

1043-111

**Dual-Site or Bi-Atrial Pacing Does Not Enhance Atrial Activation as Compared to Pacing From Novel Single Right Atrial Sites in Humans**

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**Introduction:** Atrial based pacing for prevention of atrial fibrillation using standard and novel pacing configurations is under investigation. A possible anti-arrhythmic mechanism of pacing is to enhance bi-atrial activation and decrease dispersion of refractoriness. To determine whether dual site pacing (pacing from the distal right atrial (RA) appendage plus coronary sinus os), or bi-atrial pacing (pacing from the distal RA appendage plus distal coronary sinus) results in shortened atrial activation time (AAT) as compared to pacing from single RA sites, 19 patients (age 50±19 y) undergoing standard catheter ablation procedures were studied.

**Methods:** Pacing at 600 ms was accomplished in each subject from the proximal RA appendage, distal RA appendage, high RA septum, coronary sinus os, and using dual site and bi-atrial pacing. AAT was assessed by measuring P-wave duration from high-resolution (50-400 mm/s; 1-5 mV/cm) 12-lead rhythm strips.

**Results:** AAT during sinus rhythm (116.7±13.2 ms, mean±S.D.), and during single site pacing from the high septum (118.1±13.3), proximal appendage (116.4±11.2), coronary sinus os (118.9±15.9), and using dual site (110±12.8) or bi-atrial (107.9±14.1) pacing was the same (ANOVA, p>0.07). AAT during pacing from the distal RA appendage (129.4±21.6) was significantly greater than with pacing from any other site (ANOVA, p=0.001, T-test P=0.01). Dual site or bi-atrial pacing did not result in significantly shorter atrial activation times compared with pacing from the 'best' single site (P=0.54, 0.22 respectively).

**Conclusions:** 1) There is no significant enhancement of AAT using multi-site pacing in these individuals with normal intra- and inter-atrial conduction compared to RA pacing from a single site that yields rapid atrial activation. 2) A map-guided single RA pacing site can provide the benefits of multi-site pacing on atrial activation in such individuals without the need for multiple RA pacing leads. 3) Further studies are required to determine whether multi-site pacing provides added antiarrhythmic benefit compared to pacing from selected single RA pacing sites in individuals with atrial fibrillation and intact atrial conduction.

1043-111A

**Multisite or Septal Pacing for Arrhythmia Suppression in an Experimental Model of Paroxysmal Atrial Fibrillation?**

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**Methods:** To investigate whether multisite and septal pacing suppress paroxysmal atrial fibrillation (AF) in an experimental model, sterile right atrial pericarditis was induced in 12 foxhounds to provide an anatomical substrate. As a trigger mechanism, atrial extrasystoles were simulated by constant asynchronous pacing at a cycle length (CL) of 1000 ms from randomly selected right or left atrial electrodes, contained within a custom-designed epicardial multielectrode with 128 bipoles. Additionally, a transvenous pacing lead was screwed into the interatrial septum. Four electrodes located in the high and low right (HRA/LRA) and left atrium (HLA/LLA) were selected for multisite stimulation. Constant pacing at a CL 30 ms below sinus rate was applied from the following pacing site(s) in random order: 1) HRA, 2) HRA + LRA, 3) HRA + LLA, 4) HRA + LRA + LLA, 5) HRA + LRA + HLA + LLA, and 6) septal. Number and duration of AF episodes with or without preventive pacing were studied during 10 min intervals, separated by 5 min pauses, respectively.

**Results:** The efficacy in suppressing AF increased with the number of pacing sites. Single-site septal pacing was as efficient as quadruple-site pacing. The data are summarized in the table below (\*p<0.05 vs. HRA; Tukey Kramer HSD test).

**Conclusion:** In this experimental model, preventive atrial pacing reduced the number of AF episodes, most efficiently with an increasing number of simultaneously paced sites or with a single pacing site located septally.

Pacing site(s)	AF episodes (n)	Episode duration (s)
HRA	14.3±10.2	24±38
HRA+LRA	7.5±8.3	22±27
HRA+LLA	8.4±7.4	19±52
HRA+LRA+LLA	7.1±6.5	12±19
HRA+LRA+HLA+LLA	3.9±4.2*	37±81
Septal	3.7±3.6*	37±75

POSTER SESSION

**1066 Atrial Fibrillation: Thromboembolism and Stroke**

Sunday, March 17, 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.

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**Left Atrial Appendage Ligation During Mitral Valve Surgery May Increase the Risk of Late Thromboembolic Events**

Nour M. Juratli, Bruce L. Wilkoff, Patrick J. Tchou, Delos M. Cosgrove, Bruce W. Lytle, Mina K. Chung, Michael S. Lauer, Luther T. Clark, Mark J. Niebauer, Walid Saliba, Robert A. Schweikert, Andrea Natale, Cleveland Clinic Foundation, Cleveland, Ohio.

**Background:** The need for non-pharmacological treatment to prevent thromboembolic events (TE) in atrial fibrillation (AF) is increasing. Left atrial appendage (LAA) ligation during mitral valve (MV) surgery was suggested as an alternative treatment to anticoagulation with warfarin, but the role of this surgical procedure is still controversial. **Methods:** Between 5/93 and 11/98 136 patients (pts) underwent LAA ligation during MV surgery. Complete follow up was available on 114 pts. There were 67 (58.8%) females and 47 (41.2%) males with a mean age of 61.1 ± 12.3 yrs and a mean LVEF of 46.7 ± 12.3%. The MV was replaced with bioprosthetic valve in 36 (31.6%) pts or mechanical in 27 (23.7%) pts and repaired in 51 (44.7%) pts. A control group of 146 pts who underwent MV surgery without LAA ligation were selected randomly and found to match for age, sex, LVEF, type of valve surgery, left atrial size, HTN, DM, and smoking history. Late TE was defined as stroke, transient ischemic attack, or peripheral embolism occurring 48 hours after the surgery. Cardiothoracic surgery database and telephone contact were used to assess the incidence of late TE. **Results:** Over a follow up period of 1318 ± 481 days 14 (12.3%) pts had TE in LAA ligation group vs 9 (6.2%) pts in the control group over a follow up period of 1705 ± 650 days. Late TE by Kaplan-Meier curves for the two groups differed significantly for the entire follow up period with a p value of 0.034. The one year rate of TE in LAA ligation group was 8.8 ± 2.7% vs. 2.7 ± 1.4% in the control group. No warfarin therapy or subtherapeutic anticoagulation was found in 23 pts out of 24 pts during TE. Among pts who were not prescribed warfarin prior to discharge home 6/40 (15%) pts had TE in LAA ligation group compared to 2/60 (3.3%) in the control group (p=0.023). There was no difference in late TE between the two groups among patients who were prescribed warfarin prior to discharge home 7/67 (11.5%) pts in LAA ligation group vs. 7/70 (10%) in control group (p=0.66). **Conclusion:** In this group of patients LAA ligation does not provide adequate protection from late thromboembolic events in the absence of effective anticoagulation with warfarin.

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**Prevention of Post-Cardiac Surgery Atrial Fibrillation Is Not Associated With Decrease in Post-Operative Stroke: Meta-Analysis**

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Post-operative atrial fibrillation (POAF) has been associated with increased rate of post-operative stroke. However, it is far from certain that the POAF is an actual cause of post-cardiac surgery stroke, because other intra- and extra-cardiac sources of embolism are common. No study has convincingly demonstrated that a decrease in POAF prevents post-cardiac surgery stroke. Therefore, we performed meta-analysis of randomized controlled trials on POAF prevention by drugs (beta-blockers, sotalol and amiodarone) and pacing, with the end-point of in-hospital post-operative stroke. The identification of trials and data derivation were performed in accordance to Cochrane group methodology. **Results:** The data regarding stroke were available in 12 randomized control trials, with the total population of 2683 patients. Most of trials excluded patients with low left ventricular ejection fraction and other groups at increased peri-operative risk. 1064 pts were randomized to amiodarone, 347 to sotalol, 1077 to other beta-blockers and 195 to the pacing or control treatment. The control groups received routine care, or placebo. The occurrence of POAF decreased significantly from 39% in control group to 25% in treatment group (OR 0.45, 95%CI 0.35, 057). The incidence of post-operative stroke was 1.2% in control vs. 1.2% in intervention group (OR 0.94, 95%CI 0.46, 1.92). **Conclusion:** The enrolled population had low risk of peri-operative stroke. In this meta-analysis, decrease in occurrence of POAF was not associated with change in the rate of post-operative stroke, although the power of this study was still insufficient to prove differences in range below 1%.

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**Predictors of Warfarin Use in Atrial Fibrillation: Insights From the FRACTAL Registry**

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**Background:** Warfarin is underused for stroke prevention in atrial fibrillation (AF). Previous studies have shown that some stroke risk factors such as prior stroke or congestive heart failure (CHF) are predictive of warfarin use, while other stroke risk factors are not. Prior studies have lacked longitudinal observation, and little is known about whether anticoagulation rates vary by physician specialty type.

**Methods:** We analyzed warfarin use in 1005 subjects enrolled in the Fibrillation Registry Assessing Costs, Therapies, Adverse events, and Lifestyle (FRACTAL), an observational cohort study of new onset atrial fibrillation. Possible determinants of warfarin use at enrollment and 12 months later were evaluated using logistic regression.

Cardiac Arrhythmias