CRT05
DIFFERENCE OF LEFT VENTRICULAR (LV) ACTIVATION AND ORIGIN OF SYSTOLIC PRESSURE GRADIENT AND MITRAL REGURGITATION IN OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY

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Background: Dynamic LV outflow tract (OT) systolic pressure gradient (SPG) and dysfunction of the mitral valve (MV) are classical features of hypertrophic obstructive cardiomyopathy (HOCM). The physiological substantiation of the SPG and mitral regurgitation origin in HOCM is insufficient. The present study examines of LV OT obstruction and mitral regurgitation in HOCM can be conditioned by LV activation asynchrony caused by LV excitation sequence disturbances. Methods: 55 consecutive HOCM pts (mean age 31.7±3.2 yrs) were evaluated by M-mode, N-mode and Doppler echocardiography with SPG determination, mitral regurgitation assessment, and short distance (cm) between interventricular septum (IVS) and MV anterior leaflet in stress test measurement; by cardiac catheterization with direct LV OT SPG measurement and by LV endocardial mapping in relation to His potential registered in the AV node region. We compared the LV apex (LVA) His-V interval with the same for the hypertrophied part of IVS and calculated the difference in τ between the His-VVA and the His-VIV.

Results: The linear regression analyses revealed: 1) negative relations between h (distance between IVS and anterior MV leaflet in systole and SPG on LVOT (r=-0.4, p<0.01), 2) negative relation between the Δ t index and SPG magnitude (r=-0.32, p<0.01), and 3) positive relation between Δ t and h, (r=-0.3, p=0.001).

Conclusion: The results obtained in cell culture suggest that the application of micro-current is effective in reducing cell proliferation rate at moderate and high current. As a side effect, we detected an increase in the cell death index (40, 60 :A) but a highly significant mean decrease (20.6 %) if exposed to high current (80, 100 :A). Collagen type I and type III content was quantified using a special fluorescence confocal laser scanning microscopy system including special analysis software.

40 left ventricular myocytes were isolated and cultivated in 24 well cell culture plates. Current of different magnitudes (0, 20, 40, 60, 80, 100 :A) was applied via platinum electrodes by a special custom-made device. The whole equipment was inoculated under cell culture conditions (+37°C, 5% CO2) over a period of 7 days. Changes of the collagen type I and type III synthesis were analyzed using immunohistochemical staining methods. Collagen type I and type III content was quantified using a special fluorescence confocal laser scanning microscopy system including special analysis software.

Results: Compared to cardiomyocytes exposed to 0 :A (control cells), collagen type I synthesis of cardiomyocytes showed no significant change after exposure to a moderate current magnitude (40, 60 :A) but a highly significant mean decrease (20.6 %) if exposed to high current (80, 100 :A). Collagen type III revealed a mean increase at moderate current of 29.7 % and a decrease of 25.2 % at high current exposure. As a side effect, we detected an increase in the cell proliferation rate at moderate and high current.

Conclusion: The observed results in cell culture suggest that the application of micro-current is able to modulate the synthesis of collagen. In particular, in dependency of the current magnitude collagen type I can be up- or down-regulated. Collagen type I is responsible for the stiffness and the degree of dilation of the heart. Therefore it can be envisaged that this method - if applied clinically - may help to improve cardiac function, as it helps to heal bone fractures.

CRT07
SIX YEARS FOLLOW-UP AND CLINICAL OUTCOME

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Since 1999, 174 pts (135 male, mean age 71.1±8.6 y - range 36-92) underwent to CRT (64 with ICD-bcp back-up for severe CHF: 56% had ischemic cardiomyopathy. At implant 31 pts were in AF, 47 were previously paced with right apical pacing. In 18 subjects CRT were a bridge to heart transplant. (NYHA class, Minnesota Quality Life Score-QLS) and echocardiographic evaluation (end systolic-diastolic [ESD][EDD] diameters, ejection fraction [EF] inter and intra-ventricular delay, % of mitral regurgitation area in left atrium [MR]) was scheduled every three month for the first year and then twice a year. The procedure success was 98.7%, coronary dissection and lead instability were the causes of failure. The mean follow-up was 25±16 months (range 1-66). After CRT, a significant reduction of the electric (QRS: 189±32 vs. 145±21ms, p<0.01) and the mechanical (55.3±32 vs. 25±16ms, p<0.01) delays was observed immediately after the procedure. The following parameters were significantly (p<0.01) improved after CRT:

Follow-up

Implant 6 months 1 year 2 years 3 years 4 years

<table>
<thead>
<tr>
<th>n subjects</th>
<th>174</th>
<th>150</th>
<th>132</th>
<th>81</th>
<th>42</th>
<th>23</th>
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<tbody>
<tr>
<td>Mortality</td>
<td>1 (0.57%)</td>
<td>5 (3.4%)</td>
<td>9 (6.6%)</td>
<td>11 (13.4%)</td>
<td>16 (38.1%)</td>
<td>5 (23.8%)</td>
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<tr>
<td>NYHA</td>
<td>3.16±0.41</td>
<td>2.15±0.48</td>
<td>2.04±0.65</td>
<td>2.09±0.41</td>
<td>2.13±0.47</td>
<td>2.33±0.4</td>
</tr>
<tr>
<td>QLS</td>
<td>50±12</td>
<td>35±9</td>
<td>33±8</td>
<td>32±8</td>
<td>31±10</td>
<td>33±7</td>
</tr>
<tr>
<td>EF%</td>
<td>26.3±6.9</td>
<td>35.6±7.9</td>
<td>37.0±8.4</td>
<td>38.8±10</td>
<td>36.1±11</td>
<td>31.6±4.1</td>
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Moreover, at 2 years (n=42) a significant reduction of EDD (63.1±10.6 vs. 55.2±8, p<0.01), EDD (74.1±10.1 vs. 70.7±11.3, p<0.01), MR% (21.18% vs. 12.12%, p<0.001) has been observed. A marked decreased in hospitalization for CHF were observed during the first year follow-up (3.08±1.9 vs. 0.76±0.5, p<0.01). Our real world experience confirms the benefit of CRT in a large unselected population in terms of clinical and echocardiographic improvements and reduction of both mortality and hospitalization rate.

CRT08
SIGNIFICANT REVERSE REMODELING UNDER CRT

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Background: Cardiac resynchronization therapy has been shown to improve exercise capacity and quality of life in cases of inter and intraventricular conduction delay. Several studies have demonstrated that CRT induce a LV reverse remodeling defined by an increase of the EF and a decrease of the end-diastolic diameter.

The aim of this study is to evaluate the rate of patients among whom a significant reverse remodeling is observed during a long follow up. The definition of this kind of remodeling is an increase by at least 10% of the EF in absolute value and a reduction of the LV end-diastolic diameter by at least 10%.

Methods: Echocardiographic data were compared retrospectively in 39 patients before and after CRT. The echography were performed in general 1 to 3 months after the implant, then according to the appreciation of the cardiologist (from 1 to 48 months – median 9.5 months). Results: The mean EF before implant was 24.7% +/- 6.7 and a LVEDD = 65.2 +/-7.4. At the end of the follow up a significant improvement is noted: EF = 36.1 +/-12 and a LVEDD = 62.8 +/-5.1, respectively. However a significant reverse remodeling is observed in 14 / 39 patients (35.8%). In this specific subgroup, the EF increase from 24 to 47.5%, and the LVEDD decrease from 64.7 to 53 mm.

Conclusion: Under CRT a significant reverse remodeling seems to be noted in about 35% of the patient and can be delayed or observed very quickly. An independent predictive prognostic factor is needed.