and MVP was analyzed off-line. 

Results: 1) Wall motion score index (WMSI) assessed by 2DE decreased significantly in 9 of 12 patients (75%) reflecting improvement of regional wall motion abnormality, 2) In contrast, in 11 of 12 patients (92%) the peak systolic myocardial velocity (1.17 vs 0.61 cm/sec) obtained by MVP at the region suspected to be viable increased significantly.

MVP was better sensitive than evaluation using conventional WMSI.

1189-37 Tissue Doppler Imaging Pattern of Left Bundle Branch Block Is a Strong Predictor for Mortality in Patients With Heart Failure

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Background: Recent studies had established that left bundle branch block (LBBB) is a strong predictor for mortality in patients with heart failure (HF).

Method: The study was aimed to assess if different electromechanical pattern due to LBBB, established by Tissue Doppler Imaging, had an influence on mortality in patients with HF.

Results: We Methods: Studied 21 patients with LBBB and dilated cardiomyopathy with 2D echocardiography and Tissue Doppler Imaging (TDI), we analyzed quantized color-coded m-mode of interventricular septum (IVS) and the following electromechanical patterns were identified: mildly unsynchronized (IIA), severely unsynchronized (IIIB) reversed early in systole (IIA) reversed late in systole (IIIA) reversed throughout the systole (IV). All patients were divided in three groups, according to left ventricular function (LVEF): Group I: <30%; LVEF: Group II: 30-40%; Group III: >40%. We considered also age, NYHA functional class, QRS narrowing and mitral regurgitation for multivariate analysis. Results: The highest mortality rate (100%) was observed in IIIb electrical mechanical pattern and LVEF 30-40%, while the lowest mortality rate (25%) was related to IIA TDI pattern with LVEF < 100% (p < 0.05). The multivariate analysis show that the electromechanical pattern is a strong predictor for mortality independently from age, NYHA functional class. QRS narrowing, mitral regurgitation.

Conclusions: Group I TDI pattern is a useful method to assess the severity of LV asynchrony. The electromechanical pattern is a strong predictor for mortality, independently from LVEF, in IIb patients.

1189-38 Longitudinal Myocardial Displacement and Strain Rate in the Hypertrophic Heart Evaluated by Tissue Strain Imaging With Doppler Angle Correction and Tissue Tracking Technique

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Background: The left ventricular (LV) systolic function in the long-axis direction has been evaluated by pulsed tissue Doppler mitral annulus motion. However, it could not avoid the effect of cardiac translation. A prototype software (Aplication Imaging Corp.) was recently developed to obtain tissue strain imaging (TISI). In this program, the center of contraction was set in the LV cavity and velocity was automatically angle-corrected. The resulting interventional myocardial strain rate (SRp) can be calculated using tissue Doppler imaging and cross-correlation velocity methods. In a range of myocardial motion, SRp was automatically defined and interrogated over time to yield displacement by 2D tissue Doppler tracking technology. TSI was finally obtained as a spatial derivative of the tissue displacement. 

Purpose: To evaluate longitudinal LV myocardial contractile characteristics in hypertrophic heart using TISI. Methods: Subjects consisted of 20 normal (N), 20 hypertensive hypertrophy (HHD) and 12 asymmetric septal hypertrophy (ASH). Color tissue Doppler imaging was recorded from apical four chamber view and the TSI at the base of septal ventricular segment was analyzed off-line. Results: Peak systolic displacement (Dp) and peak systolic strain rate (SRp) decreased and time to Dp prolonged in hypertrophied heart (table). Conclusions: Longitudinal myocardial fiber contraction was depressed in hypertrophied ventricular septum especially in asymmetric hypertrophy. 1st with Doppler angle correction and tissue tracking can quantitatively evaluate longitudinal LV contractility regardless of cardiac translation.

<table>
<thead>
<tr>
<th>Dp (cm)</th>
<th>Time to Dp (msec)</th>
<th>SRp (1/3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>10.4 +/- 3.2</td>
<td>267 +/- 60</td>
</tr>
<tr>
<td>HHD</td>
<td>8.7 +/- 2.8</td>
<td>303 +/- 54*</td>
</tr>
<tr>
<td>ASH</td>
<td>5.7 +/- 1.2&quot;</td>
<td>336 +/- 46*</td>
</tr>
</tbody>
</table>

1189-39 Accurate and Quick Assessment of Left Ventricular Function in Patients With Ischemic Heart Disease Using Biplane Advanced Automated Contour Tracking Method

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Background: Newly developed, automated contour tracking (AACT) method allows accurate detection of the left ventricular (LV) endocardial boundary of echocardiographic images by just placing 3 sample points at both sides of the mitral annulus and the LV apex. Accurate LV ejection fraction (EF) may be estimated by applying the AACT method to two orthogonal planes in patients with ischemic heart disease (IHD) even with regional wall motion abnormalities. The purpose of the study was to evaluate the reliability of the biplane AACT method in the measurement of LVEF in patients with IHD by using quantitative gated SPECT (QGS) as a reference standard.

Methods: We studied 46 consecutive patients who underwent QGS. In every patient, both apical and 2-chamber views were obtained by 2-dimensional echocardiography. Biplane LVEF was measured off-line by both AACT method and manual tracing method using modified Simpson's method. The accuracy of the AACT method for LVEF measurement was evaluated by comparison to QGS. The reproducibility of the AACT method for LVEF measurement was assessed by 2 blinded observers and compared to that of manual tracing methods.

Results: In 46 patients (24 with and 16 without regional wall motion abnormalities) of 46 patients (87.5%), adequate images were obtained for LVEF analysis. LVEF measured by the AACT method was correlated well with that by QGS (r = 0.94, r = 0.91). The mean difference between AACT and QGS was 0.4%±5.5% (mean±SD). The mean time required for analyzing one set of image by the AACT method was much shorter than that by manual tracing method (7±1 sec vs. 37±4 sec, p<0.001). The observer variabilities for LVEF assessment were also significantly smaller in the AACT method compared to manual tracing method (intraterasure variability: 4.3±0.3 vs. 8.8±0.3, p<0.001). Conclusion: The biplane AACT method provides accurate and quick measurement of LVEF in patients with IHD.

1189-40 Quantitative Assessment of Regional Peak Myocardial Acceleration During Isovolumic Contraction and Relaxation Time by Tissue Doppler Imaging

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Background: Myocardial acceleration during isovolumic contraction (ICT) has been reported as an index of contractility. Methods: We studied 8 sheep using tissue Doppler imaging (VingMed Vivid Five) in apical 4-chamber views to evaluate left ventricular wall segments and 2 mitral annulus sites. We analyzed peak myocardial acceleration during isovolumic contraction and relaxation (IRT) for each segment. After scanning for the baseline, we changed hemodynamic status by blood, dobutamine and metoprolol infusion and compared the pVA during IRT and ICT under 4 different hemodynamic conditions and peak positive and negative dP/dt and dP/dt conditions. Results: pVA of basal lateral segment during ICT showed the strongest correlation with peak positive dP/dt (r = 0.96, p<0.0001) and there was good correlation between pVA of septal mitral valve annulus during IRT with peak negative dP/dt (r = 0.80, p<0.0001). There was a significant difference in pVA between dobutamine and metoprolol conditions in ICT in all segments (p < 0.05), but pVA was less sensitive to blood loading. pVA during IRT showed little difference between the different hemodynamic conditions. Conclusions: pVA during ICT is a sensitive, preload independent marker for evaluation of dP/dt; the pVA of basal lateral wall during ICT showed the strongest correlation with peak positive dP/dt; pVA of septal mitral valve annulus during IRT showed a good correlation with peak negative dP/dt.
motion maps which are neither angle dependent nor limited to visible borders. Motion measurement is possible in any image sector. The technique was validated in an echo phantom and applied to a variety of clinical echoes. Results: Measured velocities (range, 0 - 24 cm/s) corresponded to known motion of the phantom. In contrast to simultaneous tissue Doppler imaging (only displaying motion vectors parallel to the beam), Multiscale Motion Mapping yielded true 2D motion vectors. In clinical echoes, comprehensive motion information became available: epicardial, pericardial, myocardial, vascular, and annular trajectories codified with known motion. Phenomena not accessible to quantitation hitherto became evident, like circular mitral annulus motion and myocardial motion with components both inward & outward the apex. Radial & tangential apex motion in the short axis view also became visible. Conclusion: Multiscale Motion Mapping is an exciting new echo imaging modality that yields true 2D motion information. It is independent and border independent motion maps. This broadly applicable technique thus allows new physiologic and pathophysiologic insights into complex cardiac motion.

The purpose of this study was to assess the feasibility of measuring left atrial (LA) dys-sfunction with tissue Doppler imaging derived strain rate (SR) and to explore its role in predicting maintenance of sinus rhythm after cardioversion for atrial fibrillation. Methods: Strain rate (SR) and tissue velocity imaging was performed with offline analysis of the basal left atrial free wall and inter-atrial septum in the apical 4-chamber view, and basal of anterior and inferior wall of left atrial at the apical 2-chamber view. Mean peak systolic (Em-SR) and peak early diastolic (Sm-SR) SR were measured with LA end-systolic anterior-posterior, longitudinal and transverse dimensions (LAD, LADlo, and LADtr). 27 healthy age-matched controls (C) and 42 patients with AF before cardioversion were studied. Follow-up was 3.5 years. Cardioversion to SR was successful in 26 pts but 14 patients reverted to AF within 4 weeks. We grouped patients into two subgroups: those who cardioverted and remained in SR (group S, n=12) and those who failed to cardiovert or reverted to AF within 4 weeks (group F, n=30).

Results: Sm-SR (2.05±0.96 s⁻¹) was significantly reduced in the AF group comparing to normal (2.85±0.73 s⁻¹, p<0.001). Em-SR (2.57±1.01 s⁻¹) was also non-significantly lower compared to normals (3.00±0.78 s⁻¹, p=0.289). Em-SR was significantly increased and Em-SR significantly lower in group F than group S (p<0.01). Multivariate regression analysis showed that Em-SR was the most strongly independent predictive parameter for maintenance of sinus rhythm post cardioversion (p<0.001).

Conclusion: Multiscale Motion Mapping is an exciting new echo imaging modality that yields true 2D motion information. It is independent and border independent motion maps. This broadly applicable technique thus allows new physiologic and pathophysiologic insights into complex cardiac motion.