

Single sweep pulmonary vein isolation using the endoscopic ablation system. Dream or reality?

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Background: The endoscopic ablation system (EAS) is an established ablation device for pulmonary vein isolation (PVI) in patients with paroxysmal and persistent atrial fibrillation (AF). In randomized studies, however, point-by-point laser ablation resulted in longer procedure times. The novel X3 EAS is now equipped with a motor driven laser generator that sweeps the diode laser beam around the individual PV ostium at a pre-defined speed (2.25°/sec) thus allowing for contiguous circumferential ablation (RAPID mode).

Purpose: To determine the feasibility of single sweep ablation using the new X3 EAS.

Methods: Consecutive AF patients were enrolled. After single transeptal puncture selective PV angiographies were performed. A 3D enabled circular mapping catheter was used to record PV potentials and to create a 3D map of the left atrium. Then, the transeptal sheath was exchanged for the 12F EAS delivery sheath. The EAS was inflated to obtain optimal circumferential contact to the PV ostium. Before ablation, the laser generator was retracted to ensure optimal contact behind the catheter shaft (blind spot). Ideally, RAPID mode ablation was employed at 13-15W. In case of esophageal heating >39°C or suboptimal tissue exposure point-by-point ablation (5.5-12W for 20-30 secs) was used instead. During ablation at the septal PVs phrenic nerve pacing was performed via a diagnostic catheter in the superior vena cava.

Single sweep ablation was defined as one single RAPID energy application per PV to complete the singular, circular lesion set. PV conduction was re-assessed after all PVs had been treated. In case of residual PV conduction, gap mapping followed by EAS guided ablation was performed. If EAS failed to achieve complete PVI, touch up ablation was allowed at the discretion of the operator. Hemostasis was achieved by means of a figure of 8 suture. Procedure time was defined as initial groin puncture to groin closure. Follow-up included office visits at 3, 6 and 12 months including 72 h Holter monitoring.

Results: One-hundred AF patients (56% male, mean age 68.10 years, 66% PAF) with normal LV ejection fraction (mean 60 ± 10%) and normal LA size (41 ± 6mm) underwent X3 EAS ablation. Of 382 PVs 378 (99%) were isolated with the X3 EAS. In 214 PVs (56%) single sweep isolation was achieved. First pass isolation and RAPID mode only PVI was achieved in 362 (95%) and 357 (94%), respectively. Single sweep isolation rates varied across PVs from 46% at LIPV to 64% at RSPV.

The mean total procedure and fluoroscopy times were 43 ± 10 and 4 ± 2 mins, respectively.

Safety data and the complete follow-up will be reported.

Conclusion: The new X3 EAS equipped with a motor driven laser generator allows for single sweep PVI in 56% of PVs. Almost all PVs (94%) may be isolated with RAPID mode only leading to a very high first pass isolation rate. Altogether, this leads to substantially faster procedure times compared to the predecessor EAS.