Bentall Procedure for the Treatment of Aortic Dissection After Cardiac Transplant: A Case Report

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Abstract

Aortic dissection affecting the donor aorta after cardiac transplant is a rarely seen complication. Data on the literature about the subject is restricted to case reports. Here, we present a case of type A aortic dissection after cardiac transplant that was successfully treated by the Bentall procedure.

Key words: *Heart transplant, Aortic dissection, Reoperation*

Case Report

A 47-year-old man without evidence of systemic hypertension was admitted to our clinic with progressive dyspnea over the last 5 years. He was diagnosed as dilated cardiomyopathy. No evidence was found about the cause of the cardiomyopathy, so it was accepted as idiopathic. Orthotopic cardiac transplant was performed. The postoperative period was uneventful, and the patient was discharged from the hospital on the 15th day. At the time of discharge, there was no pathology on the control echocardiography.

At the first control after discharge, echocardiographic assessment showed that the left ventricular ejection fraction was 57%, without evidence of aortic regurgitation and pericardial effusion, and endomyocardial biopsy specimen revealed no rejection.

Five months later, on routine echocardiographic examination, there were findings of aortic dissection (Figure 1). Prominent aortic insufficiency was detected. On computed angiography of the patient, a fusiform aneurysmatic dilatation was observed on the aortic root, starting from the level of Valsalva sinuses and affecting a 5-cm segment of ascending aorta. The ascending aorta was dissected, starting from the aortic valve and extending superiorly, until the line of anastomosis. The pathology was restricted to the donor aorta (Figure 2). Surgery was scheduled. The intraoperative examination of the aorta confirmed the radiologic findings. The aorta was dilated and blue in color. The dissection started from the valvular level and extended to the suture line. A Bentall procedure was performed with a No. 23

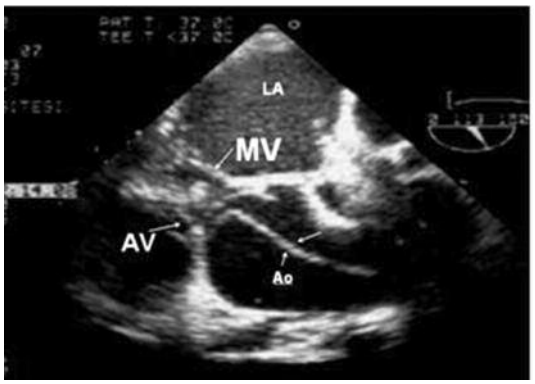

Figure 1. The echocardiographic image in the routine follow-up of the patient. The arrow shows the dissection flap.

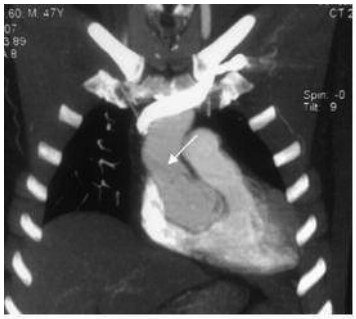

Figure 2. CT angiogram showing the dissecting flap.

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mechanical valved conduit. The pathologic examination of the tissue showed nonspecific findings. There were no postoperative complications. The patient was discharged from the hospital uneventfully on the 10th day. The patient's control echocardiography and myocardial biopsy were normal 1 year after the transplant (7 months after the Bentall operation).

Discussion

Heart transplant is an effective treatment option in end-stage heart failure, which is unresponsive to conventional treatment with 7-year survival rates exceeding 74% (1).

Certain surgical complications related to orthotopic heart transplant have been described: atrial thrombosis at the suture line (2); atrial distortion with consequent valve incompetence (3, 4); pressure gradient in a distorted pulmonary anastomosis (5); creation of a pseudo-cor triatum (6, 7); and prolonged sinoatrial block (8). Aortic dissection is rarely observed, and usually is restricted to the recipient's aorta. Data on the literature about the acute aortic dissection after heart transplant is scarce. Dissection affecting the donor aorta is limited to case reports (9, 10, 11).

There are certain risk factors that are associated with aortic dissection. Dissection restricted to native aorta can be due to the surgical technique. After cardiac transplant, acute aortic dissection can most commonly occur due to hypertension or immunosuppression treatment, especially glucocorticoids (12). Increased diameters of abdominal aortic aneurysms, and increased incidence of perivascular disease have all been reported in heart transplant recipients (13, 14). Infection, such as fungal aortitis accompanied by pseudoaneurysmal formation, can also be a causative factor.

In cardiac allograft recipients, the diagnosis of the donor aortic dissection is difficult, owing to the fact that the patient has no chest pain as the heart is denervated. On the other hand, because of mediastinal adhesion, rupture of the dissected aorta is fairly rare, which makes the diagnosis more difficult. Coppola (15) and associates, who presented the first aortic dissection after cardiac transplant patients, diagnosed the aortic dissection at autopsy. In our patient, the dissection was diagnosed incidentally with routine echocardiographic assessment. There was no underlying infection. The dissection was limited to the donor aorta; therefore, it cannot be related with the surgical technique. The patient's blood pressure was under control. The immunosuppressive regimen of the patient was tacrolimus, mycophenolate mofetil, and prednisolone. The donor also had no known connective tissue disease, such as Marfan syndrome. The involvement of the aortic valve and the Valsalva sinuses led to the necessity of aortic root replacement and therefore, a Bentall procedure was performed. The result was successful.

Even though in our patient, the underlying mechanism responsible for aortic dissection is not obvious, Bull and associates (14) pointed out that abdominal aneurysm with high incidence observed in patients with poor ventricular function, especially ejection fraction below 20%. They assumed that the new recovered hemodynamic may contribute to the development of aneurysmal dilatation in the abdominal aorta. It is possible that increased intimal stress, arteriosclerosis may be responsible for the such aortic complications. On the other hand, in addition to recipient's factor, factors belonging to donor such as hypertension, connective tissue disorder, and drugs that may cause weakness of donor aortic tissue have been disregarded. For these reasons, detailed investigation of the donor should be done carefully. The donor in our report had no hypertension or any connective tissue disorder and no history of use any drugs.

In conclusion, aortic dissection can be seen after the heart transplant sometimes without any avoidable reason. It is a potentially fatal complication. Early diagnosis is crucial for the success of the treatment. Diagnosis should not be recognized at autopsy. Meticulous echocardiographic follow-up can help with the early diagnosis.

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