Localized Reentrant Atrial Tachycardia Without a History of Catheter Ablation in a Patient With Apical Hypertrophic Cardiomyopathy

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A 67-year-old woman with apical hypertrophic cardiomyopathy (HCM) underwent electrophysiological study for atrial tachycardia (AT) refractory to multiple anti-arrhythmic agents. She had no history of catheter ablation. Transthoracic echocardiography showed apical hypertrophy with preserved left ventricular systolic function and...
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TCL and the post-pacing interval-TCL is <20 ms in this area, localized reentry is considered as a diagnosis. Furthermore, localized reentrant AT is reported to arise from a site near the scar. The majority of AT originate from the right atrium, and only a few originate from the LA without previous catheter ablation or cardiac surgery. In addition, the contiguous aorta-LA area around the mitral annulus is reported to be responsible for the low-voltage area in cases of AT originating from the LA.

Ejima et al reported the case of a 69-year-old man with idiopathic dilated cardiomyopathy presenting with localized reentrant AT in the context of atrial fibrillation ablation, and Maeda et al reported the case of a 70-year-old man with small reentrant AT, and in these 2 cases the AT originated from the contiguous aorta-LA area. In the present case, the localized reentrant AT originated from the contiguous right PA-LA area, and compression of the dilated LA by the right PA may have contributed to the fibrosis of the LA anterior wall. Furthermore, pressure overloading due to apical HCM may contribute to the remodeling and fibrosis responsible for the low-voltage area and conduction disturbance, as represented by fractionated or double potentials, subsequently leading to localized reentrant AT.

This is a very rare case of localized reentry without a hist-

dilated left atrium (LA). The baseline tachycardia cycle length (TCL) was 300 ms. Using 3-D electro-anatomical mapping, the voltage map showed the low-voltage area to have bipolar voltage amplitude ≤0.3 mV and a spontaneous scar in the LA anterior wall in contact with the right pulmonary artery (PA; Figure 1A). The activation map showed a centrifugal activation pattern, and the earliest activation site was located at the low-voltage area in the LA anterior wall (Figure 1B). The continuous fractionated potentials, which accounted for >85% of TCL were recorded from the electrodes of the circumferential catheter adjacent to the earliest activation site (Figure 2A). Moreover, double potentials were also recorded from electrodes LA 5–6 and these were found to be continuously distributed from the low-voltage area in the LA anterior wall to the atrial septum (Figure 1). Mid-diastolic fractionated potentials were recorded at the earliest activation site (Figure 2B). Radiofrequency catheter ablation was applied at this site, and the AT was successfully eliminated.

Local reentrant AT often occurs after extensive ablation for long-lasting persistent atrial fibrillation and is defined as the presence of a small reentrant circuit localized to an area with a diameter of 3 cm. Activation mapping has a centrifugal pattern, and if low-amplitude continuous activity recorded at the origin of the centrifugal activation accounts for >85% of TCL and the post-pacing interval-TCL is <20 ms in this area, localized reentry is considered as a diagnosis. Furthermore, localized reentrant AT is reported to arise from a site near the scar.

The majority of AT originate from the right atrium, and only a few originate from the LA without previous catheter ablation or cardiac surgery. In addition, the contiguous aorta-LA area around the mitral annulus is reported to be responsible for the low-voltage area in cases of AT originating from the LA. Ejima et al reported the case of a 69-year-old man with idiopathic dilated cardiomyopathy presenting with localized reentrant AT in the context of atrial fibrillation ablation, and Maeda et al reported the case of a 70-year-old man with small reentrant AT, and in these 2 cases the AT originated from the contiguous aorta-LA area. In the present case, the localized reentrant AT originated from the contiguous right PA-LA area, and compression of the dilated LA by the right PA may have contributed to the fibrosis of the LA anterior wall. Furthermore, pressure overloading due to apical HCM may contribute to the remodeling and fibrosis responsible for the low-voltage area and conduction disturbance, as represented by fractionated or double potentials, subsequently leading to localized reentrant AT.

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Figure 2. (A) Continuous fractionated potentials recorded from the electrodes of the circumferential catheter adjacent to the earliest activation site. (The position of the circumferential catheter is shown in Figure 1.) (B) Intracardiac electrogram showing the mid-diastolic potentials during atrial tachycardia (AT). Radiofrequency catheter ablation was applied at this site during AT, resulting in successful termination. Double potentials were recorded from the electrodes of LA 5-6. CS, coronary sinus; LA, left atrium.
tory of catheter ablation. The low-voltage area near the scar in the LA anterior wall was a source of arrhythmia and a target site of ablation.

**Disclosures**

The authors state that they have nothing to declare.

**References**


