

Devices for simultaneous circumferential pulmonary vein ablation: Comparison of Cryo-Balloon and Mesh-Ablator therapy in paroxysmal AF

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Introduction

Catheter ablation of the pulmonary veins (PV) has become a very promising treatment option for atrial fibrillation (AF). Point by point circumferential PV isolation however is time-consuming and can be technically challenging. Devices for simultaneous ablation of the whole PV atrial circumference are therefore of great interest. We compare the procedural and clinical results of PV ablation using the Cryo-Balloon versus the Mesh-Ablator system.

Methods

66 patients (pt) with paroxysmal AF were included in the study. The decision on the type of ablation system was only based on the availability of technical support of the producing company (as long as needed). It was attempted to alternate the ablation systems as much as possible. There were no significant differences between both pt groups in regard to age, concomitant heart disease, hypertension, AF history duration and number of failed antiarrhythmic drugs.

40 pt underwent Cryo-balloon ablation. A minimum of 2 cryo applications of each 360 sec were delivered per PV. PV isolation was confirmed by 20-pole Lasso™ mapping. Remaining breakthrough sites were ablated with a linear 8mm cryo energy catheter.

26 pt underwent Mesh ablator therapy using a Stockert™ RF generator and a TemPulse™ energy controller in a temperature controlled, unipolar mode (target 58°/power 60–100Watts/120–240sec). Following 2 circumferential RF applications, ablation of remaining potentials was performed quadrant wise. PV potentials still remaining were targeted with cooled tip RF ablation. After each application high resolution mapping was performed in a bipolar mode through the Mesh-Ablator.

Results

Procedure times were significant longer for Cryo (181±56min) compared to Mesh ablation (145±52min, p<0.01). Fluoroscopy times were also significant longer for Cryo (44±17min) compared to Mesh ablation (29±17min, p<0.001). The only significant complication was 1 tamponade after Mesh ablation which resolved without sequelae after percutaneous drainage. Mean follow-up time was 12 months for both treatment groups. 70 % of Cryo pt were in stable sinus rhythm (32% of those taking class Ic or III agents) after one ablation compared to 50 % of Mesh pt (23% of those taking class Ic or III agents)(p=0.05). Re-ablations with cooled tip RF catheters took 117±30min in Cryo pt (n=9) compared to 122±25min in Mesh pt (n=6)(n.s. for procedure time). At the time of re-ablation, recovery of electrical PV conduction was found in 3.2±0.7 PV in the Cryo compared to 3.7±0.5 PV in the Mesh pt group (p=0.09).

Conclusion

Our results demonstrate shorter procedure and fluoroscopy times with Mesh Ablator therapy. Follow-up at a mean of 12 months showed a trend (p=0.05) toward more favourable clinical with Cryo balloon compared to Mesh ablation.