LIVE IN A BOX : AT ABLATION

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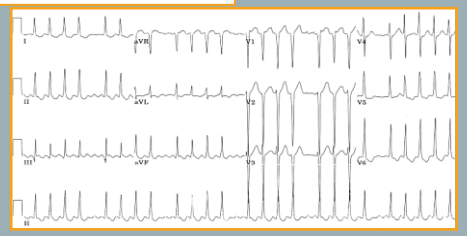
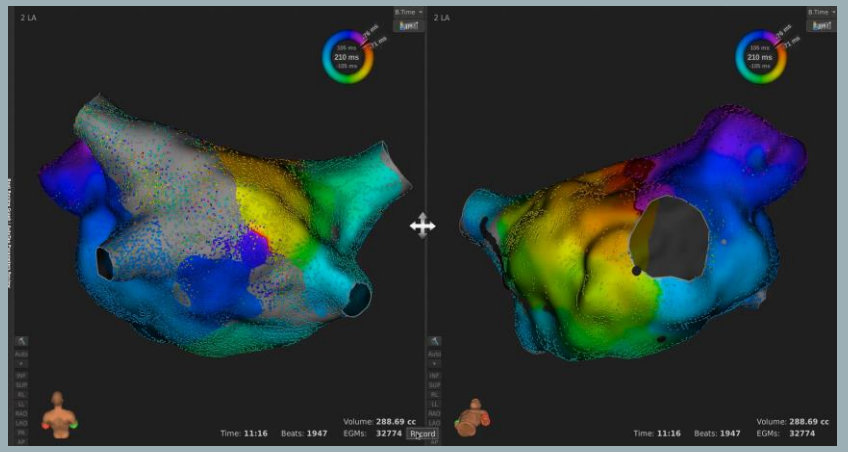


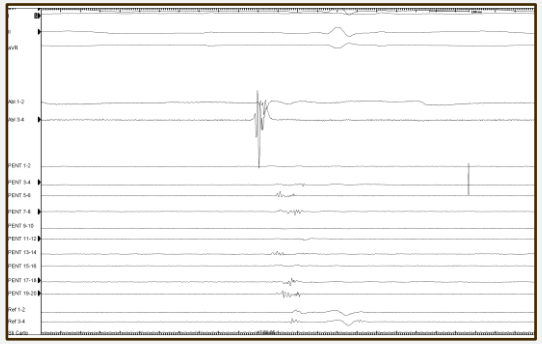


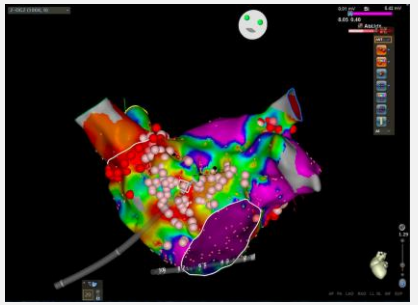
CONFLICT OF INTEREST

- None to declare.

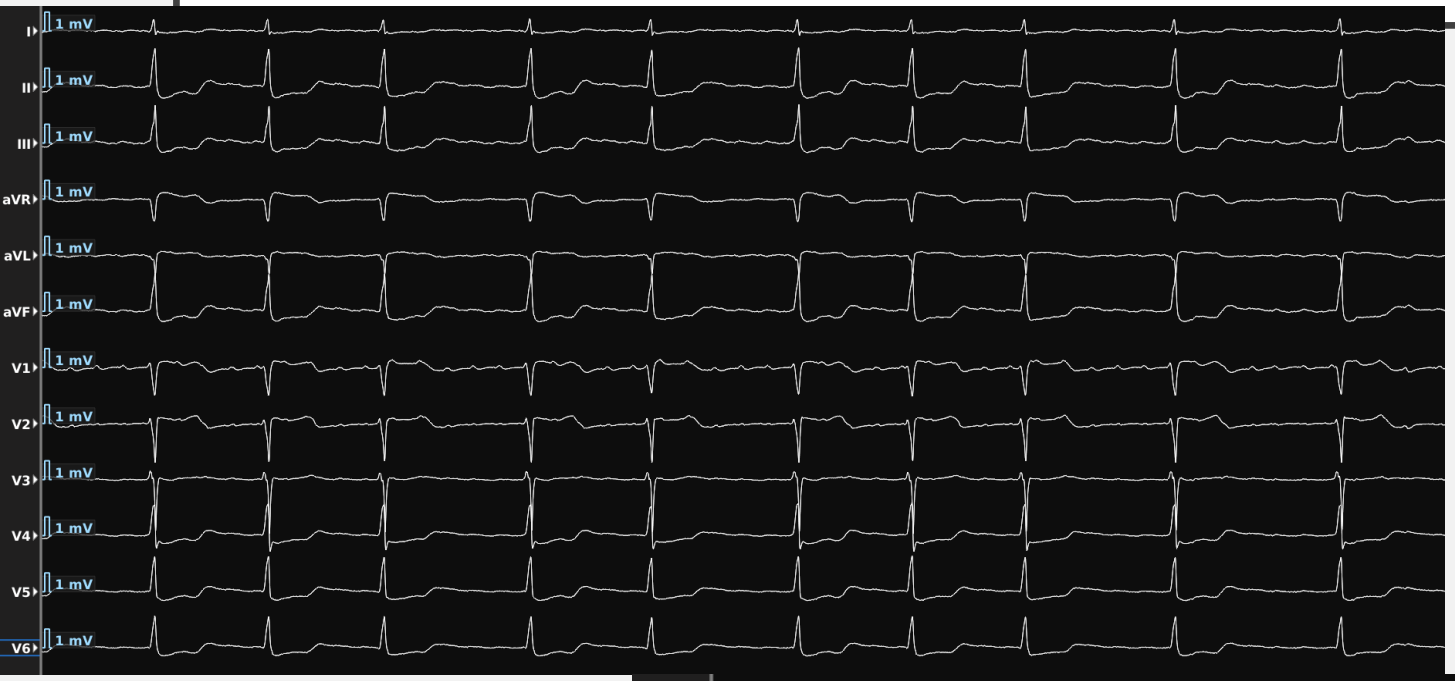
LIVE IN A BOX : A DUAL LOOP !

- A 54-years-old patient
- **Risk factors for AF** : smoking, hypertension and hyperlipidemia
- **1st épisode of AF** in April 2014, treated with Amiodarone and VKA
- Episode of common FLTR : **CTI ablation** in 2015
- Recurrence of pers Afib in January 2018, with heart failure and reduced EF.
- **AF ablation Feb 2018** : PVI and Ablation of Anterior Low Voltage Area identified in SR. AF was not inducible at the end of procedure.
- Symptomatic reccurrences 05/2018, 07/2018, required electrical cardioversion
- Redo procedure in March 2019 : Reconnexion of PV, **PVI redo** only.
- No AAR since last ablation.
- **Symptomatic Atrial Flutter in Feb 2022.**



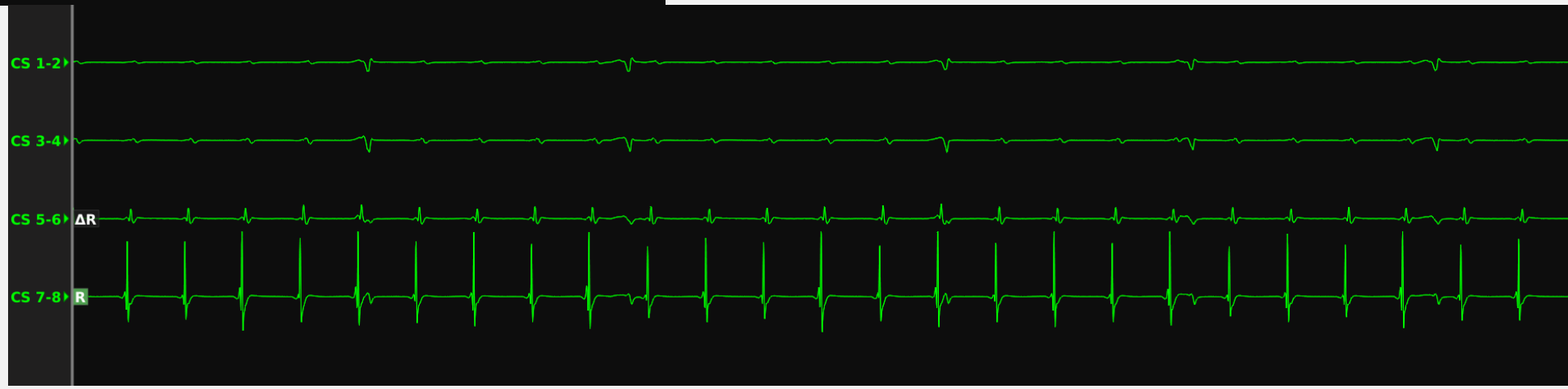


RHYTHM AT THE START OF THE PROCEDURE



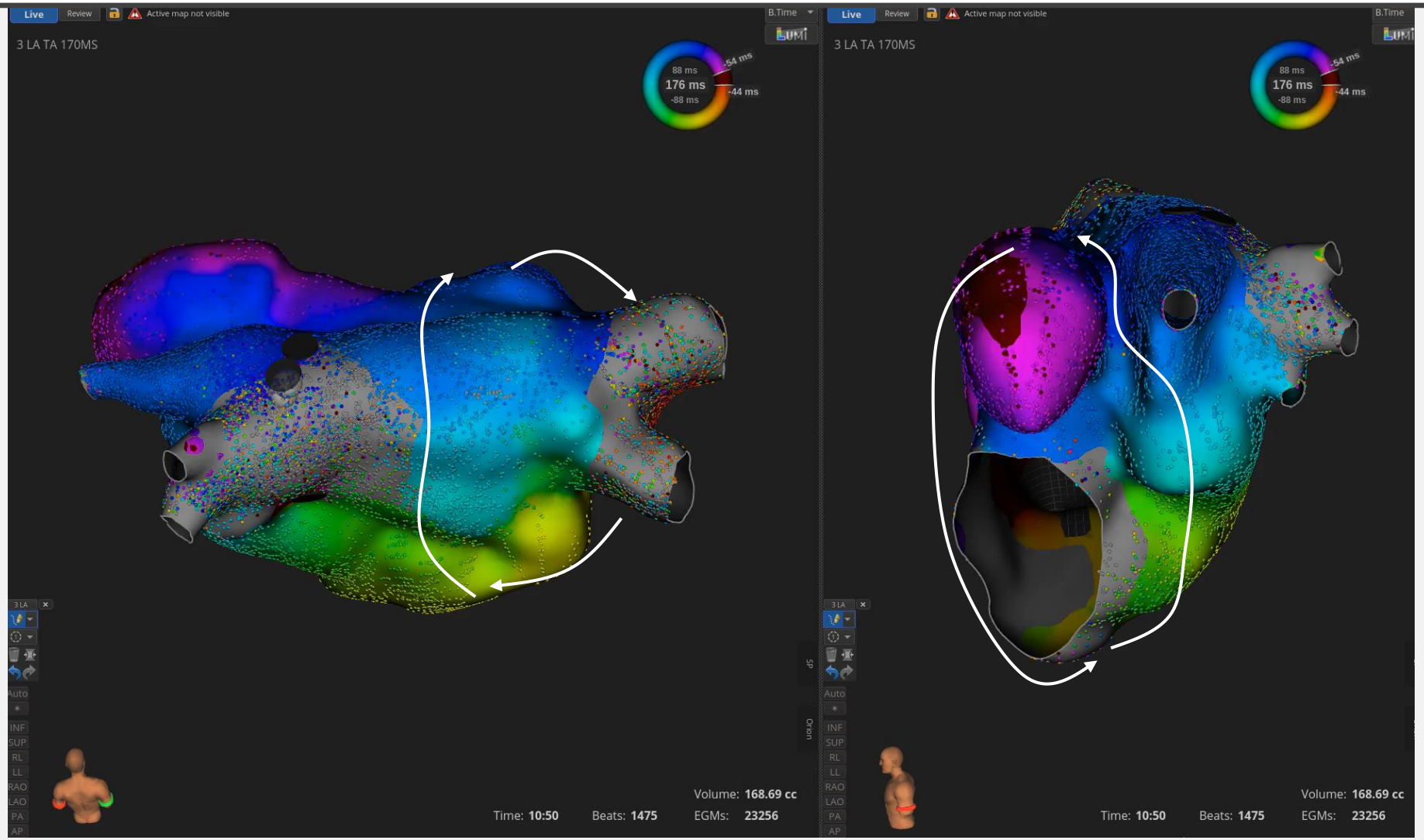
AT cycle length : 170ms

CS 100mm/s

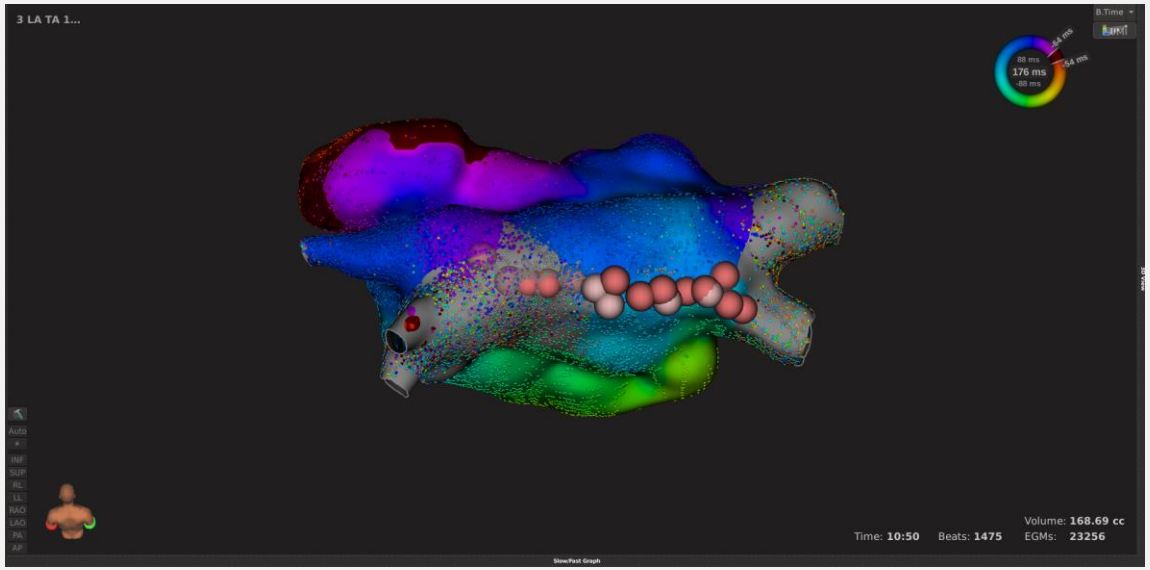


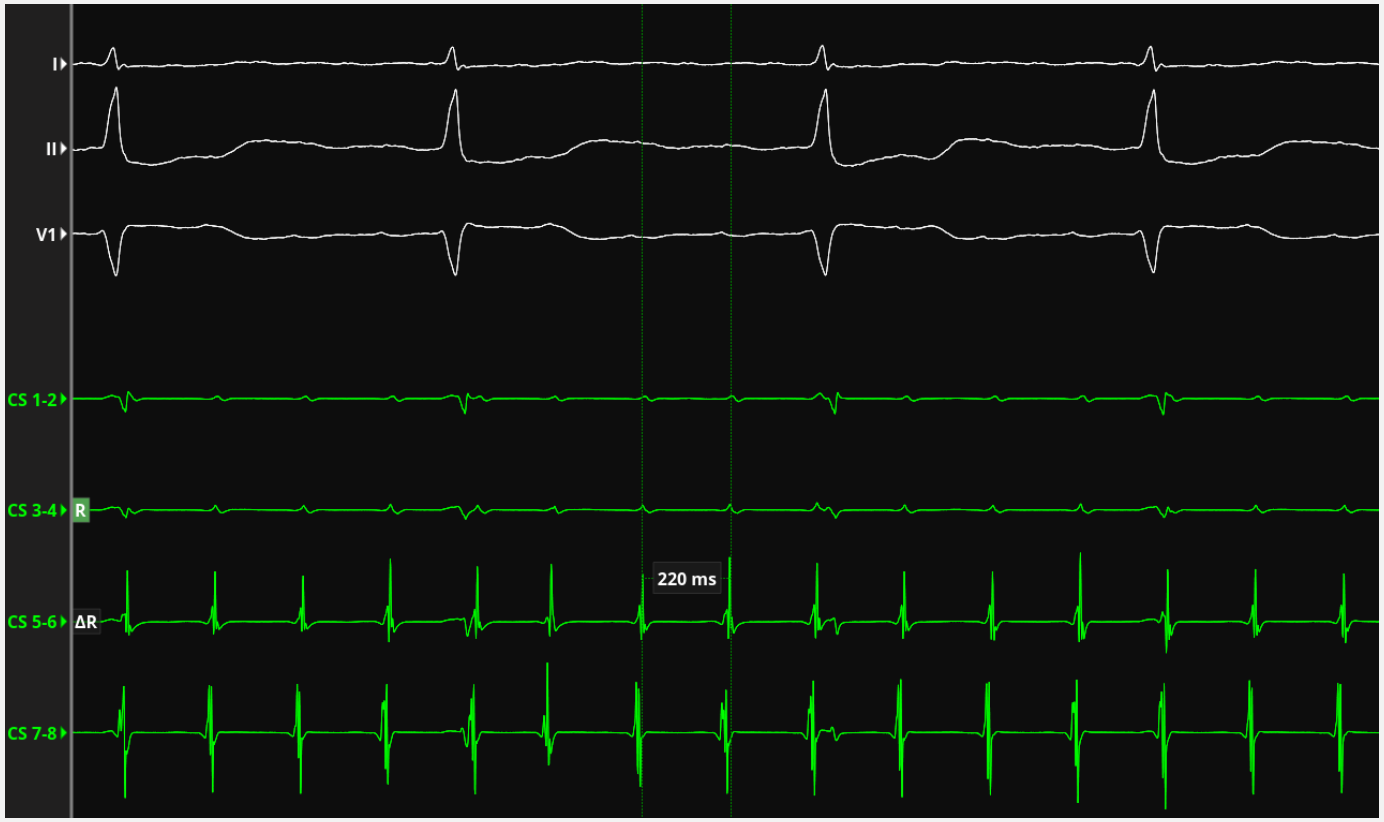
LA MAPPING : DUAL LOOP (AT : 176MS)

ROOF LOOP AND MITRAL LOOP



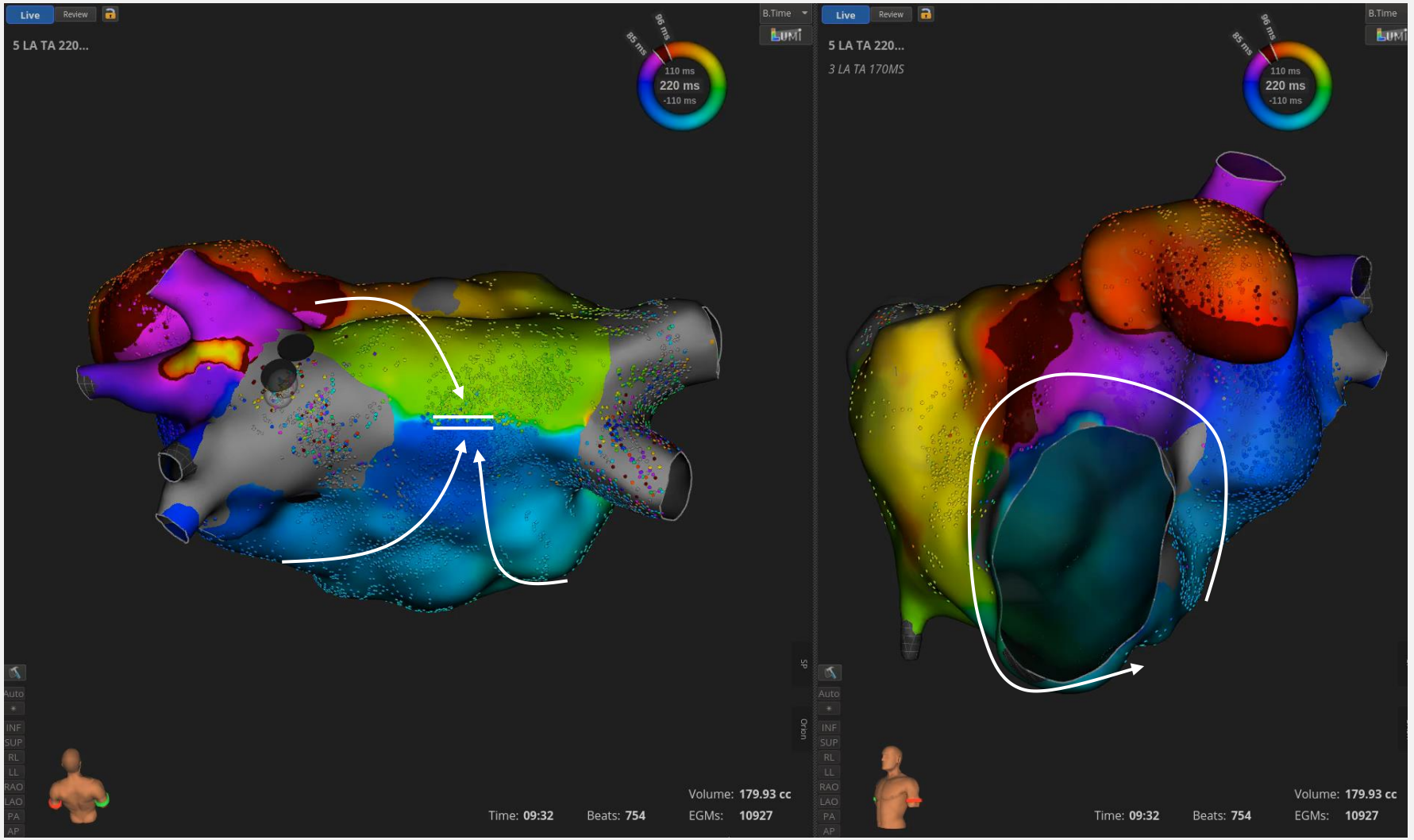
ROOF LINE ABLATION





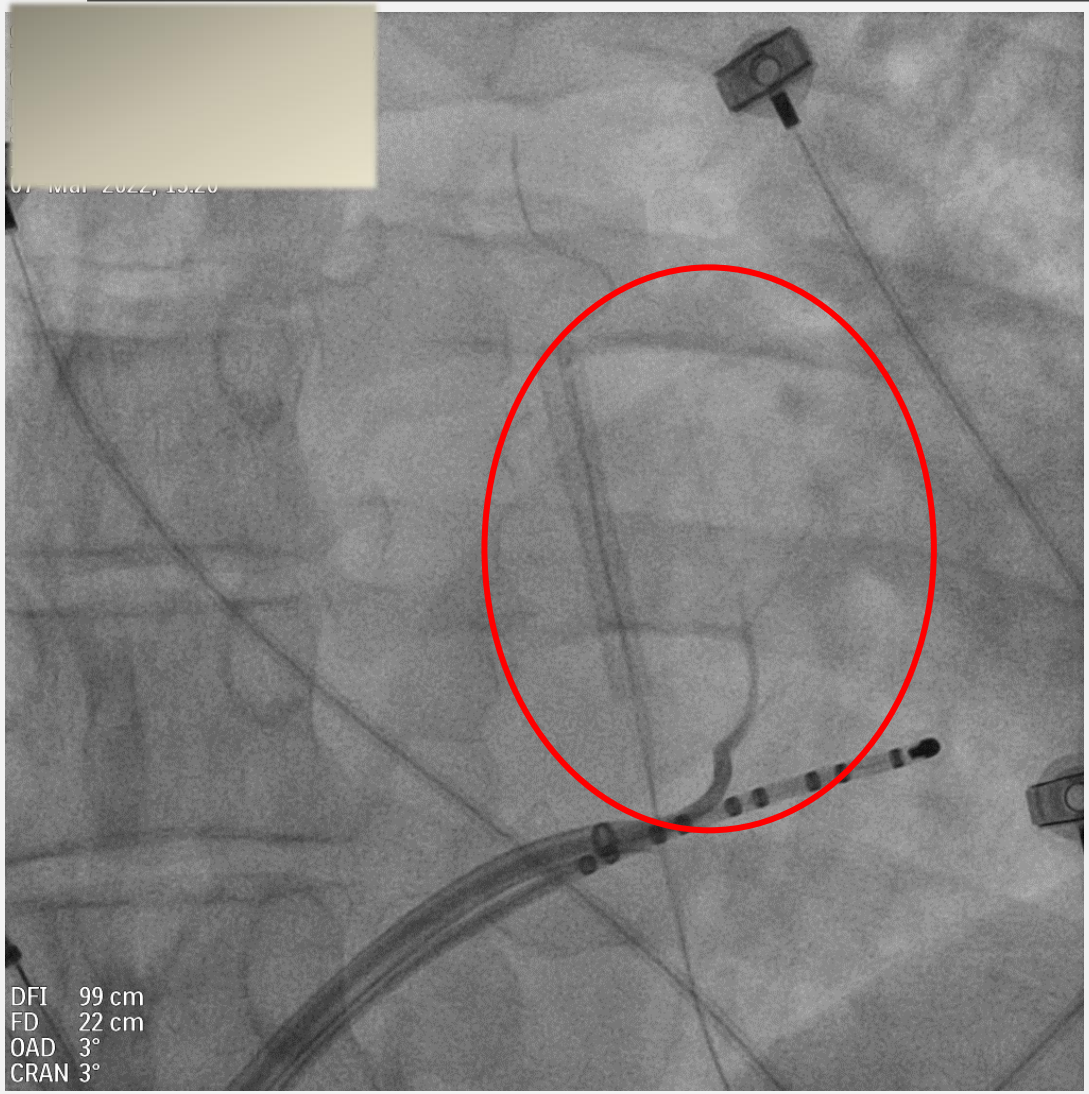
Performing this line, the AT cycle increases by 45ms

LA RE-MAPPING (AT : 220MS)



Roof line is blocked.
AT is now a perimitral flutter

MARSHALL'S VEIN ALCOHOLIZATION

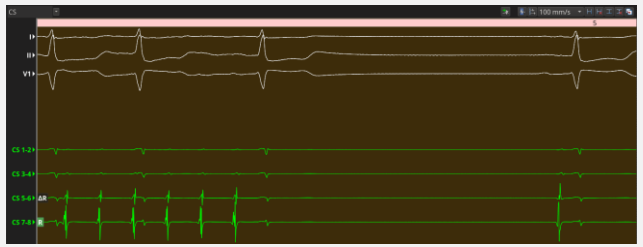


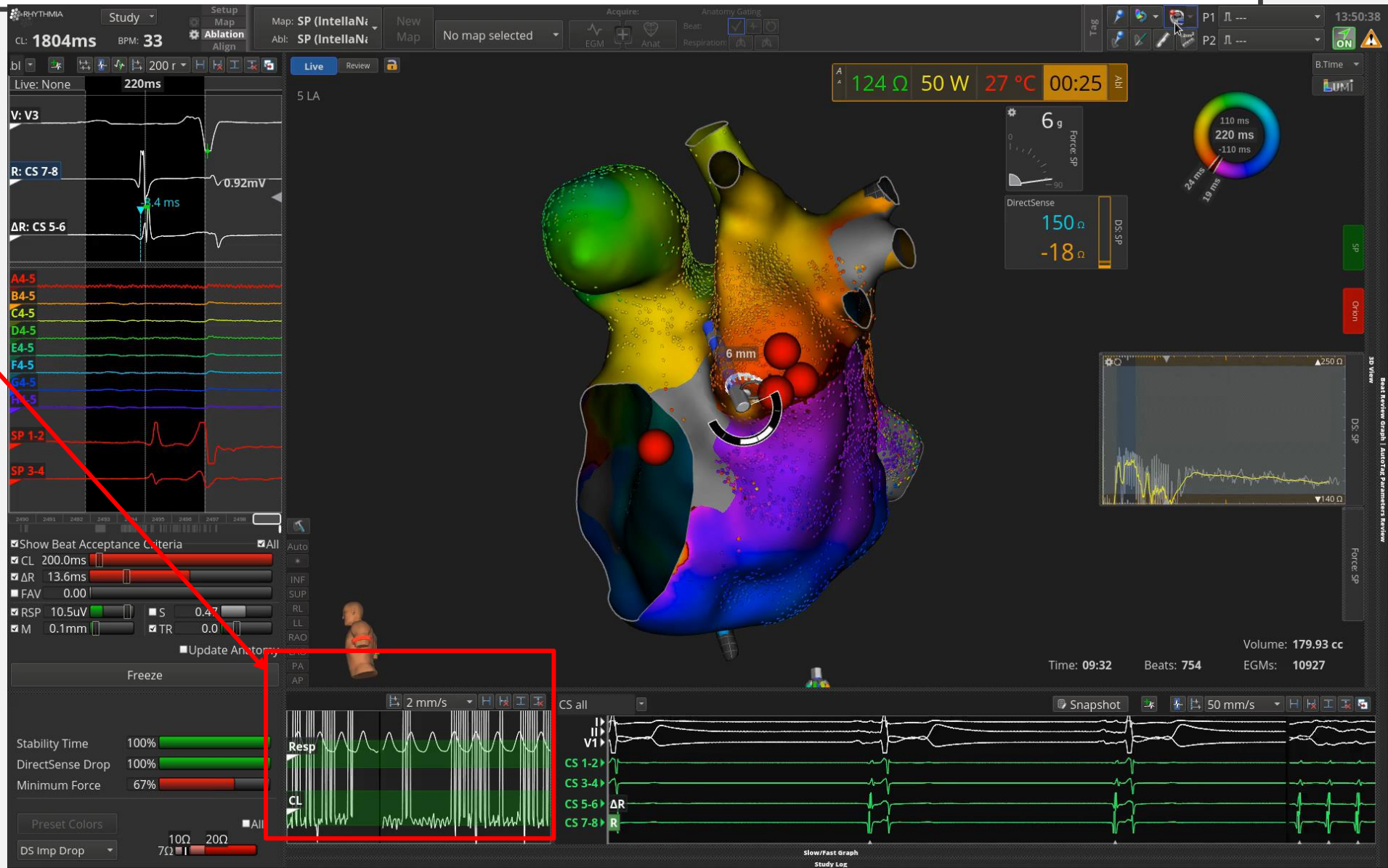
After LA mapping an ethanol injection into the Marshall's vein was performed

Marshall's vein is first identified by angiography
10 cc of ethanol was injected

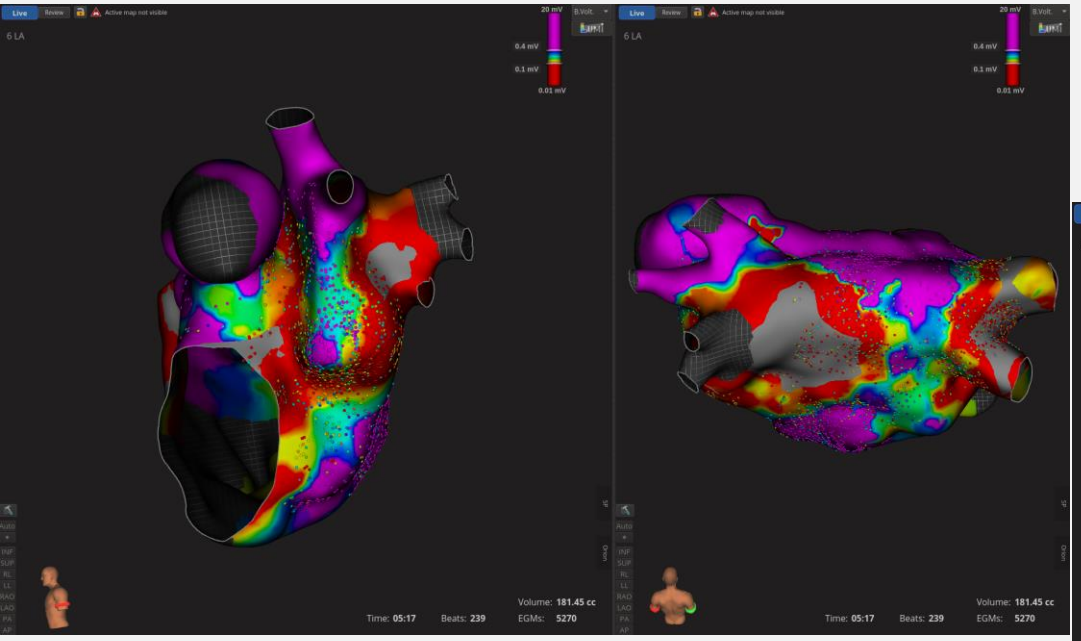
BACK TO SINUS RHYTHM DURING ABLATION !

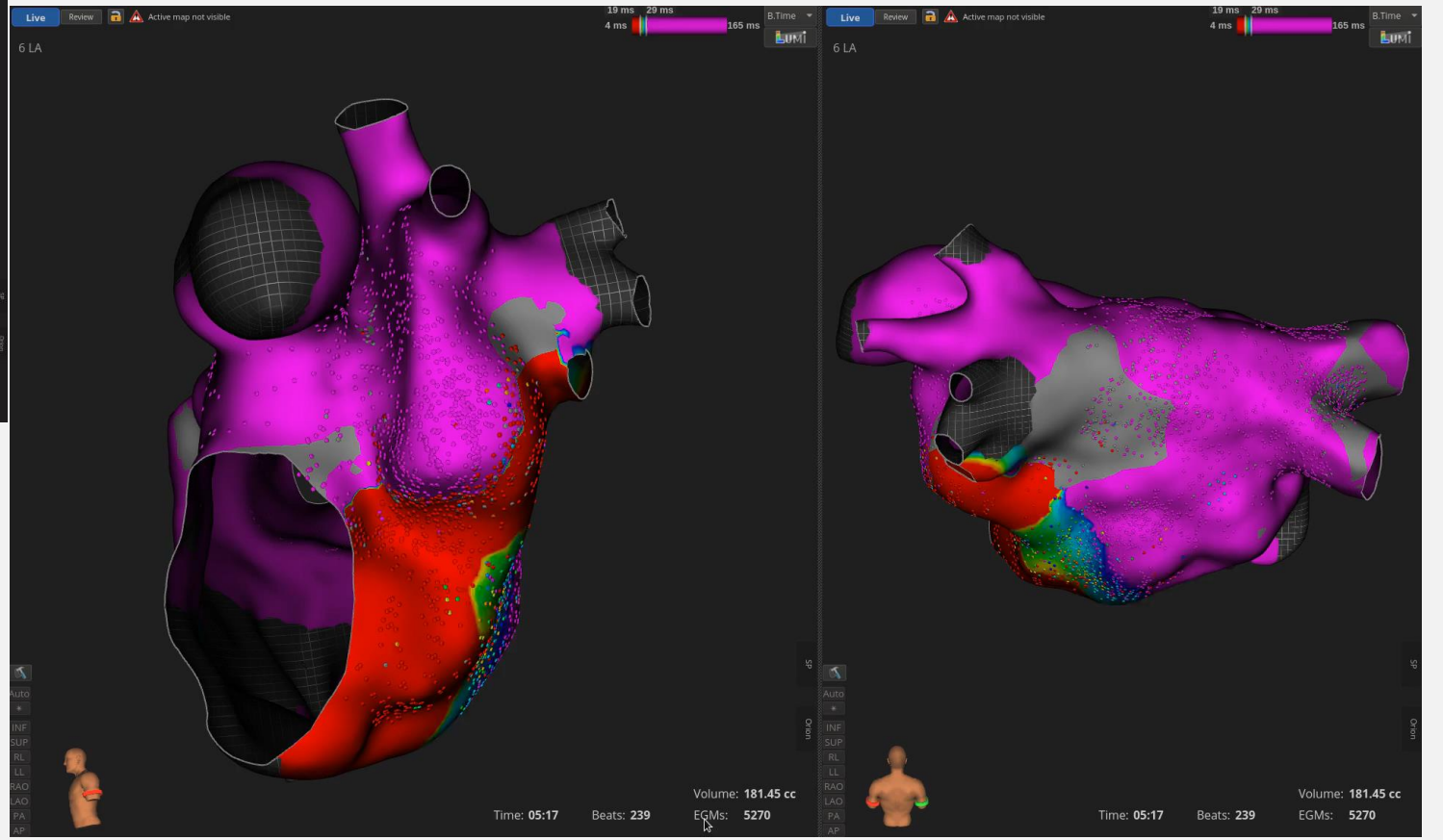
The cycle window allows visualization of the return to sinus rhythm



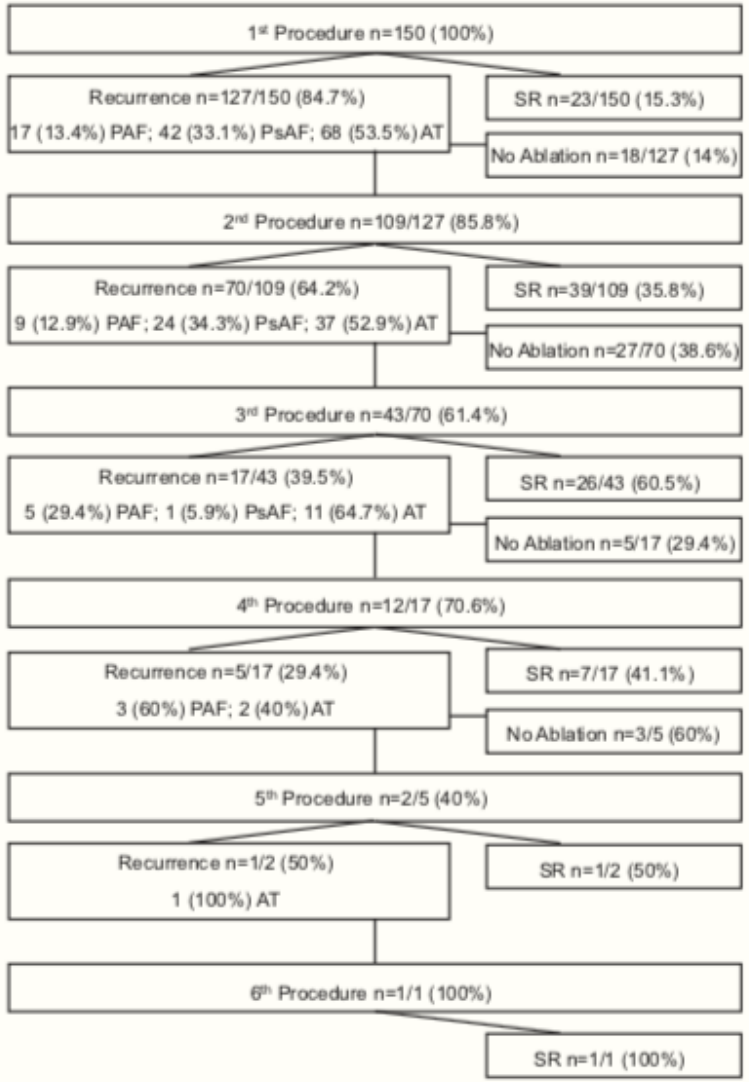


VOLTAGE AND ACTIVATION MAP CONFIRMED BLOCKED LINES





AT OCCURRENCE POST AF ABLATION



- At 5 years outcome, a high risk of AT occurrence after pers AF ablation (60%?)

Table 3. Multivariate Predictors of Arrhythmia Recurrence off Antiarrhythmic Drugs Following the Last Ablation Procedure

Variable	HR	95% CI	*P* Value
Failure to terminate AF during first procedure	3.831	2.070–7.143	<0.0001
LA diameter ≥50 mm	2.083	1.078–4.016	0.03
Continuous AF duration ≥18 months	1.984	1.024–3.846	0.04
Structural heart disease	1.874	1.037–3.388	0.04

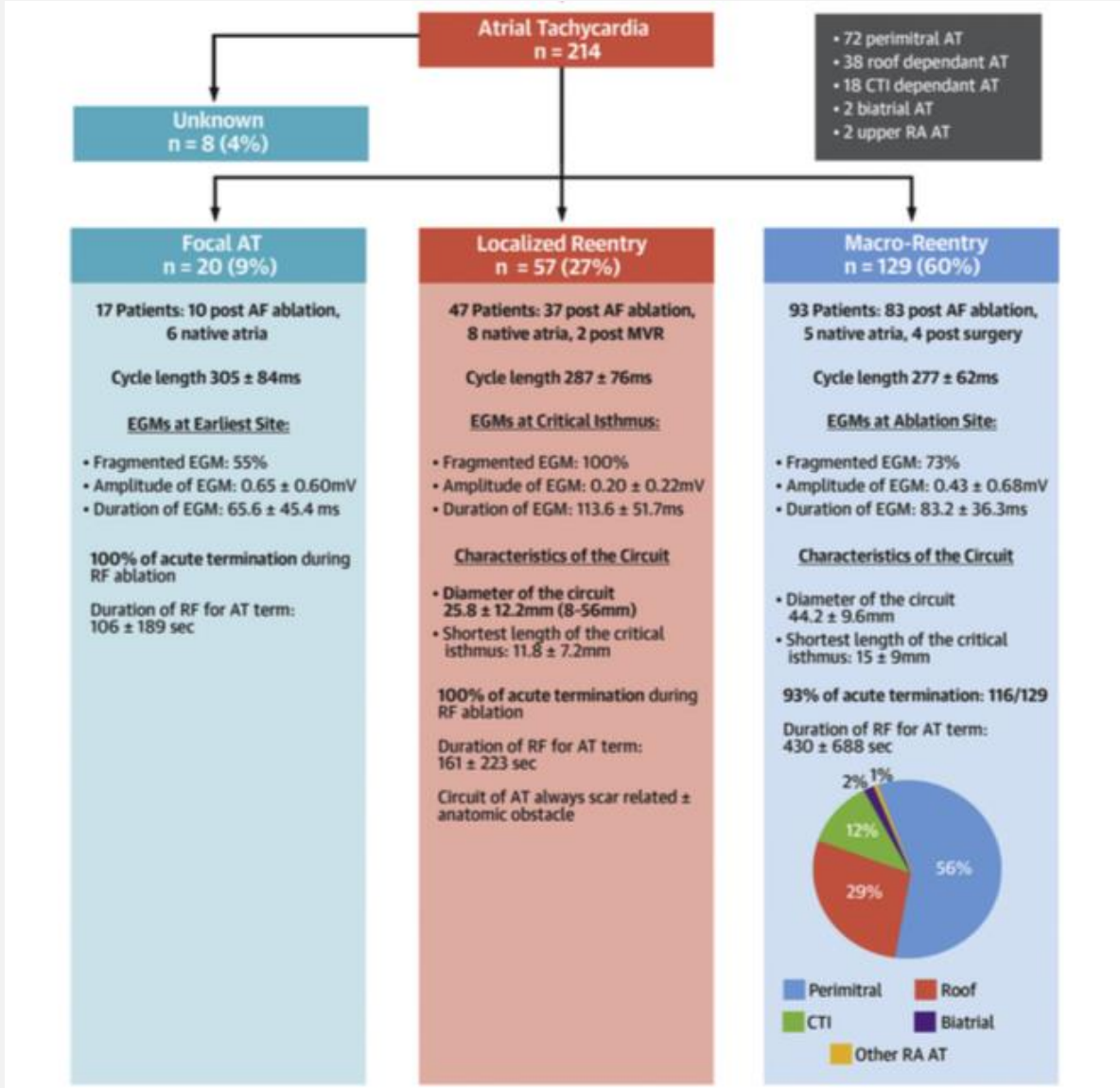
Circulation
Arrhythmia and Electrophysiology

Scherr D et al, Circ Arrhythm Electrophysiol. 2015

MECHANISMS OF AT

- A majority of patients with AT post AF ablation had **substrate-based ablation** during the index procedure
- **Perimitral flutter** represent the most common macro-reentry post AF ablation
- After a mean follow-up of 13 months (46%) patients experienced **recurrence of AT.**
- Despite accurate characterization of the AT mechanism and a high acute termination rate following ablation, the recurrence rate remains high. In one-half of the patients, **multiple complex AT circuits with variable transition between circuits were observed**, resulting in prolonged and challenging procedures.

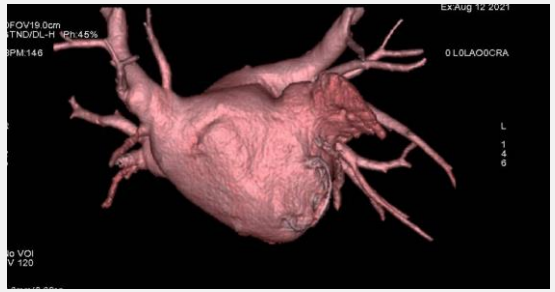
Derval N et al, J Am Coll Cardiol EP 2020



Derval, N. et al. J Am Coll Cardiol EP. 2020;■(■):■-■.

A FOCAL AT

- A 64 years-old woman
- **Risk Factor of AF** : none
- Paroxysmal symptomatic AF Ablation Dec 2021 (PVI only)
- Admitted for symptomatic AT



Centre Cardiologique du Nord

Atrial Tachycardia

Centre Cardiologie du Nord

Dr. A. Lepillier

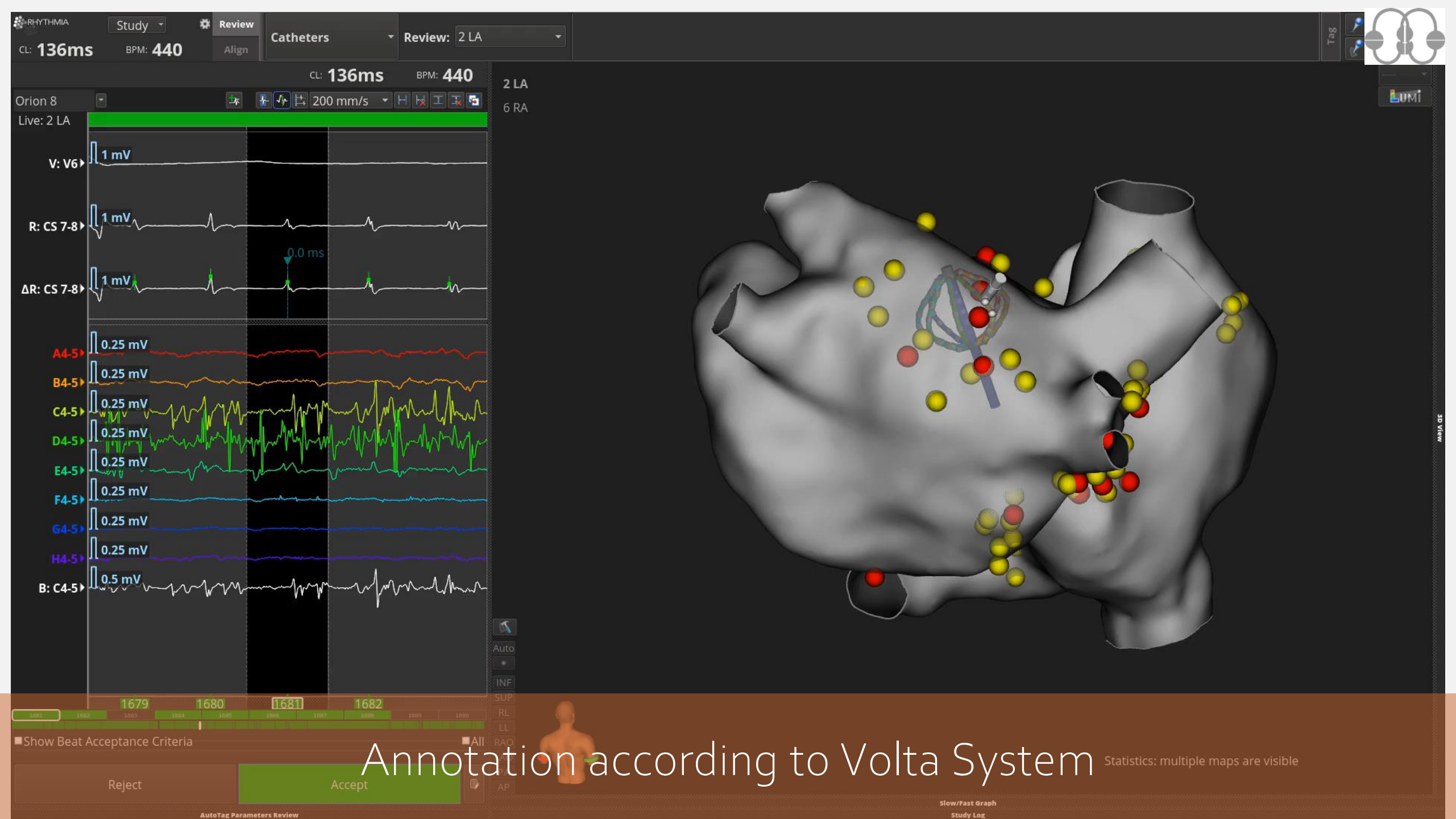
11/05/2022

A SUBBORN MITRAL ISTHMUS !

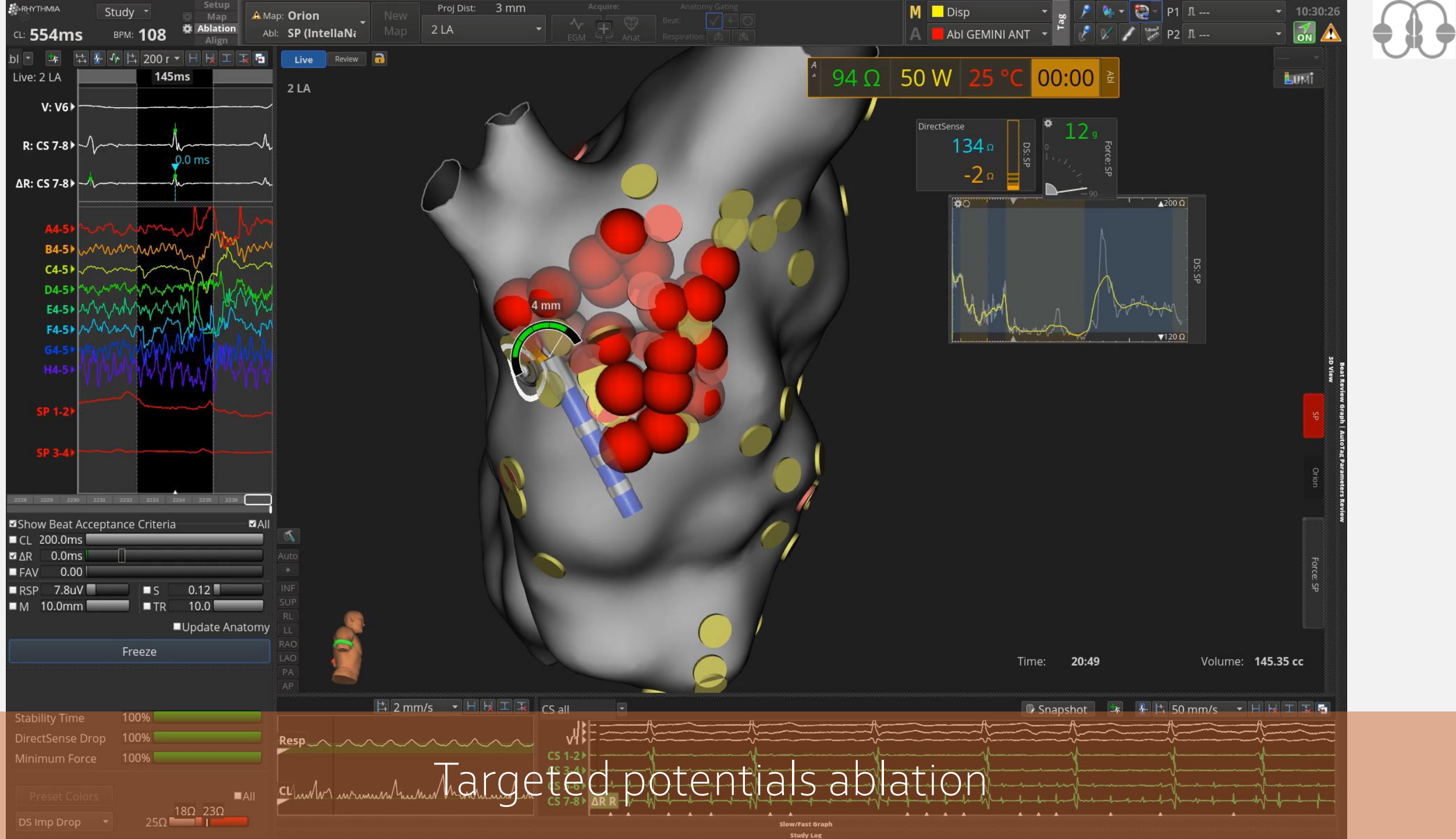
- 73 years old patient
- **Risk factor of AF** : Ageing, Hypertension
- Symptomatic Persistent AF since 6 months
- AFib ablation in December 2021 :

Guided with **Volta System**

Patient included in the **Tailored-AF study**



Annotation according to Volta System



Targeted potentials ablation

A SUBBORN MITRAL ISTHMUS !

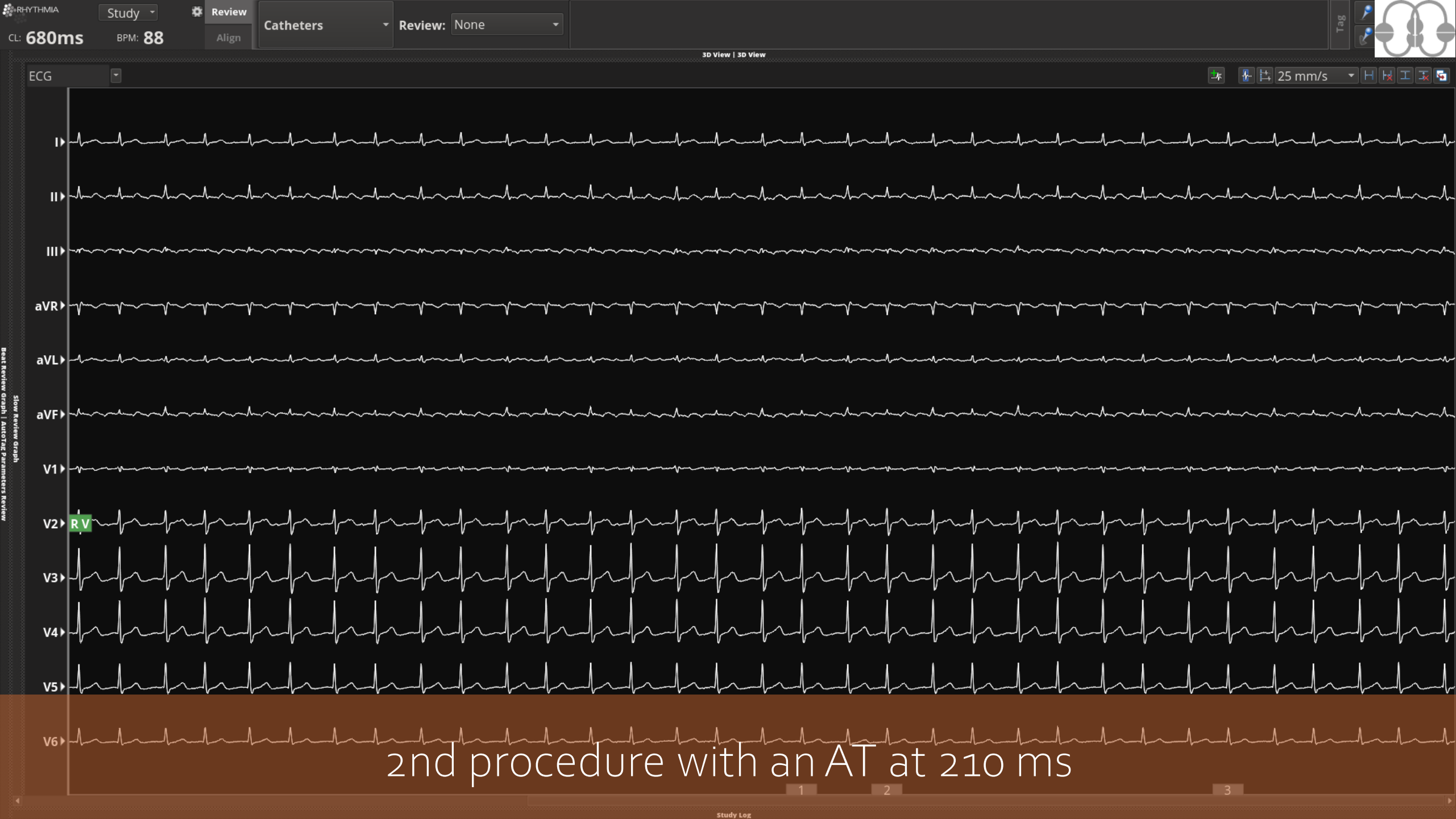
- 73 years old patient
- **Risk factor of AF** : Ageing, Hypertension
- Symptomatic Persistent AF since 6 months
- AFib ablation in December 2021 :

Guided with **Volta System**

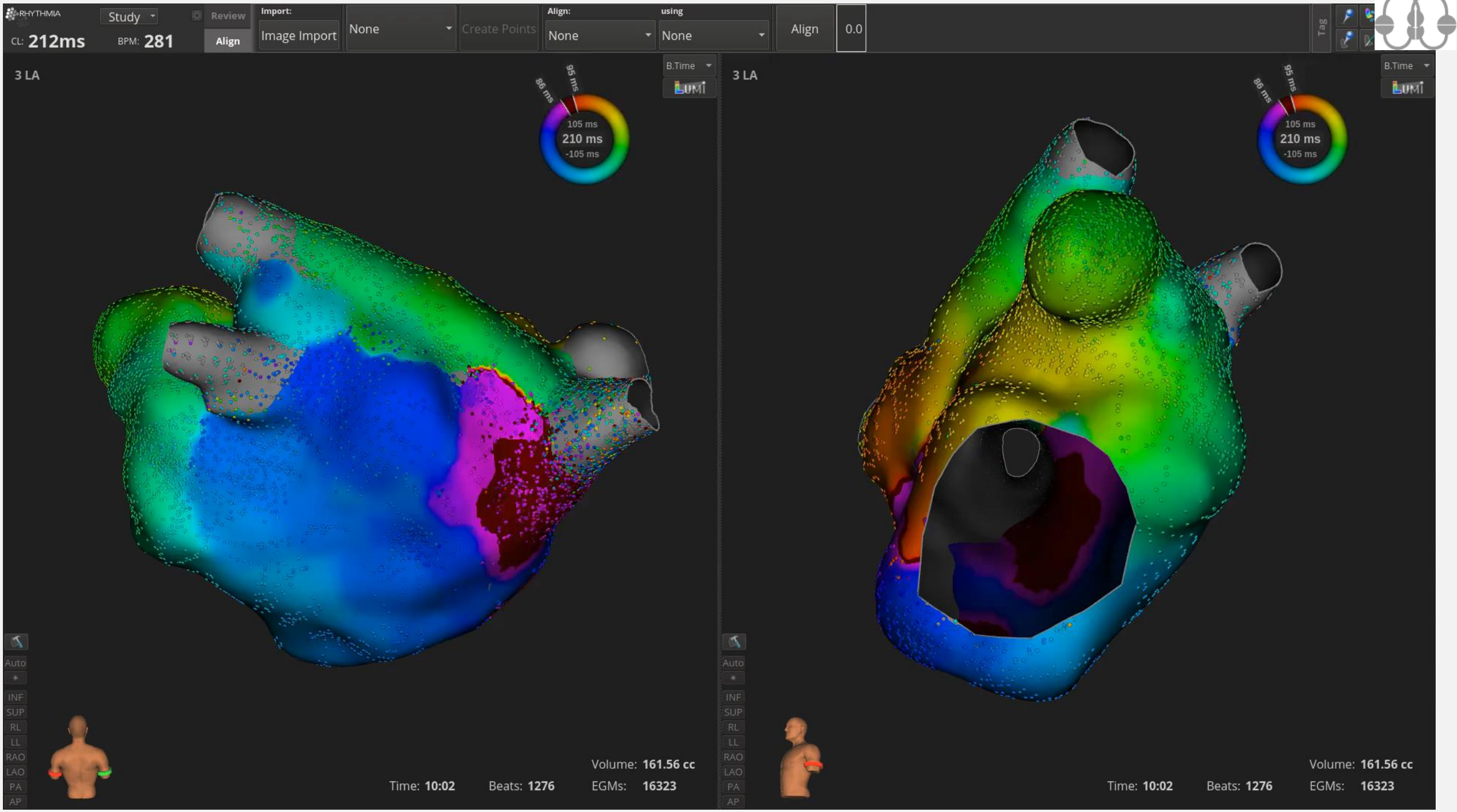
Patient included in the **Tailored-AF study**

Admitted 4 months later for AT

- **Redo procedure** in April 2022



2nd procedure with an AT at 210 ms


RHYTHMIA
Study
Review
Align
CL: 212ms
BPM: 281
Import:
Image Import
None
Create Points
Align:
None
using
None
Align
0.0
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3 LA
B.Time
LUMI
95 ms
86 ms
105 ms
210 ms
-105 ms
Auto
INF
SUP
RL
LL
RAO
LAO
PA
AP
Volume: 161.56 cc
Time: 10:02
Beats: 1276
EGMs: 16323
3 LA
B.Time
LUMI
95 ms
86 ms
105 ms
210 ms
-105 ms
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Volume: 161.56 cc
Time: 10:02
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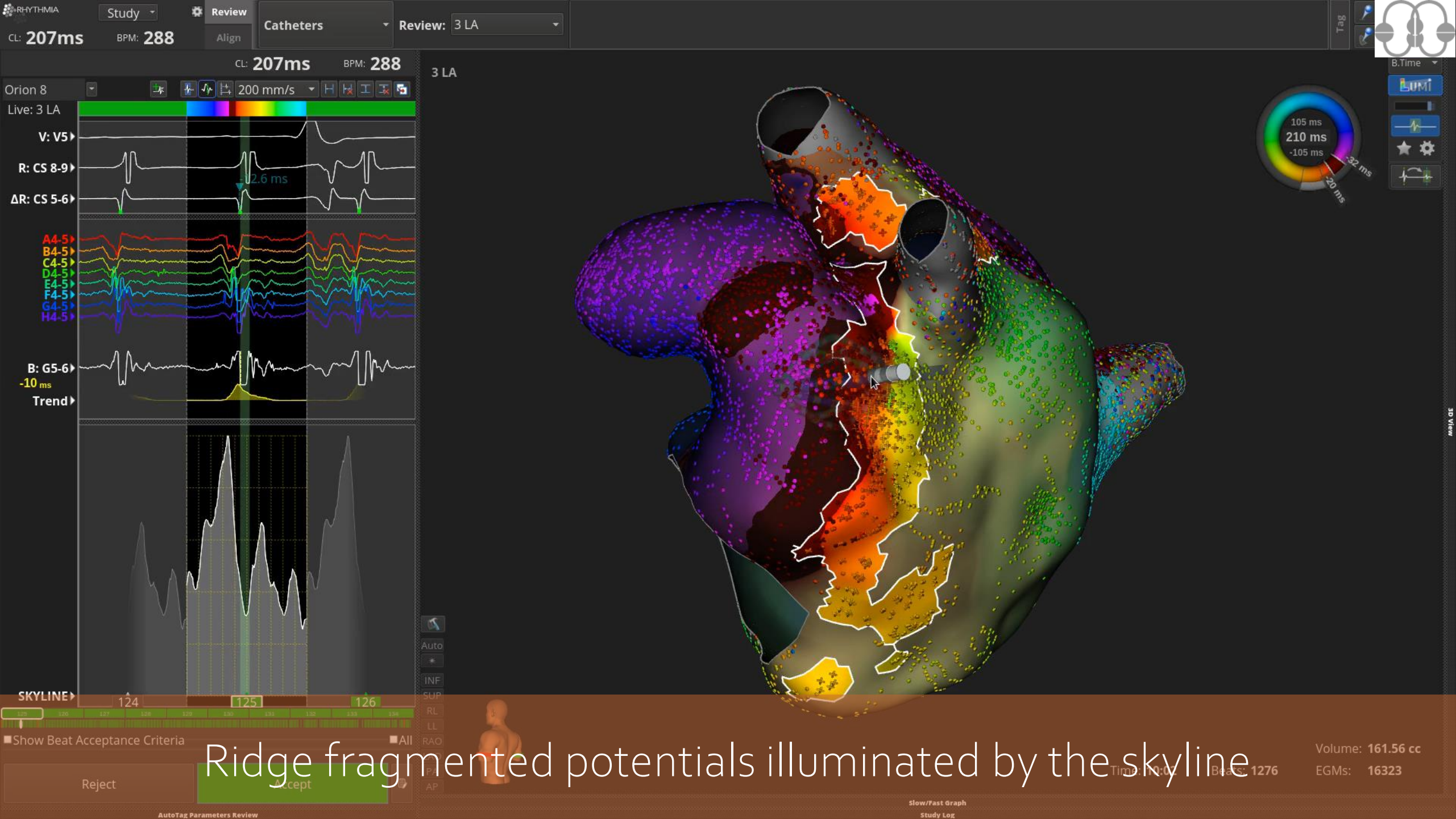
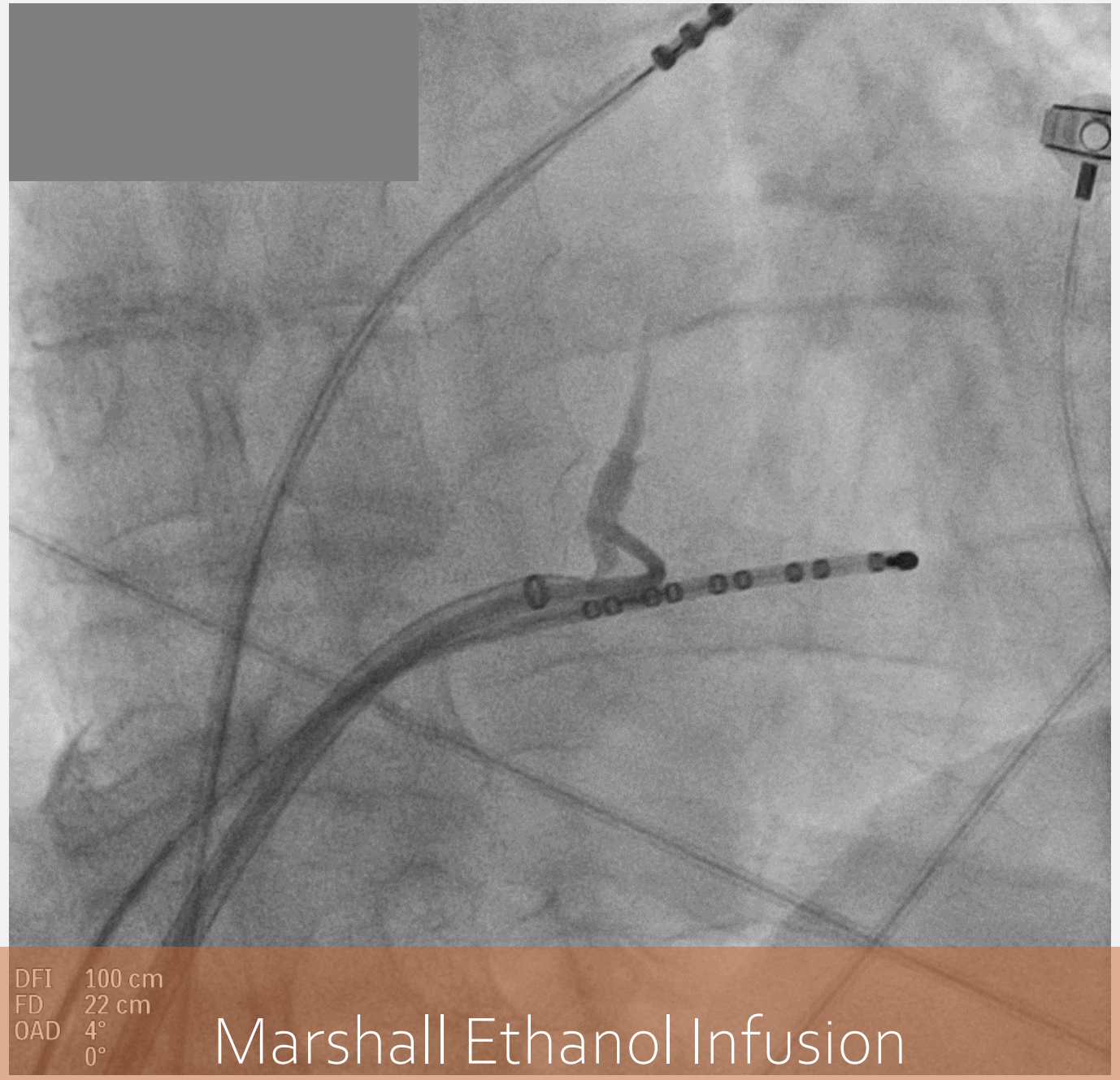
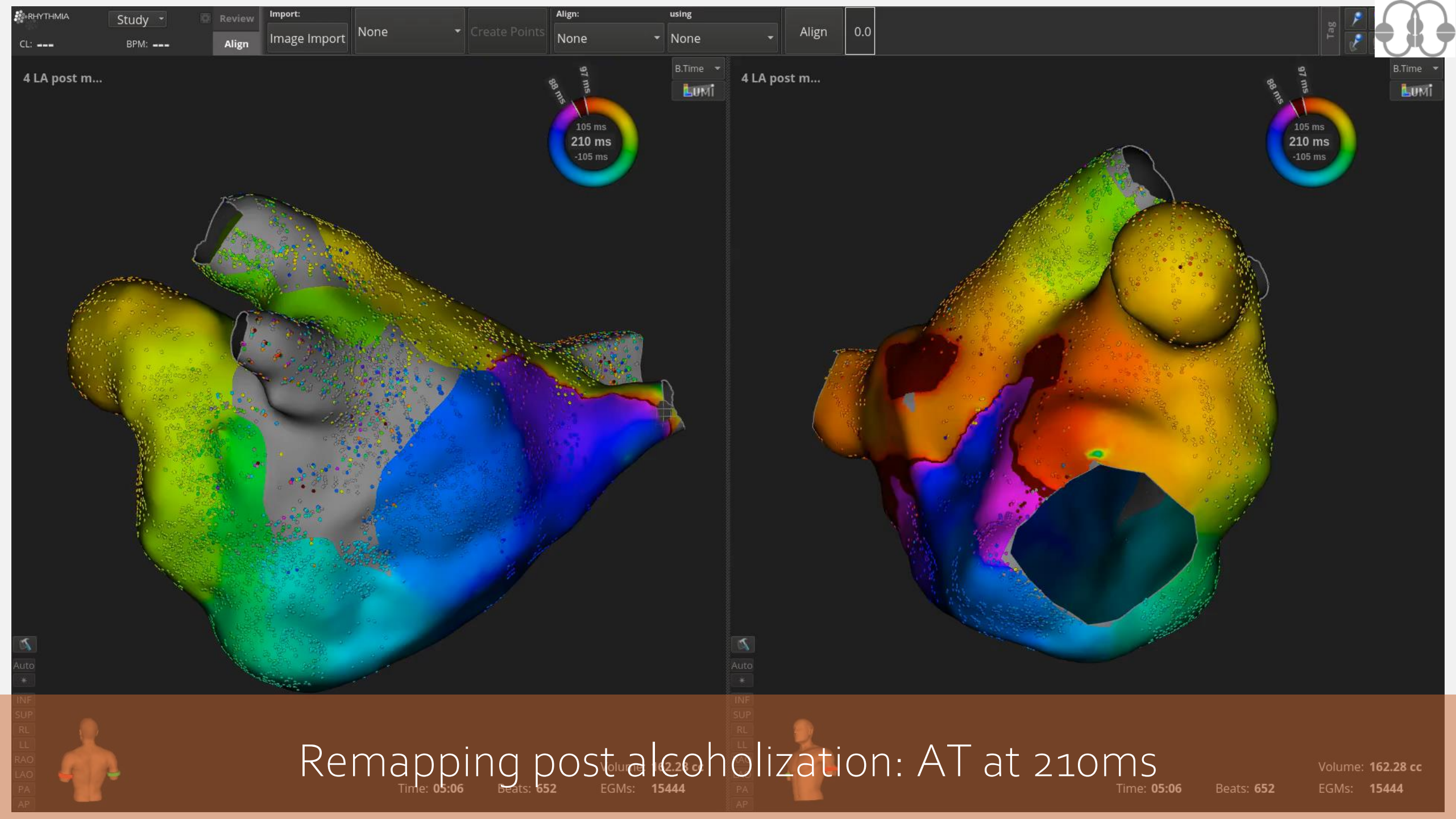
EGMs: 16323



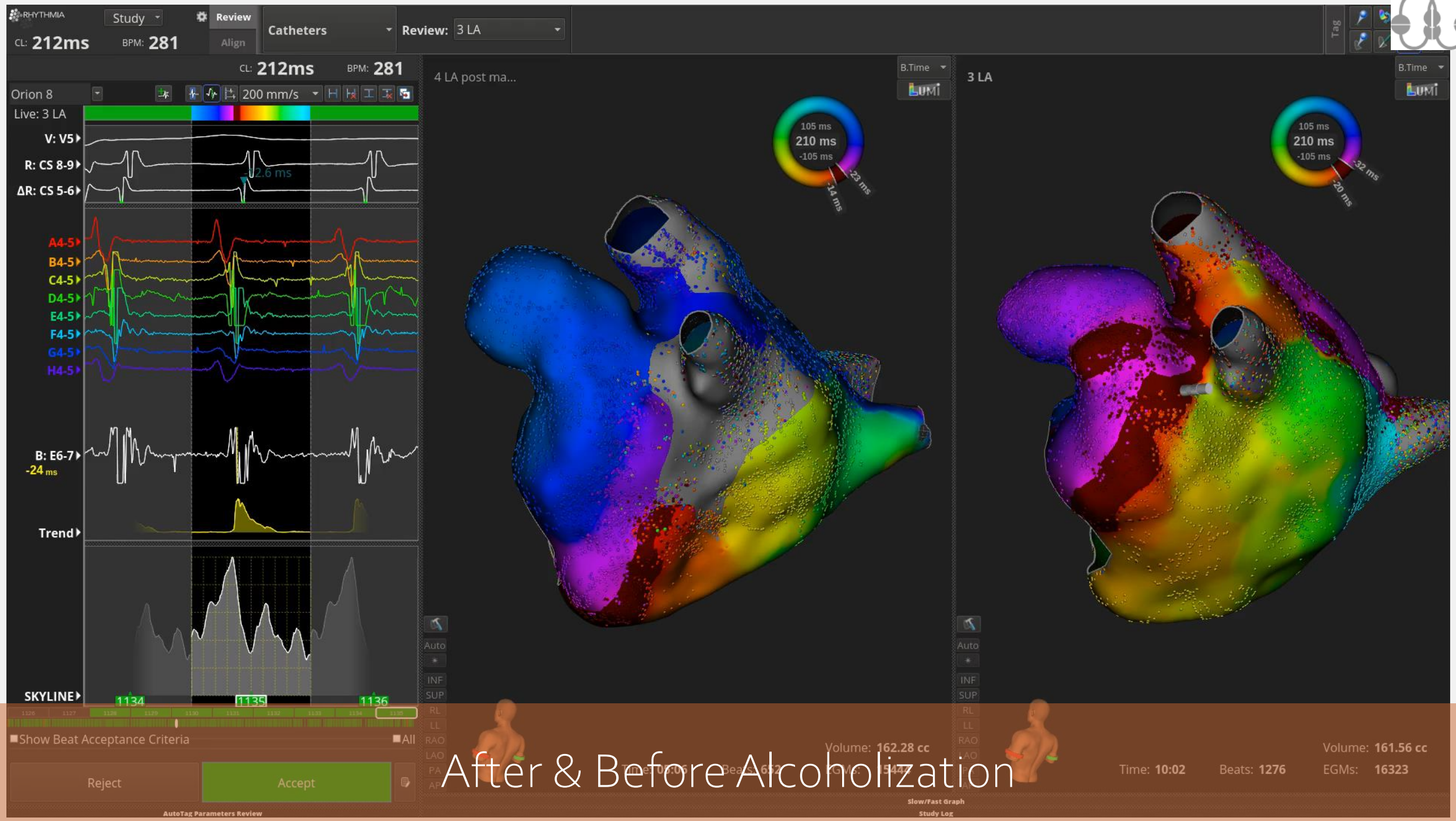
Ridge fragmented potentials illuminated by the skyline



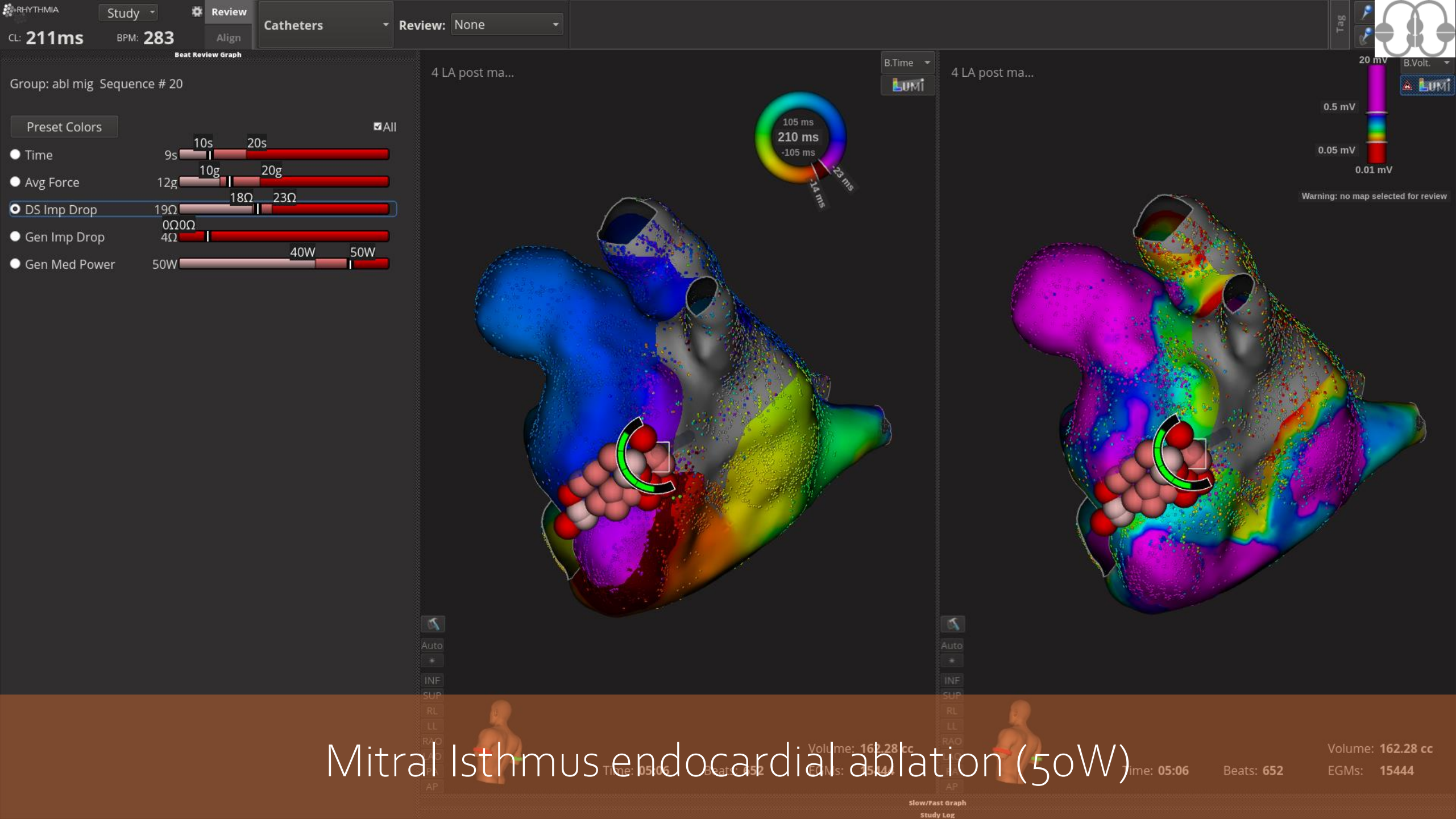
Marshall Ethanol Infusion



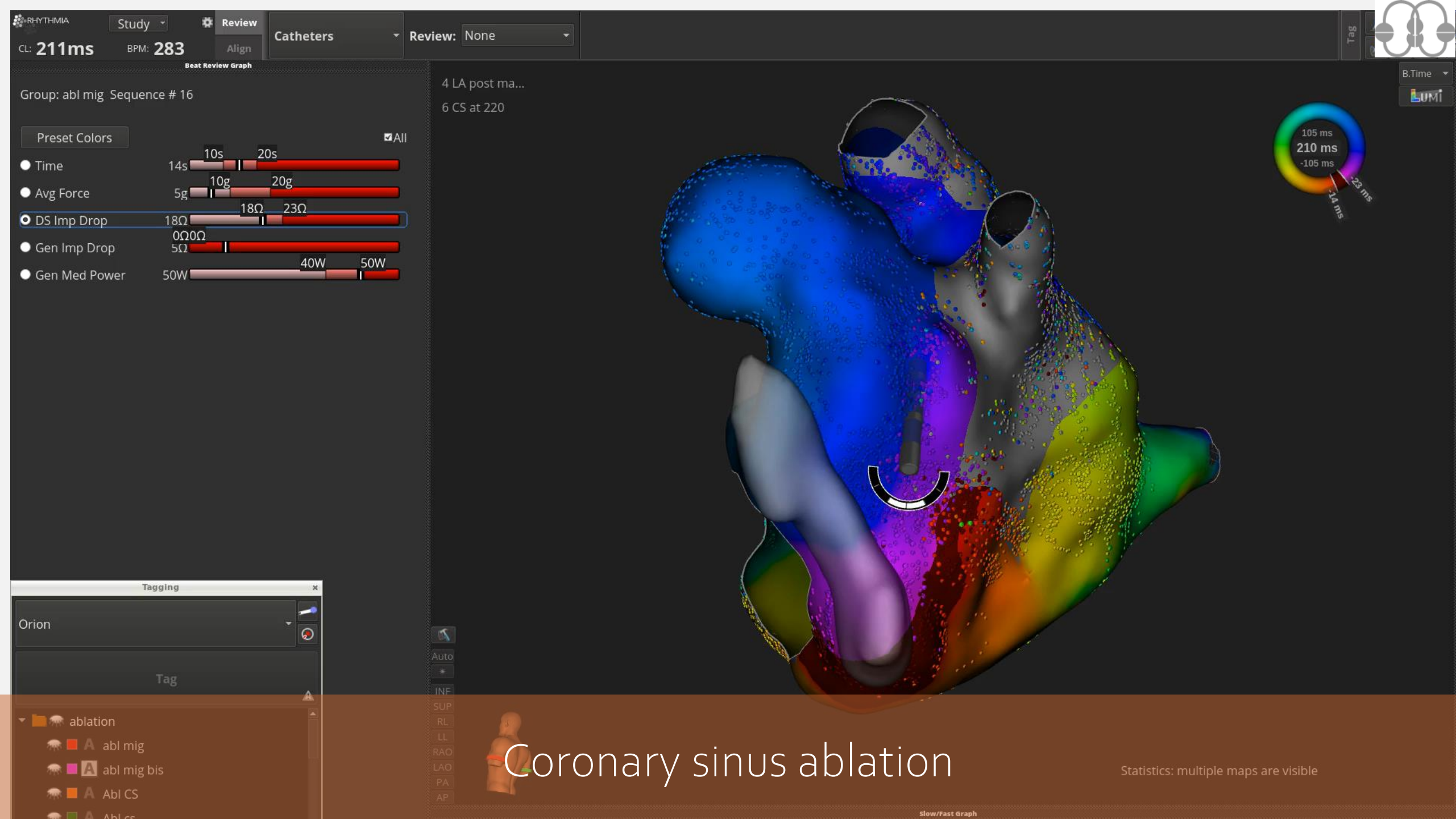
Remapping post alcoholization: AT at 210ms



After & Before Alcoholization

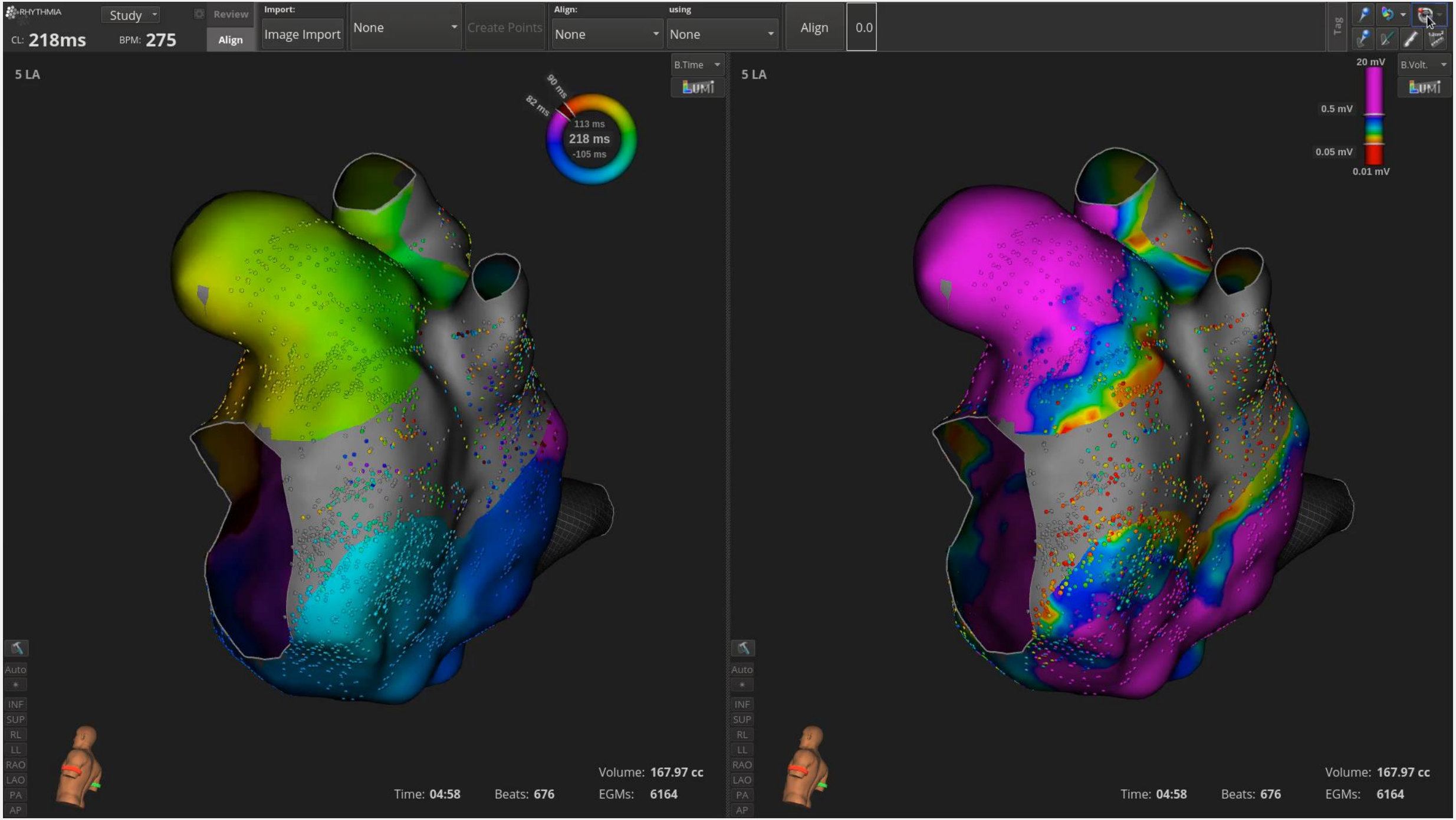


Mitral Isthmus endocardial ablation (50W)



Coronary sinus ablation

Statistics: multiple maps are visible


RHYTHMIA
Study
Review
CL: 218ms
BPM: 275
Align
Import:
Image Import
None
Create Points
Align:
None
using
None
Align
0.0
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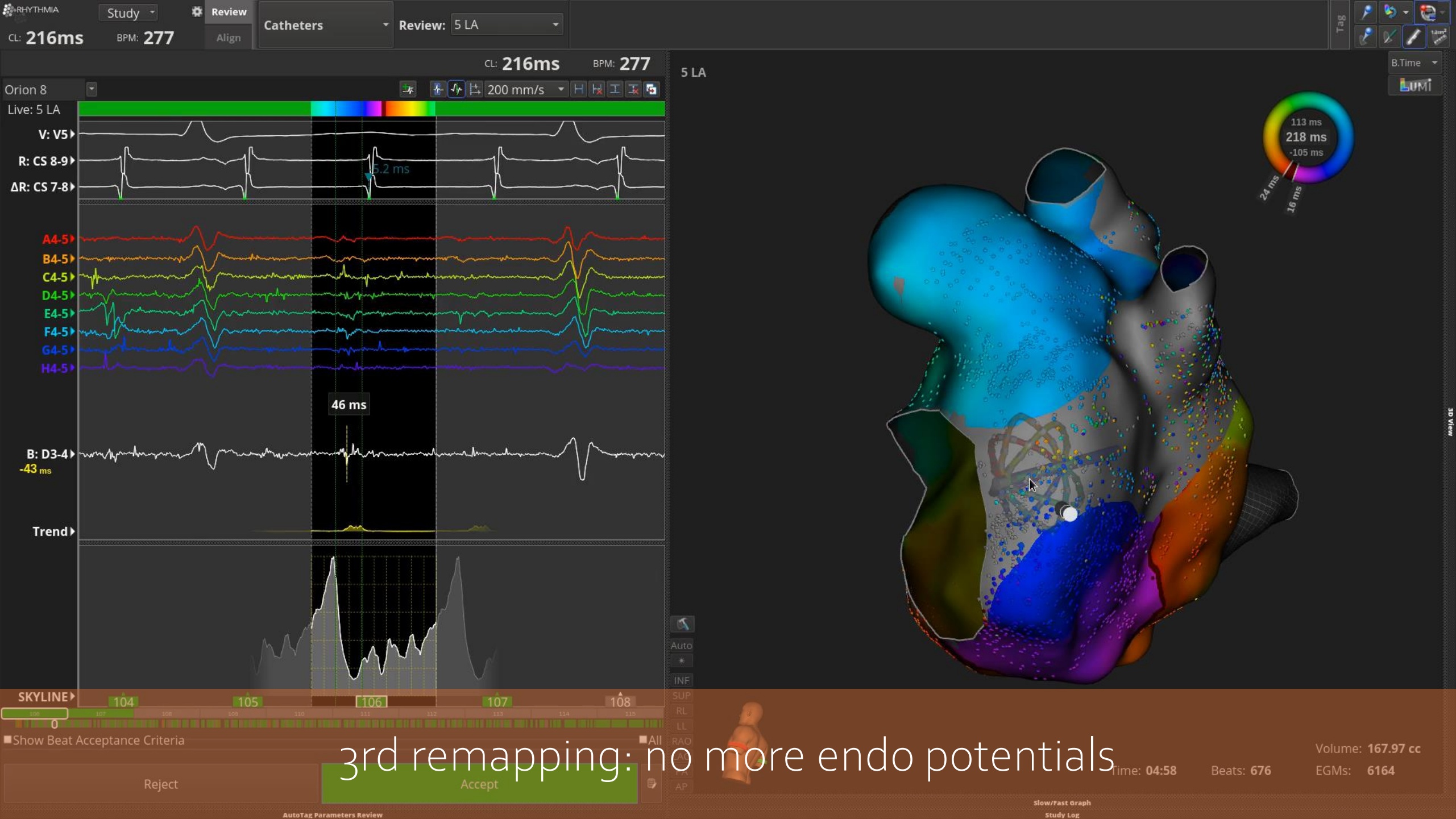
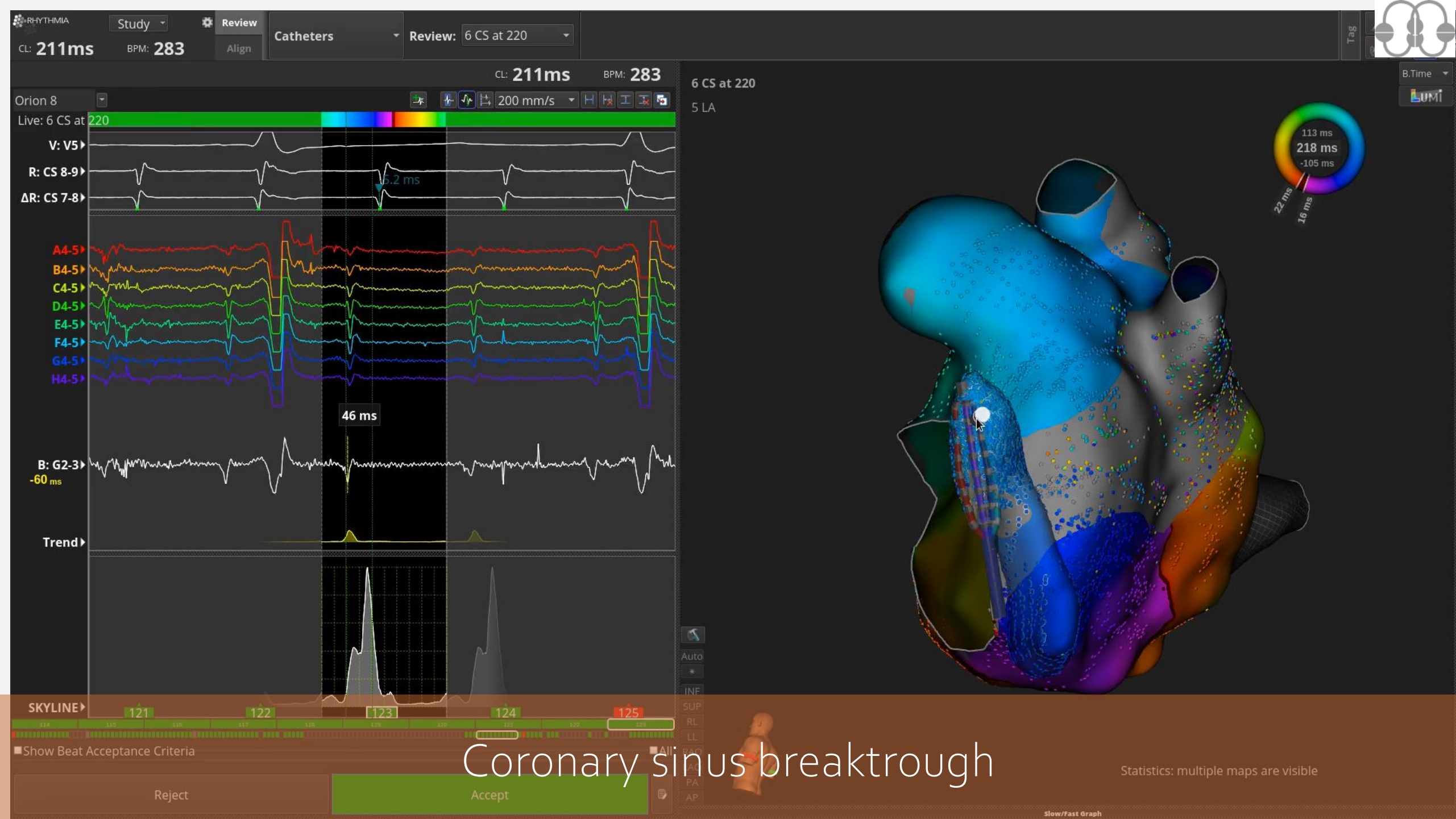
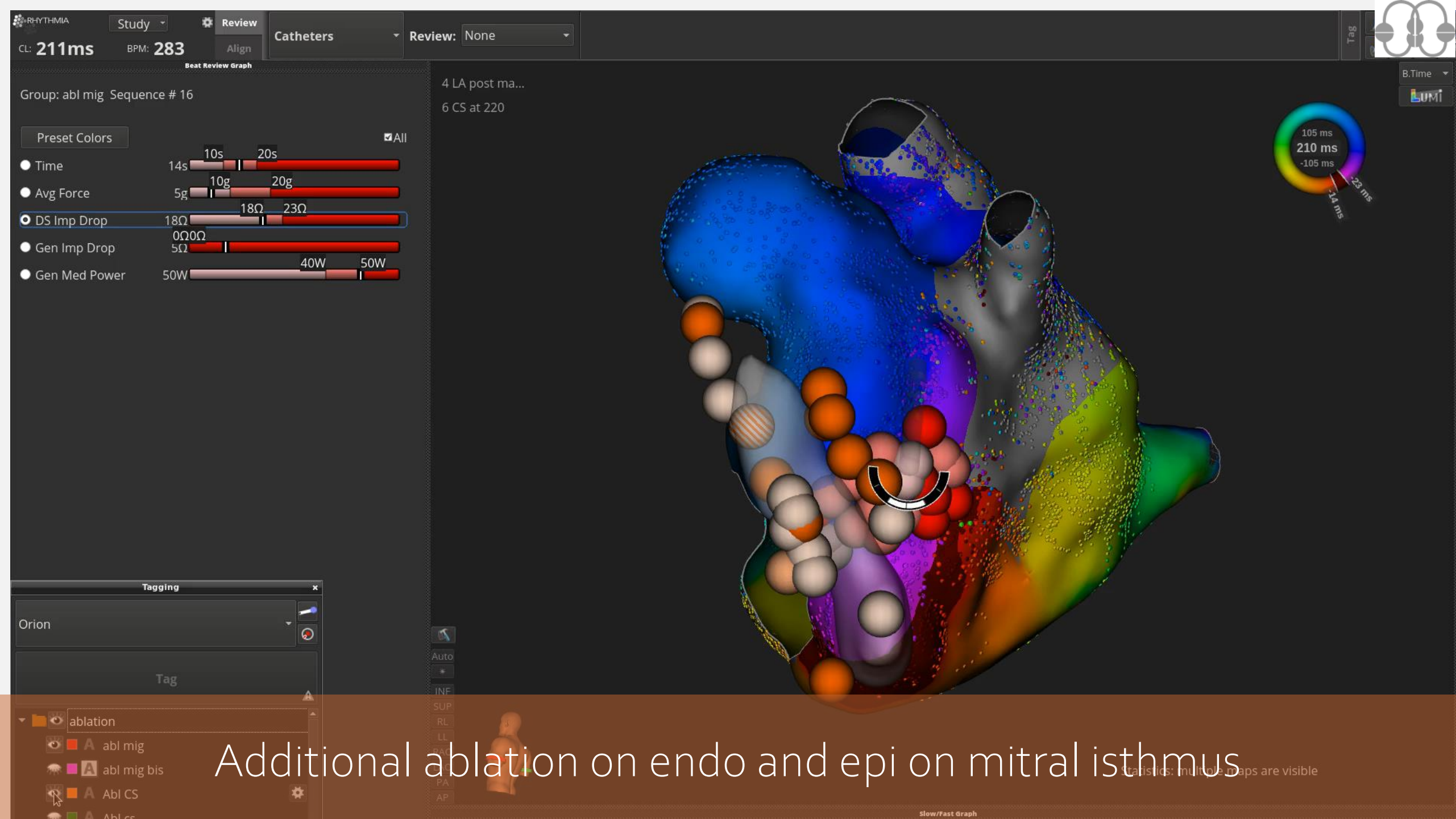
5 LA
B.Time
LUMI
90 ms
82 ms
113 ms
218 ms
-105 ms
Auto
INF
SUP
RL
LL
RAO
LAO
PA
AP
Volume: 167.97 cc
Time: 04:58
Beats: 676
EGMs: 6164
5 LA
20 mV
B.Volt.
LUMI
0.5 mV
0.05 mV
0.01 mV
Auto
INF
SUP
RL
LL
RAO
LAO
PA
AP
Volume: 167.97 cc
Time: 04:58
Beats: 676
EGMs: 6164



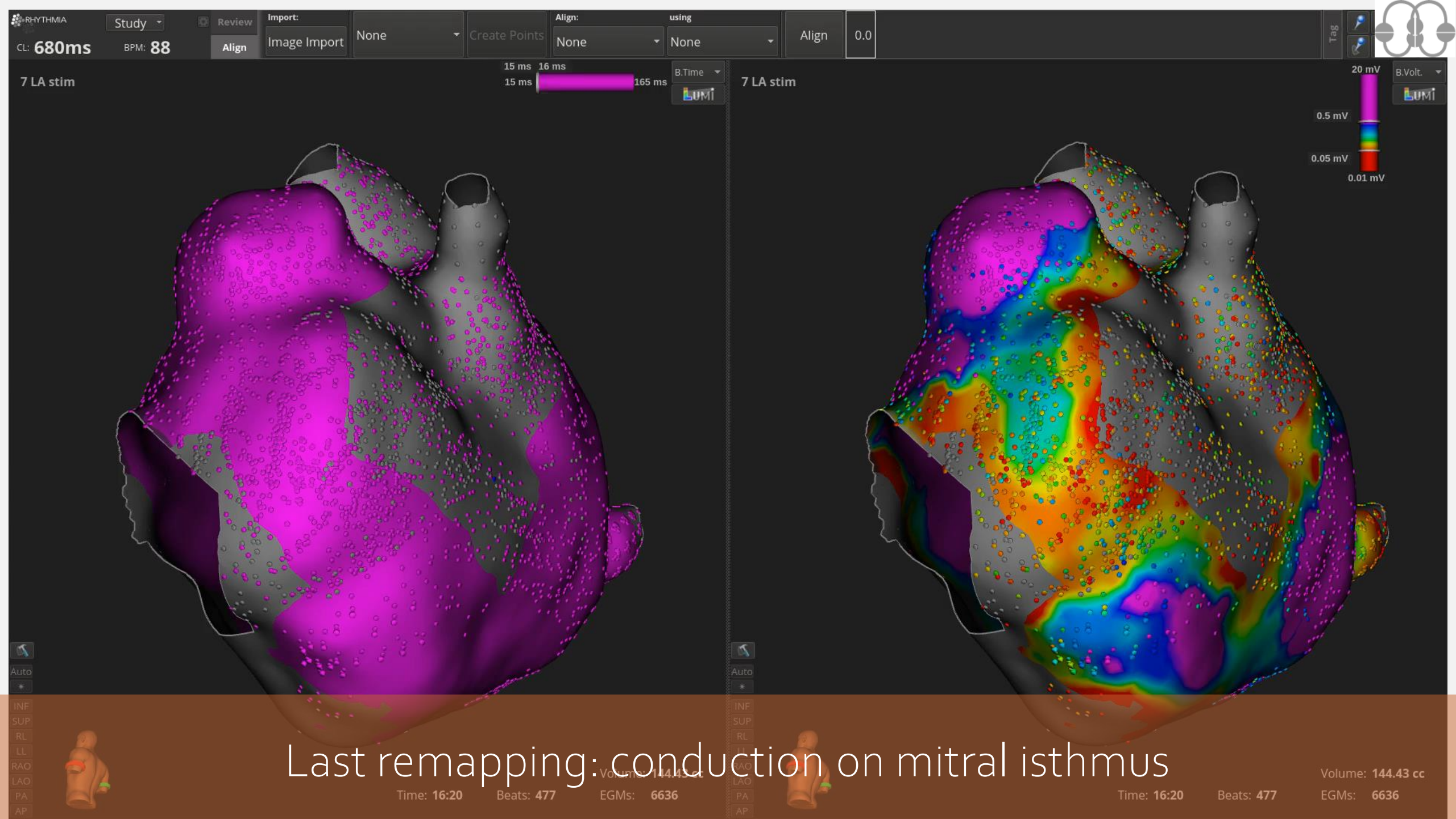
3rd remapping: no more endo potentials



Coronary sinus breaktrough



Additional ablation on endo and epi on mitral isthmus

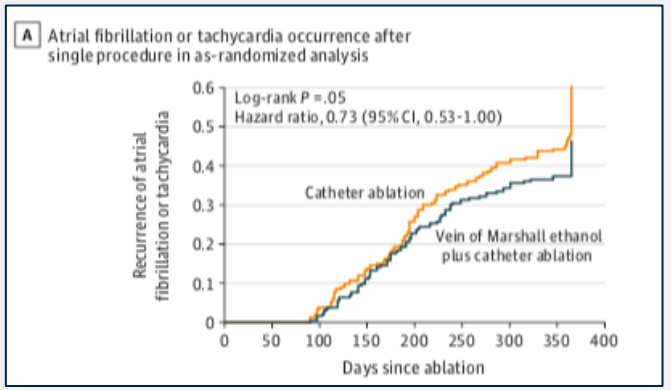


Last remapping: conduction on mitral isthmus

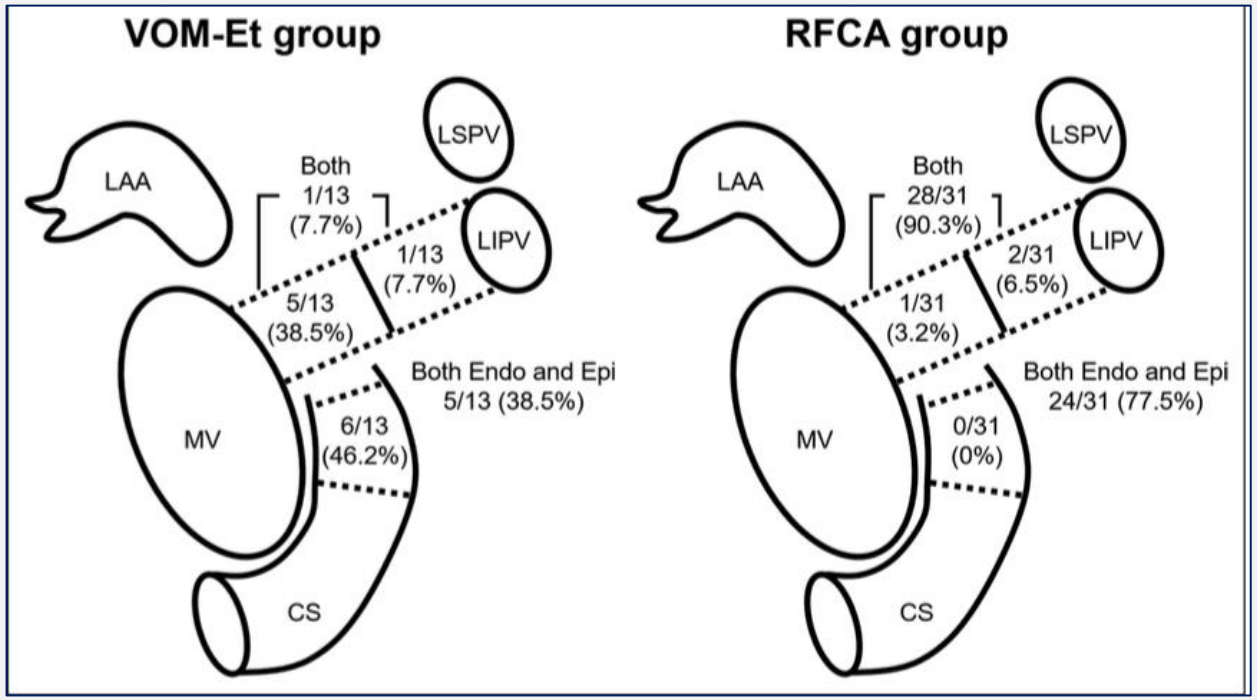
IMPACT OF V-O-M ETHANOL INFUSION

- **Venus Trial** suggest to perform vein of Marshall Ethanol Infusion to optimize results for pers Afib ablation

Valderrábano M et al, JAMA 2020



- Beyond facilitating acute MI block, **VOM-Et is associated with greater lesion durability** as evidenced by higher rates of MI block during repeat procedures : MI block in the VOM-Et group 62.9% [22/35] versus 32.6% RFCA group



Schematic illustration of gaps in mitral isthmus (MI) lesion sets, classified into 3 segments.
(1) Endocardial aspect of the mitral annulus
(2) Endocardial aspect of the pulmonary vein
(3) Epicardial aspect (within the coronary sinus).

Nakashima T et al, Circ Arrhythm Electrophysiol. 2020

CONCLUSION

- Management of atypical ATs, especially in post–AF ablation patients, results in challenging procedures.
- Despite accurate characterization of the AT mechanism and a high acute termination rate following ablation, the recurrence rate remains high with multiple complex AT circuits during FU.
- **VOM-Et is associated with greater lesion durability and** higher rates of MI block during repeat procedures
- Given the high rate of complex AT recurrences, there is a need for re-evaluation of current substrate-ablation strategies for AF.