Influence of Echo derived Preoperative Pulmonary Annulus Z value on late outcome of TOF: Outcome of 123 consecutive TOF repairs followed up for 959 patient years

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Introduction: Long-term outcome of TOF depends on the size and function of the pulmonary Valve. This study analyzes the impact of preoperative pulmonary Z Score on the long-term outcome of TOF.

Methods: A cohort of 123 consecutive TOF repairs (2004-2014) were divided into Group I [Z > -2] 52; Group II [Z -2 to -4] 54, Group III [Z < -4] 17 patients, based on preoperative pulmonary annulus (PA) Z Score. One primary repair using Contegra was excluded from the study. Median age and weight were 161(6-593) days and 5.8(3-8.9) kg respectively. Non-Transannular technique was used in 41 (33.3%) patients (Group I:21; Group II:17, Group III:3); Trans-annular technique was used in 82 (66.7%) patients (Group I:31; Group II:37, Group III:14), thus resulting in trans-annular repair in 59.6% of Group I; 68.5% of Group II and 82.4% of Group III patients. Composite pulmonary valve dysfunction was defined as peak gradient > 40 mm Hg and/or pulmonary regurgitation ≥ moderate at follow-up.

Results: All patients were alive at a median of nine (4-14) years of follow-up. 21(17%) patients needed catheter intervention: mostly for branch PA stenosis or for Melody valve insertion. 11(9%) needed reoperations, including for pulmonary valve insertion, tricuspid valve repair and side branch stenosis. A total of 10(8%) patients needed pulmonary bioprosthesis either surgically (7) or transcatheterly (3). At last follow-up, freedom from composite pulmonary dysfunction was 59.5±17.9%, 50.5±16.8% and 11.5±19.6, ±11.5% @ 10 years for Groups I-III respectively (p=0.0008). Freedom from replacement was not significantly different between groups (p=0.8) [Fig. 1]. Freedom from catheter reintervention was 88.6±9.9%, 81.8±13.1% and 88.2±11.8, -15.3% @ 10 years respectively (p=0.5).

Conclusions: While the limits of valve sparing approaches are being pushed, we have followed a middle path of relieving obstruction while also achieving pulmonary valve competence. This strategy has yielded excellent freedom from replacement as well as reintervention in the most disadvantaged group with Z > -4. The low freedom from composite dysfunction in Group III suggests the work pending before us to device methods to improve composite function in the long-term.