza della parete laterale, nella porzione superiore alla vena cava inferiore Il tool EML (Early Meets Late) evidenzia, in prossimità di due zone di blocco locale di conduzione, l'istmo critico dell'aritmia La presenza di segnali di basso voltaggio in corrispondenza dell'istmo critico del flutter, dovuti ai due interventi precedentemente effettuati, è confermata anche dalla mappa di substrato (Fig 1 a sinistra mappa di attivazione dell'atrio di attivazione dell'atrio destro con istmo critico in rosso (EML) e a destra mappa di substratomappa di substrato).

End point: il ripristino del ritmo sinusale del paziente è avvenuto alla prima erogazione effettuata con catetere TermoCool Smart Touch SF ™ (Biosense Webster, curva D/F) in controllo di potenza a 30 Watt , Ablation I ndex di 450 e drop di impedenza di 12 ohm in corrispondenza dell'istmo critico individuato.

Conclusioni: il sistema di mappaggio e la scelta di cateteri multipolari con elettrodi che consentono una lettura del segnale ad alta risoluzione sono fondamentali nella cura delle aritmie complesse, soprattutto in presenza di rimodellamento del substrato atriale



WS.13

CONTINUOUS ACTIVATION CHANGES IN DUAL LOOP LEFT ATRIAL TACHYCARDIA

Simone Taddeucci, Amato Santoro, Maurizio Collantoni, Claudia Baiocchi, Stefano Lunghetti, Daniele Menci, Massimo Fineschi
Dipartimento di Cardiologia, Università degli studi di Siena, Siena, ITALY

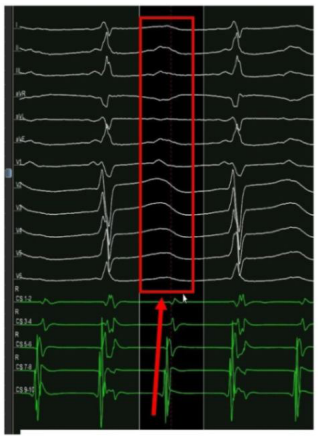
Patient Presentation: A 48-year-old woman presented with symptomatic palpitation and asthenia. During previous analogous episodes an atrial tachyarrhythmia was diagnosed and interpreted as atrial fibrillation. The patient had been electrically cardioverted and an anticoagulant was prescribed for the following month. In her medical history she underwent a mitral valve prosthetic substitution with transeptal approach made by Guiraudon technique. At the time of the last admission the patient was taking antihypertensive drugs and Sotalol.

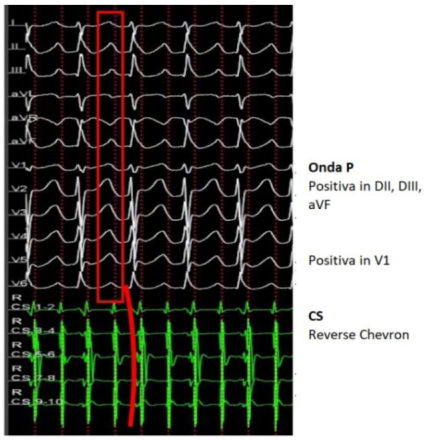
Initial work up: The admission ECG showed an atrial tachycardia with rarely visible P waves and an unstable cardiac rate. The echocardiography showed normal LVEF (60%) with mild prosthetic mitral valve regurgitation. The patient was therefore referred to EP lab catheter ablation.

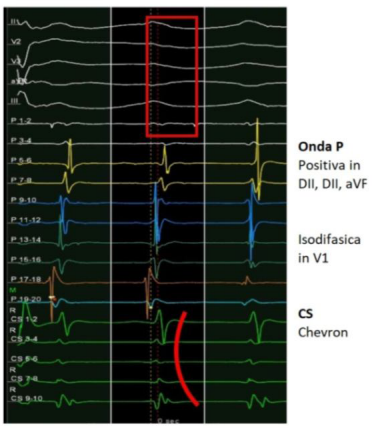
Diagnosis and Management: A decapolar lead was placed in coronary sinus and registered a continuous change in activation pattern from distal-proximal to Chevron and reverse Chevron patterns. Since the entire cycle of the most common arrhythmia wasn't covered just in the right atrium, transeptal puncture and left atrial mapping were performed. The most common arrhythmia mapped showed to be dependent on a micro re-entry circuit located in the posterior wall between superior and inferior right pulmonary veins (RPVs), near a site of electrical silenced tissue corresponding to one of the surgical incisions. There were besides discovered fragmented mesodiastolic potentials extending on interatrial septum until inferior surface of inferior RPV. Radiofrequency ablation has been delivered, observing arrhythmia interruption, and encircling of the RPVs was performed.
Bipolar voltage remapping of left atrium showed an area of low voltages on the roof. The Chevron pattern arrhythmia was reinduced with atrial burst stimulation and was mapped. It has been evidenced a macro re-entrant circuit dependent on the roof that changed propagation from posterior wall (Chevron pattern) to anterior wall (reverse Chevron pattern) depending on atrial refractory periods. Ablation made from RPVs through the roof to left PVs interrupted arrhythmias and restored stable sinus rhythm. Since desynchronization in atrial fibrillation was previously observed during the procedure, also wide antral encircling of left PVs has been made. All the lines were validated through bidirectional block.

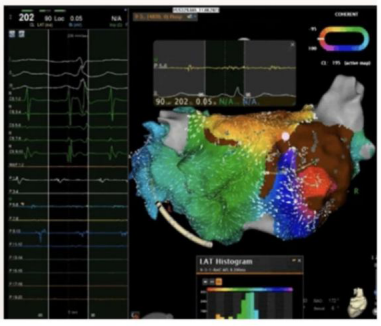
Follow-up: No complications were reported. Sotalol was withdrawn and the patient was discharged in sinus rhythm and anticoagulation was withdrawn after 1 month. No recurrence at 1 year follow up was recorded.

Conclusions: The patient presented a dual loop macro re-entrant atrial tachycardia depending on a micro re-entrant circuit in posterior wall next to RPVs and on a macro re-entrant circuit with critical isthmus located on the proximal third of left atrial roof.
In the present case, ablation of micro re-entrant circuit between RPVs allowed stabilization in the arrhythmia dependent on the roof. The observation of both Chevron and reverse Chevron patterns could be addressed to different refractory periods, induced by the fastest propagation of the micro re-entry. In cases of post-incisional tachyarrhythmias, understanding the surgical techniques underlying the physiopathological mechanisms of arrhythmias is crucial. This knowledge should be taken into consideration during catheter ablation of incisional flutters.








Mappa del microrientro in carena posteriore destra

GENETICA IN ARITMOLOGIA & MALATTIE DEI CANALI IONICI

WS.14

CARDIOMIOPATIA IPERTROFICA E TACHICARDIA ATRIALE MULTIFOCALE IN TRE PAZIENTI CON SINDROME DI COSTELLO

Silvana Catucci, Maristella Lombardi, Antonella Maiorano, Elena Massari, Giovanni Meliota, Ugo Vairo
Ospedale Giovanni XXIII, Bari, ITALY

Introduzione: La sindrome di Costello è una malattia rara, causata nell'80% dei casi da mutazione del gene HRAS, associata a disabilità intellettiva, ritardo della crescita, cute soffice, dimorfismi facciali. In circa 1/3 dei pazienti sono presenti anomalie cardiache, principalmente ipertrofia cardiaca e tachicardia atriale multifocale.

Casi clinici: Dal 2019 al 2023 sono giunti alla nostra osservazione 3 neonati con sindrome di Costello. M.M. ha mostrato alla nascita distress respiratorio, ipotonia e note dismorfiche; l'analisi genetica ha evidenziato la variante patogenetica c.64C>A (p.Gln22Lys). All'ecocardiogramma riscontro di cardiomiopatia ipertrofica prevalentemente settale con iniziale ostruzione all'efflusso sinistro e minima insufficienza mitralica, per cui è stata intrapresa terapia con propanololo. All'Holter ECG non si sono mai evidenziate aritmie ad eccezione di rare extrasistoli sopraventricolari e ventricolari non ripetitive. Il paziente è stato avviato al follow up che ha documentato stabilità del quadro clinico. All'ultimo controllo ecocardiografico ipertrofia del SIV (z-score 4,11), valvola mitrale continente, efflusso ventricolare sinistro libero. La seconda paziente, O.L., giunge nel nostro reparto a 10 giorni di vita a seguito di run di tachicardia sopraventricolare. Presenta piede torto bilaterale e dimorfismi facciali (impianto basso delle orecchie, radice nasale schiacciata, collo corto). L'ecocardiogramma è normale. All'Holter ECG tachicardia atriale interrotta da rari battiti sinusali condotta ai ventricoli con vari gradi di blocco AV. Viene intrapresa dapprima terapia con flecainide, senza beneficio. Successivamente si imposta terapia con amiodarone, a cui si associa poi digitale. Dimessa in buon compenso emodinamico e soddisfacente controllo della frequenza ventricolare media, viene avviata a follow up, ma in seguito per la comparsa di run di flutter atriale alternato ad aritmia atriale caotica viene aggiunto propanololo; all'Holter ECG in triplice terapia si osservano frequenti periodi di ritmo sinusale alternati a brevi episodi di tachicardia atriale. L'analisi genetica ha rilevato la presenza della variante patogenetica c.34G>A, p.(Gly12Ser) del gene HRAS. All'ultimo controllo ecocardiografico spessori parietali ai limiti superiori di norma. La terza paziente, F.A., è nata pretermine e ha subito presentato tachicardia atriale. La terapia con flecainide ha avuto transitorio beneficio. In seguito l'aritmia non è risultata più ben controllata per cui si è associato propanololo, senza beneficio. Si è quindi impostata terapia con amiodarone. Lo studio elettrofisiologico transesofageo ha dimostrato presenza di tachicardia atriale multifocale, non responsiva al pacing in overdrive. In terapia con flecainide, amiodarone e propanololo si ottiene parziale controllo della frequenza ventricolare media e compenso emodinamico. All'ecocardiogramma lieve ipertrofia concentrica e valvola polmonare displasica. Il test genetico ha rilevato la variante c.35G>C, p(Gly12Ala) del gene HRAS.

Conclusioni: La sindrome di Costello necessita di monitoraggio cardiaco per l'eventuale presenza di tachicardia atriale multifocale e cardiomiopatia ipertrofica. Come già descritto in letteratura, l'aritmia, che può presentarsi anche indipendentemente dall'ipertrofia, si può autolimitare nei primi mesi di vita con un trattamento farmacologico aggressivo ma può persistere o peggiorare in circa ¼ dei pazienti.

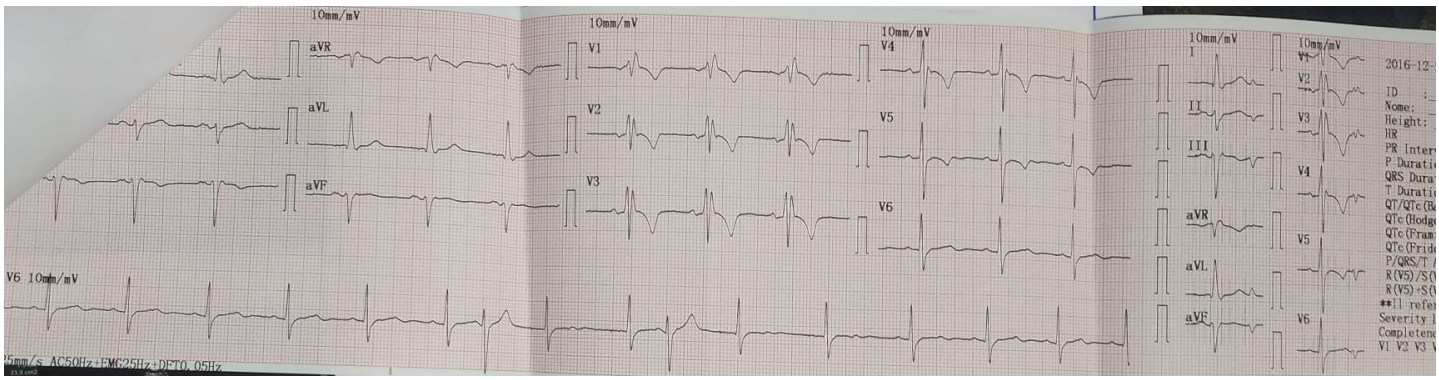
WS.15
DALL'ECG ALLA DIAGNOSI DI DISPLASIA ARITMOGENA DEL VENTRICOLO DESTRO

Maria Rosaria Gualtieri, Antonella Muscella, Antonio Marzo, Chiara Simeone
ASL Lecce, Casarano, ITALY

La displasia aritmogena del ventricolo destro e' una malattia genetica caratterizzata da una progressiva perdita di miocardio e dalla sua sostituzione con tessuto fibro adiposo. questo processo porta ad alterazioni sia elettriche che funzionali sino alla morte improvvisa causata dall'elevata instabilita' elettrica ventricolare, responsabile di tachicardia ventricolare e fibrillazione ventricolare.
negli stadi avanzati della malattia, la progressione della disfunzione del ventricolo destro ed il successivo coinvolgimento del sinistro possono portare a scompenso.

Caso Clinico: paziente di 50 anni, senza patologie cardiache note, giungeva in ps per episodi lipotimici ripetuti.
ECG presentava un ritmo sinusale con blocco di bdb destra con onde T negative da V1 a V5.
Durante la degenza il paziente evidenziava al monitoraggio ECG lembi di tachicardia ventricolare.
L'ecocardio presentava dilatazione del ventricolo destro con acinesia dell'apice e iniziale interessamento apicale del ventricolo sinistro.
Nel sospetto diagnostico di displasia aritmogena del ventricolo destro, venivano eseguiti analisi genetico-molecolare, che identificava due varianti a carico dei geni PKP2 e MYH7.
Il gene PKP2 codifica per la placofilina 2.
Il gene PKP2 si trova nei desmosomi dell'epitelio semplice e stratificato del miocardo e dei linfonodi.
Alti livelli di proteine sono stati rilevati nel ventricolo destro.
Le mutazioni di PKP2 sono causa di cardiomiopatia aritmogena.
Anche i risultati della risonanza confermavano l'analisi genetica ed il sospetto iniziale di displasia aritmogena.

Conclusioni: in questo paziente l'impianto di defibrillatore è sembrata l'unica terapia efficace per la prevenzione della morte improvvisa a scapito di un successivo impatto psicologico importante in considerazione della giovane età.
Il paziente continua ad effettuare periodici follow-up clinici e strumentali, con attuale stabilita' del quadro clinico e aritmico, grazie anche all'ottimizzazione della terapia farmacologica.



MAPPAGGIO ED IMAGING CARDIACO IN ARITMOLOGIA

WS.16
ULTRA-HIGH DENSITY MAPPING AND ABLATION OF LOCALIZED MICROREENTRANT TACHYCARDIAS: INSIGHT FROM THE CHARISMA REGISTRY

Francesca Bulian [1], Pietro Rossi [2], Gemma Pelargonio [3], Francesco Solimene [4], Giuseppe Del Giorno [5], Ricarda Marinigh [1], Antonio Bisignani [2], Gianluigi Bencardino [3], Andrea Di Cori [6], Maurizio Russo [7], Daniele Bianco [8], Andrea Giomi [9], Umberto Startari [10], Raimondo Calvanese [11], Gabriele Dell'Era [12], Matteo Anselmino [13], Gianluca Zingarini [14], Giulio Zucchelli [6], Maurizio Malacrida [15], Roberto Mantovan [1]

[1] *Santa Maria dei Battuti Hospital, Conegliano, ITALY*
[2] *Fatebenefratelli Isola Tiberina - Gemelli Isola Hospital, Rome, ITALY*
[3] *Foundation Polyclinic University Agostino Gemelli, Rome, ITALY*
[4] *Montevergine Clinic, Mercogliano, ITALY*
[5] *Maria SS. Addolorata Hospital, Eboli, ITALY*
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[10] *Fondazione Monasterio, CNR, Pisa, ITALY*
[11] *Ospedale del Mare, Naples, ITALY*
[12] *Hospital Maggiore Della Carità, Novara, ITALY*
[13] *Presidio Ospedaliero Molinette, Torino, ITALY*
[14] *Ospedale Santa Maria della Misericordia, Perugia, ITALY*
[15] *Boston Scientific, Milan, ITALY*

Background: Recent advancements in ultra-high-density mapping (UHDM) featuring automated functionalities, have enhanced our understanding of micro-reentrant atrial tachycardias (mAT) circuits and the precise localization of foci.

Purpose: To evaluate the diagnostic support provided by an automated UHDM algorithm in guiding ablation of mATs.

Methods: Consecutive patients eligible for AT ablation in 22 Italian centres were prospectively enrolled. All ATs were comprehensively mapped in either the left or right atrium utilizing the Rhythmia mapping system. The Lumipoint tool was systematically employed to confirm electrogram fragmentation within this defined area.

Results: Among 159 ATs analyzed, 97 (61.0%) were identified as macro-reentrant ATs, 50 (31.4%) as focal ATs and 12 (7.5%) as mATs. Concerning the mAT group, the targeted activity was localized in the anterior wall in 4 cases (33.3%), in proximity to PVs in 3 cases (25%), along the left ridge in 2 cases (16.6%) and at the roof, in the free wall and along the CTI in 1 case (8.3% each). Low voltage areas (<0.1 mV) were detected in all mAT cases and colocalized with the origin site. Over a median of 288[248-349] days of follow-up, 5 (3.1%) patients suffered from an AT/AF arrhythmia recurrence: 3 (3.1%) were in the MAT group, 1 (2%) in the focal AT and 1 (8.3%) in the mAT group.

Conclusion: A novel automated algorithm for mAT identification, coupled with the identification of matched areas of electrogram fractionation by the Orion catheter, may restrict the extent of required ablation and result in a low arrhythmia recurrence.

WS.17

UTILITÀ DEL SISTEMA DI MAPPAGGIO ELETTROANATOMICO NEL GUIDARE L'ISOLAMENTO DELLE VENE POLMONARI CON PVAC GOLD, UN' ESPERIENZA PILOTA MONOCENTRICA

Gabriele Ferrari, Giovanni Malanchini, Raul Limonta, Camilla Cirelli, Paola Ferrari, Paolo De Filippo
ASST Papa Giovanni XXIII, Bergamo, ITALY

La fibrillazione atriale è senza dubbio l'aritmia più frequentemente incontrata nei laboratori di elettrofisiologia. Esistono differenti metodiche per l'isolamento elettrico delle vene polmonari che rimane la pietra miliare del trattamento interventistico di questa aritmia. Da molti anni è in commercio tra i cateteri ablatori circonferenziali per l'isolamento delle vene polmonari il modello PVAC (Medtronic Inc.). La procedura standard di ablazione prevede esclusivamente l'utilizzo di fluoroscopia. E' ad oggi incerto se vi sia beneficio clinico nell'utilizzo routinario dei sistemi di mappaggio, in particolare ad alta densità, quando si utilizza la metodica di isolamento delle vene pomari con PVAC sia per la validazione del risultato sia per la navigazione tridimensionale durante la procedura ablativa. Tale informazione è importante poiché si è resa da poco disponibile una piattaforma basata sul catetere PVAC che utilizza l'elettroporesi come metodo di ablazione, particolarmente promettente nel campo dell'ablazione della fibrillazione atriale.
Per tale motivo è stato condotto uno studio prospettico monocentrico su pazienti consecutivi sottoposti ad ablazione delle vene polmonari, volto a valutare l'utilità dei sistemi di mappaggio elettroanatomico nel guidare la metodica di isolamento delle vene polmonari con catetere circolare. Tramite sistema Ensite Precision (Abbott Inc.) è stata possibile, per la prima volta dai dati disponibili in letteratura, la visualizzazione del catetere PVAC GOLD utilizzando la connessione del cavo disegnato per cateteri diagnostici duodecapolari.
Il periodo di studio è stato dal marzo 2018 al dicembre 2023. Sono stati arruolati 70 pazienti (58 uomini), di età media 54,8 anni. I pazienti sono stati così suddivisi: 1) gruppo convenzionale N=25, 2) gruppo mappaggio N=23, 3) gruppo navigazione e mappaggio N=22. L'endpoint dello studio è stata la efficacia clinica valutata come recidiva di FA clinica (elettrocardiogramma) o strumentale (episodio di > 30 secondi ad un Holter dei 7 giorni) al follow-up clinico più esteso disponibile entro l'anno dall'intervento.
56 pazienti erano affetti da FA parossistica (80%), 25 da ipertensione (37%), la media dei farmaci antiaritmici testati prima dell'ablazione era 1.5, 9 pazienti erano stati sottoposti a isolamento delle vene polmonari presso altro centro (12%), 9 pazienti presentavano foramen ovale pervio (12%).
Al follow-up le recidive sintomatiche sono state così riportate in tabella

	Gruppo 1 (25)	Gruppo 2 (23)	Gruppo 3 (22)
Palpitazioni	7 (30%)	48(36%)	4 (19%)
FA permanente	0 (0%)	0 (0%)	1 (5%)
pazienti con recidiva	7 (30%)	4 (17%)	2 (9%)
pazienti sottoposti a CVE	2 (8%)	0 (0%)	0 (0%)

Dallo studio presentato l'utilizzo del sistema di mappaggio elettroanatomico associato all'ablazione con catetere PVAC GOLD sembra avere ridotto, sebbene il campione non permetta di valutare la significatività statistica, le recidive cliniche (30% vs 9%). Tali risultati sembrano confermare la utilità dell'aggiunta di tale tecnologia nel guidare la metodica di isolamento delle vene polmonari con catetere circolare

WS.18

TRANSEPTAL APPROACH TO VENTRICULAR TACHYCARDIA ABLATION IN A PATIENT WITH ASCENDING AORTIC ANEURYSM GUIDED BY MULTIMODALITY IMAGING

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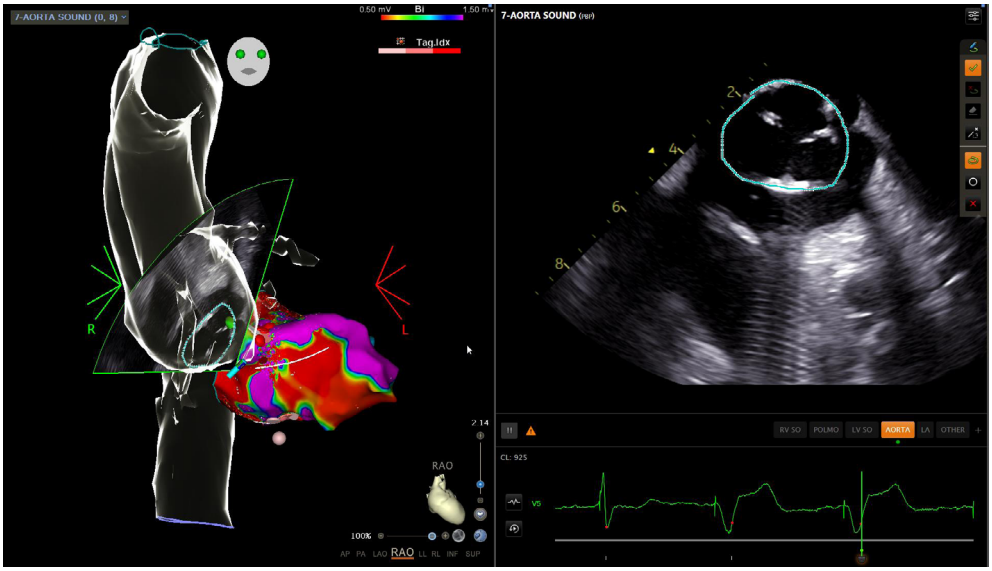
Background: Managing ventricular tachycardia (VT) in patients with structural heart conditions requires careful planning to ensure procedural safety and efficacy. This report discusses a transeptal VT ablation approach in a 75-year-old male with ascending aortic aneurysm (AscAA) and history of aortic valve replacement, utilizing fusion imaging for enhanced guidance.

Case description: The patient presented with syncopal episodes and was found to be in cardiogenic shock with wide QRS complex tachycardia with a right bundle branch block morphology and inferior axis, with a cycle length of 380 ms (158 bpm). Diffuse ST segment abnormalities were noted. Initial management involved stabilization and unsuccessful cardioversion attempts, leading to urgent catheterization. Diagnostic evaluations excluded coronary artery disease and aortic dissection, while emergent TOE identified an AscAA (58 mm) and mild left ventricular dysfunction. The decision was made to place a temporary mechanical circulatory support (tMCS) device. After retrograde guidewire insertion via the right femoral artery through the aortic annulus, sudden restoration of sinus rhythm occurred. Because of the improving clinical scenario, tMCS implantation was deferred, and the patient was admitted to our cardiac intensive care unit. Because of tachycardia recurrences responsive to adenosine, invasive electrophysiologic study was performed, identifying fascicular VT originating from the left anterior fascicle area. Decision for ablation was made after multidisciplinary discussion, highlighting the necessity of a transeptal approach due to the patient's anatomical constraints. Pre-procedural imaging included cardiac MRI to delineate areas of late gadolinium enhancement suggestive of myocardial scarring in the septal region, and CT scan was performed to assess transeptal access feasibility. Fusion of CT images with real-time procedural imaging and intracardiac ultrasound guided the safe transeptal puncture and catheter navigation.
On the day of the procedure, CT scan images were integrated using the CARTOMerge module (Biosense Webster), while intracardiac ultrasound (Soundstar) delineated the anatomy of the fossa ovalis and its relationship to the ascending aorta. An optimal posterior area of 1.6 cm2 was identified for safe puncture. The Brockenbrough needle was advanced through the SL0 sheath, and transeptal passage was achieved without complications. Subsequently, three-dimensional electroanatomic mapping (3DEAM) was conducted using the Octaray catheter. With the tachycardia being uninducible post-amiodarone initiation, substrate mapping was pursued. Bipolar electroanatomic mapping revealed scar presence at the mid-basal inferior septum, while unipolar mapping indicated a broader area, encompassing bipolar scar regions. Notably, Local Abnormal Ventricular Activity-type potentials were detected at the bipolar scar zones, guiding substrate ablation using the Decrement Evoked Potential Mapping approach. Successful ablation ensued, with no further VT episodes recorded, facilitating the patient's symptom-free discharge.



Discussion: This case illustrates the complexities of managing VT in patients with significant comorbidities. It underscores the importance of a multidisciplinary approach, incorporating advanced imaging modalities for procedural planning and execution. Limited case series and case reports have described the occurrence of iatrogenic aortic perforation during transeptal access. In this case, multimodality imaging utilizing CT and intracardiac ultrasound images were crucial in navigating anatomical challenges and optimizing patient outcomes, minimizing the risks of procedural complications.

WS.19

MERGING COMPUTED TOMOGRAPHIC SCANNING AND ELECTROANATOMICAL MAPPING OF KOCH'S PYRAMID: BEHAVIOR OF ATRIOVENTRICULAR NODE POTENTIAL IN DIRECT RECORDING AND ITS VALUE IN ABLATIVE PROCEDURES

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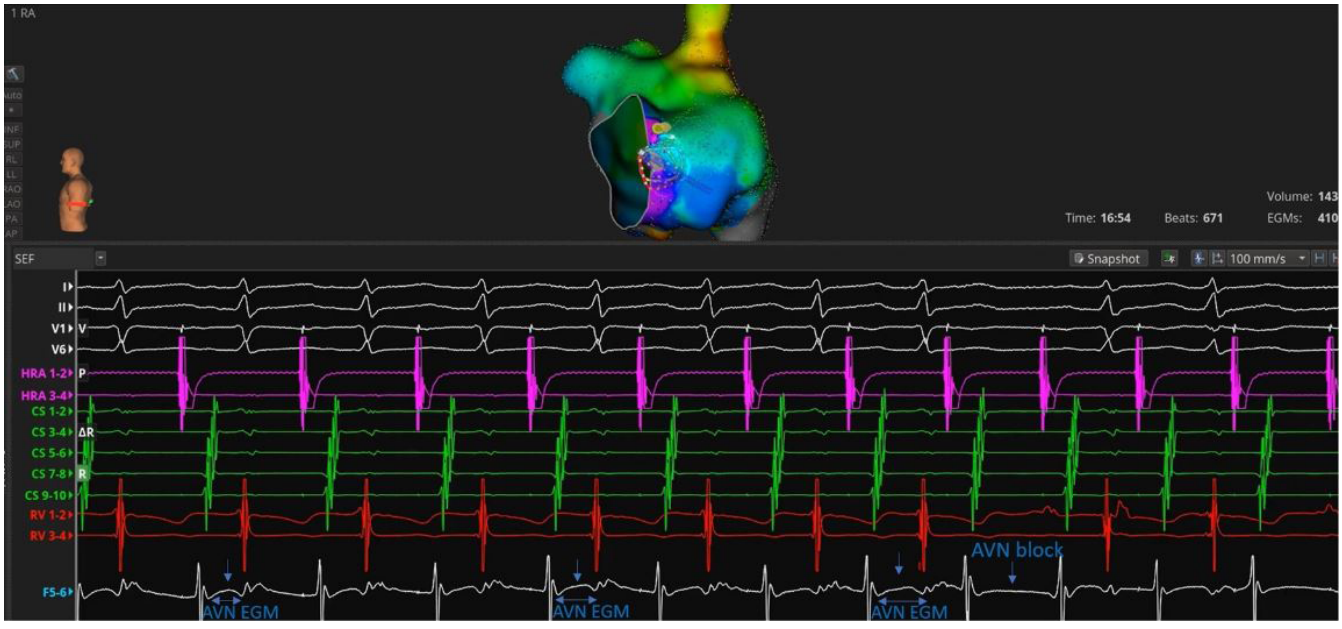
Introduction: Despite recent advances, it currently remains impossible to directly visualize the atrioventricular conduction axis of the heart using standard imaging techniques. The confirmation of location in important components such as the atrioventricular node requires the recording of specific electrograms for the anatomical structures identified on the electroanatomical map. This approach can enhance the effectiveness and safety of ablation procedures in the septal, paraseptal, and/or parahisian regions. Our study aims to show how the recording of nodal potentials in three-dimensional electro-anatomical maps fused with computed tomographic images can better delineate the location of structures within the region of Koch's pyramid.

Methods: Five patients with typical atrioventricular node re-entry tachycardia and an available cardiac computed tomography scan wereenrolled and underwent high-resolution mapping before ablation. The tomographic scans were imported and aligned with the anatomical map created with the Rhythmia mapping system. An import tool was used to acquire the pre-recorded images in DICOM format and ITK-SNAP software for highly reliable and efficient segmentation of the heart chambers.

Results: We reconstructed the size and location of the components of the conduction axis, using the dimensional data available in the literature and their relative positions to specific anatomical markers. We then proceeded to confirm the location and extent of individual components based on our ability to record specific potentials and endocavitary electrograms. The low-frequency, low-amplitude hump atrioventricular nodal potential was consistently recorded within the presumed location of the compact node. This was positioned within the true septal area in 3 patients, or in the mid-paraseptal region in the other two patients. The average length of the region was 4.5 ± 1.2 mm, with its width measured at 2.7 ± 0.6 mm. Its median distance from the atrioventricular membranous septum was 3 ± 0.8 mm. We confirmed the genuine nature of this potential with high-frequency atrial pacing to examine potential changes in nodal structure associated with an increase in heart rate and the disappearance of the AV nodal potentials following the atrial non-conducted beat of a Wenckebach sequence or after adenosine infusion.

Conclusion: We accurately estimated the position of the components of the atrioventricular conduction axis to the boundaries of the Koch pyramid, and demonstrated for the first time the changes of the atrioventricular node potential during its direct recording. Such accurate identification may improve the safety and efficacy of transcatheter ablation in the septal and paraseptal regions, as well as the implantation of pacing leads.



MISCELLANEA

WS.20
TRATTAMENTO E RISOLUZIONE DI UN CASO COMPLESSO DI ENDOCARDITE MICOTICA CIED CORRELATA IN PAZIENTE PM-DIPENDENTE

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Paziente diabetico, affetto da CAD, portatore di PM bicamerale per BAV totale dal 2007.
Nel 2012 failure dell'elettrocatetere ventricolare trattata con il posizionamento di un nuovo elettrocatetere ventricolare anch'esso disfuzionante nel 2019; presso un altro centro veniva eseguita estrazione e sostituzione dell'elettrocatetere più recente con Medtronic 5076, (mantenuto il primo elettrocatetere ventricolare isolato).
Dal 4/2022 episodi di brividi scuotenti con iperpiressia fino a 40 °C ed astenia. Agli EE PCR 1,65. Rx torace negativo. Un ecocardiocolorDoppler documentava una massa adesa ad un elettrocatetere ventricolare in corrispondenza del piano tricuspidalico di 10 x 8 mm a cui seguiva una PET con leucociti marcati, negativa.
7/2022 ricovero per febbre (39,4 C); PCR 3,65, 17000 WBC, 95% neutrofili, urea 78, creat 0,94 mg/dl. Emocolture negative. All'ecocardiogramma TT ed ETE massa mobile frastagliata su elettrocatetere VD con eversione in atrio destro, di dimensioni 1,7x 29 cm, ispettivamente aumentata rispetto al dato del 14/6. Impostata terapia empirica conceftriaxone e daptomicina.
Ulteriore set di emocolture e nuova PET negativi.
Nel sospetto di trombosi iniziava terapia scoagulante con eparina a basso peso molecolare proseguendo terapia antibiotica empirica. Indici di flogosi seriati in progressiva riduzione. Il paziente veniva dimesso asintomatico ed in buon compenso cardiocircolatorio con programma di follow-up ambulatoriale.
Al controllo eco TT e TEE dopo circa 30 gg ulteriore incremento delle dimensioni della massa per cui veniva predisposto invio in altro Centro per rimozione totale del sistema di stimolazione. Emocolture ancora negative, iniziava terapia empirica con daptomicina e ceftriaxone e veniva sottoposto alla fine di settembre 2022 (previo posizionamento di PM temporaneo da vena femorale dx per dipendenza da PM), ad aspirazione della vegetazione flottante adesa al decorso dell'elettrocatetere atriale, estrazione dello stesso e di entrambi gli elettrocateteri ventricolari. Durante la degenza isolato episodio febbrile, introdotto meropenem, sospeso ceftriaxone, (emocolture e PCR per candida negative). La vegetazione estratta veniva tipizzata per CANDIDA PARAPSILOSIS quindi impostata terapia con caspofungina e miglioramento degli indici di flogosi. Reintrodotta tp beta bloccante per episodi diTVNS.
Successivo trasferimento presso la nostra cardiologia con PM temporaneo da vena femorale sin che veniva sostituito con un elettrocatetere a fissazione attiva su setto apicale inserito per via percutanea dalla vena succlavia dx, connesso a PM VVI (stimolazione bipolare a 2.5 V @ 0.4 ms (7x valore soglia) alloggiato in posizione sovrapettorale e fissato con steridrape trasparente.
Proseguita terapia con Caspofungina titolata in base alle transaminasi per un totale di 6 settimane. Emocolture di sorveglianza e dosaggi di beta-glucano negativi.
Al termine (11/2022) si procedeva ad impianto di un PM Medtronic Micra VDD per il profilo di rischio infettivo e dopo 48 veniva rimosso il pacing temporaneo esterno dalla vena succlavia dx.
Ottimi i valori di soglia e sensing come pure il sincronismo con l'attività atriale ai successivi controlli ambulatoriali.

MONITORAGGIO REMOTO E TELEMEDICINA

WS.21

IL RUOLO DELL'INFERMIERE NELL'OTTIMIZZAZIONE E RIDUZIONE DEI TEMPI D'ATTESA DELLE SEDUTE DI FOLLOW-UP AMBULATORIALI DEI DISPOSITIVI CARDIACI IMPIANTABILI ATTRAVERSO UN'INNOVATIVA APP PRESENTE NEL PROGRAMMA

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Background: I pazienti cardiopatici portatori di pacemaker, defibrillatori, sono categorie di pazienti ad alto rischio, sia per l'età avanzata che per l'alta percentuale di patologie croniche associate. Si tratta di pazienti per i quali è richiesto un controllo almeno semestrale, in condizione di normalità, del dispositivo recandosi in presenza presso la cardiologia di riferimento. A seguito del periodo considerato e dell'esperienza vissuta durante la pandemia da Sars-Covid, abbiamo imparato che il paziente potrebbe essere esposto recandosi in luoghi affollati ad eventuali contagi. Per tale motivo, con la riapertura dell'ambulatorio dei controlli dei pacemaker e defibrillatori, abbiamo deciso di implementare un innovativo sistema, Carelink Express della ditta Medtronic, che consenta al paziente afferente al centro spoke di Rossano di poter eseguire un controllo del proprio dispositivo in tempi rapidi e senza necessità di lunga attesa in cui l'infermiere dedicato si occupa di eseguire l'interrogazione del dispositivo, mediante l'App Carelink Express presente nel programmatore SmartSync di Medtronic, che viene trasmessa direttamente al medico che revisiona tutte le interrogazioni ricevute a gruppi di 5 pazienti e fornendo istantaneamente il referto del controllo del device che non necessità riprogrammazione e trattenendo in ambulatorio il paziente che necessità un'azione clinica o tecnica.

Materiali e metodi: Medtronic Carelink Express è un sistema costituito da un tablet dedicato in cui è installata l'app CareLink express mobile che consente l'interrogazione di tutti gli ICD, dispositivi CRT, ICM e pacemaker Medtronic. L'app viene utilizzata per controllare o interrogare il dispositivo cardiaco Medtronic impiantato indipendentemente dal fatto che il paziente sia o meno registrato sulla piattaforma del controllo remoto. Proprio questo aspetto permette l'utilizzo su tutta la popolazione dei pazienti portatori di questi dispositivi e in qualsiasi momento.

Risultati: Da Ottobre 2023 ad oggi, 200 pazienti portatori di devices cardiaco impiantabile della ditta Medtronic si sono recati presso la cardiologia del centro Spoke di Corigliano Rossano per il controllo programmato. Presso il nostro ambulatorio l'infermiere dedicato, che ha eseguito una formazione specifica, esegue l'interrogazione del dispositivo cardiaco a gruppi di 5 pazienti per volta. L'interrogazione viene visionata dal medico attraverso la piattaforma Carelink Network. I pazienti, che non necessitano di interventi clinici o di riprogrammazione, ricevono dall'infermiere il referto e il prossimo appuntamento. I pazienti che richiedono una riprogrammazione vengono visitati dal medico che esegue l'azione correttiva e riprogramma il prossimo follow-up.

Conclusioni: Nel contesto del post pandemia da COVID-19, la tecnologia CareLink express Mobile offre ai pazienti la possibilità, qualora non necessario l'intervento di una riprogrammazione del dispositivo, di beneficiare di un controllo rapido e senza tempi d'attesa lungi dovuti dalle carenti strutture organiche vigenti. Offre inoltre al nostro centro di ottimizzare le risorse mediche presenti ottimizzando le attività cliniche svolte in contemporanea abbattendo le eventuali liste d'attesa grazie, oltre all'avvento della tecnologia, alla presenza di figure infermieristiche che sono state formate al fine di poter gestire i nostri pazienti portatori di questi device.

WS.22

CLINICAL VALUE OF MULTIPLE SENSORS CONTRIBUTING TO A COMPOSITE HEART FAILURE ICD MONITORING INDEX

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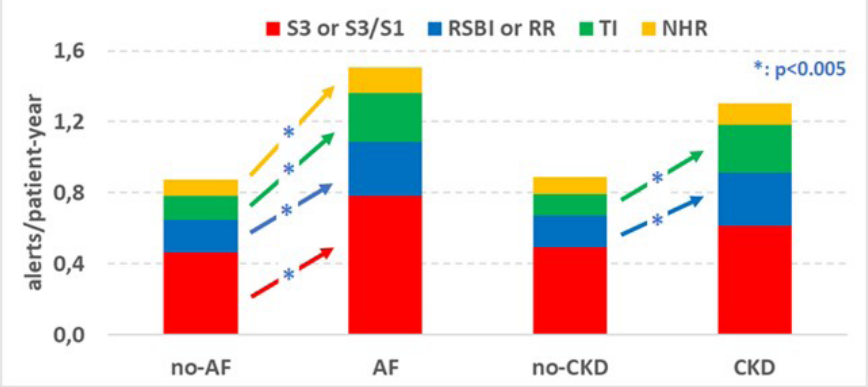
Background: The HeartLogic algorithm integrates data from various implantable defibrillator (ICD) sensors to predict impending heart failure (HF) decompensation. The algorithm computes worsening in its sensors and weighs them based on a risk level. These sensors include accelerometer-based first (S1) and third (S3) heart sounds, intrathoracic impedance (TI), respiration rate (RR), the ratio of respiration rate to tidal volume (RSBI), and night heart rate (NHR).

Objective: This study assessed the relative worsening of ICD sensors at the onset of HeartLogic alerts, their association with patient characteristics and subsequent outcomes.

Methods: The HeartLogic feature was activated in 568 ICD patients (410 with CRT-D) across 26 centers, with a median follow-up of 26 months [25th–75th percentile: 16–37].

Results: During the follow-up, 1200 HeartLogic alerts were recorded in 370 patients. The sensor with the highest worsening (SHW) at the alert onset was S3 (27% of alerts), followed by S3/S1 (25%), TI (16%), RR (15%), and NHR (11%), RSBI (6%). Patients with atrial fibrillation (AF) at implantation and those with chronic kidney disease (CKD) had higher alert prevalence (AF 84% vs. no-AF 58%, CKD 72% vs. no-CKD 59%; both p <0.05) and higher alert rates (AF 1.51/patient-year vs. no-AF 0.88/patient-year, CKD 1.30/patient-year vs. no-CKD 0.89/patient-year; both p <0.05). AF patients had alerts with every sensor as SHW, while CKD patients had alerts primarily with TI, RR, and RSBI as SHW (Figure). In 85% of cases among 247 patients with >1 alert, the SHW changed between successive alerts. Of the 88 (7%) alerts resulting in HF hospitalizations or deaths, a greater proportion featured RR or RSBI (11%) and NHR (11%) as SHW, followed by heart sounds (5%) (both p <0.05). Clinical events were more common with the first alert (12.6%) than subsequent alerts (5.2%, p <0.001).

Conclusion: HeartLogic alerts are predominantly associated with the highest worsening in heart sounds. Nevertheless, recurrent alerts often involve other sensors, suggesting varied HF progression mechanisms and potential divergent outcomes. The frequency of alerts and the pattern of worsening in ICD sensors are linked to patient characteristics.



WS.23

GESTIONE DEI PAZIENTI PORTATORI DI DISPOSITIVI CARDIACI IMPIANTABILI TRAMITE L'UTILIZZO DEL SISTEMA CARELINK EXPRESS TRA LO SPOKE DI ROSSANO E LE AFT (AGGREGAZIONE FUNZIONALE TERRITORIALE)

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Background: Il follow-up dei pazienti è un'attività clinica necessaria per verificarne lo stato di salute nel tempo, le risposte al trattamento e la comparsa di eventuali complicazioni o episodi avversi. Generalmente, l'attività di follow-up prevede una presa in carico del paziente presso l'ambulatorio ospedaliero di riferimento, a volte anche distante diversi chilometri, che continua nel tempo. Per questo è doveroso sfruttare le potenzialità offerte dalle nuove tecnologie digitali per semplificare e migliorare la gestione dei controlli e restare in contatto con il paziente anche dopo la visita senza che sia necessario uno spostamento dal proprio domicilio verso la prima cardiologia di riferimento ma, recandosi presso il proprio medico di base che invierà attraverso un innovativo sistema, Carelink Express della ditta Medtronic il controllo del dispositivo alla cardiologia di Rossano che, una volta eseguita la revisione dell'interrogazione inviata, provvederà alla refertazione ponendo indicazione al successivo follow-up o se necessario porrà indicazione ad un controllo in ospedale.

Materiali e metodi: Medtronic Carelink Express è un sistema costituito da un tablet dedicato in cui è installata l'app CareLink express mobile che consente l'interrogazione di tutti gli ICD, dispositivi CRT, ICM e pacemaker Medtronic. L'app viene utilizzata per controllare o interrogare il dispositivo cardiaco Medtronic impiantato indipendentemente dal fatto che il paziente sia o meno registrato sulla piattaforma del controllo remoto. Proprio questo aspetto permette l'utilizzo su tutta la popolazione dei pazienti portatori di questi dispositivi e in qualsiasi momento afferenti all'AFT (Aggregazione Funzionale Territoriale costituita da un raggruppamento di medici di medicina generale incaricato di garantire per l'intera giornata e per tutti i giorni della settimana, la tutela della salute della popolazione di riferimento, vale a dire degli iscritti ai medici partecipanti a quella Aggregazione Funzionale Territoriale.

Risultati: Il progetto pilota, Day Express, ideato in Calabria presso la nostra cardiologia da Ottobre 2023 prevede che il nostro reparto e il centro AFT di riferimento siano in collegamento attraverso il nuovo programmatore smart Sync dedicato. Grazie all'App Carelink Express , presente nel programmatore dedicato, il paziente che si reca presso la struttura può eseguire l'interrogazione del dispositivo ed i dati vengono inviati automaticamente alla nostra cardiologia. Il medico di riferimento visiona l'interrogazione ricevuta sulla piattaforma Carelink Network valutando se necessario un follow-up di routine oppure che il paziente si rechi presso la nostra struttura per una riprogrammazione del dispositivo o intervento clinico.

Conclusioni: Grazie all'avvento di nuove tecnologie dotate di applicativi di ultima generazione, oggi è possibile pensare di stilare dei progetti come quello da noi descritto che consenta lo spostamento dei dati e non dei pazienti. Carelink Express consente di poter eseguire il controllo di un dispositivo cardiaco impiantabile direttamente presso l'ambulatorio del proprio medico di base consentendo l'accesso in ospedale solo nel caso in cui sia necessario una riprogrammazione del dispositivo o un intervento clinico. Il paziente potrà così evitare di percorre distanze, a volte limitanti per la propria patologia ed evitare un carico non necessario presso le strutture ospedaliere.

WS.24

PROCESSO DI FORMAZIONE TEORICA E PRATICA DELL'INFERMIERE NELL'IMPIANTO E GESTIONE DEI LOOP RECORDER DI NUOVA GENERAZIONE

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Introduzione: I loop recorder impiantabili (implantable loop recorder - ICM) sono indicati nel percorso diagnostico dei disturbi del ritmo cardiaco. Con la miniaturizzazione e strumenti dedicati la procedura di impianto è stata semplificata rendendola fattibile e sicura anche da infermieri appositamente formati.
Trattandosi di atto assistenziale semplice (Legge Stabilità, comma 566), il dispositivo può essere impiantato da infermieri esperti in Elettrostimolazione che abbiano ricevuto una formazione mirata.
Un approccio guidato dagli infermieri per la gestione dei pazienti impiantati con ICM è stato anche proposto per consentire l'impiego ottimale delle risorse mediche per procedure più complesse.

Scopo: Descrivere i vantaggi dell'impianto ICM e il controllo remoto effettuato da esperti infermieri certificati.

Metodi: Gli infermieri sono stati certificati dopo un corso di due giorni e 10 impianti assistiti da un medico per Medtronic e un corso certificato di un giorno e 10 impianti assistiti per Biotronik. Il corso si articola in due diverse sessioni: teorica, con lezione frontale riguardante il posizionamento del dispositivo, conoscenza di elettrocardiografia, composizione base del dispositivo e aspetti pratici nella tecnica di trasmissione con il controllo remoto. Sessione pratica in sala con impianto dei dispositivi.
Da luglio 2023 due infermieri con esperienza di sala di elettrostimolazione hanno intrapreso un programma di formazione per garantirne la competenza. Dal completamento del programma, gli ICM nel nostro istituto vengono inseriti dall'infermiere con la disponibilità di un medico nelle vicinanze per assistenza o consigli sulla risoluzione dei problemi durante la procedura.
Dal punto di vista giuridico sono state rispettate le norme attinenti lo sviluppo professionale dell'infermiere: Legge n.42 del 1999, Legge 10 agosto 2000 n. 251.

Discussione: È stato dimostrato che un protocollo gestionale che consenta l'impianto di ICM da parte di infermieri debitamente formati e il follow-up remoto (BHRS, 2018), è sicuro e apporta benefici sia al paziente sia alla struttura sanitaria (Roebuck, 2015; Wong, 2016).

Vantaggi: ridotte dimensioni del dispositivo; riduzione delle dimensioni della ferita; riduzione della degenza in ospedale; follow-up da remoto.

Benefici legati alla strategia: riduzione dei tempi e delle liste d'attesa per incremento del numero di procedure sostenibile. Nella nostra U.O, questo protocollo ha permesso di aumentare esponenzialmente il numero di impianti di ICM (da 7 nel 2018 e 2019 a 19 nel 2023 e 12 dall'inizio del 2024).

Conclusioni: Gli impianti ILR possono essere eseguiti in sicurezza da infermieri qualificati, con benefici per i pazienti e per l'ospedale.
Sono state effettuate importanti ricerche sui monitor cardiaci inseribili (ICM), focalizzando l'importanza sulla semplificazione della procedura di inserimento aumentando al contempo le prestazioni ICM con algoritmi di rilevamento più accurati.
La marcata riduzione delle dimensioni degli ICM ha consentito un intervento di inserimento nel tessuto sottocutaneo minimamente invasivo.
Questi miglioramenti hanno aperto la porta affinché questa procedura venga eseguita da personale qualificato: professionisti infermieri certificati, adeguatamente formati, rendono efficiente la gestione del tempo e delle risorse, potenzialmente riducendo le liste d'attesa e semplificando la gestione da remoto dei dispositivi stessi.

WS.25

COME PASSARE DA UN FOLLOW-UP CONVENZIONALE DEI DISPOSITIVI ELETTRONICI CARDIACI IMPIANTABILI AD UNO VIRTUALE AL 100%: MODELLO ORGANIZZATIVO E RISULTATI DELL' ESPERIENZA DI UN SINGOLO CENTRO

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Introduzione: Durante la pandemia di SARS-CoV-2 COVID-19, il sistema sanitario globale ha dovuto rivedere importanti processi coinvolti nella routine quotidiana, come le attività ambulatoriali all'interno dell'ospedale, comprese le visite di follow-up dei dispositivi elettronici cardiaci impiantabili (CIED). Lo scopo di questo studio di 'Real world' è quello di descrivere la nostra esperienza di 3.5 anni di follow-up completamente virtuale dei CIED, valutando il tasso di successo delle trasmissioni remote e verificando l'organizzazione adottata.

Metodi e risultati: Da aprile 2020 a novembre 2023, tutti i pazienti con un sistema di monitoraggio remoto (RM) attivo e ben funzionante con tutti gli algoritmi automatici accesi, come l'autocapture e l'autosensing , sono stati sottoposti ad un follow-up esclusivamente con il solo RM (includendo: - nuovi impianti o sostituzioni, - già impiantati a partire dal 2015, - già portatori di RM). I controlli ambulatoriali non programmati sono stati eseguiti solo se indotti da allarmi gialli o rossi del RM. I pazienti sono stati divisi in due gruppi, in base alla tecnologia disponibile: sistema di trasmissione manuale (MTS) e sistema di trasmissione automatica (ATS). Il gruppo ATS garantiva una trasmissione giornaliera di eventuali allarmi gialli o rossi, ed almeno ogni 15 giorni veniva misurata la percentuale di connettività tra i CIED e il nostro centro. Una volta all'anno era prevista comunque una trasmissione automatica forzata, indipendentemente dagli allarmi verificatisi. Il gruppo MTS forniva una trasmissione manuale ogni 6 mesi. Nello studio sono stati inclusi 1937 pazienti consecutivi. A fine novembre 2023 un totale di 1409 pazienti (1192 nel gruppo ATS e 217 nel gruppo MTS) sono stati comunque seguiti attivamente dalla nostra clinica virtuale (384 deceduti, 137 dimessi, 7 trasferiti). 712 pazienti del nostro ambulatorio non stati inclusi nello studio e seguiti in modo convenzionale. Il tasso di successo complessivo delle trasmissioni con il modello organizzativo adottato è stato del 96,6% nel gruppo ATS (indice di connettività) e dell'87% nel gruppo MTS. Le visite di follow-up convenzionali in ospedale sono diminuite del 44%. Il tempo di lavoro totale, risultante dalla somma del tempo speso per i follow-up in ospedale piu' quelli da remoto, dopo un aumento iniziale, si è progressivamente ridotto fino all'attuale -25%. Il tasso di mortalità a 3,5 anni per qualsiasi causa è stato del 7,5% (vs 8.3% dei controlli convenzionai, p=NS). Nel gruppo ATS nessun malfunzionamento del dispositivo è stato notificato alla nostra clinica virtuale, prima che non ce ne fossimo già accorti tramite gli allarmi del RM. L'analisi dei costi ha evidenziato un guadagno del +156.9% risultante dalla differenza dei costi del personale e il rimborso correlato ai DRG.

Conclusioni: La tecnologia disponibile consente di passare a una clinica virtuale al 100%, senza sovraccaricare il flusso di lavoro della clinica, in modo sicuro. Adottando un modello organizzativo appropriato, è possibile mantenere elevate percentuali di successo delle trasmissioni. Le trasmissioni automatiche consentono un controllo più frequente dei pazienti con CIED, rispetto a quelle manuali.

WS.26

MISREADING OF P-WAVE AS QRS COMPLEX BY SUBCUTANEOUS LOOP RECORDER LEADING TO UNDETECTED SYNCOPAL EPISODES

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Syncope, defined as a transient loss of consciousness due to global cerebral hypoperfusion, poses a diagnostic challenge, particularly when episodes are infrequent or elusive. Advanced monitoring technologies such as subcutaneous loop recorders (SLRs) have become invaluable tools in the investigation of recurrent syncope of unknown etiology , offering prolonged heart rhythm monitoring in ambulatory settings. However, the reliability of these devices hinges upon accurate interpretation of recorded data. Herein, we present a case of recurrent syncope in which a SLR misinterpreted a critical electrocardiographic (ECG) feature, resulting in the failure to detect significant pauses.

A 55-year-old man with a history of surgical aortic valve replacement came to our attention for recurrent syncope over the past six months. Initial evaluation, including comprehensive history-taking, physical examination, electrocardiogram (ECG), echocardiography, and ambulatory ECG monitoring, yielded no conclusive findings. Given the recurrent nature of the syncope and the lack of diagnostic yield from conventional investigations, a decision was made to implant a subcutaneous loop recorder (Reveal LINQ, Medtronic) for continuous heart rhythm monitoring.

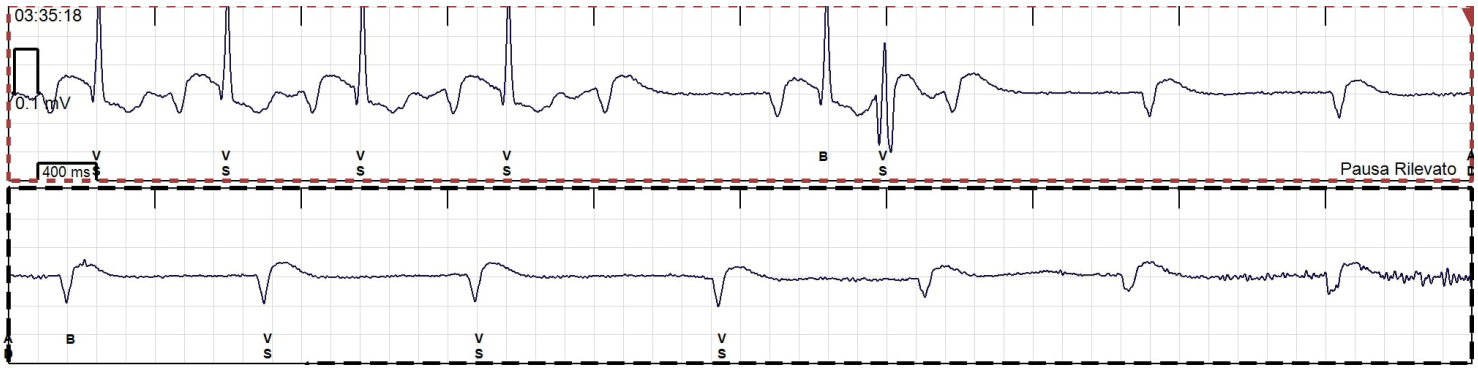
Following implantation, the patient experienced two further syncopal episodes, each prompting a call to our hospital. However, upon review of the SLR data, no abnormalities were detected, raising concerns regarding the sensitivity of the device. On one occasion, however, a transmission revealed an intriguing misinterpretation by the SLR. A P-wave, clear on the surface ECG, was erroneously identified by the device as a QRS complex. Consequently, the SLR underestimated the duration of the ensuing pause, misreading it as four seconds rather than the actual ten seconds observed on ECG. The patient was then admitted for pacemaker implantation.

His case highlights a novel instance of SLR misinterpretation leading to a missed diagnosis in a patient with recurrent syncope. The misidentification of a P-wave as a QRS complex by the SLR resulted in the underestimation of a significant pause, obscuring a potentially critical diagnostic finding. To our knowledge, this is the first reported case of such a misinterpretation by a SLR.

Subcutaneous loop recorders have revolutionized the investigation of syncope by providing continuous heart rhythm monitoring in real-world settings. However, their utility hinges upon accurate interpretation of recorded data. Although SLRs are designed to detect and record arrhythmias, they may occasionally misinterpret ECG features, particularly in complex or atypical rhythms

In our case, the SLR's misinterpretation of a P-wave as a QRS complex underscores the importance of device validation and ongoing quality assurance measures. It also emphasizes the need for clinicians to exercise caution when interpreting SLR data, particularly in cases where device findings do not correlate with clinical symptoms or other diagnostic modalities.

Furthermore, this case underscores the importance of careful consideration of device settings, including alarm thresholds and sensitivity levels. In our case, the SLR's alarm cutoff of three seconds may have contributed to the failure to detect the prolonged pause. Adjusting alarm parameters and sensitivity thresholds based on individual patient characteristics and clinical context may enhance the diagnostic yield of SLRs and improve patient outcomes.



WS.27

ASSESSING ADHERENCE TO REMOTE MONITORING RECOMMENDATIONS FOR CARDIOVASCULAR IMPLANTABLE ELECTRONIC DEVICES: A RETROSPECTIVE ANALYSIS

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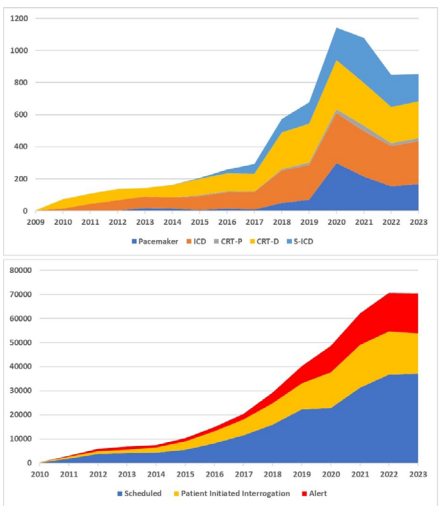
Background: The recently published Expert Consensus Statement on the Practical Management of Remote Device Clinic offers evidence-based recommendations for managing patients with cardiovascular implantable electronic devices (CIEDs).

Purpose: This study evaluates adherence to remote monitoring (RM) recommendations in current clinical practice using data from a RM database.

Methods: According to RM guidelines, patient connectivity should be maintained. If continuous connection is ensured, it is reasonable to schedule in-person visits every 24 months, with alert-based RM potentially replacing structured intermittent device follow-up. Data from 6553 CIED patients followed on the LATITUDE (Boston Scientific) remote network at 26 Italian centers between 2010 and 2023 were analyzed. Median RM duration was 40 months (25th-75th percentile: 23-67).

Results: Enrollment of patients at centers significantly increased over the observation period (Figure). As of the January 2024 data extraction, 4723 patients had transmitted data in the last 12 months. Among these, 639 (14%) were NOT MONITORED (i.e. interrupted connectivity), with no significant differences among CIED types (Pacemaker: 13%; ICD: 12%; CRT-P: 7%; CRT-D: 13%; S-ICD: 18%). Scheduled device transmissions occurred at least once every 3 months in 96% of patients. The volume of in-office device interrogations and remote transmissions is detailed in Figure. In 2023, among the 4084 MONITORED patients, 6600 in-office device interrogations were conducted, and 64296 remote transmissions were reviewed. Of these, 34267 (53%) were scheduled, 15091 (24%) were patient-initiated, and only 14938 (23%) were triggered by alerts.

Conclusions: In current clinical practice, RM adoption is increasing, alongside the volume of in-office and remote visits. Solutions must be implemented to ensure transmission continuity in a substantial percentage of patients. Additionally, there persists a significant reliance on frequent scheduled transmissions and in-office visits. Centers stand to gain from implementing the guideline-recommended alert-based RM strategy, reducing the considerable burden of nonactionable remote and in-office visits among patients with continuous connectivity.



MORTE CARDIACA IMPROVVISA

WS.28

SMALL CLUES FOR A LIFE-SAVING DIAGNOSIS: A CASE REPORT

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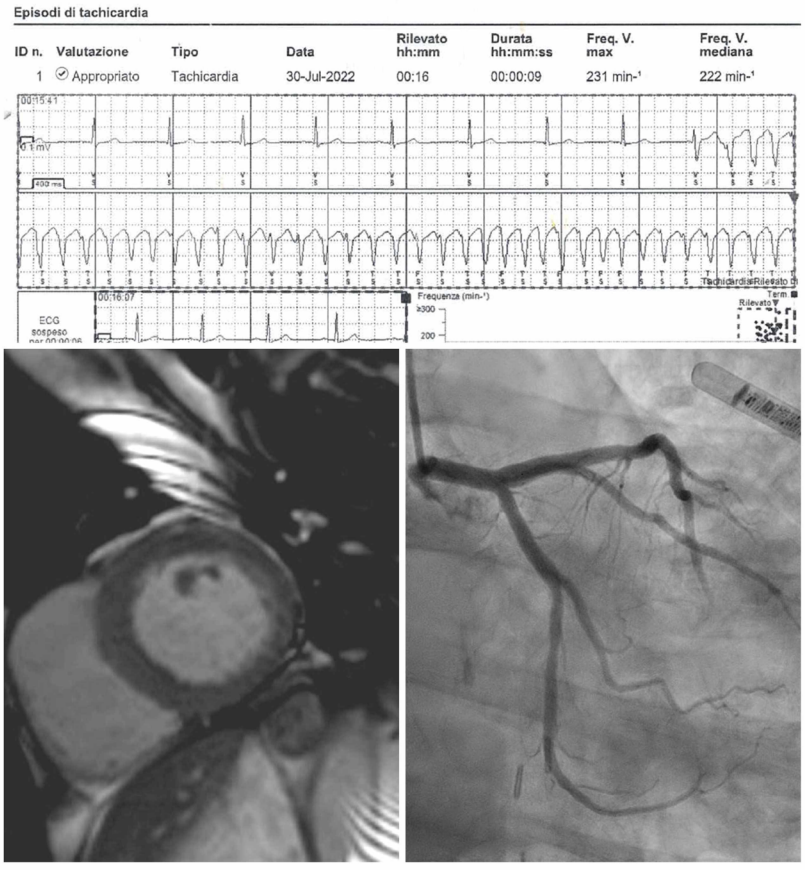
In 2020, a 57-year-old hypertensive, overweight man was admitted in our Hospital for syncope with head trauma leading to intracranial haemorrhage. He had a family history of ischaemic heart disease, with no prior cardiovascular history.
Basal ECG showed regular sinus rhythm, normal atrioventricular conduction, no repolarization abnormalities Fig.1.
Blood tests were unremarkable. Echocardiography and 24h ECG Holter monitoring showed no abnormalities. Supra aortic vessels were free from atherosclerotic disease at vascular Doppler imaging. To rule out an arrhythmic cause of syncope, an implantable loop recorder (ILR) was implanted.
For almost 2 years the patient remained asymptomatic, and the ILR did not detect any rhythm disturbances.
In 2022, however, a monomorphic, non-sustained ventricular tachycardia (NSVT) was recorded at ILR monitoring (16 seconds, median cycle length 270ms) Fig.2. The Patient remained asymptomatic. Treatment with beta blocker was initiated, and a cardiac magnetic resonance (CMR) was performed. The CMR showed normal dimensions and function of the left ventricle, with a subepicardial thin band of adipose tissue in the basal to mid segment of the anterior/anterolateral wall (replacement resulting in a India ink artifact at muscle-fat interface), in absence of oedema or fibrosis. Fig.3. No anomalies were observed in the right ventricle and in the atria.Genetic testing for cardiomyopathies was performed, and showed heterozygotic mutations in the DSP, SCN5A and VCL genes, coding for desmoplakin, sodium voltage-gated channel alpha subunit 5 and vinculin, respectively. The mutations were classified as variant of uncertain significance (VUS). The Patient was then admitted for elective implantable cardioverter defibrillator (ICD) implantation in secondary prevention. Preoperative coronary angiography showed non-significant stenosis of first diagonal branch (Figure 4) After single-chamber ICD implantation he was discharged with the following medical therapy: bisoprolol, cardioaspirin, ramipril, atorvastatin and ezetimibe. At follow-up the patient is alive and asymptomatic, without arrhythmia recurrence detected at device monitoring.

Conclusions: We presented a case of syncope in a Patient with ventricular arrhythmias and a segmental left ventricular subepicardial replacement with adipose tissue. Genetic testing showed mutations in 3 different genes associated with multiple cardiomyopathies. In this case, ILR monitoring, CMR imaging and genetic testing have converged into the diagnosis of non-dilated left ventricular cardiomyopathy (NDLVC), and led to ICD implant in secondary prevention. Our case shows how modern cardiology increasingly uses complex and differentiated diagnostic methods in order to obtain an accurate and, in this specific case, life-saving diagnosis.



WS.29

ARRHYTHMOGENIC MITRAL VALVE PROLAPSE PRESENTED WITH OUT-OF-HOSPITAL CARDIAC ARREST

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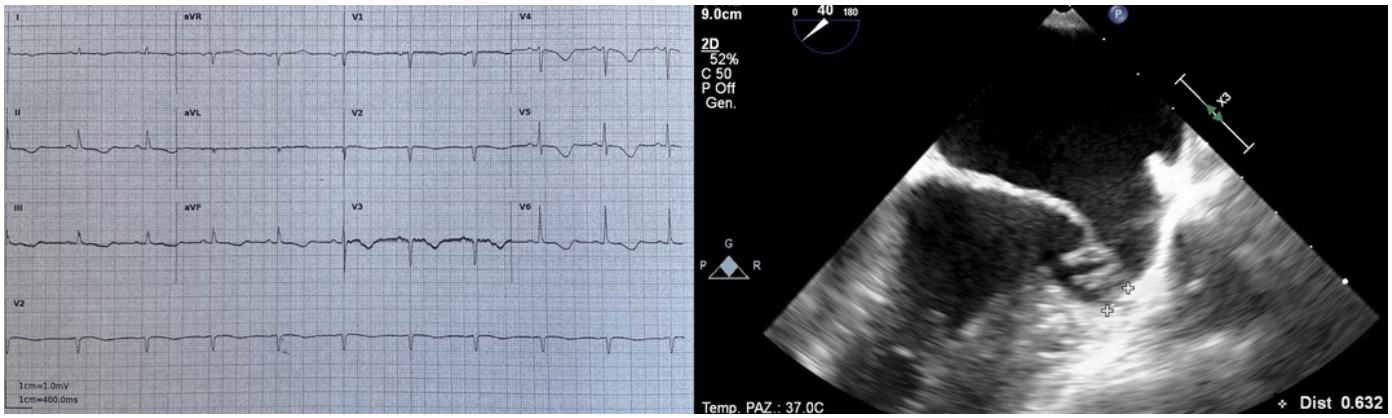
Abstract: Despite mitral valve prolapse is generally a benign condition, consistent data regarding it as cause of sudden cardiac death have been arisen. Among the poor-prognosis determinants, mitral annular disjunction plays a paramount role. We discuss the case of a young with mitral valve prolapse presented with resuscitated OHCA.

Introduction: Mitral valve prolapse (MVP) is the most common valvulopathy and its prognosis is usually excellent in the absence of relevant mitral regurgitation. However a recent meta-analisys demonstrated a significant link between MVP and sudden cardiac death (SCD). Among the features that raise the risk there is the mitral annular disjunction (MAD). MAD consists of the systolic separation of the mitral annulus from the ventricular myocardium at the level of the posterior leaflet. Independent from the presence of MAD, a recent scientific consensus has identified the elements which constitute the so called arrhythmic mitral valve complex/phenotype: 1) MVP 2) frequent or complex ventricular arrhythmias 3) absence of any other well-defined arrhythmic cause.

Case Presentation: A 32-year-old woman without any relevant medical history was collapsed; immediately her relatives called 118 and CPR was started. When the EMT arrived, the ECG showed ventricular fibrillation, and 6 DC shock were needed to restore spontaneous circulation. Once in the ED, she underwent urgent coronary angiography resulted negative. The ECG showed sinus rhythm at 65 bpm, infero-lateral negative T waves. A transthoracic echocardiogram (TTE) was carried out and it underlined a slightly depressed ventricular function (E.F. 53%), hypokinesia of the mid-apical septum, a mitral valve prolapse with moderate mitral regurgitation and mitral annular disjunction of 10mm, data concordant with the cardiac magnetic resonance (CMR) and transoesophageal echocardiography (TEE) thereafter performed. Viral and autoimmune screenings resulted negative. The patient underwent dual chamber TV-ICD implantation in secondary prevention.



Discussion: AMVP is a challenging entity because of the need of early identification of the patients affected by the arrhythmic phenotype for whom is indicated a lifelong follow up and in selected cases ICD implantation in primary prevention of SCD. Even if globally rare, SCD among patients affected by MVP is not a statistically dismissible event and in the small available post mortem studies it accounts for 4% to 7% of otherwise unexplained deaths.

SCOMPENSO CARDIACO

WS.30
TERAPIA DI MODULAZIONE DELLA CONTRATTILITA' CARDIACA: TRA RAZIONALE SCIENTIFICO E MIGIORAMENTO DELLA QUALITA' DI VITA

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Lo scompenso cardiaco rappresenta la sommazione di diversi fattori con alla base anomalie cardiache strutturali e/o funzionali che determinano un aumento delle pressioni intracardiache e/o una inadeguata portata cardiaca a riposo e/o sottosforzo.
Tante sono le terapie farmacologiche e non farmacologiche utilizzate per incrementare la sopravvivenza e prevenire la morte aritmica, ma poche hanno come obiettivo il miglioramento della qualità di vita soprattutto in quella fascia di pazienti fenotipicamente con EF lievemente ridotta (41-49%) in cui le linee guida non raccomandano nessun dispositivo specifico.

Caso Clinico: Paziente di 72 aa, affetto da diabete mellito, lieve insufficienza renale, cardiopatia ischemica rivascolarizzata con bypass AO-CO e successive rivascolarizzazioni percutanee, con numerosi ricoveri per scompenso nonostante terapia medica ottimale compresi il trattamento con sacubitril/valsartan a dosaggio tollerato e inibitori del cotrasportatore sodio glucosio tipo 2 (SGTL2).
Esami ecocardiografici ripetuti evidenziavano una moderata disfunzione della contrattilità cardiaca valutata intorno al 45%.
Holter cardiaci ripetuti evidenziavano un ritmo sinusale stabile con una normale variazione circadiana della frequenza, con sporadiche extrasistoli ventricolari monomorfe.
Esami ematochimici evidenziavano un pro BNP sempre intorno a 300 pg/ml con una sintomatologia riferita di dispnea al minimo sforzo (pochi passi).
Tale quadro non poneva indicazione ad impianto di ICD e/o terapia di resincronizzazione cardiaca per cui veniva proposta terapia di modulazione della contrattilità cardiaca (CCM).
In giugno 2023 si procedeva ad impianto di CCM mediante il posizionamento di due elettrocateteri a fissazione attiva Biotronik fissati a livello del setto ventricolare destro, ad una distanza di 2 cm tra loro, con erogazione di uno stimolo elettrico non depolarizzante, bifasico di 7.5 V nel periodo refrattario assoluto della cellula, per una durata di 20 ms.

Conclusioni: Il follow up a tre mesi evidenziava un netto miglioramento della qualità di vita e tolleranza allo sforzo, con EF stimata del 50% circa, nonostante i valori di pro bnp rimanevano sovrapponibili o addirittura più elevati.
Il follow up a sei mesi confermava tale miglioramento.
Quale che sia il meccanismo di azione della CCM, allungamento del potenziale di azione, aumento del calcio intracellulare, aumento dello stato inotropo, variazione dell'espressione genica si riflette sicuramente in un sostanziale miglioramento della tolleranza allo sforzo e della qualità di vita.
Sicuramente la CCM rappresenta, insieme ai 4 pilastri farmacologici (ai quali si è aggiunto il Vericiguat), un supporto fondamentale per il miglioramento della qualità di vita dei pazienti con scompenso cardiaco.

WS.31

LEFT BUNDLE BRANCH-OPTIMIZED CARDIAC RESYNCHRONIZATION THERAPY IN A PATIENT WITH ATRIAL FIBRILLATION AND LEFT BUNDLE BRANCH BLOCK: A CASE REPORT

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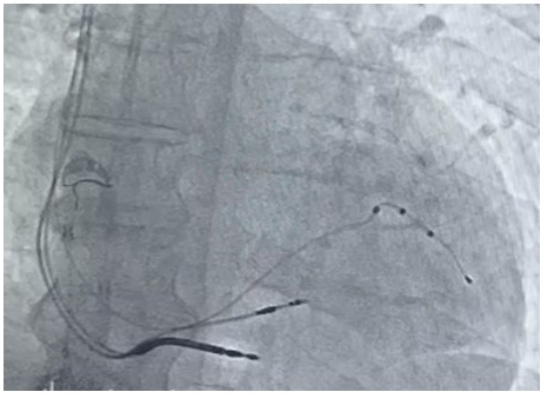
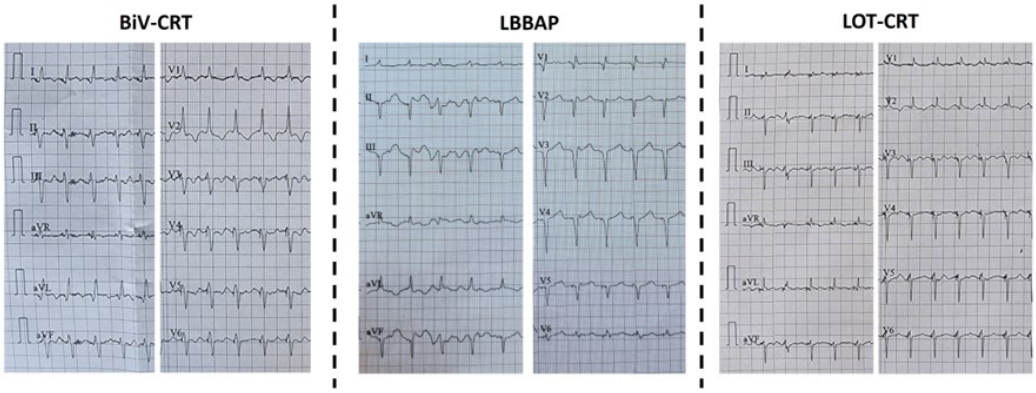
Cardiac resynchronization therapy (CRT) is currently used in the treatment of patients affected by symptomatic heart failure with reduced ejection fraction (HFrEF), atrial fibrillation (AF), and broad QRS complex. By providing a biventricular pacing (BiVp) more than 90%, the CRT has proven to be particularly effective in improving the patient clinical condition. Recently, left bundle branch area pacing (LBBAP) has been introduced as an alternative pacing strategy to conventional biventricular cardiac resynchronization therapy (BiV-CRT). In some cases, proximal LBBAP may be inherently limited in its ability to restore physiological activation of the lateral wall of the left ventricle (LV) in patients with distal conduction delay in the distal LBB, LV Purkinje network, or myocardium. In the key challenge of performing an adequate cardiac resynchronization therapy for these particular clinical conditions, could be crucial to combine LBBAP and BiV pacing (LOT-CRT). In this case report, we investigated the role of LOT-CRT in improving the clinical condition of a patient affected by HFrEF and AF with LBBB in whom LBBAP is characterized by an "RS" pattern in the V6 chest lead.
A 79-year-old man with ischemic cardiomyopathy, heart failure with reduced ejection fraction (HFrEF), NYHA class III, permanent AF, broad QRS complex with LBBB was referred to our electrophysiology department for CRT device implantation. Firstly, an active-fixation high voltage lead (Durata, Abbott Laboratories, Sylmar, CA, USA) was placed in the right ventricular (RV) low-septum region. Then, for the LBBAP, a three-dimensional delivery system (CPS Direct Universal 3D, Abbott Laboratories, Sylmar, CA, USA) was used to reach the desired implant location. A stylet-driven lead (Tendril STS, Abbott Laboratories, Sylmar, CA, USA) was used to obtain a LBBAP. The lead has been used with a helix locking tool to avoid the helix retraction during septal penetration and it was advanced by a rapid rotation of the body, exerting a slight forward pressure. Direct left bundle branch capture has been assumed using electrocardiographic criteria described in the EHRA clinical consensus statement on conduction system pacing implantation (qR in V1 and V6RWPT < 75 ms). Nevertheless, despite a significant reduction of QRS complex during LBBAP (i.e. from 144 ms to 102 ms), an "RS" pattern in V6 was observed and concerns arose about the target location and the effectiveness of pacing. Anyway we proceed with the implant of a quadripolar left ventricle (LV) coronary sinus lead (Quartet, Abbott Laboratories, Sylmar, CA, USA), which was placed in a posterolateral vein. After the implant, a comparison between BiV-CRT, LBBAP, and LOT-CRT pacing was performed to choose the best pacing configuration in terms of QRS duration. BiV-CRT resulted in a narrowing of 11% to baseline (from 144 ms to 128 ms), LBBAP resulted in a narrowing of 29% to baseline (from 144 ms to 102 ms), LOT-CRT resulted in a narrowing of 43% to baseline (ifrom 144 ms to 82 ms). The LOT-CRT could be al alternative pacing option in patients affected by HFrEF with broad QRS, LBBB, and permanent atrial fibrillation when concerns arose on LBBAP effectiveness.





WS.32

OTTIMIZZAZIONE DELLA RISPOSTA ALLA TERAPIA PER LO SCOMPENSO CARDIACO (HF) E CARDIAC CONTRACTILITY MODULATION: UN CASO CLINICO

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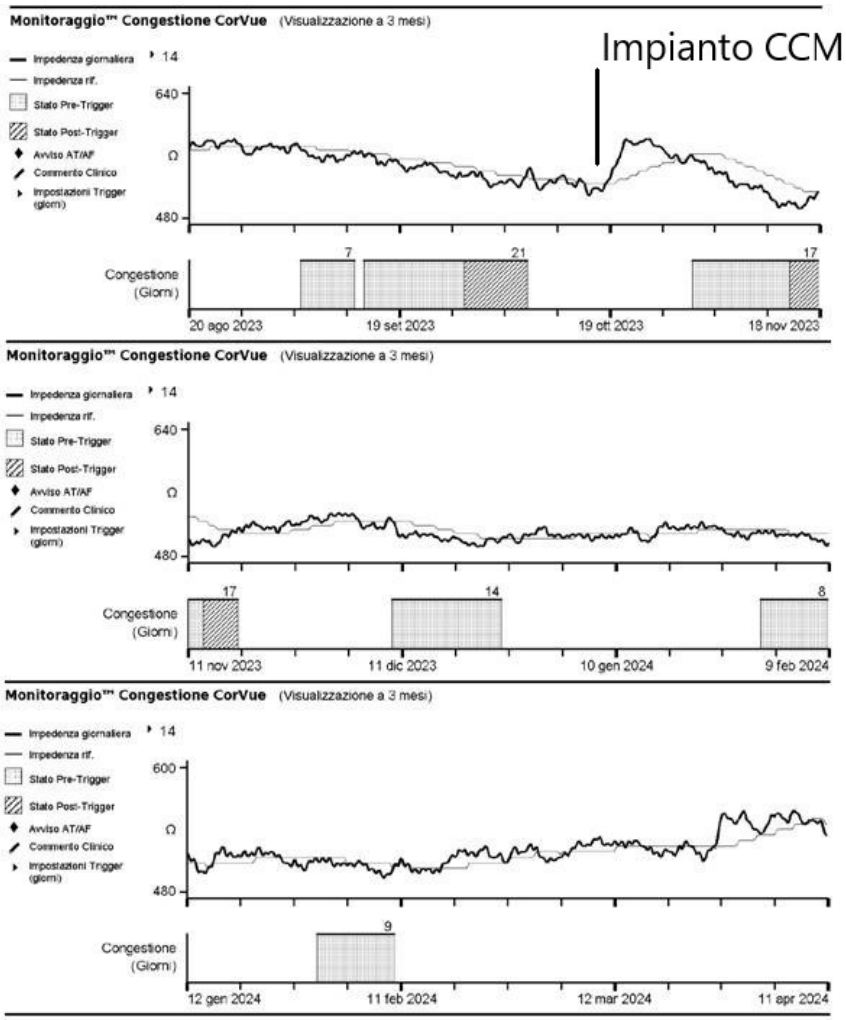
[2] *Impulse Dynamics, Milano, ITALY*

Introduzione: Un'alta percentuale di pazienti affetti da scompenso cardiaco (SC) ha una prognosi molto sfavorevole in termini di mortalità, qualità di vita e capacità funzionale. La terapia farmacologica dell'HF si è dimostrata efficace nel migliorare qualità di vita e prognosi di questi pazienti, soprattutto se si riescono ad utilizzare dosi congrue di tali farmaci.

Descrizione del caso: Un uomo di 73 anni, affetto da cardiopatia ischemica post – infartuale con severa compromissione della FE, già portatore di ICD monocamerale, è stato valutato per continue recidive di scompenso cardiaco nel nostro Ambulatorio Scompenso. Per ipotensione (PAS 85 mmHg) non era stato possibile iniziare ARNI; il paziente era in terapia con bisoprololo 1.25 mg/die, furosemide 50 + 25 mg/die, canrenone 50 mg/die, ASA e statine. Considerando la persistenza dei sintomi (NYHA III) e i ripetuti ricoveri, il 20 ottobre 2023 è stato impiantato un dispositivo CCM (Optimizer Smart, Impulse Dynamics). Due elettrocateteri a fissazione attiva sono dunque stati posizionati sul SIV medio. Dopo 15 giorni dall'impianto è stato possibile iniziare ARNI, senza modificare la terapia diuretica. Nonostante la persistenza di una FE del VSx intorno al 30%, a 6 mesi dall'impianto il paziente è attualmente in classe NYHA IIa, continua terapia con ARNI e ha ridotto il dosaggio della furosemide a 25 e 50 mg a giorni alternati.
L'analisi dell'impedenza transtoracica eseguita dall'ICD ha confermato l'assenza di recidive di congestione polmonare.

Conclusioni: La combinazione di più opzioni terapeutiche va sempre considerata per migliorare la prognosi dei pazienti affetti da SC. La CCM è una strategia terapeutica che può migliorare la qualità di vita, ridurre i sintomi e le ospedalizzazioni in pazienti affetti da SC. L'applicazione della CCM può essere valutata quando non si riesce a perseguire la migliore terapia medica ottimizzata causa della scarsa tollerabilità di alcuni farmaci.



TECNOLOGIA ED INNOVAZIONE

WS.33
VALUTAZIONE PRELIMINARE DEL NUOVO SOFTWARE DI PROGRAMMAZIONE DEI DEFIBRILLATORI MICROPORT: LA NOSTRA ESPERIENZA

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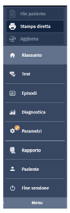
Introduzione: L'impianto di defibrillatore rappresenta una pratica clinica consolidata ormai da diversi anni.
A fianco alla normale tecnica di impianto in sala operatoria, risulta fondamentale una corretta programmazione del dispositivo, di solito effettuata su misura in base alla tipologia di paziente. Un recente consensus statement HRS (2019) fornisce dei suggerimenti su come programmare correttamente il defibrillatore, sia per quanto riguarda il modello di dispositivo (monocamerale, bicamerale e biventricolare), sia per quanto riguarda i parametri brady e i parametri tachy.
La conversione in senso pratico di questi suggerimenti è lasciata in carico alle aziende produttrici, le quali forniscono, oltre ai dispositivi, anche i sistemi di programmazione con relativi software di interfaccia, auspicabilmente intuitivi e facili da utilizzare.
L'azienda Microport (Saluggia) ha recentemente rilasciato una nuova interfaccia di programmazione, scegliendo il nostro centro per la fase pilota di lancio controllato post marchio CE.

Metodi: Il nuovo software di interfaccia, disponibile inizialmente solo sulla piattaforma tachy, è stato utilizzato nel nostro centro, in anteprima post marchio CE, per due settimane nel mese di marzo 2024, effettuando oltre 30 controlli ambulatoriali e 3 impianti ex novo.
In generale, l'interfaccia presenta un design più moderno, che ben si adatta ad un utilizzo su programmatore di tipo tablet, risultando stabile e veloce in termini di risposta al touch e di caricamento dei dati. La schermata iniziale è caratterizzata da una overview con tutti i parametri di interesse: nella parte superiore, troviamo le informazioni sullo stato delle terapie e una traccia EGM in tempo reale; nella parte sinistra, lo stato della batteria, sia in termini di tensione sia in termini di durata residua, e la programmazione con le varie zone tachy; in basso a destra, sono presenti tutte le misure di interesse, con relativa data di calcolo delle stesse. Eventuali alert su episodi o terapie sono evidenziati in arancione o rosso. Il menu si apre a tendina sulla destra, con la possibilità di selezionare la sezione di interesse. A nostro avviso, alcune icone risultano essere poco intuitive. L'esecuzione dei test elettrici è suddivisa attraverso tab in base a impedenza, sensing, soglia. In particolare, il test di soglia risulta essere chiaro sia nell'esecuzione sia nella visualizzazione del segnale. La visualizzazione degli andamenti temporali delle misure è chiara, sia come visualizzazione dei segnali sia come scelta dei colori. Gli episodi memorizzati sono di facile comprensione, in termini di segnale, migliorato in termini di qualità, e in termini di dettagli forniti (data, terapia, tacogramma). Secondo la nostra esperienza, la programmazione parametri, sia brady sia tachy, risulta avere troppe informazioni; utile, di contro, la rappresentazione grafica sia dell'algoritmo di discriminazione bicamerale (Parad+) sia dell'algoritmo di programmazione automatica della programmazione MRI (AutoMRI).

Conclusioni: La traduzione della terapia di defibrillazione in interfaccia di programmazione è un'operazione complessa, in quanto richiede di coniugare l'aspetto medico all'aspetto pratico e intuitivo. La nuova interfaccia Microport, disponibile inizialmente sulla piattaforma tachy, va nella direzione di rendere immediate e facilmente fruibili le informazioni utili al clinico, sia in sede di impianto sia in sede di controllo ambulatoriale.

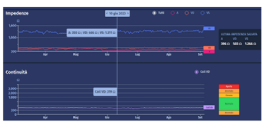

Overview


Menu

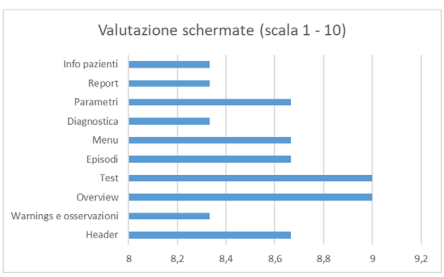

Test elettrici


Episodio con tacogramma


Spiegazione grafica AutoMRI


Trend


Spiegazione grafica Parad+



Media delle valutazioni fornite dagli operatori del nostro centro

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RESUSCITATION FROM FEAR OF DEVICE IMPLANTATION USING WEARABLE DEFIBRILLATOR: A CASE REPORT

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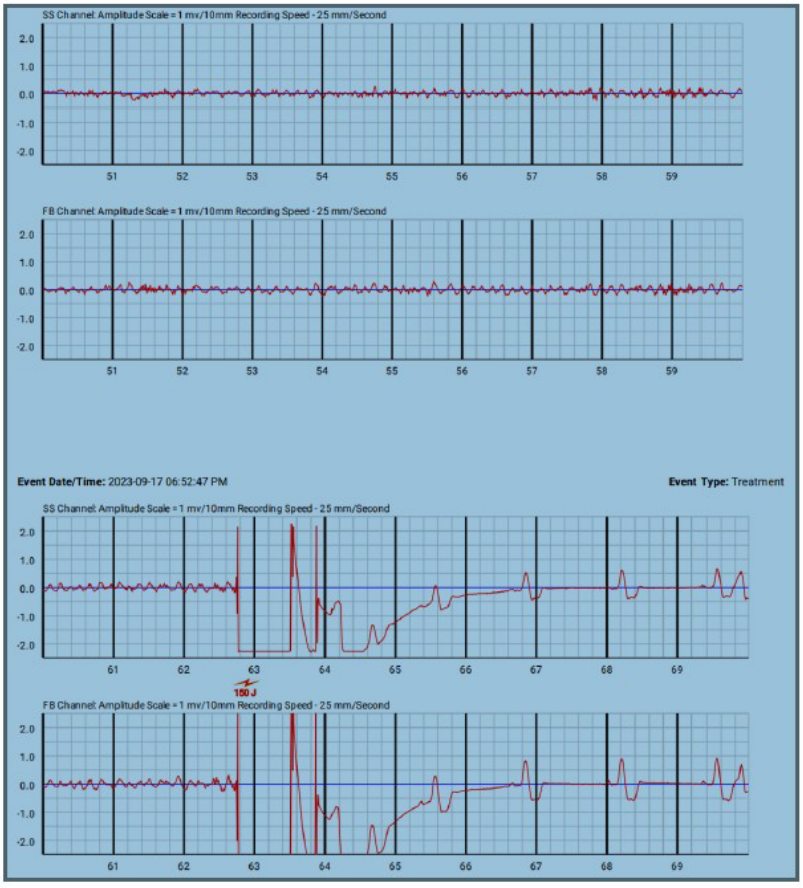
A male patient aged 49 years, with grade II familiarity for juvenile sudden cardiac death (SCD).
Absent other risk factors for cardiovascular disease. He reports that he has always been in good health. He arrived in the emergency department (ED) for worsening dyspnea. In PS he underwent ECG with finding of sinus rhythm and left bundle branch block (LBB with QRS duration 170 msec); color Doppler echocardiogram showing: Dilated left ventricle, severely and globally hypocontractile (E.F. 30%). Biatrial dilatation. Negative cardiac enzymes on laboratory tests.
The patient underwent a coronary examination that documented coronary arteries as normal in caliber origin and course. A cardiac MRI was indicated, but the patient did not undergo it because of claustrophobia. During hospitalization, blood samples were sent for genetic screening for cardiomyopathy. The patient started drug therapy following ESC 2022 and 2023 guidelines for heart failure and cardiomyopathy. After 3 days of monitoring at our department, he was transferred to cardiopulmonary rehabilitation department. At the end of the 2 weeks of the rehabilitation cycle, the patient underwent a follow-up echocardiogram that documented the persistence of left ventricular systolic dysfunction, asymptomatic for dyspnea. The patient was discharged with a wearable defibrillator (WCD) to continue therapy optimization following ESC heart failure guidelines 2022 and 2023. At the end of 3 months of optimized therapy, the patient underwent an echocardiographic recheck which confirmed dilated, severely, and globally hypocontractile left ventricle (E.F. 35%).
ICD implantation was indicated, but the patient refused it. Therefore, was prescribed the continuation of sudden cardiac death protection by WCD. The patient underwent monthly followups, for the next 6 months, reporting no improvement in left ventricular contractile capacity measured by echocardiography and continuing to refuse biventricular ICD implantation. We noted a correct and consistent wearing of the WCD. After 177 days of wearing, the patient had an episode of loss of consciousness and experienced WCD shock. When admitted to the emergency department, a remote device check documented ventricular fibrillation at 200 bpm, which was correctly recognized and discontinued. The patient accepted biventricular ICD implantation, which was implanted within 24 hours of the event. At follow-up at 1 month echocardiogram documented improvement in left ventricular contractile capacity (EF 40%), and no arrhythmic events in the absence of other symptoms.
WCDs have been used extensively in Italy since 2015, after years of experience in other countries. This technology provides temporary protection from SCD for patients with an evolving risk profile who are not yet eligible for an implantable cardioverter defibrillator. WCD is an effective therapy for the treatment of SCD with a very low complication rate and high patient compliance over time. Our case demonstrates how WCD enabled optimal titration of drug therapy following guidelines and prevented sudden death in young high-risk patients. In addition, our case shows that reduced compliance for definitive ICD implantation due to non-acceptance of the disease, fear of surgery, or subsequent lifestyle changes are not barriers to saving patients from SCD.



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