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Ablation of cti-dependent flutter using a novel advanced mini-electrodes technology: preliminary results from Leonardo registry

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Background: Ablation of cavotricuspid isthmus (CTI) represents the standard therapeutic approach for the creation of bidirectional conduction block (BDB) across the isthmus and the prevention of recurrences, yet recurrence of arrhythmia is common.

Objective: To evaluate the acute and long-term outcome of CTI ablation through a novel ablation catheter equipped with three radially distributed mini-electrodes (ME) compared with standard ablation catheter technology (ST).

Methods: Atrial Flutter Ablation in a Real World Population (LEONARDO) is a prospective, multicenter cohort study aimed at providing an estimate of acute to long-term outcome in a large population of pts indicated for AFL ablation from 2015 to 2017. The procedural endpoint was the creation of a BDB. Presence of widely split double potentials (DP) along the ablation line and assessment of the atrial activation sequence (AAS) were used as criteria for complete BDB. Recurrence of AFL and complications were assessed at 12-month follow-up.

Results: 205 consecutive pts undergoing typical AFL ablation were included (74% male, 50.6% with history of AF, median of 7[4–11] ablation lesions, median ablation time of 20[10–30] min). Complete BDB was achieved in 175 (85.4%) pts (10 pts had DP only criterion, 19 pts had AAS only criterion whereas in 1 pt we failed to reach a BDB). 15 (7.3%) pts experienced AFL recurrence during follow-up. 102 pts (49.8%) underwent ablation procedure with ME catheters whereas 103 (50.2%) pts were treated by ST catheters. The median number of lesions/pt was significantly lower in the ME group compared to the ST one (4[3–6] vs 8.5[6–12], $p < 0.0001$), whereas no differences were found in terms of fluoroscopy time (10.5[7–15] min vs 10[5.8 ± 15] min, $p = \text{NS}$) or ablation time (22.5[10–30.5] min vs 18[10–26] min, $p = \text{NS}$). No complications were reported. The acute procedural success was comparable between groups (81.4% vs 89.2%, $p = \text{NS}$) whereas the time to AFL recurrence was significantly longer among pts targeted with ME catheters (HR = 0.343; 0.12 to 0.97; log-rank $p = 0.044$).

Conclusions: In our preliminary experience, the use of the ME technology seemed safe and effective. It resulted in fewer lesions/pt and a lower AFL recurrence rate at 1-year follow-up compared with ST ablation catheters.