We have used for this implant, 3 leads from 2 different pacemakers: 2187 (16 pts), 4189 (18 pts), 4191 (25 pts) and 4193 (15 pts) from Medronic and 4512 (48 pts) from Guidant.

As a parameter of better handling we have considered a reduced fluoro-time for the positioning of the LV lead. We have made comparison in fluoro-time for each lead and dividing the 3 leads in two groups: stylet-guided leads (4189 and 2187) and angioplasty-wire guided leads (4191, 4193 and 4512).

We have not found any significant differences in fluoro-time nor for any of the considered leads neither for each group of leads.

We have also analysed if fluoro-time was related to single operator experience or to Centre experience.

We have found out that the longer the patient follow-up the longer the fluoro-time and the greater the number of patients implanted by the single operator the shorter the fluoro-time.

In conclusion, our data seem to demonstrate that all the leads available on the market have the same good handling and that –once the operator has gained a good experience in such an intervention – the mean fluoro-time required to position all the leads could be reduced to acceptable values.

**P-166 GUIDING AND OPTIMIZATION OF RESYNCHRONIZATION THERAPY WITH DYNAMIC THREE-DIMENSIONAL ECHOCARDIOGRAPHY AND SEMI-AUTOMATED BORDER DETECTION: A FEASIBILITY STUDY**


**Objective:** To assess a new approach for guiding and hemodynamic optimization of resynchronization therapy, using three-dimensional (3D) trans thoracic echocardiography.

**Background:** Resynchronization therapy for heart failure provides the greatest hemodynamic benefit when applied to the most delayed left ventricular (LV) site. Currently, the ideal LV pacing site is selected according to acute invasive hemodynamic assessment and/or tissue Doppler imaging.

**Methods:** A total of 11 patients with advanced heart failure and an implanted biventricular pacemaker were included in this study. Transthoracic apical LV images at end diastole were obtained using a probe, fast rotating second harmonic transducer to reconstruct 3D LV datasets during sinus rhythm (SR), right ventricular (RV) apical and biventricular pacing mode. A semi-automated contour analysis system (4D LV analysis, TomTec, Germany) was used for segmental wall motion analysis and identification of the most delayed contracting segment and calculation of global LV function.

**Results:** Data acquisition duration was 10 sec. and analyzable 3D images were obtained in 8 patients. Of these patients, data during SR were available in 5 and during biventricular pacing in 7. The greatest contraction delay during SR was found in the anterior and anteroseptal segments in 3 of 5 patients. Biventricular pacing resulted in reduction of the contraction delay in 3 of 5 patients. The global LV function did not change significantly.

**Conclusion:** 3D echocardiography with appropriate analytic software allows detection of the most delayed LV contracting segment and can be used to select the optimal pacing site during resynchronization therapy.

**P-167 RATIONALE, DESIGN AND END-POINTS OF A CLINICAL STUDY ON BIVENTRICULAR PACING FOR ATIVOVENTRICULAR BLOCK IN LEFT VENTRICULAR DYSFUNCTION TO PREVENT CARDIAC DESYNCHRONISATION – THE BIOPACE STUDY**

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Cardiac asynchrony is increasingly accepted as pathogenic factor in the progression of heart failure (HF). Cardiac Resynchronisation Therapy (CRT) has shown encouraging effects on symptoms and left ventricular (LV) function. Recent data has even suggested prognostic benefit of CRT. On the other hand, patients with LV dilatation and dysfunction with indication for ventricular pacing due to atrioventricular block are still routinely implanted with right ventricular (RV) pacing devices inducing cardiac asynchrony. Considering the negative prognostic impact of left bundle branch block in the presence of LV dysfunction, the desynchronising effect of RV pacing could lead to progression of HF and thus deteriorate patients’ prognosis. The question remains whether these patients would benefit from biventricular (BV) pacing, especially in terms of prognostic improvement. The BioPace study has been designed to compare standard RV pacing to Biventricular pacing in atrioventricular block, LV dilatation and dysfunction in order to prevent cardiac desynchronisation. 1200 patients will be included in this parallel, prospective randomised single-blind international multicentre european trial. Inclusion criteria are any indication for permanent ventricular pacing in the presence of LV dilatation and LVEF < 45% in sinus rhythm or atrial fibrillation, regardless the spontaneous (impaired) QRS width. Prior to pacemaker implantation and after echocardiographic assessment patients will be randomised to RV versus Biv pacing systems (St. Jude Medical Inc.). Post implantation, patients will be followed up to 5 years. Primary endpoints are long-term survival and 2-year efficacy (MUMPI score, 6-minute walk test). Secondary end-points are hospitalisation, LV dimensions, LVEF and adverse events.

Inclusion and exclusion criteria, study design, endpoints and the actual status of the study will be presented in detail.

**P-168 BNP IN BIVENTRICULAR PACING: ITS ASSOCIATION WITH FUNCTIONAL STATUS AND INFLAMMATORY MARKERS**


**Objective:** Plasma levels of N-proBNP and inflammatory activation have been associated with prognosis in heart failure (HF). Biventricular pacing (BivP) is a promising new technique for HF management. In this study, we assessed the relation between changes in N-proBNP levels following BivP and patients’ (pts) functional improvement. We also assessed whether a relation exists between these levels and proinflammatory cytokine hyperactivation.

**Methods:** Thirteen pts with CHF, NYHA class II-IV were studied (mean age ± 1SE 65 ± 2 years, PR 195 ± 5 mscs, QRS 192 ± 26 msec, LV EF 2 ± 2%). They were implanted a Biv defibrillator (n=11) or pacemaker (n=2). After a 3 month period of 1 month following device implantation (VVI mode, 30 bpm), baseline evaluation was performed, including estimation of NYHA class, plasma levels of N-proBNP, tumor necrosis factor alpha (TNFα) and its soluble receptors (STNF-RI, STNF-RIII). The same parameters were evaluated again i) after 3 months of BivP (VDD mode, 30 bpm), ii) following a subsequent 3 month no pacing period.

**Results:** After 3 months of BivP, an improvement was observed in NYHA class (1.6 ± 0.1 following therapy vs 2.8 ± 0.1 at baseline, p<0.05), sustained following pacing discontinuation (1.9 ± 0.1, p value compared to baseline <0.05). The difference observed in pts’ functional class was related to the changes in N-proBNP (r=0.60, p=0.02). N-proBNP was related to the inflammatory markers assessed before pacing (p=0.50, p=0.11 for TNFa, r=0.75, p=0.009 for STNF-R and r=0.72, p=0.01 for STNF-RII) as well as following 3 months of BivP (r=0.70, p=0.02 for TNFa, r=0.62, p=0.04 for STNF-R and r=0.56, p=0.07 for STNF-RII) and after 3 months of therapy discontinuation (r=0.89, p=0.003 for TNFa, r=0.77, p=0.02 for STNF-R and r=0.81, p=0.01 for STNF-RIII).

**Conclusion:** The improvement observed in the functional capacity of pts with HF following BivP is associated with changes in N-proBNP plasma levels. N-proBNP is related to markers of inflammatory hyperactivation. N-proBNP may be a useful prognostic marker in HF.

**P-169 BIVENTRICULAR PACING IN HEART FAILURE PATIENTS IMPROVES HEART RATE VARIABILITY**

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**Aim:** Heart rate variability (HRV) is an indicator of prognosis in patients (pts) with heart failure. The aim of the present study was to assess whether chronic resynchronisation therapy can affect HRV in such pts.

**Methods:** Twelve heart failure pts were studied (mean age 65±8 years, PR duration 198±16 mscs, QRS 195±19 mscs, NYHA class 3±±2, LVEF 21±6%). All were successfully implanted a biventricular pacemaker (n=5) or defibrillator (n=9). The protocol included a preliminary no pacing treatment period for 1 month following implantation, during which the device was set to VVI 40 bpm without the pts’ knowledge. Twenty-four hour Holter ECG recordings were performed at the end of the month without pacing (baseline) and after 3 months of biventricular stimulation (VDD mode). Time and frequency domain analysis was performed. ANOVA was used for analysis. Data are presented as mean±1 SD.

**Results:** Following 3 months of biventricular pacing, an improvement was observed in the functional class of study pts (1.8±0.5 following therapy vs 2.5±0.4 at baseline, p<0.0001), accompanied by a shortening in QRS duration.
**Aim:** Monitoring the effects of CRT in patients with heart failure. Our aim was to monitor the beneficial haemodynamic effects through a further increase in ejection fraction, myocardium-specific enzymes (such as creatine kinase or troponin), indicating only ischemic myocardium and not to alter its function. An extraordinary rise of the BNP level should lead to early therapeutic consequences like CRT.

**Conclusion:** Biventricular pacing in heart failure improves autonomic function by increasing HRV. Such improvement may have important clinical implications regarding patients’ prognosis.

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**P-170 BNP - A USEFUL MARKER FOR RESYNCHRONIZATION THERAPY AFTER CABG**

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Cardiac resynchronization therapy (CRT) improves left ventricular function in patients with ischemic heart failure after coronary artery bypass grafting (CABG). Brain natriuretic peptide (BNP) has proved to be a good marker for monitoring the effects of CRT in patients with heart failure. Our aim was to show the usefulness of BNP in CRT after CABG.

We tested the hypothesis that left ventricular (LV) pacing from the coronary sinus is superior to right ventricular (RV) apical pacing in patients undergoing AV junction ablation and pacing for permanent atrial fibrillation. A significant decrease of mitral regurgitation, left ventricular end diastolic volume and other echocardiographic variables was observed in the latter group. Compared with RV pacing, LV pacing caused a +5.7% increase of ejection fraction and 16.7% decrease of mitral regurgitation score. LV pacing was 4.8% shorter with LV pacing. A similar trend was observed in patients with or without left bundle branch block, except for a greater improvement in mitral regurgitation in the latter group. Compared with pre-ablation measures, ejection fraction increased by 11.2% and 17.6% with RV and LV pacing respectively, mitral regurgitation score decreased by 0% and 36.7% and diastolic filling time increased by 12.7% and 15.6%.

**Conclusion:** Rhythm regularization achieved with AV junction ablation improves ejection fraction with both RV and LV pacing; LV pacing gives additional favourable haemodynamic effect through a further increase in ejection fraction and reduction of mitral regurgitation. The effect seems to be equally present in patients with both depressed and preserved systolic functions and in patients with and without left bundle branch block.