


CASE REPORT

Perimitral 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 cavotricuspid isthmus, (ii) isolation of the posterior left atrium (LA), and (iii) multiple anterior lines for perimitral 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 ORIONTM mapping catheter and mini-electrode catheter (INTELLATIP MIFITM 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 40 W 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).

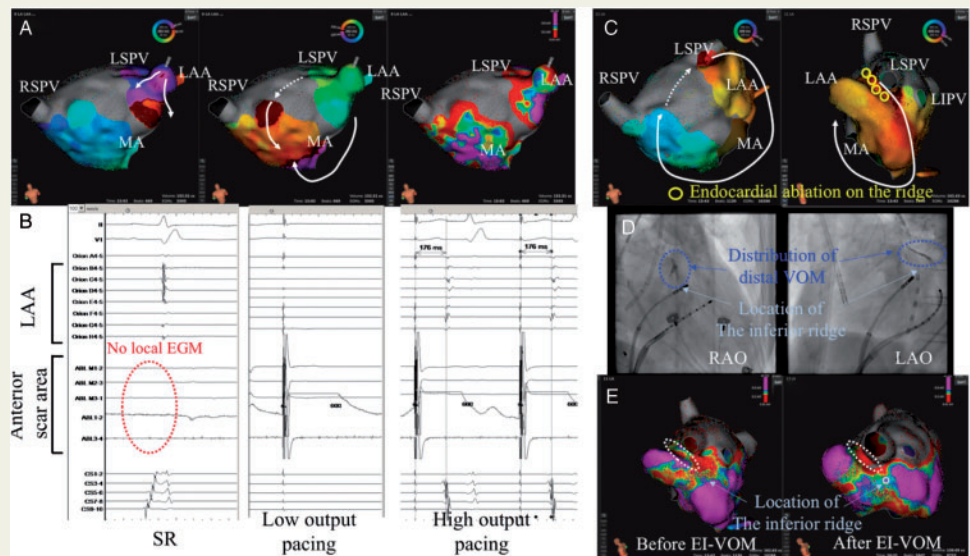


Figure 1 (A) Activation map and voltage map during LAA pacing. Note that activation from the LAA jumps through the large anterior scar, appearing at the septal edge of this scar (middle panel). (B) EGM inside the anterior scar during SR and conduction during local pacing. Note that high-output pacing in this site conducts to the LAA, although low-output pacing can not conduct to the LAA, and no EGM is identified during SR. (C) Activation map of the PMF using epicardial structures and endocardial ablation site. (D) Distribution of the distal VOM. (E) Voltage map before and after the 1ml EI-VOM. EGM, electrogram; EI-VOM, ethanol infusion to the vein of Marshall; LAA, left atrial appendage; LIPV, left inferior pulmonary vein; LSPV, left superior pulmonary vein; MA, mitral annulus; PMF, perimitral flutter; RIPV, right inferior pulmonary vein; RSPV, right superior pulmonary vein; SR, sinus rhythm.

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.¹ 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,^{1,2} 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 isthmus³, 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.

Conflict of interest: none declared.

References

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