Mitral Valve Replacement for Extensive Mitral Annular Calcification; Surgical Strategies and Outcomes

Objective: Mitral annular calcification (MAC) remains a formidable lesion in cardiac surgery with significant perioperative morbidity/mortality. Conventional mitral valve replacement (C-MVR) remains the gold standard for most patients with extensive MAC, but now transatrial hybrid transcatheter mitral valve replacement (H-TMVR) can be reserved as a bailout.

Methods: This is a retrospective review of 72 consecutive patients with symptomatic mitral disease due to extensive MAC who underwent open surgical mitral valve replacement from 1/1/2013-9/30/2022. We categorized degree of calcification as partial (?1/3 annulus), horseshoe (commissure-to-commissure), or circumferential. We excluded patients with rheumatic heart disease and MAC in <1/3 of the annulus.

Results: Mean age was 71.1±10.7 and 50 (69.4%) were female. There were 51 (69.8%) patients in NYHA class>3, 47 (65.3%) with pulmonary hypertension, and 12 (16.7%) with radiation heart disease (Table). Mean STS Score was 5.3±4.4%. There were 24 (32.8%) patients with previous valve interventions, of which 7 (9.7%) were structural procedures. Mitral pathology was mixed in 25 (34.2%) patients, regurgitant in 31 (42.5%), and stenotic in 16 (21.2%). There were 41 (56.2%) patients with partial MAC, 12 (16.4%) with horseshoe, and 19 (26%) with circumferential. Fifty-six (76.7%) patients underwent C-MVR: 32 (43.8%) utilizing periannular suture placement, 12 (16.4%) with intraleaflet implantation, 15 (20.5%) with anterior leaflet flip, and 10 (13.7%) with MAC decalcification. The remaining 16 patients were not candidates for C-MVR after valve exploration and underwent H-TMVR. Concomitant procedures were performed in 62 (84.9%) patients: tricuspid intervention in 52 (71.2%) and CryoMaze in 21 (28.7%). Mean cardiopulmonary bypass time was 157.8±62.6 and cross clamp time 121.1±52.7 minutes. Valve-related complications were left ventricular outflow tract obstruction in 3 (4.1%) patients, valve embolization in 2 (2.7%), and atrioventricular groove disruption in 1 (1.3%), all with H-TMVR. At discharge there were 2 (2.7%) patients with paravalvular leak ?moderate. In-hospital mortality was 5.4% (3 patients) with C-MVR and 25.0% (4 patients) with H-TMVR. 1-year survival was 84.6% with C-MVR and 53.6% with H-TMVR.

Conclusions: C-MVR is associated with good outcomes in patients with extensive MAC. H-TMVR as a bailout is associated with poorer outcomes but may be considered in select patients.

Ahmed El-Eshmawi (1), Gilbert Tang (1), Erick Sun (1), Sophia Alexis (1), Dimosthenis Pandis (1), Percy Boateng (1), David Adams (1), (1) Mount Sinai Health System, New York, NY
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