

time of recurrence (early vs. late, $p=0.29$). When compared to patients with early recurrence, late recurrence patients were of similar age (59.2 ± 10.5 vs. 60.16 ± 10.4 years, $p=0.56$), had similar LVEF (52.6 ± 9.7 vs. $51.9 \pm 9.6\%$, $p=0.66$) and left atrial size (27.7 ± 15.4 vs. 25.8 ± 6.0 cm², $p=0.19$). There was no difference in cardiovascular risk factors, including hypertension ($p=0.64$), diabetes ($p=0.79$), and coronary artery disease ($p=0.26$) between the two groups. Importantly, patients in Group 2 had less recurrence of AFL (32.1% vs. 48.1% , $p<0.05$), lower BNP (83.3 vs. 131.5 pg/ml, $p<0.05$), and us CRP (2.4 vs. 4.7 mg/L, $P<0.05$) levels.

Conclusions: The incidence of very late recurrence of atrial arrhythmia in this patient series was low (6.4% over 969.7±386.1 days of follow up). Recovery of PV conduction with AF accounted for most recurrences. The success rate of repeat ablation in these patients was 74.1%.

ABSTRACT SESSION AB25: Atrial Fibrillation and Innovations in EP

Friday, May 15, 2009
10:30 AM - 12:00 PM

AB25-1

VALIDATION OF PV ISOLATION USING MULTI-ELECTRODE DUTY CYCLED RADIOFREQUENCY ABLATION IN PATIENTS WITH PAROXYSMAL AND PERSISTENT ATRIAL FIBRILLATION

Arif Elvan, MD, Jaap Jan Smit, MD, Willem Beukema, MD, Peter Paul Delnoy, MD and Anand Ramdat Misier, MD. Isala Clinics, Zwolle, Netherlands

Introduction: A novel multi-electrode catheter (PVAC, Ablation Frontiers) combining circular mapping and duty cycled multi-electrode radiofrequency energy delivery has been developed to map and isolate the pulmonary veins. The objective of the present study was to assess the feasibility and safety of the PVAC for pulmonary vein isolation in patients with paroxysmal AF.

Methods: 102 consecutive pts, age 59.6 ± 8.7 years, with paroxysmal or persistent drug refractory AF were referred for ablation. All pts had documented AF episodes with an AF duration of 9.2 ± 7.3 years (range 1.5-25).

Results: The total procedure time was 104 ± 55 min (44 to 204). In 1 pt additional ablation using conventional RF catheter ablation was necessary. The mean RF ablation time required to achieve complete PV isolation was 31 ± 8 min (range 16-56). Isolation of the PVs was confirmed using a standard circular mapping catheter. In 14 pts with persistent AF additional ablations were performed to defragmentate septal and posterior part of the left atrium. At the latest follow up 79% of the pts were in sinus rhythm.

Conclusions: Pulmonary vein isolation using the PVAC is feasible and safe. Larger studies are required to evaluate the whether the PVAC is associated with a different complication rate compared with standard PV isolation.

AB25-2

NONINVASIVE IMAGING OF ATRIAL FIBRILLATION (AF) IN HUMANS

Phillip Cuculich, MD, Yong Wang, MS, Bruce Lindsay, MD and Yoram Rudy, PhD. Washington University School of Medicine, Saint Louis, MO, Washington University, Saint Louis, MO, Cleveland Clinic, Cleveland, OH

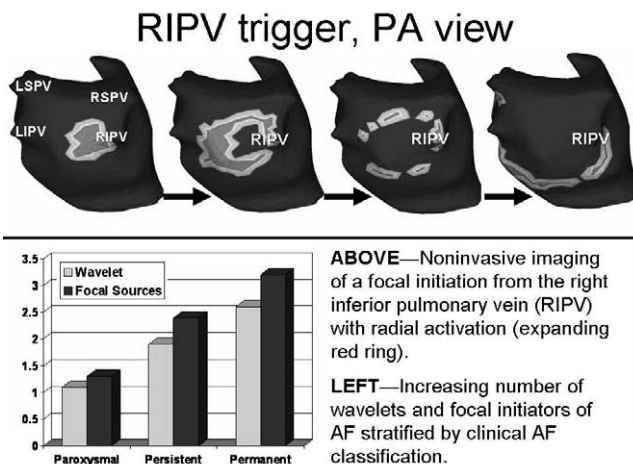
Introduction: Procedural success for AF ablation decreases with AF duration and complexity. Despite many described mechanisms of AF, we have little a priori knowledge about each

patient's mechanisms of AF. Noninvasive Electrocardiographic Imaging (ECGI) may provide insight for individual-specific AF.

Methods: We performed ECGI on 34 subjects with a diagnosis of AF: 9 paroxysmal, 18 persistent, 7 longstanding persistent. Activation movies were created using a negative slope threshold of reconstructed epicardial atrial signal. Mechanisms of AF propagation were observed. AF complexity was determined by the mean number of simultaneous wavelets and mean number of focal sources of initiation.

Results: During AF, many mechanisms were observed, including pulmonary vein foci (68%), non-PV foci (vena cava, coronary sinus, posterior wall, 64%), and non-anchored rotors (14%). Most had multiple wavelets (91%). Single wavelet reentry was rare (9%). Occult atypical atrial flutter (11%) and atrial tachycardia (6%) were also observed. There were fewer simultaneous wavelets ($p=0.0035$, ANOVA) and focal initiators ($p=0.043$) in paroxysmal vs. persistent vs. long-standing persistent. Paroxysmal AF had 1-2 foci. Longstanding persistent AF had multiple mechanisms. Persistent AF had significant heterogeneity: some with single foci, others with more complex patterns.

Conclusions: ECGI noninvasively imaged many mechanisms of AF in human subjects. ECGI-determined AF complexity increased with more advanced AF, though complexity of persistent AF varied widely. Prospective study of ECGI for tailored treatment of AF is warranted.



AB25-3

DRUG-ELUTING STENTS FOR PULMONARY VEIN STENOSIS

Tom De Potter, MD, K. R. Julian Chun, MD, Carsten Schneider, MD, Rainer Malisius, MD, Andreas Metzner, MD, Feifan Ouyang, MD, Roland Titz, MD, Buelent Koektuerk, MD, Karl-Heinz Kuck, MD, PhD and Boris Schmidt, MD. Asklepios Clinic St Georg, Hamburg, Germany

Introduction: Pulmonary vein stenosis (PVS) is a complication of RF pulmonary vein isolation (PVI). Reported restenosis rates after balloon dilatation and bare metal stent implantation are high. Drug-eluting stent implantation (DES) has not been reported in the setting of PVS.

Methods: Patients (pts) suspected of having PVS after PVI based on clinical symptoms and transesophageal echocardiography (TEE) follow-up (FU) were referred for PV DES. All pts received TEE and PV angiography prior to implantation (DES threshold of > 75% luminal narrowing). One ore more branches of the affected PV were stented (paclitaxel-