



Summit PVC

Anatomy, Mapping and Ablation of Left Ventricular (LV) Summit PVC.



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COI Disclosure

Kaoru Okishige:

The authors have no financial conflicts of interest
to disclose concerning the presentation



Catheter ablation of left ventricular septal arrhythmias is challenging, with procedure failure in more than a third of patients despite epicardial mapping via the coronary venous circulation or the pericardial space.

Common reasons of failure include difficult access, risk of coronary artery injury, and poor energy delivery due to high impedance or epicardial fat.

Failure to record the earliest site of activation can be common in epicardial and intraseptal VPDs, which is another barrier to endocardial ablation success.

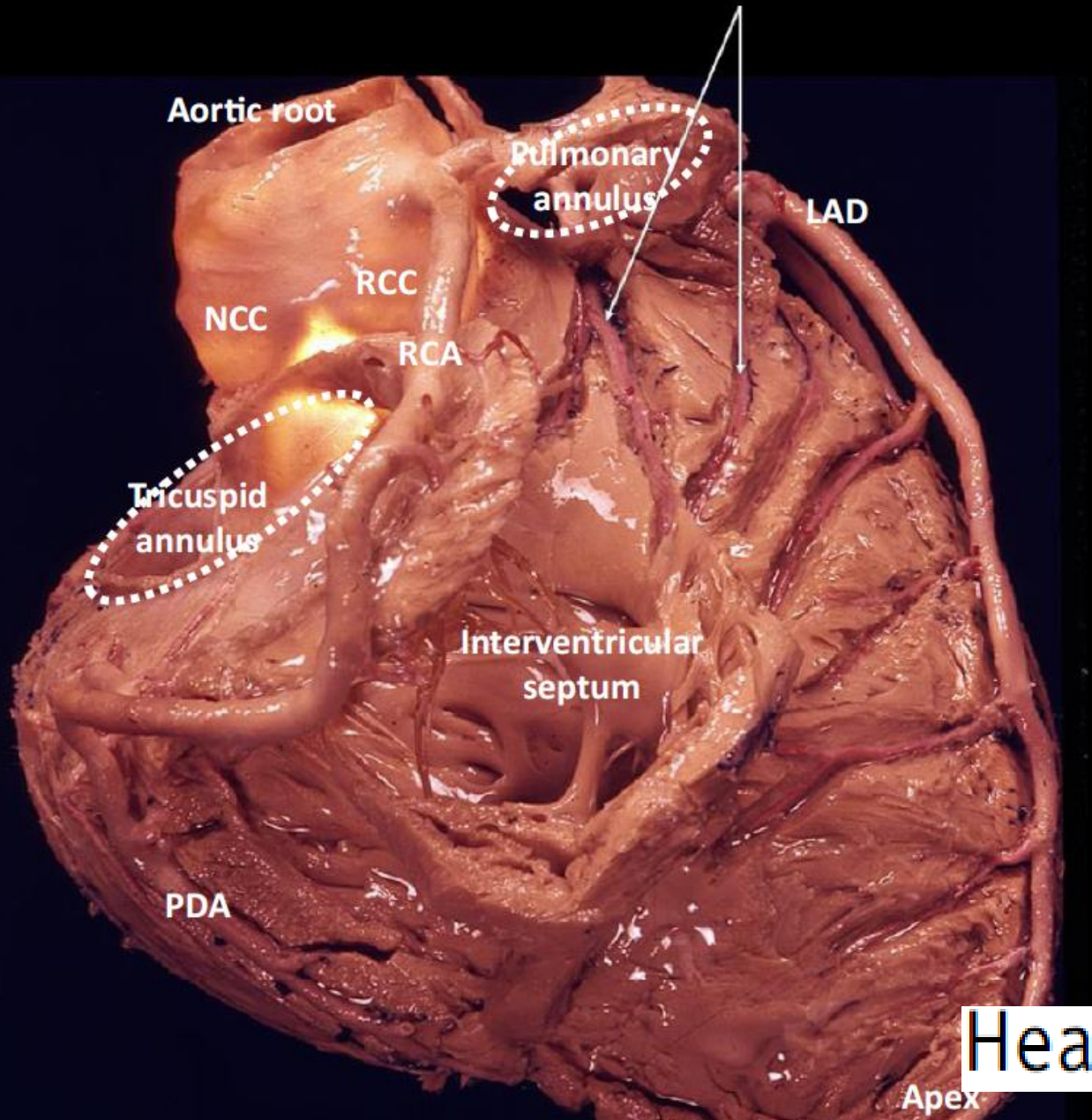
[Circ Arrhythm Electrophysiol 2010;3:616–623.](#)

Intramyocardial mapping of ventricular premature depolarizations via septal venous perforators: Differentiating the superior intraseptal region from left ventricular summit origins

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Heart Rhythm 2022;19:1475–1483

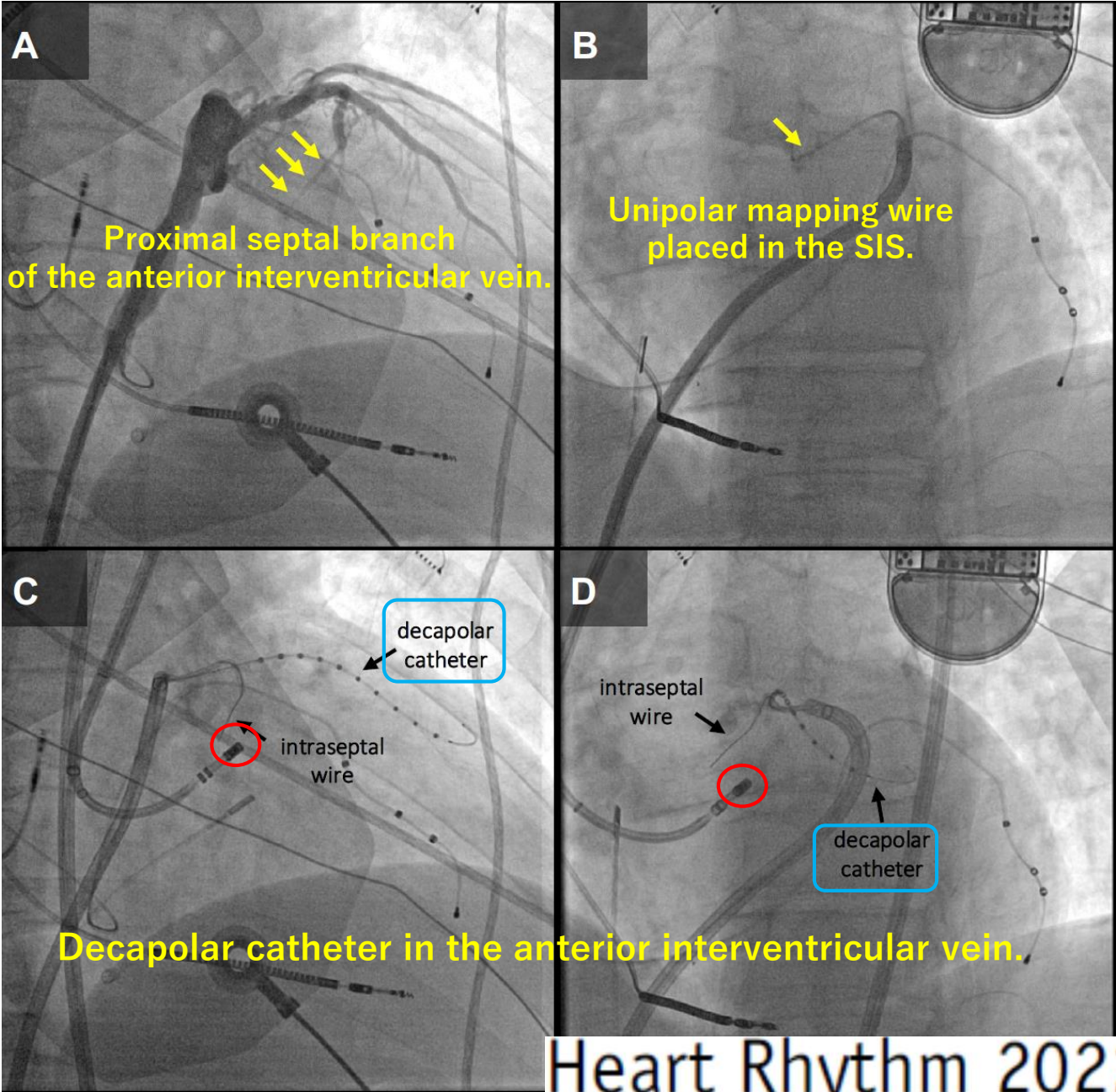
Basal superior intraseptal (SIS)



SIS region is located between the endocardial outflow tract and the epicardial left ventricular summit.

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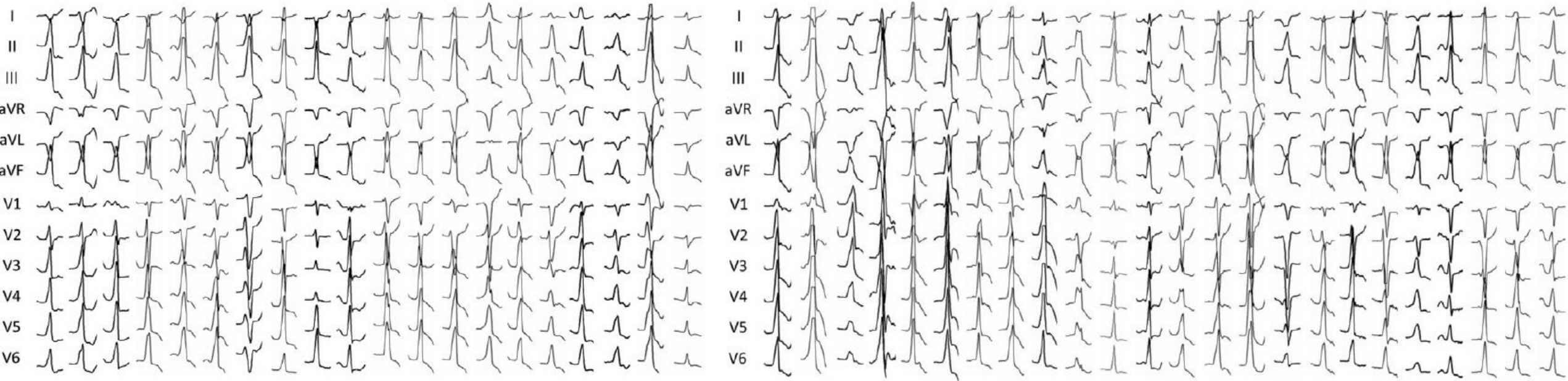
Fluoroscopic view of the procedural setup during SIS mapping.



(SIS=basal superior intra-septal)

SIS origin (Group 1)

No SIS origin (Group 2)



There were no apparent ECG characteristics capable to distinguish between the groups.

Ablation Results

***Endocardial LVOT-RF in 15/20 (75 %)**

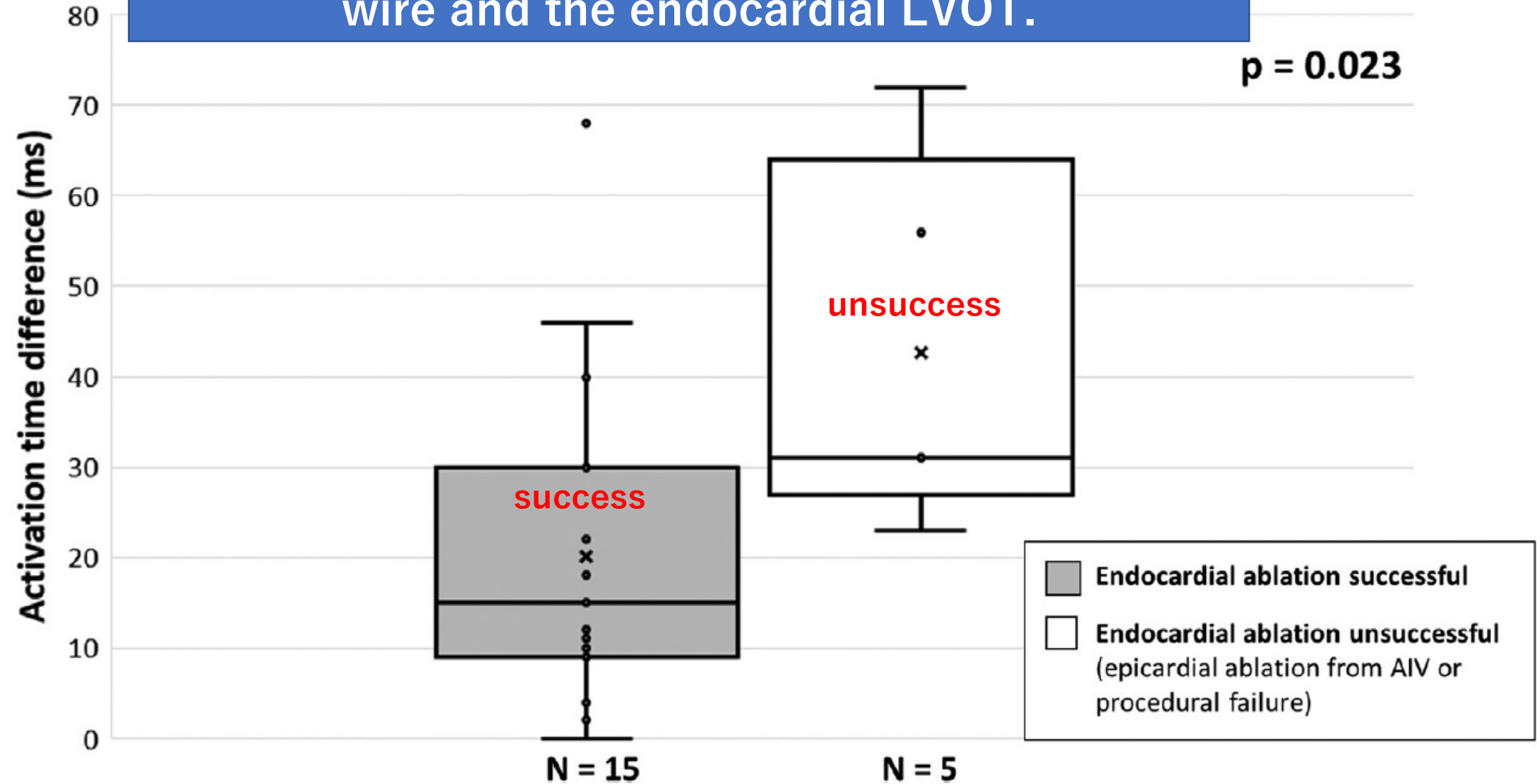
***RF inside CS in 2/20 (10 %)**

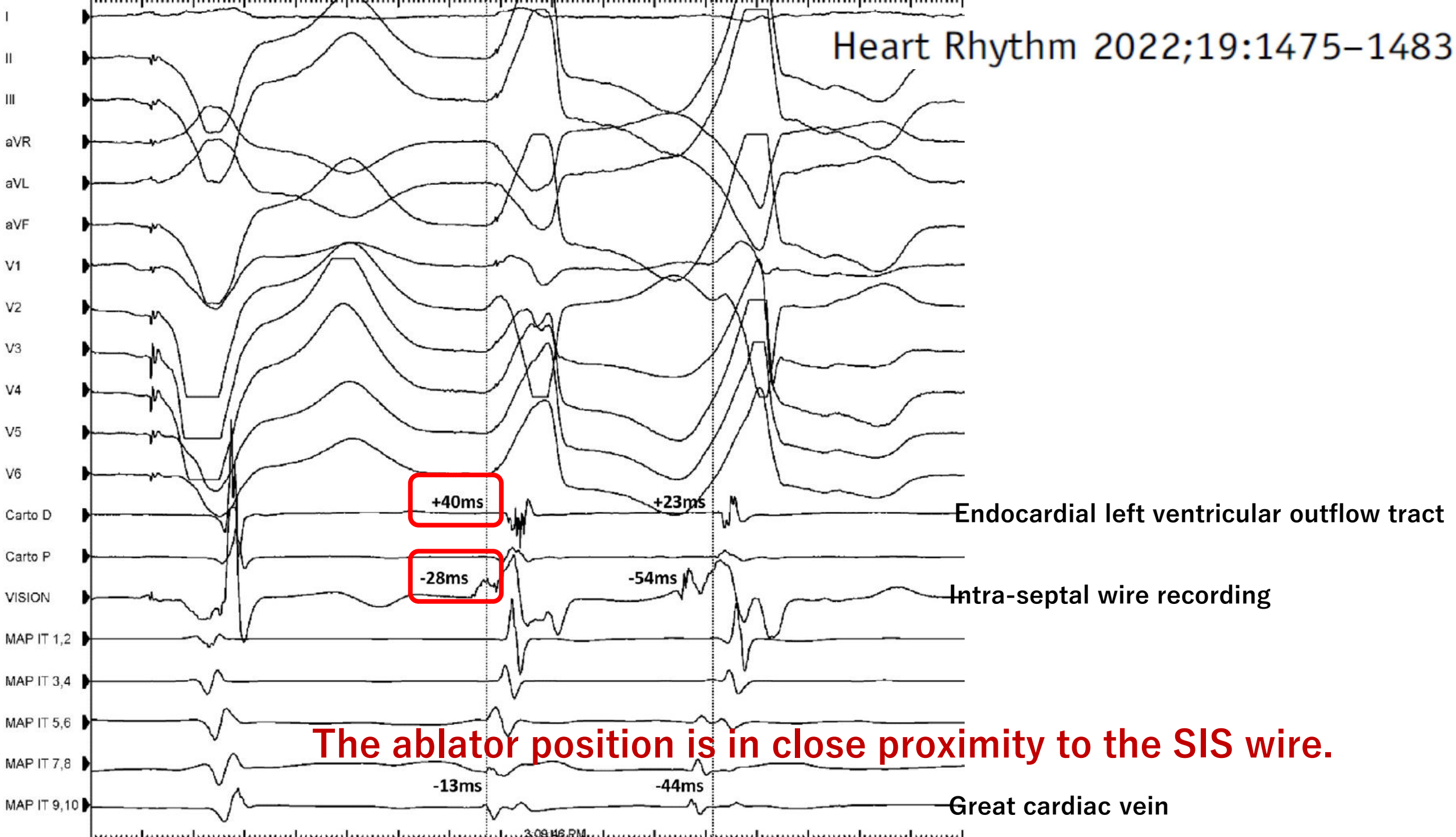
***Additional half-saline irrigated RF in 4/20 (20 %)**

Endocardial LVOT in 3, inside CS in 1

***Ethanol infusion in 1/20 (5 %)**

Activation differences between the intra-septal wire and the endocardial LVOT.





Chemical Mapping

Injection of cold saline for diagnosis of intramural ventricular arrhythmias

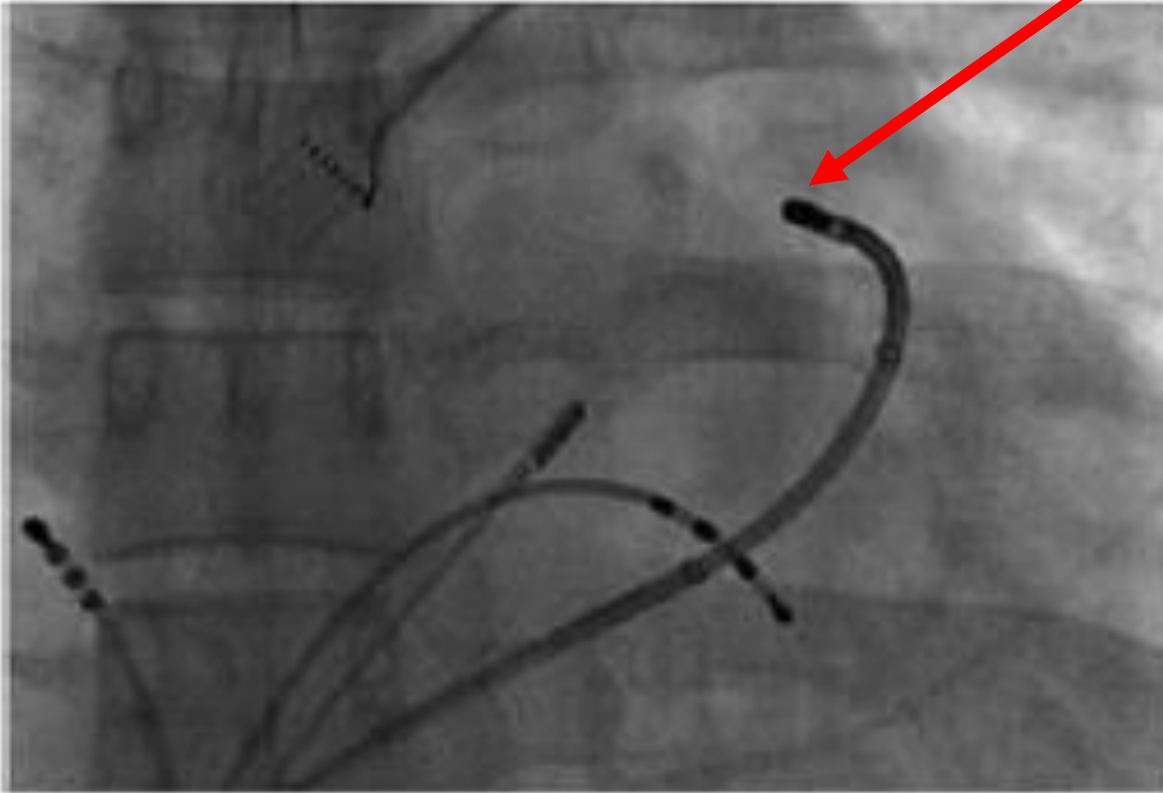
Miki Yokokawa, MD, Fred Morady, MD, FACC, Frank Bogun, MD, FACC

From the Division of Cardiovascular Medicine, University of Michigan Health Center, Ann Arbor, Michigan.

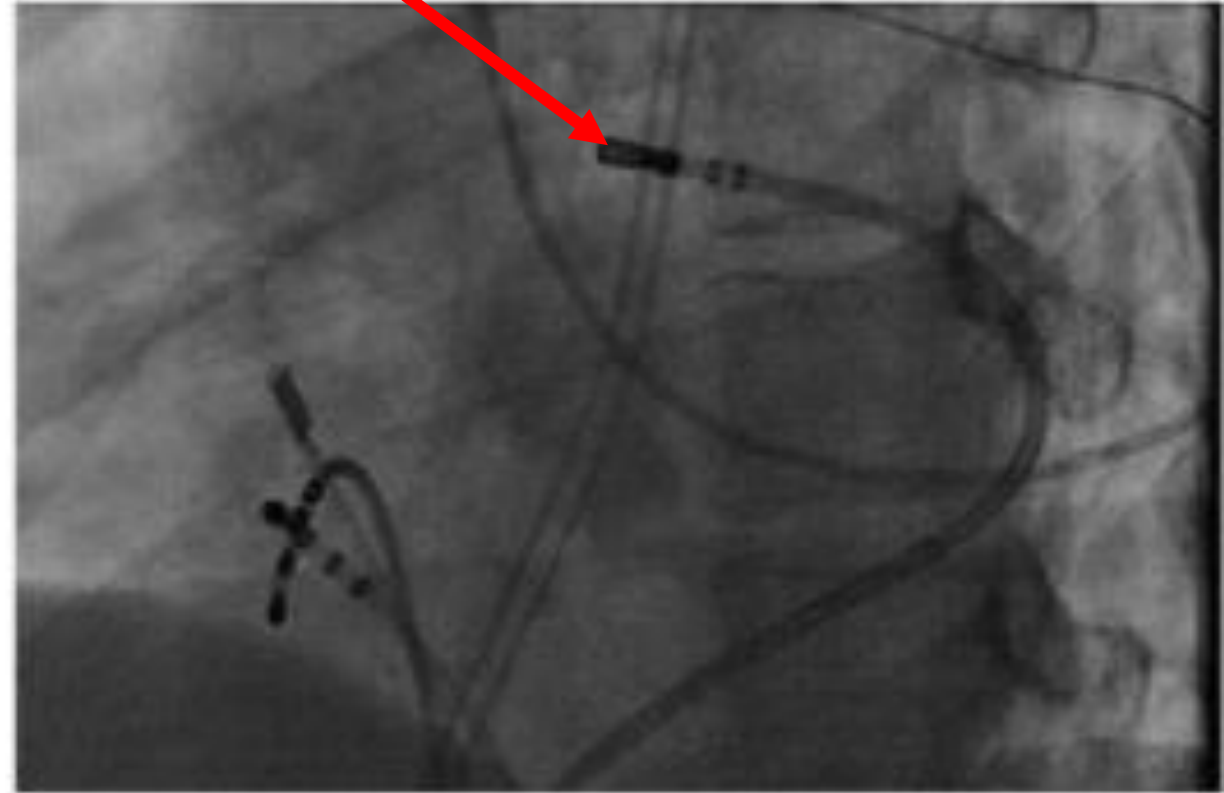
Heart Rhythm 2016;13:78–82

Irrigated ablation catheter

RAO



LAO





Suppression of premature ventricular complexes in a patient with bigeminal rhythm when cold saline was infused into the distal great cardiac vein

Table 2 Comparison of patients with intramural and non-intramural origins

Variable	Intramural PVC	Non-intramural PVC	<i>P</i> value
No. of patients	10	16	
Age (years)	56 ± 15	61 ± 12	.34
Male gender (n)	6	9	1
Left ventricular ejection fraction (%)	44 ± 16	49 ± 9	.26
PVC burden (%)	32.4 ± 11.0	25.2 ± 8.6	.07
Suppression with saline	9 (90)	2 (13)	.0002
PVC QRS width (mm)	156 ± 10	159 ± 18	.63
PVC morphology			
Left bundle branch block	7	7	.42
Inferior axis	10	12	.13
Activation time at site of origin (ms)	-34 ± 2	-30 ± 9	.35
Pace-map score at site of origin (from perforator veins for intramural PVCs)	10.5 ± 0.4	9.7 ± 2.2	.48
Successful ablation	7	13	.23
Total procedure time (min)	326 ± 88	271 ± 92	.15
Radiofrequency time (min)	25 ± 12	19 ± 14	.36

Suppression of PVCs during injection of cold saline within the CVS suggests the presence of an intramural site of origin.

were not suppressed. The suppression of PVCs by cold saline was associated with the presence of an intramural PVC focus with an accuracy of 88% (sensitivity 90%, specificity 88%, positive predictive value 82%, negative predictive value 93%, $P = .0002$).

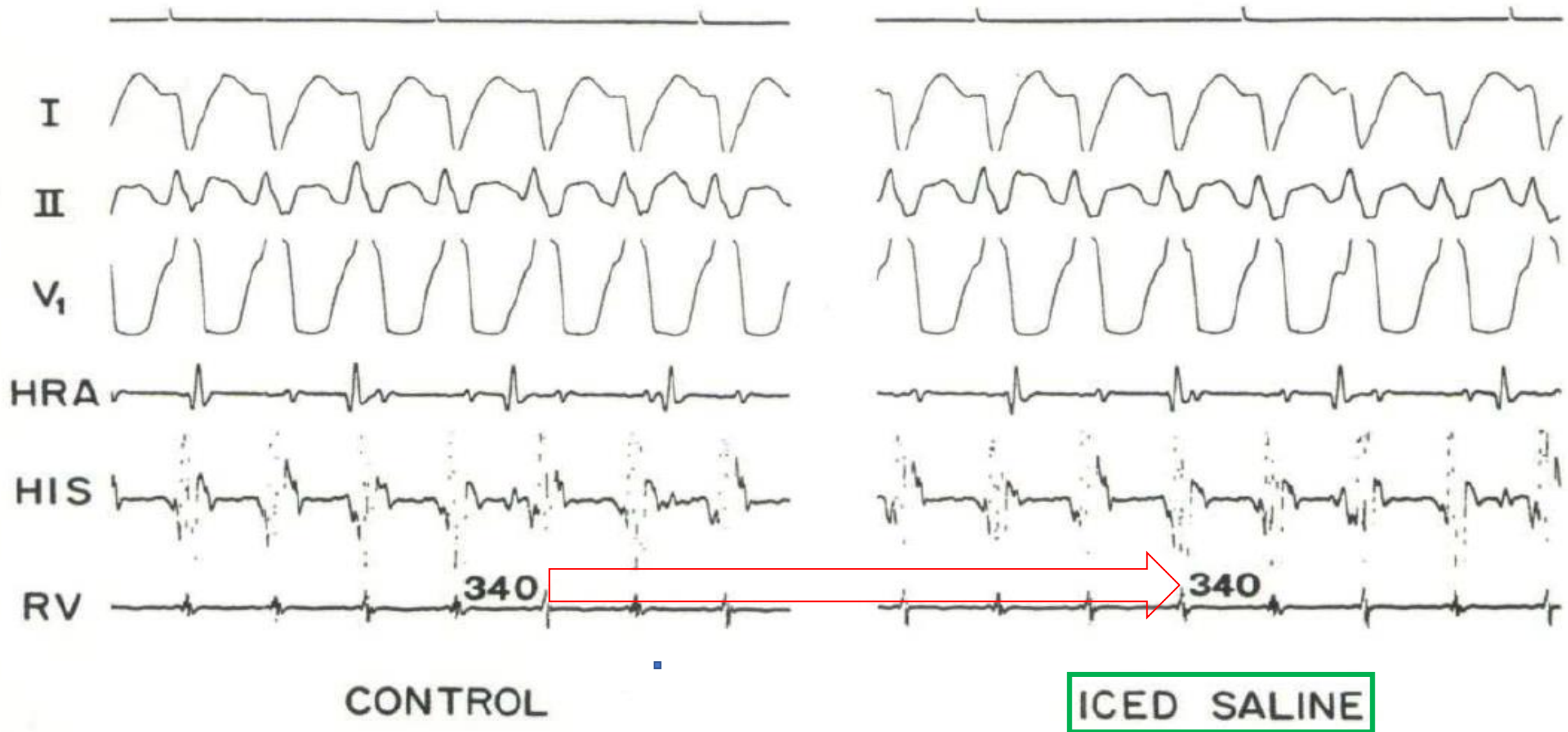
A Comparative Study of Intracoronary Iced Saline Versus Intracoronary Antiarrhythmic Drugs to Identify the Ventricular Tachycardia-Related Artery

**S. ADAM STRICKBERGER, M.D., KAORU OKISHIGE, M.D., and
PETER L. FRIEDMAN, M.D., PH.D.**

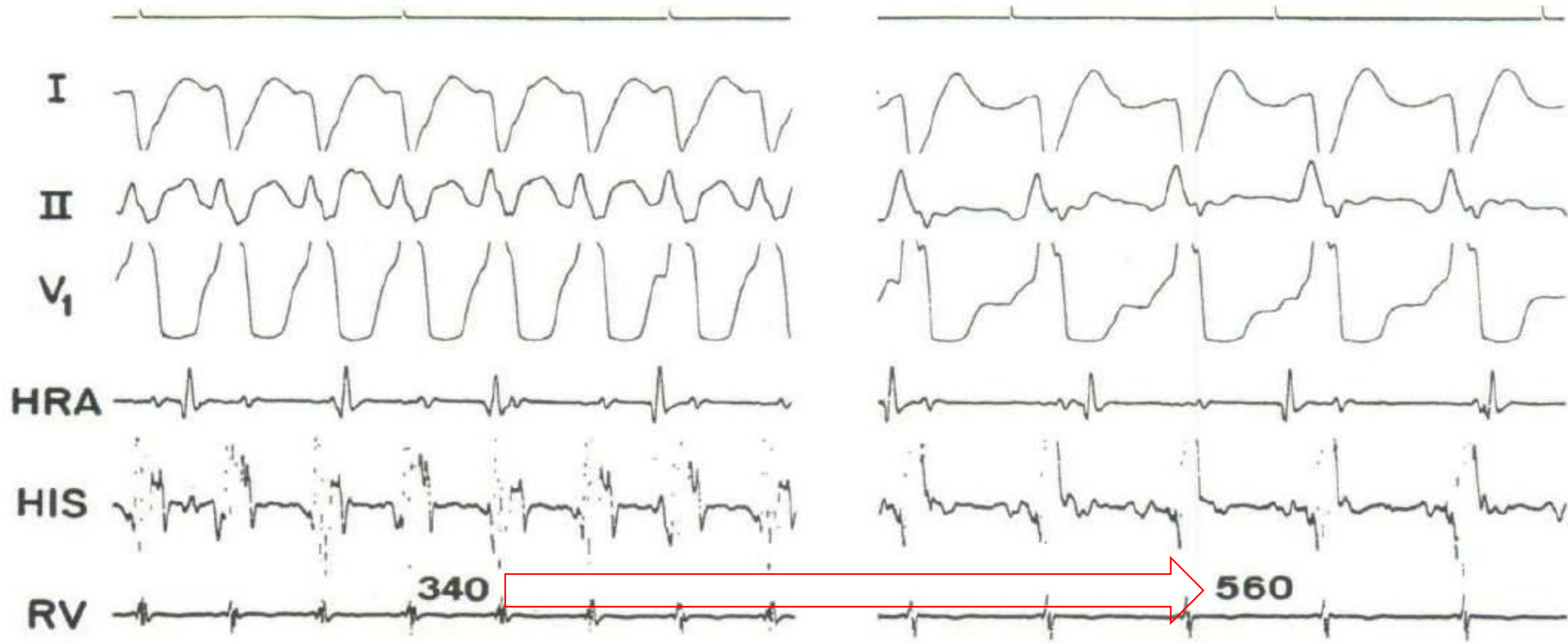
From the Cardiac Arrhythmia Service and Clinical Electrophysiology Laboratory, Brigham and Women's Hospital,
Boston, Massachusetts

J Cardiovasc Electrophysiol 1992;3:199-208

SELECTIVE CIRCUMFLEX-MARGINAL BRANCH INJECTION



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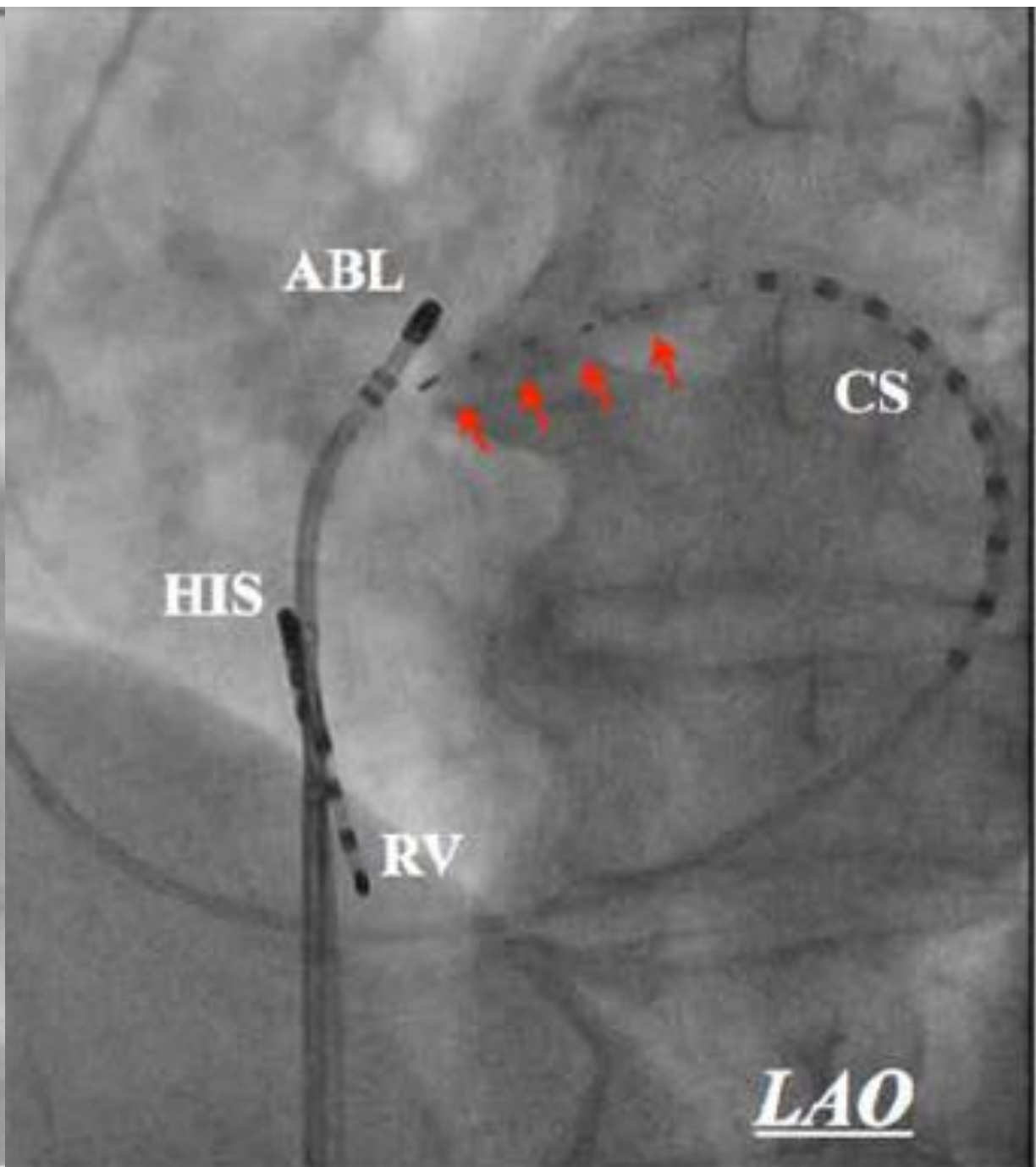
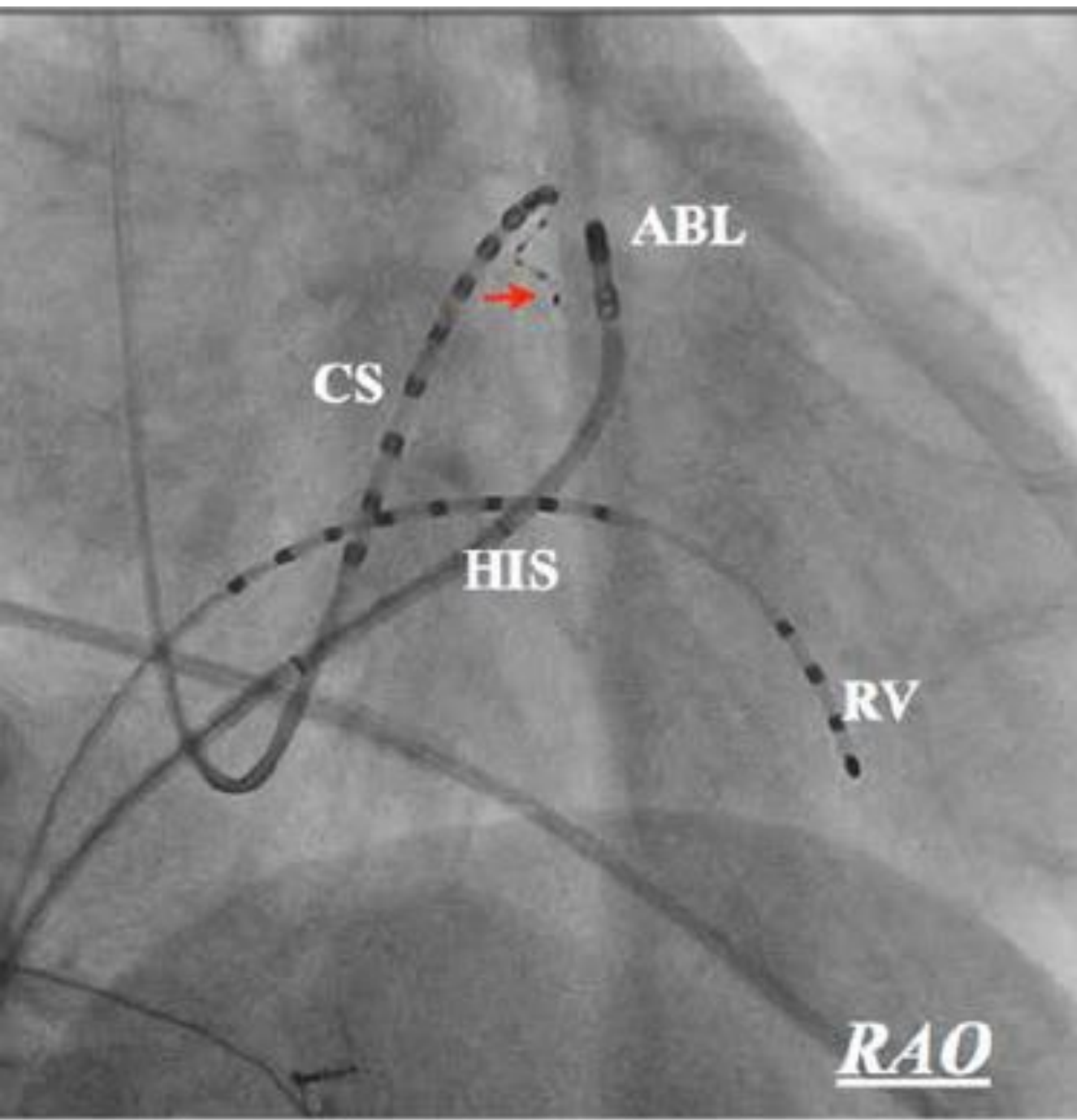


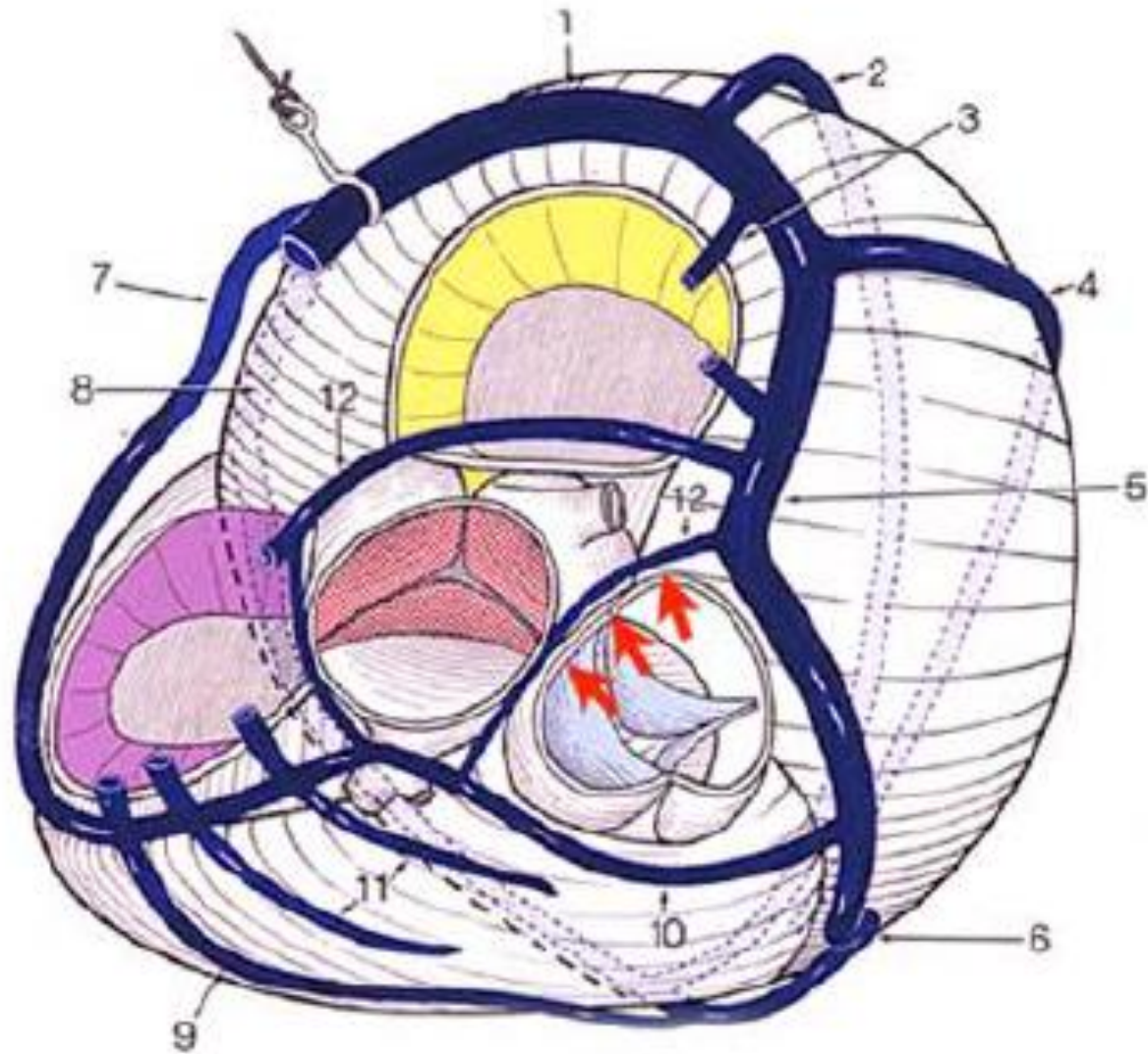
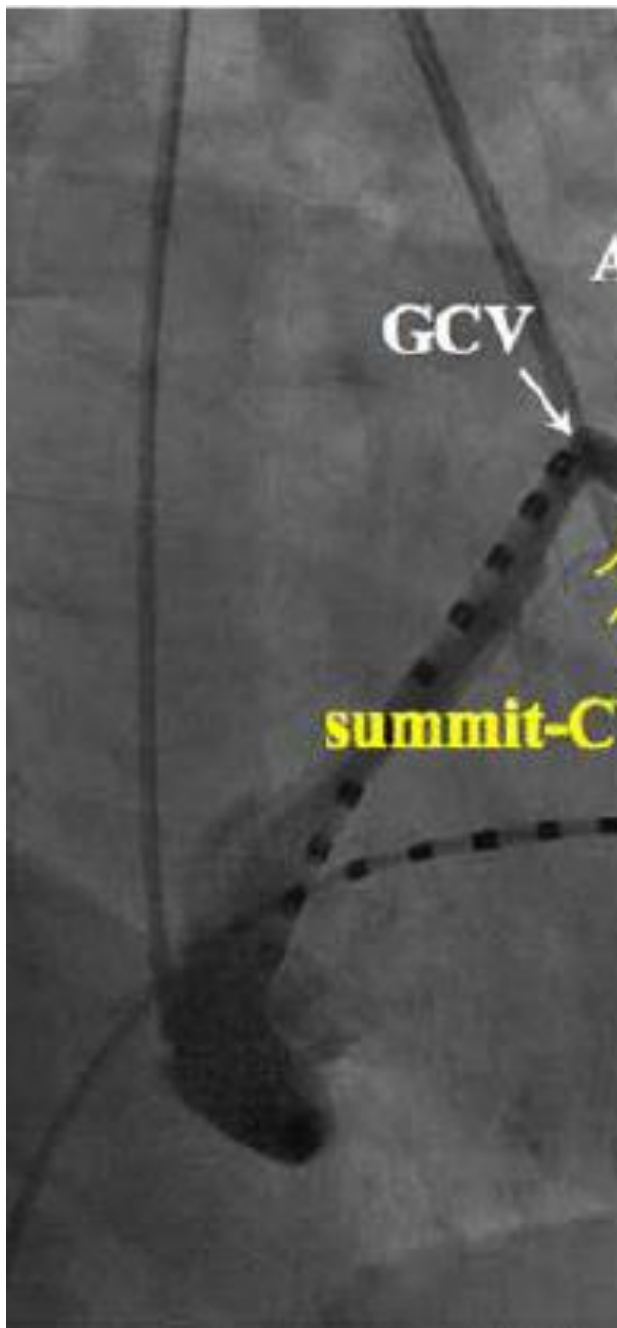
RE-CONTROL

PROCAINE AMIDE 4.0mg over 15 s

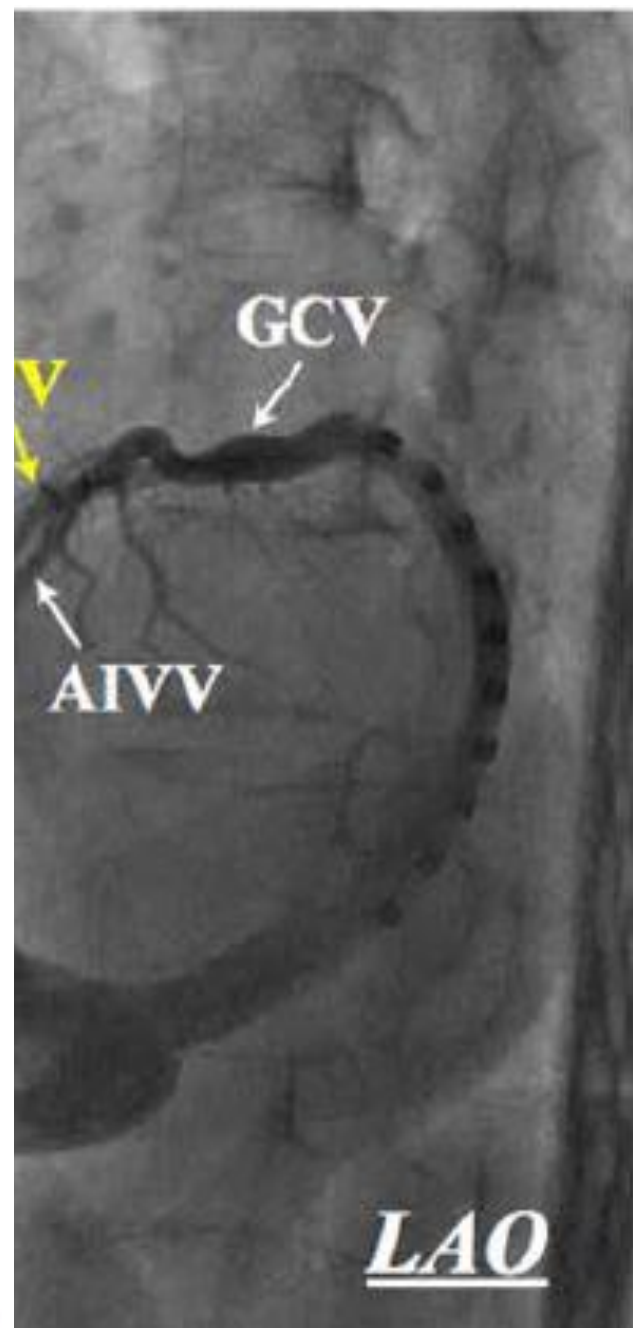
Idiopathic Ventricular Arrhythmias Originating From the Vicinity of the Communicating Vein of Cardiac Venous Systems at the Left Ventricular Summit

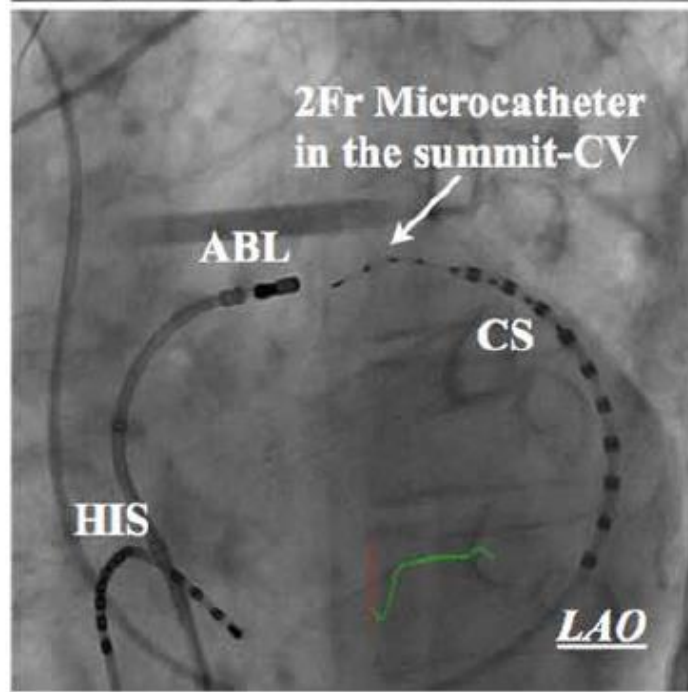
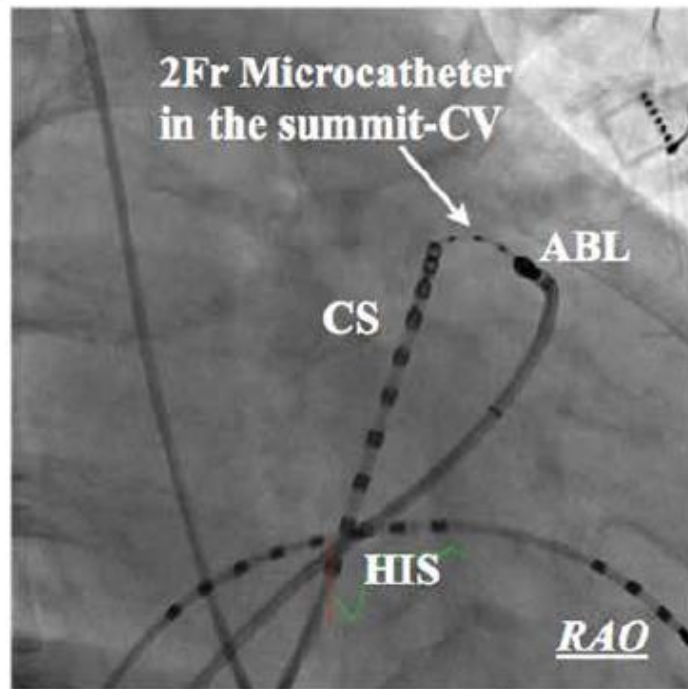
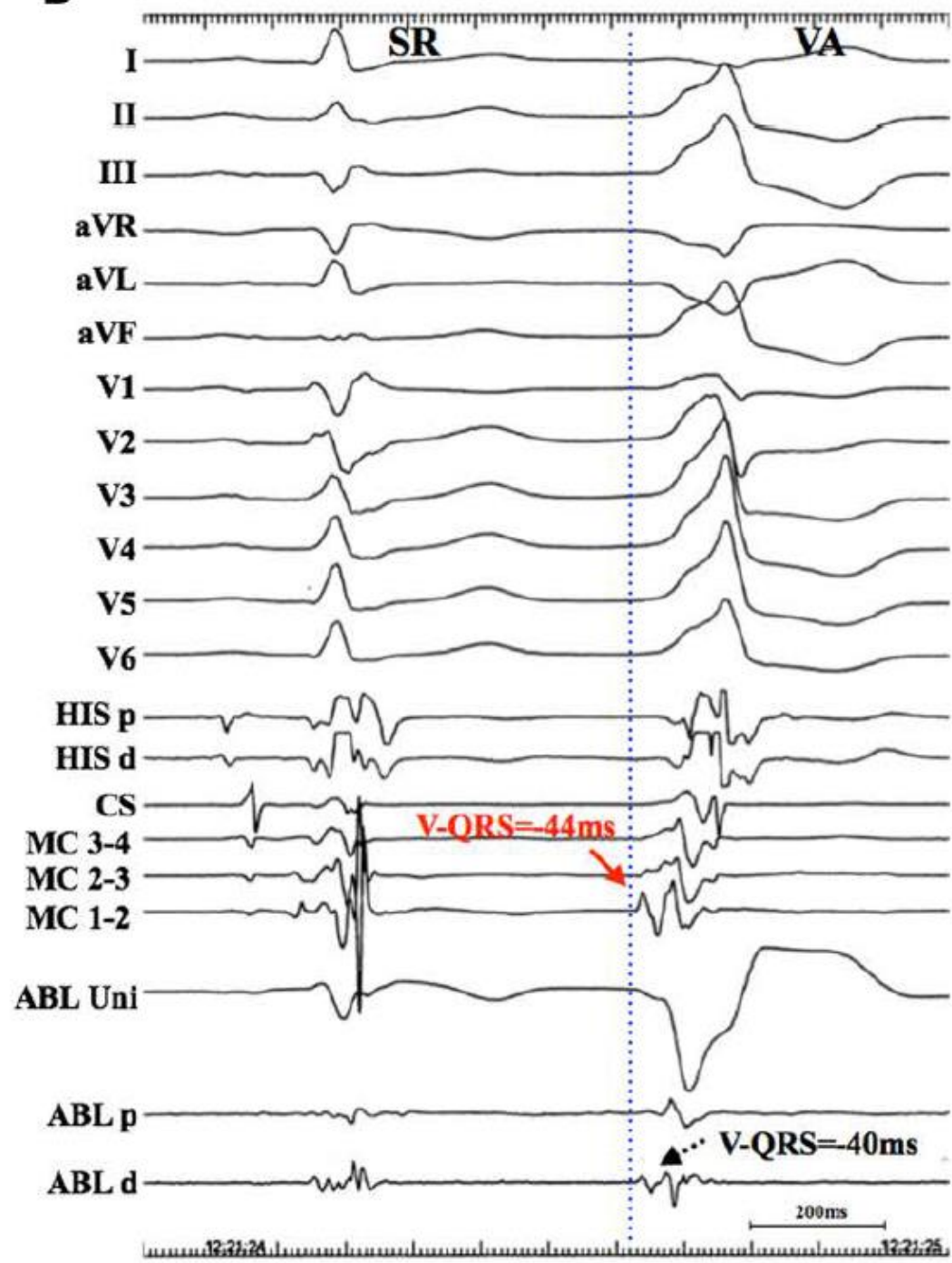
Circ Arrhythm Electrophysiol. 2018;11:e005386. DOI: 10.1161/CIRCEP.117.005386





- | | | |
|----------------------|---------------------------|-------------------|
| 1. Coronary Sinus | 5. Great Vein | 9. Right Marginal |
| 2. Posterior L.V. | 6. Ant. Interventricular | 10. Conus |
| 3. Oblique L. Atrial | 7. Small Cardiac | 11. Anterior R.V. |
| 4. Obtuse Marginal | 8. Post. Interventricular | 12. Communicating |

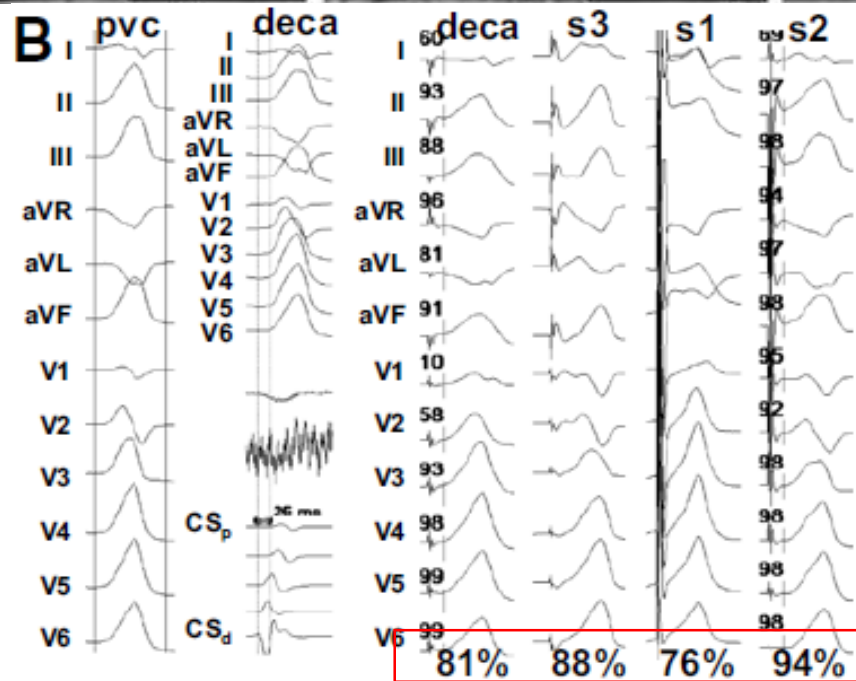
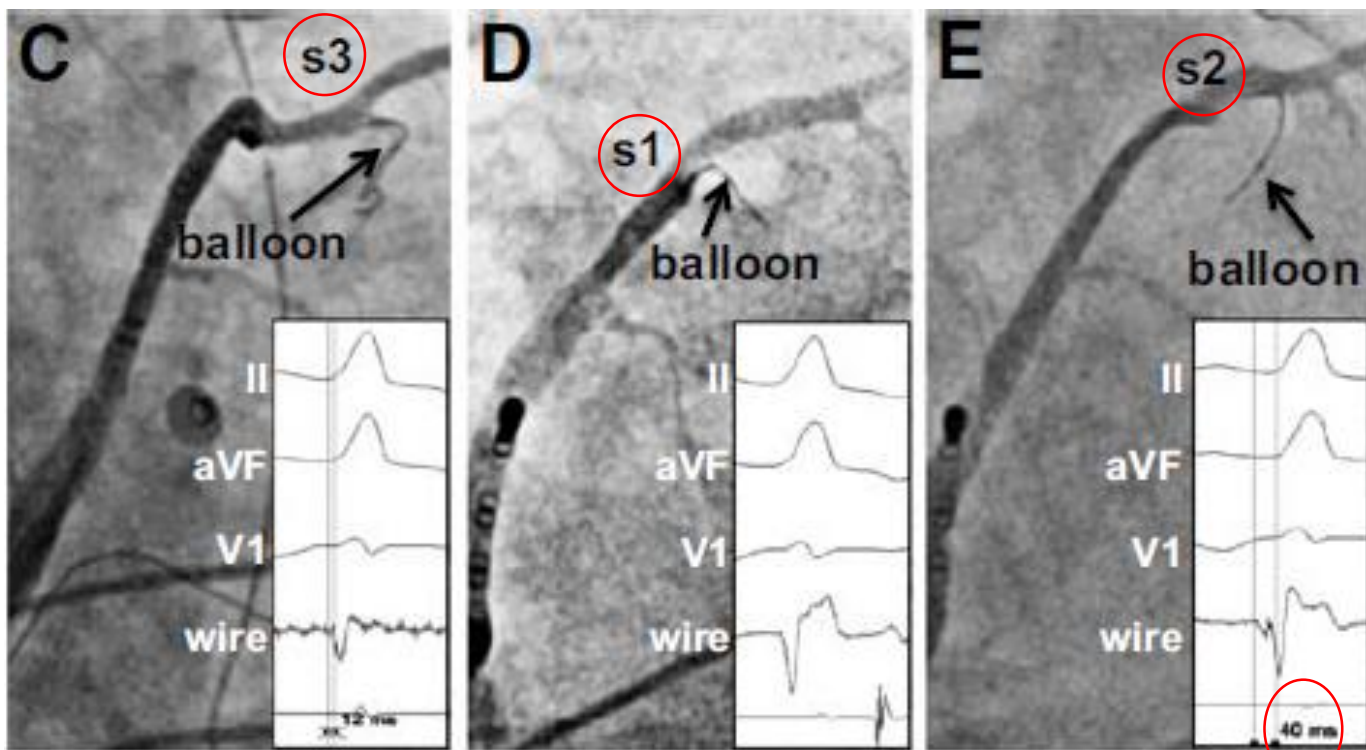


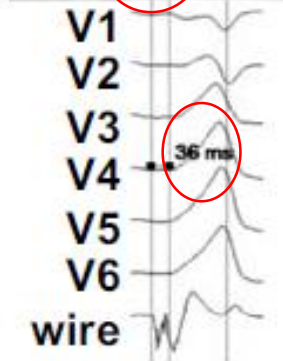
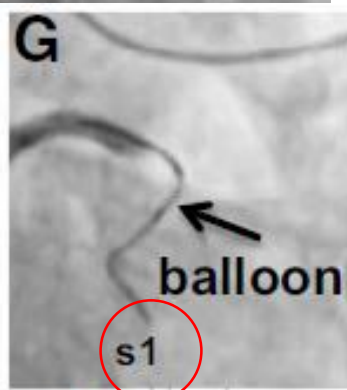
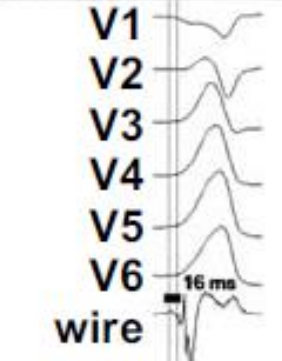
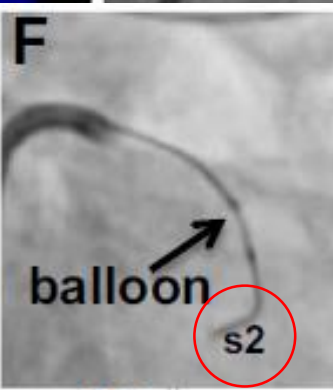
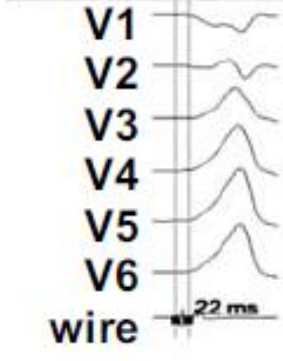
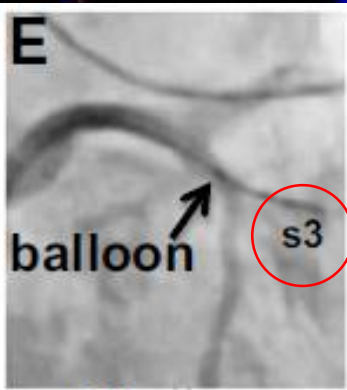
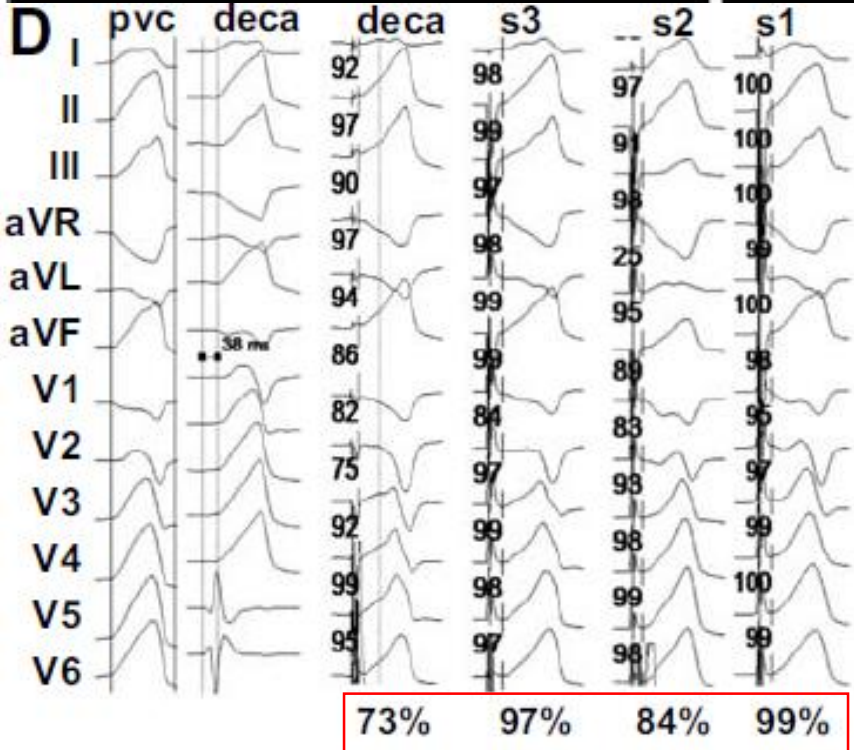
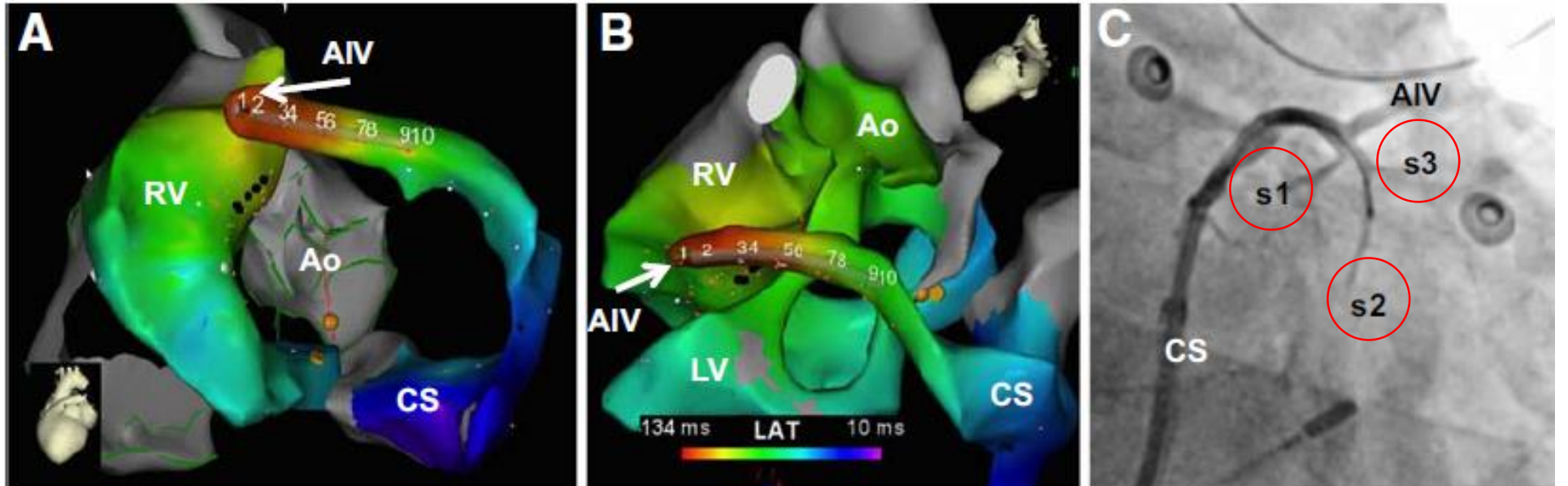
A**B**

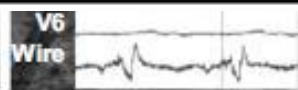
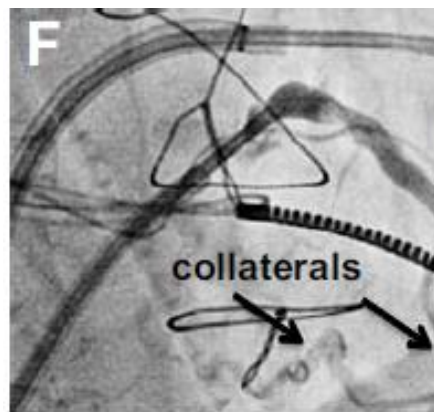
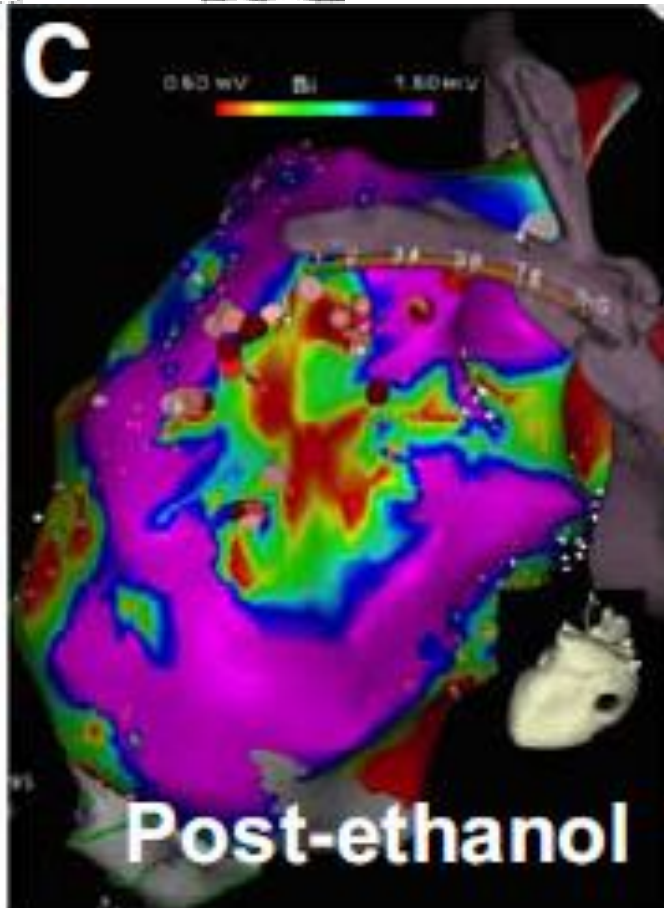
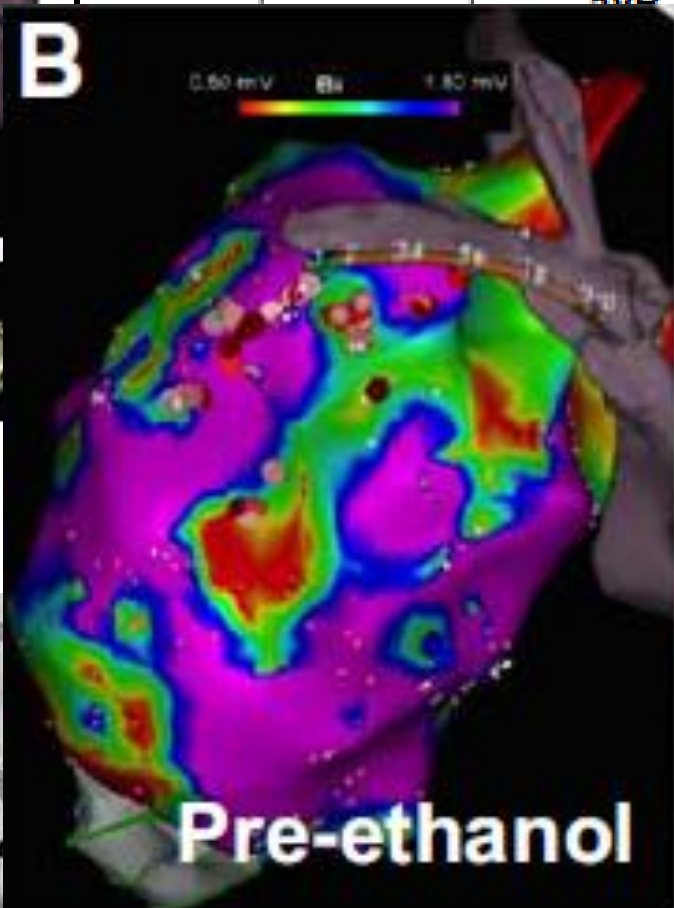
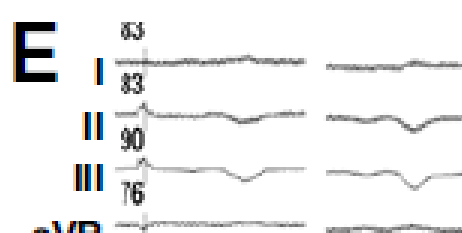
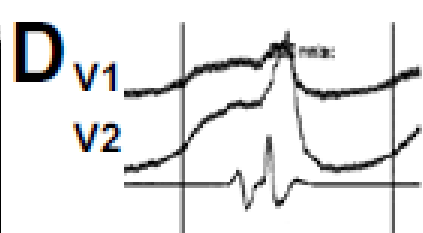
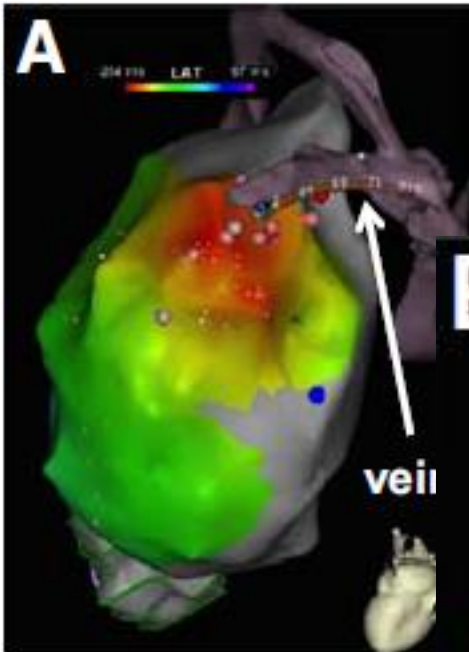
Retrograde Coronary Venous Ethanol Infusion for Ablation of Refractory Ventricular Tachycardia

Bahij Kreidieh, MD*; Moisés Rodríguez-Mañero, MD, PhD*; Paul A. Schurmann, MD;
Sergio Hugo Ibarra-Cortez, MD; Amish S. Dave, MD, PhD; Miguel Valderrábano, MD

Circ Arrhythm Electrophysiol. 2016;9:e004352.





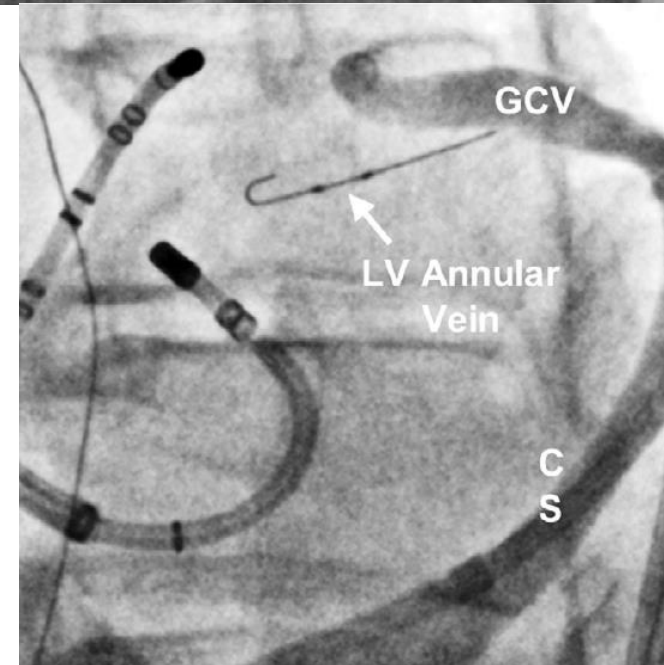
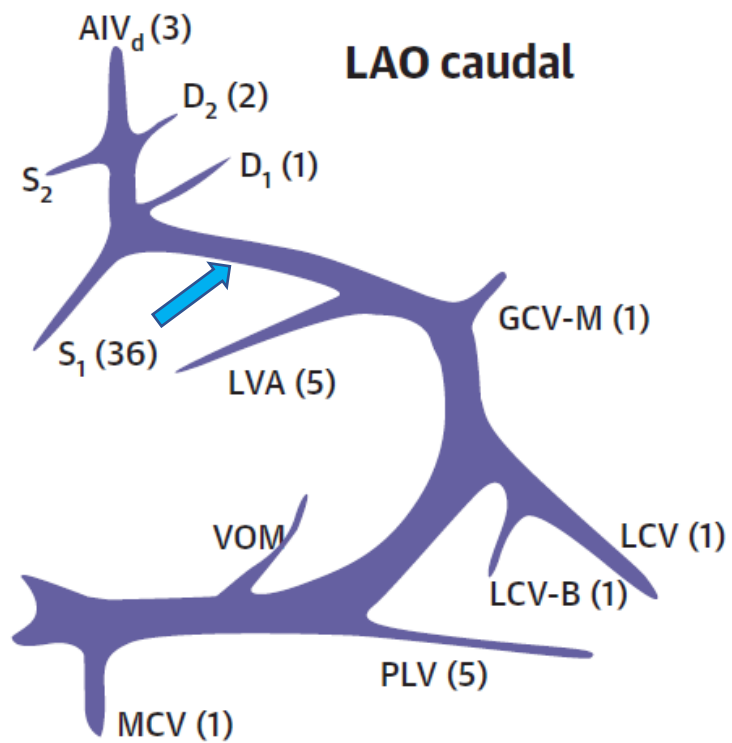
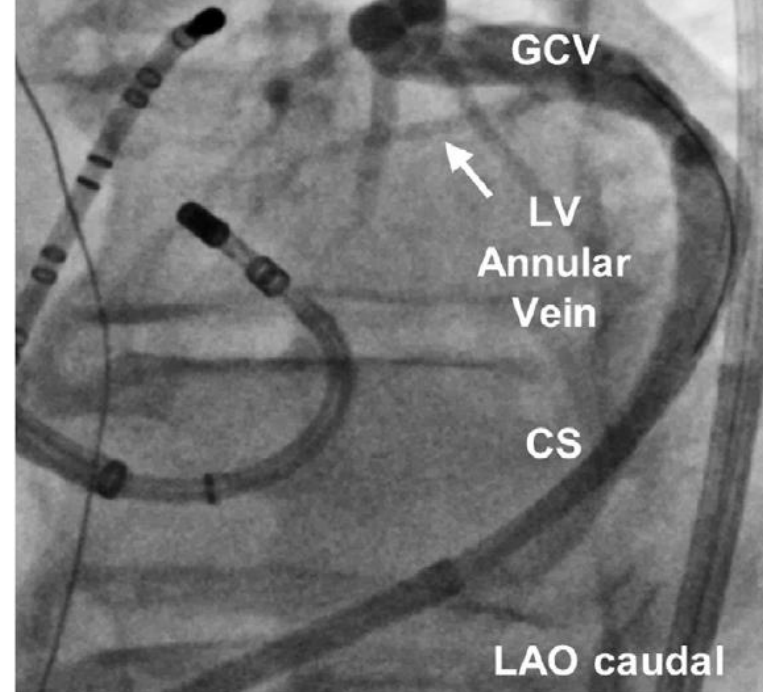
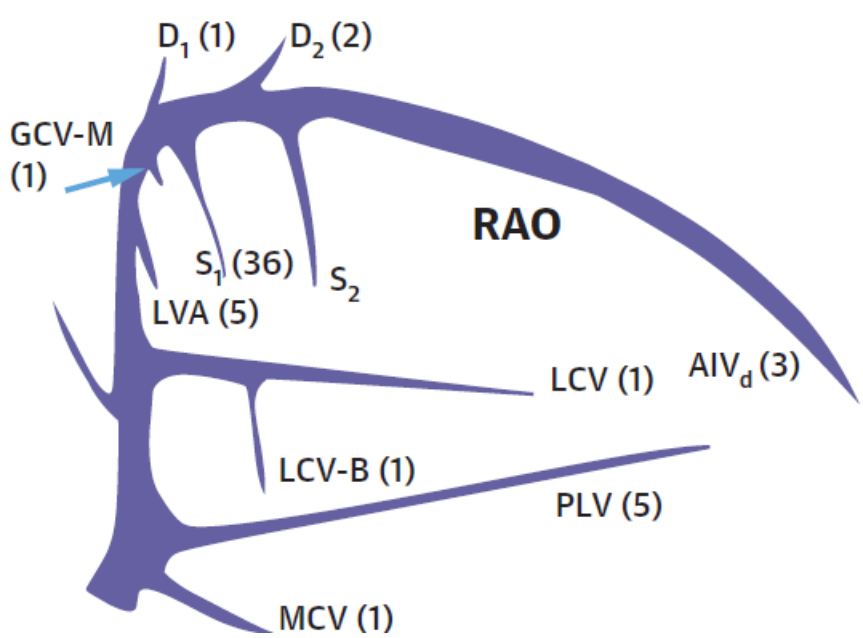


Intramural Venous Ethanol Infusion for Refractory Ventricular Arrhythmias

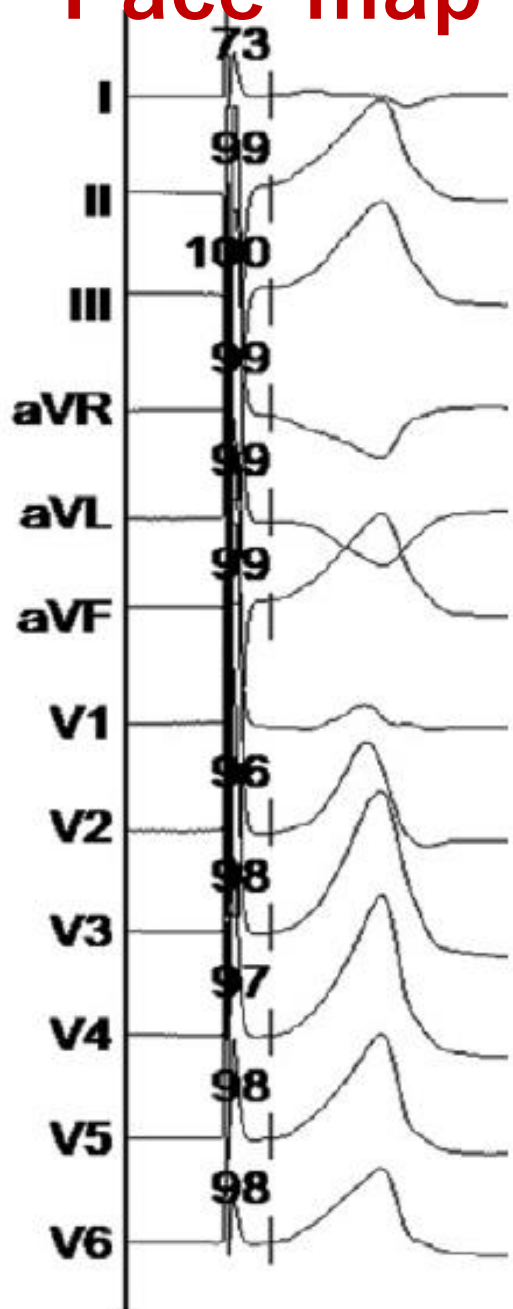
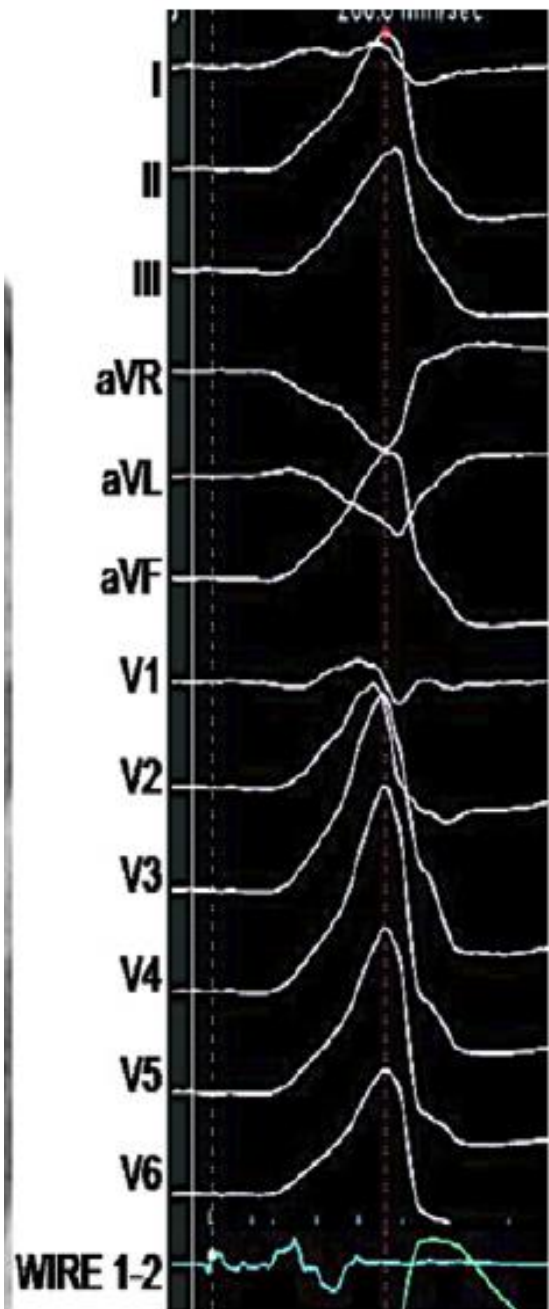
Outcomes of a Multicenter Experience

Liliana Tavares, MD,^a Adi Lador, MD,^a Stephanie Fuentes, MD,^a Akanibo Da-wariboko, MD,^a Krzysztof Blaszyk, MD, PhD,^b Katarzyna Malaczynska-Rajpold, MD, PhD,^b Giorgi Papiashvili, MD,^c Sergey Korolev, MD,^d Petr Peichl, MD,^e Josef Kautzner, MD, PhD,^e Matthew Webber, MD,^f Darren Hooks, MD, PhD,^f Moisés Rodríguez-Mañero, MD, PhD,^g Darío Di Toro, MD,^h Carlos Labadet, MD,^h Takeshi Sasaki, MD,ⁱ Kaoru Okishige, MD,^j Apoor Patel, MD,^a Paul A. Schurmann, MD,^a Amish S. Dave, MD, PhD,^a Tapan G. Rami, MD,^a Miguel Valderrábano, MD^a

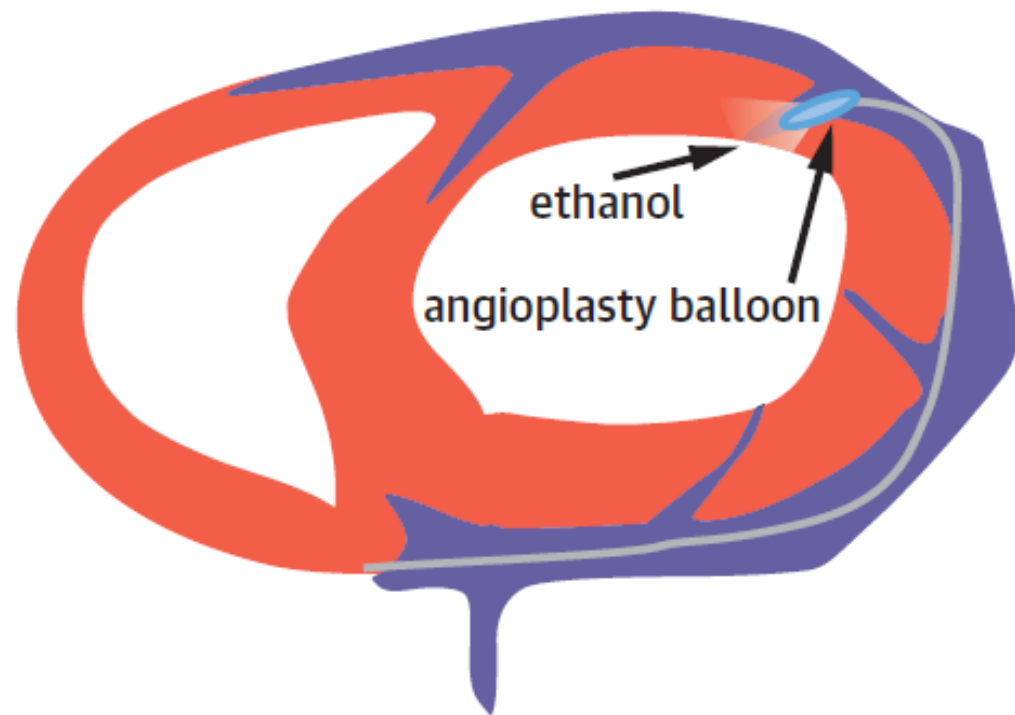
J Am Coll Cardiol EP 2020;6:1420–31



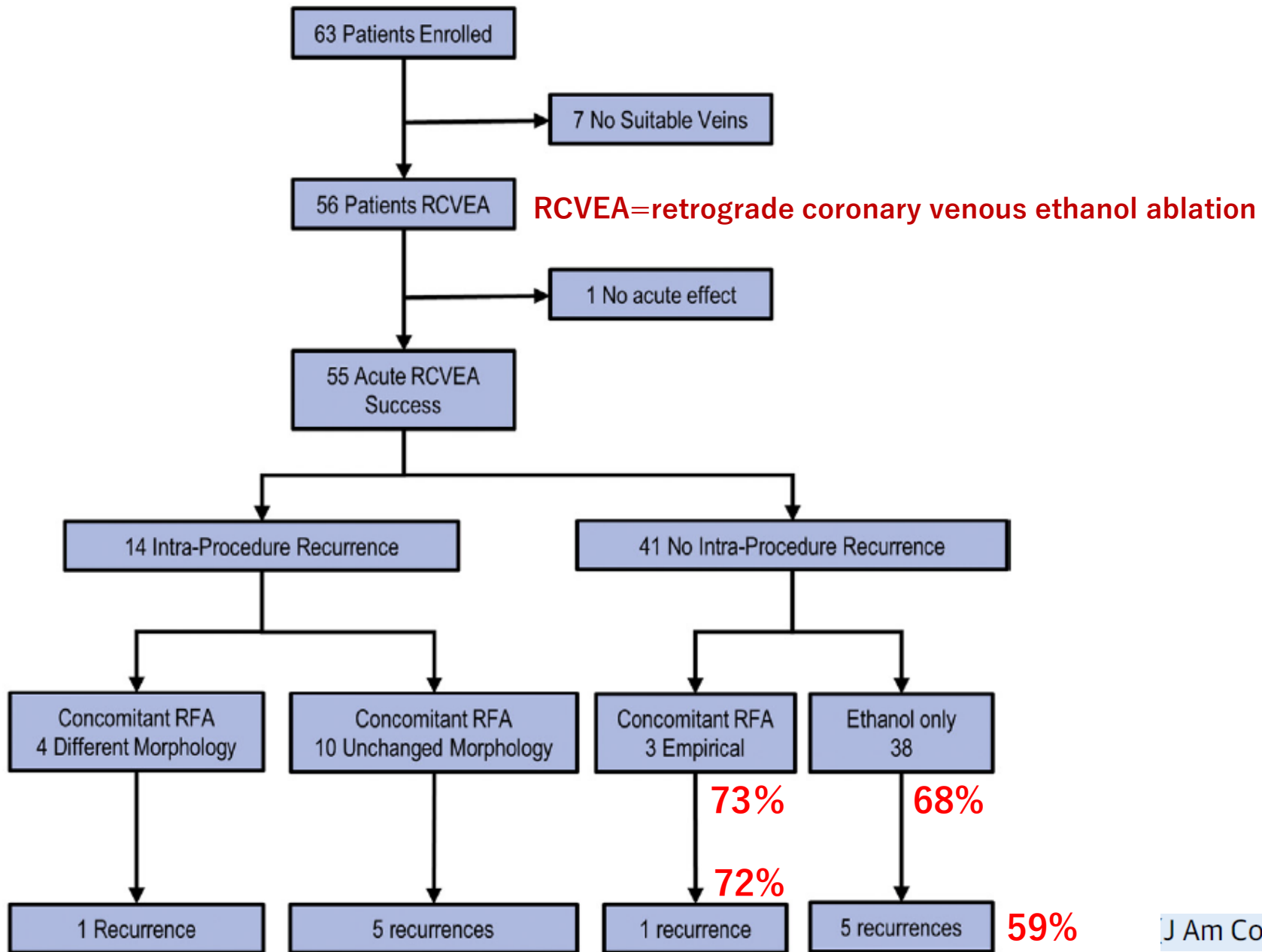
Pace-map



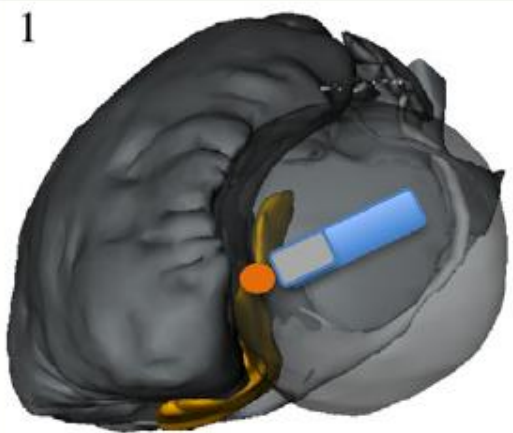
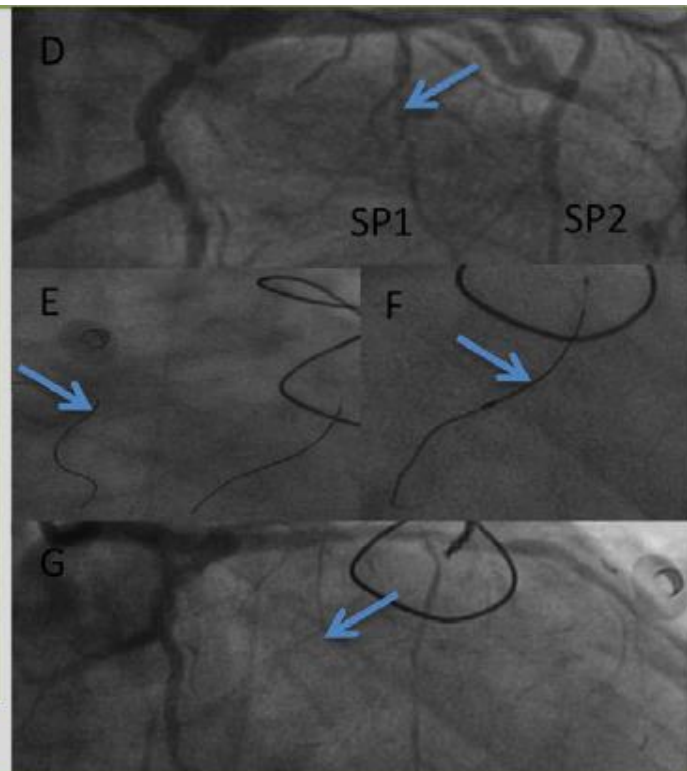
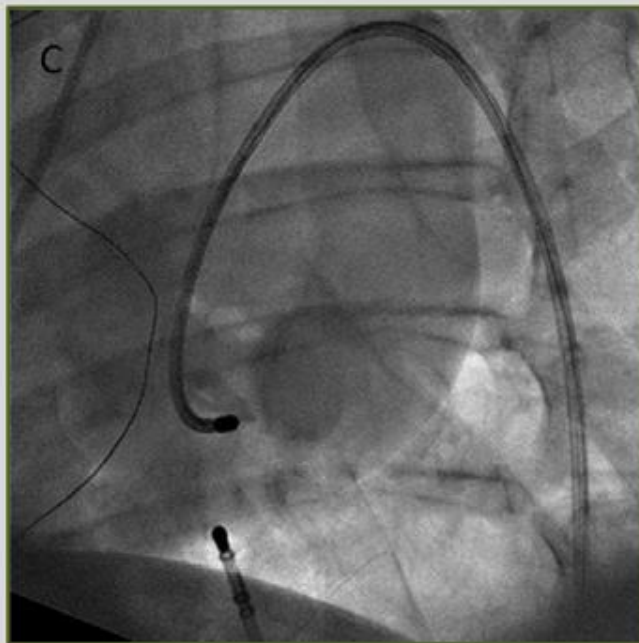
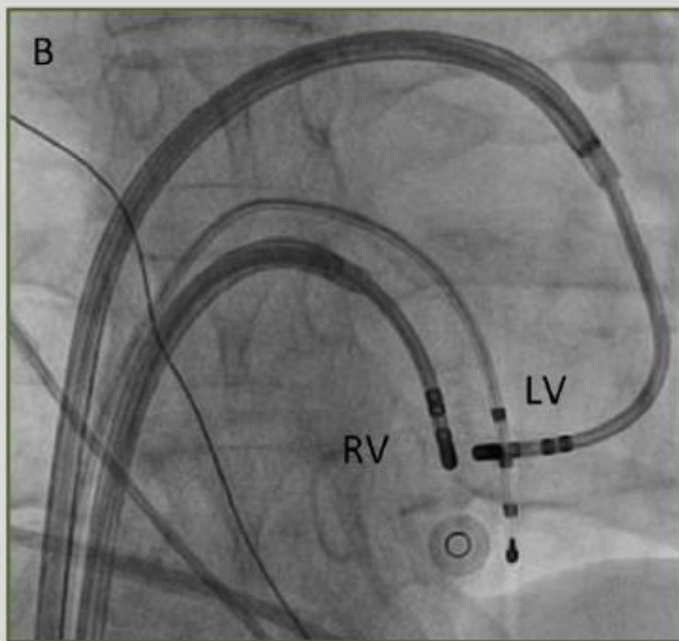
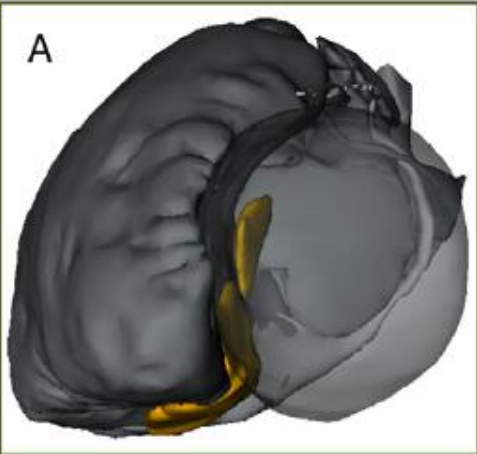
Intramural Vein Ethanol



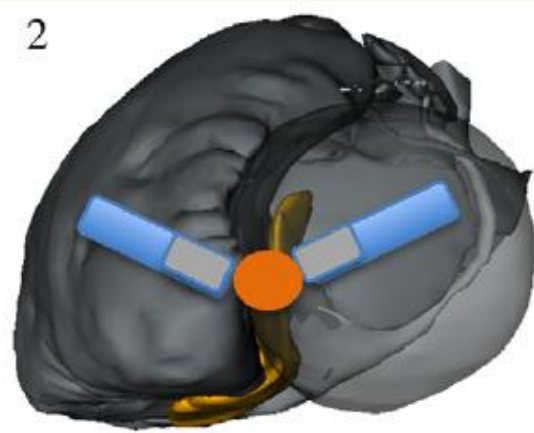
Patient outcomes



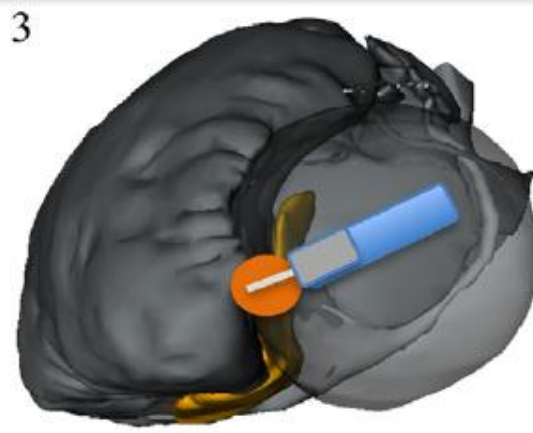
Intraseptal or
intramural scar



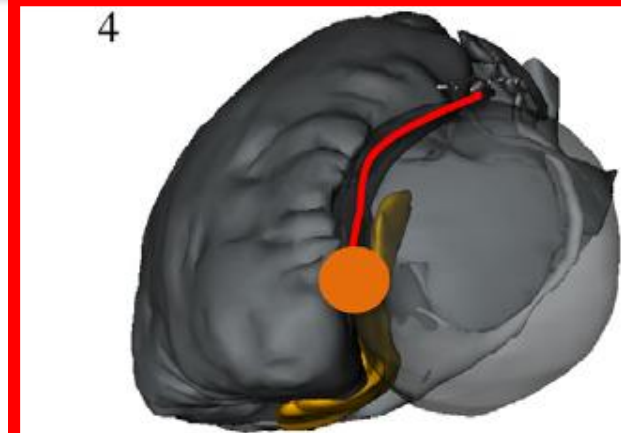
Unipolar ablation



Bipolar ablation



Needle ablation



Ethanol ablation

Thank you for your attention!



Yokohama City View