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ACKNOWLEDGEMENT TO THE REVIEWERS

The section of abstracts now published represents not only a rigorous and meticulous selection process, but also the extraordinary scientific vitality of arrhythmology in Portugal. The works presented in Arritmias 2026 reflect the quality, diversity, and relevance of national research, covering fields that range from interventional electrophysiology to new paradigms in heart failure.

It is a privilege to witness the growing maturation of the clinical research developed in Portugal, as well as our community's ability to innovate. These abstracts unequivocally attest to the commitment of Portuguese arrhythmology to scientific excellence and to the advancement of cardiovascular medicine.

The Organising Committee of ARRITMIAS 2026 would like to thank the colleagues listed below, who, in their capacity as reviewers, assisted in the assessment of the papers submitted to the conference:

Pedro Silva Cunha
Bruno Rodrigues
Gustavo Lima da Silva
João André Ferreira
Renato Margato

AGRADECIMENTO AOS AVALIADORES

A secção de *abstracts* agora publicada traduz não só um processo de seleção exigente e criterioso, mas também a extraordinária vitalidade científica da arritmologia em Portugal. Os trabalhos apresentados no **Arritmias 2026** refletem a qualidade, diversidade e atualidade da investigação nacional, abrangendo áreas que vão da eletrofisiologia de intervenção aos novos paradigmas da insuficiência cardíaca.

É um privilégio constatar a crescente maturidade da investigação clínica desenvolvida em Portugal, bem como a capacidade de inovação da nossa comunidade. Estes resumos testemunham, de forma inequívoca, o compromisso da arritmologia portuguesa com a excelência científica e com o avanço da medicina cardiovascular

A Comissão Organizadora do ARRITMIAS 2026 agradece aos Colegas abaixo indicados, que colaboraram, na sua qualidade de avaliadores, na apreciação das comunicações submetidas à referida reunião:

Pedro Silva Cunha
Bruno Rodrigues
Gustavo Lima da Silva
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COMUNICAÇÕES

Reunião Arritmias 2026

27 a 28 de Fevereiro de 2026

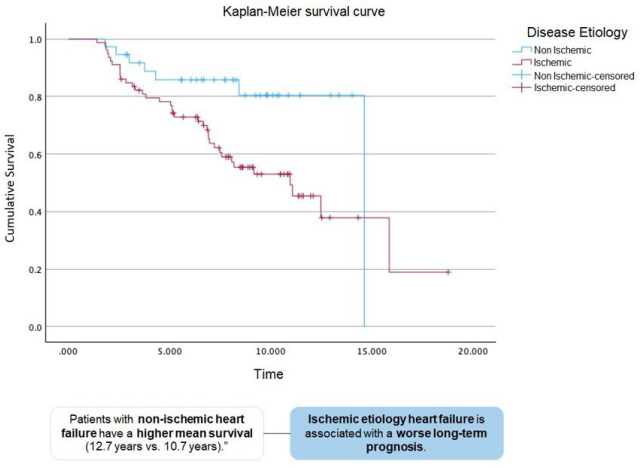
Dispositivos cardíacos implantáveis

1D. PATIENTS WITH IMPLANTABLE CARDIOVERTER DEFIBRILLATOR IN PRIMARY PREVENTION - EVALUATION OF VENTRICULAR DYSFUNCTION, ARRHYTMIC EVENTS, AND MACE

Filipe Silva Vilela, Ângela Silva, Carla Oliveira Ferreira, Bárbara Rocha, João Faria, Ana Sofia Fernandes, Mónica Dias, Inês Conde, Rui Files Flores, António Gaspar

Hospital de Braga, Braga.

Introduction: Heart failure (HF) affects millions of people worldwide and is associated with high morbidity and mortality. The left ventricular ejection fraction (LVEF) plays a key role in prognosis and treatment decisions. The implantable cardioverter defibrillator (ICD) reduces the risk of sudden death, however, there are clinical contexts where its indications remain unclear. This study evaluates arrhythmic events and the evolution of LVEF in patients with ICDs in primary prevention.
Objectives: To assess arrhythmic events in patients with ICD, considering therapeutic optimization and to explore potential futility in various clinical scenarios.



Methods: A retrospective study was conducted on ICD recipients for primary prevention between 2015 and 2022. Statistical analysis was performed using IBM® SPSS® Statistics, version 29. A p-value of less than 0.05 was considered statistically significant, with a 95% confidence interval.
Results: A final sample of 116 patients was included after applying exclusion criteria, consisting of 99 men (85.3%) and 17 women (14.7%), with a mean age of 62 ± 10.7 years. A statistically significant recovery in LVEF was observed in patients with non-ischemic dysfunction (pré-ICD 29% vs. follow-up 33%; $p < 0.001$; $r = 0.617$). Recovery to > 35% was also more frequent in non-ischemic group (34.3% vs. 12.3%; $p = 0.009$; OR 3.717). The use of ARNi and SGLT2 inhibitors significantly increased during follow-up. Appropriate shocks occurred in 29.3%, with higher rates patients with non-ischemic HF ($p = 0.039$), alcohol-related HF ($p = 0.025$), and those with a lower baseline LVEF ($p = 0.008$). Mortality was significantly higher in ischemic HF patients (46.8% vs. 18.9%; $p = 0.004$).
Conclusions: This study provides new insights into the role of pharmacological therapy in LVEF recovery across different heart failure subtypes. As a retrospective study, it highlights the lack of large-scale research evaluating the potential futility of implanting high-energy devices in patients who might benefit more from the optimization of prognostic-modifying therapies—particularly in non-ischemic patients, where this study observed greater potential for recovery.

2D. CORONARY SINUS LEAD EXTRACTION: REAL RISK OR CLINICAL MYTH?

Raquel França Moreira, Leonor Magalhães, Margarida Figueiredo, Guilherme Portugal, Paulo Osório, Sofia Jacinto, Madalena Cruz, Helder Santos, Ana Lousinha, Pedro Silva Cunha, Rui Ferreira, Bruno Valente, Mário Oliveira

ULS São José, Hospital de Santa Marta, Lisboa.

Introduction: Cardiac device extraction has grown dramatically in recent years and is likely to continue expanding. Each case has its own technical challenges and specificities; however, coronary sinus lead extraction has always inspired particular respect and fear among physicians, due to the risk of adhesions that may lead to coronary venous tears and potentially life- threatening complications. This study aimed to compare lead extraction outcomes and procedural characteristics between Cardiac Resynchronization Therapy (CRT) and non-CRT devices in a tertiary center.
Methods: A retrospective analysis was conducted on 282 consecutive lead extractions between 2013 and 2024 (60 CRT; 222 non-CRT). Clinical records were reviewed. Two groups were compared: CRT extractions and non-CRT extractions (without a coronary sinus lead). The statistical analysis

comprised chi-square tests and comparisons of proportions and means, with a significance level set at $p < 0.05$.

Results: Baseline age and cardiovascular risk factors were comparable, but sex distribution differed significantly ($p = 0.016$), with a higher proportion of women in the CRT group (40% vs. 24.3%). CRT patients showed significantly higher rates of heart failure NYHA classification > 2 (58.3% vs. 28.8%; $p < 0.001$), dilated cardiomyopathy (65% vs. 5.9%; $p < 0.001$), and reduced ejection fraction (< 50% in 68.3% vs. 17.1%; $p < 0.001$) (Table 1). There were no significant differences in major extraction indication (infectious vs. non-infectious), or previous extraction attempts. CRT patients had a greater number of leads removed (median 3 vs. 2; $p < 0.001$) and extraction techniques did not differ significantly between the two groups ($p = 0.052$), both being submitted more often to the PISA technique (73.3% CRT; 84.2% non-CRT) compared to simple traction (26.7% CRT; 15.8% non-CRT), even though lead dwell time was longer among CRT cases (median 84 vs. 108 months; $p = 0.002$) (Table 2). Overall clinical and radiological success rates were similar, as well as procedure-related major or minor complications and all-cause mortality (Table 3).

Table 1. Sample characterization

	CRT (n = 60)	Non-CRT (n = 222)	p value
Age in years, Median (IQR)	69 (18)	75 (23)	0.101
Sex, n (%)			0.016
Male	36 (60)	168 (75.7)	
Female	24 (40)	54 (24.3)	
Cardiovascular risk factors, n (%)			
Hypertension	32 (53.3)	119 (53.6)	0.97
Diabete Mellitus	17 (28.3)	68 (30.6)	0.731
Previous Cardiac Disease, n (%)			
Heart Failure	35 (58.3)	64 (28.8)	< 0.001
Dilated cardiomyopathy	39 (65)	13 (5.9)	< 0.001
Hypertrophic cardiomyopathy	0	5 (2.3)	0.588
Coronary artery disease	13 (21.7)	33 (14.9)	0.206
Valvular disease	11 (18.3)	34 (15.3)	0.571
CKD (eGFR < 60 ml/min), n (%)	23 (38.3)	65 (29.3)	0.179
LVEF in %, Median (IQR)	35 (25)	55 (10)	< 0.001
LVEF < 50%, n (%)	41 (68.3)	38 (17.1)	< 0.001
Missing	53 (23.9)	12 (20)	
Previou LE attempts*, n (%)	7 (11.7)	14 (6.3)	0.161
Missing	9 (15)	29 (13.1)	

IQR, Interquartile Range; CKD, Chronic kidney disease; LVEF, Left ventricular ejection fraction; LE, Lead Extraction.

Table 2. Extraction analysis

	CRT (n = 60)	Non-CRT (n = 222)	p value
Main indication for extraction, n (%)			0.099
Infection	40 (66.7)	176 (79.3)	
Non infeccious (*)	20 (33.3)	46 (20.7)	
Number of extracted leads, Median (IQR)	3 (1)	2 (1)	< 0.001
Extraction procedure, n (%)			0.052
Simple traction	16 (26.7)	35 (15.8)	
PISA technique	44 (73.3)	187 (84.2)	
3 ou more extracted leads, n (%)	42 (70)	9 (4.1)	< 0.001
Lead dwell time in months, Median (IQR)	60 (84)	108 (96)	0.002

*Disfunction, upgrade or occlusion.

Table 3. Procedure success, complications and mortality

	CRT (n = 60)	Non-CRT (n = 222)	p value
Clinical success, n (%)	59 (98.3)	216 (97.3)	1
Radiologic success, n (%)	55 (91.7)	205 (92.3)	0.792
Procedure-related complications, n (%)			
Major complications	3 (5)	8 (3.6)	0.212
Minor complication	4 (6.7)	20 (9)	0.085
Missing	1 (1.7)	3 (1.4)	
Total All-cause mortality, n (%)	11 (18.3)	55 (24.8)	0.519
In-hospital	5 (8.3)	8 (3.6)	0.334
During the 1st year	1 (1.7)	17 (7.7)	0.229

Conclusions: Coronary sinus lead extraction in CRT devices achieved comparable clinical and radiological success rates, complication rates, and all-cause mortality to those observed in non- CRT systems. These findings suggest that coronary sinus lead extraction is feasible and safe, with similar technical challenges to non-coronary lead extraction.

5D. DETERMINANTS OF VENTRICULAR ARRHYTHMIA BURDEN IN ISCHEMIC CARDIOMYOPATHY: LOOKING AT ISCHEMIC PRESENTATION

Inês Amorim Cruz, Tiago Filipe Aguiar, Carlos Oliveira Costa, Mariana S. Silva, Luís Miguel Santos, Pedro Cardoso, Andreia Fernandes, Ana Briosa

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Introduction: Ischemic cardiomyopathy is a major substrate for ventricular arrhythmias and a leading cause of sudden cardiac death (SCD). However, arrhythmic risk varies according to factors, such as left ventricular ejection fraction and myocardial scar burden. Further refinement of prognostic stratification is needed to better identify patients who benefit from ICD therapy. Data comparing arrhythmic outcomes across different ischemic presentations remain limited.

Objectives: To evaluate the incidence and burden of ventricular arrhythmias in patients with ischemic cardiomyopathy and to compare arrhythmic outcomes according to the type of index ischemic event.

Methods: In this retrospective study, consecutive patients with ischemic cardiomyopathy who underwent ICD or CRT-D implantation at our center were included (2020-2024). Ventricular arrhythmic outcomes comprised nonsustained ventricular tachycardia (NSVT), ventricular tachycardia/ventricular fibrillation (VT/VF) and appropriated ICD therapies. Time-to-first arrhythmic event was analysed using Cox regression, while overall arrhythmic burden was assessed using count- based regression models accounting for follow-up duration.

Results: Seventy-five patients were included – median age of 69 years [IQR 62-75] and 88% were men. 80% had an ICD implantation and 69% were implanted for primary prevention. Median LVEF at implantation date was 31% [IQR 27-34]. A history of acute coronary syndrome was present in 70% of patients, and 60% had multivessel coronary artery disease. During a median follow-up of 33 months [IQR 21-48], 47 patients (63%) experienced at least one ventricular arrhythmic event – overall 306 NSVT episodes were documented in 51% of patients, while 132 VT/VF episodes occurred in 27%. Median NSVT and VT/VF burden was 0.18 [IQR 0-1.21] and 0 [IQR-0.20] episodes per patient-year, respectively. Compared with STEMI, patients with CCS had higher risk of earlier NSVT occurrence (HR = 2.51, [95%CI, 1.22-5.14]). However, no significant differences in NSVT or VT/VF burden were observed across ischemic presentation groups (Table 1). Patients with three-vessel coronary artery disease had a significantly higher NSVT rate compared with those 1-vessel disease (Incidence Rate Ratio = 4.25 [95%CI, 1.42-13.76], Table 1), whereas VT/VF rates did not differ. Arrhythmic burden was not associated with prevention type primary vs. secondary) or prior revascularization (Table 1).

Table 1. Negative binomial regression and Cox regression for ventricular arrhythmic event

	NSVT		VT/VF	
Characteristic	Negative binomial regression			
	IRR (95%CI)	p-value	IRR (95%CI)	p-value
Index ischemic event				
NSTEMI vs. STEMI	0.93 (0.30-3.58)	0.9	0.82 (0.15-6.72)	0.83
CCS vs. STEMI	1.20 (0.45-3.52)	0.72	2.76 (0.76-13.43)	0.17
Type of prevention	1.09 (0.40-2.71)	0.86	0.29 (0.06-1.07)	0.08
No. of diseased vessels				
1 vs. 2	1.42 (0.50-4.13)	0.51	4.08 (0.88-19.8)	0.07
1 vs. 3	4.25 (1.42-13.76)	0.01	4.48 (0.88-27.0)	0.08
Prior revascularization (vs.OMT)	0.45 (0.16-1.14)	0.12	0.28 (0.06-1.06)	0.08
	Cox regression			
	HR (95%CI)	p-value	HR (95%CI)	p-value
NSTEMI vs. STEMI	2.34 (0.98-5.60)	0.055	1.17 (0.31-4.42)	0.8
CCS vs. STEMI	2.51 (1.22-5.14)	0.012	2.33 (0.90-6.05)	0.082

CCS, chronic coronary syndrome; CI, Confidence interval; HR, Hazard ratio; IRR, Incidence Rate ratio; NSVT, nonsustained ventricular tachycardia; NSTEMI, Non-ST- Elevation Myocardial Infarction; OMT, optimal medical treatment; STEMI, ST-Elevation Myocardial Infarction VT/VF, ventricular tachycardia/ventricular fibrillation.

Conclusions: In this cohort of patients with ischemic cardiomyopathy, although chronic coronary syndrome was associated with earlier NSVT occurrence, when looking to negative binomial models, overall arrhythmic burden was not influenced by ischemic presentation. Instead, arrhythmic burden was driven by the extent of coronary artery disease.

6D. SUBCUTANEOUS VS. TRANSVENOUS IMPLANTABLE CARDIOVERTER- DEFIBRILLATORS OUTCOMES IN DIALYSIS PATIENTS

Leonor Magalhães, David Vicente Marques, Margarida Figueiredo, Sofia Jacinto, Helder Santos, Madalena Cruz, Guilherme Portugal, Paulo Osório, Pedro Silva Cunha, Ana Lousinha, Rui Cruz Ferreira, Bruno Valente, Mário Oliveira

Unidade de Arritmologia, Pacing e Electrofisiologia, Serviço de Cardiologia, Hospital de Santa Marta, ULS São José, Lisboa.

Introduction: The subcutaneous implantable cardioverter-defibrillator (S-ICD) should be considered according to current guidelines for dialysis patients for its extravascular system, reducing infection risk and vascular access complications. However, evidence regarding long-term safety and efficacy remains limited. The number of dialysis patients receiving S-ICDs has surpassed implantation of transvenous ICDs (TV-ICDs), highlighting the need to evaluate real-world outcomes.
Methods: A systematic review with meta-analysis was conducted comparing outcomes (1) S-ICD and TV-ICD in dialysis patients, and (2) S-ICD outcomes according to dialysis status (dialysis vs non-dialysis). Searches were performed in PubMed, ClinicalTrials.gov, and Embase using the terms "defibrillation", "hemodialysis", "dialysis", and "ICD". Primary endpoints were overall complications, infections and efficacy (appropriate and inappropriate shocks).
Results: For comparison of S-ICD and TV-ICD outcomes in dialysis patients, 3 studies were included (n = 4,751; 2,094 S-ICD and 2,647 TV-ICD). Mean age of 62 years, 69.2% male, mean LVEF 27.4%, ischemic etiology in 64%, and primary prevention in 86.9%. The mean follow-up (FUP) was 58 months. Among dialysis patients, no significant differences were found between S-ICD and TV-ICD regarding total complications (p = 0.78) or infection rates (p = 0.24) [Figure 1A and 1B]. For comparison of dialysed status vs non-dialysed outcomes in S-ICD recipients, three additional studies were analysed (n = 1,802; 265 dialysed, 1,537 non-dialysed). Mean age of 55 years, mean LVEF 29.1%, ischemic etiology in 43.8%, and 74.7% had primary prevention indications, with a mean FUP of 10.5 months. Within the S-ICD cohort, dialysis patients showed a trend toward higher overall complications and infection risk, without significance (p = 0.65 and p = 0.57) [Figure 2A and 2B]. Regarding safety, the rate of appropriate shocks was higher in dialysis patients (p < 0.001), while inappropriate shocks were comparable (p = 0.94) [Figure 2C and 2D].

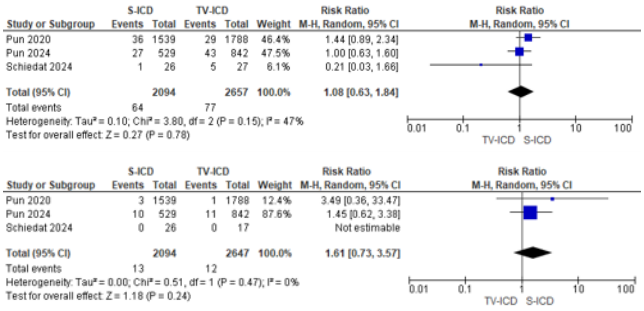


Figure 2A: Systematic review with the number of complications in S-ICD patients according to dialysis status.

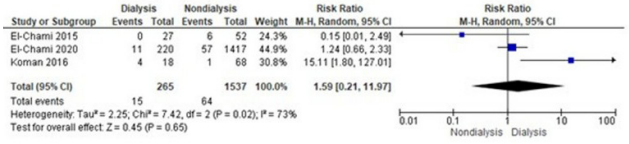


Figure 2B: Systematic review with the number of infections in S-ICD patients according to dialysis status.

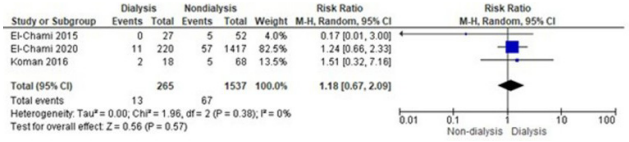


Figure 2C: Systematic review with the number of appropriate S-ICD shocks according to dialysis status.

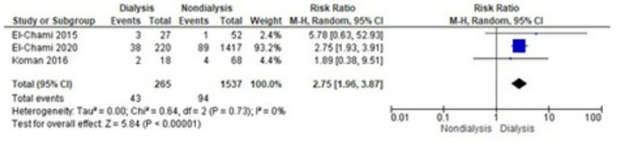
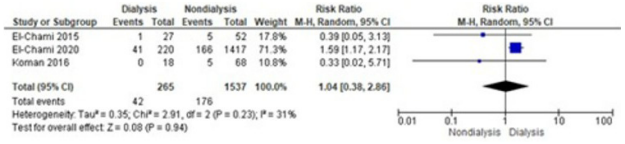


Figure 2D: Systematic review with the number of inappropriate S-ICD shocks according to dialysis status.



Conclusions: In our analysis, despite current indications and proved devices efficacy, S-ICD did not demonstrate significant lower complications or infection rates compared with TV-ICDs in dialysis patients, during medium-term FUP. Also, among S-ICD, dialysis status did not impact safety outcomes. This suggests that while S-ICDs remain a reasonable option in dialysis patients, their superiority over TV-ICDs needs stronger more evidence.

8D. ANTIBIOTIC DURATION AFTER TRANSVENOUS LEAD EXTRACTION FOR DEVICE-RELATED INFECTION: A 10-YEAR SINGLE-CENTER COHORT

David Vicente Marques, Leonor Magalhães, Margarida Figueiredo, Sofia Jacinto, Hélder Santos, Pedro Silva Cunha, Guilherme Portugal, Paulo Osório, Ana Lousinha, Pedro Coelho, Bruno Valente, Mário Martins Oliveira

ULS São José, Hospital de Santa Marta, Lisboa.

Introduction: The increasing use of cardiovascular implantable electronic devices (CIEDs) has led to a growing burden of device-related infections, particularly in older patient population with associated comorbidities. Transvenous lead extraction (TLE) and prolonged antibiotic therapy represent the cornerstone of treatment. However, the optimal duration of antibiotic therapy after complete removal remains poorly defined. We aimed to evaluate the impact of antibiotic duration after TLE on reinfection, complications and long-term outcomes in patients with CIED infection.
Methods: We performed a retrospective analysis of consecutive patients undergoing TLE for CIED-related infection at a national high-volume referral center between February 2014 and December 2024. Patients were stratified according to post-extraction antibiotic duration into ≤ 2 weeks or > 2 weeks. Baseline characteristics, microbiology, procedural data, complications, reinfection, rehospitalization and mortality were compared between groups.
Results: A total of 217 patients with CIED infection were included, of whom 121 (55.8%) received antibiotic therapy for ≤ 2 weeks and 96 (44.2%) for > 2 weeks after TLE. Mean age (71.8 ± 15.8 vs. 71.5 ± 13.4 years), left ventricular ejection fraction (50.8 ± 11.8% vs. 50.6 ± 12.3%) and sex distribution (male 78.5% vs. 79.2%) were similar between groups, as were major cardiovascular comorbidities and device type. The duration of antibiotic therapy before TLE was similar between groups (3.67 ± 1.89 weeks in the ≤ 2-week group vs. 3.79 ± 1.80 weeks in the > 2-week group). Patients receiving > 2 weeks of antibiotics had a significantly higher proportion of systemic infections (positive hemocultures or electrode endocarditis) compared with those treated for ≤ 2 weeks (57.1% vs. 35.0%, p = 0.002). Microbiological isolation was obtained in 103 patients (47.5%), with no difference in isolation rate between groups. Patients receiving > 2 weeks of antibiotics had a significantly higher prevalence of MRSA (40/96 vs. 9/121, p < 0.001) and Gram-negative organisms (55.2% vs. 36.4%, p = 0.013). Procedural success and complication rates, including tamponade, hematoma and need for urgent surgery, were comparable between groups. Reinfection rate was low and did not differ significantly (0.8% vs. 2.1%, p = 0.54). All-cause in-hospital mortality was similar (5.0% vs. 9.4%, p = 0.31), as was overall long term mortality (22.3% vs. 29.2%, p = 0.36) for a median follow-up of 39 months (IQR 17-73 months). However, 1-year mortality was significantly lower in patients treated with antibiotics for > 2 weeks (2.1% vs. 10.0%, p = 0.041). A non- significant trend toward fewer rehospitalizations was observed in the > 2-week group (23.0% vs. 31.6%, p = 0.30).
Conclusions: In patients undergoing TLE for CIED-related infection, prolonged antibiotic therapy did not impact in- hospital outcomes nor long term survival. Prolonged therapy was associated with a significant reduction in 1-year mortality, despite having a greater number of serious infections with positive hemocultures and electrode endocarditis. These findings suggest that longer post-extraction antibiotic therapy may improve late survival in this high-risk population.

9D. REMOTE MONITORING AND MORTALITY OUTCOMES IN HEART FAILURE PATIENTS WITH CARDIAC IMPLANTABLE DEVICES IN AN ULTRA-PERIPHERAL REGION

Margarida Câmara Farinha, Inês Almeida, Inês Coutinho dos Santos, Fabiana Duarte, André Viveiros Monteiro, Miguel Pacheco

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Introduction: Delivering specialised heart failure (HF) care in geographically remote island regions is challenging due to limited access to in-person follow-up and specialised services. Although remote monitoring of cardiac implantable electronic devices (CIEDs) could help to overcome these barriers, real-world evidence remains scarce.
Objectives: To evaluate the association between remote monitoring and healthcare utilisation and mortality in HF patients with CIEDs followed in an ultra-peripheral archipelago.
Methods: We conducted a retrospective observational study of HF patients implanted with CIEDs at a single referral centre serving a remote Atlantic island region. Patients were stratified according to the presence of remote monitoring. Outcomes included emergency department visits for HF, HF rehospitalisation, cardiovascular mortality and all-cause mortality.
Results: Of the 236 patients, 132 were monitored remotely. Rates of emergency department visits for HF (22.2% vs. 17.7%, *p* = 0.47) and of HF rehospitalisation (25.8% vs. 28.9%, *p* = 0.63) were similar between groups. Five-year cardiovascular mortality was lower in patients with remote monitoring compared with those without (1.5% vs. 6.2%, *p* = 0.04), as was all-cause mortality (2.3% vs. 12.4%, *p* = 0.005).
Conclusions: In this geographically isolated healthcare setting, patients followed with remote monitoring showed numerically lower all-cause and cardiovascular mortality, while rates of healthcare utilisation were comparable between groups. These findings provide real-world insight into heart failure care delivery in ultra-peripheral regions.
tema Arritmologia Clínica.

10D. SURGICAL HISTORY AND ARRHYTHMIC OUTCOMES IN ADULTS WITH CONGENITAL HEART DISEASE AND IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS

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Introduction: Adults with congenital heart disease (ACHD) often undergo multiple cardiac surgeries throughout life. The impact of surgical history on subsequent arrhythmic manifestations and device-related long-term outcomes after implantable cardioverter-defibrillator (ICD) implantation remains poorly defined.
Objectives: To evaluate whether the number and timing of cardiac surgeries are associated with arrhythmic outcomes—including appropriate and inappropriate ICD therapies, new-onset supraventricular tachyarrhythmias (SVT), and need for catheter ablation—during a very long-term follow-up in ACHD patients.
Methods: We retrospectively analyzed ACHD patients with ICDs followed at a tertiary center. Data collected included number of prior surgeries, age at first cardiac intervention, and arrhythmic events (appropriate/inappropriate ICD therapies, SVT, and ablation after ICD implantation). Comparisons between groups were performed using Mann-Whitney U and chi-square or Fisher's exact tests as appropriate.
Results: Forty-six ACHD patients (42 ± 13.9 years, 54% female) with > 10 years follow-up were included. Patients with appropriate ICD therapies (n = 21) and those without (n = 25) had a similar number of prior surgeries (median ranks 24.4 vs. 22.5, p = 0.59) and similar age at first surgery (23.8 vs. 21.7 years, p = 0.28). Only two patients (4.3%) had never undergone cardiac surgery; none of them experienced appropriate ICD therapies during follow-up. No significant associations were found between surgical history and the occurrence of inappropriate therapies. Patients who had undergone catheter ablation (n = 14) were younger at their first surgery than those without ablation (n = 32, p = 0.047). A non-significant trend toward higher surgical burden was observed among patients with supraventricular tachyarrhythmias (n = 18 vs. 28, p = 0.10).
Conclusions: In this ACHD cohort with ICDs, neither the number of prior surgeries nor the age at first repair influenced the occurrence of device therapies. However, younger age at first surgery was associated with a higher likelihood of subsequent ablation, and a tendency toward greater surgical burden was observed in patients with supraventricular tachyarrhythmias. These real world findings are consistent with the fact that early and complex

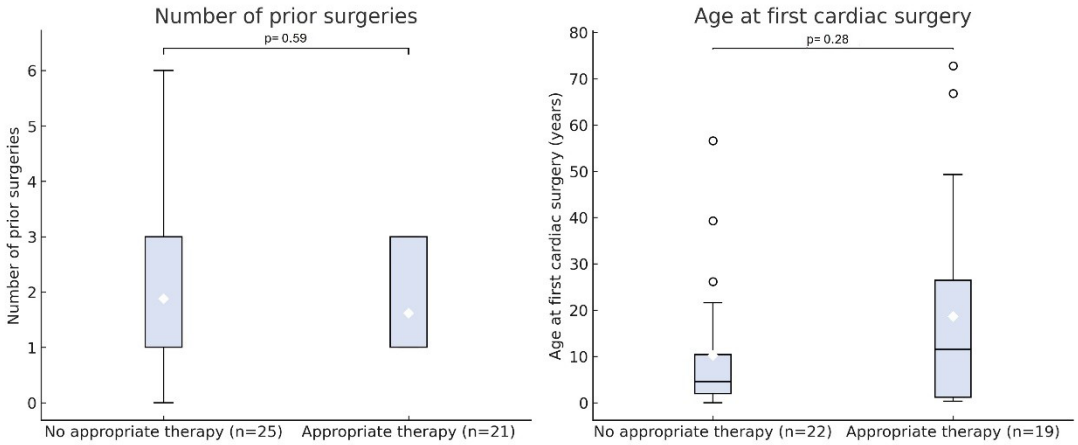

Figure 1. Number of prior surgeries (A) and age at first cardiac surgery (B) according to the occurrence of appropriate ICD therapies. Boxplots show median, interquartile range, and outliers; means are indicated by diamonds. No significant differences were observed between groups (Mann–Whitney p = 0.59 and p = 0.28, respectively).

Figure 10D

surgical histories reflect a more arrhythmogenic substrate warranting closer long-term follow-up.

11D. IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR THERAPY IN ADULT CONGENITAL HEART DISEASE: INSIGHTS FROM LONG-TERM FOLLOW-UP AT A TERTIARY CENTER

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Introduction: Sudden cardiac death (SCD) remains a major cause of mortality among adults with congenital heart disease (ACHD). However, evidence regarding the use and long-term outcomes of implantable cardioverter-defibrillators (ICDs) in this heterogeneous population is limited.
Objectives: We aimed to describe the clinical characteristics and long-term outcomes of ACHD patients with ICD therapy followed at our tertiary center.
Methods: We performed a retrospective analysis of consecutive ACHD patients who underwent ICD implantation in a single tertiary care center, between January 1994 and November 2025. Baseline characteristics, including cardiac anatomy, prior surgical history, and arrhythmic profile, were collected. Device data comprised indication for implantation, ICD type (single chamber, dual chamber, or CRT-D), and follow-up events, namely appropriate therapies, device-related complications, hospital admissions and mortality.
Results: Forty-six adult ACHD patients (mean age 42 ± 13.9 years) were included. The most frequent diagnoses were Tetralogy of Fallot (39.1%), D-transposition of the great arteries (10.9%), and shunt lesions such as VSD or ASD (8.7% each). Most patients were in NYHA class I (39.1%) or II (41.3%). ICD implantation was performed for primary prevention in 52.2% and secondary prevention in 47.8% of patients. The majority received single-chamber devices (69.6%), followed by dual-chamber (30.4%) and subcutaneous (13%). 10.9% of the transvenous systems were CRT-ICD (10.9%). The mean follow-up time was 7.2 (± 6.4) years. Appropriate ICD therapies occurred more frequently in the secondary prevention group (54.5% vs. 37.5%, p = 0.25), while rates of inappropriate therapies were similar, and mostly due to sinus tachycardia and supraventricular arrythmias with heart rate > 160 bpm (28.6% vs. 20.8%, p = 0.55). Within the subgroup implanted for primary prevention, appropriate ICD therapies were significantly more frequent among patients with class I indications compared to class II (p = 0.03, r = 0.45). In contrast, inappropriate therapies did not differ significantly between class I and class II indications (14.3% vs. 23.5%, p = 0.61).

Age (years) - mean±SD	42±13.9
Male sex - n (%)	35 (76.1)
Comorbidities - n (%)	
Hypertention	5 (10.9)
Diabetes	4 (8.7)
Coronary Artery Disease	5 (10.9)
Cerebrovascular Disease	4 (8.7)
NYHA class - n (%)	
I	18 (39.1)
II	19 (41.3)
III	9 (19.6)
LVEF (%) - mean±SD	45±14.1
TAPSE (mm) - mean±SD	16±4.4
Tricuspid s' (cm/s)	9±14.3
RVEF (%) - mean±SD	38±10.4
QRS duration (ms) - mean±SD	154±23.1
Medication - n (%)	
ACE-I/ARB/ARNI	19 (41.3)
Beta-blocker	27 (58.7)
Other antiarrhythmic drug	25 (59.3)
Anticoagulation	19 (41.3)

Footnote: SD - Standard deviation. LVEF - Left Ventricular Ejection Fraction. TAPSE - Tricuspid annular plane systolic excursion. Tricuspid s' Tissue Doppler lateral annular tricuspid s'. RVEF - Right Ventricular Ejection Fraction. NYHA - New York Heart Association. DM - Diabetes Mellitus. ACE-I - angiotensin-converting enzyme inhibitor. ARB - angiotensin II receptor blocker. ARNI - angiotensin receptor-neprilysin inhibitor.

Table 1. Baseline Characteristics of the studied population.

Conclusions: ICD therapy in adults with congenital heart disease is associated with a substantial rate of appropriate interventions, but also with inappropriate therapies, suggesting a high arrhythmic burden and underscoring the need for careful risk stratification and follow-up.

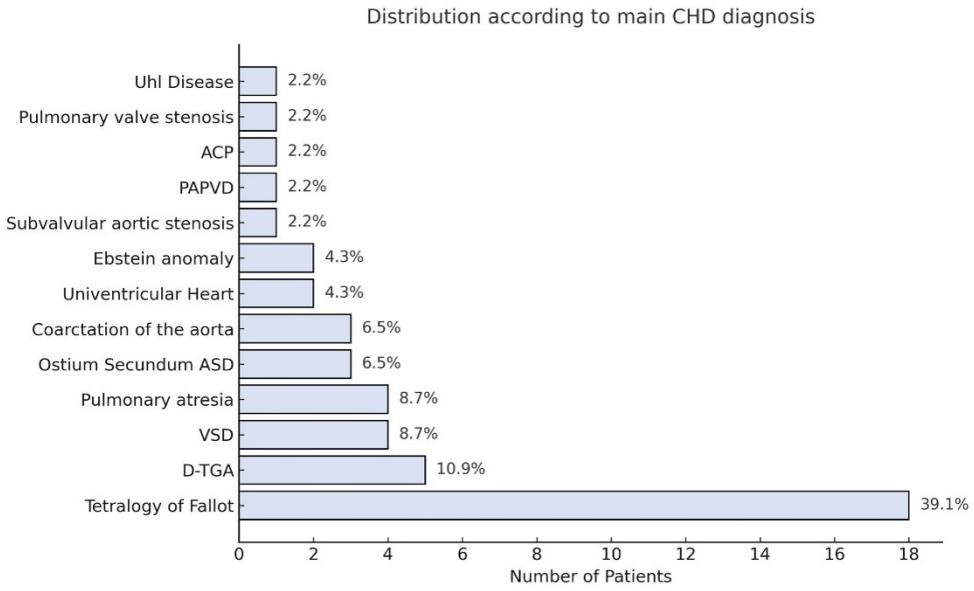

Figure 1. Patient distribution according to main CHD diagnosis.
ASD - Arterial Septal Defect, PAPVD - Partial anomalous pulmonary venous drainage, PDA - Arterial canal persistence, VSD - Ventricular septal defect, D-TGA - dextro-Transposition of Great Arteries.

Indication - n (%)	
Secondary Prevention	22 (47.8)
Class I Primary Prevention	7 (15.2)
Class II Primary Prevention	17 (37.0)
Type of ICD - n (%)	
Single-Chamber ICD	32 (69.6)
Dual-Chamber ICD	14 (30.4)
Subcutaneous-ICD	6 (13.0)
CRT-ICD	5 (10.9)

Table 2. Indication for implantation and type of ICD.

Figure 11D 2

12D. LEFT BUNDLE BRANCH PACING: QRS NARROWING AND PREDICTORS OF ELECTRICAL RESPONSE

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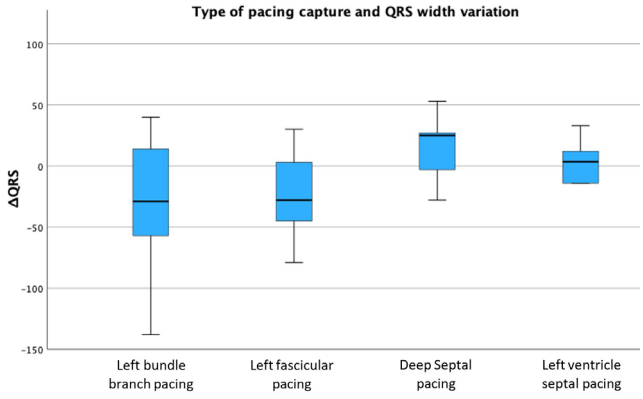
Introduction: Left bundle branch area pacing (LBBAP) has emerged as a physiologic pacing strategy that preserves synchronous ventricular activation and may overcome the dyssynchrony associated with conventional pacing. However, predictors of electrical response, particularly QRS narrowing, remain insufficiently characterized in real-world populations.
Objectives: Describe clinical and procedural characteristics of patients undergoing LBBAP and identify predictors of QRS width variation following implantation.
Methods: We conducted a retrospective cohort study including consecutive patients who underwent LBBAP between October 2021 and October 2025 at a tertiary centre. Demographic, procedural, and electrocardiographic parameters were collected at implantation and first interrogation (at 1st month). QRS variation (ΔQRS = paced − intrinsic) was used as a continuous marker of electrical response. Between-group comparisons were performed using parametric and non-parametric tests, including Kruskal-Wallis analysis for type of pacing capture. Linear regression was applied to identify predictors of ΔQRS.
Results: A total of 120 patients (mean age 74 ± 15 years; 29% female) were included. The pacing indication was bradyarrhythmia in 92.5% and cardiac resynchronization in 7.5%. The most frequent capture types were left fascicular pacing (45.8%) and left bundle branch pacing (38.3%), while stylet-driven leads were used in 38% of procedures and the axillary approach in 51%. Baseline QRS duration was 135 ± 35 ms, decreasing to 115 ± 16 ms post-implant (mean ΔQRS = -17.5 ± 39 ms). In univariable linear regression, baseline QRS ≥ 120 ms (B = -47.9 ± 7.6 ms, $p < 0.001$) and type of pacing capture (B = 5.7 ± 1.9 ms, $p = 0.003$) were associated with QRS narrowing, whereas transcatheter aortic valve replacement (TAVR), LVEF < 50%, and type of lead were not significant predictors. The Kruskal-Wallis test confirmed differences in QRS narrowing across the types of pacing capture ($p = 0.033$), with LBBP and left fascicular pacing showing greater electrical improvement compared with deep or left septal pacing.

	QRS width variation predictors		p value
	Correlation	95%CI	
Post TAVR	-7.308	(-29.502; 14.89)	0.513
LVEF < 50%	-16.062	(-34.588; 2.47)	0.088
Stylet-driven lead	-3.590	(-19.066; 11.89)	0.645
Initial QRS > 120 ms	-47.952	(-63.124; -32.781)	**< 0.001**
Type of pacing capture	5.721	(1.953; 9.490)	**0.003**

Type of pacing capture and QRS width variation		
	Mean rank (ΔQRS)	p value
Left bundle branch pacing	**30.33**	
His bundle branch pacing	56.00	
Left fascicular pacing	**30.50**	**0,033**
Deep Septal pacing	51.50	
Left ventricle septal pacing	48.50	



Conclusions: In patients undergoing LBBAP, QRS narrowing was frequent and influenced by both baseline QRS duration and type of pacing capture. Conduction system pacing (LBBP and fascicular pacing) achieved greater electrical synchronization compared to septal pacing. These findings support the physiologic advantage of conduction system capture.

13D. LEADLESS PACEMAKERS IN DIALYSIS PATIENTS

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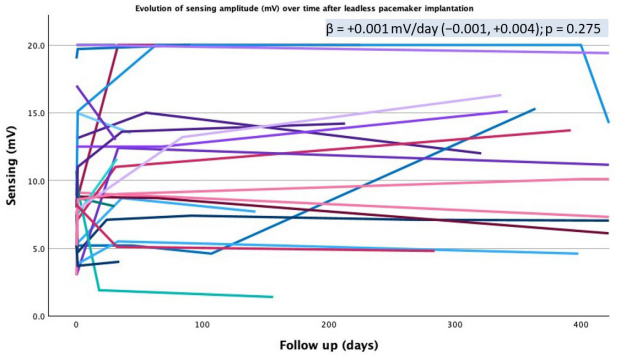
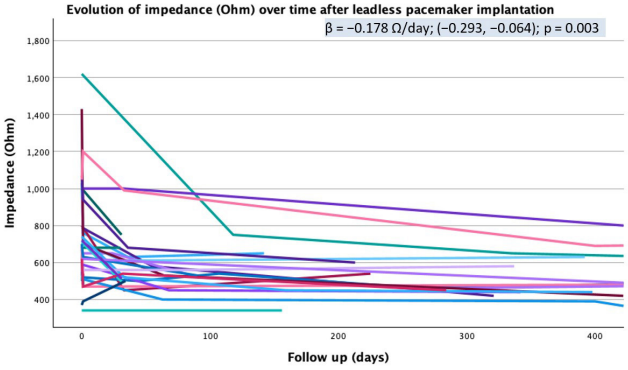
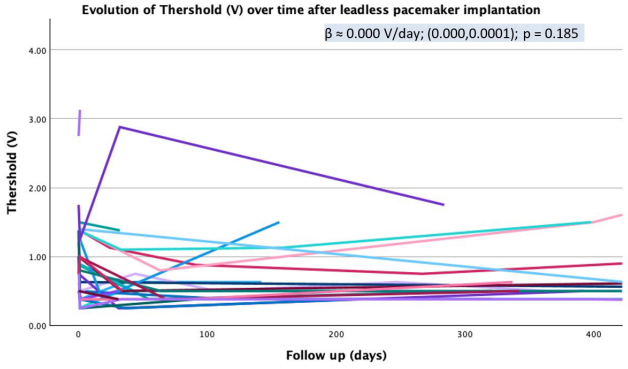
Introduction: Leadless pacemakers represent a major advancement in cardiac pacing, particularly for patients in whom traditional transvenous systems pose higher procedural and long-term risks. Individuals with end-stage renal disease (ESRD) on dialysis are especially vulnerable due to limited vascular access, central venous stenosis, and increased infection risk. By eliminating transvenous leads and subcutaneous pockets, leadless pacemakers reduce these complications while preserving venous integrity. However, data on their long-term electrical performance in dialysis patients remain scarce. Evaluating the evolution of pacing parameters— sensing amplitude, impedance, and capture threshold—is essential to confirm their reliability in this high-risk group.
Objectives: Evaluate the evolution of pacing parameters during the first year after leadless pacemaker implantation in patients under dialysis.

Methods: We conducted a retrospective two-centre cohort study including consecutive patients who underwent leadless pacemaker implantation between 2016 and 2025 under dialysis. Baseline clinical and procedural data were collected. Pacing parameters (sensing amplitude, impedance, and capture threshold) were recorded at implantation and during follow-up interrogations. Linear mixed-effects models were used to assess changes in pacing parameters over time.
Results: A total of 36 patients (mean age 71.8 ± 10,2 years, 31% female) were included. The majority (58,3%) had atrial fibrillation. Implantation was most frequently in the mid-septum (56%) using Micra VR (53%). At implantation, mean sensing was 7,6 mV (range 3,0-20,0), impedance 695 Ω (341-1620), and threshold 1.00 V @ 0.24 ms (0.38-2.75). During follow-up (median 335 days, (1-2533)), mixed-effects analysis showed no significant change in sensing (β = +0.001 mV/day; 95%CI −0.001 to +0.004; p = 0.275) and in capture threshold (β ≈ 0.000 V/day; 95%CI 0.000-0.0001; p = 0.185). Conversely, impedance decreased significantly over time (β = −0.178 Ω/day; 95%CI −0.293 to −0.064; p = 0.003), corresponding to approximately −5.4 Ω per month.







Conclusions: In dialysis patients, leadless pacemaker performance remained stable during the first year of follow-up, with preserved sensing and capture thresholds and a mild, expected decrease in impedance. These findings support the procedural and functional safety of leadless pacing in this high-risk population, although larger studies with longer follow-up are warranted to confirm long-term device stability and performance.

14D. SHORT TERM LEADLESS PACEMAKER PERFORMANCE

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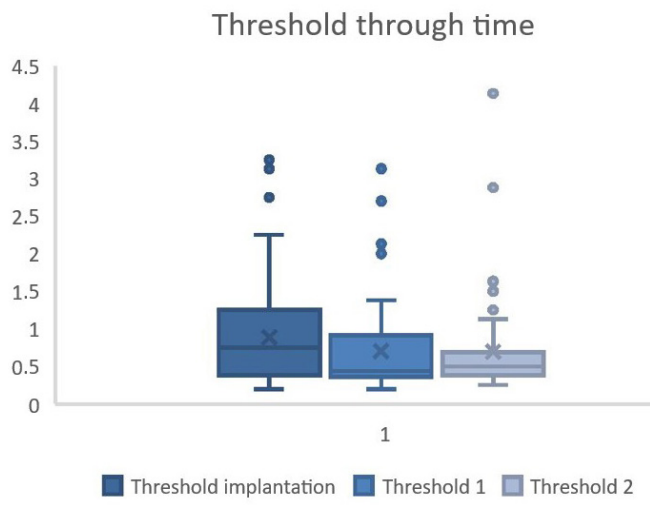
Introduction: Leadless pacemakers (LPM) have changed bradycardia management by eliminating transvenous leads and reducing device-related complications. A key determinant of procedural success and long-term device performance is the evolution of pacing capture thresholds, which should stabilize after implantation. Understanding the natural trajectory of LPM parameters and factors influencing their variation is essential to guide implantation strategy and follow-up management.
Objectives: Evaluate the evolution of device parameters over time following implantation and assess which procedural factors influence threshold changes.
Methods: A retrospective cohort study included consecutive patients who underwent LPM implantation between 2016 and 2025 at a tertiary centre. Baseline clinical and procedural data were collected. Both parametric and non-parametric tests, including ANOVA and linear regression, were used to analyse threshold evolution and association with procedural variables. A p-value < 0.05 was considered statistically significant.
Results: A total of 83 patients were included (mean age 74 ± 12 years, 33.7% female). Most procedures were performed in patients with atrial fibrillation (63%), and the majority were managed as outpatients (74.7%). All implantations were successful, predominantly located in the medium septum (60.2%) and apical septum (20.5%). There was one tamponade submitted to emergency surgery. The mean pacing threshold at implantation was 0.75V (range 0.20–3.25), which significantly decreased at the first interrogation [0.44 V (0.20–3.13), p = 0.005] and remained low at 1-month post-implantation [0.50 V (0.25–4.13), p = 0.003]. Impedance values declined over time (from 710 Ω to 570 Ω, p = 0.001), while sensing amplitude increased significantly (p = 0.003). No correlation was found between the presence of chronic kidney disease (CKD), implantation site, procedure duration or initial measured parameters and the evolution of device performance overtime.

Baseline Characteristics (n=83)		
Characteristic	Count (n) or Mean	Percentage (%) or SD
Age - years	74.1	±12.3
Female - n (%)	28	33.7
Origin		
Outer patient - n (%)	33	39.8
Hospitalized - n (%)	29	34.9
Outpatient - n (%)	21	25.3
Rythm		
Sinus Rythm - n (%)	31	37.3
Atrial Fibrillation - n (%)	52	62.7
Motive		
Infectious - n (%)	29	34.9
Chronic Kidney Disease - n (%)	7	8.4
Dialysis - n (%)	24	28.9
Tricuspid Disease - n (%)	7	8.4
Access - n (%)	8	9.6
Other - n (%)	8	9.6
Success - n (%)	83	100

	Implantation (n=83)		First interrogation (n=74)		p value	Second interrogation (n=50)		p value
Timing - days			1	(0-105)		34	(0-105)	
Sensing - mV	8	(3-20)	10.2	(1.9-20)	0.006	11.1	(1.4-20)	0.001
Impedance - Ohm	710	(341-1610)	615	(341-1660)	0.001	570	(341-990)	0.001
Threshold - V	0.75	(0.20-3.25)	0.44	(0.2-3.13)	0.005	0.5	(0.25-4.13)	0.003
Threshold difference - V			-0.151	± 0.47		-0.1509	± 0.60	
Ventricular pacing - %			96.7	(0-100)		96.7	(0-100)	
Fluoroscopy time - min	4	(1-18)						
Procedure Time - min	57	(29-140)						

Localization	Threshold difference 1st - V		p value	Threshold difference 2nd - V		p value
Apical septum	-0.2997	± 0.527		-0.261	± 0.427	
Higher septum	-0.146	± 0.673		-0.385	± 0.827	
Medium septum	-0.1348	± 0.447	0.367	-0.103	± 0.701	0.796
Lower septum	0.031	± 0.364		-0.05	± 0.274	

	Threshold difference 1			Threshold difference 2		
	Coefficient	95%CI	p-value	Coefficient	95%CI	p-value
Implantation Threshold	-0.293	(-0.486;-0.101)	0.03	-0.78	(-0.64;0.85)	0.13
Procedure Time	0.005	(-0.002;0.012)	0.164	0.003	(-0.008;0.014)	0.527



Conclusions: LPM implantation demonstrated high procedural success with favourable electrical performance and a predictable decrease, followed by stability of pacing thresholds over time. The consistent trend toward threshold stabilization appeared independent of CKD, implantation site, procedure duration, or initial threshold, supporting the intrinsic maturation process at the electrode–myocardial interface.

15D. REDEFINING ACCESS: THE JUGULAR APPROACH FOR LEADLESS PACEMAKER IMPLANTATION

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Introduction: Leadless pacemakers have emerged as a valuable alternative to conventional transvenous pacing systems, particularly in patients with higher infectious risk, limited venous access or severe chronic renal disease. The femoral vein is the stablished traditional access, but the approach through internal jugular vein has been proposed as an alternative to simplify the device delivery, reduce procedural time and allow for earlier mobilization. However, data on the efficacy and safety of the jugular approach remain limited.
Objectives: To evaluate the initial experience of leadless pacemaker implantation via right jugular access.
Methods: A retrospective cohort study including adult patients who underwent leadless pacemaker implantation through the jugular vein between January and October 2025 at a tertiary centre. Baseline clinical characteristics and procedural variables were collected. Univariate analysis, including chi-square and Mann–Whitney U were used in between-group comparisons (jugular vs. femoral access). A p-value < 0.05 was considered statistically significant.
Results: A total of 13 consecutive patients (mean age 80.7 ± 6.3 years; 38% female) underwent jugular leadless pacemaker implantation. The main indications were previous device infection (31%) and severe chronic kidney disease or dialysis (46%). The majority of the procedures were performed in outpatients (86%) and in patients with atrial fibrillation (77%). Implantation success was achieved in all patients. At implantation, mean sensing amplitude was 7.8 ± 2.5 mV, impedance 749 ± 142 Ω, and threshold 0.5 V (0.25–2.0). When compared with the femoral approach series of our centre (n = 72), the jugular approach was associated with shorter fluoroscopy time (3.5 vs. 5.4 min, p = 0.025), shorter total procedure time (51.7 ± 6.9 vs. 59.3 ± 21.9, *p* = 0.045), and shorter hospitalization duration (p = 0.026). No major procedural complications were observed.

Baseline characteristics		
Age - Years	80,7	(± 6,3)
Female - n (%)	5	(38)
Origin		
Outer patient	4	(31)
Hospitalized - n (%)	3	(23)
Ambulatory - n (%)	6	(46)
Rhythm		
Atrial Fibrillation - n (%)	10	(77)
Sinus Rhythm	3	(23)
Motive		
Infectious - n (%)	4	(31)
Chronic Kidney Disease - n (%)	3	(23)
Dialysis - n (%)	3	(23)
Tricuspid Disease - n (%)	1	(8)
Other - n (%)	2	(16)
Success - n (%)	13	(100)

	Jugular access	Femoral access	p value
Ambulatory - n (%)	6 (46)	15 (21)	0,017
Hospitalized - n (%)	7 (54)	57 (79)	
Fluoroscopy time - min	3,5 (2-10)	5,4 (1-18)	0,025
Procedure Time - min	51,7 (± 6,9)	59,3 (± 21,9)	0,045
Hospitalization length - days	1 (1-6)	1 (1-79)	0,026

Conclusions: Leadless pacemaker implantation via jugular access is safe and feasible with high success and adequate electrical performance. Compared with the usual femoral approach, appeared to be associated with shorter fluoroscopy and procedure times, as well as reduced hospitalization length. Larger prospective studies are needed to confirm these observations.

16D. LEFT BUNDLE BRANCH PACING AFTER SURGICAL SEPTAL MYECTOMY: FEASIBILITY, ELECTRICAL PERFORMANCE, AND EARLY OUTCOMES

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Introduction: Surgical septal myectomy (SSM) involves targeted septal reduction and is indicated to prevent secondary left ventricular outflow tract (LVOT) obstruction following correction of aortic stenosis. However, it is frequently associated with conduction disturbances, with permanent pacemaker implantation required in approximately 9–10% of cases. Left bundle branch pacing (LBBP) has emerged as a physiologic pacing alternative that minimizes the desynchrony associated with conventional right ventricular pacing. Post-myectomy septal fibrosis, left septal resection and anatomical remodelling may pose additional technical challenges, influence capture thresholds and may compromise conduction system capture.
Objectives: To evaluate the feasibility, acute electrical performance, and early outcomes of LBBP in patients with prior SSP.
Methods: A pilot study was conducted including consecutive patients who underwent LBBP following SSP at a tertiary referral centre. Baseline demographic and echocardiographic characteristics were recorded, along with procedural variables. Electrical performance parameters were assessed at implantation and first device interrogation. Electrocardiographic measurements, including paced QRS duration, V6 R-wave peak time (RWPT), and interpeak V6-V1 interval, were analysed to confirm left bundle recruitment.

Baseline Characteristics					
	Age	Days after SSP	LVEF (%)	Lead	Indication
Patient 1	81	4	56	Stylet driven lead	BAVC
Patient 2	79	4	55	Stylet driven lead	BAVC
Patient 3	21	3,812	33	Stylet driven lead	Cardiac resynchronization therapy
Patient 4	76	4	37	Stylet driven lead	BAVC

	Access	Type of pacing	Initial QRS width (ms)	Final QRS width (ms)	V6 RWPT (ms)	Interpeak V6-V1 (ms)	Sensing (mV)	Threshold (V@0,4 ms)	Impedance (Ohm)
Patient 1	Axilliary	LBBP	138	95	87	29	4.7	1.6	390
Patient 2	Axilliary	LFPP	125	102	77	39		0.4	380
Patient 3	Axilliary	LBBP	165	120	76	60	8	1.3	975
Patient 4	Axilliary	LBBP	162	116	72	32		0.8	721

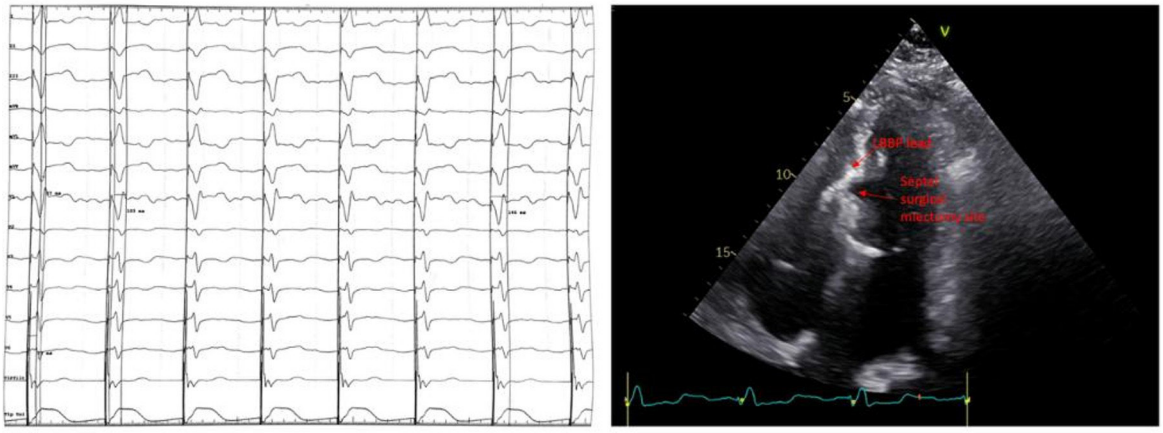

Figure 1 – Final paced QRS (right panel) and echocardiographic characteristics (left panel) of patient #2.

Results: Four patients (median age 78 years, 50% female) underwent LBBP following SSM. All implantations were performed using a stylet-driven lead. The median time from surgery to implantation was 4 days, except for one late case (3812 days post-SSM). The main indication for LBBP was bradycardia (n = 3), and cardiac resynchronization therapy for one patient with decreased left ventricular ejection fraction (33%) and typical LBB bloc.
Conclusions: LBBP after Surgical septal myectomy appears to be feasible, safe and associated with physiological ventricular activation and stable early electrical parameters. This strategy may represent an effective pacing approach in patients with conduction disturbances following septal myectomy, though larger series are warranted to confirm long-term outcomes and optimal procedural techniques.

17D. A DECADE OF LEADLESS PACEMAKER IMPLANTATION: TECHNICAL PERFORMANCE, SAFETY AND DEVICE LONGEVITY

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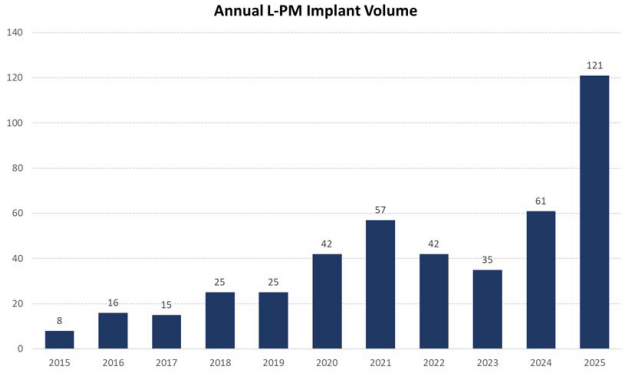
Introduction: Leadless pacemakers (L-PM) eliminate the need for transvenous leads and pacemaker pockets, reducing lead-related complications. After more than a decade of clinical use worldwide, real-world data on long-term performance and management of end-of-life devices remain limited. We report a 10-year single-center experience focusing on procedural practice evolution, long-term pacing parameters, safety and battery longevity.
Methods: Single-center prospective registry including all consecutive patients undergoing ventricular L-PM implantation from May 2015 to November 2025. Clinical characteristics, procedural data, pacing parameters and estimated battery longevity were collected at implant and at latest follow-up (FUP).
Results: The cohort included 447 patients (mean age 80.0 ± 9.4 years; 64% male). Successful implantation occurred in 445 patients (99.6%). Main pacing indications were high-grade AV block (64%) and atrial fibrillation with pauses (27%). Notably, 8% of implants were performed after extraction of an infected conventional system and 17% following transcatheter structural heart procedures. Procedural efficiency improved over the years, with global mean procedure and fluoroscopy times of 41.1 ± 24.7 min and 4.4 ± 3.8 min. Acute major complications were infrequent: pericardial effusion occurred in 0.9% (one tamponade), and 0.4% required conversion to a transvenous pacemaker (one due to acute L-PM dysfunction and the other due to a small RV cavity). Additionally, two lymphatic access-site complications were reported, one requiring surgical treatment. No device dislodgment occurred. During a mean FUP of 2.5 ± 2.3 years, pacing parameters remained stable (threshold: 0.64 to 0.60V; R-wave amplitude: 12.3 to 12.5 mV). Mean ventricular pacing was 59 ± 39% and estimated battery longevity was > 8 years in 84%. Among those with > 5-year of FUP (N = 60; mean FUP 6.7 ± 2.4 years), 80% maintained > 5 years of predicted longevity. Three upgrades to CRT or LBBAP occurred due to pacing-induced LV dysfunction. One true end-of-life event occurred 6 years post-implant (100% VP, high thresholds), successfully managed with a second L-PM. There were 119 deaths (27%), none device-related.

L-PM implantations from May 2015 to November 2025 (N = 447)	
Baseline characteristics of the patients	
Age (years)	80.0±9.4
Male sex	285 (64%)
Indications for permanent pacing	
High-degree atrioventricular block	288 (64%)
Atrial fibrillation with pauses	119 (27%)
Other	38 (9%)
Specific scenarios	
L-PM after conventional device extraction	37 (8%)
L-PM after percutaneous structural intervention	77 (17%)
Procedural characteristics	
Duration (min)	41.1±24.7
Fluoroscopy time (min)	4.4±3.8
Acute major complications	
Pericardial effusion	4 (0.9%)
Conversion to a transvenous pacemaker	2 (0.4%)
L-PM Pacing mode	
VVI	278 (62%)
VDD	167 (36%)
Follow-up characteristics (mean follow-up of 2.5 ± 2.3 years; 60 pts > 5year FUP)	
Pacing threshold (V)	0.60 (versus 0.64 at baseline)
R-wave amplitude (mV)	12.5 (versus 12.3 at baseline)
Ventricular pacing (percentage)	59±39
L-PM end-of-life	1 (0.4%)
Upgrade to CRT/LBBAP	3 (1.2%)
Death from any cause	119 (27%)*



V –Volts; mV – millivolts; L-PM Leadless pacemaker; CRT - cardiac resynchronization therapy; LBBAP - left bundle branch area pacing
*a mean of 83.2 ± 38.3 years old and 2.1±1.8years after L-PM implantation

Figure 1. *Baseline, procedural characteristics and follow-up data for patients who underwent L-PM implantation between May 2015 and November 2025 (upper panel). Annual L-PM implant volume throughout the study period (lower panel).*

Conclusions: Over 10 years of experience, L-PM implantation proved to be a robust and safe pacing modality in routine practice, maintaining stable electrical performance and excellent battery durability, with only one device reaching end-of-life. Ongoing FUP will clarify long-term replacement strategies and lifetime device management in this growing population.

18D. PHYSIOLOGICAL PACING IN ROUTINE PRACTICE: REAL-WORLD OUTCOMES OF LEFT BUNDLE BRANCH AREA PACING

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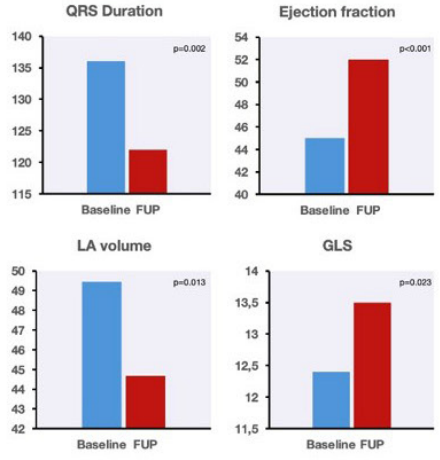
Introduction: Left bundle branch area pacing (LBBAP) has emerged as a physiologic pacing strategy that preserves native ventricular activation, improving ventricular synchrony and function. However, real-world data on procedural performance and early cardiac remodeling in multimorbid populations remains limited.
Objectives: To describe the experience of LBBAP implantation in a tertiary center and to evaluate early electrical, echocardiographic and clinical outcomes in a consecutive cohort of patients.

Baseline characteristics	All patients (n=71)
Age, mean ± SD	79±8
Male sex, n (%)	40 (56.3)
Medical history	
DM, n (%)	18 (25.4)
Hypertension, n (%)	58 (81.7)
Atrial fibrillation, n (%)	25 (35.2)
Heart failure, n (%)	25 (35.2)
HFrEF, n (%)	15 (21.1)
NYHA functional class, mean ± SD	1.6±0.7
Electrocardiographic parameters	
LBBB, n (%)	22 (31.0)
RBBB, n (%)	22 (31.0)
Indication for implantation	
AV node dysfunction, n (%)	42 (56.3)
Sinus node dysfunction, n (%)	18 (25.4)
Bradifibrillation, n (%)	9 (12.7)
Ressynchronization, n (%)	2 (2.8)
AV node ablation, n (%)	2 (2.8)
Procedural outcomes	
Succes rate, n (%)	67 (95)
Procedure duration, mean±SD (min)	70±20
Fluoroscopy duration, mean±SD (min)	12±11
Venous access	
Cephalic, n (%)	14 (19.7)
Subclavian, n (%)	54 (76.1)
Axillary, n (%)	3 (4.2)
Type of device	
DDDR, n (%)	57 (80.3)
VVIR, n (%)	14 (19.7)
Complications	
Pneumothorax, n (%)	1 (1.4)
Lead dislodgement, n (%)	1 (1.4)
Significant haematoma, n (%)	1 (1.4)

Parameter	Baseline	Follow-up	p-value
Electrocardiographic response			
QRS,mean±SD (ms)	136±32	122±21	**0.002**
Echocardiographic response			
LVEF, mean±SD (%)	45±12	52±10	**<0.01**
GLS, mean±SD (%)	−12.4±3.6	−13.5±3.1	**0.023**
LVEDV/BSA, mean±SD (mL/m²)	63.4±23.7	55.1±19.1	0.122
LVESV/BSA, mean±SD (mL/m²)	30.5±14.8	26.0±11.2	0.109
LA volume/BSA, mean±SD (mL/m²)	49.4±27.2	44.7±25.4	**0.013**
E/e', mean±SD	13±6.8.5	13.3±5.1	0.834
TAPSE, mean±SD (mm)	19.8±4.1	21.2±3.3	0.070
PASP, mean±SD (mmHg)	37.4±16.9	35.6±19.2	0.719
Clinical response			
NYHA functional class, mean ± SD	1.6±0.7	1.83±0.72	0.678
NT-proBNP (pg/mL)	7376±13404	5928±11510	0.131
Hospital admissions for CV cause, n (%)	7 (10)	6 (9)	1.000



Methods: A retrospective, observational, single-center study was conducted, including 71 patients who underwent LBBAP implantation. Baseline characteristics, pacing indication, procedural metrics and complications were collected. Clinical outcomes, electrocardiographic and echocardiographic parameters were assessed at baseline and follow-up.
Results: Mean age was 79 ± 8 years, 56% were male, and comorbidity burden was high. AV node dysfunction was the most common indication for pacing (42, 56%) followed by sinus node dysfunction (25%), atrial fibrillation with slow ventricular conduction (12%), and post-AV node ablation (3%). In two patients, LBBAP was performed with resynchronization intent due to left ventricular ejection fraction (LVEF) < 35% and left bundle branch block. Mean baseline LVEF was 45 ± 12%. Implantation success rate was 95%, with a mean procedure duration of 70 ± 20 minutes and fluoroscopy time of 12 ± 11 minutes. Complications were infrequent and comparable to those reported for conventional right ventricular pacing, including one pneumothorax (1.4%) and one lead dislodgement (1.4%). During a mean follow-up, of 8 months, LBBAP achieved significant electrical improvement with QRS narrowing from 136 ± 32 to 122 ms (p = 0.002). Echocardiography demonstrated favorable remodeling with an increase in LVEF (45 ± 12% to 52 ± 10%, p < 0.01) and global longitudinal strain (-12.4 ± 3.6% to -13.5 ± 3.1%, p = 0.023) and a reduction in left atrium volume index (49.4 ± 27.2 to 44.7 ± 25.4 mL/m^2, p = 0.013). LV volumes showed a non-significant trend toward reduction. NYHA class and NT-proBNP levels remained unchanged.
Conclusions: In a real-world tertiary-center cohort, LBBP was safe, feasible, and associated with improved electrical synchrony and early signs of favorable cardiac remodeling, supporting LBBP as an effective physiological pacing strategy across a broad clinical population.

20D. LEFT BUNDLE BRANCH AREA PACING VS RIGHT VENTRICULAR APICAL PACING: CHANGING THE PACING PARADIGM

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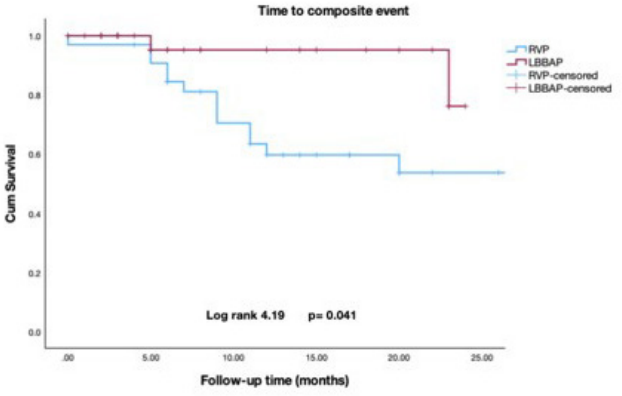
Introduction: Right ventricular pacing (RVP) can induce ventricular dyssynchrony and increase the risk of left ventricular dysfunction in patients requiring frequent ventricular pacing. Left bundle branch area pacing (LBBAP) provides a more physiological activation pattern and may offer superior long-term clinical outcomes. However, comparative real-world evidence in patients with preserved left ventricular function remains limited.
Objectives: To compare electrical, echocardiographic and clinical outcomes between LBBAP and RVP in a consecutive cohort from a tertiary center.
Methods: A retrospective observational study included 69 patients with preserved left ventricular ejection fraction (LVEF) undergoing pacemaker implantation (LBBAP n = 35; RVAP n = 34). Baseline clinical, electrocardiographic, echocardiographic and procedural data were collected. Electrical, echocardiographic and clinical outcomes were assessed during follow-up. The primary endpoint was a composite of cardiovascular hospitalization or cardiovascular death, evaluated by Kaplan–Meier analysis.
Results: Baseline characteristics were similar between groups. LBBAP procedures were longer and required more fluoroscopy (68.66 ± 19.98 min and 12.69 ± 11.76 min versus 37.15 ± 10.6 min and 4.079 ± 4.74 min; p < 0.001), with similarly low complication rates. Baseline QRS duration was similar (123 ± 29 ms vs. 121 ± 27 ms), but LBBAP resulted in significant QRS narrowing (-11.5 ± 30.1 ms) whereas RVP led to QRS widening (+27.0 ± 28.0 ms, p < 0.001). LVEF remained stable in both groups (baseline 60% vs. 58%; follow-up 58% vs. 57%). LBBAP showed a more favorable echocardiographic profile, with superior GLS changes (-0.8 ± 1.9% vs. +1.6 ± 3.3%, p = 0.032) and nonsignificant improvements in ventricular and atrial volumes, E/e', TAPSE and PSAP. Clinical outcomes favored LBBAP. Cardiovascular hospitalizations were lower in the LBBAP group (3% vs. 38%, p < 0.001) and cardiovascular deaths occurred only in the RVP group (0 vs. 2, p = ns). Kaplan–Meier analysis showed a significant reduction in the composite endpoint in the LBBAP group (log-rank χ^2 = 12.8, p < 0.001). Events occurred mainly in patients with ventricular pacing > 20%.

Parameter	LBBAP (n=35)	RVP (n=34)	p value
Electrocardiographic response			
Δ QRS (ms)	-11.5±30.1	+27.0±28.0	**<0.001**
Echocardiographic response			
Δ LVEF (%)	-1.6±5.1	-0.8±11.2	0.799
Δ GLS (%)	-0.8±1.9	+1.6±3.3	**0.032**
Δ LVEDV/BSA (mL/m²)	-4.3±22.9	+1.1±11.0	0.402
Δ LVESV/BSA (mL/m²)	-1.4±9.1	+2.1±9.3	0.275
Δ LAVI (mL/m²)	-7.8±7.9	+0.1±2.4	0.154
Δ E/e'	-0.1±2.4	+2.2±5.3	0.417
Δ PASP (mmHg)	-4.0±7.1	+0.5±12.8	0.816
Δ TAPSE (mm)	2.3±2.9	-1.5±6.3	0.729
Clinical response			
Hospital admissions, n (%)	1 (3)	13 (38)	**<0.001**
Death of CV cause, n (%)	0 (0)	2 (6)	0.239



Conclusions: In this real-world population with preserved LVEF, LBBAP provided superior electrical synchrony and better clinical outcomes compared with RVP. The marked reduction in cardiovascular events supports LBBAP as a safer and more physiological pacing strategy in patients with an expected high burden of ventricular pacing.

21D. DISRUPTING THE GREY AREA: LBBAP VERSUS CRT IN PATIENTS WITH LVEF 35-50%

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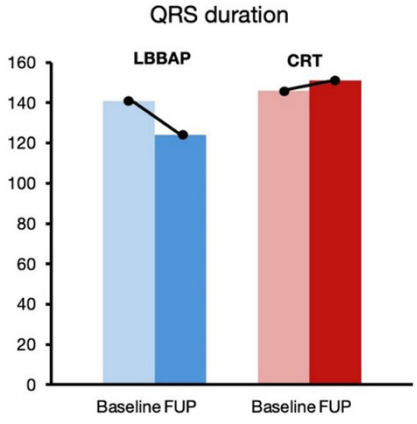
Introduction: In patients with moderately reduced left ventricular ejection fraction (LVEF 35–50%) who require ventricular pacing (VP), right VP can induce ventricular dyssynchrony and increase the risk of left ventricular (LV) dysfunction. Current expert consensus recognizes both CRT and conduction system pacing as viable options. Left bundle branch area pacing (LBBAP) provides a more physiological ventricular activation and may offer advantages over conventional CRT in selected patients, but real-world comparative data on electrical, structural and clinical outcomes are still scarce.
Objectives: To compare procedural, electrical, echocardiographic and clinical outcomes between LBBAP and CRT in a real-world cohort of patients with bradycardia pacing indication and LVEF 35-50%.
Methods: Retrospective, single-center study including 37 patients who underwent either LBBAP (n = 20) or CRT (n = 17) implantation. Baseline characteristics, procedure metrics and complications were recorded.

Electrocardiographic, echocardiographic and clinical parameters were evaluated at baseline and follow-up.
Results: Baseline clinical parameters were similar between groups. Procedural duration, fluoroscopy time and complication rates were similar. Mean baseline QRS duration was similar (133 ± 32 ms for LBBAP and 135 ± 27 ms for CRT, p = ns) although LBBAP resulted in greater QRS shortening (-19.3 ± 24.9 ms) compared with CRT (+4.5 ± 33.3 ms, p = 0.033). Mean baseline LVEF was also similar between groups (39 ± 4% for LBBAP and 37 ± 2% for CRT). Improvements in LVEF were nearly identical (+8.0 ± 8.4% with LBBAP vs. +7.7 ± 8.9% with CRT; p = 0.920), as were changes in GLS (-0.9 ± 3.6% vs. -1.0 ± 1.7%; p = 0.969). LV volumes showed parallel reductions without significant differences between groups. Atrial and diastolic parameters including ΔLAVI, ΔE/e' and ΔPASP demonstrated variable but comparable patterns. Clinically, no significant differences were observed between strategies and changes in NYHA class were similar and not statistically significant (+0.3 ± 0.8 with LBBAP vs. -0.4 ± 0.6 with CRT, p = 0.08).

Procedural outcomes	LBBAP	CRT	p value
Procedure duration, mean±SD (min)	72.3±22.2	65.5±33.9	0.418
Fluoroscopy duration, mean±SD (min)	11.3±11.5	12.7±12.3	0.713
Complications			
Pneumothorax, n (%)	0 (0)	0 (0)	1.000
Lead dislodgement, n (%)	0 (0)	0 (0)	1.000
Significant haematoma, n (%)	0 (0)	0 (0)	1.000

Parameter	LBBAP (n=25)	CRT (n=25)	p value
Electrocardiographic response			
Δ QRS (ms)	-17.2±24.1	4.6±28.7	**0.010**
Echocardiographic response			
Δ LVEF (%)	+11.5±12.0	+9.4±10.9	0.523
Δ GLS (%)	-1.25±1.6	-1.01±3.3	0.838
Δ LVEDV/BSA (mL/m²)	-10.5±23.5	-8.9±25.5	0.858
Δ LVESV/BSA (mL/m²)	-6.3±12.9	-3.3±20.9	0.663
Δ LAVI (mL/m²)	-3.4±9.0	+0.6±14.7	0.331
Δ E/e'	-0.5±5.8	-1.9±6.5	
Δ PASP (mmHg)	-1.4±19.9	3.20±16.9	0.565
Δ TAPSE (mm)	0.84±3.3	0.32±4.0	0.350
Clinical response			
Δ NYHA functional class, mean ± SD	-0.3±0.9	-0.4±0.6	0.838



Conclusions: In patients with LVEF 35-50% requiring VP, LBBAP demonstrated a safety profile comparable to CRT and provided markedly superior electrical resynchronization; however, this did not translate into significant differences in structural remodeling or clinical outcomes. These findings support LBBAP as a robust physiological pacing strategy and a viable and cheaper alternative to conventional CRT in everyday practice.

22D. CARDIOPULMONARY EXERCISE PERFORMANCE IN PHYSIOLOGIC VERSUS CONVENTIONAL PACING

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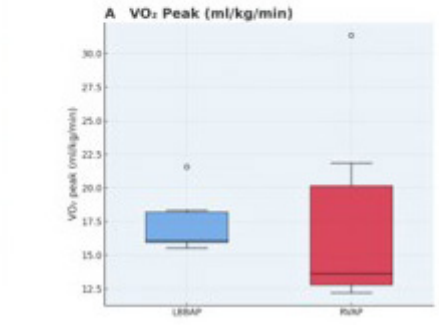
Introduction: Right ventricular pacing (RVP) can induce electrical and mechanical dyssynchrony, potentially impairing left ventricular performance and exercise tolerance, especially in patients who experience > 20% of RVP burden. Left bundle branch area pacing (LBBAP) provides a more physiologic alternative by engaging the native His-Purkinje system and preventing pacing induced cardiomyopathy (PICM). However, the impact of RVP on functional capacity among patients who do not develop PICM remains poorly characterized, and no study to date has compared LBBAP and RVP during exercise.
Objectives: To compare exercise capacity and cardiopulmonary response in patients who underwent LBBAP versus RVP implantation and who did not develop PICM, in a real-world cohort.

Baseline characteristics	LBBAP (n=7)	RVP (n=7)	p value
Age, median (IQR) (years)	67 (54-81)	69 (57-77)	0.383
Male sex, n (%)	7 (100)	6 (86)	1.000
Medical history			
DM, n (%)	5 (71)	4 (57)	1.000
Dislipidemia, n (%)	22 (63)	24 (71)	1.000
Hypertension, n (%)	7 (100)	4 (57)	0.192
Atrial fibrillation, n (%)	3 (43)	0 (0)	0.192
BMI, mean ± SD (kg/m²)	29±6	28±4	0.607
Electrocardiographic parameters			
QRS lenght, median (IQR) (ms)	120 (111-154)	155 (93-202)	1.000
LBBB, n (%)	3 (43)	0 (0)	0.192
RBBB, n (%)	1 (14)	2 (29)	1.000
Echocardiographic parameters			
LVEF, median (IQR) (%)	56 (51-62)	55 (50-64)	1.000
GLS, median (IQR) (%)	-15 (-13-(-17))	-15 (-11-(-20))	0.818
LVEDV/BSA, median (IQR) (mL/m²)	44 (30-57)	58 (45-70)	0.620
LVESV/BSA, median (IQR) (mL/m²)	21 (12-26)	29 (17-36)	0.710
LA volume/BSA, median (IQR) (mL/m²)	26 (16-38)	33 (19-45)	0.620

CPET parameters	LBBAP (n=7)	RVP (n=7)	p value
Exercise time, mean ± SD (min)	14:51±04:32	11:43±05:31	0.730
Power, mean ± SD (W)	127.25±38.20	99.00±60.81	0.730
VO_2 peak, mean ± SD (mL/kg/min)	18.52±2.30	17.04±6.82	0.468
VE/VCO_2 slope, mean ± SD	30.60±3.31	28.34±4.06	0.655
RER, mean ± SD	1.12±0.02	1.13±0.03	0.903
Peak HR, mean ± SD (bpm)	107±11	128±18	0.287



Methods: A prospective, non-randomized pilot study was conducted including patients undergoing CPET after LBBAP (n = 7) or RVP (n = 7) implantation. Baseline clinical, electrocardiographic, echocardiographic,

and procedural characteristics were collected. CPET was performed on a cycle ergometer using a ram protocol. A short programmed atrioventricular interval (120 ms) ensured 100% pacing in each mode during exercise. Groups were compared using appropriate statistical tests.
Results: Baseline demographic, clinical, and echocardiographic characteristics were similar between groups. QRS duration was narrower in the LBBAP group (120 ms vs. 155 ms) and all patients achieved maximal tests (RER > 1.10). Regarding functional capacity measures, although between-group differences did not reach statistical significance, LBBAP showed a consistent trend toward superior performance, including higher achieved workload (127 ± 38 W vs. 99 ± 61 W; p = 0.73) and slightly higher VO_2 peak (18.5 ± 2.3 vs. 17.0 ± 6.8 mL/kg/min; p = 0.47). Ventilatory efficiency (VE/VCO_2 slope), RER, and chronotropic response were comparable.
Conclusions: In this pilot cohort, LBBAP demonstrated a consistent trend toward improved exercise performance compared with RVP, despite the absence of statistical significance—likely influenced by limited sample size. These findings support the physiologic rationale of LBBAP and suggest that it may mitigate pacing-induced impairment during exercise, highlighting the importance of assessing functional capacity beyond resting left ventricular ejection fraction. Larger prospective studies are needed to validate these preliminary observations.

26D. LEFT BUNDLE BRANCH AREA PACING: STABLE PARAMETERS AND PRESERVED FUNCTION AT LONG-TERM FOLLOW-UP

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Introduction: Left bundle branch area pacing (LBBAP) is increasingly recognized as a physiological pacing technique that preserves left ventricular (LV) synchrony. This study aims to evaluate long-term stability of pacing, electrocardiographic, and echocardiographic parameters.
Methods: Single center retrospective study including consecutive patients who underwent LBBAP between 2021 and 2025. LBBAP criteria was defined as a right bundle branch block pattern in lead V1 and LV activation time (LVAT) of < 90 ms. Data on lead performance and electrocardiographic and echocardiographic parameters were obtained at implantation and at the final follow-up visit.
Results: A total of 298 patients were included [median age 79 (IQR 71-84) years, 66% (n = 197) male]. The most common indications were atrioventricular (AV) node disease (59%, n = 176), sinus node disease (18%, n = 53) and biventricular cardiac resynchronization therapy (CRT) bailout (11%, n = 32). Nineteen patients (6%) had undergone transcatheter aortic valve implantation prior to LBBAP implantation. Procedural duration was 63 (IQR 50-80) minutes, with a fluoroscopy time of 5 (IQR 3-8) minutes. Median LVAT was 86 ms (IQR 76-93), paced QRS duration was 111 ms (IQR 100-120), and the interpeak V1-V6 interval was 38 ms (IQR 29-45). The acute R-wave amplitude reached 11.8 mV (IQR 7.4-16.6), and the pacing threshold was 0.5 V (IQR 0.5-0.7). At a median follow-up of 11 months (IQR 5-22), lead parameters remained stable, with a pacing threshold of 0.6 V (IQR 0.5-0.8) and an R-wave amplitude of 12.2 mV (IQR 9.2-20.0). The paced QRS duration remained narrow at 120 ms (IQR 110-126). Only five procedure-related complications were reported: two cases of device-associated endocarditis, two cases of lead dislodgement, and one case of pericarditis. In the subgroup of patients who underwent left ventricular ejection fraction (LVEF) assessment at 1-year follow-up (n = 104), LVEF remained preserved after LBBAP [60% (IQR 44-60) vs. 55% (IQR 50-60); p = 0.485], with a ventricular pacing dependency of 95% (IQR 32-100) at follow-up. Among the 21 patients with a baseline LVEF < 40%, most received LBBAP as a bailout CRT strategy, and 13 (62%) demonstrated an improvement in LVEF > 40% at follow-up [median LVEF 32% (IQR 26-35) vs. 42% (35-50), p = 0.001].
Conclusions: At a median follow-up of 11 months, lead parameters were stable and QRS duration was narrow. In the subgroup of patients who underwent echocardiographic evaluation at 1-year follow-up, LVEF was

Figure 1 – Lead parameters, QRS duration and left ventricular ejection fraction at implantation time and at end of follow-up.

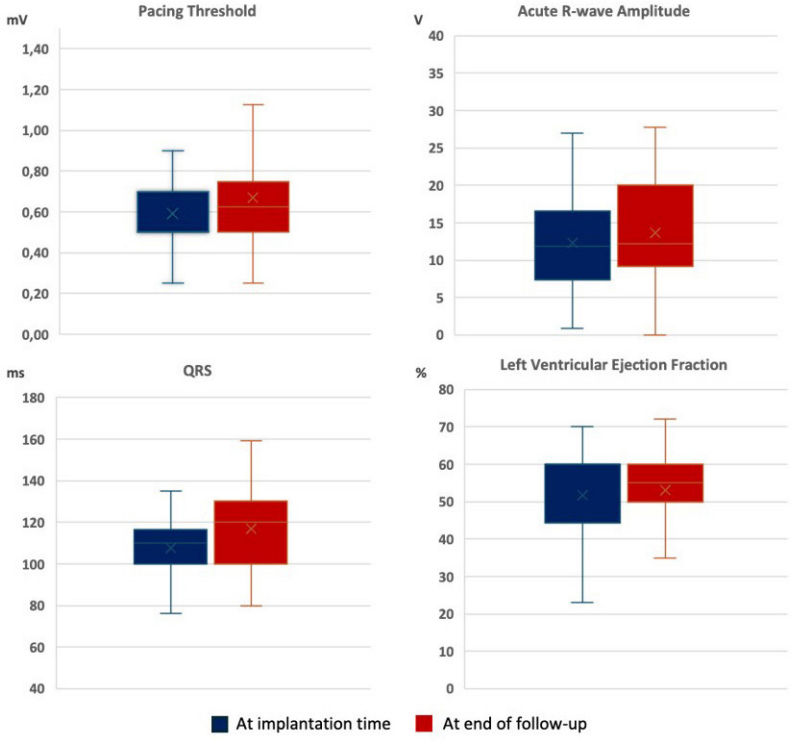

Figure 26D

preserved. Moreover, 62% of patients with previously reduced LVEF demonstrated improvement in LVEF.

27D. ONDE ESTIMULAR IMPORTA: SISTEMA DE CONDUÇÃO VERSUS SEPTAL/APICAL COM ELEVADA CARGA *PACING* VENTRICULAR

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Introdução: A estimulação do sistema de condução (CSP) é uma estratégia de estimulação fisiológica na bradicardia sintomática e terapêutica de ressincronização cardíaca. Poucos estudos avaliam resultados a médio prazo da CSP face diferentes modalidades de estimulação do ventrículo direito (RVP), particularmente com *pacing* ventricular frequente, associada ao desenvolvimento de cardiomiopatia induzida por *pacing* (PICM) e piores desfechos.
Objetivos: Avaliar resultados clínicos a médio prazo da CSP comparativamente às modalidades de RVP, com implicações na estratégia terapêutica em doentes com necessidade de *pacing* ventricular frequente.
Métodos: Estudo observacional prospetivo, unicêntrico de doentes submetidos a colocação de *pacemaker* entre janeiro de 2023 e janeiro de 2025, com carga de *pacing* ventricular > 40%. O desfecho primário foi um composto de PICM ou idas ao Serviço de Urgência (SU) por insuficiência cardíaca aguda (ICA) e os desfechos secundários foram os mesmos, mas avaliados individualmente. Regressão Cox através de modelos multivariáveis para estimar o risco de ida ao SU por ICA.
Resultados: Foram analisados 740 doentes: 228 submetidos a CSP, 303 a estimulação septal e 209 a estimulação apical. O grupo CSP foi significativamente mais jovem (mediana 77 anos [IQ 69–82] vs. 81 anos [IQ 75–86]; p < 0,001) e predominantemente do sexo masculino (74% vs. 65%; p = 0,023). A mediana de seguimento foi inferior no CSP (459 dias [IQ 188–681]) face à RVP (760 dias [IQ 417–1.013]). Comparativamente à estimulação septal e apical, CSP obteve QRS estimulado estreito (média 119 ± 16 vs. 152 ± 19 vs. 166 ± 20 ms; p < 0,001) e nos QRS > 120 ms, maior frequência de encurtamento do QRS (93% vs. 35% vs. 7%; p < 0,001) e menor ΔQRS médio (-18 ± 30 vs. 22 ± 27 vs. 40 ± 27 ms; p < 0,001).O desfecho primário foi menos frequente nos tratados com CSP, face à estimulação septal e apical (12% vs. 44% vs. 61%; p < 0,001), PICM (5% vs. 25% vs. 35%; p < 0,001) e ida ao SU por ICA (2,6% vs. 10,6% vs. 20,1%; p < 0,001). O modelo Cox demonstrou que CSP é um preditor robusto de redução de idas ao SU por ICA (HR ajustado 0,183; IC 95% 0,072–0,463; p < 0,001) e em menor magnitude, estimulação septal (HR ajustado 0,492; IC 95% 0,270–0,897; p = 0,021), quando comparadas com a estimulação apical (Fig. 1).

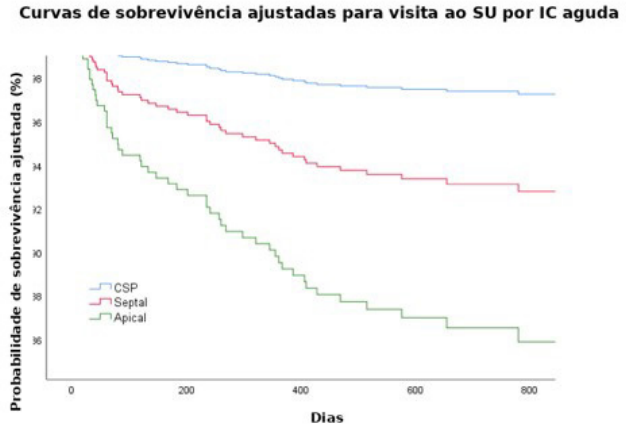

Figura 1. *Modelo de Cox ajustado para idas ao SU por ICA. A CSP apresenta maior sobrevivência livre de eventos do que a estimulação septal e apical (HR ajustado 0,183; IC 95% 0,072-0,463; p < 0,001).*

Conclusões: Nesta coorte a CSP associou-se a benefícios clínicos substanciais a médio prazo quando comparada com RVP, apoiando a adoção de estratégias de estimulação fisiológica em doentes com expectativa de *pacing* ventricular frequente.

28D. EXTRAVASCULAR IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS IN CHILDREN: CASE SERIES AND SYSTEMATIC REVIEW

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Introduction: Extravascular implantable cardioverter-defibrillators (EV-ICDs) and other non-transvenous systems are attractive options for paediatric patients in whom the use of transvenous leads is constrained by body size, cardiac anatomy, and concerns about long-term lead-related complications. Although EV-ICDs have demonstrated safety and efficacy in adult pivotal trials, paediatric patients were excluded from these studies, and available data in children are limited to small case series and isolated reports, and comprehensive synthesis of the existing experience is lacking.
Objectives: To describe a case series and systematically review the literature on EV-ICD use in paediatric patients.
Methods: A retrospective, single-centre case series was conducted including all consecutive patients aged < 18 years who received an EV-ICD between 2024 and 2025. Indications, patient and procedural characteristics, defibrillation testing results, device parameters and complications were obtained from electronic medical records. In parallel, we systematically searched electronic databases (MEDLINE, Scopus, and Web of Science) up to November 2025 for studies reporting EV-ICD use in patients aged < 18 years, with data extracted on implantation feasibility, safety, and efficacy outcomes.
Results: We report two paediatric patients who underwent uncomplicated EV-ICD implantation with successful defibrillation testing. Patient 1: A 13-year-old girl (52 kg) with non-obstructive hypertrophic cardiomyopathy (MYBPC3 mutation; HCM Risk-Kids 8.4%) received a primary-prevention EV-ICD. She experienced two inappropriate shocks at 2 months due to P-wave oversensing, which resolved after sensing vector reprogramming, with no further events over 7-months of follow-up. Patient 2: A 17-year-old boy (48 kg) with idiopathic ventricular fibrillation after aborted sudden cardiac death received a secondary-prevention EV-ICD. Follow-up at 16 months was uneventful, with no shocks or device-related complications. The systematic review identified 8 published articles including 33 paediatric patients, predominantly adolescents, in whom implantation success was 100% (Table 1). Defibrillation testing, when performed, was uniformly successful, and reported complications were infrequent, mainly involving lead repositioning and inappropriate shocks. Follow-up was limited to a maximum of 9 months, limiting assessment of long-term device performance and late complications.
Conclusions: Overall, the available evidence—though limited to small, heterogeneous case series with short follow-up, suggests that EV-ICD implantation in paediatric patients is technically feasible with consistently high acute success and low short-term complication rates. Robust long-term data are still needed to understand durability, growth-related effects, and late device performance in this population.

29D. FOURTEEN-MONTH EXPERIENCE WITH THE EXTRAVASCULAR IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR (EV-ICD) IN A TERTIARY CENTRE: PROCEDURAL PERFORMANCE AND EARLY COMPLICATIONS

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Introduction and objectives: The extravascular implantable cardioverter-defibrillator (EV-ICD) was developed to combine the benefits of transvenous and subcutaneous ICD systems while avoiding the limitations inherent to

each approach. By enabling pacing, cardioversion, and defibrillation without transvenous access, it represents an appealing option for young patients who may require decades of device therapy. We sought to evaluate our center's first 14-month experience with EV-ICD implantation, with particular emphasis on procedural feasibility, early safety, and device-related complications.

Methods: We conducted a single-centre observational study including all consecutive patients who underwent EV-ICD implantation between November 2024 and January 2026. Demographic, clinical, imaging, pharmacologic, and procedural variables were collected, as well as device performance parameters and short-term follow-up outcomes.

Results: Fifteen patients (Table 1) were implanted (mean age 36.7 ± 10 years; 20% female). Underlying aetiologies included hypertrophic cardiomyopathy (n = 5), non-dilated LV cardiomyopathy (n = 3), dilated cardiomyopathy (n = 2), Brugada syndrome (n = 2), polymorphic VT (n = 1), arrhythmogenic RV cardiomyopathy (n = 1) and cardiac sarcoidosis (n = 1). Implantation was successful in all cases, with no procedural or peri-procedural complications. Mean procedure duration was 64.93 minutes (range 44–78 min), and median fluoroscopy time was 3.46 minutes (range 1,55–6.13). Defibrillation threshold testing was successful in all patients. During follow-up, one lead dislodgment occurred after cardiopulmonary resuscitation, and three patients experienced an inappropriate shock related to sinus tachycardia, myopotential oversensing, and the lead dislodgment. All events were promptly managed, with no lasting sequelae. No infections, ineffective therapies, or device malfunctions were observed (Table 2).

Table 1. Baseline Characteristics and Procedural Metrics.

Characteristic	Overall (N=15)
Patients	15
Age — yr	36.7±10
Female sex — no. (%)	3 (20.0)
Underlying diagnosis — no. (%)	
Hypertrophic cardiomyopathy	5 (33.3)
Non-dilated LV cardiomyopathy	3 (20.0)
Dilated cardiomyopathy	2 (13.3)
Brugada syndrome	2 (13.3)
Polymorphic ventricular tachycardia	1 (6.7)
Arrhythmogenic RV cardiomyopathy	1 (6.7)
Cardiac sarcoidosis	1 (6.7)
Procedure duration — min	64.9 (44–78)
Fluoroscopy time — min	3.5 (1.6–6.1)
Successful implantation — no. (%)	15 (100)
Defibrillation-threshold testing successful — no./	15/15 (100)
Peri-procedural complications — no. (%)	0 (0)

* Plus-minus values are means ±SD. Procedure duration is shown as mean (range); fluoroscopy time as median (range).

Table 2. Early Device-Related Events during Follow-up.

Event	Value
Patients with any reported device-related event -	3 (20.0)
Lead dislodgment — no. (%)	1 (6.7)
Inappropriate shock — no. (%)	3 (20.0)
Cause of inappropriate shock — no.	
Sinus tachycardia	1
Myopotential oversensing	1
Lead dislodgment after CPR	1
Device infection — no. (%)	0 (0)
Ineffective therapies — no. (%)	0 (0)
Device malfunction — no. (%)	0 (0)

* Events are reported for follow-up after implantation; duration of follow-up was not specified in the abstract.

Conclusions: In this fourteen-month real-world experience, the EV-ICD demonstrated high procedural success, excellent acute safety, and reliable defibrillation performance. Although a small number of inappropriate shocks and a lead dislodgment occurred, these were manageable and expected within early adoption. Overall, the EV-ICD appears to be a highly promising and robust alternative for carefully selected patients, particularly younger individuals with long anticipated exposure to ICD therapy.

31D. DETERMINANTS OF POST-TAVI CONDUCTION DISORDERS: THE ROLE OF SEX AND BASELINE ECG ABNORMALITIES

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Introduction: Permanent pacemaker implantation (PM) remains a relevant complication after transcatheter aortic valve implantation (TAVI). Sex-related differences in conduction outcomes have been suggested, but it is unclear whether these differences are explained by baseline electrocardiographic abnormalities or persist after comprehensive adjustment.

Methods: We analyzed a consecutive single-center real-world cohort of patients undergoing TAVI. Valve types were categorized according to expansion mechanism as self-expanding, balloon-expandable, or other devices. Baseline electrocardiographic conduction status was assessed prior to TAVI and categorized as normal conduction, low/intermediate-risk abnormality (first-degree atrioventricular block or left anterior fascicular block in isolation), or high-risk abnormality (second-degree atrioventricular block, complete bundle branch block, or combined conduction disturbances). The primary endpoint was new permanent pacemaker implantation, defined according to Valve Academic Research Consortium-3 (VARC-3) criteria. Multivariable logistic regression was performed to evaluate the association between sex and PM implantation, adjusting for age, valve type, and baseline conduction status. A sex-by-conduction interaction was explored.

Results: Among 154 patients included in the analysis, baseline conduction abnormalities were similarly distributed between men and women (p = 0.94). Overall, PM implantation occurred in 21.8% of patients and increased stepwise according to baseline conduction risk (10.5% in normal conduction, 18.2% in low/intermediate-risk abnormalities, and 38.5% in high-risk abnormalities; p < 0.001). PM implantation was more frequent in men than in women (31.7% vs. 15.6%; p = 0.027). In multivariable analysis, female sex remained independently associated with a lower risk of PM implantation (OR 0.33, 95%CI 0.14–0.78; p = 0.011), while high-risk baseline conduction abnormalities were strongly associated with increased PM risk (OR 4.21, 95%CI 1.85–9.58; p < 0.001). No significant interaction between sex and baseline conduction status was observed.

Conclusions: In this real-world TAVI cohort, women experienced significantly lower rates of permanent pacemaker implantation compared with men, independent of baseline electrocardiographic conduction abnormalities. These findings highlight clinically relevant sex-based differences in conduction outcomes after TAVI and support the integration of sex-specific risk assessment into procedural planning and patient counseling.

32D. CONDUCTION SYSTEM ABNORMALITIES IN PATIENTS UNDERGOING EVOQUE SYSTEM IMPLANTATION AND OUTCOMES

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Introduction: Severe symptomatic tricuspid regurgitation (TR) has limited treatment options and poor prognosis. Transcatheter tricuspid valve replacement (TTVR) with the EVOQUE system is a promising alternative.

Baseline conduction abnormalities may increase the risk of rhythm disturbances, including atrioventricular (AV) conduction disorders and permanent pacemaker implantation (PPI).
Objectives: The primary endpoint was post-TTVR conduction abnormalities and/or PPI.
Methods: Single-center prospective study of patients undergoing TTVR with the EVOQUE system (October 2024-December 2025). Standard 12-lead electrocardiograms were assessed at baseline and postprocedural. Patients were monitored for at least 48 hours, with a median follow-up of 5 months (IQR 8).
Results: The cohort included 20 patients (55% female; median age 79 years, IQR 8.5). Hypertension was present in 85%, diabetes 15%, and atrial fibrillation 95%. TR was torrential in 50%, severe in 35%, and massive in 15%. Pre-existing pacemaker in 4 patients, and in 3, TR was related to the pacing lead. Overall, 8 patients (40%) had mixed etiologies, 2 had a primary mechanism only, and 10 had a secondary mechanism only. At baseline, conduction system abnormalities were assessed in 17 patients (3 were in ventricular pacing): 1 (5.9%) had an incomplete right bundle branch block (RBBB), 5 (29.4%) a complete RBBB, and 5 (29.4%) a complete left bundle branch block (LBBB). The implanted valve sizes were: 56 mm (n = 4), 52 mm (n = 7), 48 mm (n = 6), and 44 mm (n = 3). Post-procedure, 1 patient developed complete RBBB associated with left anterior fascicular block, and another a complete RBBB. Two patients progressed to complete AV block and required PPI within 30 days. Pre-existing RBBB (complete or incomplete) or LBBB did not predict risk of PPI or *de novo* conduction abnormalities (p > 0.05). There was also no association with the valve size, right ventricular dilation, TR severity or mechanism (p > 0.05). No in-hospital mortality occurred, and 2 patients were hospitalized for heart failure (HF).

Baseline electrocardiographic features and post-TTVR outcomes (n = 20)	
Baseline conduction abnormalities (n = 17)	
Incomplete RBBB, n (%)	1 (5.9%)
Complete RBBB, n (%)	5 (29.4%)
Complete LBBB, n (%)	5 (29.4%)
Ventricular pacing, n (%)	3 (15%) of 20
Postprocedural conduction abnormalities (n = 17)	
New complete RBBB ± LAFB, n (%)	2 (11.8%)
Complete AV block requiring PPI, n (%)	2 (12.5%) of 16
Hospitalizations for Heart Failure and Mortality (n = 20)	
Heart failure hospitalization, n (%)	2 (10%)
In-hospital mortality	0

Conclusions: In this cohort of patients, baseline conduction abnormalities and valve size were not associated with an increased risk of postprocedural conduction disturbances or PPI. Despite the high prevalence of conduction system disease and complex TR etiologies, procedural outcomes were favorable, with low rates of HF hospitalization and no in-hospital mortality. Larger studies are needed to confirm these findings.

34D. FROM PACING TO RESYNCHRONIZATION: WHO TRULY REAPS THE BENEFITS?

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Introduction: Right ventricular (RV) pacing can lead to intraventricular desynchrony, resulting in left ventricular (LV) dysfunction and worsening heart failure (HF) in up to 30% of patients within a few years of implantation. Cardiac resynchronization therapy (CRT) has been shown to reverse these adverse effects, improving LV ejection fraction (LVEF) and reducing morbidity and mortality. Despite these benefits, 20–40% of CRT recipients do not demonstrate a significant response. Previous studies have suggested that specific patient characteristics may predict a higher likelihood of benefiting from CRT.
Objectives: Finding variables associated with CRT response within a year of CRT upgrade in a district hospital.
Methods: Single-center, observational and retrospective study of patients with RV pacing systems and HF with reduced LVEF who underwent revision to CRT between January 2015 to December 2024. CRT response was defined as ≥ 5% increase in LVEF and ≥ 1 NYHA class improvement. LVEF was assessed before and 6–12 months after revision.
Results: 55 patients were included, 78% male, mean age 76 ± 7.9 years. 64% had a double chamber PM and 20% an ICD. Mean % of RV pacing was 78 ± 33%. Mean time from initial implantation to CRT revision was 8 ± 2.6 years. All procedures were successful (CRT-D 76% and CRT-P 24%). Mean age at upgrade was 73 ± 7 years. HF etiology was ischemic in 30 (54%) patients. 27 (49%) had atrial fibrillation. All the patients were in NYHA II-III, with mean LVEF 29.1 ± 6.7%. CRT response occurred in 35 (64%) patients, with a mean ΔLVEF 10.7 ± 8.9%. All responders improved NYHA class, with 27 (49%) patients in NYHA I and 24 (44%) in NYHA II at 6-12 months. Patients with non-ischemic cardiomyopathy had a significantly higher rate of response to CRT compared with the ischemic ones (ΔLVEF: 14 ± 9.9 vs. 7.9 ± 5.8, p = 0.019). Patients aged < 70 years showed higher LVEF improvement than older patients (12.5 ± 9.8 vs. 10 ± 7.1, p = 0.002), as did those with RV pacing ≥ 40% (11.9 ± 6.6 vs. 10 ± 4.4, p=0.022). In our population, gender, sinus rhythm, time to revision and device type were not predictors of response during follow-up.

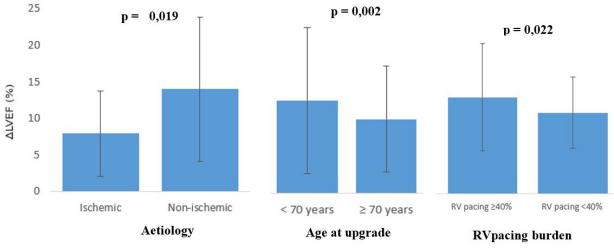

Figure 1. *Predictors of CRT response in a 6-12 months follow-up after upgrade.*

Conclusions: CRT upgrade in patients with HF and reduced LVEF resulted in a high response rate, particularly in those with non-ischemic HF, younger age and higher RV pacing burden. These results, coming from a district hospital context, emphasize the real-world efficacy of CRT and reinforce the value of CRT programs in regional healthcare settings.

35D. LESS IS MORE: THE ROLE OF QRS NARROWING IN CARDIAC RESYNCHRONIZATION THERAPY UPGRADE

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Introduction: Chronic right ventricular (RV) pacing can lead to intraventricular desynchrony, left ventricular (LV) dysfunction and progressive heart failure (HF) over time. In patients undergoing cardiac resynchronization therapy (CRT) upgrade, a reduction in QRS duration has been linked to improved clinical and echocardiographic outcomes, including a higher rate of responders. Accordingly, systematic assessment of QRS reduction after device implantation could provide valuable prognostic insight into patient response to CRT.
Objectives: To evaluate the incidence and impact of QRS narrowing within a year of CRT upgrade in a district hospital.
Methods: Single-center, observational and retrospective study of patients with RV pacing systems and HF with reduced LV ejection fraction (LVEF) who underwent upgrade to CRT between January 2015 to December 2024.

CRT response was defined as NYHA class improvement ≥1 category and LVEF improvement by ≥5%, 6–12 months post-upgrade.
Results: We included 55 patients, 78% male, mean age 76 ± 7.9 years. Most had a dual-chamber pacemaker (64%) or an ICD (20%), with RV pacing burden of 78 ± 33%. The average time to CRT upgrade was 8 ± 2.6 years and the mean age at upgrade 73 ± 7 years. All procedures were successful (CRT-D 76%, CRT-P 24%). HF etiology was ischemic in 54% of patients. Baseline mean QRS duration was 178 ± 16 ms. All the patients were in NYHA II-III, with mean LVEF 29.1 ± 6.7%. 35 (64%) patients met criteria for response, with a mean ΔLVEF 10.7 ± 8.9%. An improvement in NYHA functional class was seen in all patients with LVEF recovery, with 27 (49%) patients in NYHA I and 24 (44%) in NYHA II at 6-12 months. The average QRS duration significantly decreased from 178 ± 16 ms to 157 ± 12 ms after upgrade ($p < 0.001$). Baseline QRS duration did not differ between responders and non-responders (178 ± 13 vs. 176 ± 16 ms, $p = 0.786$), but responders had a significantly greater QRS reduction compared with non-responders (–21 ± 9 ms vs. –14 ± 10 ms; $p = 0.02$). Over a median follow-up of 5 years, 8 patients died. There was no significant association between baseline QRS duration or QRS change and mortality.
Conclusions: CRT upgrade was safe and effective, improving clinical and echocardiographic outcomes. Reversal of electrical desynchrony, reflected by QRS shortening, was associated with a higher rate of CRT response. Although responders had greater QRS reduction, this change was not linked to long-term mortality in this small cohort.

Eletrofisiologia

1E. NON-PULMONARY VEIN ABLATION WITH A CIRCULAR PULSED FIELD CATHETER

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Introduction: Pulmonary vein isolation (PVI) and linear ablation strategies remains central to catheter ablation of atrial fibrillation (AF) and associated atrial flutter (AFL) circuits. Pulsed field ablation (PFA) offers a non-thermal energy source with potentially improved safety and efficiency. However, the safety and efficacy of circular PFA catheters for non-PVI ablations is unknown.
Objectives: To demonstrate the safety profile and short-term outcomes of linear ablations using a circular PFA catheter.
Methods: A prospective analysis of consecutive patients admitted for AF ablation who also underwent PFA of non-pulmonary vein foci was performed. Linear ablations targeting AFLs were performed in patients with documented flutters and those who developed flutter during the procedure. PFA was performed using the PulseSelect™ catheter (Medtronic Inc., Minneapolis). Ablation of other foci such as LA anterior wall, posterior wall or roof linear ablation was performed positioning the catheter according to electroanatomic mapping systems, including activation mapping of the macro-re-entrant circuits. In those with CTI-dependent flutter, the sheath was positioned at the junction of the inferior vena cava and the right atrium, over the wire, stable at the right ventricular. 2 to 4 distal electrodes of the circular catheter were extended out of the sheath achieving a straight configuration. No other forms of ablation were used during the procedures here described and no prophylactic medication, such as nitroglycerine, was administered. Bidirectional block across ablation lines was confirmed with differential pacing and/or electroanatomic mapping.
Results: 11 patients were analyzed, medium age 66 ± 8 years, with 55% male patients. All patients performed AF and concomitant AFL ablation, either typical or atypical AFL. CTI-dependent AFL was the most targeted AFL subtype, with ablation performed in 9 patients (82%). In 5 patients, left-sided ablations were performed beyond PVI, including ablations of 2 roof-dependent, 2 posterior wall-dependent and 1 anterior wall-dependent AFL. Biatrial AFLs were presented in 2 patients. All procedures were successful, and no complications were reported, with no readmissions or arrhythmia recurrence at follow-up.
Conclusions: This report provides insights into safety, efficacy and procedural feasibility, with particular focus on ICT-dependent flutter ablation with a circular PFA catheter.

2E. REAL-WORLD FEASIBILITY AND OUTCOMES OF CTI PULSED-FIELD ABLATION DURING PVI

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Introduction: Atrial flutter (AFL) and atrial fibrillation (AF) often co-exist. Cavotricuspid isthmus (CTI) ablation is the treatment of choice for typical CTI-dependent AFL, whereas pulmonary vein isolation (PVI) is the gold-standard catheter-based therapy for AF. Although pulsed-field ablation (PFA) has been widely adopted for PVI, CTI ablation with PFA remains off-label and supported by limited real-world evidence. We assessed the feasibility, efficacy, and periprocedural safety of CTI ablation using PFA in patients undergoing combined PVI and CTI ablation.
Methods: Single-center retrospective study including consecutive patients referred for PVI with PFA who underwent concomitant CTI ablation between 2022 and 2025. CTI ablation was performed using either PFA or radiofrequency (RF) catheters from commercially available systems, according to operator preference. Acute success was defined as complete bidirectional CTI block. The primary outcome was defined as recurrence of typical AFL documented on 12-lead ECG, Holter monitoring, or clinical records. Recurrence of any sustained atrial tachyarrhythmia was the secondary outcome.
Results: A total of 65 patients were included (68% male; mean age 66.8 ± 11.2 years). Redo procedures accounted for 12% of cases for PVI and 3% for CTI. Typical AFL had been previously documented in 71% of patients, while the remaining 29% had CTI-dependent AFL induced during the index PVI procedure. Concomitant CTI ablation was performed using PFA in 50 procedures (77%) and RF in 15 (23%). Within the PFA group, the systems used were FARAPULSE™ [Boston Scientific] (62%), VARIPULSE™ [Biosense Webster] (14%), Volt™ [Abbott] (14%), Affera™ [Medtronic] (8%) and CENTAURI™ [Galaxy Medical] (2%). Acute bidirectional CTI block was achieved in all cases. No periprocedural adverse events, including cardiac tamponade, vascular complications, stroke/transient ischaemic attack or procedure-related death were documented. Over a median follow-up of 8 months (IQR 4–12), typical AFL recurred in 1 patient (2%) in the PFA group and none (0/15) in the RF group. The secondary outcome occurred in 2 patients (4%) in the PFA group and 3 patients (20%) in the RF group ($p = 0.130$).
Conclusions: In this real-world cohort undergoing combined PVI and CTI ablation, CTI-PFA achieved 100% acute bidirectional block without any significant periprocedural complication. Mid-term recurrence of typical AFL was rare and comparable to RF-based CTI ablation.

3E. EARLY CATHETER ABLATION IN ELECTRICAL STORM: A PROPENSITY SCORE-MATCHED COMPARISON WITH MEDICAL THERAPY

Rita Almeida Carvalho, Joana Certo Pereira, Ana Rita Bello, Daniel Gomes, João Presume, Daniel Matos, Christopher Strong, Tânia Laranjeira, Francisco Costa, Pedro Galvão Santos, Pedro Carmo, Diogo Cavaco, Francisco Bello Morgado, Catarina Brízido, Pedro Adragão

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Introduction: Electrical storm (ES) is a life-threatening arrhythmic emergency requiring prompt suppression of ventricular arrhythmias through antiarrhythmics, beta-blockers, sedation, and hemodynamic stabilization. Early catheter ablation (CA) may improve outcomes by reducing arrhythmic burden and achieving clinical stability. This study compared CA with medical therapy in patients presenting with a first ES episode.

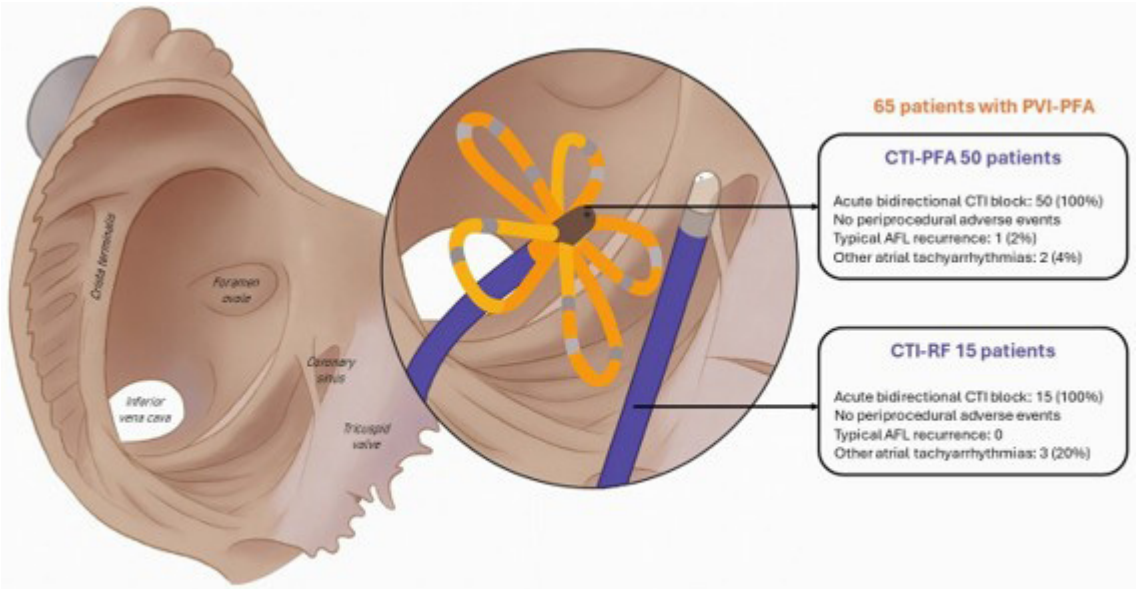

Figure 1. Right atrial view showing cavotricuspid isthmus (CTI) ablation with pulsed-field ablation (PFA) versus radiofrequency (RF) catheters and corresponding outcomes.

Figure 2E

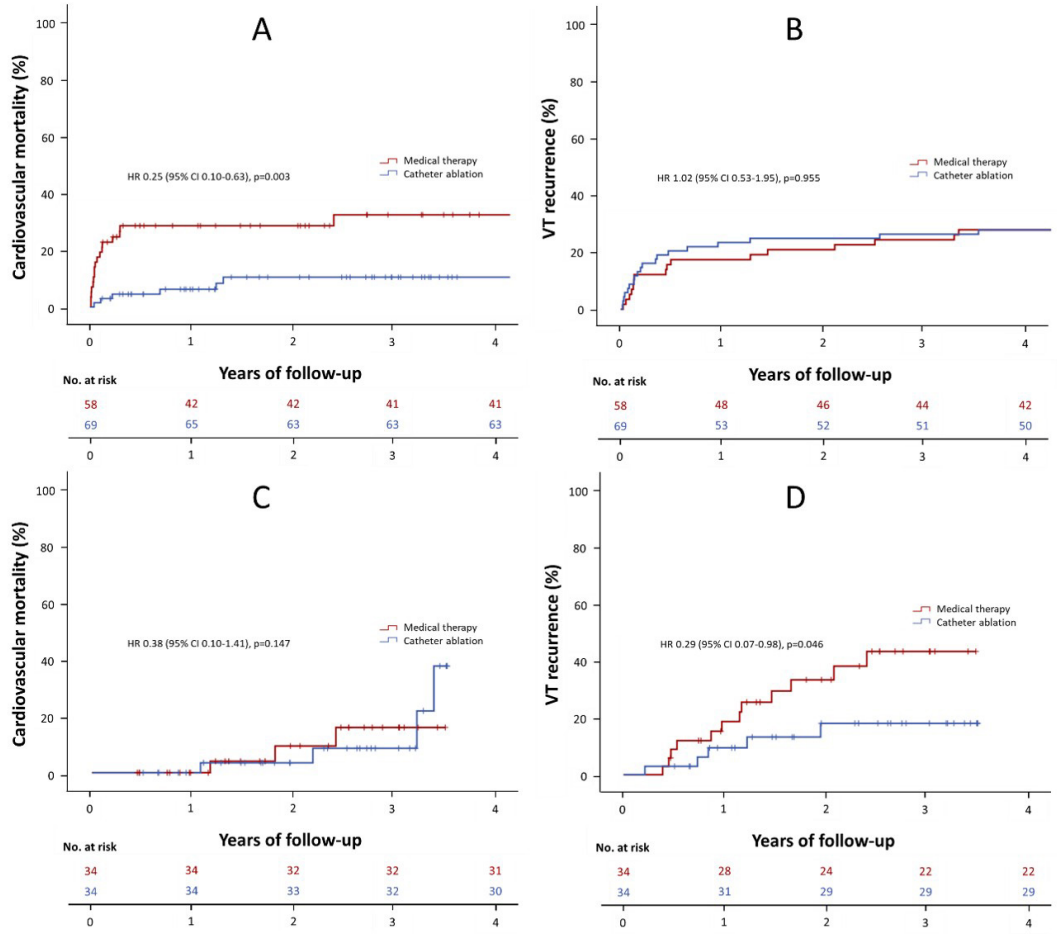

Figure 1. Kaplan–Meier curves showing CV mortality (A and C) and VT recurrence (B and D) according to treatment strategy before (A and B) and after (C and D) propensity-score matching.

Figure 3E

Methods: In this single-center retrospective study (2015–2025), patients admitted with a first ES - defined as ≥ 3 sustained ventricular arrhythmias within 24 hours - were classified by initial management: medical therapy or CA during the same hospitalization. Groups were matched 1:1 for age, left ventricular ejection fraction, PAINESD score, creatinine, NT-proBNP, trigger presence, and use of sedation, mechanical ventilation, or vasoactive support. In the matched cohort, Cox regression estimated hazard ratios (HR) for ventricular tachycardia (VT) recurrence and cardiovascular (CV) mortality.
Results: Among 127 patients (mean age 65 ± 14 years, 88% male), 69 (54%) underwent CA and 58 (46%) received medical therapy. Ischemic cardiomyopathy predominated (59%); 88% presented monomorphic VT. Medically treated patients more often had acute myocardial infarction (22% vs. 3%, p < 0.001), out-of-hospital cardiac arrest (12% vs. 1%, p = 0.023), and identifiable triggers (47% vs. 13%, p < 0.001). During hospitalization,33% required continuous sedation, 30% mechanical ventilation, and 26% vasoactive support. Compared with medical therapy, CA patients required less sedation (25% vs. 43%, p = 0.044), mechanical ventilation (19% vs.43%, p = 0.005), and vasoactive drugs (17% vs. 36%, p = 0.027), indicating greater early clinical stability. Time to CA was 5 days [3-8], hospital stay 11 days [6-20], and in-hospital mortality 13%. After median follow-up of 2.1 [0.4-3.5] years, CV mortality was 18% and VT recurrence 29%. Before matching, CV mortality was lower with CA (9% vs. 29%, p = 0.006) but VT recurrence was similar. In the matched cohort (34 pairs), CA reduced VT recurrence (HR 0.29, 95%CI 0.07-0.98, p = 0.046) without significant mortality difference (HR 0.38, 95%CI 0.10-1.41, p = 0.147).
Conclusions: Medically managed ES patients showed greater instability and higher early mortality, reflecting baseline risk. After adjustment, CA independently predicted lower VT recurrence, suggesting that early ablation reduces arrhythmic burden though survival benefit remains unproven.

4D. PREDICTORS OF SUCCESS IN ELECTRICAL CARDIOVERSION: OPTIMIZATION STRATEGIES IN A REAL-WORLD SETTING

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Introduction: A rhythm control strategy is increasingly favoured in the management of atrial arrhythmias. Electrical cardioversion remains a cornerstone for restoring sinus rhythm. However, success rates are influenced by clinical and procedural factors. Given the logistical constraints and limited elective schedules for the intervention, identifying predictors of success is essential to optimize outcomes and resource allocation.
Objectives: This study aimed to identify clinical and procedural predictors of electrical cardioversion success, providing evidence to refine patient selection and individualised procedural planning.
Methods: We conducted a retrospective study of patients undergoing elective external electrical cardioversion with a biphasic synchronized shock in 2025. Clinical and procedural variables were analysed. Procedure success was defined as the presence of sinus rhythm at the time of discharge from the recovery unit. Group comparisons used Chi-square and Mann–Whitney U tests (p < 0.05).
Results: A total of 87 patients were included (36.8% female; mean age 67.2 ± 8.8 years). Referrals originated from the Emergency Department (26.4%), Heart Failure Consultation (23.0%), Arrhythmia Consultation (17.2%), General Cardiology Consultation (13.8%), and Inpatient wards (3.4%). The primary indications were atrial fibrillation (AF) (90.8%) and atrial flutter (AFL) (9.2%). The median waiting time from referral to procedure was 80 days (IQR 44–134). The overall success rate was 83.9%. For AF, the median (IQR) initial and total energies were 200 (200) and 200 (200-263), respectively. For AFL, median (IQR) initial and total energies were 138 (78-188) and 150 (106-198), with a 100% success rate. Significant predictors of procedural failure included left atrial enlargement, higher initial energy requirements, a greater number of shocks, and higher total energy delivered (p < 0.05). A non-significant trend toward longer waiting times was observed in the success group (Table 1).

Table 1. Comparison of clinical, echocardiographic, and procedural characteristics between success and failure groups

	Success group (n = 73)	**Failure group** (n = 14)	p-value
Baseline characteristics			
Age (years), median (IQR)	69.0 (61-74)	69.5 (61-76.5)	0.525
Female sex, n (%)	26 (35.6)	6 (42.9)	0.607
Hypertension, n (%)	55 (75.3)	8 (57.1)	0.163
Diabetes mellitus, n (%)	15 (20.5)	2 (14.3)	0.588
Dyslipidaemia, n (%)	51 (69.9)	9 (64.3)	0.679
BMI (kg/m^2), median (IQR)	28.5 (25.8-32.4)	28.9 (27.9-32.1)	0.555
Obstructive sleep apnoea, n (%)	11 (15.1)	1 (7.1)	0.431
Prior electrical cardioversion, n (%)	8 (11.0)	0 (0.0)	0.200
Prior antiarrhythmic drugs, n (%)	21 (28.8)	4 (28.6)	0.988
Waiting time (days), median (IQR)	103 (49-138)	45 (33-80)	0.055
Echocardiographic parameters			
LVEF (%), median (IQR)	50.7 (42.5-61.3)	51.5 (33.3-67.5)	0.887
LA enlargement, n (%)			0.036
Mild	17 (23.3)	1 (7.1)	
Moderate	14 (19.2)	1 (7.1)	
Severe	14 (19.2)	2 (14.3)	
Procedural characteristics			
Initial energy (J), median (IQR)	200 (200-200)	200 (200-213)	0.047
Total energy (J), median (IQR)	200 (200-200)	525 (200-920)	< 0.001
Number of shocks, median (IQR)	1 (1-1)	2 (1-3)	< 0.001
Female operator, n (%)	13 (17.8)	3 (21.4)	0.749

Conclusions: Left atrial dilatation remains a key negative predictor of procedural success. Counterintuitively, longer waiting times did not impair success, suggesting a role for pre-procedural clinical optimization. The association between success and prompt rhythm conversion suggests that the utility of repeated attempts diminishes after initial failure. These findings underscore the need for individualized procedural planning and further assessment of long-term rhythm stability.

5E. NEUROMODULATION IN ELECTRICAL STORM: SAFETY AND EFFICACY OF RENAL DENERVATION

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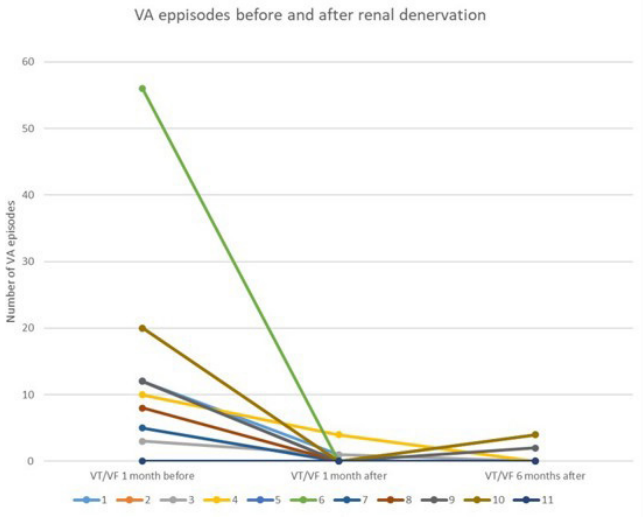
Introduction: Catheter ablation (CA) has shown efficacy in managing ventricular arrhythmias (VA) associated with structural heart disease. However, some patients continue to experience refractory VA despite pharmacological therapy and multiple CA attempts. In such cases, additional interventions, including autonomic neuromodulation, have been investigated. Renal denervation (RDN), a technique originally developed to treat resistant arterial hypertension, works by inhibiting the afferent renal sympathetic pathways, thereby reducing systemic sympathetic overactivity. Given this mechanism, RDN has been studied as a therapeutic option for arrhythmias, including atrial fibrillation and VA, with promising outcomes.
Objectives: This study aims to evaluate both the effectiveness and safety profile of renal denervation as a therapeutic strategy for managing refractory ventricular arrhythmia storms in patients classified as high-risk.
Methods: A retrospective analysis was conducted on renal denervation procedures performed to manage electrical storms at a tertiary center from

February 2020 to October 2024. Baseline patient characteristics, procedural details, and acute complications were recorded. Recurrence of ventricular arrhythmia post-RDN was evaluated at one month and six months to assess the intervention's impact on arrhythmia control.
Results: A total of 11 patients underwent renal denervation (RDN) for the treatment of refractory ventricular arrhythmias (VA). The cohort had a mean age of 63 ± 10 years, with 9 males. The primary diagnosis in most patients was ischemic cardiomyopathy (n = 7), characterized by a mean left ventricular ejection fraction (LVEF) of 25 ± 8%, with no history of resistant arterial hypertension. All patients had implantable cardioverter-defibrillators (ICDs), and two of these devices included concomitant cardiac resynchronization therapy. Nine patients had previously undergone endocardial VA ablation. Among the two patients without prior ablation, one was contraindicated due to a large left ventricular thrombus, while the other underwent an electrophysiological study without inducible ventricular tachycardia. In the four weeks preceding RDN, patients experienced an average of 18 ± 20 sustained VA episodes, meeting the criteria for an electrical storm (≥ 3 episodes within 24 hours). During RDN, a mean of 15 ± 9 radiofrequency applications were delivered to the right renal artery and 12 ± 9 to the left renal artery. No acute procedural complications were observed. One month post-RDN, VA episodes were reduced to a mean of 0 ± 1, with only two patients experiencing recurrent VA. At the six-month follow-up, VA recurrence remained low (mean 1 ± 2 episodes), and at one year, there was an increase in mean episodes (29 ± 50), with only one patient experiencing new episodes.



Conclusions: In our pilot study, RDN appeared to be a safe and effective treatment for the management of VA.

6E. THE CLINICAL IMPACT OF VASOVAGAL SYNCOPE IN BRUGADA SYNDROME: ASSESSING THE ROLE OF HOLTER MONITORING IN PREDICTING SYNCOPE TRIGGERED BY AUTONOMIC REFLEX ACTIVITY

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Introduction: The European Society of Cardiology (ESC) guidelines for diagnosing and managing syncope recommend cardiac pacing as a Class IIb indication for preventing recurrent neurocardiogenic syncope in patients who exhibit a cardioinhibitory response during tilt testing. While pacing can mitigate the cardioinhibitory component of the vasovagal reflex, it has no effect on the vasodepressor component, which often predominates, limiting the overall efficacy of pacing in these patients. Aim: To evaluate the utility of Holter monitoring as a primary tool for predicting which patients with vasovagal syncope will benefit most from cardiac pacing, with the goal of enhancing treatment personalization and improving clinical outcomes in neurocardiogenic syncope management.
Methods: We conducted a study involving 32 patients (75% male, mean age 57 ± 14 years) who underwent a head-up tilt test (70° for 20 minutes, followed by nitroglycerin administration in the absence of symptoms) and 24-hour Holter monitoring to analyze heart rate variability (HRV). All participants were diagnosed with BS, presenting either spontaneous or drug-induced type 1 ECG patterns following flecainide testing. Of these patients, 14 had a history of syncope.
Results: The HUT test yielded a positive response (cardioinhibitory or vasodepressor) in 18 patients (56%), showing a high rate of positive HUT tests in both symptomatic and asymptomatic patients. The association between syncope symptoms and positive HUT test results was not statistically significant (10 positive tests in symptomatic patients vs. 8 in asymptomatic patients, p = 0.127). The mean RR intervals did not differ significantly between patients with positive and negative HUT test results (856 ± 30 ms vs. 807 ± 39 ms, p = 0.888). Similarly, HRV analysis comparing patients with and without prior syncope showed no statistically significant difference in SDANN values (125 ± 6 ms vs. 117 ± 8 ms, p = 0.148).

	HUT +	HUT -	P	Syncope	No Syncope	p
NN (ms)	856 ± 30	807 ± 39	0,888	802 ± 24	857 ± 36	0,098
SDNN (ms)	138 ± 5	131 ± 10	0,069	138 ± 6	132 ± 8	0,153
SDANN (ms)	123 ± 6	118 ± 9	0,216	125 ± 6	117 ± 8	0,148
rMSSD (ms)	33 ± 4	32 ± 4	0,069	31 ± 3	34 ± 4	0,099
pNN >50 (%)	6,7 ± 1,5	7,5 ± 2,19	0,615	7,3 ± 1,6	6,9 ± 2,0	0,632

Conclusions: In these patients with Brugada syndrome (BS), we found that vasovagal syncope is highly prevalent, a finding supported by several previous studies. We were unable to identify any significant differences in heart rate variability between patients with increased vasovagal response (positive HUT test) and those without this component. Consequently, the hypothesis of using cardiac pacing to manage syncope triggered by cardioinhibitory mechanism, with Holter monitoring as a screening tool, was not validated. Additionally, no differences were found in SDANN analysis between the two groups to suggest a heightened vulnerability to ventricular arrhythmias. These findings underscore the need for further research to clarify the prognostic impact of neurogenic syncope in BS and to explore unexplained syncope as a potential marker for major adverse events in this unique patient population.

8E. IS PFA READY FOR ATYPICAL ATRIAL FLUTTER?

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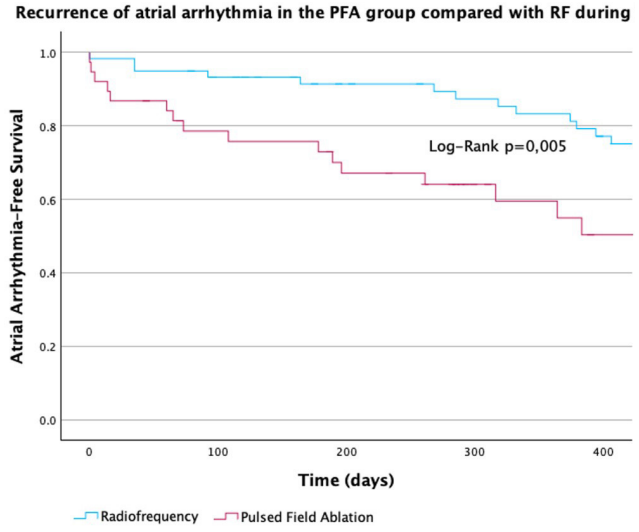
Introduction: Pulsed field ablation (PFA) has emerged as a non-thermal modality with high tissue selectivity and favorable acute safety in the treatment of atypical atrial flutter (AAF). Although PFA is hypothesized to improve acute procedural outcomes due to its rapid and homogeneous lesion formation, its long-term performance compared with radiofrequency (RF) ablation remains uncertain. Experimental and clinical observations suggest that reduced acute collateral and myocardial injury with PFA may paradoxically lead to incomplete substrate modification and higher arrhythmic recurrence over time.
Methods: We retrospectively analyzed 98 consecutive patients who underwent catheter ablation for AAF between January 2023 and September 2025. Baseline characteristics included age, sex, CHA_2DS_2-VASc score, LVEF, CT-derived left atrial volume index (LAVI), and history of prior AF ablation. Patients were treated with RF (n = 60, 61%), PFA (n = 35, 36%), or a combination of both (n = 3, 3%). Acute success was defined as termination of the clinical flutter during

ablation and non-inducibility of atrial arrhythmias at the end of the procedure. Long-term recurrence was defined as documented AAF or AF on ECG or Holter monitoring during follow-up. Median follow-up was 13 (6-21) months.
Results: Mean age was 69 ± 13 years, 47% were female, the mean CHA_2DS_2-VASc score was 3 ± 1, and the CT-LAVI was 67 ± 20 mL/m². Regarding ablation lesion sets, 33% of lines were delivered for pulmonary vein isolation, 24% targeted the posterior wall, 27% corresponded to a mitral isthmus line, and 16% were performed at other atrial sites. Acute procedural success was numerically higher with PFA compared with RF (90% vs. 83%), although this difference did not reach statistical significance (p = 0.397). Of the total procedures, 24 (24,5%) were redo radiofrequency ablations. During follow-up, the outcome of interest occurred in 34 (34,7%) patients. In the mid-term, PFA was independently associated with a significantly higher risk of arrhythmia recurrence compared with RF (HR 2.62, 95%CI 1.31-5.26, p = 0.007).



Conclusions: In this contemporary cohort of AAF, approximately one-third of patients experienced arrhythmia recurrence. Although acute success was numerically higher with PFA, mid-term recurrence rates were greater in this group. This pattern may reflect the reversible or retractile characteristics of acute PFA lesions, which could limit long-term substrate modification. These results highlight the need to refine PFA lesion strategies in complex atrial arrhythmias and underscore the importance of prospective evaluation of long-term lesion durability.

9E. HIGH-DEFINITION MAPPING-GUIDED PULSED FIELD ABLATION USING THE OPAL HDX SYSTEM: A SINGLE-CENTER EXPERIENCE

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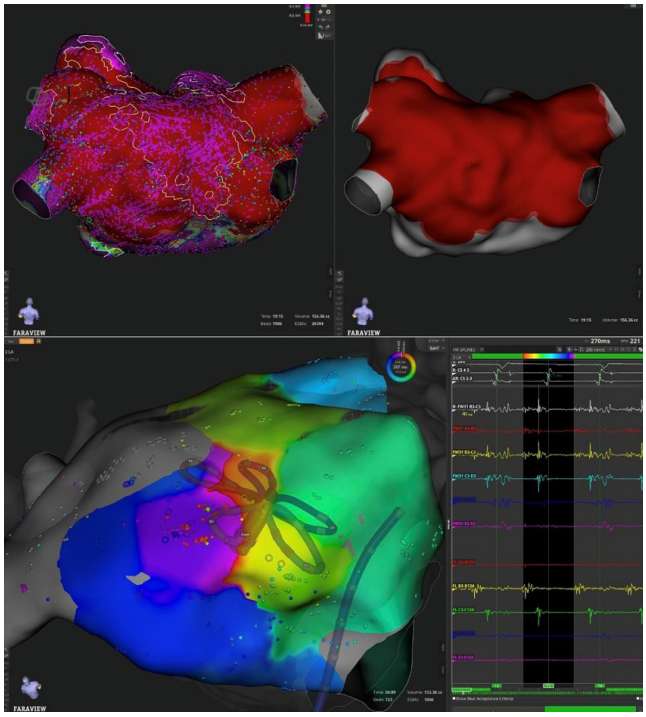
Introduction: High-definition electroanatomic mapping may enhance the precision and efficiency of catheter ablation. The OPAL HDx system (Boston Scientific) integrates ultra-high-density mapping with a streamlined FARAPULSE pulsed field ablation (PFA) workflow, yet real-world evidence on its added value remains limited. We report our initial single-center experience evaluating procedural efficiency, safety, and short-term outcomes using OPAL HDx-guided PFA.
Methods: We analyzed 175 consecutive atrial arrhythmia ablation procedures performed between February and November 2025 using the OPAL HDx mapping system integrated with the FARAPULSE PFA platform. All procedures were performed under general anesthesia. Baseline clinical variables included cardiovascular comorbidities, ongoing antiarrhythmic drug therapy, left atrial volume index (LAVI), left ventricular ejection fraction (LVEF), and history of prior catheter ablation. Procedural performance metrics included total procedure duration, fluoroscopy time, and radiation dose. Safety endpoints encompassed periprocedural and early postprocedural complications (i.e., cardiac tamponade, stroke, vascular access complications, and death). Arrhythmia recurrence - defined as documented atrial fibrillation or atrial flutter on electrocardiogram, Holter monitoring, or clinical records - was evaluated during follow-up.
Results: The mean patient age was 64 ± 10 years, 61.7% were male, and cardiometabolic comorbidities were prevalent. Atrial fibrillation accounted for 90% of procedures (43% paroxysmal), while atrial flutter represented the remaining 10%; 25% of cases were redo ablations. Regarding ablation lesion sets, 45% underwent pulmonary vein isolation (PVI) alone; 29% received PVI plus a posterior wall isolation (PWI); and 10% underwent PVI plus PWI and an additional linear lesion (e.g., mitral line, anterior wall, roof line, and/or cavotricuspid isthmus). The mean procedure duration was 57 ± 26 minutes, fluoroscopy time was 9.8 ± 6.7 minutes, and a radiation dose of 155 ± 147 mGy. No periprocedural complications were observed. The median follow-up duration was 153 days (IQR 80-227). During follow-up, arrhythmia recurrence occurred in 11 patients (6.3%), with a median time to recurrence of 205 days (IQR 153-243).



Conclusions: In this real-world experience, the OPAL HDx system enabled rapid high-resolution mapping with low fluoroscopy exposure and an excellent safety profile when used as the primary mapping platform for PFA-guided ablation of atrial fibrillation and flutter. These findings support the clinical efficiency and safety of Farapulse integrated in the OPAL HDx mapping software with promising short and mid term result.

10E. ATYPICAL ATRIAL FLUTTER AFTER AF ABLATION *VERSUS DE NOVO* ATYPICAL FLUTTER: ARE THEY THE SAME?

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Introduction: Atypical atrial flutter (AAFL) may occur *de novo* or following catheter ablation for atrial fibrillation (AF). Post-AF ablation AAFL may reflect distinct atrial substrate modification, but whether these patients differ clinically and electrophysiologically from those with *de novo* AAFL remains unclear.

Methods: A total of 98 AAFL ablation procedures were performed between January 2023 and September 2025. Of these, 7 were redo procedures in previously included patients and 11 patients with prior flutter-only ablation were excluded. The final cohort comprised 80 unique patients: 41 with *de novo* AAFL and 39 with post-AF ablation AAFL. Baseline characteristics included age, sex, BMI, CHA_2DS_2-VASc score, LVEF, and CT-derived left atrial volume index (LAVi). Procedural variables included energy modality (radiofrequency [RF] or pulsed-field ablation [PFA]), flutter circuit location, procedure duration, and fluoroscopy time. Arrhythmia recurrence was assessed by ECG, Holter monitoring, or clinical documentation.
Results: Patients with *de novo* AAFL were significantly older (73 ± 10 vs. 68 ± 12 years; p = 0.03) and had higher CHA_2DS_2-VASc scores (3.2 ± 1.4 vs. 2.5 ± 1.6; p = 0.035) compared with those with post-AF ablation AAFL. Body mass index, left ventricular ejection fraction, and CT LAVi were similar between groups. Procedural characteristics, including total procedure duration, fluoroscopy time, and radiation dose, did not differ significantly. Regarding energy modality, *de novo* AAFL ablations used RF in 31 cases and PFA in 10, whereas post-AF ablation procedures used RF in 18, PFA in 18, and a combined RF+PFA strategy in 3 cases. Termination sites differed markedly between groups. *De novo* AAFL circuits were predominantly anterior mitral line–dependent (34%), whereas post-AF ablation AAFL most frequently terminated along the posterior mitral line (23%), with additional posterior wall– and roof-dependent circuits. These patterns suggest distinct mechanisms: anatomical macroreentry in *de novo* AAFL versus scar-related perimitral macroreentry due to conduction gaps in post-ablation patients. Arrhythmia recurrence showed a non-significant trend toward higher AFL/AF recurrence in the post-AF ablation group (41% vs. 22%; p = 0.066).

Termination site	De novo AAFL (n=41)	Post-AF Ablation AAFL (n=39)
Anterior mitral line to left pulmonary veins	8 (19.5%)	5 (12.8%)
Anterior mitral line to right pulmonary veins	6 (14.6%)	4 (10.3%)
Posterior mitral line	3 (7.3%)	10 (25.6%)
Posterior wall	4 (9.8%)	5 (12.8%)
Roof line	4 (9.8%)	3 (7.7%)
Right atrium - CTI	3 (7.3%)	2 (5.1%)
Right pulmonary veins	2 (4.9%)	2 (5.1%)
Left pulmonary veins	1 (2.4%)	0
Right atrium - lateral wall	1 (2.4%)	0
Right atrium - SVC region	1 (2.4%)	1 (2.6%)
Left atrial appendage	0	1 (2.6%)
Spontaneous termination	2 (4.9%)	0
Cardioversion only	4 (9.8%)	3 (7.7%)

Conclusions: *De novo* AAFL and post-AF ablation AAFL represent distinct clinical and electrophysiological entities. Post-ablation AAFL demonstrated differing circuit distribution and a trend toward higher recurrence despite comparable procedural characteristics. These findings highlight the evolving complexity of atrial arrhythmias in the era of widespread AF ablation.

11E. ONE THOUSAND CASES OF PULSED-FIELD ABLATION: REAL-WORLD INSIGHTS

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Introduction: Pulmonary vein isolation (PVI) is the standard catheter-based treatment for atrial fibrillation (AF). Due to its safety profile and efficacy, pulsed field ablation (PFA), a non-thermal energy, has been increasingly adopted as the default strategy across many centers. We aimed to analyse the real-world efficacy and safety of PFA for the treatment of atrial arrhythmias in a tertiary high-volume center.

Methods: All patients undergoing PFA for atrial tachyarrhythmias (i.e., AF and atrial flutter [AFL]) between July 2022 and November 2025 were included in the registry. Baseline characteristics included age, sex, left atrial volume (LAVi), left ventricular ejection fraction and history of prior catheter ablation. Procedural metrics included procedure duration, fluoroscopy time, and use of general anesthesia/sedation. The outcome of interest was arrhythmia recurrence, defined as AFL/ AF documented on ECG, Holter or clinical records after a 3-months period. Safety endpoint encompassed periprocedural complications, including cardiac tamponade, stroke, vascular access complications, and death.
Results: A total of 1,000 patients were included (mean age 64 ± 11years, 62,5% male, LAVI 62 ± 24, 51% paroxysmal AF, 15% atypical atrial flutter, 21% redo procedures). The PFA systems used were Farapulse (73%), Varipulse (18%), Volt (7%) and Affera (2%). Regarding ablation sets, most patients underwent PVI alone (58%) or combined with other lesions posterior wall isolation (32,6%), posterior mitral isthmus line (10,5%), anterior line (2,6%) and cavotricuspid isthmus isolation (5,3%). Mean procedure time was 75 ± 26 min, and fluoroscopy duration was 8.5 ± 6 min. A total of 748 procedures (75%) were performed under general anesthesia (GA), whereas the others were under sedation with remifentanil, dexmedetomidine and midazolam. Periprocedural complications were documented in 0.8% (2 tamponade, 2 vascular access). During a median follow-up of 10 months (IQR 6-14), a total of 13% suffered arrhythmia recurrence. Results were not different whether performed under GA or sedation. Efficacy was not significantly different when compared to our center and other high-volume center registries of AF ablation using thermal energies (RF or cryo).

Baseline Characteristics	Pulsed Field Ablation n = 1,000
Age, years	64 ± 11 years
Male	625 (62,5%)
Body mass index, kg/m²	28.1 ± 5.5
CHA_2DS_2-VASc score	2.8 ± 1.4
Session type	
Paroxysmal AF	511 (51%)
Atypical FLA	151 (15%)
Redo AF	208 (21%)
Echocardiogram/CT scan findings	
LVEF %	53 ± 12%
LAVi by CT, ml/m²	62 ± 24
Ablation target	
Pulmonary Vein Isolation	975 (97.5%)
Posterior Wall Isolation	326 (32.6%)
Anterior Wall	26 (2.6%)
Cavotricuspid isthmus	53 (5.3%)
Mitral line	105 (10.5%)
Procedure time, min	75 ± 26
Fluoroscopy time, min	8.5 ± 6
Complication	4 (0.8%)

Conclusions: In this comprehensive evaluation of 1000 PFA cases, the procedure showed a good efficacy and safety profile. PFA has become the standard catheter-based treatment of AF.

13E. APPLYING RECENT EVIDENCE ON ORAL ANTICOAGULATION CESSATION AFTER ATRIAL FIBRILLATION ABLATION

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Introduction: The decision to initiate oral anticoagulation (OAC) in atrial fibrillation (AF) patients has traditionally been guided by the CHA_2DS_2-

Table 13E. Baseline characteristics and comparative analysis of the study cohort

	ALONE-AF	OCEAN	Our cohort	p-value (vs ALONE-AF)	p-value (vs OCEAN)
Number of patients, n	417	643	76	-	-
Female gender, n (%)	96 (23.0%)	184 (28.6%)	24 (31.6%)	0.110	0.590
Age (years), mean ± standard deviation	63.0 ± 8.0	66.3 ± 7.6	65.2 ± 9.8	0.068	0.347
CHA_2DS_2-VASc score					
Mean ± standard deviation	2.1 ± 1.0	2.2 ± 1.1	2.3 ± 1.2	0.174	0.490
Distribution (%)				0.792	0.887
1	29.4	30.5	28.0		
2	40.1	37.8	38.7		
3	19.8	19.8	18.7		
≥ 4	10.7	12.0	14.7		

VASc score. However, uncertainty persists regarding OAC maintenance after successful catheter ablation, where arrhythmia recurrence and thromboembolic risk are significantly reduced. Recent evidence from the OCEAN and ALONE-AF trials suggests that OAC discontinuation may be safe in patients without recurrences.

Objectives: This study aimed to characterize a real-world population of patients post-ablation and compare their clinical profile with those of the aforementioned trials to assess the local applicability of these findings.

Methods: We conducted a retrospective study of patients who underwent AF and/or atrial flutter ablation between 2021 and 2024. Clinical variables were collected, and CHA2DS2-VASc score was calculated for all participants. Our cohort's baseline characteristics were compared with the published data from the OCEAN and ALONE-AF trials. Statistical analyses were performed using t-tests for means and Chi-square tests for categorical distributions, with significance set at $p < 0.05$.

Results: A total of 88 patients were included (mean age 62.6 ± 12.1 years; 24 females). Twelve patients (13.6%) had a CHA_2DS_2-VASc score of 0 (all males, mean age 42.6 ± 12.6 years) and were excluded from the primary comparative analysis. In the remaining 76 patients, the mean age was 65.2 ± 9.8 years (40-81) and the mean CHA_2DS_2-VASc score was 2.3 ± 1.2 (1-6). Comorbidity distribution was as follows: heart failure (16.0%), hypertension (68.0%), prior stroke/systemic embolism (4.0%), vascular disease (6.7%), and diabetes (21.3%). CHA_2DS_2-VASc score distribution was: 1 (28.0%), 2 (38.7%), 3 (18.7%), and ≥ 4 (14.7%). Those characteristics were not significantly different from OCEAN and ALONE-AF populations (Table 1).

Conclusions: The clinical profile of patients undergoing ablation at our centre is comparable to the populations studied in the OCEAN and ALONE-AF trials. These findings suggest that a strategy of OAC discontinuation after successful ablation could be applicable to a significant portion of our patients. Nonetheless, clinical prudence remains essential, and decisions should be individualized by carefully weighing thromboembolic versus haemorrhagic risks.

15E. STANDARD *VERSUS* HIGH POWER IN AF ABLATION – ADDING EFFICENCY TO EFFICACY: DOES IT TRANSLATE TO REAL WORLD IN A MEDIUM-VOLUME CENTER?

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Introduction: Catheter ablation using radiofrequency (RF) energy is an established therapy for atrial fibrillation (AF), yet procedural efficiency and radiation exposure remain key challenges in electrophysiology practice. Advances in technology aim to improve efficiency while reducing fluoroscopy use and total procedure time. Reducing radiation exposure is essential for patient and operator safety; similarly, improving time efficiency has become a priority for centers facing a growing procedural demand. Given these factors, evaluating whether newer RF catheter technologies do in fact enhance procedural efficiency without compromising effectiveness is clinically relevant. This study compares AF ablation using standard power and duration versus high power and short duration ablation, focusing on fluoroscopy exposure and total procedure time as indicators of workflow optimization.

Objectives: We conducted a retrospective, single-center study, including all consecutive patients who underwent RF catheter ablation for AF between January 2022 and December 2024. During this period, 2 contact-force sensing catheters – TactiFlex® and TactiCath® - were used according to operator preference.

Methods: A total of 112 patients were included, comprising 46 women (41.1%) and 66 men (58.9%), with a median age of 66 years (58-72). The mean left atrial indexed volume was 44 mL/m² (35-63). Of these procedures, 81 patients underwent ablation with TactiFlex® catheter, whereas 31 patients were treated with the TactiCath® catheter. All patients underwent standard RF pulmonary vein isolation under 3D electroanatomic mapping guidance. Procedural parameters, including total procedure time and fluoroscopy exposure, were prospectively recorded in the institutional database.

Results: A total of 112 AF ablation procedures were analyzed. Because the distributions were non-normal, non-parametric testing was applied. TactiFlex® was associated with significantly lower fluoroscopy/procedure time compared with TactiCath® (median 45.6min vs. 85.0 min; $U = 372.0$; $Z = -5.75$; $p < 0.001$) and lower radiation exposure (median 48.6 µGy vs. 77.1 µGy; $U = 616.5$; $Z = -4.16$; $p < 0.001$). During a follow up of 360 days, recurrence rates differed significantly between catheter types, with TactiFlex® demonstrating a lower recurrence rate (17.5% vs. 45.2%), confirmed by Pearson's chi-square test ($\chi^2 = 9.06$, $p = 0.003$) and Fisher's exact test ($p = 0.006$).

Conclusions: In this medium-volume center, the use of high power short duration catheters is associated with shorter procedures, reduced radiation exposure, and significantly lower recurrence rates compared to standard power ablation, suggesting improved procedural efficiency and effectiveness in AF ablation which allows to overcome the burden of demanding waiting lists for AF ablation without compromising outcomes.

17E. ATRIAL FIBRILLATION RECURRENCE AFTER CARDIAC NEUROMODULATION: PREDICTORS AND TIME-TO-EVENT PATTERNS IN A 10-YEAR SINGLE-CENTRE COHORT

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Introduction: Cardiac neuromodulation (CNM) targets atrial ganglionated plexi to rebalance autonomic tone in atrial fibrillation (AF). Although CNM is increasingly used, real-world predictors of AF recurrence and the temporal pattern of recurrence remain incompletely characterised.

Objectives: To explore demographic and procedural predictors of AF recurrence after CNM and to describe recurrence timing using time-to-event analysis.
Methods: We retrospectively analysed consecutive patients undergoing CNM for AF between 2015 and 2025 at a single centre. AF recurrence was assessed at follow-up visits and documented by ECG and/or Holter monitoring. Recurrence status was coded as binary; values previously coded as "999" were treated as no recurrence, per the centre's definition. Time to symptom recurrence (years) was recorded for recurrence cases. Kaplan–Meier analysis was used to estimate AF recurrence-free survival (administrative censoring at 31 December 2025 based on procedure date). Baseline and procedural characteristics were summarised overall and by recurrence status; analyses were descriptive given sample size and event count.
Results: Thirty-three patients (Figure 1) were included (age 59.8 ± 12.5 years; 51.5% male). Hypertension, dyslipidaemia and diabetes were present in 63.6%, 51.5% and 12.1%, respectively; palpitations were reported in 87.9%. AF recurrence occurred in 8/33 patients (24.2%). Among those with recurrence, time to symptom recurrence (Figure 2) ranged from 1.0 to 2.5 years (median 1.0 years). In Kaplan-Meier analysis, events clustered within the first three years, with substantial censoring thereafter. Patients with recurrence were younger on average, while the number of ganglionated plexus targets at the index procedure did not show a clear signal. Intra-procedural heart-rate change (pre- vs. post-ablation) was available in a subset only, limiting inference regarding acute autonomic response as a predictor.

Table 1. Baseline Characteristics According to AF Recurrence (N=33; AF recurrences=8).

Characteristic	Overall	No recurrence (n=25)	Recurrence (n=8)
Age — yr	59.8±12.5	62.0±10.9	52.8±15.2
Male sex — no. (%)	17 (51.5)	13 (52.0)	4 (50.0)
Hypertension — no. (%)	21/33 (63.6)	17/25 (68.0)	4/8 (50.0)
Dyslipidaemia — no. (%)	17/33 (51.5)	14/25 (56.0)	3/8 (37.5)
Diabetes — no. (%)	4/33 (12.1)	3/25 (12.0)	1/8 (12.5)
Current smoker — no. (%)	2/33 (6.1)	2/25 (8.0)	0/8 (0.0)
Ex-smoker — no. (%)	3/33 (9.1)	3/25 (12.0)	0/8 (0.0)
Beta-blocker — no. (%)	16/33 (48.5)	14/25 (56.0)	2/8 (25.0)
Antiarrhythmic drug — no. (%)	13/33 (39.4)	10/25 (40.0)	3/8 (37.5)
Anticoagulation at discharge — no. (%)	7/23 (30.4)	0/16 (0.0)	7/7 (100.0)
Classic stimulation — no. (%)	30/33 (90.9)	22/25 (88.0)	8/8 (100.0)
Extracardiac stimulation — no. (%)	3/33 (9.1)	3/25 (12.0)	0/8 (0.0)
Ganglionated plexus targets at index procedure — mean±SD	1.90±0.83	1.83±0.64	2.14±1.35
Immediate HR rise ≥10 bpm† — no./no. (%)	9/12 (75.0)	8/11 (72.7)	1/1 (100.0)

Plus-minus values are means ±SD. Fractions indicate available data. Recurrence code 999 was treated as no recurrence, per instruction. †Immediate HR rise (≥10 bpm) calculated from intra-procedural HR recorded before/after ablation when both were available.

Figure 1.

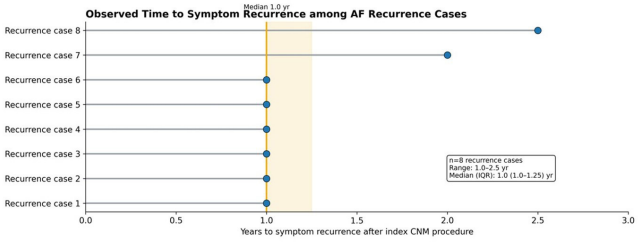

Figure 2.

Conclusions: In this small single-centre CNM cohort, AF recurrence was observed in approximately one quarter of patients and, when present, occurred predominantly around one year after the index procedure. Younger age showed a directional signal toward recurrence, whereas procedural target count did not demonstrate an evident association. These findings are hypothesis-generating and underscore the need for prospective cohorts with standardised monitoring, complete follow-up capture, and systematic autonomic endpoint acquisition to refine patient selection and improve CNM durability.

19E. JOINING FORCES FOR GENDER EQUITY IN INTERVENTIONAL CARDIOLOGY: RESULTS OF A NATIONAL SURVEY IN PORTUGAL

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Introduction: Women remain under-represented in interventional cardiology. This study aimed to assess perceptions and lived experiences of cardiology trainees and specialists, identifying barriers, concerns, and opportunities to promote a more equitable training environment and clinical practice.
Methods: A national online survey was distributed to all cardiology residents and specialists in Portugal. The questionnaire was disseminated with the support of the Portuguese Society of Cardiology, APAPE and APIC. Responses were collected between September and November 2025.
Results: A total of 257 responses were obtained (53% women, mean age 42 ± 13 years, 73% specialists, 53% from the Lisbon region). Overall, both genders agreed that interventional cardiology is still perceived as predominantly male and that gender-related differences in career opportunities persist and that radiation exposure is a major concern. Most participants did not perceive inequality in access to training or in the response to error/feedback. Among women (n = 136), most reported equal opportunities to act as first operator but identified insufficient training in radiation-protection and inadequate protective equipment for female body types. Among those who considered but did not pursue an interventional career (n = 23; 17%), the main reasons were radiation concerns, family expectations, and a perceived non-inclusive culture. Among women who chose or are pursuing intervention (n = 52; 38%), the main challenges were maternity-related issues and inadequate protective equipment. Pregnancy is often postponed and the number of planed children reduced. Most women suspended invasive activity during pregnancy, but returned to interventional work while breastfeeding. The most valued potential solutions included clear maternity-support policies and protective equipment adapted to female anatomy. Most men recognized these difficulties and reported feeling personally responsible for promoting equity within their teams. Both genders reported that institutional initiatives to reduce gender disparities were largely absent.
Conclusions: National perceptions from both genders indicate that gender inequities persist in interventional cardiology and that few structured institutional efforts are in place to mitigate them. National and institutional policies on radiation protection, maternity support, and appropriate protective equipment may be essential to promote gender equity and increase female representation in interventional cardiology.

20E. FEASIBILITY AND TOLERABILITY OF PULSED-FIELD ABLATION FOR ATRIAL FIBRILLATION USING THE VOLT™ SYSTEM UNDER CONSCIOUS SEDATION: A REAL-WORLD EXPERIENCE

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Introduction: Pulsed-field ablation (PFA) is an emerging, tissue-selective technique for atrial fibrillation (AF) ablation, allowing safer and shorter procedures but requiring deep sedation or general anaesthesia. The newly introduced VOLT™ mapping and ablation system (Abbott™), with the balloon-in-basket design and bipolar energy delivery, enables more efficient lesion formation with a simplified workflow, potentially reducing acute procedural pain and requiring lower levels of sedation. Data on feasibility under conscious sedation remain limited. This study aimed to evaluate procedural performance, anesthetic management, and acute safety outcomes in patients undergoing AF ablation using this technology.

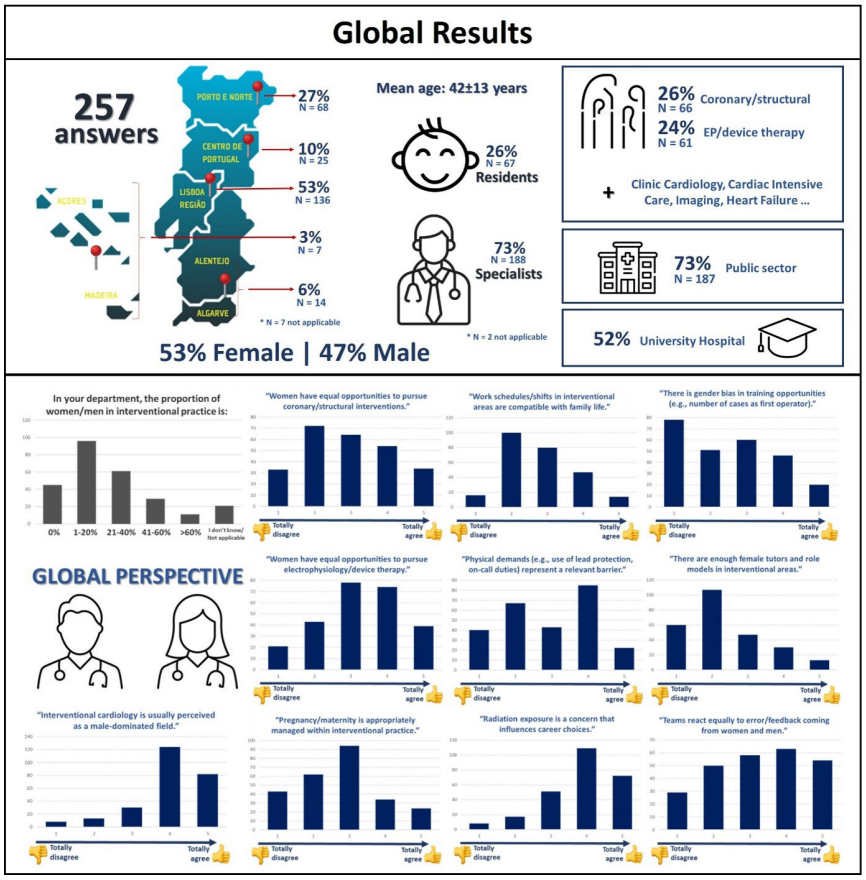


Figure 19E

Figure 1. *Global Results - Respondent demographics and overall perceptions of gender equity in interventional cardiology in Portugal (n = 257).*

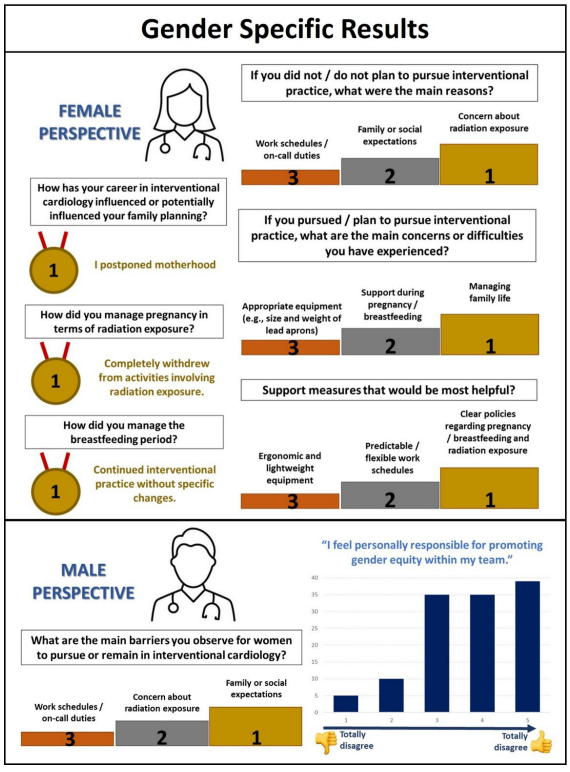
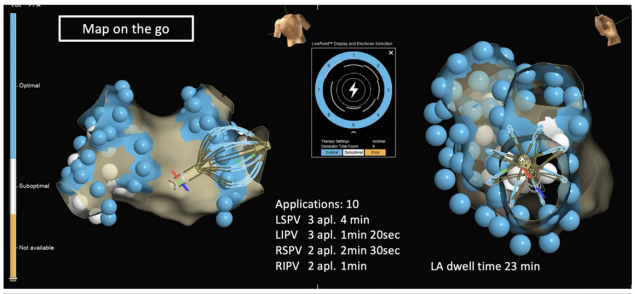


Figure 19E

Figure 2. *Gender-Specific Results - Gender-based differences in barriers, pregnancy-related experiences, and proposed equity-enhancing measures.*

Methods: We conducted a single-center registry included all patients who underwent AF ablation using the VOLT™ system between June and November 2025. Patient selection for conscious sedation followed predefined criteria: BMI < 30 kg/m², low procedural anxiety, prior successful procedures under sedation, anticipated procedure time < 45 minutes, and absence of significant obstructive sleep apnea or chronic lung disease. Sedation protocols included midazolam, remifentanil, and dexmedetomidine, with adjunctive propofol in selected cases. Procedural duration, fluoroscopy time, acute success, and complications were recorded.
Results: A total of 43 patients were included (mean age 61 ± 10 years, 63% male, 72% with paroxysmal AF, 21% Redo procedures). Mean procedure duration was 64 ± 22 min and mean fluoroscopy time was 10 ± 6 min. The mean number of PVI applications per patient was 19 ± 9, and additional lesions averaged 7 ± 9 applications. Twenty-four patients (56%) underwent PVI-only procedures while and the reminder (44%) required PVI plus additional lesions– figure 1. Complete acute PVI was achieved in all cases. No major periprocedural complications were observed. General anesthesia was used in 35% of cases, while 65% were performed under conscious sedation. The most used conscious sedation regimen included dexmedetomidine + midazolam + remifentanil (n = 20; 71%). In the conscious sedation group, no remapping was required due to patient movement during energy application, nor were there conversions to general anesthesia. In two cases, sedation was temporarily deepened to a non-conscious level due to discomfort/anxiety. Overall, pain and discomfort were minimal, and operators reported preserved catheter stability throughout the procedures.

Ablation with VOLT™ PFA – PVI with conscious sedation



PFA ablation for AF Using the VOLT™ system – procedural characteristics (N = 43)	
Baseline characteristics of the patients	
Age (years)	61 ± 10
Male sex	27 (63%)
Procedural characteristics	
Redo AF Ablation	9 (21%)
AF at beginning of procedure	14 (33%)
PVI-only ablation	24 (56%)
PVI + other lesions	19 (44%)
Posterior wall	14 (33%)
Cavotricuspid isthmus	5 (12%)
Mitral annulus	2 (5%)
Other	2 (5%)
Total number of aplications (n)	19 ± 9
PVI	13 ± 2
Other lesions	7 ± 9
Total procedural duration (min)	64 ± 22
Fluoroscopy time (min)	10 ± 6
Radiation dose (mGy)	133 ± 79
Sedation characteristics	
General anaesthesia	15 (35%)
Conscious sedation	28 (65%)
Dexmedetomidine + Midazolam + Remifentanil	20 (71%)
Propofol + Midazolam + Remifentanil	5 (18%)

PFA – Pulsed-field ablation; AF - atrial fibrillation; PVI – pulmonary vein isolation.

Figure 1. *Example of a PVI procedure using the VOLT™ PFA system under conscious sedation (upper panel) and summary of baseline patient characteristics and procedural data for the study population (lower panel).*

Conclusions: In our initial experience, the VOLT™ system demonstrated high acute efficacy and a favorable safety profile. Procedures performed under conscious sedation were feasible, well tolerated, and efficient, with complete acute success and no complications. These real-world findings supports conscious sedation as a feasible alternative to general anaesthesia, potentially facilitating same-day workflows and optimizing resource utilization in AF ablation programs.

21E. PATIENT-REPORTED QUALITY OF LIFE AFTER ATRIAL FIBRILLATION ABLATION: A REAL-WORLD STUDY

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Introduction: Patients with atrial fibrillation (AF) often experience reduced quality of life (QoL), making patient-reported outcome measures (PROMs) essential in patient-centred care. Although catheter ablation improves symptoms, PROM-based QoL outcomes remain variably reported. We assessed changes in AF-related QoL in a population submitted to AF ablation using the AF Effect on Quality-of-Life (AFEQT) questionnaire.
Methods: Consecutive patients undergoing catheter ablation for AF were invited and prospectively enrolled between May 2023 and May 2025. QoL was assessed at baseline on the day of ablation (prior to the procedure) and at 1, 3, 6, 12, 18, and 24 months post-ablation. The AFEQT questionnaire includes 20 items scored from 1 to 7 and converted to a 0–100 scale, where 0 represents severely impaired QoL and 100 represents no negative QoL impact. We assessed the change in AFEQT overall score from baseline to follow-up. A clinically meaningful improvement was defined as a > 5-point increase in the overall score. A 7-day Holter was performed at discharge to detect early recurrence (ER), and AF recurrence during follow-up was assessed using Holter or 12-lead ECG. Procedural and safety outcomes were recorded.
Results: Of 1,247 patients submitted to AF ablation during this period, 204 accepted the invitation and 153 completed at least one AFEQT questionnaire at follow-up and were analysed (age 62 ± 11 years; 95 men; 43% paroxysmal AF) (Figure 1A). Of those, energy source was pulsed-field ablation in 65 patients (43%) and the majority (n = 84, 54%) underwent pulmonary vein isolation only. No major adverse events were observed until discharge. ER on the 7-day Holter occurred in 17 patients (11%). After AF ablation, AFEQT scores increased progressively from baseline to 2-year follow-up (Figure 1B). After a mean follow-up of 14 ± 4 months, the overall AFEQT score improved significantly (53 ± 23 to 71 ± 22; 95%CI 14.654-21.632; p < 0.001) (Figure 1C). Most patients (n = 109, 71%) achieved a clinically meaningful QoL improvement (> 5-point AFEQT increase) (Figure 1D). AF recurrence at follow-up was observed in 28% (n = 43) of the patients. Importantly, QoL also improved significantly in this subgroup (54 ± 23 to 67 ± 22; 95%CI 6.927-19.670; p < 0.001), with 66% achieving a clinically meaningful improvement, suggesting symptomatic benefit despite intermittent arrhythmia recurrence.
Conclusions: In a real-world cohort of AF ablation patients, PROM-based AFEQT assessment showed a significant improvement in QoL over time, irrespective of recurrency status, with most patients achieving a clinically meaningful benefit and low rates of early recurrence on systematic monitoring. These findings support the routine feasibility and clinical value of integrating PROMs into post-ablation follow-up.

25E. ARTIFICIAL INTELLIGENCE VERSUS CARDIOLOGISTS FOR PREMATURE VENTRICULAR COMPLEX LOCALIZATION

Rodrigo Afonso, Marta Vilela, Sofia Esteves, Inês Araújo, João Ribeiro, Joana Brito, Afonso Nunes Ferreira, Gustavo Lima da Silva, Nuno Cortez-Dias, Fausto J. Pinto, João de Sousa

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Introduction: Artificial intelligence (AI) has shown promise in electrocardiographic (ECG) interpretation, yet its capacity to accurately localize the origin of idiopathic ventricular arrhythmias remains uncertain. Precise identification of premature ventricular complex (PVC) sites of origin is essential for ablation planning and mechanistic understanding, but the real-world performance of general-purpose AI models for this task is largely unknown.
Objectives: To assess the diagnostic accuracy of AI engines in identification of the origin of idiopathic PVCs from ECG images, and to compare their performance with that of cardiologists.

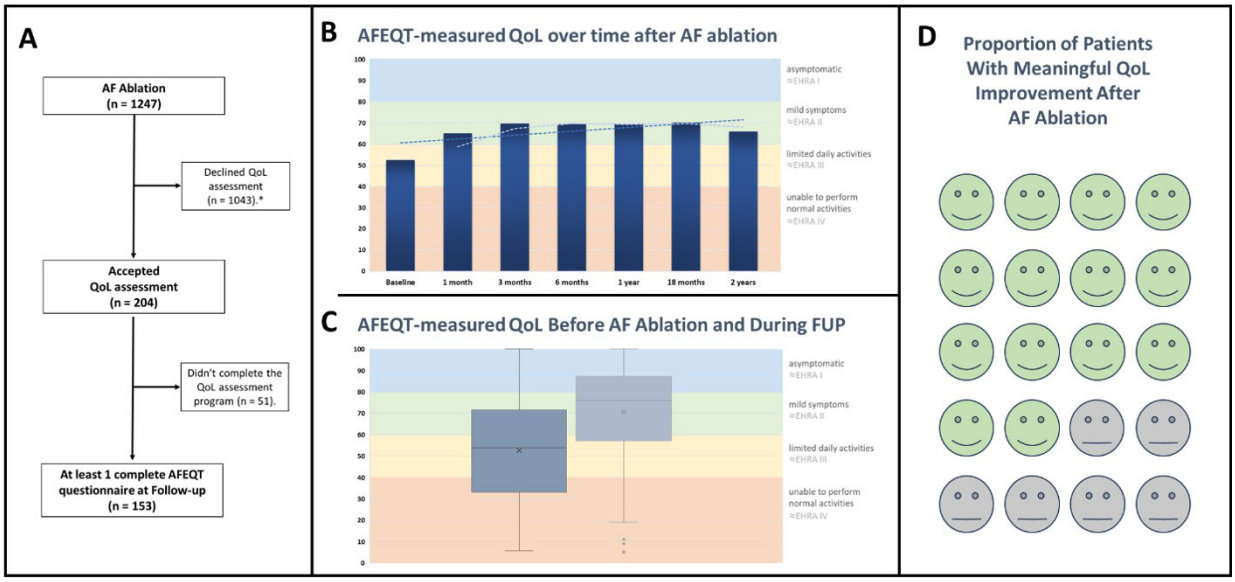

Figure 21E

Figure 1. *Quality of life (QoL) improvement after atrial fibrillation (AF) ablation assessed by the AFEQT score. (A) Flowchart of QoL assessment with AFEQT questionnaire after AF ablation. (B) Longitudinal evolution of QoL from baseline to two years post-ablation, showing a progressive increase in AFEQT scores over time. Background color bands illustrate the approximate correspondence between AFEQT values and EHRA symptom status. (C) Distribution of AFEQT scores before ablation and at mean follow-up, demonstrating a significant overall improvement in QoL. (D) Proportion of patients who achieved a clinically meaningful QoL improvement, defined as a > 5-point increase in AFEQT at follow-up. *Reasons for refusal included logistical limitations (e.g. long distance between the patient's residence and the study center), fatigue with frequent hospital contacts and technological or capability barriers to completing questionnaires. AF, Atrial Fibrilation; QoL, Quality of life; AFEQT-AF, Effect on Quality-of-Life (questionnaire); FUP, follow up.*

Methods: We retrospectively analyzed 12-lead ECG from patients with idiopathic PVCs and structurally normal hearts who underwent invasive EP mapping and ablation. Each ECG was uploaded to ChatGPT® and Microsoft CoPilot®, and both engines were prompted to identify the most likely site of origin. The heart was divided into 16 anatomical segments: right ventricular (RV) outflow tract (4), aortic cusps (3), mitral papillary muscles (2), left ventricular (LV) summit (1), and remaining LV and RV wall regions (6). The "gold standard" reference for PVC origin was established by invasive EP study, defined as the site of acute successful ablation.
Results: A total of 35 patients were included (mean age 53 years, 46% male). Correct identifications occurred by both AI engines in 9 (26%) patients, exclusively within the RVOT region. Mean sensitivity, specificity, and accuracy were 26%, 95%, and 91%, respectively. For cardiologist interpretation, corresponding values were 46%, 96%, and 93%, with no statistically significant difference compared with ChatGPT® (p = 0.051) or CoPilot® (p = 0.07). The trend toward better human performance did not reach statistical significance, likely due to sample size limitations.
Conclusions: Both ChatGPT® and Microsoft CoPilot® showed limited sensitivity and spatial discrimination for localizing idiopathic PVC origins, performing below experienced clinicians and failing outside the RVOT. Despite high specificity, these models remain unsuitable for clinical localization tasks, underscoring the need for domain-specific ECG datasets and dedicated training. The coexistence of multiple ECG-based localization algorithms may further hinder accuracy, as general-purpose AI cannot yet identify or apply the appropriate diagnostic criteria.

26E. BEYOND THE ENDOCARDIUM – OUTCOMES OF INITIAL EPICARDIAL VENTRICULAR TACHYCARDIA ABLATION GUIDED BY ADVANCED IMAGING

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Introduction: Conventional VT ablation typically combines endocardial and epicardial mapping. Advanced imaging (cardiac CT and MRI) can identify substrates predominantly epicardial, supporting a paradigm shift: epicardial-only ablation from the outset.
Objectives: To compare safety and effectiveness of initial epicardial-only versus combined endo-epicardial VT ablation guided by pre-procedural imaging in structural heart disease.
Methods: Retrospective single-centre study (2015–2025) including all patients undergoing VT ablation with epicardial access after systematic imaging (CT in all; MRI when feasible). Imaging findings guided procedural strategy: epicardial-only or combined approach. Procedures used subxiphoid access under general anesthesia, high-density epicardial mapping, and epicardial RF ablation when abnormal electrograms were confirmed.
Results: Fifty-four patients (59 procedures; mean age 62; 89% male; mean LVEF 36%) were analyzed: 80% dilated and 20% ischemic cardiomyopathy; 83% had ICDs. Indications: sustained VT (44%) or ICD shocks (56%), with 60% in electrical storm. Epicardial-only was performed in 31 procedures; combined in 28. Epicardial RF was delivered in 95% of cases; in 5% of all procedures, no abnormal substrate was found, exposing patients to unnecessary epicardial access. Median procedure time: 130 min; fluoroscopy: 17 min; RF: 33 min. Periprocedural complications occurred in 29% (major 15%, including 1 death [1.7%]); tamponade requiring drainage: 5%. Major complications were less frequent with epicardial-only (10% vs. 21%, p = NS). During a mean follow-up of 2.2 years, VT recurrence occurred in 11 (22%) patients, 11 (22%) died, and 4 (9%) underwent heart transplantation. Kaplan-Meier survival at 1 and 5 years: 88% and 61%; VT-free survival: 88% and 60%. Outcomes did not differ significantly between groups.
Conclusions: Pre-procedural multimodality planning based on advanced imaging appropriately identifies patients in whom arrhythmogenic substrate requires epicardial access. Moreover, it delineates a subgroup in which an exclusively epicardial approach achieves durable arrhythmia control with an acceptable safety profile, comparable or superior to that obtained with the conventional combined strategy. This strategy may redefine patient selection and procedural planning for complex VT substrates.

	Total (n=59)	Epicardial (n=31)	Endocardial + Epicardial (n=28)
Periprocedural complications – n (%)	**17 (28.8)**	**8 (25.8)**	**9 (32.1)**
Major	**9 (15.3)**	**3 (9.7)**	**6 (21.4)**
Acute tamponade with percutaneous drainage	3 (5.1)	1 (3.2)	2 (7.1)
Significant pericardial effusion with percutaneous drainage	3 (5.1)	1 (3.2)	2 (7.1)
Retroperitoneal bleeding leading to death	1 (1.7)	0 (0.0)	1 (3.6)
Cardiogenic shock	1 (1.7)	0 (0.0)	1 (3.6)
Hemothorax with percutaneous drainage	1 (1.7)	1 (3.2)	0 (0.0)
Minor	**8 (13.6)**	**5 (16.1)**	**3 (10.7)**
Acute pericarditis (no relevant pericardial effusion)	5 (8.6)	5 (16.1)	0 (0.0)
Pseudoaneurysm / AV fistula (no intervention required)	2 (3.4)	0 (0.0)	2 (7.1)
Access site infection	1 (1.7)	0 (0.0)	1 (3.6)

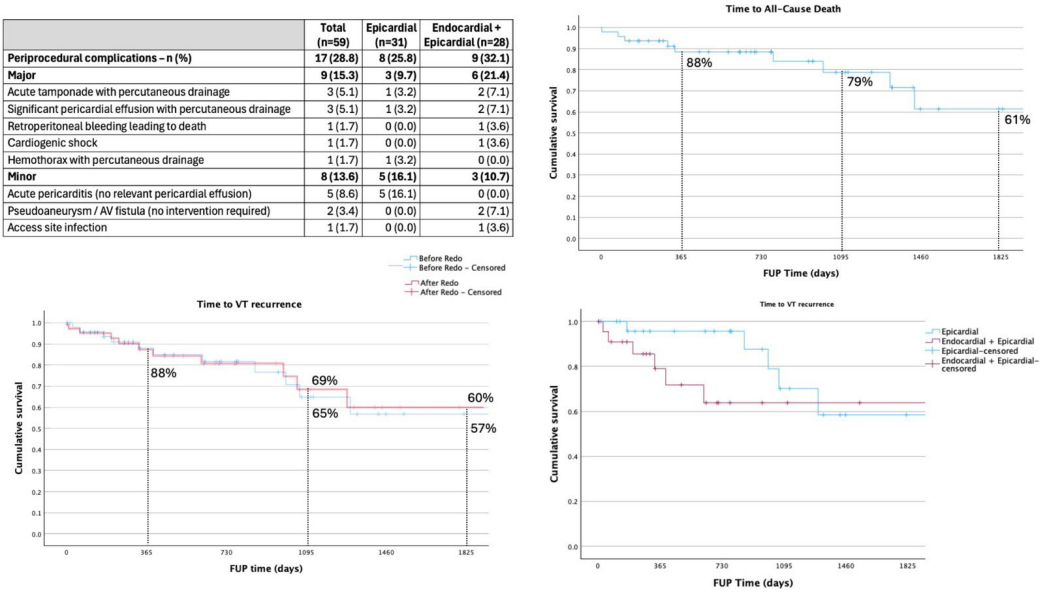

Figure 26E

28E. SAFETY AND EFFICIENCY OF SAME-DAY DISCHARGE AFTER ELECTIVE ATRIAL FIBRILLATION ABLATION: IMPACT OF VASCULAR CLOSURE DEVICES AND ABLATION TECHNIQUE

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Introduction: Same-day discharge (SDD) following atrial fibrillation (AF) ablation is an emerging strategy to improve patient experience and optimize healthcare resources. Despite its potential benefits, concerns regarding safety and applicability across different ablation technologies remain.
Objectives: To evaluate the safety and feasibility of SDD after elective AF ablation and assess the influence of vascular closure devices and ablation modality on discharge timing.
Methods: We conducted a single-center retrospective study of AF patients undergoing ablation between January 2023 and November 2025. Pulmonary vein isolation (PVI) was the primary strategy, complemented by cavo-tricuspid isthmus (CTI) ablation in patients with atrial flutter. SDD was considered after a minimum 4-hour observation period, provided patients met predefined criteria: hemodynamic stability, absence of immediate complications, and adequate home support. Outcomes included 30-day emergency readmissions and complication rates.
Results: A total of 462 patients were included (pulsed field ablation [PFA] 50.9%, cryoablation [CA] 47.2%, radiofrequency 1.9%). Acute PVI success was 99.3%, and CTI ablation was performed in 20% of cases. Mean procedure time was 75.7 ± 35.8 min. SDD was achieved in 69.6% of patients, reflecting 81.7% of the procedures ending before 4 pm. Thirty-day ER readmission rates were similar between SDD and overnight stay (ONS) groups (7.8% vs. 12.5%, p = 0.19), as were complication rates (0.4% vs. 2.6%, p = 0.07). SDD rates were comparable between PFA and CA (82.6% vs. 80.6%, p = 0.69). Vascular closure devices were used in 31.2% of cases, significantly reducing time to discharge compared to figure-of-eight suture (314 min vs. 344 min, p = 0.03).
Conclusions: SDD after elective AF ablation is safe and feasible with carefully selected patients, without increasing 30-day complications or readmissions. Vascular closure devices further shorten discharge time, and outcomes are consistent across PFA and CA techniques. These findings support broader implementation of SDD protocols, provided structured selection criteria is ensured.

30E. WOMEN UNDERGOING CATHETER ABLATION FOR ATRIAL FIBRILLATION: DISTINCT CLINICAL PROFILE WITH COMPARABLE OUTCOMES

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Introduction: Catheter ablation is an established rhythm control strategy for atrial fibrillation (AF). However, sex-related differences in clinical profile, atrial remodeling, and ablation outcomes remain incompletely characterized, with women historically underrepresented in ablation cohorts.
Objectives: To characterize clinical and echocardiographic differences between men and women undergoing catheter ablation for atrial fibrillation and to evaluate potential sex-related differences in procedural outcomes.
Methods: We conducted a retrospective analysis of 517 consecutive patients undergoing catheter ablation for atrial fibrillation between 2016 and 2020. The study population included 332 men (64%) and 185 women (35.8%). Clinical characteristics, comorbidities, procedural features, and echocardiographic parameters were systematically collected. Ablation success at 12 months and the need for redo ablation were assessed. Continuous variables were compared using independent-samples t-tests and categorical variables using chi-square tests.
Results: Women were older at the time of ablation compared with men (59.4 ± 11.0 vs. 54.2 ± 12.6 years, p < 0.001) and had a higher body mass index (29.0 ± 6.0 vs. 27.7 ± 3.7 kg/m^2, p = 0.003). Paroxysmal AF was more prevalent among women (80.5% vs. 63.6%, p < 0.001). Women had a slightly smaller left atrial volume (42.5 ± 7.4 vs. 44.3 ± 7.0 mL, p = 0.027), while left ventricular ejection fraction was similar between sexes. Hypertension was more frequent in women (62.7% vs. 53.0%, p = 0.034), whereas obstructive sleep apnea was more prevalent in men (13.0% vs. 5.4%, p = 0.006). Redo ablation was performed less frequently in women 11.4% vs. 18.4%, p = 0.044). Ablation success at 12 months did not differ significantly between women and men (68.6% vs. 66.9%, p = 0.696).
Conclusions: Women undergoing catheter ablation for atrial fibrillation present with a distinct clinical phenotype characterized by older age, higher body mass index, and a higher prevalence of paroxysmal AF, yet demonstrate similar procedural success compared with men. Despite differences in baseline characteristics, ablation efficacy at 12 months was comparable between sexes, while redo ablation was less frequently required in women.

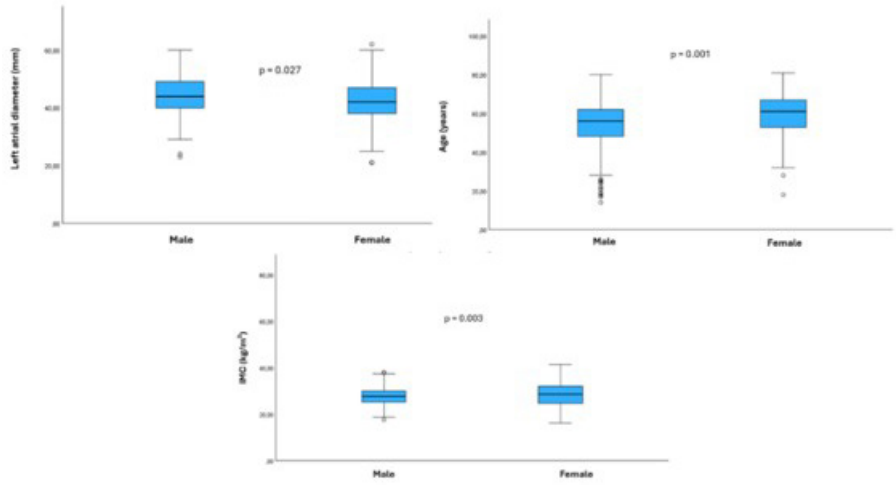

Figure 30E

These findings underscore the importance of sex-specific characterization in AF ablation populations and support equitable referral and management strategies.

31E. PREDICTORS OF REDO CATHETER ABLATION AFTER ATRIAL FIBRILLATION ABLATION

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Introduction: Catheter ablation is an established rhythm control strategy for atrial fibrillation (AF). Nevertheless, AF recurrence remains frequent, and a substantial proportion of patients undergo repeat ablation procedures. Identifying factors associated with redo ablation may help refine patient selection and guide post-procedural management.
Objectives: To identify independent clinical and echocardiographic predictors of redo catheter ablation following an initial AF ablation in a real-world population.
Methods: We performed a retrospective analysis of 517 consecutive patients undergoing catheter ablation for AF between 2016 and 2020, including patients undergoing a first ablation and those requiring redo procedures. The median age of 58 years (IQR 50–65), and 35.8% were female. Paroxysmal AF was present in 61.5% of patients. During follow-up, redo catheter ablation was performed in 82 patients (16%). Clinical characteristics, and echocardiographic parameters were collected. Multivariable logistic regression analysis was used to identify independent predictors of redo ablation. Results are reported as odds ratios (OR) with 95% confidence intervals (CI).
Results: In the final multivariable model, paroxysmal AF was independently associated with a lower likelihood of redo ablation (OR 0.43, 95%CI 0.21-0.87; p = 0.018). Higher body mass index was associated with an increased likelihood of redo ablation (OR 1.09 per kg/m2, 95%CI 1.03-1.16; p = 0.006), as was increased left atrial volume (OR 1.05 per unit increase, 95%CI 1.00-1.10; p = 0.037). Obstructive sleep apnea was associated with a lower likelihood of redo ablation (OR 0.18, 95%CI 0.08-0.40; p < 0.001). Sex, age, left ventricular ejection fraction, hypertension, diabetes mellitus, and dyslipidemia were not independently associated with redo ablation. Discussion: Redo catheter ablation after initial AF ablation appears to be primarily influenced by atrial substrate severity and cardiometabolic burden. Paroxysmal AF is associated with a lower likelihood of repeat procedures, whereas increased body mass index and left atrial enlargement identify patients at higher risk of redo ablation. The observed association between obstructive sleep apnea and lower redo rates likely reflects a more conservative approach to repeat ablation in patients with obstructive sleep apnea, rather than a true protective effect.
Conclusions: Redo catheter ablation following atrial fibrillation ablation appears to be driven by the extent of atrial remodeling and cardiometabolic burden rather than traditional clinical risk factors. Recognition of these features may allow for improved patient selection and optimization of modifiable risk factors to enhance long-term ablation success.

32E. PREDICTORS OF CATHETER ABLATION FAILURE IN ATRIAL FIBRILLATION: A CLINICAL AND ECHOCARDIOGRAPHIC ANALYSIS

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Introduction: Catheter ablation is an established treatment for atrial fibrillation (AF); however, arrhythmia recurrence and procedural failure remain frequent. Identifying independent predictors of ablation failure is essential for optimizing patient selection and improving long-term outcomes.
Objectives: To identify independent clinical and echocardiographic predictors of atrial fibrillation ablation failure at 12 months in a real-world cohort.
Methods: We conducted a retrospective analysis of consecutive patients undergoing catheter ablation for atrial fibrillation between 2016 and 2020. A total of 517 patients were included, of whom 35.8% were women, with a median age of 58 years (IQR 50–65). Ablation failure at 12 months, defined as documented recurrence of atrial arrhythmia following a blanking period, occurred in approximately 21.1% of patients. Multivariable logistic regression analysis was performed to identify independent predictors of ablation failure. Covariates included sex, AF type (paroxysmal vs. permanent), age, left ventricular ejection fraction (LVEF), diabetes mellitus, hypertension, body mass index (BMI), and left atrial (LA) volume. Results are reported as odds ratios (OR) with 95% confidence intervals (CI).
Results: In multivariable analysis, paroxysmal AF was independently associated with a lower risk of ablation failure (OR 0.45, 95%CI 0.28-0.73; p = 0.001). Hypertension was associated with a significantly higher risk of failure (OR 2.37, 95%CI 1.25-4.49; p = 0.008). Increased BMI showed a borderline association with ablation failure (OR 1.09 per kg/m^2, 95%CI 1.01-1.20; p = 0.050), while left atrial volume was independently associated with failure (OR 1.04 per unit increase, 95%CI 1.00-1.07; p = 0.033). Sex, age, LVEF, and diabetes mellitus were not significantly associated with ablation outcome.

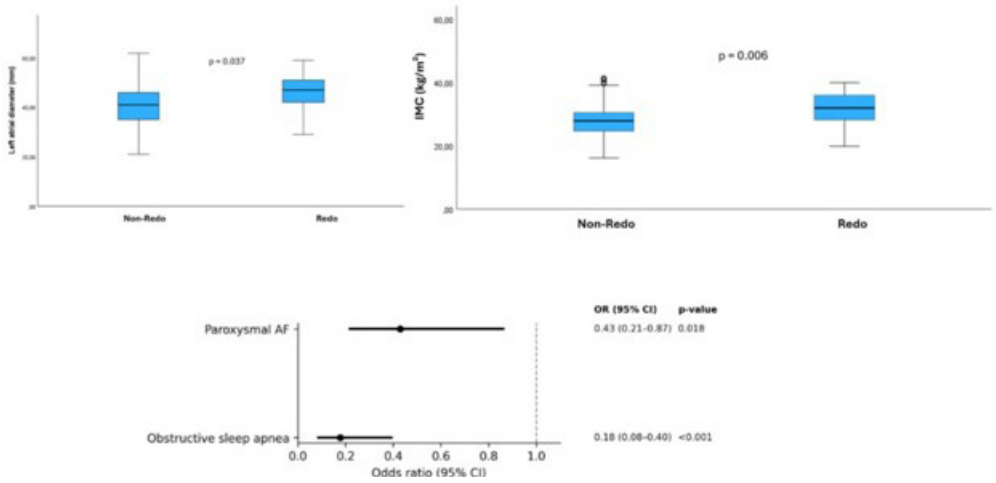
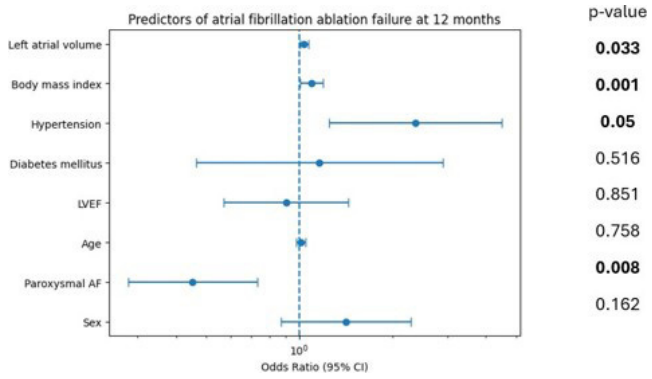


Figure 31E



Conclusions: In this cohort, paroxysmal atrial fibrillation was a protective factor against ablation failure, whereas hypertension, increased body mass index, and larger left atrial volume were independent predictors of failure at 12 months. These findings underscore the role of atrial structural remodeling and cardiometabolic burden in determining long-term outcomes after AF ablation.

33E. PREDICTING ATRIAL FIBRILLATION – CAN ATRIAL PARAMETERS IN CARDIAC MAGNETIC RESONANCE BE THE KEY IN HYPERTROPHIC CARDIOMYOPATHY?

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Introduction: Atrial fibrillation (AF) is a common comorbidity in hypertrophic cardiomyopathy (HCM) with a prevalence above 25%, much higher than the 2% in the general population. It carries not only a high-risk of stroke but can also be a marker of advanced cardiomyopathy. Early diagnosis and management are essential to minimizing AF-related adverse outcomes in patients with cardiomyopathies.
Objectives: Our aim is to investigate if there were CMR parameters differences in HCM that could be predictors of AF.
Methods: We retrospectively analyzed a population of patients submitted to CMR and divided them in two groups – those with HCM and those without structural disease. We documented demographic factors, left (LAEF) and right (RAEF) atrial ejection fraction, atrial volumes and the longitudinal LA shortening obtained in CMR. We then performed univariate analysis to establish the relationship between variables.
Results: Out of 103 patients, 22,3% (n = 23) had no structural disease that we considered the control group and 37,9% (n = 39) had HCM. 53,2% were male, with mean age of 55 ± 18 years, with no differences between groups. Patients with HCM had a 5-times higher prevalence of AF (5% vs. 1%). When comparing groups, these patients had similar RAEF and right atrial volume. However, patients with HCM had significantly lower LAEF (49,9% vs. 65,7%, p ≤ 0,001), higher indexed diastolic LA volume (43,8 mL vs. 34,2 mL, p = 0,003), lower LA longitudinal shortening (15 vs. 40, p < 0,001) and lower RA longitudinal shortening (31 vs. 40, p < 0,001).
Conclusions: Patients with HCM have a higher prevalence of AF than the general population. Besides atrial volumes, significant differences in CMR parameters like LAEF and atrial longitudinal shortening could possibly be a step in identifying AF earlier and improving morbimortality in HCM.

34E. LEFT VENTRICULAR PARAMETERS IN CARDIAC MAGNETIC RESONANCE AND ITS ASSOCIATION WITH ATRIAL FIBRILLATION IN PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY

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Introduction: It is established that atrial fibrillation (AF) has prognostic implications in patients with hypertrophic cardiomyopathy (HCM) being associated with higher rates stroke and mortality. Automatic parameters analyzed n CMR enhances the precision, speed, and depth of assessment. This technology offers immense potential in improving the diagnosis, treatment planning, and research endeavors related to cardiovascular conditions.
Objectives: Our study aimed to investigate if there was an association between AF and left ventricular function CMR parameters in individuals with HCM.
Methods: We retrospectively analyzed a population of patients submitted to CMR, selected those with hypertrophic cardiomyopathy (HCM) and divided them in two groups – those with and without AF. We documented demographic factors, left ventricular ejection fraction (LVEF), left ventricular volumes and the longitudinal LV shortening obtained through AI in CMR for both groups. We then performed univariate analysis to establish the relationship between variables and multivariate analysis to identify independent predictors.
Results: Out of 103 patients, 37,9% (n = 39) had HCM. When comparing groups, 59% were male, with mean age of 61 ± 13 years with no differences between groups. However, patients with AF had significantly lower biplane LVEF (56,5% vs. 64%, p = 0,029), higher indexed end-diastolic LV volume (93,5 mL vs. 79 mL, p = 0,026) and higher indexed end-systolic LV volume

(39 mL vs. 27mL, p = 0,016). In multivariate analysis, a lower LVEF remained independently and significantly associated with AF (p = 0,042).
Conclusions: In patients with HCM, CMR derived lower biplane LVEF, higher indexed end-diastolic and end-systolic LV volume are associated with AF in patients with HCM, with LVEF proving to be independently associated with history of AF. Extended research must be done to uncover additional predictors and establish potential impact on outcomes.

35E. ATRIAL STRAIN AND RHYTHM OUTCOME AFTER ELECTRICAL CARDIOVERSION IN ATRIAL FIBRILLATION

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Introduction: Atrial strain assessed by speckle-tracking echocardiography has been proposed as a marker of atrial remodelling and as a potential tool to characterise rhythm outcome after electrical cardioversion (ECV) in atrial fibrillation (AF). However, its clinical relevance in patients with established atrial cardiomyopathy remains uncertain.
Objectives: To characterise baseline atrial and ventricular functional parameters according to rhythm outcome after ECV in a real-world cohort of patients with AF.
Methods: We conducted a single-centre observational study including patients undergoing elective electrical cardioversion for atrial fibrillation. All patients underwent comprehensive transthoracic echocardiography prior to cardioversion, including left and right atrial reservoir strain, atrial volumes, and biventricular systolic function. Rhythm outcome was defined as maintenance of sinus rhythm versus atrial fibrillation persistence or recurrence. Owing to the limited sample size and small group dimensions, non-parametric statistical analyses were performed. All analyses were considered exploratory.
Results: A total of 34 patients were included (median age 69 years; 76% male), of whom 65% achieved sinus rhythm after ECV. Baseline clinical characteristics, left and right atrial volumes, and atrial reservoir strain values were similar between patients maintaining sinus rhythm and those with AF persistence or recurrence. In contrast, tricuspid annular plane systolic excursion was significantly lower in patients with persistent AF, suggesting impaired right ventricular systolic function. Although differences in atrial strain parameters did not reach statistical significance, their direction was consistent with previously described patterns of atrial mechanical dysfunction.

	Total	Sinus rhythm attained	Atrial fibrillation remains	p-value
	n = 34	n=22	n=12	
Age, years	69 (63;75)	68 (56;76)	69 (64;75)	0.817
Gender, male	26 (76.5)	18 (81.8)	8 (66.7)	0.320
CHA2DS2-VAS	2 (1;3)	2 (1;3)	2 (1;3)	0.522
HASBLED	1 (1;2)	1 (1;2)	1 (0;2)	0.507
LVEF, %	49 (44;55)	48 (44;54)	52 (44;56)	1.0
LV GLS, %	12 (10;14)	11 (10;14)	12 (10;14)	0.803
TAPSE, mm	18 (17;23)	21 (17;24)	18 (15;19)	**<0.05**
RV FAC	39 (32;45)	38 (34;47)	39 (29;45)	0.526
LA volume, ml/m2	47 (36;56)	47 (35;55)	47 (37;57)	0.403
LA reservoir, strain, %	8 (6;11)	8 (7;11)	7 (6;11)	0.291
RA volume, ml/m2	37 (23;46)	36 (19;43)	37 (29;48)	0.383
RA reservoir, strain, %	12 (7;15)	13 (11;15)	9 (7;16)	0.346

Table 1. *Selected baseline clinical and echocardiographic parameters according to rhythm outcome after electrical cardioversion.*

Conclusions: In this cohort with globally reduced atrial deformation, baseline atrial structural and functional parameters were comparable regardless of rhythm outcome after ECV, suggesting a shared substrate of advanced atrial remodelling. Conversely, impaired right ventricular systolic function was associated with AF persistence, supporting the concept that rhythm outcome after cardioversion may reflect integrated atrial–ventricular dysfunction rather than isolated atrial mechanics.

36E. EARLY ATRIAL MECHANICAL RECOVERY AFTER ELECTRICAL CARDIOVERSION IN ATRIAL FIBRILLATION

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Introduction: While baseline atrial strain has been extensively investigated as a predictor of rhythm outcome after ECV, the clinical significance of early post-cardioversion changes in atrial mechanics is less well defined.
Objectives: To assess early changes in atrial and ventricular functional parameters one month after successful ECV and their association with rhythm stability.
Methods: Patients with immediate ECV success and available 1-month follow-up echocardiography were analysed. Changes (Δ) in left and right atrial reservoir strain and ventricular functional parameters were compared between patients maintaining sinus rhythm and those with AF recurrence. Owing to the limited sample size, analyses were exploratory.
Results: Among patients with immediate ECV success, maintenance of sinus rhythm was associated with a significant improvement in left atrial reservoir strain at 1 month [Δ +8% (1–19)], whereas patients with AF recurrence showed minimal change [Δ +1.5% (−2.5 to 3); p < 0.05]. Right atrial reservoir strain showed a similar numerical trend without statistical significance. No significant between-group differences were observed in early changes in ventricular functional parameters.

	Sinus rhythm	Atrial fibrillation recurrence	p-value
	n=15	n=6	
Δ LA reservoir, strain, %	8 (1;19)	1,5 (-2,5;3)	<0.05
Δ RA reservoir, strain, %	8 (0;16)	2,5 (0,75;7,5)	0.165
Δ LVEF, %	5 (1;11)	-4 (-7;-4)	0.228
Δ LV GLS, %	5 (3;8)	1,8 (1;27)	0.094
Δ RV FAC	0 (-5;16)	8 (-1;16)	0.182
Δ RVFWLS, %	3,7 (-1;8)	-1,2 (-4;5)	0.097

Table 1. *Changes in atrial and ventricular functional parameters one month after successful electrical cardioversion.*

Conclusions: Early improvement in left atrial reservoir strain was observed exclusively in patients maintaining sinus rhythm after ECV, suggesting rhythm-dependent reverse atrial remodelling. These findings indicate that atrial strain may be a more valuable dynamic marker of functional recovery than an isolated baseline predictor, particularly in patients with established AF.

38E. RISK STRATIFICATION OF LEFT BUNDLE BRANCH BLOCK AFTER TRANSCATHETER AORTIC VALVE IMPLANTATION: ELECTROPHYSIOLOGICAL STUDY VERSUS AMBULATORY MONITORING

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ULS São João, Porto.

Introduction: Left bundle branch block (LBBB) is a common conduction disturbance after transcatheter aortic valve implantation (TAVI) and has been associated with delayed high-grade AV block and increased permanent pacemaker implantation (PPI). Management varies between invasive evaluation with electrophysiological study (EPS) and conservative approaches employing ambulatory continuous ECG monitoring (AECG). The optimal approach balancing safety, diagnostic yield, and resource utilization remains undefined.
Objectives: To compare EPS versus AECG for risk stratification of patients with persistent LBBB after TAVI.
Methods: We conducted a single-centre retrospective cohort study of all patients who underwent TAVI between January 2020 and January 2025. Patients with persistent LBBB before discharge were managed either

with EPS or AECG for 7–15 days, according to availability and clinical judgement. Baseline clinical, procedural, and PPI data were recorded. Group comparisons used χ^2 or Fisher's exact tests for categorical variables and t-tests or Wilcoxon rank-sum tests for continuous variables, according to data distribution. Negative predictive value (NPV) for late PPI was calculated for each strategy among patients with normal EPS or AECG.
Results: Of 1,076 TAVI patients, 131 with persistent LBBB underwent risk stratification (EPS n = 53, AECG n = 78). Median age was 81 years; 62% were female, 30% received balloon expandable valves and 24% had atrial fibrillation. Baseline comorbidities were similar, but EPS patients had longer mean PR (192 vs. 181 ms, p < 0.001) and QRS (157 vs. 149 ms, p = 0.04) intervals. After a median follow-up of 26 months, PPI was significantly more frequent in the EPS group (38% vs. 10%, p < 0.001), reflecting the higher-risk profile of patients selected for EPS. In this group, most PPI procedures were performed at baseline due to a prolonged HV interval (90%). Among 35 patients with normal EPS, 2 (6%) required late PPI (NPV 94%). Both cases were older women treated with self-expanding valves, admitted with paroxysmal advanced AV block. In the AECG group, 4 patients (5%) had high-grade AV block detected early after discharge, leading to prompt PPI; 2 had severe presentations requiring emergency assessment, including 1 with cardiopulmonary arrest. Extending AECG beyond 7 days did not improve diagnostic yield. Among 74 patients with normal AECG, 4 (5%) required late PPI (NPV 95%).
Conclusions: Both strategies showed high NPV for late PPI after TAVI. EPS allows early identification of patients at higher risk, but likely incurs higher costs and more frequent PPI. AECG carries a residual risk of severe late-presenting bradyarrhythmias, although most clinically significant events were detected early after discharge. These findings support a tailored approach based on patient risk profile and local resources.

40E. EVALUATING THE SAFETY AND EFFICACY OF ZERO-FLUOROSCOPY AVNRT CATHETER ABLATION IN PAEDIATRIC PATIENTS: A RETROSPECTIVE STUDY

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Introduction: Atrioventricular nodal reentrant tachycardia (AVNRT) is a common supraventricular tachycardia in paediatric patients, with catheter ablation (CA) for slow pathway modification being the preferred treatment for symptomatic cases. Traditionally, CA is performed under fluoroscopic guidance, exposing both patients and operators to ionizing radiation. With advancements in electroanatomical mapping, zero fluoroscopy catheter ablation has emerged as a safe and effective alternative for various arrhythmias. However, data on its safety and efficacy in paediatric patients remain limited.
Objectives: To compare the safety and efficacy of zero-fluoroscopy radiofrequency ablation (RFA) with that of conventional RFA guided by electroanatomical mapping in paediatirc patients with AVNRT.
Methods: We performed a single-centre retrospective cohort study, including all patients under 18 years who underwent CA for AVNRT between 2016 and 2023. Patients with congenital heart disease, severe comorbidities or accessory pathways were excluded.
Results: A total of 56 patients underwent CA during the study period, with a mean age of 15.2 ± 1.9 years. The median weight was 54 kg (IQR 19 kg), and 61% were female. Most patients (89%) were receiving anti-arrhythmic medication, and all had structurally normal hearts. Zero-fluoroscopy ablation was performed in 43% of cases. Typical AVNRT was observed in 98% of patients. Baseline characteristics were similar between the groups. Procedure duration was slightly longer in the zero-fluoroscopy group (62 vs. 57 minutes, p = 0.021), but acute ablation success was achieved in all cases. Over a median follow-up of 3.5 years, AVNRT recurrence rates (4.1% vs. 6.36%, p = 0.29) and repeat ablation rates (4.1% vs. 2.8%, p = 0.539) were comparable between groups. No major complications occurred in either group.
Conclusions: Zero-fluoroscopy catheter ablation for AVNRT in paediatric patients is a safe and effective approach, demonstrating high success rates with minimal impact on procedural duration.

42E. RENAL DENERVATION AS A NEUROMODULATORY STRATEGY IN ELECTRICAL STORM: SAFETY AND EFFICACY

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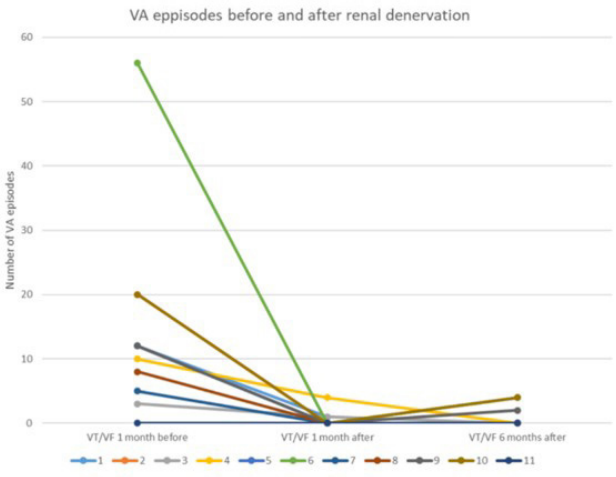
Serviço de Cardiologia, Hospital de Santa Marta, Lisboa.

Introduction: Catheter ablation (CA) has shown efficacy in managing ventricular arrhythmias (VA) associated with structural heart disease. However, some patients continue to experience refractory VA despite pharmacological therapy and multiple CA attempts. In such cases, additional interventions, including autonomic neuromodulation, have been investigated. Renal denervation (RDN), a technique originally developed to treat resistant arterial hypertension, works by inhibiting the afferent renal sympathetic pathways, thereby reducing systemic sympathetic overactivity. Given this mechanism, RDN has been studied as a therapeutic option for arrhythmias, including atrial fibrillation and VA, with promising outcomes.
Objectives: This study aims to evaluate both the effectiveness and safety profile of renal denervation as a therapeutic strategy for managing refractory ventricular arrhythmia storms in patients classified as high-risk.
Methods: A retrospective analysis was conducted on renal denervation procedures performed to manage electrical storms at a tertiary center from February 2020 to October 2024. Baseline patient characteristics, procedural details, and acute complications were recorded. Recurrence of ventricular arrhythmia post-RDN was evaluated at one month and six months to assess the intervention's impact on arrhythmia control.
Results: A total of 11 patients underwent renal denervation (RDN) for the treatment of refractory ventricular arrhythmias (VA). The cohort had a mean age of 63 ± 10 years, with 9 males. The primary diagnosis in most patients was ischemic cardiomyopathy (n = 7), characterized by a mean left ventricular ejection fraction (LVEF) of 25 ± 8%, with no history of resistant arterial hypertension. All patients had implantable cardioverter-defibrillators (ICDs), and two of these devices included concomitant cardiac resynchronization therapy. Nine patients had previously undergone endocardial VA ablation. Among the two patients without prior ablation, one was contraindicated due to a large left ventricular thrombus, while the other underwent an electrophysiological study without inducible ventricular tachycardia. In the four weeks preceding RDN, patients experienced an average of 18 ± 20 sustained VA episodes, meeting the criteria for an electrical storm (≥ 3 episodes within 24 hours). During RDN, a mean of 15 ± 9 radiofrequency applications were delivered to the right renal artery and 12 ± 9 to the left renal artery. No acute procedural complications were observed. One month post-RDN, VA episodes were reduced to a mean of 0 ± 1, with only two patients experiencing recurrent VA. At the six-month follow-up, VA recurrence remained low (mean 1 ± 2 episodes), and at one year, there was an increase in mean episodes (29 ± 50), with only one patient experiencing new episodes.



Conclusions: In our pilot study, RDN appeared to be a safe and effective treatment for the management of VA.

43E. INFLUENCE OF QRS DURATION AND VENTRICULAR CONDUCTION ABNORMALITIES ON THE PERFORMANCE OF AN AI-ECG MODEL FOR DETECTING LEFT VENTRICULAR DYSFUNCTION

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Introduction: Artificial intelligence applied to electrocardiography (AI-ECG) enables scalable detection of left ventricular (LV) systolic dysfunction. PMcardio® is a commercially available AI-ECG model that estimates LV function from standard ECGs. Ventricular depolarization characteristics, including QRS duration and conduction abnormalities, may modulate model outputs and contribute to prediction variability. A systematic assessment of these ECG features may enhance the clinical interpretability and mechanistic understanding of AI-based ECG predictions.
Objectives: To evaluate the diagnostic performance of an AI-ECG model for detecting left ventricular systolic dysfunction and to assess the relationship between QRS duration, ventricular conduction abnormalities, and model performance.
Methods: This retrospective observational study included 380 patients who underwent ECG and transthoracic echocardiography (TTE) within a predefined clinical timeframe. The PMcardio® AI- ECG model classifies LV function into three categories (reduced, mildly reduced, and preserved); for diagnostic analyses, AI-ECG outputs were dichotomized into LV dysfunction (< 50%) or no LV dysfunction (≥ 50%), in accordance with echocardiographic classification. QRS duration was analyzed as a continuous variable and dichotomized as narrow (< 120 ms) or wide (≥ 120 ms). Ventricular conduction abnormalities included left and right bundle branch block, nonspecific intraventricular conduction delay, and paced ventricular rhythm, and were categorized as present or absent. Diagnostic performance metrics of the AI-ECG model were assessed across QRS and conduction subgroups.
Results: LV systolic dysfunction was present in 112 patients (29.5%). QRS duration was non-normally distributed and was longer in patients with LV dysfunction compared with those with preserved LV function (median 100 ms [IQR 94–106] vs. 96 ms [IQR 89–103], p = 0.002). Wide QRS complexes (≥ 120 ms) were more frequent among patients with LV dysfunction (24% vs. 14%, p = 0.018), whereas ventricular conduction abnormalities showed similar prevalence between groups (27% vs. 25%, p=0.64). Overall, the AI-ECG model demonstrated good diagnostic performance for detecting LV dysfunction, with a sensitivity of 84.8%, specificity of 85.1%, accuracy of 85.0%, positive predictive value of 71.2%, and negative predictive value of 93.1%. Model performance remained consistent across QRS duration strata, with comparable accuracy in patients with narrow and wide QRS complexes (85.4% vs. 83.2%, p = 0.48), and was not significantly affected by the presence of ventricular conduction abnormalities.
Conclusions: In this cohort of 380 patients, QRS duration was modestly associated with left ventricular systolic dysfunction. Importantly, the diagnostic performance of the PMcardio® AI-ECG model remained stable across different ventricular activation patterns, supporting its robustness and reinforcing the value of ECG feature analysis to enhance the clinical interpretability of AI-based detection of LV dysfunction.

47E. REAL-WORLD PREDICTORS OF ATRIAL FIBRILLATION RECURRENCE FOLLOWING ELECTRICAL CARDIOVERSION

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Introduction: Electrical cardioversion (ECV) is effective in restoring sinus rhythm in atrial fibrillation (AF), yet recurrence within the first months remains high. Beyond atrial remodeling, the combined impact of metabolic and respiratory comorbidities is increasingly relevant and may critically influence rhythm outcomes.
Objectives: To characterize patients undergoing ECV in a single-center hospital (ambulatory, emergency), and identify clinical and echocardiographic predictors of AF recurrence at 6 months.
Methods: A retrospective analysis included 504 patients who underwent ECV between May 2020 and July 2025. Collected variables included comorbidities, pharmacologic therapy, lifestyle habits, biomarkers, AF type and duration, and echocardiographic parameters. The primary endpoint was AF recurrence at 6 months, assessed at outpatient follow-up.
Results: Mean age was 68.1 ± 10.5 years, and 63.8% were male. Persistent AF was present in 73.2%, with a median AF duration of 9 months (IQR 4–14). Obesity (BMI ≥ 30 kg/m²) was present in 46.4%, obstructive sleep apnea syndrome (OSAS) in 35.7%, hypertension in 72.4%, and diabetes mellitus in 37.1%. Coronary artery disease was present in 19.8%, valvular heart disease in 15.8%, and tachycardiomyopathy in 13.8%. Echocardiography showed a mean LVEF of 61.2 ± 9.7%, LAVI 44 ± 13 mL/m², and left atrial diameter 49 ± 13 mm. Additionally, 18.8% of patients had previously undergone at least one ECV. Acute ECV success was 90.2%, and 85.2% were discharged on amiodarone. AF recurrence at 6 months occurred in 50.7%. In multivariate logistic regression, three variables remained independently associated with AF recurrence: Obesity (OR 1.84; 95%CI 1.19–2.85; p = 0.006), OSAS (OR 1.91; 95%CI 1.12–3.24; p = 0.017), and an increased LAVI > 48 mL/m² (OR 1.63; 95%CI 1.02–2.62; p = 0.041). AF duration > 12 months and age (> 70 years) were associated with recurrence in univariate analysis but became non-significant after adjustment, suggesting their effect is largely mediated through atrial remodeling and metabolic/respiratory comorbidities.
Conclusions: In this real-world cohort, obesity, OSAS, and increased LAVI were the strongest independent predictors of AF recurrence after ECV. These findings highlight the need for an integrated management strategy focused on weight reduction, systematic screening and treatment of sleep-disordered breathing. Incorporating these elements may significantly improve long-term sinus rhythm stability after ECV.

48E. SGLT2 INHIBITORS AND ATRIAL FIBRILLATION RECURRENCE AFTER ELECTRICAL CARDIOVERSION

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Introduction: Sodium-glucose cotransporter 2 inhibitors (SGLT2i) have demonstrated pleiotropic cardiovascular benefits, including reductions in heart failure hospitalizations and cardiovascular mortality, independent of diabetes mellitus status. Emerging evidence suggests potential antiarrhythmic properties, but data on atrial fibrillation (AF) recurrence after external electrical cardioversion (ECV) remain limited.
Objectives: To evaluate the association between SGLT2i use and AF recurrence following elective ECV.
Methods: Retrospective cohort of 49 consecutive patients undergoing elective electrical cardioversion for AF. Patients were stratified by SGLT2i use. The primary endpoint was AF recurrence at 12 months (12M). Fisher's exact test and age- and sex-adjusted multivariable logistic regression were used.
Results: Mean age was 62 ± 8 years; 32.7% were women. Atrial fibrillation was paroxysmal in 49.0% of patients, while 51.0% had non-paroxysmal atrial fibrillation (persistent or long-standing persistent). Fifteen patients (30.6%) were treated with SGLT2i. Patients on SGLT2i had a higher-risk baseline profile, with a higher prevalence of diabetes mellitus (46.7% vs 8.8%, p = 0.005) and coronary artery disease (33.3% vs 8.8%, p = 0.047). Despite this, AF recurrence at 12M was significantly lower in the SGLT2i group (33.3% vs 73.5%, p = 0.012). In univariable analysis, SGLT2 inhibitor use was associated with lower AF recurrence at 12M (p = 0.012). Coronary artery disease was also associated with AF recurrence at 12M (p = 0.043). Age, sex, hypertension, type 2 diabetes, obstructive sleep apnea, alcohol consumption, obesity, dyslipidemia, smoking status and AF type were not associated with AF recurrence (p > 0.05). In multivariable logistic regression, SGLT2i use was independently associated with reduced AF recurrence at 12M after adjustment for age and sex (OR 0.13, 95%CI 0.03-0.57, p = 0.007). In

a sensitivity analysis including type 2 diabetes, effect estimates remained consistent (OR 0.15, 95%CI 0.03–0.77, p = 0.023), supporting that the observed association was not solely explained by diabetes status.

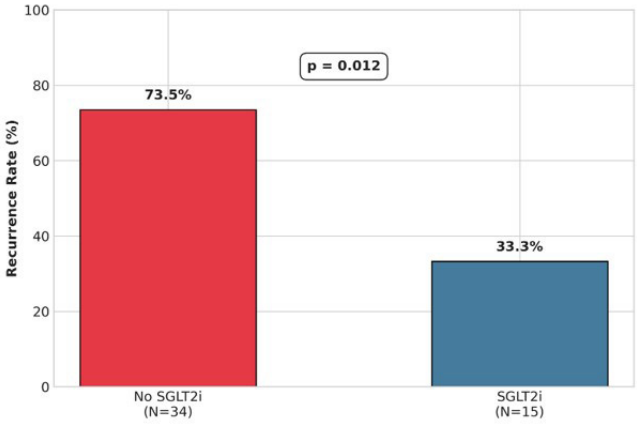

Figure 1. *Atrial fibrillation recurrence at 12 months post-cardioversion according to SGLT2i use.*

Conclusions: In this cohort, SGLT2i use was associated with a reduction in AF recurrence after ECV, even in patients with a higher-risk profile. These exploratory findings suggest a potential protective role of SGLT2i in rhythm maintenance, warranting prospective controlled studies to confirm these observations and elucidate underlying mechanisms.

49E. ELECTROCARDIOGRAPHIC CONDUCTION FEATURES ASSOCIATED WITH GENETIC POSITIVITY IN BRUGADA SYNDROME

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Introduction: Brugada Syndrome (BrS) is an inherited channelopathy associated with an increased risk of sudden cardiac death (SCD). Genetic pathogenic variants are identified in less than half of cases and clinical predictors of genetic positivity are poorly defined.
Objectives: To assess whether routine electrocardiogram (ECG) identifies patients with non-spontaneous BrS, more likely to have positive genetic testing.
Methods: Retrospective, single-center observational study including 227 patients with non-spontaneous BrS, between 2014 and 2025. Basal ECG was obtained in all patients. Patients with inconclusive genetic results were excluded from the analysis. Clinical characteristics and ECG parameters were compared between patients with positive (+) and negative (-) genetic testing. Multivariable logistic regression using a forward likelihood ratio method was performed to identify independent ECG predictors of genetic positivity.
Results: A total of 110 patients met the inclusion criteria, of whom 49 (44.5%) tested (+). Mean age was 48.9 ± 14.4 years, and 44 patients (40.0%) were female and 59 (53.6%) were index cases. Patients with (+) genetics were younger at diagnosis (45.2 ± 15.7 vs. 51.9 ± 12.6 years, p=0.014) and more often female (51.0% vs. 31.1%, p = 0.034). Previous symptoms and family history of SCD were similar between groups. There were no differences in device implantation rates, nor in cardiovascular events during follow-up (mean 711.9 ± 298.8 months). First-degree atrioventricular block was significantly more common in the (+) group (28.6% vs. 4.9%, p < 0.001), while no differences were observed in intraventricular conduction disturbances. Several ECG parameters differed between groups, including longer PR interval, more rightward QRS axis, lower R-wave amplitude in lead DI and aVR, and higher S-wave amplitude in aVL (all p < 0.05) in (+) genetics. In multivariable analysis, longer PR interval (OR 1.034 per ms [1.02-1.05], p < 0.001), QRS axis (OR 1.015 per degree [1.00-1.03], p = 0.035), and S wave in aVL (OR 25.23 per mV [1.11-571.82], p = 0.043) were independently associated with (+) genetic testing, whereas R wave in lead aVR was strongly negatively associated (OR 0.904 per 0.01 mV [0.83-0.98], p = 0.019). ROC curve analysis demonstrated that the PR interval (AUC = 0.71; optimal cut-off = 185 ms, sensitivity = 52.1%, specificity = 85.2%), QRS axis (AUC = 0.70; optimal cut-off = 60º, sensitivity = 51.1%, specificity = 90.2%), and S-wave in aVL (AUC = 0.68; optimal cut-off = 0.04 mV, sensitivity = 74.5%, specificity = 57.4%) were all statistically significant predictors of genetic test positivity (all p < 0.05).

	Negative	Positive	
Demographics	n = 61	n = 49	p-value
Age diagnosis (y)	51.9 ± 12.6	45.2 ± 15.7	**0.014**
Female gender	19 (31.1%)	25 (51.0%)	**0.034**
Index cases	51 (83.6%)	8 (16.3%)	**< 0.001**
ECG parameters			
QRS axis (º)	27.0 ± 29.6	52.1 ± 50.1	**0.002**
PR interval (ms)	163.6 ± 25.7	188.4 ± 33.7	**< 0.001**
QRS duration (ms)	105.7 ± 15.6	111.3 ± 14.9	0.058
Intraventricular disturbance	22 (36.1%)	9 (18.4%)	
RBBB	5 (22.7%)	3 (33.3%)	
iRBBB	13 (59.1%)	3 (33.3%)	
LAFB	4 (18.2%)	2 (22.2%)	
RBBB + LAFB	0 (0.0%)	1 (11.1%)	
QTc interval (ms)	402.7 ± 21.3	402.7 ± 23.4	0.996
R DI (mV)	0.724 ± 0.287	0.550 ± 0.269	**0.002**
S DI (mV)	0.07 [0.00-0.16]	0.15 [0.08-0.20]	**< 0.001***
S DII (mV)	0.16 [0.07-0.28]	0.15 [0.00-0.30]	0.586*
R DIII (mV)	0.18 [0.10-0.42]	0.42 [0.15-0.60]	**0.013***
S DIII (mV)	0.20 [0.06-0.47]	0.10 [0.00-0.35]	**0.03***
R aVR (mV)	0.05 [0.02-0.08]	0.02 [0.00-0.05]	**0.004**
S aVL (mV)	0.02 [0.00-0.17]	0.15 [0.03-0.36]	**< 0.001***
S aVF (mV)	0.15 [0.05-0.29]	0.13 [0.00-0.30]	0.330*
R V1 (mV)	0.19 [0.10-0.25]	0.20 [0.10-0.34]	0.525*
R V6 (mV)	0.13 [0.05-0.24]	0.20 [0.05-0.30]	0.115*

Values are expressed as mean ± standard deviation and median [interquartile range]. *Mann-Whitney U test. ECG, electrocardiogram; iRBBB, Incomplete Right Bundle Branch Block; LAFB, Left Anterior Fascicular Block; RBBB, right bundle branch block.

Conclusions: In patients with BrS, genetic test (+) is associated with distinct ECG conduction features, particularly PR prolongation and specific frontal plane voltage patterns, while clinical presentation and outcomes remain similar. These findings suggest that surface ECG parameters may aid in identifying patients with a higher likelihood of underlying pathogenic variants.

50E. SCORE DEVELOPMENT FOR PREDICTING ATRIAL FIBRILLATION RECURRENCE AFTER ELECTRICAL CARDIOVERSION

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Introduction: Electrical cardioversion (ECV) restores sinus rhythm in atrial fibrillation (AF), yet recurrence within 12 months remains frequent. Metabolic, respiratory and structural atrial factors, along with age and arrhythmia duration, may critically influence long-term rhythm maintenance.
Objectives: To characterize a real-world ECV cohort, identify predictors of AF recurrence, and develop a pragmatic clinical score to stratify recurrence risk.

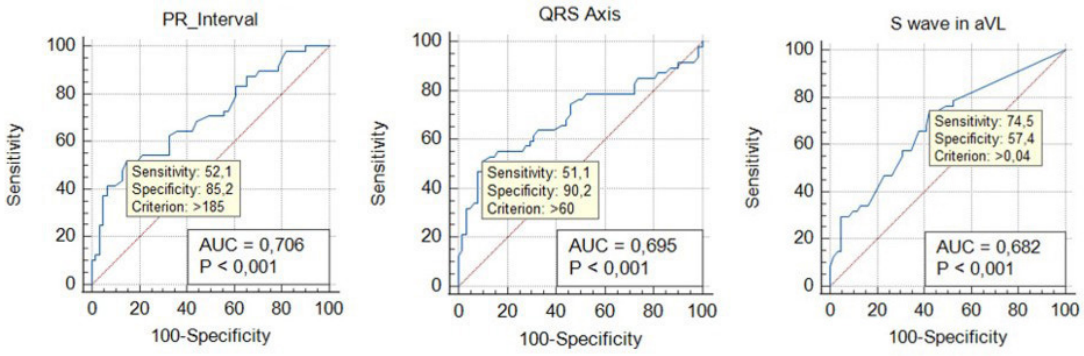

Figure 49E

Methods: This retrospective study included 387 patients undergoing ECV between January 2021 and June 2024 in a single hospital center (ambulatory and emergency). Clinical and echocardiographic data were collected. The primary endpoint was AF recurrence at 12 months. Multivariate logistic regression identified independent predictors. A simulated ROC analysis assessed score performance and optimal threshold using Youden's index.
Results: Mean age was 66.3 ± 10.4 years; 63% were male and 72% had persistent AF (median duration 8 months). Obesity (BMI ≥ 30 kg/m²) was present in 43%, Obstructive sleep apnea in 32%, and mean Left Atrial Volume Index (LAVI) was 43 ± 12 mL/m². Acute ECV success was 89%, with 12-month recurrence of 54.6%. Independent predictors of recurrence included: Obesity (OR 1.84; p = 0.006), Obstructive sleep apnea (OR 1.91; p = 0.017), LAVI > 48 mL/m² (OR 1.63; p = 0.041). Age ≥ 70 years and AF duration > 12 months were both statistically significant in univariate analysis. Due to strong physiological plausibility, they were retained and incorporated into the scoring model. The resulting score (0-7 points) assigned: Obesity (2 points), Obstructive sleep apnea (2 points), LAVI > 48 mL/m² (1 point), age ≥ 70 years (1 point), and AF duration > 12 months (1 point). Simulated ROC analysis demonstrated moderate discrimination, with an AUC consistent with clinically useful prediction. The optimal Youden-derived threshold was ≥ 3 points, yielding a sensitivity of 78% and a specificity of 55%. Patients with scores ≥ 4 demonstrated recurrence probabilities exceeding 70%, whereas those scoring ≥ 6 points approached recurrence rates above 90%.
Conclusions: Obesity, Obstructive sleep apnea and left atrial enlargement are the strongest independent predictors of AF recurrence after ECV. This score provides a simple, intuitive tool for risk stratification, identifying patients with moderate risk at ≥ 3 points and those with high likelihood of recurrence at ≥ 4 points. This score may support clinical decision-making.

EP selecionados

4E. BEYOND THE ABLATION INDEX: INVESTIGATING UNIPOLAR ELECTROGRAM GUIDANCE FOR ATRIAL FIBRILLATION ABLATION

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Introduction: While pulsed field ablation (PFA) is reshaping atrial fibrillation (AF) ablation strategies, radiofrequency (RF) ablation remains widely used. Metrics such as the Ablation Index (AI), which integrates power, contact force, and catheter stability, have improved procedural standardization by providing a surrogate for lesion quality. However, lesion durability ultimately depends on achieving true transmurality, and the unipolar electrogram (UE) transition to a purely positive morphology has emerged as a physiologic marker of this endpoint. How this signal-based marker relates to conventional AI-guided ablation remains uncertain.
Objectives: This study aimed to evaluate how AI-guided ablation correlates with the physiologic endpoint of UE transition, comparing standard and high-power short-duration (HPSD) applications.
Methods: A retrospective, point-by-point analysis of 373 RF applications was performed in consecutive pulmonary vein isolation procedures for AF under three-dimensional electroanatomical mapping guidance. Ablation was performed using an irrigated 4 mm contact force–sensing catheter, supported by a long sheath. Posterior-inferior PV segments were targeted with 90 W × 4 s HPSD applications, and antero-superior segments with 50 W, aiming for an AI ≈ 500. For HPSD lesions (n = 248), the proportion achieving UE transition within 4 s was assessed. For 50 W lesions (n = 125), RF time and AI at UE transition were compared with total RF duration and final AI using the Wilcoxon signed-rank test.
Results: UE transition occurred in 117/248 (47.2%) HPSD applications and 72/125 (57.6%) 50 W applications. Among 50 W lesions with UE transition, median RF time and AI at transition were 12.6 s (IQR 8.7-17.4) and 480 (IQR 390-515), significantly lower than total RF time [18 s (IQR 14.0-20.5)] and final AI [520 (IQR 510-520); p < 0.001]. At 6-month follow-up, no AF recurrence was documented.

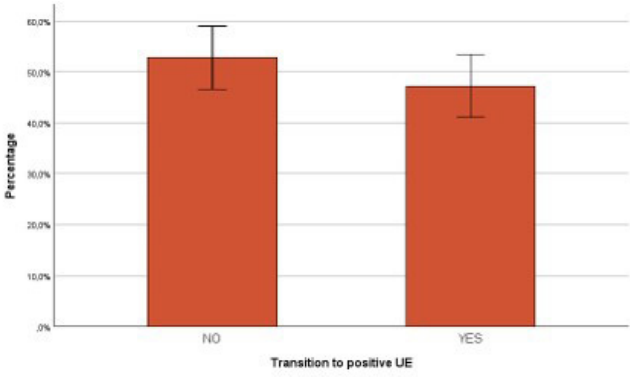

Figure 1. *Proportion of HPSD applications achieving UE transition with 95% binomial confidence intervals. UE, unipolar electrogram.*

Conclusions: Fixed 90 W × 4 s dosing did not consistently achieve the physiologic marker of transmurality, and approximately 40% of standard applications also failed to reach UE transition. These findings suggest that UE-guided titration may complement AI-based strategies, enabling a more individualized, physiology-driven approach to RF lesion formation in the era of energy diversification.

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16E. CATHETER ABLATION OF PREMATURE VENTRICULAR CONTRACTIONS IMPROVES QUALITY OF LIFE AND REDUCES HEALTHCARE UTILIZATION: A REAL-WORLD COHORT STUDY

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Introduction: Premature ventricular contractions (PVCs) can cause significant symptoms and impaired quality of life (QoL). Catheter ablation is highly effective, but real-world data integrating arrhythmic outcomes with patient-reported measures remain limited.
Objectives: This study aimed to evaluate the impact of successful PVC ablation on QoL, symptom burden, arrhythmic outcomes, and healthcare utilization in a real-world cohort.
Methods: We conducted a retrospective, single-centre, observational before-and-after study including 103 consecutive patients (46% women; mean age 59 ± 16 years) who underwent successful PVC ablation between 2007 and 2025. Patients with unsuccessful ablation, alternative causes of symptoms, or death during follow-up were excluded. Clinical characteristics, cardiovascular risk factors, β-blocker and antiarrhythmic drug (AAD) use, and healthcare utilization were recorded. QoL was assessed using the EQ-5D-5L index, EQ-VAS, and the ASTA symptom questionnaire, administered via structured telephone interview. PVC burden was quantified by 24-hour Holter monitoring, and LVEF was measured echocardiographically before and ≥ 6 months after ablation.
Results: Median PVC count decreased from 20,471 [IQR 13,247-34,379] to 23 [IQR 3-218] per 24 hours (p < 0.001), corresponding to a burden reduction from 24.7% to 0.8% (p < 0.001). Mean LVEF increased from 54 ± 9% to 56 ± 8% (p = 0.09). QoL improved significantly: EQ-5D-5L index 0.74 ± 0.16 → 0.85 ± 0.14 (p < 0.001), EQ-VAS 67 ± 15 → 84 ± 15 (p < 0.001), and ASTA symptom score 51.7 ± 14.7 → 29.2 ± 16.8 (p < 0.001). AAD use declined from 36% to 8% (p < 0.001) and β-blocker use from 74% to 25% (p < 0.001). Unplanned visits for palpitations decreased from 14.6% to 1% (p < 0.001). Recurrence occurred in 13 patients (12.6%), yielding a sustained success rate of 87.4%.

Table 1. Clinical, echocardiographic, and patient-reported outcomes before and after premature ventricular contraction (PVC) ablation. Data are presented as mean ± SD or median [IQR], as appropriate.

Variable	Pre-ablation	Post- ablation	p-value
Age, years (mean ± SD)	59 ± 16	—	—
Female sex, n (%)	47 (46%)	—	—
PVC count / 24 h, median [IQR]	20 471 [13 247-34 379]	23 [3-218]	< 0.001
PVC burden, %	24.7	0.8	< 0.001
LVEF, % (mean ± SD)	54 ± 9	56 ± 8	0.09
EQ-5D-5L index (mean ± SD)	0.74 ± 0.16	0.85 ± 0.14	< 0.001
EQ-VAS (mean ± SD)	67 ± 15	84 ± 15	< 0.001
ASTA symptom score (mean ± SD)	51.7 ± 14.7	29.2 ± 16.8	< 0.001
Antiarrhythmic drug use, n (%)	37 (36%)	8 (8%)	< 0.001
β-blocker use, n (%)	76 (74%)	26 (25%)	< 0.001
Unplanned visits for palpitations, n (%)	15 (14.6%)	1 (1.0%)	< 0.001
Recurrence, n (%)	—	13 (12.6%)	—

AAD, antiarrhythmic drug; ASTA, Arrhythmia-Specific questionnaire in Tachycardia and Arrhythmia; EQ-5D-5L and EQ-VAS, EuroQol instruments; LVEF, left ventricular ejection fraction; PVC, premature ventricular contraction; QoL, quality of life.

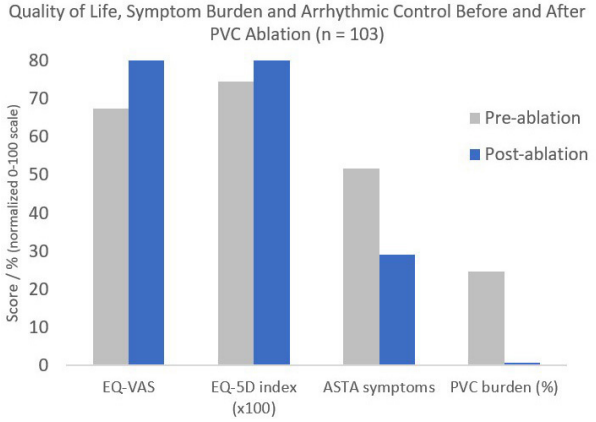

Figure 1. *Changes in quality of life (EQ-5D-5L index, EQ-VAS), symptom burden (ASTA), and arrhythmic control (PVC burden) before and after successful PVC ablation (n = 103). All parameters improved significantly (p < 0.001). Bars represent mean values (± SD for EQ and ASTA; median for PVC burden).*

Conclusions: In this real-world cohort, catheter ablation of PVCs led to sustained improvements in quality of life, symptom burden, and arrhythmia control, with a marked reduction in healthcare utilization and medication

use. These findings reinforce the patient-centred value of PVC ablation beyond arrhythmia suppression.

27E. SCAR-RELATED VENTRICULAR TACHYCARDIA ABLATION USING A DUAL-ENERGY LATTICE-TIP ABLATION SYSTEM GUIDED BY PRE-PROCEDURAL IMAGING

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Introduction: Catheter ablation for scar-related ventricular tachycardia (VT) remains challenging due to limitations in ventricular mapping and the need for deeper lesions to eliminate intramural conduction channels.
Objectives: To evaluate the feasibility, safety, and acute efficacy of a structured multimodal planning strategy combined with a hybrid high-energy ablation protocol for scar-related VT.
Methods: We prospectively studied consecutive patients undergoing endocardial VT ablation guided by pre-procedural imaging integration. Multidetector computed tomography (MDCT) and late gadolinium enhancement cardiac magnetic resonance (LGE-CMR) were segmented and co-registered into the mapping system to prioritize zones of interest. A standardized hybrid protocol—radiofrequency followed by pulsed-field ablation at each site—was applied. Acute success was defined as complete elimination of local abnormal ventricular activity (LAVA) and VT non-inducibility.
Results: Nineteen patients (mean age 68 ± 8 years; 74% ischemic cardiomyopathy; 63% VT storm) were included. Imaging predicted LAVA-bearing segments with sensitivity/specificity of 80%/85% for MDCT and 67%/75% for LGE-CMR. Complete LAVA abolition was achieved in 94.7% of patients, and VT non-inducibility in 73.7%. One major vascular complication occurred; no deaths or cardiac perforations were observed. After a median follow-up of 106 days, VT recurrence occurred in 10.5% of patients.
Conclusions: A structured imaging-guided workflow combined with hybrid RF–PFA ablation is feasible and safe, achieving high acute success in scar-related VT. Further studies should confirm long-term outcomes and optimize energy delivery parameters.

29E. THE ROLE OF ELECTROCARDIOGRAPHIC IMAGING IN ABLATION OF IDIOPATHIC VENTRICULAR TACHYCARDIA

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Introduction: Precise localization of arrhythmogenic foci is critical for the success of radiofrequency catheter ablation (RCA) in patients with premature ventricular contractions (PVCs) or idiopathic ventricular tachyarrhythmias (IVT). Reliable preprocedural tools that aid localization are therefore of significant clinical interest.
Objectives: To evaluate the diagnostic accuracy of electrocardiographic imaging (ECGi) compared with conventional 12-lead ECG in identifying the site of origin of IVTs.
Methods: In this retrospective, single centre study, consecutive patients undergoing RCA for PVCs or ITVs were included. All patients underwent 12-lead ECG, and 32% also underwent ECGi with a 252-electrode vest and thoracic CT scan (CardioInsight®). ECG locations from 12 lead recordings were interpreted by both arrhythmologists and nonarrhythmologists. For ECGi, the earliest activated site was considered the arrhythmia origin. Electrophysiology (EP) study with successful ablation defined the reference standard.
Results: Thirty-seven patients were analyzed (mean age 53 ± 14.6 years, 45.9% male). Compared with 12-lead ECG, ECGi demonstrated superior sensitivity (90.9% vs. 56.9%), specificity (99.4% vs. 97.1%), and overall diagnostic accuracy (98.9% vs. 94.6%; all p = 0.025). Furthermore, ECGi use was associated with significantly shorter EP procedure times (92.1 ± 23.3 vs. 157.9 ± 62.5 minutes; p < 0.05).

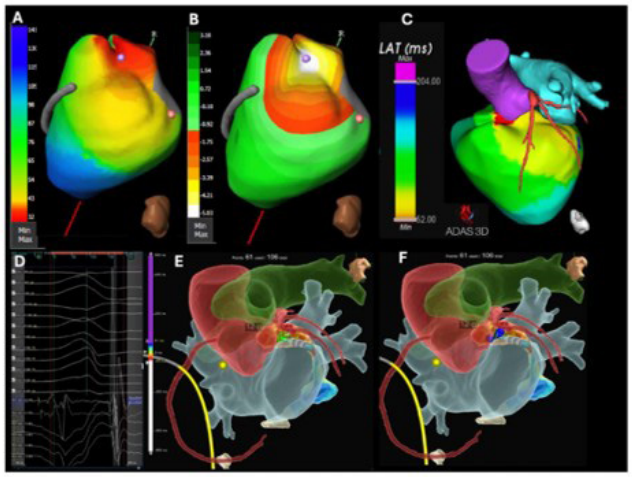

Figure 1: A. ECG imaging demonstrating the activation map of the PVC with the earliest activated area (origin of the PVC) in the LV summit; **B.** ECG imaging isopotential map showing high voltage activated area in the same area; **C.** Segmentation of ECGi into ADAS 3D software before integration into the invasive 3D mapping system; **D.** 12-lead ECG of the clinical PVC ; **E.** 3D invasive mapping system with earliest activated area in the same epicardial area mapped through the coronary sinus directly with the ablation catheter (no need to use multipolar catheter); **F.** final ablation setting with total suppression of the PVC (dark blue dots).

Conclusions: ECGi provided more accurate localization of arrhythmia origins than conventional 12-lead ECG and was associated with shorter procedure times. Incorporating ECGi into pre-procedural planning may improve efficiency and outcomes in RCA.

37E. IMPACT OF SODIUM-GLUCOSE COTRANSPORTER-2 INHIBITORS ON RECURRENCE AFTER ATRIAL FIBRILLATION ABLATION IN PATIENTS WITH INDICATIONS FOR SGLT2I THERAPY

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Introduction: Sodium-glucose cotransporter 2 inhibitors (SGLT2i) are associated with cardiovascular benefits that extend beyond glycemic control, including reductions in heart failure events and atrial fibrillation (AF) incidence. Whether these pleiotropic effects translate into improved rhythm outcomes after catheter ablation in patients with a pre- existing indication for SGLT2i therapy is a topic of ongoing investigation.
Objectives: To systematically evaluate the impact of SGLT2i therapy on AF recurrence after catheter ablation, including the need for redo ablation, and to assess relevant clinical secondary outcomes in patients with an established indication for SGLT2i.
Methods: A systematic search (December 2025) of PubMed, Cochrane Library, Scopus, and Web of Science identified observational studies and randomized data comparing outcomes in patients treated with SGLT2i versus controls after AF catheter ablation. Eligible studies included patients with guideline-based indications for SGLT2i. The primary outcome was AF recurrence and redo ablation. Secondary outcomes comprised all-cause mortality, all-cause hospitalization, and atrial arrhythmia recurrence. Pooled risk ratios (RR) with 95% confidence intervals (CI) were calculated using inverse-variance random-effects models. Heterogeneity was assessed with the I^2 statistic.

Results: From 192 screened records, 9 observational studies published between 2022 and 2025 were included, encompassing 18974 patients. SGLT2i therapy was associated with a significant reduction in AF recurrence after catheter ablation (RR 0.61, 95%CI 0.52-0.70; I^2 = 0%). The need for redo ablation was not significantly different (RR 0.25, 95%CI 0.03-1.87; I^2 = 64%). SGLT2i use was associated with lower all-cause mortality (RR 0.64, 95%CI 0.45-0.91; I^2 = 0%) and reduced all-cause hospitalization (RR 0.82, 95%CI 0.74-0.92; I^2 = 0%). A significant reduction in atrial arrhythmia recurrence was also observed (RR 0.53, 95%CI 0.42-0.66; I^2 = 0%). Across analyses, treatment effects were consistent with low heterogeneity except for the need for redo ablation.
Conclusions: In patients with an established indication for SGLT2i undergoing AF catheter ablation, SGLT2i therapy is associated with a reduction in AF and atrial arrhythmia recurrence, alongside lower mortality and hospitalization rates. Although a reduction in redo ablation did not reach statistical significance, these findings suggest a clinically meaningful adjunctive role for SGLT2i in rhythm control strategies after AF ablation.

Selecionados

23D. CLINICAL OUTCOMES OF BACHMANN'S BUNDLE VERSUS RIGHT ATRIAL PACING: A REAL-WORLD STUDY

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Introduction: Conventional right atrial (RA) pacing is associated with P-wave prolongation, interatrial conduction delay, and left-sided atrioventricular dyssynchrony, potentially leading to electromechanical dysfunction and increased arrhythmogenesis. Bachmann's bundle (BB) pacing preserves physiological conduction and has been linked to reduced atrial fibrillation (AF) burden and favourable haemodynamics. Nevertheless, comparative real-world data remains limited.
Objectives: To compare procedural parameters, atrial thresholds, complication rates, and atrial arrhythmia outcomes between BB and RA pacing.
Methods: We retrospectively analysed consecutive patients undergoing atrial lead implantation for sinus node dysfunction at a tertiary center between October 2022 and December 2025. Procedural parameters, electrical thresholds, procedure-related complications, and atrial arrhythmia occurrence were evaluated.
Results: A total of 220 patients were included (mean age 75 years; 45% men), with 175 in the RA and 45 in the BB cohort. Mean follow-up was 160 ± 119 days (BB) and 838 ± 431 days (RA). BB pacing was associated with longer procedure time (81.0 ± 25.1 vs. 66.9 ± 30.2 minutes, p = 0.023) and fluoroscopy time (12.3 ± 6.7 vs. 5.8 ± 3.8 minutes, p < 0.001). At discharge, atrial capture thresholds were similar (0.56 vs. 0.54 V, p = 0.82), while atrial sensing was higher in the RA cohort (3.56 vs. 2.56 mV, p = 0.006). During follow-up, atrial undersensing (< 0.5 mV) and rise in capture threshold (> 1.5 V) were infrequent and comparable between RA and BB groups (6.7% vs. 8.1%, p = 0.75; and 4.7% vs. 8.9%, p = 0.27). The percentage of atrial pacing was similar (51.9% ± 34.6% RA vs. 58.5% ± 34.7% BB), with high pacing burden (> 20%) in both groups (74.0% RA vs. 79.5% BB). Procedure-related complications were only observed in RA cohort, including three macro-dislodgements and two lead dislodgements. The incidence of atrial arrhythmias was significantly higher in the RA cohort compared with the BB cohort (59.8% vs. 33.3%, p = 0.02).
Conclusions: Bachmann's bundle pacing is safe and feasible, with comparable lead performance and low complication rates. Despite longer procedural times, BB pacing was associated with a lower incidence of atrial arrhythmias, supporting its role as a physiological atrial pacing strategy with potential benefits in atrial rhythm preservation and haemodynamics.

24D. EXTRACTION OF NON-INFECTED LEADS: A NEW PARADIGM FOR PORTUGAL PACING

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Introduction: Transvenous lead extraction (TLE) has become widespread use mainly for infection indications. However, the use in non-infectious (N-I) causes, such as lead dysfunction or venous occlusion, is increasing. Some advocate it should be a more regular procedure for N-I. The PISA technique, a rotational sheath–based approach that does not require locking stylets, offers greater procedural flexibility and allows alternative strategies based on a tailored risk–benefit. Particularly relevant in cases of venous access occlusion where complete lead removal may not be required once access is restored.
Objectives and methods: Retrospective study of patients (P) submitted to TLE with PISA technique for N-I indications at a national referral center between February 2013 and December 2024. Clinical and radiological success, according to HRS/EHRA criteria, complications, and mortality were analyzed.
Results: Of 283P undergoing TLE, 71 underwent extraction of 117 leads. Median lead dwell time was 72 months (36–120). 36P (51%) were male, with a median age of 67 years (IQR 43–120). Heart failure was present in 48%, with dilated cardiomyopathy in 27%, and median LVEF was 55% (IQR 39–60). Only 6% had previous extractions, and 11% had more than 3 leads removed. Pacemakers were most frequently extracted (41%), followed by implantable cardioverter-defibrillators (31%) and cardiac resynchronization therapy systems (28%). The main indication was device dysfunction (80%), followed by venous access related problem (14%), chronic pain (1.4%) and pre-radiotherapy (1.4%). Venous occlusions (11%) included mostly brachiocephalic trunk (7%), subclavian vein (1.4%), and two superior vena cava syndrome, both treated with concomitant endovascular intervention. Device reimplantation was performed in 85%, mostly during the same procedure. Clinical and radiological success rates were 92.6% and 97.2%, respectively. No major complications occurred and only 1P had a minor pocket hematoma. During the first year, 11% were hospitalized (4% for cardiac causes non-related to TLE), and 1P died. Over a median follow-up of 29 months (IQR 14–67), all-cause mortality was 15%.
Conclusions: This study presents probably the broader series of N-ITLE in Portugal. In a high-volume referral center, N-I TLE was extremely safe and effective, with excellent success rates and minimal complications. This supports TLE as a reliable strategy in N-I cases and should be more often considered compared to abandoned leads.

30D. CLINICAL OUTCOMES IN LEFT BUNDLE BRANCH AREA AND BIVENTRICULAR PACING RESYNCHRONIZATION THERAPY

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Introduction: Cardiac resynchronization therapy (CRT) with biventricular pacing (BVP) is an established treatment for patients with heart failure and reduced left ventricular ejection fraction (HFrEF). Recently, conduction system pacing (CSP) using left bundle branch pacing (LBBP) has emerged as a potential alternative to BVP for CRT delivery. However, comparative data between these pacing strategies remain limited.
Objectives: To compare clinical outcomes between BVP and LBBP in patients undergoing CRT.
Methods: This prospective, single-center observational registry enrolled consecutive patients with HFrEF (left ventricular ejection fraction [LVEF] < 50%) who underwent CRT implantation between January 2023 and January

2025. The primary outcome was echocardiographic response to CRT during follow-up, defined as an absolute LVEF increase > 5%, while super-response was defined as an LVEF increase > 15%. Secondary outcomes included all-cause mortality and emergency room (ER) visits for acute heart failure (AHF). Multivariable Cox proportional hazards models were used to estimate the risk of ER visits related to AHF.
Results: 176 patients were included, with 88 treated with CSP and 88 with BVP. Age and sex distribution were similar between the two groups. The median follow-up was 835 days (IQR 629; 967). Baseline QRS duration did not differ significantly between CSP and BVP (167 ± 26 vs. 161 ± 26 ms; p = 0.276), nor did baseline LVEF (30 ± 9% vs. 32 ± 8%, respectively; p = 0.236). Compared with baseline, paced QRS duration was significantly reduced in both CSP (122 ± 16 vs. 167 ± 26 ms; p < 0.001) and BVP (148 ± 28 vs. 161 ± 25 ms; p = 0.001), and was significantly narrower with CSP than with BVP. Echocardiographic response occurred more frequently in the CSP group (90% vs. 61%; p = 0.005), as did super-response to CRT (40% vs. 20%; p = 0.05). Improvement in LVEF was greater with CSP (15 ± 10% vs. 8 ± 12%; p = 0.002). ER visits for AHF were less frequent among patients treated with CSP (2% vs. 11%; p = 0.017), while mortality did not differ between groups (p = 0.552). On multivariable analysis, CSP was an independent predictor of reduced ER visits for AHF (adjusted HR 0.198, 95%CI 0.042–0.927; p = 0.04).
Conclusions: In this cohort, CRT with CSP outperformed BVP, translating into superior outcomes and supporting CSP as an alternative strategy for resynchronization therapy.

46E. CLINICAL IMPACT OF CAPTURE TYPE IN LEFT BUNDLE BRANCH AREA PACING

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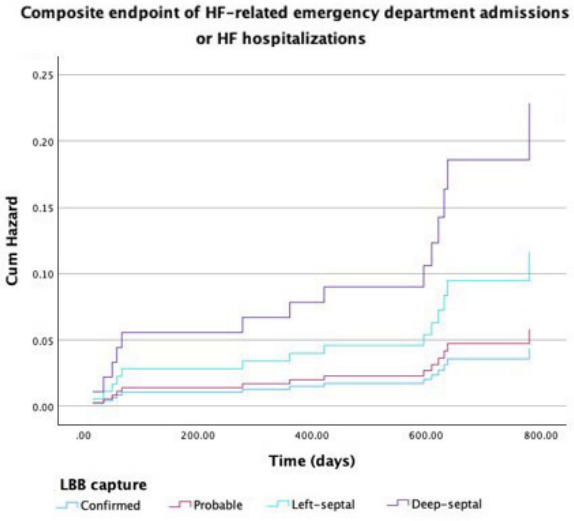
Introduction: Left bundle branch area pacing (LBBAP) enables physiological ventricular activation, but whether different capture types translate into distinct clinical outcomes remains uncertain.
Objectives: To compare outcomes according to LBBAP capture type (confirmed, probable, left-septal, and deep-septal).
Methods: This single-center, retrospective study included consecutive patients who underwent LBBAP implantation between September 2022 and July 2024. Confirmed LBB capture was defined by QRS transition with output reduction (from non-selective to left ventricular septal pacing or to selective LBB capture), paced V6 RWPT < 75 ms (< 80 ms in LBBB), V6–V1 interpeak interval > 44 ms, or selective capture on programmed stimulation. The primary outcome includes a composite of heart failure (HF)-related emergency department (ED) admissions or HF hospitalization.
Results: A total of 294 patients were included: 222 (75.6%) had confirmed, 36 (12.2%) probable, 20 (6.8%) left-septal, and 16 (5.4%) deep-septal capture. Mean age was 74.5 ± 9.7 years, 68.4% were male, and median follow-up was 19.5 months. The most frequent indication was third-degree atrioventricular (AV) block (35.7%), followed by second-degree AV block (19.4%) and HF with reduced ejection fraction (14.6%). Paced QRS duration was significantly shorter with confirmed LBB capture (115.7 ± 13.8 ms) compared with left-septal (126.5 ± 17.5 ms; p = 0.016) and deep-septal capture (139.6 ± 15.7 ms; p < 0.001), with no difference versus probable capture (121.1 ± 14.3 ms; p = 0.224). Paced left ventricular activation time (LVAT) was also significantly shorter in the confirmed group (74 ms, IQR 12) compared with probable (85 ms, IQR 12), left-septal (96 ms, IQR 8), and deep-septal capture (92 ms, IQR 12; p < 0.001). Baseline LVEF was 49.6 ± 12.7%, slightly lower in the left-septal group (42.1 ± 12.7%; p = 0.035). Post-pacing LVEF (53.1 ± 11.2%) and LVEF improvement (4.7 ± 9.4%) were not significantly different across capture types (p = 0.417 and p = 0.802, respectively). In the multivariable Cox model adjusted for age, sex, and pacing percentage, and using confirmed LBB capture as the reference, no significant differences in clinical events were observed for probable (HR 1.326, 95%CI 0.155–11.353; p = 0.797) or left-septal capture (HR 2.653, 95%CI 0.533–13.218; p = 0.234). In contrast, deep-septal capture was associated with a significantly higher risk of the primary outcome (HR 5.204, 95%CI 1.213–22.321; p = 0.026).



Conclusions: Confirmed LBB capture resulted in more physiological ventricular activation, with shorter paced QRS and LVAT. Deep-septal capture was associated with a higher risk of adverse events, suggesting that achieving true conduction-system capture may be essential for optimizing the clinical benefit of LBBAP.

Síncope

14E. PREDICTIVE VALUE OF PASSIVE TILT-INDUCED ASYSTOLE FOR SPONTANEOUS SYNCOPE: INSIGHTS FROM A SINGLE-CENTRE ILR COHORT

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Introduction: Tilt-induced asystole is considered a marker of cardioinhibitory syncope, but its predictive value for spontaneous events remains debated.
Objectives: To determine whether asystole during the passive phase of the tilt-table test (TTT) predicts spontaneous asystole documented by an implantable loop recorder (ILR), and to assess outcomes according to ILR-guided management.
Methods: This retrospective single-centre cohort (2015–2025) included adults with syncope and asystole ≥ 3s occurring during the passive phase of a standard two-stage TTT protocol (70º, 20-min passive phase followed by nitroglycerin if negative). Patients whose first event occurred only after nitroglycerin were excluded. All subsequently underwent ILR implantation (median TTT-to-ILR interval 29.5 days [IQR 15.0–45.3]). ILR-documented symptomatic episodes were classified (blinded to TTT results) as bradycardia with asystole (pause ≥ 3 s), bradycardia without asystole, or normal rhythm. The primary endpoint was TTT–ILR concordance (positive predictive value, PPV). Secondary endpoints were 1-year syncope recurrence and outcomes according to therapy. Treatment was ILR-directed and included pacemaker (PM) implantation or cardioneuroablation (CNA); these were analysed as a single treated group.
Results: Among 74 patients (mean age 54.7 ± 14.4 years; 58.1% women), ILR follow-up averaged 21.6 ± 7.9 months. ILR recorded ≥1 symptomatic event in 54 (73.0%). ECG-based ILR mechanisms were bradycardia with asystole 19 (25.7%), bradycardia without asystole 23 (31.1%), and normal rhythm 12

(16.2%). TTT-ILR concordance for asystole was 25.7% (19/74). Among ILR-asystolic patients, 16 were treated based on ILR findings (13 PM; 3 CNA). At 1 year, syncope recurred in 12.5% of treated patients vs. 46.6% in the non-treated group (RR 0.27, 95%CI 0.07–1.01; p = 0.019); all recurrences occurred in PM recipients.

Table 1. Baseline characteristics of the study population (n = 74)

Characteristic	Value
Age, years	54.7 ± 14.4
Female, n (%)	43 (58.1)
Hypertension	40 (54.1)
Dyslipidaemia	25 (33.8)
Coronary artery disease	12 (16.2)
Heart failure	18 (24.3)
Atrial fibrillation	17 (23.0)
Chronic kidney disease	5 (6.8)
Type 2 diabetes mellitus	17 (23.0)
Medications	
ACEi/ARB	32 (43.2)
β-blocker	19 (25.7)
MRA	21 (31.1)
ARNI	15 (20.3)
SGLT2 inhibitor	39 (52.7)
Antiarrhythmic drugs	8 (10.8)

Values are presented as mean ± SD or n (%). ACEi, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; MRA, mineralocorticoid receptor antagonist; ARNI, angiotensin receptor–neprilysin inhibitor; SGLT2, sodium–glucose cotransporter 2.

Table 2. Tilt-table test and ILR findings

Parameter	Value
Mean TTT pause, s	6.5 ± 2.3
Time to syncope, min	15.7 ± 3.2
Time from TTT to ILR implantation, days	29.5 (15.0–45.3)
ILR follow-up, months	21.6 ± 7.9
ILR with symptomatic event	54 (73.0%)
No symptom–rhythm correlation	20 (27.0%)
ILR-documented mechanism (n = 74)	
Bradycardia with asystole	19 (25.7%)
Bradycardia without asystole	23 (31.1%)
Normal rhythm	12 (16.2%)
TTT–ILR concordance for asystole	19 (25.7%)
PM implantation	13 (68.4%)
Cardioneuroablation (CNA)	3 (15.8%)
Total treated	16 (84.2%)
Syncope recurrence (1 year)	
Treated (only in PM recipients)	2/16 (12.5%)
Not treated/others	27/58 (46.6%)
Risk ratio (95%CI)	0.27 (0.07–1.01)
Fisher's exact p-value	0.019

TTT, tilt-table test; ILR, implantable loop recorder; PM, pacemaker; CAN, cardioneuroablation.

Conclusions: Passive-phase TTT asystole predicted spontaneous asystole in only one in four patients, suggesting TTT may overestimate cardioinhibition. ILR-guided therapy markedly reduces recurrence.

18E. CARDIONEUROABLATION FOR CARDIOINHIBITORY REFLEX SYNCOPE: PAIRED IMPROVEMENTS IN SINUS PAUSES AND ATRIOVENTRICULAR NODAL CONDUCTION IN A SINGLE-CENTRE COHORT

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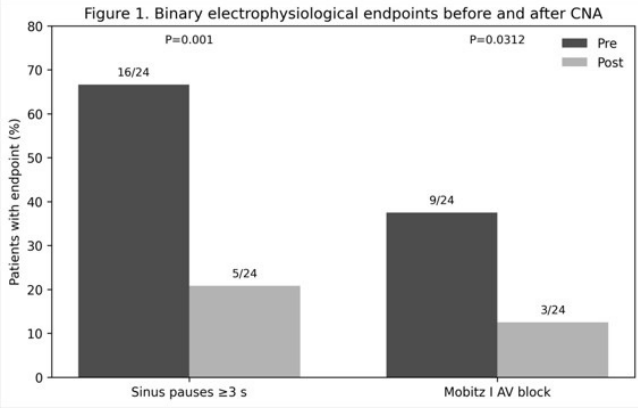
Introduction: Cardioneuroablation (CNA) is used in selected patients with cardioinhibitory (CI) reflex syncope to attenuate excessive vagal influence, but objective procedural and electrophysiological endpoints remain heterogeneous.
Methods: We conducted a single-centre retrospective cohort study (2020–2025) including patients undergoing CNA for CI reflex syncope. Complete-case paired analyses were performed for each endpoint. Exact McNemar tests were used for paired binary variables, and Wilcoxon signed-rank tests were used for paired continuous variables (two-sided). Continuous variables are reported as median [interquartile range (IQR)]. Intraprocedural heart-rate (HR) success was defined as an immediate post-ablation ≥20% stable increase from baseline. CNA was performed using a predefined atrial ganglionated plexus (GP) target set (7 sites); the median number of GP targets addressed at the index procedure was 4 [2–4] (range 2–7), with higher cumulative target counts in patients undergoing repeat procedures.

Table 1. Baseline Characteristics and Paired Endpoints after Cardioneuroablation.

Characteristic	Total	Post	P value
Baseline characteristics			
Patients — no.	25		
Age — yr*	39.2±12.9		
Male sex — no. (%)	17 (68.0)		
Hypertension — no. (%)	4 (16.0)		
Dyslipidaemia — no. (%)	4 (16.0)		
Re-intervention — no. (%)	3 (12.0)		
Paired electrophysiological endpoints			
Sinus pauses ≥3 s — no./total (%)	16/24 (66.7)	5/24 (20.8)	0.001
Mobitz I second-degree atrioventricular block — no./total (%)	9/24 (37.5)	3/24 (12.5)	0.0312
PQ interval — ms†	275 [239–336] (n=8)	185 [175–225] (n=8)	0.0078
Immediate intraprocedural heart rate — bpm†	70 [58–76] (n=17)	85 [75–95] (n=17)	<0.0001
Intraprocedural heart-rate success‡ — no./total (%)	11/17 (64.7)		
24-hour Holter mean heart rate — bpm†	69 [63–82] (n=11)	80 [69–90] (n=11)	0.0098
24-hour Holter minimum heart rate — bpm†	39 [34–47] (n=8)	48 [41–56] (n=8)	0.0547
Head-up tilt test negative — no./total (%)	2/11 (18.2)	7/11 (63.6)	0.0625
Syncope recurrence documented — no./total (%)	2/19 (10.5)		

* Plus–minus values are means ±SD.
† Values are median [interquartile range]. P values for continuous endpoints are from Wilcoxon signed-rank tests; P values for binary endpoints are from exact McNemar tests.
‡ Heart-rate success was defined as immediate post-ablation heart rate ≥100 bpm or a ≥20% increase from baseline.



Results: A total of 25 patients (Table 1) were included (age, 39.2 ± 12.9 years; male sex 68.0%); hypertension and dyslipidaemia were present in 4 of 25 patients (16.0%). Sinus pauses ≥ 3 s (Figure 1) decreased from 16 of 24 patients (66.7%) before CNA to 5 of 24 (20.8%) after CNA (11 improved and 0 worsened; P = 0.001). Mobitz I second-degree atrioventricular block decreased from 9 of 24 patients (37.5%) to 3 of 24 (12.5%) (6 improved and 0 worsened; P = 0.03). PQ interval shortened from 275 [239–336] ms to 185 [175–225] ms (Δ −90 [−105 to −45] ms; P = 0.007; n = 8). Immediate intraprocedural HR increased from 70 [58–76] bpm to 85 [75–95] bpm (Δ +20 [+10 to +23] bpm; p < 0.0001; n = 17); intraprocedural HR success was achieved in 11 of 17 patients (64.7%). On 24-hour Holter monitoring, mean HR increased from 69 [64–74] bpm to 80 [74–91] bpm (Δ +10 [+6 to +17] bpm; p = 0.009; n = 11), and minimum HR increased from 39 [34–47] bpm to 48 [41–56] bpm (Δ +7 [+2 to

+25] bpm; p = 0.05; n = 8). Paired head-up tilt testing (HUT) was available in 11 patients; HUT negativity increased from 2 of 11 patients (18.2%) to 7 of 11 (63.6%) (p = 0.0625). Syncope recurrence was documented in 10.5% of the cases. Re-intervention occurred in 3 patients (12.0%). The median duration of follow-up was 23 months (interquartile range, 13 to 36).
Conclusions: In this cohort of CI reflex syncope, CNA was associated with substantial improvements in objective bradyarrhythmic markers and atrioventricular conduction, accompanied by a reproducible immediate intraprocedural HR rise. These findings are hypothesis-generating and support prospective standardisation of CNA outcome assessment.

22E. INFLUENCE OF SEX ON VASOVAGAL RESPONSE PHENOTYPES DURING HEAD-UP TILT TESTING

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Introduction: Sex differences in vasovagal syncope have been reported, but the association with distinct hemodynamic response patterns during head-up tilt testing (HUTT) remains unclear. Since women have higher prevalence and recurrence of syncope, clarifying this relationship is crucial to optimize sex-specific diagnostic and management strategies. This study aimed to assess sex effects over HUTT positivity and response subtypes.
Methods: A retrospective single-centre analysis was conducted on 238 consecutive patients undergoing HUTT (62% female, 57 ± 22 years) using standardized Front Loaded (50%) and Fast Italian (50%) protocols. Responses were classified by VASIS (Type 1 mixed, Type 2 cardioinhibitory, or Type 3 vasodepressor). Multivariable logistic regression tested the independent effect of sex on response phenotype among positive tests, adjusting for age and protocol, with inverse probability weighting (IPW) as sensitivity analysis. Follow-up data were available for 150 patients.
Results: Overall, HUTT positivity was 70.5% (165/234) with no significant difference between females and males (73.8% vs. 65.2%, p = 0.209). Among all patients, males tended to exhibit higher cardioinhibitory rates (18% vs. 9%, p = 0.068). When analysing positive tests, this difference was significant: cardioinhibitory responses were observed more than twice as often in men than women (27.6% vs. 12.1%, p = 0.023). After adjustment for age and protocol, male sex remained independently associated with a cardioinhibitory phenotype (OR 2.74, 95%CI 1.15–6.55, p = 0.024), confirmed by IPW analysis (OR 2.53, 95%CI 1.10–5.82, p = 0.029). Vasodepressor responses were primarily age-dependent (OR 1.04 per year, 95%CI 1.02–1.07, p < 0.001), rather than sex-related. Chronotropic incompetence (2.1%), orthostatic hypotension (6.4%), and POTS (2.1%) showed no sex-related differences. Syncope recurrence at one-year follow-up occurred in 22.7% of patients, similar between sexes (25.0% vs. 19.0%, p = 0.43).

Table 1. Protocols

	Female (n = 158)	**Male** (n = 106)	p value
Front Loaded, n (%)	64 (40.5)	55 (51.9)	
Fast Italian, n (%)	82 (51.9)	37 (34.9)	
Classic Italian, n (%)	3 (1.9)	2 (1.9)	0.03
Passive, n (%)	9 (5.7)	12 (11.3)	

Table 2. Hemodynamic parameters measured during HUTT

	Female (n = 158)	**Male** (n = 106)	p value
Minimum measurable systolic blood pressure (mmHg), median (IQR)	78 (30)	84.5 (40)	0.436
Maximum measurable systolic blood pressure (mmHg), median (IQR)	128 (19)	129 (19)	0.664
Minimum measurable diastolic blood pressure (mmHg), median (IQR)	48 (23)	52.5 (25)	0.074
Maximum measurable diastolic blood pressure (mmHg), median (IQR)	84 (14)	88 (14)	0.019
Minimum measurable heart rate (bpm), mean ± s	60.9 (14.3)	59.8 (15.6)	0.559
Maximum measurable heart rate (bpm), median (IQR)	100 (36)	94.5 (28)	0.098
Average measurable heart rate (bpm), median (IQR)	78 (20)	74 (22)	0.089
Missing, n (%)	1 (0.6)	0	-

Table 3. Test positivity

	Female (n = 158)	**Male** (n = 106)	p value
Negative | n (%)	43 (27.2)	39 (36.8)	0,075
Positive | n (%)	114 (72.2)	64 (60.4)	

Table 4. Test results

	Female (n = 158)	**Male** (n = 106)	p value
Negative, n (%)	43 (27.2)	39 (36.8)	
Positive Type 1, n (%)	64 (40.5)	30 (28.3)	
Positive Type 2A, n (%)	3 (1.9)	3 (2.8)	
Positive Type 2B, n (%)	10 (6.3)	14 (13.2)	0.032
Positive Type 3, n (%)	37 (23.4)	17 (16)	
No positivity criteria, n (%)	1 (0.6)	3 (2.8)	

Table 5. Chronotropic incompetence, Dysautonomia, and Non-adaptive responses

	Female (n = 158)	**Male** (n = 106)	p value
Chronotropic incompetence, n (%)	7 (4.4)	2 (1.9)	0.322
Classic OH, n (%)	12 (7.6)	6 (5.7)	
Initial OH, n (%)	4 (2.5)	3 (2.8)	
Delayed OH, n (%)	0	2 (1.9)	
Orthostatic intolerance, n (%)	0	1 (0.9)	
PPS, n (%)	1 (0.6)	0	0.334
POTS, n (%)	5 (3.2)	1 (0.9)	
Dysautonomia, n (%)	1 (0.6)	0	
Cardiovascular autonomic neuropathy, n (%)	0	1 (0.9)	

OH , Orthostatic Hypotension; PPS, Psychogenic Pseudosyncope; POTS, Postural Orthostatic Tachycardia Syndrome.

Table 6. Syncope recurrence at one year follow up

	Female (n = 158)	**Male** (n = 106)	p value
Yes, n (%)	27 (17.1)	13 (12.3)	
No, n (%)	75 (47.5)	55 (51.9)	0.268
Missing, n (%)	56 (35.4)	38 (35.8)	

Table 7. Therapeutic decisions

	Female (n = 158)	**Male** (n = 106)	p value
Device			0.734
Pacemaker, n (%)	5 (3.2)	3 (2.8)	
ICD, n (%)	1 (0.6)	0	
CRT-D, n (%)	0	1 (0.9)	
EP Study, n (%)			0.004
Cardioneuroablation, n (%)	0	4 (3.8)	
Pharmacological therapy, n (%)	8 (5.1)	5 (4.7)	0.955
Tilt Training referral| n (%)	8 (5.1)	2 (1.9)	0.319
Missing, n (%)	51 (32.3)	37 (34.9)	-

ICD, Implantable Cardioverter Defibrillator; CRT-D, Cardiac Resynchronization Therapy Defibrillator; EP study, Electrophysiology Study.

Conclusions: While overall HUTT positivity rates do not differ between sexes, women predominantly show vasodepressor or mixed vasovagal responses, while men are nearly three times more likely to exhibit cardioinhibitory responses — a finding robust across different analytical approaches. These results suggest sex-specific differences in autonomic modulation during vasovagal episodes, with potential implications for risk stratification and clinical management.

23E. DIAGNOSTIC IMPACT OF HEAD-UP TILT TABLE TESTING OVER ONE YEAR IN A TERTIARY CENTER

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Introduction: Syncope is a common cause of emergency room attendance. Head-Up Tilt Table Testing (HUTT) is a vital exam in identifying the etiologies and should be considered in recurrent syncope, orthostatic hypotension (OH), postural orthostatic tachycardia syndrome (POTS), psychogenic pseudosyncope (PPS), carotid sinus syndrome (CSS) and autonomic disorders.

Objectives: Retrospective analysis of HUTTs performed over one year at a tertiary center regarding test outcomes and therapeutic interventions.

Methods: A total of 271 HUTTs performed in 2024 were analyzed and 7 were excluded (3 inconclusive, 3 missing protocol/results, 1 only for CSS evaluation). Clinical records and complementary diagnostic tests were reviewed. Hemodynamic data were obtained via continuous monitoring.

Results: 264 HUTTs were included, 59.8% female and 40.2% male, aged 13–90 years old (mean 57.2), with 68.6% ≥ 50 years old. Hypertension was present in 29.2%, dyslipidemia in 43.9%, diabetes mellitus in 12.9%, atrial fibrillation and other arrhythmias in 5.3%, ischemic heart disease in 3.4%, cerebrovascular disease in 3.8% and epilepsy in 4.2%. Left atrial dilation was present in 7% and moderate-severe valvular disease in 6%. Systolic function was generally preserved (mean LVEF 60 ± 7.2%, TAPSE 21.3 ± 4.2 mm, S' 12.5 ± 3.5 cm/s). Most tests used Front Loaded or Fast Italian protocols (45.1% each), 8% Passive, 1.9% Classic Italian. Additionally, 3 Autonomic, 5 Active standing and 2 Carotid sinus massage tests were performed. Results showed 31.1% negative, 67.4% positive (35.6% type 1; 2.3% type 2ª; 9.1% type 2B; 20.5% type 3) and 1.5% did not meet positivity criteria. Chronotropic incompetence was present in 3.4%. Autonomic and non-adaptative responses included 6.8% classic OH, 2.7% initial OH, 0.8% delayed OH, 2.3% POTS and 0.4% PPS, orthostatic intolerance, autonomic dysfunction and cardiovascular autonomic neuropathy. Post-HUTT interventions involved event recorder implantation in 9.5%, pacemaker in 3%, ICD and CRT-D in 0.4% (9.1% had a pre-existing event recorder, 2.3% a pacemaker and 0.4% an ICD and CRT-P). An electrophysiological study was conducted in 3% (1.5% cardioneuromodulation) and 4.9% started pharmacological therapy. Syncope recurrence occurred in 15.2% at one year follow-up.

Conclusions: HUTT demonstrated high diagnostic utility, reinforcing its central role in evaluating unexplained syncope and guiding therapeutic management to reduce episodes of recurrent syncope.