

Noniskemik kardiyomiyopatilerde yaklařım

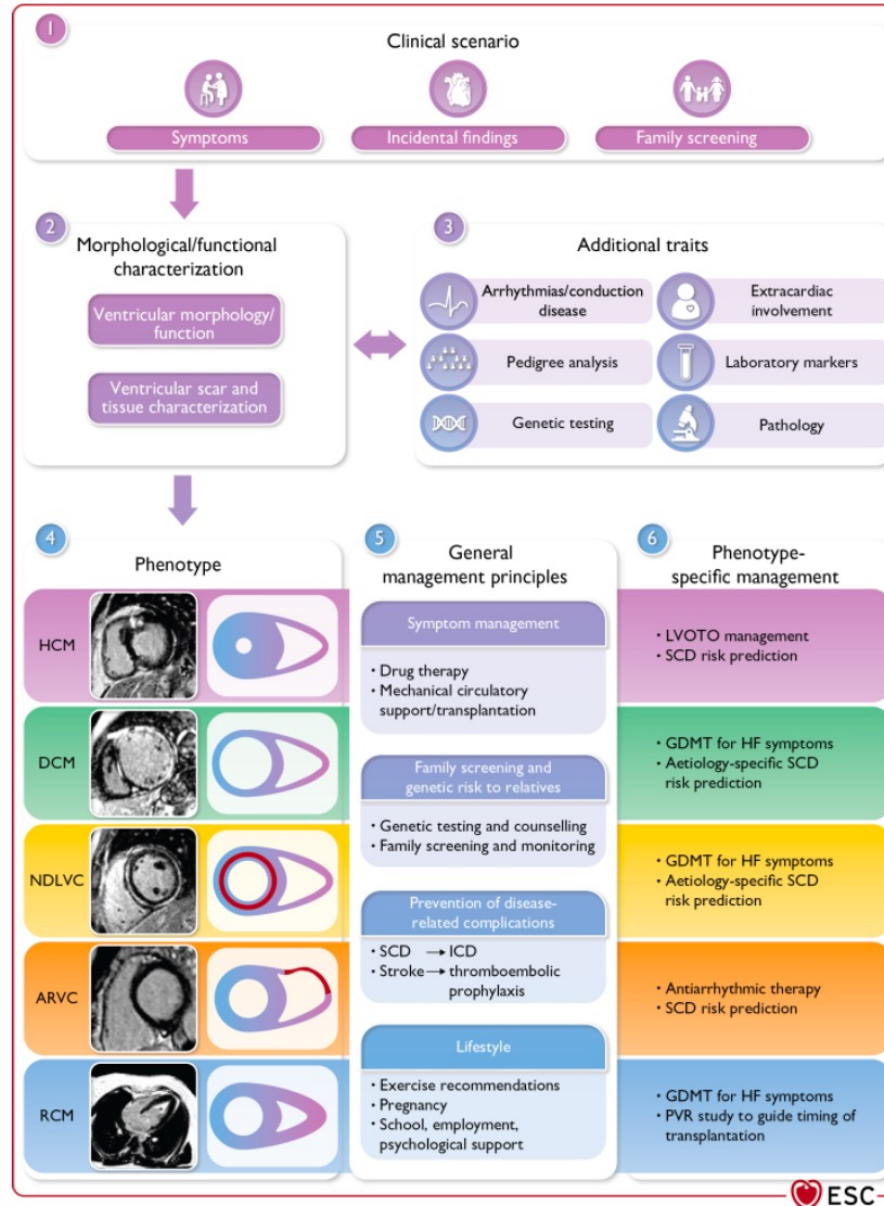
Dr. Emin Evren Özcan, PhD.

Heart Rhythm Management Center
Dokuz Eylul University, İzmir, Turkey

Central illustration

Key aspects in the evaluation and management of CMPs

The **patient pathway**, from presentation (**clinical scenario**) to the morphological and functional characterization (the **phenotype**) using a **multiparametric approach** that include additional variants such as pedigree analysis, genetic test, extracardiac involvement, laboratory markers, **to arrive at an aetiological diagnosis.**



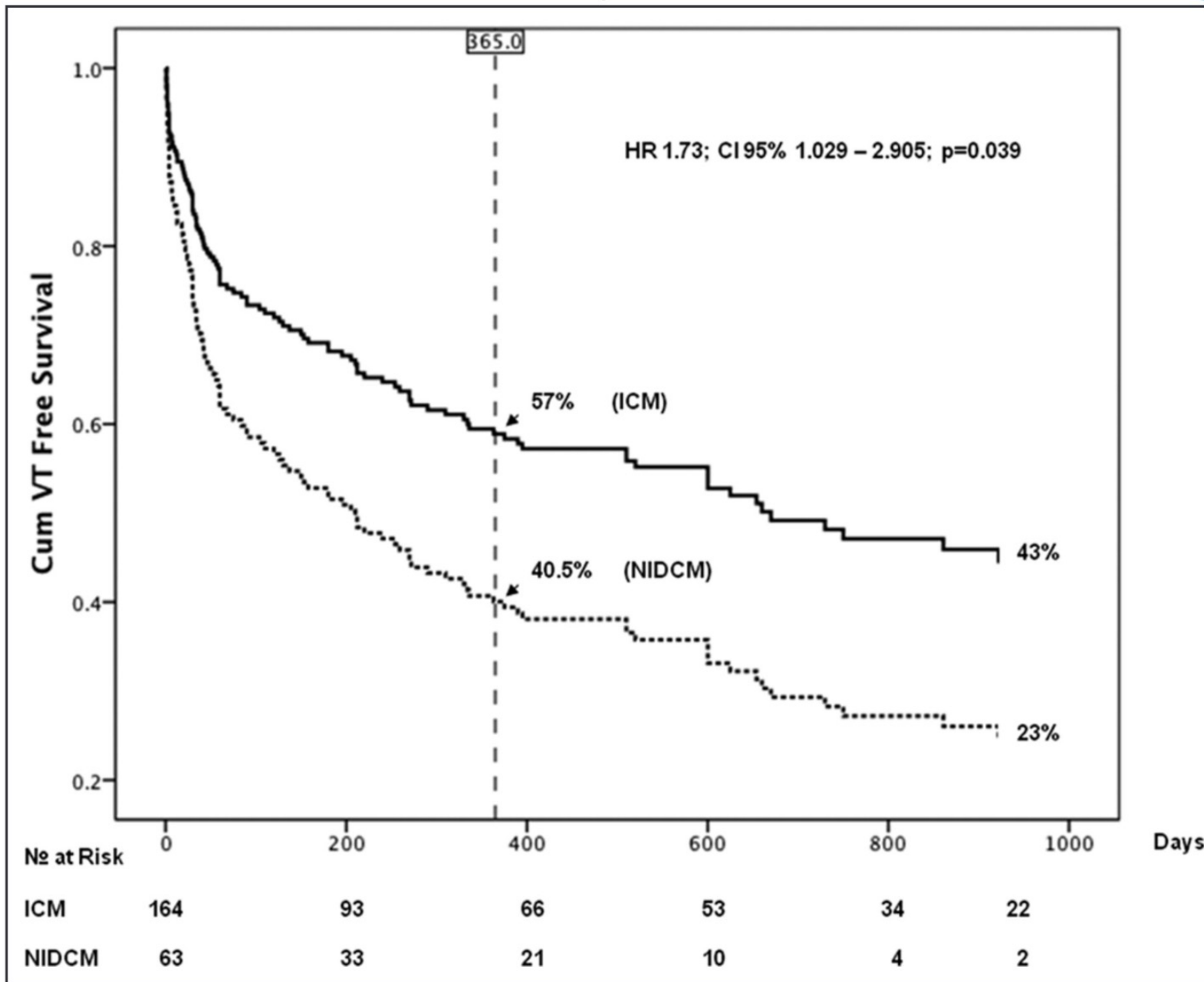
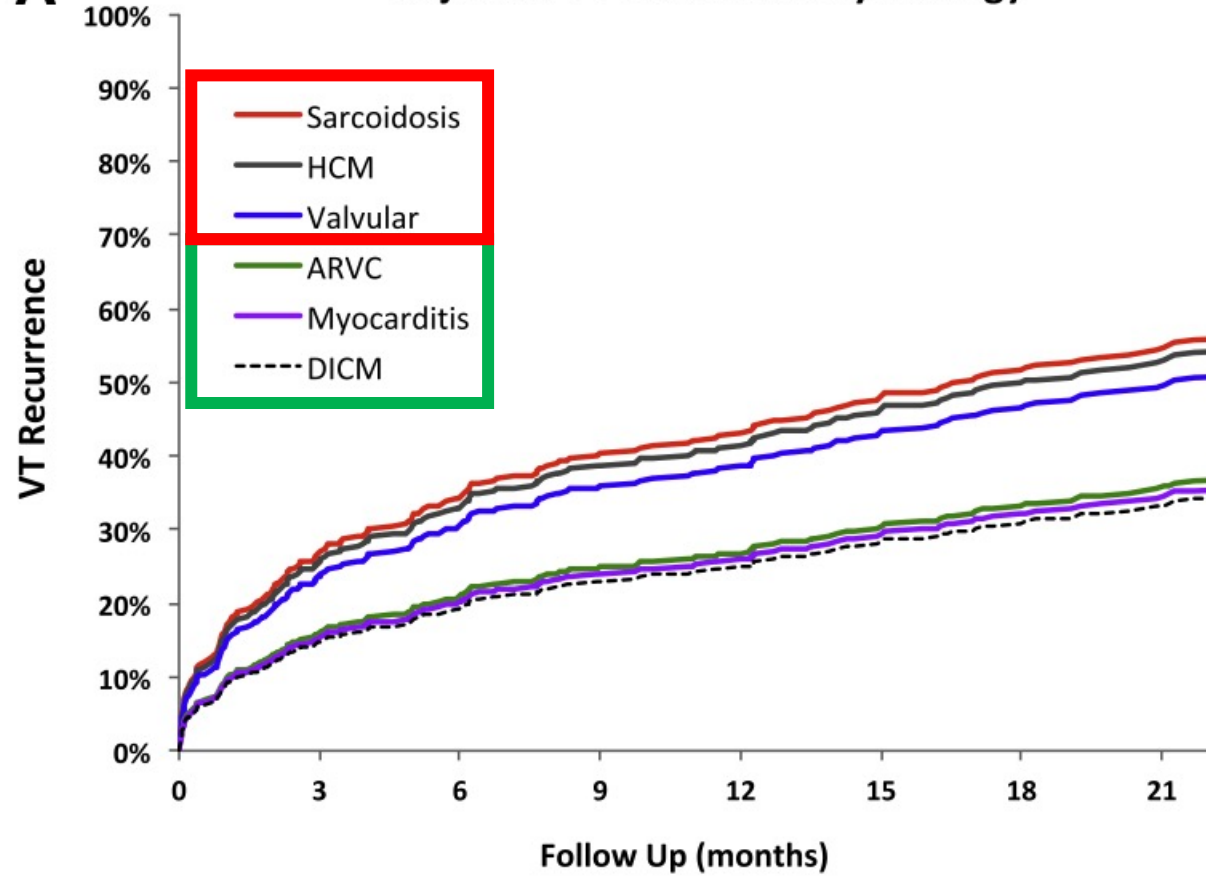


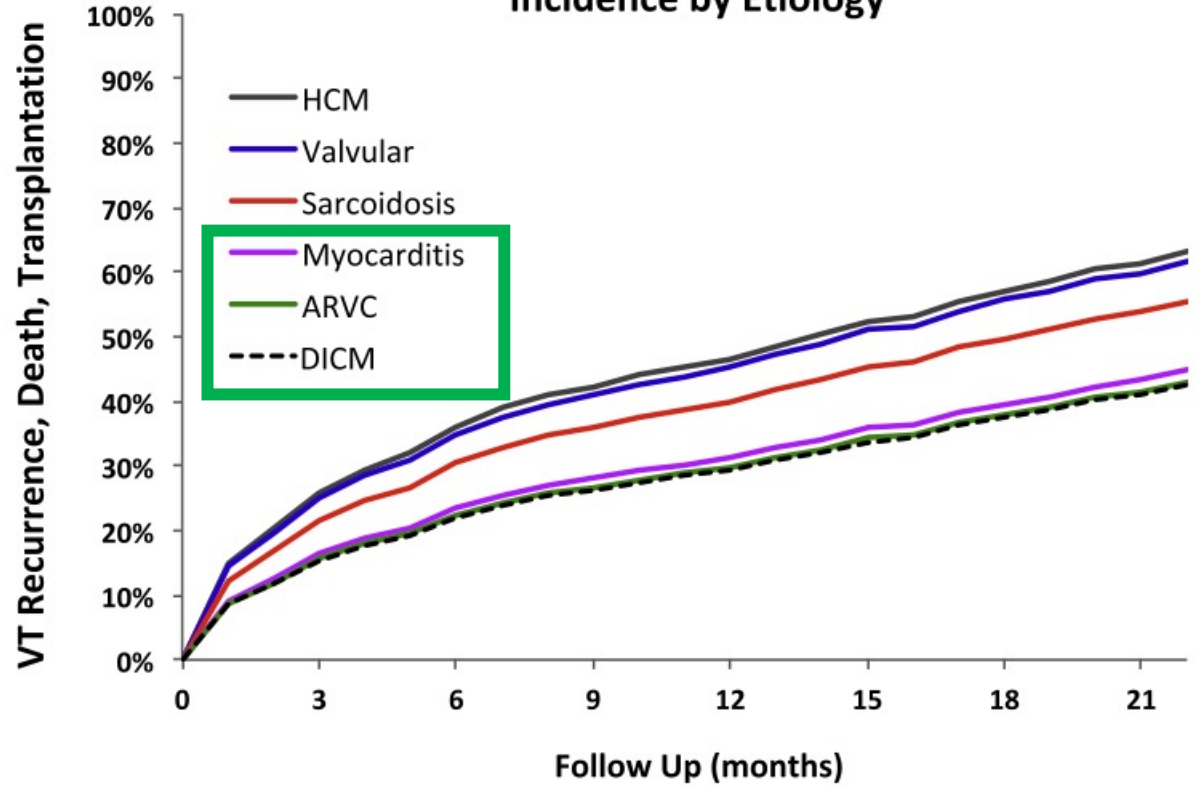
TABLE 1 Patient Characteristics by Etiology

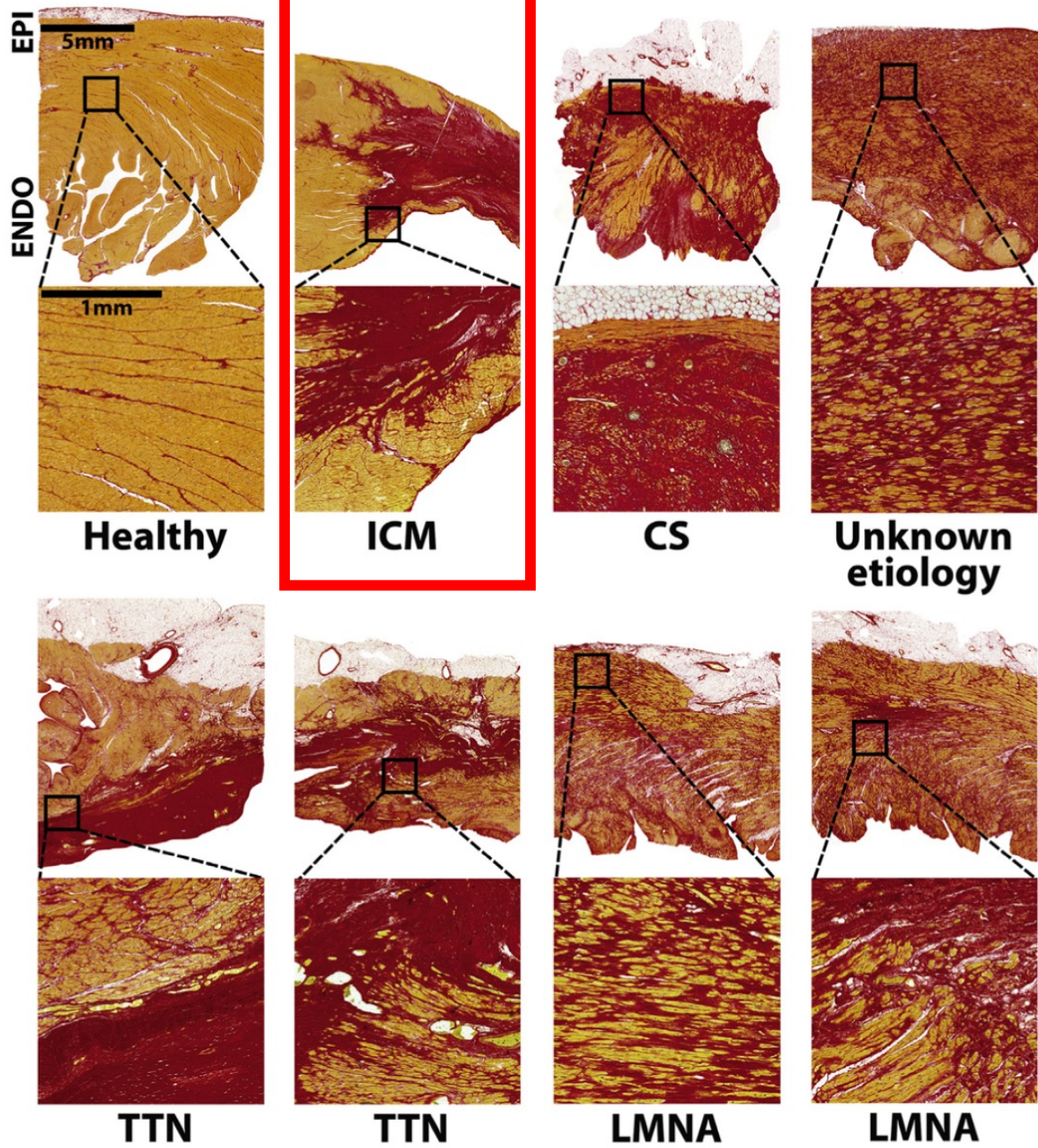
	All (N = 780)	DICM (n = 518)	ARVC (n = 100)	Valvular (n = 50)	Myocarditis (n = 50)	HCM (n = 35)	Sarcoidosis (n = 27)	p Value
Age, yrs	57 ± 14	60 ± 13	46 ± 16	65 ± 11	50 ± 15	59 ± 12	50 ± 11	<0.01
Female	18	18	22	16	14	11	30	0.40
LVEF, %	37 ± 13	33 ± 13	53 ± 11	31 ± 13	43 ± 16	41 ± 17	39 ± 15	<0.01
NYHA functional class								<0.01
I	40	31	73	30	62	44	48	
II	34	35	24	40	22	35	48	
III	21	27	2	26	14	15	4	
IV	1%	7	1	4	2	6	0	
HTN	39	44	17	40	24	37	30	<0.01
DMII	14	16	2	16	6	20	15	<0.01
CKD	23	27	4	30	10	29	11	<0.01
VT storm	34	37	24	46	20	29	22	0.01
≥2 AADs	13	14	9	16	6	17	7.4	0.38
Prior VT ablation	45	42	63	38	46	50	48	<0.01

A Adjusted VT Recurrence by Etiology



B Adjusted VT Recurrence, Death, and Transplantation Incidence by Etiology





Healthy

ICM

CS

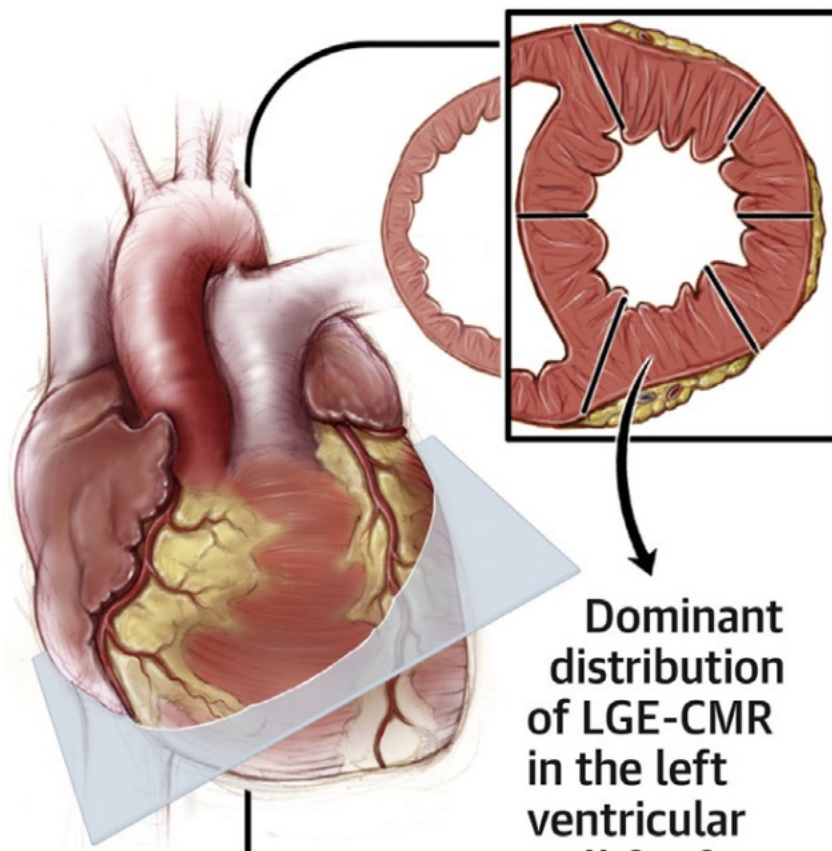
Unknown etiology

TTN

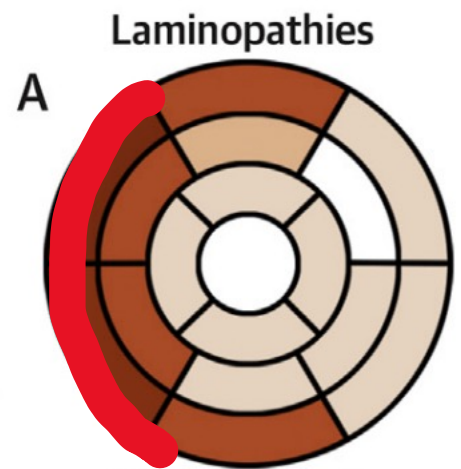
TTN

LMNA

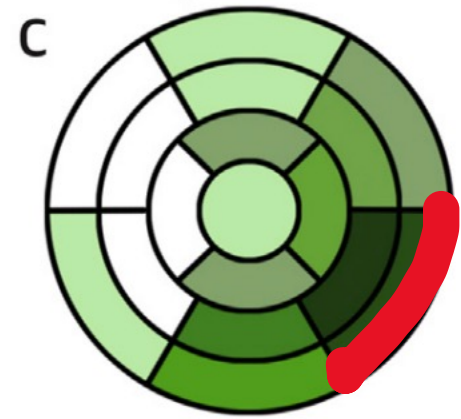
LMNA



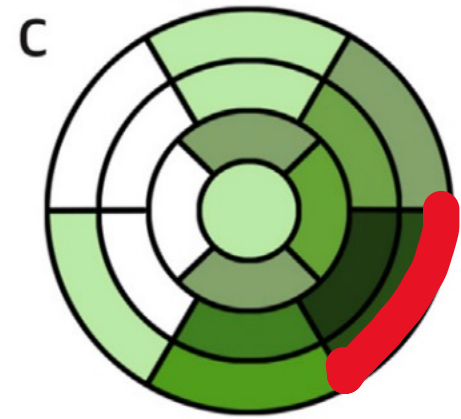
Dominant distribution of LGE-CMR in the left ventricular wall for four different etiologies



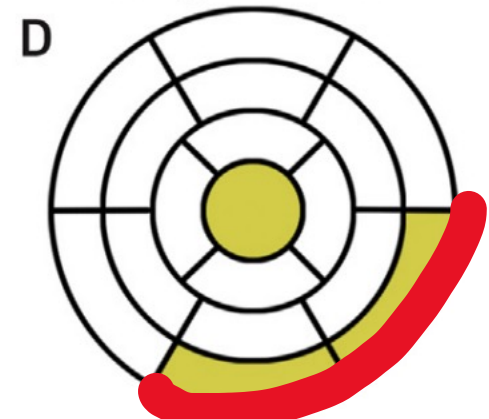
Predominantly Intramural



Predominantly Epicardial > Endocardial



Predominantly Epicardial > Endocardial

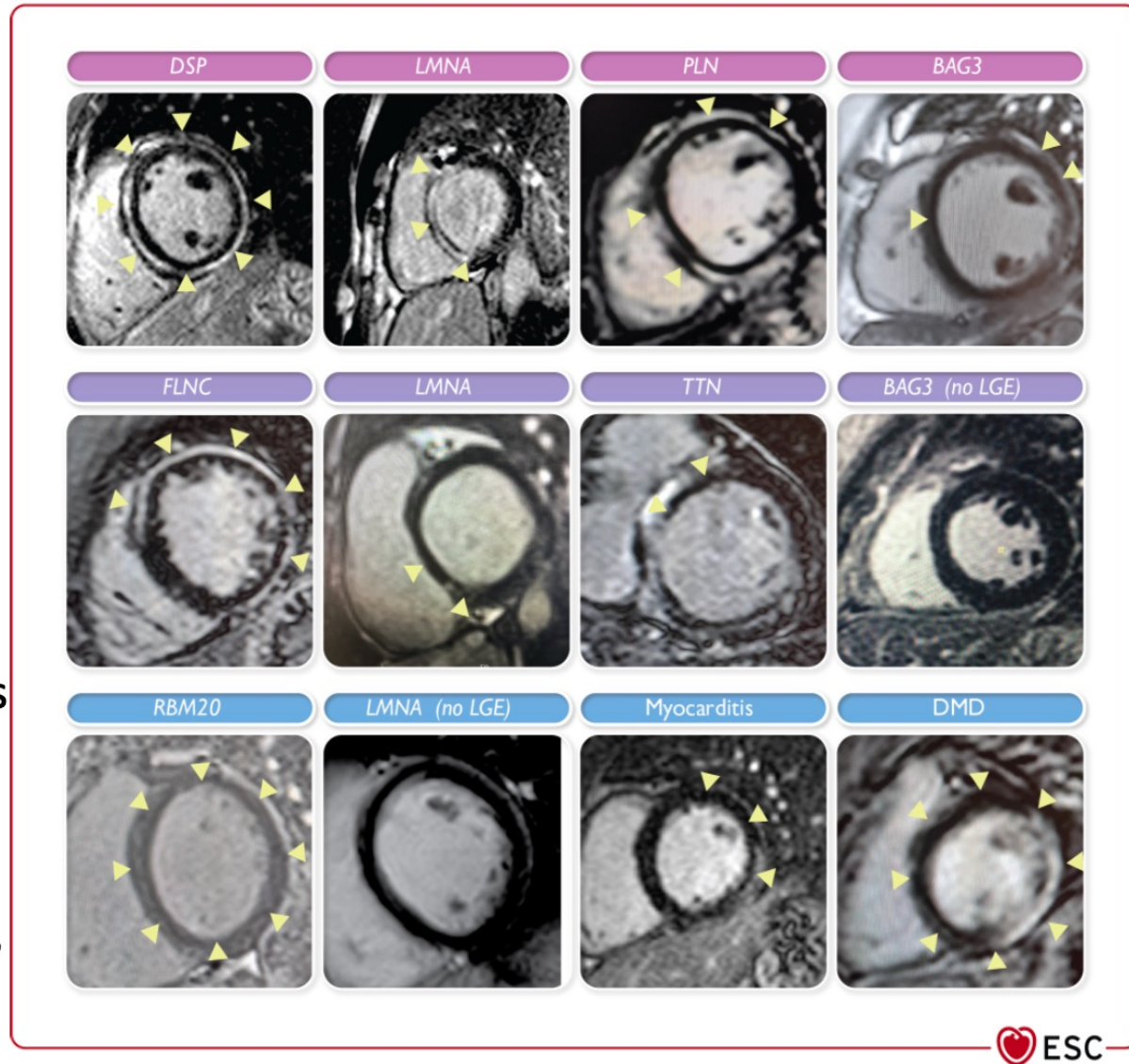


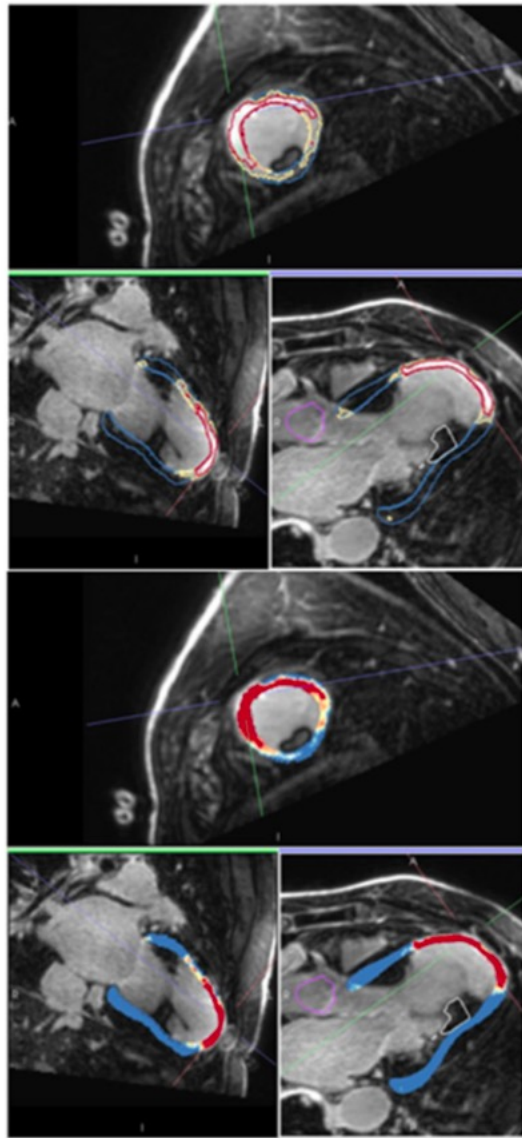
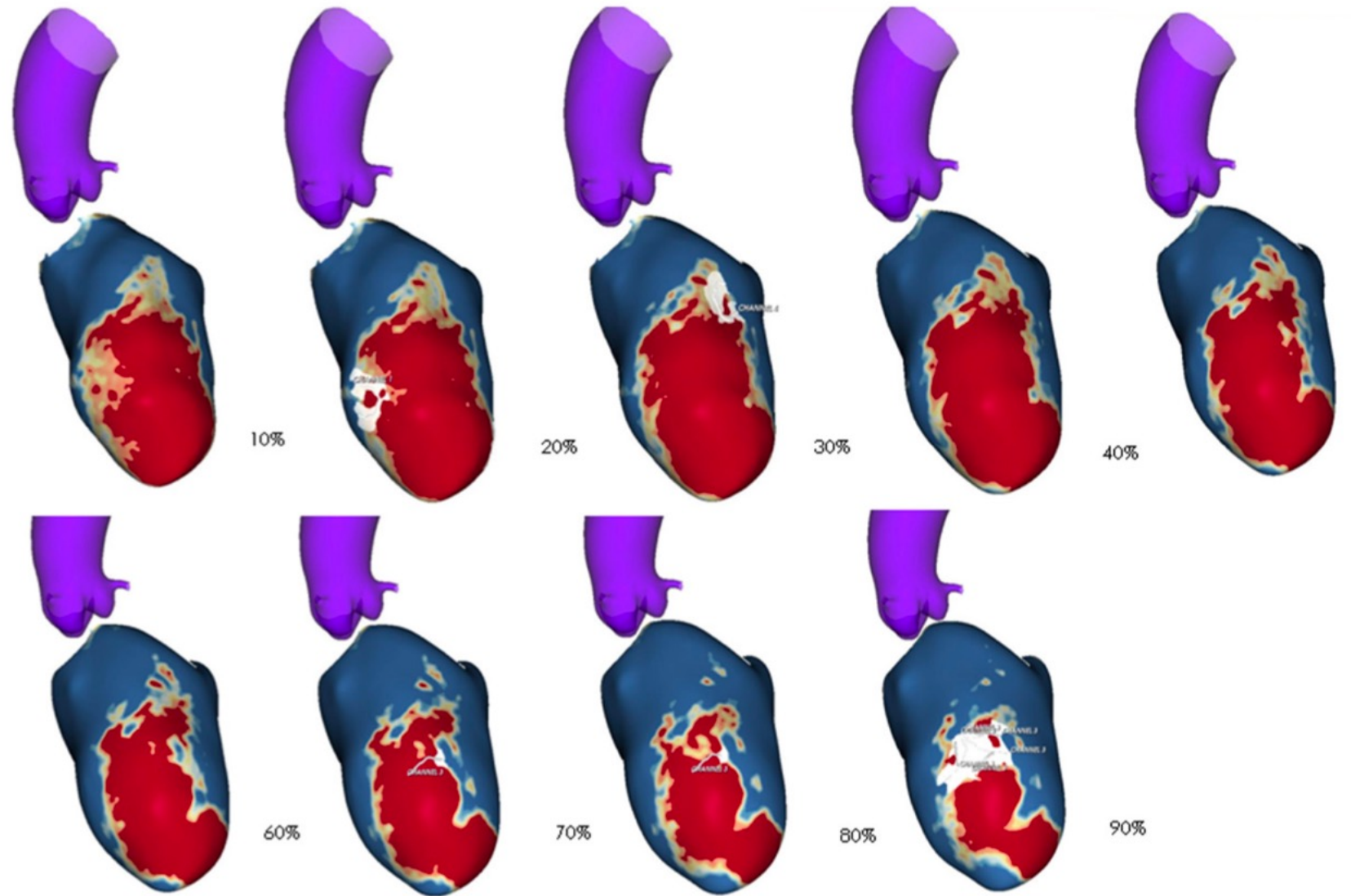
Predominantly Transmural & Epicardial > Endocardial

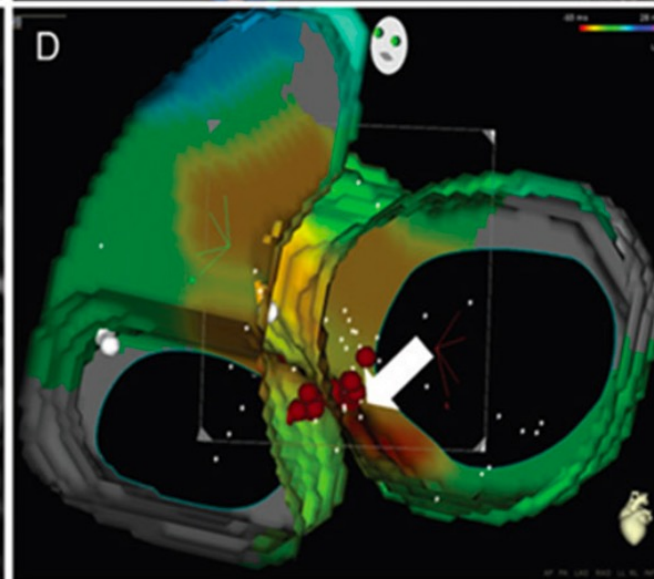
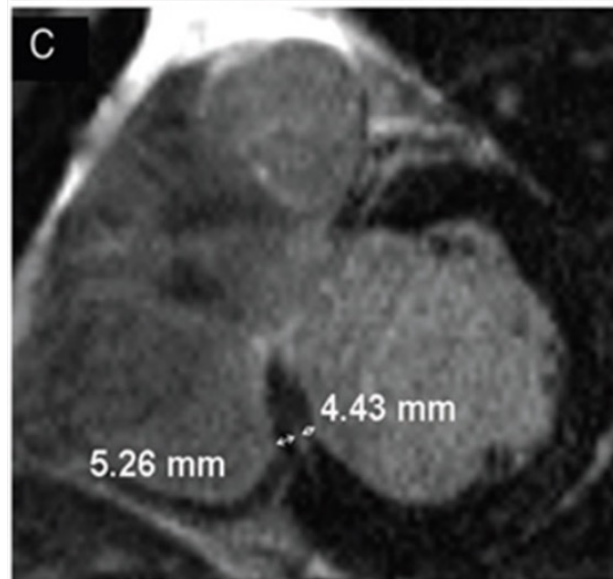
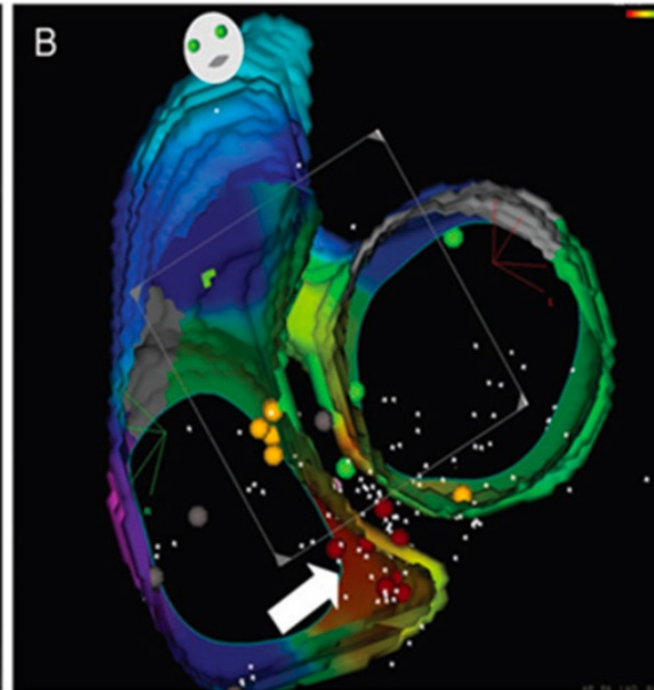
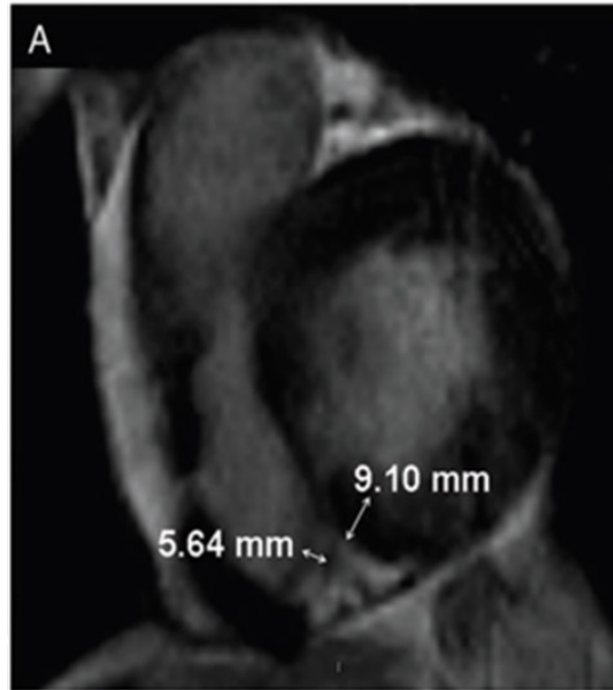
Examples of non-dilated left ventricular cardiomyopathy phenotypes and their aetiological correlates

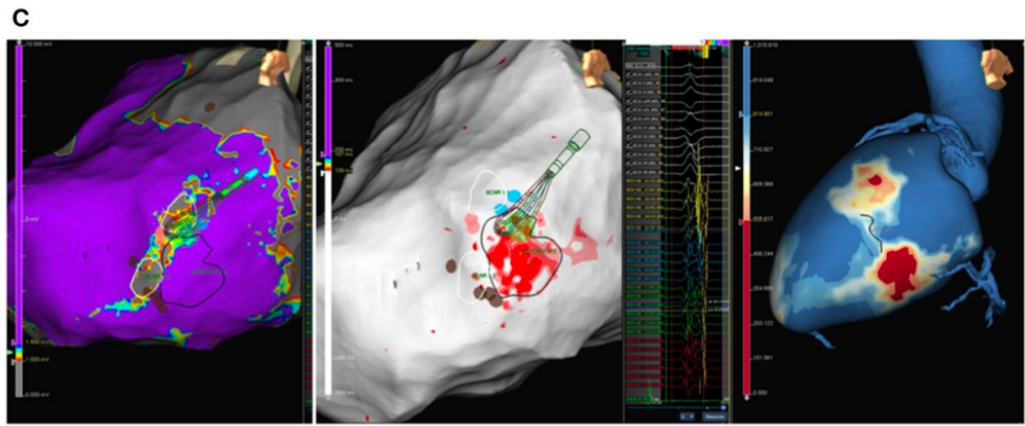
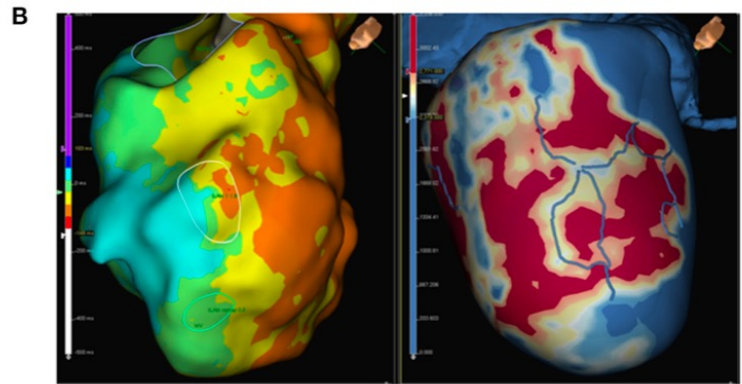
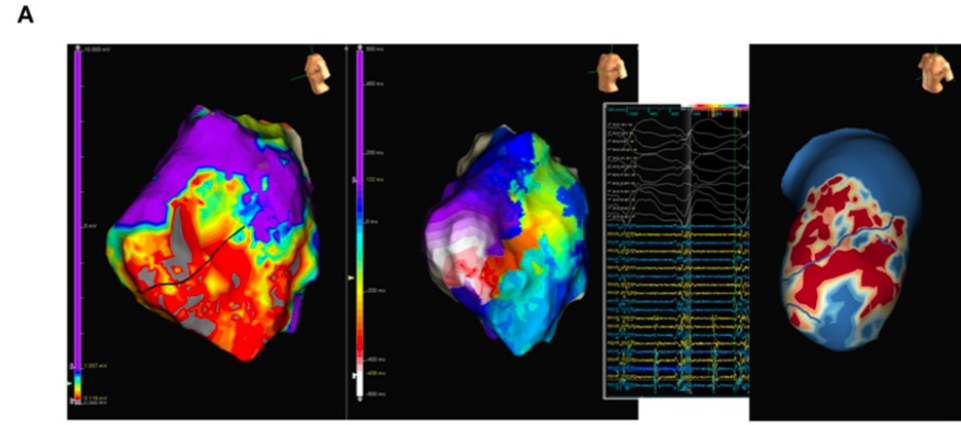
NDLVC phenotype is defined as the presence of **non-ischaemic LV scarring or fatty replacement** regardless of the presence of global or regional WMAs, or **isolated global LV hypokinesia without scarring**.

The NDLVC phenotype will include individuals that up until now may have variably been described as having **DCM** (but without LV dilatation), arrhythmogenic left ventricular cardiomyopathy (**ALVC**), **left-dominant ARVC**, or **arrhythmogenic DCM** (but often without fulfilling diagnostic criteria for ARVC)



A**B**





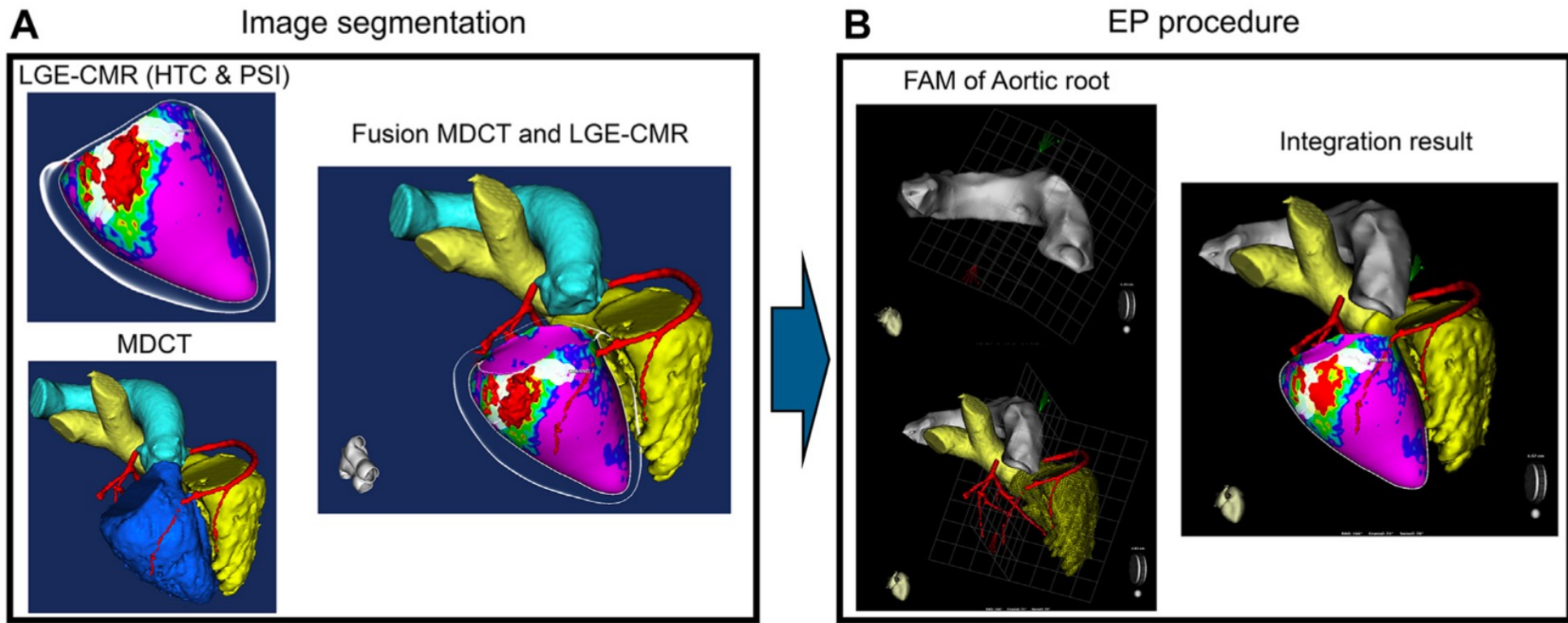
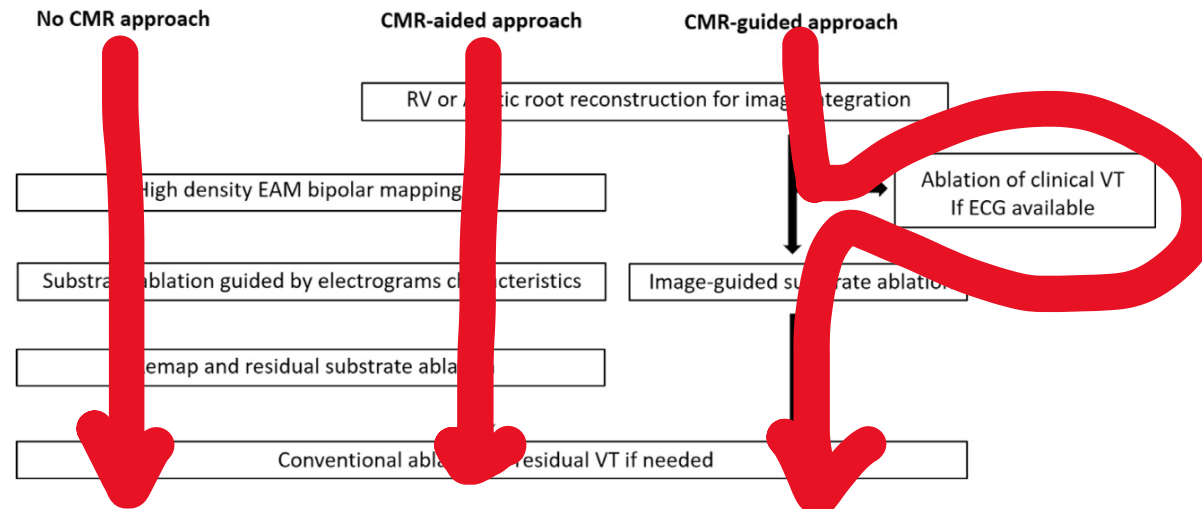
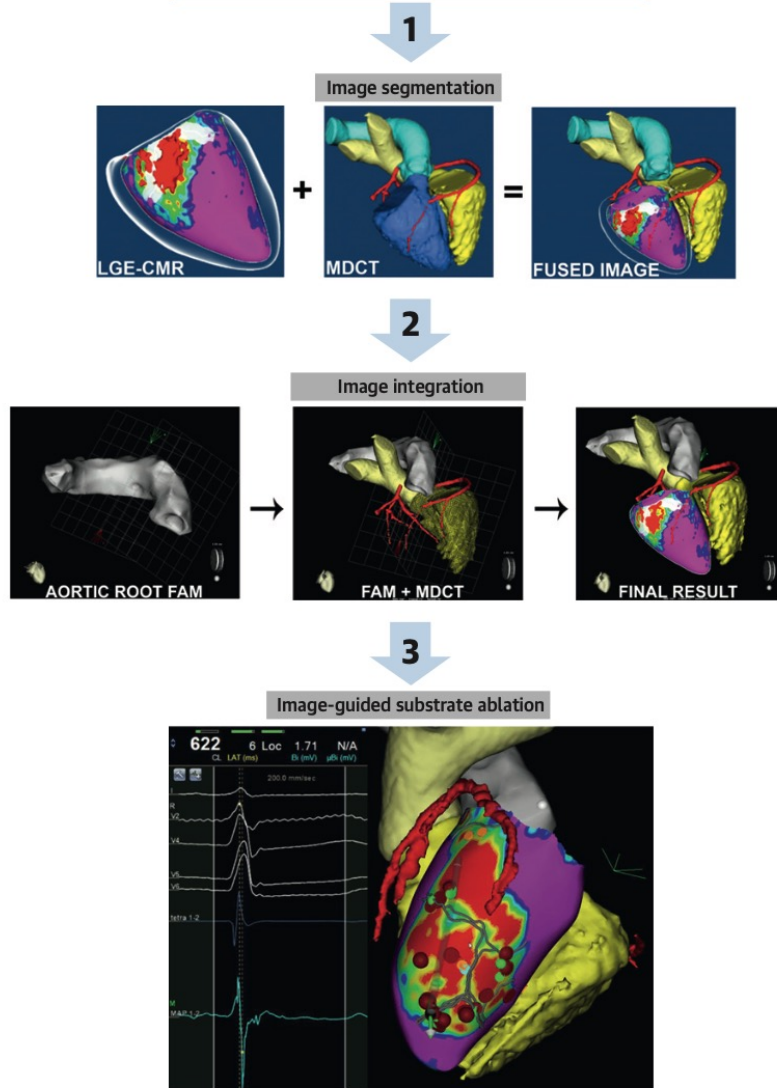


FIGURE 1 Summarizing Workflow

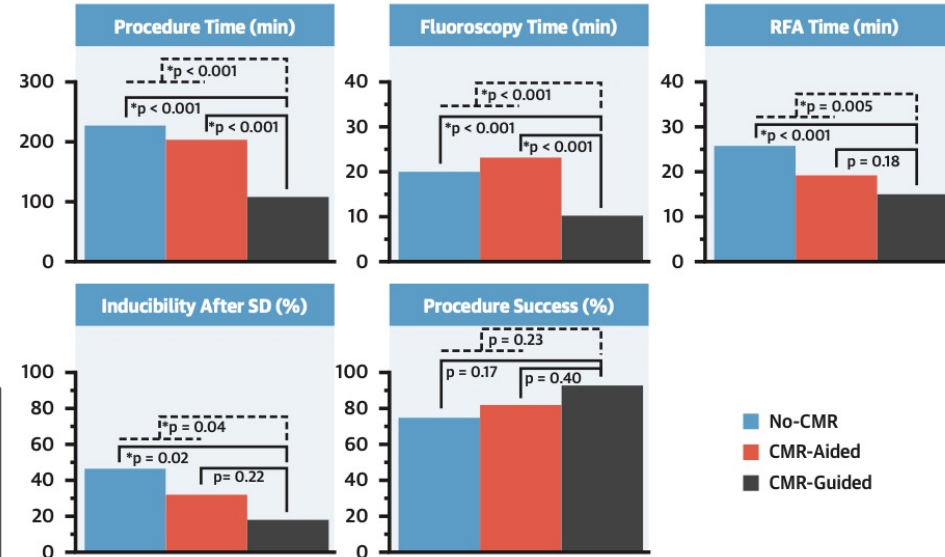


CMR-GUIDED VT SUBSTRATE ABLATION

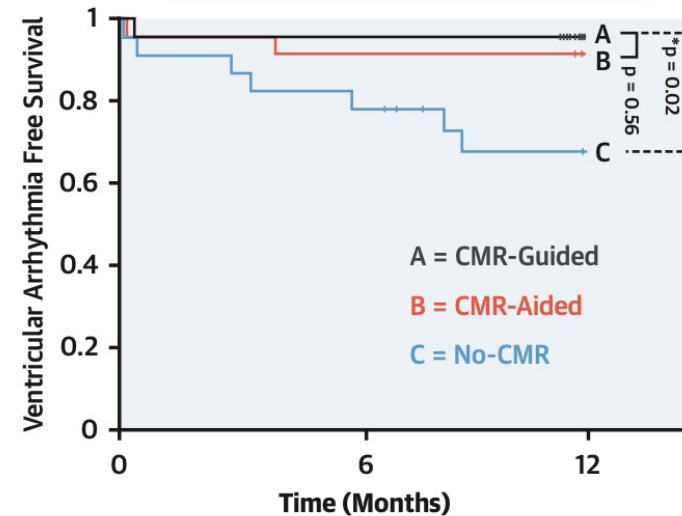
A. PROCEDURE WORKFLOW



B. ACUTE OUTCOMES



C. LONG-TERM OUTCOMES



%82 iskemik KMP

12 derivasyon EKG

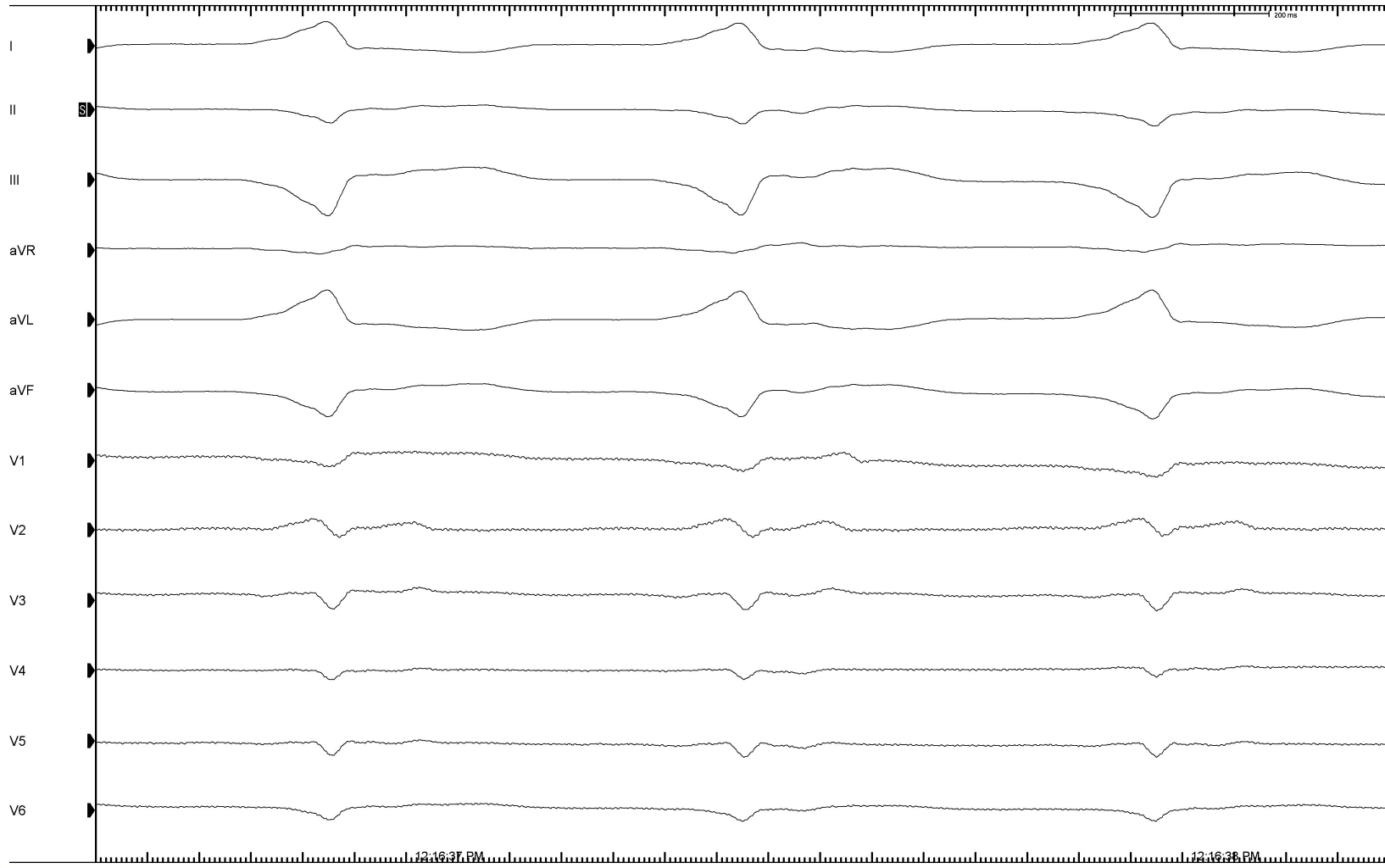
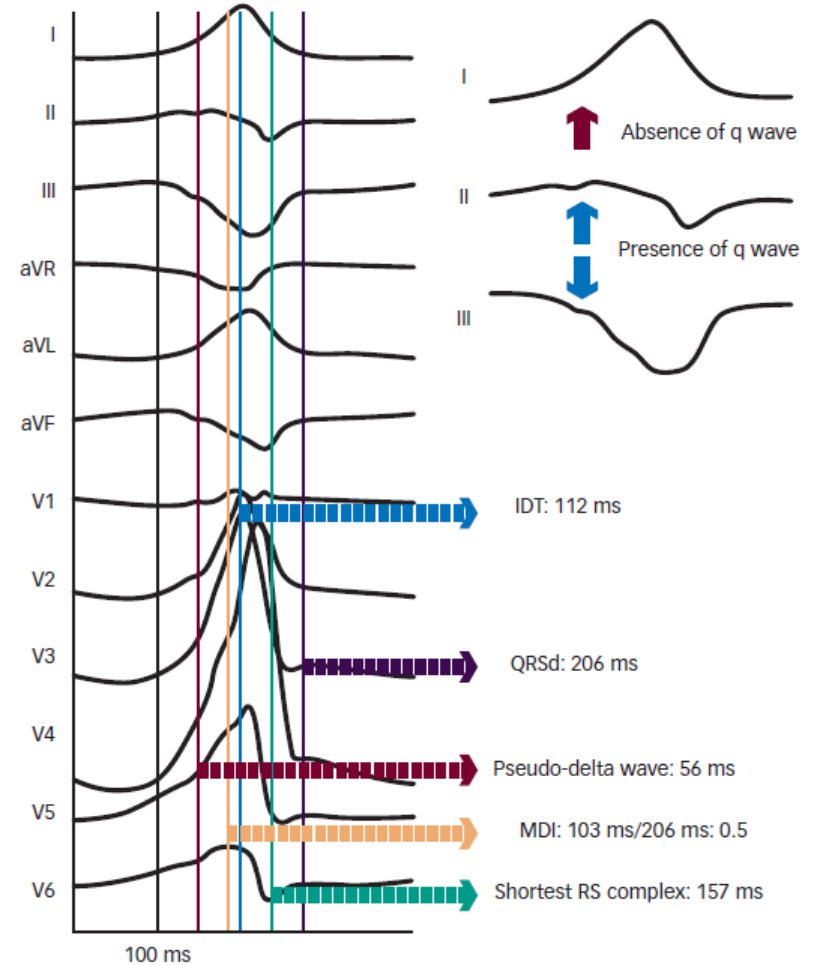


Figure 1: 12-lead Electrocardiogram of a Ventricular Tachycardia Demonstrating Interval and Morphology Criteria



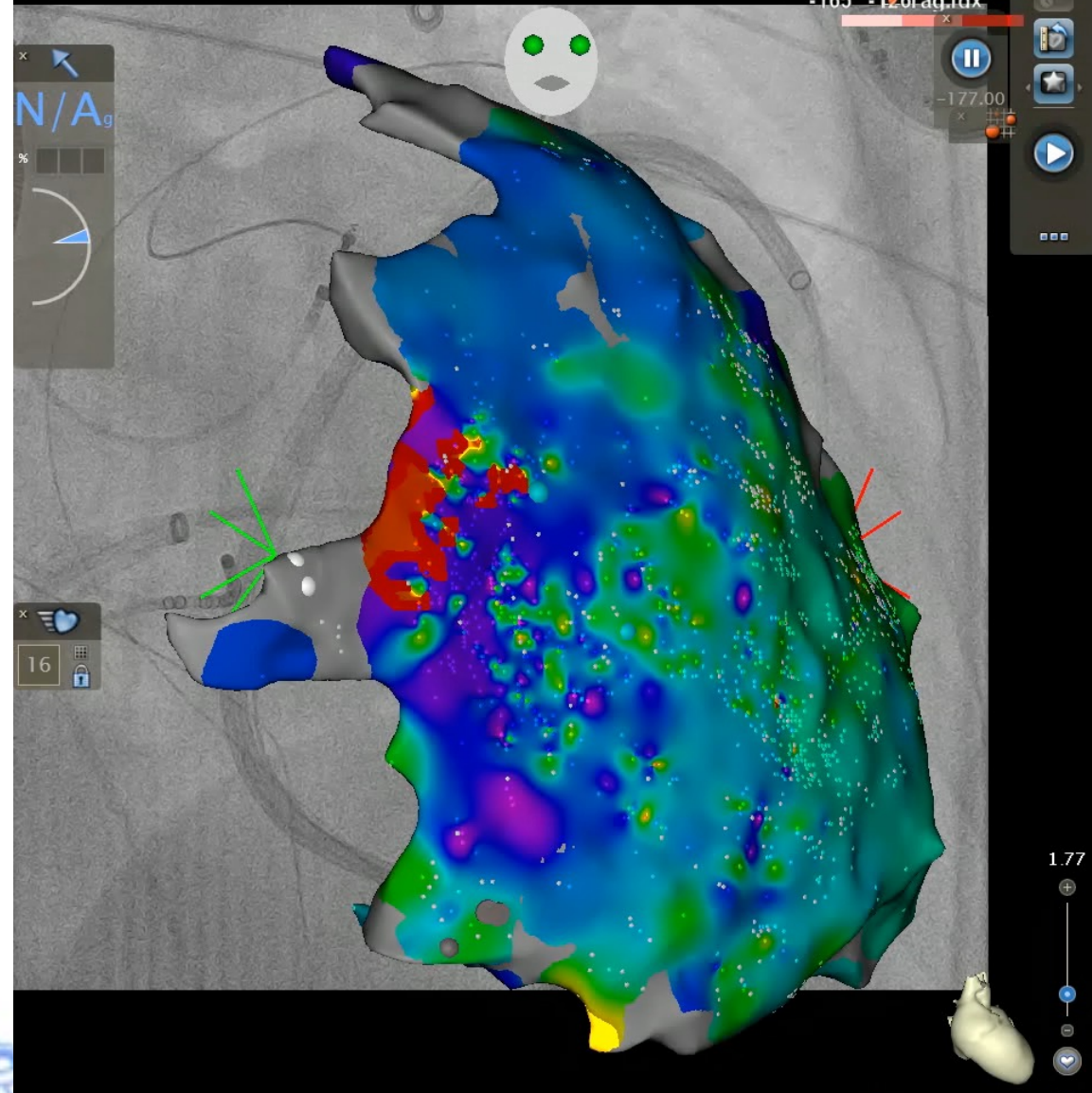
IDT = Intrinsicoid deflection time; MDI = Maximum deflection index; QRSd = QRS duration.
For explanation of interval criteria see Table 1. Adapted with permission from Valles et al.¹⁴

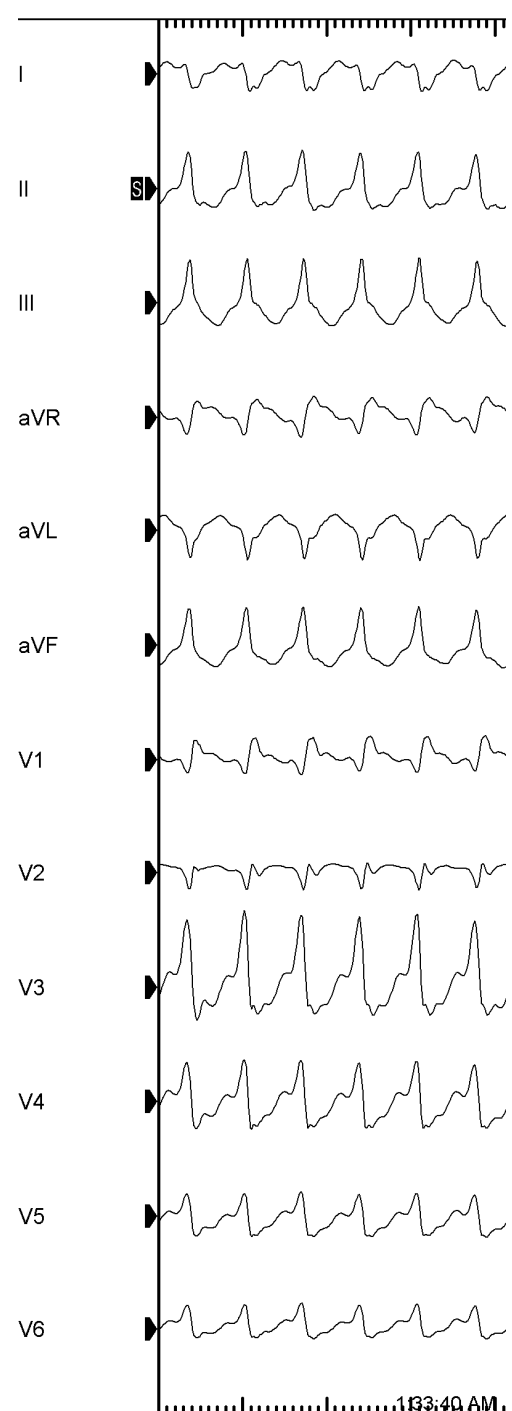
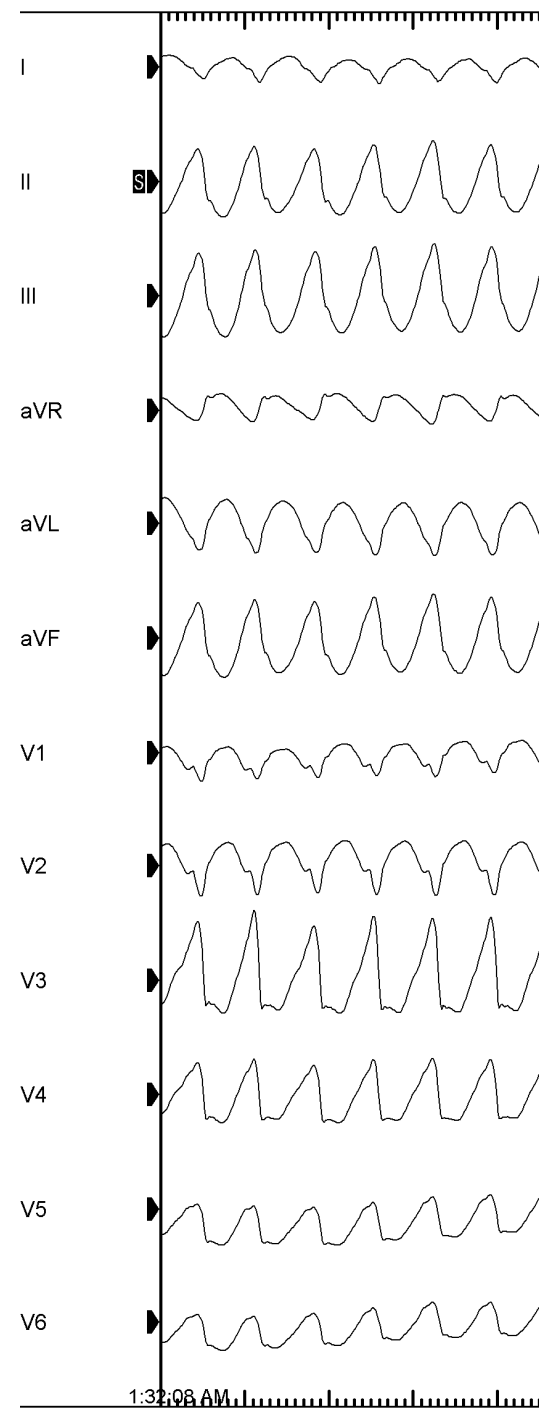
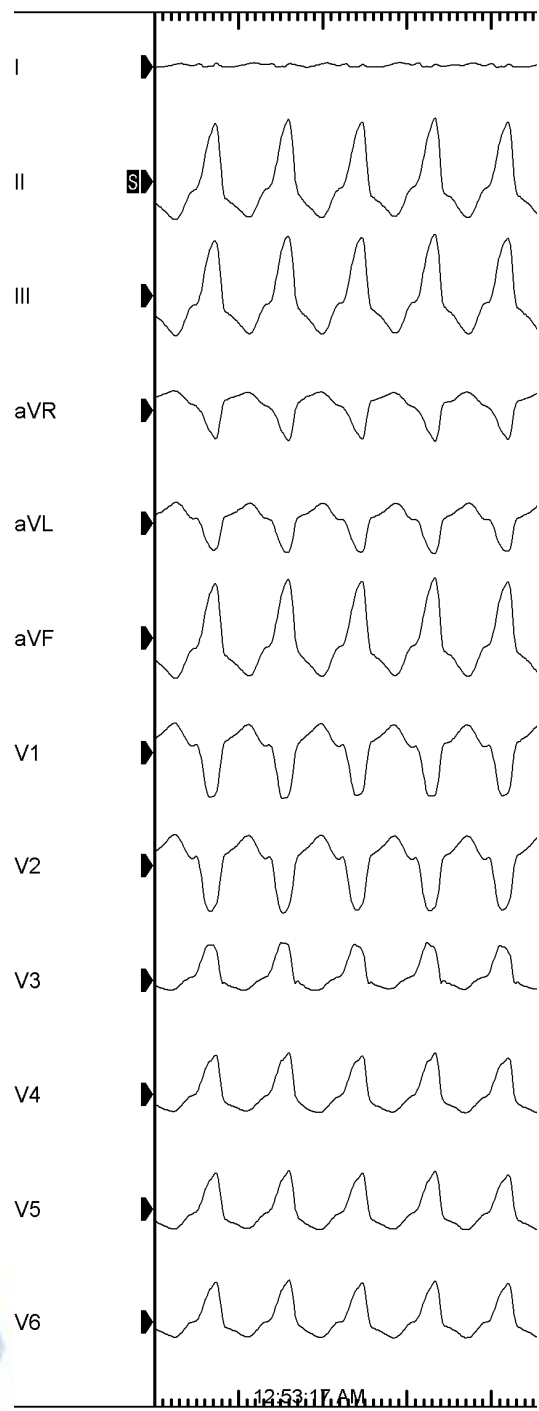
2-epi_rv_sinus (2929, 0) v

-194 ms LAT 20x
-165 -126 Tag.Idx

2-epi_rv_sinus (2929, 0) v

0.20 mV Bi 1.00x
Tag.Idx





63 yaş erkek

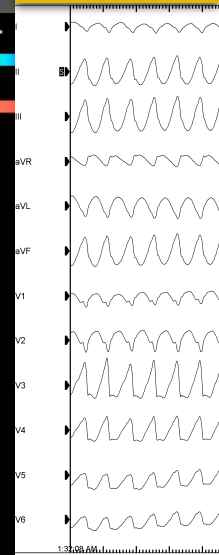
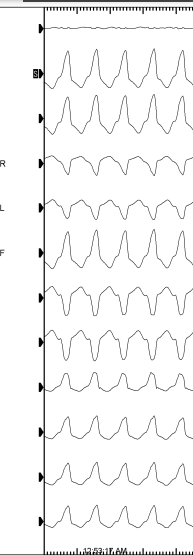
Noniskemik KMP

EF %35 Global Hipokinezi

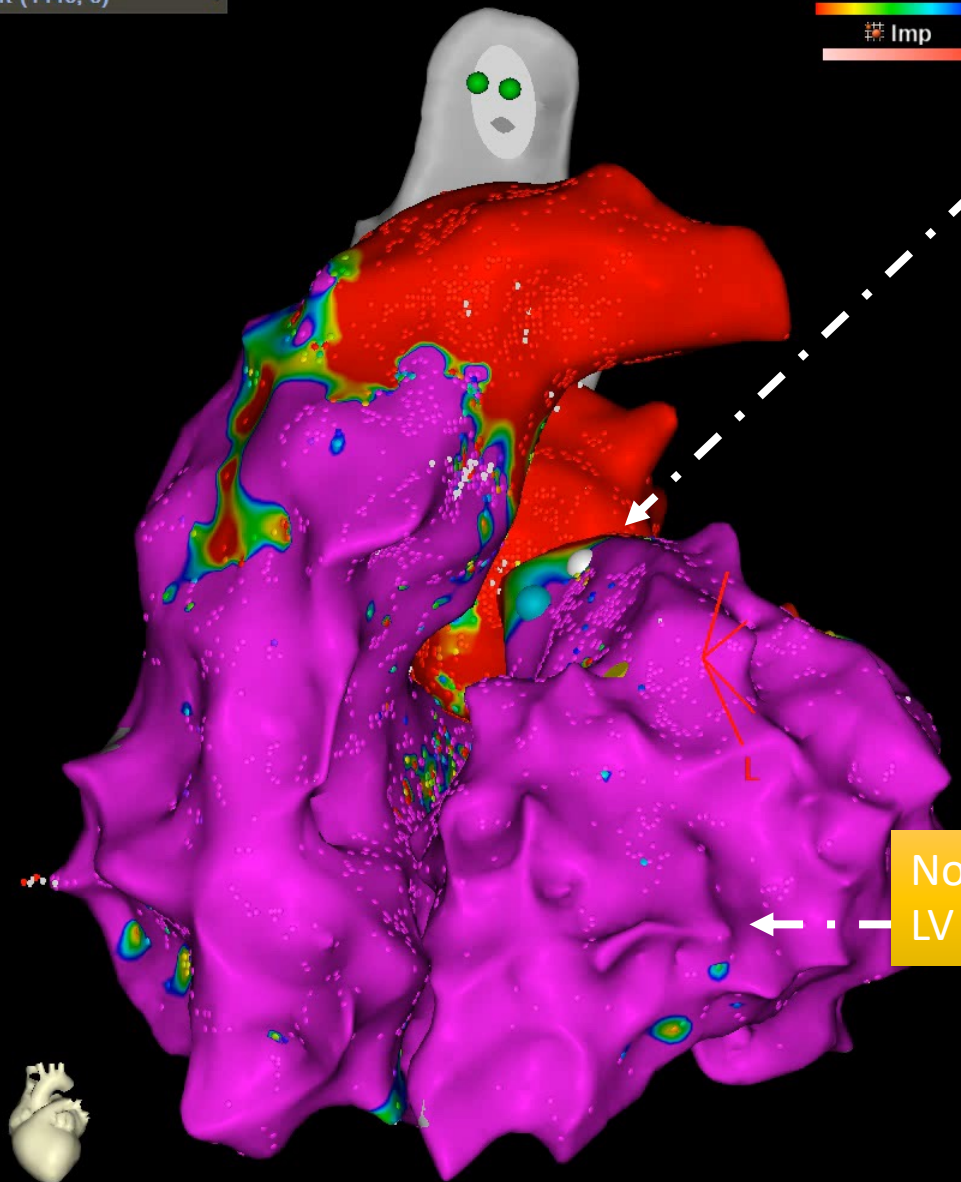
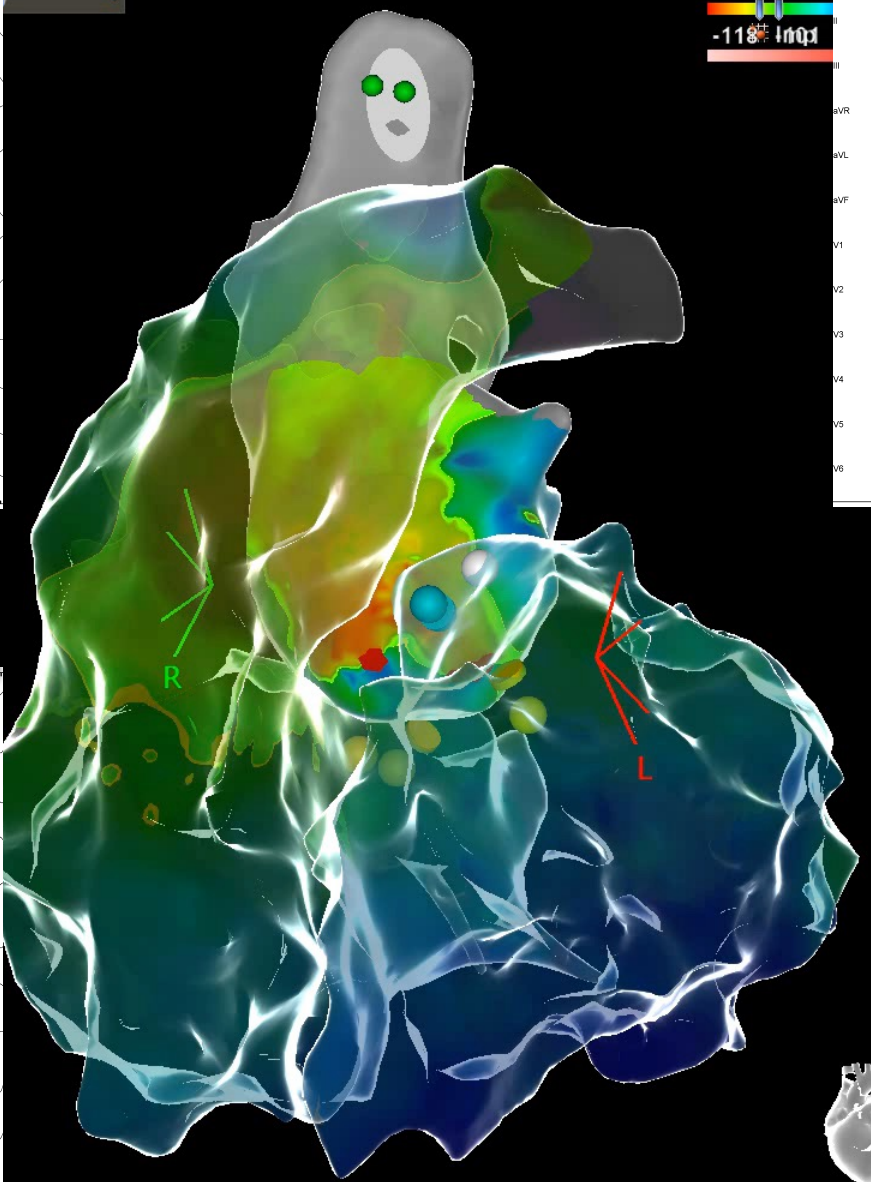


VT - 1

VT - 2



VT - 3



Periaortic scar

No scar RV & LV

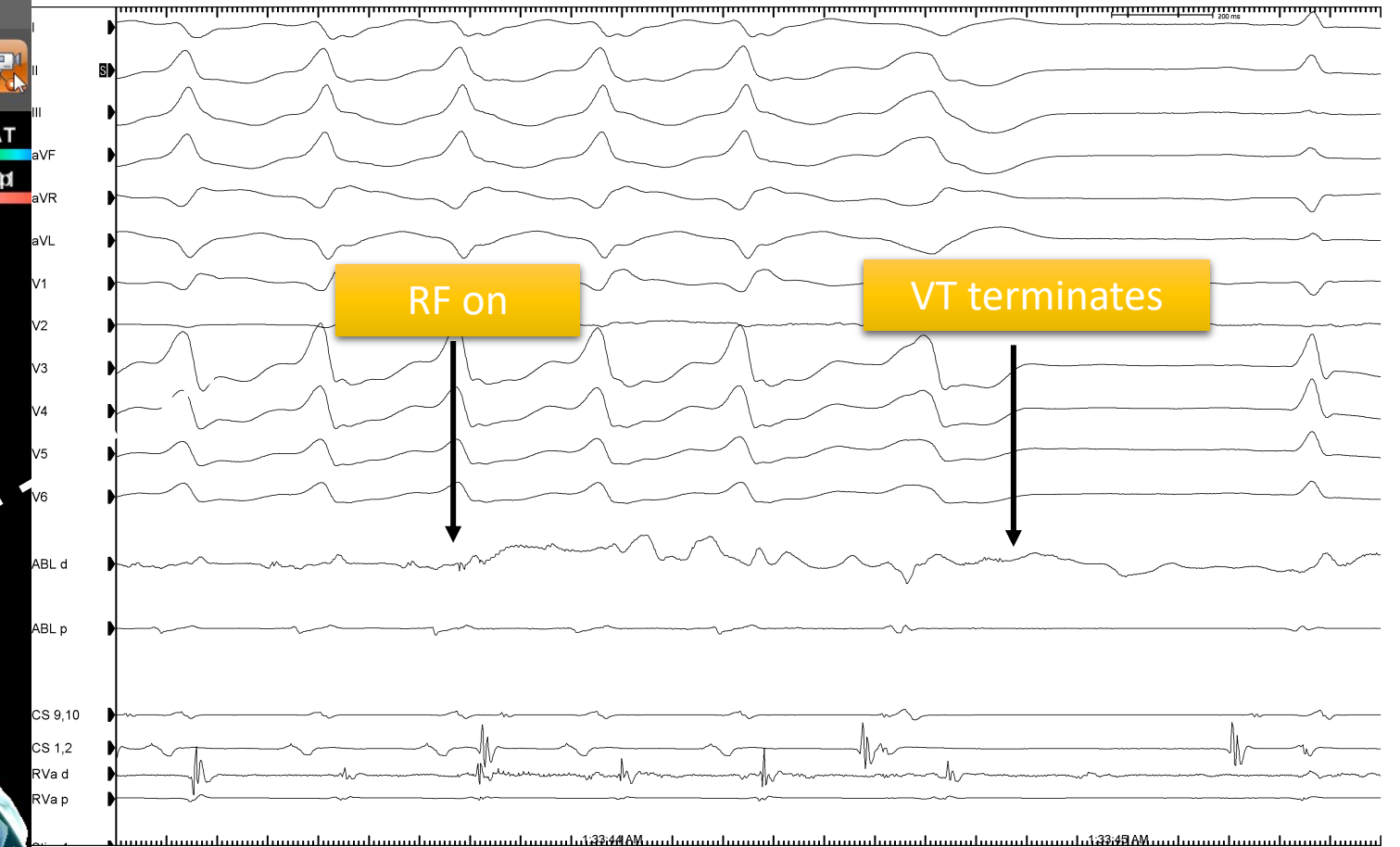
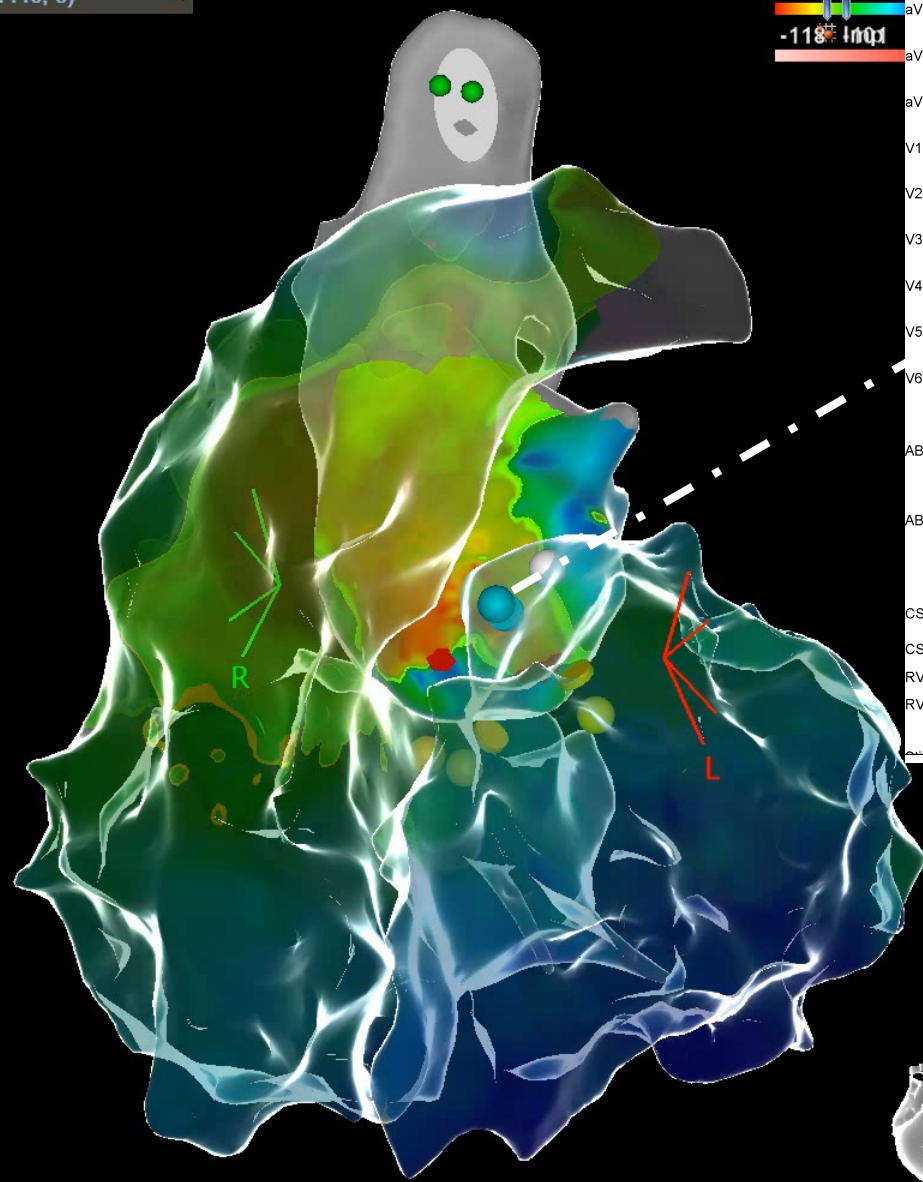
59% 0%
 AP PA LAO RAO LL RL INF SUP

Sync



3-left (1446, 0)

-165 ms LAT
-118 ms

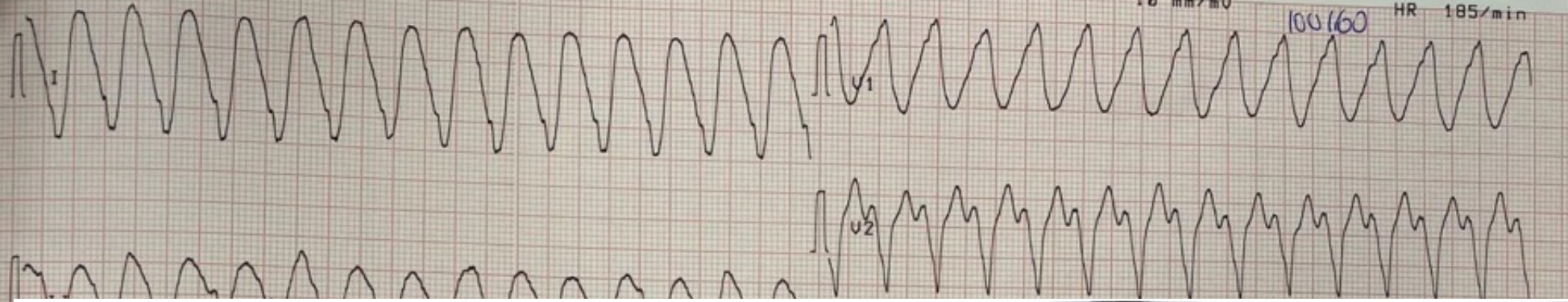


18

1.21

59%

AP PA LAO RAO LL RL INF SUP



51y, M

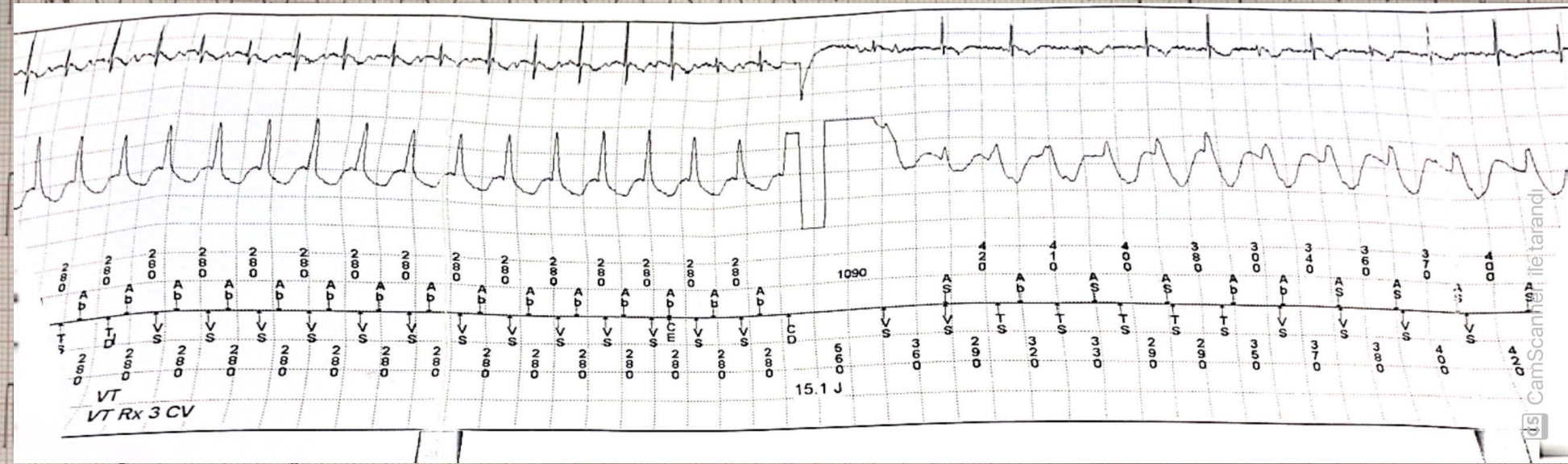
Electrical storm

2016-KAG: N

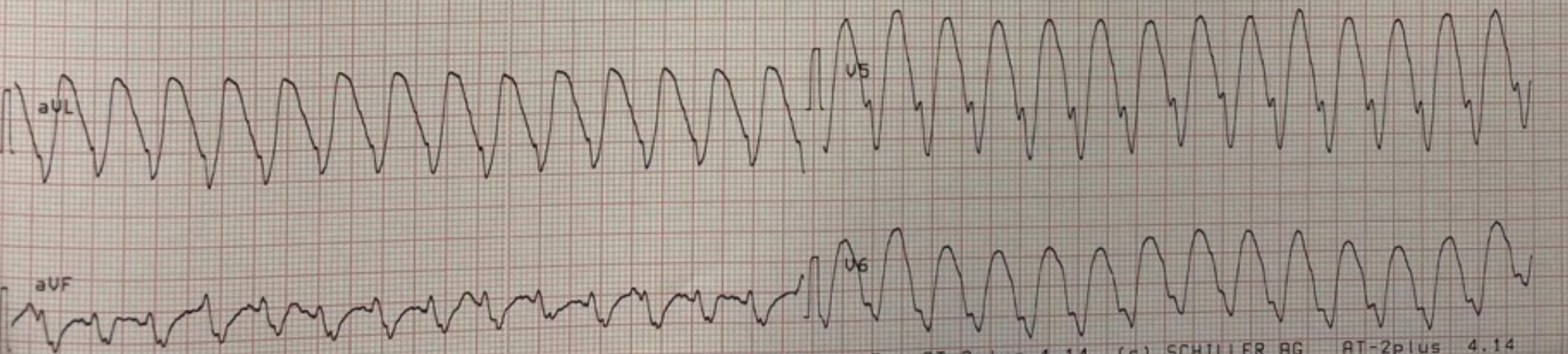
2018-CRT-D

2020 – AFL Abl

2021-Mitraclip



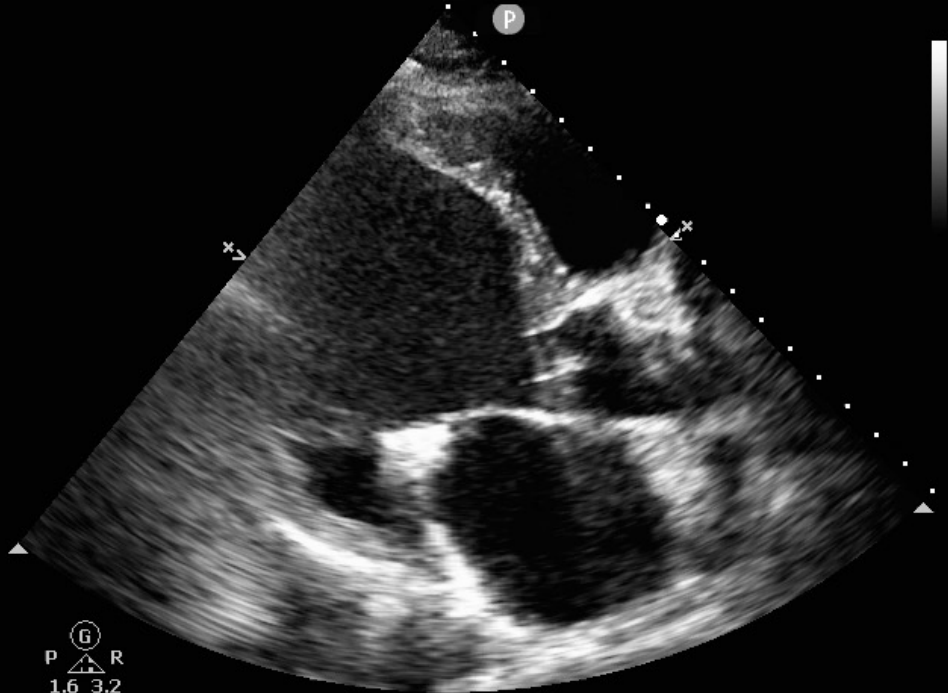
Thyrotoxicosis due to
amiodarone



PHILIPS TemporaryID-20230317175004 MI 1.3 3/17/2023
23-03-17-175004 Philips Healthcare TIS 0.4 5:52:00 PM

Adult Echo
S5-1
30 Hz
17.0cm

2D
HGen
Gn 50
C 50
3/2/0
75 mm/s



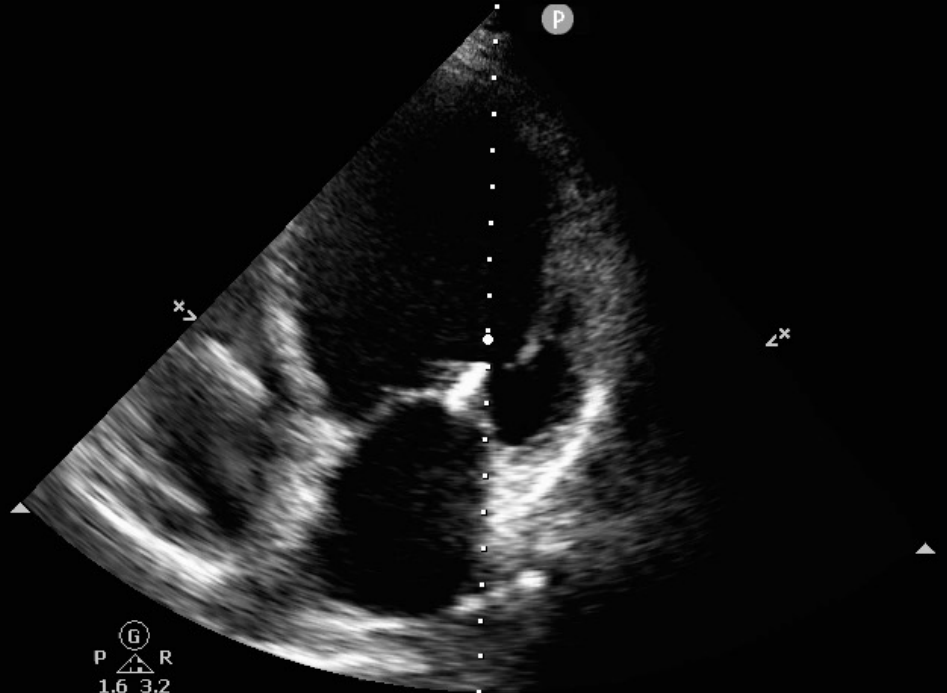
P G R
1.6 3.2

68
BPM

PHILIPS TemporaryID-20230317175004 MI 1.0 3/17/2023
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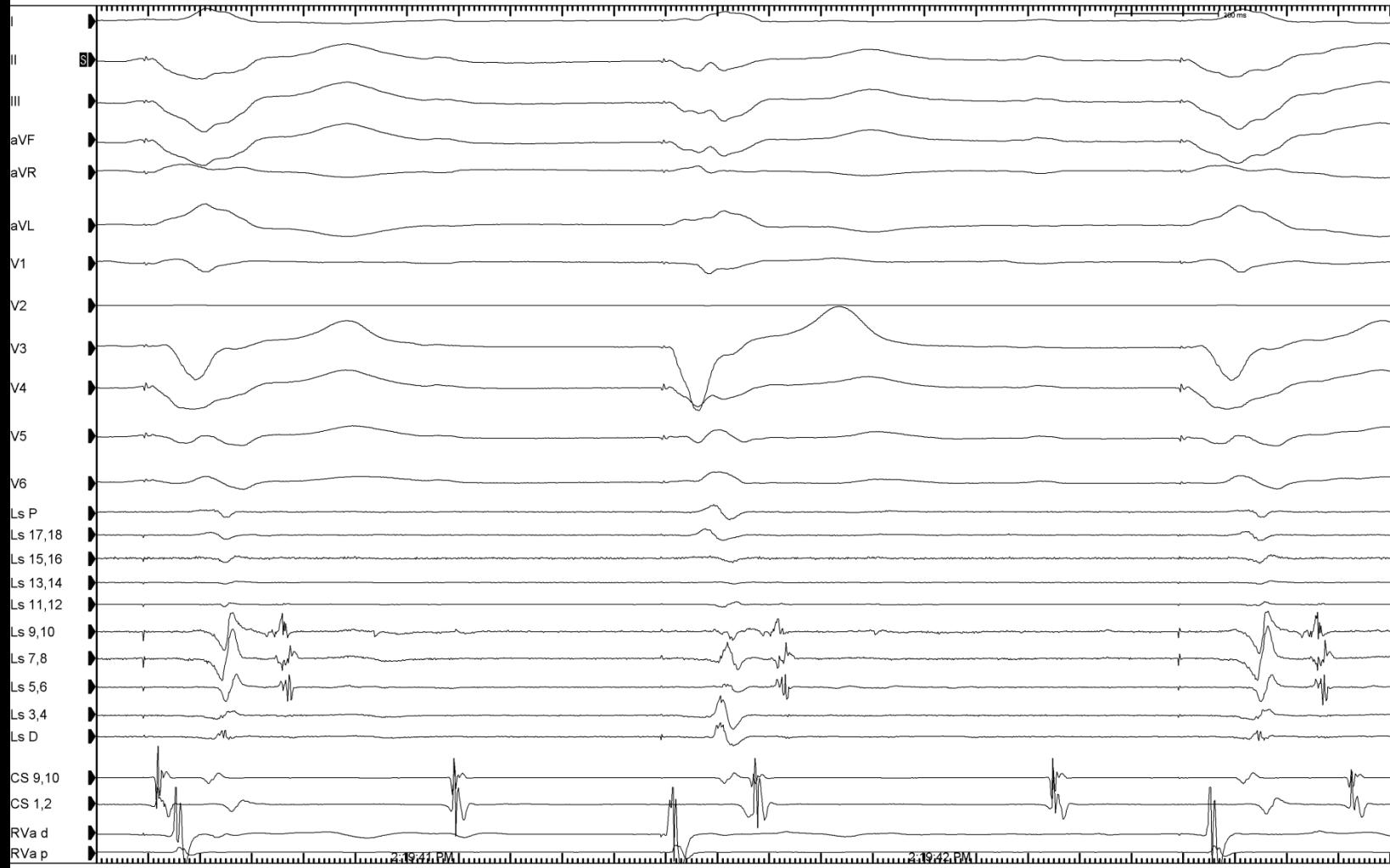
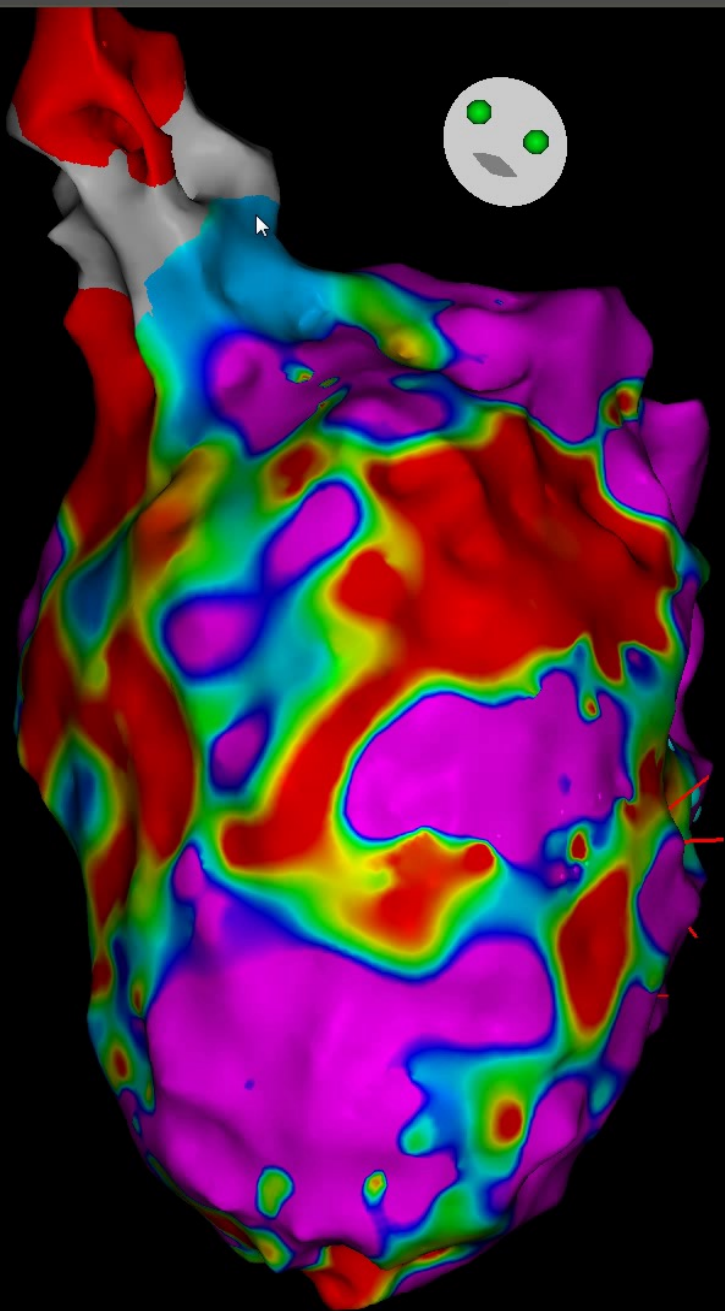
Adult Echo
S5-1
27 Hz
19.0cm

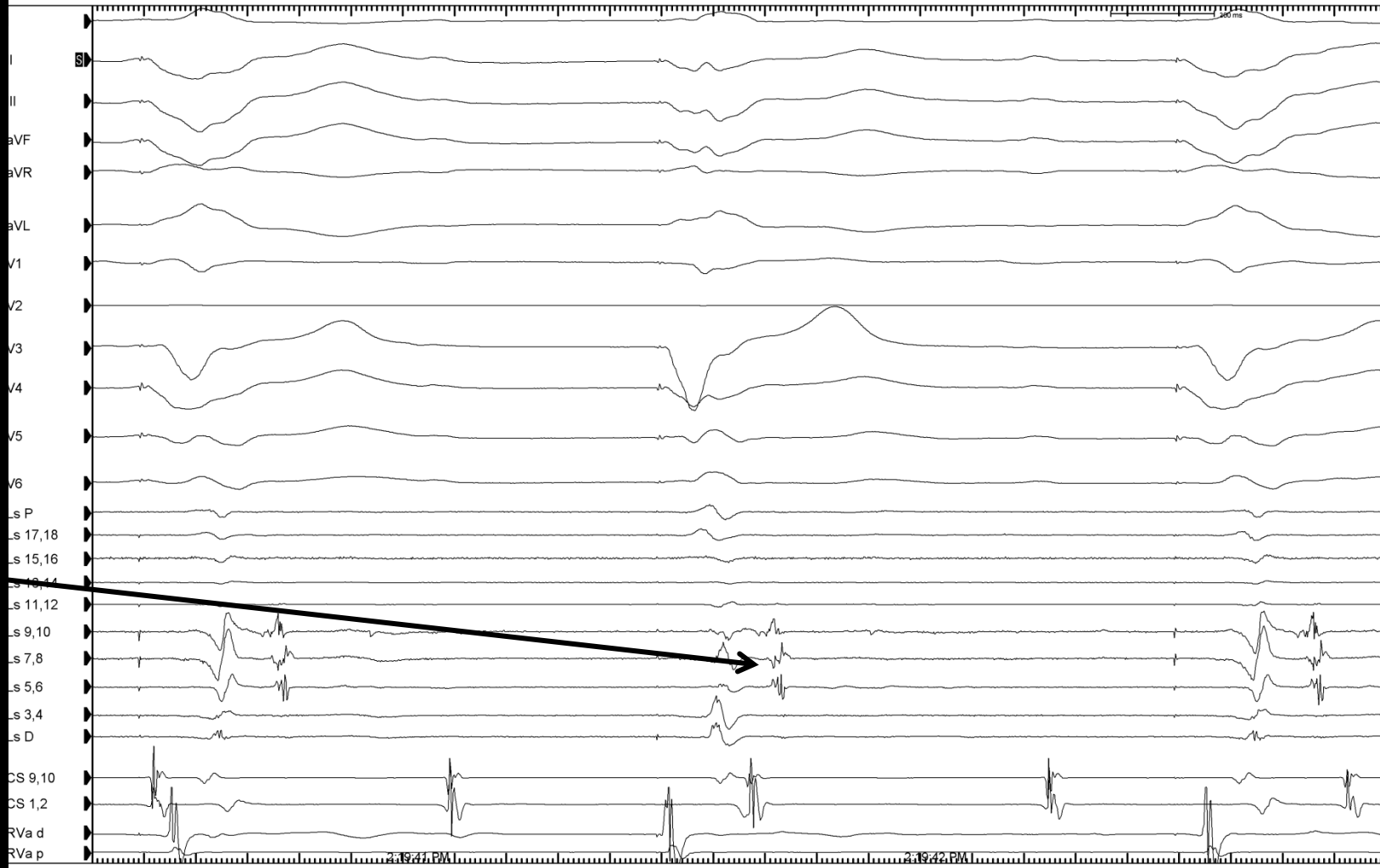
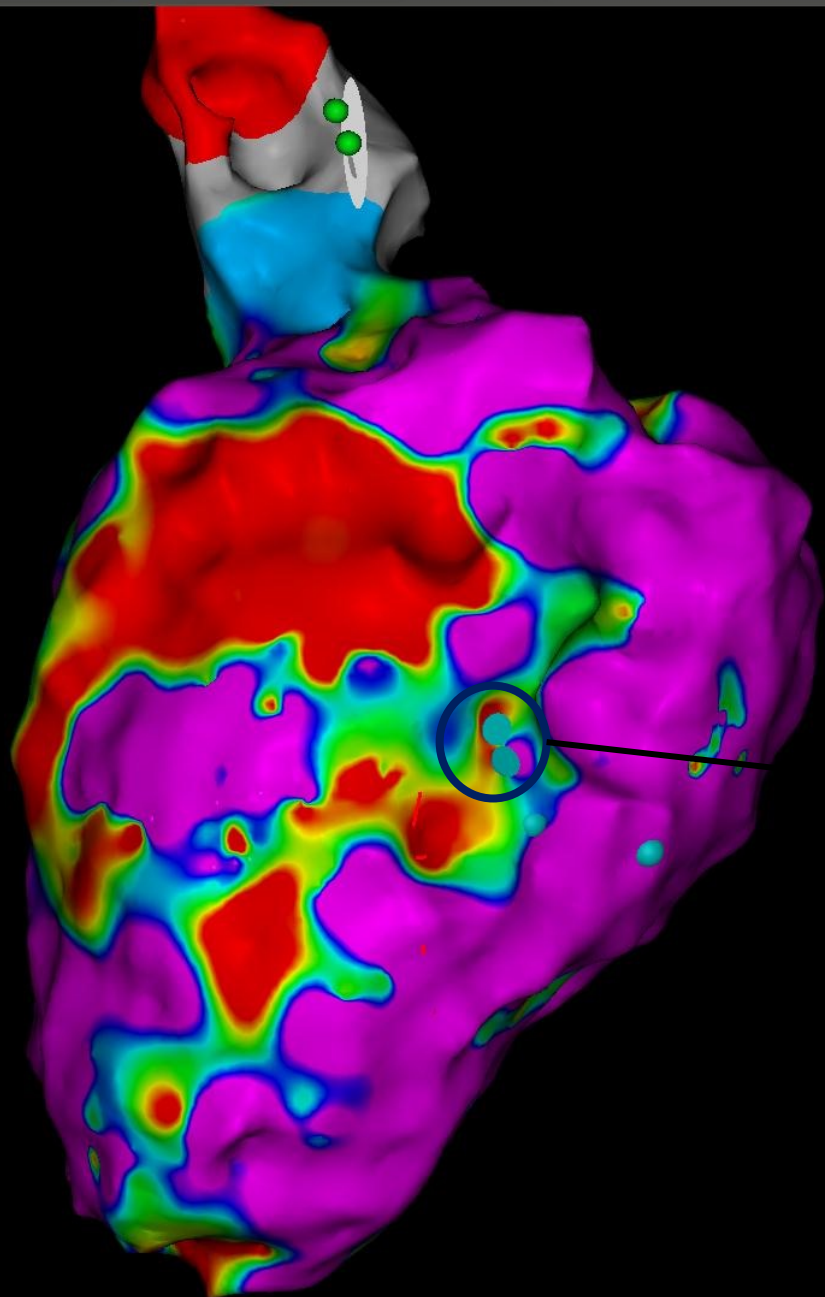
2D
HGen
Gn 50
C 49
3/2/0
75 mm/s



P G R
1.6 3.2

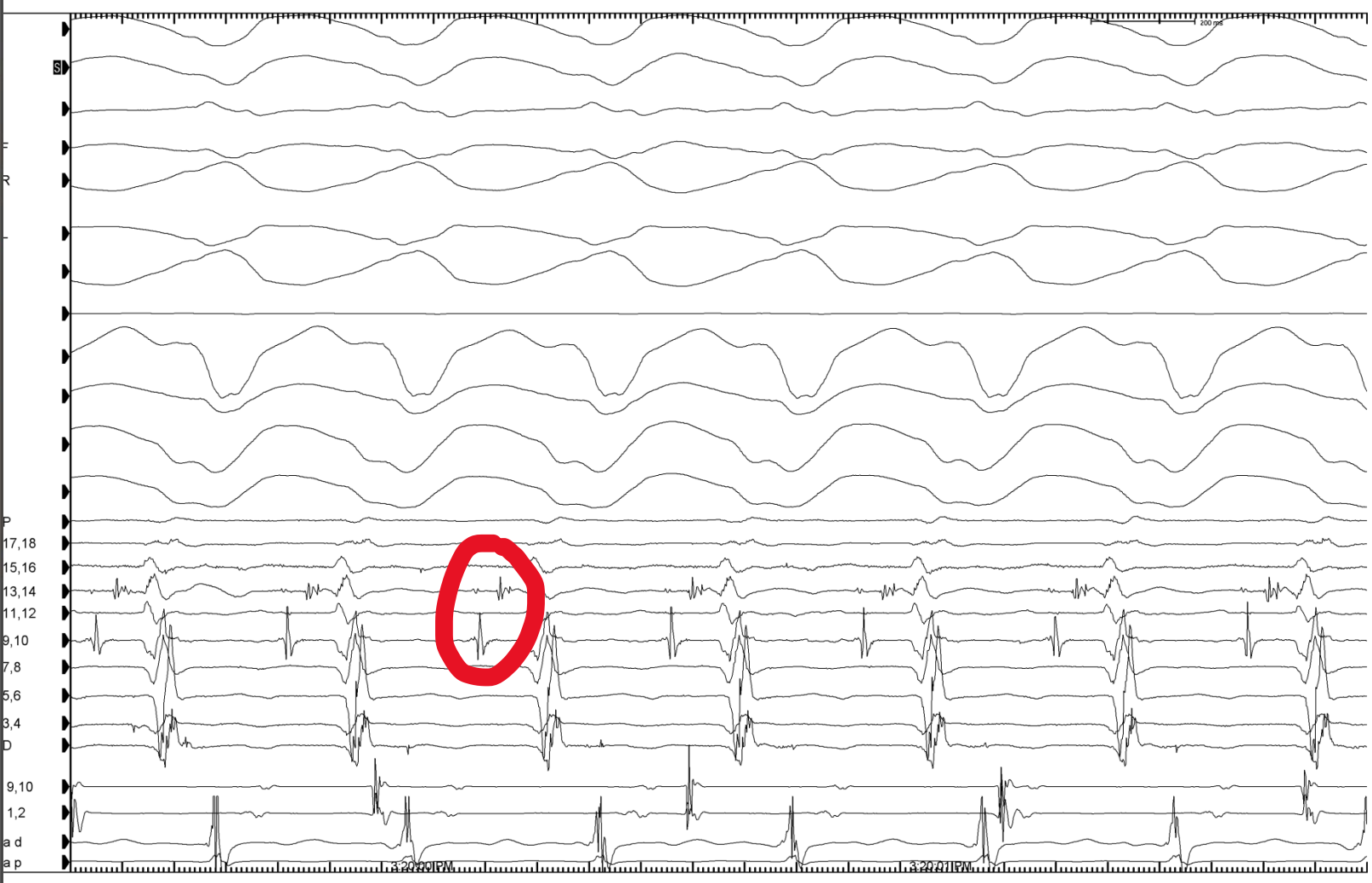
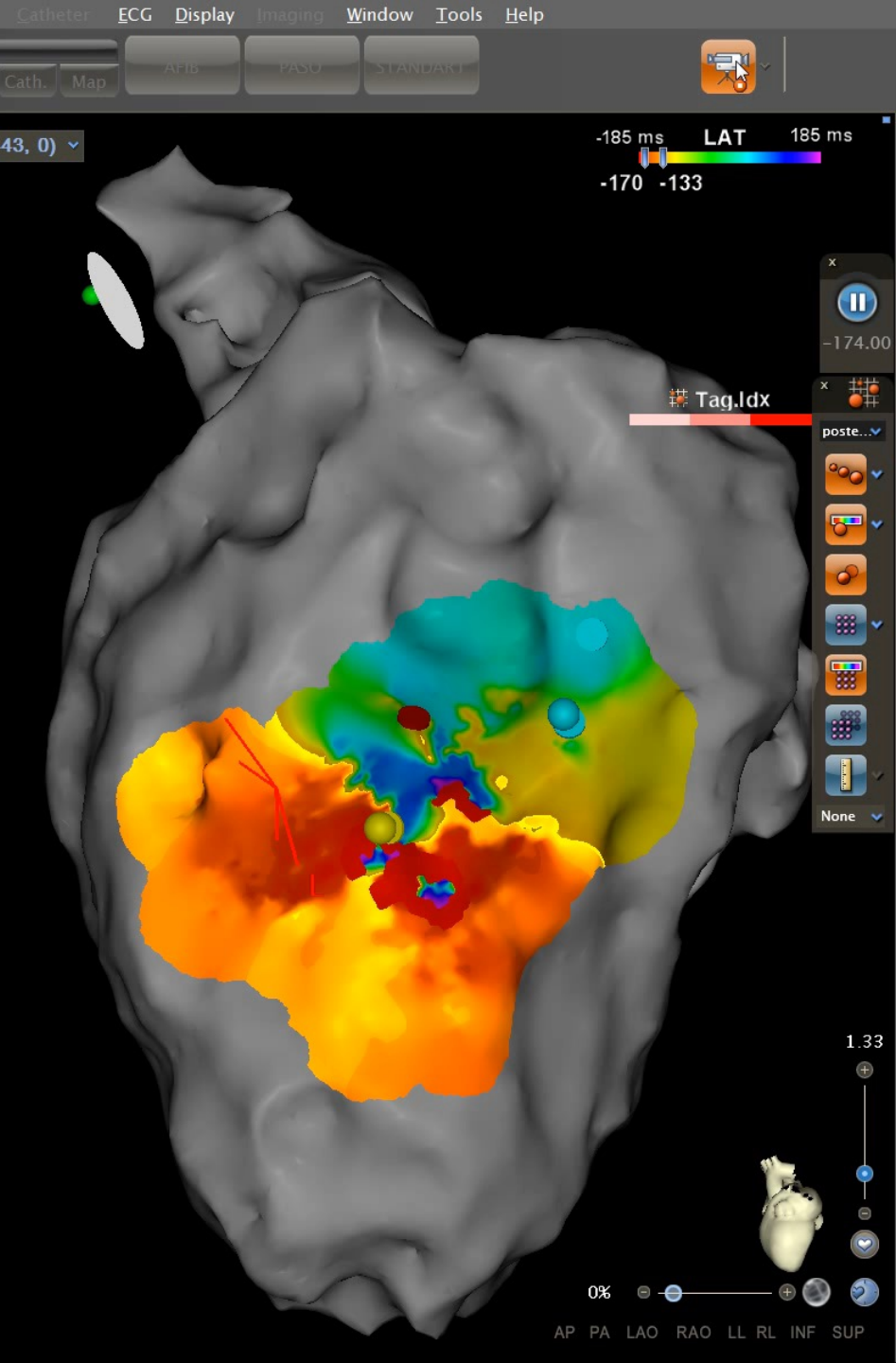
71
BPM



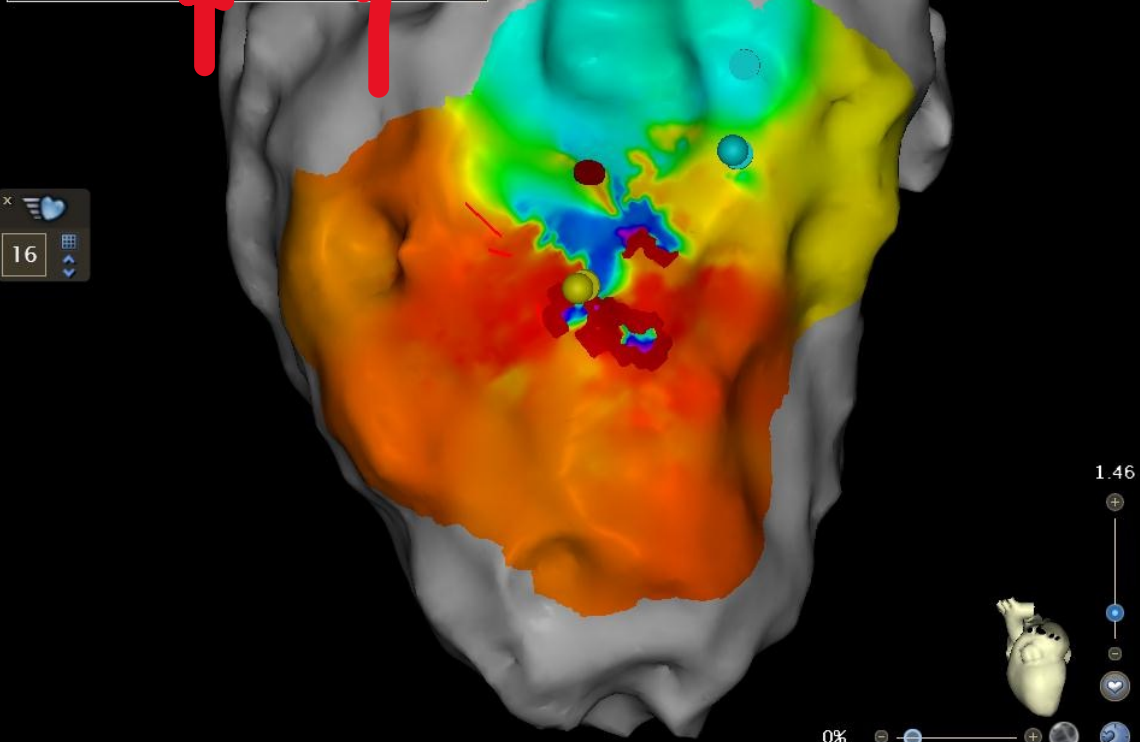
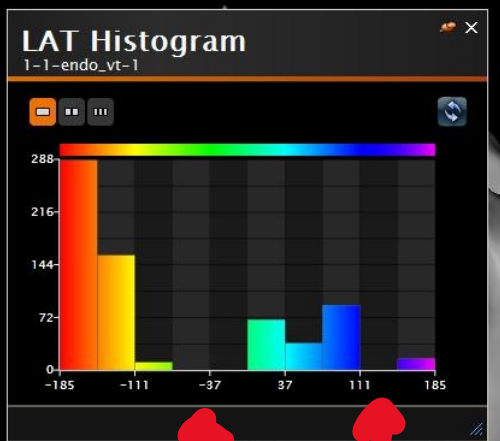


2:19:41 PM

2:19:42 PM

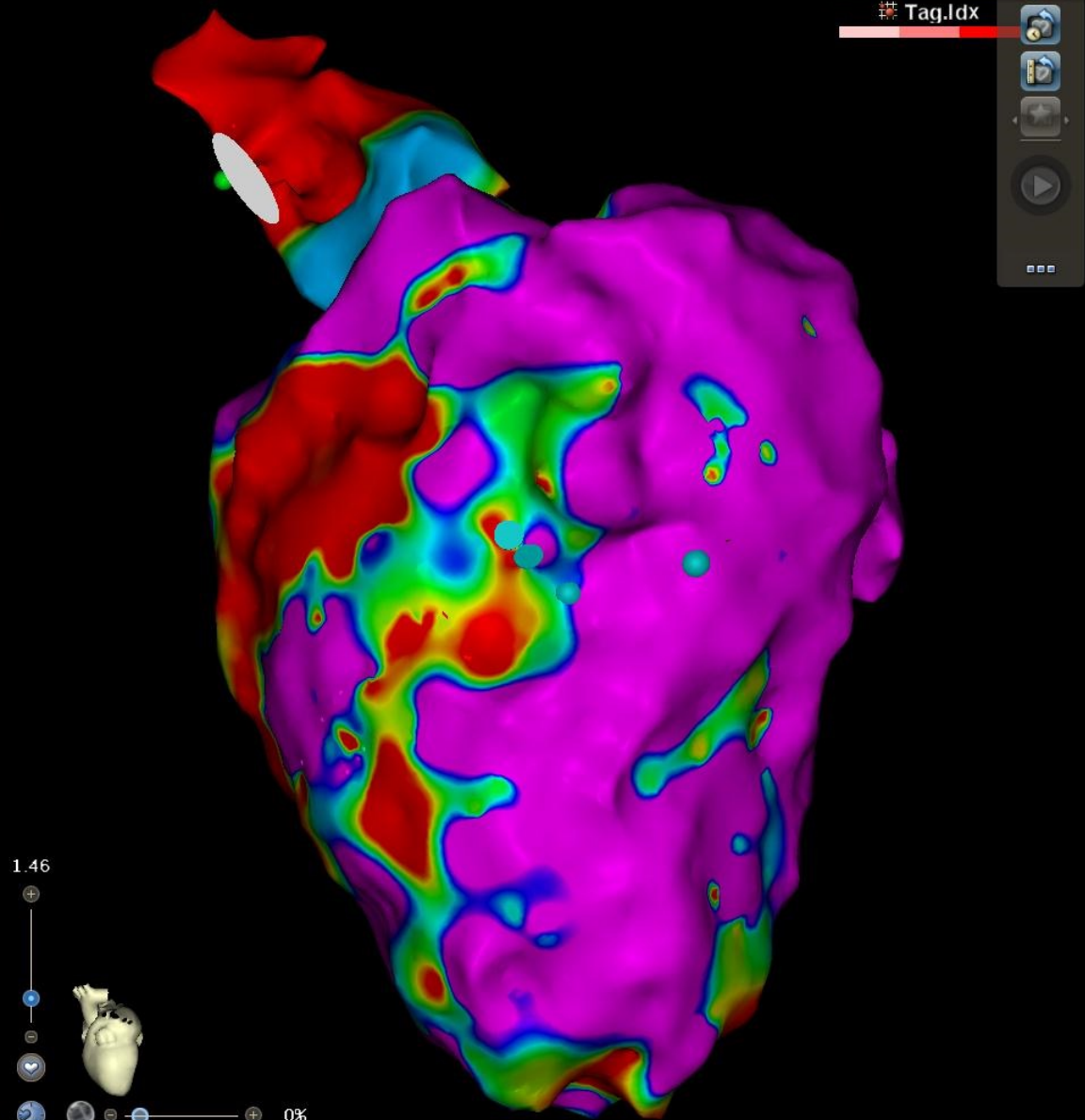


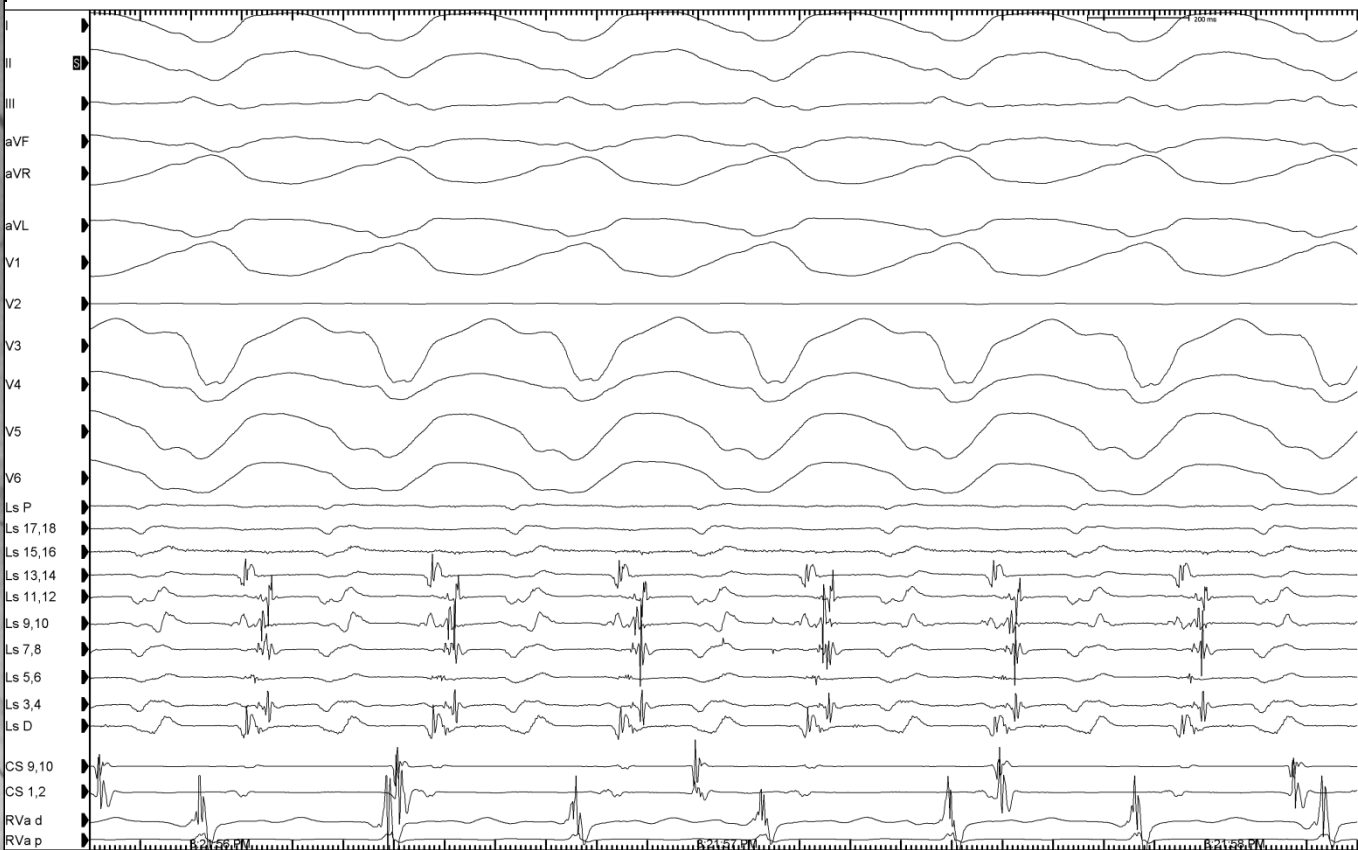
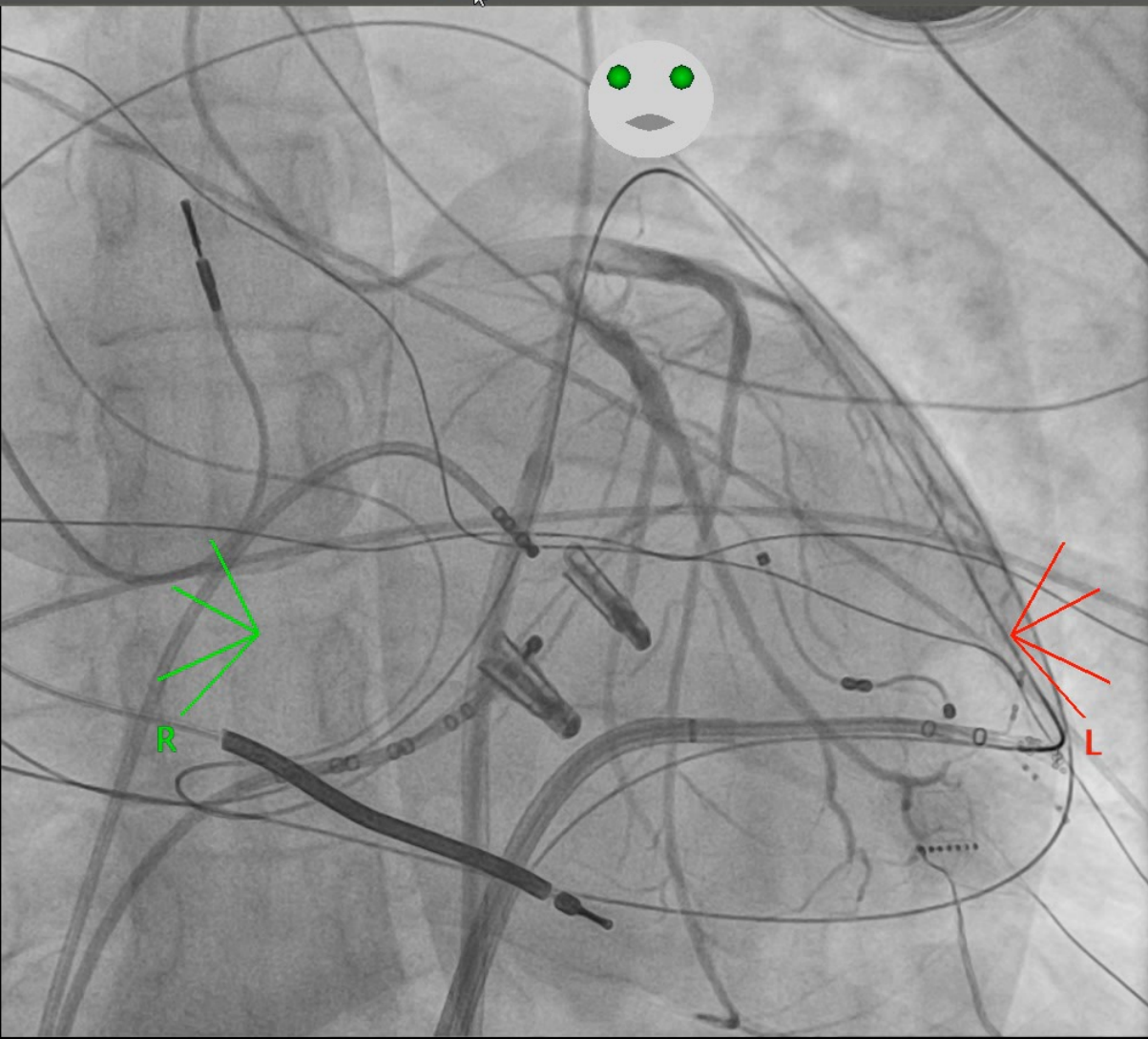
1-1-endo_vt-1 (1443, 0) -185 ms LAT 185 ms

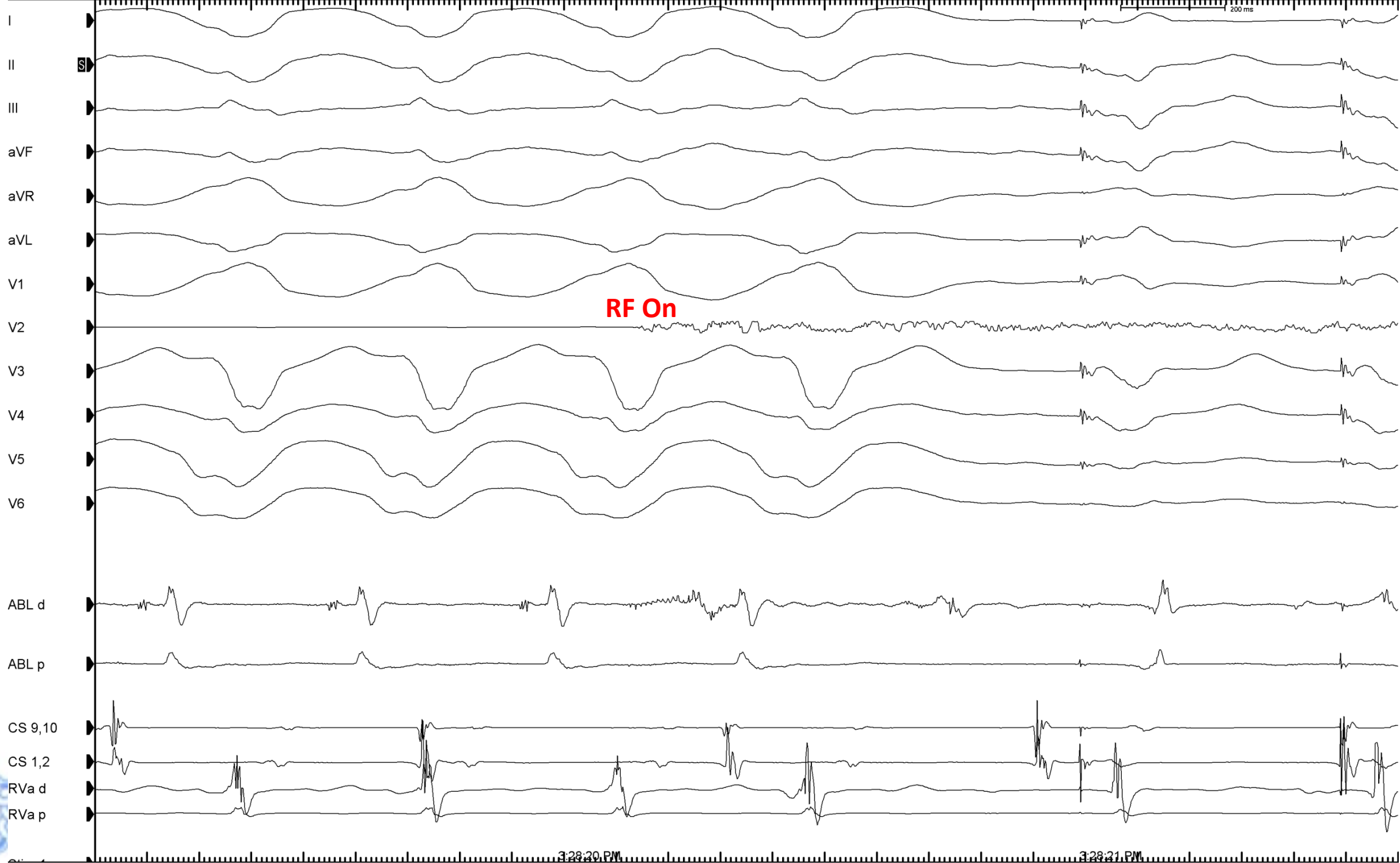


16

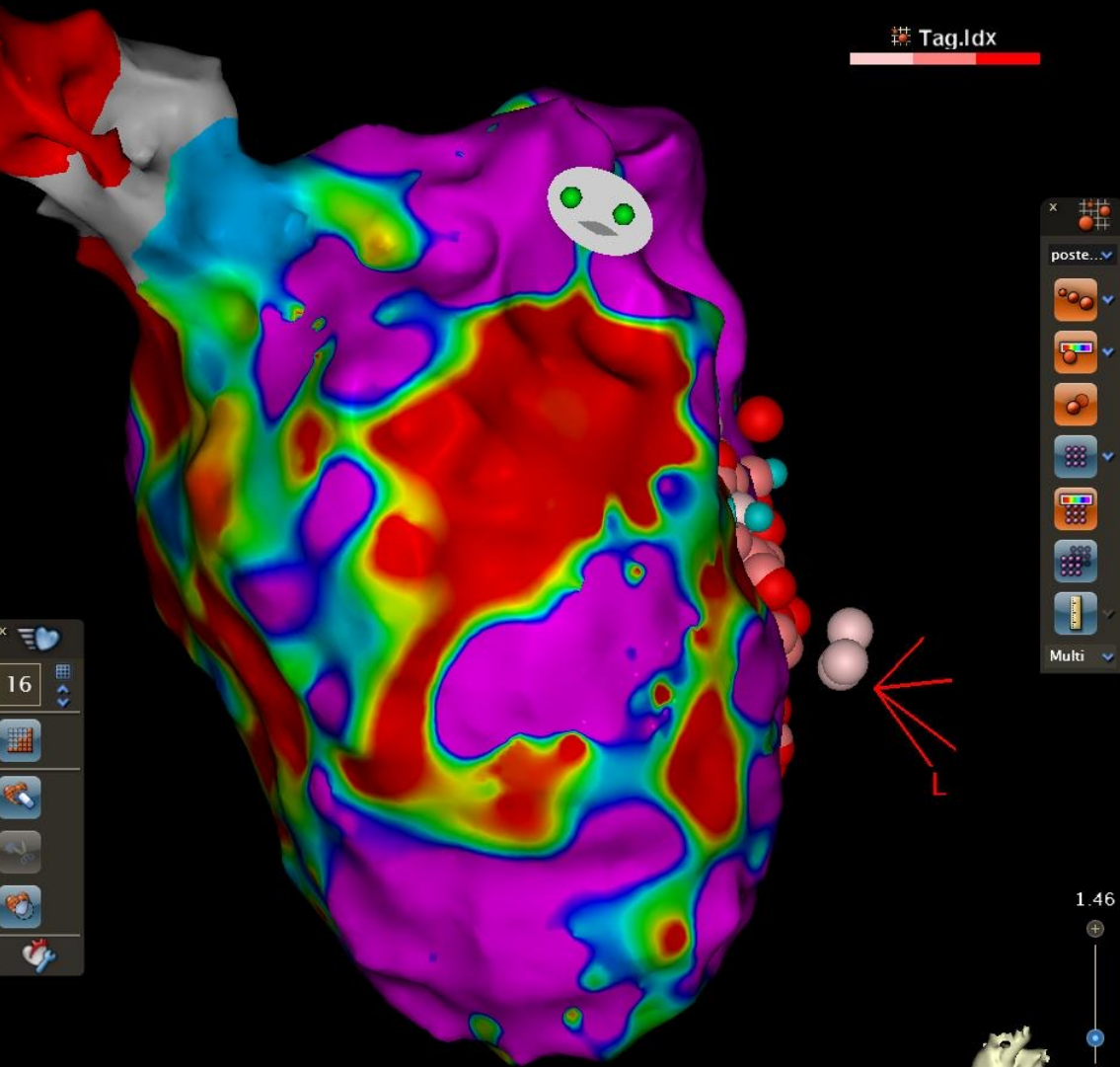
1-endo_scar (891, 0) 0.50 mV Bi 1.50 mV



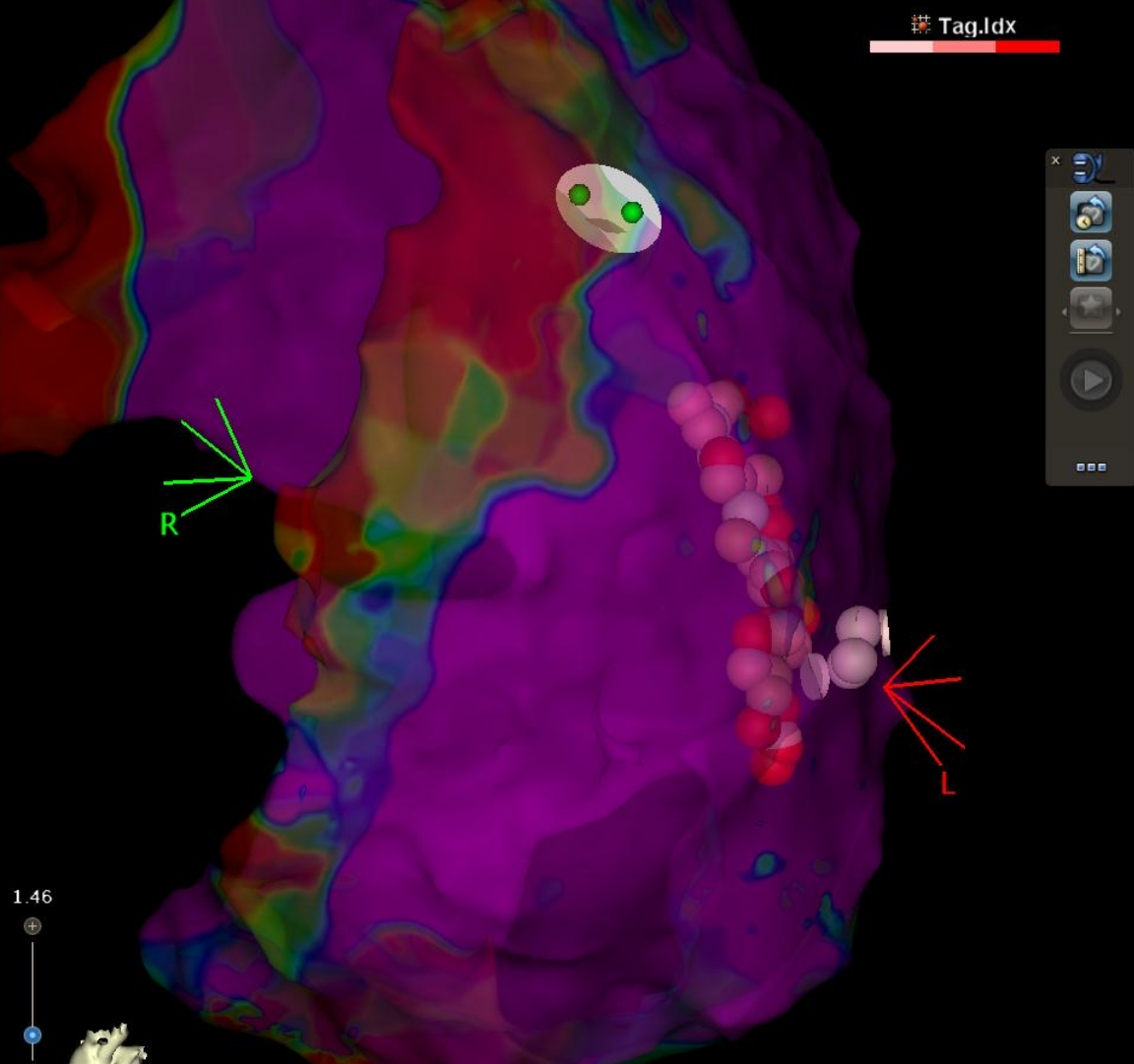




1-endo_scar (891, 0) 0.50 mV Bi 1.50 mV



2-epi_scar (3265, 0) 0.50 mV Bi 1.50 mV



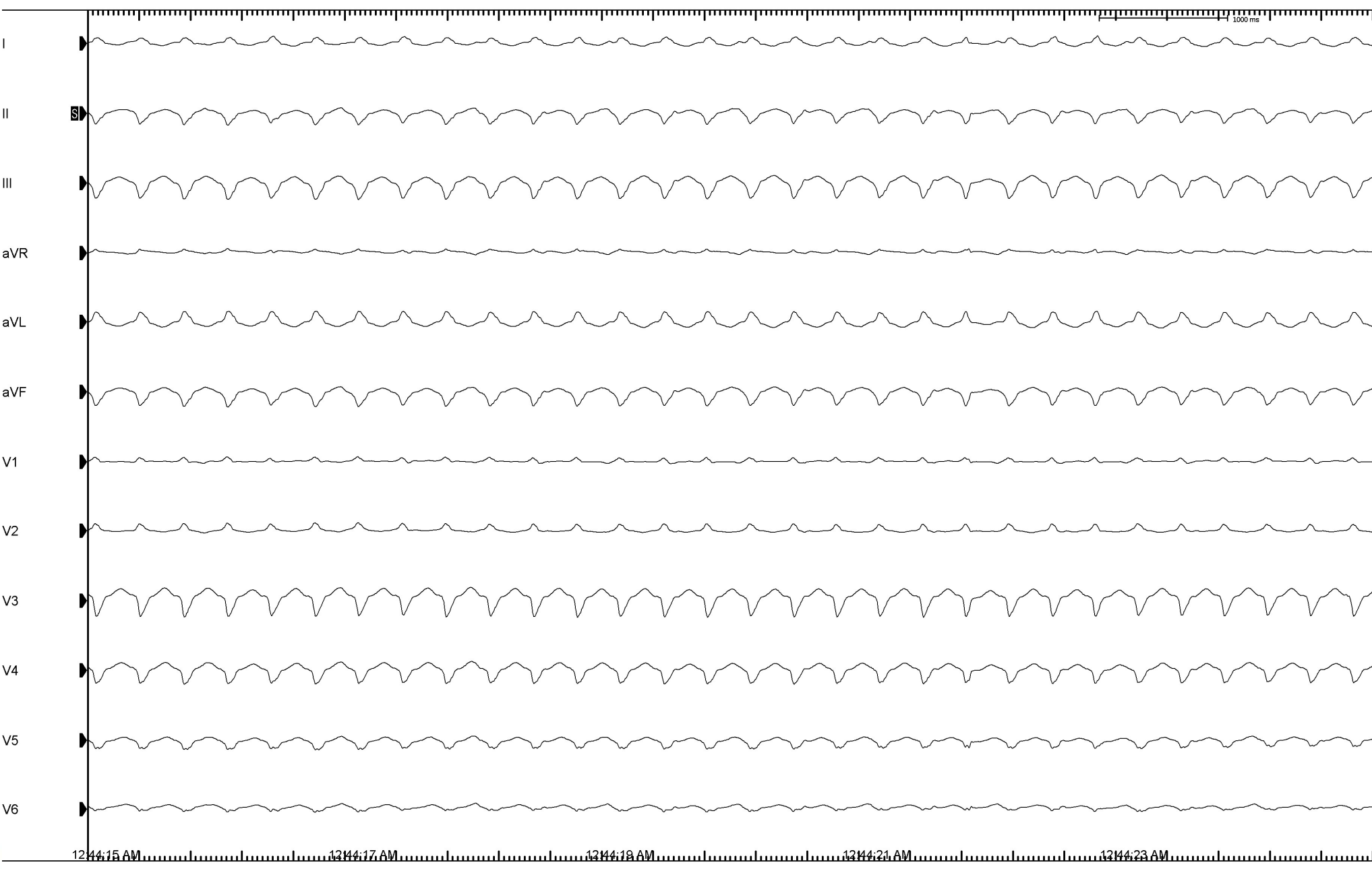
16
[Grid icon]
[Map icon]
[Catheter icon]
[Tools icon]

Multi
[Posterior icon]
[Map icon]
[Catheter icon]
[Tools icon]

1.46
[Zoom slider]
0% [AP PA LAO RAO LL RL INF SUP] 47%

[Navigation icons: back, forward, home, search, play, menu]

Sync



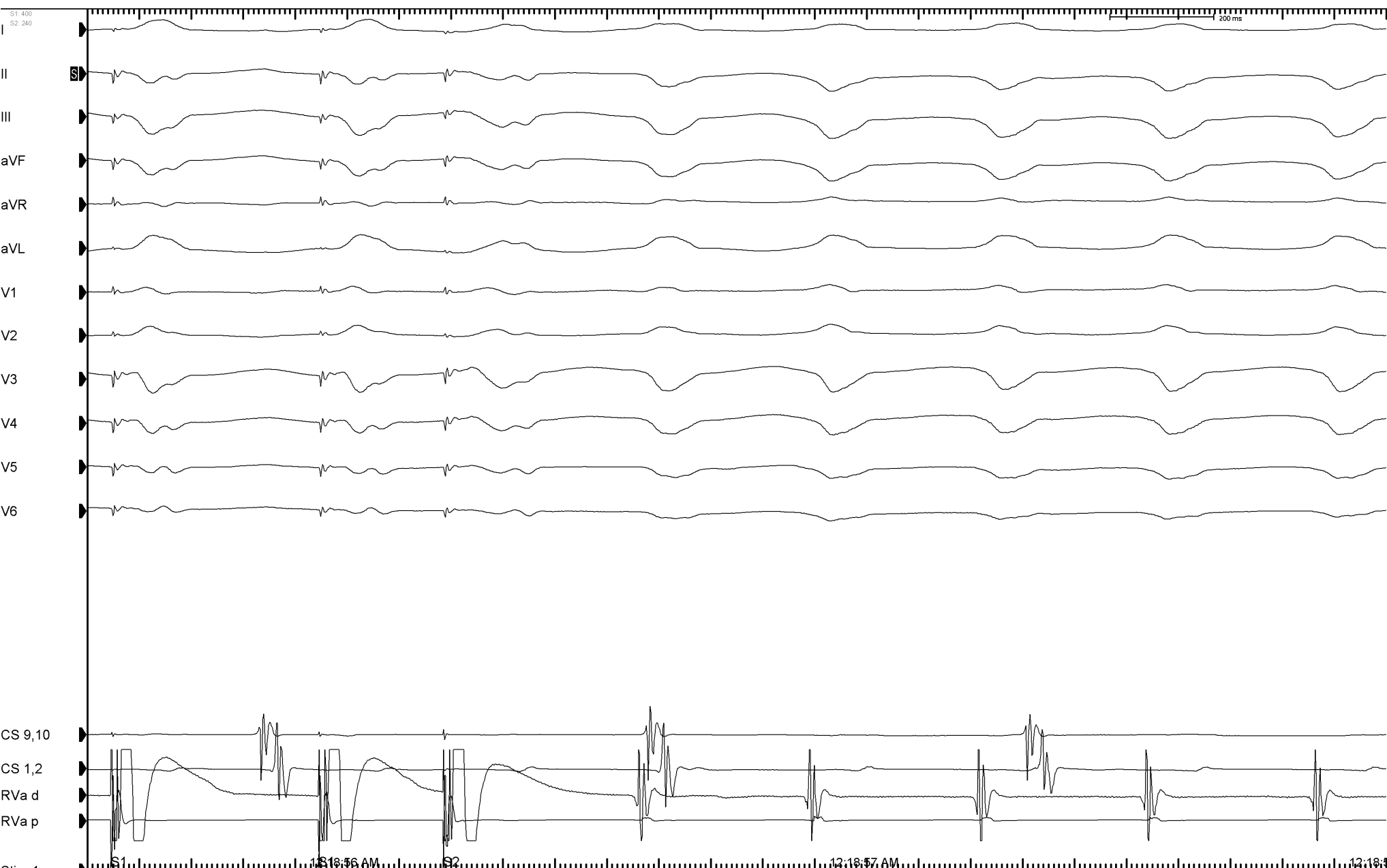
54 y, F
Wide QRS
tachycardia – DCCV

LVEF 45%- Septal
Hypokinesia

KAG: LAD,CX, RCA: N

CARDIAC MRI:
LV mid anteroseptal
hypokinesia
MR TR
No late contrast
enhancement

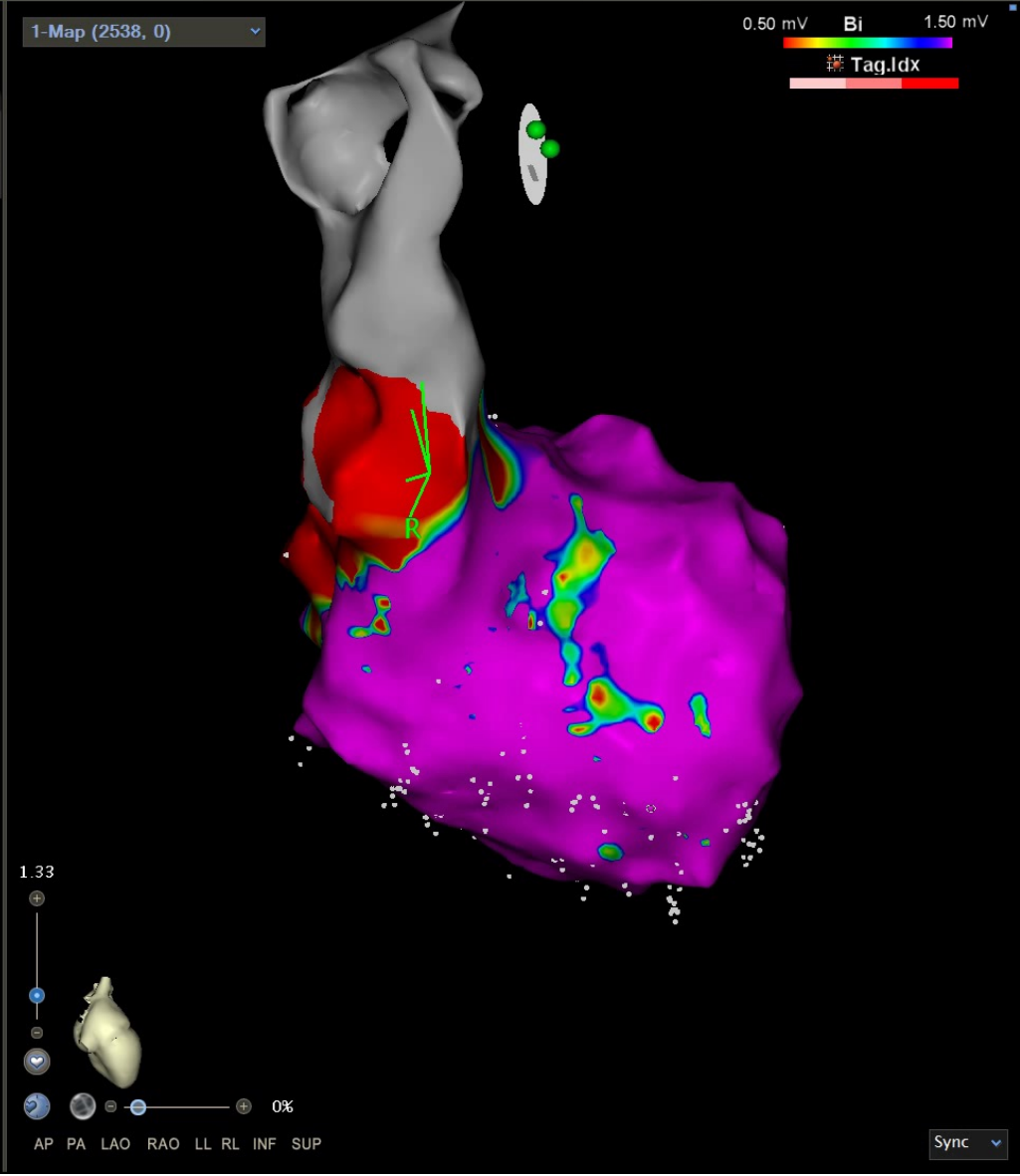
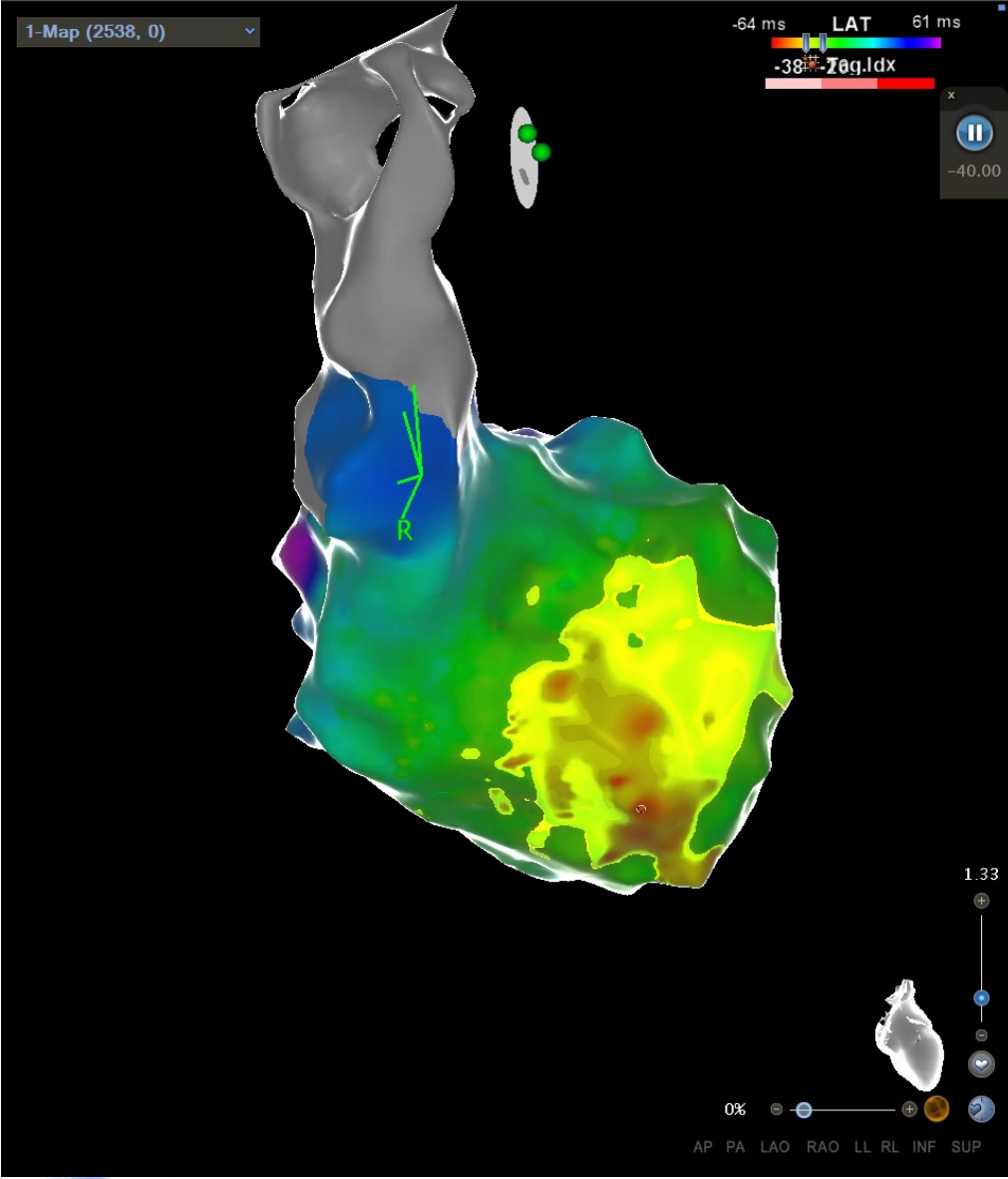
S1: 400
S2: 240

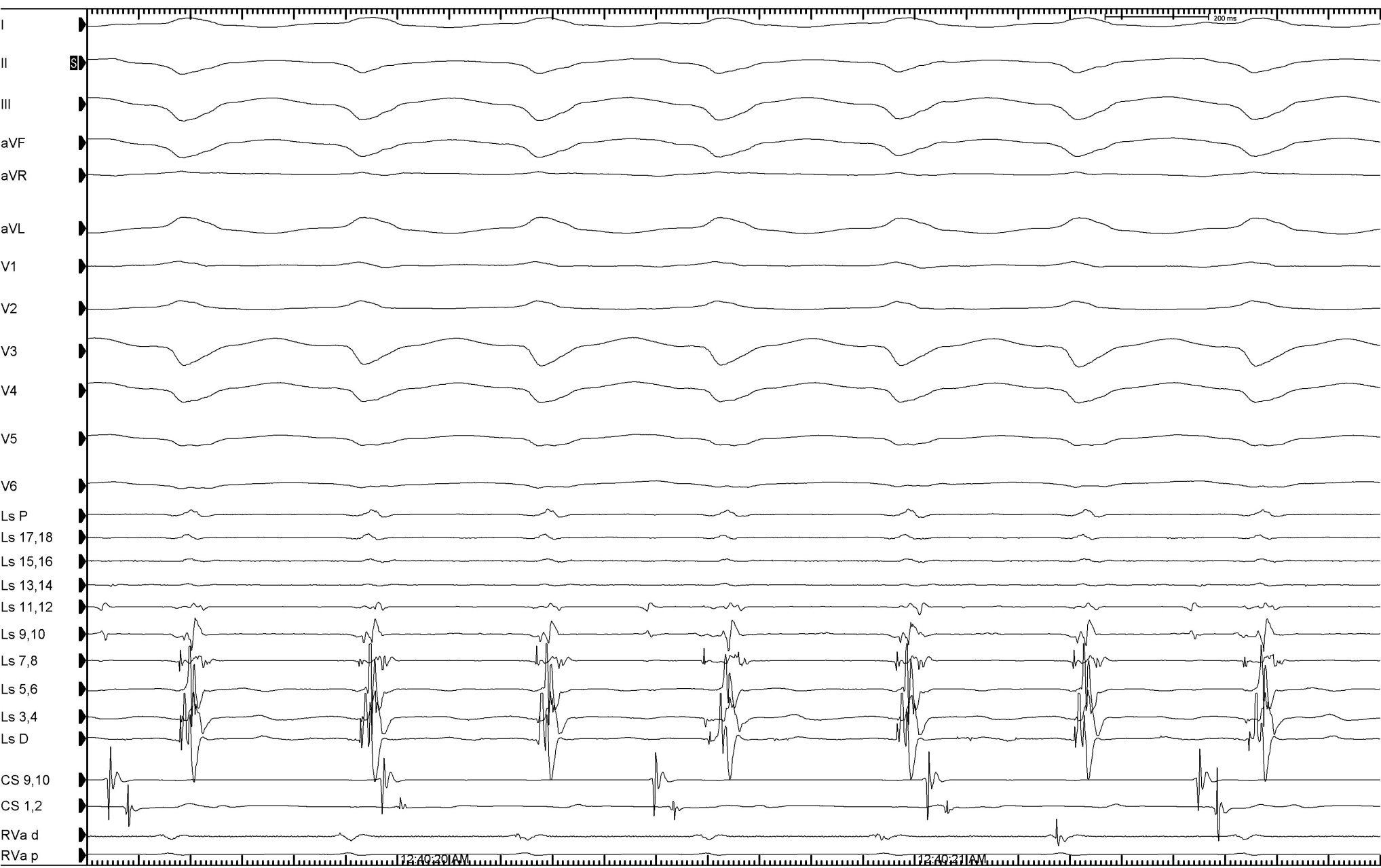


PES from RV

QRS duration 125 ms

S1 12:18:56 AM S2 12:18:57 AM 12:18:58 AM



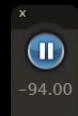




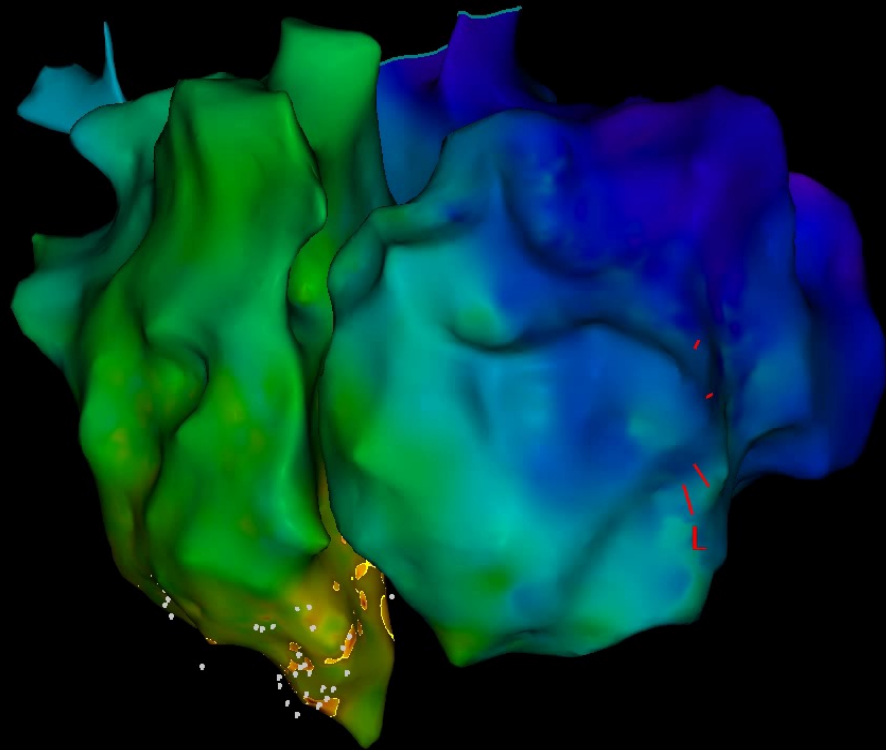
2-rv (1961, 0)



-101 ms LAT 61 ms
-93 -77



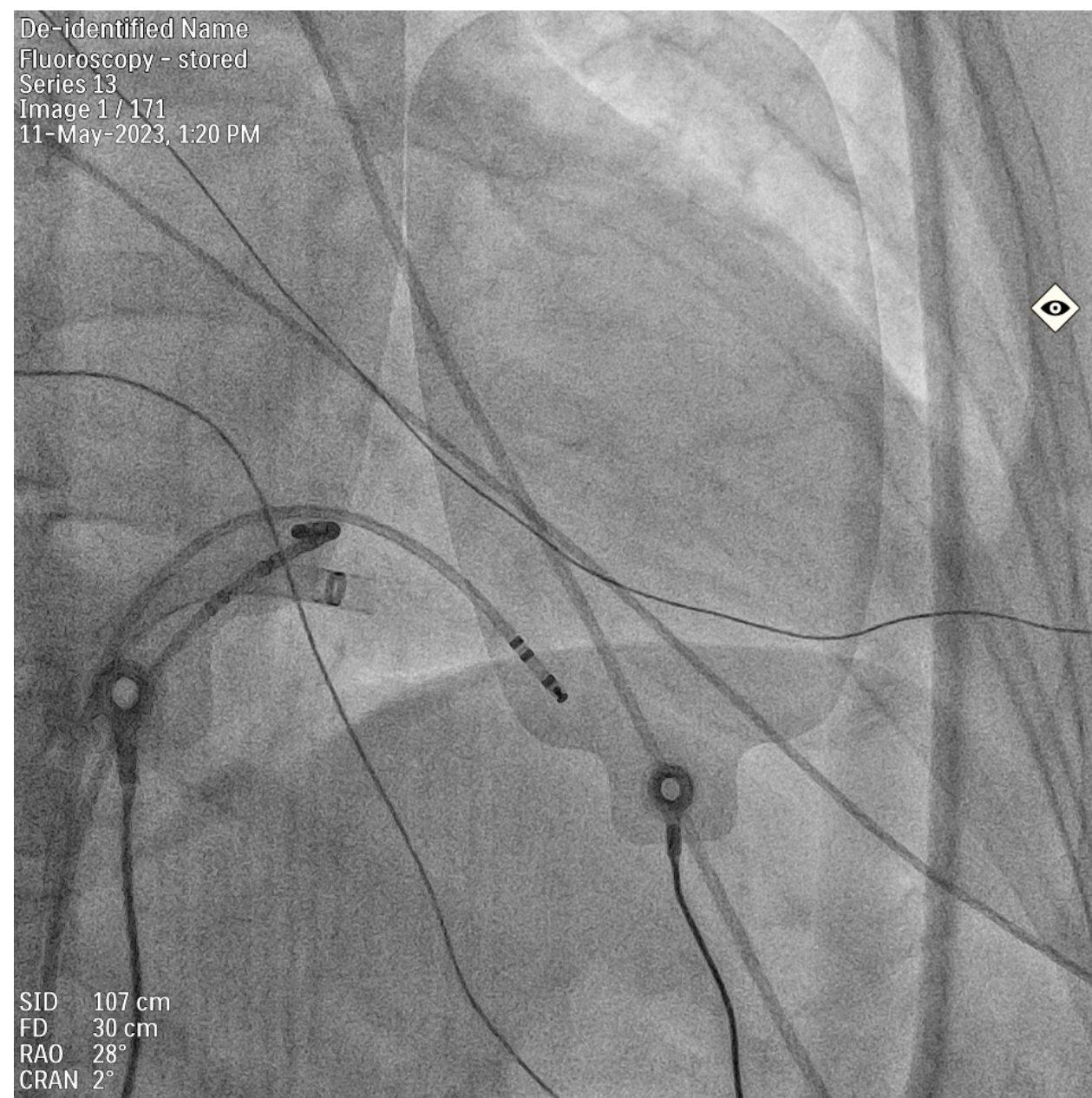
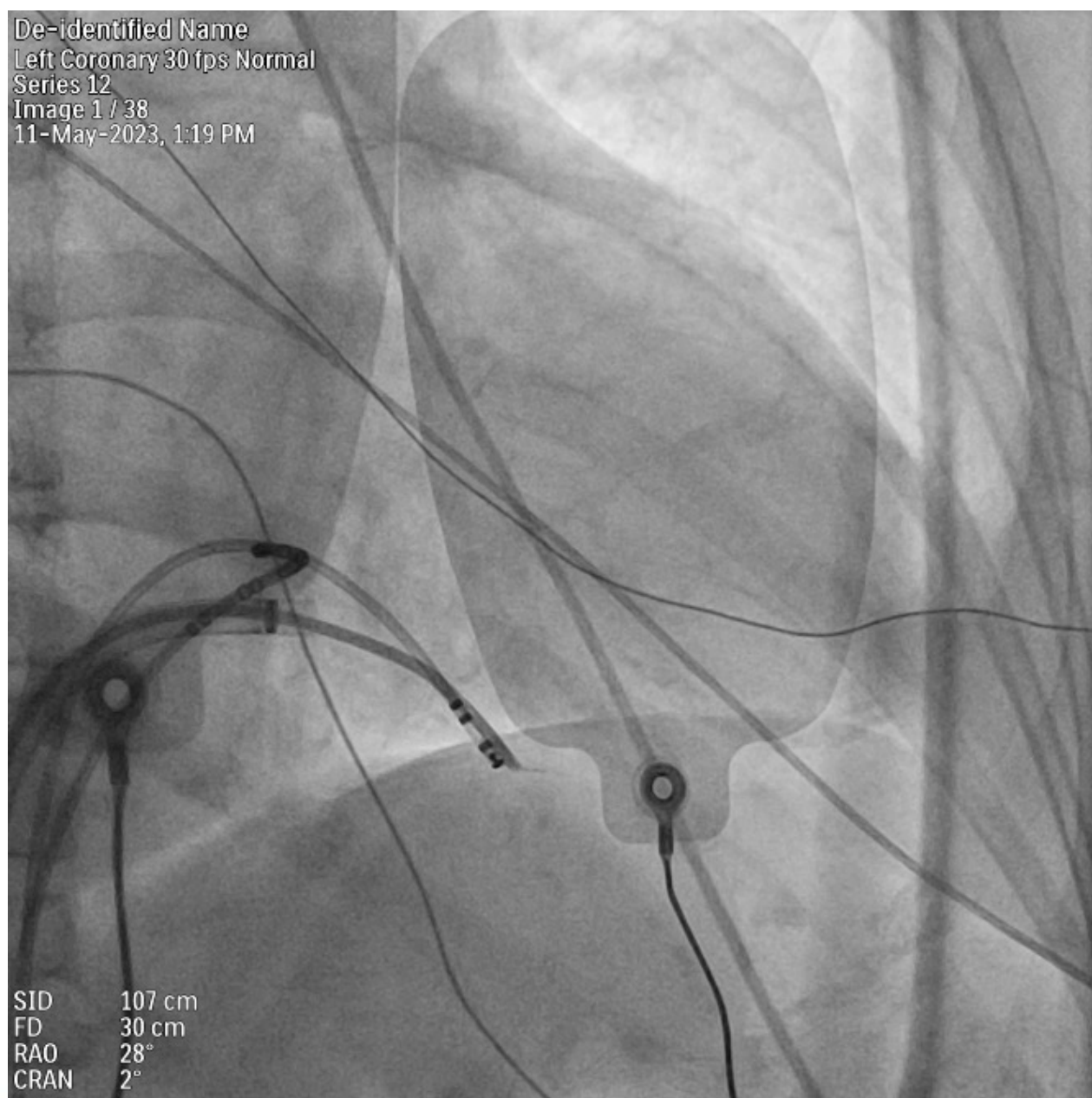
Tag.Idx



0%

AP PA LAO RAO LL RL INF SUP







1-ygtmap (2538, 0)

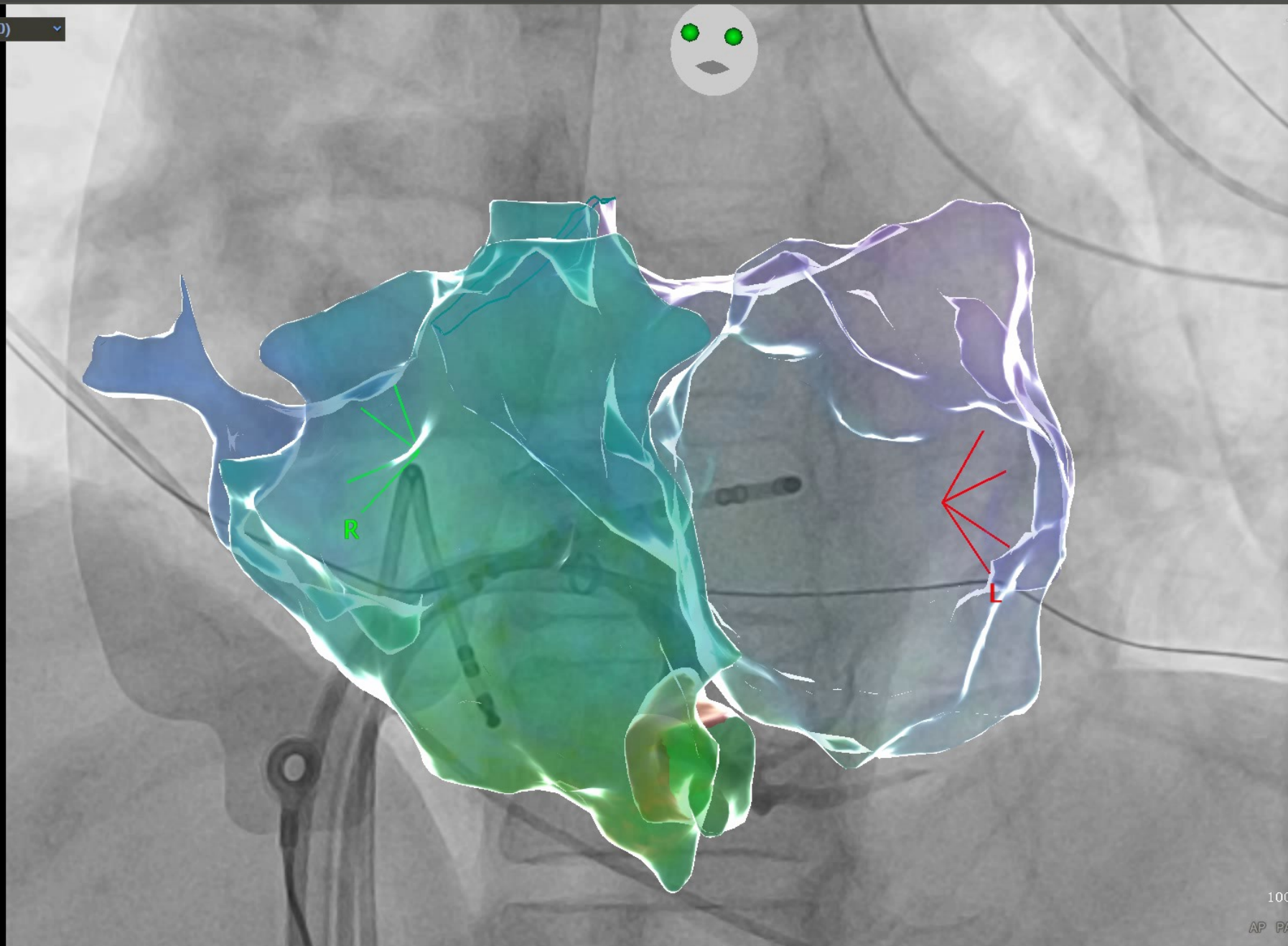
64 ms LAT 61 ms



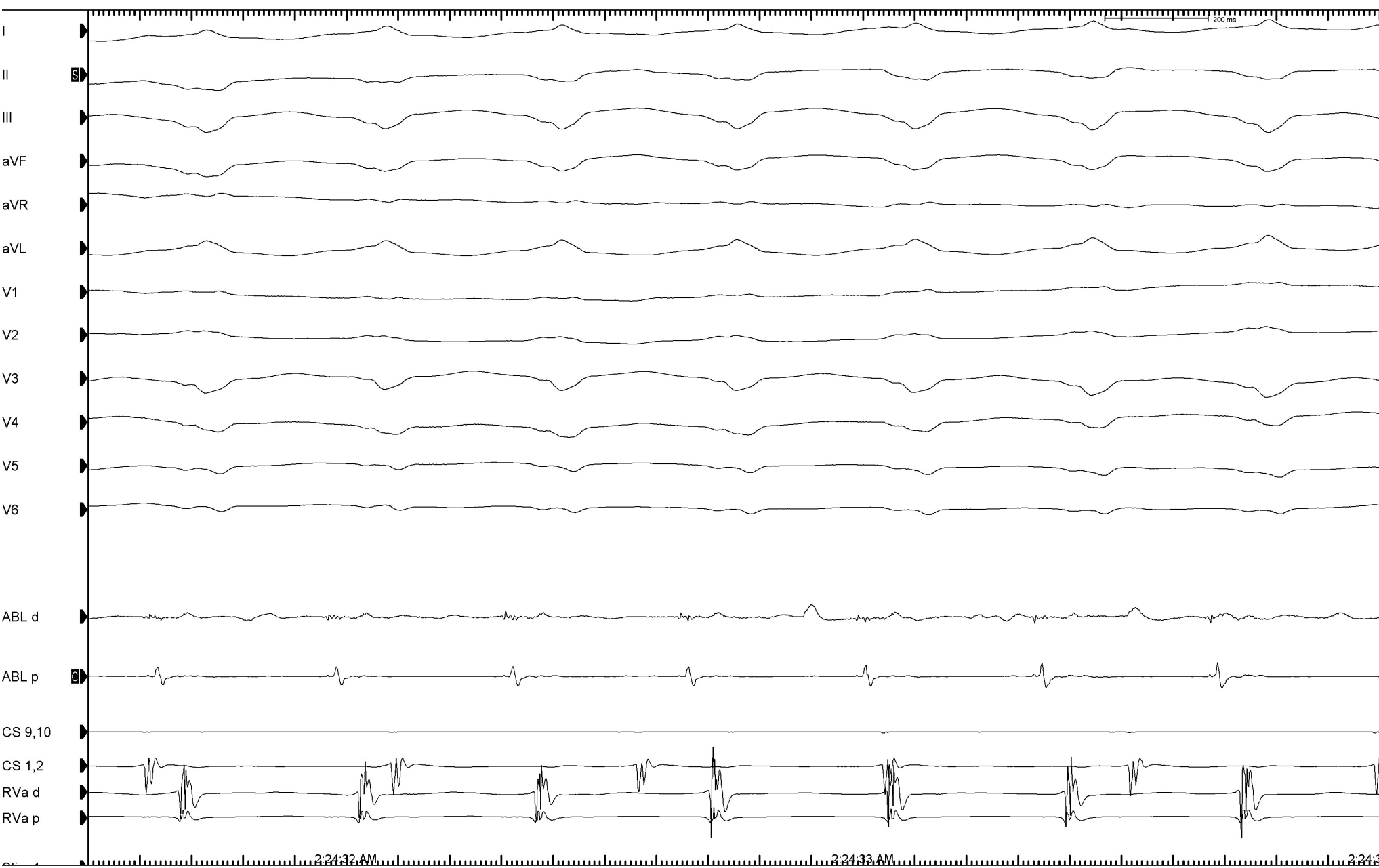
Tag.Idx

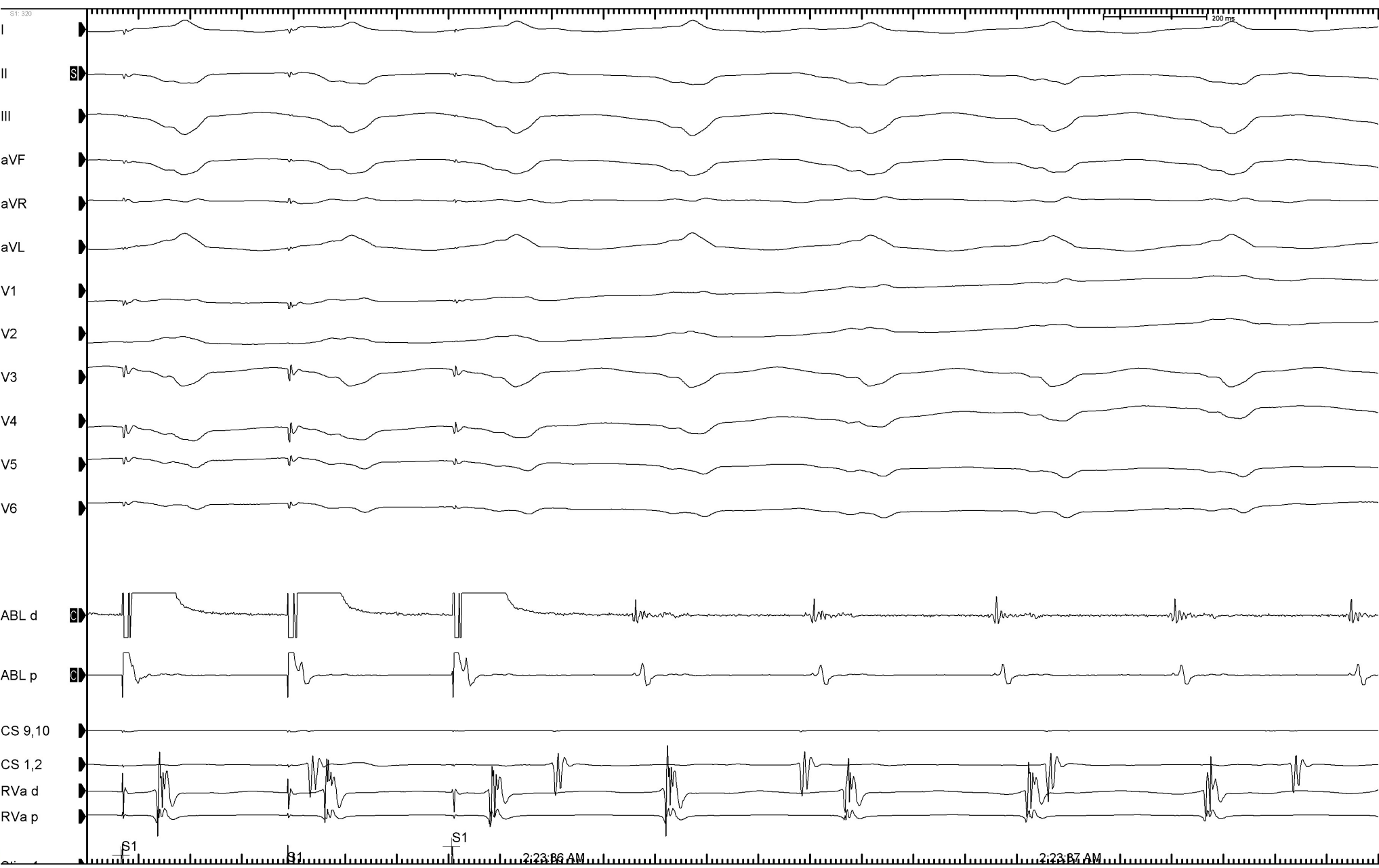


x
16



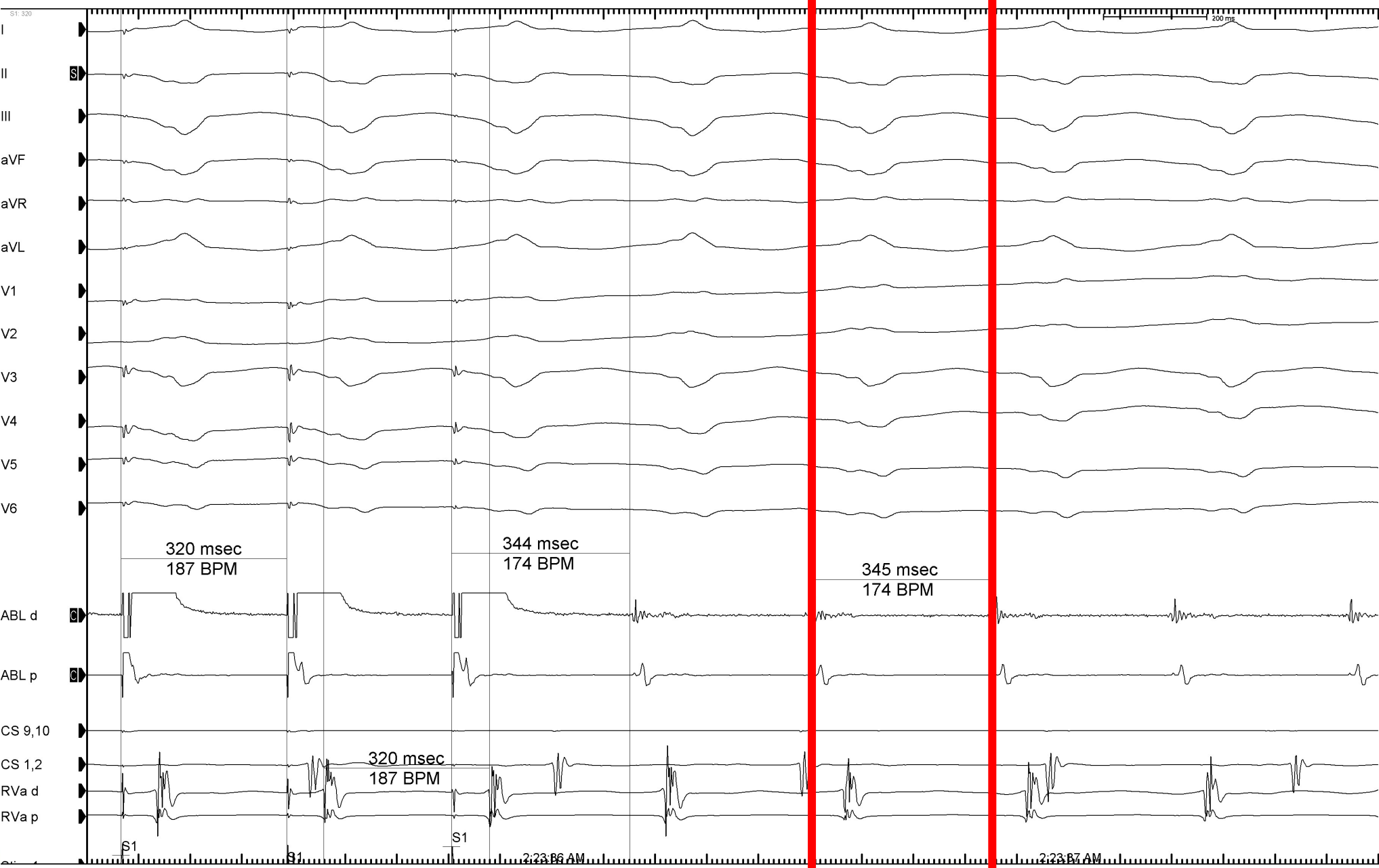
poste...
[Icons for various map tools and settings]





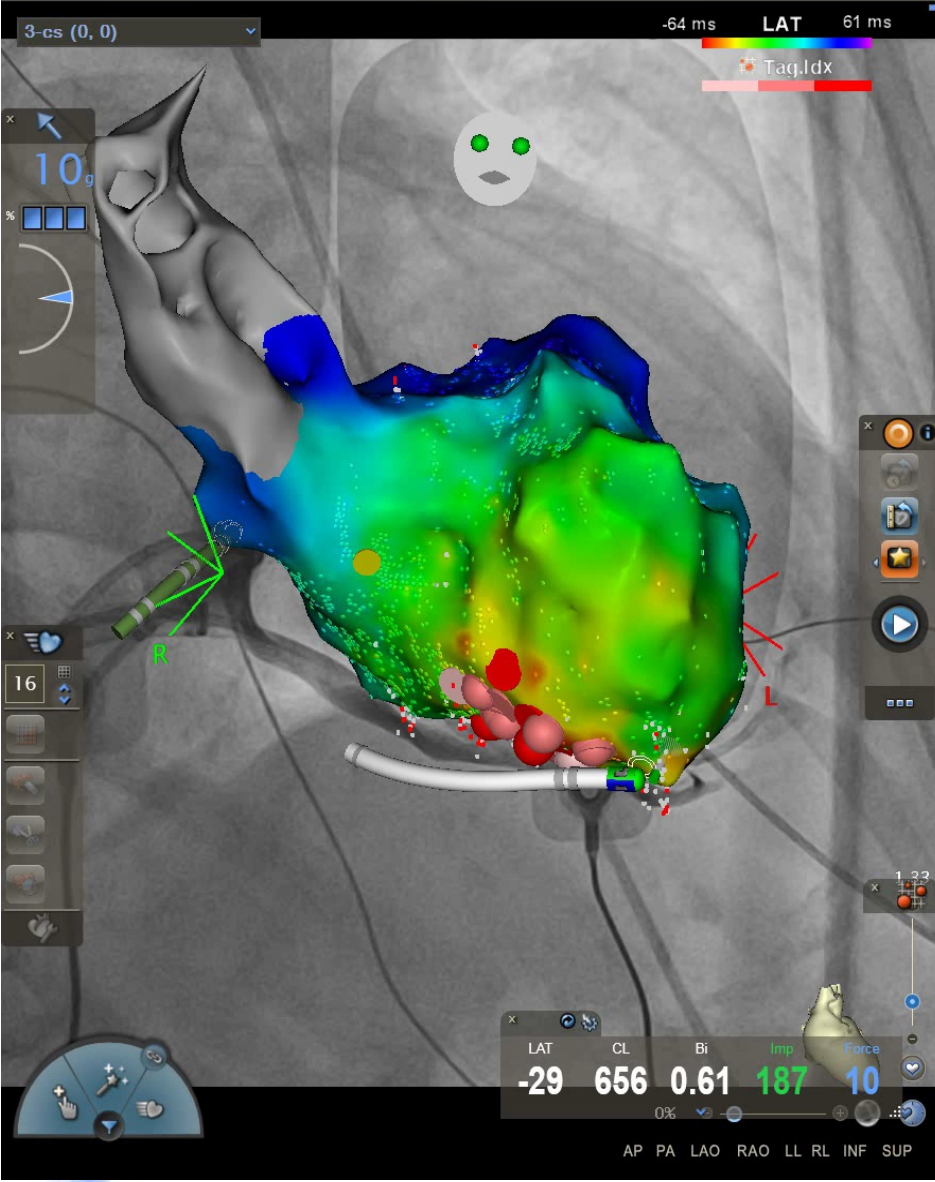
Entrainment

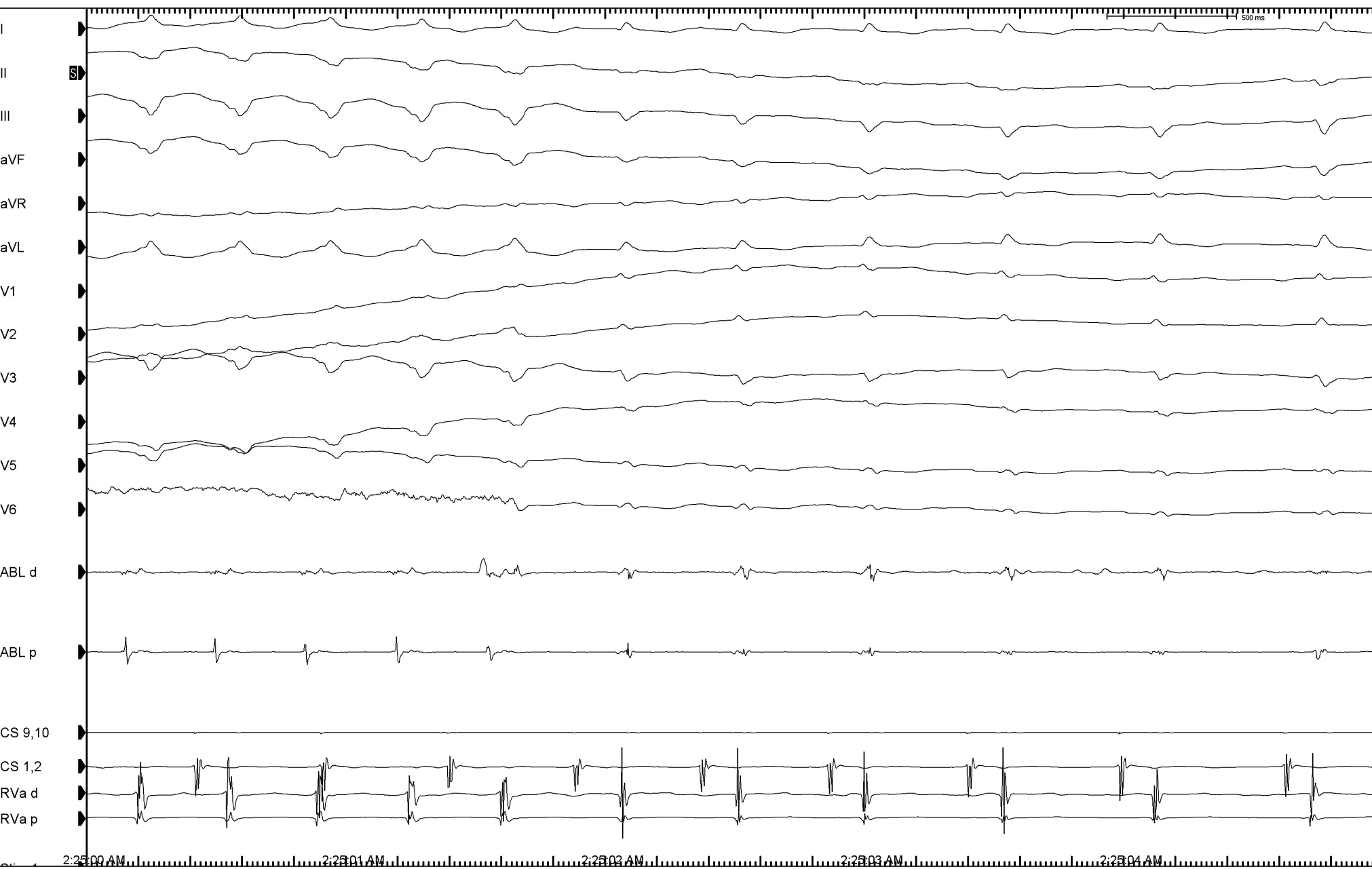
Within the CS



Entrainment

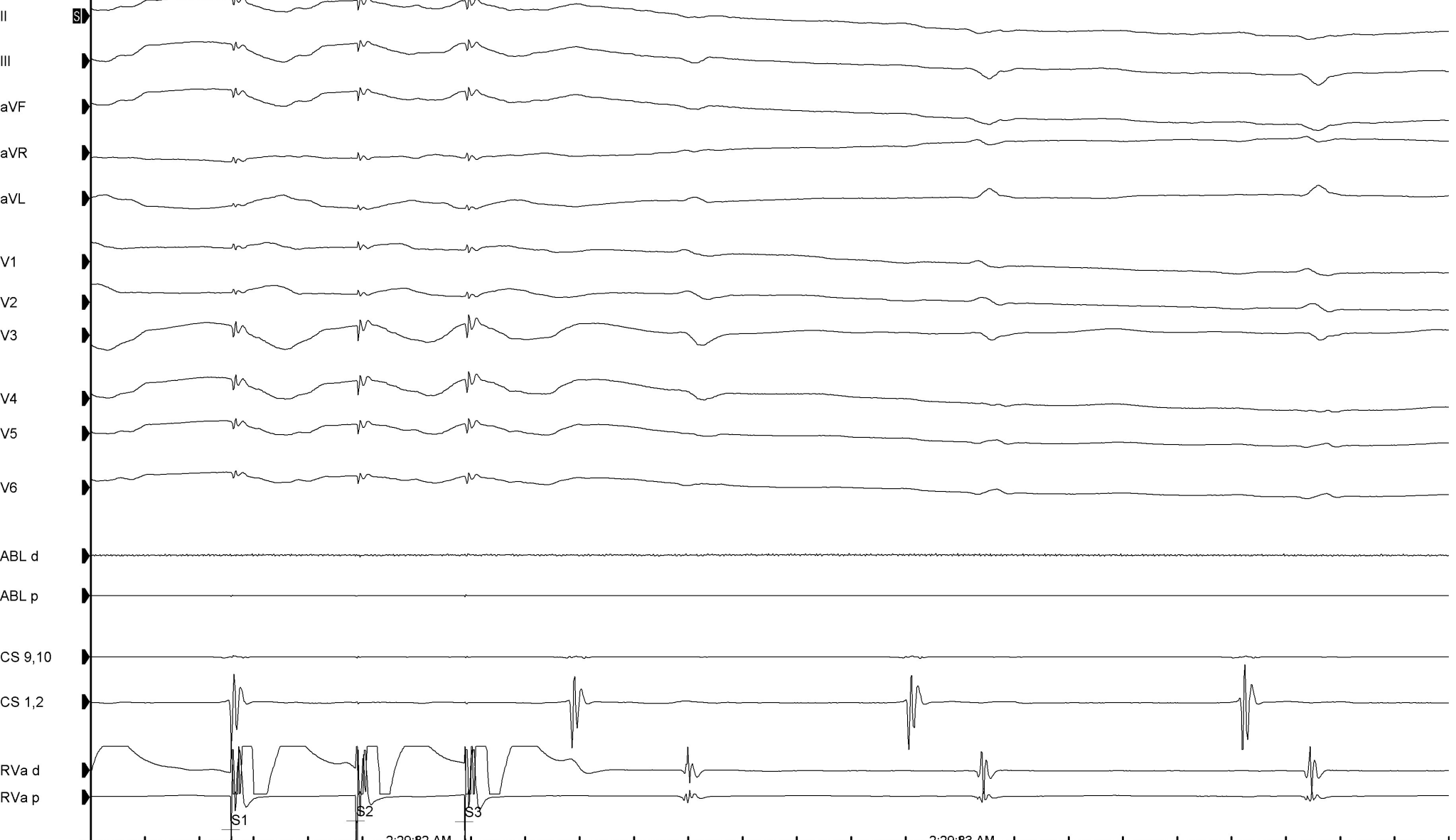




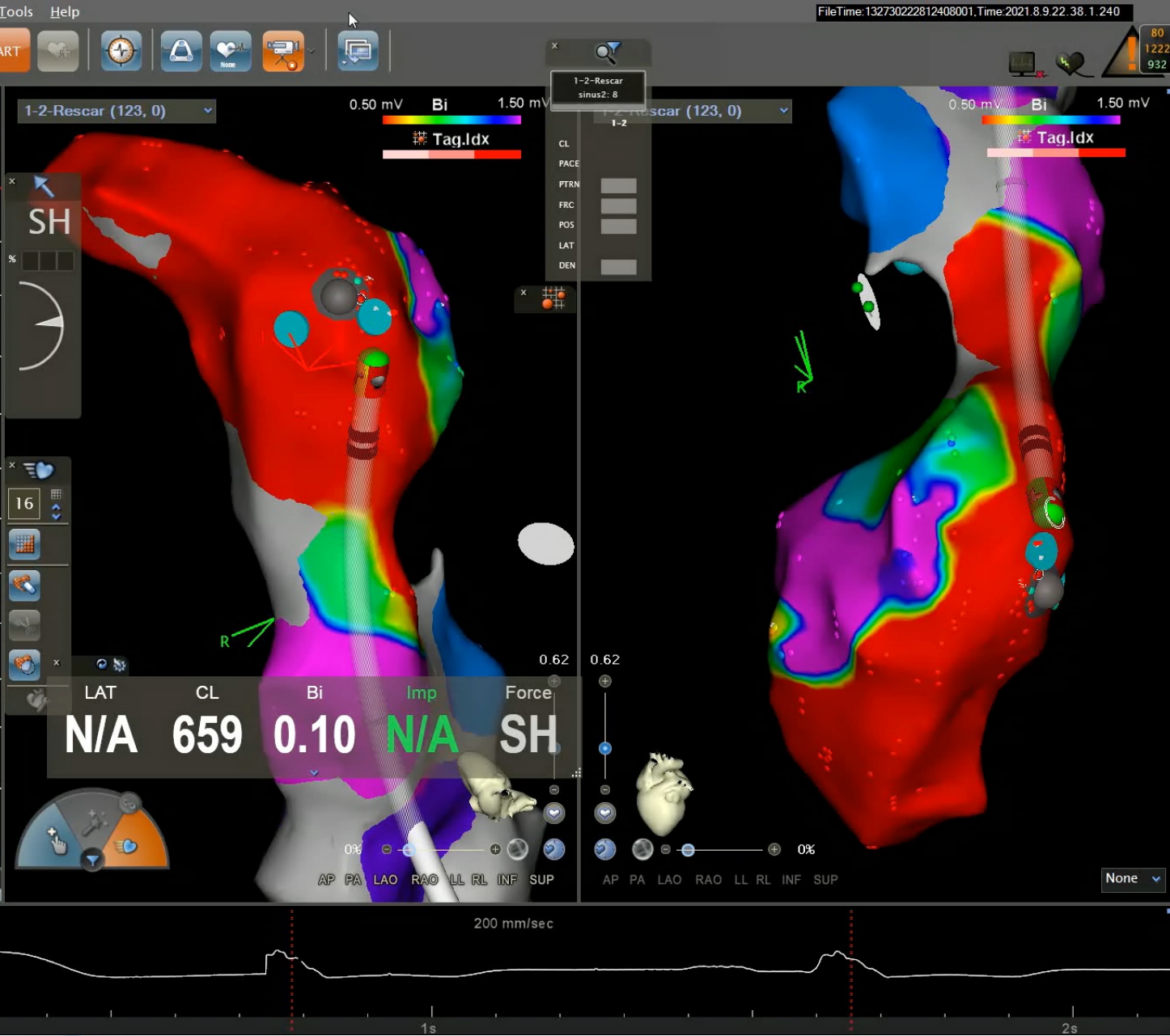


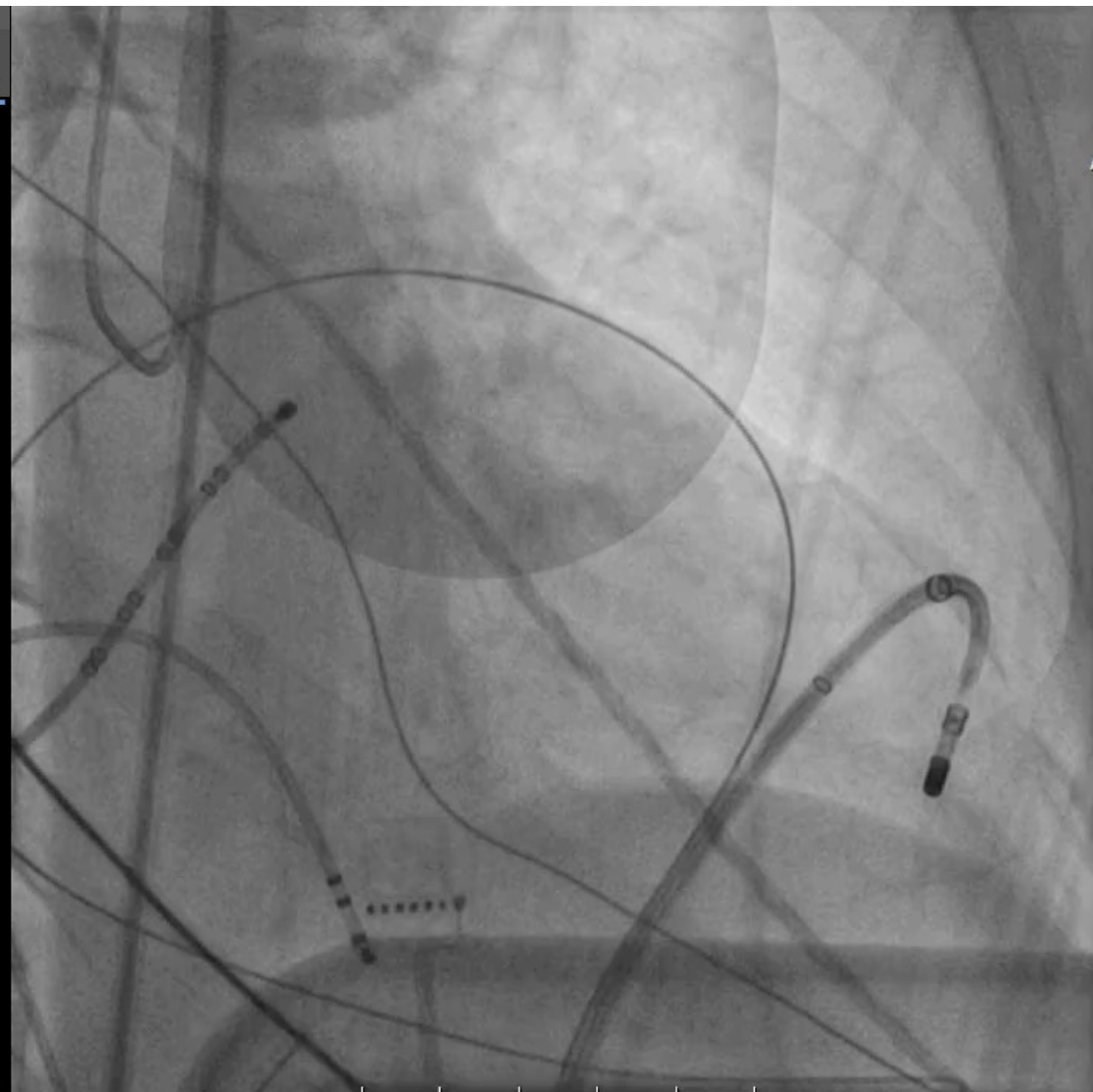
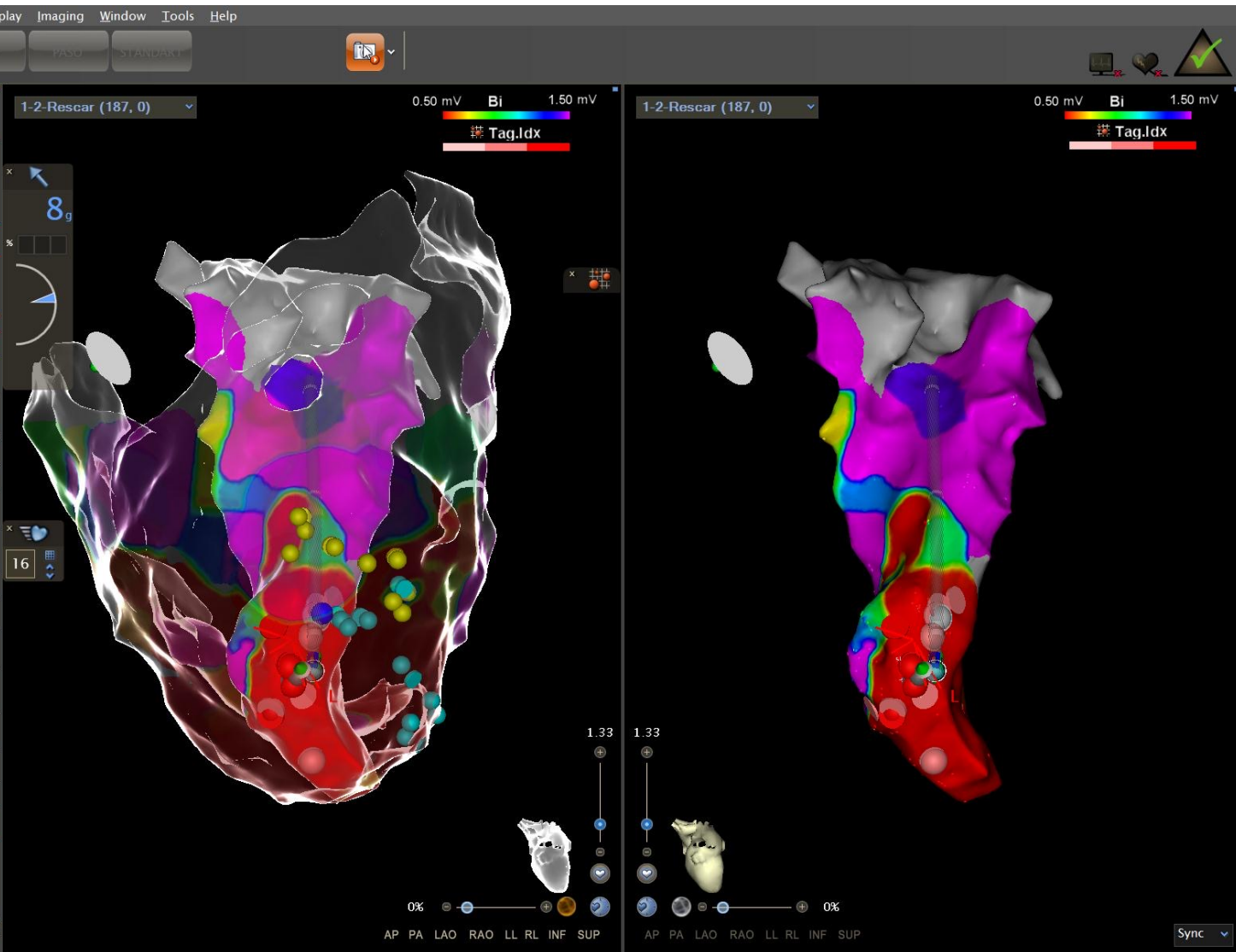
2:25:00 AM 2:25:01 AM 2:25:02 AM 2:25:03 AM 2:25:04 AM

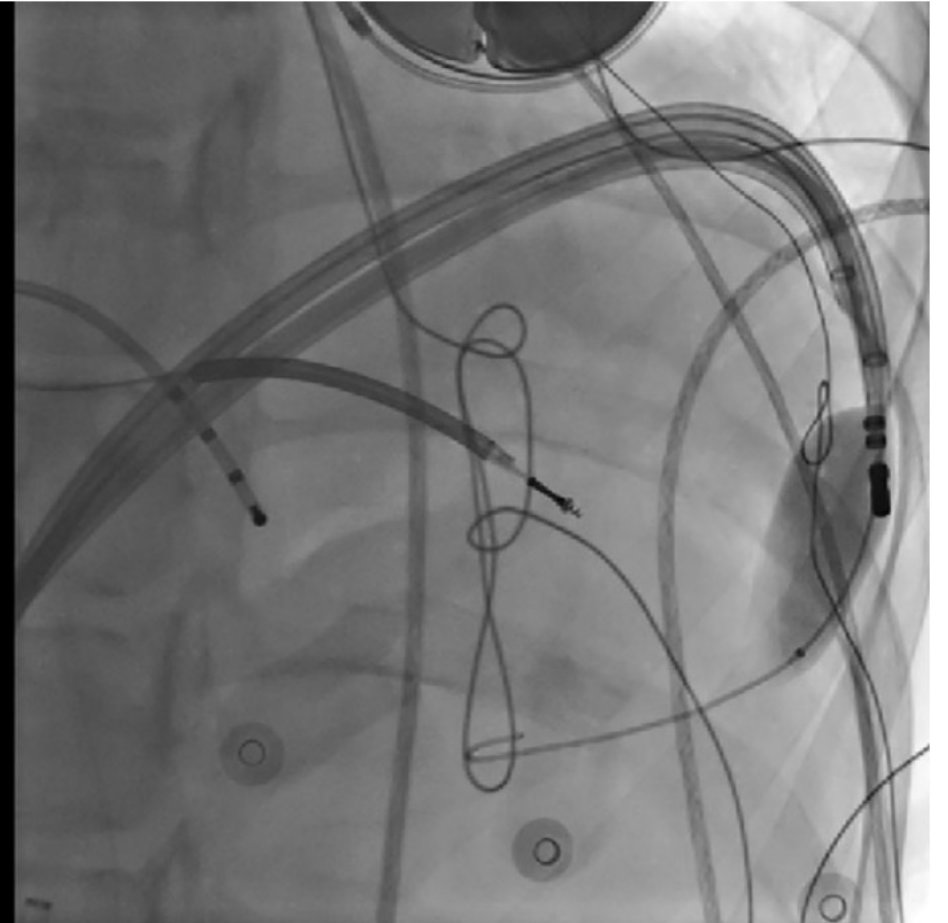
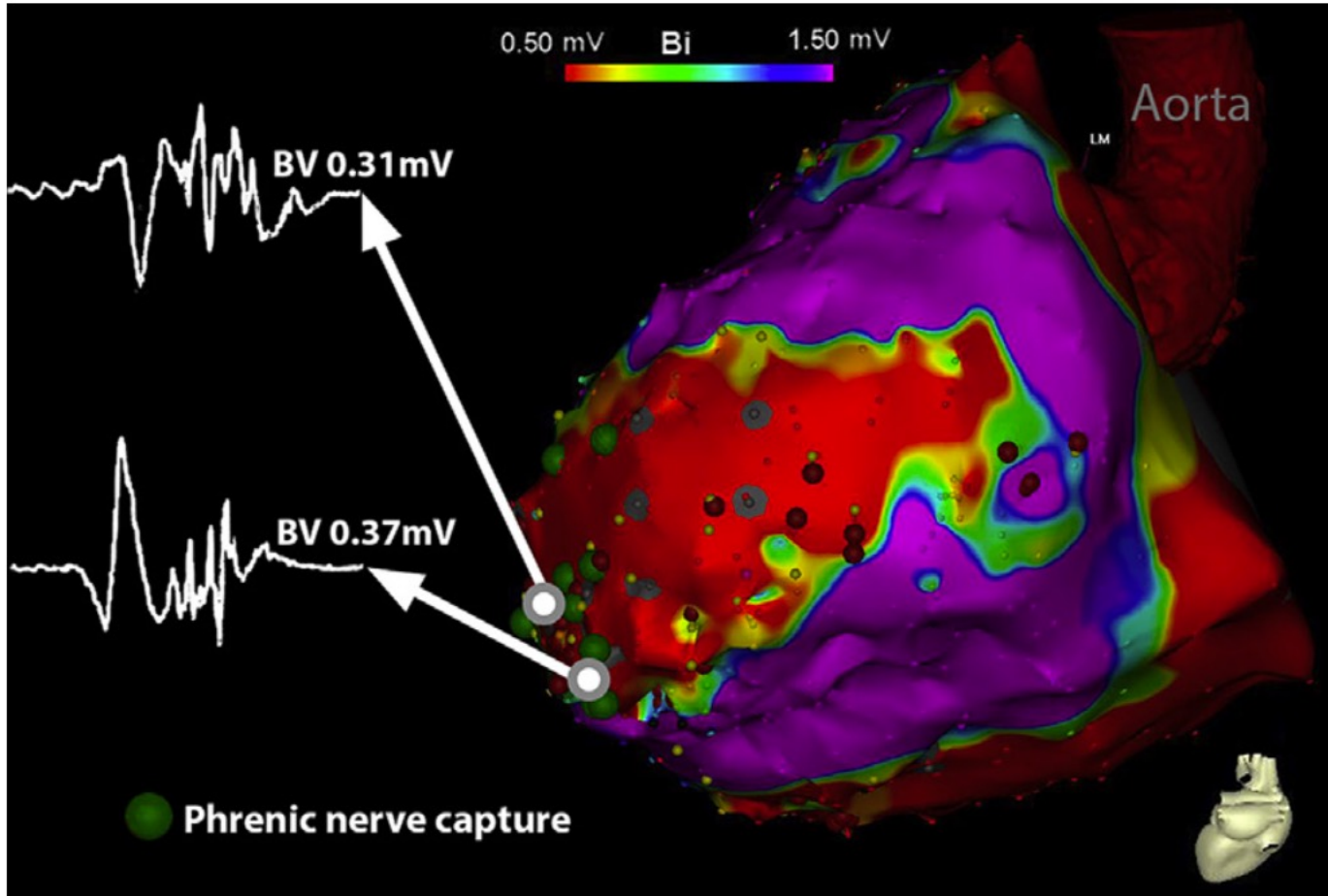
S1: 330
S2: 230
S3: 200

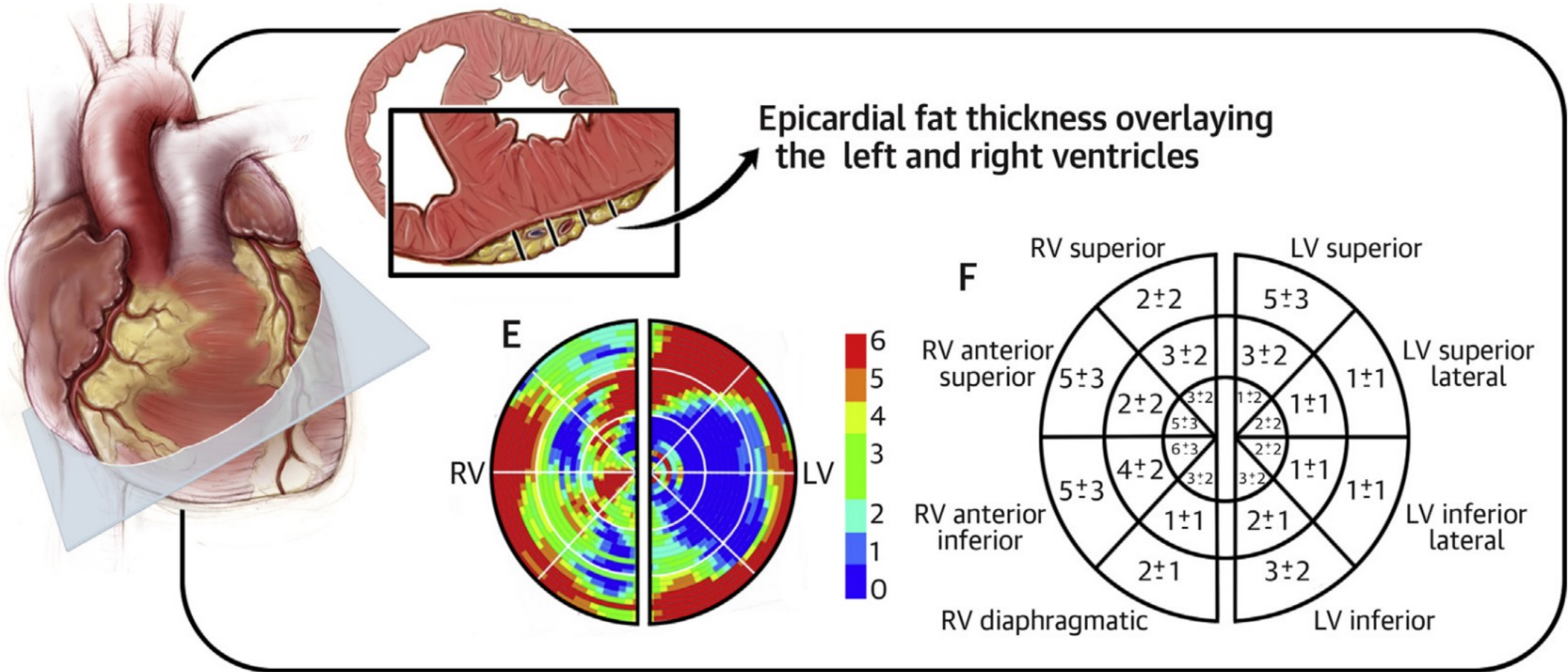


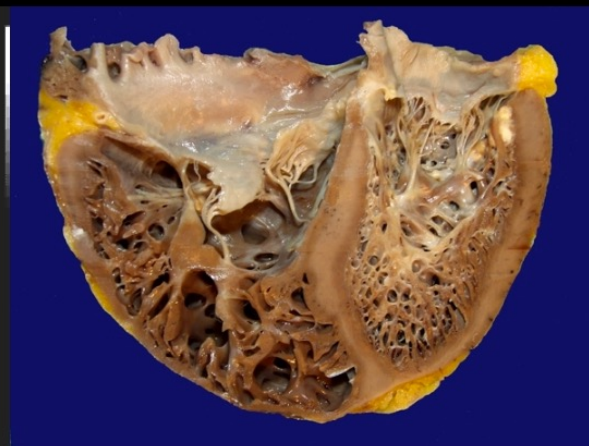
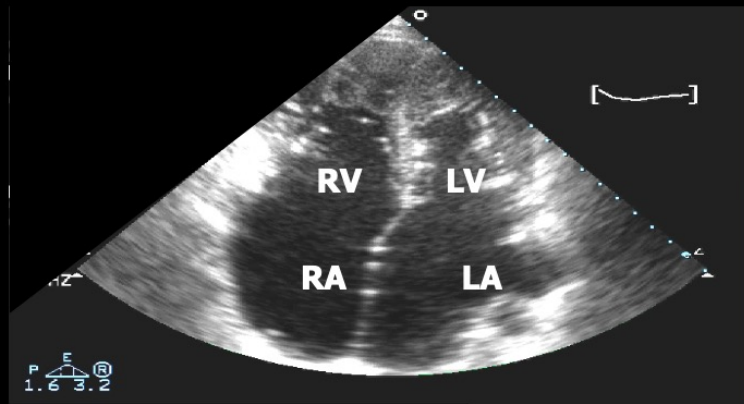
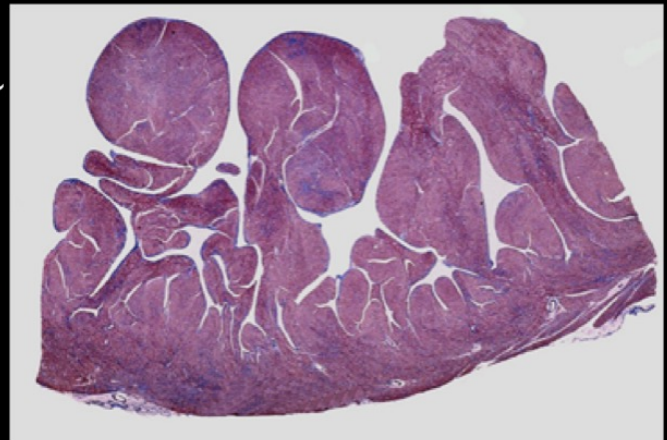
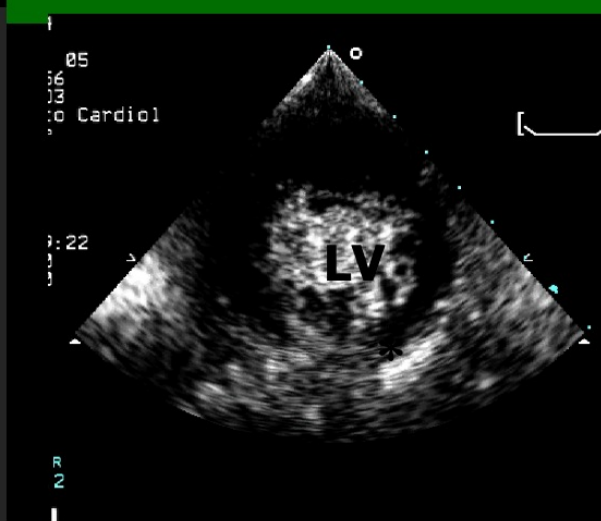
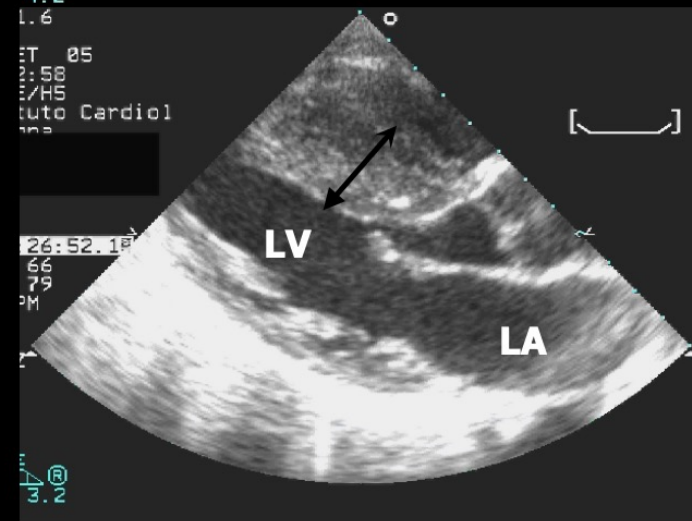
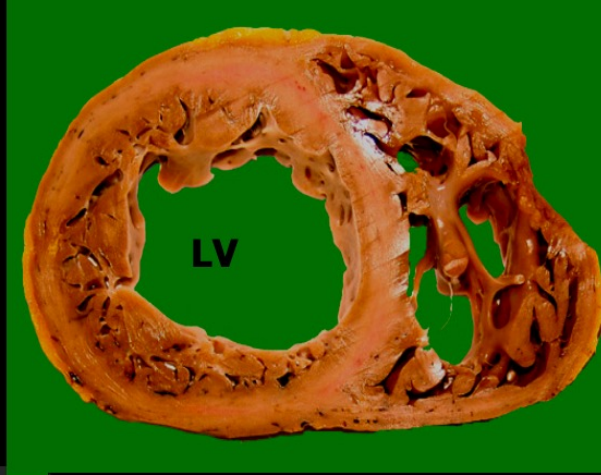
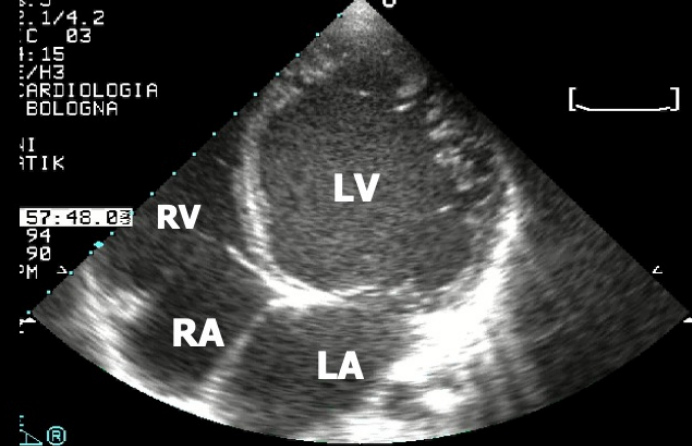
S1 S2 S3
2:28:52 AM 2:28:53 AM





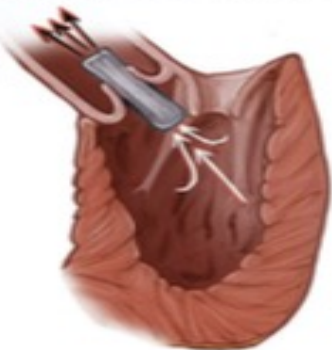




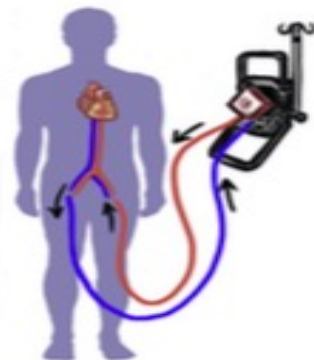


2. Mechanical circulation support during ablation guided by risk score assessment

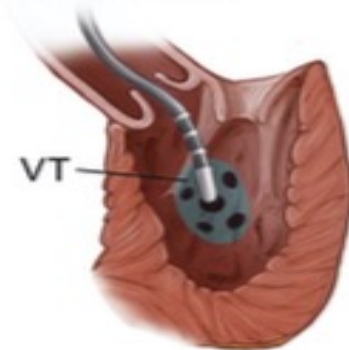
a. pLVAD



b. ECMO



3. Improved substrate definition and ablation tools



4. Larger lesion formation / deeper lesions

a. lower ionic irrigant



b. impedance modulation



c. needle-tipped electrode



d. simultaneous unipolar ablation



e. bipolar ablation

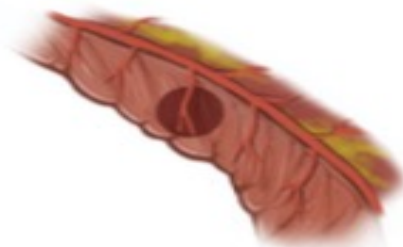


5. Alternatives to radiofrequency

a. cryoablation



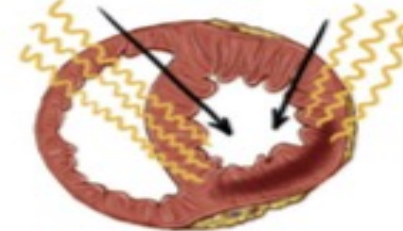
b. chemical ablation

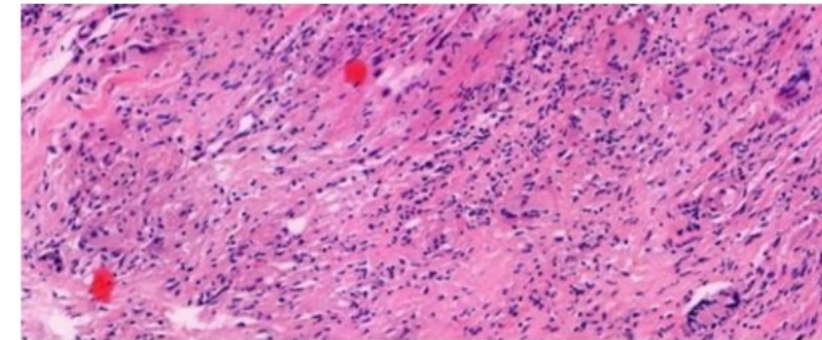
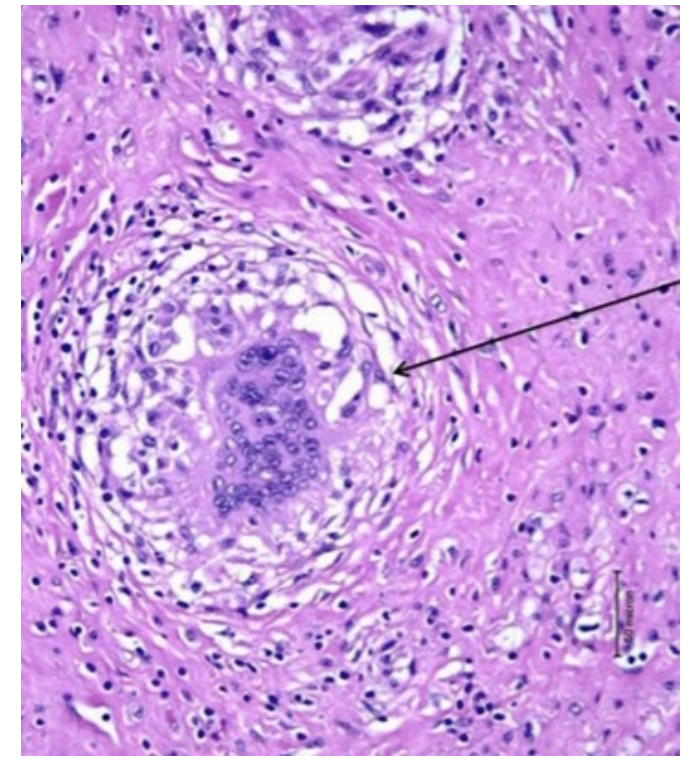
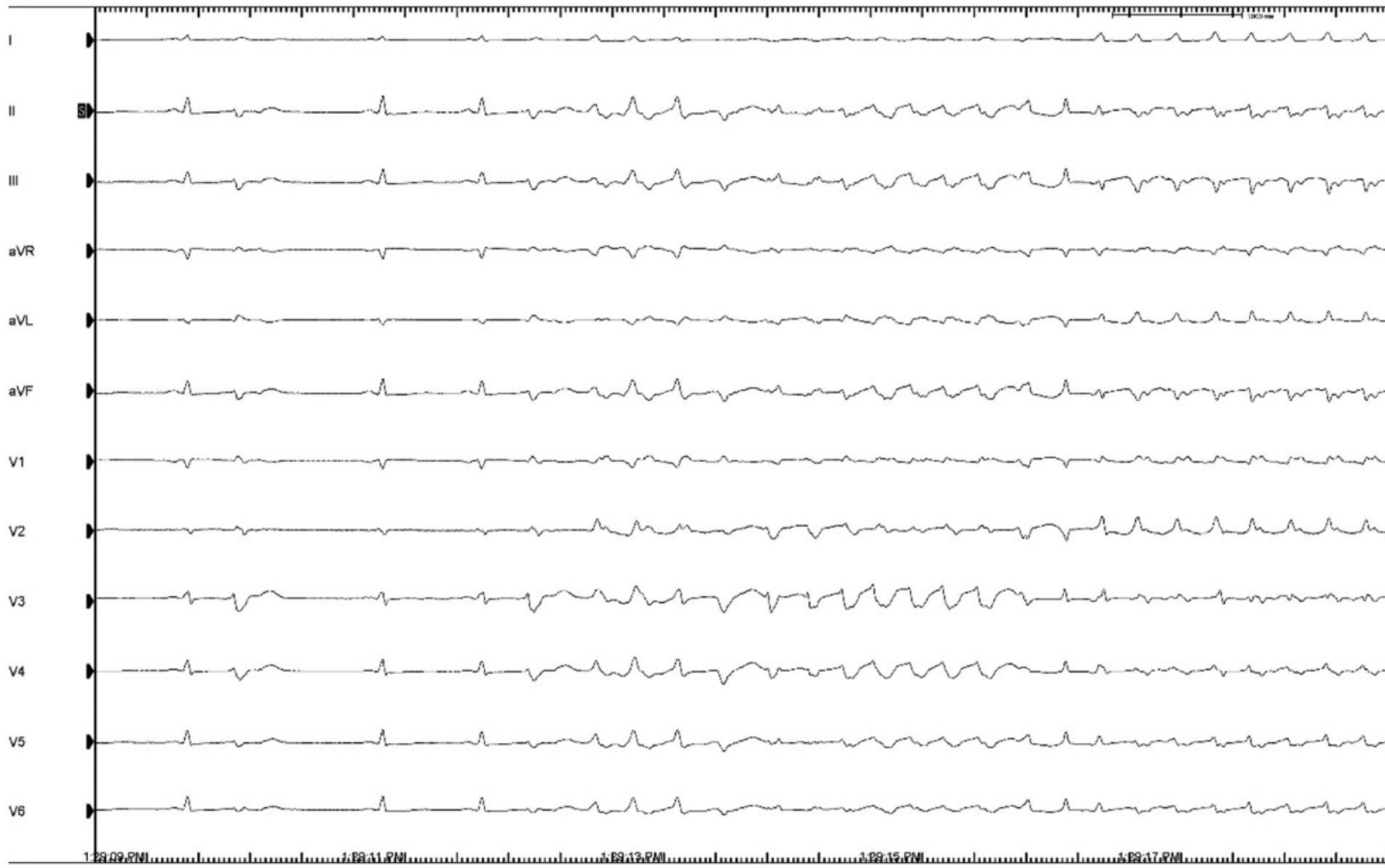


c. pulse-field ablation



d. radiation therapy





Ozcan EE. Should add-hoc cardiac biopsy be routine in patients with cardiomyopathy of unknown etiology undergoing electrical storm ablation? Pacing Clin Electrophysiol. 2022



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