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Simplified semiquantitative assessment of asynchrony and resynchronization with color tissue Doppler


Introduction: Color tissue Doppler (CTDI) allows to analyze myocardial velocity and to assess left ventricular (LV) activation sequence.

Objective: To identify CTDI patterns for a simplified evaluation of dysynchrony.

Material and methods: 11 patients (p) with good clinical response to cardiac resynchronization were analyzed (mean age 65±11 years, 7 p (64%) biventricular (BIV), LV, biventricular with offset of 40 ms (BIV-40) pacing and intrinsic rhythm (INT)). Asynchrony was defined by the presence of a triphasic pattern in the velocity rally (M-prolonged isovolumetric phase, short systolic period and postsystolic movement) as shown in the figure. The presence of the M sign was evaluated in every segment and averaged in every pacing mode.

Results: Shown in the table.

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Correlation</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVT pre vs. 6 WT pre</td>
<td>R=0.36</td>
<td>0.0085</td>
</tr>
<tr>
<td>LV EF pre vs. 6 WT pre</td>
<td>R=0.53</td>
<td>0.81</td>
</tr>
<tr>
<td>FT pre vs. 6 WT pre</td>
<td>R=0.43</td>
<td>0.0015</td>
</tr>
<tr>
<td>IVT change vs. 6 WT Increase</td>
<td>R=0.65</td>
<td>0.0001</td>
</tr>
<tr>
<td>6 WT Increase change vs. 6 WT Increase</td>
<td>R=0.44</td>
<td>0.0012</td>
</tr>
<tr>
<td>LV EF change vs. 6 WT Increase</td>
<td>R=0.34</td>
<td>0.0016</td>
</tr>
</tbody>
</table>

Conclusion: The improvement in exercise tolerance with biventricular pacing is related to efficiency in timing. These results re-emphasize the importance of time interval analysis of the cardiac cycle in CRT.

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Cardiac incoordination and left ventricular function in patients with cardiomyopathy and left bundle branch block

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Background: Left bundle branch block (LBBB) worsens the LV performance in patients with idiopathic (DCMP) or ischemic cardiomyopathy (ICMP). We investigated the grade of cardiac incoordination (CI) in patients with LBBB and DCMP/ICMP by means of Tissue Velocity Echocardiography (TVE).

Methods: 83 subjects were studied: 20 Controls (C), 21 subjects with isolated LBBB, 23 with LBBB+DCMP and 19 with LBBB+ICMP. Longitudinal myocardial velocities were obtained from the averaged LV six basal segments and CI was calculated from the velocity profiles as follows: electro-mechanical delay (EMD), hemo-dynamic delay (HD), isovolumic contraction time (IVCT) and isovolumic relaxation time (IVRT).

Results: The EMD was significantly lower in DCMP than in ICMP (P < 0.01) and higher in LBBB than in DCMP and ICMP (P < 0.01 for both comparisons), and did not differ between DCMP and ICMP (P = ns).

Conclusion: CI was worse in DCMP than in ICMP and was associated with further impairment of LV function. TVE is a valuable method to quantify CI, to assess LV function and to characterize patients with LBBB and DCMP or ICMP.

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Dynamic changes of dysynchrony induced by dobutamine are related with both resynchronization and left ventricular functional changes postbiventricular pacing

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Introduction: Evaluation of left ventricular (LV) dysynchrony (DYS) is based upon consideration only of resting time delays. Changes of time delays and respective DYS post low dose dobutamine stress (DOB) provocation have not been studied.

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