

# Longterm results of multi-electrode pulmonary vein isolation with bipolar/unipolar RF energy for paroxysmal AF

Anton A.W. Mulder, MD, Maurits C.E.F. Wijffels, MD, PhD, Eric F.D. Wever, MD, PhD, Lucas V.A. Boersma, MD, PhD

Clinical Electrophysiology Unit, Department of Cardiology, St. Antonius Hospital, Nieuwegein, The Netherlands  
*l.boersma@antoniuziekenhuis.nl*



## INTRODUCTION

- PV isolation for AF has varying reported success rates with complex and lengthy procedures
- We evaluated the long term efficacy of a novel ringshaped ablation catheter using alternating unipolar and bipolar RF energy

## METHODS

- Consecutive patients treated with the PVAC

### Patients

- Symptomatic paroxysmal AF (PAF) or persistent AF (PersAF)
- Failed of at least one class I or III anti-arrhythmic drugs (AAD)
- No significant structural disease on MRI and TTE/TOE

### Follow-up

- Follow up 3, 6, and 12 months: ECG and/or 7-day holter
- Class I or III AAD were discouraged after a blanking period of 3 months
- Pulmonary vein (PV) MRI repeated > 6 months in selected patients
- Symptomatic patients: event recording

## ENDPOINTS

- Complication: stroke, bleeding, tamponade, hematoma, phrenic nerve damage
- Chronic Success: absence of AF assessed with a 7-day holter, ECG and event recording in the first 12 months post procedure, with exception of the first 3 months blanking period

**Table 1 PATIENT CHARACTERISTICS OVERALL**

No. of patients	210		
Male / Female	165 / 45		
Age (years)	59 9 (26 – 80)		
<u>Procedural experience</u>			
Procedural time	Total time (min)	86	28
	Fluoroscopy time (min)	23	16
Applications PVAC	26 7		
Complications	Procedural	0/210	
	<u>1<sup>st</sup> 50</u>	<u>last 50</u>	<u>Decrease</u>
Procedure time (min)	97 33	82 29	-15%
Fluoroscopy time (min)	26 20	25 19	-4%
Applications PVAC	29 7	23 7	-21%

## MULTI-ELECTRODE ABLATION CATHETER

### PVAC - Pulmonary Vein Ablation Catheter

- Circular decapolar catheter for pulmonary vein ablation
- 3 mm electrodes and spacing, 25 mm diameter



### Procedure

- Mapping and ablation in each PV atrium
- Application: 60 seconds at 60 C
- 4:1 ratio of duty-cycled bipolar to unipolar RF energy
- Maximum power of 8W
- Check PV isolation with Lasso or PVAC

**Table 2 FIRST 41 PATIENTS 12 MO FOLLOW UP**

PAF / PersAF	37 / 4
Male / Female	34 / 7
Age (years)	60 9 (34 – 76)
Left atrium dimension (mm)	40 6 (32 – 58)
Mitral insufficiency grade 1 - 2	22%
Direct current cardioversion (DCCV)	51%
Antiarrhythmic drugs	2 1
Amiodarone (use or used)	29%

**Table 3 RESULTS**

PV stenosis	Angio and/or MRI	0/41
Freedom from AF (12 months)	Holter 7-day any recording	25/33 (76%)*
	PAF	27/41 (66%)^
	PersAF	26/37 (70%)^^
AF recurrence	REDO	1/4 (25%)^^^
	- PAF	2/41 (5%)
	- PersAF	0/37 (0%)
		2/4 (50%)

\*\* (7/25), ^ (4/27), ^^ (4/26), ^^ (0/1) patients on class I or III AAD

### Predictors of failure (12 months)

- History of PersAF (75%) and DCCV (70%)
- AF in blanking period (80%)

## CONCLUSION

### Multi-electrode catheter approach for PAF and PersAF

- Feasible, efficient, safe
- Longterm results in first 41 patients
- Freedom of AF beyond 12 months is promising in patients with PAF without history of cardioversion
- Additional target in PersAF