1196-158 Doppler-derived Pulmonary Regurgitation Velocity Is a Non-invasive Index of Pulmonary Vascular Resistance in Children With Congenital Heart Disease

K. Mizelle, C. Morris, M. Silberbach. *Oregon Health Sciences University, Portland, OR, USA*

Knowledge of the pulmonary vascular resistance (PVR) is essential in the pre-operative assessment of most cardiac malformations and its measurement is now one of the most common indications for non-interventional cardiac catheterization. We retrospectively compared the CW Doppler-derived pulmonary regurgitation velocity (PI) with the catheterization lab-determined measurement of PVR in 35 individuals who had a variety of congenital heart defects. Chi square analysis demonstrated that PI <2.5 m/s correlated with PVR of ≤3 wu (torr/liter/min/m^2) and PI >2.5 m/s correlated with PVR >3 wu ($p < 0.006$). Fixed non-linear regression analysis showed an exponential correlation between PI and PVR ($p < 0.03$). To determine if PI distinguishes high PVR from high pulmonary blood flow (PBF) in the subset of patients with elevated pulmonary artery pressure, we compared a group with large VSD and high PBF (n = 11) to a group with high PVR (n = 10). Mean pulmonary artery pressure was similar in the two groups, 46 vs 53 torr (ns). PVR was significantly lower, and PBF was significantly higher in the VSD group, 2.49 vs 8.73 wu ($p = 0.01$) and 14.6 vs 5.35 l/min/m^2 ($p < 0.002$). PI was undetectable or trivial in the VSD/high PBF group but was present in all cases of the high PVR group. CW Doppler-determined PI was significantly lower in the VSD/high PBF group compared to the high PVR group 0.264 vs 3.2 m/s ($p < 0.0001$) even though the pulmonary artery pressures were similar. These data indicate that PI is an excellent marker of PVR and routine assessment of PI in the echocardiography laboratory may eliminate the need for cardiac catheterization in selected situations.

1196-159 One-to-Seven-Year Follow-up Results of Transvenous Atrial Septal Defect Occlusion With the Buttoned Device

P. Syamasundar Rao, F. Berger, T.R. Lloyd, R. Zamora, A.M. Worms, E.B. Sideris. *For the International Buttoned Device Trial Group; Saint Louis University School of Medicine, St. Louis, MO, USA*

Background: Immediate and short-term results of atrial septal defect (ASD) closure with the buttoned device have been documented. This study evaluates long-term follow-up of the cohort of 180 ASD occlusions which were performed with 1st, 2nd and 3rd generation buttoned devices and in whom we reported immediate and short-term results.

Methods & Results. Patient age varied between 0.6 and 76 years and stretched ASD diameter between 5 and 25 mm. The defects were closed with 25 to 50 mm devices delivered through 8-F (N = 148) or 9-F (N = 32) sheaths. Of the 180 patients, 166 (92%) had successful device implantation. The ASDs were effectively occluded as demonstrated by decrease in Qp:Qs, normalization of auscultatory findings and improvement of right ventricular volume overloading. During follow-up up to seven years (46 ± 20 mo; median, 48 mo), 14 (8%) required surgical (N = 13) or transcatheter (N = 1) intervention to close residual shunts (N = 11), treat late unbuttoning (N = 1) or core-wire migration (N = 2). Actuarial event-free rates at 1, 2, 5 and 7 years was 88%, 87%, 85% and 85% respectively. At the conclusion of the device placement trivial to small shunts were present in 43% patients. Percent residual shunts were 41, 34, 26, 25, 21, 21, 9, 8 and 10% respectively at 1 and 6 months and 1, 2, 3, 4, 5, 6 and 7 years; there is a tendency for residual shunts to become smaller and disappear. Reduction in the size of the right ventricle and normalization of interventricular septal motion occurred. No evidence for thrombus formation or vegetations was observed and there was evidence for trivial or mild mitral insufficiency in 4 (2.4%) patients.

Conclusion: Transcatheter occlusion of ASD with buttoned device is feasible, safe and effective and progressive disappearance of residual shunts occurs during the follow-up. With the introduction of 4th generation device and over-the-wire technique, the initial success rate has increased to 99% and therefore, long-term success rate is likely to be greater than 90%.

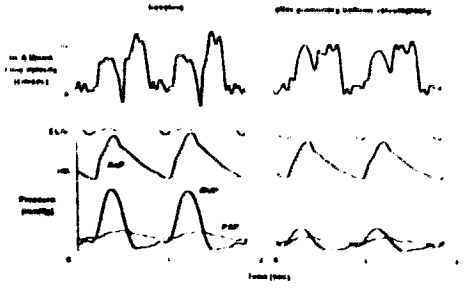
1196-160 Pulmonary Balloon Valvuloplasty Results in Improvement of Right Coronary Blood Flow Velocity Pattern in Patients With Pulmonary Valve Stenosis

I.E. Kallikazaros, C.G. Stratos, C.P. Tsioufis, C.T. Stefanadis, A.V. Sideris, P.K. Toutouzas. *Department of Cardiology, University of Athens, Greece*

Background: The effects of the elevated right ventricular systolic pressure (RVSP) and its changes on the right coronary artery (RCA) blood flow have not been well studied in humans.

Methods: The proximal RCA blood flow velocity (BFV) was measured, using an intracoronary Doppler velocimeter, along with hemodynamic parameters before and after pulmonary balloon valvuloplasty (PBV) in 10 patients with severe isolated pulmonary valve stenosis (mean age 28.6 ± 16.1 years).

Results: The pre-valvuloplasty phasic RCA BFV pattern was predominantly diastolic with an obvious systolic retrograde wave (Fig. left panel). RVSP had a negative correlation with the peak systolic antegrade BFV and the systolic antegrade BFV curve area ($r = -0.690$, $r = -0.454$, respectively) and a positive correlation with the peak systolic retrograde BFV, the systolic retrograde BFV curve area and the peak diastolic BFV ($r = 0.986$, $r = 0.722$, $r = 0.560$ respectively). PBV caused a significant reduction in both the transvalvular pressure gradient and the RVSP ($p = 0.002$) (Fig. right panel). The peak systolic antegrade BFV, the systolic antegrade BFV curve area and the ratio of total systolic to diastolic BFV curve area increased significantly ($p = 0.023$, $p = 0.048$, $p = 0.030$, respectively). The peak systolic retrograde BFV and the systolic retrograde BFV curve area decreased significantly ($p = 0.019$, $p = 0.038$, respectively). RVSP changes were negatively correlated with the changes in the peak systolic antegrade BFV and the ratio of total systolic to diastolic BFV curve area ($r = -0.743$, $r = -0.892$, respectively) and positively correlated with the changes in the systolic retrograde BFV curve area and the diastolic BFV curve area ($r = 0.805$, $r = 0.722$, respectively).



Conclusion: RCA BFV pattern is strongly dependent on the RVSP level and its changes after PBV. The reduction in RVSP induced by PBV results in improvement of the RCA BFV pattern.

1197 Coronary Artery Disease: Basic and Clinical Studies

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Georgia World Congress Center, West Exhibit Hall Level
Presentation Hour: 1:00 p.m.–2:00 p.m.

1197-29 Effect of Acute Testosterone Administration on Exercise-induced Myocardial Ischemia in Men With Coronary Artery Disease

G.M.C. Rosano, B. Bonfigli, F. Leonardo, P. Pagnotta, F. Pelliccia, R. Patrizi, P.L. Della Monica, S.L. Chierchia. *Cardiology, Istituto H San Raffaele Roma, Italy*

The role of Testosterone (T) on the development of coronary artery disease (CAD) in men is controversial. Though men have a greater incidence of CAD than women of similar age, recent studies have shown that T improves endothelium-dependent relaxation of coronary arteries in men. We evaluated the effect of acute administration of T on exercise-induced myocardial ischemia in 12 men aged 58 ± 4 years with proven CAD. After withdrawal of antianginal therapy, pts underwent 3 exercise tests (Modified Bruce protocol) on 3 different days at baseline and 30 minutes after either i.v. administration of testosterone (T, 2.5 mg) or i.v. placebo (P) given in a random order. All patients had diagnostic (>1 mm) ST segment depression after P, while only 9 pts had a positive test after T. Time to 1 mm ST segment depression (579 ± 222 sec. vs 471 ± 248; $p < 0.01$) and total exercise time (629 ± 204 sec vs 534 ± 242 sec; $p < 0.01$) were increased by T. Testosterone significantly increased the level of heart rate at the onset of 1 mm ST segment depression (135 ± 12 vs 123 ± 14; $p < 0.01$) and at peak exercise (140 ± 12 vs 132 ± 12; $p < 0.01$) as well as the rate pressure product at the onset of 1 mm ST segment depression (24213 ± 3750 vs 21619 ± 3542; $p < 0.05$) and at peak exercise (26746 ± 3109 vs 22527 ± 5443; $p < 0.05$). These preliminary data show that acute administration of T has a beneficial effect on exercise-induced myocardial ischemia in men with coronary artery disease. This effect may be partially related to coronary vasodilation.