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References

CASE REPORT
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Entrapment of the circular mapping catheter in the mitral valve in two patients undergoing atrial fibrillation ablation
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The circular catheter is a useful tool to guide and test pulmonary vein (PV) isolation in atrial fibrillation ablation. However, its shape may facilitate entrapment in cardiac structures. We describe the entrapment of a circular mapping catheter within the mitral valve apparatus after transseptal catheterization and mapping of the left atrium and PVS in two of our patients.

Introduction
Since its introduction by Haïssaguerre et al.,1 the use of a circular catheter (lasso catheter), to guide ablation and to ensure isolation of the pulmonary veins (PVs), has become standard practice in the majority of centres performing atrial fibrillation (AF) ablation. Using a transseptal approach to position a circular catheter at the PV ostia facilitates the identification of PV potentials, but is not completely free of risk.

We describe two patients with refractory AF, undergoing PV isolation (PVI) who developed a major complication involving entrapment of a circular catheter in the mitral valve (MV).

Clinical cases
Case 1. A 40-year-old man with a 3-year history of paroxysmal AF and previous ablation of typical atrial flutter referred to AF ablation.

Case 2. A 42-year-old man with a 4-year history of paroxysmal AF and a history of sarcoidosis referred to AF ablation.

Pre-operative transoesophageal echocardiogram and computed tomography showed mild left atrium (LA) dilation, structurally normal heart valves, and normal left ventricular systolic function. Double transseptal catheterization was done. The 7 Fr 20-pole deflectable tip Lasso catheter (Biosense Webster, in Case 1, and St Jude Medical, in Case 2) was inserted into LA through the long vascular 8 Fr Mullins sheath. During catheter movement in LA, the lasso became entrapped in the MV. The catheter was freed by careful back-and-forth manipulations, with clockwise and counterclockwise rotation, and, with the patient haemodynamically stable in both cases, PVI was achieved. Upon removal of the catheters, echocardiography was performed, revealing flail posterior MV leaflet and severe mitral regurgitation (Figure 1). Both patients were referred to cardiac surgery. Intra-operative examination of MV showed rupture of the anterior papillary muscle with consequent prolapse of the posterior MV leaflet and severe MV regurgitation. Mitral valve reconstruction and surgical PVI were performed in both cases.

Discussion
Catheter entrapment in the MV during AF ablation has been reported. The circular spine of the circular catheter became entrapped in the chordae tendineae, either during initial deployment of the circular catheter through a transseptal sheath or during PV mapping. Once the circular catheter is caught in the MV, and manoeuvres to remove it are attempted, probably the shape of the circular catheter contributes to catheters inability to slide off the MV and damage occurs. In both of our patients, transseptal punctures were performed in the inferior edge of the foramen ovale. The sheath was probably pointing towards the left ventricle and, therefore, the circular catheter entered presumably directly through the chordae, becoming trapped when it was manipulated to reach the atrium. This

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risk can be minimized by taking special care to avoid a direct entrance from the sheath into the left ventricle. In addition, the shape of the curve requires that counterclockwise rotation be avoided if the catheter falls into the ventricle. In ~1000 AF ablations performed in the last 5 years, using lasso to guide the PVI, we encountered only in those two patients the case of catheter entrapment causing MV damage. However, in the case of entrapment, some published papers described successful techniques of release of entrapped catheter tip with a use of the sheath. For example, Kesek et al. described the technique in which sheath was advanced to the tip of the catheter, to straighten it, and since the sheath is more floppy than the catheter, the catheter could be retracted and released without damaging the MV.

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References

CASE REPORT
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Demonstration of a right ventricular substrate of ventricular tachycardia after myocardial infarction


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A 57-year-old man with prior anteroseptal myocardial infarction underwent catheter ablation of ventricular tachycardia (VT) exhibiting a left bundle branch block QRS morphology. After failed left ventricular ablation, catheter ablation from the right ventricle (RV) eliminated the VT. An RV voltage map demonstrated an area of low voltage around the successful ablation site that likely allowed for a VT substrate.

A 57-year-old man, who had prior anteroseptal myocardial infarction underwent implantation of an implantable cardioverter defibrillator with cardiac resynchronization therapy (CRT-D) due to a reduced systolic function of the left ventricle (LV) and atrioventricular conduction block, was referred for catheter ablation of ventricular tachycardias (VTs). Voltage mapping of the LV was first performed during pacing from the CRT-D using an ablation catheter (EZ STEER™ ThermoCool™ NAV, Biosense Webster, Diamond Bar, CA, USA) on the three-dimensional shell created by the fast anatomical mapping technology equipped in the CARTO™ 3 system (Biosense Webster, Diamond Bar, CA, USA). This revealed an extensive area of low voltage in the anteroseptal wall (Figure 1A). Programmed ventricular stimulation from the right ventricle (RV) induced the clinical sustained VT exhibiting a left bundle branch block and left inferior-axis QRS morphology (cycle length = 345 ms, Figure 1B). During the VT, mid-diastolic potentials with a double potential configuration consisting of a low-amplitude first component and a sharp second component were recorded from the His bundle (HB).

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