Leaflet tear in a Trifecta aortic bioprosthesis 34 months after implantation

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Received 28 July 2014; received in revised form 6 October 2014; accepted 16 October 2014

Abstract

Bioprosthetic valves are used in aortic valve replacement to avoid lifelong anticoagulation. Bovine pericardial valves have excellent haemodynamics and equivalent freedom from reoperation compared with a porcine bioprosthesis [1]. However, early failure (parastent post-cusp tear) can take place due to mechanical stress. We report an acute structural failure on a Trifecta pericardial valve (St Jude Medical, Inc) explanted after 34 months from a 71-year old woman.

Keywords: Bioprosthesis • Aortic valve insufficiency • Reoperation

CASE DESCRIPTION

A 71-year old female was admitted to the emergency room complaining of a 72-h episode of resting dyspnoea, orthopnoea and haemoptysis. She had undergone aortic valve replacement 3 years before (in July 2010, Trifecta 21-mm, St Jude Medical, Inc). She had medical history of arterial hypertension, transient ischaemic attack (on anti-thrombotic therapy with clopidogrel) and fibromyalgia (she was not under immunosuppressive corticosteroid therapy). The patient reported an accidental fall without the loss of consciousness. Physical examination revealed an arterial blood pressure of 103/35 mmHg, bilateral crepitant rales and aortic

Figure 1: (A) TTE: Colour Doppler five-chamber view, showing aortic regurgitation flow that fills the left ventricular outflow tract. (B) TTE: High-density CW Doppler signal with a steep deceleration slope (pressure half time of 128.2 ms) consistent with severe acute aortic regurgitation. (C) TOE: Intraprosthetic origin of the regurgitant jet on colour flow imaging in a long-axis view.
diastolic murmur that was not present at the routine visit (1 month before admission). Pulmonary congestion was seen on chest radiography. Transthoracic (TTE) and transoesophageal echocardiography (TOE) data were consistent with acute severe aortic regurgitation, and echocardiogram findings ruled out any evidence of endocarditis (Fig. 1). Aortic insufficiency was not present in the routine follow-up echo images. Aortic prosthetic valve replacement was performed on an urgent basis. The surgical findings showed a parastent tear in the non-coronary cusp, beginning at the top of the post, and extending to the nadir (Fig. 2). The prosthetic and the native annulus were intact without any para-valvular leak. A 21-mm St Jude Epic prosthesis was implanted. The postoperative period progressed without any complication. The patient was extubated 3 h after leaving the operating theatre, no inotropic drugs were used. Hospital discharge was at the 6 postoperative day. Blood cultures and microbiological analysis of the prosthesis were unremarkable.

**COMMENT**

Avoidance of anticoagulation, good performance and durability of the porcine bioprosthesis—which can last up to 20 years—are the basis for the increasing use of tissue valves in the USA and Europe in younger patients. In order to improve haemodynamic parameters and reliability, glutaraldehyde-treated bovine pericardial valves were designed with favourable results reported in the long-term follow-up of some models [2]. In this sense, St Jude Medical data from in vitro accelerated wear testing indicates a 99.2% (7.3–100) reliability at 200 million cycles (equivalent of 5 years) with the Trifecta valve [3]. Nevertheless, in vivo behaviour can be different. In the past, Hancock and Ionescu-Shiley pericardial valves were withdrawn from the market because of early failure [4, 5]. To the authors’ knowledge, this is the first case of tears occurring in this exact model. The morphological features observed in our case were similarly described in the single sheet pericardial valve Mitroflow A12, with the appearance of a big leaflet tear; before a 3-year term, in this model. These findings were explained by the pressure exerted on the parastent sutures that induced abrasion and cutting into the pericardium, initiated at the suture hole [5]. Acute aortic regurgitation occurred in this case and urgent prosthesis replacement was performed. Further data of the mid- and long-term follow-up are needed to assess in vivo durability of these prosthetic valves.

**Conflict of interest:** none declared.

**REFERENCES**