

Valve-in-valve transcatheter aortic valve implantation in a degenerated bioprosthetic aortic valve with severe aortic stenosis and regurgitation: a case report

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KEYWORDS: Valve-in-valve, transcatheter aortic valve implantation, bioprosthetic valve degeneration, aortic stenosis, aortic regurgitation, high surgical risk.

CITATION: *Cardiol Croat.* 2026;21(1-2):39. | <https://doi.org/10.15836/ccar2026.39>

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Introduction: Transcatheter aortic valve implantation (TAVI) in degenerated bioprosthetic valves, also known as valve-in-valve TAVI, is increasingly used in high-risk surgical patients. While commonly performed for structural valve deterioration causing stenosis, combined severe stenosis and regurgitation presents additional clinical and procedural challenges.¹⁻⁴

Case report: We report the case of a 69-year-old female with a history of arterial hypertension, hyperlipidemia, coronary artery disease, and previous surgical aortic valve replacement with a bioprosthetic valve and aortic root repair according to the Manouagian technique 10 years prior. The patient presented with progressive dyspnea (NYHA Class III) and signs of congestive heart failure. Echocardiography revealed severe aortic stenosis (mean gradient 50 mmHg), severe central aortic regurgitation, preserved left ventricular ejection fraction (LVEF 50%), and significant left atrial enlargement. Given her prior cardiac surgery and high operative risk a multidisciplinary Heart Team recommended transfemoral valve-in-valve TAVI. Valve was implanted via transfemoral access under conscious sedation. Preprocedural CT imaging was used to confirm annular dimensions and coronary height. Deployment was guided by fluoroscopy and echocardiography. The valve was successfully positioned within the degenerated surgical bioprosthesis without complications. Post-procedure echocardiography confirmed appropriate valve positioning, no paravalvular leak, and complete resolution of aortic regurgitation. Peak velocity decreased to 3.5 m/s (mean gradient 26 mmHg). Left ventricular ejection fraction is mildly reduced at 40%. Before discharge, medical therapy for heart failure with reduced ejection fraction was optimized.

Conclusion: Valve-in-valve TAVI is a safe and effective alternative for patients with failed surgical bioprosthetic valves and prohibitive surgical risk. This case highlights the feasibility of the procedure even in the presence of both severe stenosis and regurgitation, underlining the importance of detailed preprocedural imaging, careful valve sizing, and interdisciplinary planning. With appropriate patient selection, valve-in-valve TAVI offers excellent early outcomes and symptomatic relief in high-risk populations.

RECEIVED:

October 16, 2025

ACCEPTED:

November 14, 2025



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