Tuesday, March 5, 1991
4:00PM–5:30PM, Room 260, West Concourse
Pediatric Cardiomyopathy and Cardiac Transplantation

4:00

ELEVATED PULMONARY VASCULAR RESISTANCE AND CARDIAC TRANSPLANTATION: ARE LARGER DONORS BETTER?

Linda I. Addonizio, Daphne T. Hsu, Welton M. Gersony, Craig R. Smith, Eric A. Rose, Columbia University, New York, New York

Cardiac transplantation in patients with elevated pulmonary vascular resistance can result in lethal RV failure in the perioperative period. It is generally believed that a heart from a larger donor may help prevent this occurrence. We compared the donor and recipient weights, pulmonary vascular resistance index (PVRI), donor ischemic times, and incidence of RV failure in the 23 of 51 pediatric cardiac transplant patients with PVRI ≥ 6.

Twenty-three pts ranging in age from 1-18 years, had PVRI≥ 6 (mean 9 ± 2.7, range 6-16). Donor size was calculated as a percent of recipient size, and ranged from - 56% to +140%. The incidence of RV failure was compared between recipients whose donors were >25% or <25% larger than the recipient.

There was no correlation between the relative size of the donor hearts and PVRI(r=.32, p=.15), therefore larger donors were not always selected for these high risk patients in our series. Seven of 23 pts developed RV failure with 4 perioperative deaths. Three of 14 pts (21%) who received hearts from donors <25% larger than the recipient developed RV failure with 2 deaths. Three of 9 pts (33%) with donors >25% larger than the recipient developed RV failure with 2 deaths. There was no significant difference between these 2 groups (p=.64). There was no difference in the length of ischemic time for the donor organs.

Although the current belief is that a larger donor heart will help a patient with elevated pulmonary vascular resistance to survive the immediate perioperative period, we conclude from our series of 23 patients with elevated PVRI that choosing a donor larger than the recipient made no difference in the incidence of RV failure, or death from RV failure postoperatively.

4:15

ROLE OF ENDOMYCARDIAL BIOPSY REJECTION SURVEILLANCE IN PEDIATRIC CARDIAC TRANSPLANTATION

Vincent Zales, Susan Crawford, Carl Backer, Constantine Mavroudis, D. Woodrow Benson, Jr., Children's Memorial Hospital, Chicago, IL.

This report describes our post-Cardiac transplantation (CT) rejection surveillance protocol. CT have been performed for neonates (Group I, 8 pts; 6-35 days, mean = 18), and children (Group II, 10 pts; 1.1-14 yrs, mean = 7). Post-CT immunosuppression consisted of cyclosporin, imuran, and prednisone. Prednisone was discontinued 6 months following CT in Group I, but continued in Group II. Non-invasive rejection surveillance included clinical exam, echocardiographic (Echo) left ventricular (LV) dimensions and function. Cardiac biopsy was performed on an outpatient basis in Gr I and Gr II pts. Billinghams criteria were used to evaluate 4-8 biopsy samples. In Group I, biopsy was performed quarterly for 1 yr, after weaning Prednisone. In Group II, biopsy was performed 12 times in the first 6 months. Rejection was followed by weekly biopsy until resolution. In Group I, 7 episodes of rejection in 3 pts were suspected by clinical exam (heart rate, and appetite changes) and treated in the first 60 days post-CT. Echo change in LV function was only seen in 1 rejection episode. In 6 pts, 8 biopsy were performed, all <9 kg, with no evidence of rejection. There were no complications. In Group II, heart rate and Echo change in LV function was seen in 3 rejection episodes, but acute rejection was diagnosed in 14 of 140 biopsy in 9 pts. Because of a paucity of findings suggesting rejection during non-invasive rejection surveillance, biopsy must be utilized in the care of children post-CT. biopsy is safe and provides adequate tissue for reliable rejection surveillance.

4:30

USEFULNESS OF SURVEILLANCE ENDOMYOCARDIAL BIOPSY AFTER PEDIATRIC CARDIAC TRANSPLANTATION

Elizabeth Braunlin, R. Morton Bolman, III, Sara Shumway, W. Steves Ring, Maria T. Olivari and Raouf E. Nakhleh, University of Minnesota, Minneapolis, MN

Endomyocardial biopsy (BX) remains the gold standard for the diagnosis of acute rejection after cardiac transplantation (CTX) but few guidelines exist to determine the indications for BX in pediatric cardiac transplant recipients. To determine the usefulness of surveillance BX, we reviewed 176 BXS obtained in 12 patients, aged 0.5 - 16 (avg 9.7) years, maintained on cyclosporin, azathioprine and prednisone immunosuppression, and followed 2.8 - 45.5 (avg 19.3) months after CTX. Children old enough to cooperate undergo BX on 9 occasions in the first 6 months after CTX and quarterly thereafter. Children too young to cooperate undergo BX with general anesthesia on 4 occasions in the first 6 months after CTX and every 6 months thereafter. Additional biopsies are performed as warranted by symptoms or noninvasive tests.

Treatable acute rejection was present in 12 BXS (7%); continuing or resolving rejection in 16 others (9%). Remaining BXS had no evidence of rejection (105 BXS, 60%), had infiltrates insufficient to treat (28 BXS, 16%), were inadequate for diagnosis (14 BXS, 8%) or were consistent with ischemia (1 BX, 0.5%). During the first 6 postoperative months 9/101 BXS were positive for rejection, 6 occurring on surveillance BX. After 6 months 3/75 BXS showed a new episode of rejection, none occurring on surveillance BX.

We conclude: 1) episodes of rejection are unusual with triple drug immunosuppression; 2) surveillance BXS in the first 6 months after CTX may show unsuspected rejection; 3) routine surveillance BXS more than 6 months after CTX are unlikely to show rejection in the absence of symptoms or other tests.

4:45

LATE CARDIAC FUNCTION IN THE DISTALLY PROCURED GRAFT POST INFANT HEART TRANSPLANTATION

Mohammad S. Kanakriyeh, Mark M. Boucek, Jorge McCormack, Cheryl M. Mathis, Susan M. Moorehead, Leonard L. Bailey, and Steven R. Gundry
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Although acute transplant mortality is not affected by graft ischemic time up to 8 hours, the question of late graft function after long ischemia has not been answered. We compared cardiac function of 22 consecutive patients, 11 had locally procured grafts (LPG) and 11 had distally procured grafts (DPG). Ischemic times were longer in DPG (287±60) min vs LPG (107±11) min (p<.001). Mean follow-up period was 17 mos for both groups. Infants were evaluated by simultaneous ECHO and cardiac catheterization. Load independent end-systolic wall stress (ESWS)/velocity of circumferential fiber shortening (Vcf) relationship was studied at rest and after increasing afterload with methoxamine infusion (20-80 mcg/Kg/min).

Results:	LPG	DPG	PV
Heart rate (b/min)	114±10	113±14	NS
LV fractional shortening (%)	41±6	43±4	NS
LV pre-ejec/ejec time ratio	.27±.07	.27±.04	NS
Vcf (circ/sec)	1.56±.29	1.8±.24	NS
ESWS (gm/cm^2)	75±13	68±6	NS
Mean PA pressure (mmHg)	16±4	14±2	NS
PA wedge (mmHg)	10±2	8±2	0.05
LVEDP (mmHg)	10±2	8±2	<0.01
CI ($L/min/m^2$)	4.5±.8	3.7±.6	<0.05

The slope of relationship of ESWS/Vcf at various levels of afterload was similar in both groups. Resting CI was lower in DPG but LV filling pressure was also less.

Conclusion: Prolonged ischemia associated with distal procurement does not impair late graft function post infant cardiac transplant.