Conclusions: The ipsilateral PV carina region origins may partly be responsible for an immediate PVEI and dormant PV induced by the ATP injection. These findings may be useful for selecting the sites to ablate for PV isolation and potential recurrences and to improve the success.

PO04-37

DUTY-CYCLED, UNIPOLAR-BIPOLAR RF ABLATION VIA MULTI-ELECTRODE CATHETER IN PATIENTS WITH PAROXYSMAL ATRIAL FIBRILLATION

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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.
Conclusions: 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.

PO04-38

ATRIAL ARRHYTHMIA MECHANISMS FOLLOWING SINGLE RING (BOX) ISOLATION OF THE POSTERIOR LEFT ATRIUM AND PULMONARY VEINS IS ASSOCIATED WITH RECONNECTION ACROSS PREVIOUSLY INTACT ABLATIONS LINES

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Introduction: Recurrent atrial arrhythmias, especially organized atrial arrhythmias (OAT) are common after single ring isolation (SRI) of the posterior left atrium (PLA) and pulmonary veins (PV) for atrial fibrillation (AF). However, their mechanisms and associations are unclear.
Methods: We systematically studied the mechanisms of recurrence in 48 patients undergoing repeat ablation for AF (n=24, 50%) and/or OAT (n= 35, 71%) after a previous SRI procedure.
Results: Reconnection of the PLA and PV through gaps in the ring was seen in 40 patients (83%, 2.6 ± 1.9 gaps per patient) and 24 (60%) of them had recurrent AF while 16 (40%) had OAT only. Of the 8 patients without reconnection, 3 had recurrent AF and 5 had recurrent OAT. OAT was recorded in 29 (60%) patients during the procedure and was most commonly due to macroreentrant mitral annular (MA) flutter (n=12, cycle length 330 ± 109ms). Patients who had an electrically intact mitral isthmus ablation line at the first procedure were more likely to have MA flutter (7/12 vs 8/36, OR 4.9, p=0.02). Macroreentry through two ring gaps was next most common (n=11, cycle length 303 ± 82 ms) and these patients had a larger number of ring gaps per patient (3.8 ± 1.7 vs 2.3 ± 1.9, p= 0.02). The most common sites of ring gaps were in the roof (n=22) and the ridge between the left atrial appendage and the left PVs (n=19). Typical right atrial flutter was seen in 4 patients and they all had previously intact cavotricuspid isthmus ablation lines. PLA re-isolation and ablation of OAT was successful in all patients and 38 (79%) remain arrhythmia free after 6.1 ± 4.4 months follow up. Kaplan Meier estimate of arrhythmia free survival at 6 months was 79 ± 7%.
Conclusions: Arrhythmia recurrence is usually associated with reconnection across previous lines of ablation. Reconnection of the PLA and PVs is common but does not always lead to AF recurrence nor is it necessary for sustained AF in some patients. Macroreentrant OAT was common and was also associated with reconnection across previously intact lines of ablation. Repeat ablation results in good short term outcomes.

PO04-39

CIRCUMFERENTIAL PULMONARY VEIN ABLATION: DOES THE USE OF A CIRCULAR MAPPING CATHETER IMPROVE RESULTS? RESULTS FROM A PROSPECTIVE RANDOMIZED STUDY

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Introduction: To evaluate whether the use of a circular mapping (CM) catheter improved the outcome of circumferential pulmonary vein ablation (CPVA).We hypothesized that assessment of pulmonary vein (PV) antrum isolation using a CM catheter could improve the outcome of the procedure as compared to use of a single catheter in the left atria(LA) both to ablate and map the electrical signal.
Methods: A series of 146 consecutive patients (83% males, 53±10 years, 53% paroxysmal AF) were randomized to two ablation strategies. In both, ipsilateral PV encirclement until disappearance or dissociation of the local electrogram within the surrounded area was performed by an irrigated tip catheter. In the first group, only the radiofrequency catheter was used, both to map and ablate (CPVA group, n=73). In the other group, a CM catheter was added to assess the electrical activity of the PV antrum (CPVA-CM group, n=73). In addition, ablation line along the LA roof was created in all patients. Procedure and fluoroscopic times were longer in the CPVA-CM group (p<0.05).
Results: Severe procedure-related complications occurred in 1 (1.4%) and 3 (4.1%) patients in the CPVA and CPVA-CM groups, respectively (p=0.317). Procedural efficacy was lower in the CPVA group as compared to the CPVA-CM: after a mean follow-up of 9±3 months, 31 (42.5%) and 47 (64.4%) patients, respectively, were arrhythmia-free without antiarrhythmic medication (p=0.008).
Conclusions: The use of a CM catheter to ensure the isolation