Letter to the Editor

Echocardiographic Demonstration of Atrioventricular Mechanical Contraction in Atrial Flutter

To the Editor,

We present the case of a 54-year-old patient with no history of heart disease who underwent transesophageal echocardiography (TEE) to rule out the presence of thrombus in the left atrial appendage (LAA) prior to programmed electrical cardioversion for common counterclockwise atrial flutter with 2:1 ventricular response at 150 bpm.

The TEE confirmed good biventricular function, no thrombus in LAA, and slight dilatation of both atria. In the mid-esophageal plane we obtained pulsed-wave Doppler echocardiograms of the LAA at 60° (Fig. 1A) showing organized flow with waves 200 ms apart (broken lines) and peak velocities of 0.6 m/s. Rotating to 90° to visualize the interatrial septum (IAS), we obtained M-mode recordings of IAS and tricuspid annulus (Fig. 1B), simultaneously visualizing the IAS swirling motion at 300 bpm (atrial frequency) and tricuspid annular systolic motion (TAPSE, black triangles) at 150 bpm (ventricular frequency). The lower part of the image (Fig. 1C) shows a detail of ECG lead III for this patient: triangles indicate QRS at 140–150 bpm; broken lines indicate F waves at 300 bpm.

Echocardiography is capable of diagnosing supraventricular arrhythmias from IAS or free atrium wall motion. 1,2 The LAA flow velocity and organization recorded by pulsed Doppler diminish with atrial flutter. This reduction is even greater in atrial fibrillation than in sinus rhythm—facilitating diagnosis of the arrhythmia—and has been associated with states of hypercoagulability.3 Our case shows electromechanical correlation in atrial flutter and demonstrates how M-mode and pulsed Doppler echocardiography can diagnose atrial flutter. Furthermore, we discovered some physiopathological details of notes: the repercussion of ventricular contraction (black triangles, Fig. 1A) on mechanical LAA contraction (note a small wave of LAA emptying: white arrowheads, Fig. 1A) and the atria (note a small notch in IAS descending motion at the time of ventricular contraction, corresponding to venous pulse V wave: white arrowheads, Fig. 1A).

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REFERENCES


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Entrapment of Circular Mapping Catheter in the Mitral Subvalvular Apparatus During Segmental Isolation of Pulmonary Veins

To the Editor,

The entrapment of a circular catheter in the mitral subvalvular apparatus is a rare but serious complication. We report here a case study about the maneuvers that can be performed to help release it as well as the frequent need for surgical treatment.

The subject is a 46-year-old male athlete with recurrent episodes symptomatic of paroxysmal atrial fibrillation (AF) despite antiarrhythmic therapy. An electrophysiological study was requested, to be performed using a transseptal approach with Mullins sheath and Brockenbrough needle (electrophysiological guide and single puncture). A 20-mm circular catheter (LassoNav®, Biosense Webster) and an irrigated-tip ablation cathether (Navistar®) were used. Using a non-fluoroscopic navigation system (CARTO V.10), an electroanatomic reconstruction of the left atrium and pulmonary veins (PV) was performed. After isolating both the left PV and the right superior PV, the 20-mm circular catheter was

Figure 1. A: Transesophageal echocardiography (TEE) image (60°), pulsed Doppler of left atrial appendage flow. B: TEE (90°), M-mode images of interatrial septum and tricuspid annulus. C: ECG lead III detail.
and asymptomatic from the cardiologic point of view, was not possible to release it using traction during surgery, and it catheter between the chordae of the anterior mitral leaflet. It was regurgitation (MR) and trapping of the circular portion of the echocardiogram was performed that showed grade II/IV mitral cardiopulmonary bypass. During the procedure, a transesophageal median sternotomy and transverse aortotomy while under with surgical extraction. The mitral valve was accessed through similar cases, we decided to terminate the procedure and proceed (Fig. 1), and given the high risk of valvular lesion, as reported in this too failed to release it. The fluoroscopic view of the circular tip catheter to encircle the distal tip of the circular catheter. However, made to free it by gently advancing the catheter with a clockwise rotation and traction on the catheter, with and without the support of the Mullins sheath, which was advanced to the distal end of the catheter in an effort to straighten it. These maneuvers were repeated, without success, during ventricular pacing at 220 bpm to reduce cardiac output during adenosine-induced asystole, and under Isoproterenol infusion administered to increase inotropism. A 4-mm ablation catheter with a deflectable distal tip was introduced by a retrograde approach to surround the distal end of the multipolar guide and modify the traction point, like a “lasso” catheter to encircle the distal tip of the circular catheter. However, this too failed to release it. The fluoroscopic view of the circular tip of the catheter made us suspect a fracture of the distal portion (Fig. 1), and given the high risk of valvular lesion, as reported in similar cases, we decided to terminate the procedure and proceed with surgical extraction. The mitral valve was accessed through median sternotomy and transverse aortotomy while under cardiopulmonary bypass. During the procedure, a transesophageal echocardiogram was performed that showed grade II/IV mitral regurgitation (MR) and trapping of the circular portion of the catheter between the chordae of the anterior mitral leaflet. It was not possible to release it using traction during surgery, and it replaced by a low-caliber 15-mm catheter (LassoNav®, Biosense Webster) to access the inside of the right inferior PV. The catheter shifted into the left ventricle during placement and remained trapped in the subvalvular apparatus. An unsuccessful attempt was made to free it by gently advancing the catheter with a clockwise rotation and traction on the catheter, with and without the support of the Mullins sheath, which was advanced to the distal end of the catheter in an effort to straighten it. These maneuvers were repeated, without success, during ventricular pacing at 220 bpm to reduce cardiac output during adenosine-induced asystole, and under Isoproterenol infusion administered to increase inotropism. A 4-mm ablation catheter with a deflectable distal tip was introduced by a retrograde approach to surround the distal end of the multipolar guide and modify the traction point, like a “lasso” catheter to encircle the distal tip of the circular catheter. However, this too failed to release it. The fluoroscopic view of the circular tip of the catheter made us suspect a fracture of the distal portion (Fig. 1), and given the high risk of valvular lesion, as reported in similar cases, we decided to terminate the procedure and proceed with surgical extraction. The mitral valve was accessed through median sternotomy and transverse aortotomy while under cardiopulmonary bypass. During the procedure, a transesophageal echocardiogram was performed that showed grade II/IV mitral regurgitation (MR) and trapping of the circular portion of the catheter between the chordae of the anterior mitral leaflet. It was not possible to release it using traction during surgery, and it became necessary to section the circular portion into three parts. Despite immediate postoperative AF, the patient had a favorable evolution. The echocardiogram prior to discharge showed trivial MR that had already been reported in the pre-ablation study.

Very few cases of circular catheter entrapment in the mitral valve apparatus have been published and most have been produced using catheters with diameters of between 10 and 20 mm (more commonly 10, 12 or 15 mm). Some have been freed by advancing the sheath over the catheter and rotating it clockwise around the catheter. There have been reports of breakage in the circular portion of the catheter and percutaneous extraction while performing these maneuvers, although most have required surgical intervention due to failure of extraction attempts or development of acute MR due to rupture of the subvalvular apparatus or commissural tearing. There are also reports of catheter release and extraction using minimally invasive surgery.

This complication is rare but probably also underestimated. In a recent record of 8745 patients that underwent AF ablation, only one case of unspecified valvular damage was reported. However, a retrospective review of 348 patients found that the incidence of circular catheter entrapment in the mitral valve apparatus was significantly higher (0.9%).

There are no reports on the usefulness of maneuvers designed to reduce cardiac output or increase contractility in an effort to facilitate the release of the catheter, but in our case they were not effective.

The published data indicate the need to consider the risk of injury to the mitral valve and to rely mainly on the maneuver of advancing the sheath over the catheter using clockwise rotation, resorting to surgical extraction if this maneuver is not effective.

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REFERENCES


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Giant Aneurysm in a Coronary–Pulmonary Artery Fistula

Aneurisma gigante de fístula coronariopulmonar

To the Editor,

A 67-year-old woman, with no cardiovascular risk factors and asymptomatic from the cardiologic point of view, was referred to our unit for the study of a cystic mass adjacent to the cardiac outline, detected incidentally on a chest radiograph (Fig. 1). The transthoracic echocardiogram showed a large spherical mass with a hyperechogenic wall and heterogeneous content, situated at the level of the atrio-ventricular sulcus, adjacent to the aortic root (Fig. 1, Video 1). Multislice computerized tomography and coronary angiography showed a fistula between the right coronary artery and the pulmonary artery, which originated near the ostium of the right coronary artery and

Figure 1. Catheter trapped in the mitral subvalvular apparatus.

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