



## Simultaneous deployment of multiple device occluders and the anchor wire technique for a treatment of paravalvular defect of a surgical mitral ring

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A 65-years-old man presented with severe dyspnea due to mitral paravalvular leak (PVL). He previously underwent mitral repair with a complete 28 mm Carpentier-Edwards annuloplasty ring and had postoperative mitral valve endocarditis. Transesophageal echocardiogram (TEE) demonstrated severe mitral PVL originating from a medial defect (Figs. 1, 2). Our heart-team elected to perform percutaneous PVL closure due to his severe morbidities, 5.5% of STS-score. The procedure was performed using an antegrade approach. Following transseptal puncture along the posterior-septum, an 8.5-French, medium-curved Agilis catheter (St. Jude Medical, Fridley, MN, USA) was steered down anteriorly in the left atrium. An angled-tip, exchanged-length 0.035" Glidewire (Terumo, Somerset, NJ, USA) passed through a 6-French multipurpose (MP) guide catheter, was used to cross the defect using TEE and fluoroscopy (Fig. 3). After the MP was placed into the left ventricle (LV), the Agilis catheter was exchanged over a 260 cm Safari-wire (Boston Scientific, Marlborough, MA, USA) for 20-French Dryseal sheath (W. L. Gore, Flagstaff, AZ) due to the medial defect. Two 0.032" extra-stiff Amplatz wires were advanced through the MP catheter into the LV, followed by removal of the single MP and subsequent placement of two 6-French MP separately over each Amplatz wire (Figs. 4, 5). Next, we simultaneously deployed two 12-mm AVP-2 occluders (St. Jude Medical, Fridley, MN, USA). However, there was continued moderate PVL originating near the medial device, which was recaptured. We then exchanged this MP catheter over an 0.032 wire for a 6-French flexor sheath (Cook

Medical, Bloomington, IN, USA) and deployed a 16-mm AVP-2 next to the previously placed plug (Figs. 6, 7, 8) with an 0.032" wire left in place as an anchor. Following

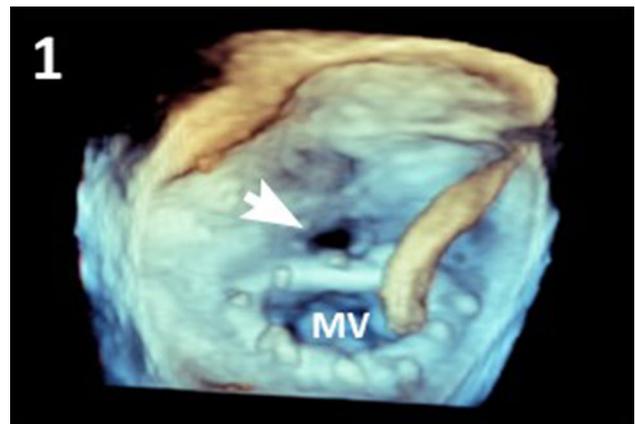


Fig. 1 3D-TEE imaging demonstrates a large medial defect next to the mitral annuloplasty ring (arrow), MV mitral valve

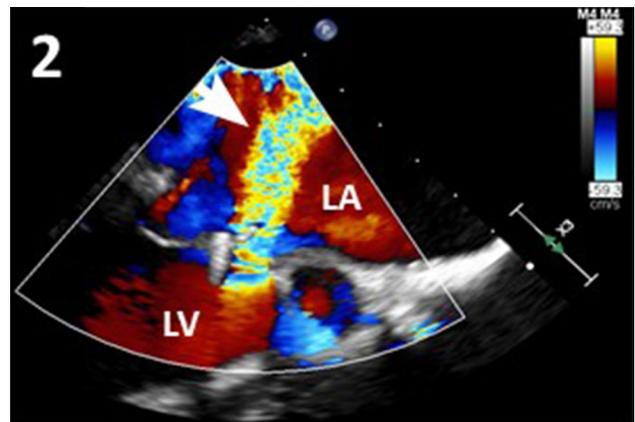
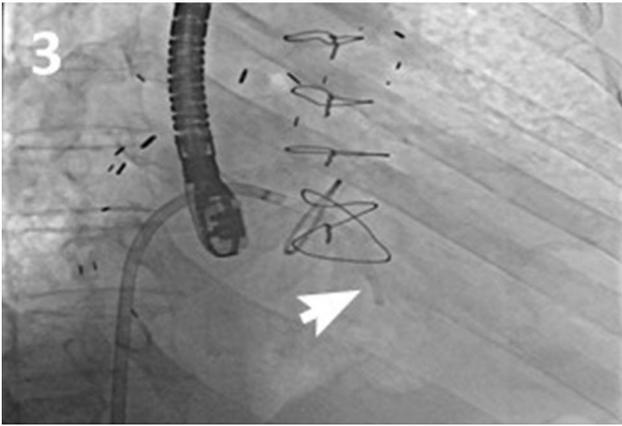


Fig. 2 Color-flow Doppler imaging demonstrates severe mitral regurgitation (MR) (arrow), LA left atrium, LV left ventricle

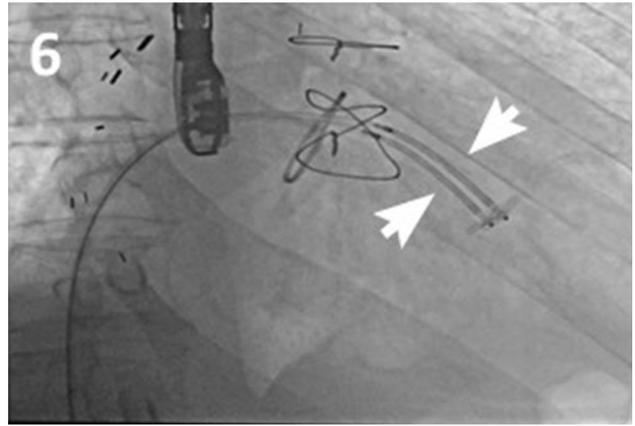
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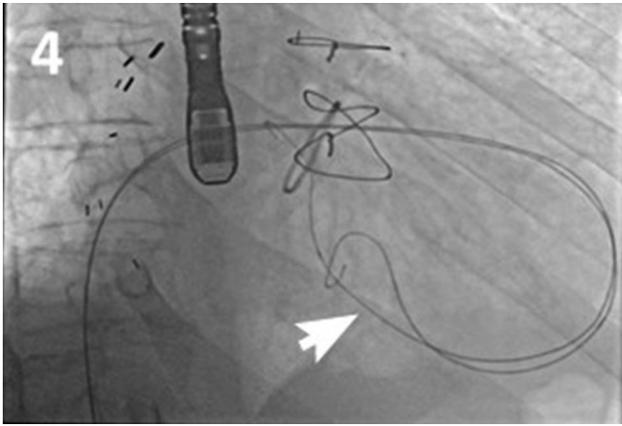
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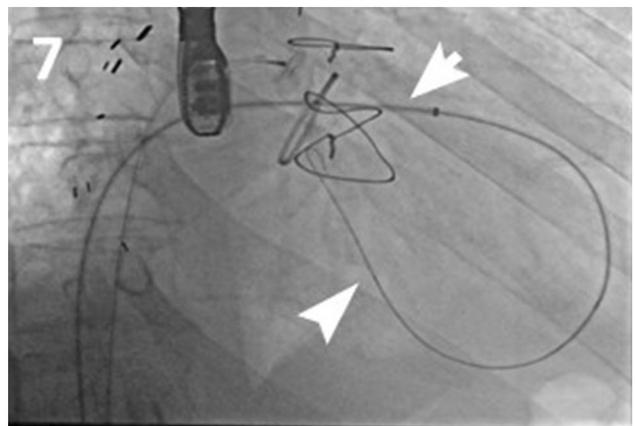
**Fig. 3** A 6-French MP catheter is used to cross the defect (arrow)



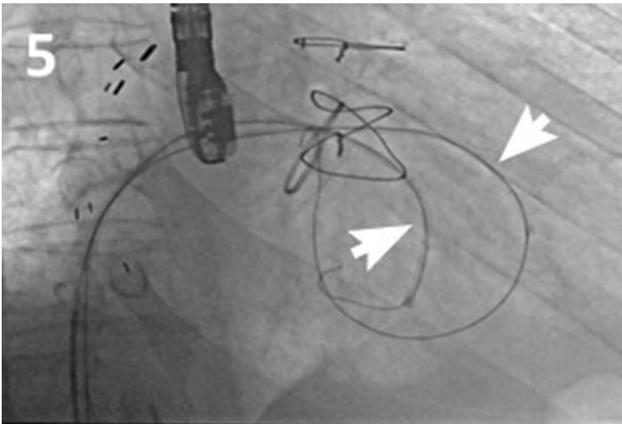
**Fig. 6** Simultaneous placement of two 12 mm AVP-2 occluders (arrows)



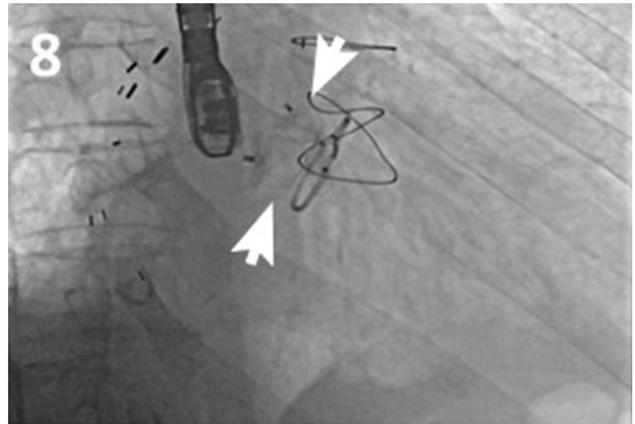
**Fig. 4** Two 0.032" extra-stiff Amplatz wires are advanced through the guide catheter into the LV (arrow)



**Fig. 7** Following recapture of the medial 12 mm AVP-2, a 6 Fr shuttle sheath was used to place a 16 mm AVP-2 (arrow) with a 0.032" anchor wire (arrowhead) left in place



**Fig. 5** A 6-French MP catheter (two total) is placed over each Amplatz wire in the LV (arrows)



**Fig. 8** Final placement of a 12 and a 16-mm AVP-2 occluders (arrows)

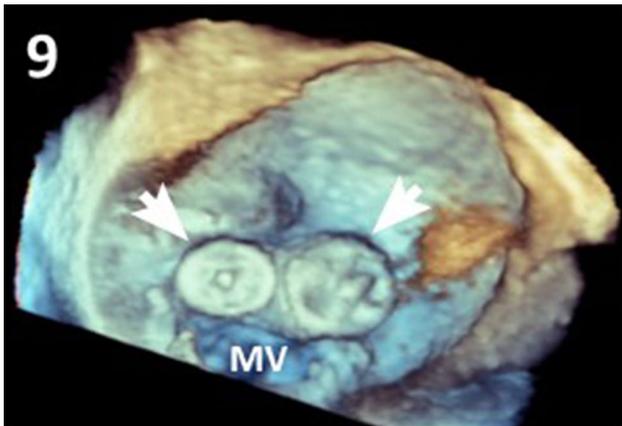


Fig. 9 On TEE, placement of two AVP-2 occluders is shown (arrows)

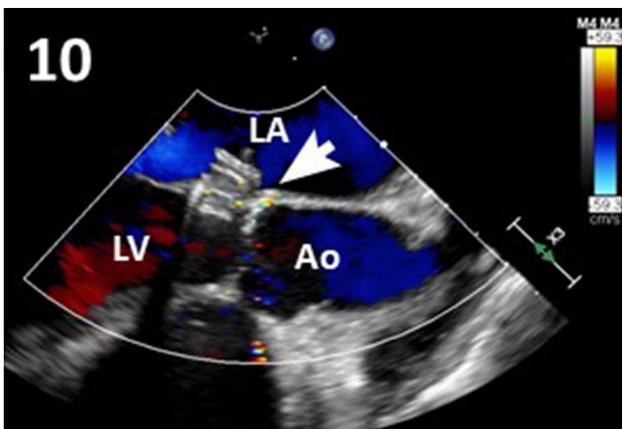


Fig. 10 Post-procedural TEE shows only trivial MR (arrow), Ao aorta

deployment, there was only trivial MR (Figs. 9, 10). The common reason for procedure failure is leaflet impingement due to proximity of defect to the surgical ring. Use of multiple, relatively smaller occluders, rather than a large single device can reduce likelihood of leaflet impingement. This technique is useful for maintaining a position across the paravalvular defect if an occluder needs to be exchanged for different or multiple other devices.