**Objective:** Presenting a new technique to settle the coronary sinus lead, in cases of displacement, using an accessory coronary sinus lead implanted, called as our anchor lead.

**Methods and Material:** Six patients with Cardiac Resynchronization Therapy (CRT) presenting displacement of coronary sinus lead, were submitted to replacement with the implant of additional coronary sinus lead. After the implant of both coronary sinus leads, the chosen lead to stimulate the left ventricle, was the one which presented the best pace threshold without frenic stimulation, and the other one (the anchor lead) was isolated.

**Results:** The patients were followed for a mean period of 7 months (5 to 11 months) The threshold of coronary sinus lead were good and stable, and no more displacement was observed.

**Conclusion:** The anchor lead showed to be a good option to prevent coronary sinus lead displacement. This technique allows other options of left ventricle stimulation sites, due to the possibility of effective fixation, in several places, into the coronary sinus.

**P-245**

**ELECTROPHYSIOLOGICALLY-GUIDED APPROACH TO CORONARY SINUS CANNULATION AND IMPLANTATION OF THE LV LEAD FOR CARDIAC RESYNCHRONIZATION THERAPY IN CHRONIC HEART FAILURE**

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**Introduction:** Both the implant success rate and the implant time of a special LV lead remain important factors when considering cardiac resynchronization therapy (CRT) as a standard treatment in chronic heart failure. The aim of this study was to analyse such parameters in a cohort of consecutive cases from a single-center, using electrophysiological guided approach to coronary sinus (CS) cannulation.

**Methods:** Electrophysiologically (EP)-guided technique was used for fast identification of the CS os: standard quadripolar electrode catheter (Josephson curve, Diag) was advanced through a special introducer (Attain 6126, Medtronic) into the right atrium. Catheter tip was manipulated into the CS os based on endocardial signal character. The catheter was then introduced into the CS and the introducer slipped over it into the body of the CS. After that 5F balloon angiography catheter was introduced (Reverse Berman, Arrow) and angiography performed in 3 views. Based on specific anatomy, suitable LV lead was introduced into particular CS branch. Both duration of each step and corresponding fluoroscopic time (pulsed fluoro) were measured.

**Results:** Over a period of 22 months, 124 patients were indicated to CRT. Implant success rate reaches 90%. Biventricular ICD (n=23) and right-ventricular based on endocardial signal character. The catheter was then introduced into the coronary sinus. Biventricular ICD (n=23) and right-ventricular based on endocardial signal character. The catheter was then introduced into the coronary sinus. Cathe

**Conclusion:** Implanted success increased while procedure duration, and potential radiation exposure decreased with operator experience. Patients with complications decreased with experience and the evolution of LV lead technology. The procedure related deaths and perioperative complications are acceptable.

**P-247**

**CARDIAC RESYNCHRONIZATION THERAPY DECREASES INDUCIBILITY OF VENTRICULAR ARRHYTHMIA IN CONGESTIVE HEART FAILURE PATIENTS**

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**Background:** Biventricular (BV) pacing may improve systolic left ventricular function, functional status and well-being of patients with depressed left ventricular function and interventricular conduction delay. These patients with congestive heart failure often have an indication for ICD implantation as well. The aim of the present study was to evaluate whether long term BV pacing decreases inducibility of ventricular arrhythmias in these patients.

**Methods:** 10 patients treated with a combined BV-ICD device for dilated cardiomyopathy and at risk for ventricular arrhythmia were included. All patients underwent an electrophysiological (EP) study with ventricular programmed electrical stimulation (PES), both before implantation of the BV-ICD device and after a period of at least 6 months of BV pacing. PES protocol was 8 beat drive train with basic cycle length 600, 500 and 400 ms and up to 3extrasystoles with minimal cycle length 200 ms.

**Results:** The patient included (7 M, age 64&12y) had dilated cardiomyopathy (5 ischemic, 5 idiopathic) and interventricular conduction disturbances. Indications for ICD device were out of hospital cardiac arrest (n=6) or ventricular tachycardia (n=4). Antiarrhythmic drugs before BV-ICD (sotalol n=5, amiodarone n=4) was not significantly changed at long term follow-up (sotalol n=5, amiodarone n=3). Before BV-ICD implantation, sustained VT could be induced in 8 patients and nonsustained VT in one. After a period of 9.9±4.1 months of BV pacing, VT could be inducible in only 4 patients.

**Conclusion:** Long term BV resynchronization therapy decreases the inducibility of VT from 90% to 40% (p<0.05). Resynchronization therapy may have an antirhythmic effect.

**P-246**

**SAFETY OF TRANSVENOUS CARDIAC RESYNCHRONIZATION DEVICE IMPLANTATION: RESULTS OF OVER 2000 IMPLANT ATTEMPTS FROM THE MIRACLE PROGRAM**

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The Miracle Program includes the Miracle, Miracle ICD and InSync III studies. All patients had a QRS > 120 ms, EF < 35% on a stable heart failure pharmacological regimen. The purpose of this analysis was to assess whether there was an improvement in implant success rates and complication rates with increased experience and introduction of new LV lead technologies. The Attain 2187 and Attain 4189 are stylet delivered leads. The Attain 4193 is delivered by either stylet or over-the-wire. Implant time is defined as initial incision to final suture. The perioperative period is from implant to hospital discharge and post-operative from discharge through 6 months. Complications are defined as an adverse event requiring intervention or loss of significant device function.

**Results:** See table.
Methods: Twenty patients with a dual coil lead implanted were randomly programmed to EGM Can to SVC or Can to RV for the Wavelet algorithm. To accelerate the underlying supraventricular rhythm an exercise test was performed and the VT-zone was programmed to 100/min (theophylline off) for discrimination of the rhythm by the device. The matching percentage between the template and the EGM morphology during the test were evaluated at different frequencies. In the second run the same test was repeated with the other EGM source programmed.

Results: 4873 matching percentages were analyzed. The similarity of EGM morphology to the template was significantly higher (p<0.05) with the Can to RV source (mean±SD 89.6%±15.47) than with the Can to SVC source (mean±SD 72.4±2.38%). However, in one patient Can to SVC showed significantly higher similarities (p<0.001). All together 21 episodes in the VT-zone were stored by the ICD. 7 episodes with Can to SVC and 8 episodes with Can to RV as EGM source were adequately classified as SVT. Inadequate classification was apparent in 5 episodes with Can to SVC and 1 episode with Can to RV.

Conclusion: For the majority of patients Can to RV is the EGM source of choice for the new Wavelet algorithm and should be programmed routinely. Nevertheless in a small percentage of patients Can to SVC may be superior.

Methods and Results: Twenty one pts with RVOT-PVC and 81 pts with RVOT-PVC underwent catheter mapping and ablation. Thirteen pts had a focus of anteroseptal TA adjacent to the His bundle (HB). In all these 13 pts, the local ventricular electrogram recorded from HB catheter preceded QRS onset by 15 to 45 ms, and pacing from HB catheter produced nearly identical QRS configuration. In PVC originating near HB, QRS axis was inferior axis in 11 of 13 pts, and superior axis in remaining 2 pts. Compared to ECG of PVC originating from RVOT, ECG characteristics of PVC originating near HB was as follows: narrow QRS width, tall monophasic R wave in lead I, relatively low R wave in the inferior leads, obviously lower R wave in lead III than that in lead II, R wave in lead aVL, QS pattern in lead V1, and tall R wave in lead V5 and V6. Three pts had PVC originating from posteroseptal TA. Four pts had PVC originating from anterior TA. One pt had PVC originating from lateral TA. In 15 patients, PVC was successfully abolished. RFCA could not be performed in 2 patients because the earliest activation site was the HB. PVC recurred in 4 patients. On the tricuspid valve approach was failed, and beneath the tricuspid valve approach lead to complete elimination of PVC in 2 patients.

Conclusions: RV-PVC occasionally originates from RVIT as well as RVOT, and has distinctive features of 12-lead morphology.

Poster Session 2

P-249 IDIOPATHIC LEFT REPETITIVE VENTRICULAR PREMATURE BEATS WITH A WAVEFORM LIKE MORPHOLOGY ORIGINATING FROM THE MITRAL ANNULUS

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Recently it has been reported that idiopathic repetitive ventricular premature beats can arise not only from RVOT but also LVOT. However, little is known about the sites of origin of idiopathic left repetitive ventricular premature beats originating from the mitral annulus (MAVT/VPB). This study was designed to confirm the electrocardiographic characteristics of idiopathic MAVT/VPB.

Methods: Twenty four consecutive patients out of 48 patients (17 men and 7 women, mean age 51±12 years) had VT originated from LV underlying no cardiac diseases had MAVT/VPB's from the results of precise mapping and successful RFCA. According to the successful RFCA site close to the mitral annulus, the patients were subdivided into 3 groups. Delta wave like morphology of MAVT was evaluated by the widest ventricular activation time (VAI) and duration of QRS complex (lead V5) compared with those of aortic sinoatrial cusps VT. The polarity of delta wave like morphology of MAVT was measured within the initial 20 ms of VAT, classified as positive, negative, or isoelectric.

Results: The sites of origin subdivided were as follows: Group 1: anterior (n=7), Group 2: lateral (n=12) and Group 3: posterior (n=5). Analysis of the 12 lead electrocardiograms revealed a precordial R wave transition occurred on leads V1 or V2 in all groups. No S wave in group 1, an Rs pattern in group 2 and 3 were observed in either V5 or V6. Moreover, both the ventricular activation time and duration of the QRS complex of MAVT/VPB's were significantly wider, compared with those of aortic sinoatrial cusps VT (p<0.05, 0.01). The polarity of delta wave like morphology in inferior leads was positive in group 1 and 2, but negative in group 3.

Conclusions: Idiopathic left repetitive ventricular premature beats were mainly originated from either ventricular outflow tract or the mitral annulus. A focus of MAVT/VPB's might be suggested by a delta wave-like morphology because it was very similar to that of the WPW syndrome.

P-250 CATHETER ABLATION OF IDIOPATHIC PREMATURE VENTRICULAR CONTRACTION ORIGINATING FROM THE RIGHT VENTRICULAR INFLOW TRACT

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Idiopathic frequent premature ventricular contraction (PVC) usually arises from right or left ventricular outflow tract (OF). However, there are some right ventricular (RV) PVCs originating from RV inflow tract (RIT). The aim of this study was to clarify electrocardiographic (ECG) characteristics and efficacy of radiofrequency catheter ablation (RFCA) of PVC originating from the RIT around the tricuspid annulus (TA), including the site of the vicinity of the His bundle, especially compared with PVC originating from the RVOT.

Methods: Although magnesium has been shown to be effective in terminating torsades de pointes (TDP), its electrophysiological mechanism remains unclear. In this study, we evaluated the effects of magnesium on transmural dispersion of repolarization (TDR), early afterdepolarization (EAD) and TDP induction after administration of d-sotalol in isolated rabbit heart.

Methods: In isolated female rabbit hearts, TDP was induced by d-sotalol, bradycardia and abruptly changing the perfusate from normal Tyrode's solution to hypokalemic Tyrode's solution. 23 rabbit hearts were divided into 3 groups in which the concentration of magnesium in hypokalemic Tyrode's solution was low (0.35mM, n=9), normal (1mM, n=7) and high (10mM, n=7) respectively. ECG and monophasic action potential (MAP) of the left ventricular epicardium, midmyocardium and endomyocardium were recorded simultaneously. The incidence of EAD and TDP was observed as well.

Results: (1) d-Sotalol markedly prolonged MAP duration in all the three myocardial layers, especially in midmyocardium. The TDR among three myocardial layers increased significantly after d-Sotalol. With the level of magnesium increasing, the TDR tended to decrease. (2) d-Sotalol induced high incidence of EAD (9/9) and TDP (7/9) in low-magnesium group. These values decreased by increasing the level of magnesium/3/7 and 1/7 in normal-magnesium; 0/7 and 0/7 in high-magnesium group.

Conclusions: These findings suggest magnesium could decrease TDR and suppress EAD induction by d-Sotalol in isolated rabbit heart, which may be related to its therapeutic mechanism for TDP.