

The Mitracut Technique To Prevent LVOT Obstruction After Transapical Mitral Valve Replacement

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Background

This study sought to report the first-in-human experience with a new minimal-invasive surgical hybrid technique to split the anterior mitral valve leaflet (AML) and prevent iatrogenic left ventricular outflow tract (LVOT) obstruction during transapical transcatheter mitral valve replacement.

Methods

Between November 2022 and December 2022, four patients were treated with the endoscopic mitral-leaflet cutting (Mitra-Cut) technique before undergoing a transapical mitral valve replacement using a self-expandable transcatheter heart valve system. All patients were at potential risk for iatrogenic LVOT obstruction. A 26F Gore DrySeal sheath (W.L. Gore & Associates, Inc., Flagstaff, AZ, USA) was shortened to an appropriate length and inserted via the transapical access site.

After insertion of straight endoscopic scissors (CERAMO HCR, MRT-2, Fehling Instruments, Karlstein am Main, Germany; blade length: 10mm, shaft diameter: 5mm), the anterior mitral leaflet was cut in the A2 segment under transesophageal echocardiographic guidance. The result was assessed using transesophageal echocardiography; the transcatheter mitral valve replacement was then performed in a standardized fashion

Results

The anterior mitral valve leaflet was successfully split in all cases. The mean procedural time for the Mitra-Cut was 2.5 ± 0.5 minutes. Procedural success for the TMVR procedure was 100%, with no systolic anterior leaflet motion, left ventricular outflow tract obstruction, or other major complications.

At hospital discharge, the echocardiographic evaluation revealed trace residual mitral regurgitation in 2 patients and no MR in 2 patients. The mean transvalvular mitral and aortic gradients were 3.3 ± 1.0 and 5.2 ± 2.3 mmHg, respectively.

Patients were transferred to the normal ward either on the same day (n=2) or on the first postoperative day (n=2) and discharged after 9 ± 2 days after TMVR, with all patients being New York Heart Association functional class II.

Conclusion

The Mitra-Cut technique is a safe, effective, fast, and simple alternative to the LAMPOON procedure for prevention of iatrogenic LVOT obstruction in patients undergoing transapical TMVR. Because it is primarily an echo-guided procedure that does not require additional vascular access, the radiation exposure and the risk for vascular complications are probably reduced. Further studies with a larger number of patients and longer follow-up are warranted.

