chronic findings from bifocal (BRAP) and unifocal (URAP) right atrial pacing. The findings presented here from 8 pts (6 women, aged 67 ± 8 years) are part of an ongoing prospective study, which investigates the role of BRAP in patients with sick sinus syndrome (SSS) and paroxysmal atrial fibrillation. BRAP was applied with electrodes at the right atrial appendage and at the coronary sinus os. The dimensions of the atrium were normal in every pt. In each case echo-Doppler was used to evaluate the cardiac output (CO) and the E/A ratio from the mitral flow under DDD mode with the optimum AV delay, during unifocal and bifocal pacing in random order, acutely and chronically, with a two month interval between.

	Acute effects			Chronic effects		
	Unifocal	BRAP	p	Unifocal	BRAP	p
Optimum AV delay	122.22 ± 4	128.8 ± 5	NS	125.55 ± 46	130.5 ± 55	NS
CO (1/min)	4.6 ± 1.9	5.2 ± 1.5	0.006	4.4 ± 1.8	5.0 ± 1.9	0.007
E/A	0.84 ± 0.3	0.73 ± 0.3	0.08	1.03 ± 0.4	1.08 ± 0.4	NS

These preliminary findings indicate that BRAP produces a better acute and chronic hemodynamic result at rest than does URAP in pts with SSS.

5:15

726-6 Effect of Various Atrio-Ventricular Intervals on Coronary Artery Flow Velocity Profiles in Dual Chamber Pacemakers

Heyder Omran, Thorsten Lewalter, Dean MacCarter, Werner Jung, Rami Rabahieh, Wolfgang Fehske, Berndt Lüderitz. *Department of Cardiology, University of Bonn, Bonn, Germany*

Background: The programmed duration of the atrio-ventricular interval (AVI) in dual chamber pacemakers (DDD) influences left ventricular filling patterns and the length of the diastolic period. As coronary artery flow is mainly determined by diastolic flow, the length of the AVi may alter coronary flow.

Methods: To determine whether the duration of the AVI influences resting profiles of coronary artery flow velocities, coronary artery flow velocity spectra of the left anterior descending coronary artery were registered by means of transesophageal Doppler echocardiography (TEE) in 12 patients without coronary artery disease with DDD pacemakers at various AVI at a heart rate of 90 bpm. Peak systolic and diastolic coronary flow velocities (Vs, Vd), and systolic and diastolic Velocity-Time-Integral (VTIs, VTId) were measured.

Results:

AVI (ms)	Vs (cm/s)	VTIs (cm)	Vd (cm/s)	VTId (cm)
200	19 ± 5	3.1 ± 1.3	41 ± 6	9.5 ± 2.2
100	19 ± 9	3.1 ± 1.7	43 ± 14	13.3 ± 1.2**
60	26 ± 10*	3.2 ± 1.6	40 ± 17	14.4 ± 4.5*

*p < 0.05 200 vs 60 ms, **p < 0.05 200 vs 100 ms

Conclusions: Transesophageal Doppler echocardiography can be used to demonstrate and quantify differences in coronary artery flow between different AVI's in dual chamber pacemakers. The finding that diastolic coronary artery flow at short AVI's is significantly higher than at long AVI's may be of importance for programming the duration of AVI's in patients with coronary artery disease.

727 VT: Mapping and Catheter Ablation

Monday, March 25, 1996, 4:00 p.m.–5:30 p.m.
Orange County Convention Center, Room 314

4:00

727-1 Accuracy of Endocardial Maps Using Reconstructed Non-Contact Unipolar Electrograms in Locating Specific Endocardial Pacing Sites

Stuart W. Adler, Brian D. Pederson, Jeffrey R. Budd, Charles C. Gornick. *University of Minnesota and VAMC, Minneapolis, MN*

A non-contact multi-electrode array catheter (MEA) and analysis system permits reconstruction of endocardial surface activation using 2500 unipolar virtual electrograms. Use of an integrated emitted signal (LOCATOR) aids the operator in directing a standard quadripolar catheter (QUAD) to specific map directed LV endocardial sites.

The accuracy of the MEA system was assessed in 5 open chest dogs. Bipolar (2 mm) plunge (PLUNGE) electrodes were passed through the LV wall and secured at various endocardial positions. The MEA catheter was inserted via the femoral artery and deployed (1.6 × 4.0 cm) within the LV cavity. Pacing from 7 distinct PLUNGE sites permitted site specific endocardial activation. Real time activation maps were displayed and the LOCATOR signal was used to direct a QUAD (4 mm tip) to the site of earliest paced activation. After final QUAD positioning the LOCATOR signal was shifted from the QUAD to the paced PLUNGE electrode to measure the distance between the QUAD tip and the PLUNGE site on the map. Radiofrequency energy (RF) application marked the QUAD tip location. At autopsy the distance between the RF lesion marking the final QUAD tip location and the endocardial PLUNGE site was measured.

Results: The LOCATOR signal shift between the final QUAD position and the map PLUNGE site was 12.0 ± 5.4 mm. Similarly the distance between the RF lesion center and the actual PLUNGE location at autopsy was 8.3 ± 5.5 mm. The paired difference between these two measurements was 3.7 ± 2.6 mm and is smaller than the mean RF lesion diameter of 3.9 ± 0.9 mm. After RF one plunge had marked elevation in pacing threshold and another could not be paced.

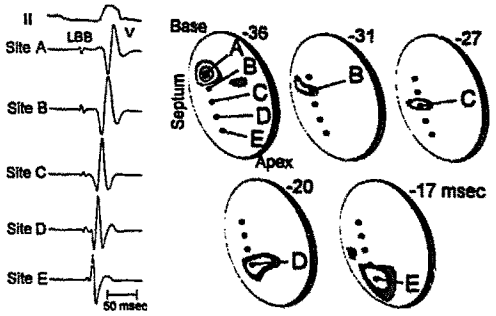
Conclusions: The MEA system provides accurate, real time display of LV endocardial depolarization maps and standard catheter location. The system permits an operator to place a catheter in a 9 mm radius of an endocardial site without the use of contact electrograms. System accuracy is within 4 mm.

4:15

727-2 New Noncontact Multielectrode Array Catheter Mathematically Reconstructs Left Bundle Branch Potentials

Hiroshi Nakagawa, Graydon Beatty, James H. McClelland, Lawrence E. Widman, Mauricio Arruda, Karen J. Beckman, Mario D. Gonzalez, Ralph Lazzara, Wyn Davies, Warren M. Jackman. *Univ of Oklahoma, Okla City, OK*

A new noncontact multielectrode array (MEA) catheter has been developed to mathematically reconstruct endocardial potentials for LV mapping. This study was undertaken to determine if discrete subendocardial potentials from the left bundle branch (LBB) can be mathematically reconstructed. In 3 closed chest dogs (30–34 kg), the 9 Fr MEA catheter (64 electrodes on 40 mm × 16 mm balloon) was inserted into the LV via the right femoral artery. During sinus rhythm, the isopotential map generated from the MEA showed a pattern of excitation along the septum from base to apex, before ventricular activation, consistent with activation of LBB network in all 3 dogs (figure). Mathematically reconstructed bipolar electrograms (left panel) from sites A to E on the map display (right panel) show potentials typical of LBB activation.



Conclusion: Discrete LBB potentials can be mathematically reconstructed using MEA catheter.

4:30

727-3 Characterization of Local Electrogram With Diastolic Potential and Diastolic Potential Guided Catheter Ablation of Ventricular Tachycardia in Patients With Structural Heart Disease

Junichi Saito, Eugene Downar, Toshio Yamamoto, Hiroshi Matsuo. *Saitama Medical School Hospital, Saitama, Japan; Toronto General Hospital, Toronto, Canada*

Diastolic Potential (DP) are often sought for catheter ablation in ventricular tachycardia (VT). However, a delivery of energy at such sites is not always successful. We therefore characterized the local electrograms (LE) with DP which were obtained by 112 bipolar endocardial balloon, intra-operatively. Then, we performed a DP guided catheter ablation in a Pt with VT post myocardial infarction (Pt 1) and analyzed the LEs at the successful catheter ablation sites in two Pts, retrospectively (Pt 2; arrhythmogenic right ventricular tachycardia, Pt 3; cardiomyopathy). *Results:* 30 VTs in 17 pts who had surgical mapping showed LE with DP. By mapping of DP, tracking DPs from