

ELECTRA

4-5 DÉCEMBRE 2021

HOTEL VILLA M.
MARSEILLE | FRANCE

1^Èmes journées françaises
pratiques de rythmologie
& de stimulation cardiaque

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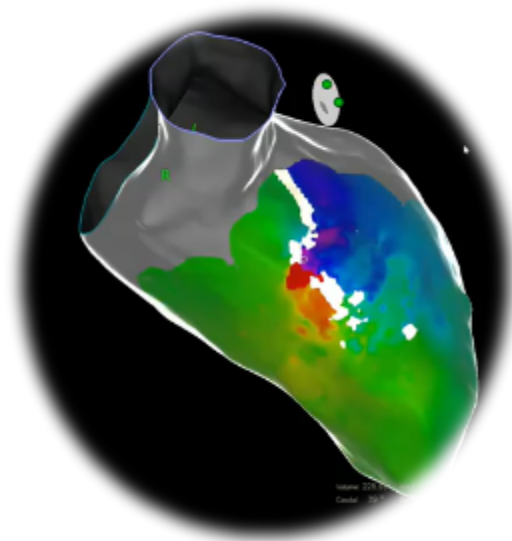
4-5 DÉCEMBRE 2025

VILLA M. - MARSEILLE | FRANCE

19^{èmes} journées françaises
pratiques de rythmologie
& de stimulation cardiaque

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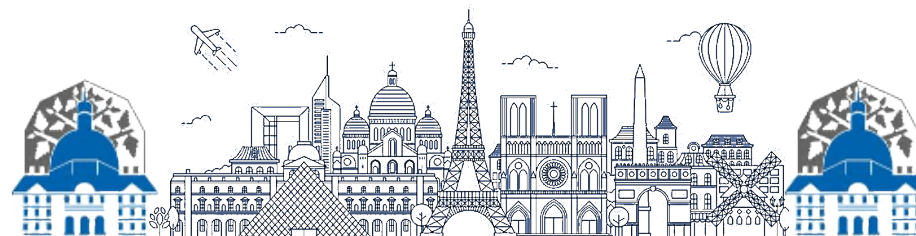
Comment ablater une TV septale profonde



Dr X. Waintraub

Département de cardiologie Unité de Rythmologie

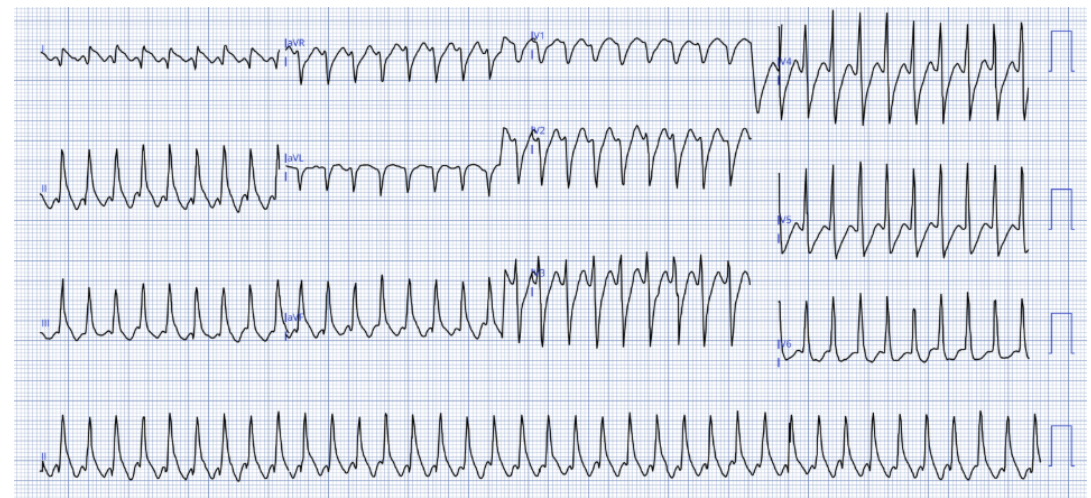
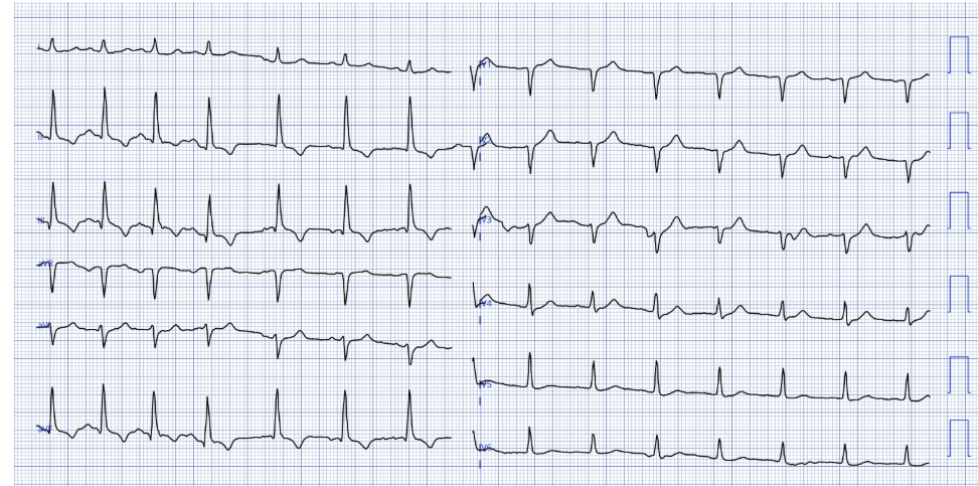
Groupe Hospitalier Pitié Salpêtrière



TV et substrat septal



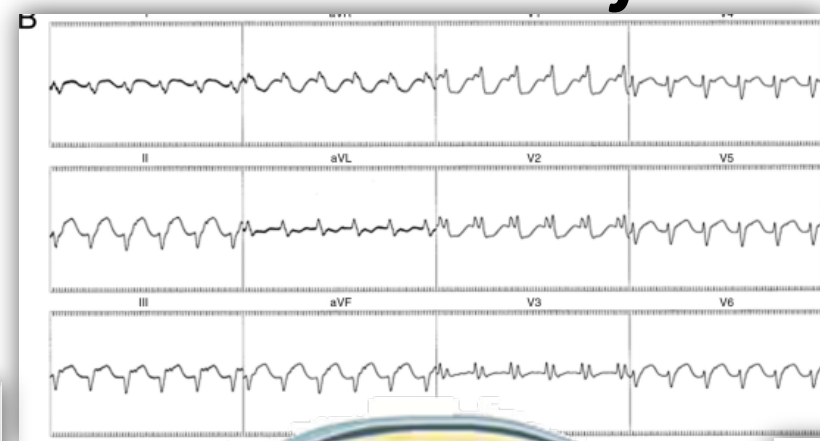
Patient de 58 ans
Cardiopathie ischémique
Séquelle antérieure et inférieure
FEVG 40%
Consulte aux SAU
pour asthénie dyspnée



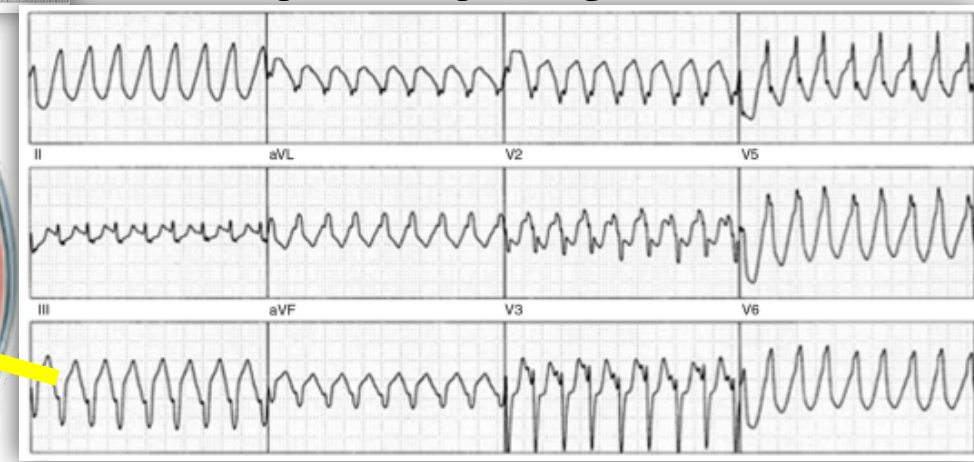


TV et substrat septal

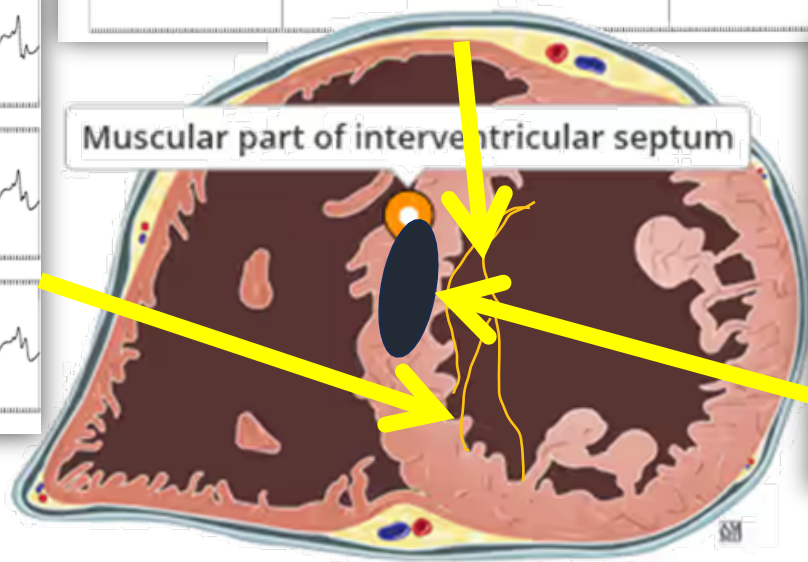
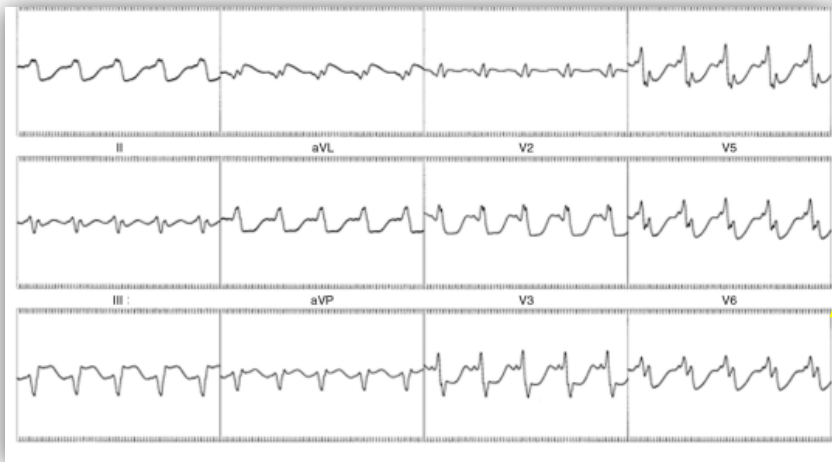
Fibre de Purkinje



Septal profond

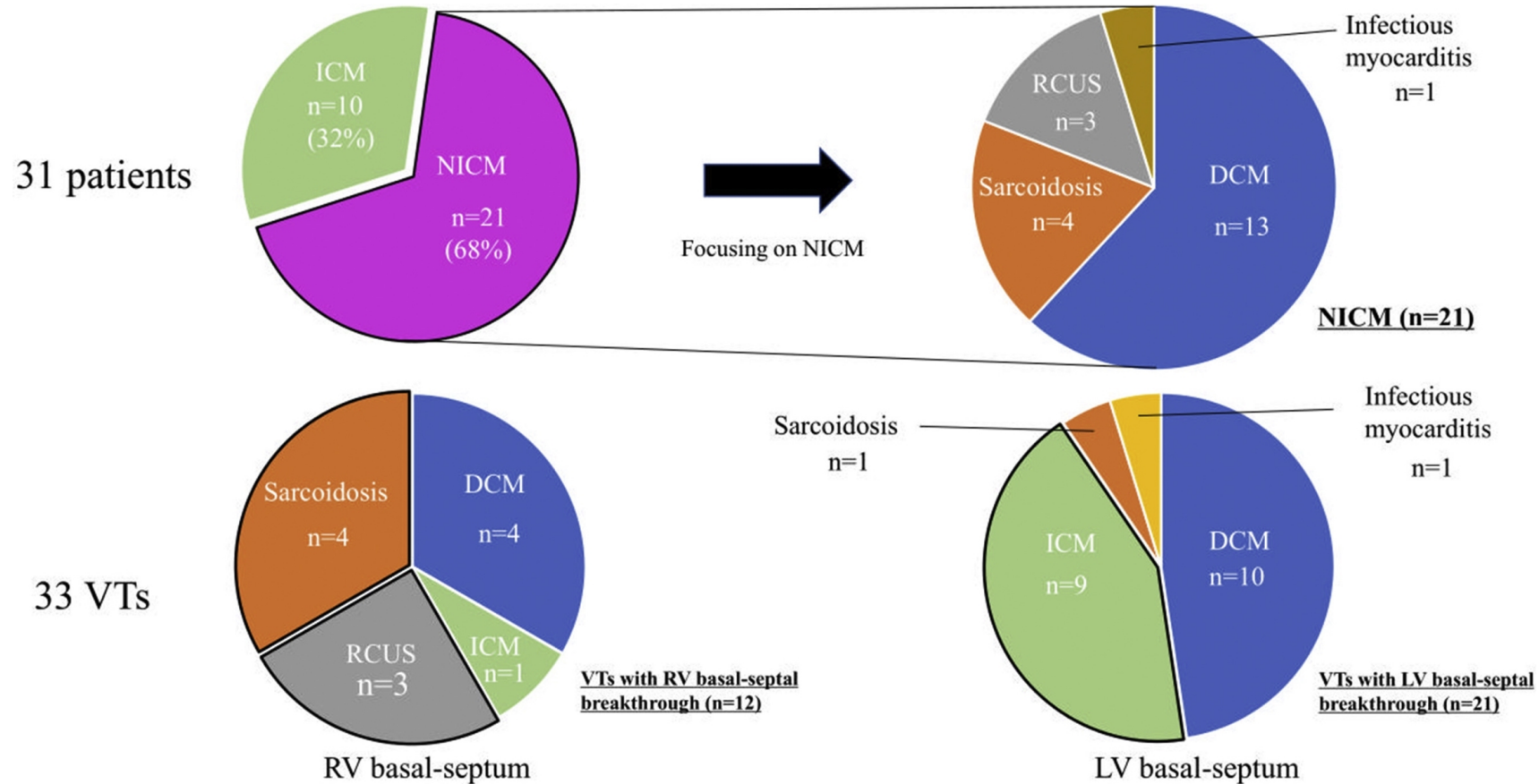


Endocarde du VG

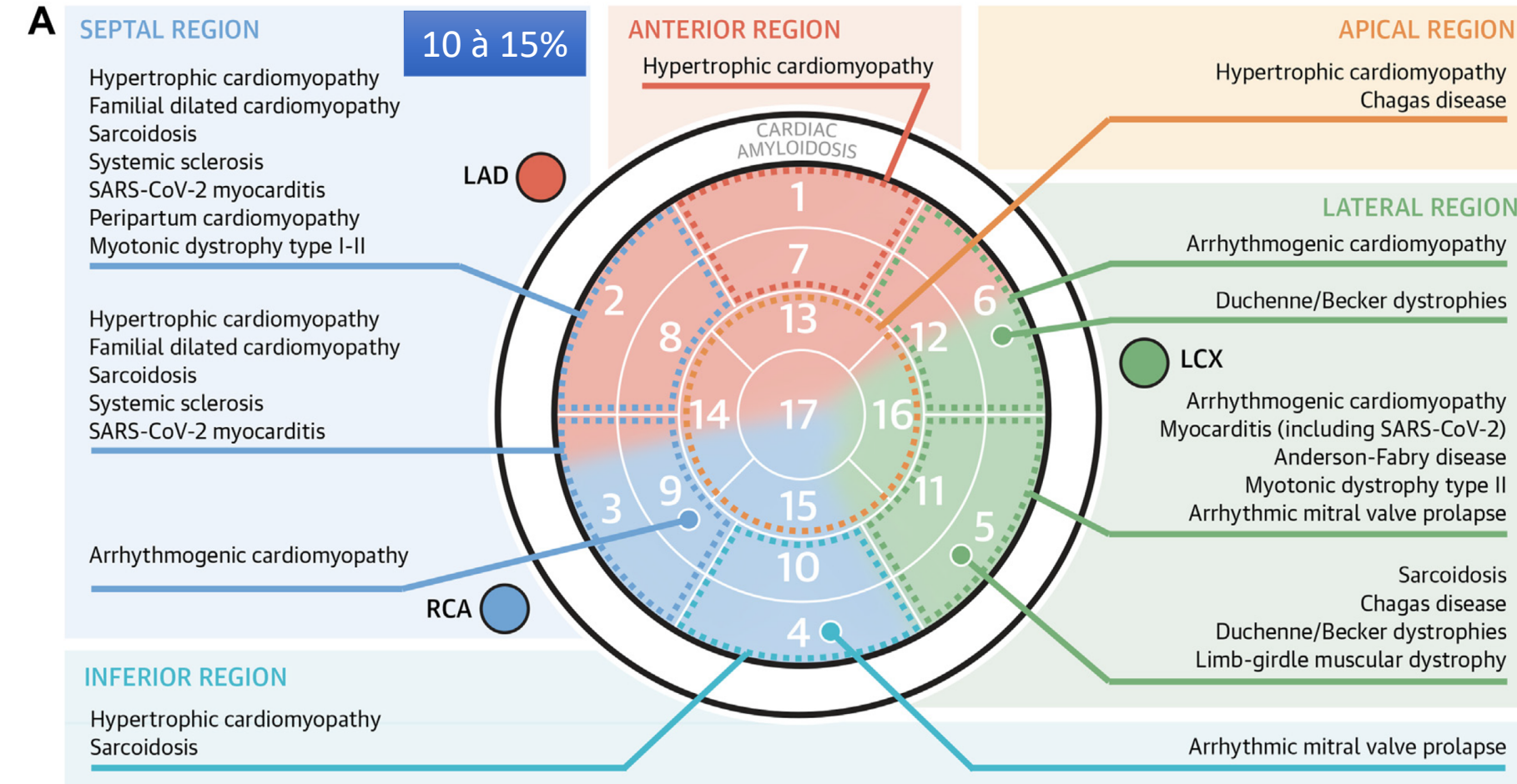


Muscular part of interventricular septum

Substrat septal



Présence d'un substrat septal

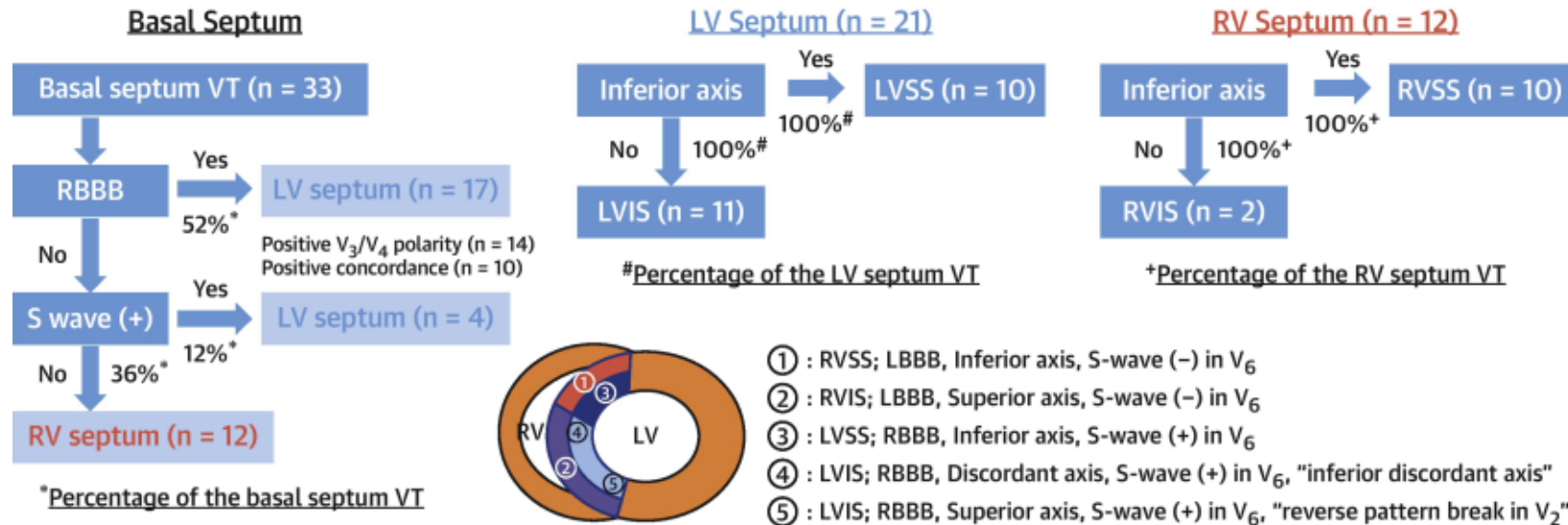


typical ECG abnormalities :

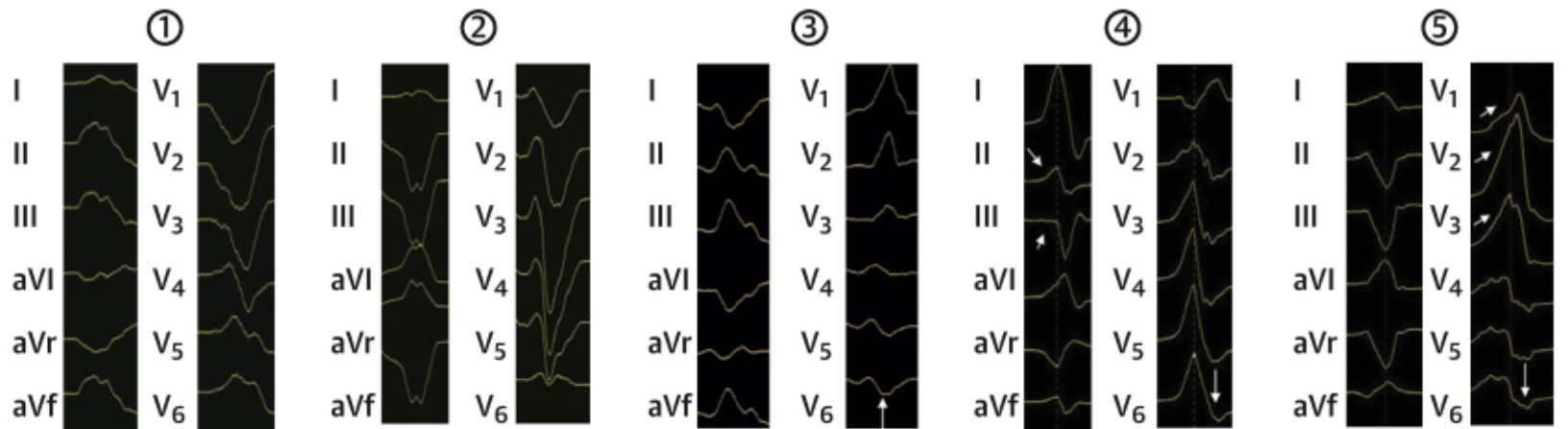
- atrioventricular block,
- septal remodeling evidenced by Q waves in V1-V2, and fragmented QRS



ECG selon le site de sortie septo-basal

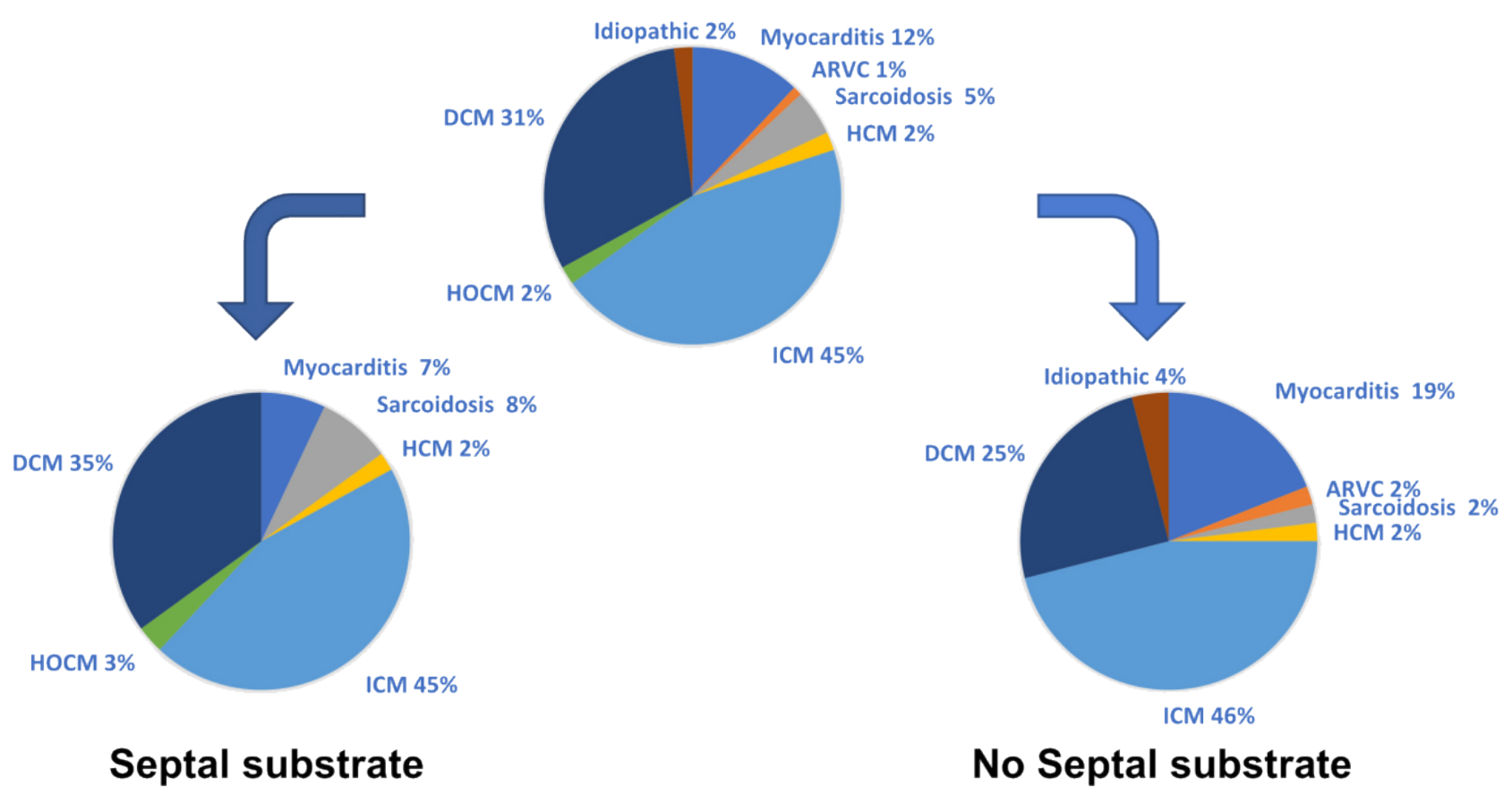


JACC
Clinical
Electrophysiology



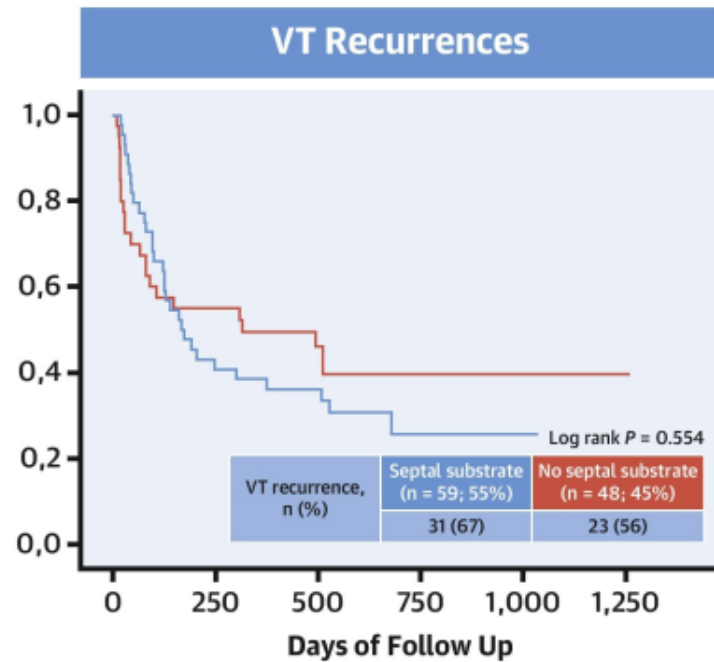


Substrat septal



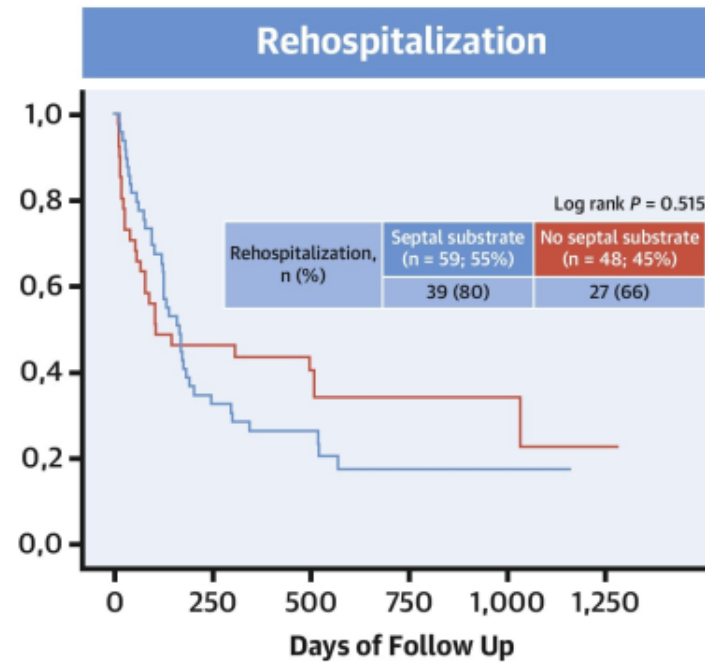


Pronostic



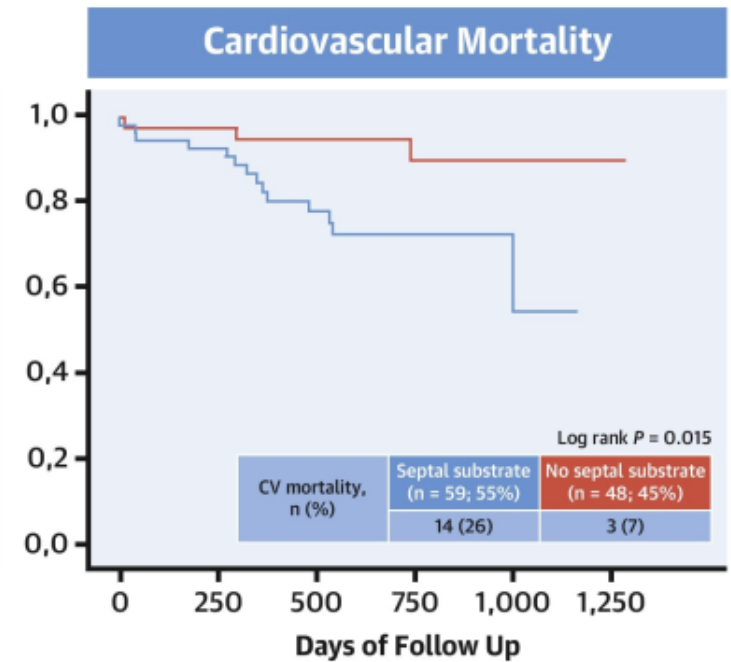
Patients at risk

—	18	14	3	1	0
—	21	14	7	4	1



Patients at risk

—	16	11	2	1	0
—	19	14	8	6	3

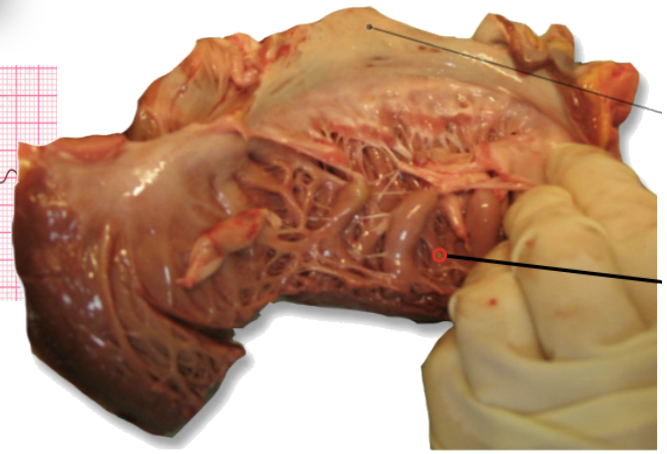
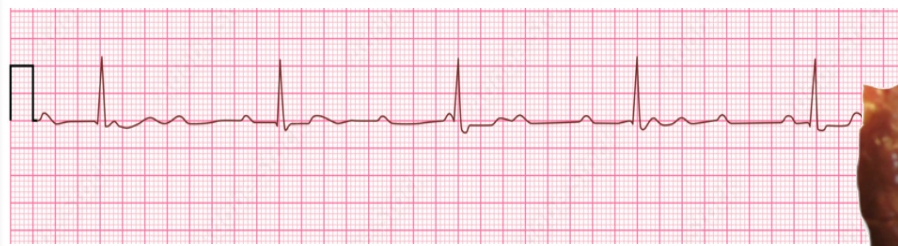
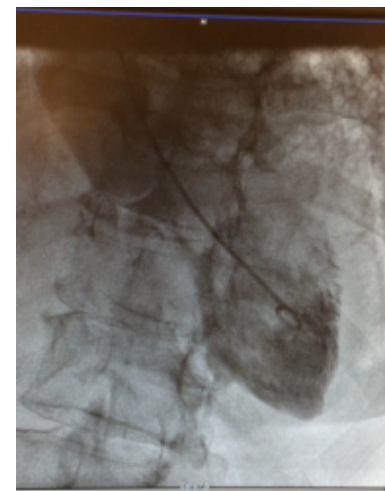
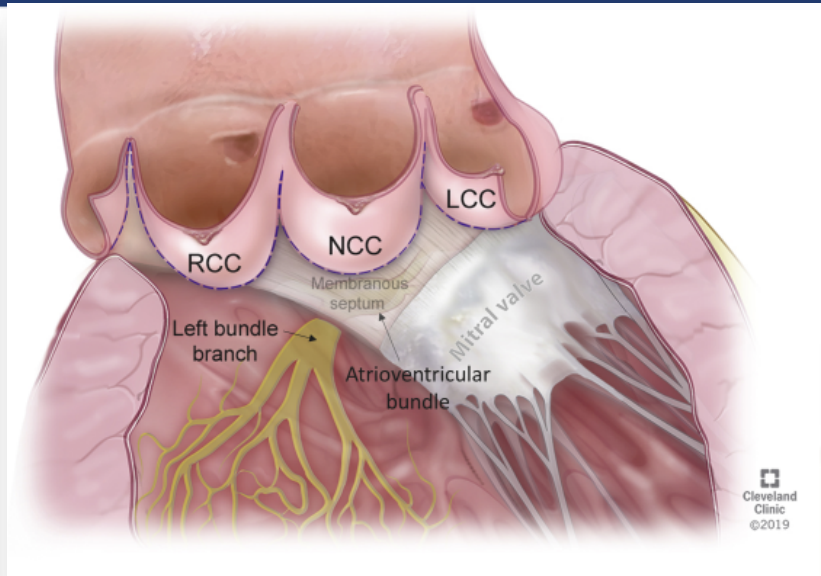
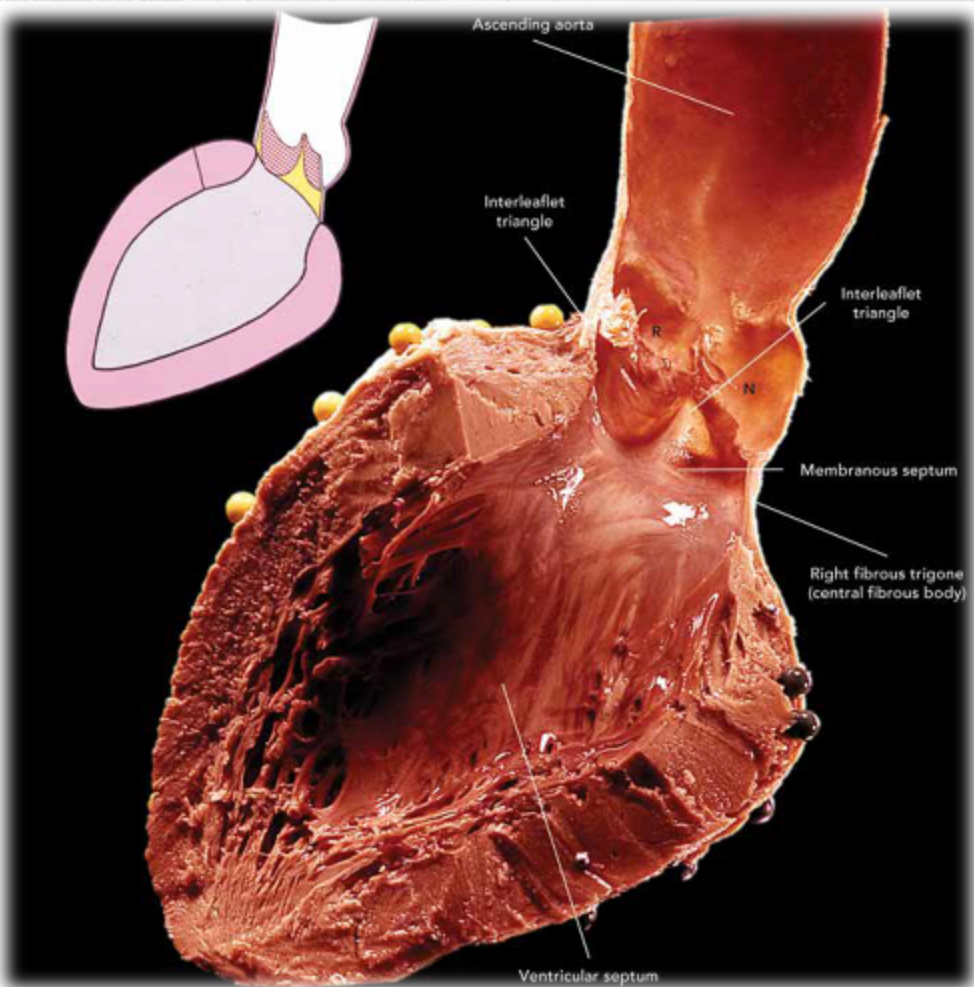


Patients at risk

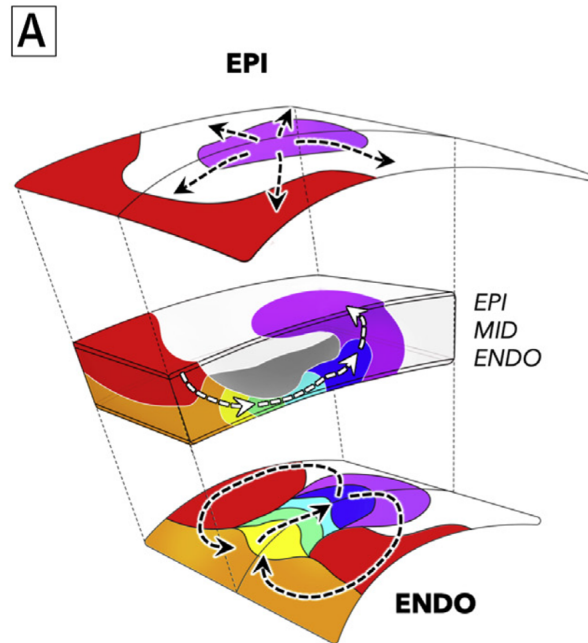
—	49	30	17	4	0
—	38	28	16	8	2

— Septal Substrate — No Septal Substrate

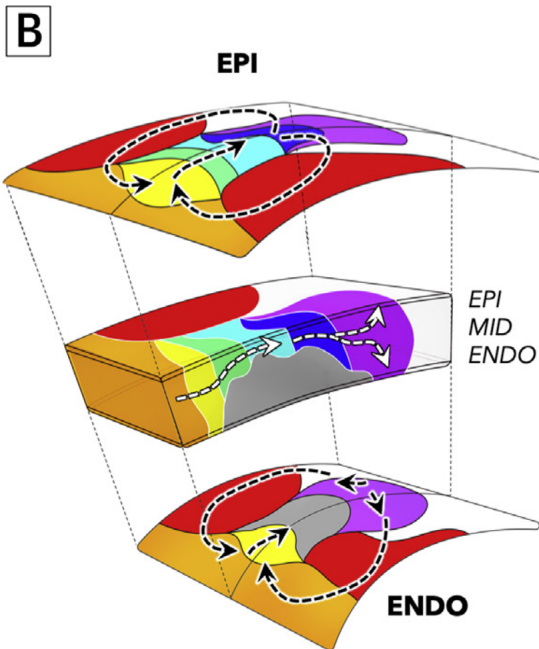
Spécificités



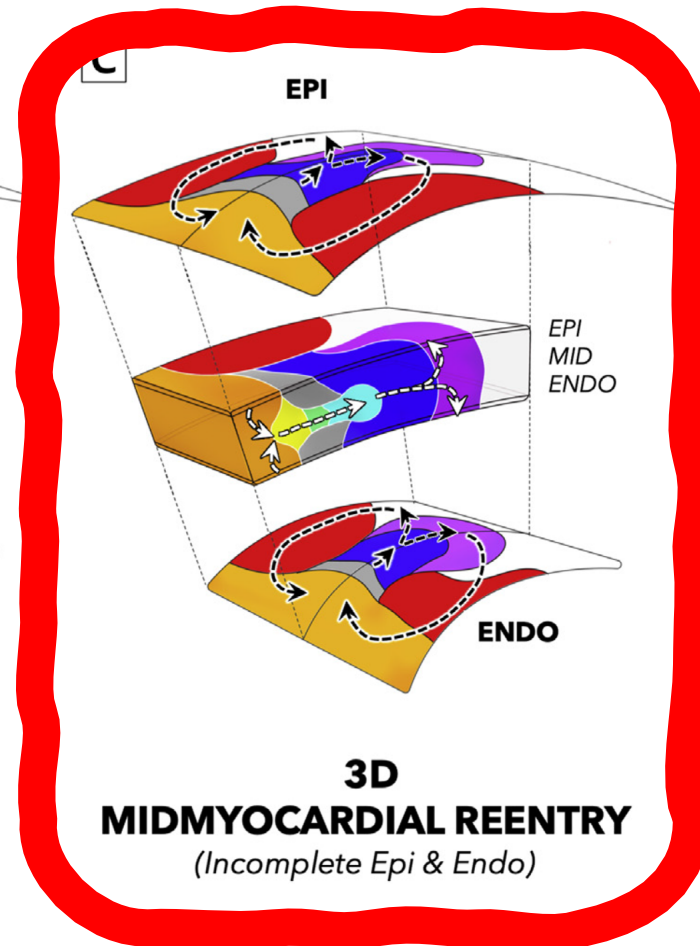
Circuit en 2D ou en 3D



2D
ENDOCARDIAL REENTRY
(Focal Epi)



3D
EPICARDIAL REENTRY
(Incomplete Endo)



3D
MIDMYOCARDIAL REENTRY
(Incomplete Epi & Endo)



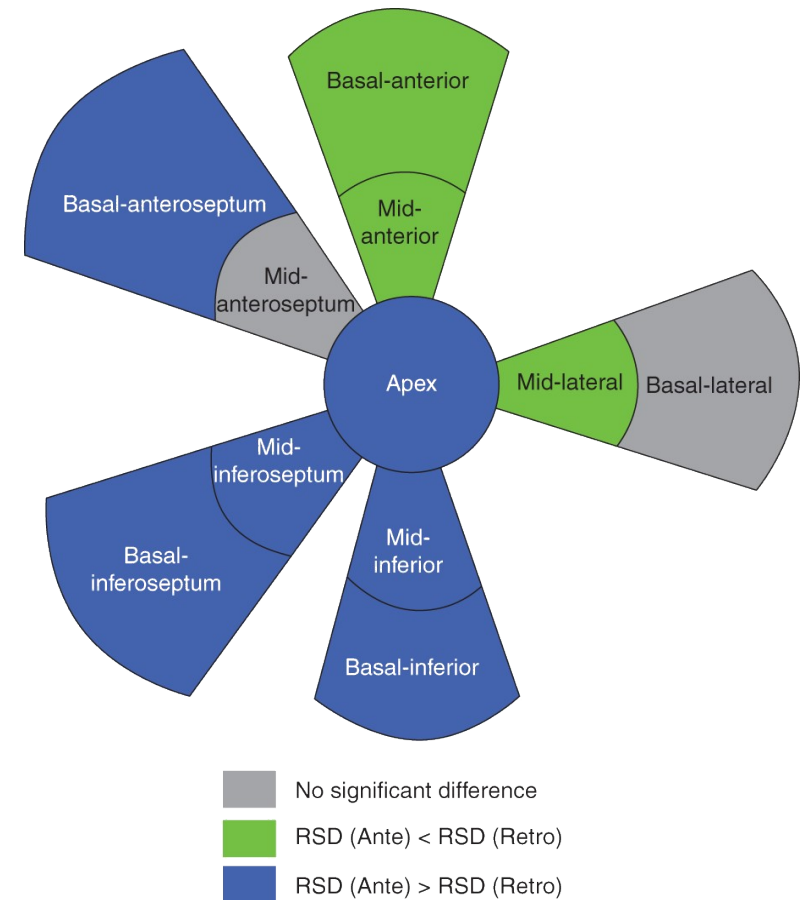
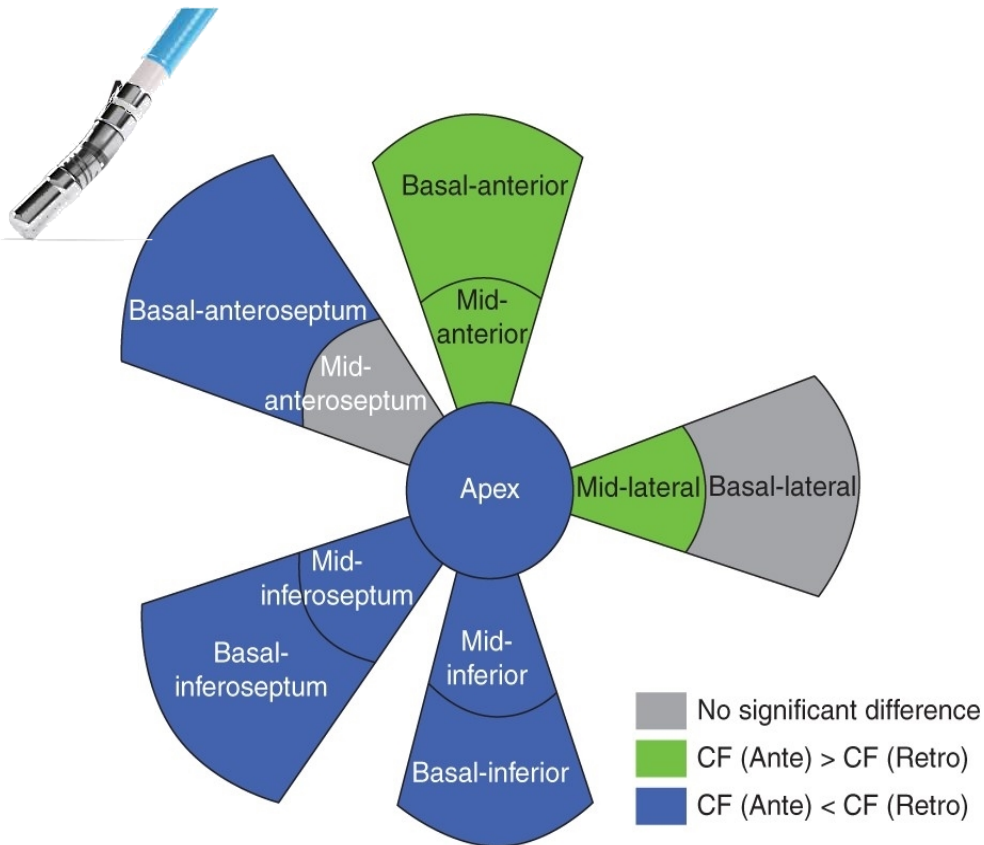
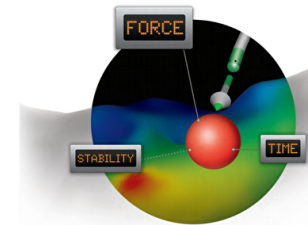
Identifier le substrat septal

Identifier un substrat septal :

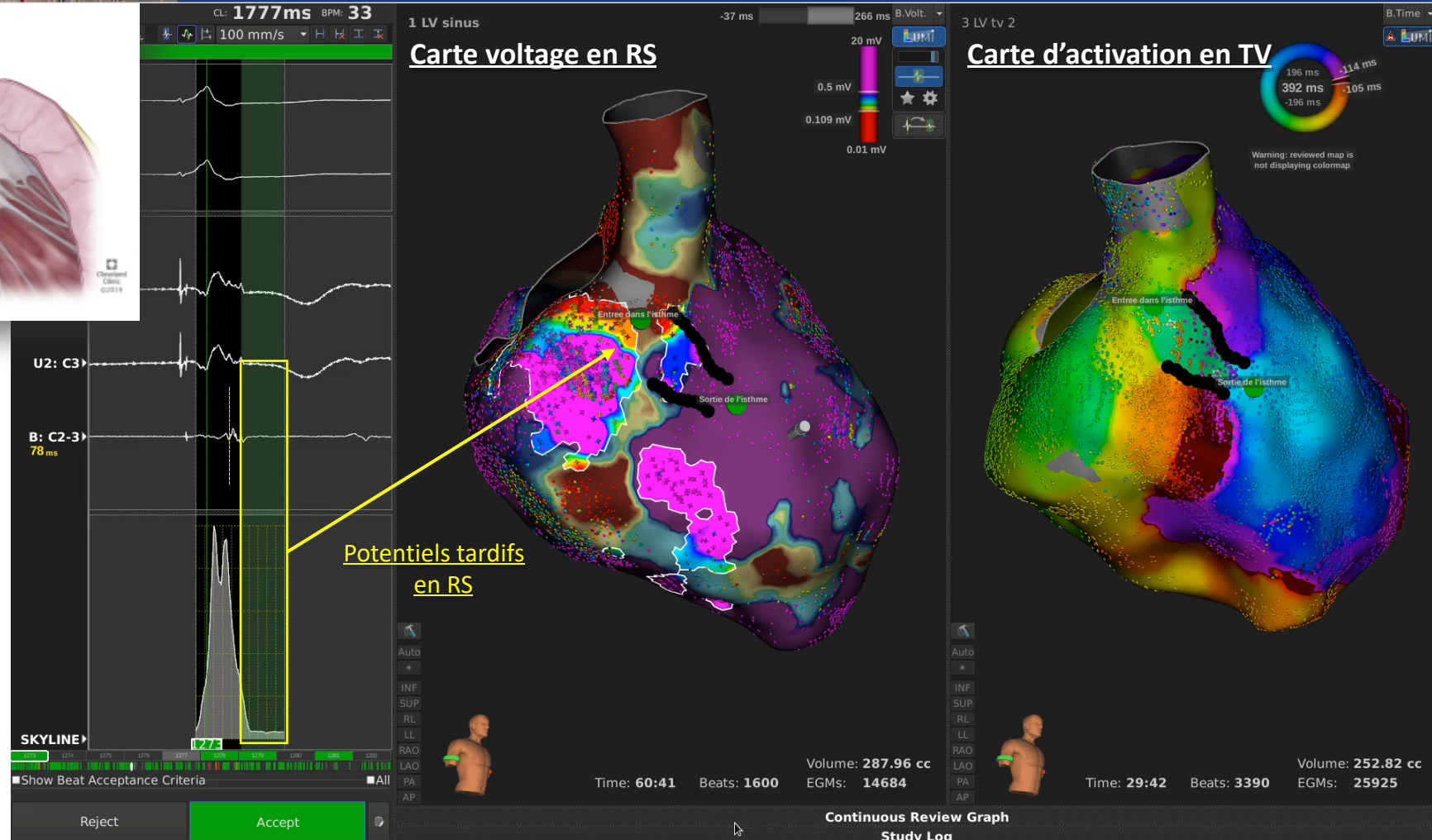
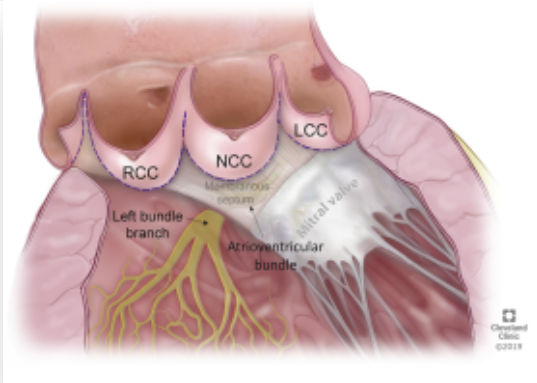
- Meilleure précession ventriculaire dans l'endocarde < 20 ms du début du QRS
- Temps d'activation similaire de part et d'autre du septum
- Absence de signal unipolaire avec QS au meilleur site de précession endocardique
- Présence d'un far field au meilleur site endocardique
- Score de topostimulation sous-optimal
- Meilleure précession ventriculaire mesurée dans un branche septal veineuse



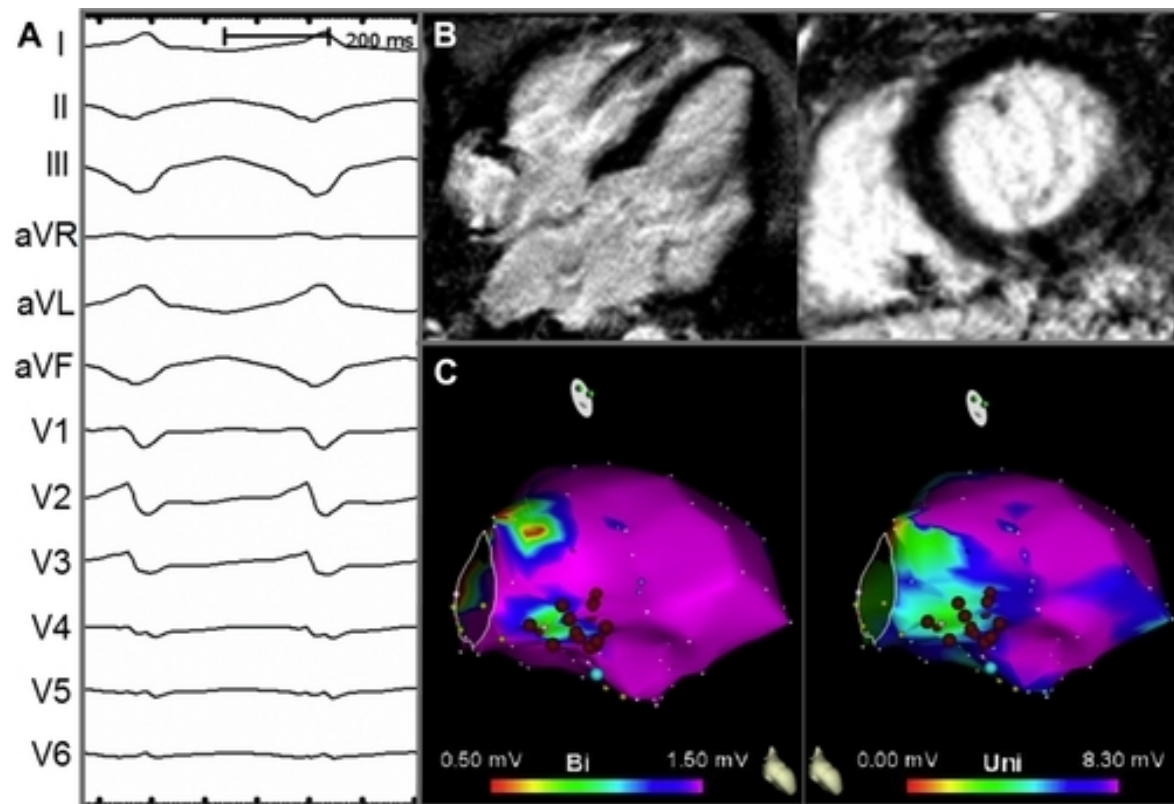
Quelle voie d'abord ?



Cartographie haute densité



Cartographie – substrat profond



Rarement on constate un foyer septal isolé :

- 7% en cartographie unipolaire
- 21% en bipolaire

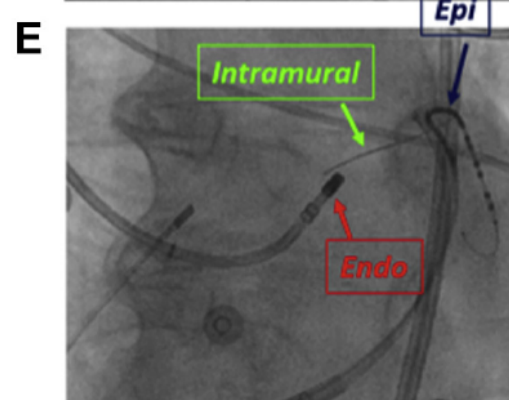
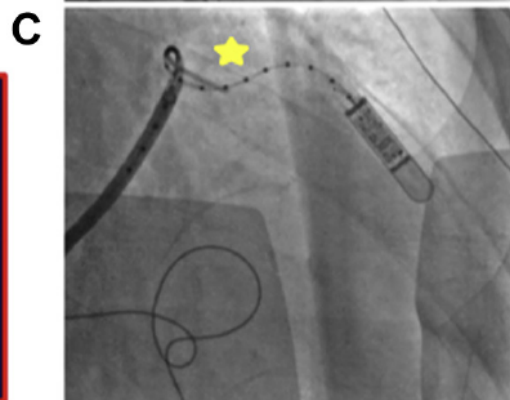
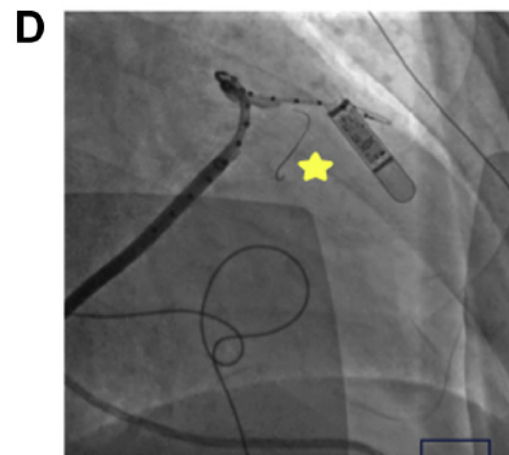
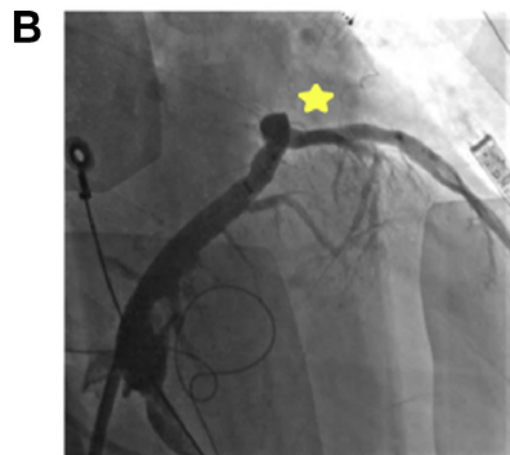
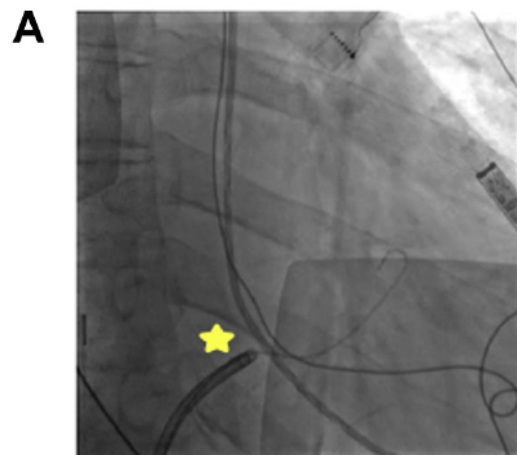
Cartographie en unipolaire dans cette série :

- Avec un cutoffs unipolaire de 4.8 mV on a la meilleure corrélation avec l'IRM
- Avec un cutoff de 8.3 mV on peut définir un substrat hétérogène et "patchy"



Quelle voie d'abord ?

Veines septales

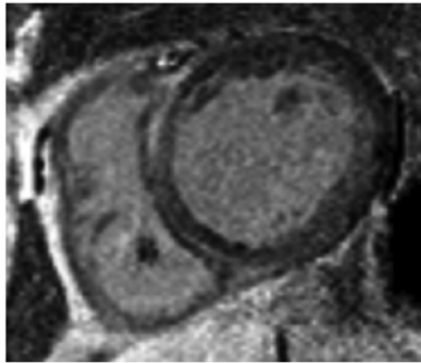


- 1- CS access with sheath (Agilis)**
 - Fits more than one mapping catheter
- 2- Venogram**
- 3- Multipolar catheter to epicardial branch**
- 4- Selective cannulation of septal veins**
 - Terumo 4F catheter
 - Guidewire (Vision Wire)
 - Connect the wire to system - unipolar
 - Filtered 30 - 150 Hz
- 5- Global Activation**

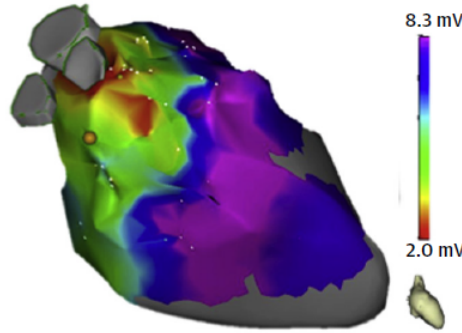
Quelle voie d'abord ? Veines septales

A *Septal Intramural Substrate*

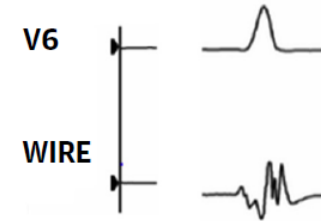
CMR



Unipolar Voltage Map

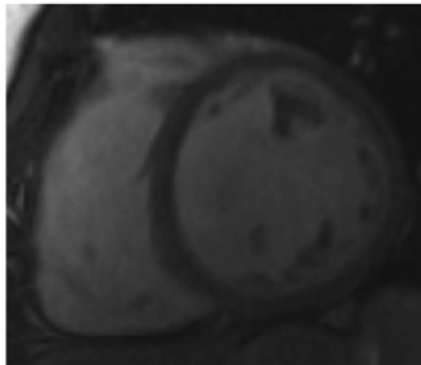


Direct Intramural Recording

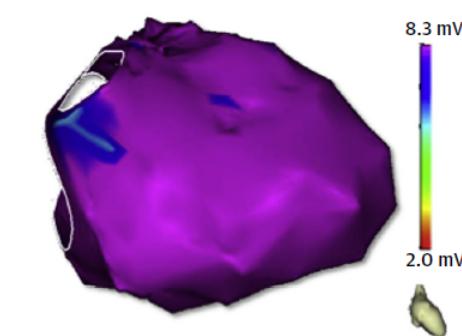


B *Normal Septum*

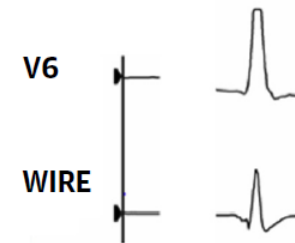
CMR



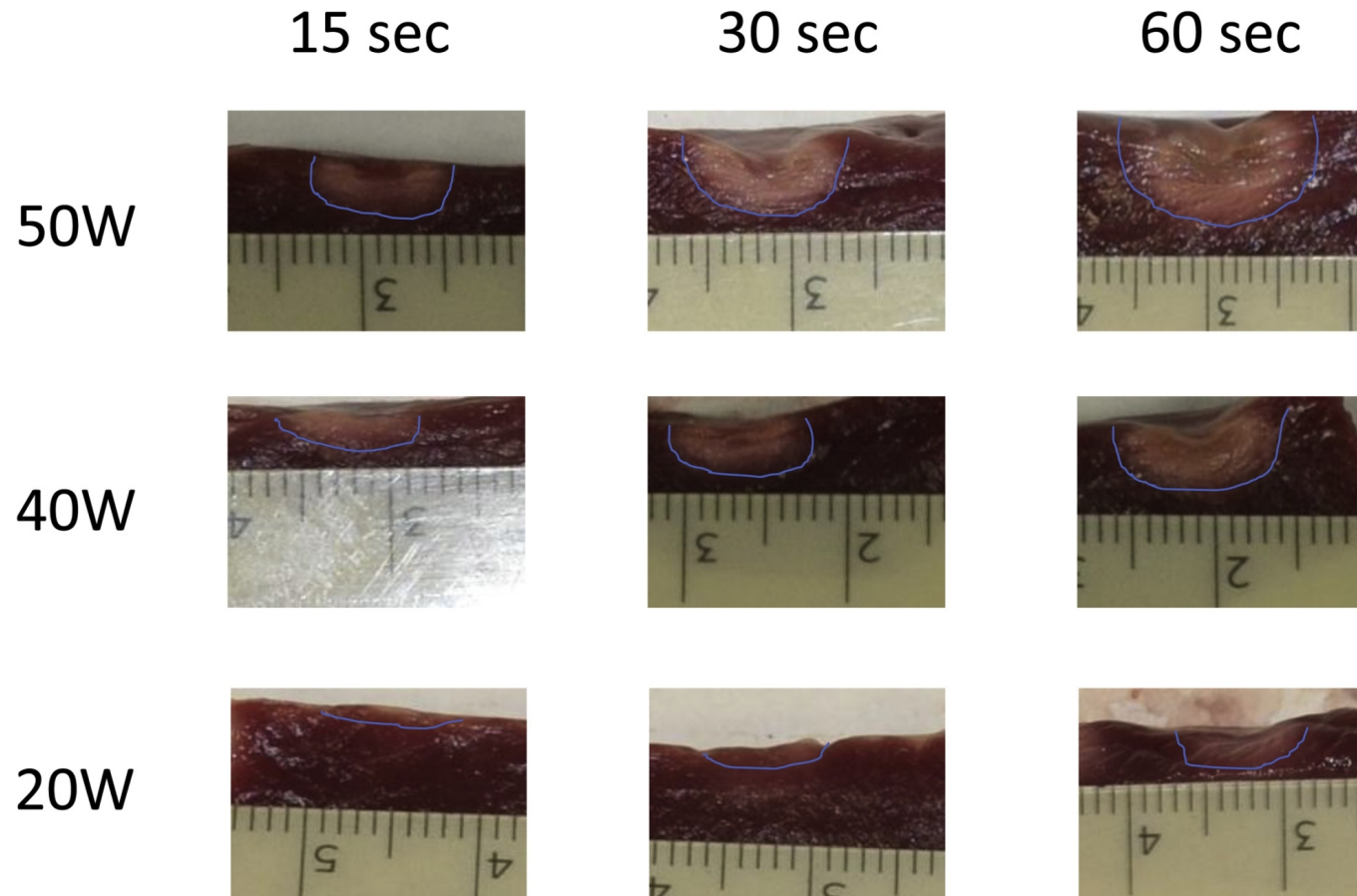
Unipolar Voltage Map



Direct Intramural Recording



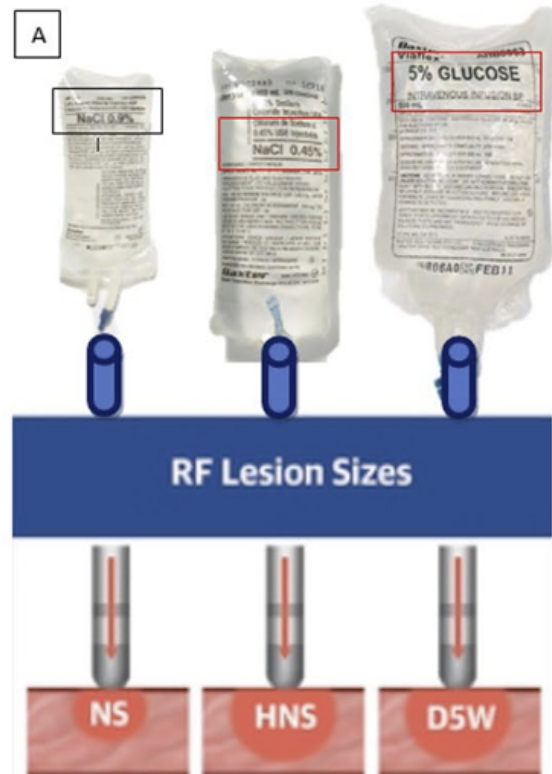
Ablation : durée de l'application



Ablation : impédance

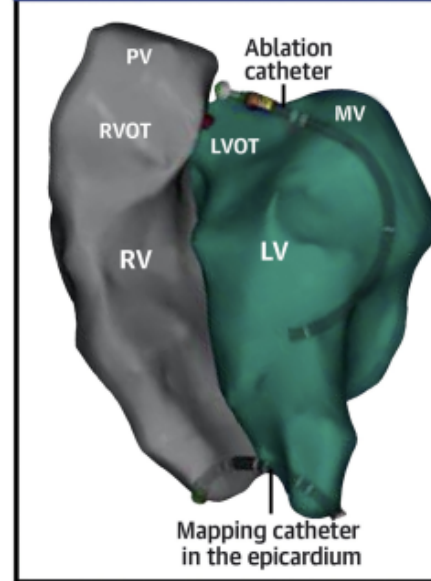
On augmente l'impédance autour du cathéter à pour effet :

- Augmente la profondeur de la lésion
- lésion plus durable

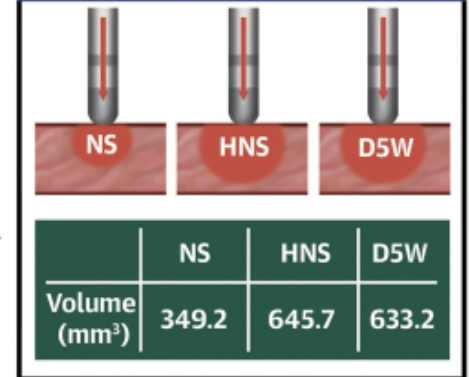


CENTRAL ILLUSTRATION: Ovine Biventricular Anatomy and Contact Force-Guided Radiofrequency Ablation Using Normal Saline, Half-Normal Saline, and 5% Dextrose in Water Irrigation

Ovine Biventricular Anatomy and CF-Guided RF Ablation



RF Lesion Sizes



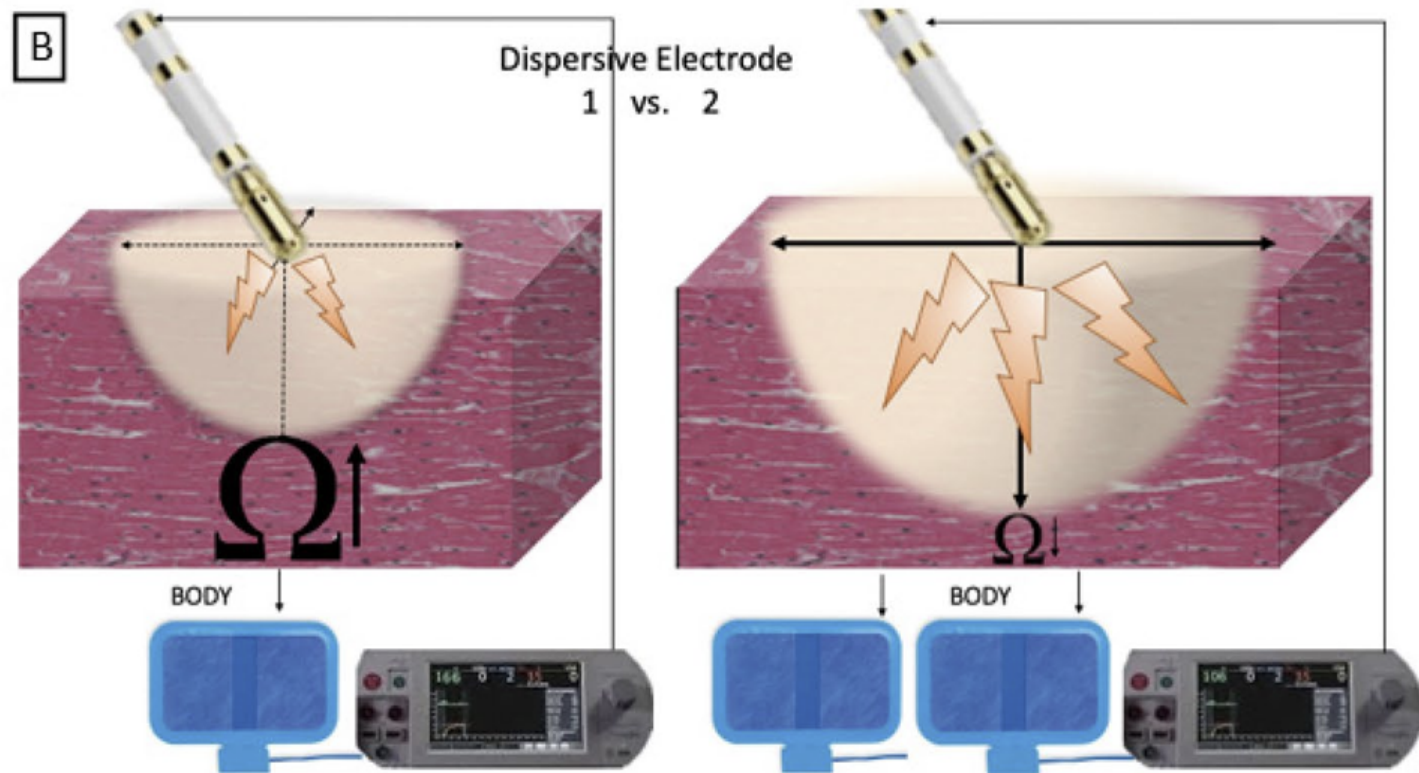
Larger lesions with HNS and D5W but increased frequency of steam pops with D5W

Bennett, R. et al. J Am Coll Cardiol EP. 2021;7(10):1229-39.

Ablation : impédance

On peut rapprocher les
patches de la zone
d'ablation ce qui diminue
l'impédance :

- augmente la
profondeur de la lésion
orientée vers le patch
- lésion plus durable



Ablation 2 cathéters unipolaires

Original Article

Radiofrequency Catheter Ablation of Idiopathic Ventricular Arrhythmias Originating From Intramural Foci in the Left Ventricular Outflow Tract

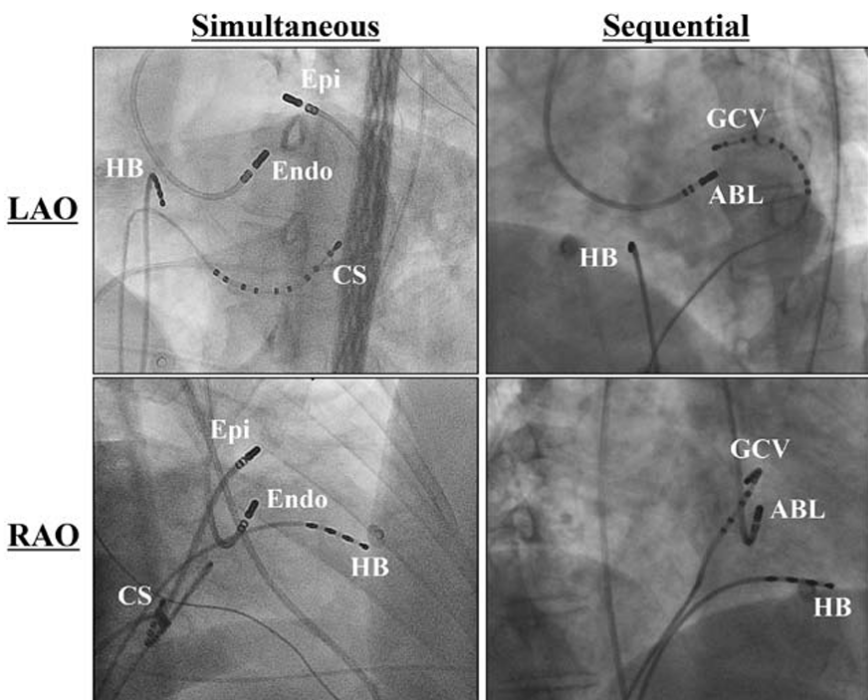
Efficacy of Sequential Versus Simultaneous Unipolar Catheter Ablation

Takumi Yamada, MD, PhD; William R. Maddox, MD; H. Thomas McElderry, MD; Harish Doppalapudi, MD; Vance J. Plumb, MD; G. Neal Kay, MD

Table 4. Sensitivity, Specificity, and Positive and Negative Predictive Accuracies of the Parameters for the Requirement of the Simultaneous Ablation

	Sensitivity	Specificity	PPV	NPV
The distance between the ablation sites >8 mm	100%	88.9%	83.3%	100%
V-QRS <-30 ms	80%	100%	100%	90%

NPV indicates negative predictive value; and PPV, positive predictive value.



2 cathéters unipolaires utilisés simultanément :

- Augmente la densité de courants
- Augmente la chaleur de part et d'autre
- Lésion plus profonde

Ablation bipolaire vrai

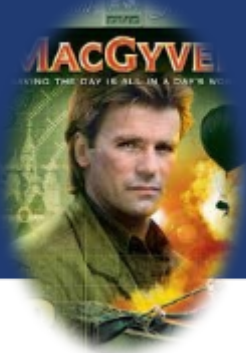


Fig. 6 Bipolar setup. Traditionally, the setup for bipolar RF ablation involves a connection of a second ablation catheter over a custom-made cable to a conventional RF generator replacing the standard dispersive patch as the return electrode. (Adapted from Derejko P et al. JACC EP June; 9(6): 733–737, with permission from Elsevier) [54]. New dedicated CE-marked bipolar RF ablation generators have now become available to allow for regular connection of two ablation catheters with separate irrigation pumps as shown by Kany et al. Europace 2022 [57].

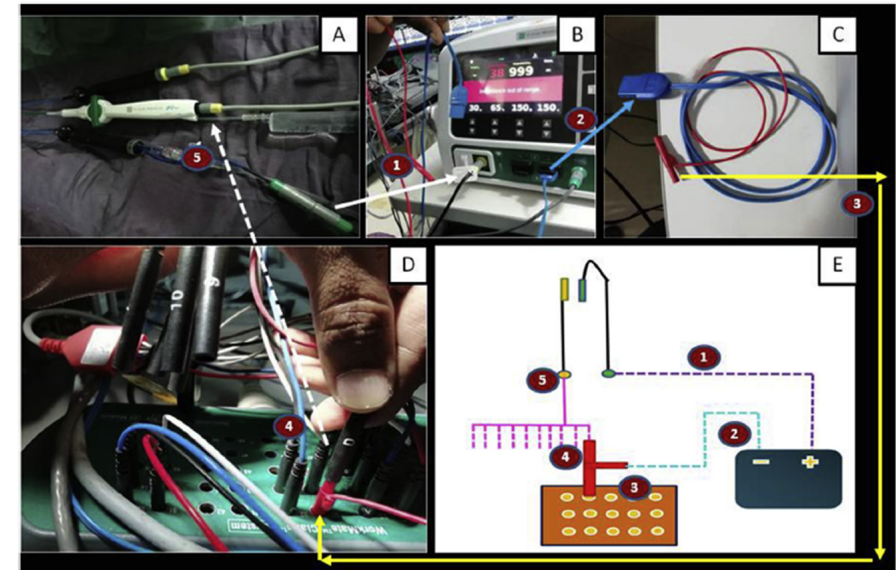
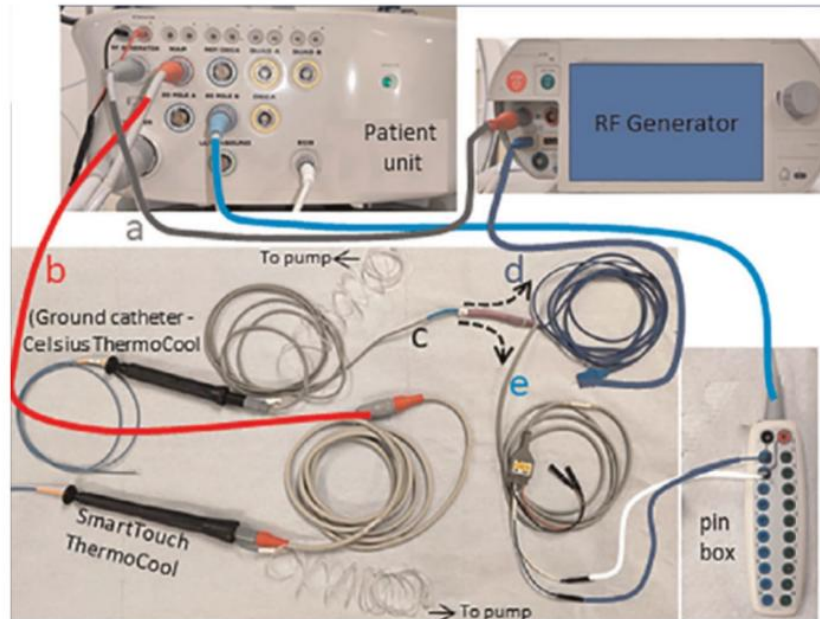
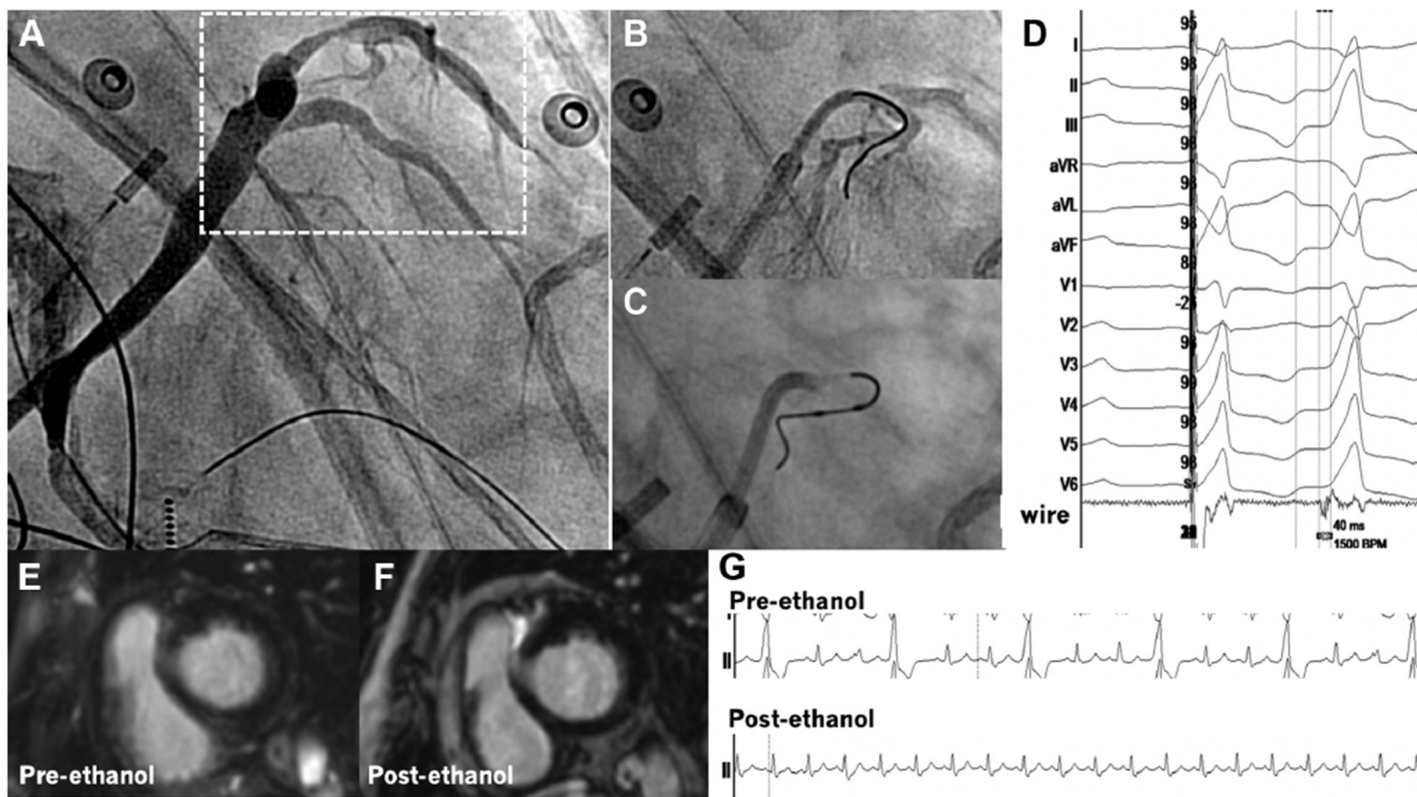


Fig. 3. A) 3D electro anatomic map (3D-EAM) during bipolar ablation in left anterior oblique view and left lateral view showing right ventricular outflow (RVOT) catheter in white colour with green tip (active) and left coronary cusp (LCC) catheter (grounding) in yellow colour. B) 3D-EAM during bipolar ablation with polarity swap in left anterior oblique view and left lateral view showed LCC catheter in white colour with green tip (active) and RVOT (grounding) in yellow colour. C) Fluoroscopic image in left anterior oblique view showed retrograde ablation catheter in LCC and antegrade catheter in RVOT during bipolar ablation. The decapolar catheter in coronary sinus and 5F TIG diagnostic catheter (radial access) that was used to confirm that left main coronary artery was safely away from the ablation site, was parked in ascending aorta are also seen. D) 12 lead surface ECG showed initiation of ventricular tachycardia immediately after the onset of bipolar ablation with LCC as the active end and RVOT as the grounding. E) 12 lead surface ECG showed successful termination of PVCs during bipolar ablation.

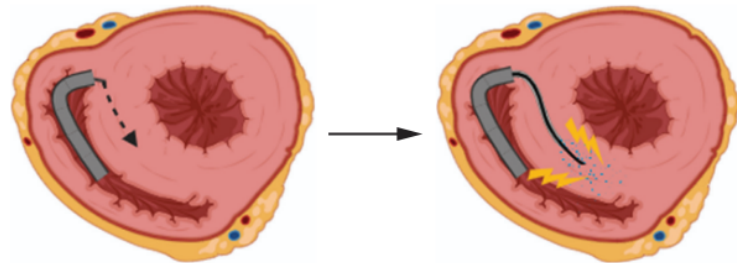
Alcoholisation septale





Guide intra-myocardique

VINTAGE



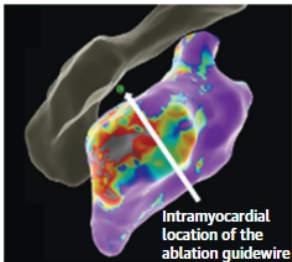
Intramyocardial navigation to any area of interest "within" the myocardium

Intramyocardial irrigation and RF ablation

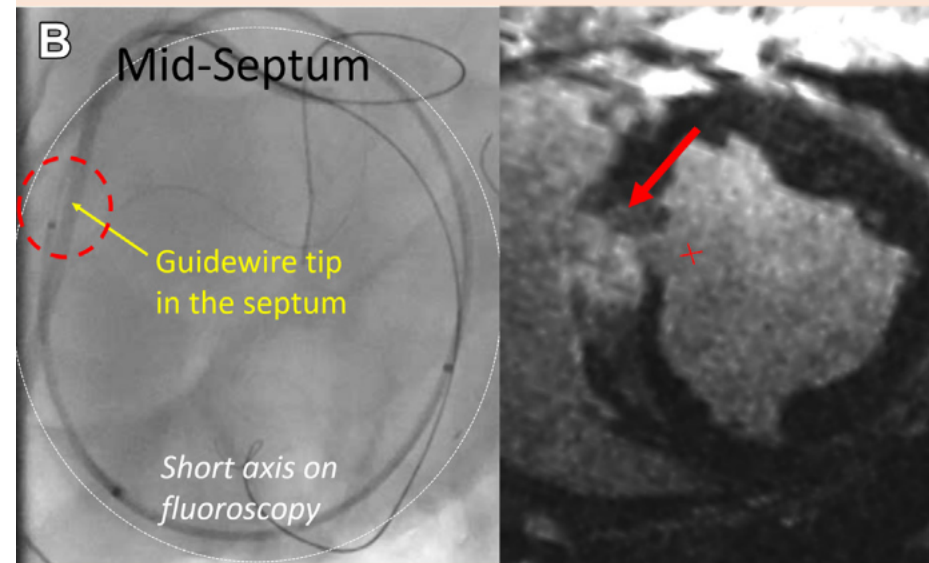
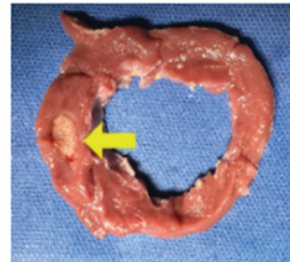
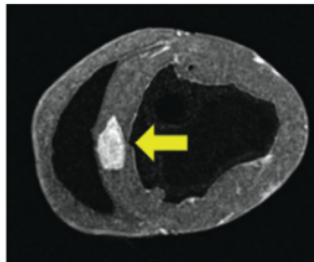
Access to deep myocardial targets that are inaccessible for ablation from the endocardial and epicardial surfaces, including deep septum, LV summit, papillary muscles

Registration with EAM

Large intramural ablation lesions



Intramyocardial location of the ablation guidewire



B

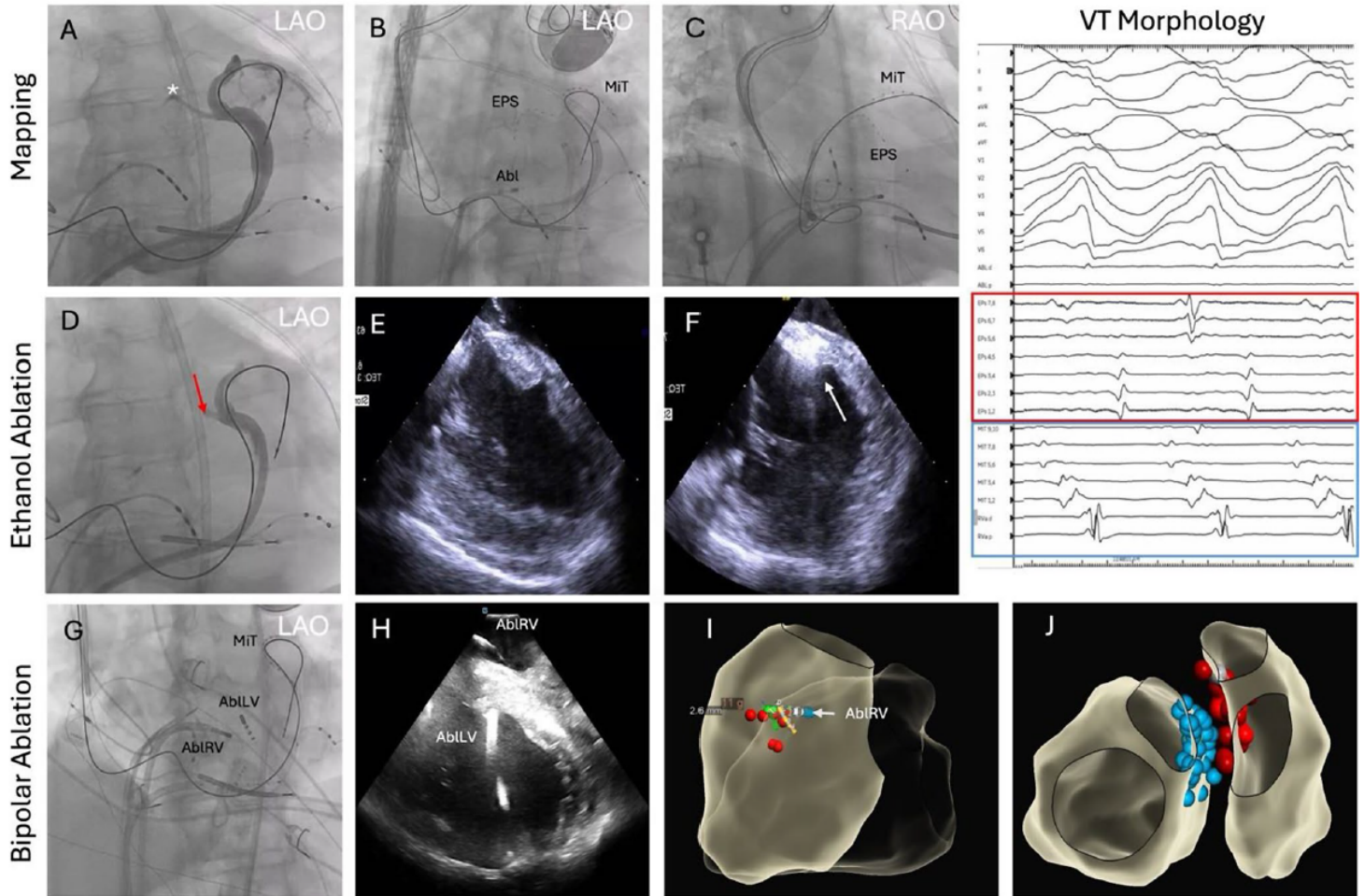
Mid-Septum

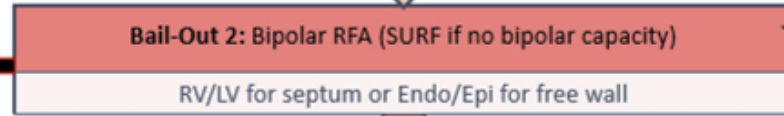
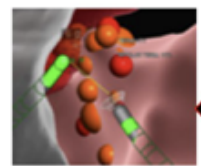
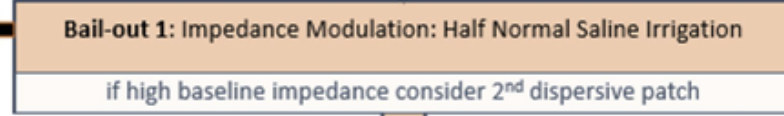
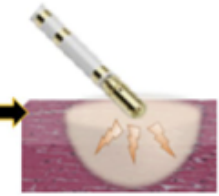
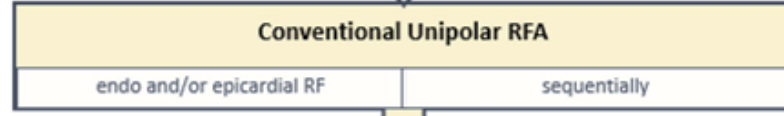
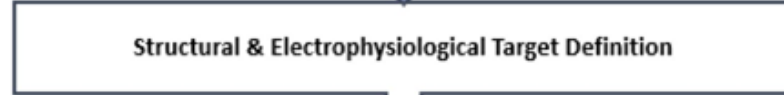
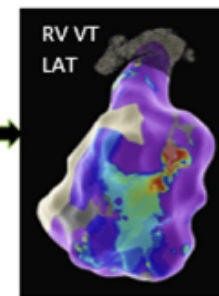
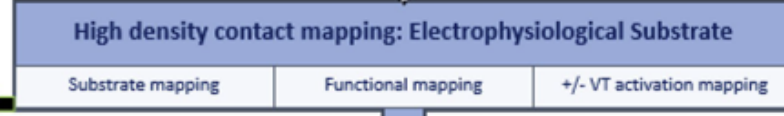
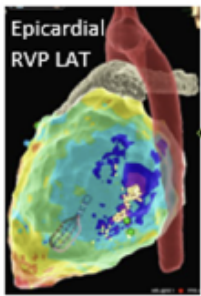
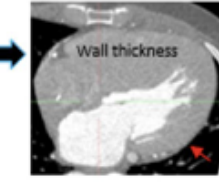
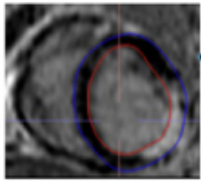
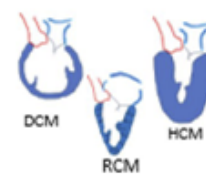
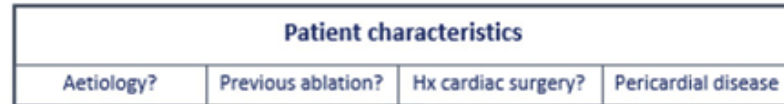
Guidewire tip in the septum

Short axis on fluoroscopy

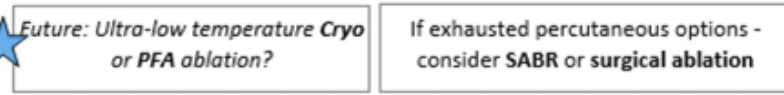
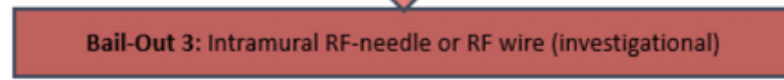


Conclusion

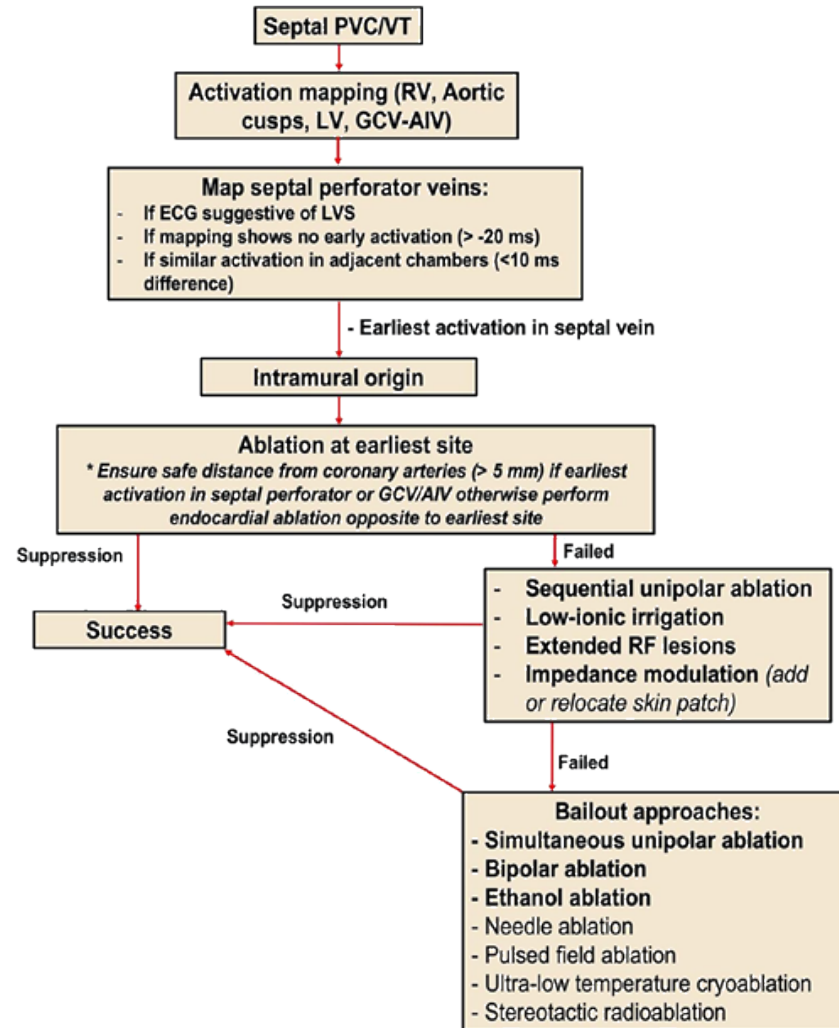




Alternative: Ethanol ablation if suitable venous or arterial coronary branch to target area & local Expertise



Stratégies d'ablation

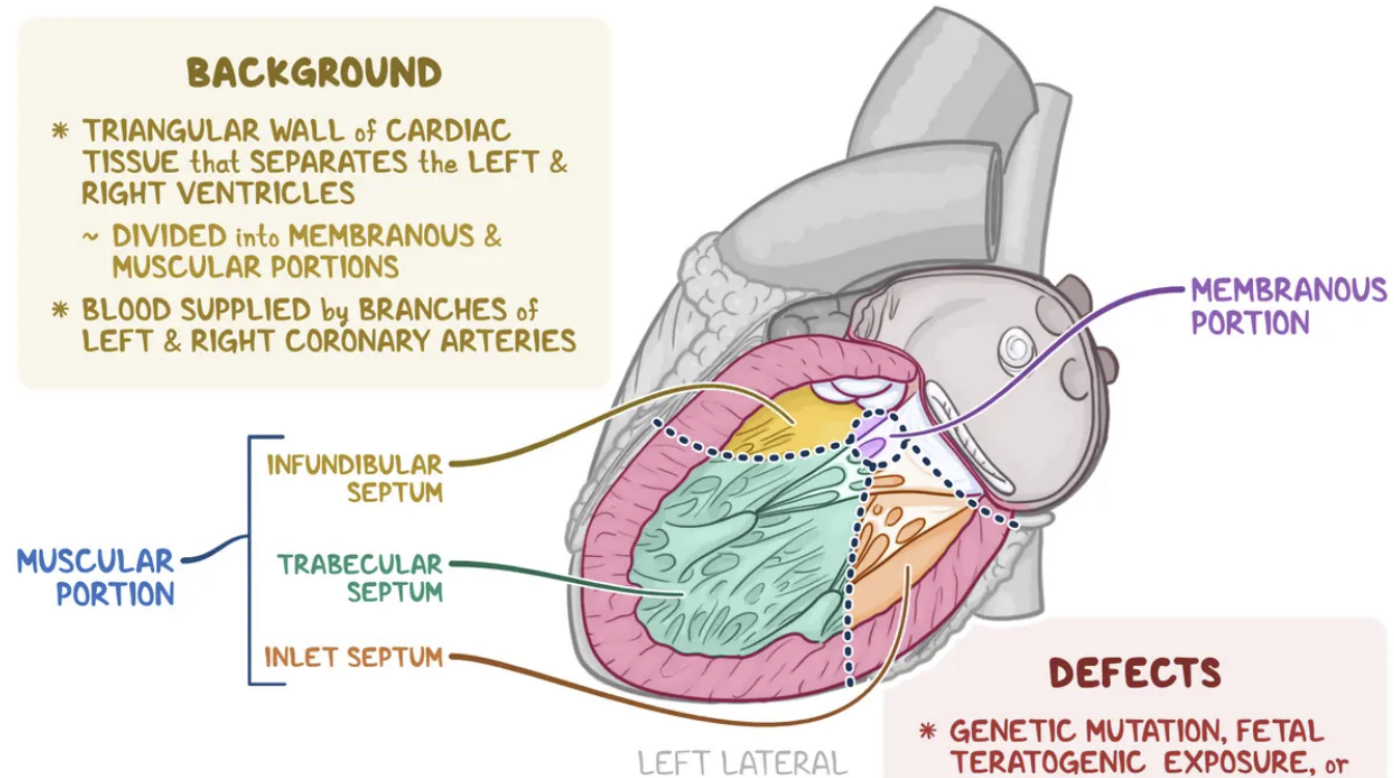






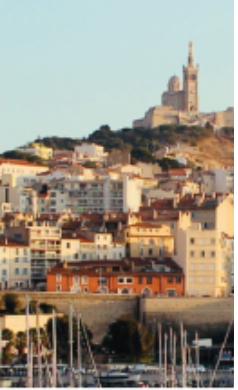
BACKGROUND

- * TRIANGULAR WALL of CARDIAC TISSUE that SEPARATES the LEFT & RIGHT VENTRICLES
- ~ DIVIDED into MEMBRANOUS & MUSCULAR PORTIONS
- * BLOOD SUPPLIED by BRANCHES of LEFT & RIGHT CORONARY ARTERIES



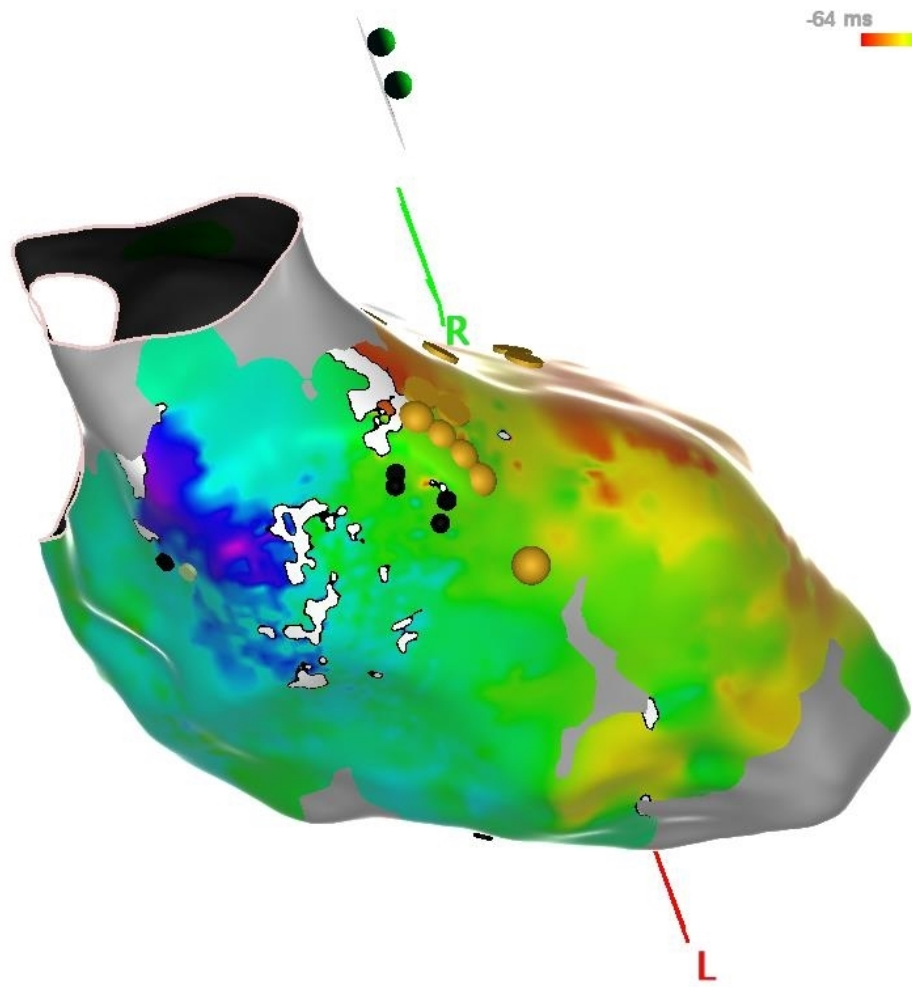
DEFECTS

- * GENETIC MUTATION, FETAL TERATOGENIC EXPOSURE, or THROUGH ACQUIRED CAUSES
- * CONGENITAL VENTRICULAR



5-1-R_ (6363, 0) Resp

-64 ms LAT 132 ms



Control panel with icons for zoom, pan, and other navigation functions.

Navigation controls including a compass and directional buttons.

Technical data and navigation controls:

- Volume: 144.20
- RAO: 88 °
- Caudal: 40 °
- Swivel: 19 °
- 1.46 (vertical scale)
- AP PA LAO RAO LL RL INF SUP (view options)

ELECTRA



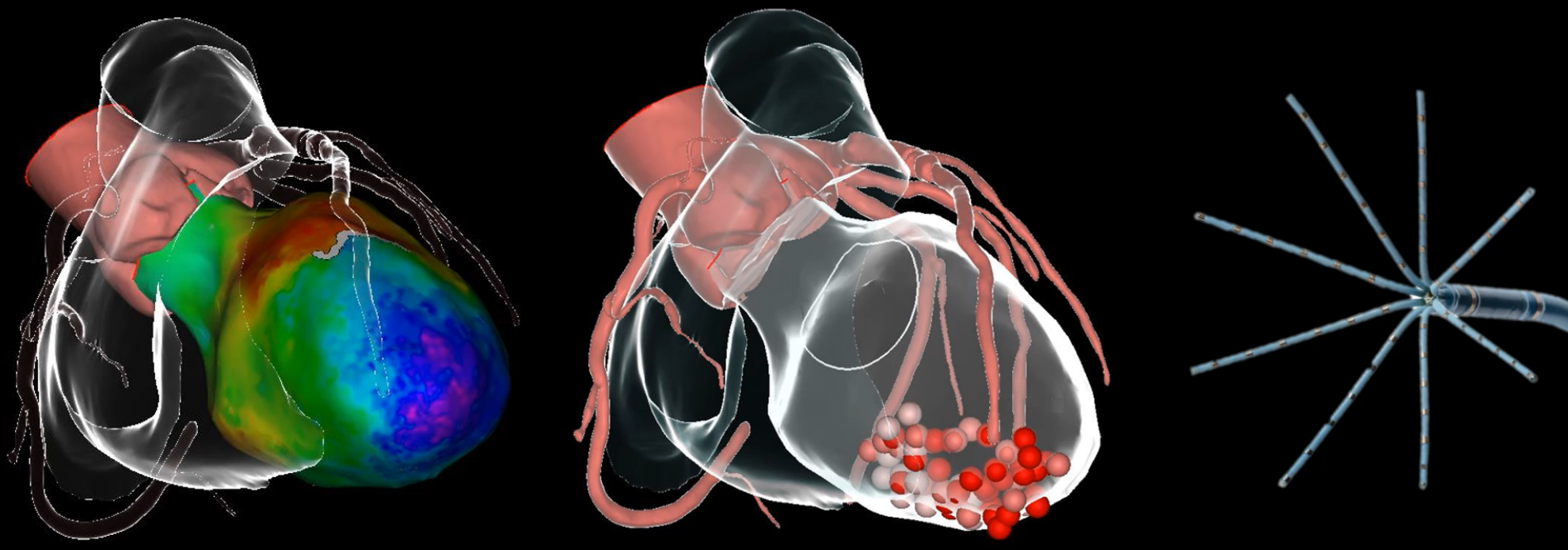
4-5 DÉCEMBRE 2025

19^{èmes} journées françaises
pratiques de rythmologie
& de stimulation cardiaque

WWW.CONGRES-ELECTRA.COM

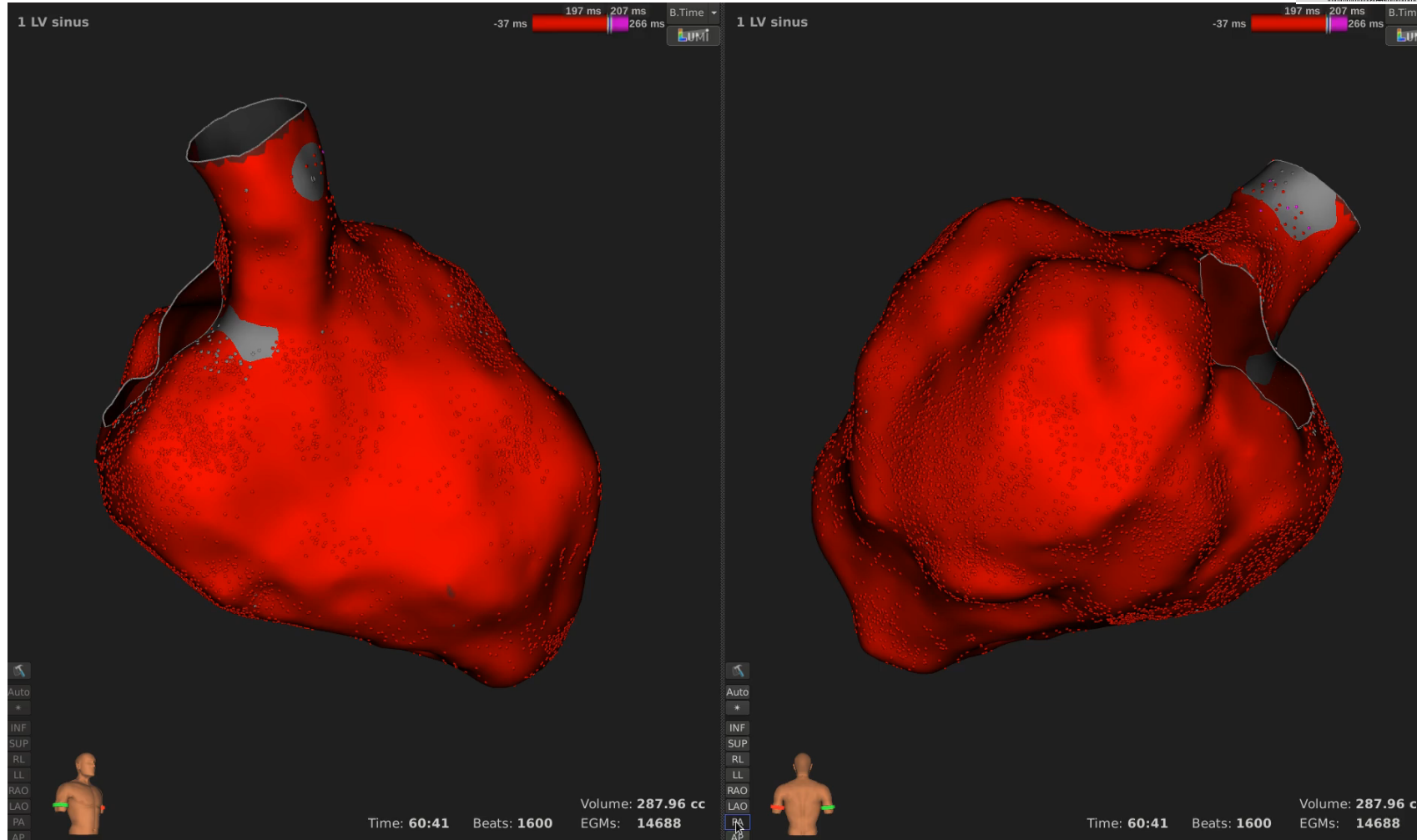
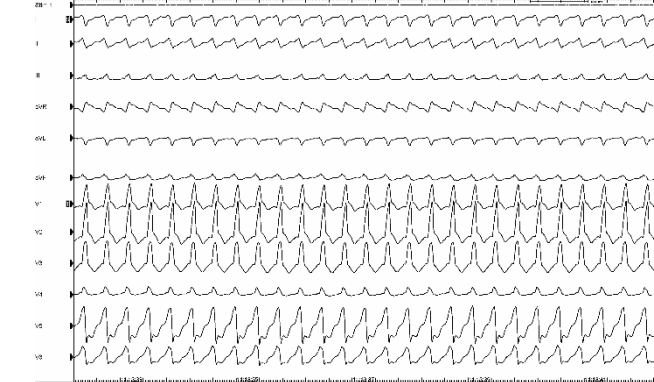
Ablation de TV – Mapping du substrat dans le cadre d'une cardiomyopathie ischémique

Dr. Xavier Waintraub – 05/03/2025



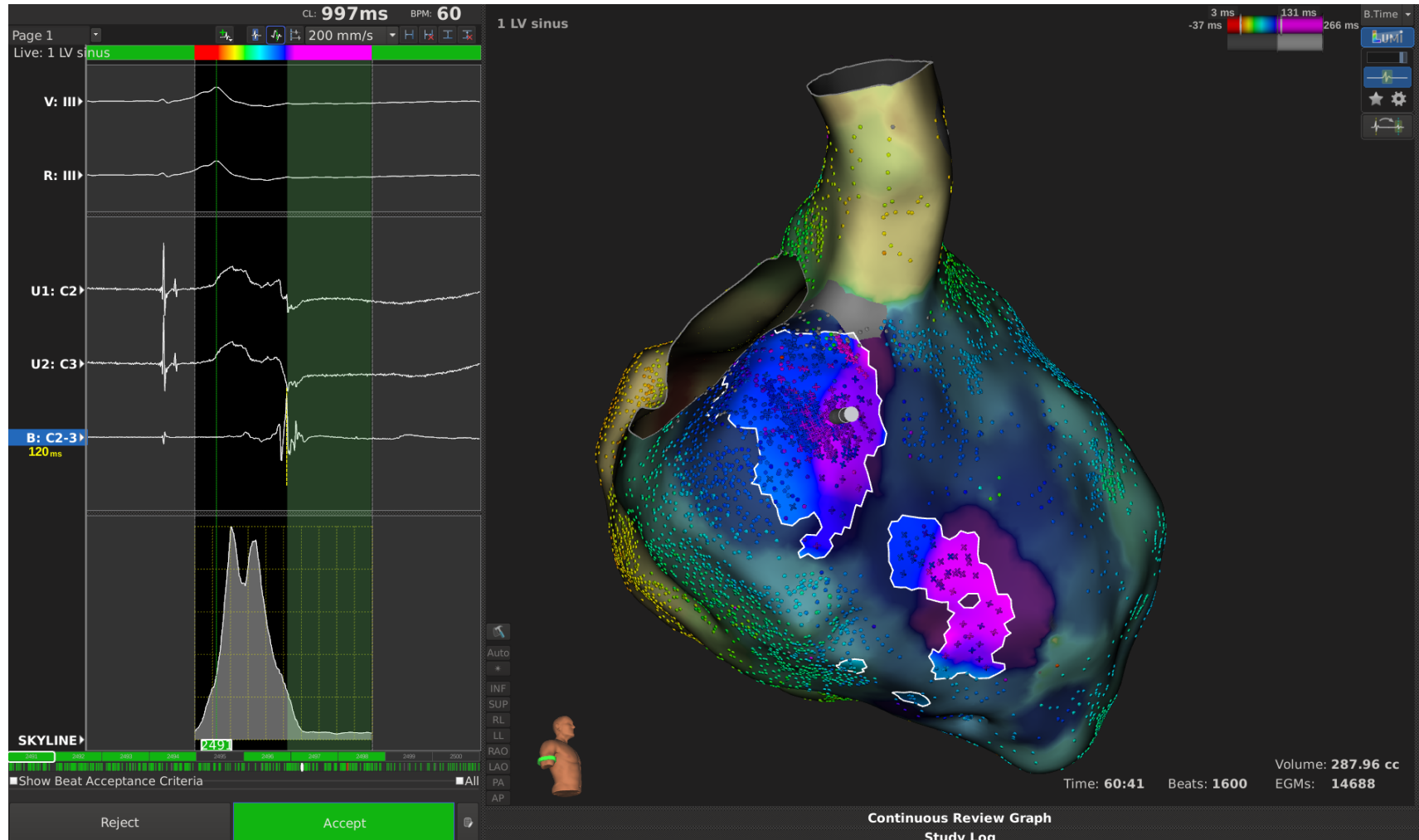
Aide à la compréhension du circuit

Orage rythmique chez un patient de 86 ans avec défibrillateur triple chambre
Cartographie en rythme sinusal (vidéo)



Annotation des potentiels tardifs en rythme sinusal

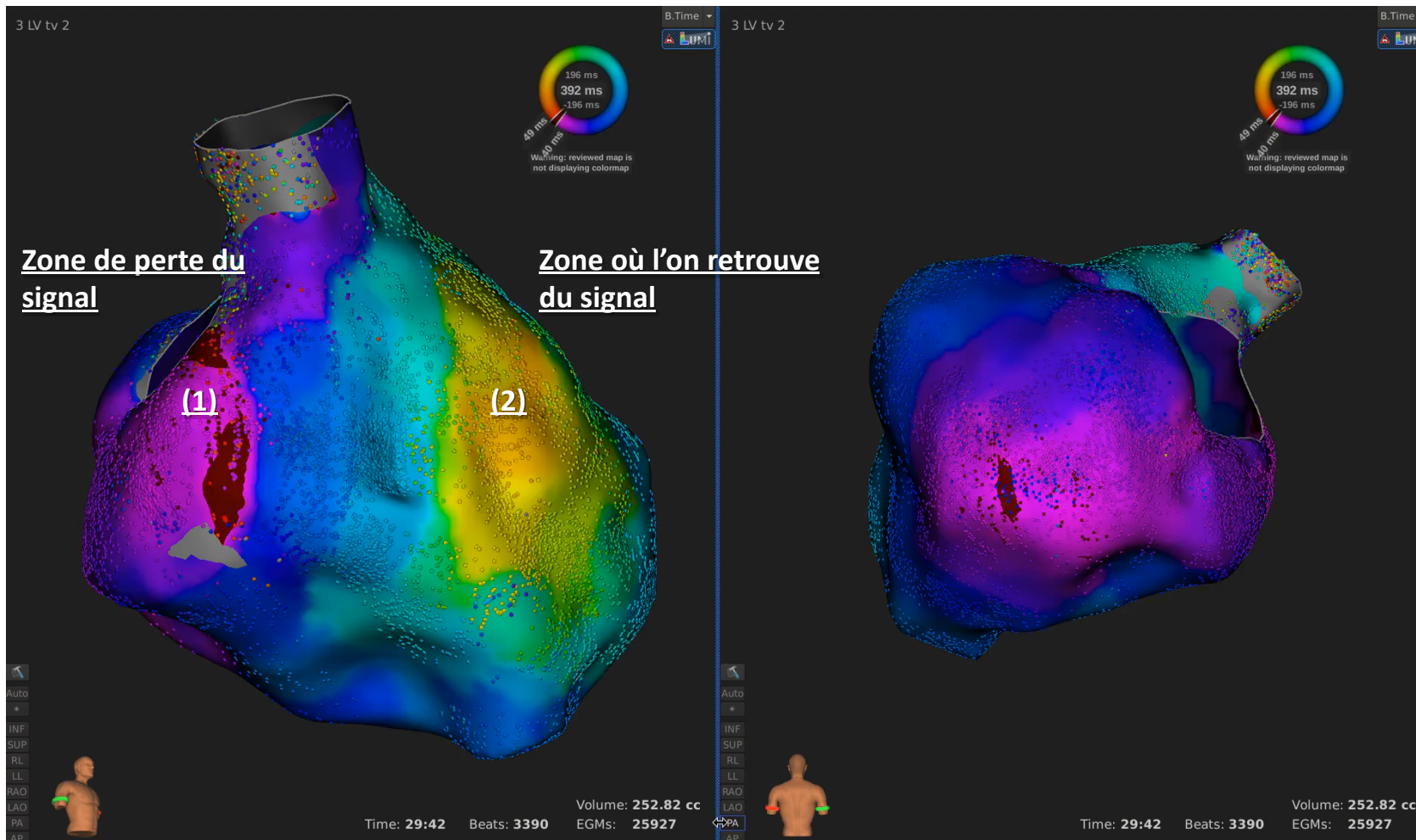
Potentiels tardifs mises en valeur par Lumipoint en rythme sinusal





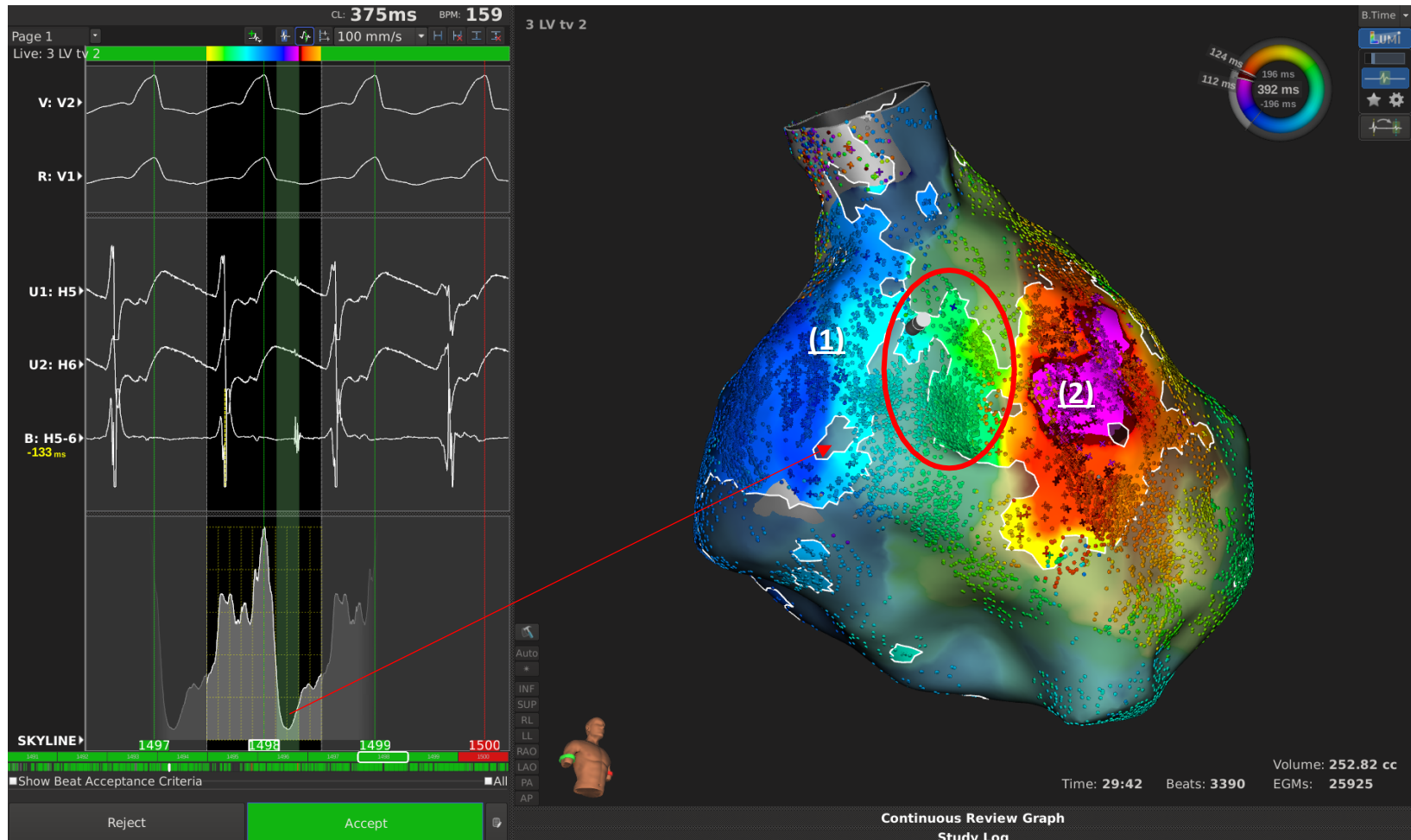
Carte d'activation de la TV clinique

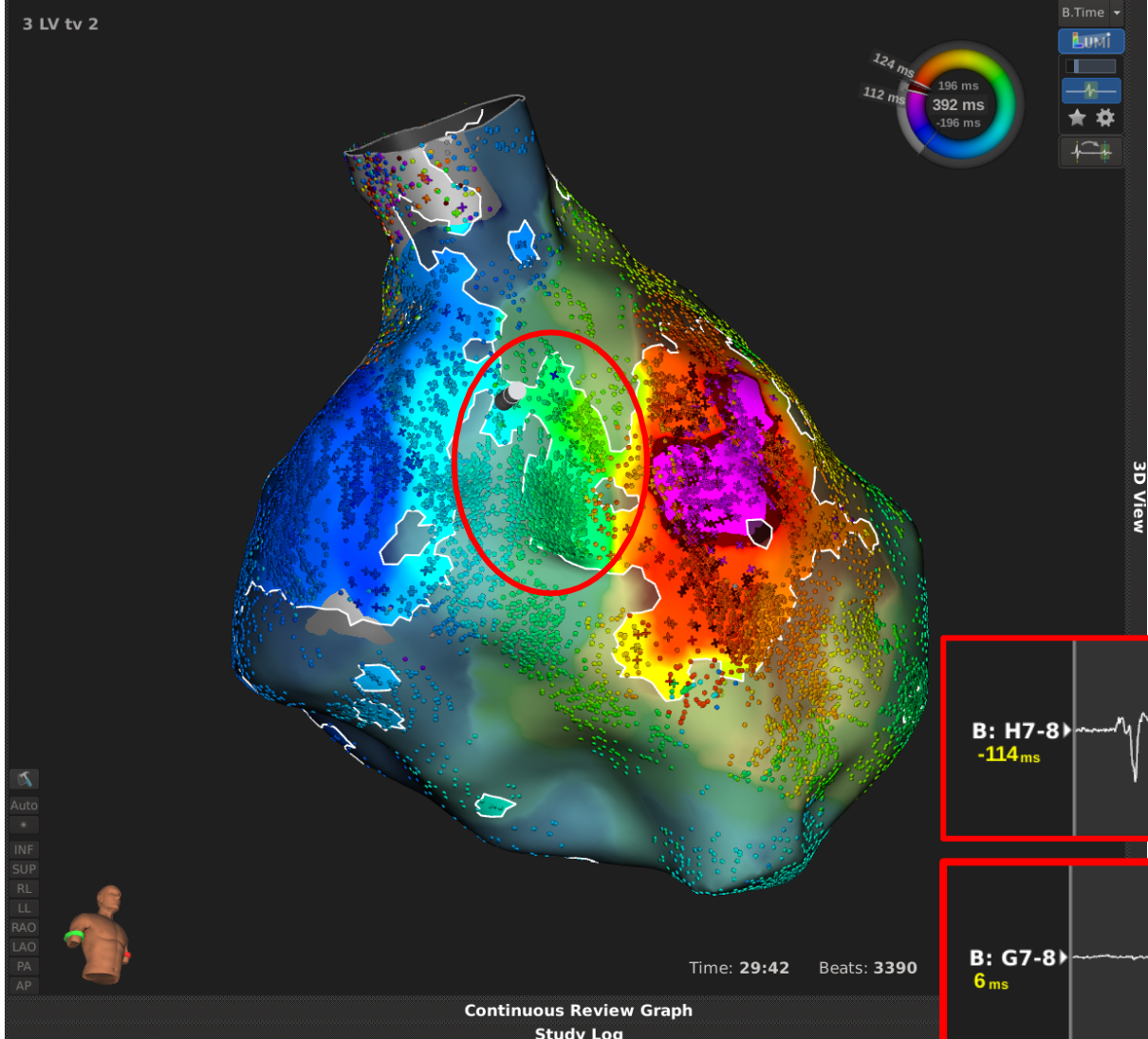
Cartographie brute de la TV ne montrant aucun circuit de réentrée mais plutôt une émergence focale



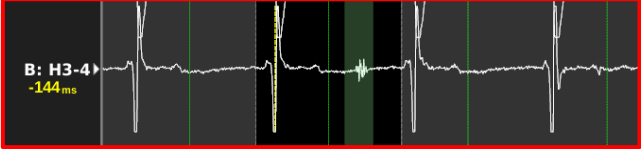
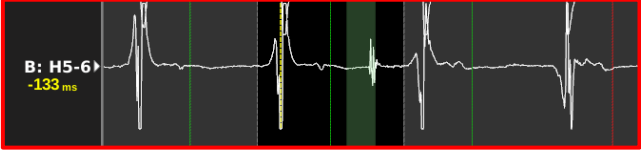
Utilisation de la SKYLINE

Dans la vallée de la Skyline (potentiellement l'isthme critique) Lumipoint met en évidence des signaux entre les zones (1) et (2)

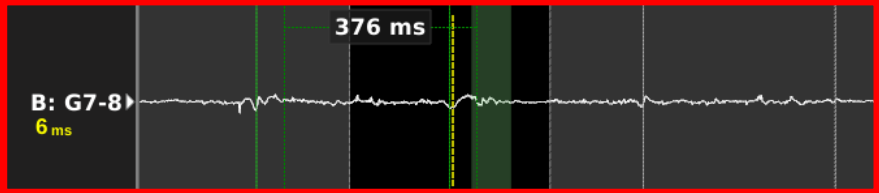
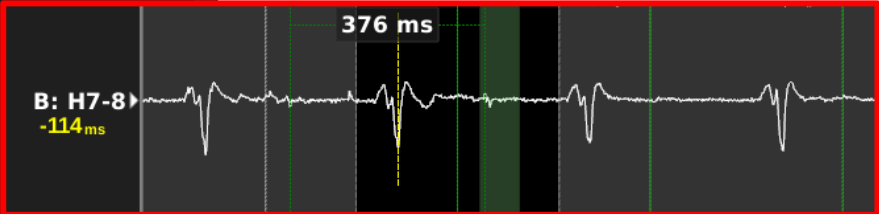




On remarque que certains de ces signaux sont irréguliers...

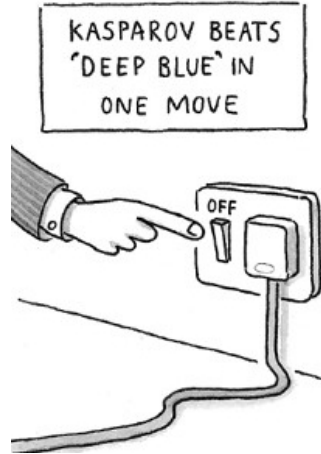
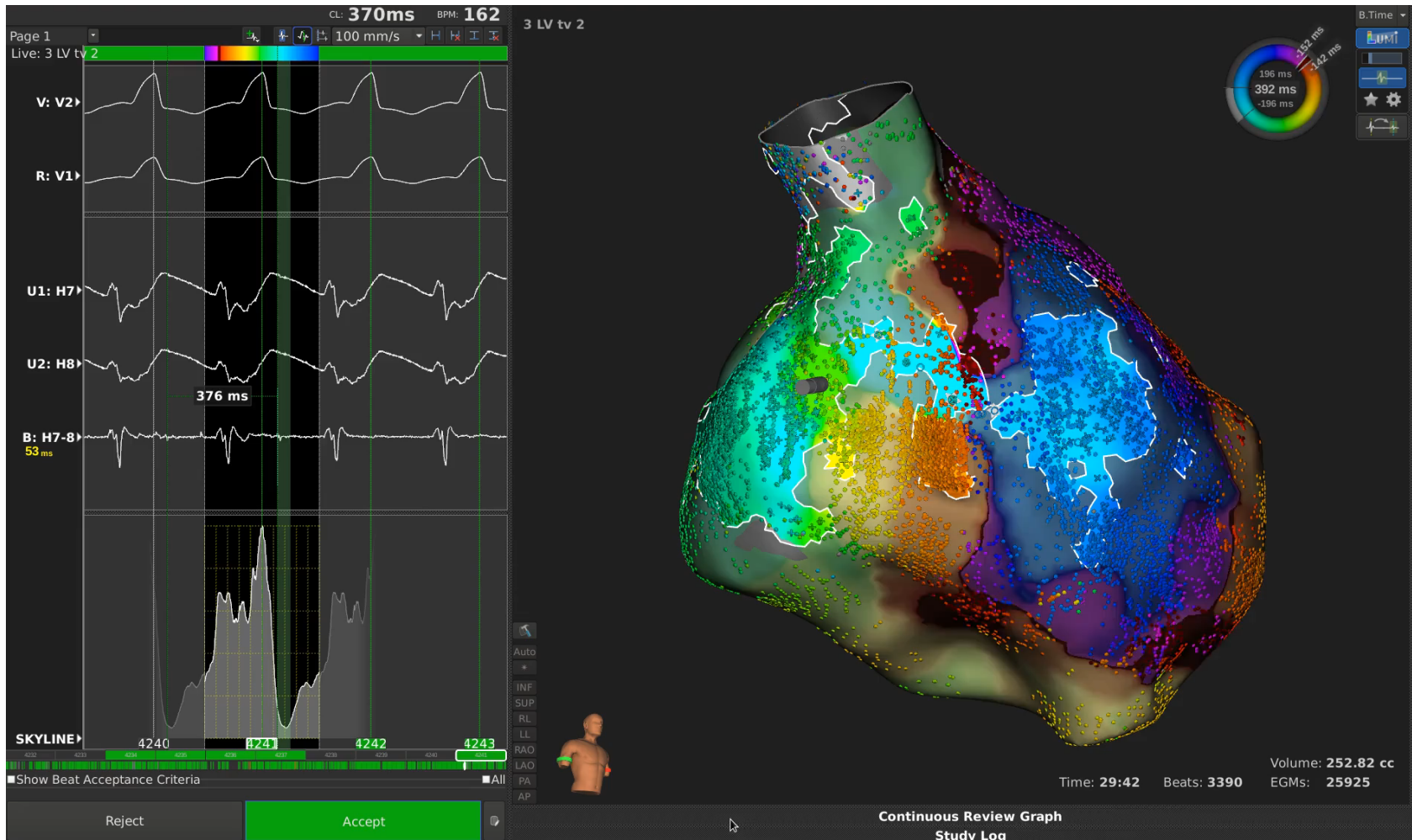


Mais que d'autres, très bas voltés, le sont!!!



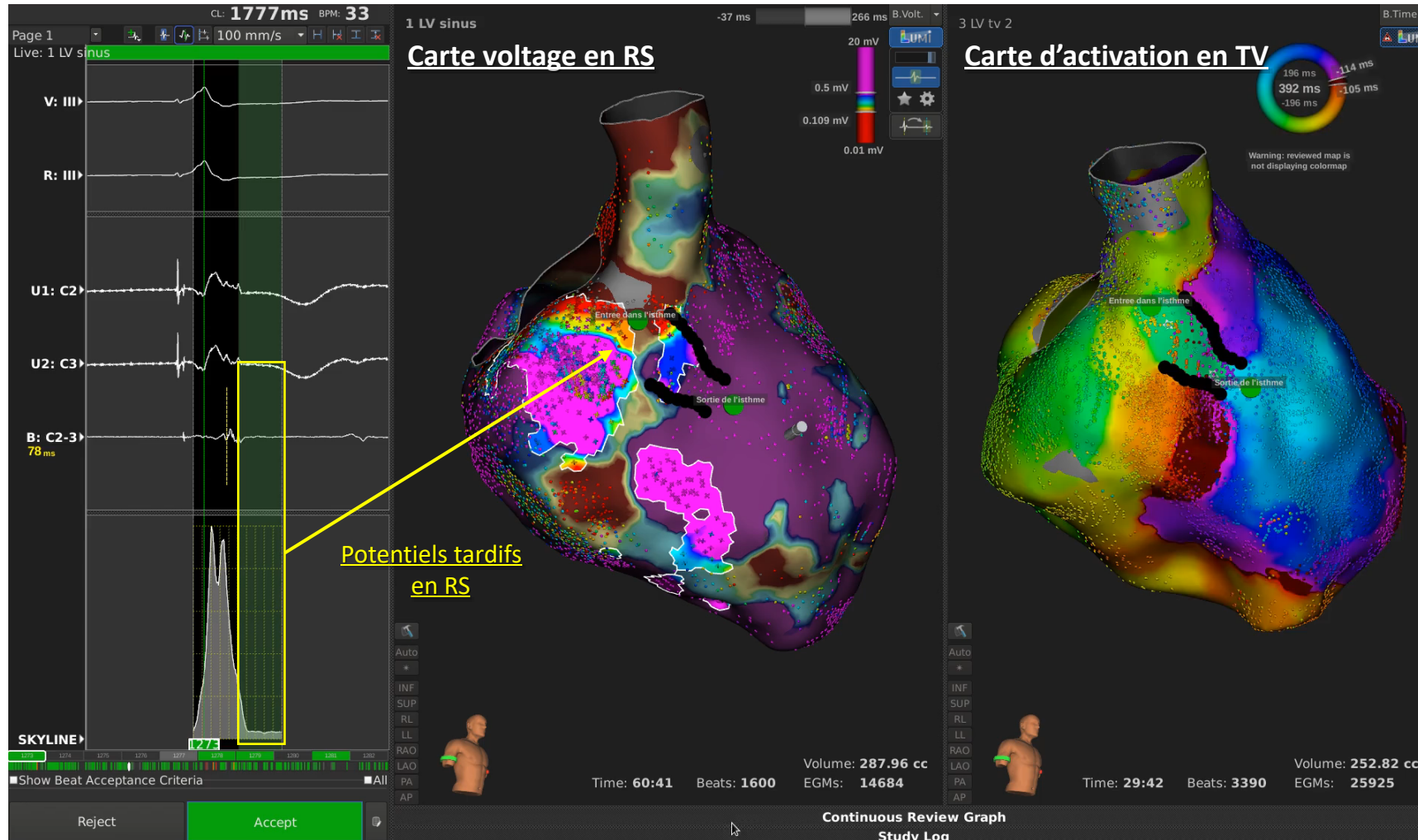
Réannotation manuelle des potentiels diastoliques

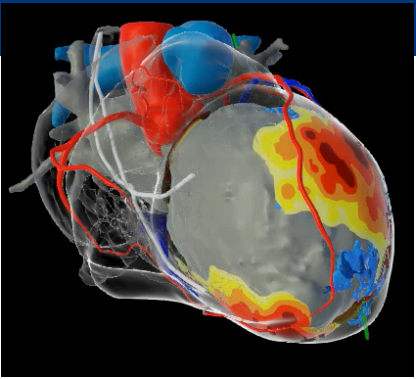
On réannote manuellement les points réguliers révélés par Lumipoint pour faire apparaître l'isthme critique



Meilleure définition de l'isthme critique

Corrélation entre les potentiels tardifs en RS et l'entrée dans l'isthme en TV





Cicatrice latérale
épicardique



Cicatrice septale

