



## Congenital Cardiology Solutions

### DOPPLER FLOW PATTERNS IN THE NEO-AORTA AND RIGHT VENTRICLE-TO-PULMONARY ARTERY SHUNT IN INFANTS WITH SINGLE RIGHT VENTRICLE ANOMALIES: IMPACT ON OUTCOME AFTER INITIAL STAGED PALLIATIONS

Poster Contributions

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**Background:** A Pediatric Heart Network trial compared outcomes in infants with single right ventricle (RV) anomalies undergoing a Norwood procedure randomized to either modified Blalock-Taussig shunt (MBTS) or right ventricle-to-pulmonary artery shunt (RVPAS). In this cohort, we sought to assess Doppler flow patterns in the neo-aorta and RVPAS as they may provide insight into the physiologic burdens created during initial palliation.

**Methods:** An echo core lab measured neo-aortic cardiac index (CI), retrograde fraction (RF) in the descending aorta and RVPAS conduit, RVPAS/neo-aortic systolic ejection time ratio, and systolic/diastolic (S/D) duration ratio early post-Norwood, prior to stage II palliation and at 14 months of age. We examined the association of these Doppler patterns with transplant-free survival, length of ICU/hospital stay after surgeries, and RV functional indices [RV size, ejection fraction (EF), fractional area change, myocardial performance index, and severity of tricuspid regurgitation].

**Results:** The cohort included 529 subjects with a mean follow-up of  $3.0 \pm 2.1$  years. Neo-aortic CI ( $8.1 \pm 2.7$  vs.  $4.4 \pm 2.0$  L/min/m<sup>2</sup>;  $p < 0.001$ ) and descending aortic RF (45% vs. 4%;  $p < 0.001$ ) were higher in MBTS than RVPAS post-Norwood. RVPAS RF averaged  $< 25\%$  at both interstage intervals. Higher pre-stage II descending aortic RF correlated with decreased RV EF ( $R = -0.24$ ;  $p = 0.032$ ) at 14 months in MBTS. Higher post-Norwood CI ( $5.6$  vs.  $4.4$  L/min/m<sup>2</sup>;  $p = 0.04$ ) and lower S/D ratio ( $1.40$  vs.  $1.68$ ;  $p = 0.01$ ) correlated with better interstage transplant-free survival in RVPAS. We found no other associations between outcomes or RV functional status and Doppler flow patterns in either shunt group at any interval.

**Conclusion:** After the Norwood procedure, infants appear to tolerate significant descending aortic RF (in MBTS) and conduit RF (in RVPAS) with little correlation with transplant-free survival, length of hospital stay, or RV functional indices during the first year. Doppler assessment of neo-aortic cardiac output and S/D duration ratio at the post-Norwood echocardiogram may provide additional non-invasive tools to help identify patients at risk for interstage events after Norwood with RVPAS.