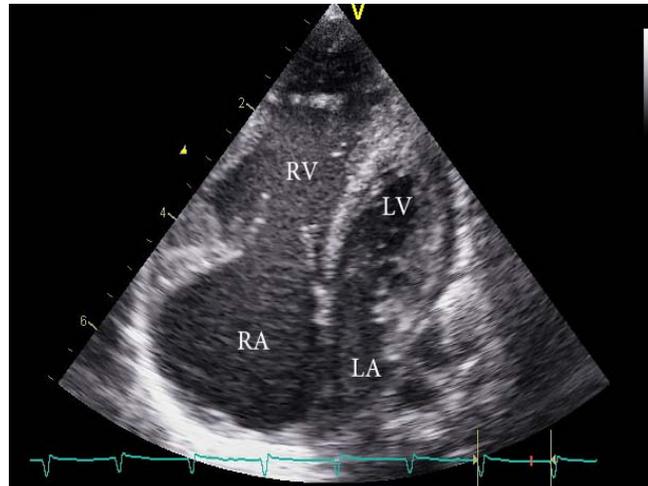


## Midterm Follow Up after Bi-ventricular Repair of the Hypoplastic Left Heart Complex

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### Introduction:

In neonates with the hypoplastic left heart complex (HLHC), as defined by Tchervenkov CI 1998, biventricular repair is considered superior to univentricular repair. The Z-scores of the mitral valve (MV)- and the aortic valve (AoV)-annulus are primary factors for the choice of repair. Yet, predictive cutoff values for the feasibility and optimal outcome of biventricular repair are unknown. This study assesses the midterm outcome and the growth of the left heart structures after neonatal biventricular repair, and tries to evaluate a cutoff value for the MV- and AoV-annulus Z-scores.



### Methods:

HLHC-patients who underwent biventricular repair at our institution between 2004 and 2013 were reviewed retrospectively. MV-annulus, AoV-annulus, left ventricle inlet length and left ventricular internal diastolic dimension were measured by echocardiography before and at 6, 12, 24 & 48 months after biventricular repair to calculate the Z-scores. Using t-testing, the change in Z-scores before and after operation, and the influence of preoperative Z-scores on the need of re-interventions was assessed. The Z-score calculation method of Pettersen et al 2008 was used.

### Results:

Nineteen patients were included. The follow-up ranged from two to 98 months. The 30-day mortality was zero. The midterm survival rate was 95% and 85% of the patients were classified as NYHA I. One patient died due to a non-cardiac related cause after two months. Seven patients (37%) required a total of 8 re-interventions, due to recurring or residual obstructive lesions (4 re-CoA, 2 supravalvular AS and 2 subvalvular AS). Within six months after biventricular repair, the Z-scores almost normalized but remained small thereafter ( $p < 0.001$ ).

### Conclusion:

Neonatal biventricular repair is successful even in HLHC patients with AoV- and MV-annulus Z-scores equal to -5.8 and -4.73 respectively. It can be concluded that the left heart structures undergo temporary compensatory growth after neonatal biventricular repair as within the first six months after repair the Z-scores almost normalize. Nevertheless re-appearance of stenotic lesions requires re-intervention in 37% of the HLHC population. However the re-appearance of stenotic lesions was not significantly correlated to the magnitude of the pre-operative MV- and AoV-annulus Z-scores.