Real-Time Three-Dimensional Transesophageal Echocardiography Outperforms Three-Dimensional Printing in Detecting Multiple Perivalvular Leaks after Mitral Valve Replacement: A Case Report and Literature Review

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## Abstract

To report on a patient who developed multiple perivalvular leak (PVL) after a mechanical mitral valve replacement, and how clinicians successfully used real-time three-dimensional transesophageal echocardiography combined with 3D printing to complete transapical perivalvular closure. Additionally, we reviewed the literature to explore the advantages and disadvantages of multimodal imaging for perivalvular

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