(TGF-β1) after ablation. The area under the curve (AUC) of MMP-9 and TGF-β1 significantly correlated with the ablation-induced reduction of LA volume measured by echocardiography before and 6 months after ablation (MMP-9: R=-0.56, $p<0.05$; TGF-β1: R=-0.57, $p<0.05$). The AUC of PIIINP predicted an adverse ablation outcome ($p<0.05$).
Conclusions: Markers of tissue healing show a significant up-regulation after AF ablation detectable for up to 3 months. A more pronounced up-regulation of TGF-β1 or MMP-9 levels is associated with a stronger reduction of LA size. High PIIINP predicts a poor ablation outcome.

P1620 Left atrial appendage isolation: evidence of discrete connections between the left atrial appendage and the main chamber

L. Di Biase[1], J.D. Burkhardt[2], R. Horton[2], J. Sanchez[2], G. Gallinghouse[2], D. Patel[2], S. Beheiry[3], D. Lakkireddy[4], R.A. Schweikert[5], A. Natale[2]. *[1]Texas Cardiac Arrhythmia Institute at St David Medical Center, Un. of Texas and University of Foggia, Austin, United States of America; [2]Texas Cardiac Arrhythmia Institute at St David Medical Center, Austin, United States of America; [3]Sutter Pacific Hospital, San Francisco, United States of America; [4]University of Kansas, Kansas City, United States of America; [5]Akron General Hospital, Akron, United States of America*

Introduction: The left atrial appendage has been recognized as a potential site of initiation of atrial fibrillation. Electrical isolation of the left atrial appendage (LAA) is sometimes required. We evaluated the extent of lesions required to isolate the LAA.
Methods: 987 consecutive patients (76% chronic and 24% paroxysmal) undergoing catheter ablation for symptomatic and drug resistant atrial fibrillation have been enrolled in this study. Patients requiring isolation of the left atrial appendage (LAA) were identified. In each case the extent of ablation required to isolate the LAA was recorded.
Results: 86 patients (52 female) out of 987 [(8.7%), (81 patients with chronic and 5 patients with paroxysmal AF), required isolation of the left atrial appendage after triggers initiating atrial fibrillation from this location were documented. The prevalence of this finding was 10.9% (81/741 pts) in chronic patients and 2% (5/246 pts) in the paroxysmal patients.
In 82% (71) of these patients, isolation of the LAA was achieved with segmental ablation. The remaining patients required nearly circumferential ablation.
Conclusions: Isolation of the LAA may be necessary during catheter ablation of atrial fibrillation. Similarly to the pulmonary veins, most LAAs can be isolated with segmental ablation.

P1621 Duty-cycled, unipolar-bipolar RF ablation via multi-electrode catheter in patients with paroxysmal atrial fibrillation

S. Yuan, O. Kongstad. *Lund University Hospital, Lund, Sweden*

Introduction: Techniques for catheter ablation of atrial fibrillation (AF) continue to improve, but often require complex equipment, high level of operator skill, and a long learning curve.
Methods: To simplify AF ablation, we investigated a system featuring a multi-channel radiofrequency (RF) generator that simultaneously delivers duty-cycled, bipolar-unipolar energy to operator selectable electrodes of a decapolar circular catheter (PVAC, Ablation Frontiers) for achieving pulmonary vein (PV) isolation via antrum ablation. RF was delivered in a temperature-controlled manner to achieve a target of 55-60 C° with power limited to 10W per electrode. PV angiography was performed to facilitate identification of the PV ostium. End-points are disappearance of all PV potentials and electrical isolation of the PVs as verified by use of a circular mapping catheter.
Results: Since Sept. 2007 we have treated 45 patients with paroxysmal AF, aged 60±9 years, using this technique. Average number of RF applications per PV was 7±3. Procedure time was 92±16 min and fluoroscopy time was 19±9 min. CT/MRI performed pre-procedure and at 2-4 months follow up ruled out asymptotic PV stenosis. No other complications were observed. 29 of the patients have had ≥ 5 months follow up. Holter monitoring demonstrated freedom of AF in 17/29 (59%) patients and significant reduction of AF burden (>90% reduction) in 9/29 (31%) patients. Thus, total effective rate after a single procedure was 90% (26/29 patients), though 17 of them (58%) are still on antiarrhythmic drugs.
Conclusion: This single-catheter method is safe, efficient, and feasible for AF ablation and has early results comparable to those of widely reported techniques. In addition, simplified catheter manipulation, shorter learning curve, shorter procedure time and independence from 3D-mapping system may make the method available to a larger number of centers.

P1622 Acute and long-term outcome of remote magnetic navigation for ablation of atrial fibrillation using a magnetic irrigated ablation catheter

X. Chen, J.H. Svendsen, S. Pehrson. *Rigshospitalet (The Heart Centre), Copenhagen, Denmark*

Purpose: Unavailability of magnetic irrigated (MI) catheter had limited the widespread use of the remote magnetic navigation (RMN) system in radiofrequency (RF) ablation of atrial fibrillation (AF). The purpose of current study was to evaluate the feasibility of the newly introduced MI catheter in ablation of atrial fibrillation (AF).
Methods: Ninety-eight patients (age 58±13, 75 male, 42 (42%) with persistent/permanent AF) underwent RF ablation using a MI catheter and RMN system. In the first series of 37 patients (group I), a prototype MI catheter was used. In the recent series of 61 patients (group II), the procedures were performed using a re-introduced modified MI catheter, which is now commercially available. The irrigation rate was set to 10-20 ml/min, with a target temperature of 48 C° and the power limit of 40 watts. For paroxysmal AF, pulmonary vein (PV) circumferential isolation and roof linear ablation were performed. For persistent/permanent AF, fractionated potentials in left atrium were targeted in group I, and in both left and right atrium in group II. After encirculation of PVs, careful mapping within the PV antrum was performed. If the AF was not terminated by RF ablation, patients were DC cardioverted and mapping within the PV antrum was re-performed during SR.
Results: Complete PV isolation was achieved in 94 of 98 (96%) patients. In 13 of 42 (31%) patients with persistent/permanent AF, AF was terminated by RF ablation. Stable SR was achieved in all patients after the procedure. The mean total procedure time was 141±35 min and RF application time was 39±22 min. The total fluoroscopy time was 7±5 min. Charring on catheter tip was found in two (2/37, 5%) group I procedures, but none in the last 61 group II procedures using the modified MI catheter. No major complications were observed during or after the procedures. During a mean of 12±2 (11-14) months follow up, 27 of the first 37 patients (73%) were free of AF.
Conclusions: RMN for ablation of AF using magnetic irrigated catheter is safe, with a short procedure- and fluoroscopic- time, and a promising long-term efficacy.

P1623 The effect of ganglionated plexi ablation on atrial fibrillation triggers: long-term results

E. Pokushalov, A. Romanov, S. Artemenko, P. Shugaev, A. Turov, N. Shirokova. *State Research Institute of Circulation Pathology, Novosibirsk, Russian Federation*

Purpose: Elimination of the triggers is an important factor for the efficacy of the catheter ablations in patients with atrial fibrillation (AF). Existing data confirms that focal firing from the pulmonary veins (PV) is determined by autonomic nervous system (ANS) hyperactivity, that is by the presence of compromised ganglionated plexi (GP) that produce excess amounts of neurotransmitters. The purpose of this study was to assess the impact of GP ablation on atrial fibrillation triggers.
Methods: Spontaneous triggers and those provoked with isoproterenol (up to 20 microg/min) and/or cardioversion in 73 patients with AF were identified using multipolar catheter recordings. Radiofrequency ablation of the main clusters of GPs in the left atrium was performed in all patients with symptomatic, drug-refractory, paroxysmal (n = 56) and persistent (n = 17) AF.
Results: 118 reproducible triggers were noted in 73 patients with 91 from PV and 27 (22.8%) from non-PV sites ($p < 0.05$). The most PV triggers (41.7%) originated from "carina zone" segments ($p < 0.05$) from both right (47 triggers) and left (44 triggers) PVs. Ablation of the main clusters of GPs in the left atrium (without any changes of the PV conduction properties evaluated by multipolar catheter) abolished focal firing from the PVs in 69 (94.5%) patients and decreased the ability to induce sustained AF (>3 min) in all patients. GP ablation lead to the elimination of the triggers which were located at some distance from catheter ablation zones. During 14±8 months of followup after a single ablation procedure, 58.9% of patients were in sinus rhythm without antiarrhythmic drugs, 16.4% had AF, 10.9% had both AF and atrial flutter, 1.4% had persistent left atrial flutter, and 12.4% had sinus rhythm on antiarrhythmic drugs. The second ablation procedure was performed in 27.3% of patients. The 3-D maps from the first and repeated procedures were compared to find presence of any gaps. All the patients that underwent repeated procedure had gaps in the areas of catheter ablation. 18 out of 20 patients had triggers different from the initial localization ($p < 0.05$), 95% of which were adjacent to the gaps.
Conclusion: GP ablation lead to the elimination of most of the triggers, including the ones that were located at a significant distance from the ablation areas thus confirming their close connection with ANS. This fact can play a very important role in increasing the efficacy of the existing methods of AF ablation.

P1624 Antral vs. ostial circumferential isolation of pulmonary veins in patients with atrial fibrillation; when is antral isolation needed?

M. Kuniss, T. Neumann, S. Zaltsberg, A. Berkowitsch, D. Erkapic, D. Pajitnev, C. Hamm, H.F. Pitschner. *Kerckhoff Klinik GmbH, Bad Nauheim, Germany*

Introduction: Previous studies have shown that antral isolation of pulmonary veins (PVI) is a competing therapy strategy in comparison to conventional ostial circumferential PVI in patients with drug resistant atrial fibrillation. However no stratification regarding type of AF and stage of left atrial remodelling was performed in these studies. Our aim was to investigate efficiency of antral and ostial circumferential PVI depending on patients characteristics.
Methods: A total of 255 pts (183 male, age=58 IQR (49-63) years, n=136 parox-