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Application of tissue tracking and dobutamine stress echocardiography in the diagnosis of coronary artery disease.
C.Z. Pan, X.H. Shu, C.A. Jiao, N.S. Cai, Zhongshan Hospital, Fudan University; Department of Cardiology, Shanghai, China

Objective: The combination of tissue tracking technique and Dobutamine stress echocardiography were studied to evaluate the ischemic regions in patients with coronary artery disease (CAD).

Method: A total of 25 patients with suspected CAD underwent dobutamine stress echocardiography, and the systolic mitral annular displacement (MAD) was determined at rest and during stress by tissue tracking technique. Apical four chamber, three chamber and two chamber views were used to determine the MAD at 6 sites (post interventional septum PVS, anterior interventional septum AISV, anterior ANT, lateral LAT, posterior POST and inferior INF). Coronary arteriography was performed within 1 week after echocardiographic examination. All patients were divided into two groups according to the result of coronary arteriography. Group A included 23 patients with more than 70% stenosis in left anterior descending coronary artery (LAD). Group B consisted of 27 patients with no significant stenosis of LAD.

Result: (1) The systolic MAD at rest 10ug/kg/min, 20ug/kg/min, 30ug/kg/min were not significantly different between group A and group B (P > 0.05), but at 40ug/kg/min, the systolic MAD in ANT in group A was lower than that in group B (P < 0.01). The systolic MAD at other sites was not significantly different between the group A and group B. (2) The systolic MAD of group A in ANT and AISV during stress were not significantly different from each other at rest (P > 0.05). However it was higher in POST and LAT at 30ug/kg/min, 40ug/kg/min, and in INF and PVS at 30ug/kg/min, 40ug/kg/min, 50ug/kg/min than that at rest in group B (P < 0.005-0.01). The systolic MAD at the 6 sites during stress was higher than that at rest in Group B (P < 0.01).

Conclusions: Tissue tracking imaging combined with dobutamine stress echocardiography can early and accurately detect abnormal mitral annular displacement in patients with coronary artery disease.

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Application of a novel non tissue doppler based method for real-time quantification of myocardial function in normal subjects during exercise echocardiography.
M. Leitman1, P. Lysyansky2, Z. Vered1, 1Assaf Haroche Medical Center, Cardiology, Zerifin, Israel; 2UltraShall, Haifa, Israel

Objectives: To assess the feasibility of a novel software for real-time quantitative assessment of myocardial function in normal subjects during exercise echocardiography.

Background: Reliable methods for quantitative assessment of myocardial function for stress echocardiography are limited.

Methods: 12 patients underwent standard exercise echocardiography. Apical views at baseline and peak exercise were stored in a cineloop format for off-line analysis. The novel software is based on the estimation that a discrete set of tissue velocities, strain and strain rate were significantly higher at peak exercise. Velocities were maximal in basal segments. Strain was homogenous over the myocardium. Velocities, strain and strain rate were significantly higher at peak exercise. Corrected time to the peak systolic strain was shorter at peak exercise than at rest; strain acceleration index was higher at peak exercise than at rest (Table). Quantitative parameters during exercise

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Basal velocities (cm/sec)</th>
<th>MD velocities (cm/sec)</th>
<th>Atrial velocities (cm/sec)</th>
<th>Strain (sec^-1)</th>
<th>Strain (%)</th>
<th>Peak time to peak strain (CU)</th>
<th>SA (%CU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>6.22 ± 1.26</td>
<td>4.2 ± 1.3</td>
<td>1.87 ± 0.93</td>
<td>1.02 ± 0.39</td>
<td>11.4 ± 2.53</td>
<td>114.0 ± 9.69</td>
<td>4.12 ± 0.63</td>
</tr>
<tr>
<td>p value</td>
<td>-0.004</td>
<td>-0.0001</td>
<td>0.3</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>-0.0001</td>
</tr>
</tbody>
</table>

Conclusion: This novel non-Doppler based software may provide real-time quantitative assessment of global and regional myocardial function at rest and during exercise echocardiography.

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Dobutamine versus levsimendan stress echocardiography for the prediction of recovery of left ventricular dyssynergies after revascularization.
K. Bouki1, G. Pavlikis1, T. Kakavas2, E. Bougiotis2, V. Foulidis3, K. Kominos3, K. Kostopoulou1, E. Papasteriadi2. 1General Hospital of Nikea, Cardiology Dept., Piraeus, Greece; 2General Hospital of Nikea, Cardiology, Athens, Greece

Objectives: To compare the accuracy of levsimendan (L) and dobutamine stress echocardiography (DSE) for the prediction of recovery of left ventricular dyssynergies after revascularization.

Methods: Twenty eight patients with left ventricular dysfunction due to previous myocardial infarction scheduled for revascularization (16 PTCA and 12 CABG) underwent low-dose DSE (5-10ug/kg/min) and LSE. Levsimendan was infused at least 1h after dobutamine infusion, at 2 doses of 12 and 24ug/kg, over a 5 min period each. Left ventricular wall motion score was assessed using a 16-segment model. Myocardial viability was detected if improvement of >1 grade of regional wall motion score in at least two contiguous segments was noted, during either LSE or levsimendan infusion. All patients also underwent resting echocardiography within 6 months after successful revascularization.

Results: Of the 448 segments studied, 212 (47%) was dyssynergic at rest. Dobutamine infusion resulted in augmented contraction in 98/212 (46%) abnormal segments while 88(90%) of these showed functional improvement after revascularization. During LSE 110/220(50%) dyssynergic segments improved and 100/91(91%) of these recovered function after revascularization. Analysis of results showed a significantly lower sensitivity of DSE compared with LSE (73% vs 94% respectively, p<0.01) but a similar specificity (89% vs 80%, respectively, p=ns) for the prediction of postrevascularization recovery of left ventricular dyssynergies.

Conclusions: LSE can predict postrevascularization recovery of left ventricular dyssynergies with higher accuracy than DSE.