829 Baseline left ventricular asynchrony predicts long-term benefit of resynchronisation therapy.
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We previously demonstrated the role of left ventricular asynchrony (LVA) assessed by echocardiography in predicting short term reverse remodelling after cardiac resynchronisation therapy (CRT).

To study the predictive role of LVA in long term, we studied 18 patients (64±11 yrs, 9 male) with heart failure (HF), NYHA class III and left bundle branch block (LBBB), in optimal medical therapy. Before biventricular pacemaker (PM) implantation, LVA was evaluated by calculating the shortest interval between the maximum systolic posterior displacement of the septum and the maximum systolic displacement of the left posterior wall (septal to posterior wall motion delay, SPWMD). Before, one month and 1 year after PM implantation, left ventricular end-diastolic (LVEDVI, ml/m2) and end-systolic (LVESVI, ml/m2) volume indexed for body surface area and left ventricular ejection fraction (LVEF, %) were evaluated. Baseline median SPWMD value was used to dichotomise patients with (LVA+) and without (LVA-) LVA.

LVA+ patients showed a significant improvement of LVEDVI, LVESVI and LVEF after 1 month and a further improvement after 1 year (Figure). In LVA- patients no hemo-dynamic changes were found after one month as well as after one year (Figure). After one year LVA+ showed significantly lower values of LVEDVI (p<0.0001) and of LVESVI (p<0.0001) and a higher value of LVEF (p<0.0001) in comparison to LVA-.

In conclusion, in patients with advanced HF and LBBB, baseline SPWMD is a strong predictor of the occurrence of reverse remodelling and systolic functional improvement after CRT, thus suggesting the usefulness of LVA in identifying patients likely to benefit from biventricular pacing.

830 Quantification of left ventricular asynchrony in patients with systolic dysfunction with transthoracic real-time 3D echocardiography.
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Asynchronous contraction of myocardial segments is a recognised feature of left ventricular dysfunction, even in the absence of bundle branch block. Quantification of mechanical asynchrony may be important for a more accurate functional assessment of LV function. Transthoracic real-time three-dimensional echocardiography (RT3DE) is a new modality which may be able to provide a swift and accurate measure of left ventricular asynchrony.

Methods: Forty six patients with normal QRS duration (~120 ms) referred for assessment of left ventricular function were investigated. Routine 2D echocardiography was performed and patients were separated into 4 groups depending on the degree of LV dysfunction: 1. Normal, 2. Mild LV dysfunction, 3. Moderate LV dysfunction, and 4. Severe LV dysfunction. RT3DE was performed immediately after 2D echocardiography utilising the Philips Sonos 7500 with the X4 matrix array transducer. A full volume acquisition (FVA) of the left ventricle was obtained from the apical position. The 3D dataset was analysed offline (4D LV analysis, version 1.1, TomTec) to derive left ventricular time-volume curves utilising semi-automated endocardial border detection. Time-volume curves were also obtained for the regional volume from onset of systole (Ts) was calculated and an asynchrony index derived by evaluating the standard deviation of the Ts for all regional volumes. The time to minimum volume for each regional volume from on-endocardial border detection. Time-volume curves were also obtained for the regional volume from onset of systole (Ts) was calculated and an asynchrony index derived by evaluating the standard deviation of the Ts for all regional volumes. The time to minimum volume for each regional volume from end-systole.

In conclusion, patients with advanced HF and LBBB, baseline SPWMD is a strong predictor of the occurrence of reverse remodelling and systolic functional improvement after CRT, thus suggesting the usefulness of LVA in identifying patients likely to benefit from biventricular pacing.

831 Correlation between Doppler derived Dp/Dt and left ventricular asynchrony in patients with dilated cardiomyopathy: a study combined using of strain imaging and conventional Doppler echocardiography.
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The aim of this study was to evaluate the echocardiographic determinants of left ventricular asynchrony (LVAs) in pts with dilated cardiomyopathy.

Study group was consisted of 35 pts with dilated cardiomyopathy and mitral regurgitation. After obtaining the conventional echo variables LV Dp/Dt was calculated from the MR Doppler spectrum by known rate-pressure-rise method. Apical 4-2 and long axis strain images were of-line analyzed to assess LVAs. The longest time interval between the peaks of negative strain waves from any reciprocal segments was defined as LVAs in each pt. The mean Dp/Dt was 838±266 mmHg/sec (range 420-1440) and the LVAs was 72±65 msec (range 0-200). Linear regression analysis revealed a significant correlation between LVAs and Dp/Dt but none of the other echo variables (Table 1). The Dp/Dt values under 650 mmHg/sec yielded a sensitivity of 100% and specificity of 92% for predicting the LVAs over 130 msec, which is an indication for biventricular pacing (Fig. 1).

Table 1

<table>
<thead>
<tr>
<th>LV function</th>
<th>LVEF</th>
<th>Asynchrony Index</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>58%</td>
<td>3.6 (3.2-4.0)</td>
<td>0.022</td>
</tr>
<tr>
<td>Mildly impaired</td>
<td>45-65%</td>
<td>4.1 (3.3-4.9)</td>
<td>0.04</td>
</tr>
<tr>
<td>Moderately impaired</td>
<td>25-45%</td>
<td>7.5 (6.3-8.7)</td>
<td>0.008</td>
</tr>
<tr>
<td>Severely impaired</td>
<td>&lt;25%</td>
<td>17.5 (11-24)</td>
<td>0.006</td>
</tr>
</tbody>
</table>

Conclusion: RT3DE and regional volumetric analysis is a sensitive tool for quantifying mechanical LV asynchrony which appears to increase with increasing degrees of systolic dysfunction.