

CF. Conclusion: Increased MMP-2 activity in chronic AR may result in part from AR-induced downregulation of TIMPs, with subnormal inhibition of MMP. Pharmacological targeting of the MMP/TIMP-system may be effective in normalizing remodeling in AR.

Inhibit or	Regurgitant Fraction (%)	Inhibitor Band Intensity : GAPDH Band Intensity (n=6)		Ratio (NL:AR)
		NL	AR	
TIMP-1	14	0.9:1	0.6:1	1.5:1
	25	2.3:1	1.0:1	2.2:1
	45	2.4:1	1.7:1	1.4:1
			Avg Ratio	1.7:1 (p=.01)
TIMP-2	14	1.0:1	1.0:1	1.1:1
	25	2.6:1	1.6:1	1.6:1
	45	1.7:1	1.2:1	1.3:1
			Avg Ratio	1.3:1 (p=.06)

POSTER SESSION

1086 Valvular Heart Operations: New Procedures and Interventions

Monday, March 08, 2004, Noon-2:00 p.m.
Morial Convention Center, Hall G
Presentation Hour: 1:00 p.m.-2:00 p.m.

1086-135 The Modified Ross Procedure in Patients With Aortic Dilatation

Paul Stelzer, Charles Geller, Robert Tranbaugh, Beth Israel Medical Center, New York, NY

Background: The Ross Procedure (pulmonary autograft replacement of the aortic valve) has become a very useful option in young patients with isolated aortic valve disease. There has been concern about using this option in patients with ascending aortic dilatation or aneurysm. This study was designed to examine whether an aggressive approach to repairing or replacing the dilated ascending aorta could be safely combined with the modified Ross Procedure.

Methods: Fifty-six of 339 consecutive adult patients undergoing the modified Ross Procedure over 16 years had replacement (15) or reduction (41) of the ascending aorta. This included 47 men and 9 women with an average age of 43.8 years. Of the 15 graft replacement patients, the autograft root was supported with either an external "jacket" of graft material (10) or residual native aorta (3). Thirteen graft replacement patients required hypothermic circulatory arrest averaging 20 minutes. Thirty-seven patients had elliptical lateral aortorrhaphy and 4 had closed plication. Cardiac ischemic time averaged 180 minutes for graft replacement and 156 minutes for aortorrhaphy versus 145 minutes for patients without concomitant procedures.

Results: There was one operative death (from sepsis) for a 1.8% mortality compared to 2.2% (6/283) without ascending aortic surgery. Two other patients survived major complications – right ventricular failure and reversible neurologic deficit. Discharge echocardiograms of the 55 survivors revealed no or trace aortic regurgitation in 39 and mild in 16 patients. All returned to Class I functional status. No patients have required further surgery. Follow up echo data show only one patient (un-"jacketed") with evidence of root dilatation.

Conclusion: The modified Ross Procedure can be safely extended to include patients with a dilated or aneurysmal ascending aorta using an aggressive approach to repair or replacement.

1086-136 Tissue Engineered Heart Valve Conduits of Porcine or Human Origin Differ Importantly in Chemotactic Activity for Monocytic Cells

Erwin Rieder, Marie-Theres Kasimir, Gernot Seebacher, Ernst Wolner, Paul Simon, Guenter Weigel, University Vienna, Vienna, Austria

Background: To overcome the obstacles of conventional heart valve substitutes an already clinically applied approach is to decellularize xenogenous or allograft valves. As these prostheses are considered to be non-antigenic and thus superior to cryopreserved valve allografts, the aim of this study was to examine a remaining chemotactic activity of porcine and human acellular valve matrices.

Methods: Porcine and human pulmonary valves were decellularized using a detergent-based method. Soluble matrix proteins of the acellular tissue were extracted and chemotactic activity for U937 monocytic cells was examined in a transmigration-chamber. Native porcine and cryopreserved valve allograft tissue was used as positive control. To detect residual soluble proteins within the matrix, protein-electrophoresis was performed.

Results: A significantly reduced ($p < 0.05$) cell migration was seen comparing the cryopreserved allograft tissue (746.4 ± 136.1 cells/ μ l \pm SEM in lower chamber, $n=10$) and the

decellularized porcine valve conduit tissue (183.6 ± 18.7 , $n=10$). Surprisingly, the chemotactic activity of acellular human valve tissue (34.6 ± 8.6 , $n=10$) was similar to the negative control (39.2 ± 6.6 cells/ μ l, $n=10$) and significantly lower ($p < 0.001$) than the decellularized porcine valve matrix. Electrophoresis of the acellular xenogeneic tissue revealed that considerable amounts of soluble proteins with different molecular weights remain in the porcine matrix which were not detected in the decellularized human valve tissue.

Conclusion: We describe for the first time that the remaining immunogenic activity strongly depends on the source of a tissue engineered heart valve. Whereas the acellular porcine pulmonary valve does not result in the considered inert heart valve scaffold and thus might induce an immunological response, the decellularization of a human pulmonary heart valve diminishes the chemotactic activity of the valve tissue. This findings will have an important impact on further investigations on tissue engineered heart valves.

1086-137 Impairment of Left Atrial Appendage Mechanical Function Following Electrical Isolation With Epicardial Radiofrequency Bipolar Ablation

Marco A. Zenati, David Schwartzman, University of Pittsburgh, Pittsburgh, PA

Background: Intraoperative, open-chest, beating heart epicardial radiofrequency ablation without atriotomy is an emerging technique for cure of atrial fibrillation. During these procedures, in order to replicate electrophysiologically the MAZE III procedure, an operator may ablate at the base of the left atrial appendage (LAA), rendering it electrically isolated, without physically removing or occluding it. Our experience suggests that this might be dangerous. **Methods:** In each of 5 large healthy pigs, electrical isolation of the LAA at its base (junction with left atrial body) was achieved without atriotomy in a beating heart/open chest preparation with a single application of energy via a bipolar ablation device. Post-mortem analysis demonstrated the ablation lesion to be transmural and very discrete, involving $< 10\%$ of the total LAA volume. LAA, pulmonary vein, transmittal Doppler velocities and electromechanical properties were measured immediately prior to and after ablation using intracardiac echocardiography (ICE, AcuNav) and electromechanical mapping (NOGA, Biosense Webster). All animals were in sinus rhythm throughout the study. **Results:** There was a marked diminution of LAA peak flow velocity between pre (0.4 ± 0.2 meters/sec) and post (0.1 ± 0.08 meters/sec) ablation ($p < 0.05$). There was no significant change in either pulmonary venous or transmittal velocity. NOGA-derived LAA local linear shortening was markedly diminished in the LAA region ($8\% \pm 3\%$ pre vs $2\% \pm 1\%$ post-ablation; $p < 0.05$). ICE also demonstrated spontaneous echo contrast not seen before. **Conclusions:** Electrical isolation of the LAA produces mechanical paralysis, dilatation, and blood stasis. It is reasonable to hypothesize that these changes would be clinically prothrombotic. If an electrically isolated LAA is not to be excised, its orifice should be carefully occluded.

1086-138 In Which Patients Does Artificial Renal Support Really Help After Cardiac Surgery?

Marzia Leacche, Wolfgang C. Winkelmayr, Subroto Paul, Julie Lin, Tomislav Mihaljevic, James D. Raw, John G. Byrne, Brigham and Women's Hospital, Boston, MA

Objective: We developed a scoring system to predict outcome in patients who develop acute renal failure (ARF) requiring artificial renal support after cardiac surgery, thereby providing a tool to guide whether or not intensive artificial renal support therapy is justified.

Methods: From 01/92-07/01, 136/14,000 (0.9%) patients developed ARF requiring artificial renal support following cardiac surgery. Fifty-five (40%) underwent CABG/valve, 39 (29%) isolated CABG, 21 (15%) isolated valve, 12 (9%) heart transplant and 9 (6%) other procedures. Multivariate logistic regression, based on pre-dialysis parameters, was used to construct a prediction score for operative mortality for those patients with ARF requiring artificial renal support.

Results: The overall operative mortality (OM) was 58% (70/136). From the logistic regression model (Table) we assigned a score based on the presence of independent predictors of OM. Higher scores strongly predicted OM. Among the 54 patients with a score ≥ 3 prior to artificial renal support, OM was 85% (115/136) (Specificity 95%). The positive predictive value was 94%. In patients with score ≤ 1 , OM was 18% (24/136).

Conclusions: The scoring system represents a simple and accurate tool for predicting OM in cardiac surgery patients who develop ARF prior to the institution of resource intensive artificial renal support. Thus, in patients with high scores, artificial renal support is associated with exceedingly high OM and may not be justified.

Multivariate Predictors of Operative Mortality

Patient Characteristics	OR	CI	P Value	Points Assigned
Pre Dialysis Coma	9.6	2.3-39	0.001	2
Preop Creatinine < 1.5 mg/dL	5.0	2.0-12	0.0007	1
Preop Hypertension	4.4	1.6-12	0.004	1
Pre Dialysis Sepsis	6.4	2.2-18	0.0005	1
Pre Dialysis Total Bilirubin > 2 mg/dL	5.6	2.1-15	0.0006	1