

and apical short axis (SA) levels. Percent tissue segmental shortening was measured at equally spaced intervals throughout systole (table). The direction of motion of each tissue segment was also measured. No significant differences in shortening were seen from base to apex at each time point.

	% Segment shortening			
	Early systole	Mid systole	Late systole	End systole
Base	5.5 ± 7.6	11.0 ± 9.7	14.2 ± 11.7	17.3 ± 14.6
Mid	5.1 ± 9.6	11.5 ± 14.6	14.9 ± 12.9	18.1 ± 13.9
Apex	2.4 ± 11.3	8.9 ± 15.2	12.9 ± 12.5	10.1 ± 12.6
Mean	4.4 ± 9.5	10.5 ± 13.2	14.0 ± 12.3	15.3 ± 14.1

Assessment of the direction of motion of the RV segments indicated motion in an inferior direction in a pattern of pre-ejection coiling in early systole, and movement superiorly and posteriorly during the remainder of systole. These motion patterns cannot be observed visually from un-tagged images. Characterization of the contractile function of the RV myocardium and patterns of motion (e.g. pre-ejection coiling) using tagging provides unique information that may prove useful in assessing RV adaptation to volume and pressure overload.

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794-6 Regional Heterogeneity of Mural Mechanics in Left Ventricular Hypertrophy From Chronic Volume Overload

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Although abnormal intramural myocardial function has been reported using magnetic resonance tissue tagging (MRTT) in left ventricular hypertrophy (LVH) induced by pressure overload, little is known regarding intramural mechanics in LVH due to chronic volume overload. Accordingly, we studied 5 patients (4 male, mean age 50) with chronic asymptomatic aortic regurgitation (AR) of moderate severity and preserved systolic function and compared them to 10 normals (6 male, mean age 27) to determine whether mechanical dysfunction was present in volume overload LVH. We used fast breath-hold MRTT and two-dimensional finite element analysis to measure the principal intramural orthogonal strains, λ_1 (greatest systolic elongation), λ_2 (greatest systolic shortening), β (angular deviation of λ_1 from the radial direction), and element displacement (D) in 4 regions at three short axis levels of the LV. We used Doppler echo to measure end-diastolic LV diameter and fractional shortening, which were 5.8 ± 0.1 cm and $34 \pm 8\%$, respectively. Results (means):

Region	λ_1		λ_2		β (°)		D (mm)	
	NL	AR	NL	AR	NL	AR	NL	AR
Septum	0.16*	0.22	-0.22	-0.19+	12.6	12.8	5.0*	4.3+
Inferior	0.18	0.18	-0.23	-0.19+	11.8	10.5	6.8	8.1+*
Lateral	0.23	0.18	-0.23	-0.17+	8.7	10.3	7.3	8.7+*
Anterior	0.24	0.20	-0.23	-0.17+	11.0	10.4	7.1	5.6*
ANOVA p	<0.05	NS	NS	NS	NS	NS	<0.05	<0.05

*p < 0.05 Sept vs others, +p < 0.05 AR vs NL, #p < 0.05 Inf&Lat vs others

In volume overload LVH, there was a significant reduction in greatest systolic shortening (λ_2) in all regions despite preserved global function. The normal regional heterogeneity of λ_1 was lost, yet β remained unchanged. The pattern of D became incoordinate, being attenuated in the septal and anterior walls, but augmented in the inferior and lateral walls. MRTT demonstrates changes in intramural function and motion which precede the development of clinical symptoms and the decline in global systolic function in AR.

795 Impact of Atrial Fibrillation on the Care of the Cardiac Surgical Patient

Wednesday, March 27, 1996, 2:00 p.m.-3:30 p.m.
Orange County Convention Center, Room 230B

2:00

795-1 Atrial Fibrillation Increases Length of Stay and Cost After Cardiac Surgery in Low Risk Patients Targeted for Early Discharge

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Reduction of hospital costs and lengths of stay (LOS) after cardiac surgery may be limited by postoperative atrial fibrillation (popAF), which does not peak

in incidence until postoperative days 2-4. We sought to determine if popAF affects hospital cost or LOS in low risk patients and to identify predictors of popAF in younger, low risk patients. We studied 258 pts enrolled in a 5-day recovery plan (FRP), that targeted low-risk patients undergoing cardiac surgery for early discharge. Inclusion criteria for the FRP included age \leq 72 yrs, normal or mildly impaired LV function, and absence of significant pulmonary, renal or neurologic disease.

Results: PopAF occurred in 79/258 pts (30.6%), was the most common reason for LOS > 5 days, and was associated with higher LOS ($p = 0.0001$) and cost ($p = 0.0022$) [see Table 1]. Univariate and multivariate logistic regression analysis of pre- and intra-operative variables identified age, valvular surgery, and ventricular hypertrophy as independent predictors of popAF occurrence in this low-risk group [see Table 2].

Table 1

	No popAF	PopAF	p value
Age, yrs*	56 (48, 63)	62 (54, 67)	0.0026
LOS, days	7.0 ± 4.6	7.6 ± 2.6	0.0001
Operative LOS	6.5 ± 4.5	7.1 ± 2.3	0.0001
Direct cost, \$*	7542 (6483, 8878)	8519 (7611, 9785)	0.0022

*median, interquartile range (25, 75th percentile) for non-normal distribution

Table 2

	Odds Ratio	95% CI	p value
Age (per 10 yrs)	1.75	1.24-2.49	0.0017
Valve surgery	2.50	1.21-5.15	0.0131
Ventricular hypertrophy	4.14	1.38-12.44	0.0113

Conclusions: Postoperative AF remains an important complication in low risk patients that increases LOS and cost after cardiac surgery. Application of effective prophylactic strategies for postop AF to patients targeted for early discharge after cardiac surgery may reduce hospital LOS and cost.

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795-2 Effect of Cardiopulmonary Bypass on Plasma Ionized Magnesium Level and Correlation With Atrial Fibrillation After Coronary Artery Bypass Grafting

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Postoperative AF (POAF) occurs frequently after CABG. Previous studies have suggested that total Mg (Mg_{TOT}) falls after cardiopulmonary bypass (CPB), and that patients with low Mg_{TOT} are more likely to develop POAF. We measured intraoperative plasma Mg_{TOT} and the biologically active species, ionized Mg (Mg_{ION}), the latter using a novel ion-specific electrode (NOVA-8), in 34 patients undergoing CABG. Mg was routinely used in the pump-priming solution ($MgCl_2$, 30 mg/dl) and patients received $MgSO_4$ supplementation postoperatively (target $Mg_{TOT} \geq 2$ mg/dl). Continuous cardiac monitoring was performed postoperatively until hospital discharge. Thirteen patients (38%) had AF lasting at least 60 minutes, the primary endpoint.

	Mg_{ION} (mmol/l)		Mg_{TOT} (mg/dl)	
	pre CPB	post CPB	pre CPB	post CPB
AF (n = 13)	0.50]*	0.48]*	1.77]*	1.65]*
No AF (n = 21)	0.44]	0.44]	1.76]	1.62]
Total (n = 34)	3.46	0.45	1.76	1.63

*p = NS, t test, Bonferroni corr.

Thus, intraoperative Mg containing solutions prevent the reduction during CPB of Mg_{ION} , the active moiety, but not Mg_{TOT} . Intraoperative levels of Mg_{ION} and Mg_{TOT} are not correlated with POAF after CABG. Aggressive Mg supplementation alone does not prevent POAF after CABG.

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795-3 Low Dose Sotalol to Prevent Supraventricular Arrhythmias After CABG Surgery and Its Effects on Hospital Stay

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To assess a potential prophylactic effect of low dose sotalol (S) in the prevention of supraventricular arrhythmias (SVA) after CABG surgery, 215 consecutive patients (pts) (197 male, 23 female, age 60 ± 9 years) were prospectively studied. In a double-blind randomized fashion, pts received 80 mg S bid (n =