

# Peri-mitral atrial tachycardia mimicking localized reentry after the superior transeptal approach

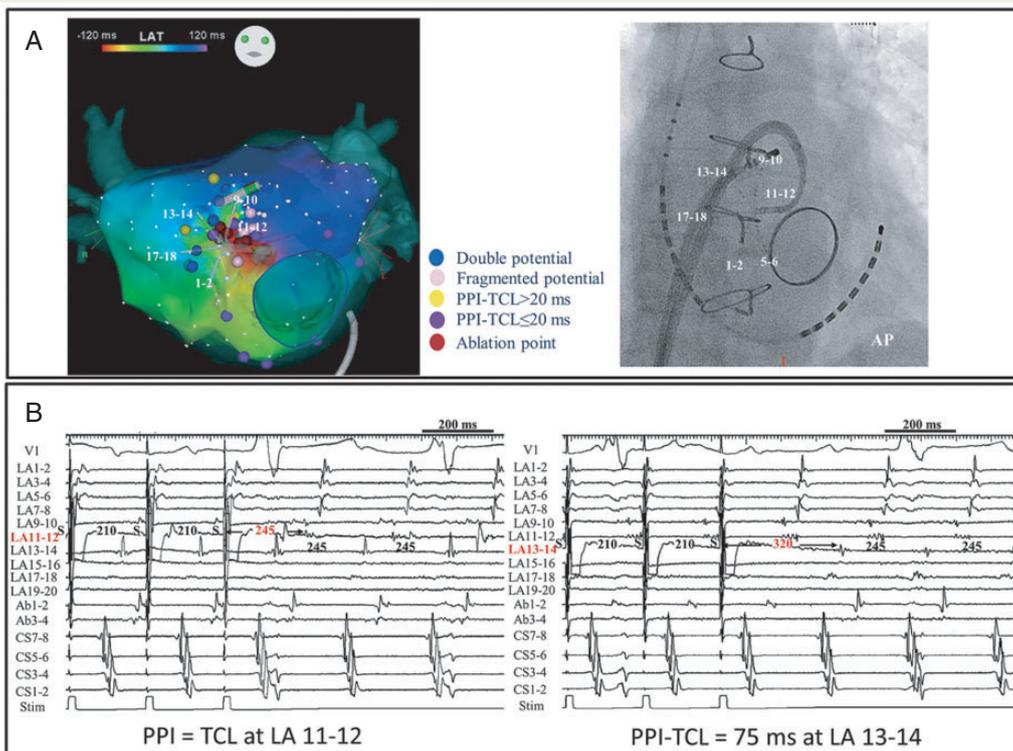
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A 65-year-old man with persistent atrial tachycardia (AT) after mitral valve replacement via the superior transeptal approach (STA) was referred for catheter ablation. At the beginning of the procedure, the baseline tachycardia cycle length (TCL) was 245 ms. A three-dimensional activation map (CARTO, Biosense Webster Inc., CA, USA) showed a counterclockwise peri-mitral AT pattern. With the entrainment pacing from the multiple sites at the coronary sinus and left atrium (LA) along the mitral annulus (MA), the post-pacing interval (PPI) – TCL was  $\leq 20$  ms (Panel A). Based on these observations, tachycardia was diagnosed as peri-mitral AT. Interestingly, the continuous fractionated potentials, accounting for  $>85\%$  of TCL, were recorded by the electrodes of the duodecapolar catheter (Pentaray, Biosense Webster Inc.), which was positioned at the anterior wall of the LA along the MA (Panels A and B). Double potentials (DPs) were recorded at the centre of the anterior wall of the LA, which indicated the incisional line made via the STA (Panel A, blue ovals). With the entrainment pacing at the MA side of the DP recording sites, the PPI matched the TCL (Panel B, left). Meanwhile, the PPI – TCL was 75 ms at the right pulmonary side of the DP recording sites (Panel B, right). The tachycardia was terminated by radiofrequency catheter ablation from the DP recording sites to the 11 o'clock direction of the MA, and the bidirectional block of the ablation line was confirmed.

Localized reentrant AT often occurs after extensive ablation for long-lasting persistent atrial fibrillation; it rarely occurs in patients without a history of catheter ablation.<sup>1,2</sup> It is defined as the presence of a small reentrant circuit localized to an area with a diameter of 3 cm and fractionated continuous potentials accounting for  $>85\%$  of the TCL. The present case fulfilled the above conditions; However, the right pulmonary side of the DP recording sites was out of the reentrant circuit by entrainment pacing, that is, this tachycardia was not localized reentrant AT, but peri-mitral AT. Peri-mitral AT is commonly recognized to be one of the most frequent ATs that develop after atrial fibrillation ablation and mitral valve surgery. Lateral mitral isthmus ablation is usually performed although it is technically challenging to create a complete and durable transmural lesion in this anatomical location. In the present case, a narrow isthmus was identified by entrainment pacing, and the tachycardia was successfully terminated by ablation at a few points (Panel A, red ovals). AT after mitral valve surgery via the STA commonly originates from the right atrium, and rarely from the LA. In the present case, the



incisional line on the LA made via the STA led to peri-mitral AT, which mimicked localized reentrant AT. Close attention should be paid to the details of both local electrograms and observations of entrainment pacing, whereby tachycardia circuit may be identified.

## References

1. Wakabayashi Y, Hayashi T, Mitsuhashi T, Momomura S. Localized reentrant atrial tachycardia without a history of catheter ablation in a patient with apical hypertrophic cardiomyopathy. *Circ J* 2014;**78**:2990–2.
2. Jais P, Matsuo S, Knecht S, Weerasooriya R, Hocini M, Sacher F *et al*. A deductive mapping strategy for atrial tachycardia following atrial fibrillation ablation: importance of localized reentry. *J Cardiovasc Electrophysiol* 2009;**20**:480–91.