Totally Endoscopic, Robotic-Assisted Papillary Muscles

Cryoablation and Mitral Valve Repair

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Disclosures Statement

Dr. Amabile receives consulting fees from JOMDD/Sanamedi. Michael LaLonde receives consulting fees from Edwards Lifesciences and Intuitive Surgical. Dr. Krane is a physician proctor and a member of the medical advisory board for JOMDD/Sanamedi, a physician proctor for Peter Duschek, is a medical consultant for EVOTEC and Moderna and has received speakers’ honoraria from Medtronic and Terumo. Dr. Geirsson receives consulting fees for being a member of the Medtronic Strategic Surgical Advisory Board and from Edwards Lifesciences.

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IRB Approval

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Informed Consent Statement

Informed written consent was obtained.
Central Picture

![Intraoperative image post-mitral valve repair.](image)

Central Picture Legend (90 characters)
Intraoperative image post–mitral valve repair.

Central Message (200 characters)
Using a robotic approach for the treatment of bileaflet arrhythmic mitral regurgitation is safe and effective.

Case Video Word Count: 343/350
In patients with arrhythmogenic mitral valve prolapse, both ablation (1) and surgical

correction of the underlying valvulopathy (2, 3) have been described as beneficial approaches to

reduce the arrhythmogenic burden. While centers have increasingly adopted robotic assistance as

part of their mitral valve repair armamentarium (4, 5), the technical nuances of a robotic

approach for arrhythmogenic mitral valve prolapse remain under reported.

We present the case of a 67-year-old male with severe, symptomatic, bileaflet mitral

valve prolapse and history of ventricular tachycardia with prior ablation attempt and ICD

implantation performed at an outside hospital. Ports configuration consisted of the working port

and camera placed in the third intercostal space at the right 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 exposure through the Waterston’s groove,

the mitral valve was inspected and had myxomatous degenerative changes leading to bileaflet

prolapse and severe annular dilatation. We closed the left atrial appendage and performed a two-

minute cryo-ablation of both papillary muscles (from the tip to mid-shaft height) using the

Atricure cryoablation probe (Atricure, Mason, OH). We then repaired the mitral valve: we

excised the thickened, disjunct basal portion of P1 and P2 with subsequent sliding plasty, we

placed two neochords to P2, and we completed the repair with a 38-mm annuloplasty band.

Cardiopulmonary bypass and aortic cross-clamp times were 193 and 148 minutes, respectively.
After the procedure, transesophageal echocardiography revealed trace mitral regurgitation and a mean gradient of 3 mmHg. The patient had an uneventful postoperative recovery, with no subsequent ventricular arrhythmic events.

In conclusion, using a totally endoscopic, robotic-assisted approach is safe and effective for the treatment of bileaflet arrhythmogenic mitral regurgitation.
112 References


Video 1. Narrated case video.