Three-Dimensional Noncontact Mapping Demonstrates Synergistic Electrophysiologic Effects of Multisite Atrial Pacing and Linear Atrial Ablation in Patients With Refractory Atrial Fibrillation

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Background: While linear right atrial (RA) ablation has limited efficacy in atrial fibrillation (AF) & dual site RA pacing (DAP) can be efficacious, the electrophysiologic effects of combined "hybrid" therapy have not been studied using 3-D non-contact mapping (NCM). Methods: We examined global atrial activation & RA activation before & after RA maze with refractory AF using NCM. Results: 30 pts, mean age 69±10 yrs, mean LA size 42±9 mm, mean LVEF 43±12%, with cardiac disease (n=25) were studied. Conclusion: Reduction in atrial activation time was reduced by 10.30% (mean 18%). Conclusions: 1. RA maze procedures produce conduction delay, prolong global atrial activation & can promote macro-reentrant arrhythmias. 2. DAP resynchronizes RA maze compartments & prevents spontaneous tachycardias. 3. DAP & RA maze have potential for synergy in antiaarrhythmic effects in nyctoma therapy of AF.

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Combined Atrial Pacing Prevention Algorithms Reduce Atrial Tachyarrhythmia Burden in Bradycardia Patients With Frequent Premature Atrial Contractions and Standard Atrial Lead Placement: ASPECT Trial Results

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Background: Atrial prevention pacing algorithms (PPA) have previously been shown to reduce the frequency of premature atrial contractions (PAC) in bradycardia patients with a history of atrial tachyarrhythmias (AT). Whether this reduction is associated with a reduction in AT burden in patients with high PAC frequency is unknown. Methods: 120 patients with a Class 1 pacing indication and a history of paroxysmal AT receiving a DDDR pacemaker with AT and PAC detection and enhanced far-field R- wave rejection (AT500; Medtronic) were enrolled into an open-label analysis. Patients with atrial septal defects (14%) and atrial septal defects (14%) were ineligible for analysis. After a one-month monitoring period with DDDR pacing at 60 bpm, patients were randomized to 3 months of PPA programmed ON or OFF in a cross-over fashion. Conclusions: Patients were stratified into two groups based on whether their PAC frequency during the monitoring period was above or below the median PAC frequency in the overall group (2841/day). Device classified AT burden was reduced between PPA ON and OFF periods. Results: High PAC frequency during the monitoring period was associated with burden reduction during the PPA ON period in patients with non-septal leads. Conclusion: Patients with non-septal lead placement and high frequency PAC's may represent a responder group for atrial prevention pacing algorithms.

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Effects of Atrial Septal Lead Placement on Atrial Tachyarrhythmia Detection and Device Diagnostics in Bradycardia Patients

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Background: The impact of atrial septal lead placement on the accuracy of atrial tachyarrhythmia (AT) detection is unknown. Methods: Patients with a history of bradyarrhythmia and AT were randomized to atrial septal or non-septal lead placement and implanted with a DDDRP pacemaker (AT500, Medtronic). Each stored episode was classified for appropriateness of AT detection (i.e. AT confirmed at episode onset) and termination (i.e. sinus or paced rhythm confirmed at device-classified episode termination). Positive predictive value (PPV) was adjusted for lead position (low, mid, or high-septal). Results: A total of 16,843 stored episodes were analyzed from 239 patients. PPV for episode detection was similar for both lead locations (Table). The PPV of episode termination was significantly lower for patients with septal leads. Most inappropriate terminated episodes were followed by appropriate re-detection within 1 minute. Conclusion: Patients with non-septal lead placement and high frequency PACs may represent a responder group for atrial prevention pacing algorithms.