

ABSTRACT SESSION AB02: Technology Advancing Tachyarrhythmia Management

Wednesday, May 4, 2011

2:30 p.m. - 4:00 p.m.

AB02-1

FEASIBILITY OF ELECTRO-ANATOMICAL MAPPING AND ABLATION CONCEPT USING 3-TESLA REAL-TIME MRI GUIDANCE

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Introduction: We assessed the feasibility of a novel electrophysiological mapping and ablation concept using real-time MRI (RT-MRI) at 3-Tesla (3T).

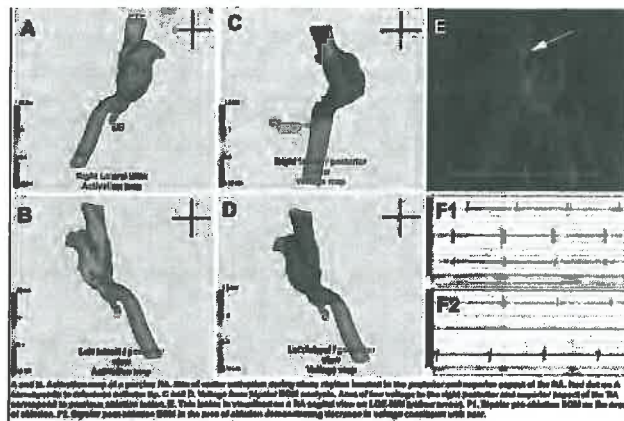
Methods: Three swine were taken to the interventional 3T MRI suite and two MRI compatible mapping and ablation catheters were navigated under RT-MRI, one was placed in a stable location for reference and the other used for mapping. Custom software was used for catheter tracking and 3D spatial localization of both catheters. EGMs were recorded at each mapped location and co-registered with catheter tip location. The amplitude and timing of the bipolar EGMs obtained at each location was measured.

Each electro-anatomical map (EAM) was generated from sampling 30 points. The location of these points acquired with RT-MRI software was then projected in a 3D segmented model of the cardiac chamber of interest obtained from MR angiography. Ablation lesions under RT-MRI guidance were delivered and pacing and recording from the RA and RV was also performed.

Results: Three activation and voltage EAM maps of the RA (figure) and one EAM map of the RV were generated. Atrial and ventricular pacing was also performed and electrophysiological

properties of the AV node were assessed during RT-MRI scanning.

Conclusions: Electro-anatomical mapping and electrophysiological evaluation can be performed under the high magnetic field of 3T RT-MRI scanner. This combined with the ability to visualize lesion formation and arrhythmic substrate may prove very useful in the treatment of complex arrhythmias.



AB02-2

PERSISTENT PULMONARY VEIN ISOLATION USING THE VISUALLY-GUIDED LASER BALLOON: RESULTS OF A MULTICENTER PV REMAPPING STUDY

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Introduction: In patients with paroxysmal AF, acute PV isolation can be achieved in the vast majority of cases. However, the durability of PV isolation is suboptimal and PV reconnections account for clinical recurrences. Recently, acute PV isolation using the visually-guided laser balloon ablation catheter (BAC) has been shown to be possible. In this study, we assessed the ability of the BAC in achieving durable PV isolation in patients with PAF.

Methods: The study population consisted of 56 patients with drug-refractory PAF who underwent catheter ablation utilizing the BAC at 3 centers. Following transeptal puncture, a 12 Fr deflectable sheath was positioned at the target PV and the BAC was inflated at the ostium. Using endoscopic guidance, a 300 arc of laser energy was used to place lesions around the PV in a contiguous, overlapping manner. PVI was confirmed using a circular mapping catheter. At ~3 months, all patients underwent a repeat procedure regardless of symptoms; the durability of PVI was assessed at this time.

Results: The mean age of the pts was 57.1±10.3 yrs (64% M / 36% F). In 56 pts, 200/204 PVs (98%) were acutely isolated using the BAC with a mean of 1.1 catheters/pt. At ~3 months, in the 52 pts that returned for PV remapping, 165/194 PVs (85%) were persistently isolated. Electrical isolation of all PVs was present in 31/52 pts (60%). Seven pts (13%) had clinical recurrence of AF and had complete electrical isolation of the PVs, suggesting a non-PV trigger for AF.

Conclusions: Using the visually-guided laser balloon catheter, a high rate of persistent PV isolation can be achieved in patients with paroxysmal atrial fibrillation.