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**Title:**

Sex-specific Differences in Right Ventricular Dimensions in Repaired Tetralogy of Fallot

**Background****:**

Patients with repaired Tetralogy of Fallot (rTOF) frequently develop pulmonary regurgitation (PR) after repair, leading to progressive right ventricular (RV) dilatation and dysfunction. RV volumes constitute the major indications to consider pulmonary valve replacement (PVR). These indications, however, do not account for sex-based differences in cardiac chamber dimensions. We hypothesized that there are sex-based differences in RV dimensions in patients with rTOF and that females are less likely to meet published indications for PVR.

**Methods:**

Cardiovascular magnetic resonance imaging (CMR) data on 40 unique patients with rTOF between January 2011 and December 2017 were analyzed (17 female, 23 male). Paired t-test was used to compare cardiac dimensions by sex. Data include age, operative procedures, height, weight, PR fraction and cardiac chamber dimensions.

**Results:**

Average female age was 31.7 (range 14-64) years and male age was 30.7 (range 14-60) years (p=0.85). After adjusting for body surface area, females had smaller RV end diastolic volumes, 115mL/m2 (SD 30) vs 134mL/m2 (SD 35) for females and males respectively (p=0.07). Similar differences were seen after adjustment for height, 117mL/m (SD 33) vs 149mL/m (SD 46) for females and males respectively (p=0.02). Significant difference was observed by sex for indexed RV end-systolic volume, 56mL/m2 (SD 20) for females and 70mL/m2 (SD 22) for males (p=0.049). Males (43%) were more likely than females (18%) to have RV volumes above indication threshold for PVR (150 ml/m2). There was no significant difference between sexes in RV ejection fraction or PR fraction.

**Conclusion:**

There are sex-specific differences in RV dimensions after rTOF repair. Females were less likely to have RV dimensions meet indications for PVR. Sex-based normative data should be considered when evaluating patients for PVR.

Figure 1: Comparison of Male and Female Right Ventricular End Diastolic Indexed Volumes in Repaired Tetralogy of Fallot Patients

Right Ventricular End Diastolic Volume, Indexed (mL/m2)

 = 150mL/m2, indication threshold for PVR

Male

Female