

Initial shunt type for the Norwood procedure affects long-term myocardial function in children with HLHS

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Introduction: Long-term effects of initial shunt types on myocardial function are poorly understood in hypoplastic left heart syndrome (HLHS). We studied the effect of initial shunt type, Blalock–Taussig (BT) and Sano, on myocardial function at different stages of the treatment protocol.

Methods: Population based cohort of Finnish children with HLHS (n=63) born between 2003 and 2010 was studied with echocardiography at four time points: before stages one, two and three and 0.5-2 years after stage three. 23 children were palliated with a BT shunt and 40 with a Sano shunt. For comparison, we utilized the fractional area change (FAC) derived from velocity-vector-imaging (Syngo, Siemens). This method has been validated with MRI.

Results: There were no differences between groups in demographics, HLHS morphology or mortality (BT 26.1% vs Sano 15.0%, $p=0.2$) during study period. Among the survivors, an increase in FAC was observed after stage two in the BT shunt group but not in the Sano shunt group ($+8.8\pm 9.4$ %units vs $+1.8\pm 8.5$ %units, $p=0.01$) (Figure). After stage three, those palliated with a BT shunt had higher FAC values ($33.0\pm 6.4\%$ vs $25.6\pm 6.1\%$) (Figure). In multiple regression analysis, shunt type and stage of palliation had an impact on myocardial function.

Conclusions: In patients palliated with a BT-shunt, increase in FAC during treatment protocol was higher and myocardial function after stage three better than in those palliated with a Sano shunt. This may be due to long term effect of myocardial scarring caused by a Sano shunt.

Figure. Fractional area change (FAC) in HLHS patients in different stages of treatment protocol initially palliated with either a Blalock–Taussig (BT) or a Sano shunt.

