Totally Endoscopic, Robotic-Assisted Mitral Valve Repair after TAVR

Objective: Moderate-to-severe mitral regurgitation (MR) affects approximately 25% of patients with severe aortic stenosis undergoing transcatheter aortic valve replacement (TAVR). Even though MR may improve after TAVR in up to 50% due to left ventricular reverse remodeling, persistent MR is associated with increased morbidity and hospitalization for heart failure. What the best modality is for the treatment of severe MR after TAVR remains debated.

Case Video Summary: We present the case of an acutely decompensated, frail, 86-year-old patient with severe aortic stenosis and moderate-to-severe MR (due to anterolateral commissural prolapse) with multiple comorbidities, who suffered for persistent MR after TAVR. The patient was denied conventional mitral surgery, transcatheter mitral valve replacement, and MitraClip. We offered a totally endoscopic, robotic-assisted approach for mitral valve repair. Port configuration consisted of the working port and camera being placed in the third intercostal space at the left anterior axillary line; the left robotic arm port placed in the second intercostal space halfway between the anterior axillary line and the midclavicular line; the right robotic arm port placed in the fifth intercostal space, slightly below the anterior axillary line; and the left atrial retractor placed in the fourth intercostal space two centimeters medial to the midclavicular line. Cardiopulmonary bypass was achieved by percutaneous femoral cannulation. Aortic cross-clamp and cardioplegia delivery were provided using the endoaortic balloon occlusion device. After entering the left atrium via the interatrial groove, we exposed the mitral valve while avoiding TAVR valve dislocation via careful manoeuvring of the atrial retractor. The mitral valve had myxomatous degenerative changes, with flailed P1 and anterolateral commissure. We repaired the valve with commissural plication and placement of a 30-mm Physioflex annuloplasty band. Cardiopulmonary bypass and aortic cross-clamp time were 115 minutes and 77 minutes, respectively. Postoperative transesophageal echocardiography revealed trace mitral regurgitation with a mean gradient of 4 mmHg. The patient developed a transient ischemic attack on postoperative day 2, but remained neurologically intact and asymptomatic thereafter.

Conclusions: Using a totally endoscopic, robotic-assisted approach is safe and effective for the treatment of persistent severe MR after TAVR in selected patients.

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