ischemia after a positive DSE, and they had maximal heart rates and blood pressures during surgery below the treshold for ischemia during DSE.

This study confirms that DSE can discriminate pts at high risk from those at relatively low risk for myocardial ischemia during aortic surgery, and can identify the myocardial area at risk. However, the predictive value is limited when intraoperative changes in heart rate or blood pressure exceed those achieved during DSE.

905-60 Preoperative Assessment of Contractile Reserve at Exercise Echocardiography Predicts Left Ventricular Function After Mitral Valve Repair

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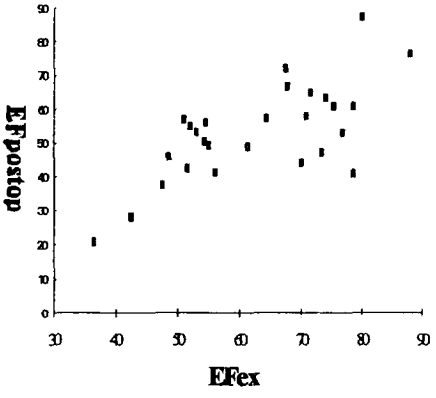
Postoperative (postop) left ventricular (LV) ejection fraction (EF) after surgery for mitral regurgitation (MR) is difficult to predict using preoperative (preop) markers of *resting* LV function. To determine whether *exercise* (EX) parameters are more predictive, we compared LV volume and EF responses to EX with postop EF measured at predischarge echo in 27 patients (74% male, age 58 ± 12 y) without coronary disease undergoing valve repair for MR. Postop EF was also correlated with *resting* end-systolic and end-diastolic volume index (ESVI and EDVI) and EF, and resting dP/dT (measured from CW Doppler of the MR jet in 19 pts with adequate signals).

Results. Preop resting EF and EF_{EX} were 61 ± 10% and 63 ± 13%; postop EF was 53 ± 14%. Change in resting EF postop could be predicted from EF change with EX using the equation; *EF change postop = 0.9EF change postex-9.5* ($r = 0.75$, $p < 0.001$). In pts with *EF increase >10% with EX,* rest EF was preserved postop (sensitivity 83%, specificity 100%). Preop rest ESVI and $ESVI_{EX}$ were 28 ± 12 and 23 ± 10 ml/m^2, postop EF correlated with $ESVI_{EX}$; ($r = 0.75$, $p < 0.001$). Thus, *ESV_{EX} of <27 ml/m^2* identified pts whose postop EF was >50% (sensitivity 83%, specificity 100%). Resting dP/dT of >1000 mmHg/sec was 60% sensitive and 67% specific for predicting post-repair EF > 50%. Preoperative resting EDVI ($r = -0.35$), ESVI ($r = -0.36$), rest EF ($r = 0.14$) and $EDVI_{EX}$ ($r = -0.35$) were not predictive of postop EF.



Conclusions: LV contractile reserve measured as EF_{EX} and ESV_{EX} with exercise echo can be used to predict postop LV function in pts undergoing valve repair for MR.

906 New Methods to Quantitate Left Ventricular Global and Regional Function

Monday, March 20, 1995, Noon–2:00 p.m.
Ernest N. Morial Convention Center, Hall E
Presentation Hour: Noon–1:00 p.m.

906-61 Acoustic Quantification in the Infarcted Ventricle: Comparison with Electron Beam Computed Tomography

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Assessment of LV size and function by acoustic quantification (AQ) correlates well with other techniques in patients with normally contracting ventricles. This prospective study examined the correlation between AQ and electron beam computed tomography (EBCT) volume measurements in patients with first anterior Q-wave MI and abnormally contracting ventricles. End-diastolic (EDV) and end-systolic (ESV) volumes by AQ were determined from standard four-chamber (4ch) and two-chamber (2ch) apical windows. The AQ tracings were transformed to volumetric measurements using the area-length (AL) and the modified Simpson's (mod.S) methods. EDV and ESV by EBCT were obtained conventionally by summation of manually traced LV areas on each short axis tomograms using Simpson's rule. Thirteen patients were imaged by both EBCT and echocardiography within 24 hours. EBCT-EDV ranged from 129–234 ml (mean 173 ± 34 ml) and ESV from 58–109 ml (mean 82 ± 19 ml). The EDV and ESV by AQ, their correlation to EBCT and the accompanying *p* values are shown below:

		EDV-2ch	EDV-4ch	ESV-2ch	ESV-4ch
	Vol (ml)	88 ± 30	97 ± 30	43 ± 20	50 ± 22
AL	r	0.76	0.56	0.58	0.34
	p	0.006	0.049	0.061	0.258
	Vol (ml)	80 ± 33	90 ± 31	40 ± 21	45 ± 20
mod.S	r	0.76	0.70	0.72	0.58
	p	0.006	0.008	0.012	0.037

Conclusions: [1] AQ underestimates absolute EDV and ESV measured by EBCT. [2] AQ-EDV correlates well with EBCT, particularly using the mod.S method. [3] AQ-ESV correlation to EBCT drops due to the asymmetric contraction pattern of infarcted ventricles. [4] The AL method's accuracy is particularly susceptible to asymmetric contraction in distorted ventricles. [5] Correction factors can be applied to account for the offset of EDV and ESV measurements by AQ.

906-62 Improved Quantitation of Left Ventricular Area and Fractional Area Change by Automatic Contour Chase: A New Method for Automated Border Detection without Tracing a Region of Interest

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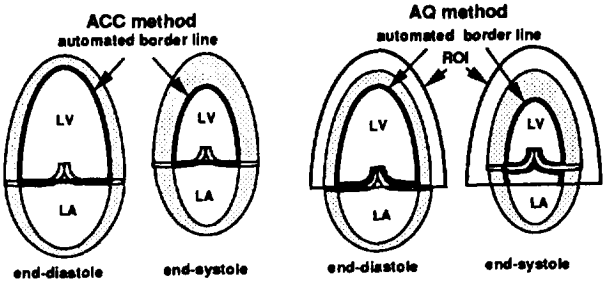
Automated contour chase (ACC) is a new contour extraction model which automatically detects and tracks a heart wall boundary by an energy minimization method. In conventional acoustic quantification (AQ) method, a part of the left atrium is always included in the calculated left ventricular area (LVA) from apical views as shown in the bottom figures. ACC can extract heart wall boundary and calculate ventricular area and volume without tracing a region of interest (ROI). To test the accuracy of a newly developed ACC method in the quantitation of LVA and fractional area change (FAC), nine patients were studied by ACC, AQ, and manual analysis. *Results:* There was no significant difference in end-diastolic LVA among each analysis. Although there was no significant difference in end-systolic LVA between ACC and manual analysis, end-systolic LVA calculated by AQ was larger than that calculated by manual tracing ($p < 0.05$). Although there was a good correlation in FAC between ACC and manual analysis ($r = 0.85$), correlation between AQ and manual analysis was somewhat lower ($r = 0.67$).

Conclusion: A newly developed ACC appears to be a better method for automated quantitation of the left ventricular area and FAC.



906-63 Quantitative Doppler Tissue Imaging for the Noninvasive Assessment of Left Ventricular Contractility

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Doppler Tissue Imaging (DTI) is a new noninvasive imaging modality that allows direct quantitation of myocardial velocity. This study was designed to test the correlation of peak systolic myocardial velocities with other measures of left ventricular (LV) systolic function under conditions of varying con-