ing. The CS catheter was then replaced with the MESH electrode catheter. The MESH electrode was deployed and RF lesions were delivered just outside and just inside the CS os. After each ablation the CS mapping catheter was repositioned and activation sequence re-evaluated.

Results: CS access was possible in 3 of 4 dogs. CS activation sequence (high frequency potentials) during low right atrial pacing was proximal (CS os) to distal in all animals. In addition, far field (low frequency) left atrial potentials were seen with similar sequence. After RF ablation the CS activation sequence now progressed from distal to proximal, consistent with conduction block in the CS. Left atrial far field potentials however still showed a proximal to distal sequence. Macroscopic lesion evaluation showed circumferential lesions just inside the CS os.

Conclusion: In this model, (1) a novel RF energy MESH electrode ablation catheter can create circumferential ablation lesions inside the CS os, (2) these lesions result in conduction block along the CS. (3) Creation of inter-atrial conduction block may be useful in catheter ablation of AF.

POSTER SESSION

1138 Measuring the Effectiveness of Biventricular Pacing

Monday, March 18, 2002, 3:00 p.m.-5:00 p.m.
Georgia World Congress Center, Hall G
Presentation Hour: 4:00 p.m.-5:00 p.m.

1138-106 Flow and Tissue Doppler Echocardiography Before and After Biventricular Pacing: Resynchronization Results in a Significant Decrease of Mitral Regurgitation

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Background and Introduction: Resynchronization of ventricular contraction and optimization of left ventricular (LV) filling are two mechanisms which contribute to the clinical benefit observed in heart failure patients (CHF-pts.) with a wide QRS complex treated with biventricular or LV pacing (BLP). The influence of BLP on a concomitant mitral regurgition (MR) is largely unknown.

Methods and results: 49 CHF-pts (mean NYHA-class: 3.0±0.3) were studied by flow (FDE) and tissue (TDE) Doppler echocardiography before and 144±94 days after BLP. Left ventricular asynchrony was assessed by TDE comparing the electromechanical delay (EMD: from QRS onset to onset of movement) of the basal septal and lateral walls. LV filling time and mitral inflow velocities were measured by pulsed FDE (all time measurements corrected for a cycle length of 1000 ms). Severity of MR was assessed by FDE color flow mapping measuring jet areas in the 4 chamber and long axis views (Nyquist velocity held constant at 58 cm/s).

Conclusions: BLP eliminates the difference between septal and lateral EMD, thus synchronizes LV contraction, and lengthens LV filling time. Mitral regurgitant jets are significantly reduced. This results in a decrease of LA size and mitral inflow e wave. Further investigation will show whether these effects persist and have a positive influence on the long-term prognosis of this population.

Variable	Baseline	Follow-up	p-value
LV enddiastolic diameter (mm)	80±10	73±12	<0.001
LA endsystolic diameter (mm)	54±9	48±11	<0.0001
LV filling time (FDE;ms)	399±102	462±83	<0.0001
Mitral inflow e wave velocity (cm/s)	86±35	69±30	<0.01
Regurgitant jet area (4 chamber, cm²)	10±7	7±6	<0.01
Regurgitant jet area (long axis, cm²)	7±5	4±5	<0.01
LV septal EMD (TDE;ms)	157±103	154±55	n.s.
LV lateral EMD (TDE;ms)	193±109	140±44	<0.01

1138-107 Echocardiographic Predictors of Functional Class Changes During Cardiac Resynchronization Therapy: Results From the MIRACLE Trial

Martin St. John Sutton, Ted Plappert, William T. Abraham, Andrew L. Smith, David B. Delurgio, Evan Loh, Dusan Z. Kocovic, Alfred L. Clavell, David L. Hayes, Kathryn E. Hilpisch, Ed Chinchoy, Michael R. Hill, *Medtronic, Inc., Minneapolis, Minnesota, Cardiovascular Division, University of Pennsylvania, Philadelphia, Pennsylvania.*

INTRODUCTION: Cardiac resynchronization therapy (CRT) has been shown to improve both functional and symptomatic status in patients (pts.) with advanced heart failure (HF) and dilated cardiomyopathy. This analysis investigated relationships between echocardiographic parameters and symptomatic (NYHA class) improvements. METHODS: Pts. with symptomatic HF (NYHA class III/IV), QRS duration ≥ 130 ms, EF<35% and left ventricular end diastolic dimension (LVEDD) > 55 mm were implanted with the InSync atrial synchronous biventricular pacing device, and randomized to control (pacing off) or treatment (pacing on). Doppler echocardiograms and assessment of NYHA class were performed at baseline and 6-month follow-up by a single sonographer. RESULTS: A significant difference was found for NYHA class between pts. in upper and lower quartiles based on left ventricular end diastolic volume LVEDV (p=0.0496) and LVEDD (p=0.0103).

CONCLUSIONS: This data suggests a relationship between the ventricular diastolic dimensions and changes in functional NYHA class. Further evaluation is warranted.

NYHA Class Mean Paired Differences: Baseline to 6-month Follow-up

(mean, median ± std)	Echo parameter to determine quartiles		
	LVEDV	LVEDD	LVEF
Lower Quartile	-0.56, 0 ± 0.77 N=48	-0.38, 0 ± 0.70 N=26	-0.57, 0 ± 0.71 N=49
Upper Quartile	-0.82, -1 ± 0.75 N=55	-0.97, -1 ± 0.87 N=37	-0.72, -1 ± 0.7 N=57

1138-108 Right Ventricular Anodal Capture in Biventricular Stimulation for Heart Failure: A Look at Multiple Lead Models

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Background: In second-generation devices with independent ventricular outputs the RV ring electrode can be included in both the LV and RV pacing configurations. Stimulation initiated at the RV ring electrode (i.e. anodal capture (AC)) has been observed. This study evaluates the RV lead ring effects on AC.

Methods: The Medtronic InSync III U.S. Clinical Study is a prospective study in which AC threshold data (consistent capture) were collected when pacing LV tip to RV ring.

Results: Available data were analyzed to compare RV ring type, tip fixation, and tip position. AC thresholds were compared between groups using a two-sided t-test.

The percentage of leads exhibiting AC decreases with time from pre-discharge (70.05%) to 3 months (59.78%). The percentage of leads with RV ring AC thresholds less than 2x the LV threshold, decreased from pre-discharge (18.63%) to 3 months (8.79%).

Conclusions: Multiple RV lead types exhibit AC. Therefore loss of sequential pacing can occur with all lead types. There is no statistical significance (SS) in AC threshold between ring types or fixation types. Collectively there is no SS in AC threshold for the positions studied. When ring types are separated, the platinized 10mm spaced leads shows SS in AC threshold between septal and apex positions at 3 mo. The majority of patients can be programmed > 2x safety margin chronically without AC. One solution is to alter the pacing configuration to LV unipolar so there is not a common ring.

RV Lead		Pre-Discharge			3 Month		
		Threshold (Standard Deviation)	N	P value	Threshold (Standard Deviation)	N	P value
Ring Type	Polished / 17 mm spacing	4.49v (1.99v)	39	0.065	5.81v (1.82v)	16	0.179
	Platinized / 10 mm spacing	3.84v (1.58v)	69		4.98v (1.94v)	25	
Fixation Type (same spacing and ring electrode)	Active	4.49v (1.99v)	39	0.057	5.81v (1.82v)	16	0.884
	Passive	5.57v (2.17v)	21		5.94v (2.43v)	8	
Position (Collective)	Septum	4.71v (2.02v)	33	0.315	5.81v (1.85v)	12	0.609
	Apex	4.30v (2.16v)	168		5.49v (2.03v)	78	
Position (Platinized/ 10mm)	Septum	4.59v (2.12v)	26	0.056	6.07v (1.84v)	10	0.047
	Apex	3.66v (2.05v)	65		4.59v (1.91v)	23	
Position (Polished/17mm)	Septum	5.33v (2.02v)	5	0.348	No Capture	1	N/A
	Apex	4.42v (2.02v)	40		5.70v (1.82v)	19	

1138-109 Left Ventricular Remodeling During Cardiac Resynchronization Therapy: Effect on Ventricular Dimension and Stimulation Threshold Chronically After Biventricular Pacing

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BACKGROUND: Cardiac resynchronzation therapy (CRT) improves left ventricular (LV) performance, functional status, exercise performance and quality of life in patients with moderate to severe congestive heart failure. Acute changes seen in LV performance include increased systolic blood pressure, decreased mitral regurgitation, and reversal of paradoxical septal motion. This study examines the effect of chronic CRT on LV dimensions and stimulation thresholds to determine whether biventricular pacing reverses two components of the LV remodeling associated with conduction delay and LV dysfunction.

METHODS: We selected patients (n=106) from the MIRACLE study to determine the