


Repolarisation précoce – quand s'inquiéter

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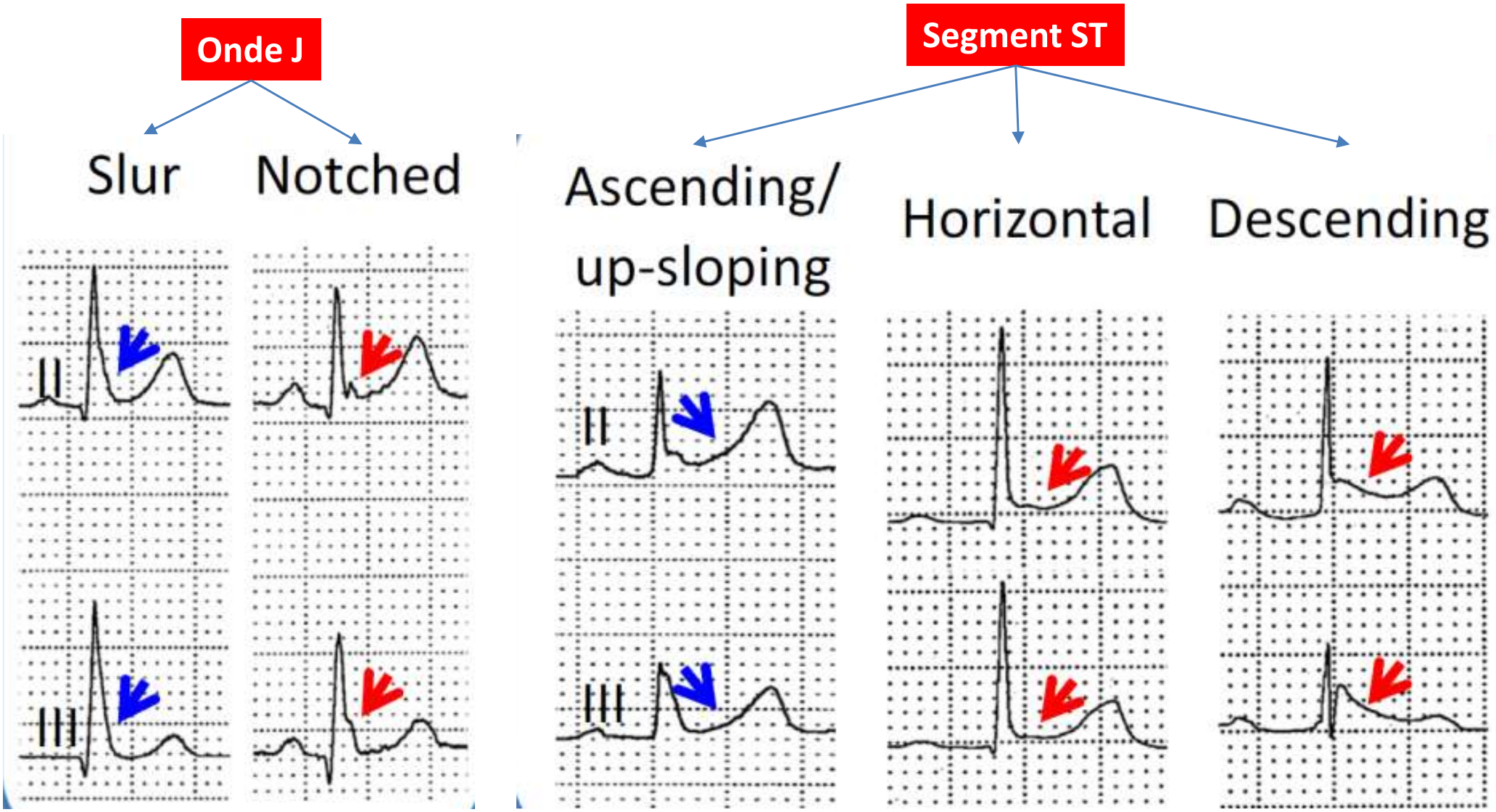
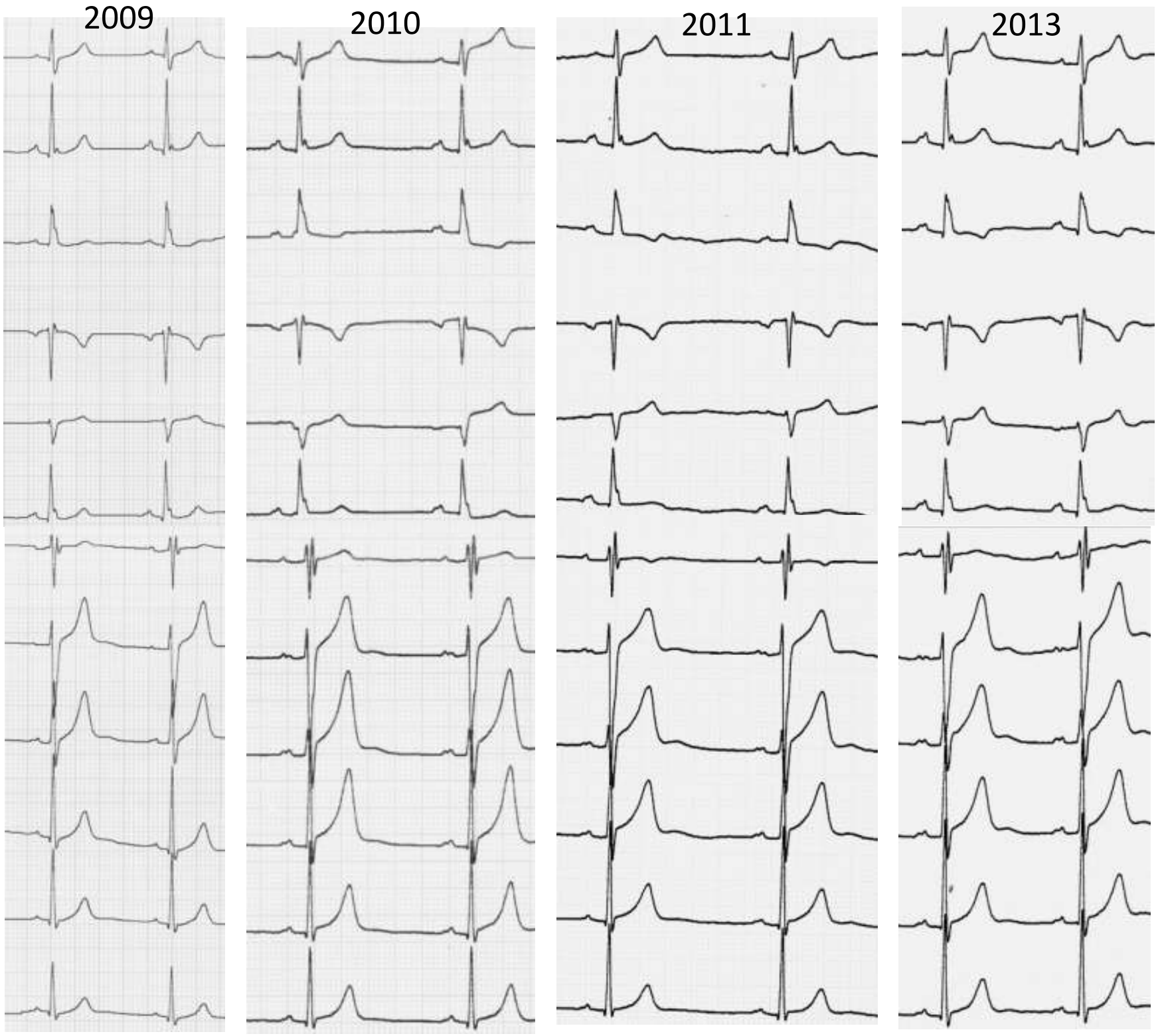
Rythmosud - ACCA
Nice, 9 janvier 2018

La repolarisation précoce

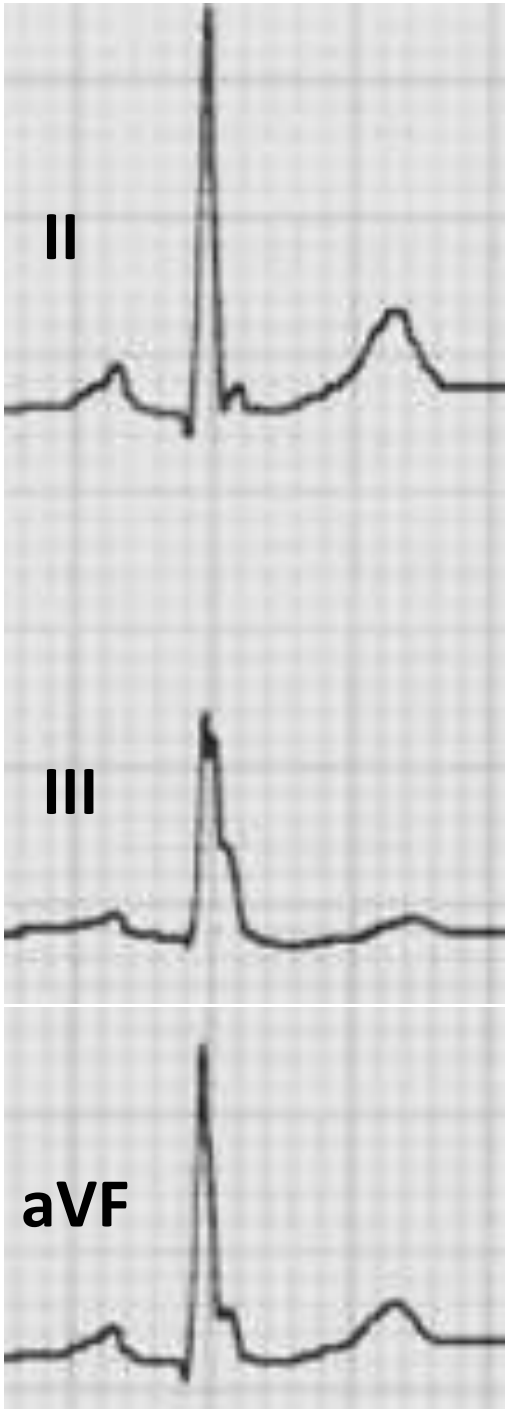


C… D…, 57 years-old male

- Sport ++ (bicycle 10 hours /week)
- PMH :
  - Duodenal ulcer
- Risk factors:
  - former smoker (30 P-Y)
  - mother died from MI at 62
  - high cholesterol treated by statins (pravastatin 40 mg/day)


2009
2010
2011
2013

25 mm/s
10 mm/mV



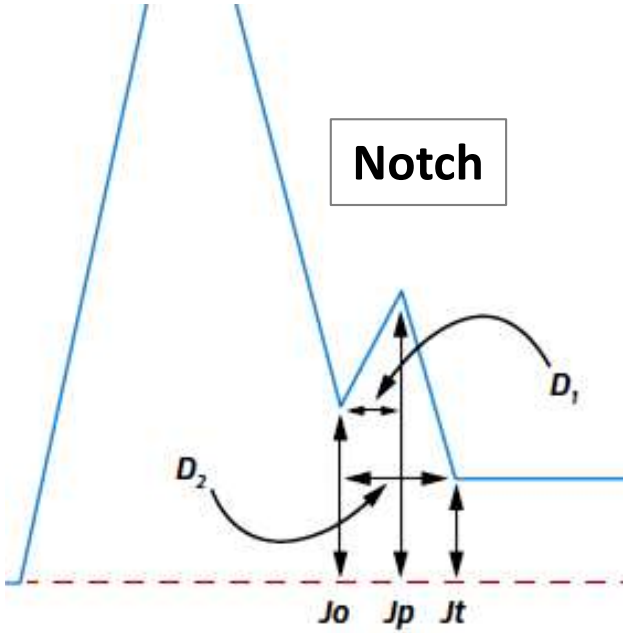
DEFINITION

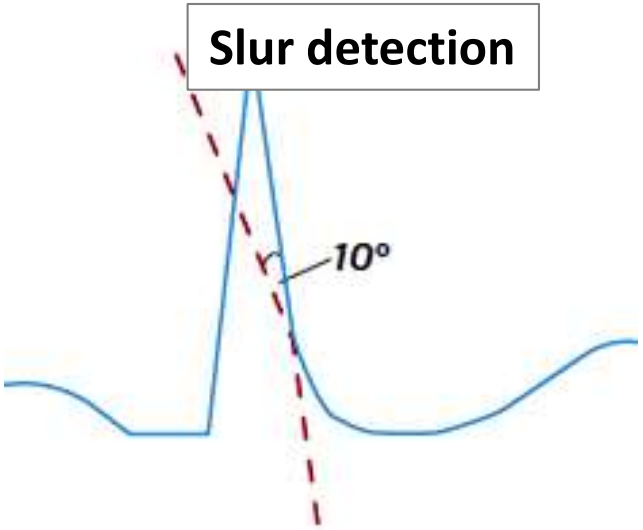
"Early repolarization" is present if **all** of the following criteria are met:

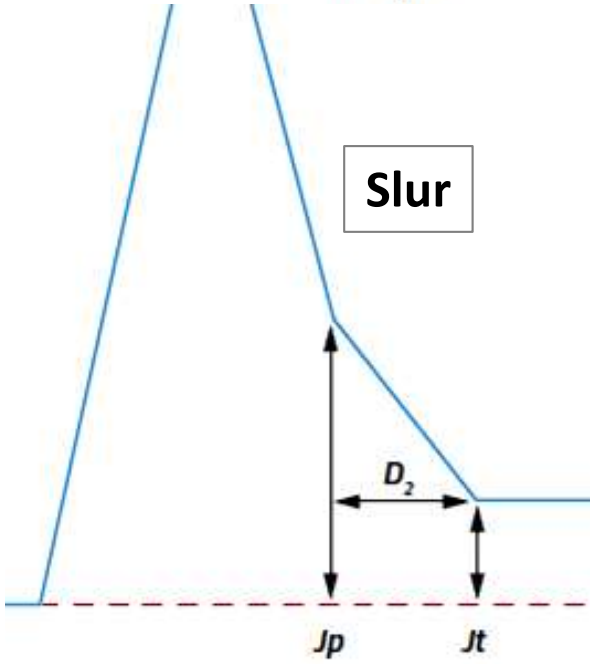
1. End-QRS **notch or slur** on the downslope of R-wave (notch or onset of slur entirely above the baseline)

2. **J_p is ≥0.1 mV** in 2 or more contiguous leads of the 12-lead ECG, excluding leads V_1-V_3.

3. **QRS** duration is **<120 ms**.







Macfarlane PW et al, JACC 2015

Syndrome de repolarisation précoce (ERS) – diagnostic

	Points
I. Clinical History	
A. Unexplained cardiac arrest, documented VF or polymorphic VT	3
B. Suspected arrhythmic syncope	2
C. Syncope of unclear mechanism/unclear etiology	1
**Only award points once for highest score within this category*	
II. Twelve-Lead ECG	
A. ER ≥0.2 mV in ≥2 inferior and/or lateral ECG leads with horizontal/descending ST segment	2
B. Dynamic changes in J-point elevation (≥0.1 mV) in ≥2 inferior and/or lateral ECG leads	1.5
C. ≥0.1 mV J-point elevation in at least 2 inferior and/or lateral ECG leads	1
**Only award points once for highest score within this category*	
III. Ambulatory ECG Monitoring	
A. Short-coupled PVCs with R on ascending limb or peak of T wave	2
IV. Family History	
A. Relative with definite ERS	2
B. ≥2 first-degree relatives with a II.A. ECG pattern	2
C. First-degree relative with a II.A. ECG pattern	1
D. Unexplained sudden cardiac death <45 years in a first- or second-degree relative	0.5
**Only award points once for highest score within this category*	
V. Genetic Test Result	
A. Probable pathogenic ERS susceptibility mutation	0.5

J-Wave syndromes expert consensus conference report

Shanghai Score System for diagnosis of ERS

Score (requires at least 1 ECG finding)

≥5 points: Probable/definite ERS

3–4.5 points: Possible ERS

<3 points: Nondiagnostic

Antzelevitch C et al, Heart Rhythm 2016

2014: 24 h 12 leads Holter ECG

Predominant morphology (99% of PVC): 805 isolated, 26 doubles, 6 triples

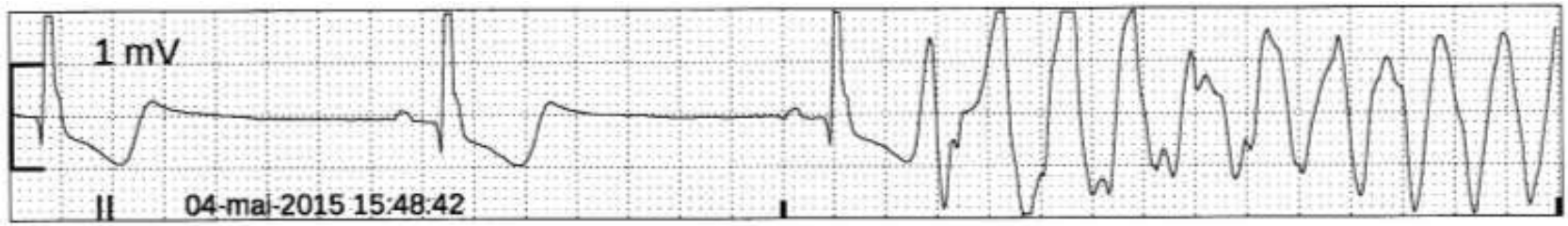
Sudden cardiac death on May 4, 2015

- lost consciousness while working (manual worker)
- 1st defibrillation at 5 minutes
- one VF recurrence while being prepared for angiocoronarography (normal)
- LVEF 55%

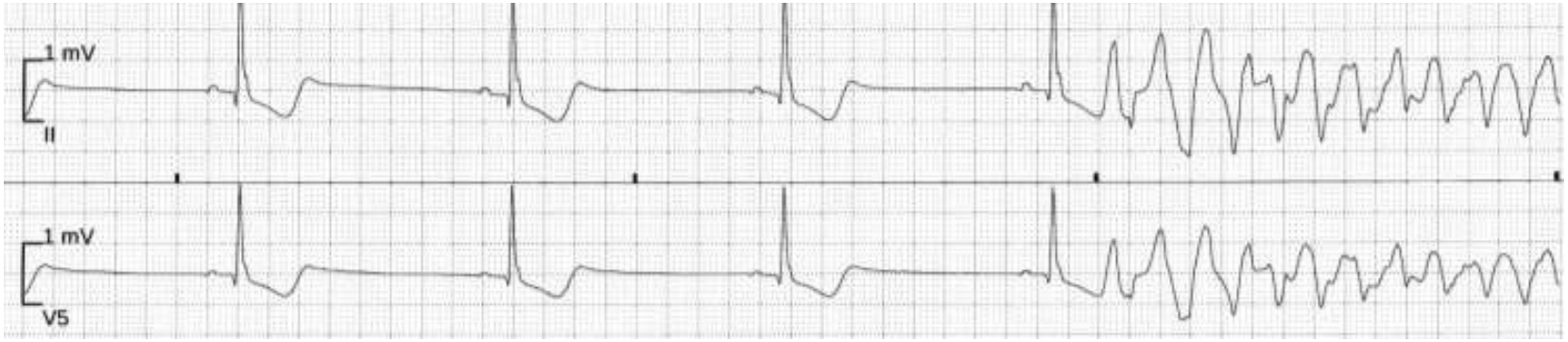
- 3 other VF recurrences during the first 24 hours despite profound sedation, therapeutic hypothermia, IV betablocker, lidocaïne and amiodarone
- no significant troponine increase (initial H1<0.05, H8=1.03, H21=0.25, H45=0.05) (not HS troponin!)
- normal blood tests (K=4.12)

- H24- H48: no VF recurrence under oral atenolol 50 mg
- sedation stopped at H48, complete neurological recovery (Glasgow 15)
- transfer to our center

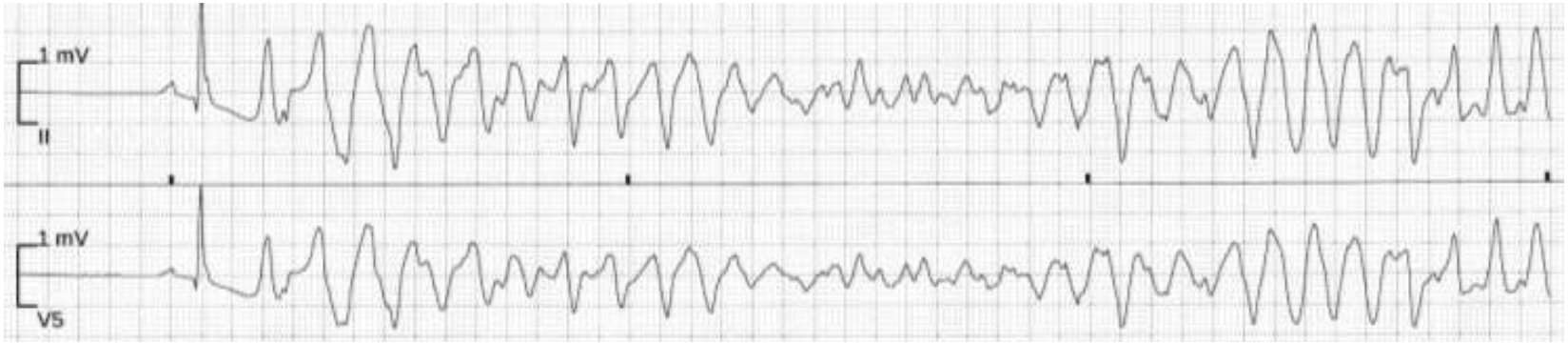
May 4
15:48



May 4
23:50

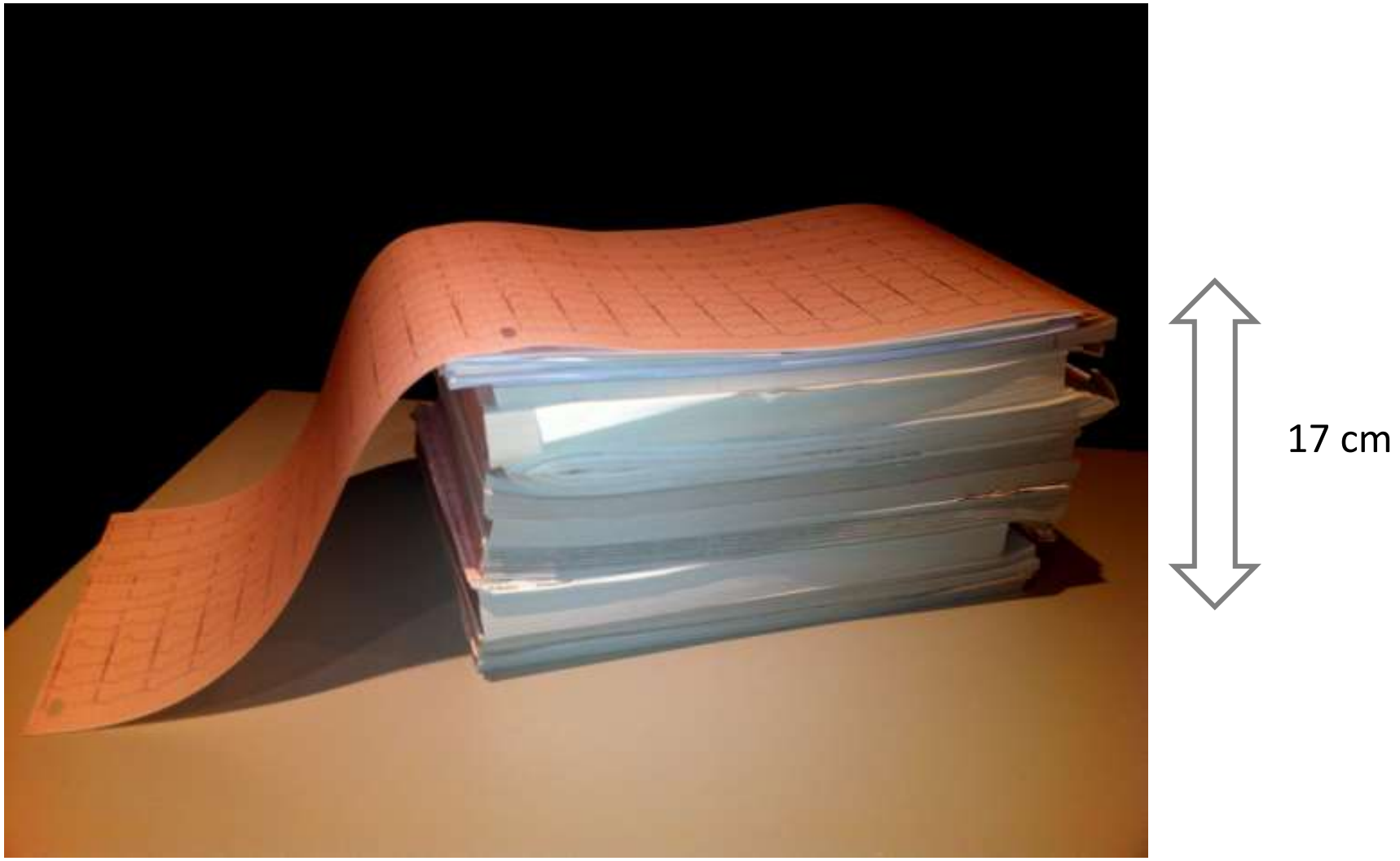


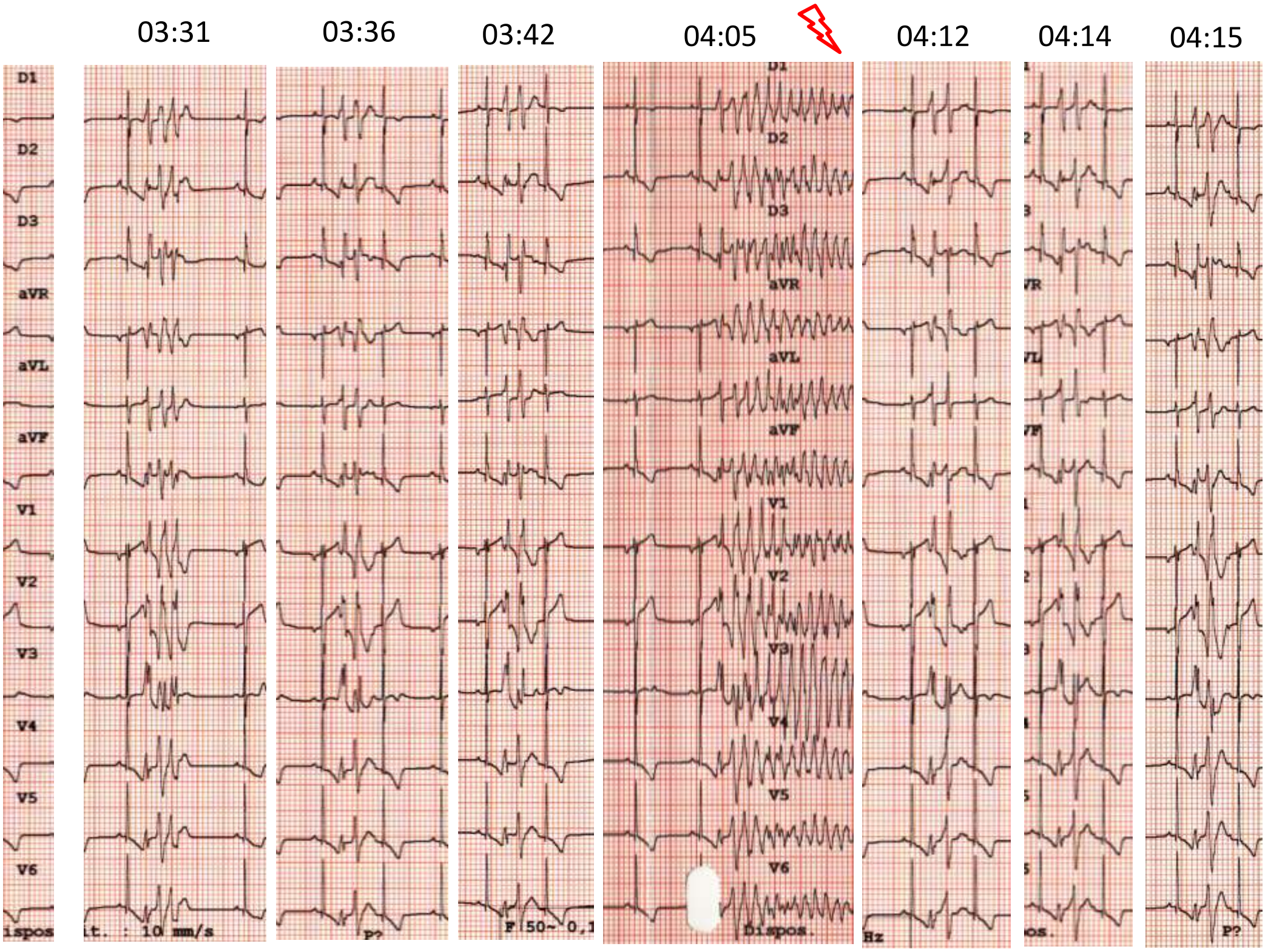
May 5
00:51



May 5
16:25

Continuous 12 lead ECG monitoring

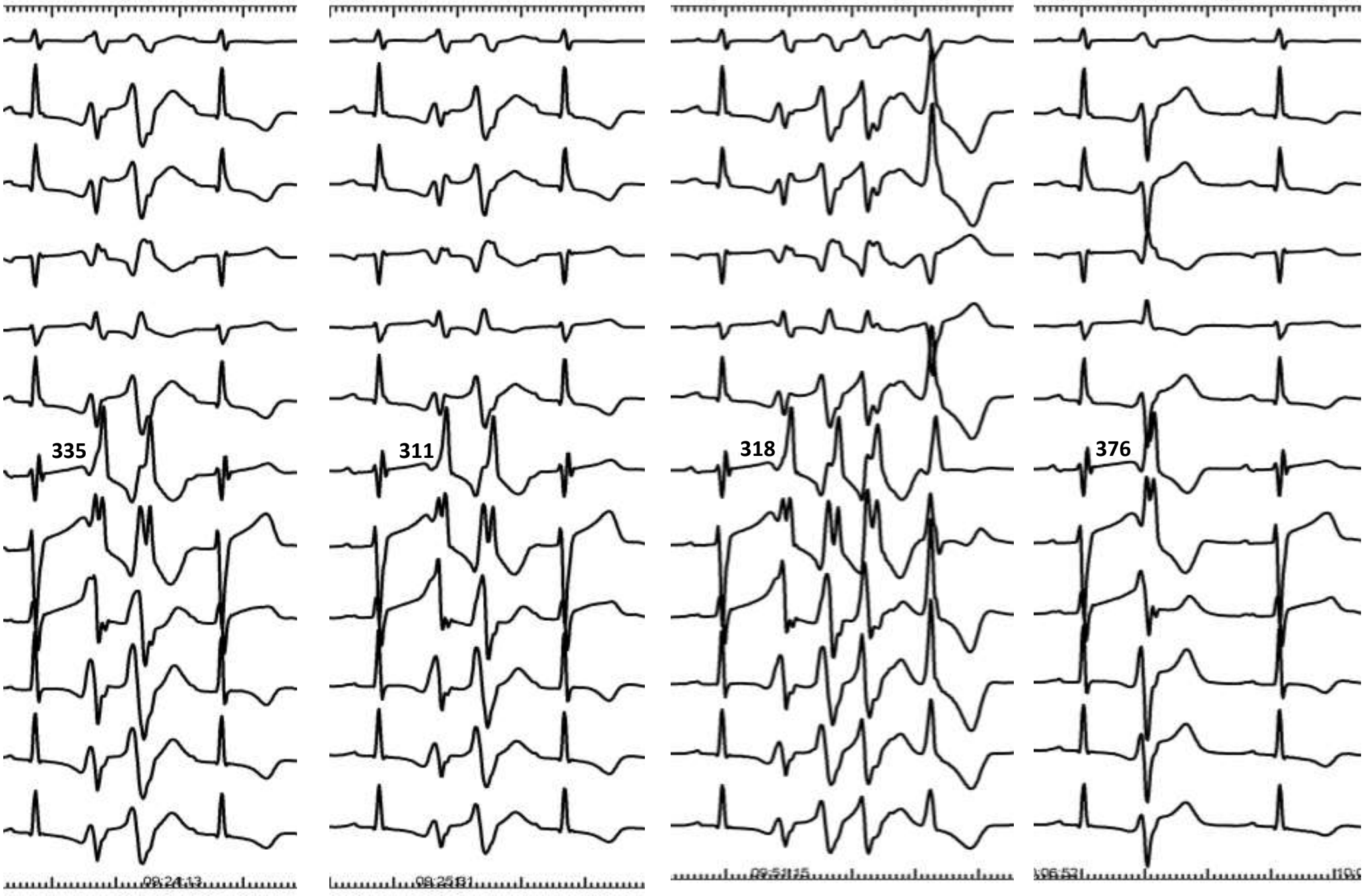



03:31
03:36
03:42
04:05
04:12
04:14
04:15
D1
D2
D3
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
ispos
t. : 10 mm/s
P?
F 50~ 0,1
Dispos.
Hz
os.
P?

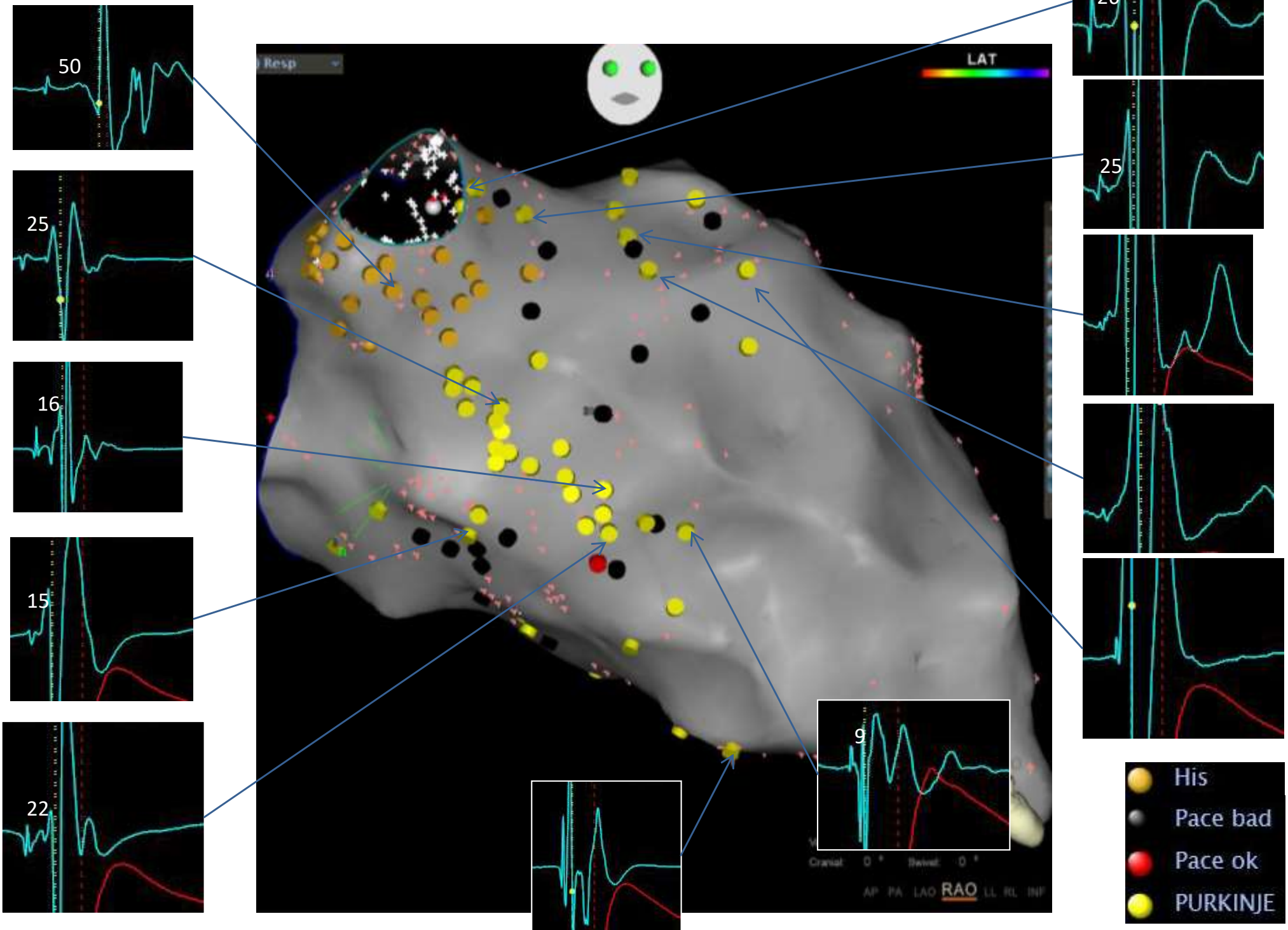
In total:

- 3 VF on May 7, 2015:
  - 02:34
  - 04:05
  - 04:16
- RF ablation on May 7

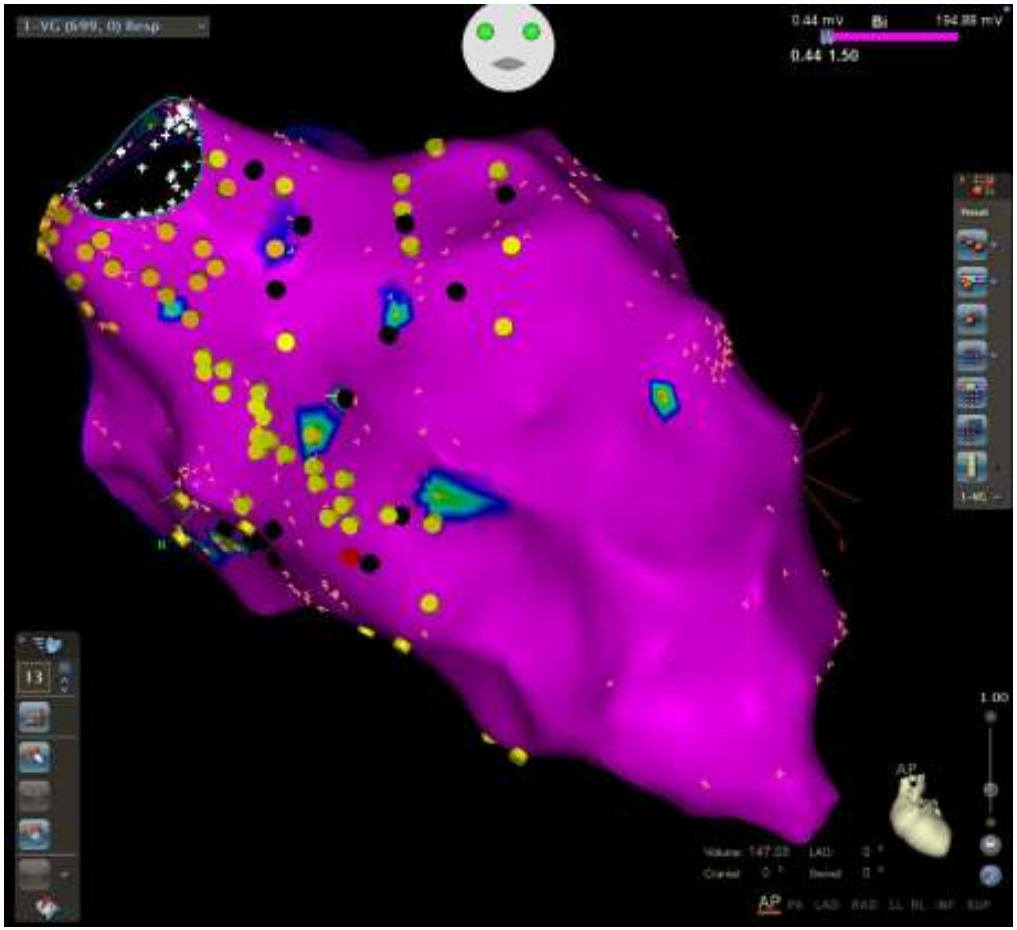
Spontaneous PVC’s during the whole procedure

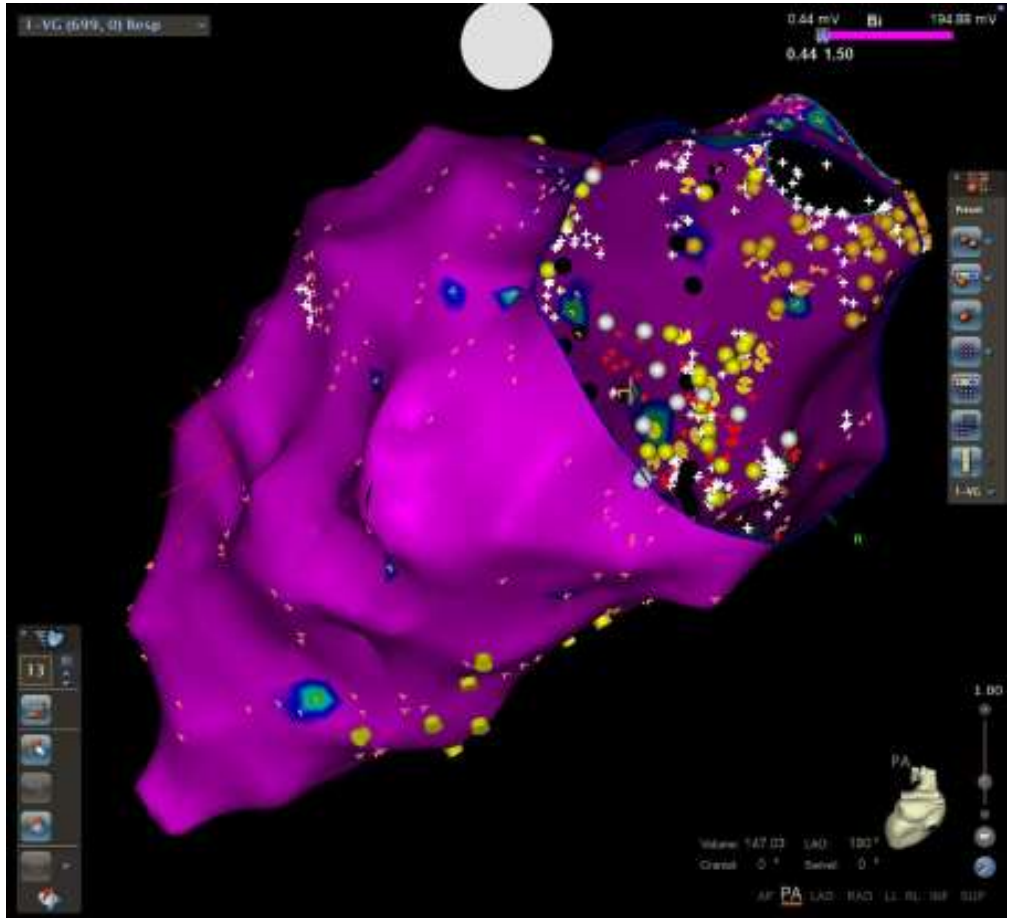


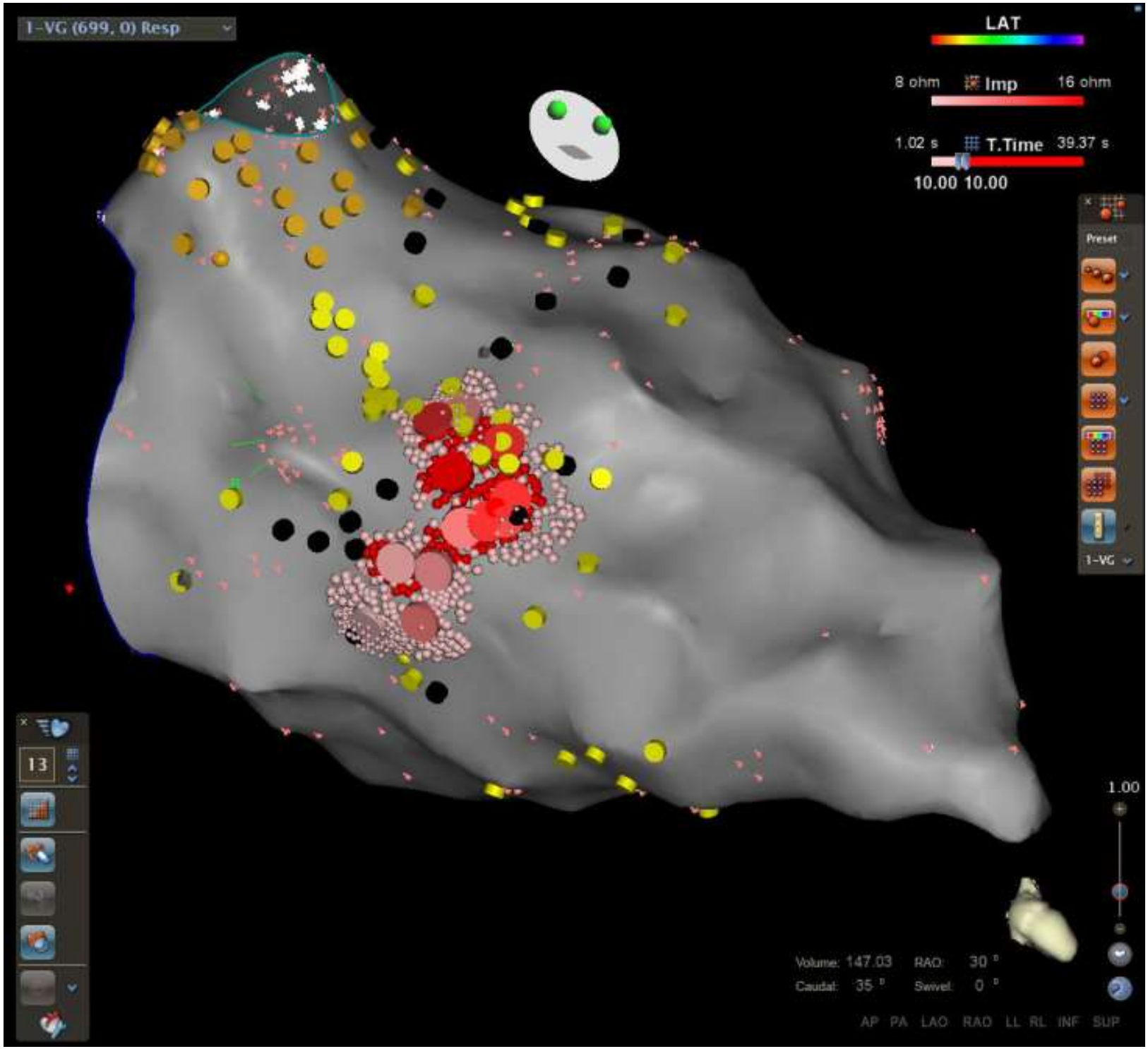
LV in SR



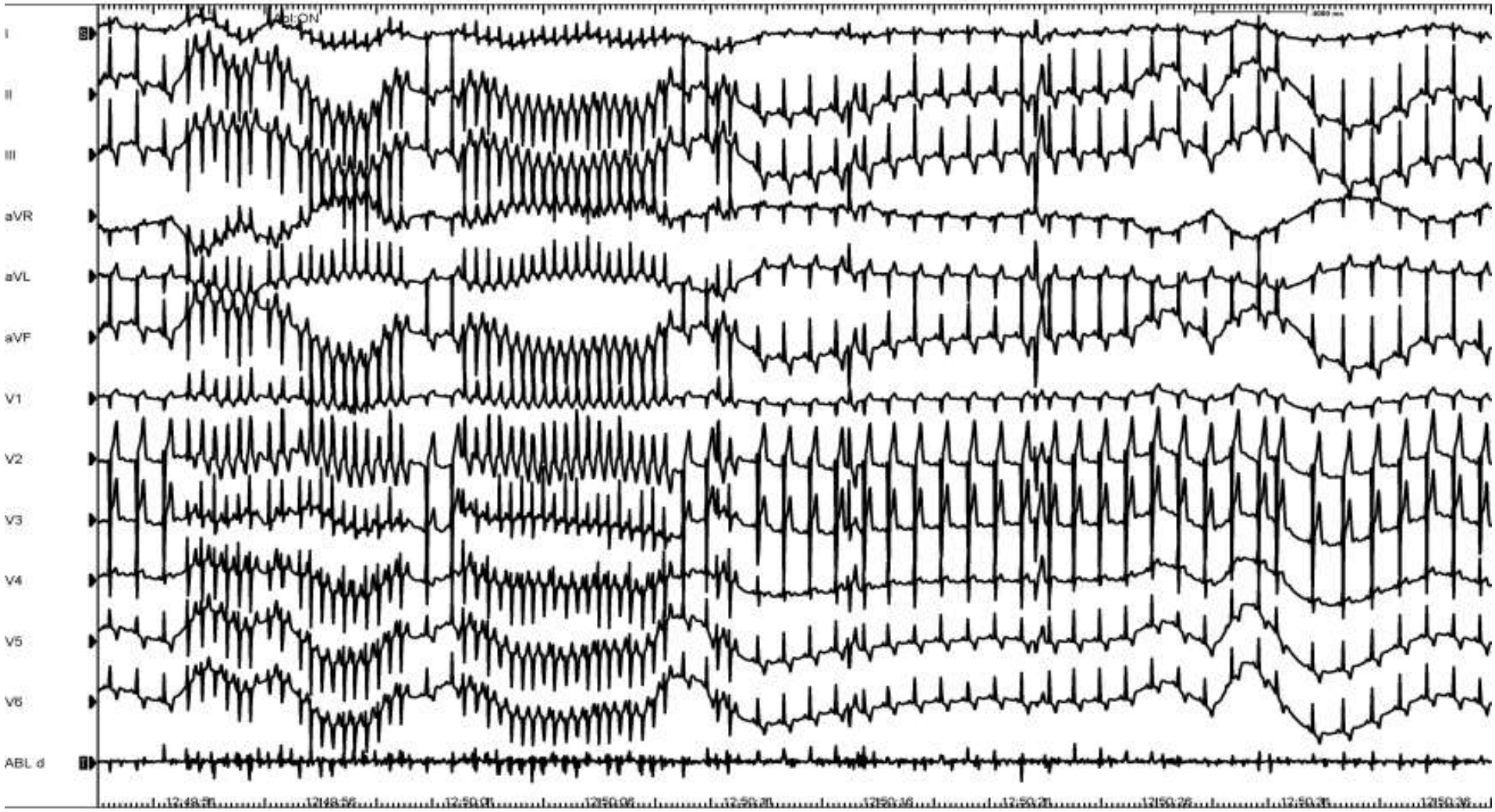
LV bipolar voltage






1-VG (699, 0) Resp
LAT
8 ohm
Imp
16 ohm
1.02 s
T.Time
39.37 s
10.00 10.00
Preset
1-VG
13
1.00
Volume: 147.03
RAO: 30 °
Caudal: 35 °
Swivel: 0 °
AP PA LAO RAO LL RL INF SUP

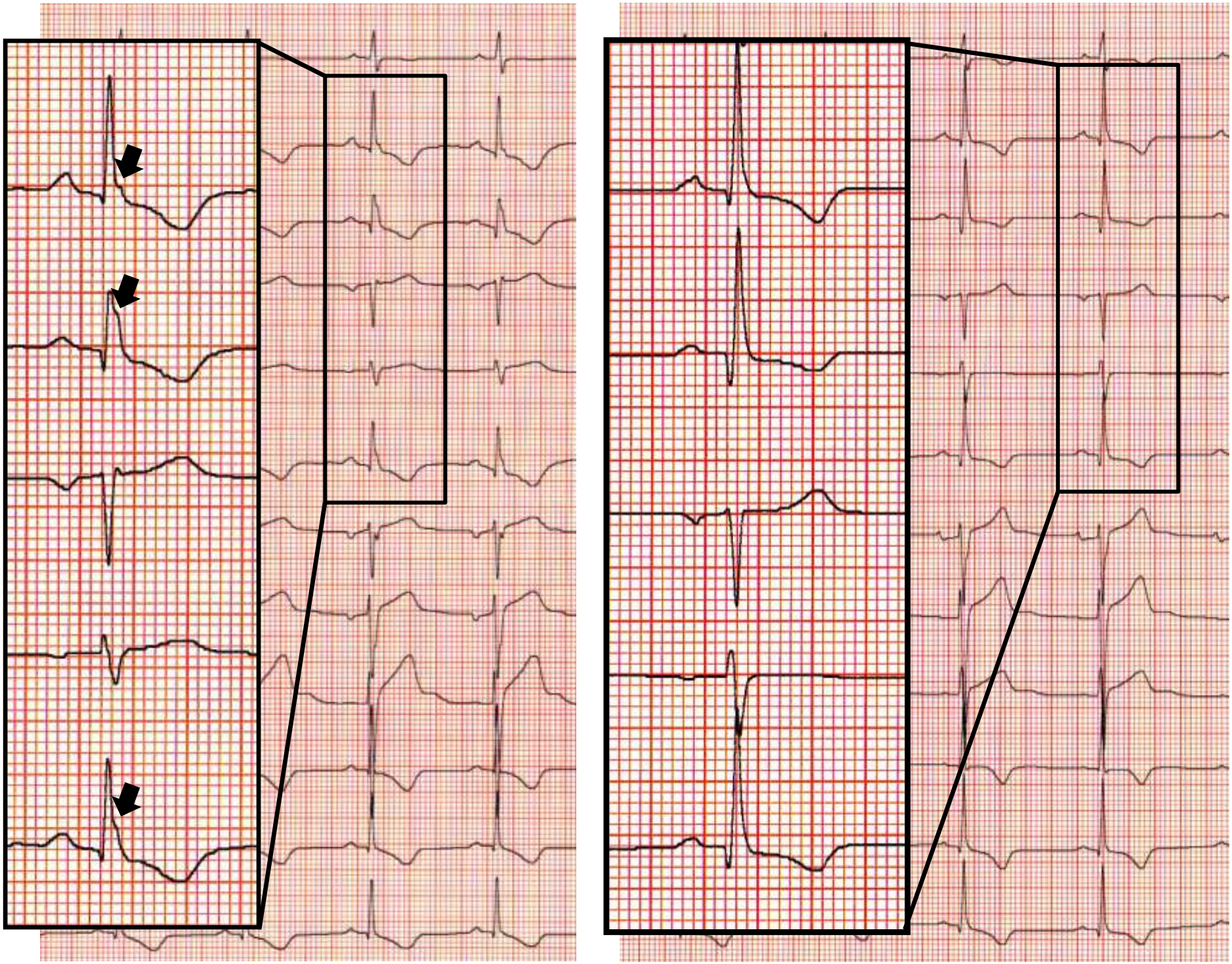
Brief thermal response (same RF)



In the ward

Before ablation

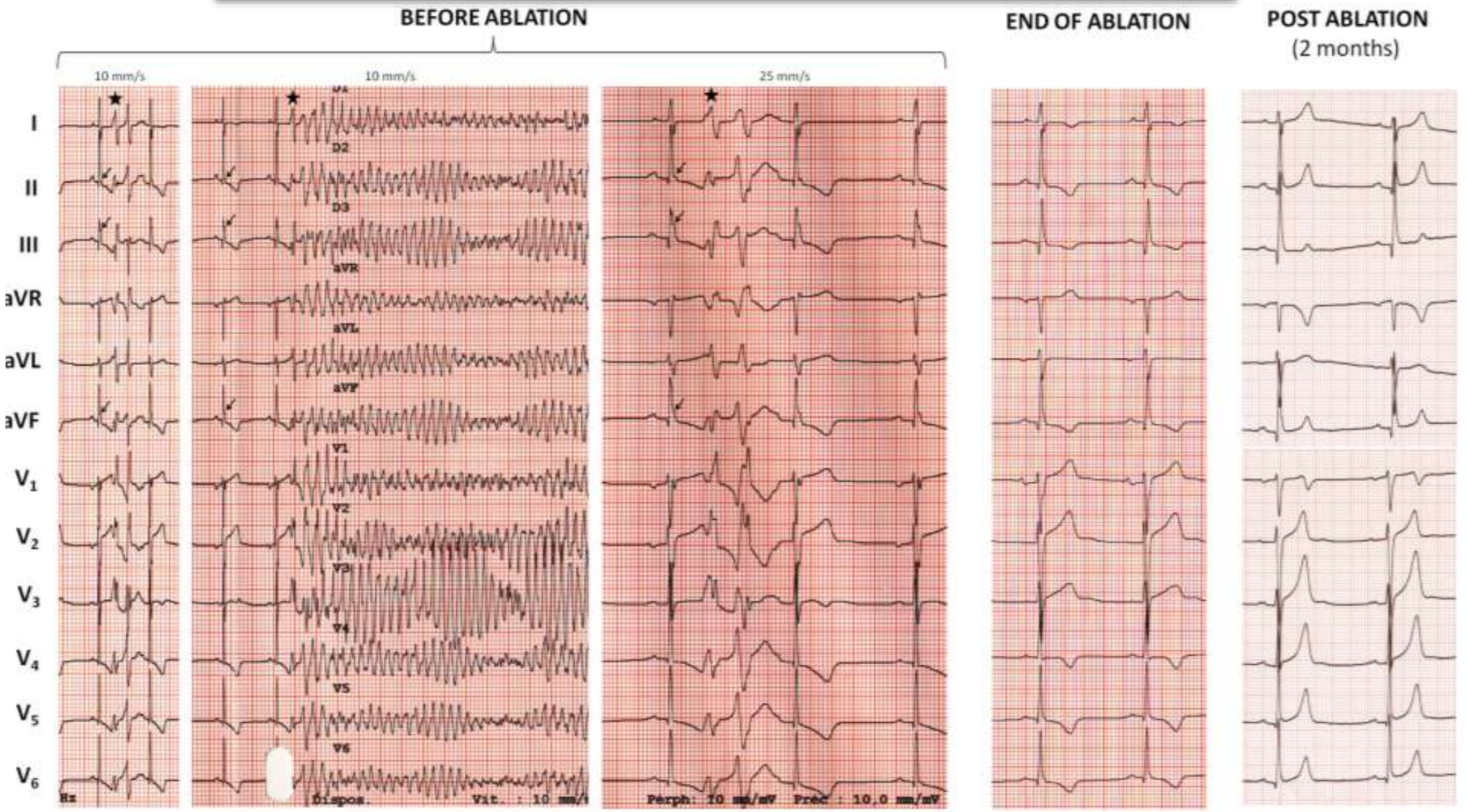
After ablation



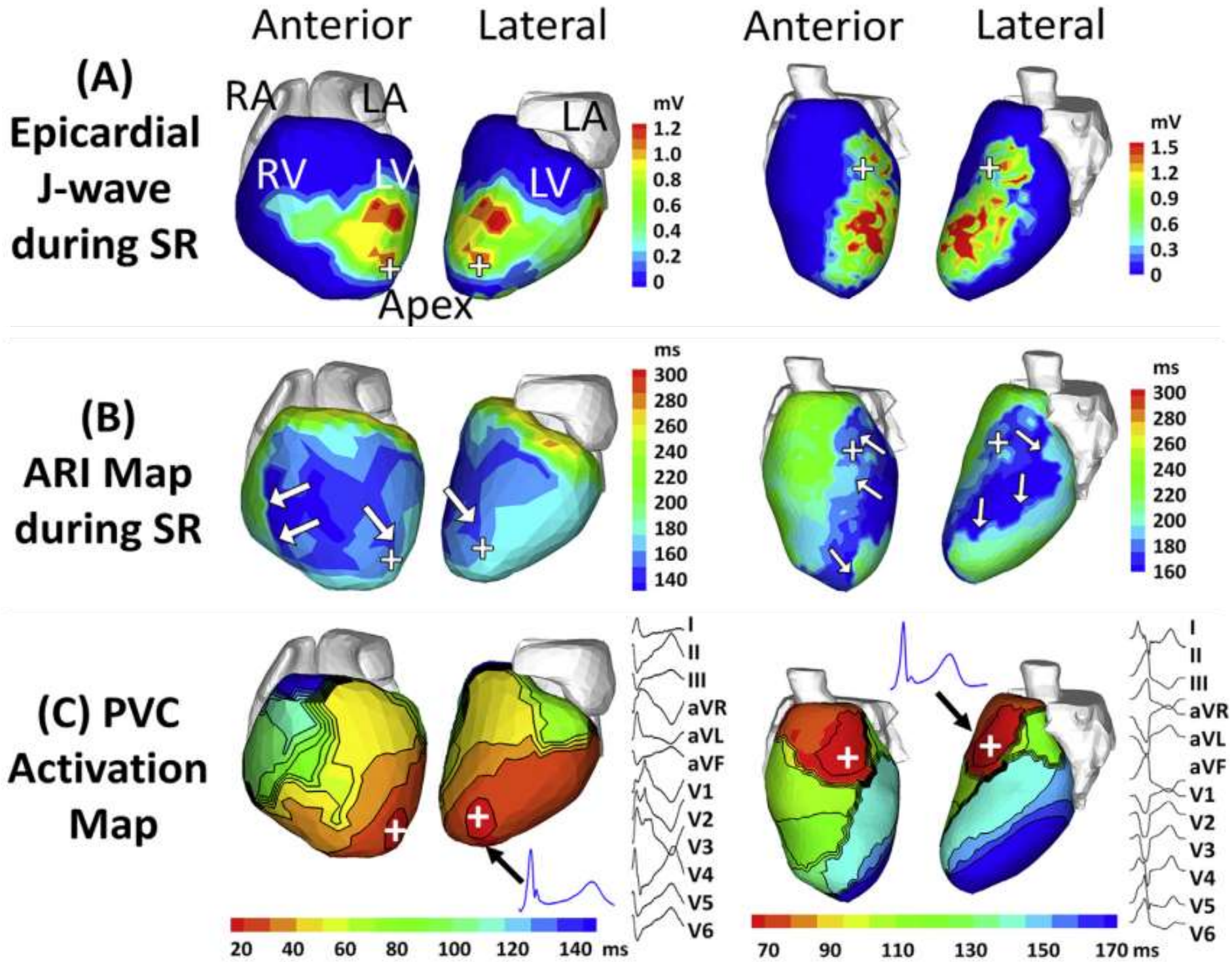
Ablation of Left Ventricular Substrate in Early Repolarization Syndrome

DECEBAL GABRIEL LATCU, M.D., SOK-SITHIKUN BUN, M.D., NAIMA ZARQANE, M.D., and NADIR SAOUDI, M.D., PH.D.

From the Cardiologie, Centre Hospitalier Princesse Grace, Monaco, Monaco (Principalty)



Laţcu DG et al, J Cardiovasc Electrophysiol. 2016 Apr;27(4):490-1.



Zhang J et al, J Am Coll Cardiol EP 2017;3:894–904

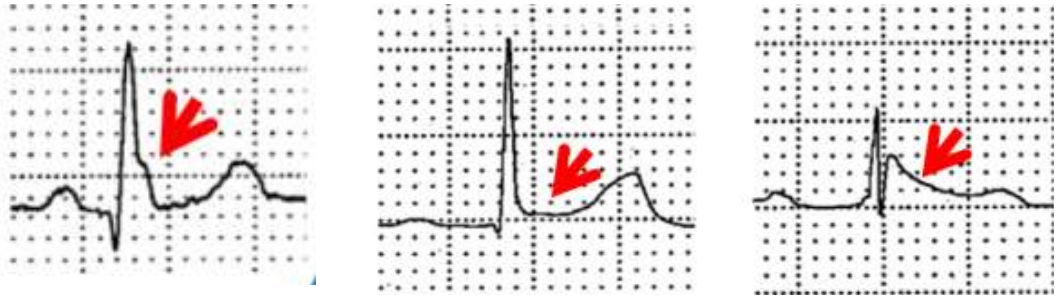
ERS – stratification du risque

Presence of a J wave on the ECG increases the probability of VF from 3.4:100,000 to 11:100,000.

Rosso R et al, JACC 2008;52:1231–1238. *Rosso R et al, HeartRhythm2011;8:923–929.*

- **high-amplitude J wave ≥0.2mV**
- **horizontal or descending ST segment**

inferior/ Inferolateral leads



Antzelevitch C et al, Heart Rhythm, Vol 13, No 10, October 2016

- Family history of sudden death
  Numm LM et al, JAmCollCardiol2011;58:286–290.
  Gourraud B et al, JAmCollCardiol2013;61:164–172.
- Coexisting Brugada ECG pattern (J waves in V_1–V_3)
  Watanabe H et al, HeartRhythm2010;7:647–652.
- Short QT intervals in subjects with ER
  Letsas KP, Europace2012;14: 877–878.

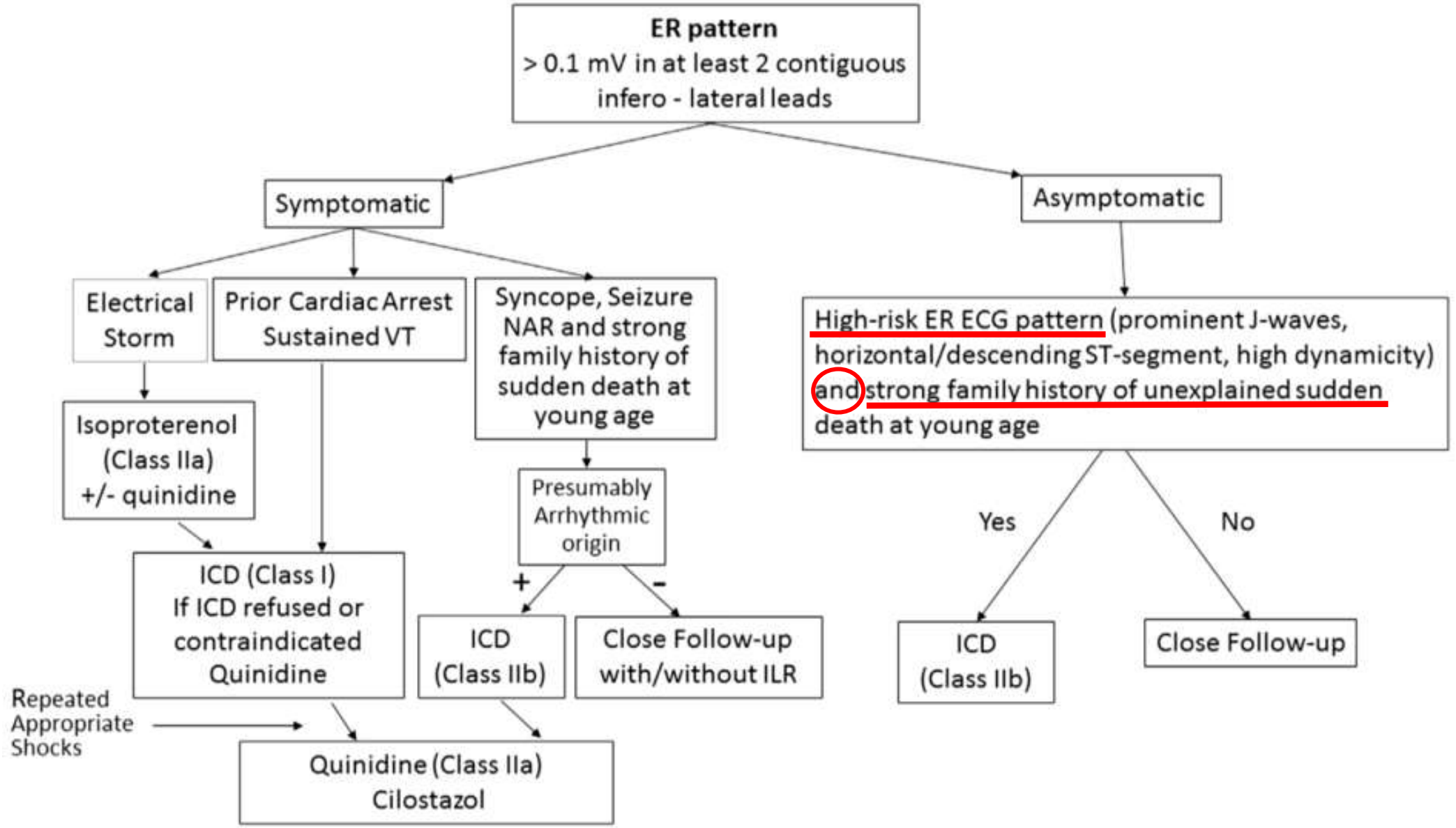
critères de malignité ERS

SVP: pas de valeur prédictive

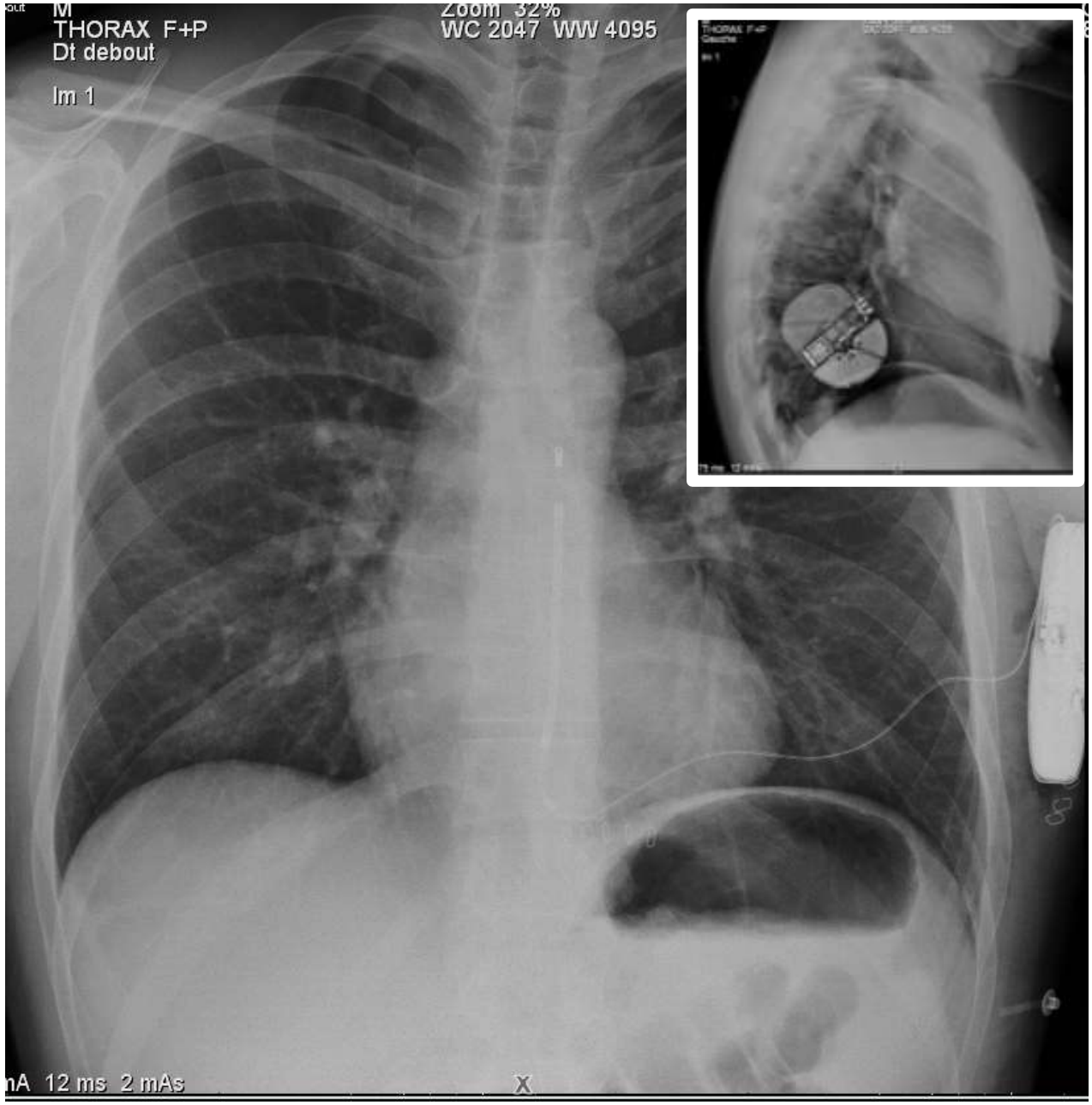
Mahida S, JAm Coll Cardiol 2015;65:151–159.

ERS – prise en charge consensus 2016

APHRS/EHRA/HRS/SOLACE J-Wave syndromes expert consensus conference report



Antzelevitch C et al, Heart Rhythm, Vol 13, No 10, October 2016


M
THORAX F+P
Dt debout
Im 1
Zoom 32%
WC 2047 WW 4095
nA 12 ms 2 mAs

AHA Scientific Statement

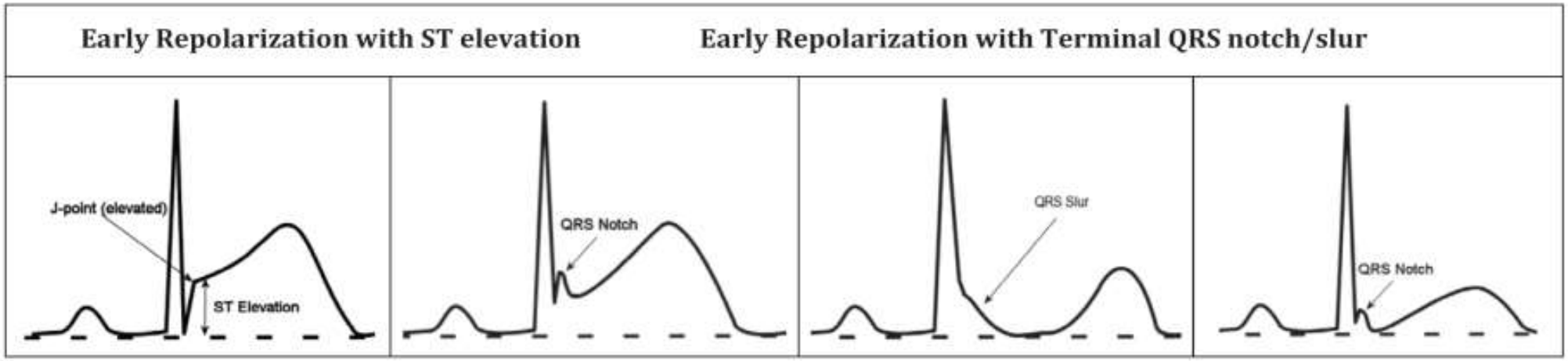


Table 1. Features That May Raise Suspicion for a Malignant and Heritable Form of ER

Family history of sudden cardiac arrest or early unexplained death
Personal evaluation and workup suggestive of a channelopathy (eg, short-QT syndrome, Brugada syndrome)
Personal history of unheralded syncope suggestive of an arrhythmogenic pathogenesis (particularly when at rest or recumbent)

ER indicates early repolarization; LOE, Level of Evidence; and VF, ventricular fibrillation.

Table 2. Recommendations for the Management of ER

Recommendation	Class	LOE
Further evaluation for the incidental findings of an ERP on an ECG in an asymptomatic patient (without family history of sudden cardiac death) is not recommended.	III	C
In patients with unexplained syncope, incorporation of the presence of most ER electrocardiographic findings into risk stratification is not well established.	IIb	C
In patients with aborted sudden death or resuscitated VF who have electrocardiographic findings of ER, programmed ventricular stimulation performed on the basis of ER pattern alone is not recommended.	III	B
In patients with both unexplained syncope and first-degree family history of sudden death, the presence of ER may be considered in overall risk stratification during appropriate evaluation for arrhythmic causes of sudden death.	IIb	C

Pathon K et al, Circulation. 2016;133:1520-1529.