19F **LOW DOSE DOBUTAMINE ECHOCARDIOGRAPHY, THALLIUM SCINTIGRAPHY AND 18-FLUORODEOXGLUCOSE POSITRON EMISSION TOMOGRAPHY FOR DETECTION OF MYOCARDIAL VIABILITY IN CHRONIC CORONARY ARTERY DISEASE**

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The clinical utilization of positron emission tomography (PET) for assessment of myocardial viability is available in a small number of medical centers. We hypothesized that low dose dobutamine echocardiography (DE) (10 mcg/kg/min) and Thallium 201 SPECT (TS) may identify viable myocardium in chronic coronary artery disease (CAD) with an accuracy comparable with that of 18-fluorodeoxyglucose (FDG)-PET). Twelve patients were prospectively investigated with FDG-PET in 18 studies before and after transmyocardial laser revascularization for severe CAD. There were 10 men and 2 women, mean age 60 years (range 44 - 73) with a mean left ventricular ejection fraction of 43% (range 15 - 60%). The left ventricle was divided into 5 regions and each was analyzed at base, mid and apex. A kappa test was used for analysis of agreement:

	DEV	DE NV	TS V	TS NV
PET V	179	30	166	52
PET NV	19	28	19	18
kappa	0.41		0.18	
p value	< 0.01*		<0.01	

V = viable; NV = nonviable; * = statistical significant

Conclusions: 1. DE identified PET viable and scar tissue in 81% of segments whereas TS identified it in 72% of segments. **2.** Agreement with PET was higher for viable than necrotic segments: DE 86% vs 60%, TS 76% vs 49%. **3.** In our study, DE had good agreement with FDG-PET for detection of myocardial metabolic state, which was better than TS.

20F DOES MYOCARDIAL VIABILITY DETECTED BY LOW-DOSE DOBUTAMINE STRESS ECHOCARDIOGRAPHY IDENTIFY PATIENTS FOLLOWING ACUTE MYOCARDIAL INFARCTION WHO'S LEFT VENTRICULAR REGIONAL FUNCTION RECOVERS AFTER REVASCULARIZATION ?

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Identification of viable myocardium in an infarcted region is important for appropriate management and risk stratification of pts with acute myocardial infarction (AMI). The aim of the study was to define the usefulness of low-dose dobutamine echocardiography (LD-DOB) in unmasking residual myocardial viability early after uncomplicated AMI and thrombolysis. 45 pts (5 female, mean age 58 ± 5 yrs) were examined with LD-DOB (5µg/kg/min over 5 minutes) 7 to 10 days after their first AMI and prior to coronary angiography. 31 pts were revascularized by PTCA (decision independent of LD-DOB).

The left ventricle was divided into 16 segments and wall motion graded visually using a score ranging from normal (=1) to dyskinetic (=4). Viability in the infarct zone was defined as an improvement of at least one grade in at least 2 asynergic segments during LD-DOB. Recovery of regional function was evaluated echocardiographically 6 ± 2 month after the AMI.

Results: 164 segments showed a resting asynergy at baseline. 20 pts (44%) had an improvement of regional wall motion at LD-DOB (i.e. viable myocardium).

		Seg 1	Seg 2	p	Score 1	Score 2	p
PTCA	via	4.1	2.6	0.01	2.2	1.6	0.001
n = 31	∅ via	3.1	2.5	ns	2.1	2.0	ns
∅ RVS	via	4.2	5.8	ns	2.0	2.5	0.05
n = 14	∅ via	4.5	4.3	ns	2.5	2.3	ns

Seg 1 and 2; Score 1 and 2 = asynergic segments (mean) and wall motion score of the infarct area at baseline and follow up resp. via= viable; ∅ via = non viable; ∅ RVS= no revascularization.

Conclusion: Improved wall motion in the infarct zone at LD-DOB is indicative of residual myocardial viability. Pts, thus identified, seem to have an enhanced recovery of regional function if revascularized.

21F **ANALYSIS OF DOBUTAMINE STRESS ECHOCARDIOGRAPHY: EYEBALL OR QUANTITATIVE METHODS?**

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Detection and quantification of wall motion abnormalities (WMA) provoked by Dobutamine stress echocardiography is particularly difficult in the presence of resting wall motion abnormalities. In the present study, we compared three methods: traditional "eyeball" scoring (WMS) of 2-D images and two novel quantitative methods: regional inward wall motion analysis (INW) and segmental systolic wall thickening (SWT) in a total of 60 pts with significant (>70% stenosis) coronary artery disease who underwent stress Dobutamine echocardiography - 25 with left anterior descending (LAD), 15 circumflex (Circ), and 20 right coronary artery (RCA).
Of this group, 26 pts had resting WMA and 34 pts did not have resting WMA. In addition to visual scoring, analysis was performed utilizing a custom designed program for SWT and INW. The left ventricle was evaluated in six equally divided segments. Anterior, inferior and lateral segments were analyzed for LAD, RCA, and Circ stenosis respectively. The results are expressed as percentage differences between baseline and peak Dobutamine in patients with and without resting wall motion abnormalities.

	SWT				INW				WMS			
	Base	Peak	%Δ	p	Base	Peak	%Δ	p	Base	Peak	%Δ	p
WMA:	28.7	33.1	11	0.007	23	27	18	0.001	5.5	5.4	11.1	NS
No WMA	42.8	56.2	30	0.001	35.6	44	20	0.001	2.0	2.12	6.1	NS
p*	p* 0.001				p* NS				p* NS			

p* = Difference between WMA vs no WMA; p = difference between base and peak.

WMS correctly identified ischemic segments with no overall change in score. However, differences identified in both quantitative methods SVT, INW indicates the full spectrum of variable response to Dobutamine infusion suggestive of viable or hybernating myocardium in these regions. Further studies are necessary to enhance the understanding of these differences in responses.

22F WALL MOTION ANALYSIS OF STRESS ECHOCARDIOGRAPHY: EYEBALL VS. TRACKBALL INTERPRETATION.

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Stress echocardiography has become a very important tool for evaluating patients with coronary artery disease. The subjective nature of the routinely used visual wall motion analysis (Eyeball) however is considered a limitation. Quantitative, computer based wall motion analysis (Trackball) has been introduced to give a sounder, more objective basis to stress echocardiography.

This study was undertaken to compare Eyeball (using a scoring system ranging from 1 = normal to 4 = dyskinetic) to Trackball (Centerline-Method using 100 lines) regarding diagnostic accuracy as well as time necessary for the analysis.

15 unselected patients were stressed with Dipyridamole (n=8) and Dobutamine (n=7). Interpretation of the tests was performed in a blinded fashion using both Eyeball and Trackball by one experienced observer. Results were compared to quantitative angiography.

RESULTS: All of the tests were evaluable using Eyeball. Due to poor quality of the stop-frame images Trackball could only be utilized in 14 patients. Concordance between the two methods was good. Disagreement occurred in only two cases.

	Mean Analysis Time	Sensitivity	Specificity	Diagnostic Accuracy
Eyeball	60 sec	88.9 %	83.3 %	86.7 %
Trackball	184 sec	87.5 %	83.3 %	85.7 %
p	0.0001	ns	ns	ns

CONCLUSION: Trackball interpretation of stress echocardiography is very time consuming, cumbersome and not objective, since it requires manual tracing of endocardial borders. It can not be applied in all of the patients and does not increase the diagnostic accuracy as compared to the Eyeball method.

At the present state of technology, Eyeball interpretation of routine stress echocardiograms seems to be the simplest, fastest, and most accurate method available.