

PV Antrum Isolation by Phased Bipolar-Unipolar RF Ablation with a Circular Multi-Electrode Catheter



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INTRODUCTION

Pulmonary Vein isolation remains a cornerstone for ablation of AF. Procedure times remain long and success rates vary widely. Use of 3-D navigation and robotics is increasingly advocated to produce complete circumferential lesions. Little progress has been made in alternative catheter design to facilitate PV isolation.

We tested the feasibility of a novel decapolar circum-linear ablation catheter (PVAC, Ablation Frontiers Inc) delivering duty-cycled RF energy for PV antrum isolation in patients with paroxysmal AF.

METHODS

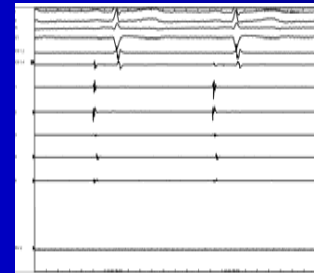
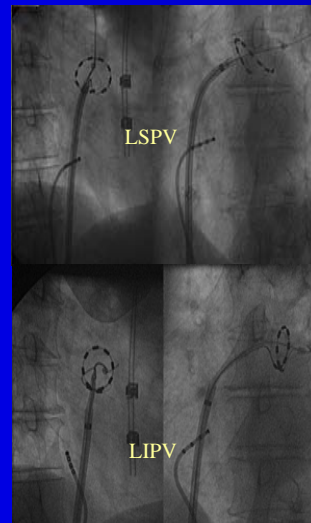
Characteristics of the Ablation Procedure

- A 4-polar 7F catheter was placed in the CS
- A single standard transseptal puncture was performed through Brockenbrough procedure, placing a 9.5F inner lumen diameter sheath (SL1 St.Jude or Channel Bard) inside the LA
- A 5000 IU I.v. bolus of Heparin was given through the sheath
- A PV angiogram was made to aid catheter manipulation
- A decapolar circular catheter (Lasso Biosense Webster or FibFocus IBI/St.Jude) was used to map and record all PV ostia
- The PVAC, a decapolar circum-linear ablation catheter was introduced in the LA over a guidewire inside the PV
- Antrum ablation was performed with alternating bipolar and unipolar RF energy (GENius, Ablation Frontiers Inc) with a 4:1 duty-cycle. A maximum power of 10W/electrode was delivered for 60 seconds at any selected electrode pair with a target temperature of 60°C.
- After ablation of all PV antrums, isolation was determined by signal recording with the PVAC inside the PV ostium and reconfirming absence of potentials with a decapolar mapping catheter.

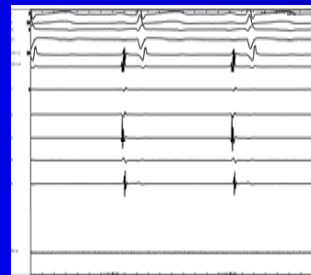
RESULTS

Procedure Data

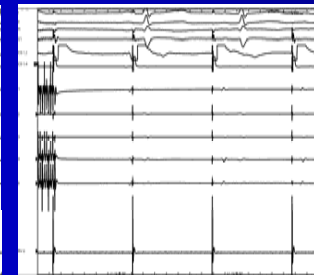
- 18 pts were included, 3 female, mean age 60±9 years
- MRI and TEE excluded significant structural heart disease, LA thrombus, or LA diameter >55 mm
- In total 70 veins were targeted for ablation. MRI showed 1 left common PV, while mapping showed 1 RSPV without significant PV potentials



PVAC Mapping



PVAC Pre Ablation



PVAC Post Ablation

Description

Total # Patients	18
Total # Veins	70

Mean # RF Applications

Total	29 ± 6 ablations
Left Superior Pulmonary Vein	8 ± 3 ablations
Left Inferior Pulmonary Vein	7 ± 2 ablations
Right Superior Pulmonary Vein	7 ± 2 ablations
Right Inferior Pulmonary Vein	7 ± 3 ablations

Procedure Times

Total Procedure [min]	92 ± 16 [74 – 150]
Fluoroscopy [min]	19 ± 9 [6 – 38]

Results

Isolation Confirmed by Lasso (100%)	70/70 Veins
Patients with > 3 mo Follow Up	12/18 [67%]
Patients with No AF at 4 ± 2 Months	15/18 [83%]

CONCLUSIONS

- Pulmonary Vein antrum ablation with a circum-linear decapolar catheter delivering duty-cycled unipolar and bipolar radiofrequency energy is feasible
- All Pulmonary Veins demonstrating PV potentials were targeted and isolated. PVI was verified with a standard decapolar mapping catheter
- 15 of 18 pts (83%) had no AF recurrence after 4 ± 2 months follow up
- No acute complications were observed (procedure through seven days)