

## EP CASE REPORT

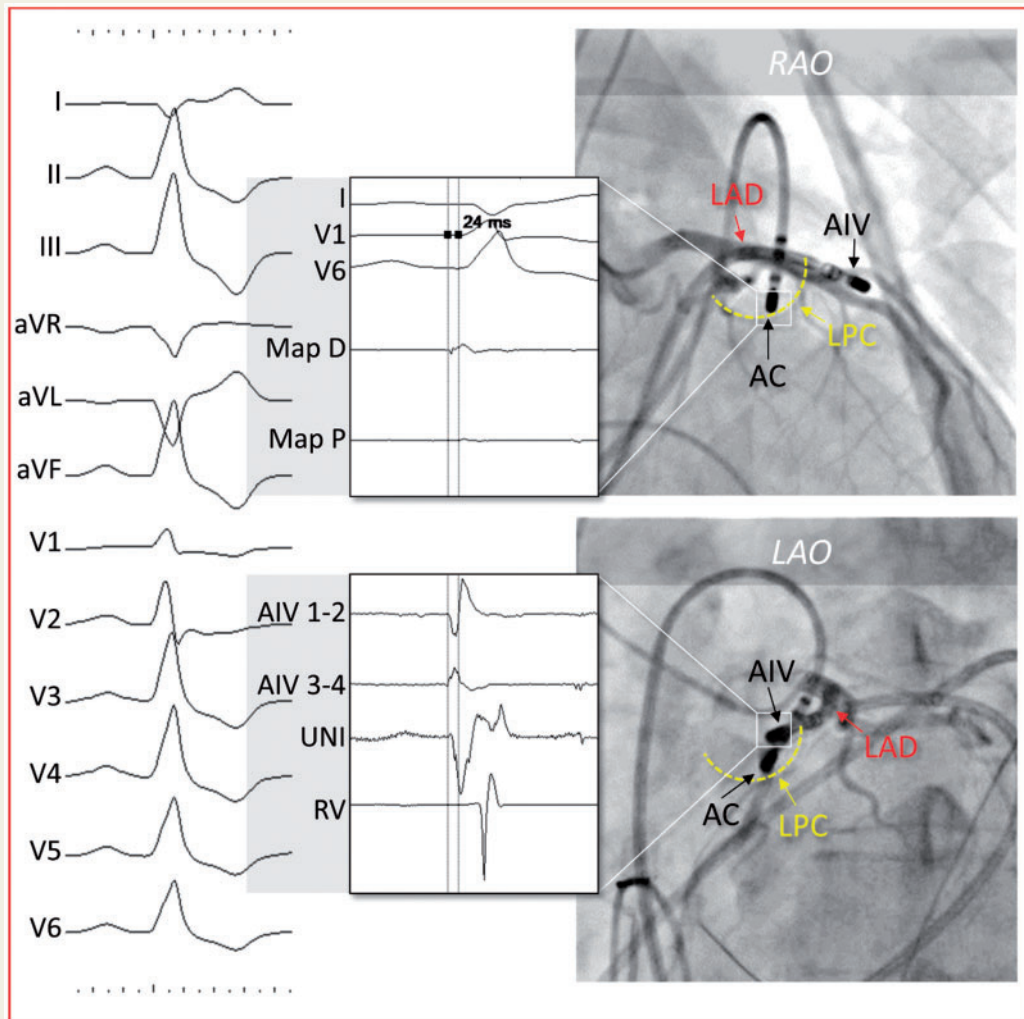
# Left pulmonary cusp ablation of refractory ventricular arrhythmia originating from the inaccessible summit

Piotr Futyma<sup>1,2\*</sup>, Kgomotso Moroka<sup>1</sup>, Michael Derndorfer<sup>1</sup>, Georg Kollias<sup>1</sup>, Martin Martinek<sup>1</sup>, and Helmut Pürerfellner<sup>1</sup>

<sup>1</sup>Department of Cardiology, Ordensklinikum Linz, Elisabethinen, Fadingerstr. 1, Linz A-4010, Austria; and <sup>2</sup>Department of Invasive Cardiology, St. Joseph's Heart Center, Anny Jagiellonki 17, 35-623 Rzeszów, Poland

\* Corresponding author: Tel: +48 533 503 044; fax: +48 17 854 85 55. E-mail address: piotr.futyma@gmail.com

Catheter ablation of premature ventricular contractions (PVC) originating from the inaccessible area of the left ventricular summit (LVS) is challenging due to the close proximity of the left descending artery (LAD). Thus, alternative approaches are often required. A 39-year-old female patient who had undergone two extensive radiofrequency (RF) catheter ablations of PVC originating from the inaccessible LVS was referred for a third procedure. During previous attempts, despite 99% match of the anterior interventricular vein (AIV) pacemapping, ablation from AIV was not delivered due to close proximity of the LAD. High-power ablation from the LV endocardium and aortic cusps failed to



abolish PVC. Prolonged ablation in the aortomitral continuity led to temporary suppression of PVC with immediate recurrence. The electrocardiogram pattern of the PVC consisting of an early transition zone in V1 and an S-wave in V2 was strongly suggestive for the LVS as the site of origin.<sup>1</sup> Mapping of the AIV performed by using a steerable catheter (ThermoCool SmartTouch, Biosense Webster, Diamond Bar, USA) confirmed again the earliest activation of the PVC in the inaccessible area of the LVS, preceding the PVC onset by 24 ms (Figure). Any RF ablation (unipolar or bipolar) at that earliest site was impossible to use due to the direct proximity of the LAD. Using a reversed U-shaped technique and a pull-down manoeuvre, a second regular 4 mm ablation catheter (AC) (Celsius, Biosense Webster, Diamond Bar, USA) prepared exclusively for bipolar LVS ablation, which was seriously considered in this case,<sup>2</sup> showed very similar PVC activation and pacemapping in the left pulmonary cusp (LPC).<sup>3</sup> A low-power unipolar application (21 W, total time of 90 s, max 55°C) delivered from the non-irrigated 4 mm catheter led to immediate elimination of the PVC with no recurrence in the follow-up.

Pulmonary valve cusps, especially LPC, emerged recently as an alternative target for ablation of outflow tract (OT) PVCs. This approach however dealt with right septal OT rather than LVS PVC.<sup>3</sup> Direct proximity of LPC and the inaccessible aspect of the LVS create a possibility of successful ablation from the pulmonary sinus. In the presented case, a low-power and non-irrigated ablation with 4 mm tip catheter led to immediate success making other more aggressive attempts unnecessary. A close proximity of nearby coronary arteries should always be taken into count during ablation within the LPC.

## Funding

EHRA Observational Training Programme Grant to P.F.

**Conflict of interest:** none declared.

## References

1. Yamada T, McElderry HT, Doppalapudi H, Okada T, Murakami Y, Yoshida Y *et al.* Idiopathic ventricular arrhythmias originating from the left ventricular summit: anatomic concepts relevant to ablation. *Circ Arrhythm Electrophysiol* 2010;**3**:616–23.
2. Futyma P, Wysokińska A, Sander J, Futyma M, Kułakowski P. Bipolar endo-epicardial radiofrequency ablation of arrhythmia originating from the left ventricular summit. *Circ J* 2018;**82**:1721–2.
3. Zhang J, Tang C, Zhang Y, Su X. Pulmonary sinus cusp mapping and ablation: a new concept and approach for idiopathic right ventricular outflow tract arrhythmias. *Heart Rhythm* 2018;**15**:38–45.