

Conclusion: In spite of a normal early post operative RVEF, many patients with P₁ after repair of ToF show a significant decrease in RVEF during long term follow up.

1120-157 The Arterial Switch Operation Twenty Years Later

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Background: The aim of our study was to evaluate incidence and severity of long term sequelae after arterial switch operation (ASO) for transposition of the great arteries (TGA).

Methods: We studied 99 consecutive pts who survived the ASO between 1977 and 1996. 65 pts had simple TGA, 34 pts had associated VSD and 11 had coarctation. A standard study protocol including serial ECG, echocardiography, and Holter was performed. Catheterisation or MRI were performed when indicated.

Results: 95 pts are in NYHA class 1, needing no medication. 1 pt died 14 years after ASO from pulmonary hypertension. 3 pts survived perioperative myocardial infarctions (MI); all had left coronary artery occlusion. All 3 have impaired LV function, but only 1 has symptoms and has had implantation of a defibrillator. Two pts have symptoms from aortic insufficiency. 38 reinterventions were performed in 24 pts, 33 for pulmonary stenosis, 2 for aortic stenosis, 2 for recoarctation and 1 for aortic insufficiency. Mean freedom from reintervention was 14 years (95% CI 12.3-15.6 y). 24 reinterventions were surgical, and 14 were balloon dilations. Pulmonary stenosis was the most frequent complication, present in 23% of patients. LV dysfunction was seen in 7 pts and dysrhythmia in 10 pts, of whom 8 have no symptoms. Apart from the three pts with MI, no coronary obstruction was found in 40 pts who had angiography.

Conclusion: At follow-up after ASO, the overwhelming majority of pts are in NYHA class 1. Pulmonary stenosis remains the most important late complication, and is only partially avoidable with improved surgical technique.

1120-158 Ten-Year Follow-up of Adults With Repaired Tetralogy of Fallot Using Serial Radionuclide Angiography

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Background: Right ventricular dysfunction contributes to long-term outcome in pts with repaired tetralogy of Fallot (rTOF). We employed serial radionuclide angiograms (RNA) to examine changes in right (RV) and left ventricular (LV) function in adults with rTOF.

Methods: We reviewed 10-yr records (1987-1997) of 97 pts (55 men) followed in our clinic with rTOF (mean age at repair 12.9 ± 10.6 yrs, mean age at follow-up 37.6 ± 9.9 yrs) and at least 2 RNAs.

Results: At the study conclusion most remained well (NYHA class I-80%, II-15%, III-5%). 11 had clinical arrhythmias (7 atrial, 4 VT); 1 died suddenly. 13 had elective right ventricular outflow tract (RVOT) reoperation (pulmonary valve replacement-10, relief of RVOT obstruction-3). No change in RV and LV function was seen (mean interval 5.7 ± 2.1 yrs between RNAs).

	LVEF rest	LVEF exercise	RVEF rest	RVEF exercise
First RNA	54.0 ± 12.1	59.2 ± 12.8	37.7 ± 11.8	40.1 ± 13.3
Last RNA	55.5 ± 12.4	60.8 ± 13.6	39.9 ± 10.8	42.9 ± 12.6

Mean values ± SD, first vs. last not significant.

In the reoperation group preoperative RV function did not differ from the remainder and did not change after surgery.

Conclusion: This group of closely followed rTOF pts remained well over 10 yrs with a low incidence of arrhythmias and stable RV and LV function, despite a relatively large number of reoperations. Aggressive intervention for right-sided hemodynamic abnormalities may have contributed to this outcome. Preserved ventricular function may herald a favorable long-term outlook in this group.

1120-159 Balloon Angioplasty of Native Coarctation of the Aorta in Adolescents and Adults: Longterm Results

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Background: In patients with coarctation of the aorta (CoA) arterial hypertension frequently persists when surgical repair is performed beyond age 20

years. We studied the effects of balloon angioplasty on blood pressure up to 12.5 years after the procedure.

Methods: 21 patients 24-50 years old (average, 32.6) underwent clinical follow-up 3.5-12.5 years after balloon angioplasty, including MRI, 24-hour ambulatory blood pressure measurement and non-invasive gradient measurement. Before balloon angioplasty 18/21 patients had hypertension. The pressure gradient was 59.7 ± 11.4 mmHg and the diameter of the stenotic segment 5.3 ± 1.9 mm. Directly after angioplasty the pressure gradient decreased to 20 ± 10.2 mmHg and the diameter increased to 11.6 ± 2.7 mm.

Results: At latest follow-up the gradient (Doppler) was 9.7 ± 7 mmHg, the diameter 14.6 ± 2.9 mm (MRI), 14/21 patients were normotensive and 7 (33%) had borderline hypertension. The residual pressure gradient of these 7 hypertensive patients was 13 ± 7 mmHg compared to 7 ± 6 mmHg in the normotensive patients. In all patients the former coarctation site was clearly visualized and measurable by MRI.

Conclusion: Balloon angioplasty is an effective mode of treatment in selected adolescent and adult patients with discrete native coarctation. At average follow-up interval of 7.9 years 66% were normotensive. Patients with persistent hypertension had higher residual pressure gradients. MRI is very useful and reliable in imaging coarctation of the aorta.

1120-160 Mechano-electric Feedback Late After the Mustard Procedure for Transposition of Great Arteries: The Arrhythmogenic Substrate?

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Background: The pathogenic mechanism for late atrial arrhythmias and sudden death (SD) after the Mustard procedure for transposition of great arteries (TGA) remains unknown. We employed different imaging techniques to examine the possible effects of ventricular dysfunction on arrhythmogenesis in these patients.

Methods: We studied 23 unselected patients (mean age 27.4 ± 4 yrs) at a mean of 24.7 ± 4yrs after the Mustard procedure with a 12-lead ECG, CXR, Echo, exercise-RNA and MRI. ECG and ventricular function indices were analyzed prior to the onset of clinical arrhythmia and therapy.

Results: There were no correlations between ventricular function indices assessed by Echo and exercise-RNA. In contrast, there were significant correlations between MRI and ECG parameters of conduction: max QRS duration correlated with RVEDD and RV free wall thickness (r = 0.72, p < 0.001 and r = 0.59, p < 0.01 resp.). When the 7 patients with clinical arrhythmia (atrial flutter-6 and VT-1) compared with the remainder, significant differences were found on QRS duration (137 ± 23 vs 116 ± 14 ms, p < 0.04), QT interval (522 ± 73 vs 450 ± 37 ms, p < 0.004) and QT dispersion (110 ± 54 vs 53 ± 25 ms, p < 0.003) and NYHA status.

Conclusion: QRS duration on the ECG in adult Mustard patients relates to RV volume and possibly pressure load, suggesting the presence of a mechano-electric interaction. Late atrial flutter after the Mustard procedure for TGA may be a surrogate marker for ventricular dysfunction.

1121 Ventricular Function: Congestive Heart Failure

Tuesday, March 31, 1998, Noon-2:00 p.m.
Georgia World Congress Center, West Exhibit Hall Level
Presentation Hour: 1:00 p.m.-2:00 p.m.

1121-29 Chronic Treatment With Amlodipine, but Not Nifedipine, Improves Enhanced Vascular Contractility in Cardiomyopathic Hamsters; A Possible Explanation for the Results of PRAISE Study?

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Background: The PRAISE study demonstrated that amlodipine, a new dihydropyridine Ca²⁺ channel antagonist, improves the prognosis of heart failure caused by nonischemic cardiomyopathy. However, the precise mechanisms by which amlodipine improves the prognosis have not been elucidated. We had previously reported that the contractility of aortic smooth muscle in cardiomyopathic hamsters (BIO 53.58; BIO) was markedly enhanced compared with that in normal hamsters (Fib), and the enhanced contractility may contribute to the pathogenesis in heart failure. In this study, we examined the effects of chronic treatment with amlodipine and nifedipine on vascular contractility in BIO.

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