451 Evaluation of right ventricular function in patients with post-operative pulmonary regurgitation by transesophageal echocardiography

A. Vitale 1, Y. Conde 2, E. Cirino 2, S. Steliofo 3, V. Fedele 3, D. Bettaglia 3, F. Caraceni 3, M. Cortes Monchets 3, 1 Roma, Italy; 2 La Sapienza University, Rome, Italy; 3 European Hospital Georges Pompidou, Paris, France

Background: We explored the accuracy of transesophageal strain Doppler echocardiography in detecting RV dysfunction in patients (pts) with postoperative tetralogy of Fallot (TOF) and hemodynamically significant pulmonary regurgitation (PR).

Methods: Transesophageal echocardiography with TDI and strain capabilities was performed in 14 pts aged 13-45 years who had repair of TOF: 12 age- and sex-matched subjects with no signs of heart disease were selected as normal controls (CTR). A thorough esophageal, low esophageal and transeophageal scanning was performed. The ratio of PR jet width measured by color Doppler to the infundibulum diameter was used to quantify the severity of PR (ratio >50% is moderate to severe PR). Right ventricular ejection fraction (EF), fractional shortening (FS), and tricuspid flow filling parameters (E/A ratio, DT) were determined. Offline analysis of the myocardial velocity data sets was performed using dedicated software. Velocity and strain traces from right ventricular free wall at 3 levels (basal, mid cavity, and apical) were processed in the esophageal 4-chamber view. Systolic and diastolic TDI values (Sw, Ew, Aw), peak systolic strain and systolic and diastolic strain rate values were determined.

Results: Three pts presented with severely dislisted RV and decreased fractional area change for progressive pulmonary insufficiency due to outflow patch and were excluded from analysis. 11 pts with dilated RV and normal fractional area change were analysed. E/Aw ratio was lower in pts than in CTR (p<0.005). Peak systolic strain and systolic and diastolic strain rate values were also lower in pts.

Conclusion: In adolescent and adult pts after repair of TOF, TEE is recommended to assess morphofunctional features especially when transthoracic images are limited by paucity of acoustic windows. In the presence of hemodynamically significant pulmonary regurgitation, strain Doppler echocardiography can detect RV systolic-diastolic impairment not shown by conventional echo-Doppler echocardiography.

452 Left ventricular false tendons and innocent heart murmurs of childhood

I. Germanakis 1, R. Perakis 1, F. Pantheeunakis 2, A. Patrakoonos 3, P.E. Vardas 3, M. Kalman 4, 1 University of Crete, Dept of Pediatrics, Pediatric Cardiology Unit, Heraklion, Greece; 2University of Crete, Dept of Pediatr. Pediatric Cardiology Unit, Heraklion, Greece; 3University Hospital, Dept of Cardioiology, Heraklion, Crete, Greece; 4University Hospital Heraklion, Dept of Pediatrics, Pediatric Cardiology Unit, Heraklion, Greece

Left ventricular false tendons are considered as insignificant findings during routine echocardiographic evaluation. Aim: To evaluate whether false tendons are implicated in the pathogenesis of innocent heart murmurs of childhood. Methods: 100 children (mean age 74.3±6.6 yrs, range:1-16 yrs) were consecutively enrolled from the outpatient population of the Pediatric Cardiology Unit. Excluded were patients with structural heart disease (including mitral valve prolapse), anemia and febrile disease. During a detailed echocardiographic evaluation the presence and location of left ventricular false tendons was documented. Blood flow across all valves and left ventricular outflow tract (LVOT) was measured and TDI measurements on septal mitral valve annulus were performed. Patients were divided into two groups according to the presence or absence of the typical vibratory murmur, by an experienced pediatric cardiologist.

Results: 61 of the children had an innocent murmur. The prevalence of false tendons was 88% and 61% in patients with and without murmur respectively (p=0.004) and their presence was associated with a 4.70.R (95% CI 1.5-14) for murmur. The presence of a false tendon, especially if multiple and located in the left ventricular outflow tract in association with increased blood flow velocities, might contribute to the pathogenesis of innocent heart murmurs of childhood.

453 Adults with total correction of tetralogy of Fallot-pulmonary regurgitation testing and plasma BNP levels

O. Trojarska 1, A. Gwizdala 2, A. Szykowska 2, Z. Oko-Sarnowska 2, 1 Inst. of Cardiology, Poznan Medical Academy, First Department of Cardiology, Poznan, Poland; 2University of Medical Sciences, Clinical Farmacology, Poznan, Poland

Introduction: Despite good long term results after total correction of tetalogy of Fallot (TOF) those patients (P) reach lower exercise capacity in comparison to healthy subjects.

Aim: Evaluation of exercise capacity with cardiopulmonary exercise test (CPET) and serum BNP levels in adults after correction of TOF and their relation with ventricular function assessed by echocardiography.

Material and methods: We studied 63 pts (31M), mean aged 27.7±5.1 yrs, operated at the mean age 7.4±5.1 yrs, mean 20.7±7.5 yrs ago. The controls: 28 intact subjects (13M), mean aged 28.7±5.1 yrs. On echo left and right ventricular end diastolic diameters (LV & RV), left ventricular ejection fraction (LVEF), right atrial diameter, deceleration time (DCT), isovolumic relaxation time (IVRT), right ventricular systolic pressure (RVSP), right ventricular outflow tract obstruction (RVOTO), pulmonary regurgitation (PR) were measured. The maximal CPET was performed (measurements of ventilator parameters during rest and modified Bruce protocol, forced vital capacity (FVC), minute ventilation (VE), first second forced expiratory volume (FEV1), maximum and peak oxygen uptake (VO2 and peak VO2), carbon dioxide production (VCO2), VENCO2 slope were assessed. Plasma BNP levels were measured by immunoradiometric assay (Shinoria BNP kit).

Results: The P reached the following parameters higher then controls: RVOT cm/s - 40,4±6.6 vs. 29.8±3.1 mm (p=0.0001), RVOTO cm/s - 227.4±63.4 vs. 110.2±10.5 mm (p=0.0001), VE/CVCO - 36.6±6.5 vs. 29.7±4.7 (p=0.0004). The P reached the following parameters lower then controls: VO2 - 24.9±5.7 vs. 36.6±1.7 ml/kg/min (p=0.0001), peak VO2 1.6±0.6 vs. 2.9±0.9 l/min (p=0.0001), VE - 60.1±19.5 vs. 114.4±38.2 l/min (p=0.0001), VC CO2 - 3.74±0.9 vs. 4.9±1.1 l (p=0.0001), BNP - 34.9±26.8 vs. 11.5±6.5 pg/ml (p=0.0001).

Negative correlations were found between BNP and VO2 (p=0.003), peak VO2 (p=0.003), BNP (p=0.0002), VE (p=0.003), V1(p=0.007), and FVC (p=0.038). Positive correlations were found between BNP and VE/CVCO2 (p=0.005) and RVOTO (p=0.01). Relations were shown between neither BNP and EF nor LV diastolic function parameters.

Conclusions: 1. Exercise capacity of adults after correction of TOF is reduced, particularly in P with IP. 2. BNP levels are elevated in this group of P indicating close exercise capacity essential to the pathogenesis of IP. 3. Higher BNP levels in those P appear to result from right ventricular volume overload.

454 Atrial strain rate and arrhythmias in patients after ASD closure

G. Di Salvo 1, G. Pacileo 2, M. Verrega 3, G. Limongelli 3, A. Rea 2, T. Miele 1, R. Caso 3, R. Calabro 4, 1 Institute of Medical Sciences, Clinical Farmacology, Poznan, Poland; 2Second University of Naples, Paediatric Cardiology, Naples, Italy; 3Monaldi Hospital, Department of Cardiology, Naples, Italy; 4Second University of Naples, Department of Cardiology, Naples, Italy

Atrial arrhythmias are common in the natural history as well as in the late postoperative course of patients with atrial septal defect (ASD).

Previous studies demonstrated electrophysiologic disturbances in ASD patients due to ASD itself and surgery. Other reports suggested an increase in atrial arrhythmias after ASD device closure. The aim of our study was to evaluate the possible correlation of atrial arrhythmias with the presence of ASD closure to that of sex-age matched ASD patients surgically treated, and sex-age matched controls, using strain (e) and strain rate (SR) imaging. In all, 68 subjects formed our studied sample: 22 patients after successful ASD device closure (ASD-D Group, mean age: 9±3 years, age at ASD closure: 7±3 years) and 22 age-sex-matched patients after successful ASD surgical closure (ASD-S Group, mean age: 9±3 years, age at ASD closure: 6±3). All patients underwent ASD correction at least 6 months before the study. As control group we selected 22 age-sex-matched healthy subjects. All subjects underwent a standard echo study, 24 h ECG imaging evaluation, and a 48 h ECG monitoring.

In the ASD-D group the peak systolic e and SR values were significantly reduced (p=0.01) in both RA (e = 47±17%; SR = 3.1±1.1 l/s) and LA (e = 40±13%; SR = 2.8±1.3 l/s) compared to controls: RA (e = 130±40%; SR = 5.9±1.3 l/s), LA (e = 94±19%; SR = 4.1±1.8 l/s) and ASD-D group (RA: e = 114±60%; SR: 5.1±2.5 l/s; LA: e = 70±23%; SR: 3.3±1.6 l/s).

Eur J Echocardiography Abstracts Supplement, December 2005