Alcool & rythme

Hugo Marchand

Claude Mariottini

Philippe Durand

Rythmosud - 03/01/2023

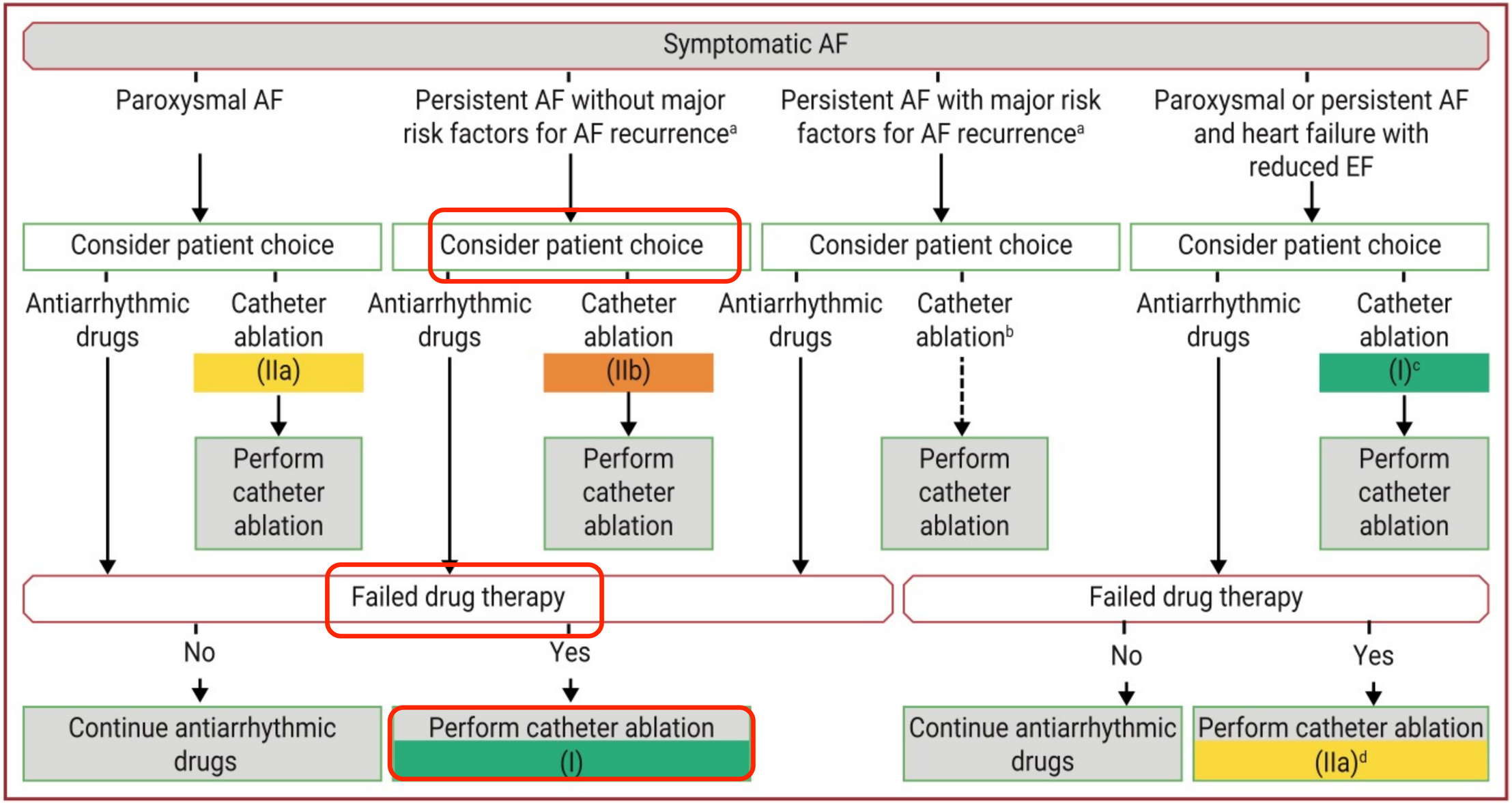
M.K, 66 ans

- Pas d’ATCD CV notable…
- …Jusqu’en 2014 !
  - Ablations de FA x 2 en 02/2014 et 05/2014
  - Ablation de voie lente en 10/2014
  - Pose de DAI double en 11/2014 pour syncope et tachycardie à QRS larges
  - Ablation de TA post-FA en 11/2014

2022 : Récidives symptomatiques

- Mai 2022 : TSV réduite par Cordarone au SAU
- Octobre : CS pour dyspnée et asthénie
  - Récidive de TA
  - Echec de réduction sous Cordarone
  - **Reprise d'ablation** (4e procédure) ou Pacemaker et ablation NAV ?

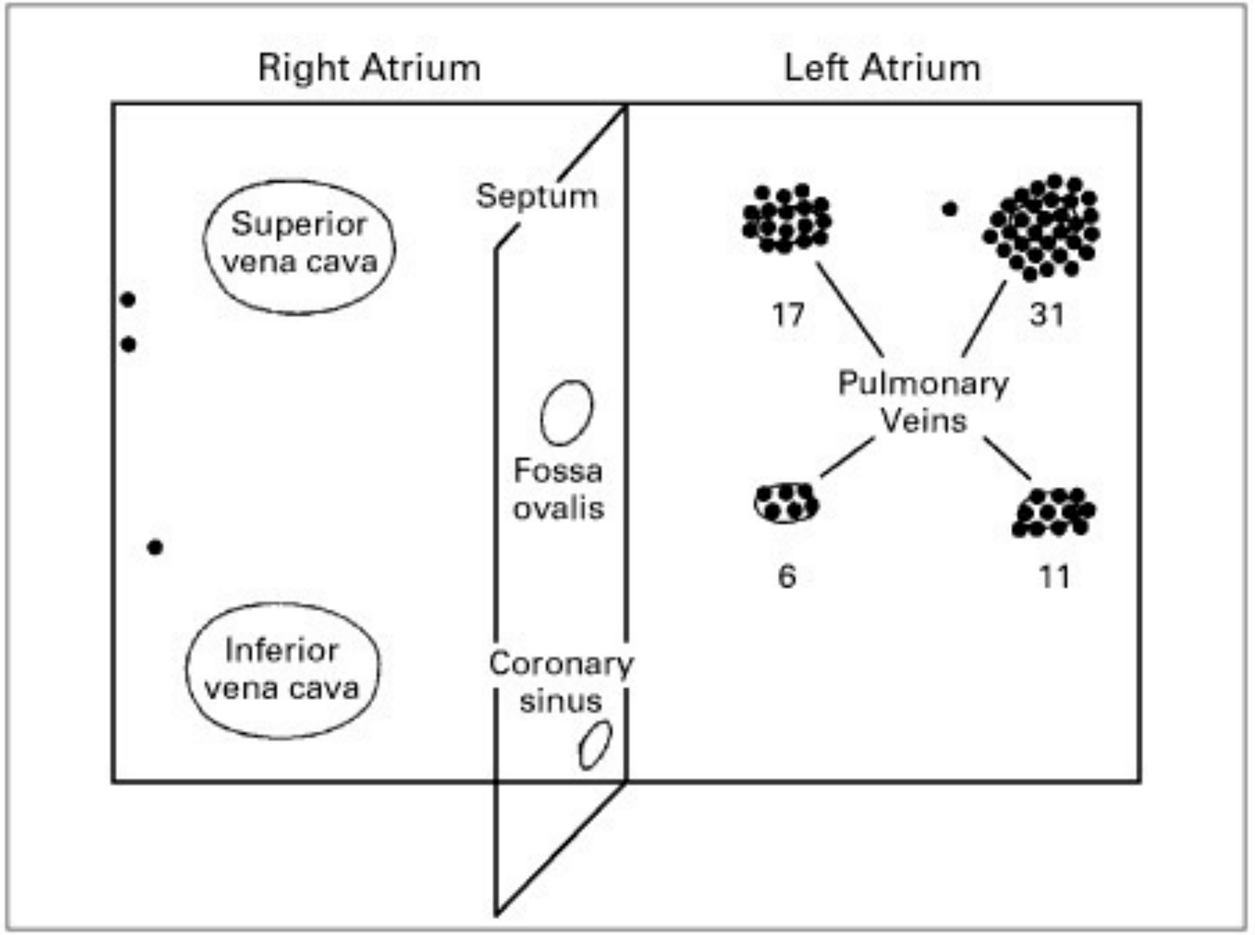
Recommandations ESC 2020



Stratégies d’ablation de FA

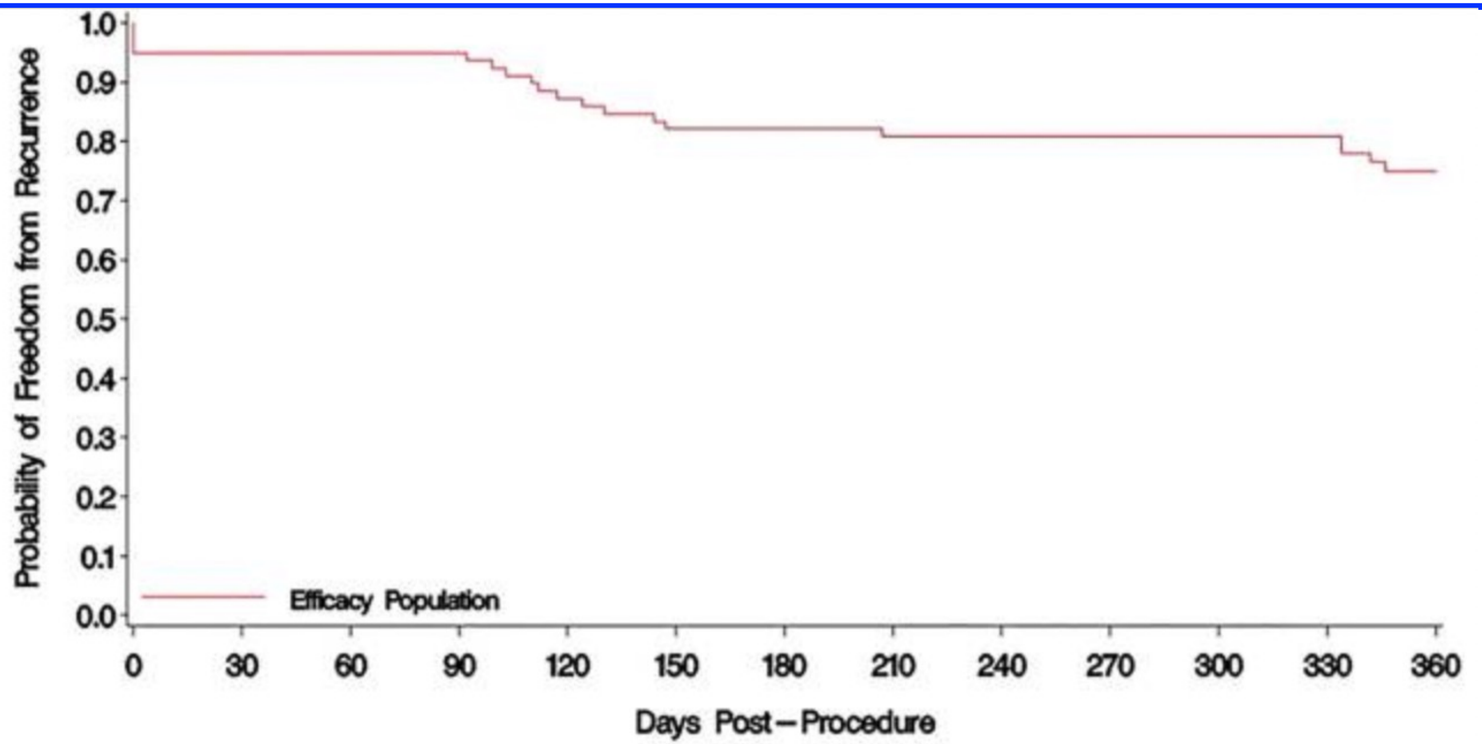
PV isolation by catheter ablation	Electrical isolation of the PVs is recommended during all AF ablation procedures.	I
	Achievement of electrical isolation requires, at a minimum, assessment and demonstration of entrance block into the PV.	I
	Monitoring for PV reconnection for 20 minutes following initial PV isolation is reasonable.	IIa
	Administration of adenosine 20 minutes following initial PV isolation using RF energy with reablation if PV reconnection might be considered.	IIb
	Use of a pace-capture (pacing along the ablation line) ablation strategy may be considered.	IIb
	Demonstration of exit block may be considered.	IIb

HRS/EHRA 2017



Haïssaguerre M, Jaïs P, Shah DC, Takahashi A, Hocini M, Quiniou G, Garrigue S, Le Mouroux A, Le Métayer P, Clémenty J. Spontaneous initiation of atrial fibrillation by ectopic beats originating in the pulmonary veins. N Engl J Med. 1998 Sep 3;339(10):659-66. doi: 10.1056/NEJM199809033391003. PMID: 9725923.

FA paroxystique: RF à 1 an



75% à 1 an

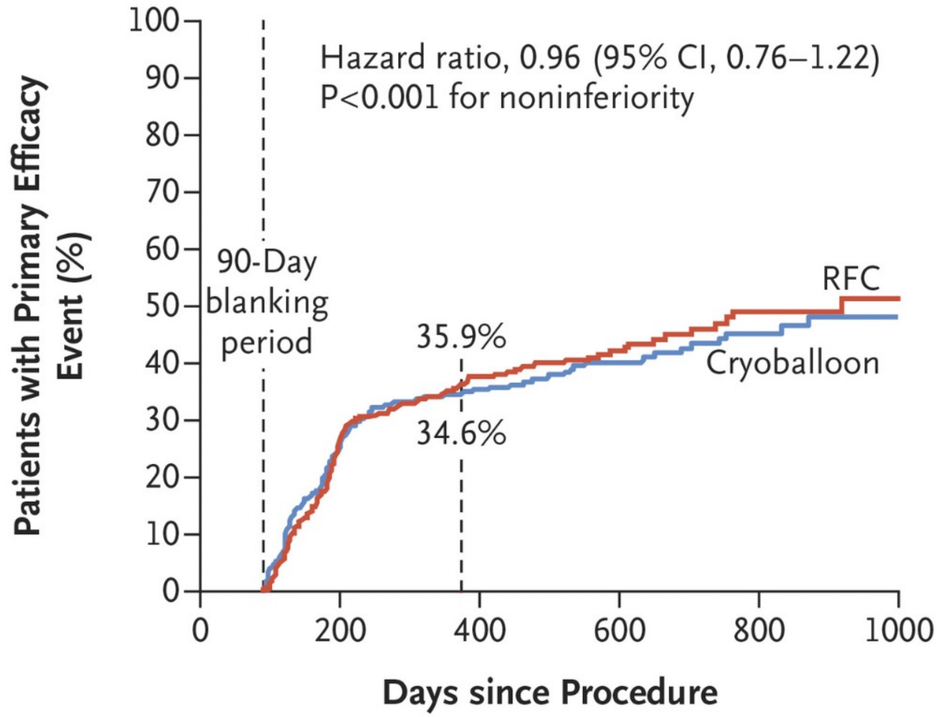
Number of subjects at risk at the associated timepoints

Days Post-Procedure	0	30	60	90	120	150	180	210	240	270	300	330	360
Number of subjects at risk	78	74	74	74	74	68	64	64	63	62	62	61	58

Natale A, et al. Long-term safety and effectiveness of paroxysmal atrial fibrillation ablation using a porous tip contact force-sensing catheter from the SMART SF trial. J Interv Card Electrophysiol. 2021 Jun;61(1):63-69. doi: 10.1007/s10840-020-00780-4. Epub 2020 May 27. PMID: 32462550; PMCID: PMC8195769.

Radiofréquence = Cryothérapie

A **Primary Efficacy End Point**

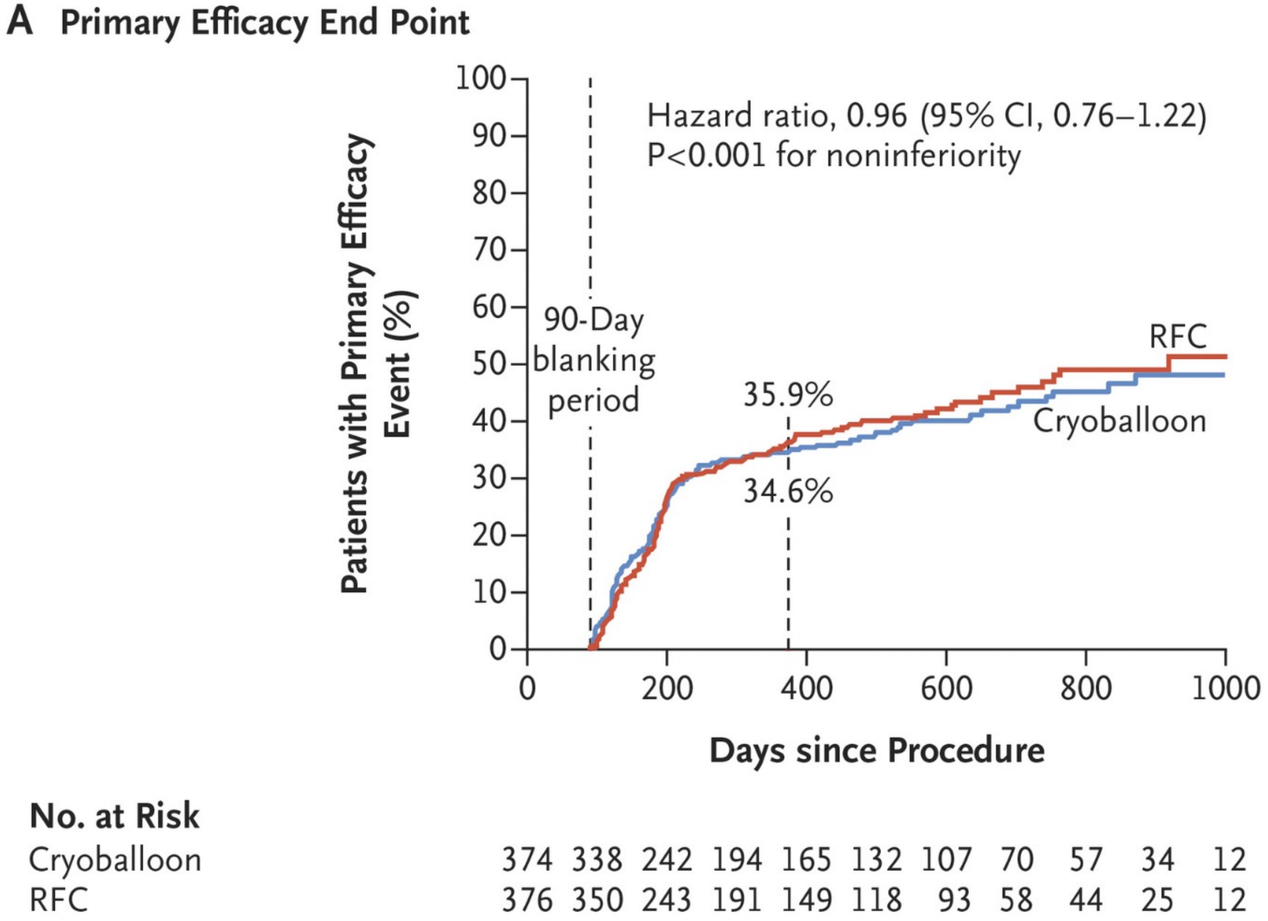


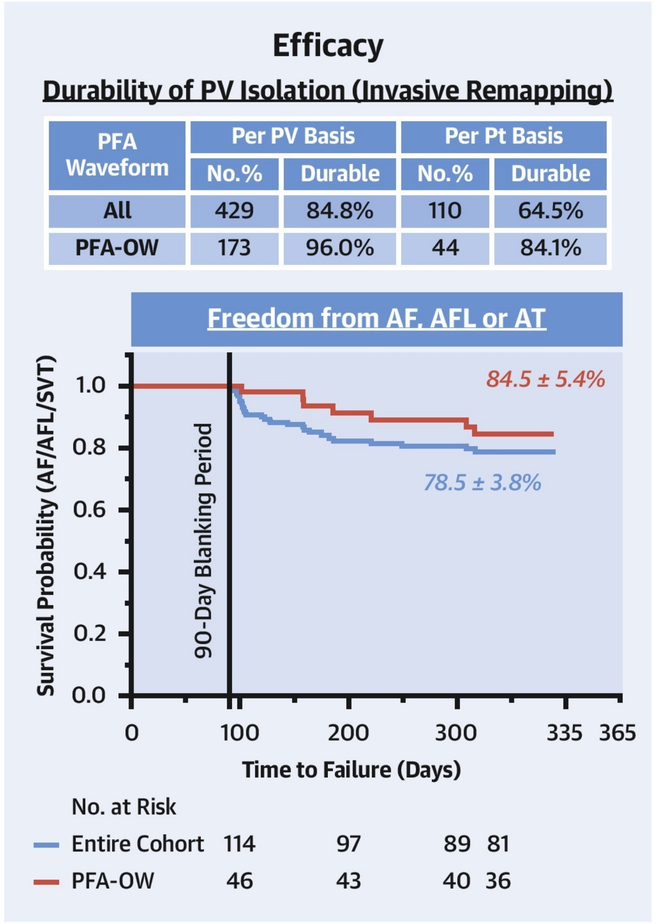
No. at Risk

Cryoballoon	374	338	242	194	165	132	107	70	57	34	12
RFC	376	350	243	191	149	118	93	58	44	25	12

Kuck KH, Brugada J, Fürnkranz A, Metzner A, Ouyang F, Chun KR, Elvan A, Arentz T, Bestehorn K, Pocock SJ, Albenque JP, Tondo C; FIRE AND ICE Investigators. Cryoballoon or Radiofrequency Ablation for Paroxysmal Atrial Fibrillation. N Engl J Med. 2016 Jun 9;374(23):2235-45. doi: 10.1056/NEJMoa1602014.

Radiofréquence = Cryothérapie = Electroporation ?

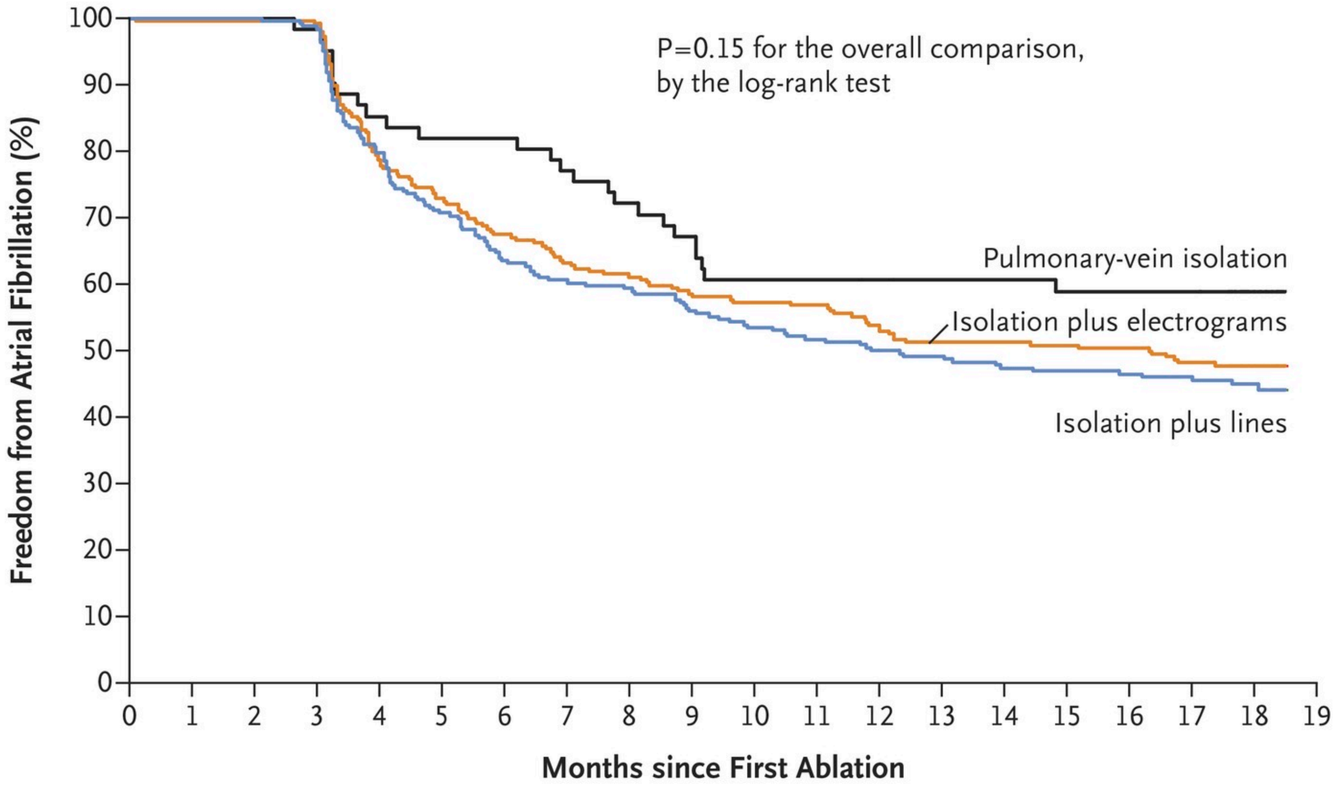




Reddy, V.Y. et al. J Am Coll Cardiol EP. 2021;7(5):614-27.

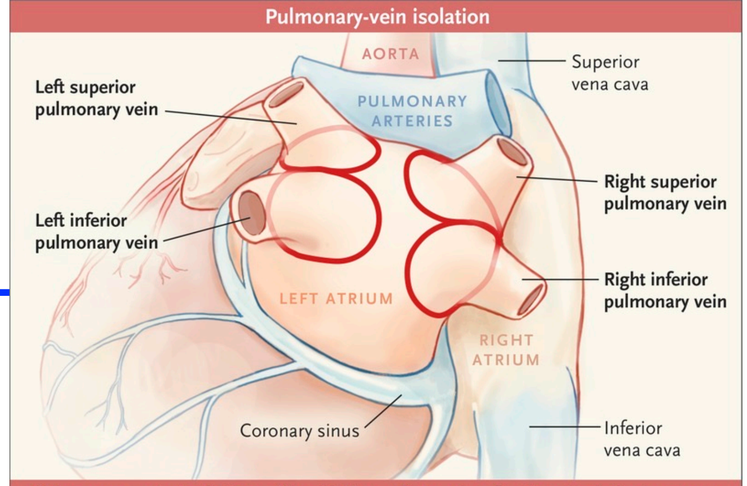
Kuck KH, Brugada J, Fürnkranz A, Metzner A, Ouyang F, Chun KR, Elvan A, Arentz T, Bestehorn K, Pocock SJ, Albenque JP, Tondo C; FIRE AND ICE Investigators. Cryoballoon or Radiofrequency Ablation for Paroxysmal Atrial Fibrillation. N Engl J Med. 2016 Jun 9;374(23):2235-45. doi: 10.1056/NEJMoa1602014.

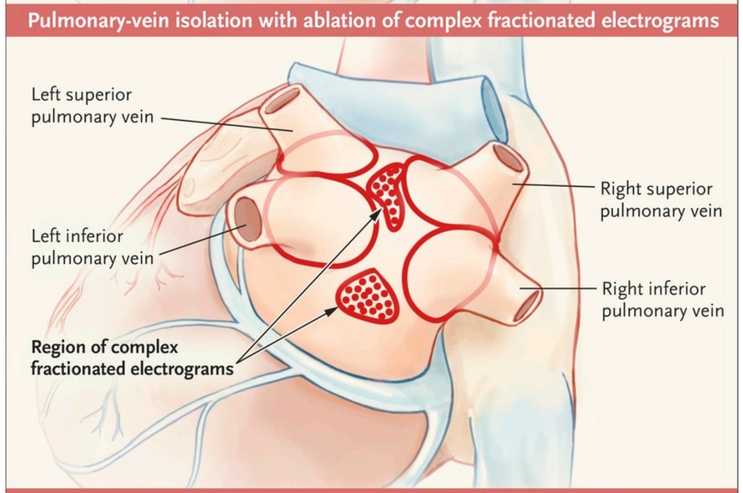
FA persistante

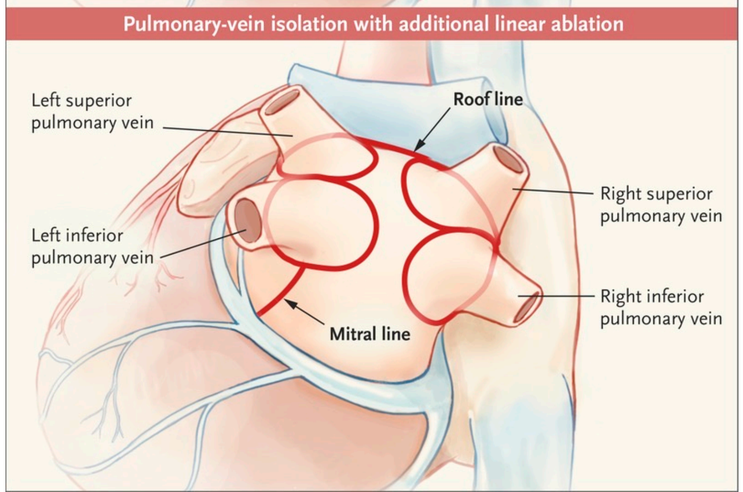


No. at Risk

Pulmonary-vein isolation	61	60	50	41	36	23
Isolation plus electrograms	244	242	161	137	124	72
Isolation plus lines	244	240	152	133	115	57







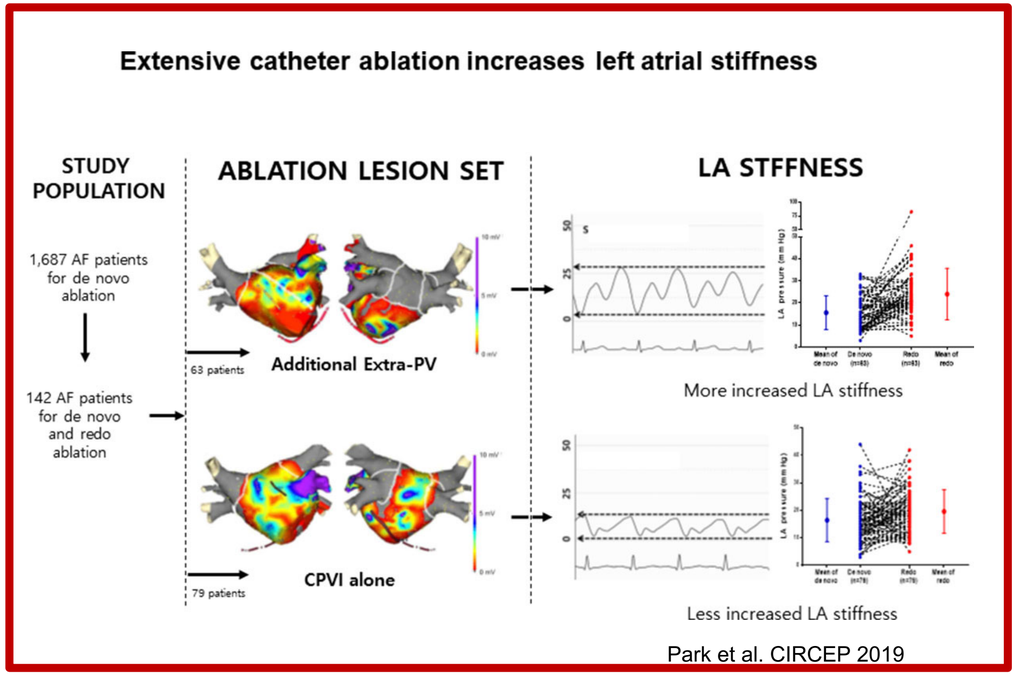
Verma A, et al
Approaches to catheter ablation for persistent atrial fibrillation.
N Engl J Med. 2015 May 7;372(19):1812-22. doi: 10.1056/NEJMoa1408288. PMID: 25946280.

Stratégies d’ablation de FA persistante

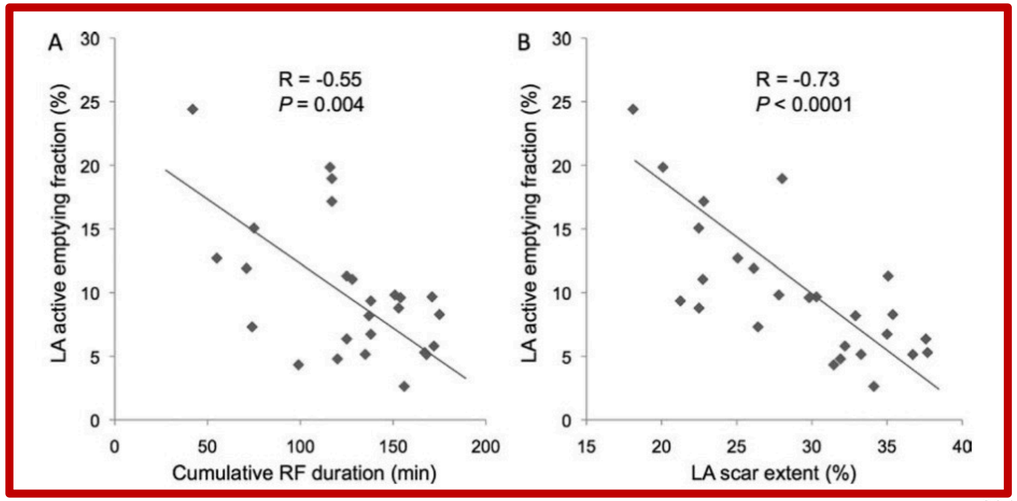
PV isolation by catheter ablation	Electrical isolation of the PVs is recommended during all AF ablation procedures.	I
	Achievement of electrical isolation requires, at a minimum, assessment and demonstration of entrance block into the PV.	I
	Monitoring for PV reconnection for 20 minutes following initial PV isolation is reasonable.	IIa
	Administration of adenosine 20 minutes following initial PV isolation using RF energy with reablation if PV reconnection might be considered.	IIb
	Use of a pace-capture (pacing along the ablation line) ablation strategy may be considered.	IIb
	Demonstration of exit block may be considered.	IIb
Ablation strategies to be considered for use in conjunction with PV isolation	If a patient has a history of typical atrial flutter or typical atrial flutter is induced at the time of AF ablation, delivery of a cavotricuspid isthmus linear lesion is recommended.	I
	If linear ablation lesions are applied, operators should use mapping and pacing maneuvers to assess for line completeness.	I
	If a reproducible focal trigger that initiates AF is identified outside the PV ostia at the time of an AF ablation procedure, ablation of the focal trigger should be considered.	IIa
	When performing AF ablation with a force-sensing RF ablation catheter, a minimal targeted contact force of 5 to 10 grams is reasonable.	IIa
	Posterior wall isolation might be considered for initial or repeat ablation of persistent or long-standing persistent AF.	IIb
	Administration of high-dose isoproterenol to screen for and then ablate non-PV triggers may be considered during initial or repeat AF ablation procedures in patients with paroxysmal, persistent, or long-standing persistent AF.	IIb
	DF-based ablation strategy is of unknown usefulness for AF ablation.	IIb
	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
	The usefulness of linear ablation lesions in the absence of macroreentrant atrial flutter is not well established.	IIb
	The usefulness of mapping and ablation of areas of abnormal myocardial tissue identified with voltage mapping or MRI as an initial or repeat ablation strategy for persistent or long-standing persistent AF is not well established.	IIb
	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
	The usefulness of ablation of rotational activity as an initial or repeat ablation strategy for persistent and long-standing persistent AF is not well established.	IIb
	The usefulness of ablation of autonomic ganglia as an initial or repeat ablation strategy for paroxysmal, persistent, and long-standing persistent AF is not well established.	IIb

HRS/EHRA 2017

Conséquences des ablations extensives



Park et al. CIRCEP 2019



Cochet, Jais, Haissaguerre et al. JCE 2014

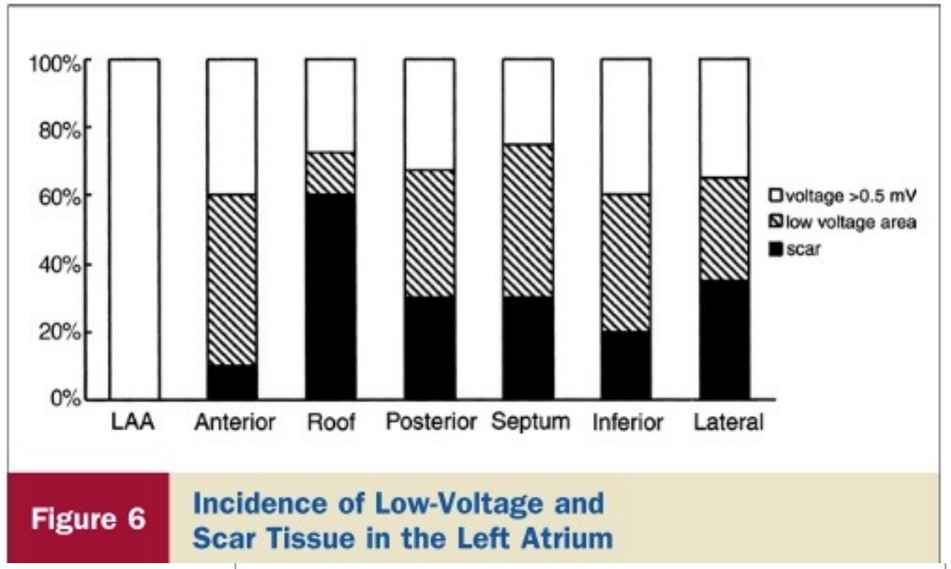
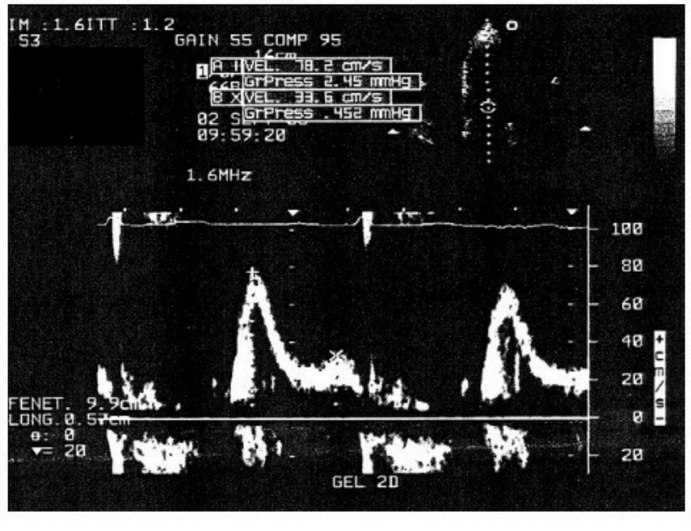


Figure 6 **Incidence of Low-Voltage and Scar Tissue in the Left Atrium**

A wave velocity
= 37±15 cm/s

N = 60±17 cm/s
(*Normal range for cardiac doppler data EHJ 2015*)



Takahashi, Haissaguerre et al. JACC 2007

Ablations de FA 02 et 05/2014

- Isolations des veines pulmonaires
- Isolation VCS
- Ligne toit
- Ligne isthme mitral
- Ligne ICT

Ablation de TA en 11/2014

Protocole et résultats

Programmation du DAI sur OFF.

Enregistrement de base

Cartographie anatomique de l'oreillette gauche avec le système Velocity.

ECG endocavitaire – Entrainements – Stimulation à haute énergie pour localiser le nerf phrénique.

Flutter périmitral en début de procédure ablaté **avec retour sinusal sur tir.**

Complément d'isolation des 2 veines pulmonaires gauches et de la VPID.

Complément sur le toit jusqu'au bloc

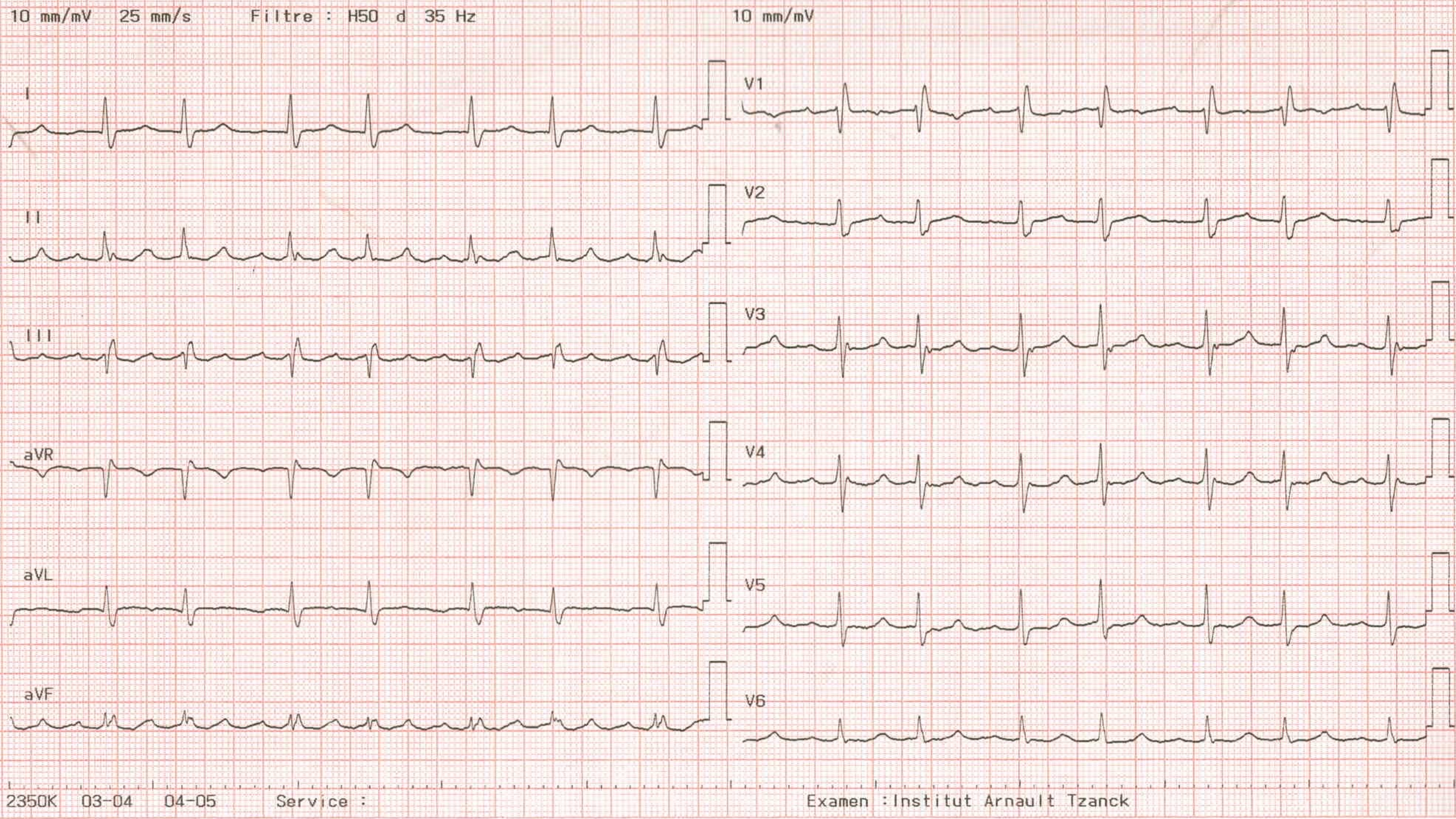
Contrôle des 4 veines et de la VCS (bloc complet bidirectionnel).

Contrôle du toit (bloc complet)

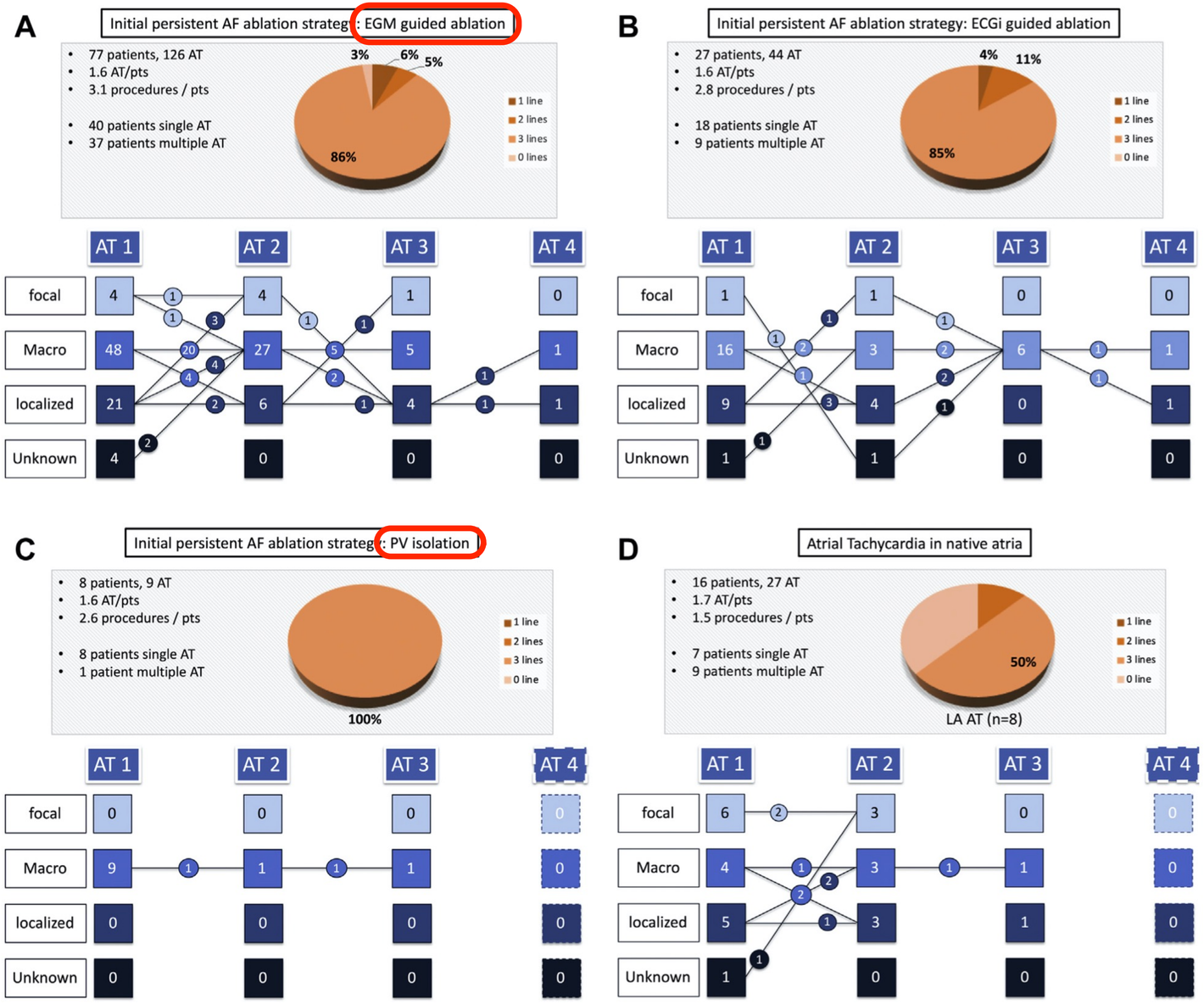
Contrôle de l'isthme gauche (bloc complet bidirectionnel)

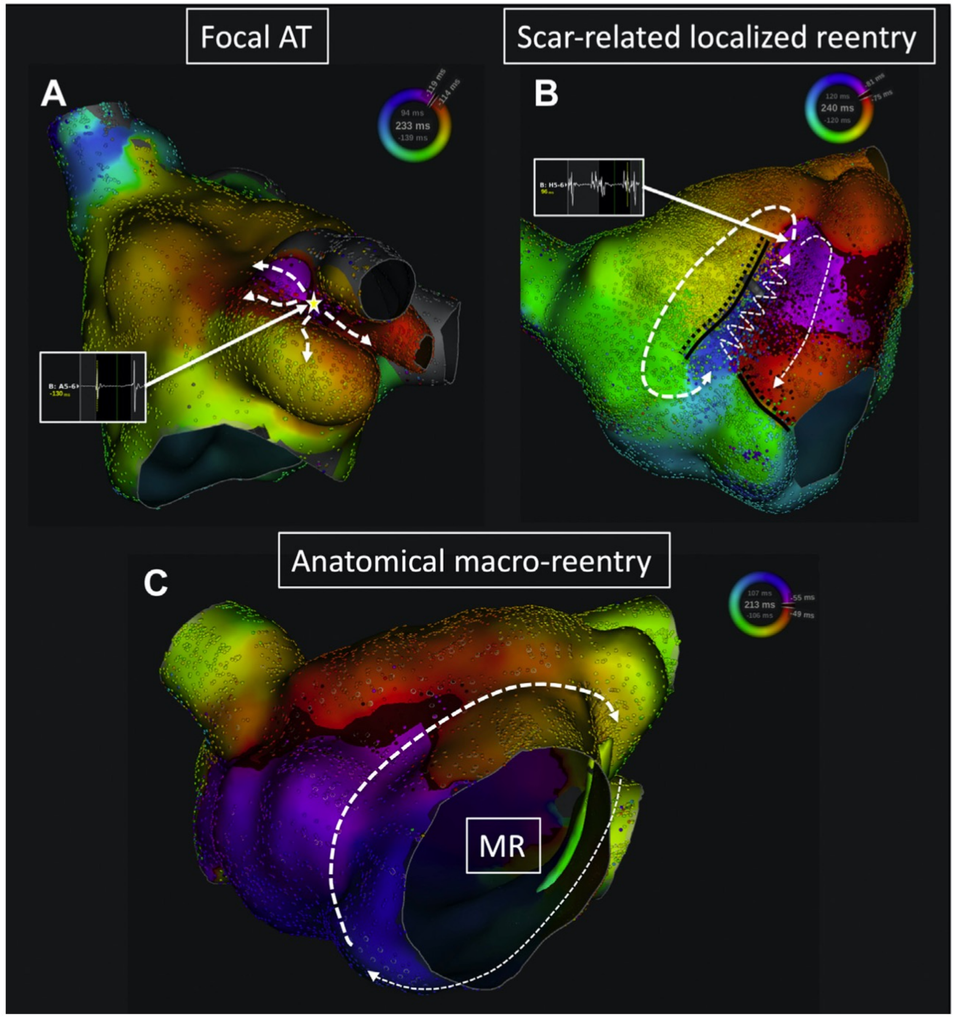
Contrôle de l'isthme droit (bloc complet bidirectionnel).

Programmation du DAI sur ON et DDDR 70 – 130/min.


10 mm/mV 25 mm/s Filtre : H50 d 35 Hz
10 mm/mV
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
2350K 03-04 04-05 Service :
Examen :Institut Arnault Tzanck

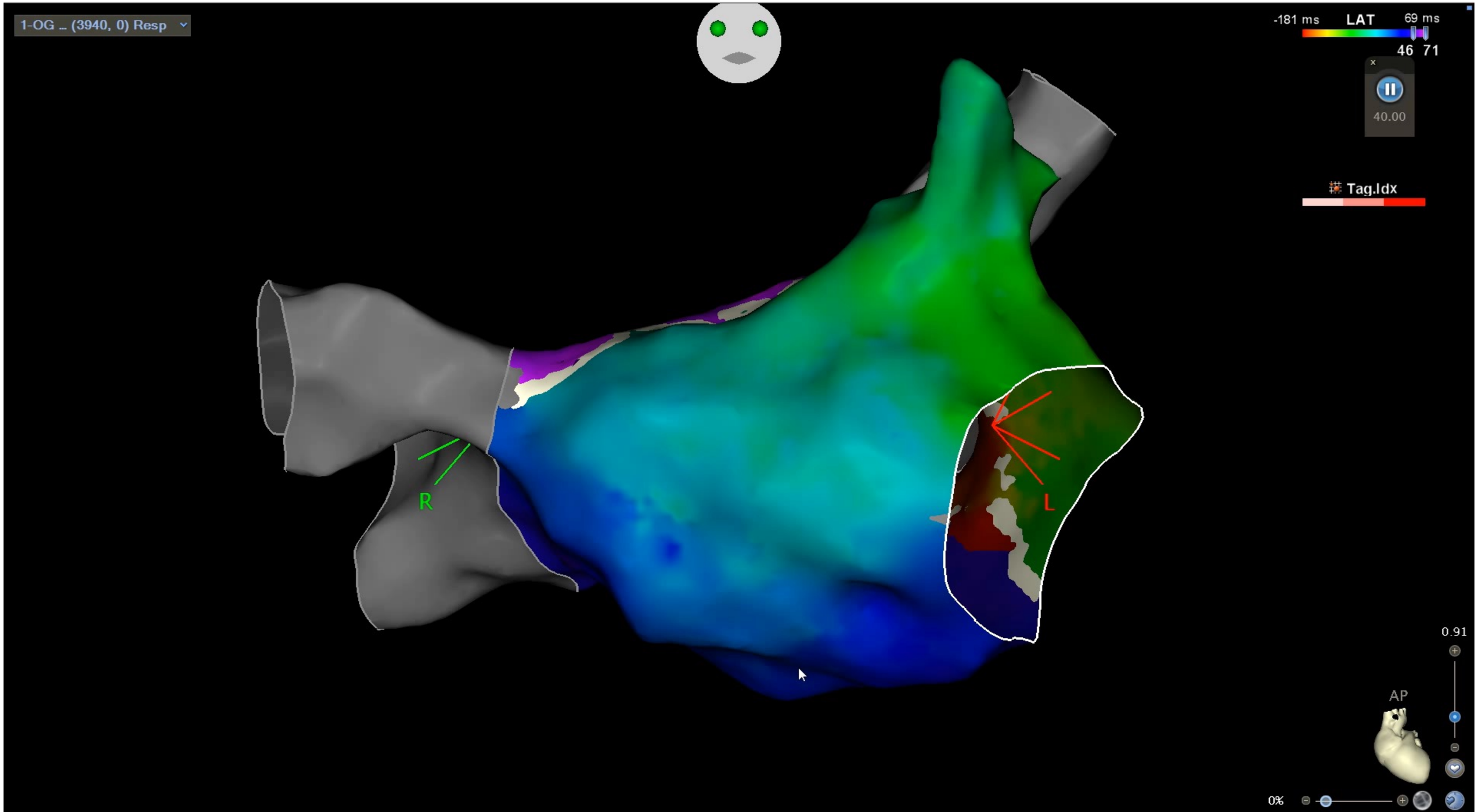
Tachycardies atriales post ablation de FA



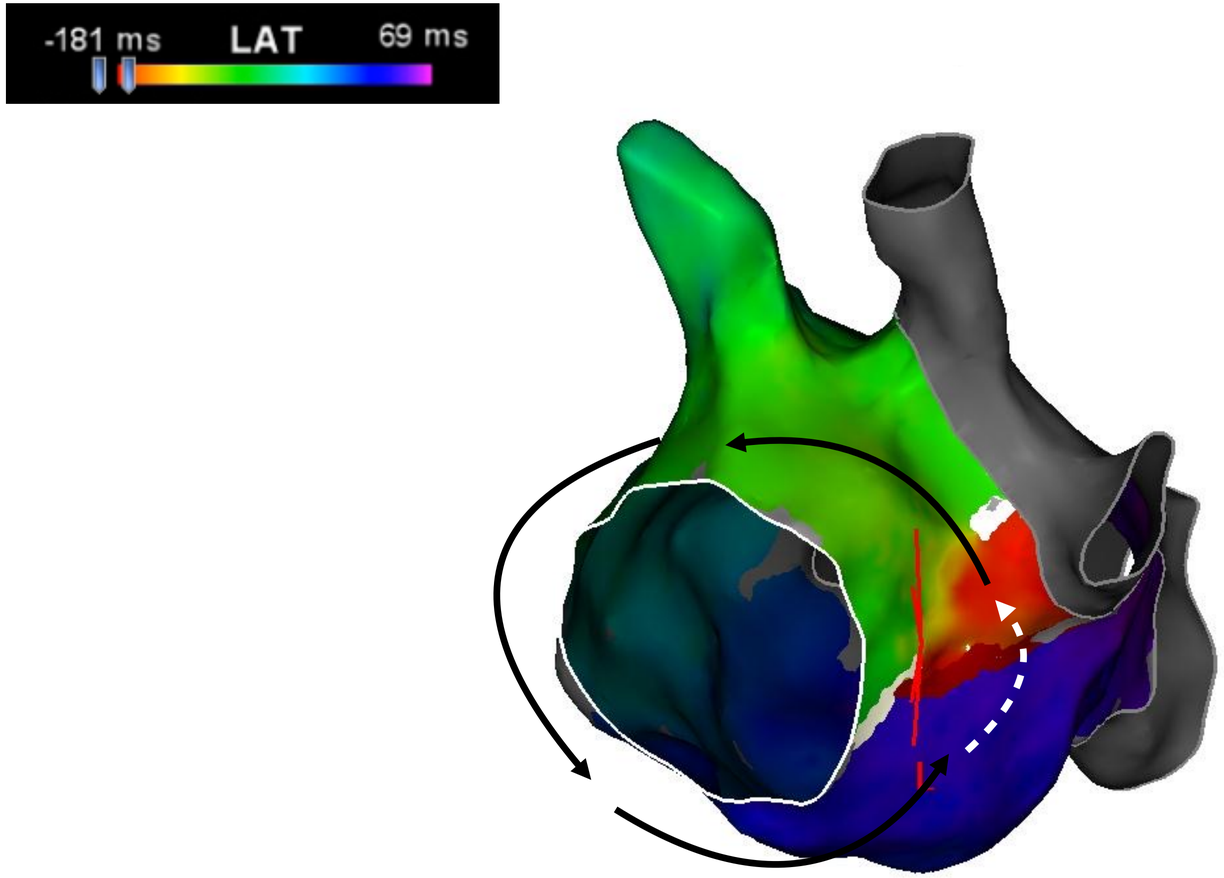


132 patients dont 84% post ablation de FA. 214 TA différentes mappées. 45% avec TA multiples. 46% de récidives à 13+/- 9mois

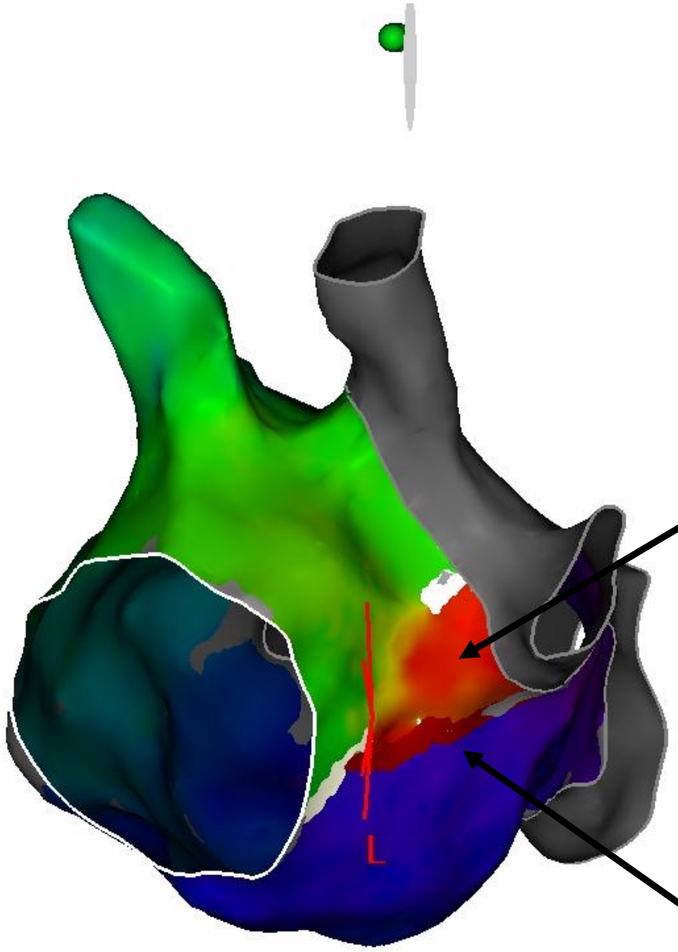
Derval et al. JACC EP 2020


1-OG ... (3940, 0) Resp
-181 ms
LAT
69 ms
46 71
40.00
Tag.Idx
R
L
0.91
AP
0%

Flutter péri-mitral



Récidive après Bloc mitral : 67,4%

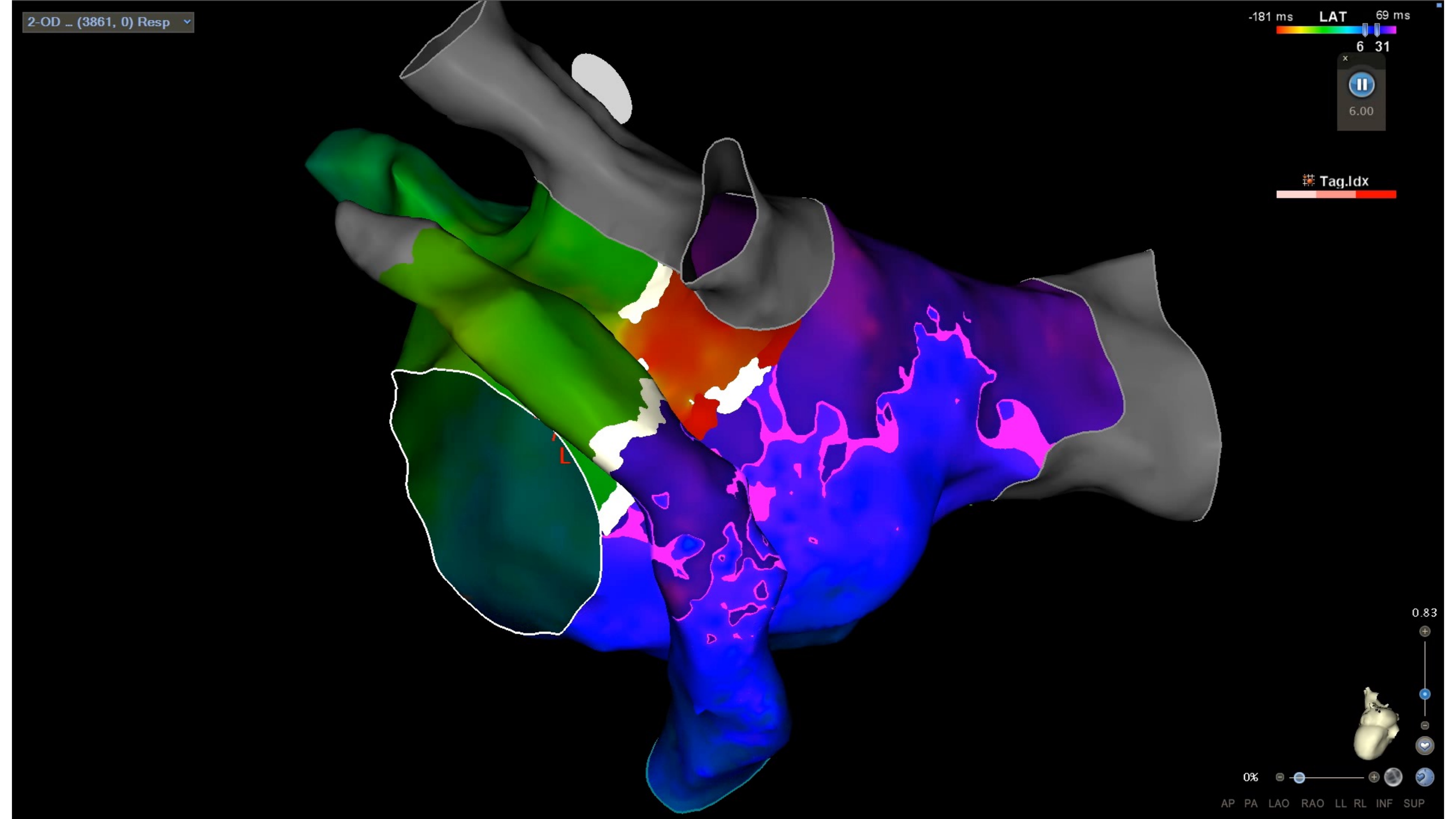


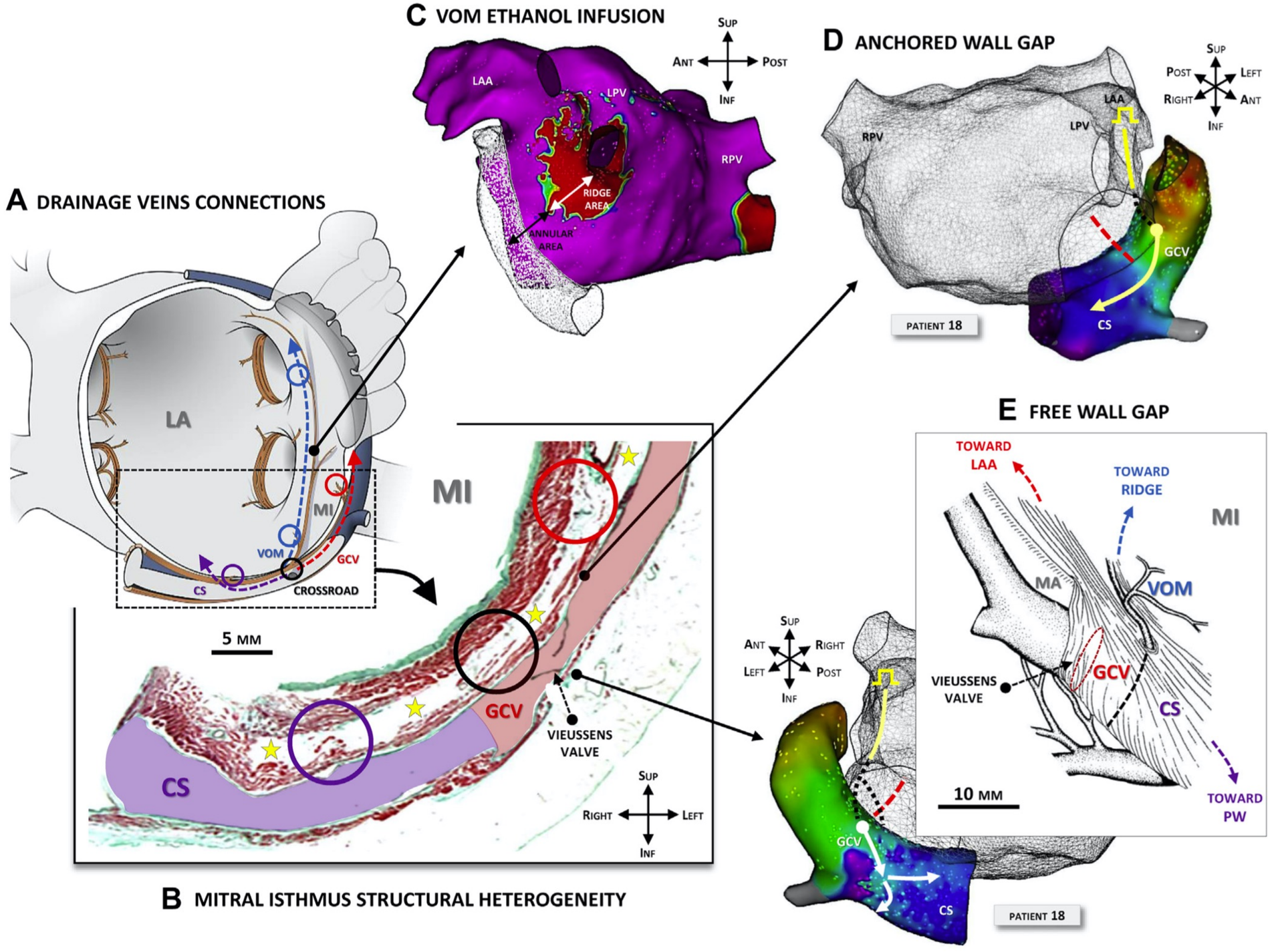
Cycle 250ms

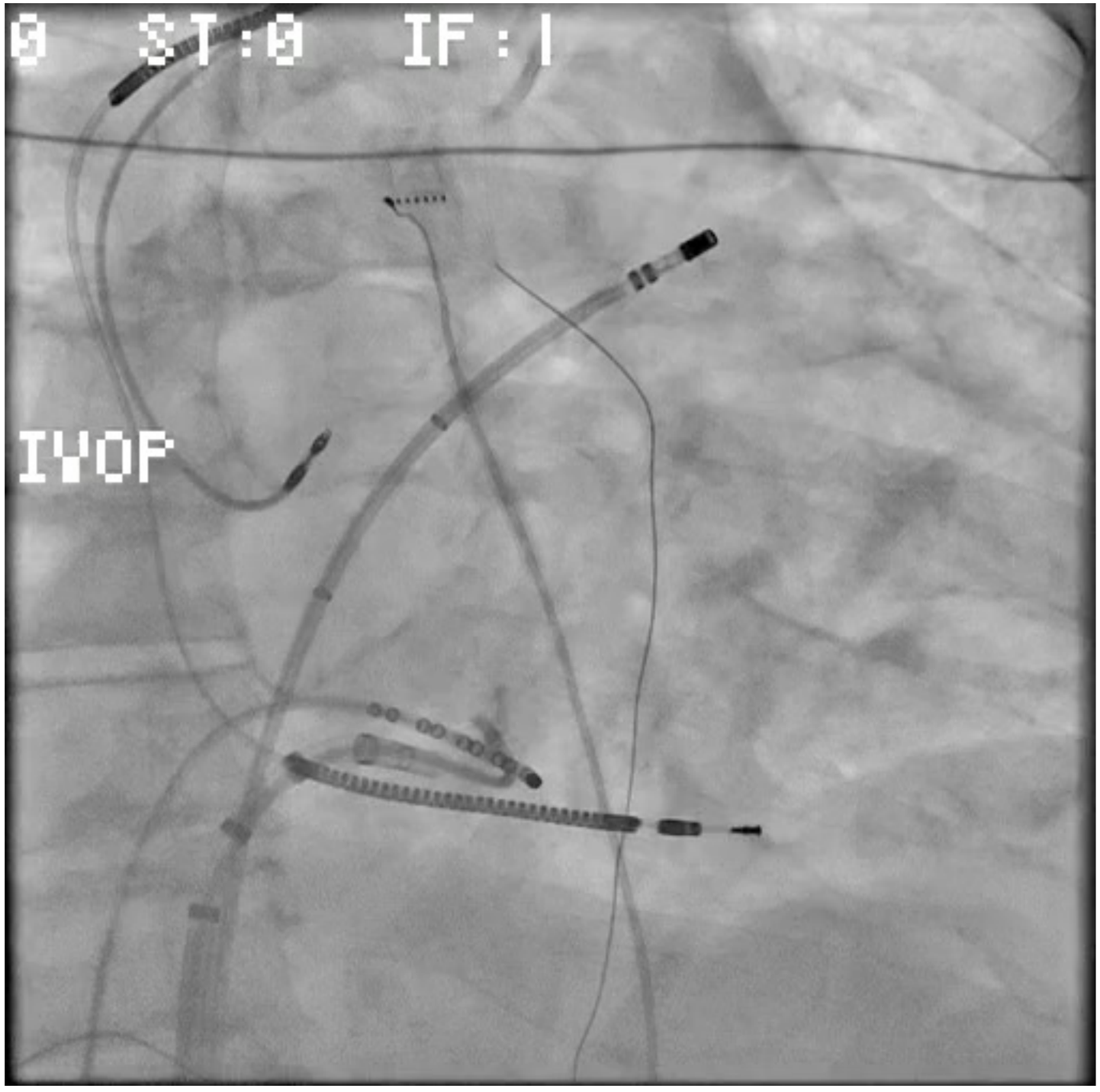
-180ms

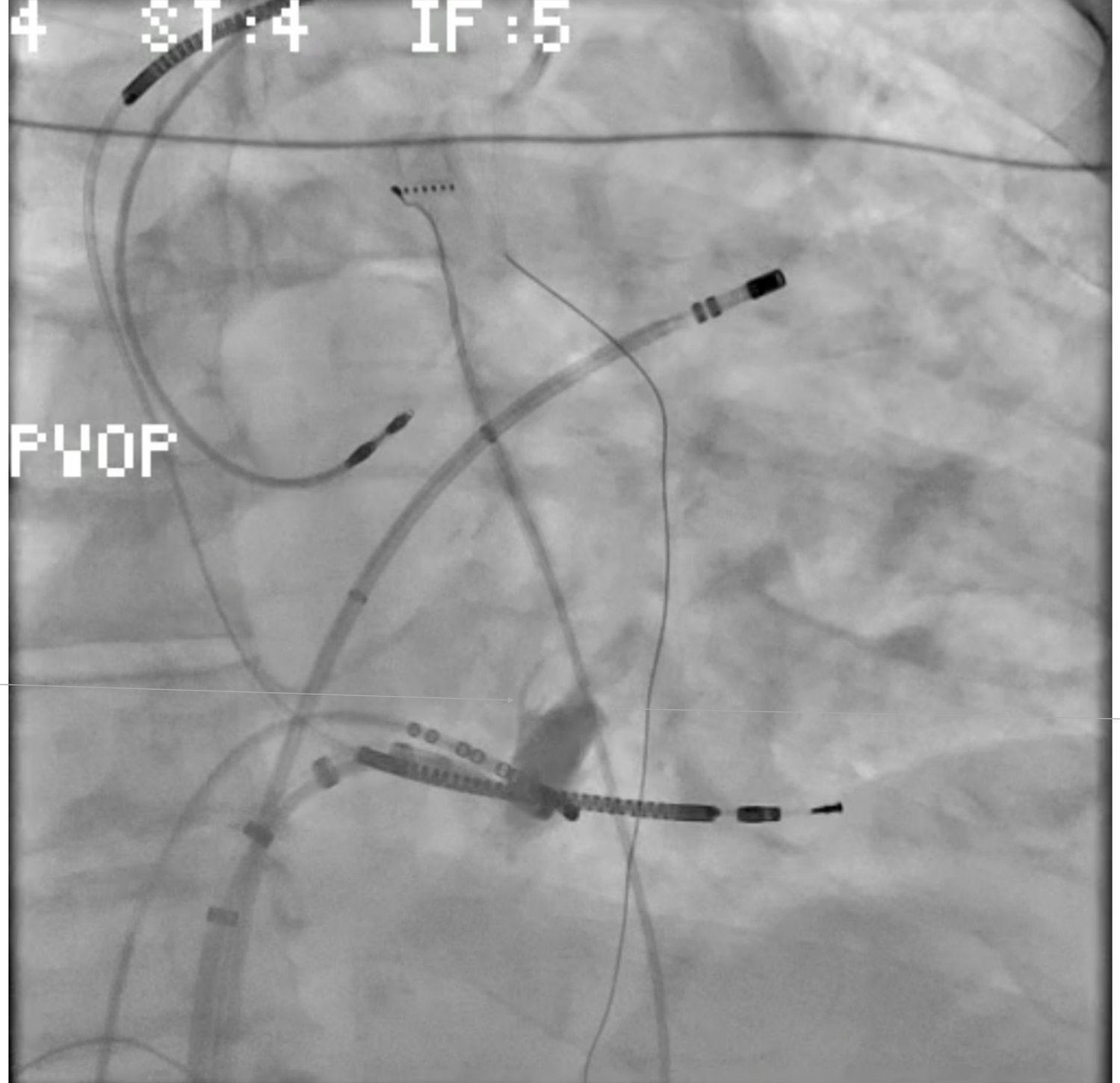
+30ms

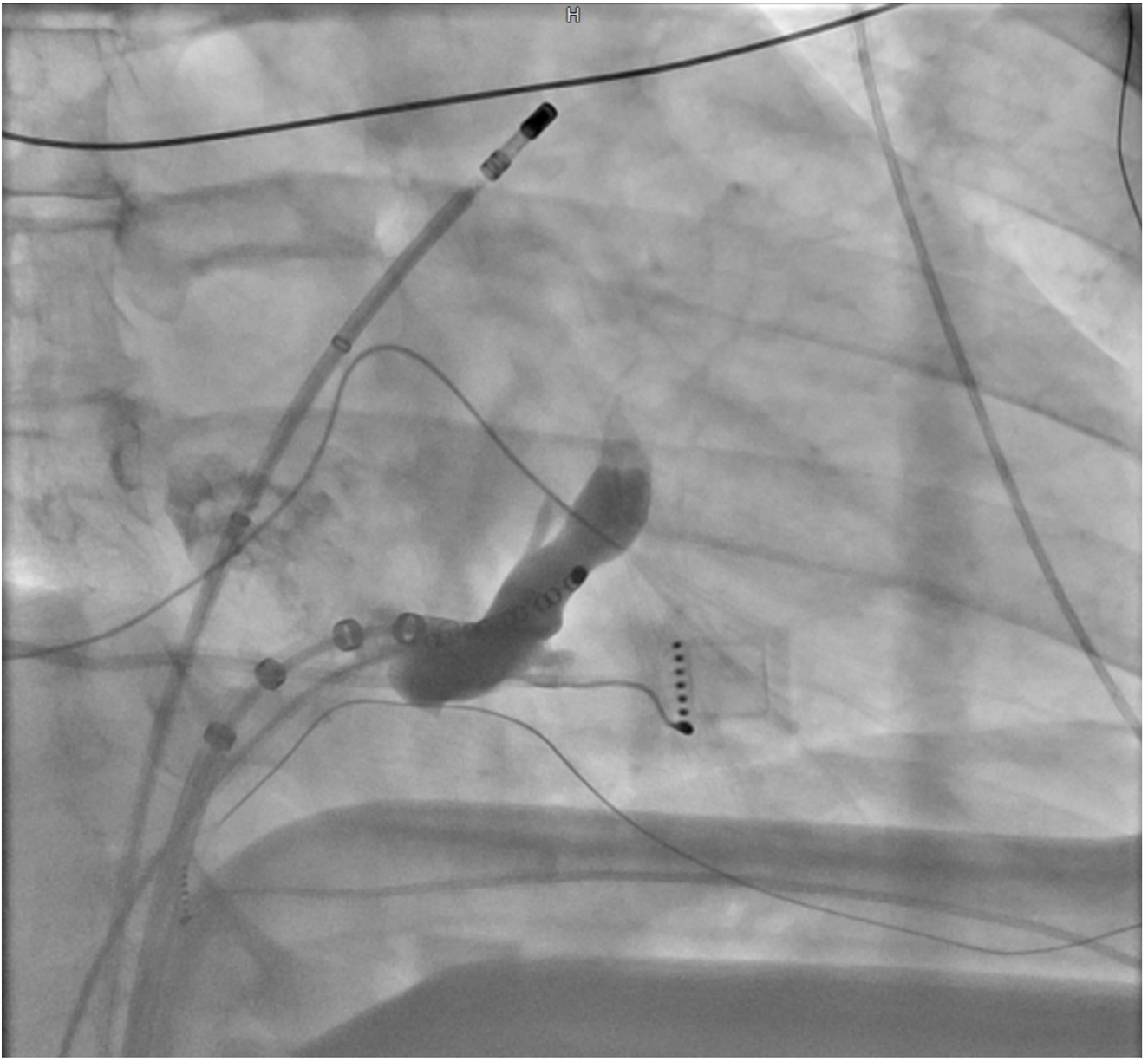
Ou sont passés
les 40ms manquantes ?

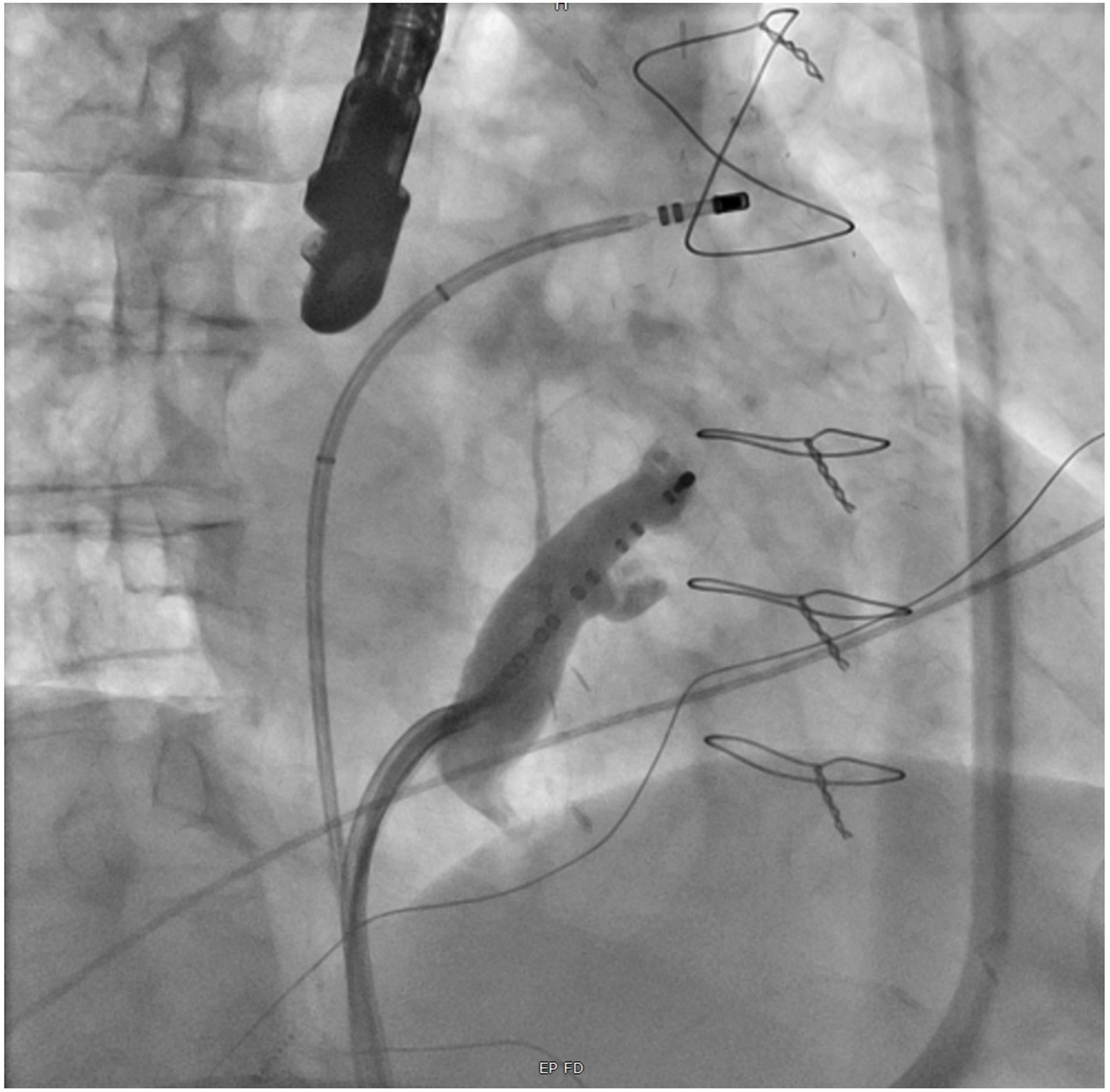

2-OD ... (3861, 0) Resp
-181 ms
LAT
69 ms
6
31
6.00
Tag.Idx
0.83
0%
AP PA LAO RAO LL RL INF SUP

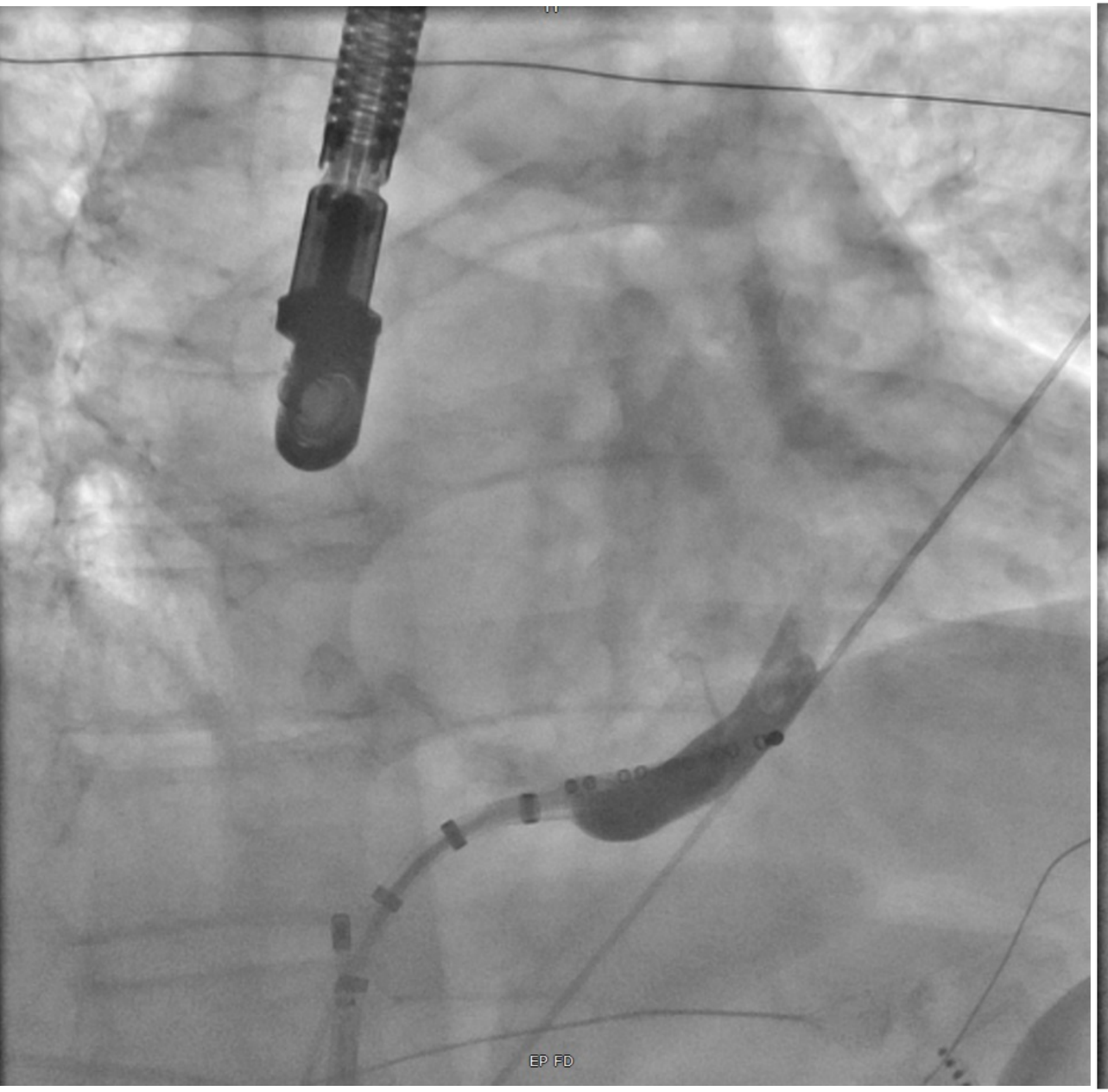

A DRAINAGE VEINS CONNECTIONS
LA
MI
VOM
GCV
CS
CROSSROAD
B MITRAL ISTHMUS STRUCTURAL HETEROGENEITY
MI
5 MM
GCV
CS
VIEUSSENS VALVE
SUP
ANT
POST
INF
RIGHT
LEFT
C VOM ETHANOL INFUSION
LAA
LPV
RPV
RIDGE AREA
ANNULAR AREA
D ANCHORED WALL GAP
PATIENT 18
E FREE WALL GAP
TOWARD LAA
TOWARD RIDGE
MA
VOM
10 MM
TOWARD PW

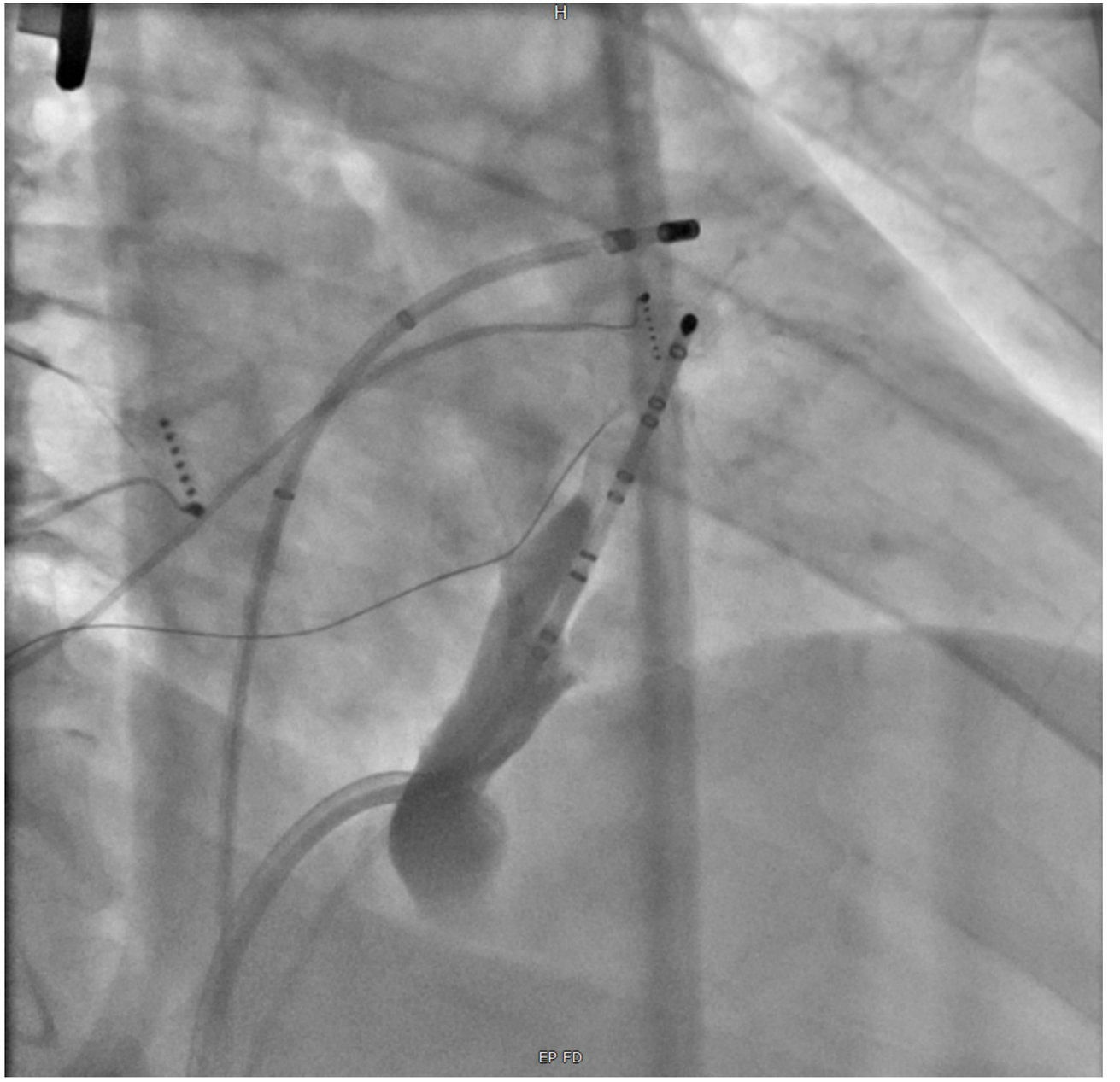

0 ST:0 IF:|
IVOP

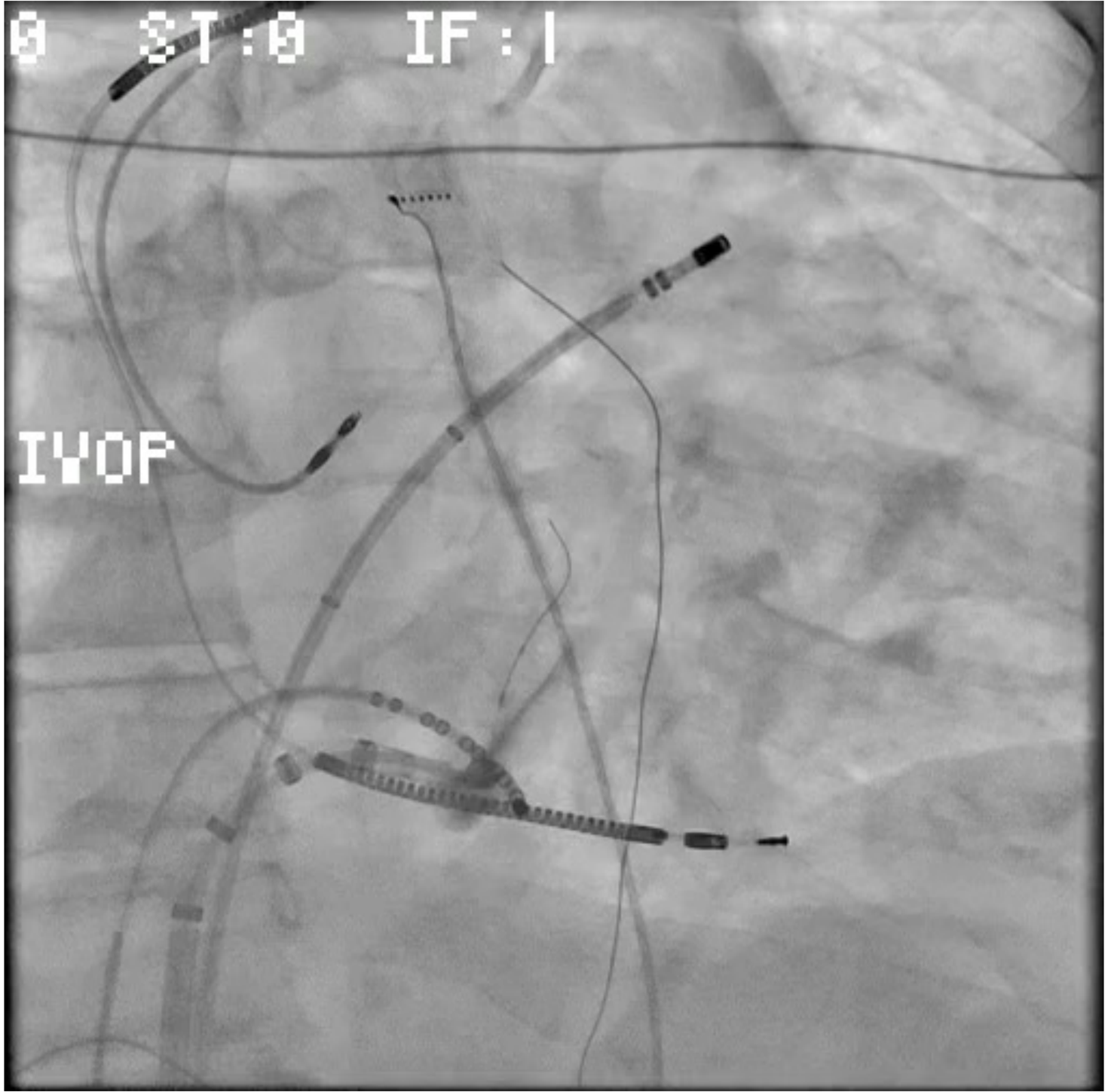

4 ST:4 IF:5
PVOP
Marshall
Valve de Vieussens

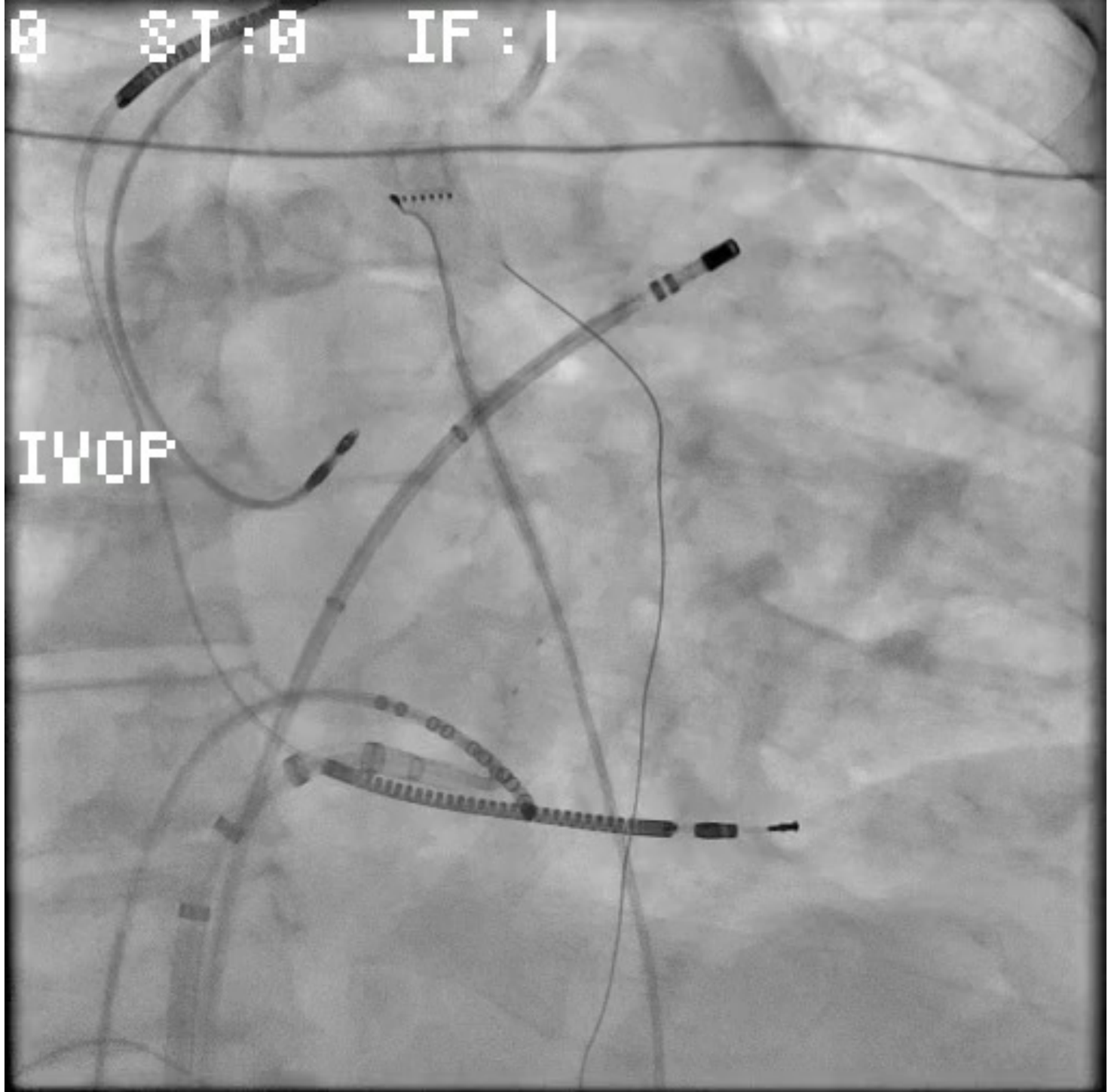

H


H
EP FD

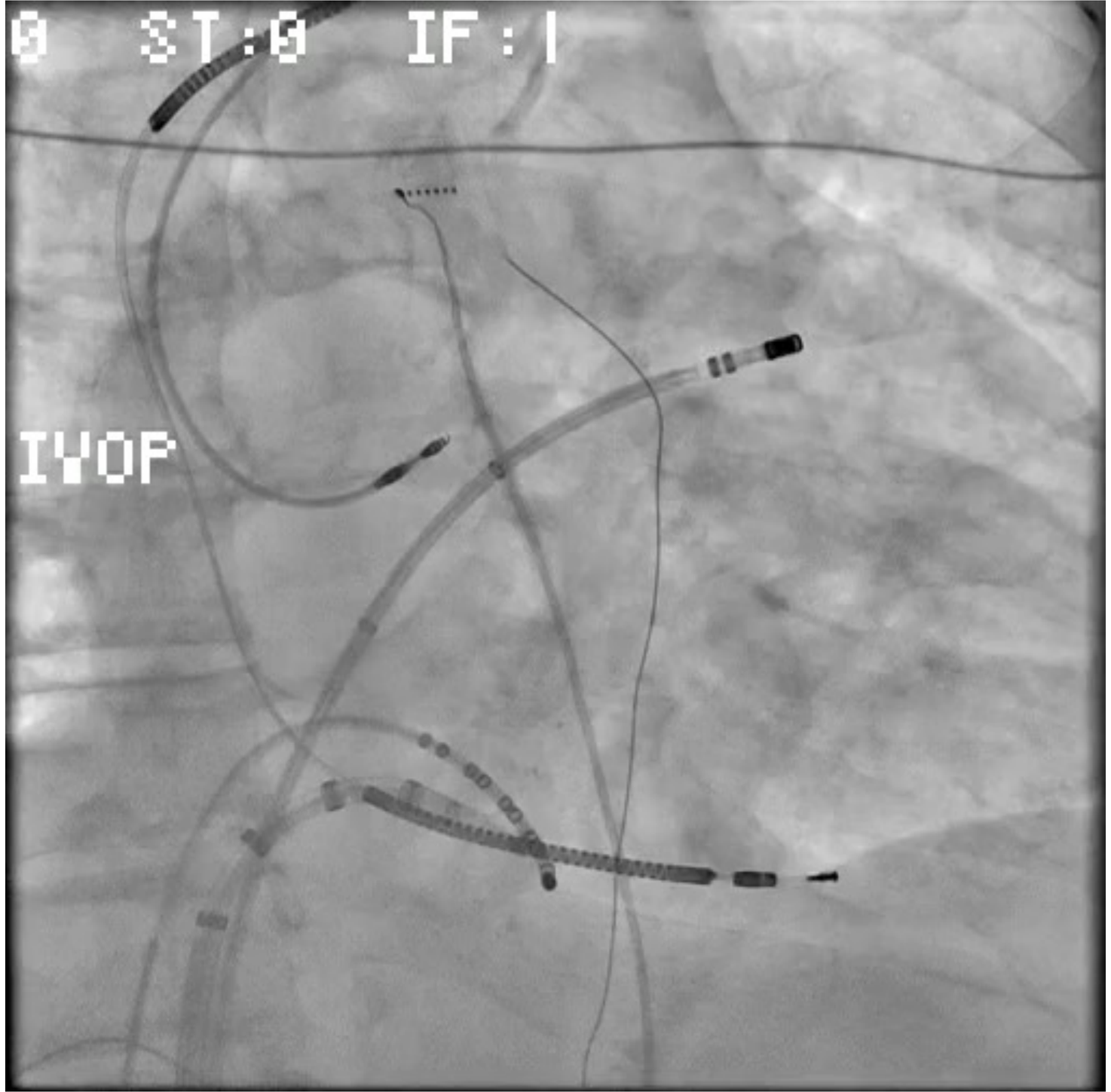

EP FD

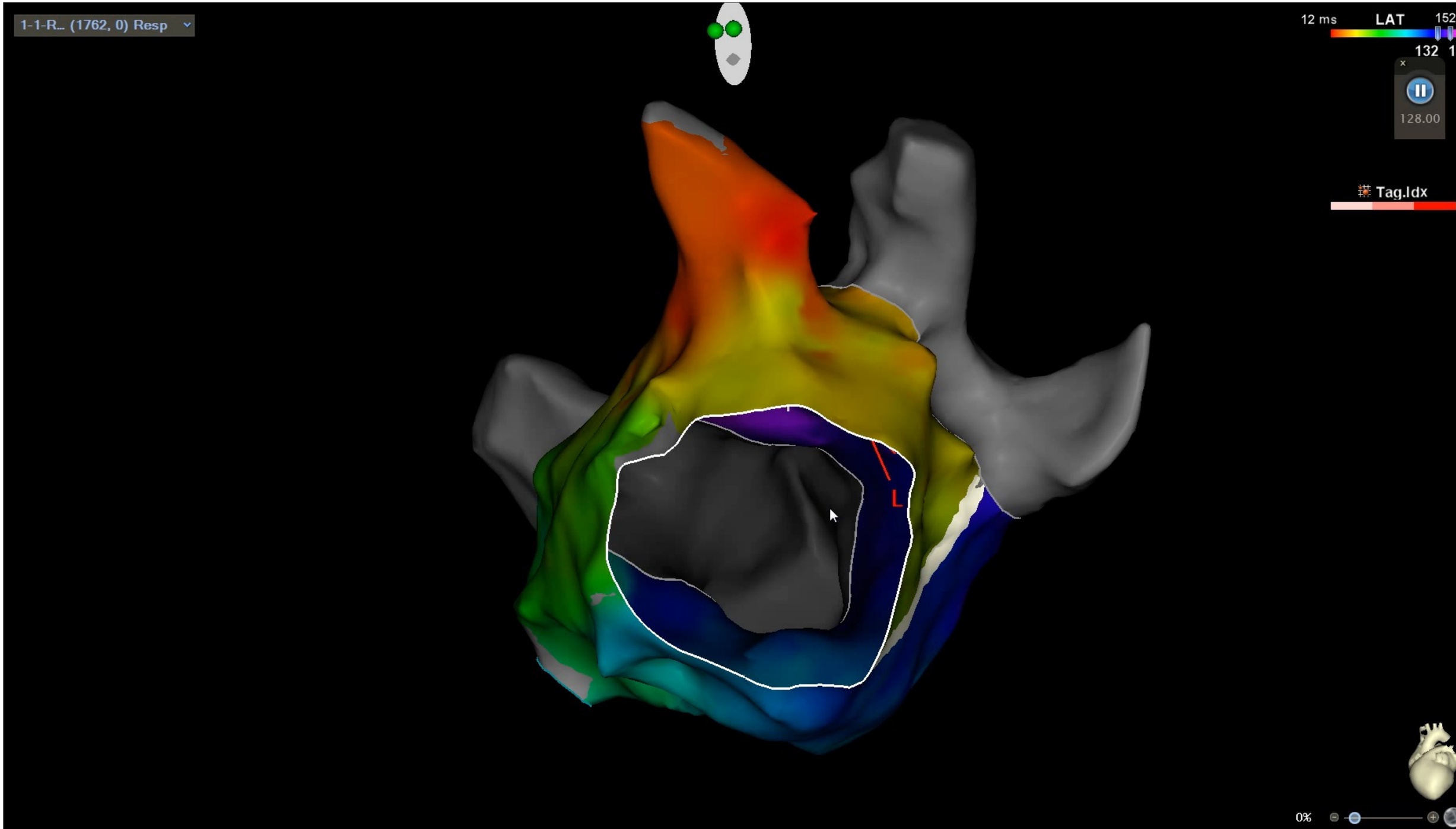

H
EP FD

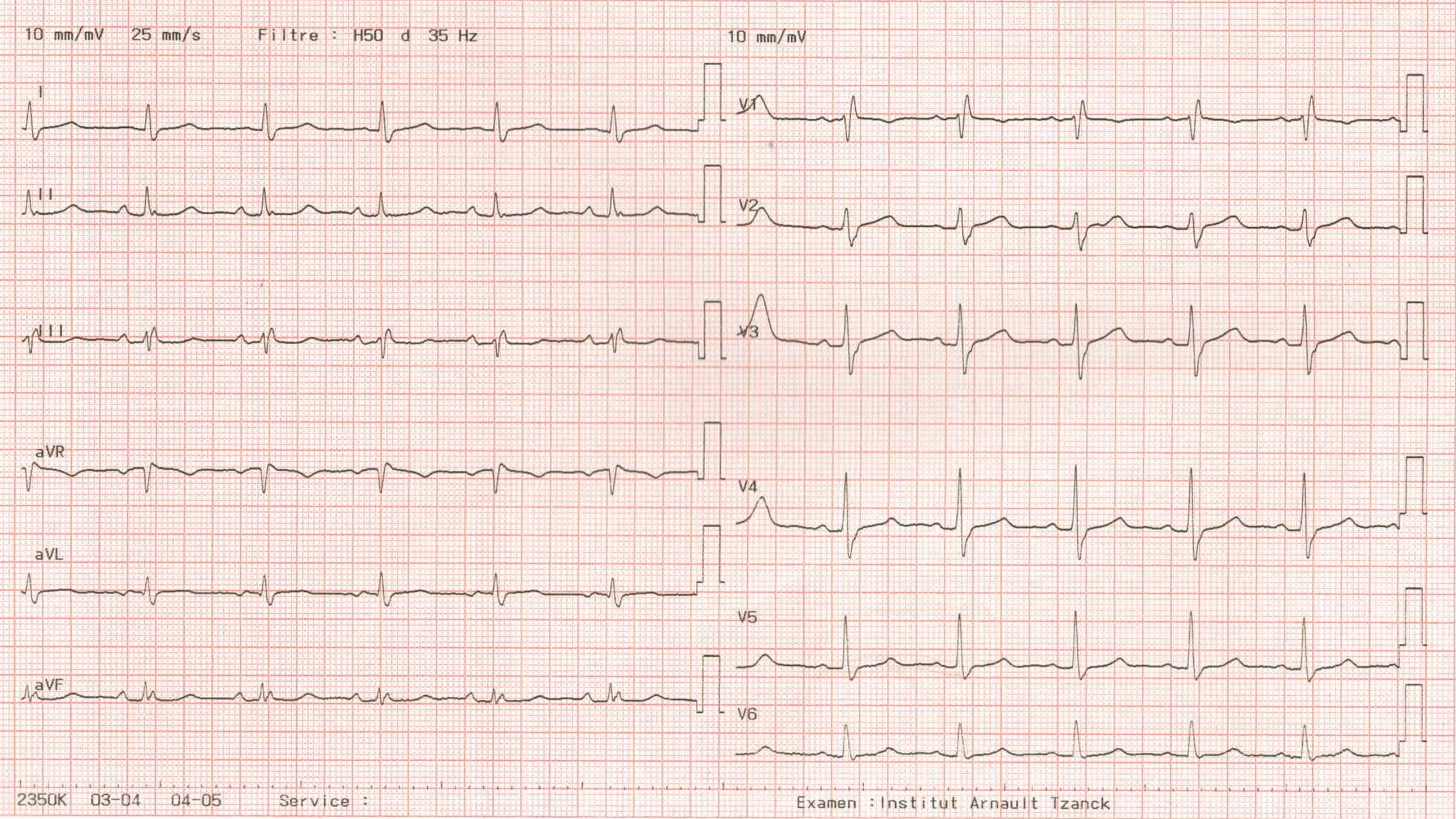

0 ST:0 IF:1
IVOP


0 ST:0 IF:1
IVOP

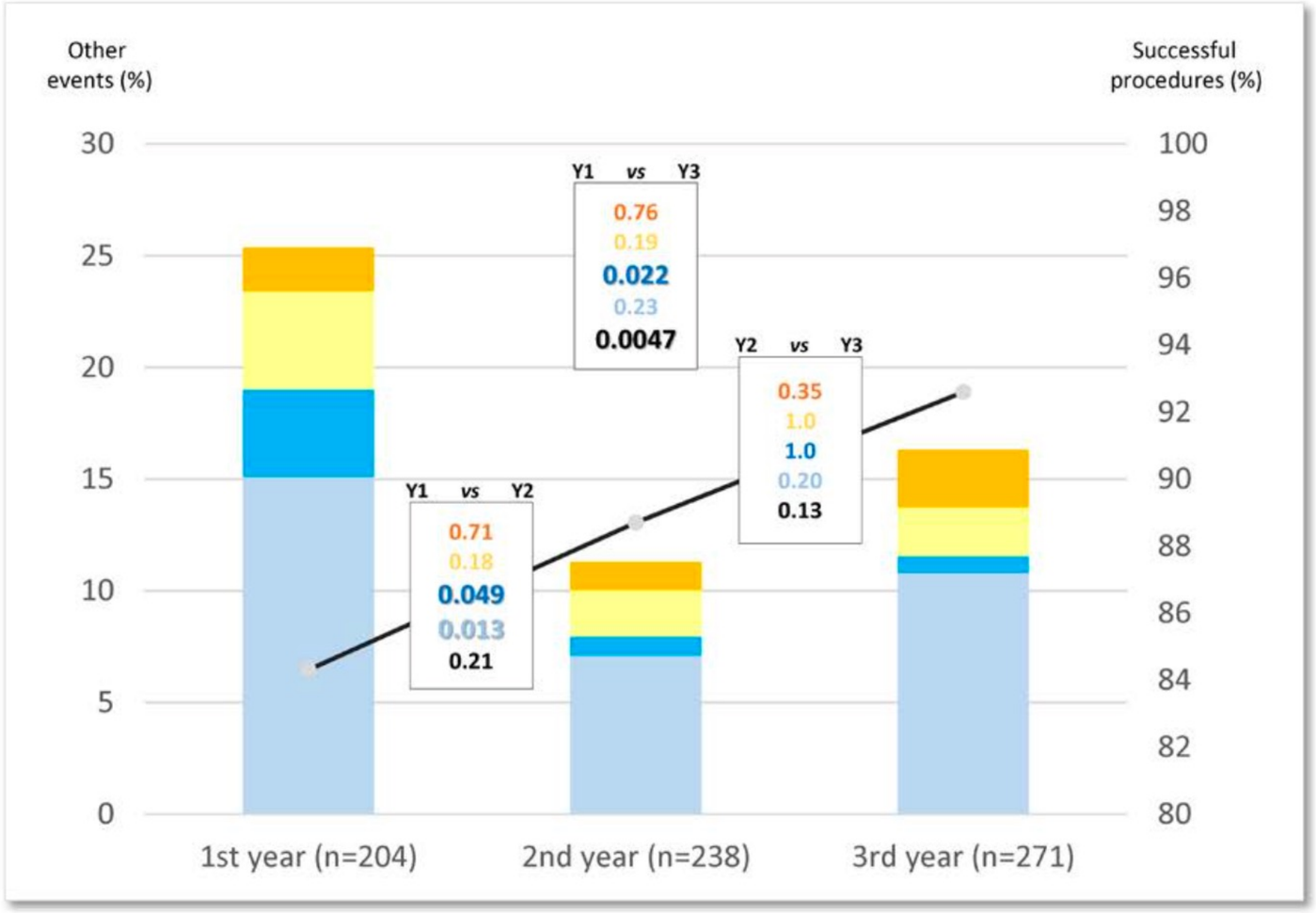
Retour sinusal pendant l’alcoolisation

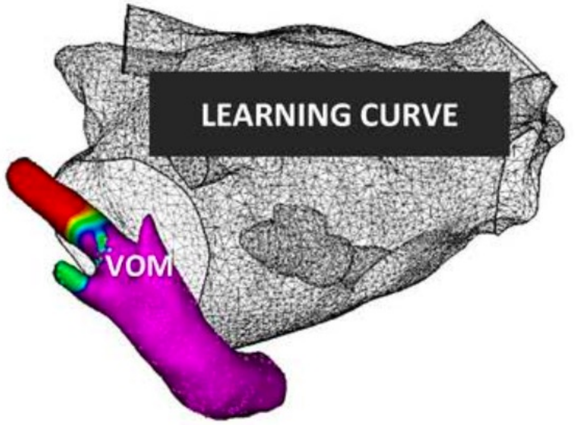

0 ST:0 IF:1
IVOP


1-1-R... (1762, 0) Resp
12 ms
LAT
152 ms
132
146
128.00
Tag.Idx
L
0%


10 mm/mV 25 mm/s Filtre : H50 d 35 Hz
10 mm/mV
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
2350K 03-04 04-05 Service :
Examen : Institut Arnault Tzanck

Courbe d’apprentissage et complications





SERIOUS COMPLICATIONS

VOM PERFORATION

WRONG VEIN (LAA)

VOM DISSECTION

SUCCESSFUL PROCEDURES

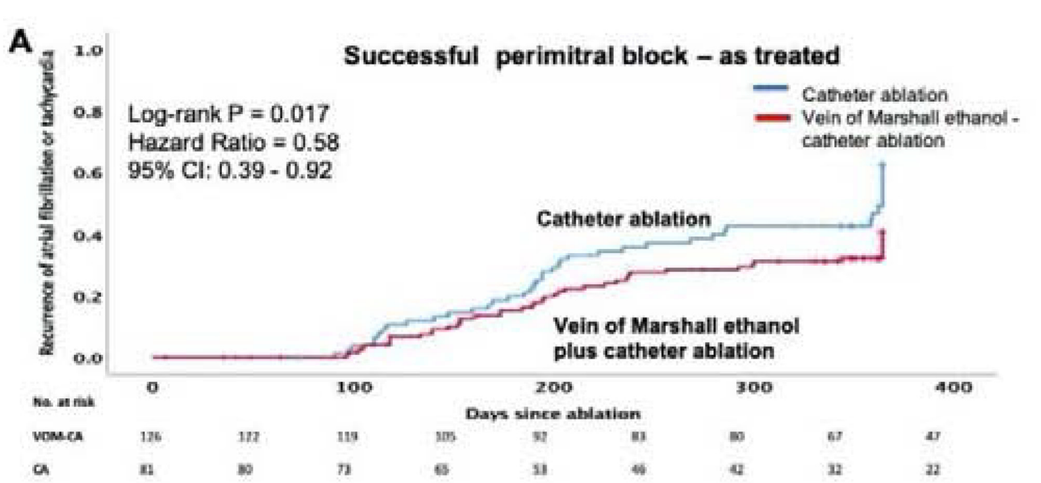
Kamakura, Pambrun, Derval. Circ EP 2020

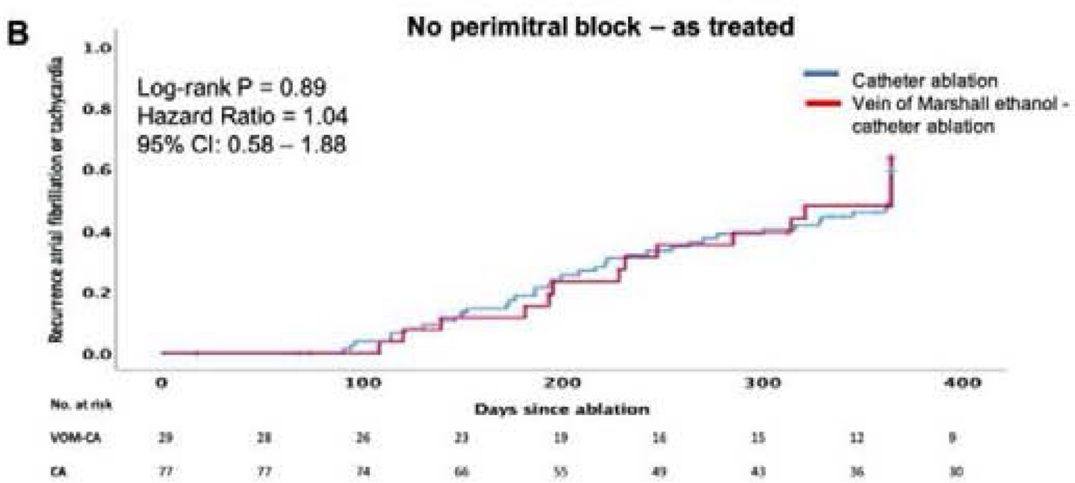
Serious complications

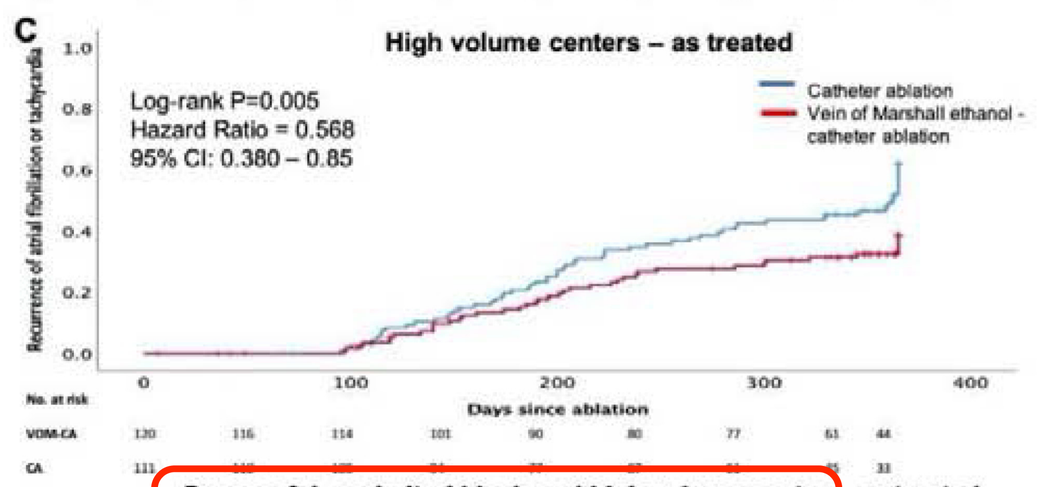
2%

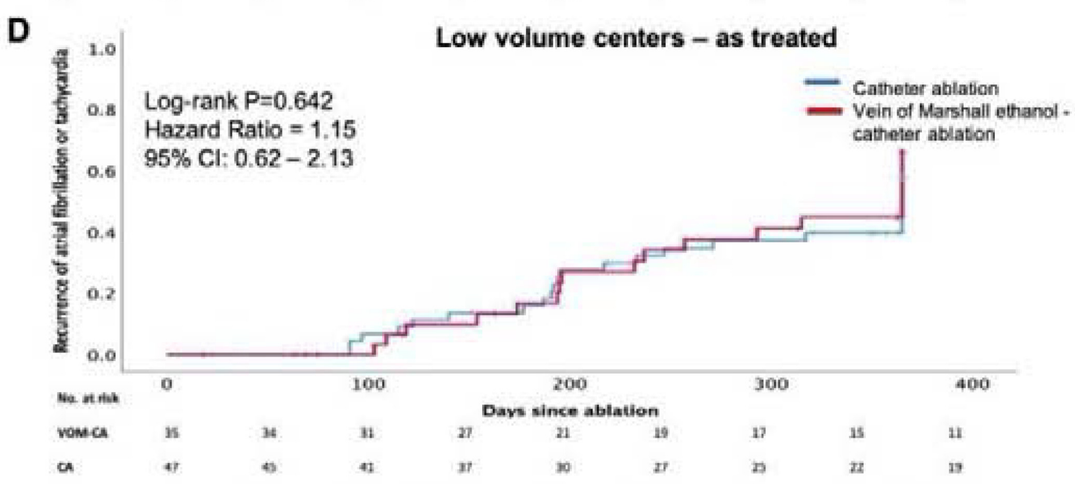
EVENT	RATE	TIME	COMMENT	MANAGEMENT
VOM PERFORATION: 20	2.8%	ACUTE	Infusion still feasible, but with a higher risk of delayed tamponade (10% *vs* 0,7% p=0.014).	Anti-inflammatory drugs and repeated echography should be considered in this category of patients.
PERICARDITIS: 13	1.8%	DELAYED	Usually at day-2.	Anti-inflammatory drugs.
DELAYED TAMPONADE: 6	0.8%	DELAYED	Serous nature of cardiac effusion in 2/3 of patients: inflammatory reaction may play a key role.	Pericardiocentesis (surgical access not necessary)
STROKE: 4	0.6%	DELAYED	Stroke rate in the reported range.	Medical management.
ACUTE TAMPONADE: 1	< 0.2%	ACUTE	Related to per-procedural steam pop.	Surgical drainage necessary.
ANAPHYLAXIS: 1	< 0.2%	ACUTE	Must be evocated first, in case of hemodynamic collapse during infusion.	Adrenaline, corticosteroids.
HIGH-DEGREE AVB: 1	< 0.2%	ACUTE	Might be favored by very proximal VOM ostium.	Monitoring of atrioventricular conduction during ethanol infusion.
LAA ISOLATION: 1	< 0.2%	ACUTE	Risk increased in case of large anterior wall scarring.	Bachmann conduction assessment prior to VOM ethanol infusion, if history of extensive ablation.

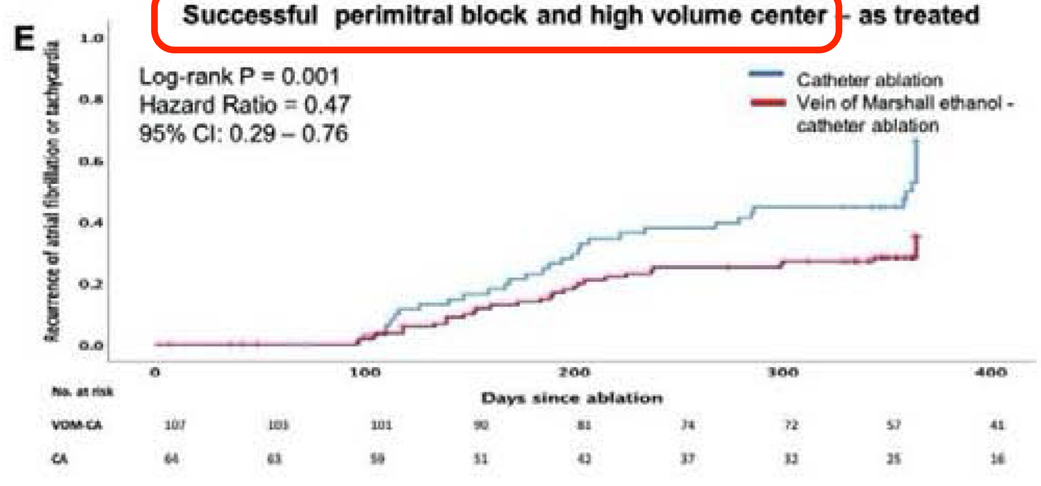
VENUS Trial

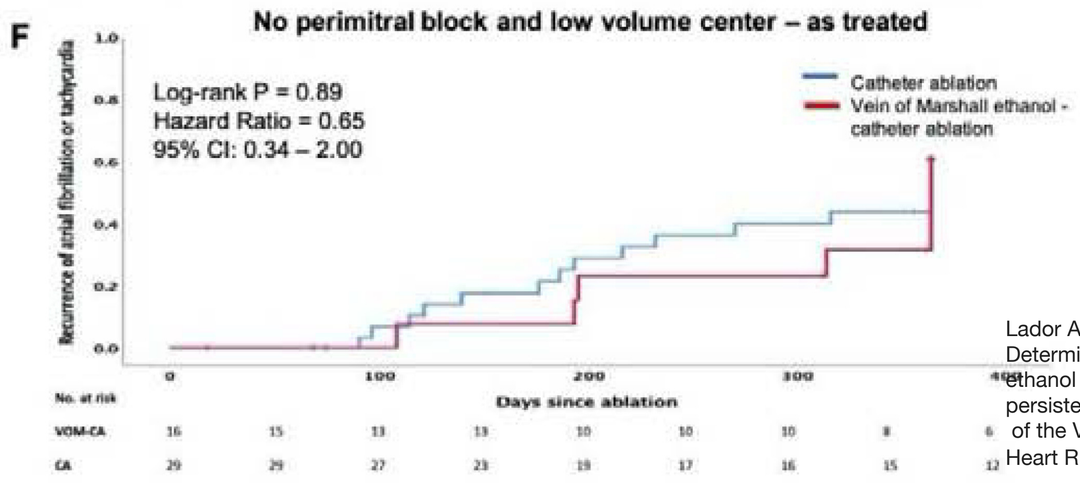






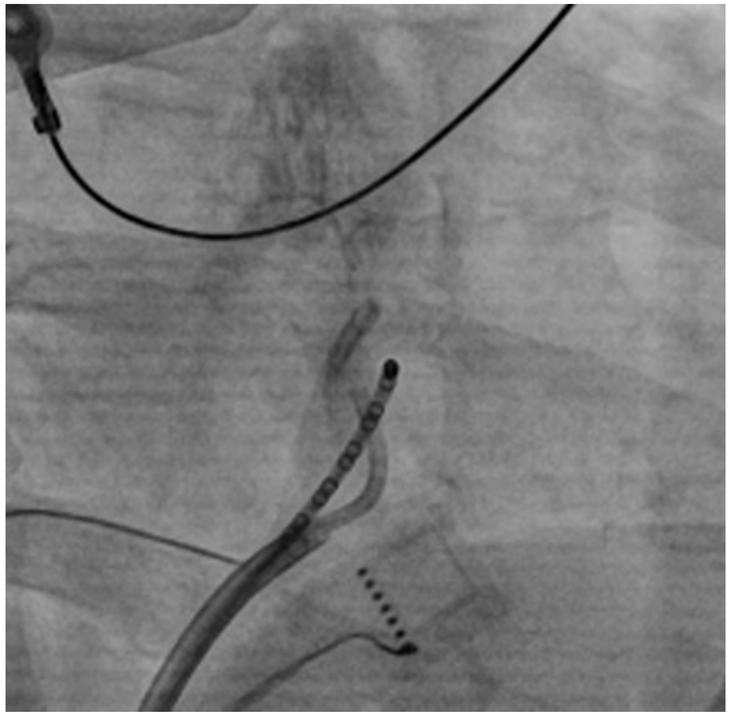


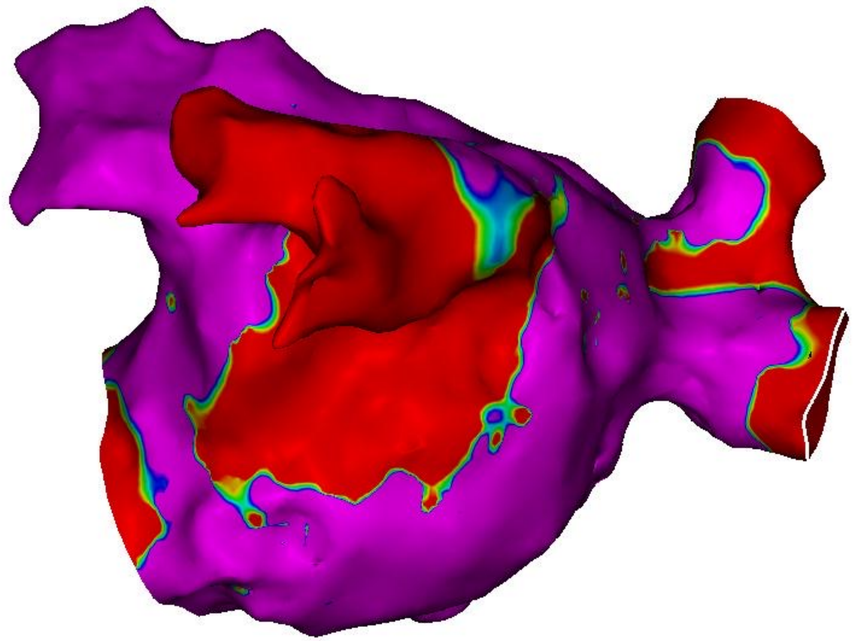


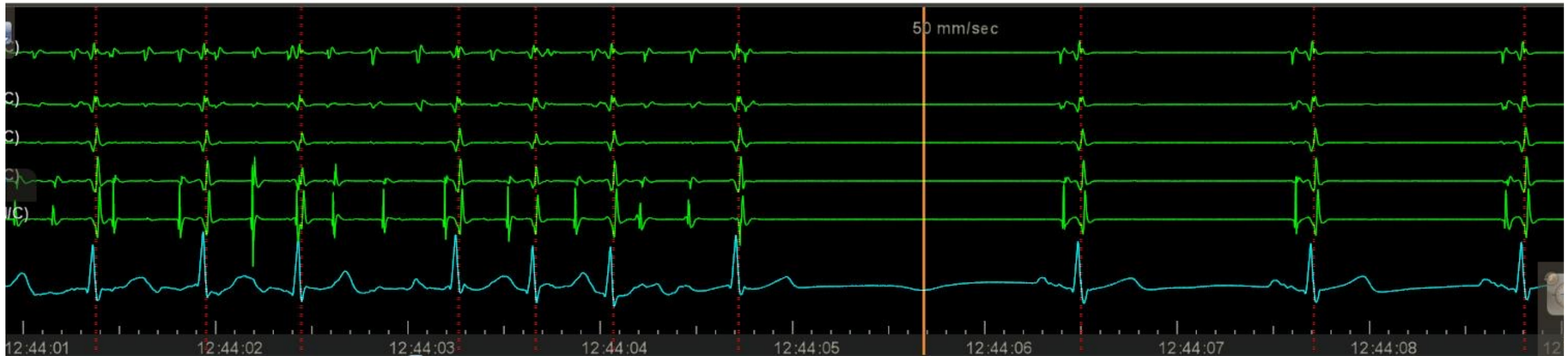


Lador A, Peterson LE, Valderrábano M. Determinants of outcome impact of vein of Marshall ethanol infusion when added to catheter ablation of persistent atrial fibrillation: A secondary analysis of the VENUS randomized clinical trial. Heart Rhythm. 2021 Jul;18(7):1045-1054.

FA persistante depuis 2018…







Merci de votre attention