

## MP1-21

### Impact of Cardiac MRI on Decision-making and Outcomes in Patients with a Borderline Left Ventricle

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#### Introduction

It is often challenging to determine whether a 'borderline' left heart is sufficient to support the systemic circulation. In the last decade, cardiac MRI has emerged as a method to quantify left ventricular (LV) size and function. The goal of this study was to assess the outcomes of patients with HLHS and 'borderline' left ventricles in the current era.

#### Methods

All neonates with HLHS who underwent cardiac MRI to assess LV volume between Jan 2003 – Jan 2012 were identified. Patients with valvar atresias and AVSD were excluded. Medical charts and imaging data were reviewed.

#### Results

42 patients were identified. One underwent single ventricle palliation (Norwood). 3/42 patients received palliative care (genetic abnormalities or neurologic injury). 27/42 patients underwent primary biventricular management (n=2 aortic valve dilation, n=22 CoA repair, n=2 CoA repair+VSD closure, n=1 CoA repair and PAB). 11/42 patients had a stage one Hybrid procedure (H1, PDA stent and pulmonary artery banding) as an initial intervention, with 7/11 having subsequent biventricular repair (arch reconstruction, PA debanding +/- VSD closure +/- ASD fenestration). Mean birthweight 3.3kg (range 2.9-4.2kg). Mean age at first intervention 10 days (range 2-35).

LVEDVi measured by MRI was 27.9+/-6.9ml/m<sup>2</sup> (17.4-44.8ml/m<sup>2</sup>), which was significantly larger compared to echo (monoplane Simpson's) 12.9+/-3.6ml/m<sup>2</sup> (4.9-24.3ml/m<sup>2</sup>) (p<0.05, r=0.58) and echo (5/6 area-length) 22.8+/-5.8ml/m<sup>2</sup> (7.7-36.5ml/m<sup>2</sup>) (p<0.05, r=0.6).

9/27 (33%) patients required re-intervention (n=1 Ross-Konno, n=1 AoV dilation, n=1 SubAS resection, n=5 MV repair (3/5 with SubAS resection). 2/9 patients required 3 and 4 re-operations each. 3/7 patients who had a BiV repair after H1 required re-intervention (n=1 RPA plasty, n=2 MV repair).

There were 2 deaths in patients with severe pulmonary hypertension and one patient underwent heart transplant. At last follow-up, one patient was awaiting MV surgery for mitral stenosis. The other patients were well without significant residual lesions.

#### Conclusions

Measurement of LV volume is underestimated when assessed by echo compared to MRI. Additional data from MRI volume measurements is useful in decision making for patients with HLHS and a borderline LV. The H1 procedure can be a useful bridge to biventricular repair in patients who are truly 'borderline'.