Efficiency and safety in AF ablation using a novel loop-shaped cryoablation catheter

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Background: Different single shot ablation systems are under development to improve the efficiency and safety of pulmonary vein isolation for the treatment of atrial fibrillation (AF).

Purpose: Evaluation of effectiveness and safety of a novel cryoloop catheter (figure 1) for pulmonary vein isolation.

Methods: In a single centre prospective registry, patients with drug-refractory AF underwent pulmonary vein isolation (PVI) using a novel loop-shaped cryoablation catheter. For efficiency assessment the following parameters were registered: 1: the number of successfully isolated pulmonary veins (PV) confirmed by entrance- and exit block; 2: total procedure time, left atrial dwell time, total cryoablation time and applications as well as total fluoroscopy time; 3: freedom from atrial arrhythmia after 6 months. For safety assessment the following parameters were studied: 1: periprocedural adverse events like pericardial effusion, thromboembolic events and bleedings according to BARC classification; 2: endoscopic detected esophageal lesions (EDEL); 3: phrenic nerve palsy; 4: computed tomography angiography (CTA) detected PV stenosis until 6 months after PVI.

Results: In total, 25 subjects were enrolled in the current registry and received PVI with the loop-shaped cryoablation catheter. In terms of efficiency, successful acute PVI could be achieved in 91/100 treated PVs. Total procedure, atrial dwell, cryoablation and total fluoroscopy times were 130.5 ± 24.2 min, 101.4 ± 19.8 min, 40.8 ± 11.0 min and 22.5 ± 5.5 min, respectively. On average, 4.5 cryoenergy applications per PV were required for acute PVI. Out of the blanking period of 3 months, after 6 months 18/25 subjects (72%) were free from any atrial arrhythmia. With respect to safety, no pericardial effusion, thromboembolic event or bleeding complication occurred. 2/25 subjects experienced a transient phrenic nerve palsy. Additionally, no EDEL or PV stenosis could be detected.

Conclusion: The present single centre registry confirmed the effectiveness and safety of the novel loop-shaped cryoablation catheter for the treatment of atrial fibrillation.

Figure 1: cryoloop catheter