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High density mapping of aortic cusps improves near field detection of pre-potentials during premature ventricular contractions

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ABSTRACT

Recognition of pre-potentials during activation mapping of aortic cusp premature ventricular contractions is useful to localize the precise site of origin and is an indicator of successful ablation, but sometimes these electrograms can be blunt and have low amplitude. High resolution mapping in the aortic cusp region allows improved near field detection of these signals in very few beats.

A 47 year old man with frequent premature ventricular contractions (PVC) (Panel A), whose electrocardiographic morphology suggested an aortic cusp origin [1], underwent electro-anatomical mapping with the Rhythmia system and Orion catheter (Boston Scientific). Delayed post-potentials after the terminal portion of the far field ventricular electrogram (egm) were noted in the left coronary cusp region during sinus rhythm (confirmed by fluoro position of the Orion mapping catheter). During PVC, the egm sequence reversed showing high amplitude discrete pre-potentials that propagated from proximal to distal along the Orion splines (Panel B) enabling a quick identification of the earliest point. Ablating at this location (Panel C) resulted in complete suppression of all PVCs. Recognition of pre-potentials during activation mapping is useful to localize the precise site of origin and is an indicator of successful ablation, but sometimes these egms can be blunt and have low amplitude [2]. High density mapping with the Orion catheter can provide a more stable positioning and evaluation of a large portion of the valve region at once, detecting the activation at multiple points that are spatially distant from one another and evaluating their timing. The catheter enables to record the electrical activity both circumferentially and longitudinally giving a quick overview of the earliest prepotential in very few beats. Small electrodes with narrow inter-electrode spacing also improve near field detection of local myocardial sleeves depolarization that cause aortic cusps PVCs.

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Disclosures

Nothing to disclosure.

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Abbreviations: PVC, Premature ventricular contractions; EGM, electrogram.

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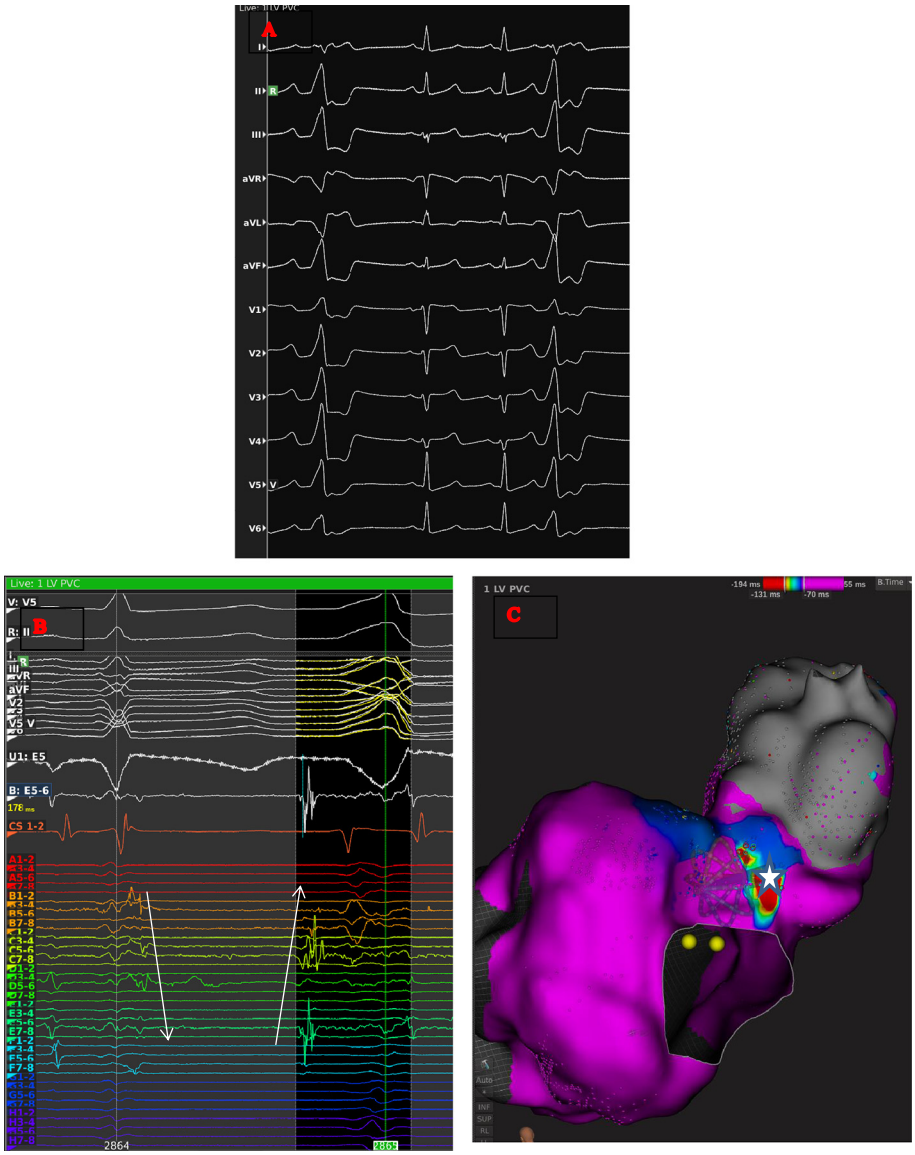

Panel A: 12 leads ecg showing ecg morphology of the PVC. Panel B: the sinus beat shows a delayed potential after the far field ventricular egm. During PVCs, the egm sequence reverses showing an early high amplitude near field pre-potential. Panel C: white star shows the region of earliest activation.