7. Atriyal Fibrilasyon Zirvesi 2018
9 - 10 Şubat 2018
Kempinski Hotel The Dome
Belek, Antalya

Kriyobalon Persistan AF'de İlk Seçenek Olmamalıdır

Dr. Mustafa AKÇAKOYUN

Persistan AF: teknik ve strateji

2012 HRS/EHRA/ECAS Expert Consensus Statement on Catheter and Surgical Ablation of Atrial Fibrillation: Recommendations for Patient Selection, Procedural Techniques, Patient Management and Follow-up, Definitions, Endpoints, and Research Trial Design

Table 3 Recommendations regarding ablation technique

- If patients with longstanding persistent AF are approached, operators should consider more extensive ablation based on linear lesions or complex fractionated electrograms.

Persistan AF: teknik ve strateji

2017 HRS/EHRA/ECAS/APHRS/SOLAECE expert consensus statement on catheter and surgical ablation of atrial fibrillation

Table 3 Atrial fibrillation ablation: strategies, techniques, and endpoints

	Recommendation	Class	LOE
Ablation strategies to be considered for use in conjunction with PV isolation	The usefulness of ablation of complex fractionated atrial electrograms as an initial or repeat ablation strategy for persistent and long-standing persistent AF is not well established.	IIb	B-R
	The usefulness of creating linear ablation lesions in the right or left atrium as an initial or repeat ablation strategy for persistent or long-standing persistent AF is not well established.	IIb	B-NR

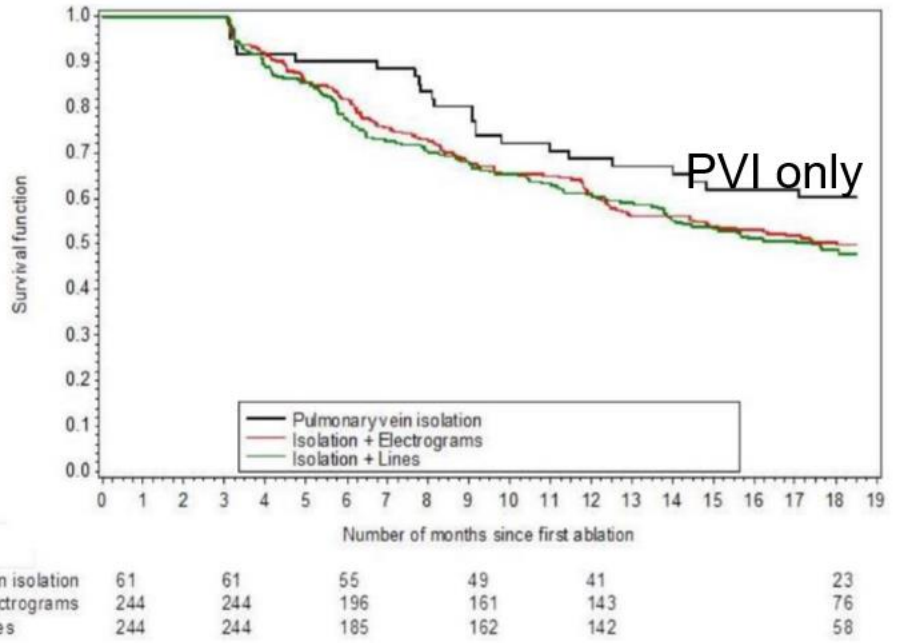
Persistan AF: PV izolasyonu yeterli mi?

ORIGINAL ARTICLE

Approaches to Catheter Ablation for Persistent Atrial Fibrillation

Atul Verma, M.D., Chen-yang Jiang, M.D., Timothy R. Betts, M.D., M.B., Ch.B., Jian Chen, M.D., Isabel Deisenhofer, M.D., Roberto Mantovan, M.D., Ph.D., Laurent Macle, M.D., Carlos A. Morillo, M.D., Wilhelm Haverkamp, M.D., Ph.D., Rukshen Weerasooriya, M.D., Jean-Paul Albenque, M.D., Stefano Nardi, M.D., Endrj Menardi, M.D., Paul Novak, M.D., and Prashanthan Sanders, M.B., B.S., Ph.D., for the STAR AF II Investigators*

N Engl J Med 2015;372:1812-22.



No. at Risk						
Pulmonary vein isolation	61	61	55	49	41	23
Isolation + Electrograms	244	244	196	161	143	76
Isolation + Lines	244	244	185	162	142	58

Repeat ablation performed in
21% PVI
26% PVI + CFAE
33% PVI + linear lesions

Freedom from **ANY** documented atrial arrhythmia >30s after **2** procedures on or off AADs

Persistan AF: kriyobalon PVI

Study	Design	N	LSPeAF	Monitoring	AAD > 3/12	FU (mo)	Succcess
Lemes 2016	Retrospective	49	✓	3, 6, 12 month 24-hour Holter	33%	13.9 ± 5.9	69%
Tscholl 2016	Retrospective	50	✗		10%	22 ± 11	56%
Straube 2016	Observational	157	✗	3, 6, 12 month 24-hour Holter	17%	14 (12–19)	82%
Guhl 2016	Retrospective	69	✓	6 months Event Monitor	17%	20.2	59%
Irfan 2016	Retrospective	62	✗	3, 6, 12 month 24-hour Holter	Off	12.2 ± 3.8	61%
Koektuerk 2015	Observational	100	✓	3, 6 month 7 day Holter	6%	10.6 ± 6.3	67%

Adapted from
A Voskoboinik, et al. Heart Rhythm 2017; 14:661–667

Paroksismal AF: RF ablasyonu

Study	Year	Patients	Age, y	Parox, %	SHD, %	Tool(s)	End Point	AF Free (Off Drugs), %	Follow-Up, d
Ouyang et al[37]	2004	41	63±9	100	NA	CARTO	PV Isolat'n	76*	178
Haissaguerre et al[36]	2004	70	53±8	NA	43	Fluoro	PV Isolat'n	79	210
Mansour et al[40]	2004	40	55±10	80	13	CARTO	PV Isolat'n	75	330
Marrouche et al[41]	2003	259	54±11	51	21	ICE	PV Isolat'n	87†	347
Oral et al[39]	2003	40	54±11	100	3	CARTO	EGM Red'n	88	365
Pappone et al[36]	2003	589	65±9	69	6	CARTO	EGM Red'n	79	861
Total		1039						81.0	

H Calkins, et al. HRS/EHRA/ECAS expert Consensus Statement on catheter and surgical ablation of atrial fibrillation Heart Rhythm 2007 Jun; 4(6): 816-861

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Kriyobalonun kısıtlılıkları

- Çok yönlü olmayışı
  - Anotomik PV varyantları
  - PV dışı hedefler (CTI, posterior duvar, LAA)
- LA substratı hakkında tanısal kabiliyet
  - Bireysel uyarlanmış substrat modifikasyonu
- EP topluluğu
  - Katater yetenek kaybı
  - Alanın ilerlemesine darbe

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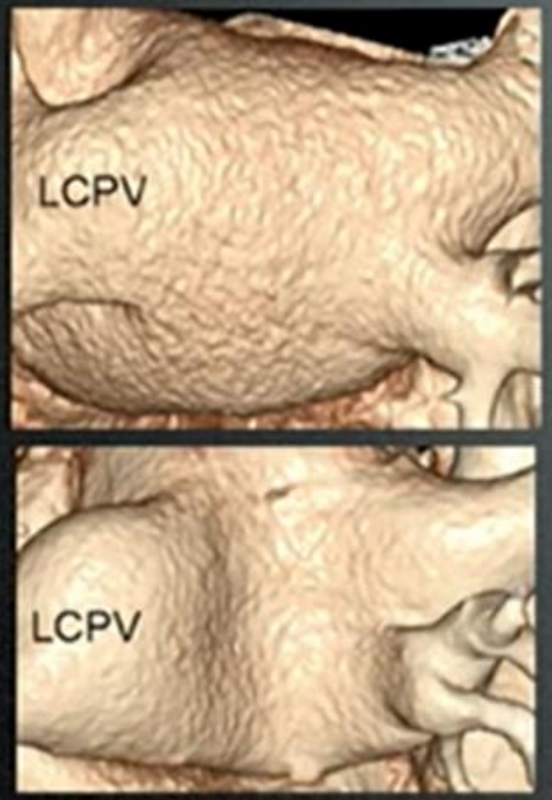
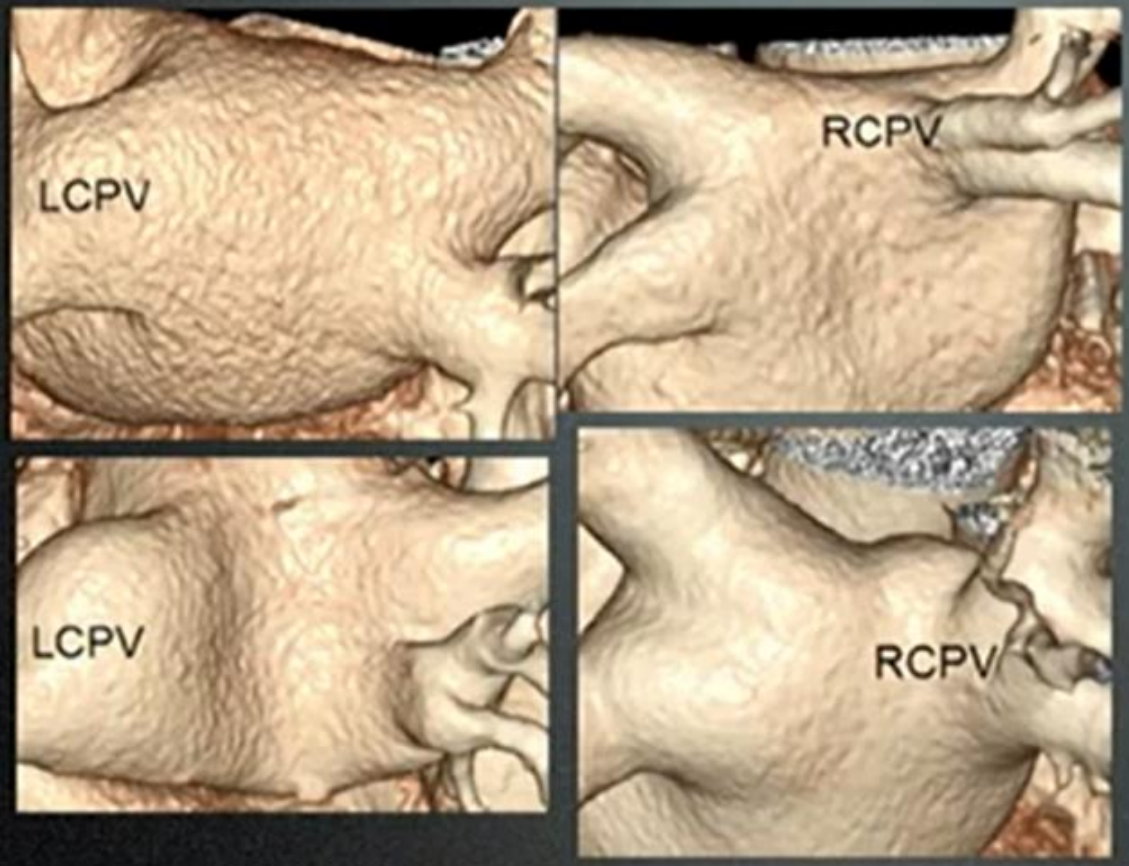


LCPV: 11.3%

1040 patients undergoing pre-PVI CT
Conventional anatomy: 81.8%

Y Kanaji et al. Journal of Cardiology 2016; 67:115-121

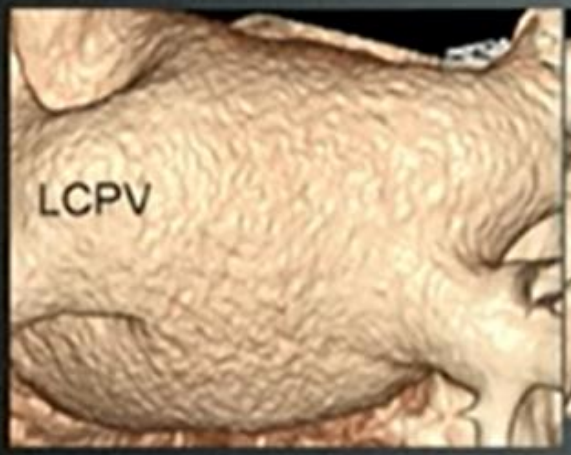


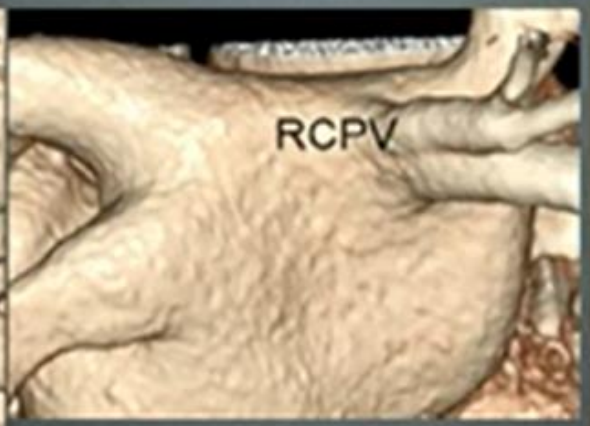
LCPV: 11.3%

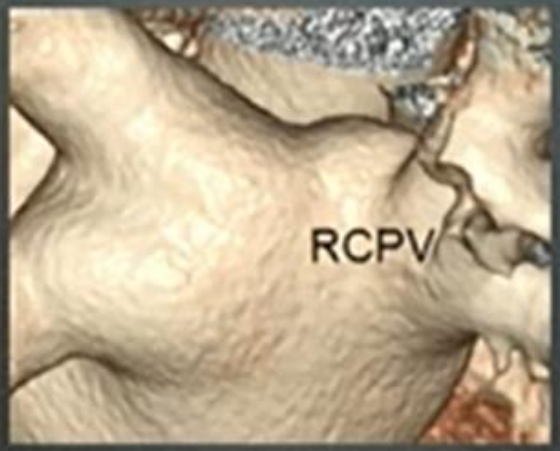
RCPV: 0.5%

1040 patients undergoing pre-PVI CT
Conventional anatomy: 81.8%

Y Kanaji et al. Journal of Cardiology 2016; 67:115-121







LCPV: 11.3%

RCPV: 0.5%

Inferior CPV: 0.6%

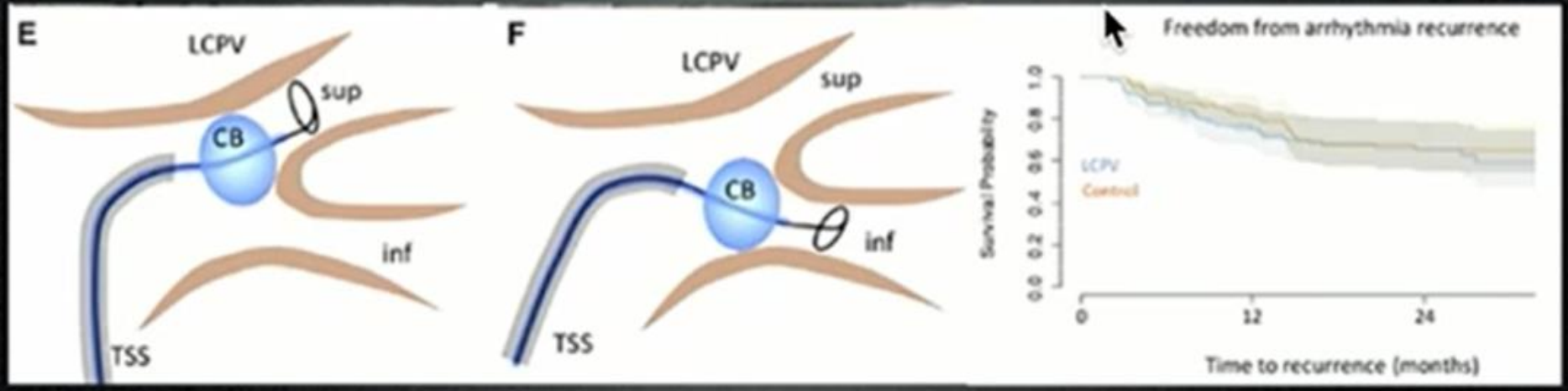
1040 patients undergoing pre-PVI CT
Conventional anatomy: 81.8%

Y Kanaji et al. Journal of Cardiology 2016; 67:115-121

Acute efficacy, safety, and long-term clinical outcomes using the second-generation cryoballoon for pulmonary vein isolation in patients with a left common pulmonary vein: A multicenter study

CH Heeger, et al. Heart Rhythm 2017; in press

74 /670 (11%) patients at 3 centres



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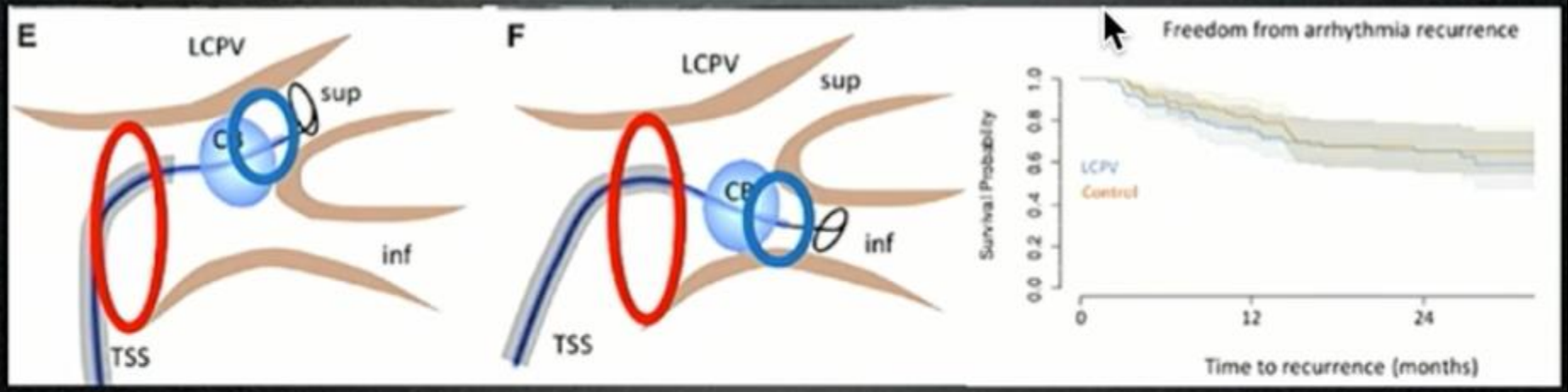
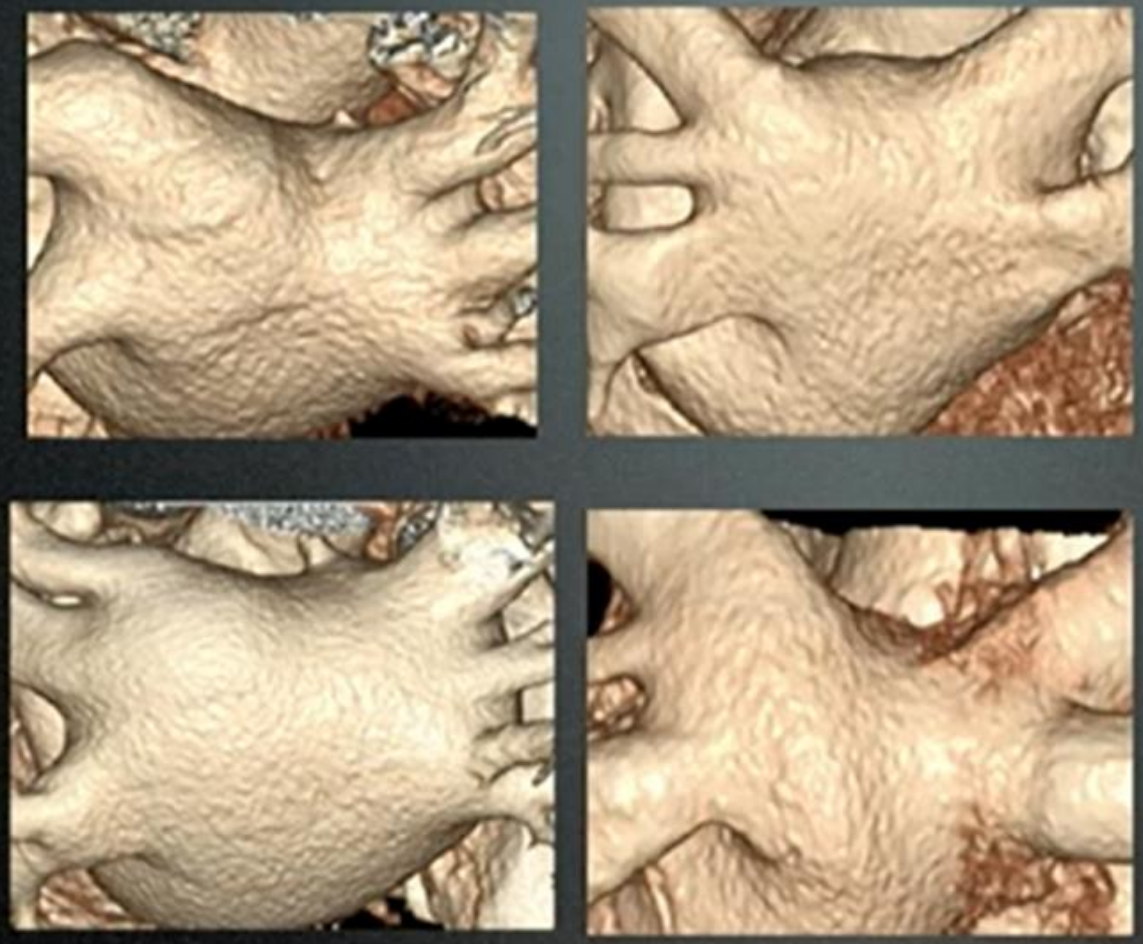
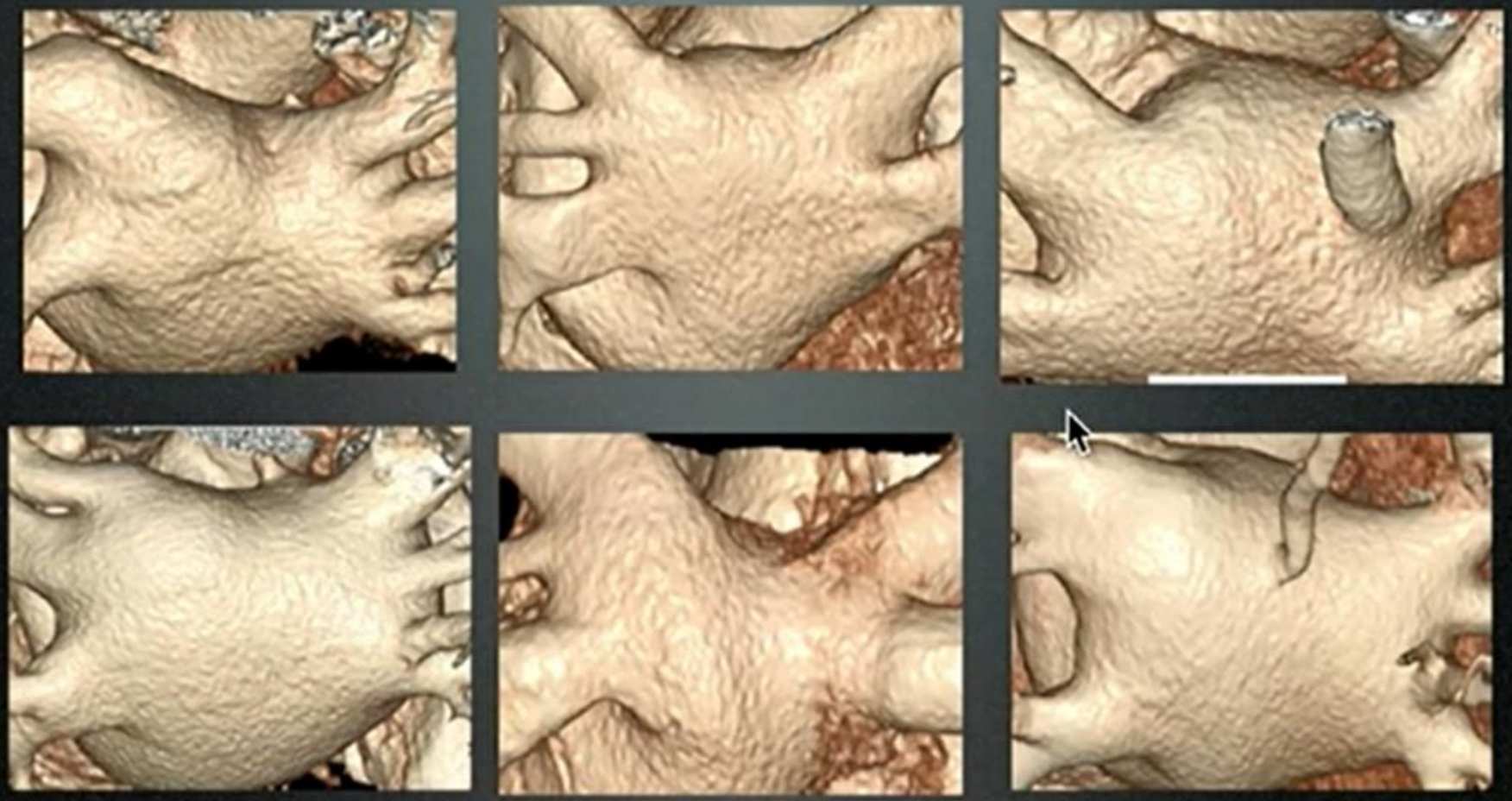


3 Right PVs 4.2%



3 Right PVs 4.2%

3 Left PVs 0.4%%



3 Right PVs 4.2%

3 Left PVs 0.4%%

Supernumerary PVs 0.8%

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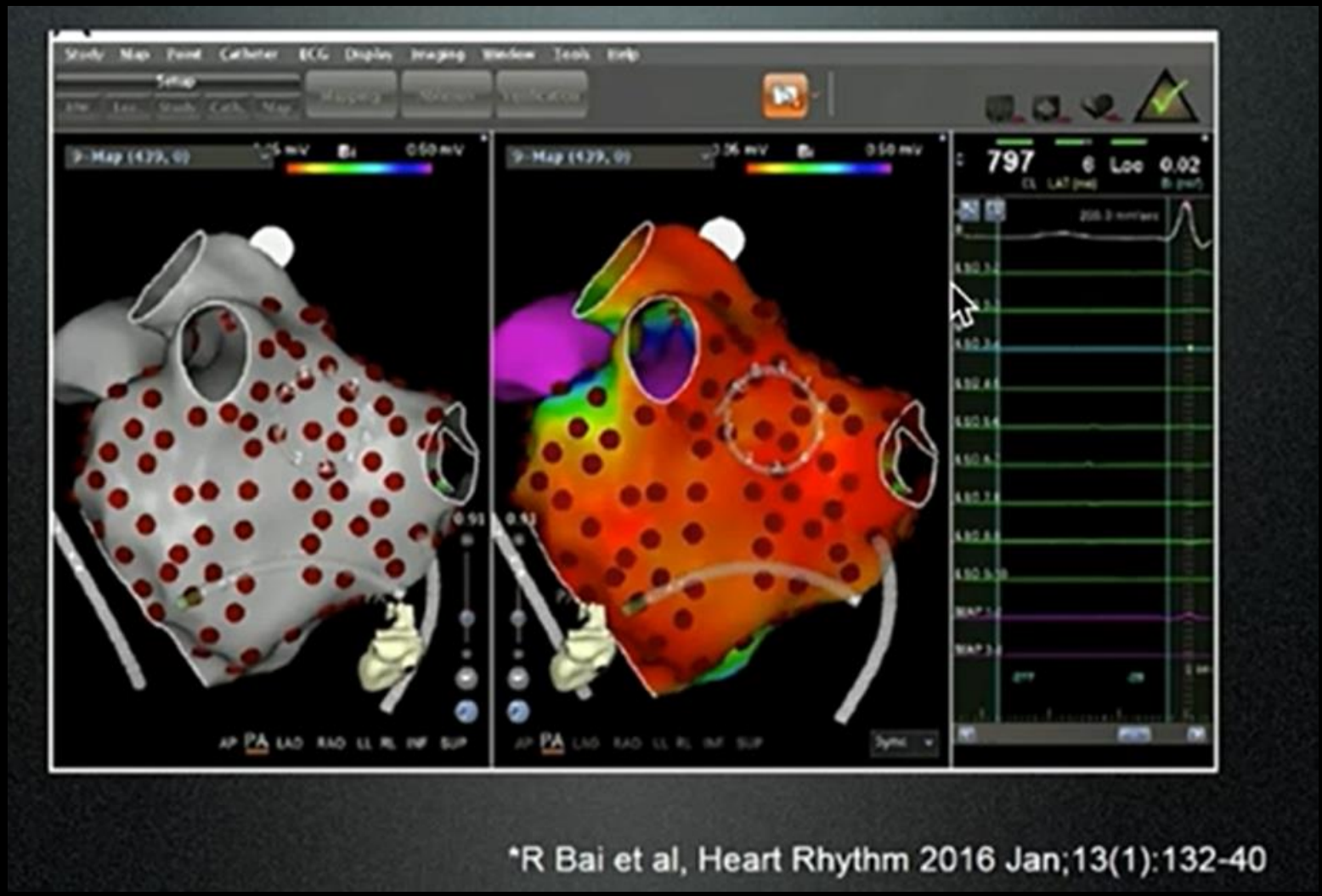
Posteriyor duvar ablasyonu

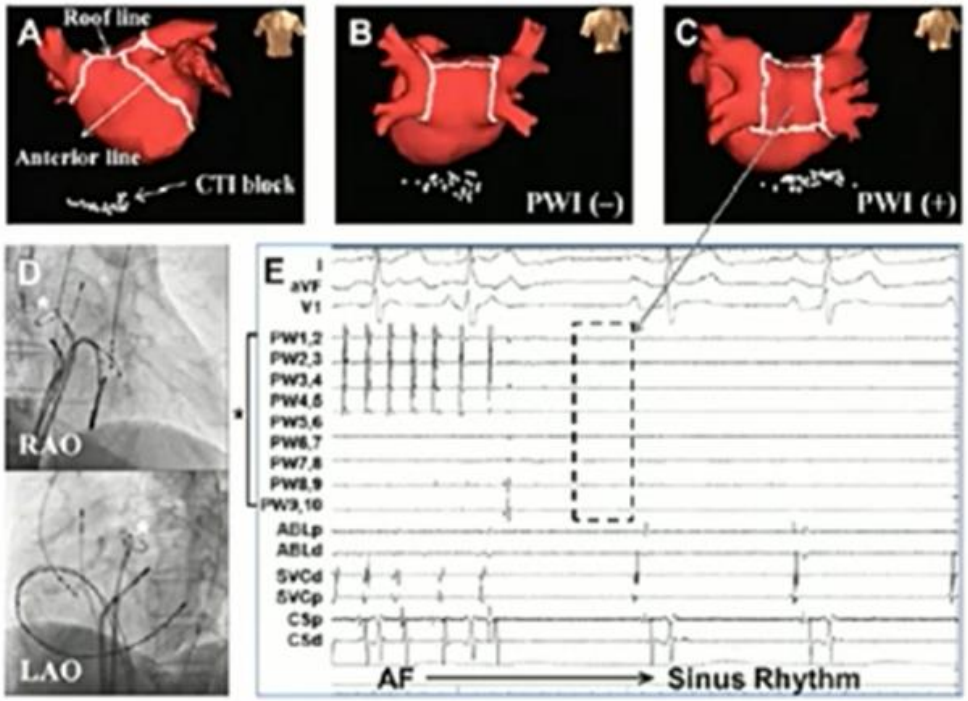


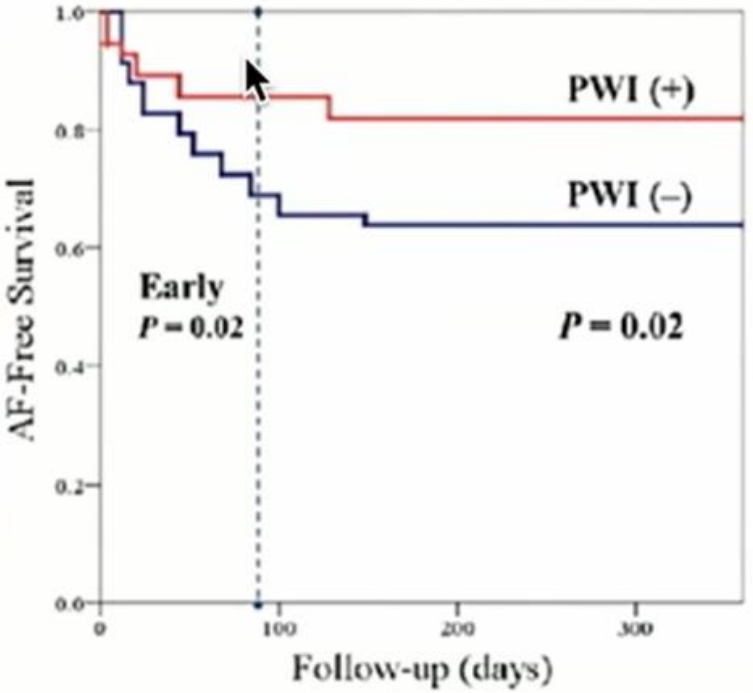
Posteriyor duvar ablasyonu

Does isolation of the left atrial posterior wall improve clinical outcomes after radiofrequency catheter ablation for persistent atrial fibrillation? A prospective randomized clinical trial

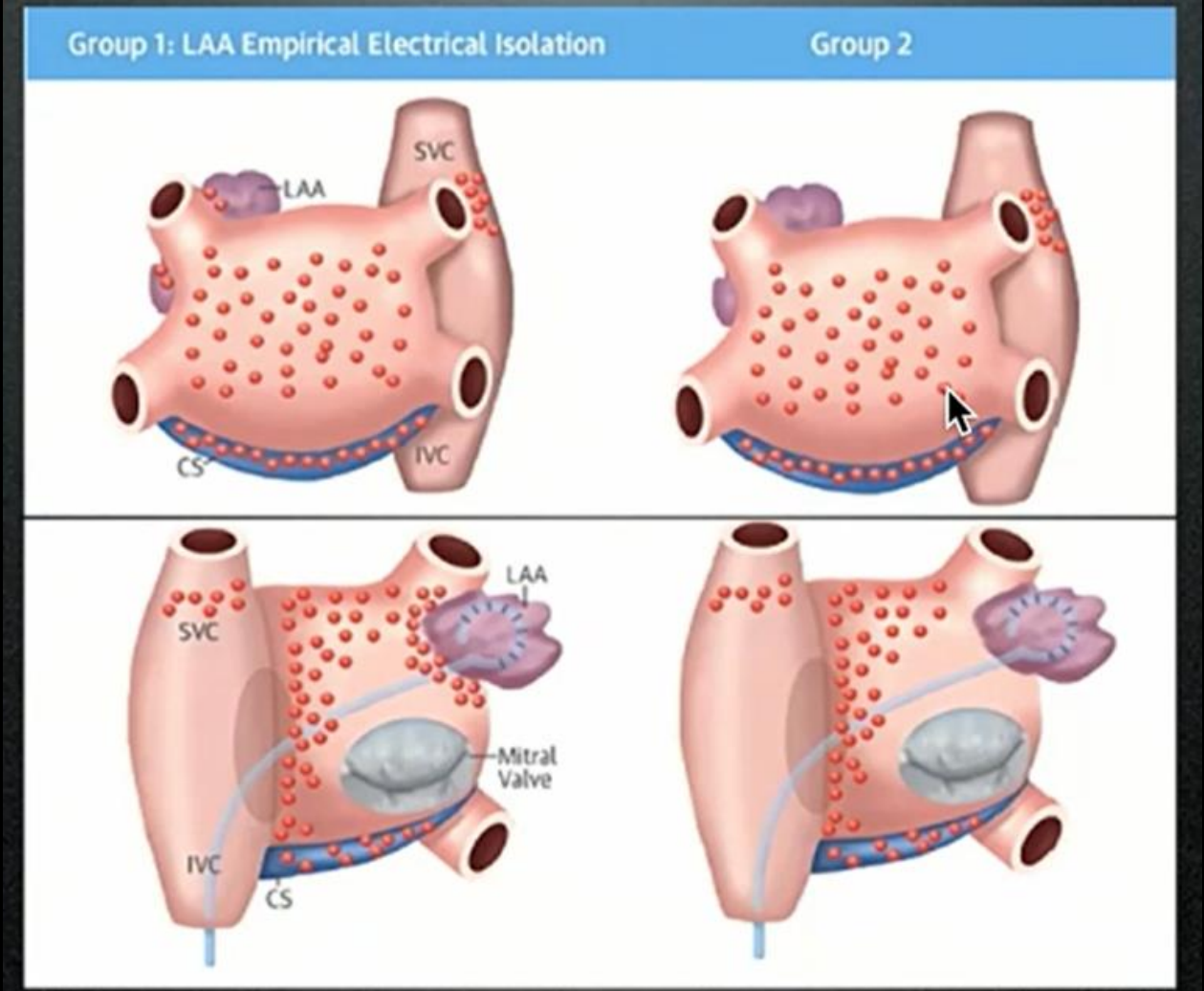
Jin-Seok Kim [a,1], Seung Yong Shin [b,1], Jin Oh Na [a], Cheol Ung Choi [a], Seong Hwan Kim [a], Jin Won Kim [a], Eung Ju Kim [a], Seung-Woon Rha [a], Chang Gyu Park [a], Hong Seog Seo [a], Dong Joo Oh [a], Chun Hwang [c], Hong Euy Lim [a,*,2]

International Journal of Cardiology 181 (2015) 277–283





LAA izolasyonu: BELIEF trial



L Di Biase, et al. J Am Coll Cardiol 2016; 68: 1929-1940

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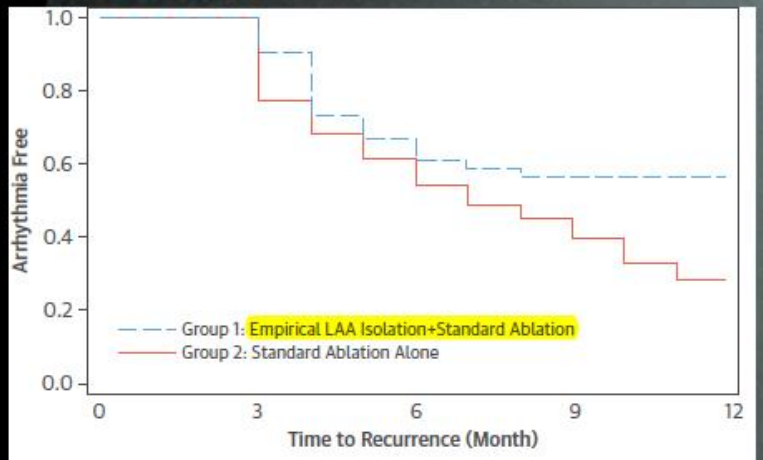
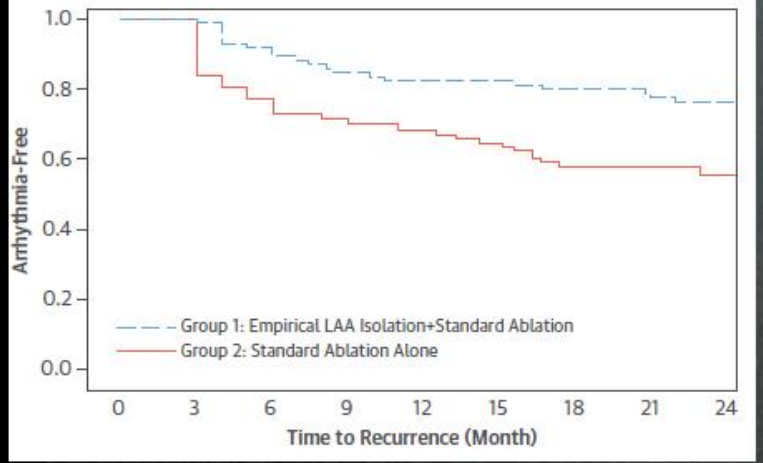




Non-PV triggers during Isoproterenol Challenge

	Group 1 (n = 85)	Group 2 (n = 88)	p Value
Coronary sinus	71 (83.5)	75 (85.2)	0.76
Superior vena cava*	25 (29.4)*	25 (28.4)*	0.89
Left atrial appendage	NA	32 (36.4)†	<0.001
Right atrium/septum	26 (30.6)	24 (27.3)	0.63
Left atrial septum	43 (50.6)	42 (47.7)	0.71
Mitral valve annulus	3 (3.5)	4 (4.5)	1.00
Right atrial crista	3 (3.5)	4 (4.5)	1.00

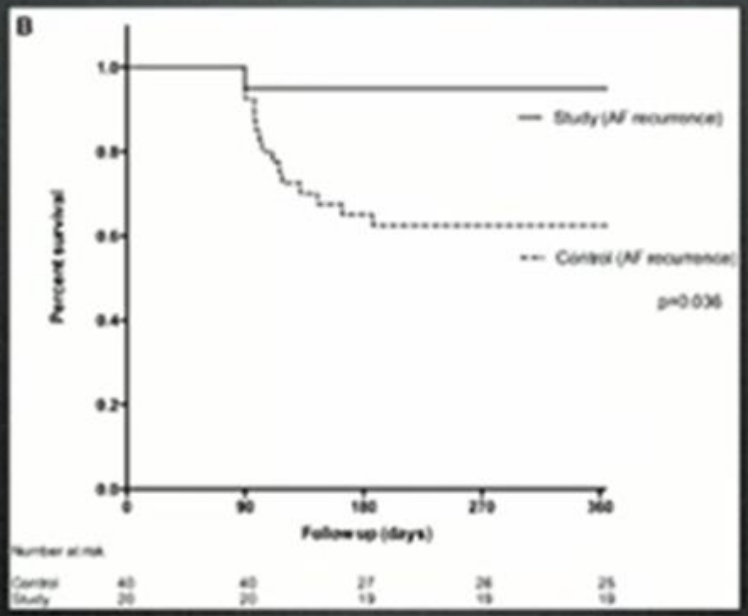
L Di Biase, et al. J Am Coll Cardiol 2016; 68: 1929-1940

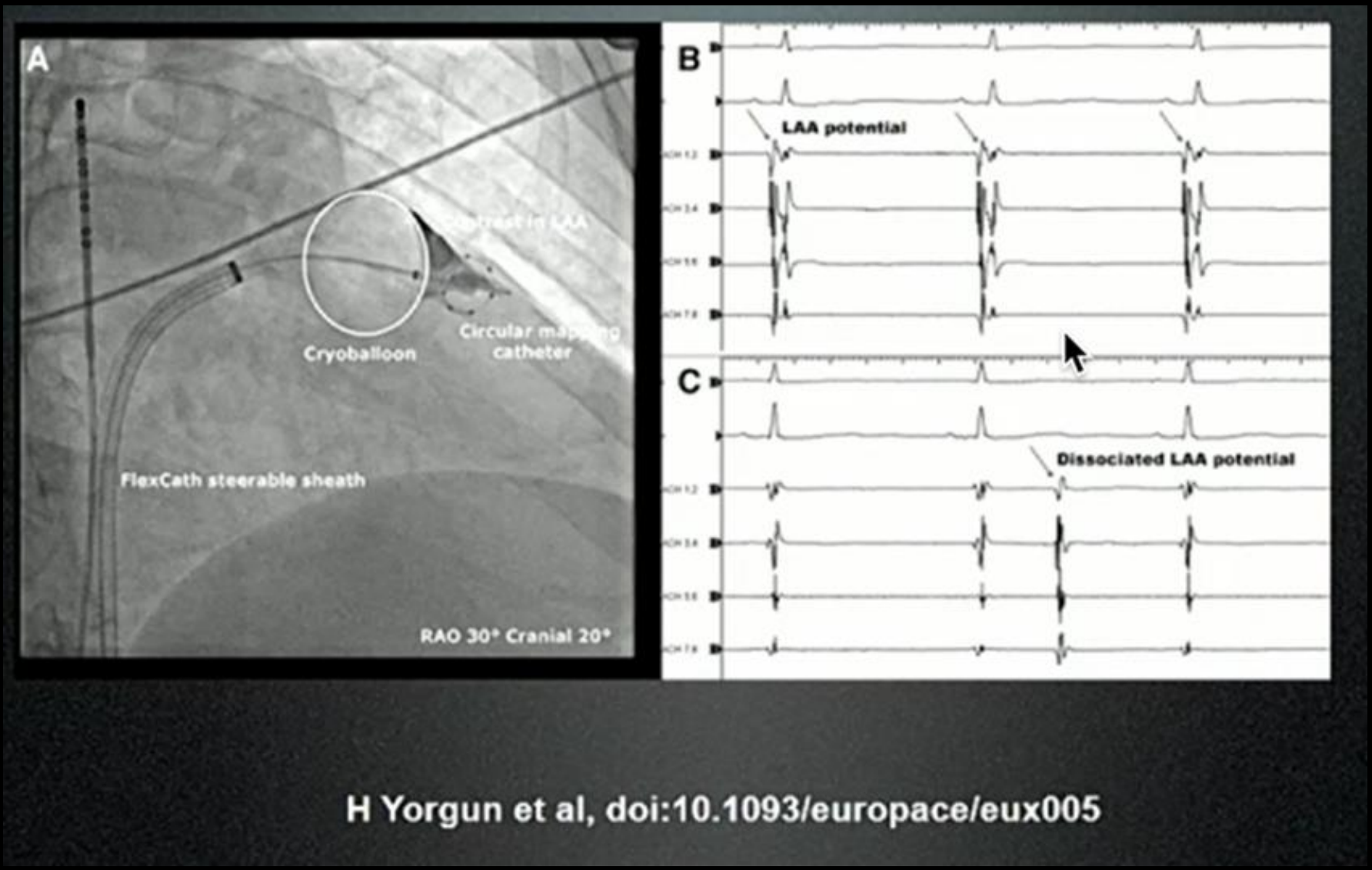
Left Atrial Appendage Electrical Isolation and Concomitant Device Occlusion to Treat Persistent Atrial Fibrillation

A First-in-Human Safety, Feasibility, and Efficacy Study

Sandeep Panikker, MBBS, MRCP; Julian W.E. Jarman, MD, MRCP; Renu Virmani, MD; Robert Kutys, MS, PA; Shouvik Haldar, MBBS, MRCP; Eric Lim, MBBS, MRCP; Charles Butcher, MBBS, MRCP; Habib Khan, MBBS, MRCP; Lilian Mantziari, MD, PhD; Edward Nicol, MD, MBA, FRCP; John P. Foran, MD, FRCP; Vias Markides, MD, FRCP; Tom Wong, MD, FRCP

(*Circ Arrhythm Electrophysiol*. 2016;9:e003710. DOI: 10.1161/CIRCEP.115.003710.)





H Yorgun et al, doi:10.1093/europace/eux005

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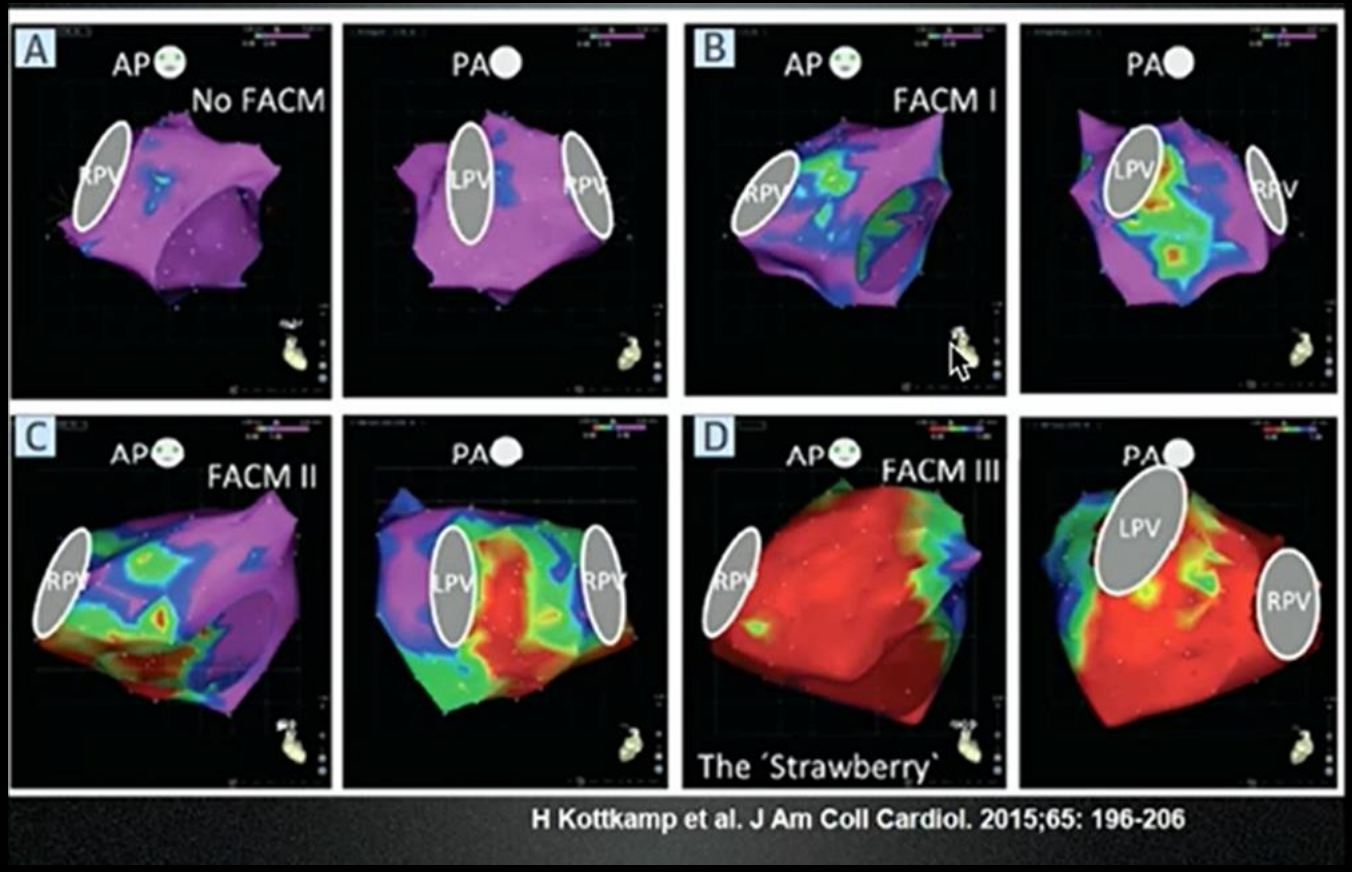
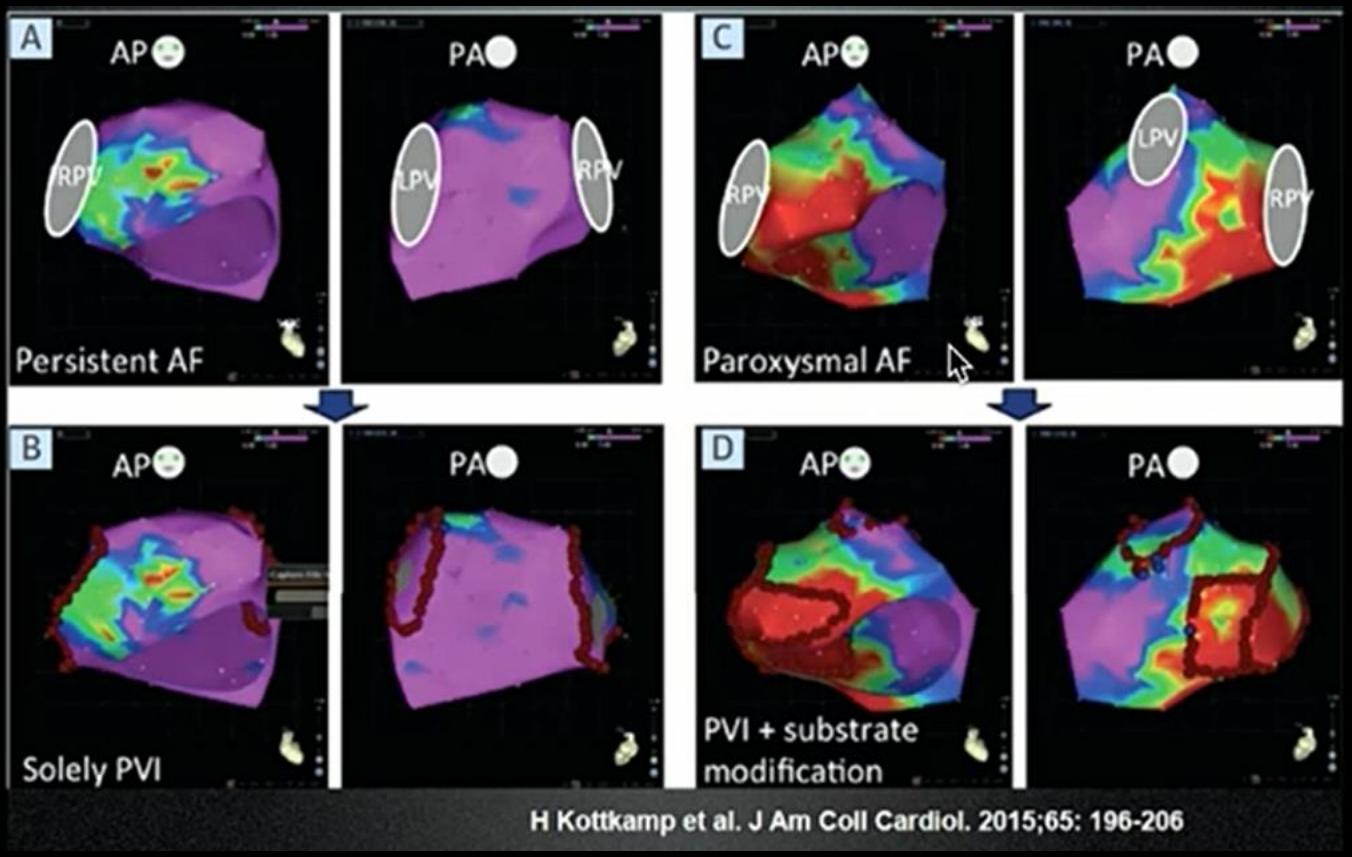
Endokardiyal voltaj haritalaması



Bireyselleştirilmiş lezyon tanımlaması



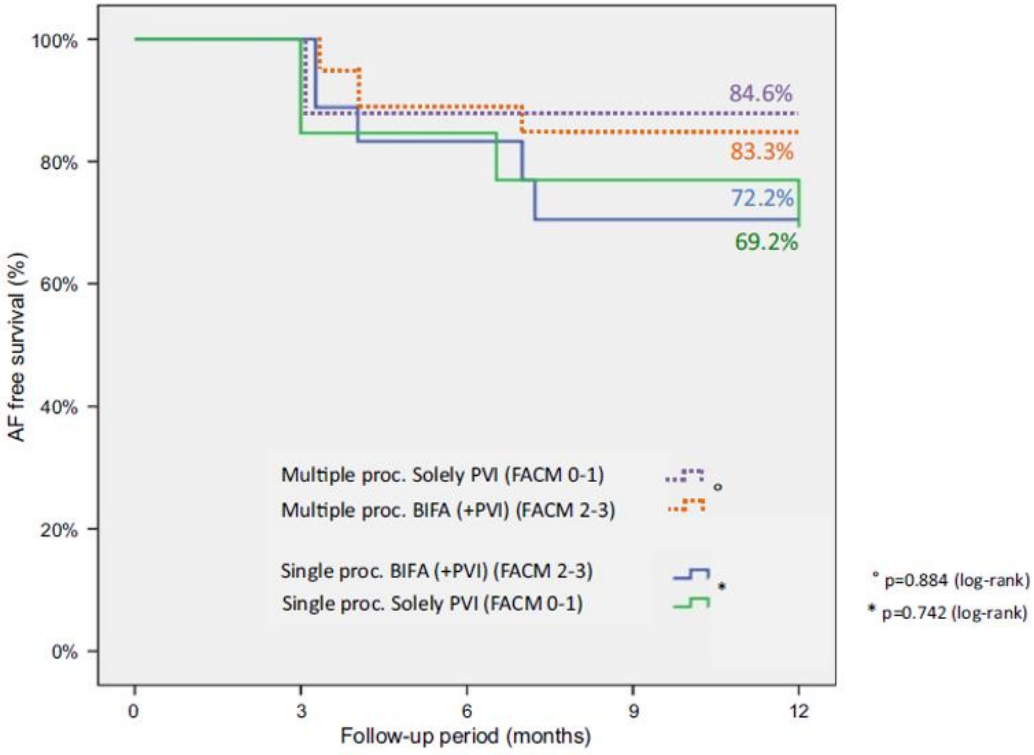
Box Isolation of Fibrotic Areas (BIFA): A Patient-Tailored Substrate Modification Approach for Ablation of Atrial Fibrillation

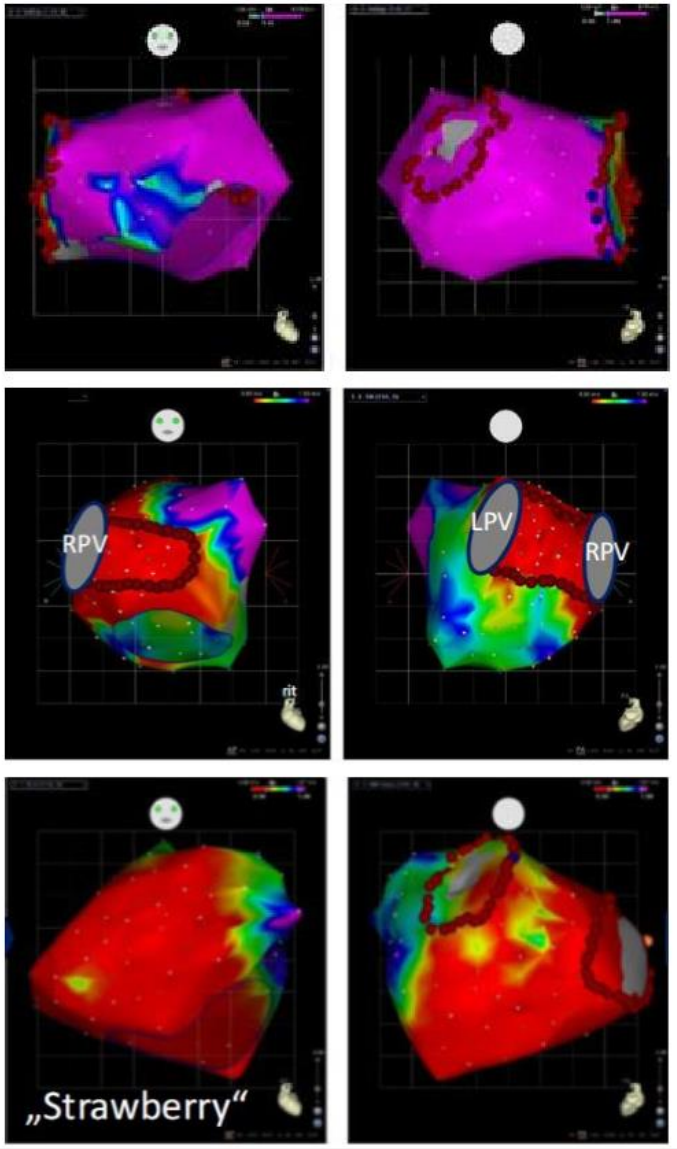
HANS KOTTKAMP, M.D., JAN BERG, M.D., RODERICH BENDER, M.D., ANDREAS RIEGER, M.D., and DOREEN SCHREIBER, M.D.

From the Hirslanden Hospital, Department of Electrophysiology, Zurich, Switzerland

(J Cardiovasc Electrophysiol, Vol. 27, pp. 22-30, January 2016)

42% of persistent AF patients had no LVA





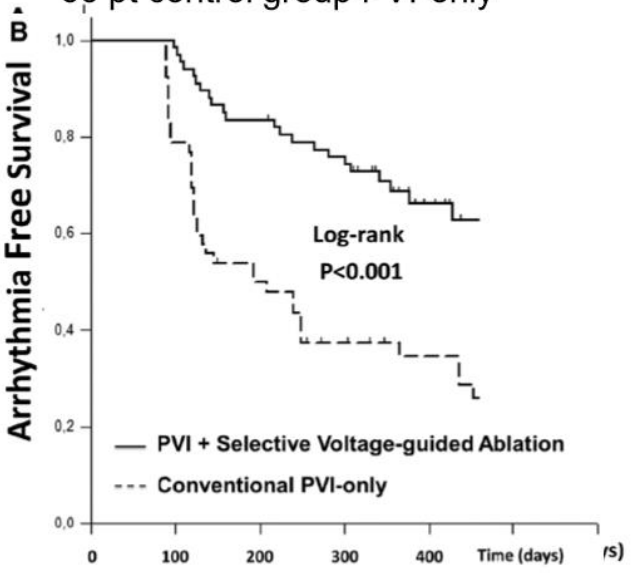
Ablation of LVAs associated with electrograms >70% CL

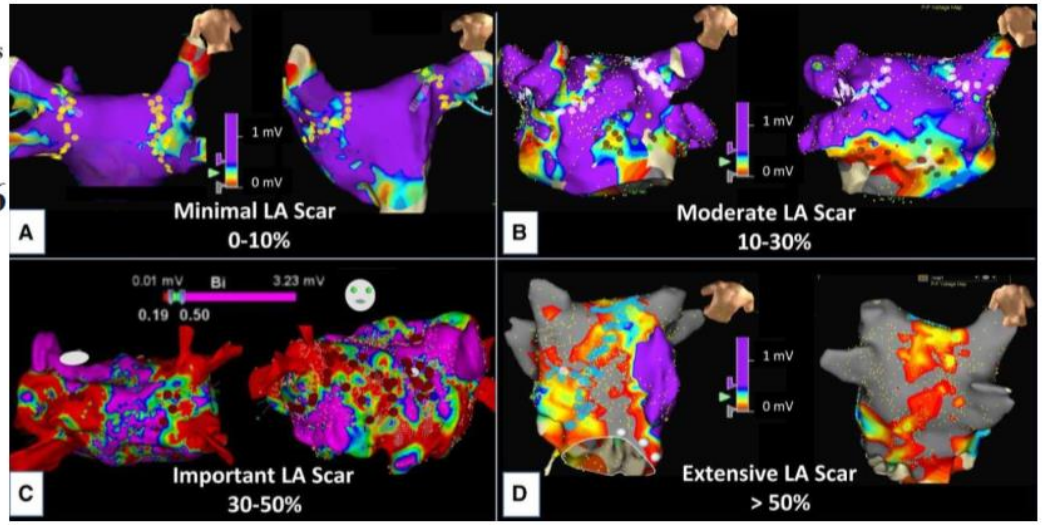
Ablation of Persistent Atrial Fibrillation Targeting Low-Voltage Areas With Selective Activation Characteristics

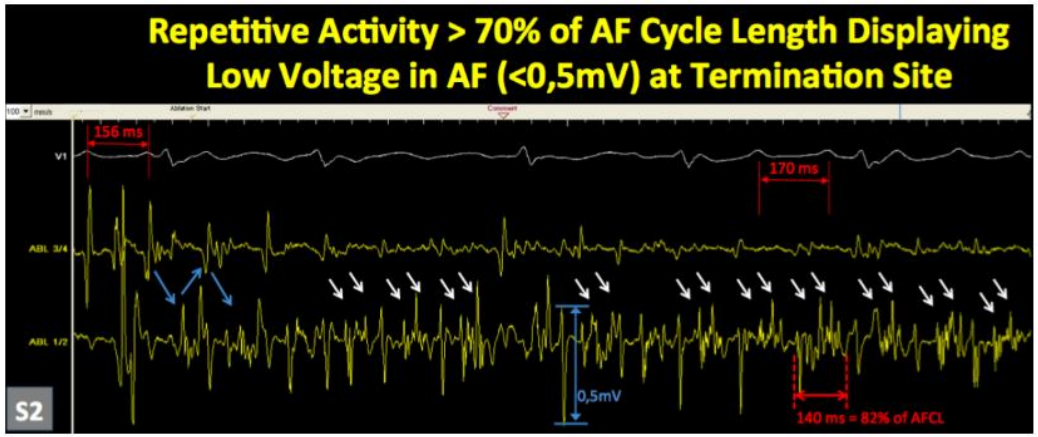
Amir S. Jadidi, MD; Heiko Lehrmann, MD; Cornelius Keyl, MD; Jérémie Sorrel, MD; Viktor Markstein, BSc; Jan Minners, MD; Chan-Il Park, MD; Arnaud Denis, MD; Pierre Jaïs, MD; Mélèze Hocini, MD; Clemens Potocnik, MD; Juergen Allgeier, MD; Willibald Hochholzer, MD; Claudia Herrera-Siklody, MD; Steve Kim, MSEE; Youssef El Omri, MD; Franz-Josef Neumann, MD; Reinhold Weber, MD; Michel Haissaguerre, MD; Thomas Arentz, MD

Circ Arrhythm Electrophysiol. 2016

85 patients with persistent AF
All underwent DCCV 10/52 before
67 still in AF
62 in AF after PVI who underwent mapping and ablation of LVAs
66 pt control group PVI-only



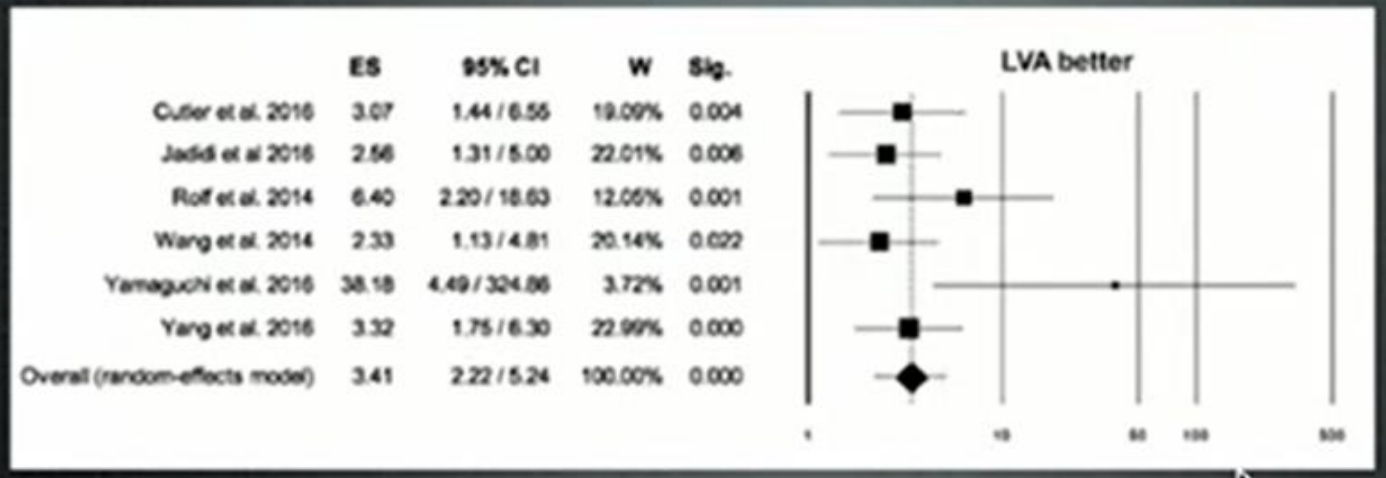




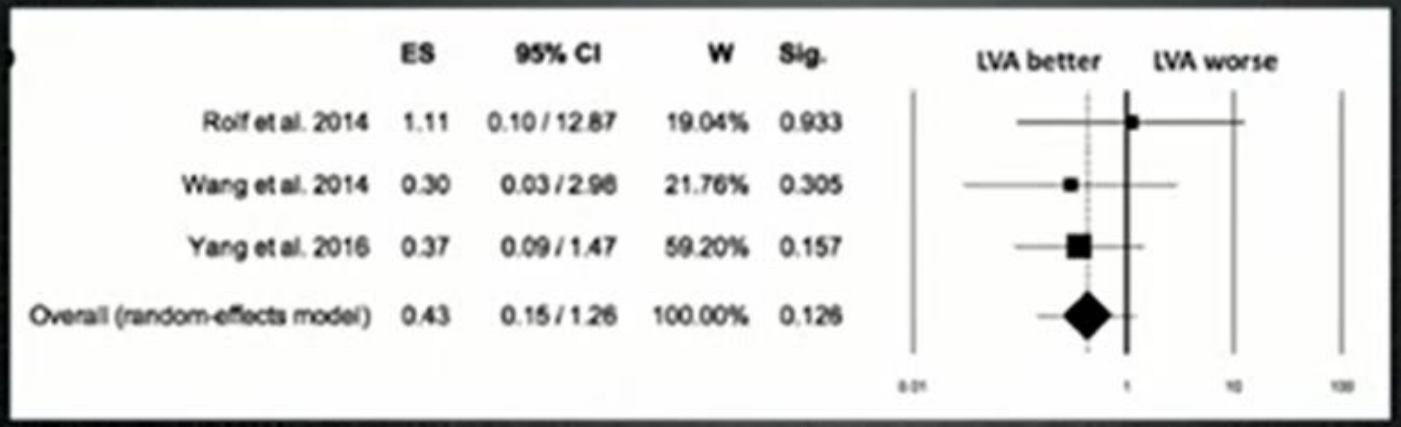
Left Atrial Substrate Modification Targeting Low-Voltage Areas for Catheter Ablation of Atrial Fibrillation: A Systematic Review and Meta-Analysis

Study	Rolf et al.		Wang et al.		Jadidi et al.		Cutler et al.		Yamaguchi et al.		Yang et al.	
Year	2014		2014		2016		2016		2016		2016	
Study Type	Retrospective		Randomized		Prospective		Retrospective		Retrospective (consecutive patients)		Retrospective (consecutive patients)	
No. Patients	204		124		151		141		101		164	
Study Groups	S 178	C 26	S 64	C 60	S 85	C 66	S 65	C 76	S 39	C 62	S 86	C 78
Age, y	61 ± 10	67 ± 9	63 ± 11	62 ± 6	63 ± 8	59 ± 10	62 ± 13	61 ± 10	66 ± 7	58 ± 10	53 ± 10	55 ± 10
Male, %	68	58	64	58	65	74	71	62	62	77	77	77
PAF, %	35	35	0	0	0	0	0	0	0	0	0	0
Pers AF, %	65	65	0	0	100	100	100	100	54	76	42	48
L-s pers AF, %	0	0	100	100	0	0	0	0	46	24	58	52

A Blandino, PACE 2017; 40:199-212

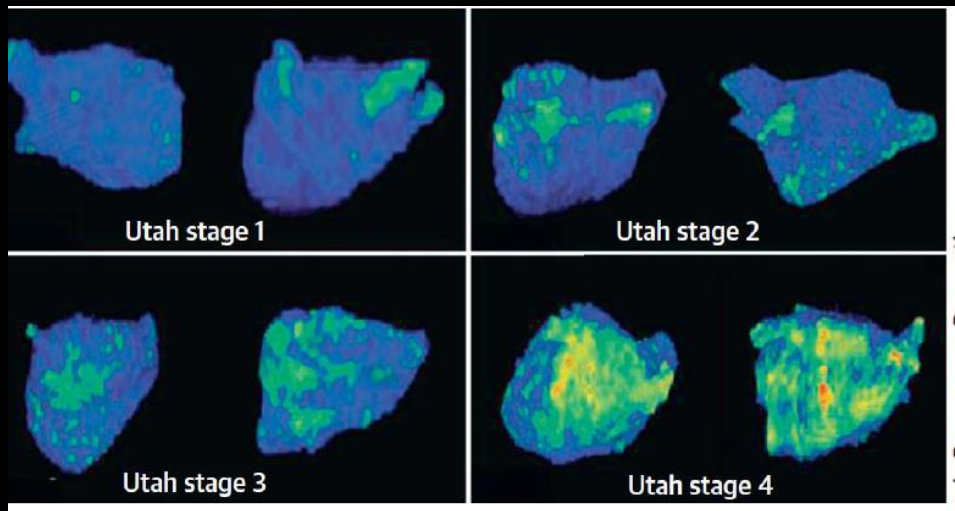


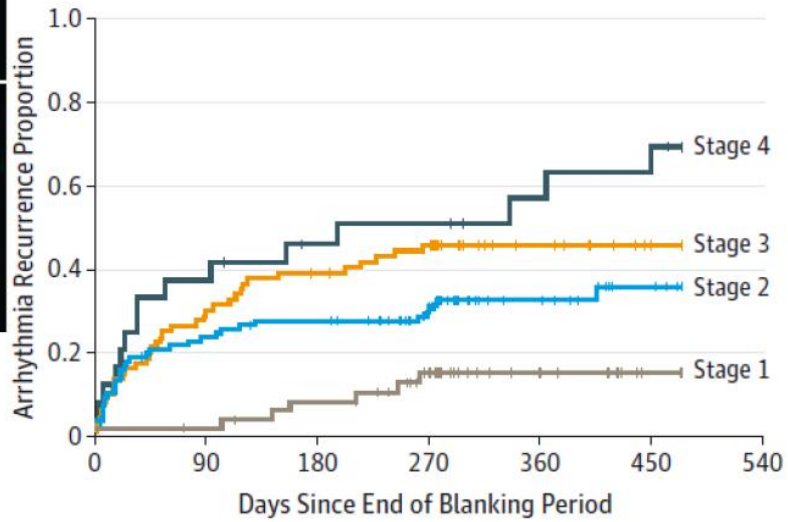
Clinical Efficacy



Adverse events

DECAAF: fibrozis yaygınlığı ablasyon sonrası sonuçları belirler

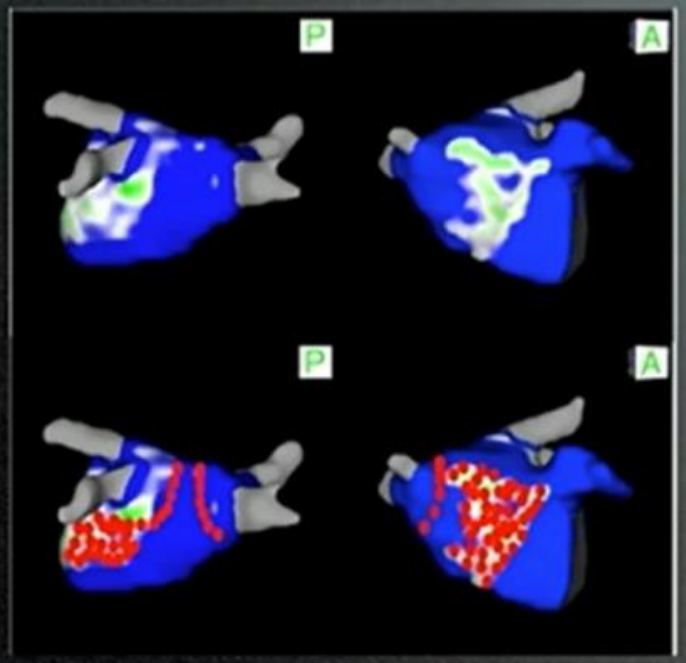


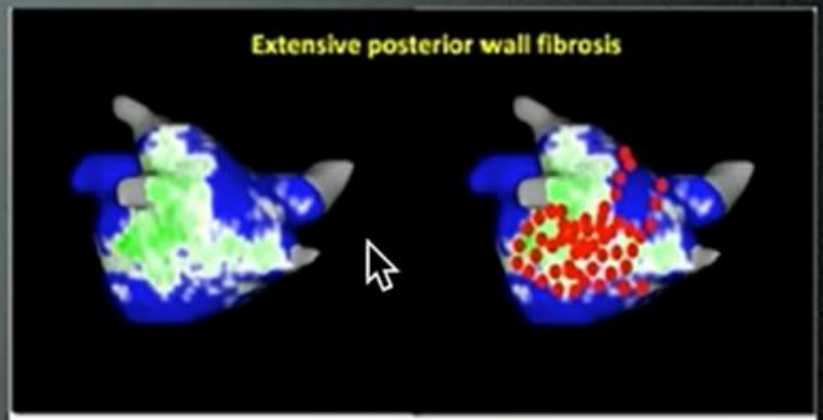


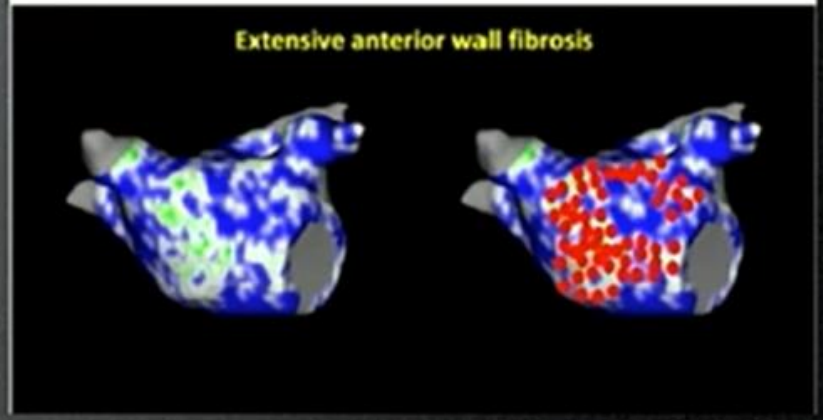
N Marrouche, et al DECAAF study, JAMA 2014;311:498-506

No. at risk						
Stage 4	24	15	11	10	7	6
Stage 3	80	56	47	41	19	12
Stage 2	107	79	74	58	26	15
Stage 1	49	47	43	33	13	4

Efficacy of DE-MRI-Guided Fibrosis Ablation vs. Conventional Catheter Ablation of Atrial Fibrillation DECAAF 2







Kriyobalonun kısıtlılıkları

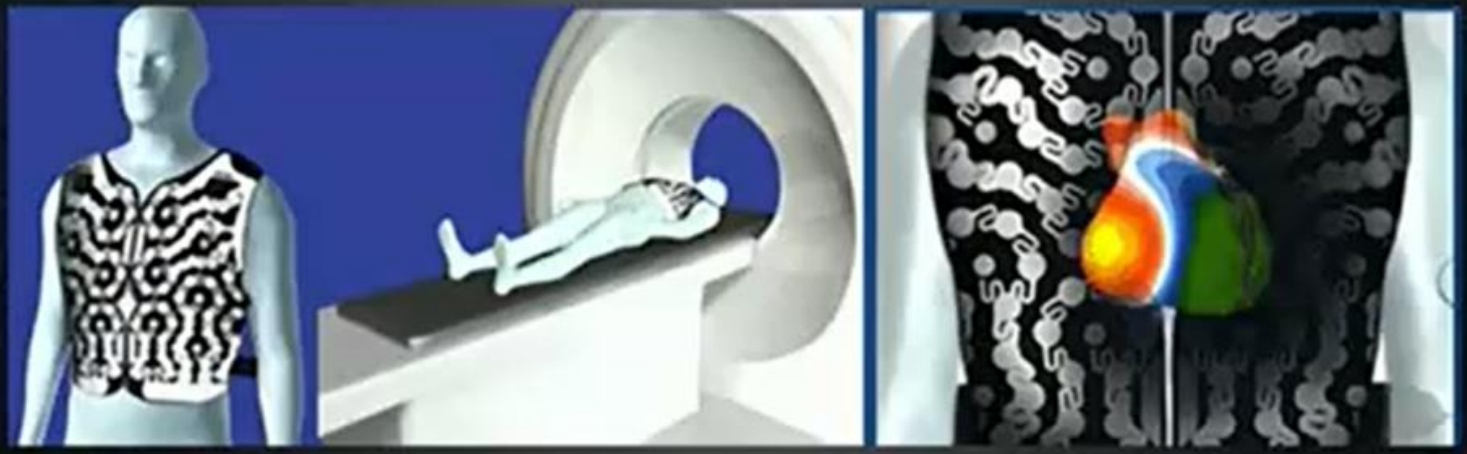
- Çok yönlü olmayışı
  - Anotomik PV varyantları
  - PV dışı hedefler (CTI, posterior duvar, LAA)
- LA substratı hakkında tanısal kabiliyet
  - Bireysel uyarlanmış substrat modifikasyonu
- EP topluluğu
  - Katater yetenek kaybı
  - Alanın ilerlemesine darbe

Complexity and Distribution of Drivers in Relation to Duration of Persistent Atrial Fibrillation

Han S. Lim, MBBS, PhD,[a] Mélèze Hocini, MD,[a,b] Remi Dubois, PhD,[a,b] Arnaud Denis, MD,[a,b] Nicolas Derval, MD,[a,b] Stephan Zellerhoff, MD,[a] Seigo Yamashita, MD,[a] Benjamin Berte, MD,[a] Saagar Mahida, MBChB,[a] Yuki Komatsu, MD,[a] Matthew Daly, MBChB,[a] Laurence Jesel, MD,[a] Carole Pomier, PhD,[a,b] Valentin Meillet, MSc,[a,b] Sana Amraoui, MD,[a,b] Ashok J. Shah, MD,[a] Hubert Cochet, MD,[a,b] Frédéric Sacher, MD,[a,b] Pierre Jaïs, MD,[a,b] Michel Haïssaguerre, MD[a,b]

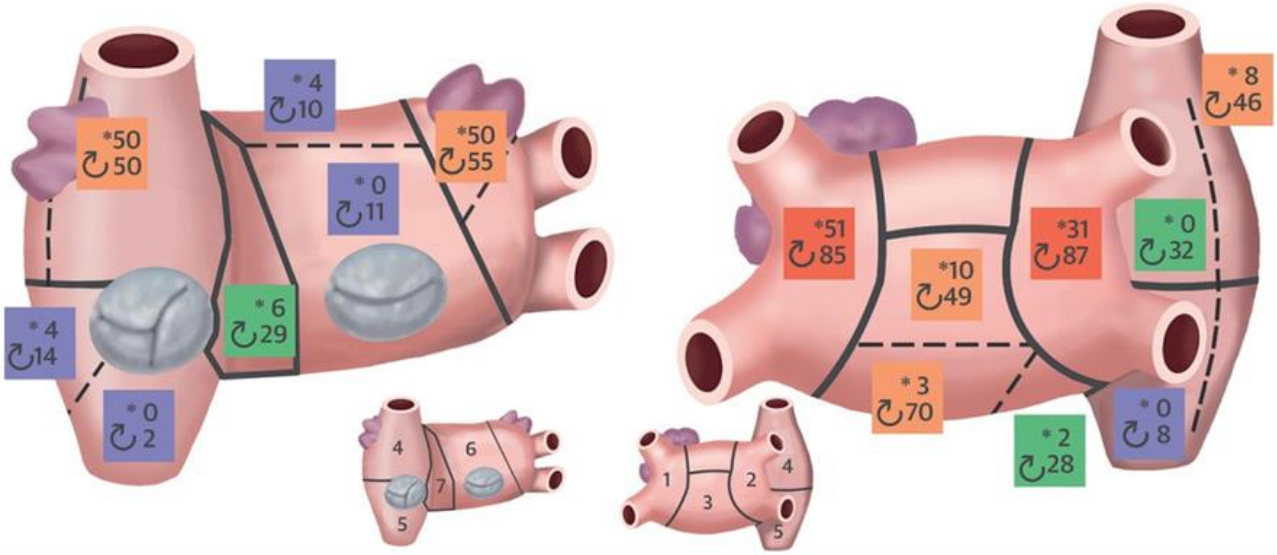
J Am Coll Cardiol 2017;69:1257-69

Body Surface Mapping in 105 patients with denovo PeAF to look for focal and reentrant drivers

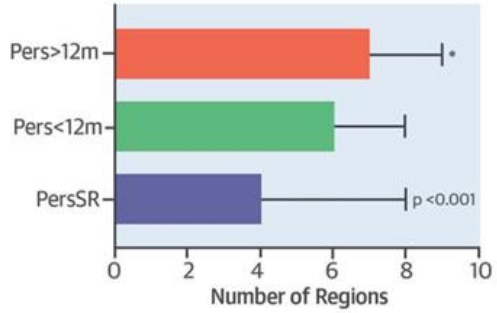


CENTRAL ILLUSTRATION: Distribution of Re-Entrant and Focal Drivers in Persistent AF

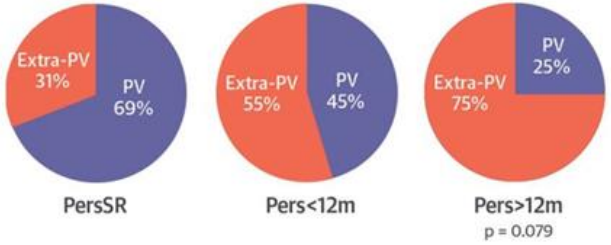
A. Distribution of Re-entrant and Focal Drivers



B. Number of Re-entrant and Focal Driver Regions

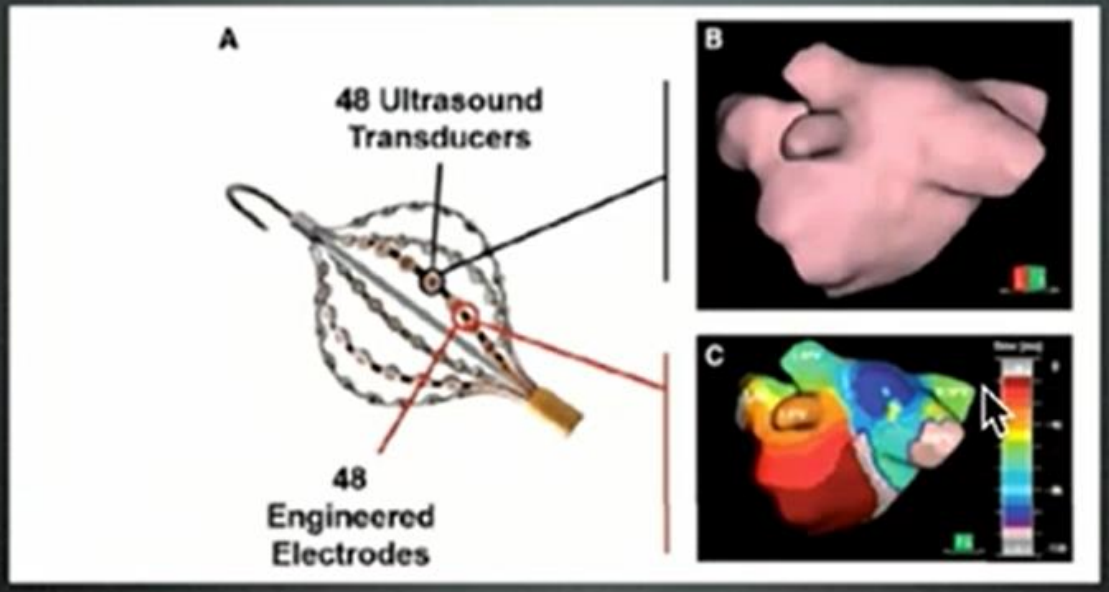


C. AF Termination Sites



Lim, H.S. et al. J Am Coll Cardiol. 2017;69(10):1257-69.

Dipole Density Mapping (AcQ Map) for AF



Non contact Instantaneous mapping

Ultrasound Anatomy Reconstruction

Dipole density or Voltage Mapping

Map Display Tracks leading edge of wave front conduction

Efficient Mapping to assess substrate modification

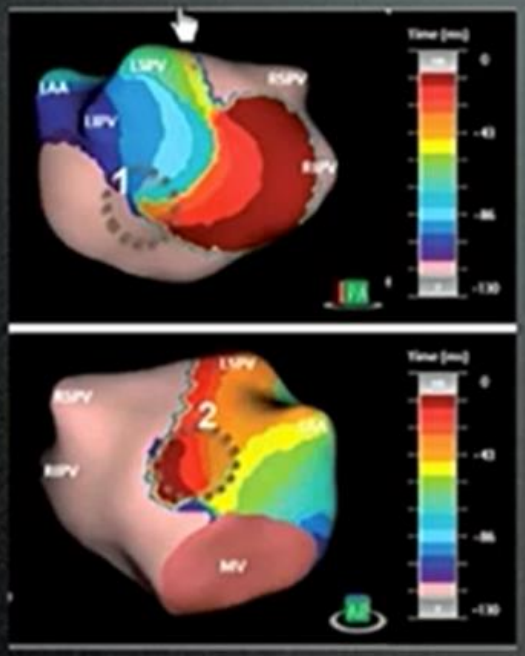
A Grace, A Verma, P Jais, Eur Heart J 2017 doi:10.1093/eurheartj/ehw585

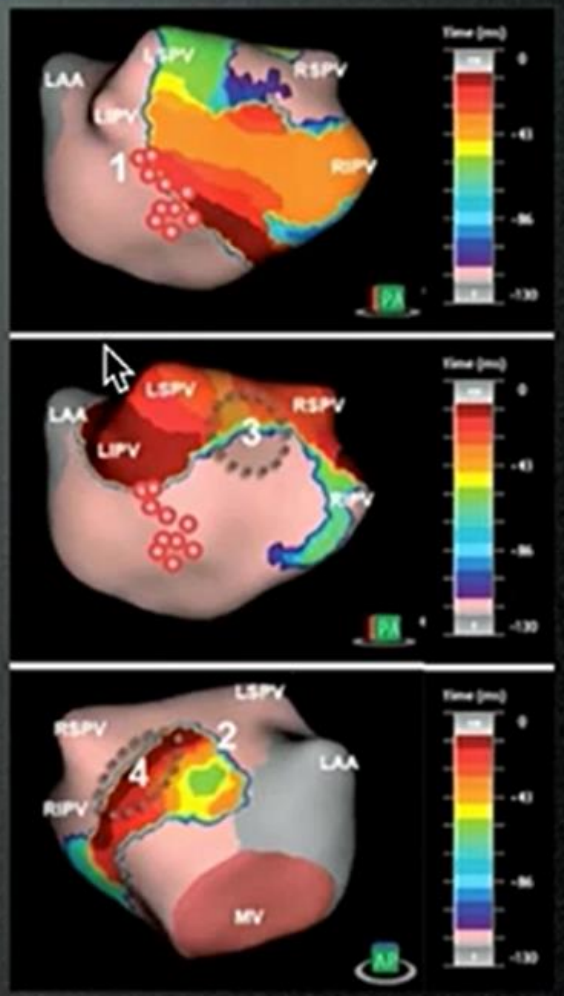
UNCOVER AF study

Utilizing Novel Dipole Density Capabilities to Objectively Visualize the Etiology of Rhythms in AF

125 patients with Persistent AF at 10 European centres

All procedures completed successfully





Sonuçlar

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- Kriyobalon PV izolasyonu için etkili bir alettir
  - Ne fazla, ne eksik

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- Kriyobalon PV izolasyonu için etkili bir alettir
  - Ne fazla, ne eksik
- EAM guided RF'in çok yönlülüğü yoktur
- EAM'ın tanısal yeteneklerine sahip değildir
- It is not a thinking man's tool !