

# Percutaneous Management of Mitral Perforation During Transcatheter Aortic Valve Replacement



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**A** New York Heart Association functional class III symptomatic 90-year-old man with severe aortic stenosis had a 519-mm<sup>2</sup> annulus aortic area estimated by computed tomography (sinus of Valsalva 710 mm<sup>2</sup> and sinotubular junction 540 mm<sup>2</sup>) (Figures 1A and 1A'). He underwent an uneventful femoral access transcatheter aortic valve replacement (26-mm Edwards SAPIEN 3, Edwards Lifesciences, Irvine, California) (Figure 1B) and 1 h after experienced intractable cardiogenic shock with intense holosystolic murmur. By transesophageal echocardiography, aortic prosthesis showed no anomaly and a massive mitral regurgitation by perforation of the mitral-aortic curtain was diagnosed (Figures 1C [arrow] and 1C'). Mitral-aortic curtain calcifications were a posteriori thought to be causative (Figure 1A', arrow). A rescue percutaneous repair was decided and, under transesophageal echocardiography control after transseptal catheterization, the mitral perforation could be crossed (Figure 1D) with a 5-F coronary hooked catheter (Bartorelli Cozy, Johnson & Johnson, New Brunswick, New Jersey) and a hydrophilic 0.035-inch wire. Using the standard technique, an 8-mm Amplatzer Septal Occluder (St. Jude Medical, St. Paul, Minnesota) was

then successfully deployed across the anterior leaflet (Figures 1D' and 1E) and dramatically decreased the mitral regurgitation (Figure E'). Mitral valve functioning was not significantly impaired (Figures 1F and 1F', Online Video 1) by the plug, and no antero-grade gradient was noted. Hemodynamics rapidly recovered, and inotropic support as well as the assisted ventilation could be stopped 6 h later. The patient was discharged 5 days later. Mild hemolytic anemia was observed during the first 6 months; this was corrected by episodic blood transfusions and ultimately resolved. At 2-year-follow-up, the patient is doing well without aortic or mitral valve abnormalities.

The mitral apparatus is vulnerable and could be badly impaired in transcatheter aortic valve replacement patients. Albeit rare, mitral perforation is a complication that physicians should be aware of because percutaneous management may be life-saving.

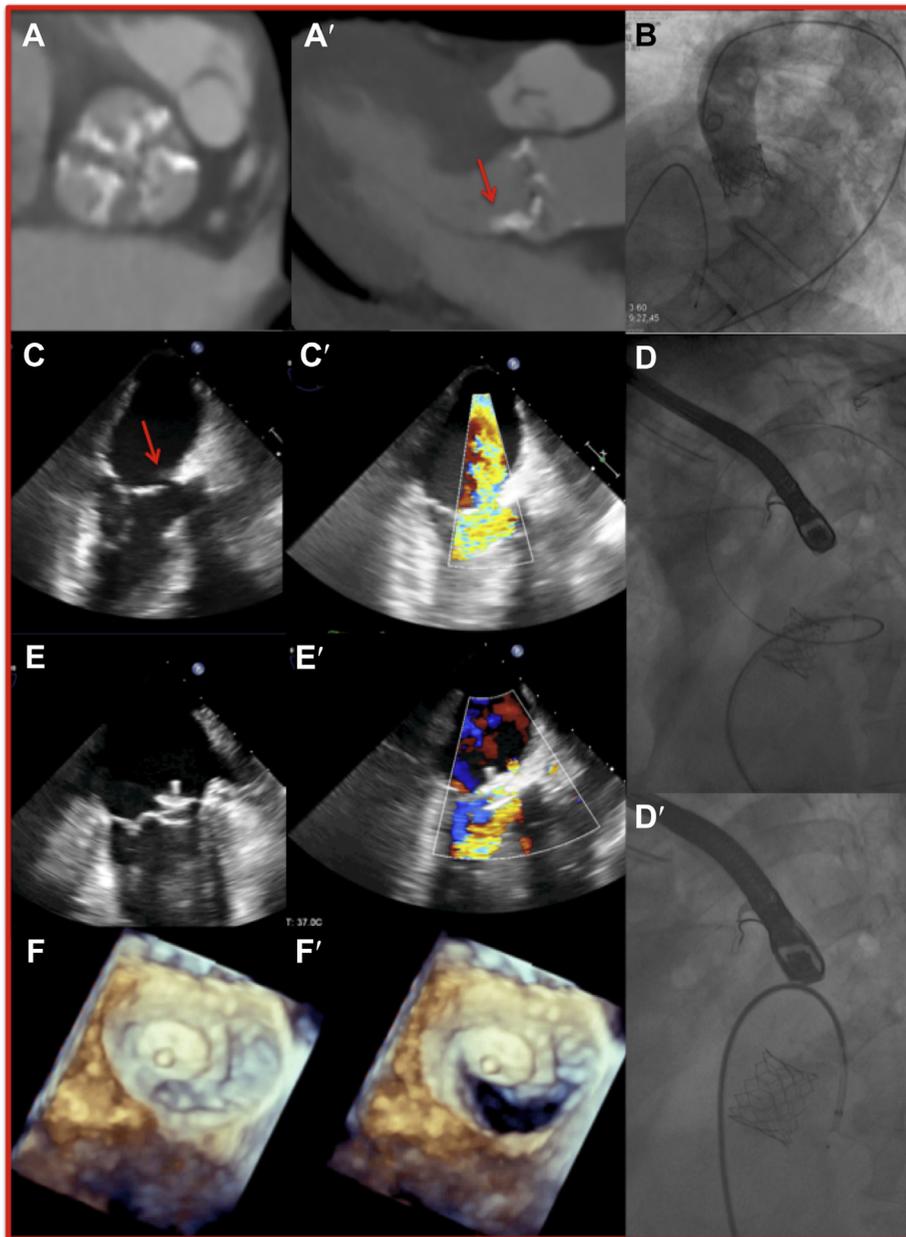
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**FIGURE 1** Images of Mitral-Aortic Curtain Perforation Management



(A, A') Three-dimensional computed tomography showing aortic stenosis and calcification developing on mitral-aortic curtain (A', arrow). (B) Final angiogram of the transcatheter aortic valve replacement. (C, C') Transesophageal echocardiography (TEE) showing severe mitral regurgitation (MR) by perforation of the mitral-aortic curtain (C, arrow). (D, D') Percutaneous management with an 8-mm Amplatzer Septal Occluder (St. Jude Medical, St. Paul, Minnesota). (E, E') Post-procedure TEE showing the plug and near disappearance of the MR. (F, F') Three-dimensional TEE of the mitral valve in systole (F) and diastole (F') (Online Video 1).