

**Figure 1.** Catheter trapped in the mitral subvalvular apparatus.

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.<sup>1</sup> There have been reports of breakage in the circular portion of the catheter and percutaneous extraction<sup>2</sup> 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.<sup>1,2</sup> There are also reports of catheter release and extraction using minimally invasive surgery.<sup>3</sup>

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.<sup>4</sup> 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%).<sup>1</sup>

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.

Irene Valverde,\* Rafael Peinado, David Dobarro, and Ulises Ramírez  
Sección de Electrofisiología y Arritmias, Servicio de Cardiología,  
Hospital Universitario La Paz, Madrid, Spain

\*Corresponding author:

E-mail address: irene.valverde.andre@gmail.com (I. Valverde).

Available online 28 January 2011

## REFERENCES

1. Kesek M, Englund A, Jensen SM. Entrapment of circular mapping catheter in the mitral valve. *Heart Rhythm*. 2007;4:17-9.
2. Tavernier R, Duytschaever M, Taeymans Y. Fracture of a circular mapping catheter after entrapment in the mitral valve apparatus during segmental pulmonary vein isolation. *Pacing Clin Electrophysiol*. 2003;26:1774-5.
3. Je HG, Kim JW, Jung SH, Lee JW. Minimally invasive surgical release of entrapped mapping catheter in the mitral valve. *Circ J*. 2008;8:1378-80.
4. Cappato R, Calkins H, Chen SA. Worldwide survey on the methods, efficacy, and safety of catheter ablation for human atrial fibrillation. *Circulation*. 2005;111:1100-5.

doi:10.1016/j.rec.2010.08.008

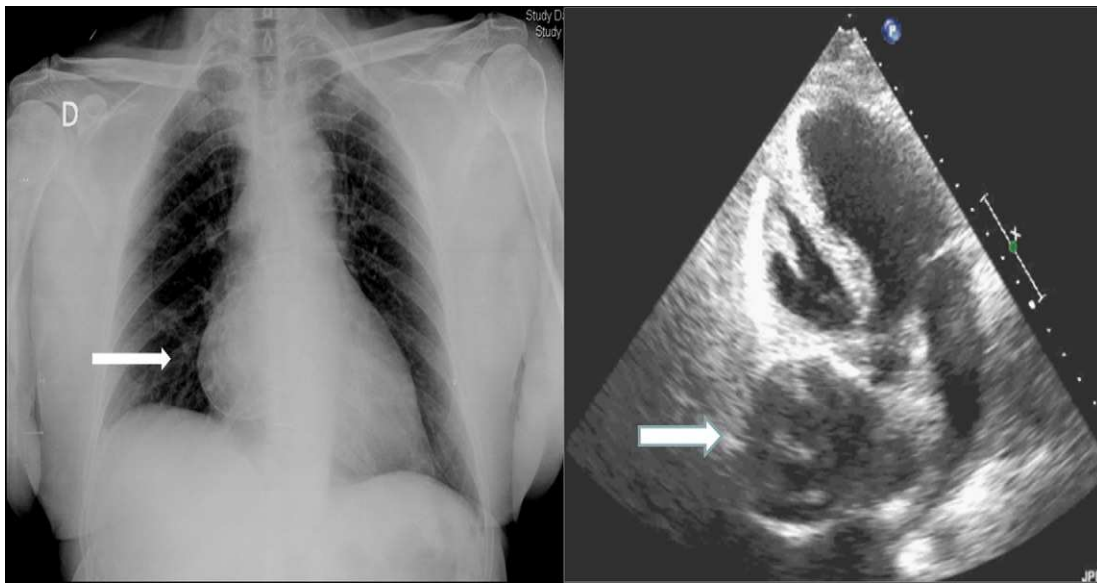
## Giant Aneurysm in a Coronary-Pulmonary Artery Fistula

### *Aneurisma gigante de fístula coronariopulmonar*

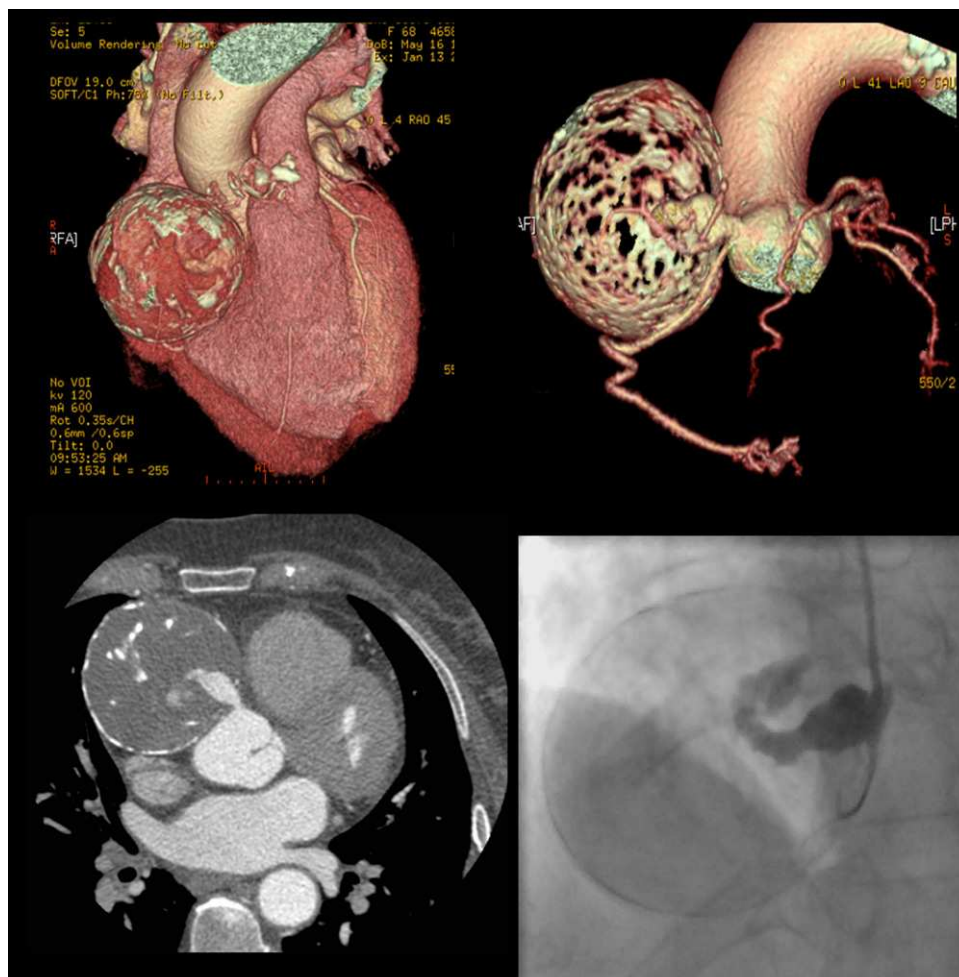
#### To the Editor,

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 heteroechoic 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.** The left side of the image is the chest radiograph of the patient, showing a paracardiac cystic mass. The transthoracic echocardiogram shows a heteroechoic mass adjacent to the aortic root.



**Figure 2.** Multidetector computed tomography and invasive coronary angiogram: fistula of the right coronary artery to the pulmonary artery with a giant thrombosed aneurysm.

drained into the main pulmonary artery via a giant aneurysm, with parietal calcification and mural thrombus (Fig. 2, Video 2). Once the presence of a major left-to-right shunt and myocardial ischemia had been ruled out, a wait-and-see attitude was adopted.

Coronary fistulas are anomalous communications, either congenital or acquired, between a coronary artery and a cardiac chamber or blood vessel, present in 0.1%–0.8% of all coronary angiographies.<sup>1</sup> The development of saccular aneurysms in coronary–pulmonary fistulas is even less common.<sup>2</sup> Most arise from the right coronary artery or the left anterior descending artery, and about 90% drain into the venous circulation (right chambers, pulmonary artery, superior vena cava or coronary sinus).<sup>1</sup> Its spectrum of clinical presentation varies, and depends on the severity of the left-to-right shunt. The entity is usually an incidental finding, though it may cause myocardial ischemia, arrhythmias, heart failure or sudden death.<sup>1</sup> As shown by our case, multislice computerized tomography permits clear definition of the origin of these fistulas, their path and their distal site of drainage, as well as their relationship to other cardiac structures, and represents a very important advance in diagnostics, compared with coronary angiography. The main indications for closure of these fistulas are the development of clinical symptoms, especially myocardial ischemia or heart failure. In childhood, treatment can be considered in asymptomatic patients with a high-flow left-to-right shunting to avoid complications. Both surgical treatment and percutaneous closure have shown

excellent results with respect to effectiveness, morbidity and mortality.<sup>1</sup>

## APPENDIX . SUPPLEMENTARY MATERIAL



Supplementary material associated with this article can be found in the online version available at [doi:10.1016/j.rec.2010.08.002](https://doi.org/10.1016/j.rec.2010.08.002).

Xacobe Flores-Ríos,\* José A. Rodríguez Fernández, and Alfonso Castro-Beiras

*Servicio de Cardiología, Área del Corazón, Complejo Hospitalario Universitario A Coruña, A Coruña, Spain*

\*Corresponding author:

E-mail address: [xacobeflores@yahoo.es](mailto:xacobeflores@yahoo.es) (X. Flores-Ríos).

Available online 28 December 2010

## REFERENCES

1. Gowda RM, Vasavada BC, Khan IA. Coronary artery fistulas: clinical and therapeutic considerations. *Int J Cardiol.* 2006;107:7–10.
2. Schamroth C. Coronary artery fistula. *J Am Coll Cardiol.* 2009;53:523.

doi:10.1016/j.rec.2010.08.002

## Biventricular Cardioverter-Defibrillator Implantation in a Patient With the Mustard Operation: “A Big Challenge”

### *Implantación de desfibrilador tricameral en un paciente con intervención de Mustard: «Todo un reto»*

#### To the Editor,

Transposition of the great arteries (TGA) is the most common type of cyanotic heart disease in newborn infants. The atrial switching procedures (Mustard and/or Senning procedures) have permitted these infants to survive to adulthood.<sup>1</sup> Sudden death is a substantial cause of late mortality. Presence of flutter or atrial fibrillation, syncope, or heart failure are predictors of sudden death in such patients.<sup>2</sup> Ventricular arrhythmias are uncommon when ventricular dysfunction is not present. Implantation of an implantable cardioverter-defibrillator (ICD) can be a complex procedure and, although there have been reports of implantation using the subclavian venous approach,<sup>3</sup> this might not always be feasible.

We present the case of an adolescent girl with TGA who underwent implantation of a atrio-biventricular ICD.

The 16-year-old patient had been born with interventricular shunting and persistent ductus arteriosus. She had undergone a Rashkind balloon atrial septostomy and, when 6 months old, a Mustard-type repair. For several years, she had asymptomatic paroxysmal complete atrioventricular block with narrow QRS interval and was in functional class II. She was admitted after cardiogenic syncope. An ejection fraction of 25% was observed in the echocardiogram and there were no obvious abnormalities in the baffles for redirection of atrial flow. We performed a

catheterization study with induced syncopal ventricular tachycardia, with cardioversion at 200 J. It was decided to place an ICD and resynchronize because of the possible need for antibradycardia pacing as she had a history of CAVB with severe systemic ventricular dysfunction. Implantation by the subclavian approach was impossible as the electrode could not be advanced further than the upper area of the right atrium. It was decided to operate and place an epicardial pacing system. During opening of the sternum, rupture of the right ventricle occurred, requiring extracorporeal circulation and repair with sutures and Teflon. Epicardial pacing and sensing electrodes were placed on the right atrium and both ventricles. In addition, conventional 2-coil defibrillation electrodes were placed in the pericardial sac, around both ventricles, and were fixed with loose stitches. The electrodes were tunneled until reaching an infraclavicular left subcutaneous bag and a high-energy (41 J) Guidant Contak Renewal 4 generator was implanted. It was confirmed that defibrillation was effective with 21 J and pacing thresholds less than 1 V in the 3 chambers. During the postoperative period, the patient developed bacteremia due to *Serratia*, which was successfully treated with a targeted antibiotic. The patient was discharged after 20 days. After 18 months of follow-up, she had not had any arrhythmic episodes and the device is currently functioning normally (Fig. 1).

The increased number of ICDs in pediatric patients with congenital heart diseases faces, among other problems, the limitations of percutaneous access in many patients, either because of small vessel size or the particular anatomy of the patient. The traditional placement of epicardial patches is associated with problems of pericardial restriction and increases in the defibrillation thresholds. Stephenson et al<sup>4</sup> and Cannon et al<sup>5</sup> both published series (22 and 8 patients, respectively)