



## Congenital Cardiology Solutions

### RESECTION OF RIGHT VENTRICULAR OUTFLOW TRACT PATCH DURING PULMONARY VALVE REPLACEMENT IMPROVES RIGHT VENTRICULAR VOLUMES AND EJECTION FRACTION IN PATIENTS WITH TETRALOGY OF FALLOT

Poster Contributions

Poster Sessions, Expo North

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**Background:** Right ventricular (RV) dilatation following Tetralogy of Fallot (ToF) repair is due to both pulmonary regurgitation and the size of the right ventricular outflow tract (RVOT) patch. Recent studies have shown a 28-36% decrease in RV volume following pulmonary valve replacement (PVR) but no change in RV ejection fraction at one year of follow up. The contribution of the RVOT patch on post-PVR ejection fraction and the role of surgical remodeling during PVR remain controversial. We sought to evaluate the effect of aggressive RVOT patch and scar resection during insertion of a bioprosthetic PVR on RV size and function using cardiac magnetic resonance imaging (MRI).

**Methods:** Fifty-three ToF patients with chronic pulmonary regurgitation and RV dilatation seen at our adult congenital heart center underwent bioprosthetic PVR from 2001 through 2010. Of those patients, 21 had a cardiac MRI performed both before and after PVR. The operative note was reviewed and 12 patients were identified in whom concomitant resection of the RVOT patch and scar were performed while the remaining 9 patients underwent isolated PVR. MRI volumes and EF were assessed for both groups.

**Results:** A cardiac MRI was performed 0.87 +/- 0.60 years prior to PVR and 3.1 +/- 2.2 years following PVR on average for both surgical groups. In the PVR and RVOT resection group, RVEDVI and RVESVI decreased substantially following surgery (185cc/m<sup>2</sup> vs. 112cc/m<sup>2</sup>; p = 0.013 and 131cc/m<sup>2</sup> vs. 60cc/m<sup>2</sup>; p = 0.002) and the RVEF improved dramatically (39% vs. 46%; p < 0.013). In the isolated surgical PVR, RVEDVI and RVESI also improved following surgery (186cc/m<sup>2</sup> vs. 117cc/m<sup>2</sup>; p<0.0001 and 102cc/m<sup>2</sup> vs. 71cc/m<sup>2</sup>; p=0.006, respectively). RVEF did not change in this surgical group (46% vs. 41%; p=0.057).

**Conclusions:** Aggressive RVOT resection during pulmonary valve replacement in ToF patients with severely enlarged right ventricles leads to dramatic improvements in RV volumes and EF. The improvement in RVEF differs from prior studies and may be explained by the extensive resection of all non-contracting RV outflow tract tissue as well as late improvement in RVEF post PVR. Whether this approach should be adopted during PVR warrants further study.