

tervention for reacoarctation) or failures at immediate (0–1 mo.), intermediate (1–72 mos.) and long-term (>72 mos.) follow-up (FU) intervals. Comparisons between categories of arch measures were performed for each FU interval. **Results:** At immediate FU, the following differences between outcome categories were observed:

Echo Measurement	Success (n = 83)	Failure (n = 22)	P value
Aortic Annulus (cm/BSA <sup>0.5</sup> )	1.48 ± 0.20	1.35 ± 0.23	<0.025
Distal Aortic Arch (cm/BSA <sup>0.5</sup> )	1.15 ± 0.20	0.95 ± 0.17	<0.0001
Isthmus (cm/BSA <sup>0.5</sup> )	1.04 ± 0.17	0.79 ± 0.10	<0.0001
Isthmus z-score	-1.14 ± 0.98	-2.61 ± 0.53	<0.0001
Isthmic Volume (ml/BSA <sup>1.5</sup> )	0.63 ± 0.35	0.30 ± 0.20	<0.0001
Coarctation Site (cm/BSA <sup>0.5</sup> )	0.54 ± 0.14	0.49 ± 0.10	NS
Isthmus/Descending Aorta	0.91 ± 0.18	0.68 ± 0.14	<0.0001

At intermediate FU, the above variables achieved similar statistical significance in describing differences between success (n = 54) and failure (n = 21). Logistic regression analysis using isthmus z-score yielded a prediction model P (Fail) = (1 + e<sup>-6.22-2.39Z</sup>)<sup>-1</sup> in the immediate group. An isthmus z-score ≤ -2.16 predicted failure (91% sensitivity, 85% specificity). In the intermediate FU group, stepwise logistic regression with aortic annulus, isthmus z-score and coarctation site/isthmus ratio yielded a model predicting failure with 91% sensitivity and 81% specificity. Though less sensitive (39%), echocardiographic presence of patent ductus arteriosus was a highly specific (93%) predictor of failure at immediate and intermediate FU, with positive predictive value of 81%. A single patient failed during the long-term FU interval. **Conclusion:** Quantitative echocardiographic analysis of aortic arch morphometry predicts outcome of BA of native COA. These data may improve selection of candidates for BA.

05:00

**721-5 Transcatheter Management of Pulmonary Atresia/Intact Ventricular Septum (PA/IVS) in 29 Neonates**

Jean-François Piéchaud, Jean Kachaner, Angelica Delogo, Laurence Iserin, Yacine Aggoun, Daniel Sidi. *Hôpital Necker/Enfants-malades, Paris, France*

Twenty-nine infants aged 1–14 days had a 'favorable' form of PA/IVS including a well developed outflow tract separated from the pulmonary artery by an imperforated membrane, a tricuspid annulus >7 mms in diameter and no coronary fistulae. All had deep cyanosis and suprasystolic right ventricular (RV) systolic pressure. They received intravenous prostaglandin (PGE1) and underwent transcatheter perforation of the membrane with a guide-wire, or more recently (6 cases) with a radio-frequency probe, followed by balloon dilation. In 6 cases (21%), we failed to perforate or to dilate. In the other 23 (79%), the RV pressure fell dramatically with an outflow gradient <30 mmHg. Sixteen (70%) recovered an adequate antegrade RV flow while on PGE1 within 1–21 days (m = 8.7 ± 7.4). They are still doing well but 3 of them had a residual infundibular stenosis which did not respond to redilation and had to be operated on. Seven (30%) did not improve despite a widely open RV outflow tract and PGE1 had to be replaced by a surgical shunt, with 2 deaths and 5 long term recoveries. Non fatal complications included ductal injury (2), myocardial perforation (1), necrotizing enterocolitis (2), sepsis (1).

In conclusion, owing to technical advances such as the use of radio-frequency currents, relief of the outflow obstruction can be obtained in 80% of the neonates with favorable forms of PA/IVS. As soon as the RV has recovered its diastolic function, an adequate forward flow will appear. PGE1 should be infused in the meantime and surgery will be avoided in 61% of the cases.

05:15

**721-6 Pulmonary Balloon Valvuloplasty: Effective Palliation for Infants with Tetralogy of Fallot and Small Pulmonary Arteries**

Julie A. Vincent, Ronald G. Grifka, Michael R. Nihill, Charles E. Mullins, Frank F. Ing, Cameron J. Ward. *Texas Children's Hospital, Houston, Texas*

Infants with tetralogy of Fallot (TOF) and small pulmonary arteries (PAs) may need palliation to improve pulmonary blood flow and allow growth of the PAs prior to complete repair. Shunts may become occluded, distort the PAs or cause pulmonary overcirculation. As an alternative palliation, we performed pulmonary balloon valvuloplasty (PBV) on infants with TOF and small PAs.

20 infants, ages 1.8 ± 1.5 mo and weights 4.1 ± 1.6 kg, underwent PBV as initial palliation for persistent cyanosis or "spells". 4/20 pts were intubated prior to or for PBV. All pts had pre and post-PBV angiograms. In all pts, single balloon valvuloplasty was performed. The ratio of balloon:pulmonary valve annulus (PVA) diameter was 1.51 ± 0.32. Post-PBV, there was no change in the PVA diameter (5.2 ± 1.1 mm vs 5.6 ± 1.1 mm; p = 0.1) or PA branch diameter (4.1 ± 1.6 mm vs 4.5 ± 1.7 mm, p > 0.05). The systemic O2 saturation increased from 81 ± 8% to 93 ± 6%. (p < 0.001).

7/20 pts underwent follow-up (FU) cath 8.2 ± 2.4 mo post-PBV. Compared to pre-PBV measurements, the PVA diameter increased from 5.2 ± 1.1 mm to 7.1 ± 1.4 mm (p < 0.03) and the McGoon ratio increased from 1.4 ± 0.4 to 2.1 ± 0.3 (p < 0.02).

Of the 20 pts, 11 pts underwent corrective surgery 8.0 ± 3.1 mo post-PBV with no surgical deaths; 5 pts remain in stable condition awaiting surgery; 3 pts required shunt placement 9–66 days post-PBV; 1 pt died due to other congenital anomalies.

**Conclusions:** Pulmonary balloon valvuloplasty promotes growth of the PAs and PVA in infants with TOF and small PAs, offering a safe and effective alternative palliation for infants who are not yet candidates for complete repair.

**722 Assessment of Viability by Dobutamine Stress Cellocardiography**

Monday, March 20, 1995, 4:00 p.m.–5:30 p.m.  
Ernest N. Morial Convention Center, Room 14

04:00

**722-1 High Dose Dobutamine Echocardiography Detects Myocardial Viability and Ischemia in Coronary Cardiomyopathy**

Stephen J. Lewis, Stephen G. Sawada, Samer Khouri, Mark O'Shaughnessy, Judy Foltz, John R. Bates, Douglas S. Segar, Thomas Ryan, Gary D. Hutchins, Harvey Feigenbaum. *Indiana University School of Medicine, Indianapolis, IN*

Augmentation of wall motion during low dose (≤10 mcg/kg/min) dobutamine infusion has been utilized to detect myocardial viability in patients with ischemic cardiomyopathy. The utility of high dose (30–50 mcg/kg/min) dobutamine infusion to detect viable and compromised myocardium has not been described. Thirty-three patients with ischemic cardiomyopathy (mean EF of 0.33 ± 0.084) had low and high dose dobutamine echocardiograms and positron emission tomography (PET) using N-13 ammonia (NH3) and fluorodeoxyglucose (FDG). Left ventricular wall motion, NH3 and FDG uptake were scored using a 16 segment model. Of 490 interpretable segments, 321 (66%) were abnormal at rest. At low dose 85 (27%) segments augmented of which 80 (94%) were viable by PET. In 15 patients, an additional 32 (10%) abnormal segments augmented at high dose. PET viability was noted in 29 (91%) of these segments. In 18 of 33 patients (55%), 38 segments had stress induced wall motion abnormalities at high dose. Of the 38 segments, 37 (97%) were viable by PET. Angiography showed 34 of these 38 (89%) segments were supplied by an obstructed coronary artery (≥50% diameter stenosis). **Conclusions:** 1) The use of higher doses increases the sensitivity of DE to detect viable myocardium. 2) Deterioration of wall motion at peak indicates viable but compromised myocardium supplied by an obstructed coronary artery.

04:15

**722-2 Predicting Viability and Functional Recovery with Dobutamine Echocardiography and Positron Emission Tomography**

Stephen J. Lewis, Stephen G. Sawada, John R. Bates, Judy Foltz, Douglas S. Segar, Thomas Ryan, Gary D. Hutchins, Harvey Feigenbaum. *Indiana University, Indianapolis, IN*

Positron emission tomography (PET) is considered the gold standard for detecting myocardial viability. Unfortunately, PET is limited by availability and cost. Dobutamine echocardiography (DE) may be a cost effective and more available method of detecting viability. This report compared DE with PET in 33 patients (pts) with advanced coronary disease using a 16 segment model for left ventricular wall motion and uptake of fluorodeoxyglucose (FDG). PET viability was defined as normal or mildly reduced uptake of FDG. DE viability was defined as preserved wall motion at rest or augmentation during DE. PET showed evidence of viability in 93% (157/169) of segments with normal rest wall motion, 85% (62/73) of mildly hypokinetic segments and 93% (68/73) of severely hypokinetic segments. DE and PET were concordant in only 41% (71/175) of akinetic segments (46 nonviable and 25 viable). To investigate this discordance we evaluated follow up echocardiograms (≥four weeks) after coronary bypass surgery in 8 pts with 36 akinetic segments at rest. The ability of PET and DE to predict functional recovery of wall motion is as shown:

	(+)PV	(-)PV	Sens	Spec
PET	0.44	0.85	0.85	0.44
DE	0.60	0.73	0.46	0.83

PV = predictive value

MONDAY  
P.M.