Perimital flutter with a long epicardial bypass tract successfully treated by selective ethanol infusion to a branch of the vein of Marshall

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Lesion control may be difficult during ethanol infusion (EI) to the vein of Marshall (VOM). We present a 83-year-old woman, who came for radio-frequency (RF) ablation of an post-atrial fibrillation (AF) ablation atrial tachycardia (AT) after three ablation procedures: (i) pulmonary vein isolation + linear line for the cavitricuspid isthmus, (ii) isolation of the posterior left atrium (LA), and (iii) multiple anterior lines for perimital flutter (PMF). The patient was in sinus rhythm (SR) at the beginning of the procedure. The activation map created during left atrial appendage (LAA) pacing showed extensive scar in the posterior and anterior walls with activation appearing at the septal edge of the large anterior scar (Figure 1A). No electrograms were identified even by the ORION™ mapping catheter and mini-electrode catheter (INTELLATIP MIFI™ OI, Boston Scientific) in the roof-to-anterior scar area. Although low-output pacing in this area did not capture the LA, high-output did (Figure 1B). The activation map of an easily inducible clinical AT (cycle length, CL = 409ms) showed a centrifugal pattern from the ridge between the left superior pulmonary vein and LAA. However, the AT demonstrated a post-pacing interval–total CL < 20 ms on the ridge, coronary sinus, and septal LA and was diagnosed as PMF using a long epicardial bypass tract on the anterior roof (Figure 1C). Endocardial RF applications with 40W along the origin of the centrifugal activation on the ridge (Figure 1C, yellow tag) failed to affect the AT, so EI to the VOM was performed. Because of a risk of the LAA being isolated with mitral isthmus block, the catheter was guided to the location of the inferior ridge based on the 3D mapping system, and only the distal VOM branch (Figure 1D, blue dotted circle) corresponding to the level of the catheter was selectively targeted for EI under fluoroscopic guidance (Figure 1D). One millilitre-EI terminated the AT, and the SR activation map showed the selective scar region on the ridge without LAA isolation. (Figure 1E, dotted circle.)
Here, in the present case, two important key messages are described. First, as previously reported, epicardial structures are frequently used in AF ablation-related ATs, especially in PMF. Although the VOM is often included in the AT circuit in this type of AT, other epicardial structures such as Bachmann’s bundle should be also considered, and this structure may bypass a long distance as shown in the present case.

Second, EI-VOM is an efficient optional strategy to help creating a durable region on the mitral isthmus, the lesion control is difficult because of a various distribution of the VOM. However, it may be still possible with a precise assessment of VOM distribution and the target of interest.

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References