

# Transcatheter Mitral Valve-in-Valve-in-Valve Implantation: Implications of complex interventional technique and 3D echocardiography for valve-in-valve Paravalvular Leak

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## Abstract

Paravalvular leak (PVL) after mitral valve replacement is the most common type of nonstructural prosthetic valve dysfunction. While most patients with only mild-moderate PVL are asymptomatic, those with severe PVL can present with heart failure and hemolysis, leading to significant morbidity and mortality. Surgical correction has remained the gold standard therapy for symptomatic PVL; however, for high surgical risk patients, percutaneous approaches have emerged as an alternative management. With the emergence of transcatheter mitral valve-in-valve techniques for failed bioprosthesis and rings, valve-in-valve PVL is being encountered more frequently and is identified as a challenging entity. We present a case of a symptomatic patient with a moderate – severe valve-in-valve PVL after two mitral valve replacements who then underwent a transcatheter mitral valve-in-valve-in-valve implantation with a 29mm Edwards® SAPIEN3 valve via transseptal approach. This unique case highlights the complexity of this clinical entity and recognizes three-dimensional transesophageal echocardiography as a tool to guide valve-in-valve PVL closures.

Dear Editor,

Please find attached article titled “Transcatheter Mitral Valve-in-Valve-in-Valve Implantation: Implications of complex interventional technique and 3D echocardiography for valve-in-valve Paravalvular Leak” for publication in your journal. The content of this manuscript is original and the manuscript is not under consideration elsewhere. None of the manuscript contents have been previously published, and all authors have read and approved the manuscript, its content, and its submission to the journal. There are no conflicts of interest to disclose, including relationship to industry.

All authors have made significant contributions to the manuscript. SS formulated concept, design and content outline, analyzed and interpreted data, drafted manuscript, revised manuscript critically for important intellectual content and finalized approval of manuscript submission. PS contributed to content, manuscript draft and revision. AR contributed to manuscript drafting and revision. MA contributed to interpretation and analysis, manuscript draft and revision. GB contributed by advising on content and design, and critical review of manuscript. All authors finalized approval of manuscript submission.

Thank you for your kind consideration. We hope you will consider it of interest to your readers.

Sincerely,

Sankalp Sehgal, MD

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