Totally endoscopic mitral valve repair for degenerative mitral valve disease with a saddle-shaped semirigid annuloplasty ring

Objective: Mitral valve repair (MVR) with annuloplasty is the gold standard treatment for degenerative mitral regurgitation (MR). Three-dimensional saddle-shaped annuloplasty rings have been developed to reproduce the mitral geometry and physiology and increase repair durability. Aim of this study was to report early results after mitral annuloplasty using the MEMO 4D saddle-shaped semirigid ring in totally endoscopic approach.

Methods: All patients undergoing minimally invasive endoscopic MVR using MEMO 4D annuloplasty ring between February 2019 and December 2022 were included. Preoperative characteristics, operative data, in-hospital outcomes and 30-day clinical and echocardiographic follow-up were analyzed. The main outcome was technical success, defined as absence of procedural mortality, successful access, correct positioning of the first intended device and freedom from reintervention related to the device or access procedure. Additional outcomes were in-hospital and 30-day mortality and morbidity and residual mitral regurgitation.

Results: The analysis included 233 patients (mean age 60.4±13.0 years, 145 males, mean EuroScore II 1.79±1.89). The surgical approach was a totally endoscopic technique, through a 3 cm mini right thoracotomy. The type of degenerative MR was Barlow's disease in 51.5% of the cases. MVR was achieved in 100% of cases. Artificial chordae were used in 217 cases (93.1%), 31 on the anterior leaflet, 128 on the posterior leaflet and 57 both. In 16 cases (6.9%) MVR was achieved using only the ring. One or more associated procedure were needed in 82 cases (35.2%). One conversion to full sternotomy was required. In 1 case systolic anterior motion was seen and 5 cases required repeated cross clamp for residual MR, all successfully resolved. In hospital mortality rate was 0.8% (2 cases). No other patients died within the 30-day follow-up. No early failure needing reoperation occurred. Limited number of stroke (0.4%), revisions for bleeding (4.7%), myocardial infarction (0.4%) and low cardiac output (5.2%) occurred during hospitalization. Post-operative echocardiography showed a left ventricular ejection fraction of 56.5±7.1% and mean mitral valve gradient of 3.2±1 mmHg. Mild residual MR was seen in 22 cases (9.4%). No cases of moderate MR were identified.

Conclusions: The MEMO 4D annuloplasty performed in totally endoscopic mitral valve surgery is technically feasible and provides excellent clinical and echocardiographic results.

Giovanni Cresce (1), Daniele Zoni (1), Luciana Benvegnù (2), Salvatore Poddi (2), Romel Mani (1), Tommaso Hinna Danesi (1), Loris Salvador (1), (1) Division of Cardiac Surgery, San Bortolo Hospital, Vicenza, Italy, (2) Department of Cardiac Surgery, University of Verona Medical School, Verona, Italy