



PO6-30

IMMEDIATE HEPARIN REVERSAL FOR SHEATH PULLING FOLLOWING PULMONARY VEIN ABLATIONS REDUCES GROIN COMPLICATIONS AND DOES NOT INCREASE STROKE RISK

Roger A. Winkle, MD, Greg Engel, MD, R. Hardwin Mead, MD and Roger A. Winkle, MD. *Cardiovascular Med & Cardiac Arrhythmias, E. Palo Alto, CA.*

Introduction: Intensive heparin anticoagulation is given during pulmonary vein ablations (PVA) to minimize stroke risk. Sheath removal following PVA may be done either by allowing the ACT to drift down (ACTDD) followed by later sheath removal or immediate reversal with protamine (IRP) at the end of the case followed by sheath pulling in the EP lab. Increased risk of immediate stroke is a concern with IRP. We switched from ACTDD to IRP in March of 2006 due to a high frequency of groin complications that we attributed to delayed removal of sheaths with residual heparin effect.

Methods: We reviewed the frequency of thromboembolic complications (TEC) and significant groin complications (SGC) with both ACTDD and IRP. Our hypothesis was that IRP would have a lower risk of SGC and equivalent risk of TEC.

Results: A total of 535 consecutive procedures were reviewed with 155 consecutive procedures ending with ACTDD and 380 consecutive procedures ending with with IRP. Mean protamine dose in the IRP group was 42±15 mg (mean±SD). Subcutaneous enoxaparin and oral warfarin were started immediately after sheath removal in both groups. The SGC rate for ACTDD and IRP respectively was 2.5%(4/155) and 0.5%(2/380) with a p value=.04. The TEC rate for ACTDD and IRP respectively was 1.25%(2/155) and 0%(0/380) with a p value=.03. SGC included 2 large bleeds requiring surgical intervention, 2 pseudoaneurysms closed non-invasively, 1 small AV fistula, and one hematoma with disability greater than one month. The TEC included one transient ischemic attack and one cerebral vascular accident which resolved completely.

Conclusions: Reversal of heparin with protamine immediately

post PVA followed by immediate sheath removal is safe, does not increase the risk of thromboembolic complications, and results in a decreased incidence of groin complications.

PO6-31

A RANDOMIZED EVALUATION OF RIGHT ATRIAL ABLATION AFTER LEFT ATRIAL ABLATION OF COMPLEX FRACTIONATED ATRIAL ELECTROGRAMS FOR LONG-LASTING PERSISTENT ATRIAL FIBRILLATION

Hakan Oral, MD, Aman Chugh, MD, Eric Good, DO, Thomas Crawford, MD, Jean F. Sarrazin, MD, Michael Kuhne, MD, Nagib Chalfoun, MD, Darryl Wells, MD, Warangkna Boonyapisit, MD, Nitesh Gutela, MD, Sundar Sankaran, MD, Krit Jongnarangsin, Frank Bogun, MD, Frank Pelosi, MD and Fred Morady, MD. *University of Michigan, Ann Arbor, MI, University of Michigan Health System, Ann Arbor, MI.*

Introduction: The incremental value of right atrial (RA) radiofrequency ablation (RFA) during electrogram guided catheter ablation to target complex fractionated atrial electrograms (CFAE) in patients with persistent AF is not clear.

Methods: In 85 patients with long-lasting persistent AF (age=59±10 years), CFAEs in the left atrium (LA) and coronary sinus were targeted until AF terminated (19) or all identified LA CFAEs were eliminated. Sixty-six patients who remained in AF were randomized to cardioversion and no additional RFA (n=33) or to RFA of RA CFAEs (n=33). RA sites included: the crista terminalis (69%), septum (38%), superior vena cava (28%), coronary sinus ostium (22%), and the base of the appendage (31%). AF terminated in 1/33 patients (3%) during RA RFA.

Results: During a mean follow-up of 17±6 months after a single ablation procedure, 74% of the patients in whom AF terminated during LA RFA were in sinus rhythm. Freedom from AF was similar between the patients randomized to no RA RFA (24%) and patients randomized to RFA of RA CFAEs (30%, P=0.8). Repeat ablation was performed in 26 patients (31%) for AF (22) or atrial flutter (4). At 16±7 months after the last procedure, 89% of the patients in whom AF terminated during LA RFA were in sinus rhythm. Among the randomized patients, sinus rhythm was maintained in 52% and 58% of the patients who did and did not undergo RFA of RA CFAEs, respectively (P=0.6).

Conclusions: Ablation of right atrial CFAEs does not appear to improve efficacy after ablation of CFAEs in the left atrium and coronary sinus in patients with persistent AF.

PO6-32

ACUTE RESULTS OF PV ANTRUM ABLATION BY A NOVEL CIRCUMLINEAR DECAPOLAR CATHETER WITH LOW-POWER DUTY-CYCLED RF ENERGY

Lucas V. Boersma, MD, PhD, Maurits C. Wijffels, MD/PhD, Eric F. Wever, MD/PhD, Hakan Oral, MD and Fred Morady, MD. *St. Antonius Hospital/HLCU, Nieuwegein, The Netherlands, University of Michigan, Ann Arbor, MI.*

Introduction: PV antrum isolation with single tip catheters guided by 3-D navigation remains a lengthy procedure with varying success. We tested a novel circumlineal decapolar catheter (PVAC) delivering duty-cycled bipolar-unipolar RF energy (Ablation Frontiers Inc, Carlsbad)

Methods: Pts with drug-refractory paroxysmal AF were enrolled. Structural cardiac abnormalities were excluded by MRI and TEE screening. A 9.5F inner lumen diameter LA sheath was introduced by standard TSP, with a 4-polar CS catheter for pacing. The PVAC was positioned in the antrum over a guidewire inside the PV. Bipolar recording of antrum signals was performed through the 5 consecutive electrode pairs. Applications lasted

60 sec with a maximum power of 10 W per electrode and target temperature of 60°C. The RF generator delivered unipolar current at each electrode of a selected pair, and bipolar current between adjacent electrodes of selected pairs with a 4:1 duty cycle. Multiple overlapping antrum applications were performed until PV isolation was established. Manipulation was done solely with biplane fluoroscopy

Results: Results: 45 pts (age 61±9 yrs, 9 female) were included in the study. A common left ostium was found in 3, while in 1 right superior PV no local signal was present. In total, 176 veins were targeted for ablation with PVAC. Ablation was performed during SR or AF. A median of 29±7 (range 16-44) applications per pt were delivered, 8±2 in LPSV, 7±3 in LIPV, 7±3 in RSPV, and 7±3 in RIPV. At the end of the ablation, PV isolation was confirmed during CS pacing for the left sided veins and during SR for all veins. In all veins (100%) there was absence of local ostial signal, including the left common and right inferior, either by a standard decapolar lasso catheter in 18 pts, or by moving the PVAC distal to the ablation lines in 27 pts. Total procedure time was 85±32 min, fluoroscopy time 17±9 min. There were no acute complications either during the procedure or in the following 7 days

Conclusions: Conclusion: PV antrum isolation with PVAC and duty-cycled bipolar-unipolar RF energy at low power is feasible in all PVs with 100% acute success without procedural complications

PO6-33

A NOVEL ATRIAL FIBRILLATION ABLATION TECHNIQUE TO ACHIEVE EXCELLENT SUCCESS RATES AND AVOID ESOPHAGEAL INJURY: A SINGLE CENTER EXPERIENCE

John D. Day, MD, Heidi T. May, B.S., Tami L. Bair, Brian G. Crandall, M.D., J. Peter Weiss, M.D., Jeffrey S. Osborn, M.D., Jeffrey L. Anderson, M.D., Donald L. Lappe, M.D., J. Brent Muhlestein, M.D., Jennifer Nelson, R.N., Scott Allison, B.S., Thomas Foley, Lars Anderson, B.S. and T. Jared. Bunch, M.D.. Intermountain Heart Rhythm Specialists, Intermountain Medical Center, Salt Lake City, UT, Intermountain Medical Center, Salt Lake City, UT, Mayo Clinic, Rochester, MN.

Introduction: Radiofrequency ablation can successfully treat atrial fibrillation (AF) in most patients. Unfortunately, AF ablation may result in significant complications including esophageal injury. We present a novel AF ablation approach designed to minimize deep tissue heating, while maintaining long-term efficacy.

Methods: The AF ablation procedures were performed using an irrigated tip high power short ablation time approach with esophageal mapping. The left atrial/pulmonary vein anatomy was rendered with NavX or CARTO. 3D esophageal mapping with temperature monitoring was incorporated into the geometries. The irrigated tip catheter was set at 50 W, 42° C, and 30 mL/min. The catheter was moved every 2 seconds when near the esophagus and every 5 seconds elsewhere while ablating. Local sites were targeted multiple times, after waiting 2 minutes for cooling, until complete elimination of the local electrogram was achieved. AF ablation consisted of pulmonary vein antral isolation with isolation of the posterior wall and linear lesions along the roof and mitral isthmus. Success was defined as no AF and off of antiarrhythmics > 3 months following one or more ablations.

Results: 802 patients who underwent 1,027 AF ablation procedures from a single center utilizing this technique were evaluated. The average age was 65 years and AF was paroxysmal in 59% and persistent/chronic in 41%. The mean left atrial procedural time was 92 ± 18 minutes with total mean radiofrequency ablation time of 55 ± 8 minutes. An esophageal

temperature rise of >1° C was seen in 52% of the cases (maximum temperature rise 2.4° C). Over a mean follow-up of 304 days ± 233 days, 86% of patients had a successful AF ablation. Complications included 6 (0.6%) CVA/TIAs, 6 (0.6%) pericardial effusions, and no cases of nerve injury, pulmonary vein stenosis, lung injury, or esophageal injury.

Conclusions: The irrigated tip high power short ablation time approach with 3D esophageal mapping allows for effective ablation of AF. In a large number of patients the safety profile was excellent, suggesting that this approach minimizes untoward deep tissue heating.

PO6-34

INITIAL EXPERIENCE WITH THE HANSEN ROBOTIC SYSTEM IN SEQUENTIAL PATIENTS UNDERGOING CATHETER ABLATION FOR ATRIAL FIBRILLATION

Conor D. Barrett, MRCP, Oussama M. Wazni, MD, John E. Meulet, MB BS, Jennifer E. Cummings, MD, Claude Elayi, MD, Luigi Di Biase, MD, Luciana Armaganijan, MD, John Zakaib, MD, Thomas Callahan, MD, Dimpi Patel, MD, Karen Phillips, MB BS, Chi K. Ching, MD, Sangeev Wasson, MD, Sandeep Duggal, MD, Mazzen Shaheen, MD, David Burkhardt, MD, Mohammed Kanj, MD, Mauricio Arruda, MD, Thomas Dresing, MD, Andrea Natale, MD and Walid I. Saliba. Cleveland Clinic, Cleveland, OH, Stanford university, Stanford, CA.

Introduction: The Hansen robotic system has recently seen use in humans in the United States. We have used the system for ablation of atrial fibrillation (AF) and have observed a high-rate of acute PV isolation with the system.

Methods: All patients who underwent AF ablation with the Hansen system were included. Double left atrial access was obtained, firstly by a conventional transseptal puncture and then by driving the robotic sheath and ablation catheter across the septum. Left and right atrial ablation was performed remotely by the primary operator. Prospectively collected data included patient demographics and procedural details.

Results: 48 patients (35 male) with AF (31 paroxysmal) underwent ablation with the system. Mean age was 59±10 yrs, LVEF 56±7% and INR on the day of the procedure was 2.4±0.7. Mean left atrial instrumentation time was 171±51 minutes. The initial transseptal puncture was performed manually in all patients. In 47/48 patients left atrial instrumentation was possible with the Hansen system, in one patient it was not possible to advance the robotic sheath across a thickened septum. One procedure was aborted intra-operatively due to a vascular complication. In the remaining 46 procedures all PVs were isolated acutely with the Hansen system. Further left atrial ablation was performed on the posterior wall (n=33), septal wall (n=29), roof (n=22). The SVC was isolated from the RA with the Hansen system in 17 patients. The cavo-tricuspid isthmus was successfully ablated with the system in 2 patients, but required conversion to a manual approach in 1 other patient. Ablation within the CS was not completed with the system in any patient, and was performed manually in 12 patients. The CS ostium could be entered in the majority but further advancement of the catheter was unsuccessful or was felt to be unsafe.

Conclusions: The Hansen robotic system was successful in acutely isolating pulmonary veins in patients with atrial fibrillation. There are no noticeable atrial regions of inaccessibility, with the exception of the coronary sinus. Long-term follow-up data will be required to assess for freedom from AF.