

Trattamento delle aritmie ventricolari sessione II

L'IMPORTANZA DELL'ANALISI DEL SUBSTRATO NELLE TACHICARDIE VENTRICOLARI STRUTTURALI

Dr.ssa Graziana Viola

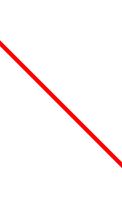
Responsabile Struttura semplice di Elettrofisiologia
AOU Sassari



Twenty-five years of catheter ablation of ventricular tachycardia: a look back and a look forward

Andrea Natale, Katja Zeppenfeld, Paolo Della Bella, Xu Liu, Avi Sabbag, Pasquale Santangeli, Philipp Sommer, Christian Sticherling, Xiaodong Zhang, Luigi Di Biase, Twenty-five years of catheter ablation of ventricular tachycardia: a look back and a look forward, *EP Europace*, Volume 25, Issue 9, September 2023, euad225, <https://doi.org/10.1093/europace/euad225>

- Catheter ablation (CA) is currently considered the most effective non-pharmacological approach in reducing recurrence of VA.⁴ The ablation strategy, as well as its efficacy, is highly dependent on the accuracy of mapping of the substrate under investigation
- Ablation target: mapping guided VT-ablation targeting critical isthmus sites
- Ablation target: identification and ablation of late potentials and local abnormal ventricular activities (LAVA) to scar dechanelling and scar homogenization,⁵



No more than 30% of patients presenting with scar-related VT display inducible and stable VA

(Zeppenfeld K, Stevenson WG. Ablation of ventricular tachycardia in patients with structural heart disease. Pacing Clin Electrophysiol 2008;31:358-74)

- substrate-based strategies have emerged as an alternative option to effectively map and ablate scar-related VT
- The majority of VT cases patient with structural hear disease are due to scar-based reentry
- These areas of myocardial scar alter the impulse propagation thereby producing slow anbd anisotropic conduction
- Such delayed local attivation presents as local abnormal ventricular activities (LAVA), with fractioneted , split and late potential during electroanatomical mapping

LONG TERM SUCCESS

The mean long-term success rate of VT ablation varies from 30% to 70%, depending on the underlying SHD.



European Society
of Cardiology

European Heart Journal (2022) **43**, 3997–4126
<https://doi.org/10.1093/eurheartj/ejac262>

ESC GUIDELINES

2022 ESC Guidelines for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death

Developed by the task force for the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death of the European Society of Cardiology (ESC)

Endorsed by the Association for European Paediatric and Congenital Cardiology (AEPC)

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NICM

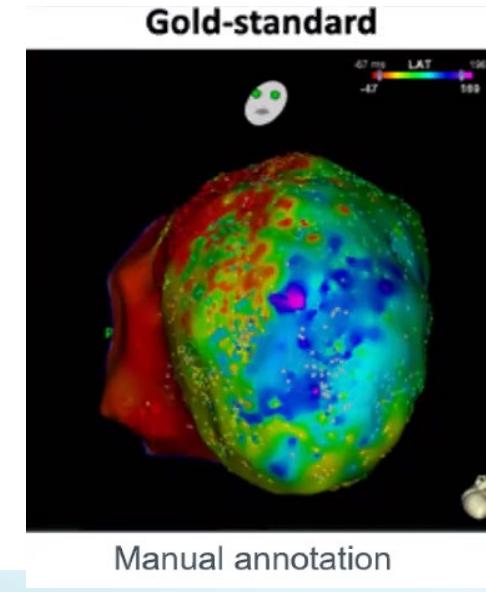
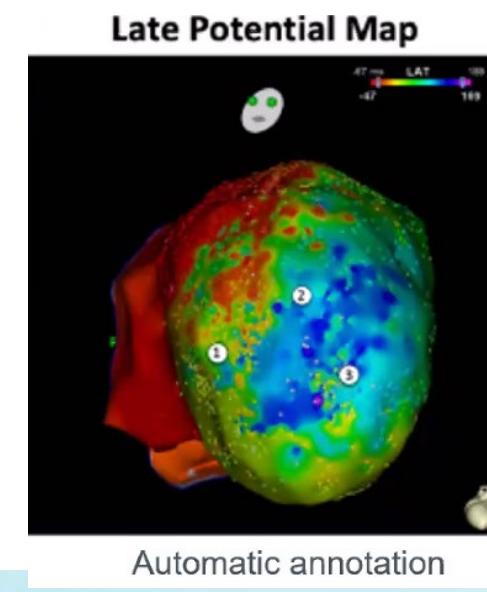
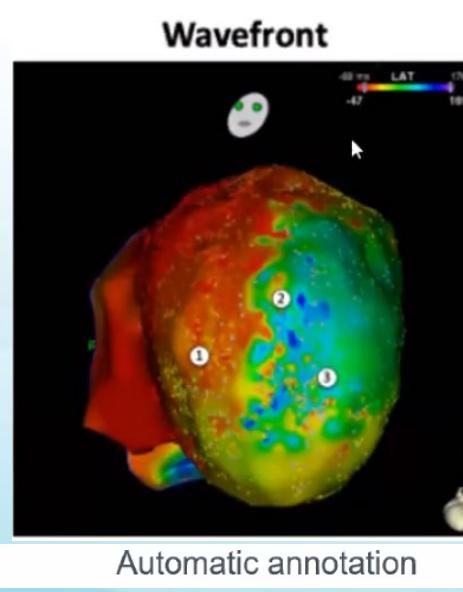
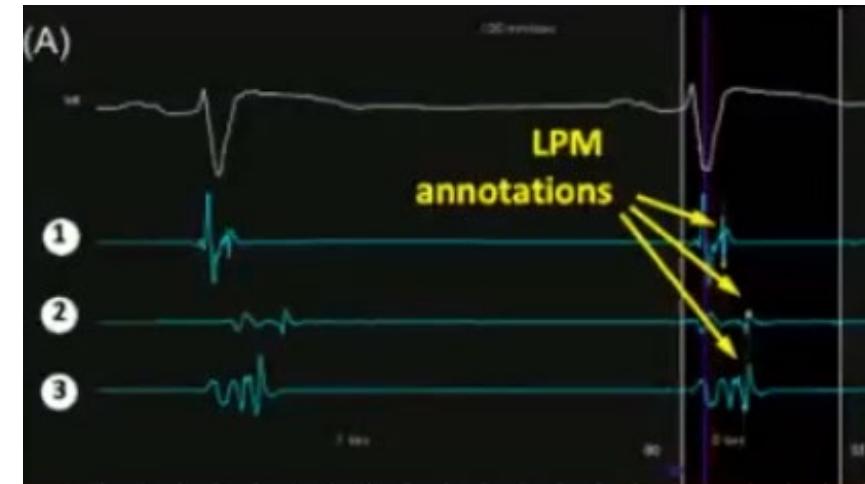
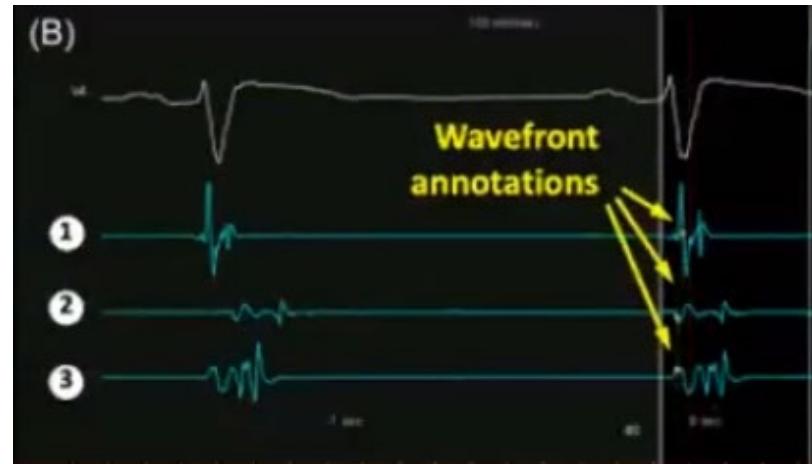
- The term NICM includes a heterogeneous group of cardiomyopathic states that are not due to coronary artery disease and with aetiologies ranging from genetic conditions to acquired inflammatory or infectious diseases.
- NICM patients undergoing CA of VT share similarities in the substrate distribution and procedural approaches required to suppress VT.^{5,35}
- Imaging and mapping studies have consistently documented a perivalvular distribution of the abnormal substrate responsible for VT in NICM and in patients with LV NICM
- Two patterns of scar distribution have been reported: a predominantly antero-septal (AS) pattern that has a high prevalence of intramural septal substrate extending to the periaortic region, and a predominantly infero-lateral (IL) pattern that is mostly characterized by basal LV free wall involvement greater in the epicardium compared to the endocardium.

3 D MAPPING IN SR OR PACING : K-POINT (MAKING A LONG STORY SHORT!)

- Identification of abnormal potential
- Identification of low voltage areas (bipolar voltage in sam
- Local activation time
- What else~



AUTOMATIC DETECTION OF NEARFIELD VS FAR FIELD (LAM)

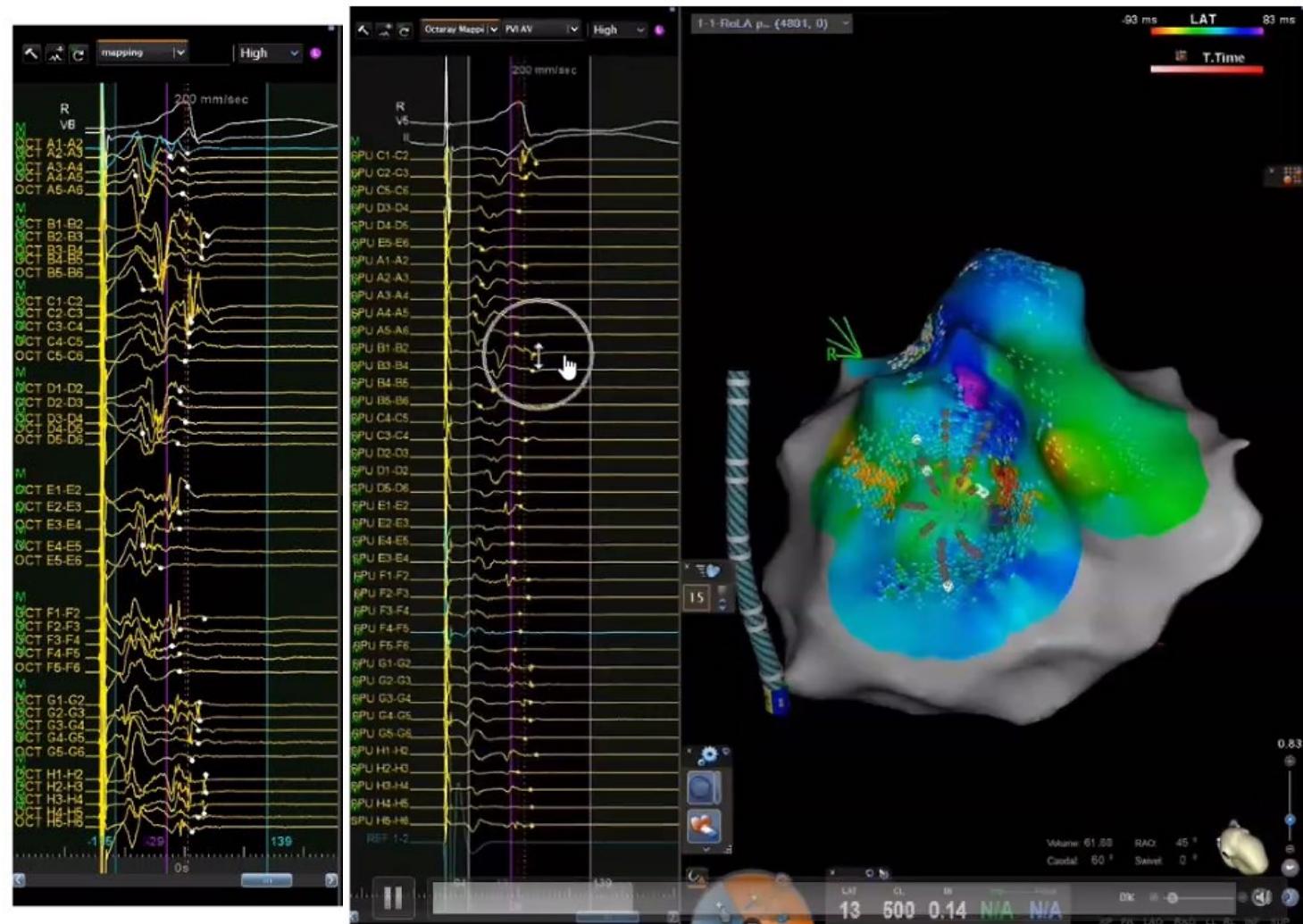


Get precise LAT maps with little effort as a results

No need of rowing
your WOI

No need to reannotate

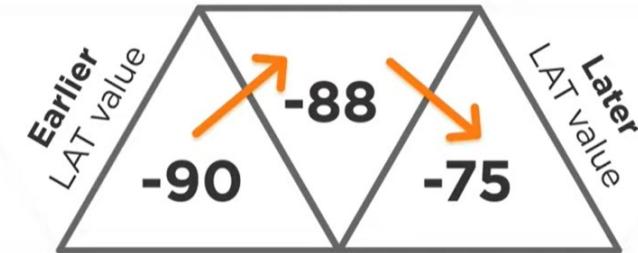
Late potentials are
automatically
annotated



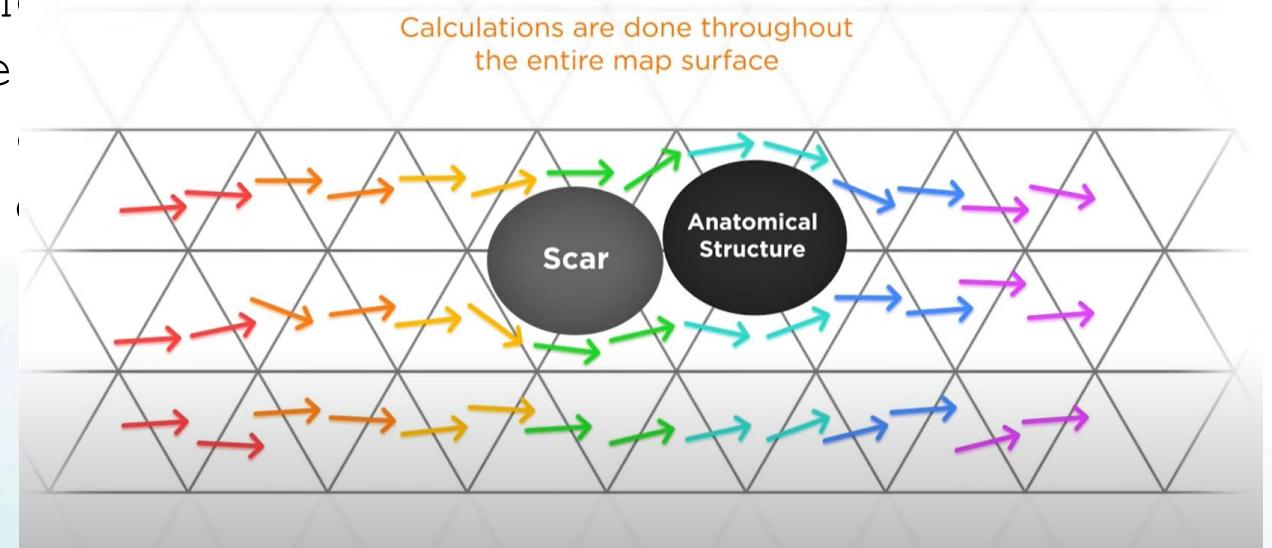
Remember:

- LAM **relies on the waveform annotation principles but incorporates in the annotation decision process information on the timing giving priority to the latest component and the signal consistency in consecutive beats** which increases the annotation accuracy for extremely low-voltage amplitude signals.
- The algorithm is flexible: the late boundary threshold and sensitivity mode can be adjusted during mapping

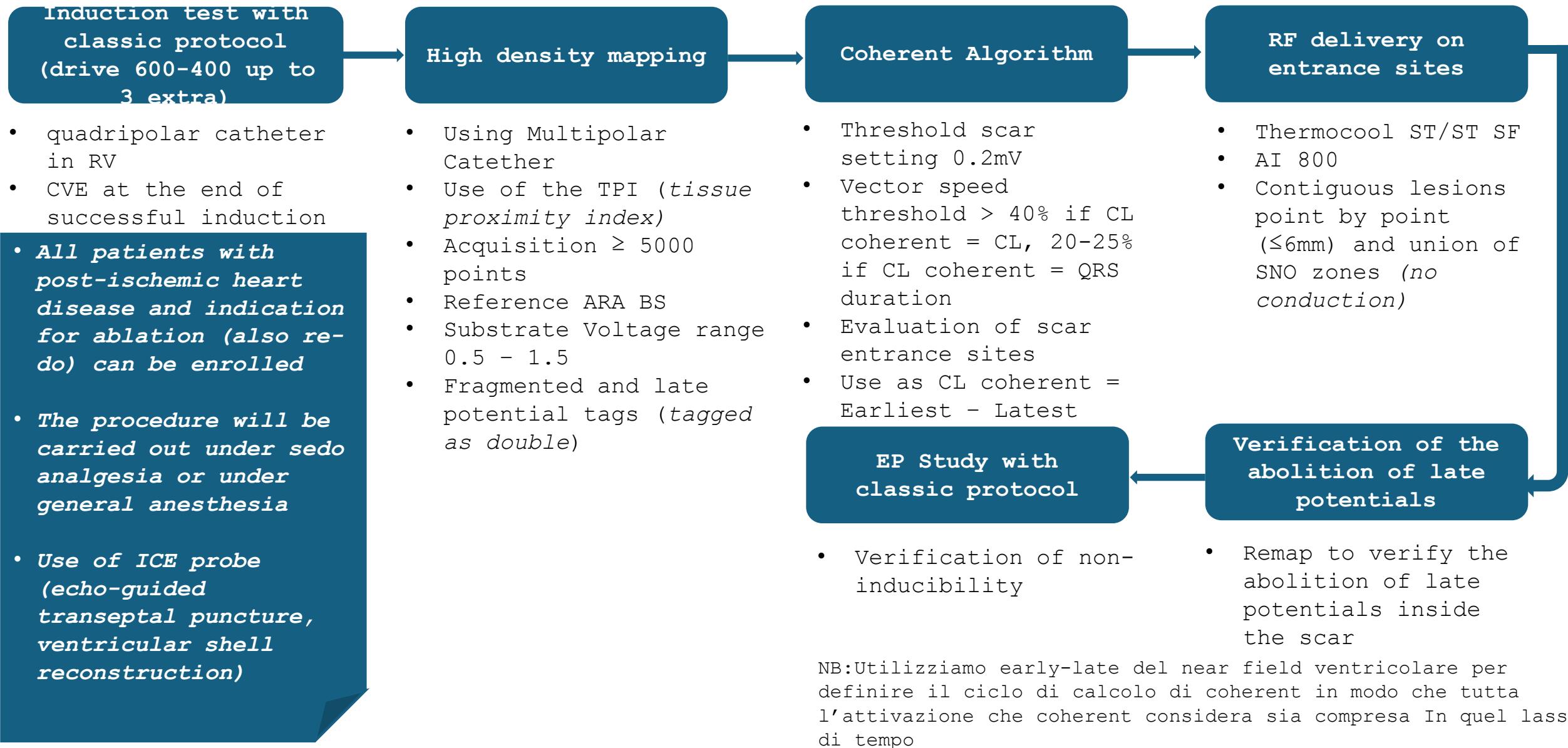
Coherent considera l'attivazione dal triangolo più precoce a al più tardivo, pertanto suppone che la direzione del vettore vada dal più precoce al più tardivo



Il sistema prende in considerazione Anatomiche e la presenza di scar e soluzione globale di attivazione più è probabile per quella camera



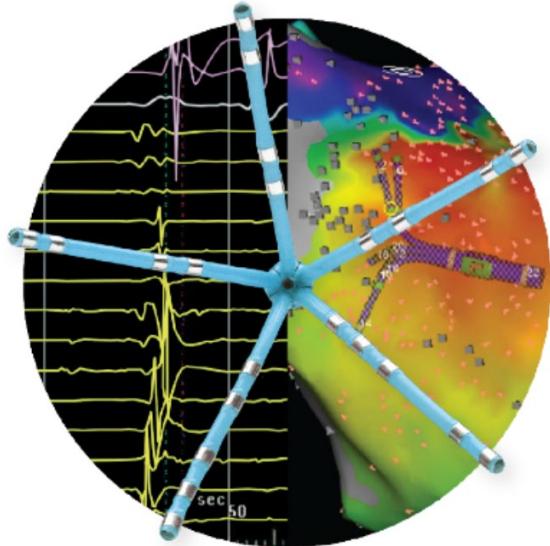
PROCEDURAL WORK FLOW



EARLY EXPERIENCE WITH THIS PROTOCOL : 27 PATIENTS

DATI CLINICI				
SESSO (n 27)	ETA'	SEDE INFARTO	STORM (n 16)	FRAZIONE D'EIEZIONE
M 100%	73 ± 7.9	Anteriore 51% Inferiore 49 %	59%	38% ± 7.52

DATI PROCEDURALI									
INDUCIBILI TA' INIZIO PROCEDURA	TEMPO DI MAPPAGGIO	N PUNTI ACQUISITI	TEMPO PROCEDURAL E	N ENTRANCE INDIVIDUA TI	ENTRANCE ABLATTI	TEMPO RF	MODIFICA SUBSTRATO	INDUCIBILI TA' POST ABLAZIONE	COMPLICA NZE (1 BAV COMPLETO)
77%	61.59 ± 32.09	7130 ± 2976	195 ± 42.14	2.59	2.55	22.2 ± 10.3	100%	11%	3.7%



ENTA VS OCTARA



	PENTAREI (n 17)	OCTAREI (n 10)
TEMPO PROCEDURA	81 ± 20	27.6 ± 9.39
N PUNTI ACQUISITI	5803 ± 1529	9387 ± 3527

DATI FOLLOW UP

RECIDIVE (n 5)	FOLLOW UP MEDIO	MORTE NEL FU PER CAUSE CARDIACHE (n 1)	MORTE PER CAUSE NON CARDIACHE (n 1)
18.5%	12 ± 6 MESI	3.7%	3.7%

CLINICAL CASE

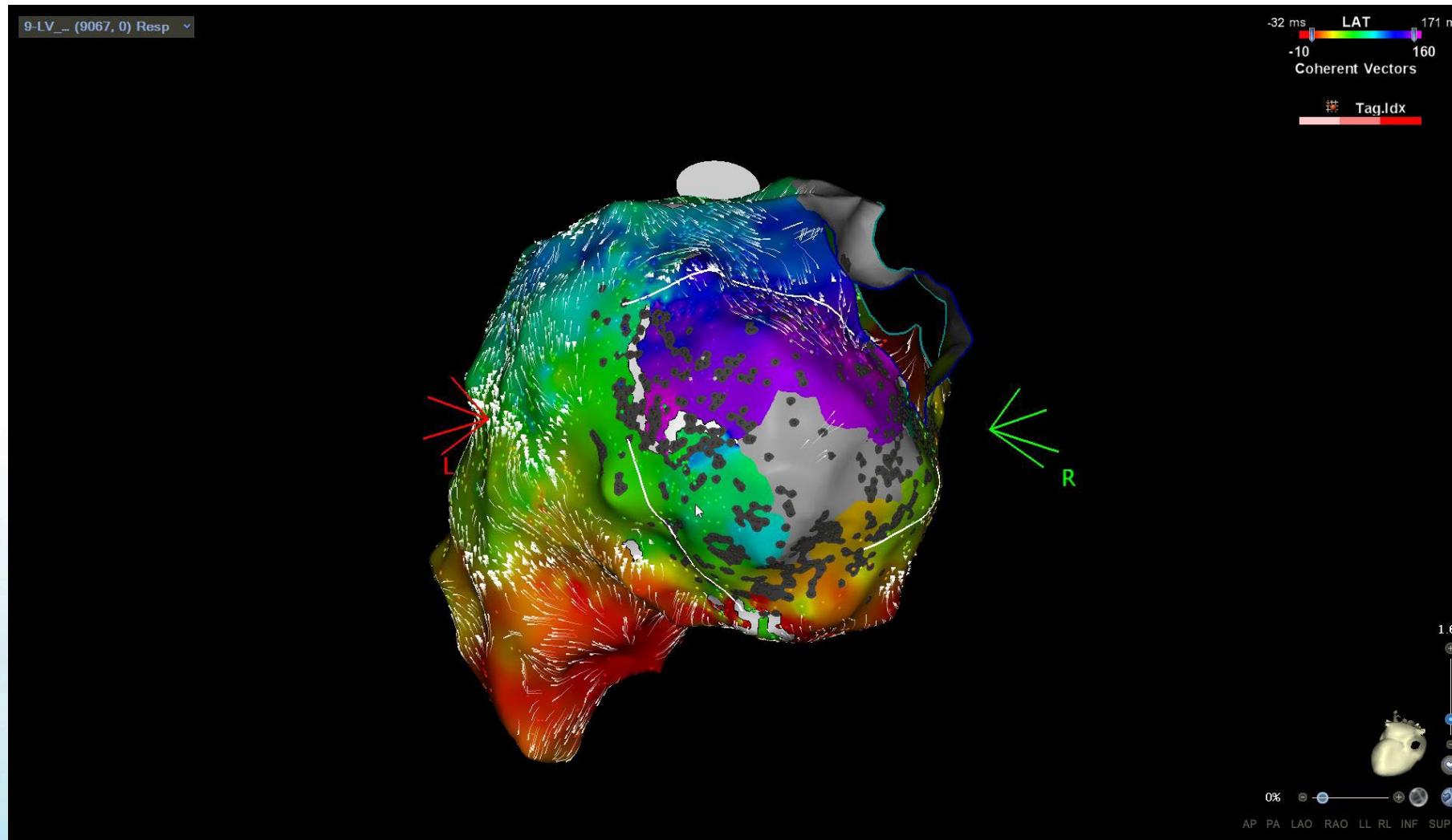
Male, 59 Yrs.

CV RF: hypertension, dyslipidemia, pre-diabetes, CKD, Obesity.

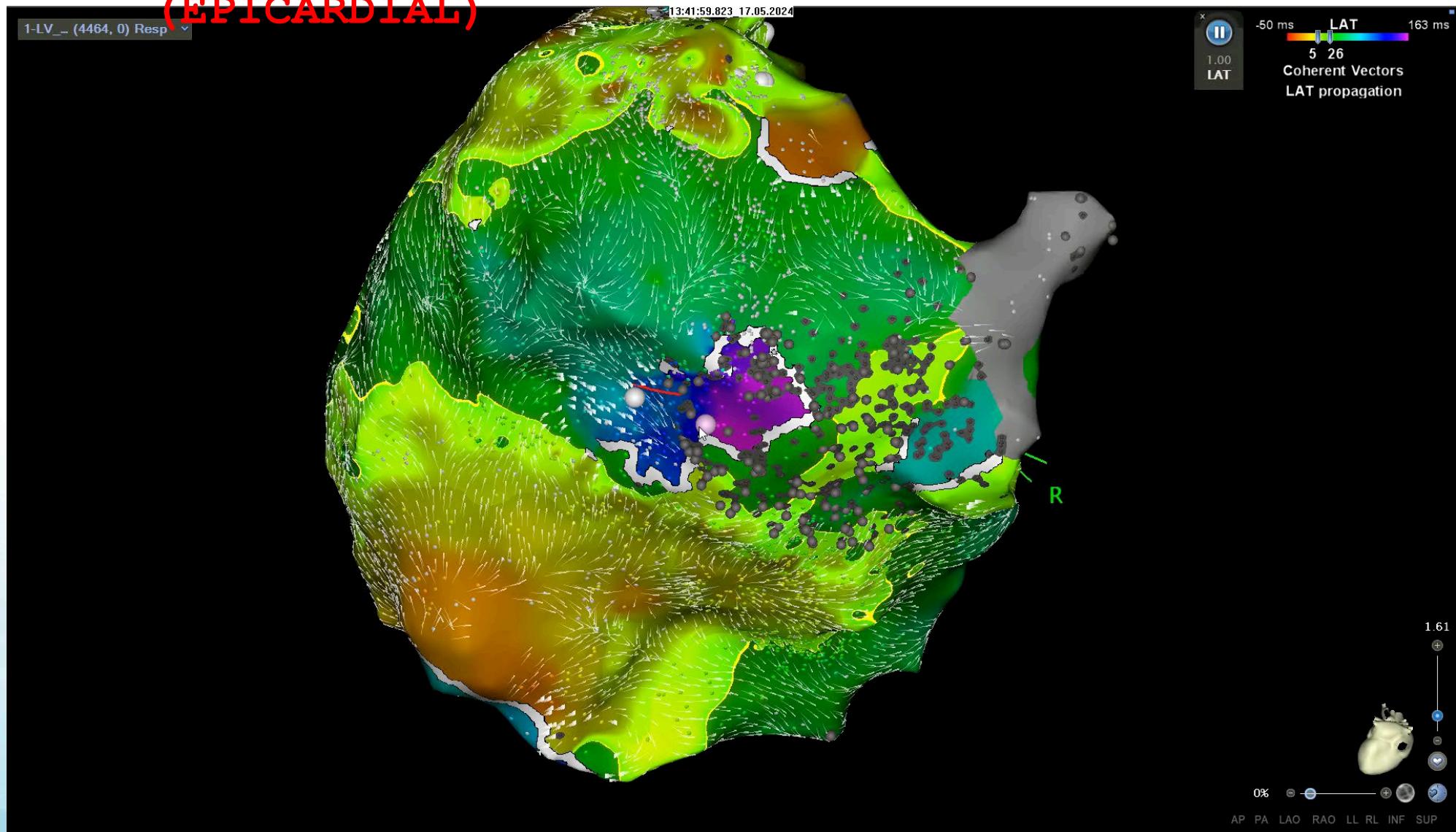
CCS: inferior MI with aneurysmatic evolution (1999), NSTEMI treated with PCI of LCX-OM AND LAD (mid).

Recent admission for monomorphic VT (detected on ICD EGM), new PCI on LCX OM, no more arrhythmias after revascularization. New admission for syncope, at device check: multiple VT episodes treated by ATP and shocks.

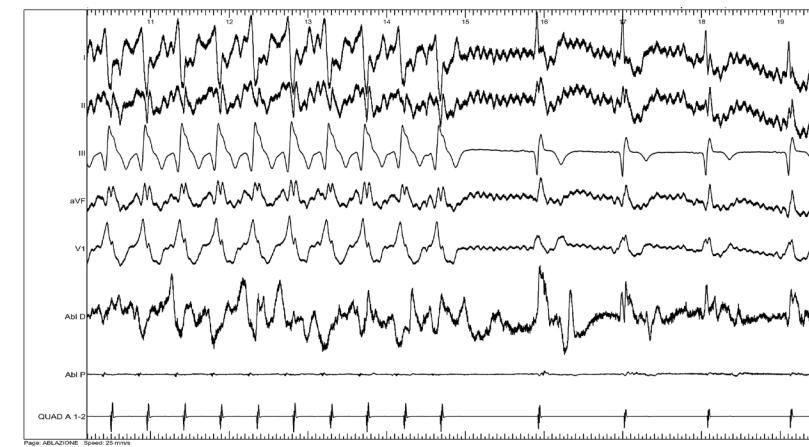
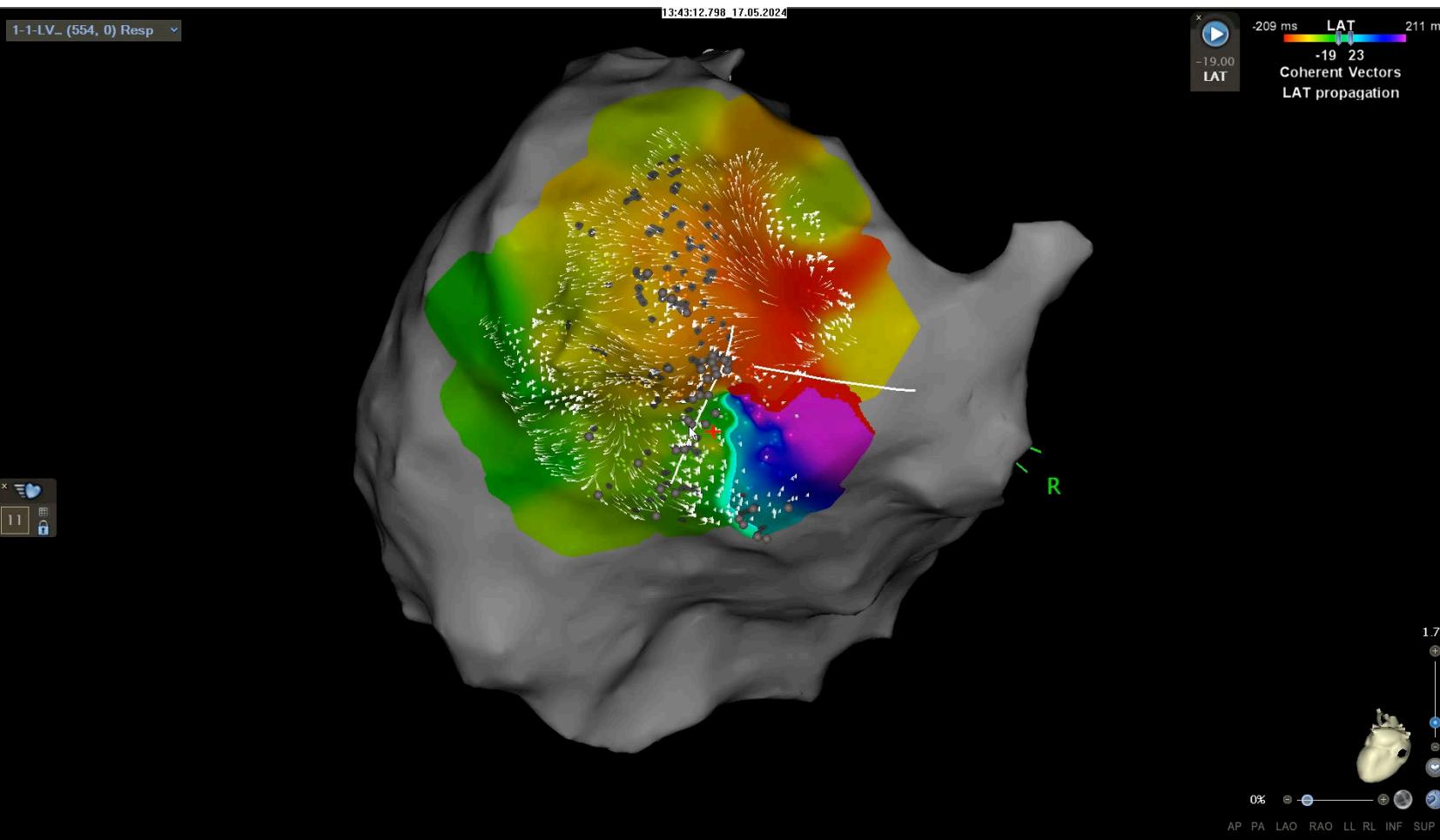
COHERENT+ LAM IN SR (ENDOCARDIAL)



COHERENT+ LAM + PROPAGATION IN SR (EPICARDIAL)



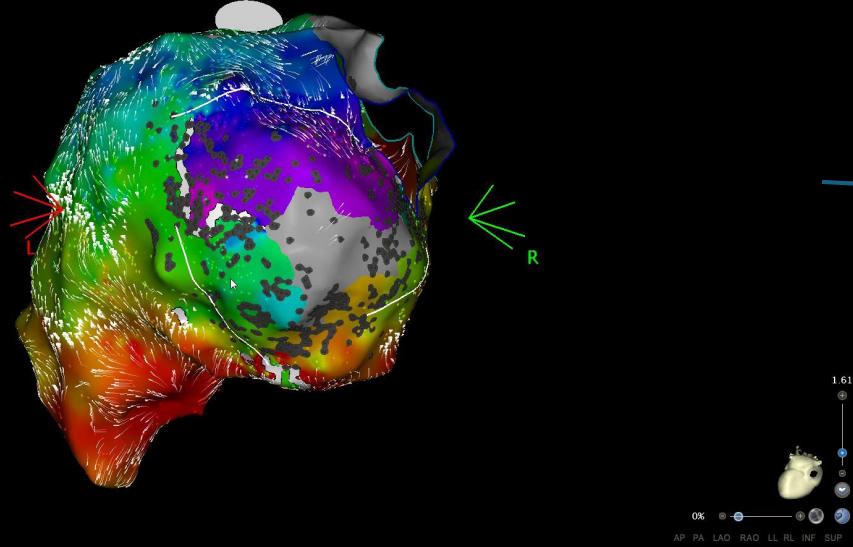
COHERENT + PROPAGATION IN VT (EPICARDIAL)



9-LV_ (9067, 0) Resp

-32 ms LAT 171 ms
-10 160
Coherent Vectors

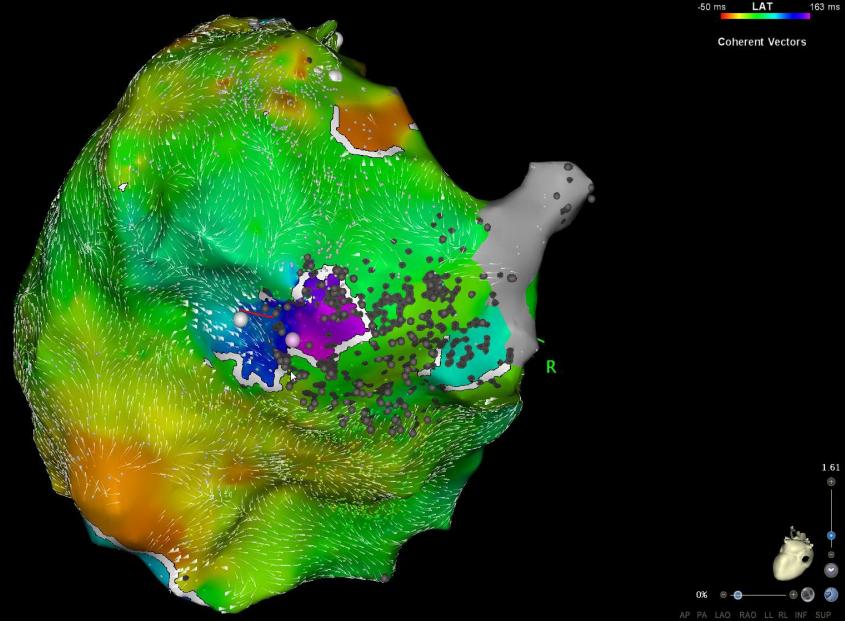
Tag.Idx



1-LV_ (4464, 0) Resp

-50 ms LAT 163 ms
Coherent Vectors

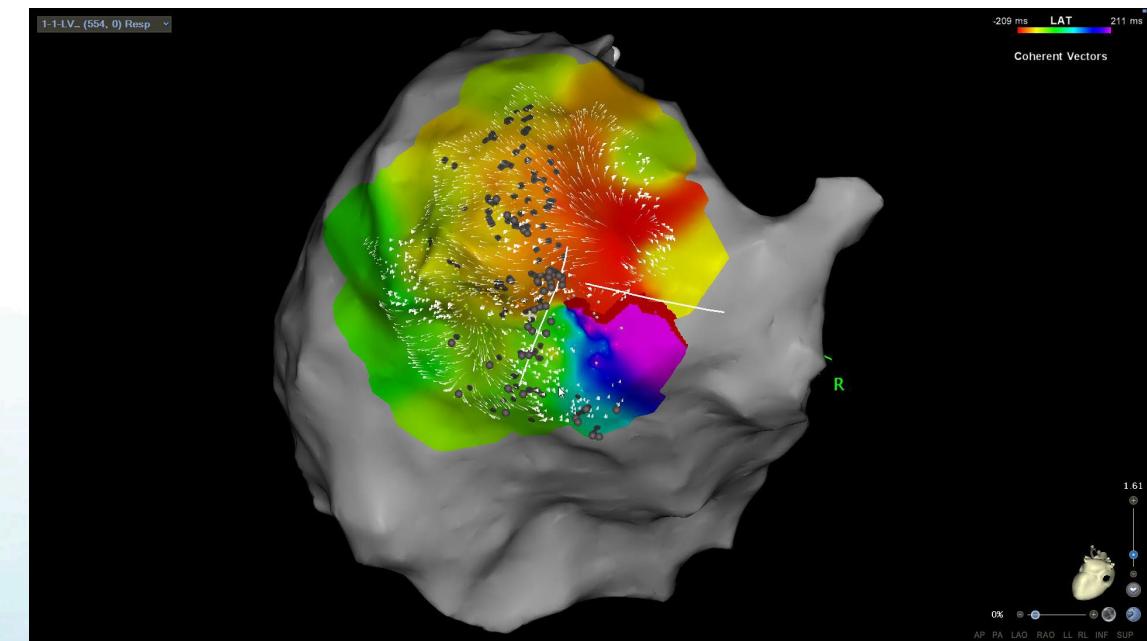
EPI



1-i-LV_ (554, 0) Resp

-209 ms LAT 211 ms
Coherent Vectors

AP PA LAO RAO LL RL INF SUP



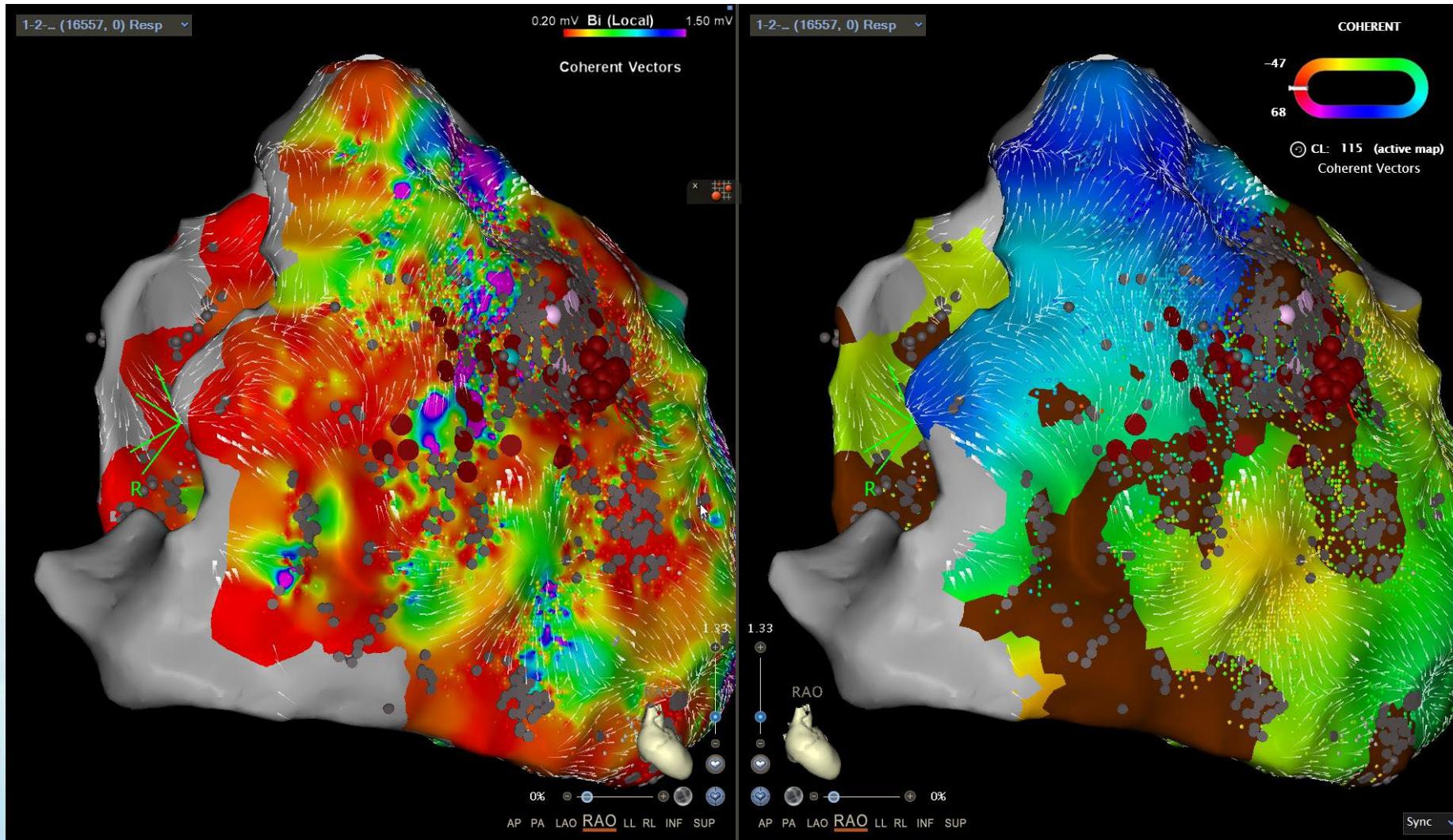
CLINICAL CASE II

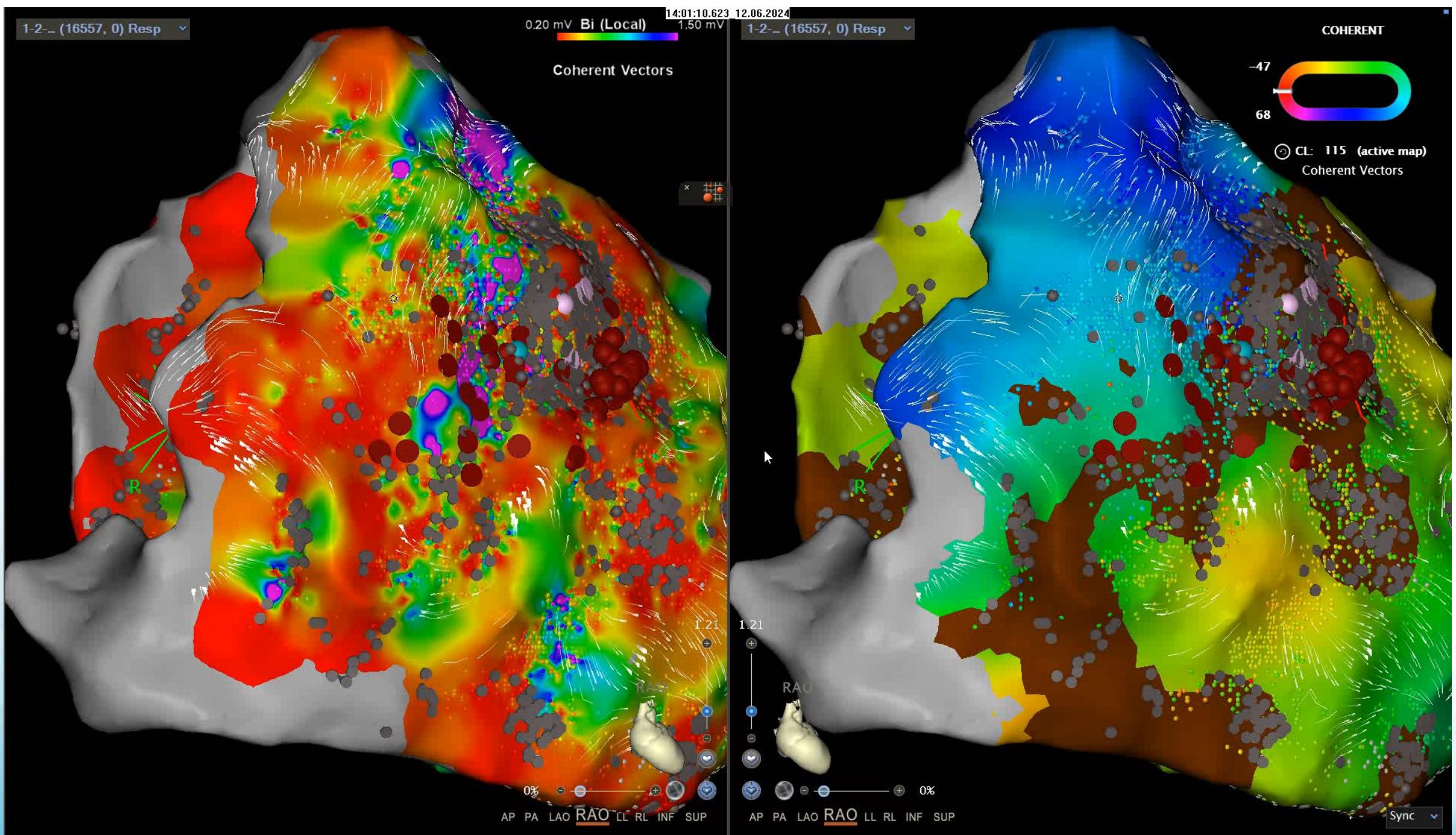
Male, 30 yo

ARVD

Recent admission for multiple shocks and ATP over fast VT

MAPPA LAT + COHERENT RS





E QUANDO IL SUBSTRATO CI DOVREBBE ESSERE E NON C'E' ??

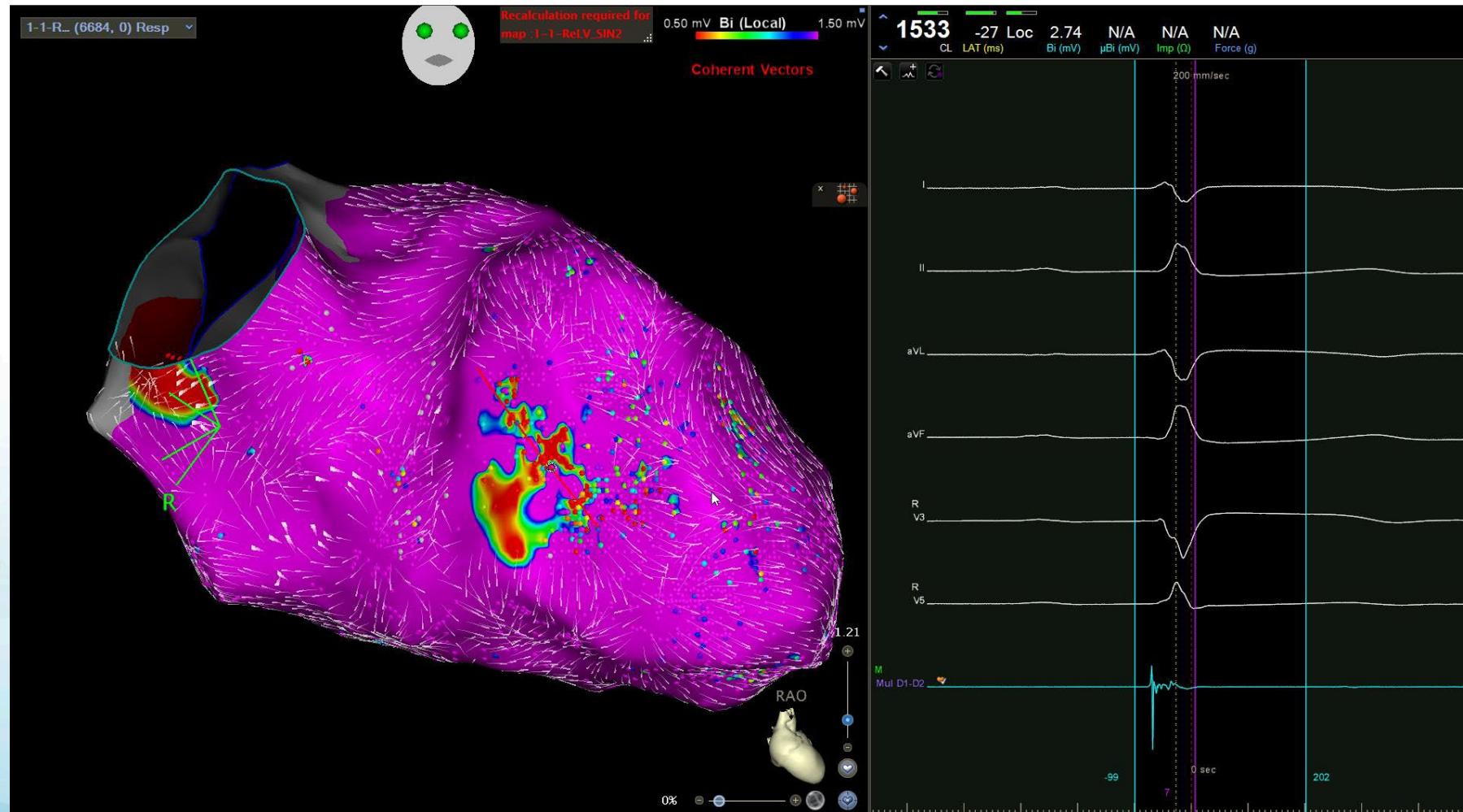
Male 42 yo

Recent anterior IM (PCI proximal DA)

After 1 month admission for incessant VT

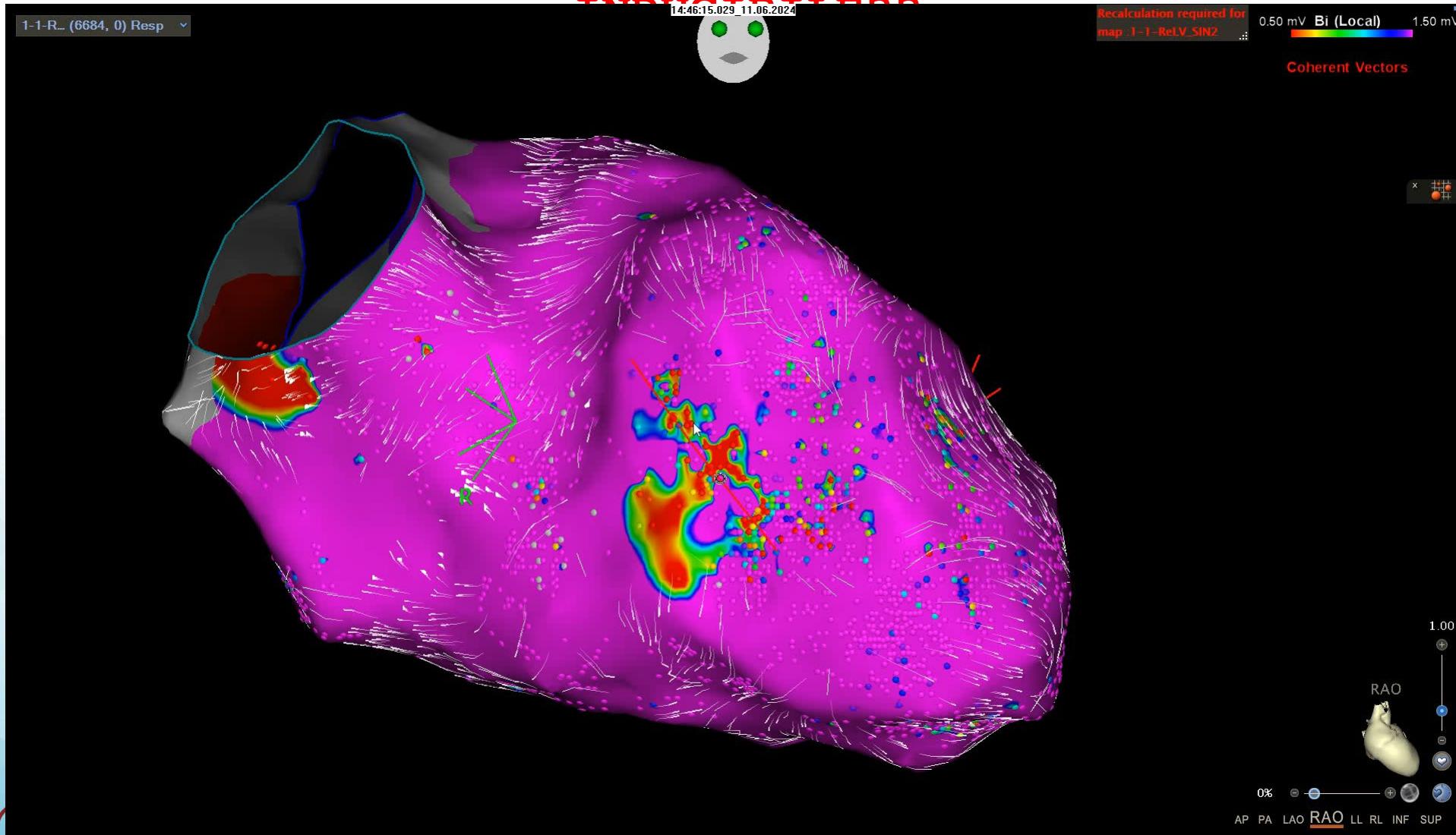
Ipokynesia anterior septum

E QUANDO IL SUBSTRATO CI DOVREBBE ESSERE E NON C'E' ??



E QUANDO IL SUBSTRATO CI DOVREBBE ESSERE E NON C'E' E LA VT NON E' Più

INDUCED TACHYCARDIA



GRAZIE PER L'ATTENZIONE !!

Un grazie di cuore ai miei m&ms (Matteo Fadda e Matteo Mirarchi) preferiti per aver dato credito alle mie idee bizzarre e aver lavorato duramente a questo progetto

