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HOW-TO-DO-IT

Percutaneous Transvenous Mitral Valve-in-Valve Implantation Using Commercially Available Transcatheter Valve. First Australian Experience

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In patients with a degenerative mitral bioprosthesis and prohibitive surgical risk there is emerging evidence for the feasibility of valve-in-valve procedures via a percutaneous transvenous transseptal approach. This paper describes the first time this procedure has been performed in Australia.

Keywords Valve in valve • TAVI • Mitral valve

Introduction

Q6 Mitral regurgitation is the most common form of valvular dysfunction worldwide [1]. Following mitral valve surgery 20–30% of patients will require redo surgery [2,3]. In patients with prohibitive surgical risk there is evidence for the feasibility of valve-in-valve procedures via a percutaneous transvenous transseptal approach [4]. This paper describes the first time this procedure has been performed Q7 in Australia.

Cases

Patient One was an 81-year-old male referred with severe prosthetic mitral valve regurgitation and progressive dyspnoea (New York Heart Association Class III) (Figure 1). Three years prior he underwent aortic valve replacement with a 27 mm Magna Ease Bovine bioprosthesis, aortic root Q8 replacement with a No 30 Dacron graft and mitral valve replacement with a 33 mm Epic Porcine bioprosthesis. Q9 Comorbidities included severe pulmonary hypertension, obstructive lung disease, obesity, atrial fibrillation, thrombocytopaenia and chronic renal insufficiency (creatinine clearance 52 mL/min). Surgical risk was high (Logistic EuroScore 55%, EuroScore II 17%, STS score 8%).

Patient Two was an 87-year-old male with severe prosthetic mitral valve regurgitation and progressive dyspnoea (New York Heart Association Class III). Eight years prior he underwent coronary artery bypass grafting, aortic valve replacement with a 25 mm Mosaic valve and mitral valve replacement with a 31 mm Mosaic valve. Other Q10

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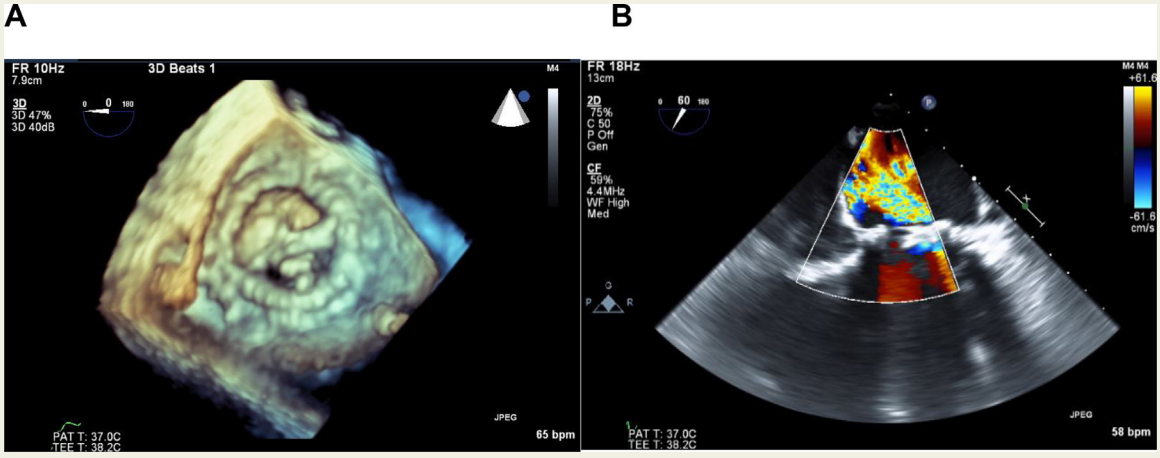

Figure 1 Transoesophageal echocardiography demonstrating the degenerative mitral bioprosthesis on 3D imaging (A) and severe mitral regurgitation (B).
Abbreviation: 3D = three dimensional.

comorbidities included atrial fibrillation, severe obstructive lung disease and chronic renal insufficiency (creatinine clearance 23 mL/min). Surgical risk was high (Logistic EuroScore 63%, EuroScore II 18.35%, STS score 21%).

Both patients were discussed at the heart team meeting and transcatheter mitral valve implantation (TMVI) via a transvenous transseptal approach was recommended.

Procedure

The procedure was performed in a hybrid operating room with a cardiac surgeon present. A 16 Fr sheath was placed in the right femoral vein and transseptal puncture was performed using the Swartz SL1 sheath and large curved Brokenbrough (BRK-1) needle (St Jude Medical, Minnesota). The location of the transseptal puncture was superior and posterior and measured using transoesophageal echocardiography (TOE) to ensure adequate height above the valve for delivery of the device. A large curved Safari wire (Boston Scientific, Massachusetts) was placed in the left ventricle and sequential balloon dilatations of the atrial septum were performed using a 10 mm × 20 mm × 80 cm Armada 35 balloon (Abbott Vascular, California) and a 14 mm × 40 mm × 120 cm XXL Balloon (Boston Scientific, Massachusetts). The 29 mm Sapien 3 valve (Edwards Lifesciences, California) passed easily across the atrial septum and with fluoroscopic and TOE guidance it was positioned

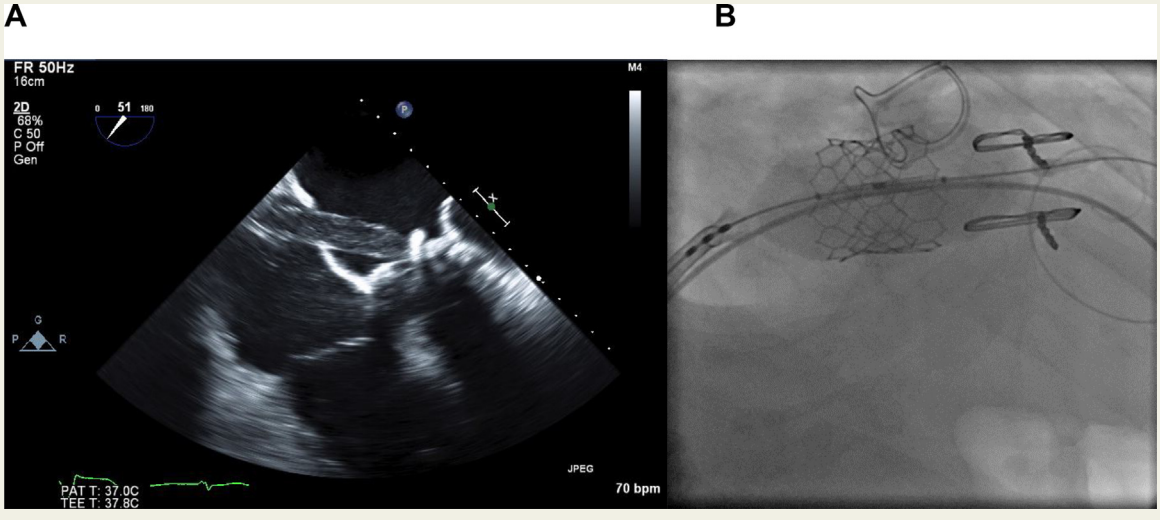

Figure 2 Dilatation of the atrial septum demonstrated on TOE (A) and intraoperative fluoroscopy during deployment of the 29 mm SAPIEN 3 valve in the mitral position (B).
Abbreviation: TOE = transoesophageal echocardiography.

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