Clinical applications

P981

Comparison of automark utilization and lesion metric target during paroxysmal atrial fibrillation ablation with a contact force-sensing ablation catheter: European and U.S. multicenter Experiences

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Background: Accurate delivery of transmural lesion is associated with improved durability of pulmonary vein isolation and reduced reconduction. Lesion quality depends on multiple parameters such as radiofrequency power, tissue-catheter contact, duration of energy application, and catheter tip temperature. Consequently, energy delivery parameters vary based on individual operators' preferences and procedural needs.

Purpose: To characterize and compare the utilization of automated lesion marking feature and lesion delivery parameters used during paroxysmal atrial fibrillation ablation performed with a magnetic sensor enabled contact force-sensing catheter across European and U.S. centers.

Methods: Procedural data were prospectively collected in clinical cases performed with a new magnetic sensor enabled, contact force ablation catheter within the first 6 months of use at participating centers in Europe and the U.S. Use of bidirectional CF catheters, steerable sheaths, automated lesion marking software and associated lesion delivery parameters during paroxysmal atrial fibrillation ablation were evaluated.

Results: A total of 149 cases across 37 centers in 11 European countries, and 112 cases across 31 U.S. centers were analyzed. A bidirectional contact force catheter (56.4% and 90.2%), a steerable sheath (65.8% and 69.6%), and the automated lesion marking module (77.9% and 90.2%) were used in most European and U.S. cases, respectively. The most commonly reported energy delivery parameters were: lesion index (LSI), Force-Time Integral (FTI), and time from European cases; LSI, average force, and FTI for U.S. cases (Table). Target LSI values were recorded for 126 cases in Europe and 34 in the U.S, ranging from 3 to 6. In anterior/roof segments, most common LSI target values for anterior/roof and posterior/inferior segments were 6 (42.9%) and 5 (51.2%) in Europe, and 5.5 (44.1%) and 5 (54.5%) in the U.S. PVI was confirmed with an average of 20.3 minutes waiting period (69.1%) for European cases and exit block (57.1%) in U.S. cases. First pass PVI were 67.1% and 74.4% for European and U.S. cases, respectively.

Conclusion: Energy delivery parameters and PVI confirmation method varied considerably by geography during paroxysmal atrial fibrillation ablation using the magnetic sensor enabled, contact force ablation catheter. Further study on efficacy implication on these differences in practice should be examined.

Energy delivery parameters used

Paroxysmal AF	N	LSI	FTI	Time	Imp Drop	Avg Force	Other	N/A
Europe	149	44.0 %	13.4 %	7.0 %	6.0 %	2.4 %	1.0 %	26.2 %
U.S.	112	31.2%	17.9 %	6.2 %	8.0 %	23.2 %	11.7 %	1.8 %

Energy delivery parameters used in paroxysmal AF ablation in Europe and U.S.

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