

FARAVIEW NELLA FIBRILLAZIONE ATRIALE: STRUMENTO ESSENZIALE O COMPLESSITÀ AGGIUNTIVA?

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2023 – 2026: a three-year history

The NEW ENGLAND JOURNAL of MEDICINE
N ENGL J MED 389;18 NEJM.ORG NOVEMBER 2, 2023

ORIGINAL ARTICLE

Pulsed Field or Conventional Thermal Ablation for Paroxysmal Atrial Fibrillation

Energy Modality	Declared Ablation Strategy	no. / total no. (%)
Pulsed Field Ablation	8 applications per vein rotating and alternating basket / flower deployments*	305/305 (100)
	31mm catheter used	226/305 (74.1)
	35mm catheter used	75/305 (24.6)
	Both 31mm and 35 mm catheters used	4/305 (1.3)
Radiofrequency Ablation	Wide area circumferential ablation	157/167 (94.0)
	Individual PV isolation	10/167 (6.0)
	Continuous "drag" of ablation catheter	64/167 (38.3)
	Point-by-point	103/167 (61.7)
	Contact force in grams [mean, (SD)]	14.2 (10.4)
	Maximum anterior power in watts [mean, (SD)]	42.2 (5.3)
Cryoballoon Ablation	Maximum posterior power in watts [mean, (SD)]	41.7 (6.1)
	One application, 180 seconds	3/135 (2.2)
	Two applications, 150 seconds	1/135 (0.7)
	Two applications, 180 seconds	40/135 (29.6)
	Two applications, varying duration	29/135 (21.5)
	Three applications, varying duration	5/135 (3.7)
	4+ applications, varying duration	6/135 (4.4)
	Combination	13/135 (9.6)
	Time to Isolation	13/135 (9.6)
	Unspecified	25/135 (18.5)

Primary
failure, d
antiarrhyth

Treatment Success (%)

N at Risk

Days from Index Procedure

nature medicine
2026

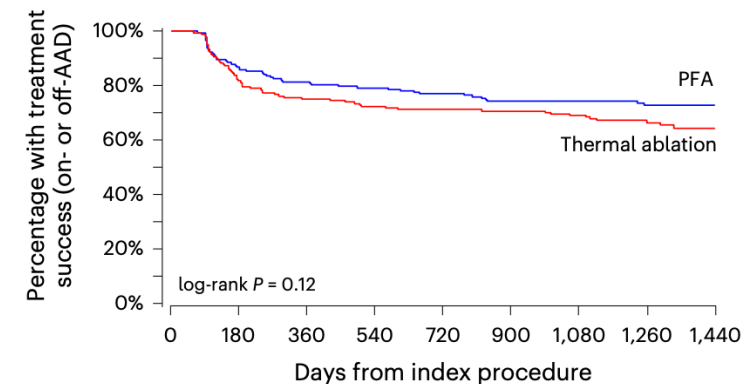


Article

<https://doi.org/10.1038/s41591-026-04246-4>

Pulsed field ablation versus conventional thermal ablation for paroxysmal atrial fibrillation: 4-year outcomes in the ADVENT-LTO study

Primary Efficacy Outcome: freedom from AF/AT/AFL recurrence lasting ≥30 seconds, cardioversion or repeat ablation after a 3-month blanking period



- Freedom from hospital-based arrhythmia intervention: 85.6% PFA, 78.6% thermal; HR=0.64, 95% CI: 0.38–1.05, p=0.08
- Fewer repeat ablations (10.4% PFA, 17.7% thermal; P = 0.04)
- Progression to persistent AF (2.6% PFA, 4.6% thermal; HR = 0.55, 95% CI: 0.16–1.88).

Paroxysmal AF: 305 PFA vs 302 Thermal (RF & Cryo)

Paroxysmal AF: 183 PFA vs 181 Thermal (RF & Cryo)

Something beyond PVI...the RF teaching

2024 ESC Guidelines for the management of atrial fibrillation.
«Pulmonary vein isolation...the cornerstone of AF catheter ablation»

January 27, 2010

JAMA

Comparison of Antiarrhythmic Drug Therapy and Radiofrequency Catheter Ablation in Patients With Paroxysmal Atrial Fibrillation

A Randomized Controlled Trial

David J. Wilber, MD; Carlo Pappone, MD, PhD; Petr Neuzil, MD; Angelo De Paola, MD; Frank Marchlinski, MD; Andrea Natale, MD; Laurent Macle, MD; Emile G. Daoud, MD; Hugh Calkins, MD; Burr Hall, MD; Vivek Reddy, MD; Giuseppe Augello, MD; Matthew R. Reynolds, MD, MSc; Chandan Vinekar, MSc; Christine Y. Liu, MPH; Scott M. Berry, PhD; Donald A. Berry, PhD; for the ThermoCool AF Trial Investigators

- symptomatic AF within 6 months before
- AF duration shorter than 30 days

February 19, 2014

JAMA

Radiofrequency Ablation vs Antiarrhythmic Drugs as First-Line Treatment of Paroxysmal Atrial Fibrillation (RAAFT-2)

A Randomized Trial

Carlos A. Morillo, MD, FRCP¹; Atul Verma, MD, FRCP²; Stuart J. Connolly, MD, FRCP¹; Karl H. Kuck, MD, FHRS³; Girish M. Nair, MBBS, FRCP⁴; Jean Champagne, MD, FRCP⁵; Laurence D. Sterns, MD, FRCP⁶; Heather Beresh, MSc¹; Jeffrey S. Healey, MD, MSc, FRCP¹; Andrea Natale, MD⁷; for the RAAFT-2 Investigators

- Paroxysmal AF lasting more than 30 seconds (≤ 4 episodes within the prior 6 months);

Catheter ablation vs. antiarrhythmic drug treatment of persistent atrial fibrillation: a multicentre, randomized, controlled trial (SARA study)

Lluís Mont^{1*}, Felipe Bisbal¹, Antonio Hernández-Madrid², Nicasio Pérez-Castellano³, Xavier Viñolas⁴, Angel Arenal⁵, Fernando Arribas⁴, Ignacio Fernández-Lozano⁷, Andrés Bodegas⁸, Albert Cobos⁹, Roberto Matía², Julián Pérez-Villacastín³, José M. Guerra⁴, Pablo Ávila⁵, María López-Gil⁶, Víctor Castro⁷, José Ignacio Arana⁸, and Josep Brugada¹, on behalf of SARA investigators

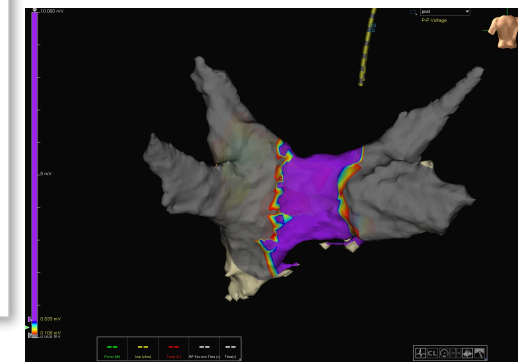
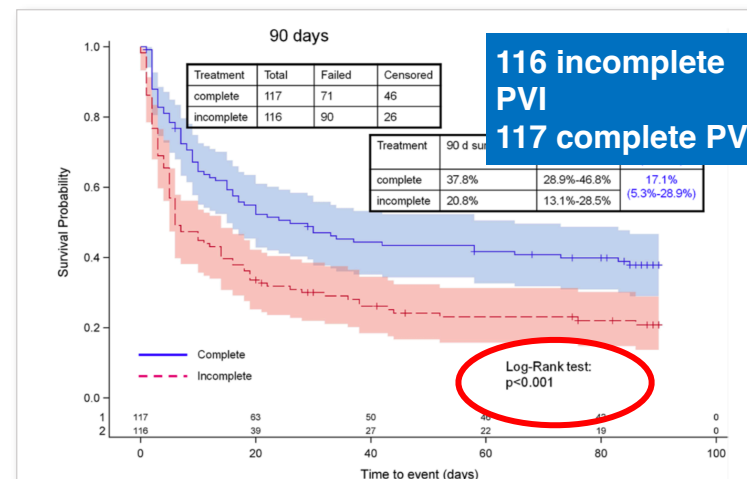
- Symptomatic AF: >7 or <7 days
- No long-standing persistent AF

AF ablation: Wide Area & Complete PVI

Impact of Complete Versus Incomplete Circumferential Lines Around the Pulmonary Veins During Catheter Ablation of Paroxysmal Atrial Fibrillation Results From the Gap-Atrial Fibrillation–German Atrial Fibrillation Competence Network 1 Trial

Karl-Heinz Kuck, MD; Boris A. Hoffmann, MD; Sabine Ernst, MD; Karl Wegscheider, PhD; Andras Treszl, MD; Andreas Metzner, MD; Lars Eckardt, MD; Thorsten Lewalter, MD; Günter Breithardt, MD; Stephan Willems, MD; for the Gap-AF–AFNET 1 Investigators*

Circ Arrhythm Electrophysiol. 2016



Circulation: Arrhythmia and Electrophysiology

Volume 7, Issue 1, February 2014; Pages 39–45
<https://doi.org/10.1161/CIRCEP.113.000922>



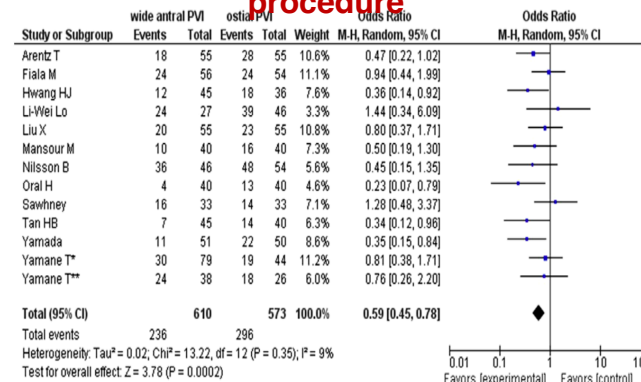
ORIGINAL ARTICLE

Comparative Effectiveness of Wide Antral Versus Ostial Pulmonary Vein Isolation

A Systematic Review and Meta-Analysis

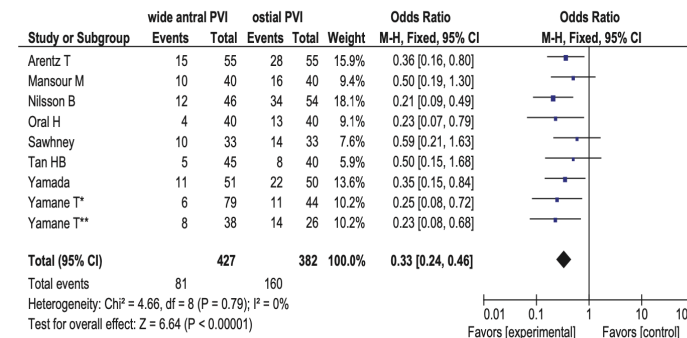
Riccardo Proietti, MD, PhD, Pasquale Santangeli, MD, Luigi Di Biase, MD, PhD, Jacqueline Joza, MD, Martin Louis Bernier, MD, Yang Wang, MD, Antonio Sagone, MD, Maurizio Viecca, MD, Vidal Essebag, MD, PhD, and Andrea Natale, MD

Antral vs ostial; outcome: atrial tachyarrhythmias recurrence after first procedure



atrial tachyarrhythmias recurrence significantly lower in the antral group (OR, 0.59; 95% CI, 0.45–0.78; $P = 0.00002$)

Antral vs ostial; outcome of AF recurrence only after first procedure



AF recurrence significantly lower in the wide antral group (OR, 0.33; 95% CI, 0.24–0.46; $P < 0.00001$)

AF: the burden of LA Low Voltage/Scarring

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ISSN 0735-1097/05/\$30.00
doi:10.1016/j.jacc.2004.10.035

Pre-Existent Left Atrial Scarring in Patients Undergoing Pulmonary Vein Antrum Isolation

An Independent Predictor of Procedural Failure

Atul Verma, MD, Oussama M. Wazni, MD, Nassir F. Marrouche, MD, David O. Martin, MD, Fethi Kilicaslan, MD, Stephen Minor, MD, Robert A. Schweikert, MD, Walid Saliba, MD, Jennifer Cummings, MD, J. David Burkhardt, MD, Mandeep Bhargava, MD, William A. Belden, MD, Ahmad Abdul-Karim, MD, Andrea Natale, MD

Table 1. Characteristics of Patients With and Without Left Atrial Scarring

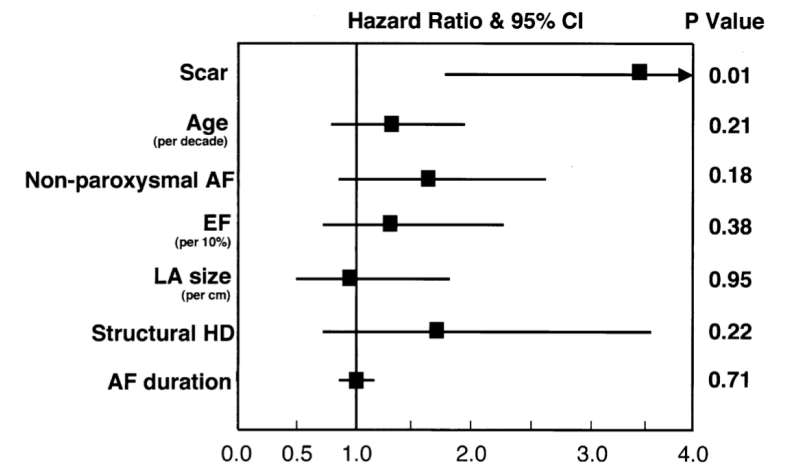
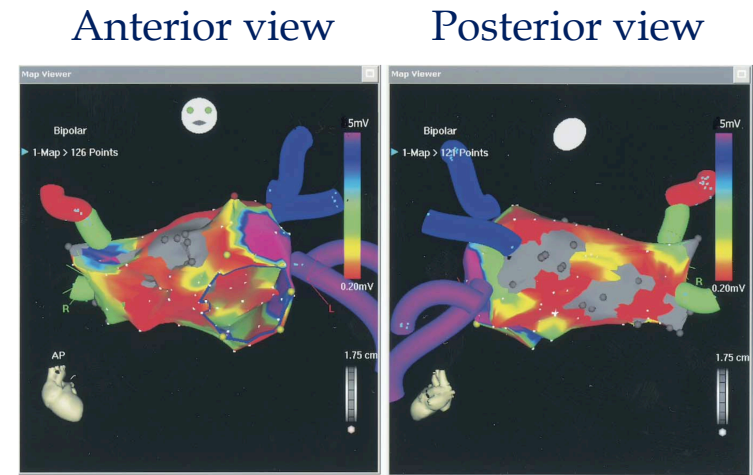
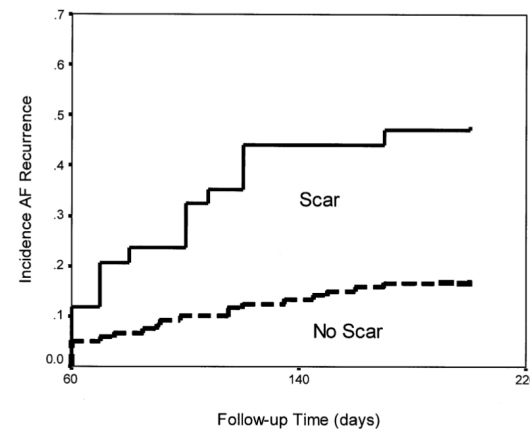
	LA Scar (n = 42)	No LA Scar (n = 658)	p Value
Age (yrs)	59 ± 13	53 ± 13	0.09
Paroxysmal AF (n)	11 (26%)	263 (40%)	0.07
AF duration (yrs)	7.0 ± 4.9	6.1 ± 5.4	0.39
Structural heart disease (n)	20 (48%)	289 (44%)	0.72
LA size (cm)	4.9 ± 0.7	4.0 ± 0.8	0.03*
Ejection fraction (%)	49 ± 8%	54 ± 7%	0.03*
C-reactive protein (mg/l)	5.93 ± 7.75	0.31 ± 0.68	0.01*
Brain natriuretic peptide (pg/ml)	191 ± 92	110 ± 80	0.06
Procedure time (min)	168 ± 47	162 ± 40	0.27
RF time (min)	47 ± 25	45 ± 28	0.48
AF recurrence (n)	24 (57%)	128 (19%)	0.003*

*Significant value (p < 0.05). Data are presented as the mean value ± SD or number (%) of patients.

AF = atrial fibrillation; LA = left atrial; RF = radiofrequency.

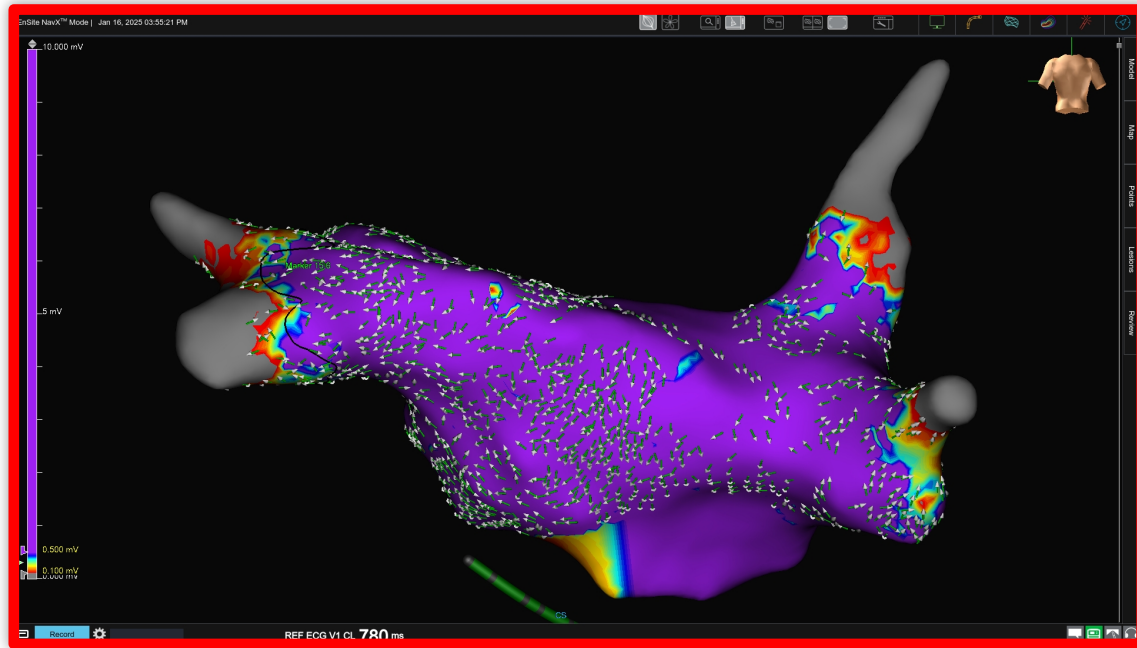
Late recurrence of AF after PVI (beyond two months) was significantly higher in patients with LAS (24 [57%] of 42) compared with patients without LAS (128 [19%] of 658; p=0.003) [Long rank p<0.01]

**Left atrial scarring:
26% of PAF**

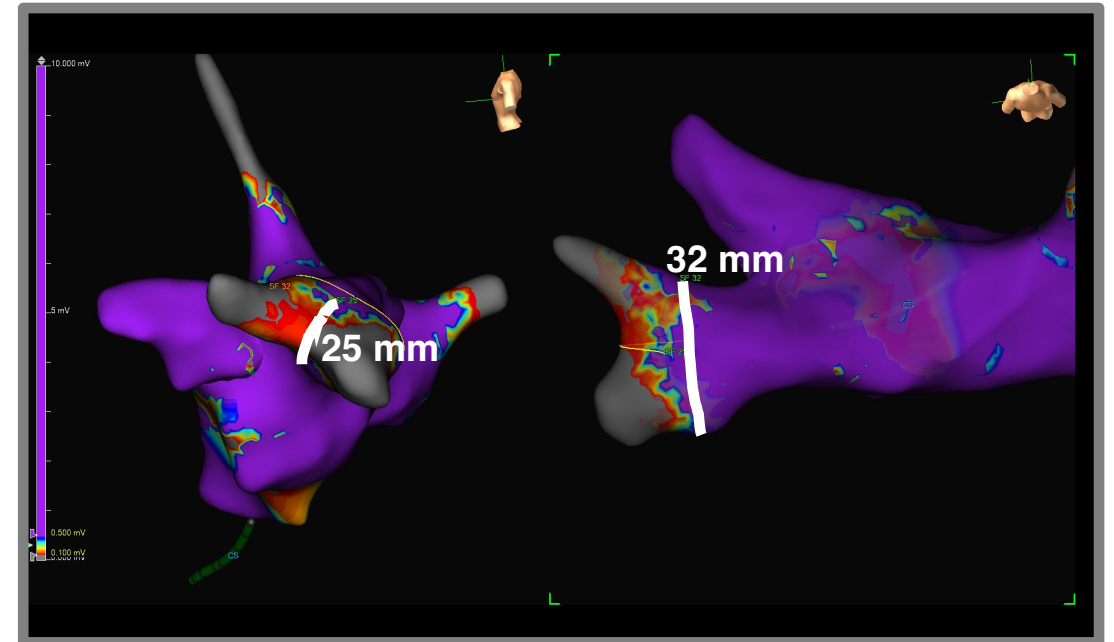


Only the presence of LAS was a significant independent predictor of late AF recurrence when combined with other clinical variables in Cox regression modeling
The hazard ratio for recurrence in patients with LAS was 3.4 (95% CI 1.3 to 9.4, p 0.01)

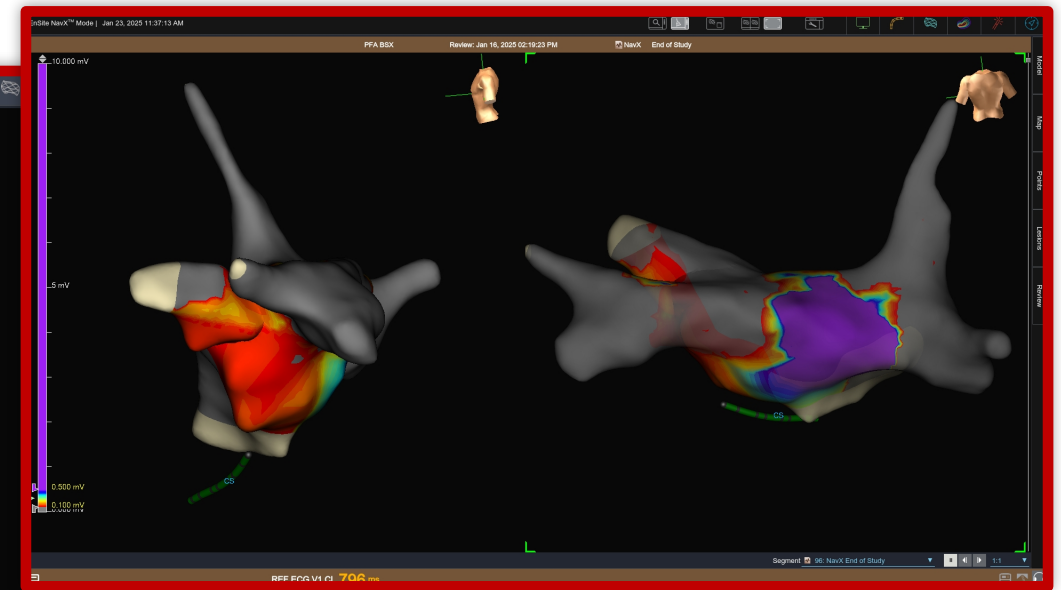
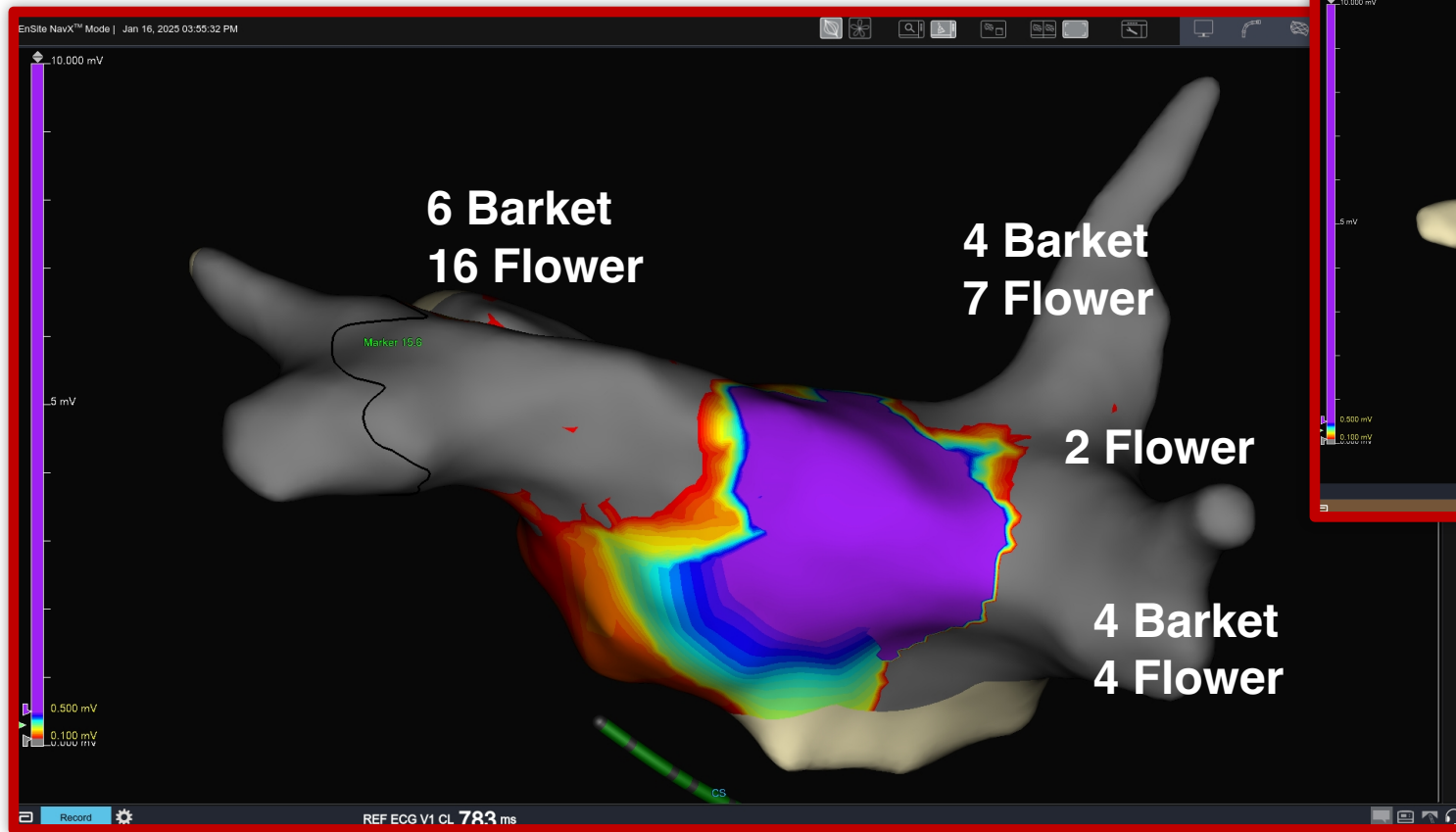
Early lesson of PFA with non-integrated EAM systems



Wide size of pulmonary vein common trunk



Early lesson of PFA with third part EAM

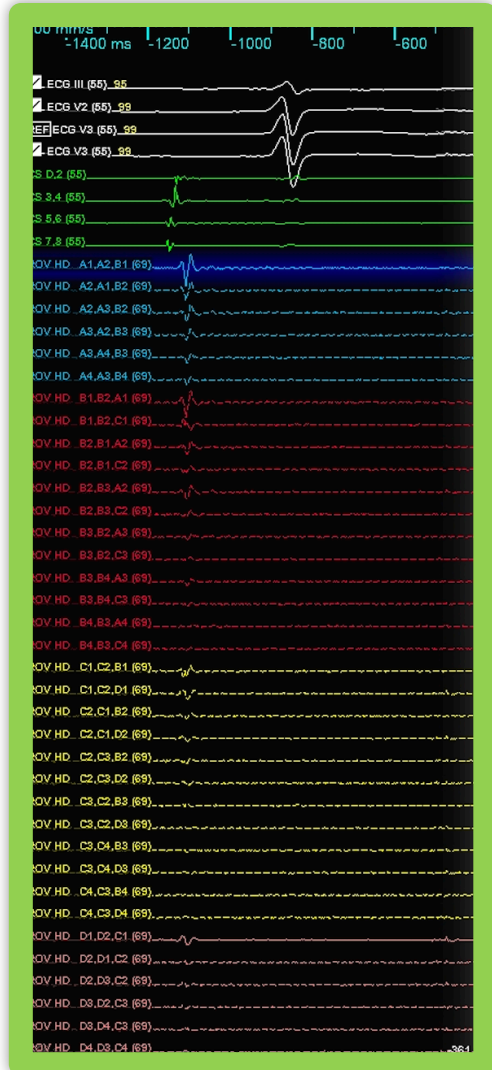


Lesson #1

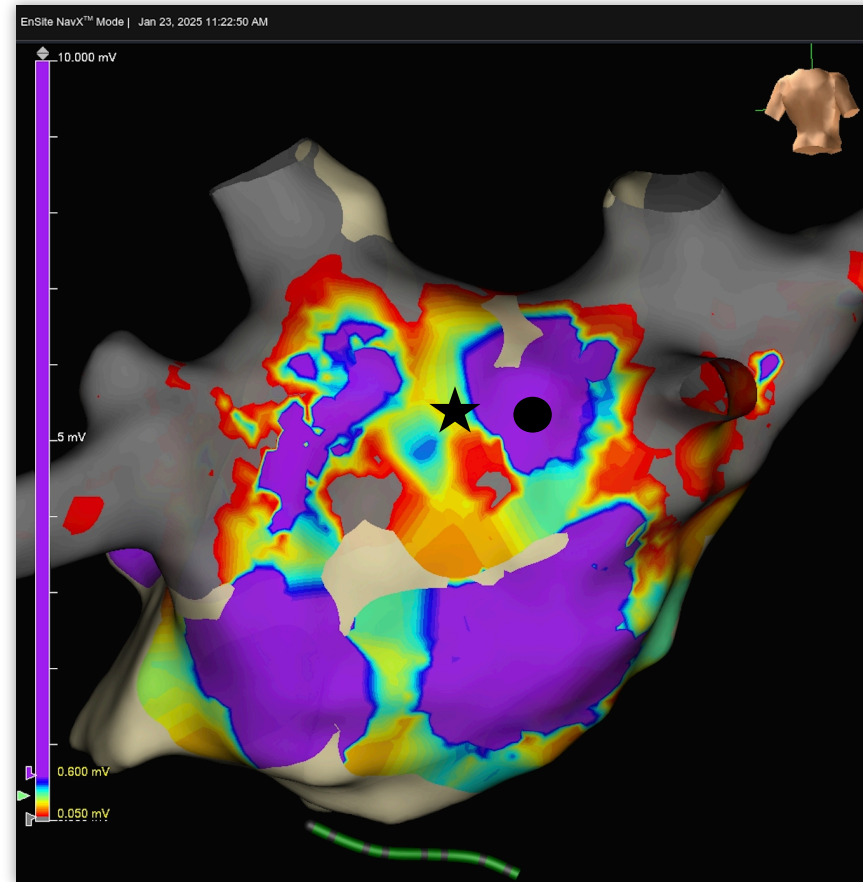
Modulating PFA lesions in order to
obtain
WACA in a difficult anatomical setting

PFA & non-integrated EAM systems

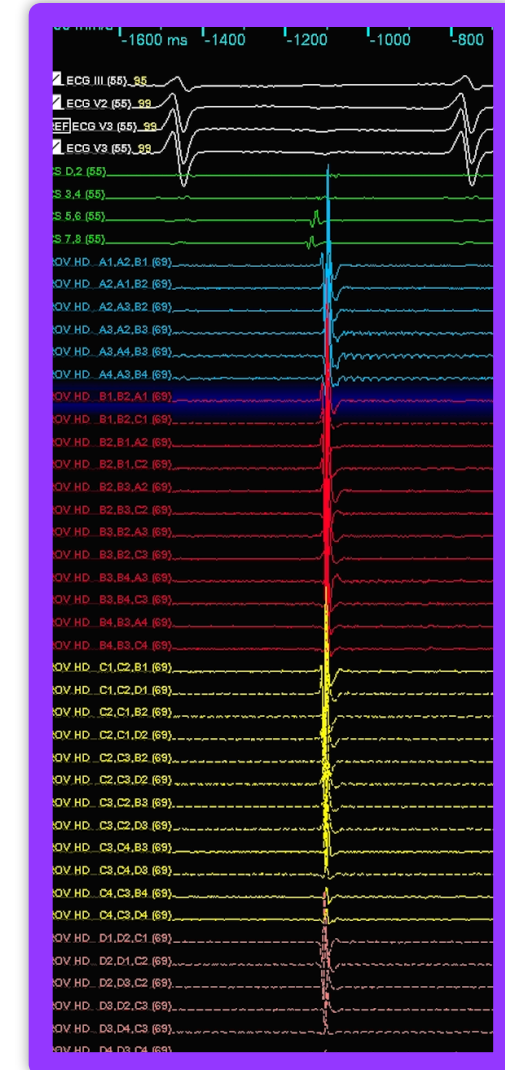
Low voltage areas



AF ablation re-do of parossistic AF



Sharp signals

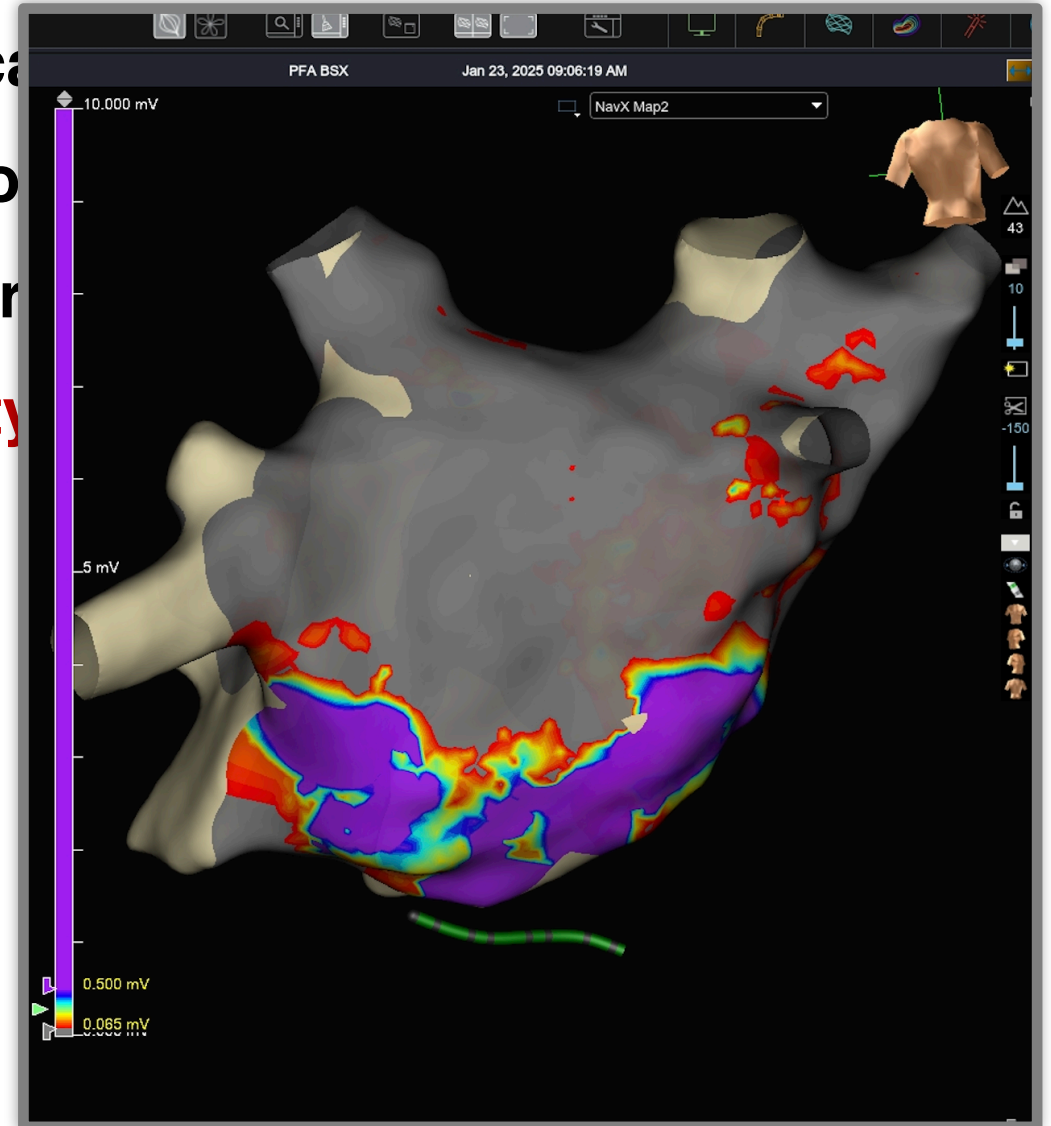
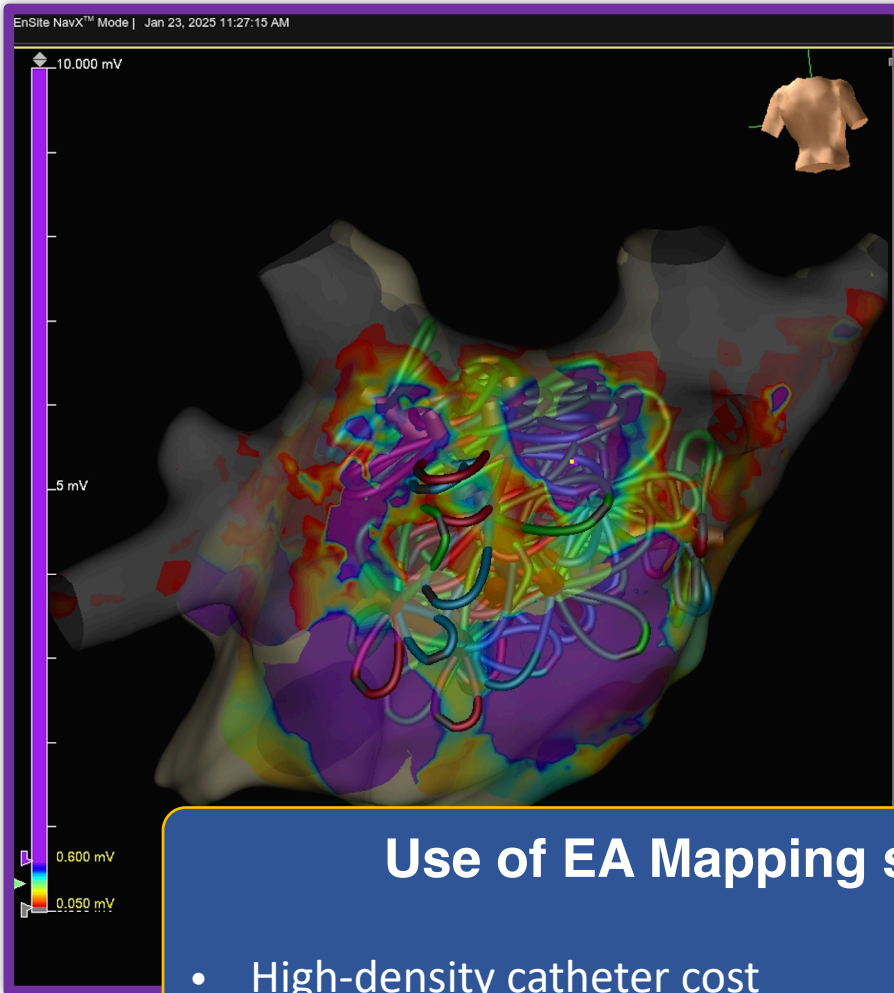


PFA & non-integrated EAM systems

- ❖ Farapulse catheter
- ❖ «Flower» catheter
- ❖ N=38 PFA episodes
- ❖ High-density catheter

Use of EA Mapping system

- High-density catheter cost
- Upgrade to latest version of the EAM system



Initial experience with Farapulse & non integrated EAM

Journal of Interventional Cardiac Electrophysiology
https://doi.org/10.1007/s10840-025-02129-1

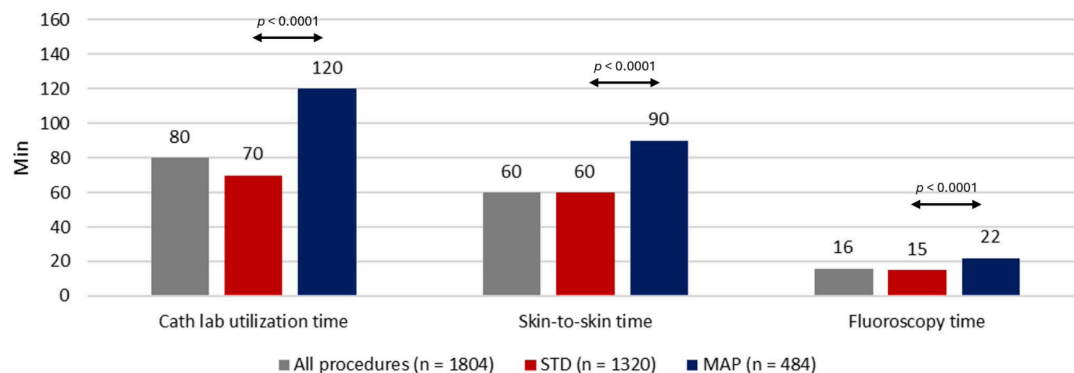
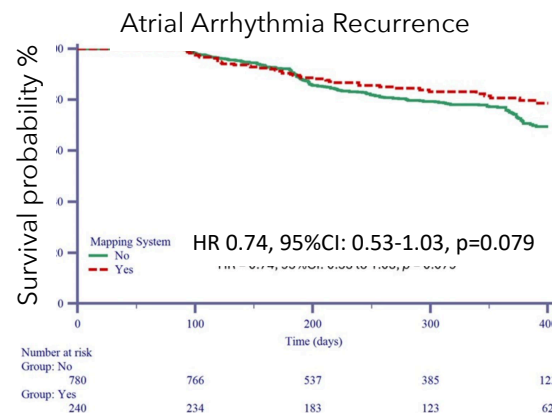
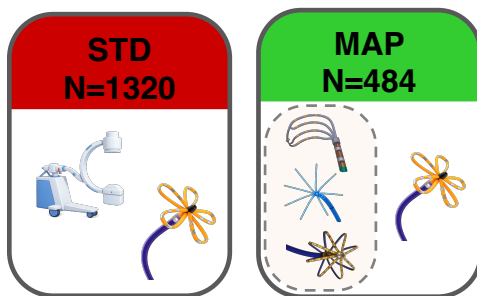
ORIGINAL RESEARCH

Conventional pulsed-field ablation versus pulsed-field ablation with non-integrated three-dimensional mapping for paroxysmal and persistent atrial fibrillation ablation

Roberto Rordorf^{1,2,4} · Stefano Bianchi² · Antonio Dello Russo^{3,4} · Francesco Solimene^{4,5} · Claudio Tondo^{6,7} · Maurizio Malacrida⁸ · Andrea Petretta⁹ · Antonio Rossillo¹⁰ · Sakis Themistoclakis¹¹ · Maurizio Russo¹² · Stefano Bandino¹³ · Matteo Bertini¹⁴ · Mario Volpicelli¹⁵ · Gianluca Zingarini¹⁶ · Gianfranco Tola¹⁷ · Ilaria Meynet¹⁸ · Gianfranco Mitacchione^{19,20} · Antonio De Simone²¹ · Beatrice Stegagno⁸ · Michele Magnocavallo² · Michela Casella^{4,9,22} · Vincenzo Schillaci⁵ · Fabrizio Tundo⁴ · Antonio Sanzo¹ · Giulio Zucchelli²³ · Saverio Iacopino⁹

Received: 26 May 2025 / Accepted: 18 August 2025

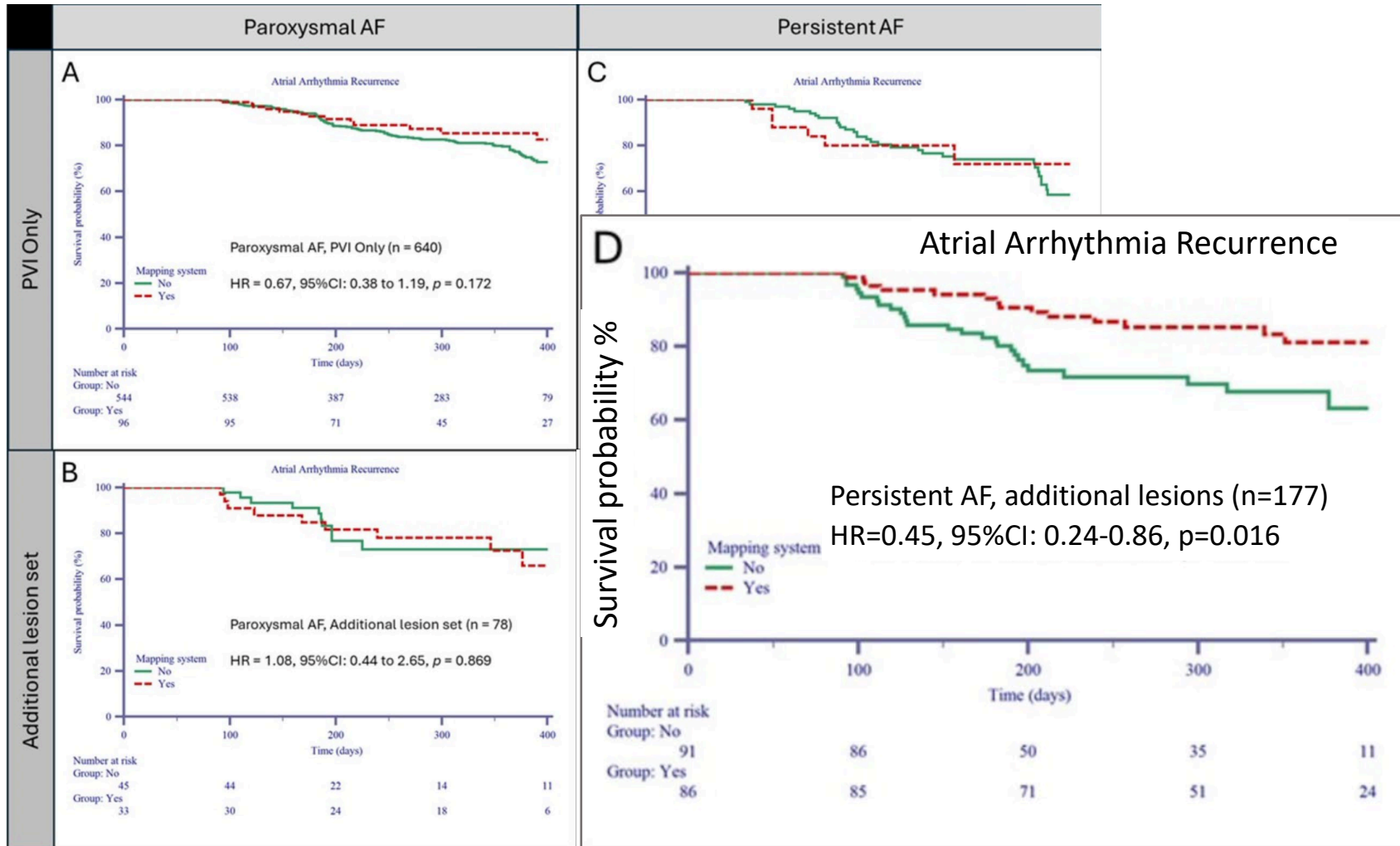
1804 Pts
July 2022-July 2024



Parameter	Overall population (n = 1804)	STD (n = 1320)	MAP (n = 484)	p
Age, years	62.5 ± 10	62.6 ± 10	62.4 ± 10	0.9706
Female Gender, n (%)	476 (26.4)	372 (28.2)	104 (21.5)	0.255612
Indication for ablation:				
• Paroxysmal AF, n (%)	• 1263 (70.0)	• 979 (74.2)	• 284 (58.7)	<0.0001
• Persistent AF, n (%)	• 541 (30.0)	• 341 (25.8)	• 200 (41.3)	
Left Atrial volume, ml	38.2 ± 13	36.9 ± 12	42.9 ± 14	<0.0001
LVEF, %	57.3 ± 8	57.4 ± 8	56.9 ± 9	0.5155
History of AT/AFL, n (%)	127 (7.0)	88 (6.7)	39 (8.1)	0.300707
Structural heart disease, n (%)	199 (11.0)	134 (10.2)	65 (13.4)	0.051374
Coronary artery disease, n (%)	180 (10.0)	114 (8.6)	66 (13.6)	0.002477
CKD, n (%)	36 (2.0)	25 (1.9)	11 (2.3)	0.574106
COPD, n (%)	51 (2.8)	37 (2.8)	14 (2.9)	0.874017
History of cancer, n (%)	117 (6.5)	78 (5.9)	39 (8.1)	0.105979
Sleep apnea, n (%)	86 (4.8)	69 (5.2)	17 (3.5)	0.136448
Diabetes, n (%)	223 (12.4)	181 (13.7)	42 (8.7)	0.003607
Hypertension, n (%)	901 (49.9)	670 (50.8)	231 (47.7)	0.264645
Antiarrhythmics, n (%)	985 (54.6)	702 (53.2)	283 (58.5)	0.246793
Beta-blockers, n (%)	894 (49.6)	612 (46.4)	282 (58.3)	<0.0001
Procedure type:				
• De Novo, n (%)	• 1531 (84.9)	• 1161 (88.0)	• 370 (76.4)	<0.0001
• Repeated ablation, n (%)	• 273 (15.1)	• 159 (12.0)	• 114 (23.6)	
Ablation target:				
• PVI only, n (%)	• 1328 (73.6)	• 1063 (80.5)	• 265 (54.8)	<0.0001
• Additional lesions, n (%)	• 476 (26.4)	• 257 (19.5)	• 219 (45.2)	
Mapping system used, n (%)	484 (26.8)	0 (0.0)	484 (100)	<0.0001
Intracardiac echocardiography, n (%)	550 (30.5)	362 (27.4)	188 (38.8)	<0.0001
Cath lab utilization time, min	80[60–120]	70[60–94]	120[100–165]	<0.0001
Skin-to-skin (primary operator) time, min	60[50–85]	60[50–70]	90[75–120]	<0.0001
Total fluoroscopy time, min	16[12–23]	15[11–21]	22[17–28]	<0.0001
Time to PVI, min	19[15–25]	19[15–25]	19[15–25]	0.7691
Number of PFA deliveries, n	39[32–49]	38[32–48]	40[32–54]	0.0003
Number of PFA deliveries at PVs, n	34[32–42]	34[32–46]	32[32–40]	<0.0001
Number of PFA deliveries outside of PVs, n	18[12–26]	16[12–20]	22[15–32]	<0.0001

Initial experience with Farapulse

Use of a 3D mapping system during PFA procedures in patients with persistent AF undergoing PVI plus posterior wall isolation was associated with a significantly better procedural success rate



2025: Farawave & Integrated Opal HDx Mapping: a breakthrough?

HeartRhythm

The Official Journal of the Heart Rhythm Society, The Cardiac Electrophysiology Society, and The Pediatric & Congenital Electrophysiology Society



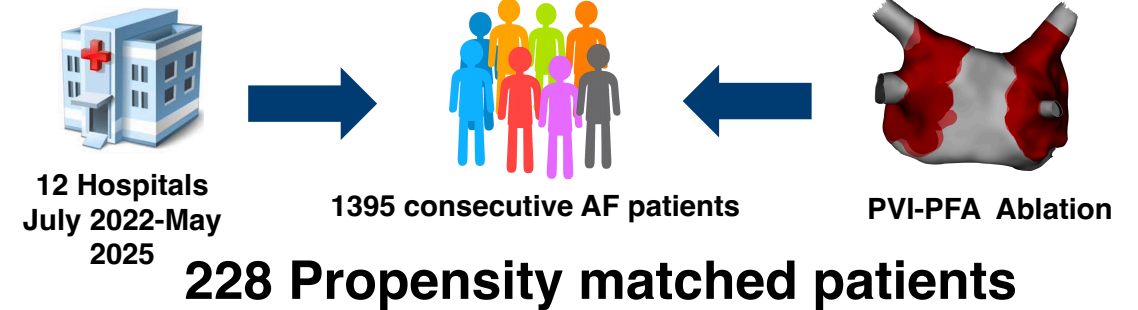
Heart Rhythm Society

Check for updates

First clinical experience using a pentaspline pulse field ablation catheter with integrated electroanatomic 3-dimensional mapping for pulmonary vein isolation

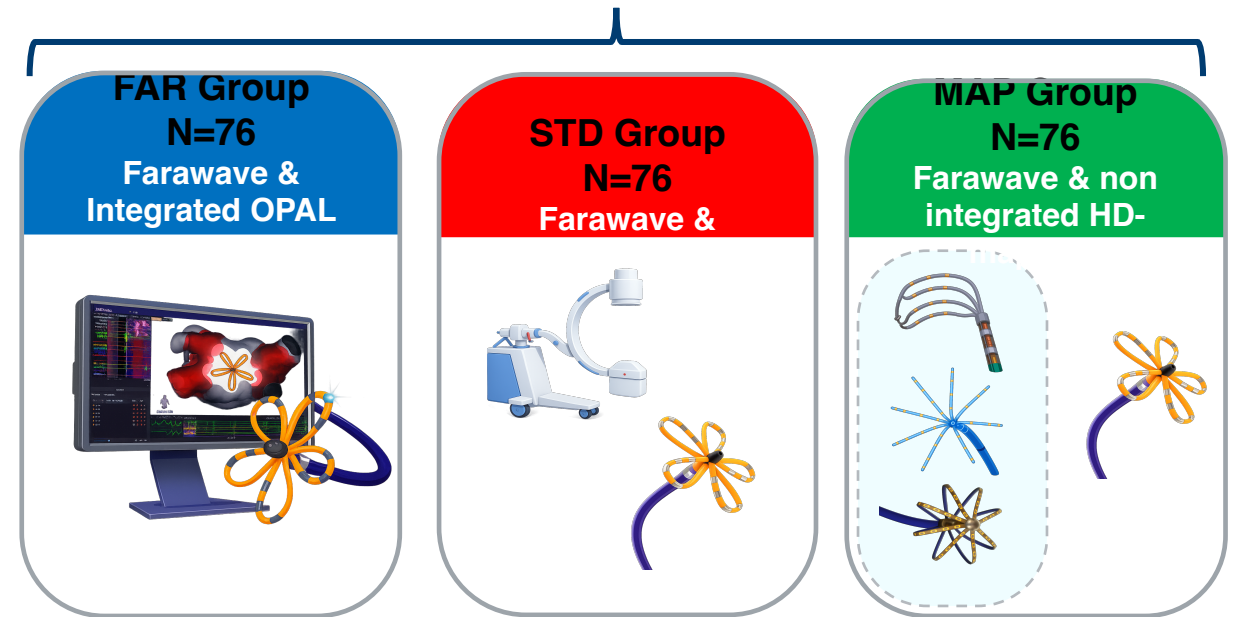
Gianfranco Mitacchione, PhD, MD,¹ Claudio Tondo, PhD, MD,^{2,3} Antonio Dello Russo, PhD, MD,^{4,5} Maurizio Malacrida, MSc,⁶ Stefano Bianchi, MD,⁷ Saverio Iacopino, MD,⁸ Luca Rossi, MD,⁹ Gianmarco Arabia, MD,¹ Marco Schiavone, PhD, MD,² Francesco Solimene, MD,^{4,10} Michela Casella, PhD, MD,^{4,8,11} Gianluca Zingarini, MD,¹² Maurizio Russo, MD,¹³ Mario Volpicelli, MD,¹⁴ Ruggero Maggio, MD,¹⁵ Vittoria Velcich, MSc,⁶ Raimondo Calvanese, MD,¹⁶ Roberto Rordorf, MD,¹⁷ Andrea Di Cori, MD,¹⁸ Fabrizio Tundo, MD,² Antonio Curnis, MD¹

- ❖ Historical Farawave control group [July 2022-April 2025: 1105 STD (79.2%), 214 MAP (15.4%)]
- ❖ All 76 (5.4%) first cases treated with Faraview from April 2025 to May 2025

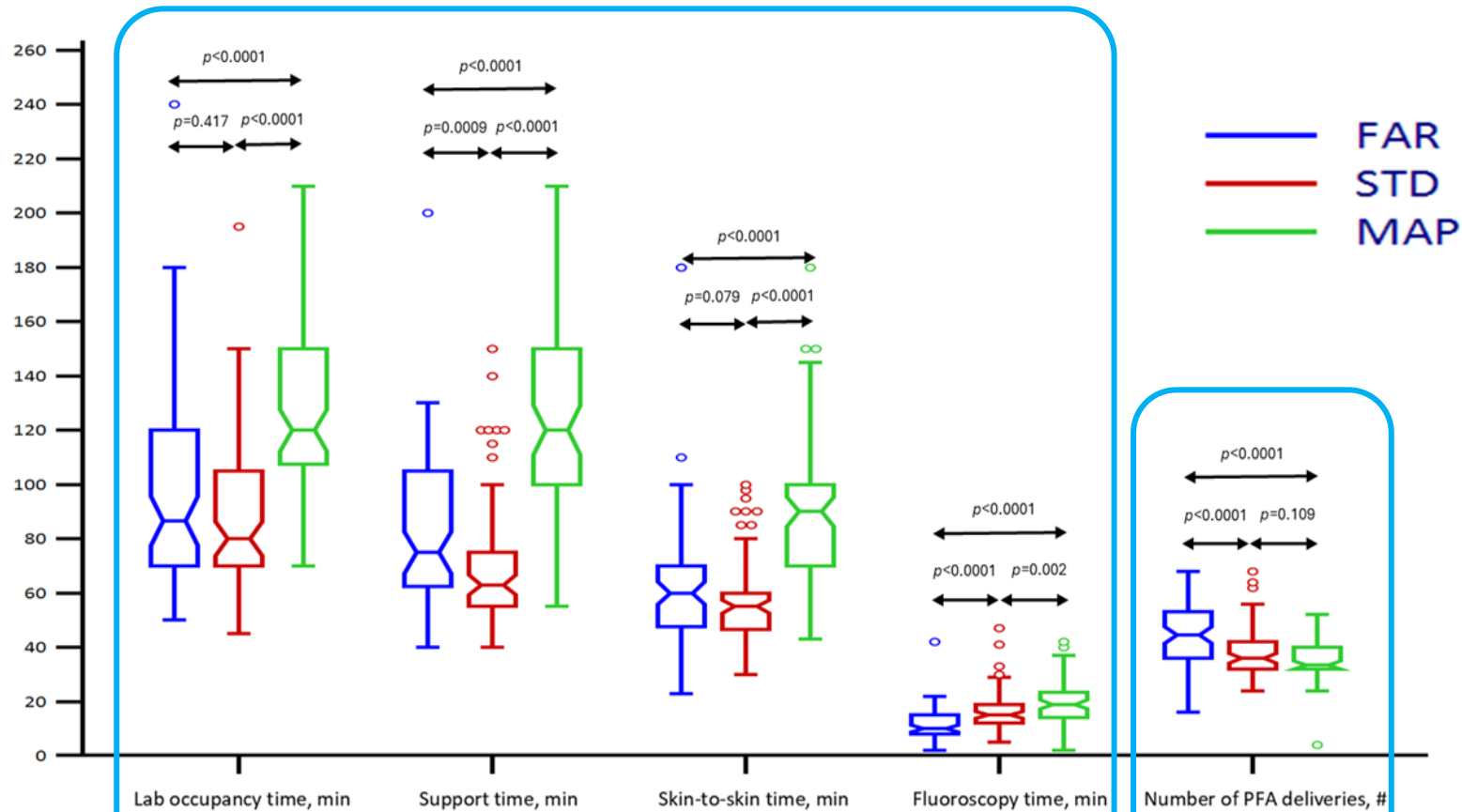


82.5% with Paroxysmal AF, 25.9% female, mean age 64±9 years, LVEF

58±7%



Faraview vs Non-integrated Mapping

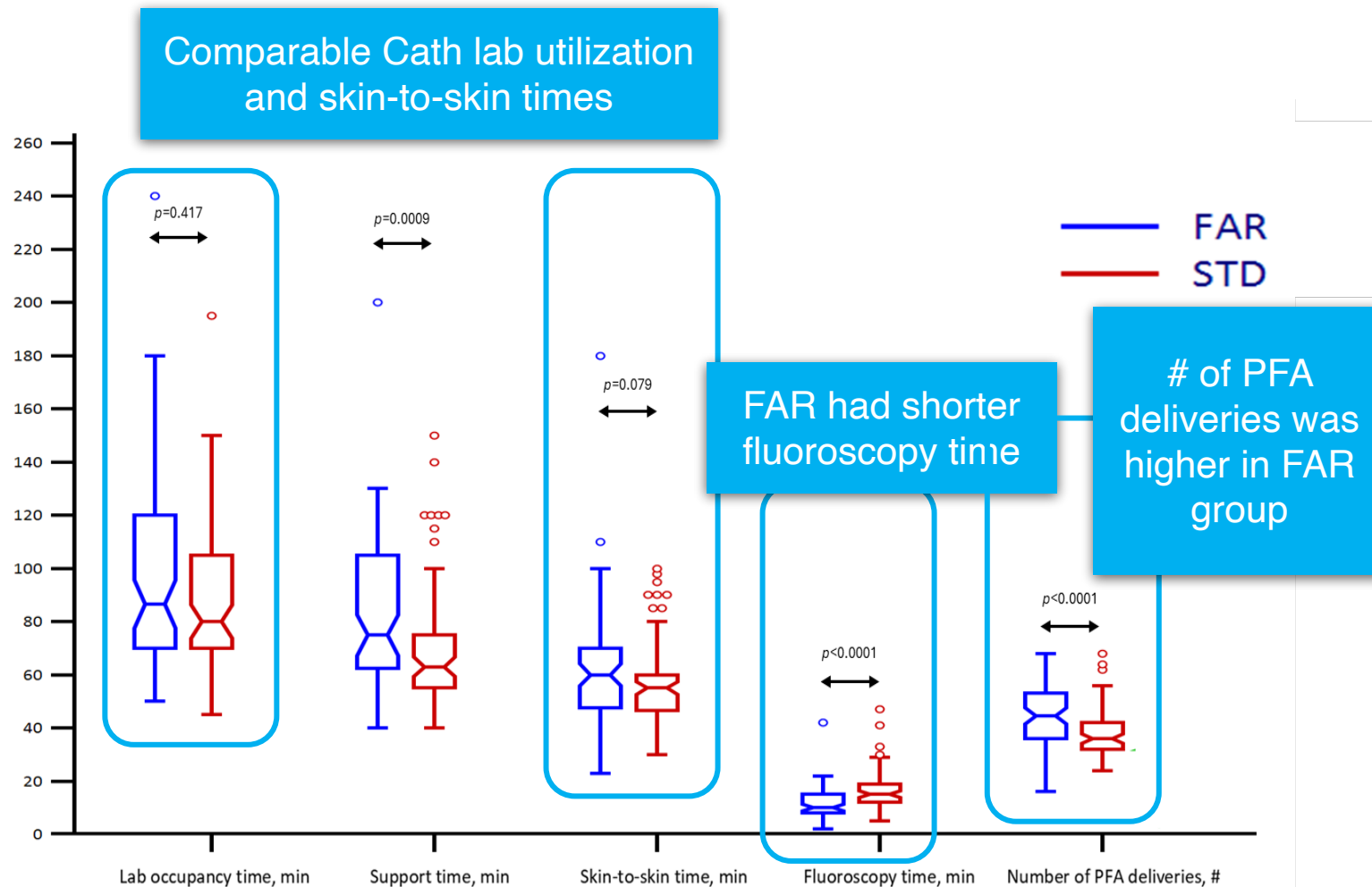


all procedural times were shorter than MAP procedures

of PFA deliveries was higher in FAR group

- Cath lab utilization time (patient entering - leaving the EP lab)
- Technical support time (engineer/technician entering - leaving the EP lab)

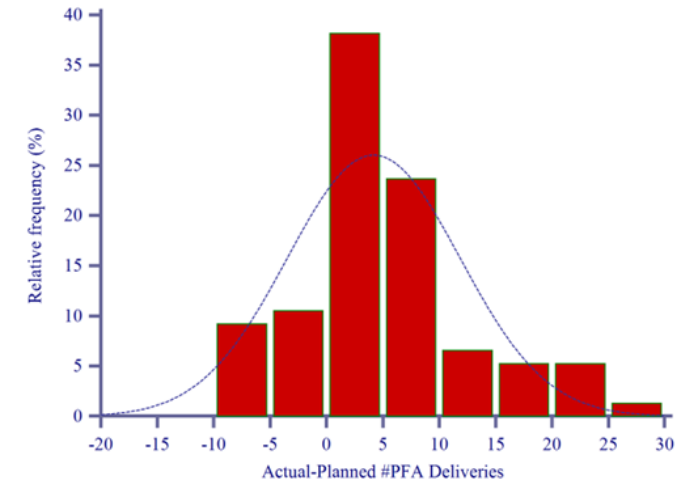
Faraview vs Fluoro Only



- Cath lab utilization time (patient entering - leaving the EP lab)
- Technical support time (engineer/technician entering - leaving the EP lab)

Operator feedback in the FAR group

- **Standard PVI strategy** (4-basket/4-flower per vein): in 42.1% of cases. 57.9% received additional lesions
 - 22.7% consolidative (same site),
 - 52.3% extensive (adjacent regions),
 - 25% combined.
- **PFA deliveries per patient:** higher than the number initially planned (44.8 ± 11 vs 40.6 ± 9 ; $P < 0.001$). More deliveries than planned occurred in 61.8% of cases, equal in 18.4%, and fewer in 19.7%



Enhanced precision of system seems to facilitate a more individualized ablation strategy (greater number of PFA applications) aimed at consolidating and extending PVI to create a wider and more contiguous antral lesions.

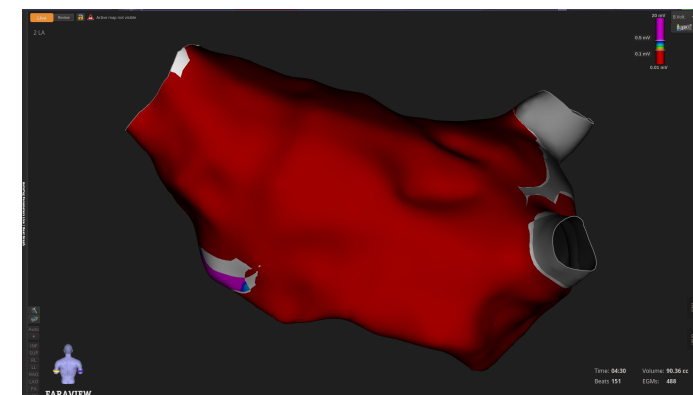
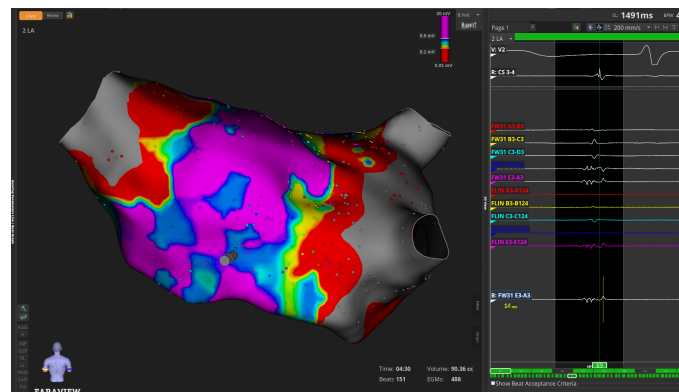


PFA Mapping Integration

What integrated EAM added...

- 1 Real time visualization of catheter configuration
- 2 Lesion TAG: Accurate definition of the lesion volume: Antral/WACA
 - *Wide isolation of Left Common trunk*
- 3 Evaluating contact area
- 4 Achieving non-PV foci: carena, PW...

A SINGLE CATHETER, A SINGLE STEP, REAL TIME INTEGRATION



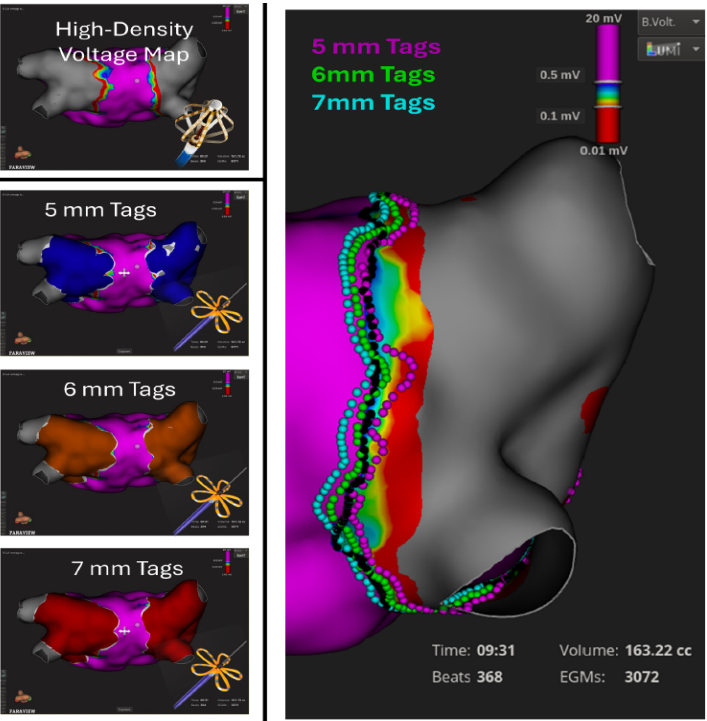
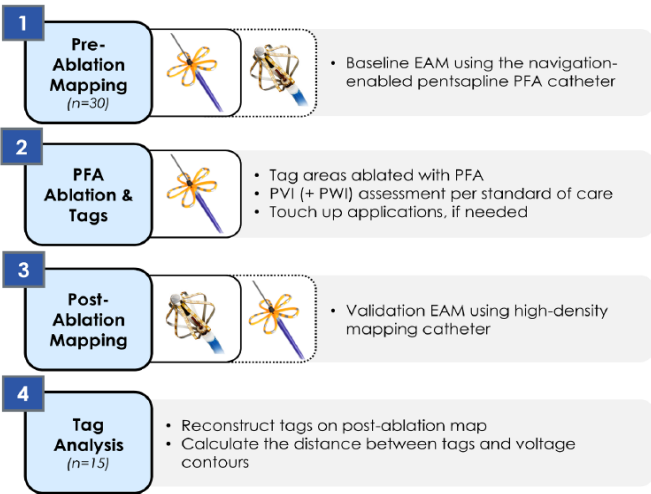
Visualization of PFA During PVI With the Second-Generation Pentaspline Catheter

NAVIGATE-PF Phase 1 Results

Ignacio García-Bolao, MD,^a Vivek Y. Reddy, MD,^{b,c} Wilber W. Su, MD,^d Jacob S. Koruth, MD,^c Noel Fitzpatrick, MD,^e Petr Neuzil, MD, PhD,^b Ramón Albarrán Rincón, MD,^a Silvia Canepa, PhD,^f Kaylen Kang, MENG,^f Tobias Oesterlein, PhD,^f Brendan E. Koop, PhD,^f Camille Metzdorff, MENG,^f Brynn Okeson, MS,^f Sarah R. Gutbrod, PhD,^f Gabor Szeplaki, MD, PhD^e

Aim: Evaluate the estimated shape and position of the acute tags relative to low-voltage borders from high-density, postablation maps

FIGURE 1 NAVIGATE-PF Phase 1 AF Ablation Procedural Workflow

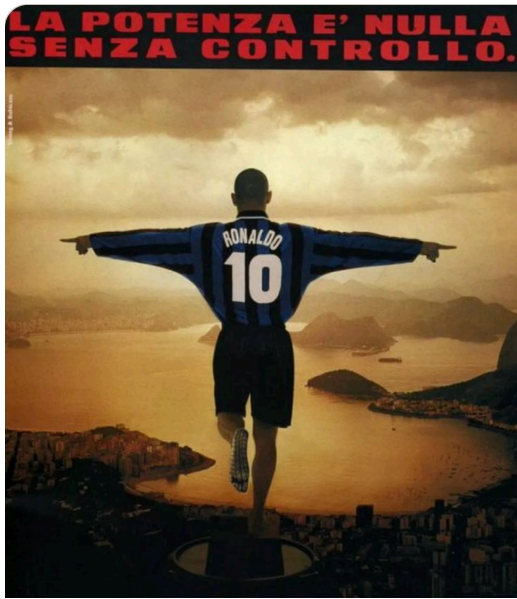


Tag 5 mm: scostamento dimensione lesione -1.71 mm – sottostima

Tag 6 mm: scostamento dimensione lesione -0.58 mm - miglior corrispondenza

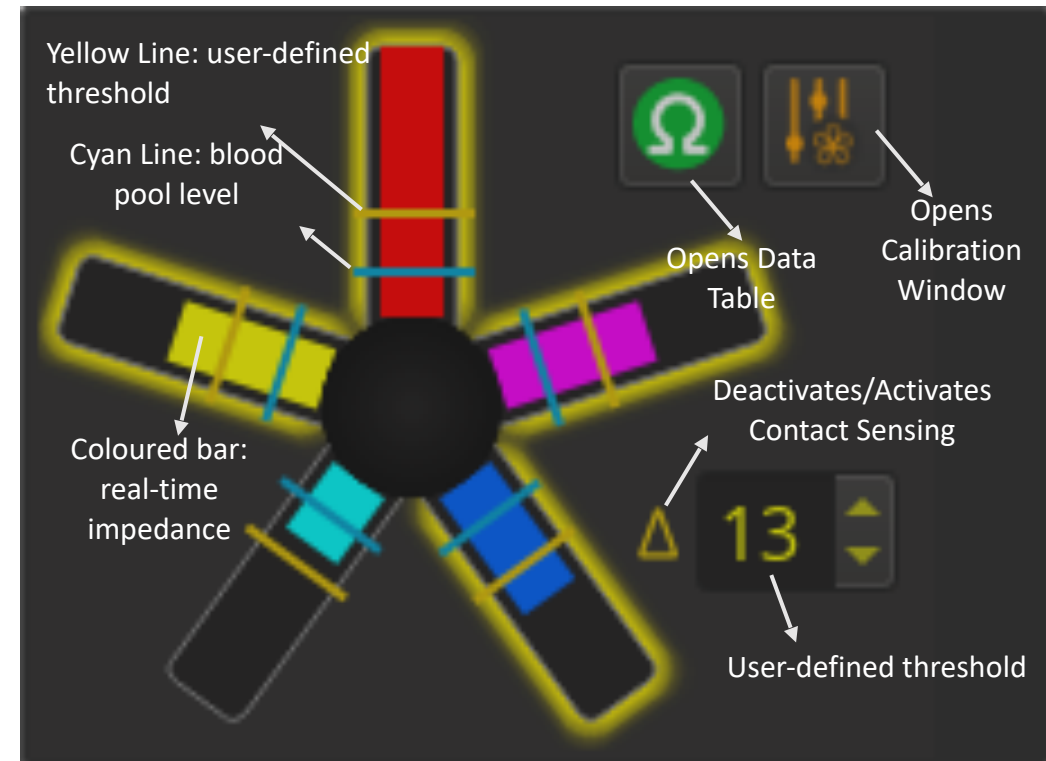
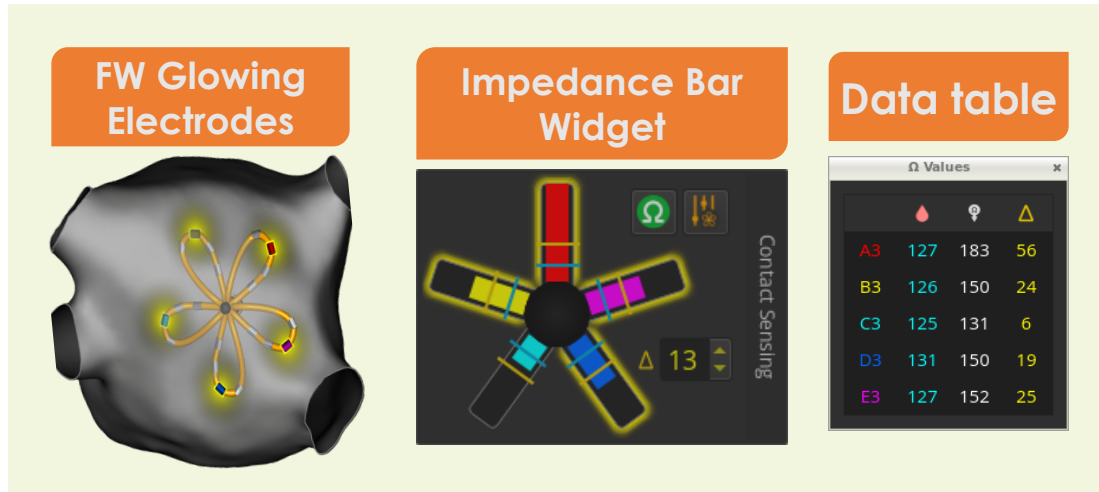
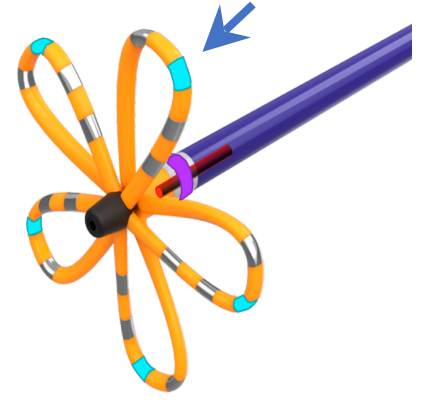
Tag 7 mm: scostamento dimensione lesione +7 mm - sovrastima

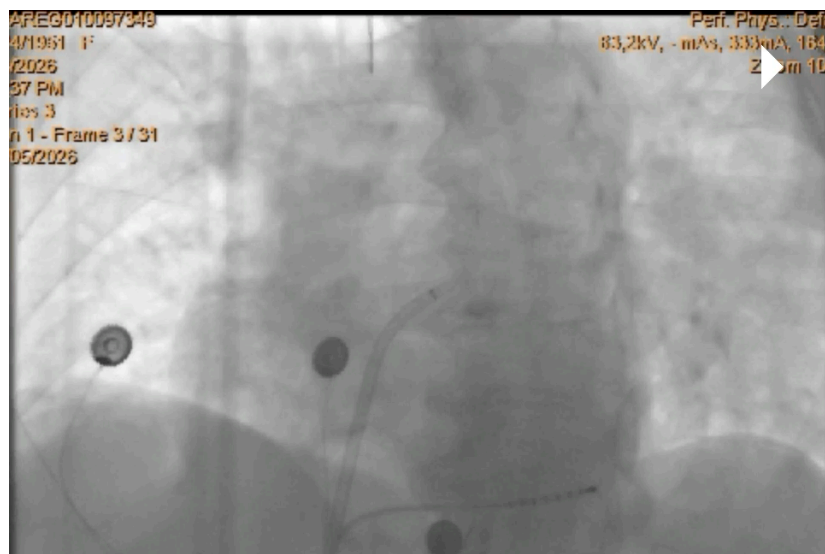
Distance between the tag and low-voltage border was -0.58 mm (Q1-Q3: -2.9 to 2.17 mm)



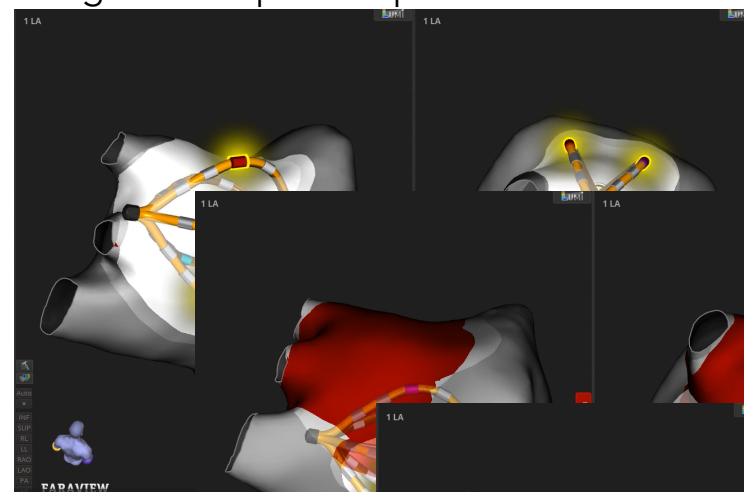
SOFTWARE 6.5 FOR CONTACT

- Contact Sensing on FARAWAVE NAV 2.0 is based on third electrode of each spline and is measured from spline to spline.
- Blood Pool Calibration: lowest impedance value measured as the baseline blood pool

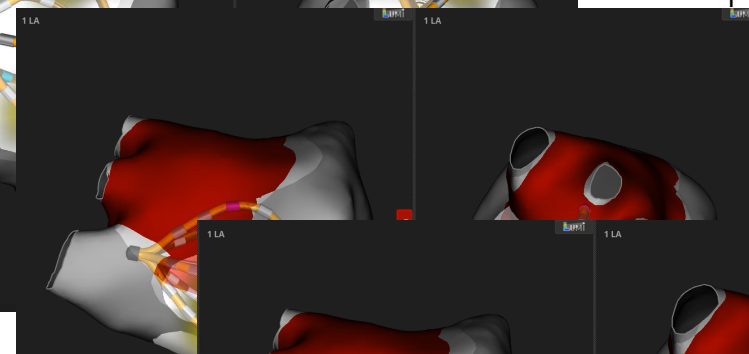




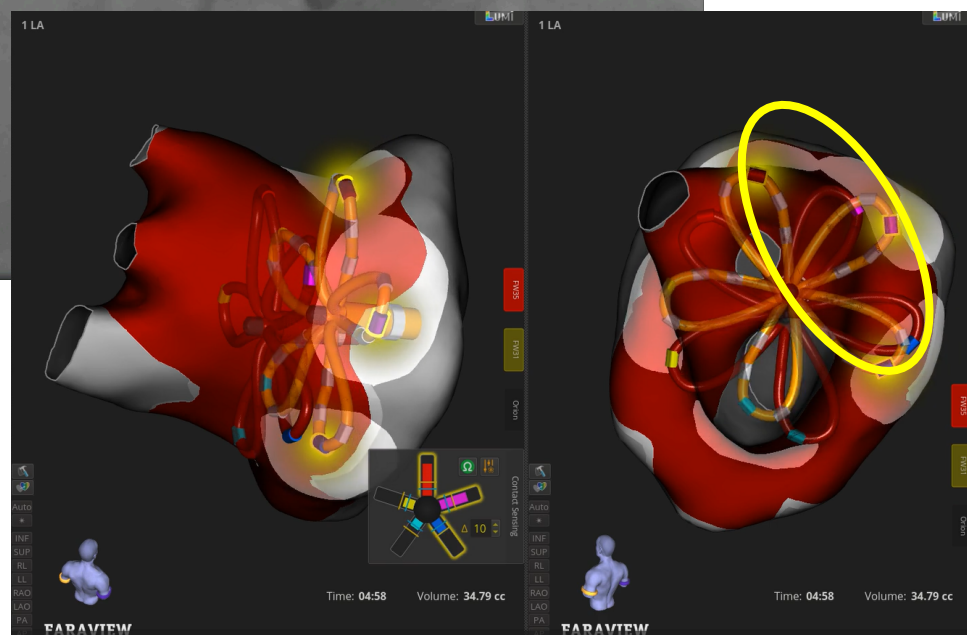
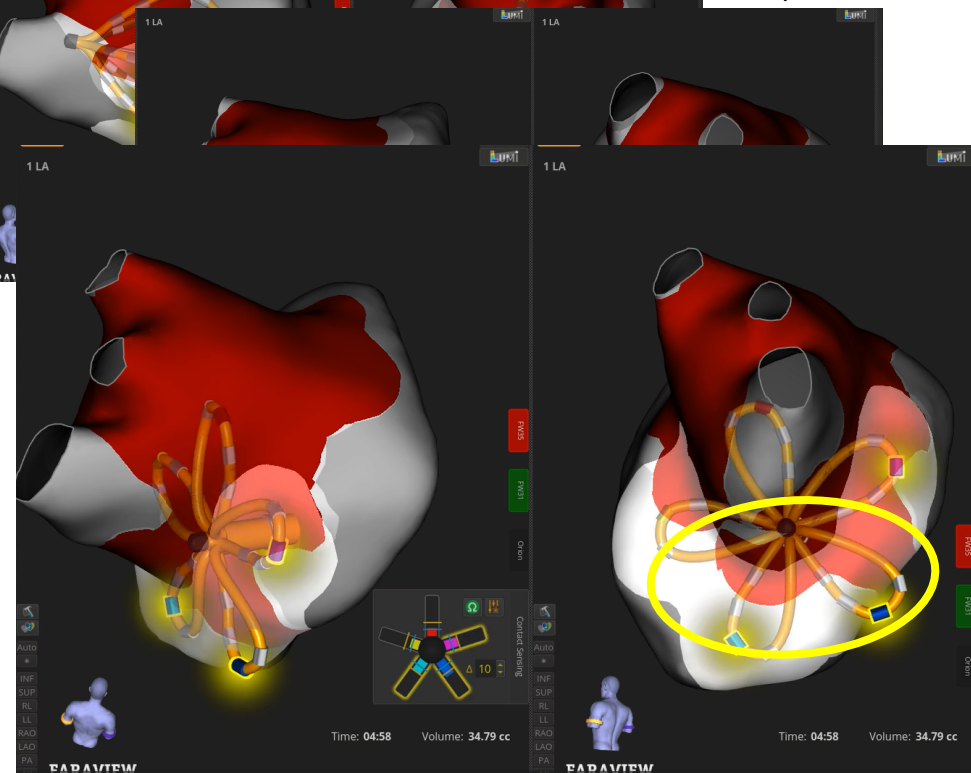
Contatto sulle splines superiori per erogare sulla parte superiore dell'ostio



Contatto sulle splines infero-posteriori



Contatto sulle splines posteriori



Contatto sulle splines supero-posteriori

Contatto sulle splines inferiori

Take-home messages

- **EAM System Integration with the FARAVIEW Module:**
 - ✓ Improved tailored lesion definition
 - ✓ Reduced fluoroscopy exposure
 - ✓ A different workflow respect to previous experience
- **Useful tool when targeting non PV foci...**