Sutureless aortic valve replacement in stentless bioprosthesis failure

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Abstract

Reoperation for a failed stentless bioprosthesis is an extremely challenging procedure due to severe adhesion around the previous stentless graft and the severely calcified aortic root. Although rarely the subject of reports in the literature, sutureless aortic valve replacement allows a fast and simple implantation, which decreases the risk of cardiac ischaemia and cardiopulmonary bypass. Here we present the case of sutureless aortic valve replacement as a potentially simple and safe option for reoperation for a failed stentless bioprosthesis.

Keyword: Valves

INTRODUCTION

Stentless bioprostheses are subject to degeneration and valve failure over time. Reoperation for the failure of a stentless aortic prosthesis is an extremely challenging procedure due to severe adhesion around the previous stentless graft and severely calcified aortic root. Total root replacement in patients with failed stentless aortic prosthesis is even more demanding and riskier, and here we present the case of a sutureless aortic valve replacement.

CASE REPORT

A 78-year-old man with hypertension was admitted with NYHA functional class IV dyspnoea. He had a history of aortic root and ascending aorta replacement using a 25-mm stentless bioprosthesis (Prima Plus, Edwards) and a 26-mm Hemashield graft for severe aortic regurgitation and aortic root aneurysm 12 years ago. Echocardiography revealed severe aortic regurgitation and mild-to-moderate mitral regurgitation. Left ventricular ejection fraction was 49% and systolic/diastolic left ventricular dimension was 63 mm/48 mm, respectively. After pleural effusion drainage and diuretics therapy, dyspnoea improved to NYHA functional class I. To avoid the surgical mortality and morbidity of conventional redo-aortic root replacement, we planned aortic valve implantation of a sutureless bioprosthesis (Perceval S bioprosthesis, Sorin Biomedica Cardio Srl, Sallugia, Italy).

Entering through the median redo-sternotomy, severe adhesion around the previous aortic root graft was encountered (Fig. 1). Transverse aortotomy was performed on the Hemashield graft above the homograft suture line. Commissure rupture and leaflet tear of the left coronary and right coronary cusp were found. After removal of all three leaflets of the stentless bioprosthesis, a severely calcified aortic root was also noted. Aortic valve replacement using a medium-size Perceval S bioprosthesis was performed without complications (Fig. 2). Cardiac ischaemic and cardiopulmonary bypass time was 40 and 83 min, respectively.

Extubation, transfer to ward and discharge took place on postoperative day 1, 2 and 21, respectively. Heart failure management using diuretics and intravenous dobutamine infusion extended the patient’s hospital stay. There was no paravalvular leakage on echocardiography at discharge. Mean transvalvular pressure gradient was 29 mmHg, and left ventricular ejection fraction was 40%.

In 3-month follow-up echocardiography, mean transvalvular pressure gradient was 21 mmHg and left ventricular ejection fraction was 47%. At 4-month follow-up, the patient is in good condition with NYHA functional class I.

DISCUSSION

Reoperation for the failure of a stentless aortic prosthesis is an extremely challenging procedure, especially if a total root replacement is needed. Severe adhesion around the aortic root graft and a severely calcified aortic root, as encountered during surgery in this case, are the common setting and the main reasons of operative complexity.

Although severe aortic regurgitation was a relative contraindication for transcatheter aortic valve implantations (TAVIs), valve-in-valve TAVI was introduced to reduce the risk of reoperation for the failed stentless aortic prosthesis [1]. At the time of preoperative decision-making, the TAVI programme was not yet ready at our hospital. Furthermore, valve-in-valve TAVI is technically more demanding than the usual TAVI. Other concerns of valve-in-valve TAVI in the setting of failing stentless bioprosthesis are the absence of radiopaque landmarks from a stent frame or sewing ring, lack of guidelines for device sizing and proximity of the coronary ostia. These factors increase the risk of complications such as device migration, embolization and coronary obstruction [1].
Sutureless aortic valve replacement (AVR) allows a fast and simple implantation under direct visual surveillance, which decreases cardiac ischaemic and cardiopulmonary bypass time.

Reports on sutureless aortic valve replacement in stentless bioprosthesis failure are very rare [4, 5]. Sutureless aortic valve replacement can make reoperation for a failed stentless bioprosthesis simpler and safer.

Sutureless aortic valve replacement (AVR) allows a fast and simple implantation under direct visual surveillance, which decreases cardiac ischaemic and cardiopulmonary bypass time. Good immediate and mid-term results had been reported with good haemodynamics [2]. Complete removal of the diseased valve resulted in a lower rate of paravalvular leak in sutureless AVR group compared with TAVI group [3]. Reports on sutureless aortic valve replacement in a failed stentless bioprosthesis are very rare. Sutureless aortic valve replacement appears a good surgical option for the patient with stentless aortic bioprosthesis failure.

CONCLUSION

Reports on sutureless aortic valve replacement in a failed stentless bioprosthesis are very rare. Sutureless aortic valve replacement appears a good surgical option for the patient with stentless aortic bioprosthesis failure.

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