A case of idiopathic premature ventricular contractions successfully ablated from the epicardial right ventricular outflow tract (RVOT) via the subxiphoid pericardial approach was described. The sites with earliest endocardial and epicardial ventricular activation were located adjacent to each other in the RVOT and at both sites, double potentials were recorded. Coronary angiography was helpful for identifying the ablation site.

A 35-year-old woman was referred for catheter ablation of symptomatic idiopathic premature ventricular contractions (PVCs) exhibiting a left bundle branch block and left inferior axis QRS morphology (Figure 1A). Endocardial activation mapping revealed the earliest ventricular activation at the anterior aspect of the right ventricular outflow tract (RVOT) where the local ventricular electrogram consisting of two components connected by a fractionated electrogram preceded the QRS onset by 24 ms (Figure 1B and C). Pacing from this site did not produce an excellent pace map (Figure 1A). Non-irrigated radiofrequency current with a target temperature of 60°C and maximum power output of 50 W was delivered for 120 s at this site, resulting in no interruption of the PVCs but a slight change in the QRS morphology, prolongation of the QRS duration, and appearance of pseudo-delta waves during the PVCs (Figure 1A). Epicardial mapping via the subxiphoid pericardial approach was then performed using an irrigated ablation catheter (EZ STEER™ ThermoCool™, Biosense Webster, Diamond Bar, CA, USA) and it revealed the earliest ventricular activation at the site adjacent to the prior endocardial ablation site (Figure 1C). At this site, the local ventricular electrogram was similar in morphology to that recorded from the endocardial ablation site and preceded the QRS onset by 48 ms (Figure 1C). Pacing from this site produced an excellent match to the QRS complex of the changed PVCs (Figure 1A). Left coronary artery angiography revealed that this site was located on the right and upper side of the left anterior descending coronary artery and more than 2 cm away from that artery. A single application of irrigated radiofrequency current in the power-control mode at 30 W delivered for 60 s at this site eliminated the PVCs. No complications occurred.

Although the indication of epicardial catheter ablation has been extended to include idiopathic ventricular arrhythmias (VAs),1 idiopathic VAs ablated from the epicardial RVOT are very rare and information about these VAs is limited. In this case, electrogons with a similar morphology were recorded at both the endocardial and epicardial sites with the earliest ventricular activation during the PVCs. The first smaller component of those electrograms likely represented the far-field ventricular activity of the VA origin and the second larger one the near-field activity of the endocardial or epicardial ventricular myocardium. Similar electrograms may be recorded at the successful ablation site of VAs with intramural origins.2 These findings suggested that the VA origin in this case was likely to have been intramural rather than epicardial although the VAs were successfully ablated from the epicardial side. A pacing study suggested that there may be a trend for the polarity amplitude ratios in leads aVL to aVR to be less than one for epicardial RVOT VAs.3 During the PVCs in this case, that was less than one at baseline and became much less after the epicardial catheter ablation in the RVOT. As the other electrocardiographic features also became more likely epicardial after the epicardial ablation, the epicardial breakout was likely to have been more preferential than the epicardial one.

Conflict of interest: none declared.

References

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Figure 1 (A) Twelve-lead electrocardiograms exhibiting premature ventricular contractions (PVCs) before (PVC1) and after the catheter ablation in the endocardial right ventricular outflow tract (RVOT) (PVC2) and pace maps which were obtained by pacing from the endocardial (PM1) and epicardial (PM2) sites in the RVOT. (B) Cardiac tracings recorded from the endocardial and epicardial ablation sites in the RVOT. ABL (HB) d(p), the distal (proximal) electrode pair of the ablation (His bundle) catheter; CS 1–5, the first to fifth electrode pairs of the coronary sinus catheter. (C) Fluoroscopic images exhibiting the endocardial and epicardial ablation sites. Note that the mapping catheter in the RVOT was not positioned at the endocardial ablation site during the epicardial catheter ablation because it was challenging to keep the mapping catheter at that site without inducing any PVCs. LAO, the left anterior oblique projection; LAD, the left anterior descending coronary artery; LCx, left circumflex coronary artery; MAP, mapping catheter; RAO, the right anterior oblique projection.
References

