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Transcatheter Therapy for Residual MR and Iatrogenic ASD after MitraClip and ASD closure

Brief title: Transcatheter therapy after ASD Closure

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An 83-year-old man presented with symptomatic, recurrent severe mitral regurgitation (MR) two years after a previous transcatheter mitral valve repair with MitraClip (Abbott Structural, Menlo Park, CA), in which closure of a large iatrogenic atrial septal defect (iASD) with an 28-mm Amplatzer atrial septal occluder (ASO) was performed. Following a multidisciplinary heart team evaluation, a second MitraClip procedure was undertaken. Initial procedural imaging demonstrated no space posterior to the ASO for a safe transseptal puncture, necessitating crossing of the ASO for the placement of the 24-French steerable guide catheter (SGC) to enable the second MitraClip procedure. Using a NRG C0 Transseptal needle (Baylis Medical, Toronto, Canada) with 10 watts of RF energy and an 8-French Mullins sheath, a crossing location on the ASO with a height of 4.5 cm to the mitral valve was utilized. A 230-cm Inoue wire was inserted into the Mullins sheath, followed by balloon dilatation of the ASO occluder segment in escalating sizes. However, the SGC was unable to pass across the ASO until dilatation with a 12 x 40 mm Atlas GOLD balloon (Bard, Tempe, AZ) and passage of an Inoue dilator (Toray, Tokyo, Japan). Transcatheter repair with two additional MitraClip-NTR clips was performed, leading to significant reduction in MR. Although a new iatrogenic defect was created through the previous ASO, this was not closed initially due to the possible need for additional MitraClip therapy, as well as the potential for unloading of left atrial hypertension.

The patient returned one month later with heart failure (NYHA class III) symptoms.

A 14-mm Amplatzer vascular plug II (AVP-II, Abbott Structural, Menlo Park, CA) was used to completely close the new iASD using intracardiac echocardiography and fluoroscopic guidance, leading to clinical improvement. The MR reduction remained stable (grade 1+), and the patient had only mild dyspnea (NYHA class II) at one-year follow-up. Also, the AVP-II was well seated with a minimal residual shunt and without hemolytic anemia despite continued anticoagulation therapy.

To our knowledge, the present case represents the first experience of successful transcatheter therapy for residual MR after MitraClip and ASD closure. These techniques also may be applicable for other left atrial interventions (e.g., appendage closure, pulmonary vein isolation) that may be required after atrial septal closure. While closure of ASD with occluder devices can pose challenges for repeat access to the left atrium, this case demonstrates the feasibility of crossing such devices to perform beneficial therapy.

Figure Legends

Figure. Transcatheter mitral valve repair after prior MitraClip and atrial septal defect

closure. A, Transesophageal echocardiography (TEE) showing prior atrial septal occluder (ASO) and no space posterior to the ASO for safe transseptal puncture. B, Fluoroscopy showing a transseptal puncture through an ASO (arrow). C, Fluoroscopy showing pre-dilatation with 12 x 40 mm balloon (arrow). D, TEE with three-dimensional (3D) imaging shows a steerable guide catheter through the ASO (arrow). E, Fluoroscopy showing deployment an additional clip (arrow) through the ASO. F, TEE showing trivial MR (arrows) after additional clips. G, 3D-TEE showing new iatrogenic defect (arrow). H, TEE showing residual shunting (arrow). I, Fluoroscopy showing placement of the Amplatzer vascular plug II (arrow). H, Transthoracic echocardiography showing no residual shunting (arrow). LA, left atrium; LV, left ventricle; RA, right atrium.

