

Balloon Fracture of a Surgical Mitral Bioprosthesis During Valve-in-Valve Transcatheter Mitral Valve Replacement First-in-Human Report

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A 65-year-old female underwent coronary artery bypass grafting plus mitral valve replacement (MVR) with a 25-mm Epic bioprosthesis (Abbott, Santa Ana, CA). Postoperatively, she was readmitted with congestive heart failure exacerbation. Transthoracic echocardiogram showed mean prosthetic gradient of 18 mmHg raising concern for early valve deterioration. She was deemed high risk for surgery. Therefore, transeptal transcatheter valve-in-valve MVR with a 23-mm Sapien3 valve (Edwards Lifesciences, Irvine, CA) was performed 15 months post-MVR. Postimplantation transesophageal echocardiogram showed decrease in the mean gradient to 10 mmHg. She returned 5 months later with congestive heart failure exacerbation, and transthoracic echocardiogram showed an increasing gradient to 17 mmHg.

She was brought back for an attempt at balloon fracture of the mitral bioprosthesis transeptally. Under rapid pacing, a 24-mm noncompliant balloon was used to fracture the bioprosthesis (Figure [A]). Because of suboptimal reduction in mean gradient, a 26-mm noncompliant balloon was then inflated under rapid ventricular pacing (Movie I in the [Data Supplement](#); Figure [B]). Fracture was confirmed by the release of the balloon waist on fluoroscopy and sudden drop in the inflation pressure. Severe mitral regurgitation was noted on transesophageal echocardiogram, hence new 23 mm Sapien3 valve was implanted. The mitral gradient was reduced to 5 mmHg by catheterization. She was discharged home on postoperative day 3 with near-complete resolution of dyspnea.

Transcatheter valve-in-valve MVR is an acceptable treatment option for high surgical risk patients with deteriorated

mitral bioprostheses.¹ However, high residual gradient after valve-in-valve for small bioprosthetic valves remains a limitation of the procedure. Recently, aortic bioprosthetic valve fracture with a high-pressure balloon has been described to overcome this problem.² We report the first case of bioprosthetic valve fracture in the mitral position.

Disclosures

Drs Kaneko and Shah are Proctor/Educator at Edwards Lifesciences and Abbott. Dr Pelletier is a Consultant at Abbott and LivaNova. The other authors report no conflicts.

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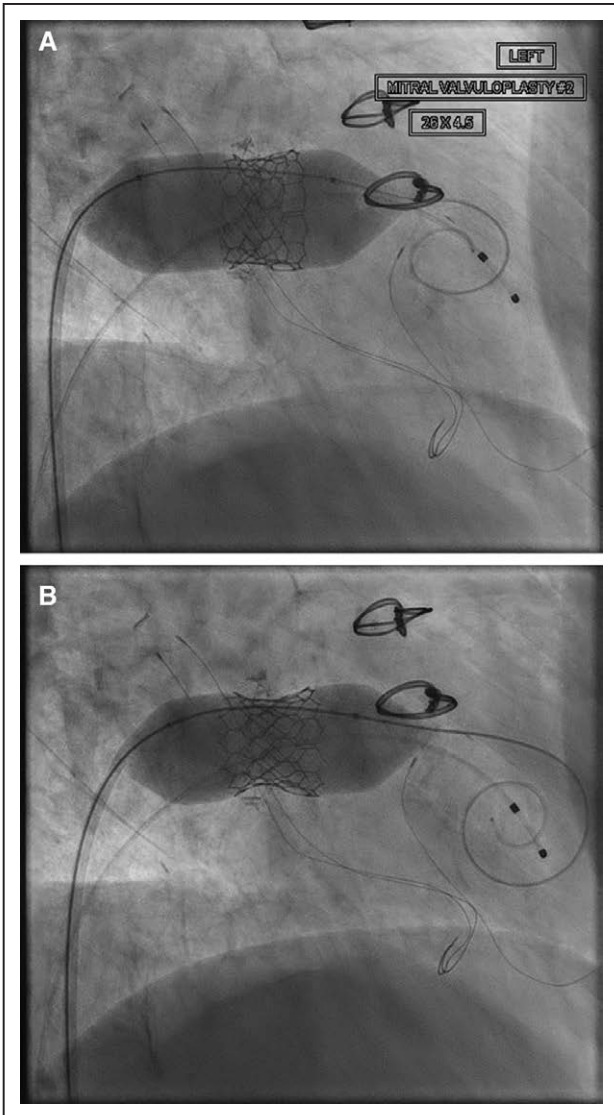


Figure. High-pressure balloon inflation fracturing the mitral bioprosthesis. **A**, Balloon inflation of the 24-mm noncompliant balloon pre-fracturing. **B**, Fractured mitral prosthesis with the 26-mm noncompliant balloon. The waist of the valve is less significant after the fracture.

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