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LONG TERM COMPARISONS OF ATRIAL FIBRILLATION ABLATION OUTCOMES WITH A CRYO-BALLOON OR LASER-BALLOON: A PROPENSITY-MATCHED ANALYSIS BASED ON CONTINUOUS RHYTHM MONITORING

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Background: In recent times, cryoballoon (CB) and laser-balloon (LB) CA have been demonstrated to achieve durable and effective pulmonary vein isolation (PVI). Only one head-to-head comparison with an intermittent rhythm monitor strategy is currently available.

Objective: Aim of this study was to compare acute and long-term outcomes of CB and LB atrial fibrillation ablation procedures, using a continuous rhythm monitoring strategy.

Methods: This was a prospective two-arm non-randomized propensity-matched observational trial, comparing the outcomes of AF ablation using LB and CB techniques. All consecutive patients undergoing catheter ablation for AF with a laser-based balloon system (LB-Cohort, n=77) or with a second-generation cryoballoon-system (CB-cohort, n=81) at two centers were prospectively enrolled in this study. For this analysis, only patients with a continuous device monitoring capable to detect ATAs recurrence were enrolled. To evaluate AF recurrences, an implantable cardiac monitor (ICM) was implanted prior to hospital discharge to detect atrial tachyarrhythmias (ATAs) recurrences, in all patients that were not already implanted with a cardiovascular implantable electronic device (CIED) capable to monitor ATAs recurrence.

Results: A total of 110 propensity-matched patients undergoing AF ablation with a LB (n=55) or with a CB system (n=55) were included in the study. The mean age of the cohort was 63.2±8.5 years and 68.2% were males. The AF pattern was paroxysmal in 57.3% of the cases. After propensity-matching, age, sex, and AF type resulted balanced between the groups, as well as all other un-matched baseline characteristics and baseline therapy. Procedural time (LB: 87 [73–104] vs CB 90 [70–130] min; p=0.264) and fluoroscopy time did not differ. No differences in ATAs recurrences were observed at 12-month (LB-30.9% vs CB-29.1% and LB-45.5% vs CB-38.2%; log-rank 0.539) (Figure 1). As for AF burden, the 12-month median was 0 [0-1] vs 0 [0-3]% (p=0.127), in the LB and CB-group, respectively. When considering only PeAF patients, median 12-month ATAs burden was 26 [18.5-40.5] vs 29 [26-35] % for the LB and CB patients (p=0.919). At univariate analysis, persistent AF (2.689 [1.482 – 4.868], p<0.001) and hypertension (2.098 [1.012 – 4.348], p=0.046) were found to be significantly associated with post-ablation arrhythmia recurrence; at multivariate analysis, only persistent AF remained significantly associated with the outcome of interest (2.489 [1.366 – 4.535], p=0.003). During follow-up, 3 patients (5.4%) of the CB-cohort and 4 patients (7.3%) of the LB-cohort (p=1.000) were admitted for AF recurrences and treated with electrical cardioversion, while 6 patients were treated with a redo CA, n=4 in the CB group (3 for AF, 1 for isthmus-dependent atrial flutter) vs n=2 in the LB group (both for isthmus-dependent atrial flutter), (p=0.679).

Conclusion: In a well-propensity-matched cohort, arrhythmic outcomes assessed by continuous rhythm monitoring did not differ between patients treated with LB and CB. In patients experiencing ATAs recurrencies, the overall burden is low, regardless of the technique used, with the only predictor of recurrences being PeAF. Regarding procedural aspects, LB and CB-procedures did not significantly differ neither in procedural nor in fluoroscopy time. There was no difference in the rates of complications.