

# Advancing a Guiding Catheter Across a Mechanical Aortic Valve

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**P**ostoperative mitral paravalvular leaks (MPVLs) occur in approximately 5% of patients undergoing mitral valve replacement and are associated with substantial morbidity. Although surgical repair is the gold standard, it carries a significant risk of morbidity and death, which makes percutaneous closure guided by transesophageal echocardiography a viable and attractive approach in high-risk patients.<sup>1</sup> Most case reports discuss an antegrade or transapical approach via an arteriovenous wire loop that serves as a monorail, in order to advance and deploy a closure device. A few case reports<sup>1-3</sup> have described a retrograde approach in patients with normal aortic valves, wherein the proximal disc of the device is deployed into the left atrium via an arterial wire. This approach saves operative time and fluoroscopy time, and lowers the risk of sequelae by avoiding a transseptal puncture and an arteriovenous loop.<sup>3</sup> The retrograde approach is usually better in patients with medial defects or with defects that create a large gradient across the leak.<sup>4</sup>

The concern is that advancing a guiding catheter across a mono- or bileaflet mechanical aortic valve can cause temporary valve malfunction and hemodynamic compromise. There have been a few published reports<sup>4,5</sup> of cases wherein a small guiding catheter was advanced across a mechanical aortic valve to facilitate the making of an arteriovenous loop by advancing the wire through the left ventricle and across the defect into the left atrium. The wire is then snared into the venous system.

Until this issue of the *Texas Heart Institute Journal*, there has, to our knowledge, been no mention in the literature of deploying a closure device through a mechanical aortic valve solely by the retrograde technique. The authors of the case series<sup>6</sup> report 2 such instances, in which MPVLs were closed in a retrograde fashion. They first tested the hemodynamic effect of crossing the mechanical aortic valve by using a 6F catheter, and then proceeded with deployment. They gave themselves a 5-minute limit in each attempt and encountered no sequelae of great consequence. Despite their success, we worry that this approach of passing a catheter through a mechanical valve is dangerous. The authors appear to agree, because they limit each attempt to 5 minutes. The worst potential sequela is valve damage and leaflet immobility that result in “wide-open” aortic regurgitation and catastrophic hemodynamic consequences.

In patients with MPVL and a mechanical aortic valve, we should still attempt an antegrade technique first, because it remains safer, with better support during deployment of the closure device. This case report shows the retrograde approach to be a feasible option only when the other approaches have failed in such patients, or are not viable. The retrograde approach should be the last resort in an otherwise-inoperable patient. Further studies are needed to validate the optimal timing and technique.

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