

**Results:** No significant difference in RA CT was observed. CAF pts had significantly prolonged LA CT vs C. CAF pts had significant shortening of DCS ERPs and paradoxically prolonged LRA ERPs as compared with C. Both PAF and CAF pts had lost normal adaptation of ERPs at HRA & DCS, but was preserved in LRA

ERP <sub>s</sub>	HRA	LRA	DCS
CAF 400	186	195	181
600	188	207*	182
PAF 400	186	183	209*
600	200	193*	217*
C 400	185	169*	201
600	193*	174*	214*

\*p < 0.05 vs 400; †p < 0.05 vs CAF

**Conclusions:** 1) In CAF, electrophysiological abnormalities mainly occur in LA. 2) Electrophysiologic remodeling seen in pts with AF affects the atrium nonuniformly with shortening or prolongation of ERPs in different parts of atrium, which may increase the heterogeneity of atrial electrophysiological properties and contributes to perpetuation of AF. 3) PAF is associated with a modest prolongation of LA CT and maladaptation of ERPs in high RA and DCS, suggesting progressive atrial electrophysiologic remodeling.

**1228-162 Batrial High Density Mapping of Electrically Induced Atrial Fibrillation in Humans**

G. Tomassoni, C.R. Johnson, R. Mehra, P.D. Wolf, J.M. Wharton. *Duke Medical Center, Durham, NC; Medtronic Inc., Minneapolis, MN, USA*

**Background:** High density electrical mapping of both atria during electrically induced atrial fibrillation (AF) in humans has not been previously reported.

**Methods:** Using a 2.4 x 2.2 cm symmetric mapping plaque (528 unipolar electrodes, 1 mm interelectrode distance), detailed sequential epicardial mapping of the right atrium (RA) and the left atrium (LA) was performed in 5 patients (age 61 ± 10 yrs, LVEF 50 ± 6.4%) undergoing CABG surgery. AF was induced by rapid atrial burst pacing. Recordings were obtained from both the RAA and LAA.

**Results:** A total of 18 seconds of activation patterns were analyzed. The mean cycle length during AF was 188 ± 58 ms (range 125-288 ms) in the RA and 204 ± 36 ms (range 148-268 ms) in the LA. In 4/5 patients, LA activation patterns were more complex with a higher incidence of fragmentation. Although complete reentry was not visualized, long lines of functional conduction block were more frequent in the RA with propagation of the wavefronts along the site of block. Non-repetitive focal epicardial activations were twice as common on the LA compared to the RA. Conduction velocities were not significantly different (RA 52.3 ± 3.4 cm/s vs. LA 55.7 ± 5.2 cm/s, p = 0.08). Electrical inactivity over the mapping plaque was greater during LA recordings (4.1 s) compared to the RA (2.7 s).

**Conclusions:** In electrically induced AF, LA activation patterns appeared to be more complex with a higher incidence of focal epicardial activations and wavefront fragmentation compared to the RA despite a greater mean cycle length and longer periods of electrical silence.

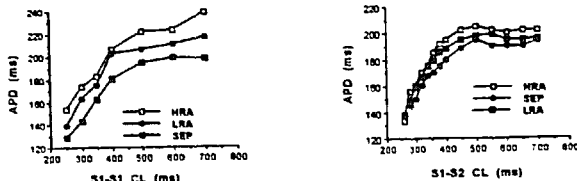
**1228-163 Cycle Length Dependence of Action Potential Duration and Dispersion in the Human Atrium**

A. Intini, J. Moubarak, P. Karasik, M.R. Franz. *VAMC and Georgetown University, Washington, DC, USA; Catholic University, Rome, Italy*

**Background:** The cycle length (CL) dependence of action potential duration (APD) has been well characterized for the human ventricle by monophasic action potential (MAP) recordings but only minimal data are available on CL dependence of atrial APD in the human heart.

**Methods:** In 7 patients, MAPs were recorded simultaneously from high (HRA), low (LRA) and septum (SEP) right atrial sites during both steady-state (SS) pacing from 700 to 250 ms and extrastimulus (ES) pacing from 700 ms to refractoriness at 600 ms basic CL.

**Results:** Steady-state APD at 600 ms CL was longer (242 ± 42 ms) at HRA than Sep (211 ± 35 ms, p < 0.05), with LRA in between. This dispersion decreased towards shorter CL. ES-curves also were dispersed at long CL (HRA 200 ± 27 vs. LRA 179 ± 25 ms at 600 ms, p < 0.05). Examples for SS (left) and ES (right):



**Conclusions:** 1) SS and ES APD show CL dependence similar to that reported in ventricular studies. 2) APD varies from site to site in the human right atrium, especially at longer CL. 3) CL and site dependence of atrial APD may be important for understanding pacing related efforts to prevent atrial fibrillation.

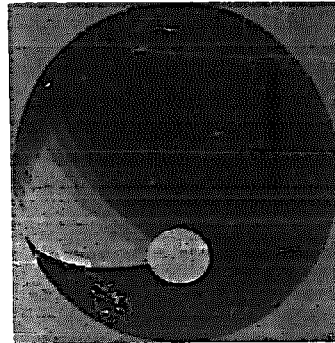
**1228-164 Three-dimensional Computer-assisted Animation of Atrial Tachyarrhythmias Recorded With a 64-Polar Basket Catheter**

B. Zrenner, F. Hofmann, M.A.E. Schneider, A. Plewan, M. Karch, A. Schomig, C. Schmitt. *German Heart Center and Klinikum rechts der Isar, Technical University Munich, Germany*

The use of a 64-polar basket catheter (B) (Constellation catheter, EPT) allows multipolar three-dimensional recording of atrial tachyarrhythmias in the clinical electrophysiologic laboratory. Thus the intraatrial activation sequence can be demonstrated.

**Methods:** We developed a software for the automatic analysis of the activation sequence. The B was used in the right atrium in 36 pts with atrial tachyarrhythmias: inappropriate sinus tachycardia in 4 pts, common type atrial flutter in 18 pts, uncommon atrial flutter in 4 pts and focal atrial tachycardia in 10 pts. The signals were recorded with a BARD EP-Lab system and transferred to an office personal computer. After evaluation of the 56 different bipolar leads the activation sequence can be visualized as a projected globe (Figure: common type atrial flutter, basal exit). The activation sequence is coded by changing colors.

**Results:** In all 22 pts with a reentry mechanism the reentry was located in the right atrium and could be demonstrated as a return of the activation to the exit area. In all but 2 patients with a focal atrial tachycardia, where the focus was located in the left atrium, the focal mechanism was demonstrated.



**Conclusion:** The animation of atrial tachyarrhythmias, recorded with a basket catheter, allows a simple instantaneous differentiation of the underlying mechanism in most of the patients.

**1228-165 Atrial Conduction After Intracardiac Defibrillation of Atrial Fibrillation: Correlation to Relapse**

D. Pfeiffer, P. Kluge, T. Walter, A. Neugebauer. *Dept. of Cardiology, University of Leipzig, Leipzig, Germany*

Intraatrial defibrillation of atrial fibrillation (AF) is a highly effective method. However, a lot of successfully treated patients will have relapses despite antiarrhythmic drug treatment. The aim of the study was to find markers for recurrences of AF.

**Patients and Methods:** The study consists of 15 patients (8 male, 7 female, age ranged between 31 and 70 years) with persistent AF after several ineffective external countershocks. LVEF ranged between 44 and 62, left atrial diameters between 38 and 50 mm. All patients were successfully converted to sinus rhythm using biphasic shocks between 3 and 25 J through two coil electrodes between high right atrium (HRA) and coronary sinus (CS). Interatrial conduction was measured 10 min after shock using extrastimulus technique at HRA and CS beginning 10 min after the shock.

**Results:** There were 2 early and 6 late relapses despite treatment with flecainide (n = 4) or propafenone (n = 4). Interatrial conduction is shown in the table:

	HRA-CS	HRA-CS <sub>max</sub>	CS-HRA	CS-HRA <sub>max</sub>
relapse	168 ± 39	186 ± 46	189 ± 29	189 ± 16
no relapse	131 ± 36	177 ± 28	155 ± 25	183 ± 27

**Conclusions:** Prolonged and decremental interatrial conduction is a common observation in persistent, drug- and external defibrillation-refractory atrial