VALVULAR HEART DISEASE

MITRAL ANNULAR CINCHING ELIMINATES REMNANT MITRAL REGURGITATION AFTER EDGE-TO-EDGE REPAIR TO CORRECT POSTERIOR LEAFLET PROLAPSE

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Background: Edge to edge (E2E) repair is an established surgical treatment for mitral leaflet prolapse, and is now performed in percutaneous clinical trials. The outcomes of percutaneous E2E repair in patients with annular dilatation is poor. In this study we sought to investigate the impact of annular cinching on efficacy of E2E in a posterior leaflet prolapse model.

Methods: 8 porcine mitral valves were evaluated in a pulsatile heart simulator prior to surgical manipulation (Control) at 120mm Hg ventricular pressure, 5L/min cardiac output at 70bpm. Mitral regurgitation (MR) was created in these valves by transecting the marginal chordae inducing P2 prolapse, and was corrected using E2E stitch at A2-P2 segments. Each valve was studied with three annular sizes: Dilated (36mm), 15% cinched (32mm), 30% cinched (30mm). MR volume (ml/beat) and leaflet coaptation length (mm) were measured.

Results: Chordal transection induced severe P2 prolapse and 12.0±5.5ml/beat of MR. E2E repair corrected prolapse but left remnant MR of 8.6±4.1ml/beat at dilated annular size, that reduced to 6.4±4.1ml/beat with 15% cinching and 1.4±1.2ml/beat with 30% cinching, and reduced MR to at normal annular (Fig 1a). Leaflet coaptation length increased as the annulus was cinched (Fig 1b).

Conclusions: E2E repair relieved MR in the setting of P2 prolapse, only when performed concomitantly with annular cinching. Percutaneous methods to cinch or reduce annular size should be used alongside E2E repair for good hemodynamic outcomes.