

Atrial Septal Defect Complicating Flutter Ablation, in Orthotopic Heart Transplantation Patient

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Abstract

The occurrence of a right-left shunt after heart transplantation is rare, usually linked to the reopening of an oval foramen.

We report the case of transient ischemic attack by paradoxical embolus, revealing an atrial septal defect in a cardiac transplant patient successively in 1988, then in 1994 by the shuntway technique.

The patient presented a radiofrequency ablated flutter in 2007. He was operated in 2017. The right atriotomy confirms the wide interatrial communication in the lower position by suture release.

The surgeon confirms the co-responsibility of the radio frequency gesture.

This post-transplant complication is related to historical surgery with bi-atrial suture.

At the moment the bi-caval technique is applied in the majority of the cases, because of the reduction of the complications.

Keywords: *Orthotopic Heart Transplantation; Atrial Septal Defect; Ablation of Flutter*

Abbreviations

OHT: Orthotopic Heart Transplantation; PFO: Patent Foramen Ovale; ASD: Atrial Septal Defect; RV: Right Ventricular; LV: Left Ventricular; TEE: Transesophageal Echocardiography; TTE: Transthoracic Echocardiography; SRO: Surface of the Regurgitant Orifice; Rv: Regurgitant Volume

Introduction

Intra cardiac shunts are rarely reported in heart transplantation. After orthotopic heart transplantation (OHT), atrial septal defect (ASD) that is not apparent preoperatively may become hemodynamically significant postoperatively and have clinical symptoms.

Rarely is surgical intervention warranted.

Here we report the case of a patient with Atrial septal defect (ASD) complicating his second (OHT), after flutter ablation, discovered during a transient brain injury.

To the best of our knowledge, this is a particular case of flutter catheter ablation complication, in OHT patients.

Observation

It is a patient aged 66 years old, having as antecedents: arterial hypertension, dyslipidemia and smoking weaned in 1988.

Cardiac grafted for the first time on 26/03/1988 in the context of ischemic heart disease.

The second heart transplant was made on 01/12/1994, for severe atherosclerosis of the triple vessel graft.

The patient was well followed, without episodes of rejection.

A right heart catheterization was performed one month after surgery, objectifying a QP/QS: 2 and was not renewed thereafter.

Many trans-thoracic echoradiography were performed as part of the follow-up, without ever mentioning this interatrial defect, at most, there was a paradoxical septum with dilatation of the right ventricle, which was accounted for by a usual complication in post-cardiac transplantation.

In April 2017, the patient had a transient ischemic attack of 20 minutes regressive.

As part of the etiological review, the trans-thoracic echocardiography showed that:

- The left ventricle non-hypertrophied with a normal systolic function. Without thrombus visualized. A mitral insufficiency Grade 2 with an SRO = 12 mm² and a RV = 25 mL.
- The left atrium is very dilated to 171 mL whether 90 mL/m².
- A minimal aortic insufficiency.
- The right cavities dilated, with a ratio RV/ LV = 60/54 = 1.11.
- The right atrium is also dilated, measured at 39 cm².
- Systolic pulmonary arterial pressure slightly increased to 36 + 10 (46 mmHg).
- Very large shunt during the bubble test.

The trans esophageal echoradiography (TEE) had demonstrated moderate spontaneous contrast in the 2 atria, without intra-cavitary thrombi. The left auricle is free without vegetation. Discovery of a wide inter-auricular communication, whose maximum diameter is measured at 50 mm in the super-inferior axis and 26 mm in anteroposterior. The 2 vena cava throw themselves into the right atrium, the pulmonary veins reach in the left atrium.

The shunt was significant, with QP/QS at 2.1.

A venous echo-doppler requested, objectified a deep vein thrombosis for which the patient was put on anticoagulant treatment.

An (ASD) closure was performed in September 2017. The origin of this (ASD), was a suture release, between the 2 interatrial septa, since the transplant technique was Shumway's classic technique. With discovery by the surgeon during the gesture, of a wire that has been severed. It is likely that this thread was burned during the Endocavitary flutter ablation procedure that took 11 years after heart transplantation. The per procedural TEE showed no difference in the severity of the mitral regurgitation after the closure of the ASD.

Discussion

Intracardiac shunts are rarely reported in (OHT). The overall incidence of (PFO) is 9.2% [1]. After (OHT), a (PFO) that is not apparent preoperatively may become hemodynamically significant postoperatively [2].

In a study relished by A Sezgin., *et al.* to evaluate the surgical complications of cardiac transplantation in 13 patients treated by the standard biatrial anastomosis technique. Among complications, a small shunt through the interatrial suture line. On cardiac catheterization, no significant shunt was detected; there was also no change in the flow ratio [3].

A literature review reveals few reports of significant right-to-left shunting through atrial defects after (OHT) [4,5]. In one case, the (PFO) and tricuspid valve were surgically corrected 19 months after (OHT) because elevation in right atrial pressure secondary to severe iatrogenic tricuspid insufficiency secondary to myocardial biopsy led to shunting.

O'Laughlin., *et al.* [5] report on a transcatheter closure of an atrial septal defect 3 months after OHT. Schulmann., *et al.* [4] described shunting through a (PFO) that resolved by medically decreasing right-sided pressures.

In 1 case a patent foramen ovale led to significant right-to-left shunting resulting in hypoxemia 3 days after transplantation [4]. The right-to-left shunting was produced by volume overload of the right ventricle during the period of early postoperative myocardial de-

pression. The shunt resolved with preload reduction and diuresis. Another patient had a persistent atrial septal defect with right-to left shunting despite perioperative closure of the defect [6]. This led to clinical findings of right ventricular volume overload and intractable atrial flutter.

All these cases reflect the dynamic nature of (PFO) and that the relative pressure difference between the atria was lower postoperatively and increased over the following days until the point where the (PFO) became hemodynamically significant and precipitated the need for immediate surgical closure.

In our patient, right ventricular (RV) dilatation and dysfunction was noted during follow-up cardiac trans thoracic echocardiography (TTE) but has been attributed to dysfunction of the (RV), quite common in post heart transplant.

And during the etiological assessment, of a transient brain injury, that the defect was visualized with the (TTE), then confirmed at (TEE). It was probably a paradoxical embolus, complicating an iatrogenic atrial communication, by burning the interatrial septum suture, during flutter ablation; since, the surgeon noted the presence of a burnt wire.

Conclusion

The frequency of symptomatic (PFO) in (OHT) remains unknown. Visual and probe inspection of the recipient and donor heart with correction of any structural defects should be done at the time of the operation if possible. It's also important to be careful during flutter ablation in transplanted hearts with the Shunway's technique in order to avoid burning wires and creating iatrogenic ASD.

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