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Transcatheter valve-in-valve procedure for degenerated mitral valve bioprosthesis

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Introduction: Re-do surgery for bioprosthetic valve degeneration carries an immense risk of morbidity and mortality, especially in the elderly population fraught with various comorbidities. Instead, transcatheter valve-in-valve (ViV) mitral valve replacement (TMVR) offers a minimally invasive alternative for these patients[1].

Case report: 78-year-old female with a prior history of rheumatic valvular disease, paroxysmal atrial fibrillation, and amiodarone-induced organizing pneumonia (treated with corticosteroid therapy for 17 months), presents with congestive heart failure. In 2008, the patient underwent open-heart surgery for the implantation of a 27 mm Carpentier-Edwards Perimount bioprosthesis due to rheumatic heart disease. The patient has since been followed at our institution due to moderate (intravalvular) mitral regurgitation (MR) and symptomatic paroxysmal atrial fibrillation, treated with flecainide. With optimal medical therapy, she attained NYHA class II. She presented to her local hospital with pulmonary edema in November 2025. Due to worsening MR, she was transferred to our hospital for evaluation of treatment options. After volume optimization, transthoracic echocardiography (TTE) revealed bioprosthetic valve degeneration (**Figure 1**) with severe intravalvular MR (EROA 0.6 cm^2, RVol 65ml), a mean transmitral pressure gradient of 12 mmHg, marked pulmonary hypertension (sPAP 80 mmHg), and large bilateral pleural effusions. Given the patient's comorbidities and high surgical risk, the Heart team concluded that she was a candidate for ViV TMVR. In February 2026, a transseptal ViV TMVR procedure was performed; the patient was implanted with a 26 mm Edwards Sapien 3 Ultra Resilia valve (**Figure 2**). Immediate follow-up echocardiography showed good valve positioning (**Figure 3**), marked hemodynamic improvement, and normalization of the mean transmitral pressure gradient to



FIGURE 1. Transthoracic echocardiography showing severe mitral regurgitation due to bioprosthetic valve degeneration.

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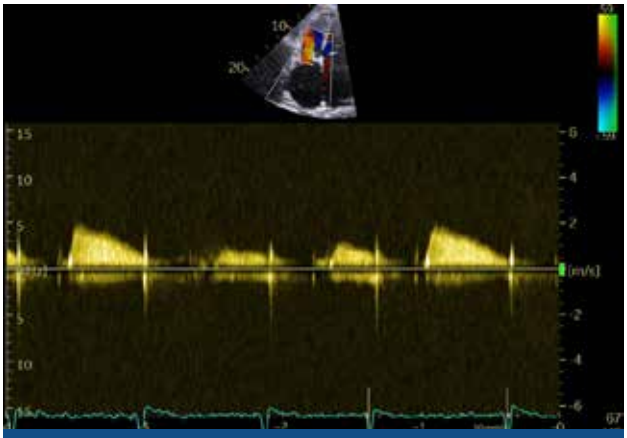


FIGURE 2. Intraprocedural 3D transesophageal echocardiography showing severe valvular mitral regurgitation.



FIGURE 3. Transthoracic echocardiography after transcatheter valve-in-valve mitral valve replacement showing good position of the valve.

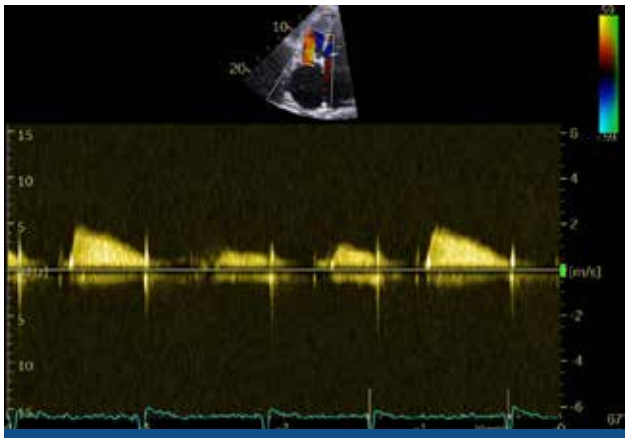


FIGURE 4. Postprocedural transthoracic echocardiography showing mean mitral valve pressure gradient of 4.7 mmHg.

around 4 mmHg (**Figure 4**), with no residual MR. Three months after the procedure, the patient had markedly improved functional capacity with no dyspnea on exertion; TTE revealed a marked reduction in sPAP (25 mmHg).

Conclusion: This case report exemplifies that Transseptal ViV TMVR proves to be a viable and successful alternative to redo cardiac surgery in select high-risk patients with structural bioprosthetic valve degeneration. The durability of such procedures remains an issue; therefore, careful candidate selection and Heart team consultation are mandatory.

LITERATURE

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