

Influence of aortic arch anomalies on long-term outcome of patients with TGA-VSD after the arterial switch operation

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Objectives: Early results after the arterial switch operation (ASO) for patients with simple transposition of the great arteries (TGA) are excellent, but studies on patients with an additional ventricular septal defect (VSD) are scarce. We aimed at analysing the long-term outcome of this subgroup of patients, focussing on reoperations and the influence of associated anomalies on outcome.

Methods: All patients with TGA-VSD, operated between 1983 and 2014 were included in a retrospective study. Study endpoints were survival and reoperation after the ASO. A reoperation was defined as a major cardiac procedure.

Results: A total of 207 patients with TGA-VSD underwent an ASO during the study period. Associated anomalies were multiple VSDs in 22 (10%), hypoplastic aortic arch (HAA) in 17 (8%), coarctation in 15 (7%), and interrupted aortic arch (IAA) in 6 (3%) patients, respectively. Early mortality was 6%, late mortality was 4%. Freedom from death was $93\pm 1.8\%$ at 1 year and $87.9\pm 2.6\%$ at 20 years. During a mean follow-up time of 12.1 ± 9.2 years (maximum 31 years), a total of 36 reoperations were required in 24 patients (11%). Freedom from reoperation was $92.3\pm 2\%$ at 1 year and $73.9\pm 4.3\%$ at 20 years. Reoperations were performed for right ventricular outflow tract obstruction in 20 (9%), residual VSD in 11 (5%), aortic insufficiency in 7 (3%), and for aortic obstruction in 7 patients (3%), respectively. Long-term survival was not significantly different for patients requiring a reoperation ($p=0.6$) and for patients with associated anomalies ($p=0.1$). Patients with associated anomalies required more often a reoperation than patients without associated anomalies ($p<0.001$). Independent risk factors for death were age greater than 6 months at ASO and concomitant aortic arch repair ($p=0.01$). Independent risk factors for a reoperation were multiple VSDs ($p=0.03$), HAA ($p=0.001$), IAA ($p=0.02$) and the use of a pericardial patch for reconstruction of the coronary buttons ($p=0.02$).

Conclusions: Long-term outcome after the ASO for TGA-VSD are excellent, but major reoperations are necessary in about 11% of the patients. Patients with associated anomalies, especially aortic arch anomalies, have a higher risk for death and for reoperation in the long-term.