Outcome of Patients With D-Transposition of the Great Arteries With Abnormal Pulmonary Valve or Left Ventricular Outflow Tract Obstruction Following Arterial Switch Operation

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Background: There have been few reports regarding the long-term outcome of the arterial switch operation (ASO) in patients (pts) with transposition of the great arteries (TGA) and abnormalities of the left ventricular outflow tract (LVOT). Methods: Records of all pts who underwent primary ASO from 1/90 to 2/02 were retrospectively reviewed. Surgical echocardiograms were performed pre- and postoperatively in 2 pts with either LVOT obstruction (n=6) or an abnormal pulmonary valve (n=24). Abnormalities included bicuspid pulmonary valve (n=15), thickened or doming pulmonary valve (n=8), subpulmonary obstruction (subPS) (n=6), and combination (n=1). Pre-operative LVOT continuous wave Doppler gradients ranged from 15-44 mmHg. Blinded review was performed on the latest follow-up echocardiogram to evaluate the LVOT and neo-aortic valve. Results: Median age at operation was 7 days (range 1 to 62) and mean follow-up was 5.2 years (range 0.4 to 10). Surgical intervention to resolve subPS was performed in 2 pts during ASO. Two pts died, one from sepsis and one from biventricular failure due to native coronary stenosis; all others are alive. No pt has required re-intervention for LVOT obstruction or aortic insufficiency. Follow-up echocardiograms were reviewed in 25/28 surviving pts. Mean LVOT gradient was 12 mmHg (range 0 to 17) by continuous wave Doppler. Mean neo-aortic annulus z score was 3.2 ± 2.6 and 19/25 pts (76%) had neo-aortic root z scores of 3.9 and 7.6. In pts with no evidence of LVOT who underwent ASO at our institution, 4 of 230 pts (2%) had moderate or severe AI at latest follow-up. Conclusion: ASO can be performed successfully in pts with abnormal pulmonary valve or LVOT obstruction, with long-term results similar to pts without LVOT abnormalities. The degree of neo-aortic root dilatation and insufficiency warrants further review.

Aortopulmonary Window: Late Results of Surgical Repair in 40 Patients

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Background: This study was undertaken to determine the long-term outcome of patients undergoing aortopulmonary window (APW) repair. Methods: Between January 1971 and January 2003, surgical repair of APW was performed on 40 patients (20 males, 20 females). Median age was 3.3 months (range, 2 days to 10 years). Thirty patients (75%) had Type I defect (window between the aortic and pulmonary trunks), nine (23%) had Type II defect (extending to the origin of the main pulmonary artery [RMPA]), and one (2%) had Type III (RMPA from ascending aorta). Twenty-three patients (58%) had additional cardiac defects including atrial septal defect (n=9), ventricular septal defect (n=5), interrupted aortic arch (n=2), coarctation (n=4), right aortic arch (n=3), and tetralogy of Fallot (n=2). Mean preoperative systemic arterial oxygen saturations (SAO2) were 93 ± 10%.

Results: Thirty-seven patients had patch (n=36) or suture closure (n=1) of the defect via an incision in the window (n=18, 45%), pulmonary artery (n=13, 35%), or aorta (n=6, 16%). Three patients underwent simple ligation of the defect. There was one early death (2.5%). Follow-up was complete in 98%. Median follow-up was 8 years (range 6 months to 30 years). Actuarial survival was 98%, 94%, and 86% at 5, 15, and 25 years, respectively. Freedom from surgical or catheter reintervention was 85%, 76%, and 51% at 5, 10, and 25 years, respectively. Risk factors for death or reintervention include APW Type II (p<0.04) and lower preoperative SAO2 (p<0.004). The majority (95%) of present survivors are NYHA class I (n=32) or II (n=5) at follow-up.

Conclusion: Surgical repair of APW can be performed with low early and late mortality. Early repair of APW and associated anomalies is advocated. The majority of late survivors have a good quality of life.

Rapidly Detractive Value of Heart Fatty Acid-Binding Protein at Risk for Myocardial Damage in Pediatric Cardiac Operation

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Objective: Heart fatty acid-binding protein (HFABP) is reported as a rapid marker of myocardial damage in adults. The objective of this study was to assess the suitability of using serum levels of HFABP for evaluation of myocardial damage in pediatric cardiac surgery.

Method: One hundred patients in pediatric cardiac surgery were prospectively enrolled. Mean age at operation was 4.9 ± 0.4 years. Levels of serum HFABP, creatine kinase isoenzyme MB (CK-MB) and troponin T (TroT), were measured serially before operation and 0, 1, 2, 3, and 6 hours after an aortic declamping.

Results: Serum HFABP reached peak at level 1 hour after declamping in 95 patients, which was significantly earlier than serum CK-MB or TroT (Fig 1). In addition, serum HFABP levels immediately after declamping correlated strongly with serum CK-MB and TroT levels (Fig 2). The serum peak level of HFABP correlated with those of CK-MB and TroT (p<0.01 for each). In the multiple regression analysis, age and aortic cross-clamp time were significant variables that influenced the release of HFABP (p<0.001 for each). There were good relationship between serum peak HFABP levels and postoperative ino-