Frequent PVC from RVOT

Case Presentation and suggested reading

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Introduction:

- 38-year-old male patient
- PVC-Burden > 30000/Day
- Exerciser induced NSVT
- Therapy refractory
- Admitted for RF Ablation

ECG features for PVC localization

Several ECG features are relevant for localization of a particular VA.

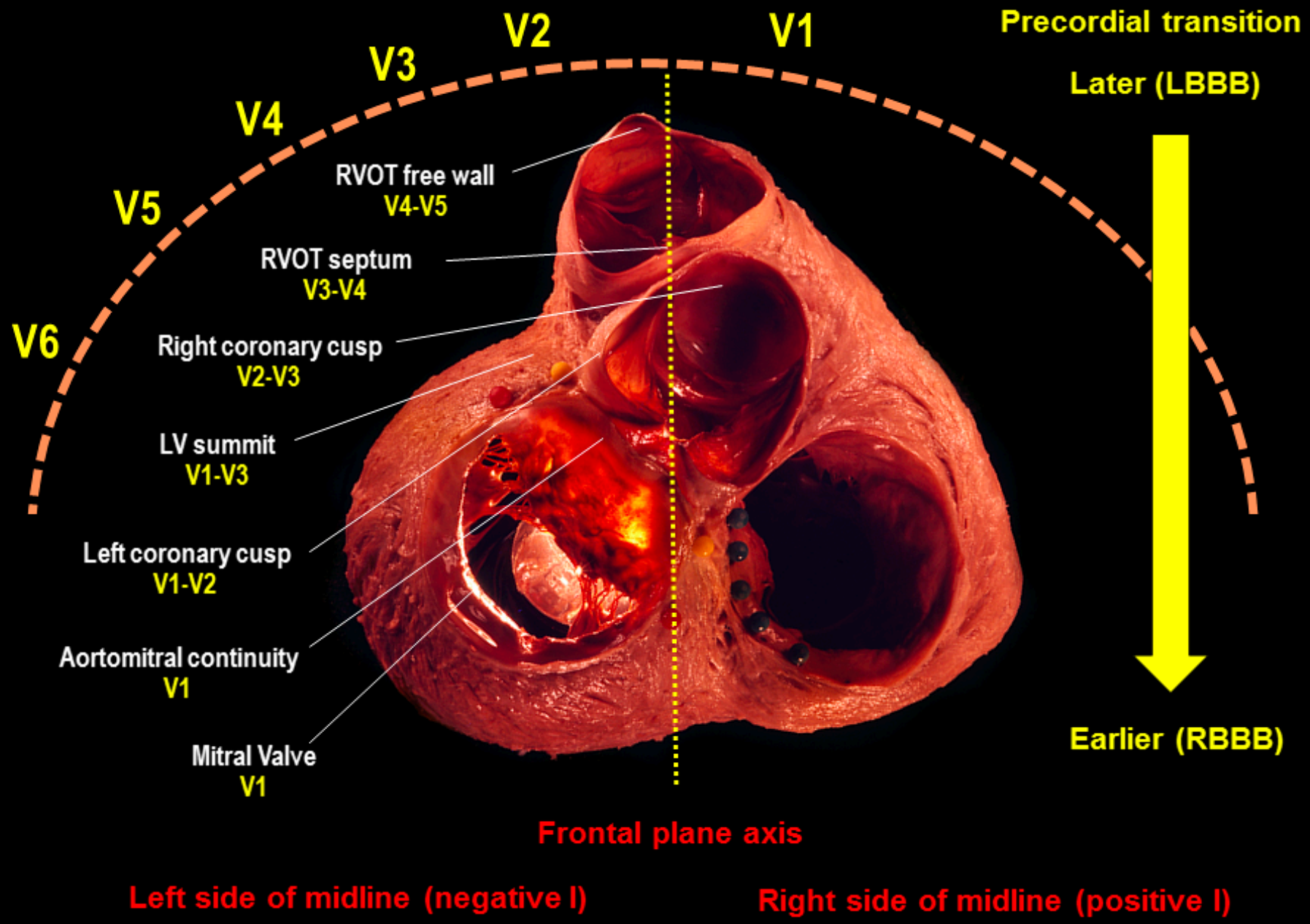
The most important are:

(1) QRS axis (both a vertical (superior-inferior) and horizontal (right-left)

(2) Bundle branch block pattern

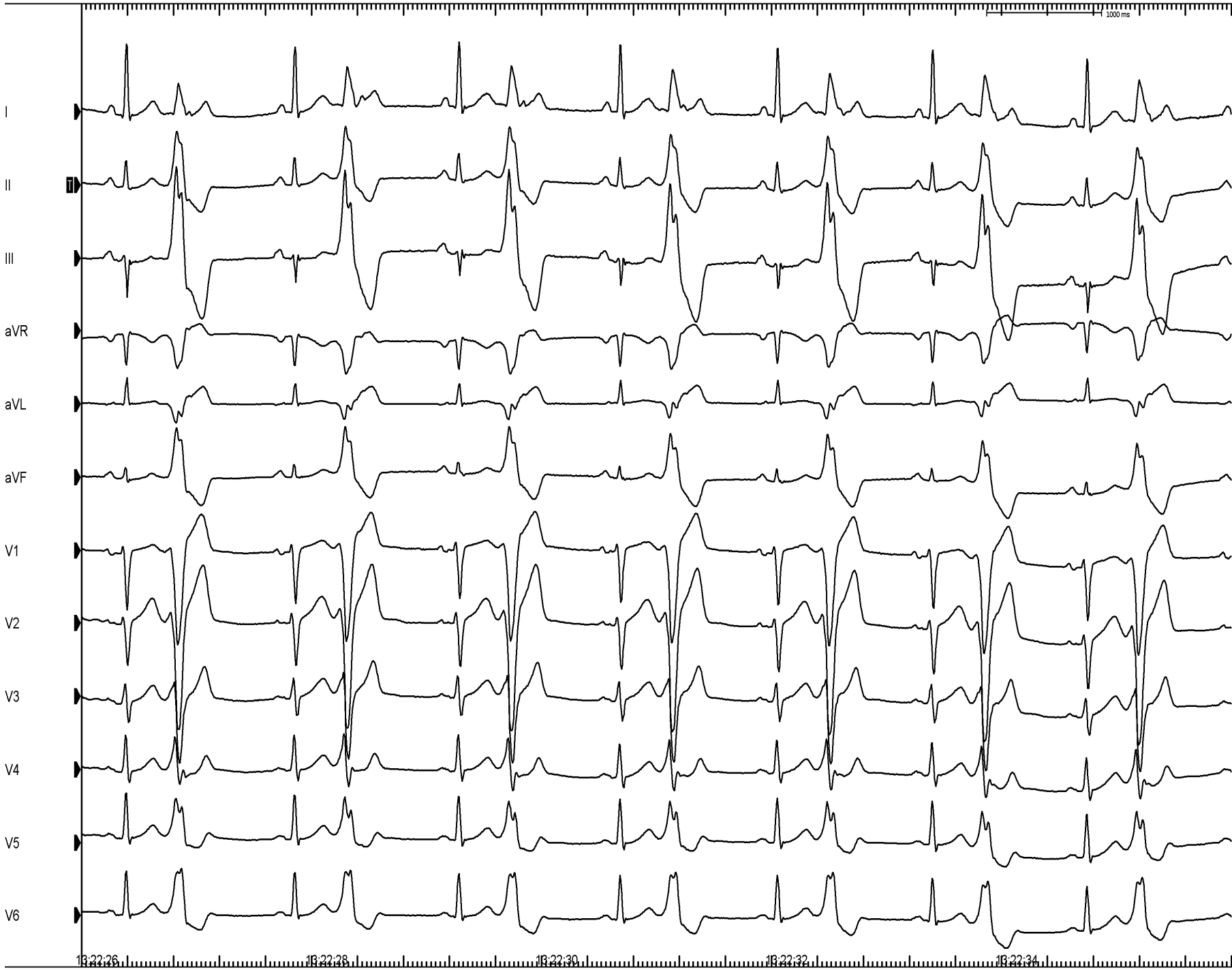
(3) Precordial transition

(4) QRS width



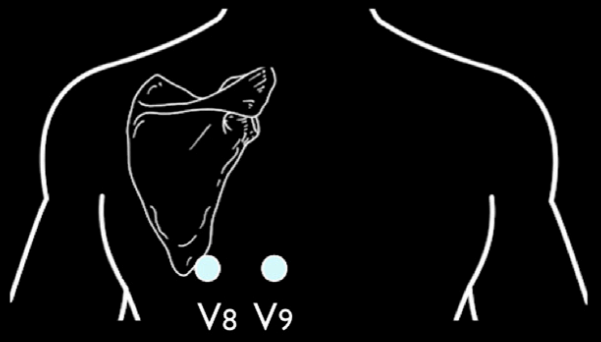
Heart Rhythm. 2019 Apr 4. pii: S1547-5271(19)30302-9. doi: 10.1016/j.hrthm.2019.04.002.

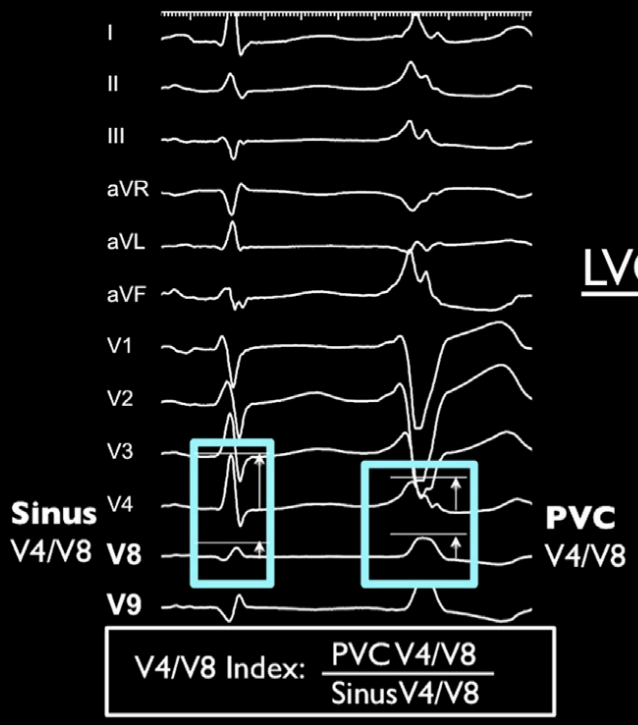
Baseline ECG

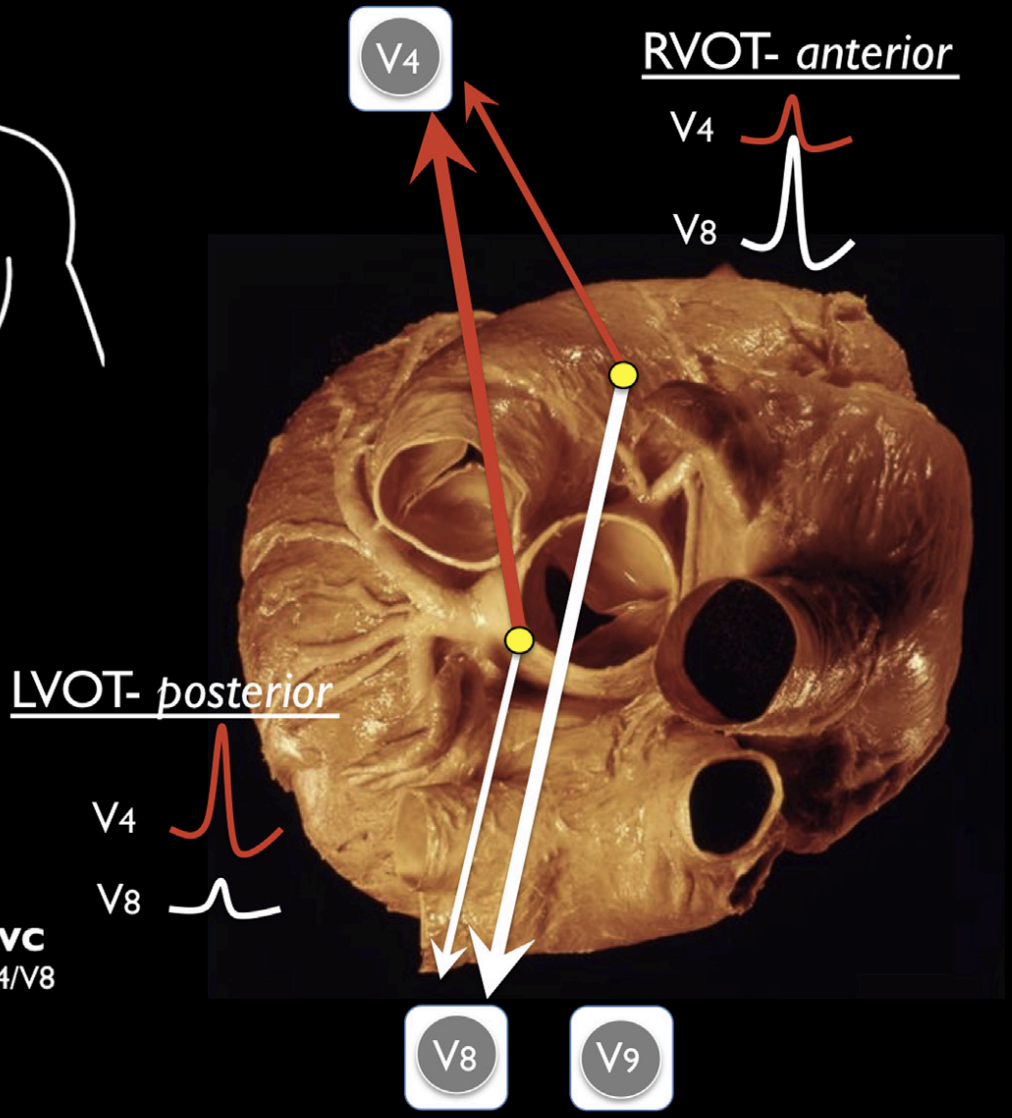


Baseline ECG

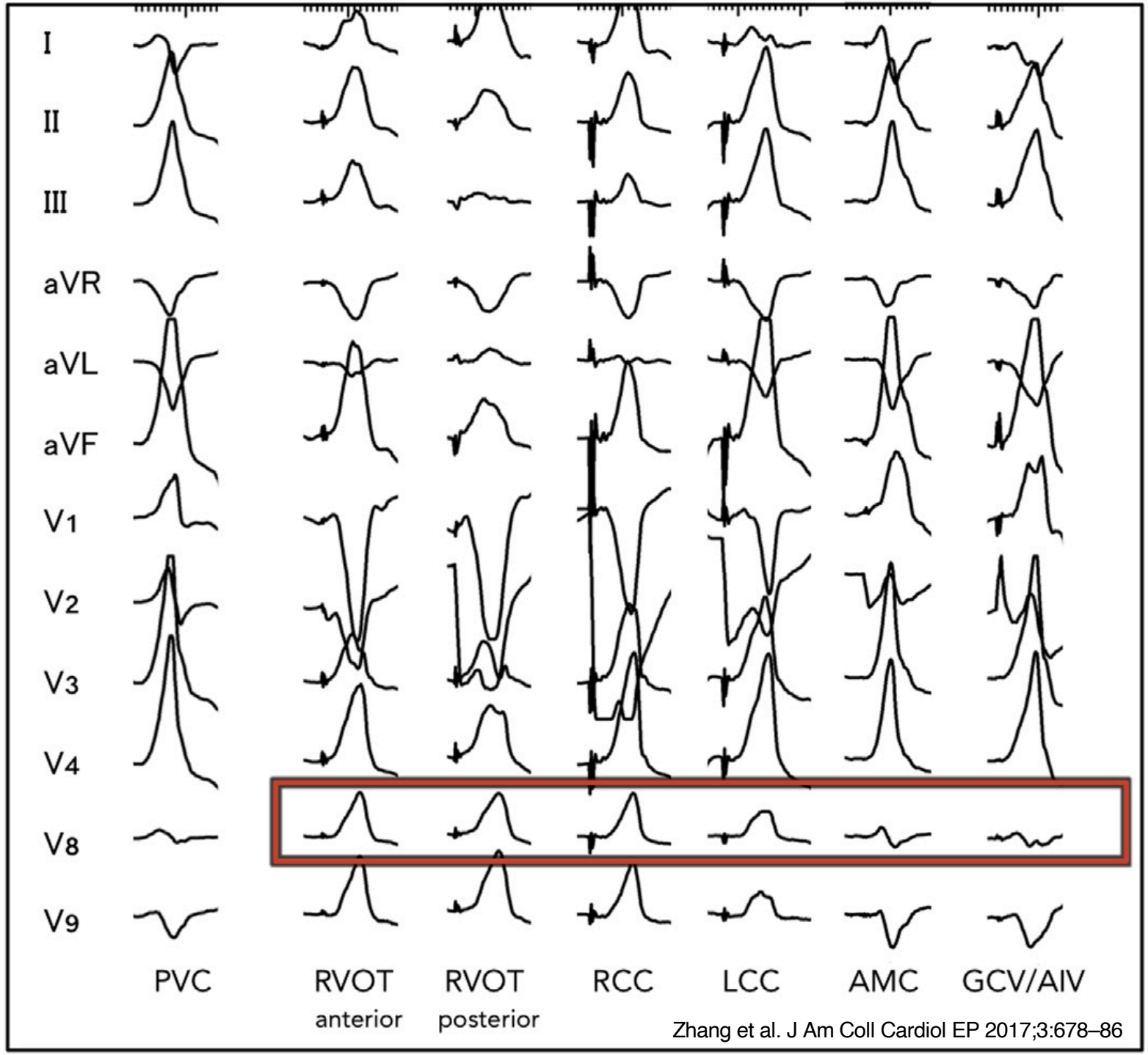
Value of Posterior ECG Leads







Zhang et al. J Am Coll Cardiol EP 2017;3:678–86



Zhang et al. J Am Coll Cardiol EP 2017;3:678–86

TABLE 3 Test Characteristics

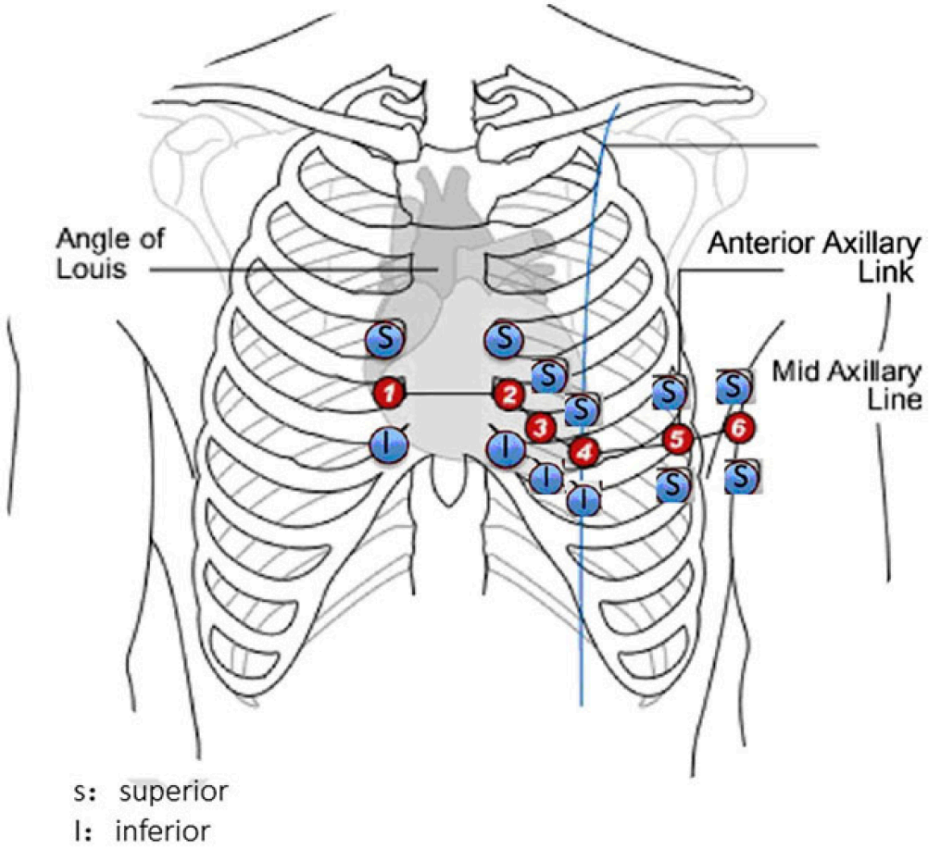
	Sensitivity	Specificity	PPV	NPV
Predictive of left-sided location in the prospective cohort				
V_4/V_8 ratio >3	75	82	64	89
V_4/V_8 index >2.28	67	96	89	87
V_2 transition ratio ≥0.6	67	67	47	82
V_{2S}/V_{3R} ≤1.5	36	71	33	74
PVC with a V_3 precordial transition (n = 19)				
V_4/V_8 ratio >3	67	81	57	87
V_4/V_8 index >2.28	67	100	100	87
V_2 transition ratio ≥0.6	50	54	33	70
V_{2S}/V_{3R} ≤1.5	40	62	29	73

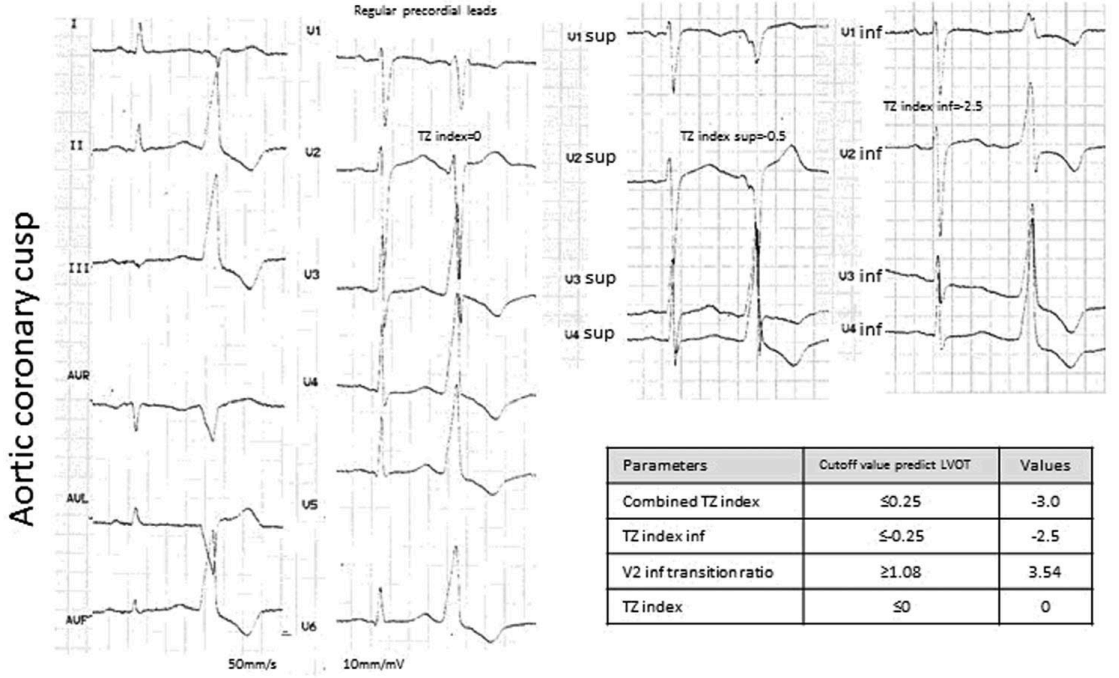
Values are %.

NPV = negative predictive value; PPP = positive predictive value.

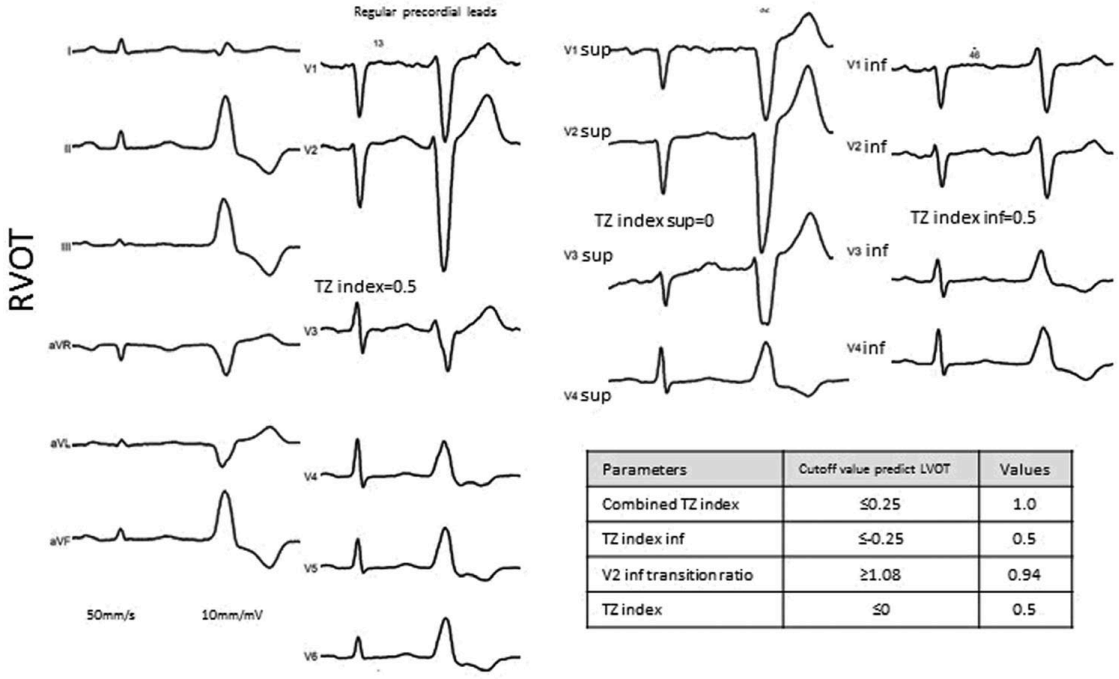
Zhang et al. J Am Coll Cardiol EP 2017;3:678–86

Multiple Intercostal Space Electrocardiogram Allows Accurate Localization of Outflow Tract Ventricular Arrhythmia Origin





Parameters	Cutoff value predict LVOT	Values
Combined TZ index	≤0.25	-3.0
TZ index inf	≤-0.25	-2.5
V2 inf transition ratio	≥1.08	3.54
TZ index	≤0	0

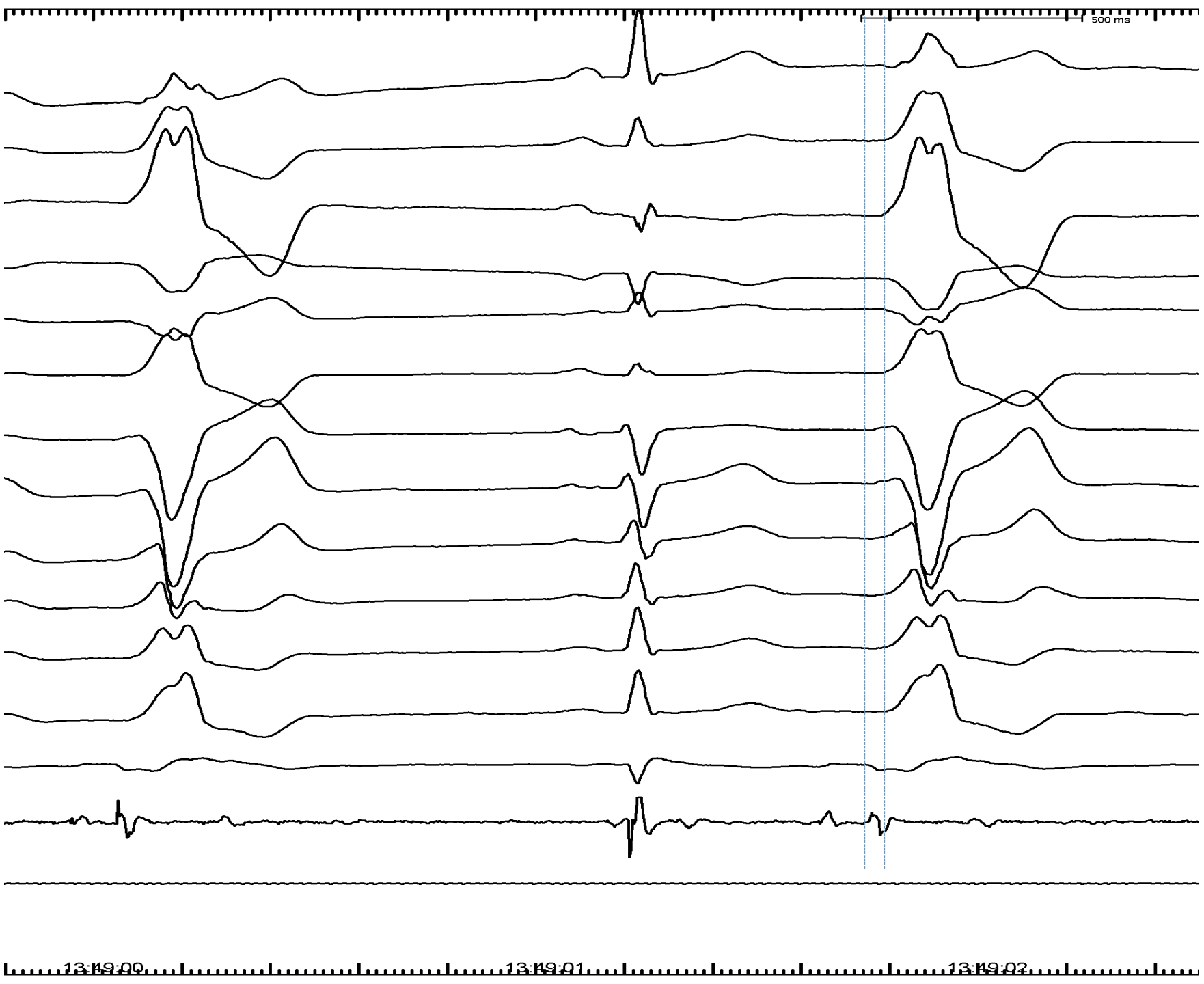


Parameters	Cutoff value predict LVOT	Values
Combined TZ index	≤0.25	1.0
TZ index inf	≤-0.25	0.5
V2 inf transition ratio	≥1.08	0.94
TZ index	≤0	0.5

The combined TZ index outperformed other ECG criteria to differentiate left from right OT-VA origins.

PACE 2016; 39:173–181

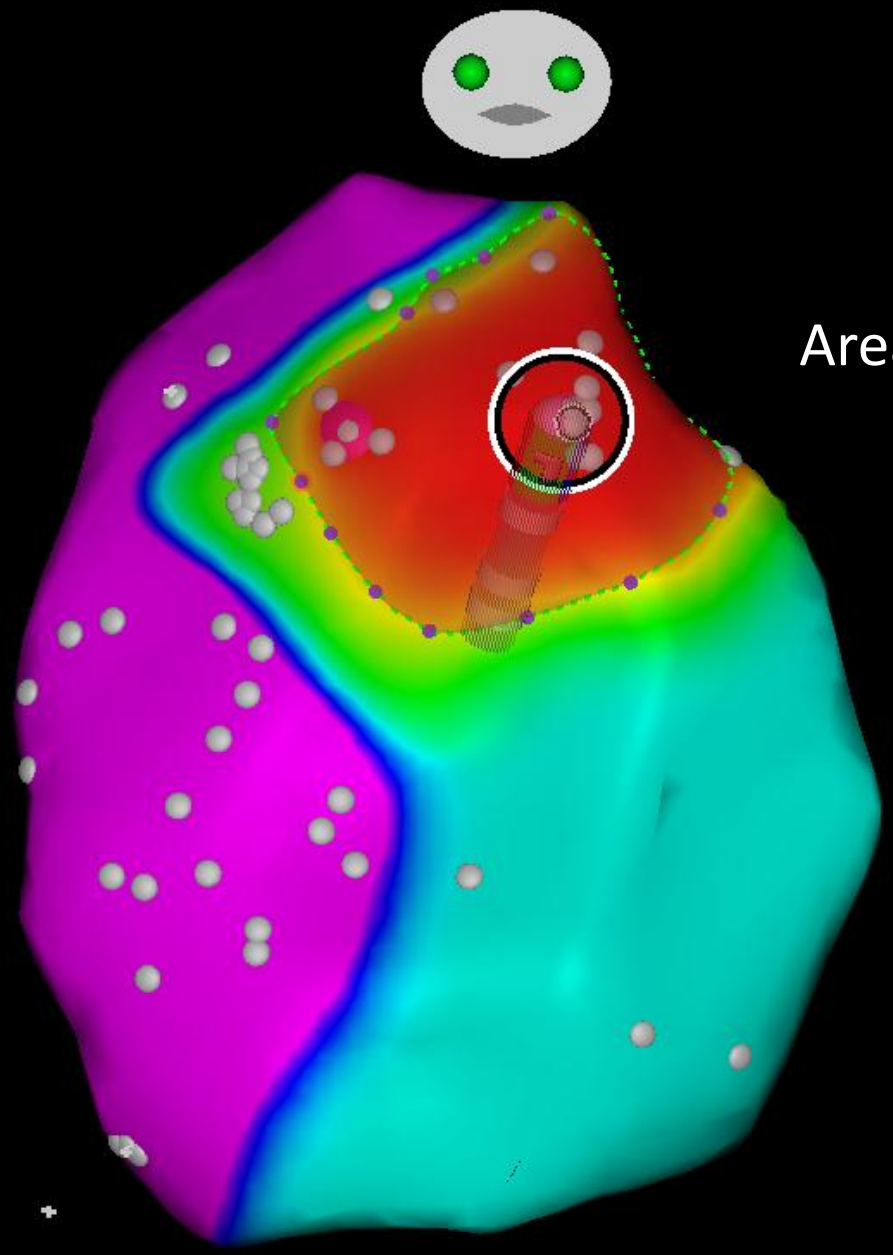
Success Signal, -40 ms



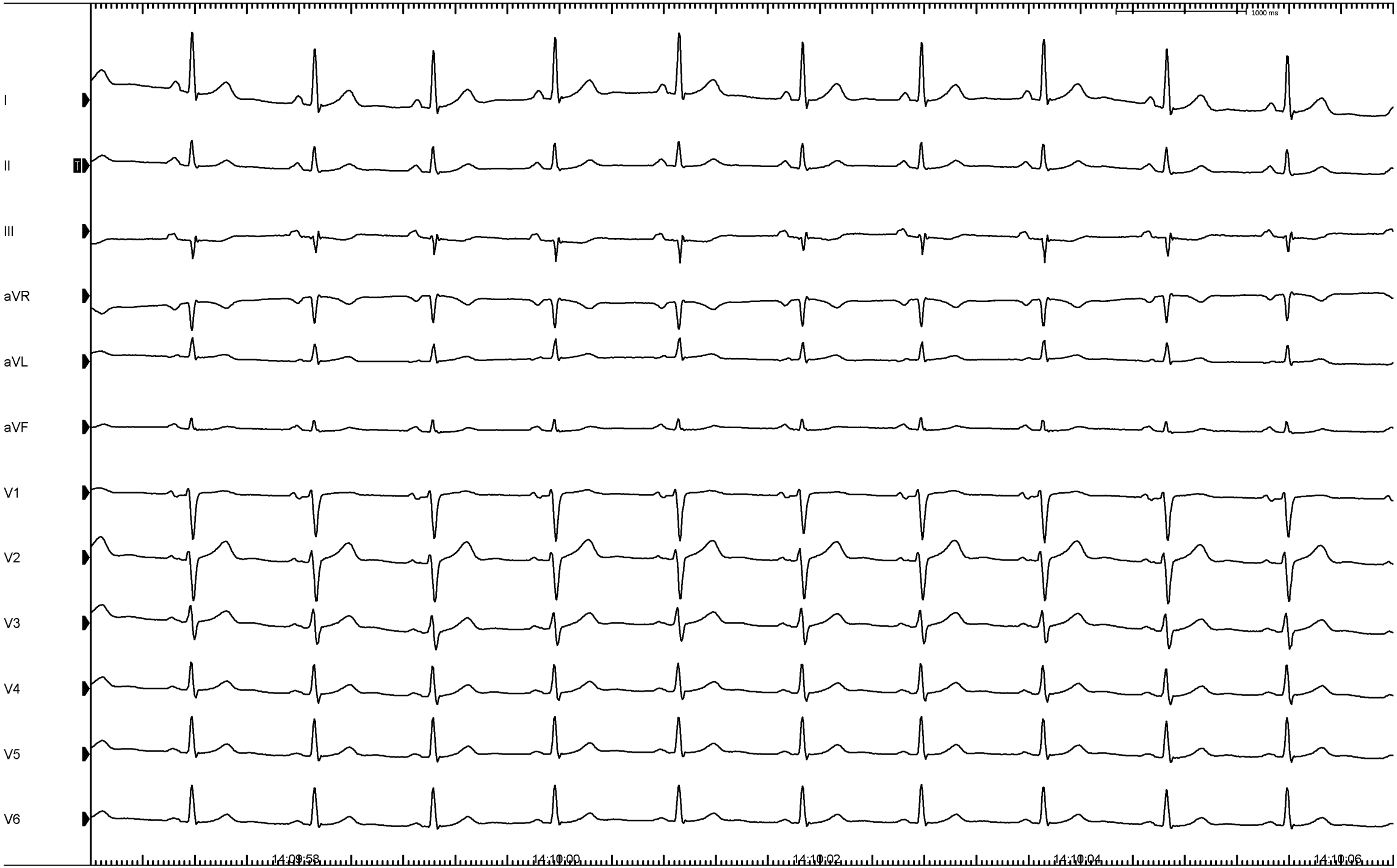
RAO

Best Pace Mapping

LAO



Area (PASO-Score>94%): 3,3 cm2


1000 ms
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
14:09:58
14:10:00
14:10:02
14:10:04
14:10:06

Suggested Reading

Trends in Successful Ablation Sites and Outcomes of Ablation for Idiopathic Outflow Tract Ventricular Arrhythmias

Tatsuya Hayashi, MD,[a,b,*] Jackson J. Liang, DO,[a,c,*] Yasuhiro Shirai, MD,[a,b] Ling Kuo, MD,[a] Daniele Muser, MD,[a] Maciej Kubala, MD,[a] Ramanan Kumareswaran, MD,[a] Jeffrey S. Arkles, MD,[a] Fermin C. Garcia, MD,[a] Gregory E. Supple, MD,[a] Robert D. Schaller, DO,[a] David S. Frankel, MD,[a] Michael P. Riley, MD, PhD,[a] David Lin, MD,[a] Pasquale Santangeli, MD, PhD,[a] Erica S. Zado, PA-C,[a] David J. Callans, MD,[a] Francis E. Marchlinski, MD,[a] Sanjay Dixit, MD[a]

JACC Clin Electrophysiol. 2020 Feb;6(2):221-230

Suggested Reading

Journal Pre-proof

How to use intracardiac echocardiography to guide catheter ablation of outflow tract ventricular arrhythmias

Ashkan Ehdaie, MD FHRS, Fangzhou Liu, MD, Eugenio Cingolani, MD, Xunzhang Wang, MD, Sumeet S. Chugh, MD FHRS, Michael Shehata, MD FHRS

Heart Rhythm. 2020 Mar 6. pii: S1547-5271(20)30191-0

Mapping and Ablation of Ventricular Outflow Tract Arrhythmias

Magdi M. Saba, MD*, Anthony Li, MD

KEYWORDS

• Catheter ablation • Ventricular outflow tracts • Ventricular ectopy • Ventricular tachycardia
• 3d mapping

KEY POINTS

- Knowledge of intracardiac anatomy and the attitudinal orientation of the outflow tracts relative to each other is critical to mapping.
- Electrocardiographic algorithms to predict the origin of outflow tract arrhythmias can be useful in preprocedure planning but may also mislead.
- Pace-mapping has an inferior spacial resolution to activation mapping in the outflow tracts.
- Automated mapping systems should not replace careful interrogation of the local electrogram.

Card Electrophysiol Clin. 2019 Dec;11(4):597-607