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Case report - Transplantation

Giant left atrial thrombus 17 years after orthotopic heart transplantation

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Abstract

We present the case of a 66-year-old woman who underwent orthotopic heart transplantation 17 years earlier for dilated cardiomyopathy. After 7 years allograft coronary vasculopathy developed requiring coronary artery angioplasty. In year 15 postoperatively she experienced congestive heart failure and she became symptomatic requiring diuretics and digoxin treatment. In year 16 postoperatively a routine coronary computed tomography (CT) angiography study revealed a giant thrombus in the left atrium. The patient had had no thromboembolic-related symptoms. Anticoagulation therapy was introduced and the patient has not presented any thromboembolic-related complication. As the symptoms of cardiac insufficiency worsened we decided to evaluate the patient for re-transplantation.

Keywords: Cardiac transplantation; Thrombus; Congestive heart failure

1. Introduction

Since the first reported case in 1967 [1], heart transplantation has become the treatment of choice for patients with end-stage heart failure. Traditionally, most orthotopic heart transplants have been performed according to the biatrial anastomotic technique developed and described by Lower et al. [2]. Although biatrial anastomosis does not require separate caval anastomoses, and therefore saves time, potential problems include atrial dysfunction, sinus node dysfunction, valvular insufficiency and thrombus formation.

2. Case report

A 66-year-old woman underwent orthotopic heart transplantation 17 years earlier for dilated cardiomyopathy. The early postoperative period was uneventful. Immunosuppression included cyclosporine A, azathioprine and prednisone with corticoid therapy withdrawal after 24 months. According to our protocol oral anti-platelet and cholesterol-lowering therapy was instituted. Since year 7 postoperatively, despite a normal cardiac function, she presented allograft coronary vasculopathy (CV) revealed by coronary angiography, requiring percutaneous coronary artery angioplasty with stent insertion. As CV developed and M-TOR inhibitor drugs became available, everolimus was introduced and azathioprine was withdrawn. In year 15 postoperatively as the allograft CV progressed, the left ventricular ejection fraction began to diminish presenting NYHA functional class III symptoms. Diuretics and digoxin therapy was introduced, the patient responded well becoming less symptomatic. In 2007, we started a clinical protocol to follow-up transplanted patients, with a coronary CT angiography performed annually. In October 2007, routine coronary CT angiography found a dilated left atrium which doubled the size of left ventricle with no other findings (Fig. 1). Twelve months later (October 2008), a second routine coronary CT angiography examination showed a huge left atrial thrombus (Fig. 2); the patients had no thromboembolic-related symptoms. Oral anticoagulant therapy was introduced with acenocumarol to obtain an International Normalized Ratio value between 2 and 2.5. Six months after thrombus discovery, the patient has not presented any thromboembolic-related complication. As the symptoms of cardiac insufficiency worsened we decided to evaluate the patient for re-transplantation.

3. Discussion

Atrial thrombus formation is a rare complication in transplanted recipients. Why did this patient present an intracardiac thrombus 17 years after transplantation?

Virchow's triad could explain the pathophysiology of thrombus formation in this particular patient.

1. Abnormal blood flow: dilated cardiac chambers, poor contractility and regional wall motion abnormalities may predispose to thromboembolism by facilitating stasis of intracardiac blood flow [3]. As we could see, the left

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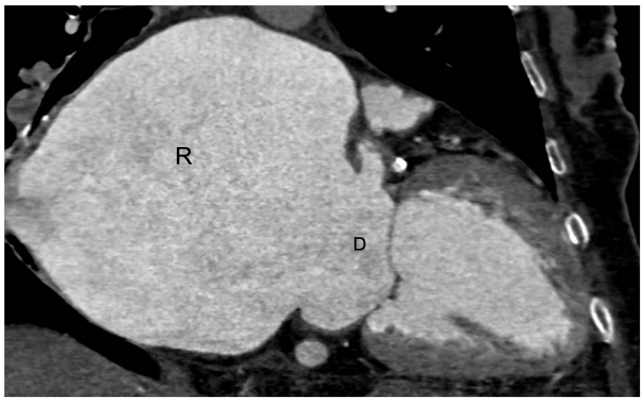

Fig. 1. First coronary CT angiography. Comment: we observed a giant left atrium that doubled the size of the left ventricle. Donor left atrium (D), recipient left atrium (R).

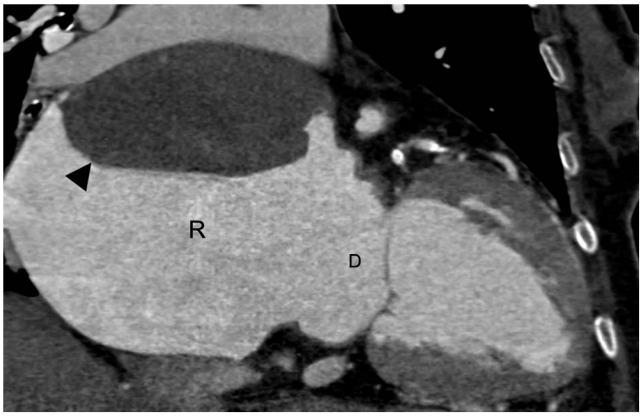

Fig. 2. Second coronary CT angiography 12 months later. Comment: giant intra-cardiac thrombus (arrow) on the roof of the left atrium occupying 1/3 of the cavity, mostly in the recipient's left atrium (R), donor's left atrium (D).

atrium (as result of standard technique) almost doubled the size of left ventricle. Although she was in sinus rhythm, the dilated left atrium, certainly had blood flow stasis.

2. Abnormalities in the blood vessels and endothelium: evidence exists indicating that heart failure is often accompanied by a hypercoagulable state and decreased endothelium function [4, 5]. Reduction in levels of endothelium-derived nitric oxide may promotes platelet adhesion inducing in situ thrombosis indicated by the fact that patients with heart failure have an increase incidence of thromboembolic events – between 1.5 and 4% compared with 0.5% in patients without heart failure [6, 7].
3. Blood constituents: it has been demonstrated that patients with heart failure, platelet function, rheology and hemostatic markers are altered [4, 8, 9].

In this particular case although the patient was under anti-platelet therapy; the bigger atrial volumes and the impaired atrial function in the standard technique, with its consequent blood stasis, in conjunction with the fall in the left ventricle ejection fraction may have played a role in the thrombus formation. Treatment options include anti-coagulation therapy or surgical exploration and thrombectomy [10]. As for treatment options for this patient, surgical exploration was avoided due to its high-risk, as the patient had not presented any thromboembolic-related complication and a left atrial thrombus was discovered in a routine examination, anticoagulation therapy was initiated and the patient was included on the waiting list for a new cardiac transplantation for re-transplantation.

PostScript: After submission of this article, unfortunately the patients died on the waiting list for heart retransplantation due to respiratory complications.

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