CRT01
SYNCHRONIZED BIVENTRICULAR PACING AFTER AV NODE ABLATION IN CHF PATIENTS
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Background: atrioventricular junctional (AVJ) ablation with PM implantation has been shown to improve quality of life (QoL) in selected patients with drug resistant atrial fibrillation (AF). However, after the procedure, some pts worsen because of asynchronous ventricular stimulation.

History: during the last 9 years among 1960 pts who referred to our Institution for AF, 28 pts underwent ablation and pace procedure by right ventricular single lead. The long term follow up(FU) of 36 months demonstrated an improvement of QoL in all but 4 pts who developed a progressive, irreversible heart failure.

Methods: from January 2001 to July 2002, 12 consecutive pts (66±8 years) of mean age of 70.2 years with dilated cardiomyopathy and chronic, non- controlled high rate AF were recruited. Eight pts had chronic paroxysmal AF and 4 pts had chronic paroxysmal AF. After AVJ ablation, a biventricular device was implanted: Medtronic InSync in 9 pts and Insync biventricular ICD in 3 pts. The NYHA functional class, the QRS duration, the mean heart rate, left ventricular ejection fraction (LVEF) and LV end diastolic diameter (LVEDD) by 2D echocardiography; 6 minutes walking test(6WT), the score of Minnesota questionnaire and the score of palpitation symptoms were evaluated at baseline and at 1, 3, 6 and 12 months FU in every pts.

Results: the mean FU was 7.2±1.4 months. The results have been quite terrific as shown as follows.

One pt,3 months after the procedure, in spite of wide clinical improvements, died suddenly on eeg Holter monitoring that demonstrated a ventricular fibrillation as the cause of death. In pts with paroxysmal AF, a trend of reduction of numbers and duration of episodes of AF was observed.

Baseline

| NYHA | QRS (msec) | IR (mm) | LVEF | LVEDD (mm) | 6’WT (mt) | Minnesota Score | Pulse
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<tr>
<td>3±0.6</td>
<td>12±2.5</td>
<td>91±12</td>
<td>34±15</td>
<td>57±6</td>
<td>66±7</td>
<td>54±12</td>
<td>7±1.3</td>
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<tr>
<td>5±0.7</td>
<td>13±13</td>
<td>74±9</td>
<td>43±15</td>
<td>55±8</td>
<td>147±95</td>
<td>30±18</td>
<td>0.7±1.3</td>
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<tr>
<td>-0.0001</td>
<td>0.16</td>
<td>0.0001</td>
<td>0.008</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>0.002</td>
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Conclusions: these results demonstrated that the AVJ ablation combined with biventricular pacing is an effective technique to improve QoL in AF in congestive heart failure pts, mostly by relief of symptoms of palpitations and by means of the resynchronization therapy. The clinical results are not correlated to the QRS duration and to the LVEDD. Also the number of episodes of paroxysmal AF seems to be lowered by the resynchronization therapy. However, life threatening ventricular arrhythmias have to be considered in pts without previous episodes.

CRT02
ESTIMATION OF LEFT VENTRICULAR FUNCTION USING ECHOCARDIOGRAPHY AND CARDIAC MAGNETIC RESONANCE IMAGING: IMPLICATIONS FOR ICD THERAPY
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Background: Estimation of left ventricular (LV) ejection fraction (LVEF) is critical in deciding upon implantable cardioverter-defibrillator (ICD) therapy. We compared visually estimated LVEF from CMR and echo as well as calculations of LV ejection fraction from M-mode and 2-dimensional echo with computerized analysis.

Methods: 32 pts presented QRS>120ms; evidence of significant left ventricular desynchronization with at least one LVD>70ms was found in 37 pts (7 pts with QRS<120ms). In this group GMI was significantly higher than in the rest of the pts (1.9±0.22 vs 0.74±0.17, p<0.0001). LVD was significantly higher in QRS>120ms pts (p=0.0001) in each LVpLp. The simple regression analysis demonstrated a statistically significant linear correlation between GMI and maximal LV end diastolic diameter in each patient (p=0.93, r=0.75). Using a GMI ≥ 0.87 (and QRS>120ms) as cut point, left ventricular desynchronization can be detected with a sensitivity of 94% (81%) and specificity of 70% (80%); positive predictive value was 92% (91 %), and negative predictive value was 77% (53 %). A trend toward correlation was found between GMI and QRSd (r=0.31). There was no correlation between QRSd and LV LVD.

Conclusion: Regional ventricular delayed activation results in an uncoordinated and prolonged ventricular contraction with lengthening of the isovolumetric contraction and relaxation time and decrease of the time available for filling and ejection. GMI explore all these parameters and may be considered a global indicator of ventricular desynchronization.

CRT03
LEFT VENTRICULAR DESYNCHRONIZATION ASSESSMENT USING GLOBAL MYOCARDIAL INDEX IN PATIENTS WITH DILATED CARDIOMYOPATHY
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Global myocardial index (GMI) is a sensitive indicator of overall cardiac function.

Aim of study: to assess the relation between GMI and currently used echocardiographic parameters of ventricular desynchronization in order to predict the value in the assessment the severity of systolic asynchrony for biventricular pacing indication.

Methods: 47 patients (pts) aged 58.3±18.3 years with dilated cardiomyopathy (DCM) were analyzed. The following parameters were measured: QRS duration (QRSd); septal (S), posterior (P), lateral (L) and posterolateral (PL) wall delays, as the time from QRS onset to maximal wall contraction, and the derived parameters: left ventricular mechanical delays (LVD) as the time interval from maximal contraction between interventricular septum and posterior (LVDp), lateral (LVDl) and posterolateral wall (LVDpl), using parametrical, 4 chamber view and subcostal incidence both as time-motion and Tissue Doppler imaging (TDI). TDI measurements were performed using both color and pulsed TDI (from QRS onset to the end of S wave for each wall).

Results: 32 pts presented QRSd>120ms; evidence of significant left ventricular desynchronization with at least one LVD>70ms was found in 37 pts (7 pts with QRS<120ms); in this group GMI was significantly higher than in the rest of the pts (1.9±0.22 vs 0.74±0.17, p<0.0001). LVD was significantly higher in QRS>120ms pts (p=0.0001) in each LVpLp. The simple regression analysis demonstrated a statistically significant linear correlation between GMI and maximal LV end diastolic diameter in each patient (p=0.93, r=0.75). Using a GMI ≥ 0.87 (and QRS>120ms) as cut point, left ventricular desynchronization can be detected with a sensitivity of 94% (81%) and specificity of 70% (80%); positive predictive value was 92% (91 %), and negative predictive value was 77% (53 %). A trend toward correlation was found between GMI and QRSd (r=0.31). There was no correlation between QRSd and LV LVD.

Conclusion: Regional ventricular delayed activation results in an uncoordinated and prolonged ventricular contraction with lengthening of the isovolumetric contraction and relaxation time and decrease of the time available for filling and ejection. GMI explore all these parameters and may be considered a global indicator of ventricular desynchronization.

CRT04
THE EFFECTS OF BIVENTRICULAR PACING ON MITRAL COAPTATION POINT DISPLACEMENT IN PATIENTS WITH HEART FAILURE
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Purpose: In recent years cardiac resynchronisation therapy (CRT) is an established treatment in selected patients with heart failure. Furthermore it has been shown that the displacement of the mitral leaflet coaptation point (CPMA) towards the LV apex correlates with the degree of left ventricular (LV) dysfunction. The purpose of this study is to find the acute effects of biventricular pacing in the mitral apparatus and LV function in heart failure patients.

Methods: We studied 16 patients (pts) 15 men, 1 woman aged 56±25 years in NYHA class III or IV and left ventricular ejection fraction (LVEF) 22±4%. The etiology was coronary artery disease (CAD) in 7 pts and dilated cardiomyopathy (DCM) in 8 pts. All the patients received cardiac resynchronisation therapy. An echocardiogram was performed within one week after implantation with biventricular pacing (CRT on) and without pacing (CRT off). The CPMA i.e. distance between coaptation point of mitral leaflets and annular axis, was measured from the apical 4-chamber view in mid systole and was evaluated with CRT on and CRT off. Echocardiographic indices such as LV end diastolic diameter (LVEDD), end systolic diameter (LVESD), ejection fraction (LVEF) and mitral annulus diameter (MAD) were also measured at CRT off and at CRT on.

Results: There was a non-significant increase in LVEF, and a non-significant decrease in LVESD and LVESD with CRT on. CPMA decreased from 10.6±1.9mm at CRT off to 8.1±1.4 cm at CRT on and MAD decreased from 38.4±4.2 mm at CRT off to 37.7±3.7mm at CRT on (both p<0.05). Moreover the absolute change in CPMA was related to the LVEDD (r=0.74, p<0.05) and inversely related with the LVEF (r=-0.72, p<0.05).

Conclusion: In patients with severe LV systolic dysfunction and LV dilatation biventricular pacing led to an improvement in both CPMA and MAD. This finding underlines the acute efficacy of resynchronisation therapy in the mitral apparatus in heart failure patients.