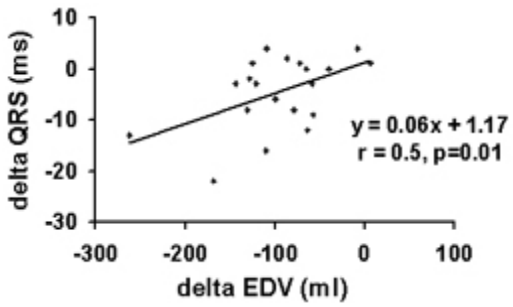

1039-200 **Outcome of Patients With D-Transposition of the Great Arteries With Abnormal Pulmonary Valve or Left Ventricular Outflow Tract Obstruction Following Arterial Switch Operation**

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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. Pre-operative echocardiograms and operative notes identified 30 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), or 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 relieve 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 in 19/25 pts (76%), aortic annulus z score was >2. Mean neo-aortic root z score at the level of the sinus of Valsalva was 3.8 ± 2.3 and neo-aortic root z score was >2 in 22/25 pts (88%). Color flow Doppler demonstrated <= mild neo-aortic insufficiency (AI) in 23/25 pts. Moderate AI was present in 2/25 pts (8%) who 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.

1039-201 **Mode and Site of Induction Affects the Organization of Atrial Fibrillation in the Canine Atrium**

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Background: The purpose of this study was to test the hypothesis that both the mode and site of induction of atrial fibrillation (AF) can alter its resultant organization.
Methods: Episodes of AF were induced in 18 normal mongrel dogs using both atrial pacing and aconitine administration. The site of AF induction was the right atrium (RA) and left atrium (LA) in 9 dogs each. Using plaque electrodes (2.5-mm inter-electrode distance), 112 electrograms were recorded from each atrium. Activation was evaluated during AF using both the local atrial cycle length (CL) and a frequency corrected ensemble vector index (EVI). The EVI is an integrated vector loop that is large when activation direction is consistent and low when activation direction is variable. Mean local atrial CL and the EVI were analyzed and compared for mode and site of AF induction.
Results: The frequency corrected EVI during aconitine induced AF (10.7±8.4) was significantly ($p<0.0001$) higher than pacing induced AF (9.1±5.9). The mean local atrial CL (milleseconds) was lower during pacing induced AF than during aconitine induced AF (114.5±40.6 vs 114.8±50.9, p=.03). The EVI was greater for AF induced from the RA than from the LA (10.9±7.3 vs 8.9±7.1, $p<0.0001$). In contrast, the CL was longer for AF induced from the LA than from the RA (119.3±42.5 vs 111.0±47.9, $p<0.001$).
Conclusion: There is a higher beat-to-beat consistency during aconitine-induced AF than during pacing-induced AF. Furthermore, there appears to be more consistency when AF is induced from the RA than from the LA. These findings may explain the propensity for LA (or pulmonary vein) tachycardias to induce AF.

1039-202 **Pulmonary Valve Replacement in Childhood: Does Early Treatment of Pulmonary Insufficiency Improve Outcome?**

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Background: The detrimental effect of chronic pulmonary insufficiency (PI) following repair of tetralogy of Fallot (ToF) on right ventricular (RV) performance has been well-established. While pulmonary valve replacement (PVR) is performed routinely in adult patients with chronic PI, exercise performance may remain impaired secondary to irreversible RV dysfunction. There is no data assessing the frequency or outcome of children (age < 18 years) undergoing PVR for isolated PI following ToF repair. **Methodology:** Retrospective data review of all children undergoing PVR at a single institution for symptomatic isolated PI following previous ToF repair was performed. **Results:** During the 10 year period 1993-2003, 48 PVR were performed in 46 children for PI with associated symptomatic RV dilation at a mean age of 12.9 ± 3.9 years and weight of 42.4 ± 19.7 kg yielding a frequency of childhood PVR following ToF repair of 44% (46/105 patients undergoing ToF repair between 4/82-5/96). The interval from initial ToF repair to PVR was 10.6 ± 3.9 years. Type of PVR included pulmonary homograft in 10, Hancock porcine bioprosthesis in 12, Edwards bovine pericardial bioprosthesis in 16, and porcine valved conduit in 4. Median valve size was 25 (17-29). Patients were followed for a period of up to 10 years post PVR (3.6 ± 2.5 years). Re-operation was required in 2 patients: 1 patient with endocarditis of the PV 2 years post implant and the other with severe PI 8 years post PVR. There were no surgery related deaths. On follow-up, 3 additional patients had > mild PI, and 5 > mild PS. RV size fell from 34.5 mm prior to PVR to 23.8 mm post PVR ($p<.001$). Exercise testing pre- PVR in 24 children revealed a peak VO2 of 27.3 ml/kg/min (60% predicted). Follow-up stress testing revealed an improved aerobic capacity with a peak VO2 34.3 ml/kg/min (73% predicted) [p=.02]. **Conclusion:** Children undergoing repair of ToF in infancy are frequently left with symptomatic PI. Early PVR is associated with improved echocardiographic RV appearance and improved functional capacity. The risk of repeat surgical intervention needs to be weighed against the benefit of preservation of right ventricular function.

1039-203 **Aortopulmonary Window: Late Results of Surgical Repair in 40 Patients**

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Background:This study was undertaken to determine the long-term outcomes 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 right 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=6), ventricular septal defect (n=5), interrupted aortic arch (n=4), aortic 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, 49%), 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 is 98%, 94%, and 86% at 5, 15, and 25 years, respectively. Freedom from surgical or catheter reintervention is 85%, 76%, and 51% at 5, 15, and 25 years, respectively. Risk factors for death or reintervention include APW Type II (P=0.08) 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.
Conclusions: 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.

1039-204 **Rapidly Detective 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. Serum levels of HFABP, creatin kinase isoenzyme MB (CK-MB) and troponin T (TnT) were measured serially before operation and 0, 1, 2, 3 and 6 hours after an aortic declamping.
Result: Serum HFABP reached to peak level at 1 hour after declamping in 95 patients, which was significantly earlier than serum CK-MB or TnT (**Fig 1**). In addition, serum HFABP levels immediately after declamping correlated strongly with serum peak HFABP levels (**Fig 2**). The serum peak level of HFABP correlated with those of CK-MB and TnT ($p< 0.01$ for each). In the multiple regression analysis, age and aortic cross-clamp time were significant variables that influenced the release of HFABP ($p<0.0001$ for each). There were good relationship between serum peak HFABP levels and postoperative ino-