1035-134 Lipoproteins, Lipid Peroxides, and Soluble Selectin in Patients Undergoing Redo Coronary Artery Bypass Surgery

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The number of redo coronary artery bypass graft (CABG) procedures is steadily increasing and it is estimated that they now make up to 10% of all CABG operations that are currently performed. However, redo procedures are associated with increased morbidity and mortality and understanding the risk factors that lead to repeat procedures may help develop better strategies for treatment and may help delay or prevent these operations.
We compared 53 patients (44 men and 9 women) undergoing redo CABG with two groups of age and sex-matched patients: patients who had undergone CABG in the past and who had no evidence of ischemia at the time of routine follow-up, and patients who were scheduled to undergo their first CABG. We compared plasma lipoproteins, lipid peroxides, which are markers for the oxidative stress, and soluble E-selectin, a marker for inflammatory processes in the vessel wall, between the 3 groups using analysis of variance.
We found no significant variance in the plasma low-density lipoprotein(LDL) cholesterol levels or in the total cholesterol/high-density lipoprotein(HDL) cholesterol ratio (P=0.22 and P=0.63, respectively) between the 3 groups. The level of lipoprotein(a), a particle that may play a dual role in atherosclerosis and thrombosis, varied significantly between the groups (P=0.001). The plasma lipid peroxides and soluble E-selectin levels also showed significant variance between the groups (P=0.03 and P=0.009, respectively).
Our data suggests that oxidative stress and inflammatory processes in the vascular wall may play important roles in the pathogenesis of coronary bypass graft atherosclerosis and may ultimately be associated with an increased risk for redo CABG. The presumed proatherosclerotic and prothrombotic/antifibrinolytic activity of lipoprotein(a) is probably another contributor to this process.

1035-135 Bosentan: A Therapeutic Strategy for Severe Radial Artery Vasospasm

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Background: Radial arteries are increasingly used as conduits for coronary artery bypass graft surgery. Severe and protracted vasospam is a rare and potentially fatal complication of radial artery use. Recent evidence suggests that the potent vasoconstrictor peptide, endothelin-1 (ET-1) may mediate resistant vasospasm of the radial artery. We compared the vasodilatory effects of the $ET_{A/B}$ receptor antagonist, bosentan vs. papaverine and verapamil in human radial arteries contracted with ET-1.
Methods and Results: Segments of human radial arteries (n=14) were obtained perioperatively from patients undergoing coronary artery bypass graft surgery. Vascular segments were cut into rings (3-5 mm in length) and mounted in isolated tissue baths for isometric dose-response assessments. Following equilibration, tissues were stimulated with a vasospastic dose of ET-1 (10^{-8}M) and concentration-response curves to bosentan (n=8), papaverine (n=9) and verapamil (n=9) constructed. Percent maximum relaxation (%Emax) and agonist-sensitivity (EC_{50}) values were compared between groups using repeated measures ANOVA. ET-1 caused marked and protracted contraction of radial artery segments. Bosentan evoked significantly greater maximum relaxation (%Emax 93.3±6.6) when compared to either papaverine (%Emax 68.4±5.3) or verapamil (%Emax 56.2±4.7), p<0.01. Additionally, bosentan was a more potent in vasodilating radial arteries (EC_{50} 2.4±1.1 x 10^{-7} M) when compared to papaverine (EC_{50} 4.2±2.4 x 10^{-6} M) or verapamil (EC_{50} 3.1±2.7 x 10^{-6} M), p<0.01.
Conclusions: ET-1 has been implicated as an important mediator of severe radial artery vasospasm. We herein report, for the first time, the superiority of bosentan (compared to conventional agents) as a potent vasodilator of human radial artery segments contracted with vasospastic ET-1 concentrations. Bosentan may be an important pharmacological strategy for radial artery vasospasm.

1035-136 Can Cardiac Operations Be Performed Safely in Liver Transplant Recipients?

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Background: Improved survival and widespread application of orthotopic liver transplantation has resulted in an increased number of liver transplant patients subsequently presenting for cardiac surgery. This study examines outcome of cardiac operations after previous orthotopic liver transplantation.
Methods: From December 1993 to November 2000, eleven liver transplant patients (7 men, 4 women) underwent cardiac operations. Median age was 61 years (range, 29 to 71). The majority (91%) was in New York Heart Association functional class III or IV. Risk factors included hypertension (73%), chronic renal insufficiency (55%), and diabetes (36%). The median left ventricular ejection fraction was 0.60 (range, 0.30 to 0.70). Cardiac operations included coronary artery bypass grafting in 5 patients, valve replacement or repair in 4, and combined valve replacement and coronary artery bypass grafting in 2. Median time interval from liver transplantation to cardiac surgery was 6.6 years (range, 1.1 to 12.1).
Results: There were no early deaths. Major complications occurred in three patients and included ventilator dependence requiring temporary tracheostomy in 2 patients, septicemia in 1, adult respiratory distress syndrome in 1, and a leg wound hematoma requiring operative drainage in 1. Average perioperative blood transfusion requirements were three units (range, 0 to 7). Transient elevations in liver function parameters occurred in five patients. There were no episodes of hepatic rejection. Follow-up was complete in all 11 patients (median 12.2 months, range, 7.8 to 83.5). There were two late deaths secondary to non-cardiac causes.
Conclusion: Cardiac surgery can be performed safely in liver transplant recipients. In our limited experience, the intermediate-term results are good with low early mortality and no major hepatic complications. Perioperative morbidity appears higher than in non-transplant recipients.

MODERATED POSTER SESSION

1036MP Moderated Poster Session...Aortic Valve Stenosis

Sunday, March 17, 2002, Noon-2:00 p.m.
Georgia World Congress Center, Hall G

Noon

1036MP-121 LV Remodeling Following Aortic Valve Replacement for Aortic Stenosis in the Elderly

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Background: Older studies of LV remodeling following valve replacement (AVR) for aortic stenosis (AS) have shown substantial reductions in LV mass. However the relevance of these findings for pts who are seen in current clinical practice, who are older, in whom LV dilation is uncommon, and in whom hypertension (HTN) is prevalent, is uncertain. **Methods:** We reviewed pre- and post-op echos in 30 pts with pure AS, age 67 ±10; mean follow-up was 24 mos (range 6-56); 14/30 pts had coexistent HTN. Myocardial function was assessed by relating midwall shortening (FSmw,%) to peak systolic stress (σc, g/cm2). **Results:** Following AVR, mass and σc fell (see Table) and there was little change in FSmw. However 17/30 pts had LV mass changes that were within ±60g of preop, well within the range of precision for M-mode LV mass calculations. Change in mass was related closely to preoperative mass: r=0.67, p<0.001. However, mass regression was not significantly different between groups when grouped by hypertension status, by prosthesis size or type, or interval between AVR and post-op echo. Only 5/30 had LV dilation on the baseline study. **Summary/Conclusion:** In older subjects, substantial, unequivocal LV mass reduction following AVR occurs, but in only 40% of pts. Many older pts experience modest mass reduction following AVR for AS. The magnitude of LV mass regression is related to the reduction in stress, but more closely to preop LV mass. Improvement in midwall shortening is marginal, despite significant reduction in afterload.

	PWTd (mm)†	LVIDd (mm)	LV Mass (g)†	RWT	peak stress (g/cm^2)†	FSmw (%)
pre-op	13±2	50±6	263±85	0.52±0.04	309±83	20±3
post-op	11±2	48±5	219±62	0.50±0.04	248±64	21±3

LVIDd and PWTd are diastolic dimension and wall thickness, RWT=relative wall thickness † = p<0.05 by unpaired t-test

12:12 p.m.

1036MP-122 The Rate of Hemodynamic Progression Is Strongly Predictive of Clinical Outcome Mostly in Mild and Moderate Aortic Stenosis

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Background. It has been recently reported that in patients with asymptomatic aortic stenosis (AS) a faster rate of hemodynamic progression is associated with a worse prognosis. The published studies however are limited by the small number of patients and by the short duration of follow-up. Furthermore little is known about the long-term outcome in mild and moderate AS. Methods. We analyzed from our echocardiographic database (1988-2000) all adult patients with an initial peak aortic velocity >2 m/s and with at least two echo examinations >6 months one apart of the other. Patients with pre-existing prosthesis and/or aortic regurgitation more than moderate were excluded. The study population includes 1040 patients (544 males, 496 females; mean age 67±11 years) followed for 45±32 months (range 6-140 months), each one with 4±3 echocardiograms. According to the first maximum Doppler velocity patients were divided into 3 groups: A) Mild AS (velocity <3 m/s): 550 patients; B) Moderate AS (velocity 3-3.9 m/s): 304 patients; C) Severe AS (velocity >3.9 m/s): 186 patients. Results. Mean increase of jet Doppler velocity was 0.15±0.29 m/s/y in the entire population, 0.12±0.28 in group A, 0.22±0.28 in group B, 0.15±0.34 in group C (p<0.001). Overall mean reduction of aortic valve area was 0.07±0.10 cm2/y; 0.07±0.12 in group A, 0.08±0.09 in group B, 0.06±0.10 in group C (p<0.01). A rapid progression (>0.3 m/s/y) was found in 19.6% of patients (13.4% in group A, 28.3% in group B and in 23.7% in group C; p<0.001). During follow-up major clinical end points (cardiac death or aortic valve replacement) were observed in 39.1% of patients (8.7% in group A, 38.5% in group B, 68.3% in group C; p<0.001). Patients with faster progression had more clinical end points (55.2% vs 22.2% in the entire population, p<0.001; 28.4% vs 5.7% in group A, p<0.001; 61.6% vs 29.4% in group B, p<0.001; 72.7% vs 66.9% in group C, p=ns). Conclusion. Our study demonstrates in a large series of patients that hemodynamic progression is faster in moderate AS than in mild and