

Are preoperative left heart dimensions in infants with coarctation repair predictive of long-term outcome?

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Introduction Infants with coarctation often present with a dilated, pressure overloaded right ventricle and a small left ventricle. Preoperative determination of the adequacy of the left ventricle to support the systemic circulation can be difficult. Left ventricular dimensions are expected to increase rapidly after coarctectomy, mainly as a result of normalization of biventricular loading conditions. Longterm data on growth of left ventricular structures in this patient group are scarce. The aim of this study was to evaluate long-term outcome in relation to echocardiographic parameters at presentation.

Methods All infants under 3 months of age, who underwent coarctectomy between December 1987 and December 2007 were studied retrospectively. Patients with mild aortic stenosis (gradient < 20 mm Hg) or with ventricular septal defect were included. Clinical charts and first and latest echocardiograms were reviewed. Preoperative diameters of mitral and aortic valve annulus as well as dimensions and length of LV and RV were obtained and compared with the same measurements at last follow-up. Values were expressed as z-scores.

Results A total of 194 infants were included. 32 (16 %) underwent concomitant VSD closure, 9 (5%) pulmonary artery banding. Follow-up was 99% complete with a mean of 11,4 years. Early mortality was 2,5%, late mortality 3,6%. During follow-up, recoarctation occurred in 30 patients (16%), 12 patients (6%) required intervention for (sub)aortic stenosis, 7 patients (3,7%) mitral valve surgery, 2 patients developed pulmonary hypertension, because of restrictive LV-physiology. Before coarctectomy, a mitral valve z-score < -2 was present in 10% of the patients, an aortic valve z-score < -2 in 23% and < -3 in 9%. In 75 patients, the ratio RV/LV internal length was < 1. At latest follow-up, only 1 patient remained with a mitral valve z-score < -2 and 10 with an aortic z-score < -2. LV length was \geq RV length in all. Initial aortic annulus z-scores correlated with the need for aortic/subaortic surgery during follow-up ($p=0,017$ t-test)

Conclusion Small left heart structures increase significantly in size after coarctation repair in infancy. A smaller initial aortic valve annulus z-score is predictive for (sub)aortic surgery during long-term follow-up.