whom the PA was not connected to main PA. In this latter group, 4 of the 7 deaths occurred following an intervention. Kaplan-Meier estimate of survival after presentation for the entire group was 81% at 6 months, 73% at 2 years and 69% at 5 years up to 20 years. No improvement in survival was demonstrable over time. Survival was similar with or without surgical connection of PA to main PA, and did not relate to the presence of associated cardiac lesions or pulmonary artery dimensions. At latest follow-up, right ventricular hypertension was present in 75%, congestive heart failure in 13%, isolated lung hypoplasia in 73% and scoliosis in 42%. Exercise tolerance was NYHA class I in 19, II in 4, III and IV in 1 patient each.

Conclusion: While collaborative interventional and surgical strategies may succeed in rehabilitating the non-confluent PA with distal ductal origin, survival remains suboptimal and long-term complications are prevalent.

3:00 p.m.

Elevated Pre-Operative Ventricular Diastolic Relaxation Indices Correlate With Poor Outcome in Fontan Patients

Alizar U. Syed, William L. Border, Enrick C. Michelfelder, Karen Utzark, Peter B. Manning, Jeffrey M. Peart, Children's Hospital Medical Center, Cincinnati, Ohio.

Background: Earlier staged palliation of single ventricle patients has made many of the classic risk factors obsolete. Diastolic dysfunction significantly impacts post-Fontan physiology. However, neither standard pre-operative catheterization data, nor the previously described Mar's index, adequately predict diastolic dysfunction post-Fontan. We hypothesized that pre-operative Tau and negative dP/dt would predict post-Fontan diastolic dysfunction and correlate with morbidity. Methods: We retrospectively reviewed 18 pre-Fontan patients in whom digitized ventricular tracings could be obtained in order to calculate Tau, and negative and positive dP/dt. Preoperative transpulmonary gradient (TPG), pulmonary vascular resistance (PVR), and ventricular end-diastolic pressures (LVEDP) were also measured. Results: Pre Fontan patients in whom digital tracings were available were 15 (20 mos-25 yrs). Diagnoses included 1 tricuspid atresia, 2 pulmonary atresia intact septum, 3 hypoplastic left heart syndrome, and 3 other single ventricle anatomy patients. Dominant ventricular morphology was LV in 14 and RV in 4. Complicated outcome was defined as death, Fontan conversion, pancreatitis, or prolonged effusions. Results: There were 3 failed Fontans- 2 deaths and one transplant. Overt pancreatitis occurred in 3. Linear regression analysis against length of hospital stay of pre-operative Tau and negative dP/dt were statistically insignificant. However Tau and negative dP/dt significantly correlated with length of hospital stay (p< .0002 and p< .05 respectively), and with poorer outcome. Post-Fontan catheterization in 3 patients confirmed diastolic dysfunction, not elevated transpulmonary gradient, as the cause of poor outcome. The mean pre-Fontan Tau in 5 patients with significant complications was 41 (38-45) compared with 25 (18-31) in the un-complicated patients. Conclusions: Pre-Fontan PVR and TPG correlated poorly with outcome. In contrast, ventricular diastolic relaxation indices like Tau and negative dP/dt had a high degree of correlation with poor Fontan outcome.

3:15 p.m.

The Skeletal Muscle Hemodynamics and Endothelial Dysfunction in Patients After Fontan Procedure

Kei Inai, Makoto Nakazawa, Shou Takeda, Yoshihide Saita, Tokyo Woman's Medical University, Heart Institute Japan, Tokyo, Japan.

BACKGROUND: Patients after Fontan procedure has reduced exercise capacity, Skeletal muscle hemodynamics during exercise has been reported in patients with chronic heart failure, but not in Fontan patients. The contribution of endothelial function on exercise capacity is not known either. We sought to evaluate whether skeletal muscle hemodynamics during exercise and endothelial function limit the exercise capacity in Fontan patients.

METHOD: We evaluated 50 consecutive patients after Fontan procedure and 15 age matched healthy controls. Every subjects underwent a bicycle ergometer exercise test and near infrared spectroscopy was used to measure muscle oxygenation and blood volume changes. Additionally, transcutaneous ultrasonography. During exercise test, near infrared spectroscopy was with expired gas measurements. Every subjects underwent a bicycle ergometer exercise test and near infrared spectroscopy was used to measure muscle oxygenation and blood volume changes. Additionally, transcutaneous ultrasonography.

RESULTS: 414A ABSTRACTS - Pediatric Cardiology

Tuesday, March 19, 2002, 3:00 p.m.-5:00 p.m.
Georgia World Congress Center, Hall G
Presentation Hour: 4:00 p.m.-5:00 p.m.

1214-97 Fast Acquisition of 3-D Volumes (14-16/Sec) Allows Anypplane Navigation for Defining Anatomy on Fetale Echocardiography as Well as Multiplanar 3-D Motion Displays

Christine S. Sahn, Keith D. Baldenster, David J. Sahn, Oregon Health & Science University, Portland, Oregon.

Background: We tested a new rapid volume scanning ultrasound system (Voluson Model 730), which provides a multiplanar 3D display at up to 16 frames/sec, or a real time 3D rendered view of cardiac anatomy (3.5-MHz). Three orthogonal views, 3D grayscale images and 3D power Doppler angiograms may be visualized. The rapid acquisition (1/10 second) also allows “freezing” motion in heart walls and valves, as well as allowing 3D navigation of the volume to define cardiac anatomy in “anyplane”. Methods: We studied 15 fetuses (19-37 weeks gestation; 11 were normal, 2 had transposition, 1 had DORV, and 1 had aortic stenosis) to assess the utility of this method for extracting diagnostic images seen from a single acquisition from the best window on the mother’s abdomen. Results: In 10/11 studies, when the fetus was lying chest up, a single volume allowed the extraction of 4 Ch, LVOT, AO/PA, short axis, atrial septal and ductal arch views of good quality. In 8 lying in the position, aortic arch views were also obtained. When the fetus was lying sideways (n=2) or spine up (n=2), aortic arch views could always be obtained. In the 6 fetuses < 24 weeks, all views could be obtained, regardless of fetal position, from one window. The diagnostic features of the aortic arches, ductal stenosis, DORV and transposition were also elucidated from a single volume acquisition. Conclusions: This improved method for rapid volume scanning is applicable for delineating normal and abnormal fetal cardiac anatomy.

1214-98 Left Ventricular Myocardial Performance in the Fetus With Severe Tricuspid Valve Disease

Noboru Inamura, Jeffrey Smallhorn, Lisa K. Homburger, The Hospital for Sick Children, Toronto, Ontario, Canada, Osaka Medical Center and Research Institute for Maternal and Child Health, Osaka, Japan.

Background: Most forms of structural heart disease are tolerated by the fetal circulation, in part because blood flow is redistributed towards the unaffected ventricle and/or outflow. Tricuspid valve disease with severe tricuspid insufficiency (TVD), however, is one condition associated with a high rate of cardiovascular compromise and demise before birth. We sought to determine whether left ventricular (LV) function is abnormal in TVD and is a primary cause of cardiovascular compromise in fetal TVD. Methods: We reviewed the fetal echocardiograms and clinical records of 21 fetuses diagnosed with TVD. The cardiac/thoracic ratio (CT ratio), shortening fraction of the left ventricle, and Tei index were measured, compared to measurements in 20 normal fetuses, and correlated with clinical outcome. Results: CT ratio and Tei index were significantly greater in TVD than normal control cases (Tei 0.90-0.34 vs 0.45-0.15, respectively, p<0.001). Whereas, left ventricular shortening fraction did not differ. Ejection times in TVD were significantly shorter than in normal controls (147+/-23ms vs 178+/-22ms, respectively p<0.001) despite similar heart rates. There was a positive correlation between Tei index and CT ratio (p=0.01). The Tei index was highest in fetuses with TVD and pulmonary valve insufficiency or atrial septal defect. Compared to those with forward pulmonary artery flow (p=0.03). Of 11 continued pregnancies, 3 were stillborn, 3 developed hydrops fetalis and died as newborns, and 5 survived beyond the neonatal period. The Tei index was significantly greater in fetuses with perinatal demise than in those who survived (0.79+/-0.04 vs 0.65+/-0.07, respectively, p<0.001). Conclusions: Our results suggest that global left ventricular performance, assessed by Tei index and not by shortening fraction, is abnormal in fatal TVD. Decreased LV preload, as suggested by reduced ejection times may in part explain the poor LV performance and risk for cardiovascular compromise. A greater Tei index may identify fetuses with TVD at highest risk for perinatal demise.