**Poster Session**

**Ablation for Supraventricular Arrhythmias**

Monday, March 08, 2004, Noon-2:00 p.m.
Morial Convention Center, Hall G
Presentation Hour: 1:00 p.m.-2:00 p.m.

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**The Sinus Nodal Tissue Arrangement Into the Musculature of the Terminal Crest: Implications in Ablation of Inappropriate Sinus Node Tachycardia?**

José Angel Cabrera, Damian Sanchez-Quintana, Siew Y. Ho, Vicente Climent, Jose M. Rubio, Fernando Cabestro, Robert H. Anderson, Jeronimo Farre, Fundacion Jimenez Diaz, Madrid, Spain, Paediatric Cardiac Morphology; Imperial College, London, United Kingdom

Treatment of inappropriate sinus node tachycardia (IST) with radiofrequency (RF) catheter ablation has lower success rates than those attained in other atrial tachycardias. Methods: In 47 normal human heart specimens (49±20 years; 31 male), we examined the shape and dimensions of the SN by histological sections and scanning electron micrographs containing the superior cavo-atrial junction. Results: Thickness of the terminal crest ranged from 3-10 mm. The SN is generally irregular and fusiform in shape with the uppermost portion described as the head, followed by the body and a tapering tail. In the majority of cases the long axis of the sinus node was parallel to the terminal groove. The nodal cells always within a matrix of connective were arranged as interlacing strands of specialized myocytes that are smaller than working atrial myocytes. The tail of the sinus node in 61% of specimens was separated by fibrous tissue into islands of specialized cells. Short nodal extensions could be traced in most of the hearts passing superiorly (0.1 to 1.5 mm in length) towards the superior vena cava (16 specimens, 36%) and inferiorly (0.3 to 2.3 mm in length) ending in the subepicardium (12 specimens, 25%) or deeper into the ordinary myocardium (26 specimens, 55%). Conclusions: The sinus nodal tissue tends to be non-uniform in shape with irregular extensions and fusions into the musculature of the terminal crest. These findings probably account for the difficulties during RF ablation of IST.

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**Contribution of Epicardial Mapping and Ablation to Treatment of Patients With Previously Failed Accessory Pathway Ablations**

Miguel Valdevegabayo, David A. Cesario, Sen Ji, Kevin Shannon, Isaac Wiener, Charles D. Swardow, Kalyanam Shivkumar, UCLA Medical Center, Los Angeles, CA

Background: Radiofrequency (RF) ablation has a cure rate >90% for accessory pathway (AP)-mediated tachycardias. Catheter instability, inadequate access to sites of interest and limited ablation success rates are the reasons that have led to the investigation of a combined transthoracic epicardial and endocardial approach for failed AP ablations. Methods and Results: We reviewed 5 AP ablations obtained from 4 patients with failed ablation attempts (median 2, 1090-214). All APs were successfully ablated. Conclusions: Epicardial mapping permits accurate AP localization for both epicardial and endocardial ablation.

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**Safety and Efficacy of Freezer MAX, A New 9FR, 8mm Tip Cryoablation Catheter for the Treatment of Atrial Flutter**

Annibale S. Montenegro, Nicola Bruno, Francesco Zumbo, Daniele Mangiameli, Andrea Antonelli, Stephen O’Connor, Olive Murphy, Policlinico Multimedica, Milan, Italy, CryoCath Technologies Inc., Montreal, Canada

Background: A new 9FR, 8mm tip, 66mm curve, quadrupolar (3-5-2) cryo catheter, Freezer MAX (Kan) (CryoCath, Kirkland, Canada), recently received CE Mark approval. It is designed for use in cardiac ablation where sizeable, yet focussed lesions, are required, such as for atrial flutter (AFL). Increased cooling to approximately –80ºC and better tip – tissue contact, produce lesions 40% deeper than the 7FR 6mm tip predecessor, Freezor V (Kan). Method: We investigated the safety and efficacy of treatment of AFL in 23 consecutive patients (pts), 17 (74%) male, with mean ± SD age and atrial duration of 62.7 ± 11.4 and 5.1 ± 6.2 years, respectively. 20 pts had common AFL and 3 had uncommon AFL. EP mapping with diagnostic catheters was performed throughout the procedure. The site for isthmus block was identified with a cryo-tip at 160s, with complete block usually observed within the first 20s of the 4 minute cryo ablation. Results: Acute cryo success with MAX was achieved in 22 (95.7%) of 23 pts, however, success was achieved in all 20 (100%) patients with common AFL. We compared our results with those from 88 consecutive AFL pts treated at centres with a statistically significantly fewer ablations (p < 0.001). 5 vs 4 ± 17 ± 20, as well as statistically significantly shorter (p = 0.004) fluorooscopy times, 17 ± 13 vs. 26 ± 13 ms, were required to successfully ablate the isthmus with MAX. There were no complications in any group of pts and, of special note, the reduced cryo energy reduced AV block. All pts remained completely comfort free during cryo energy delivery. Conclusion: Acute success with MAX in the 20 common AFL pts is 100%. Fluorooscopy time and the number of ablations are statistically and clinically significantly reduced with MAX compared with Xera. There were no adverse events in our patient population (age, gender, atrial heart disease).

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**Acute Resumption of Conduction in the Cavitricuspid Isthmus After Catheter Ablation of Common Atrial Flutter: Impact of Atrial Anatomy**

Antoine Da Costa, Cécile Romuey-Bouchard, Naima Zaqarane-Sliman, Bernard Samuel, Azbel Khel, Emmanuel Faure, Karl Issaz, University of Saint-Etienne, Saint-Etienne, France

Cavitricuspid isthmus conduction (CIC) is closely associated with the recurrence of atrial flutter (AFL) and acute resumption of CIC is not infrequent. Objectives. The aim of this study was [1] to evaluate the prevalence of acute CIC resumption and [2] to identify its predictors. Methods. Over 17 months, 39 pts with AFL were considered eligible. 185 pts (67±11 years; 21 female) accepted the protocol and underwent an isthmogram in preparation for RFA (right atrium angiography). We analyzed C1T length and C1T morphology as classified, straight, concave or with a pouch-like recess. RFA was performed with an 8-mm-tip catheters or a cooled-tip catheter. The end-point was a bi-directional block validated after a 30 minutes waiting period. Results: Patients characteristics were as follows: history of AFib ablation before (86/185), structural heart disease (77/185), LVEF (58±12%), left atrium size (43±7 mm), average C1T dimension (32±7 mm). A successful procedure was as following: (n=108); concave pouch-like recess (n=33). Di-directional block was obtained in 99% with a mean RF application time of f (12.8±13 min) and mean fluoroscopic time (14±13 min). During an observation of 30 minutes, the incidence of acute C1T restoration was 36/185 (19.5%) (mean time of 14±9 min). Among all clinical and anatomic factors tested (age, gender, structural heart disease, history of AFib, left atrium size, C1T dimension, left ventricular ejection fraction, right atrium length, systolic pulmonary arterial pressure, significant tricuspid regurgitation, cavo-tricuspid morphology, AFL recurrence), the only predictive factor was the presence of an abnormal isthmus anatomy (concave aspect or pouch-like recess). Thus, a careful observation is required in this subset immediately after AFL ablation.

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**Do Single Cryothermia Applications of Less Than Five Minutes Produce Permanent Cavitricuspid Isthmus Block in Humans?**

Randy Manusamy, Carl Timmermans, Suzanne Philpenns, Frylon Limon, Harry Crijns, Luz-Maria Rodriguez, Academic Hospital Maastricht, Maastricht, The Netherlands

Background: Previous animal studies showed that a cryotherepy application needs to be 5 minutes and repeated twice on the same site to create a permanent cavo-pulmonary conduction. The aim of this study was to compare single-3 minutes (Single-3) with double-3 minutes (Double-3) cryotherapy applications for the treatment of atrial flutter (AFL). Methods: Forty patients (56 ± 13 years; 33 men) with common AFL were randomized to Single-3 (n = 20) or Double-3 (n = 20) cryotherapy applications at each site along the cavitricuspid isthmus. Cryoablation was performed with the CryoCor cryoablation system (Cook Medical, Bloomington, IN). In 2 cases, the earliest ventricular activation during orthodromic flutter was identified with a cryo-tip at 160s, with complete block usually observed within the first 20s of the 4 minute cryo ablation time. Results: Acute cryo success with MAX was achieved in 22 (95.7%) of 23 pts, however, success was achieved in all 20 (100%) patients with common AFL. We compared our results with those from 88 consecutive AFL pts treated at centres with a statistically significantly fewer ablations (p < 0.001). 5 vs 4 ± 17 ± 20, as well as statistically significantly shorter (p = 0.004) fluorooscopy times, 17 ± 13 vs. 26 ± 13 ms, were required to successfully ablate the isthmus with MAX. There were no complications in any group of pts and, of special note, the reduced cryo energy reduced AV block. All pts remained completely comfort free during cryo energy delivery. Conclusion: Acute success with MAX in the 20 common AFL pts is 100%. Fluorooscopy time and the number of ablations are statistically and clinically significantly reduced with MAX compared with Xera. There were no adverse events in our patient population (age, gender, atrial heart disease). Such a safe, efficacious and improved catheter for the ablation of AFL.