

Efficacy and safety of 50-60 Watt high-power short-duration radiofrequency catheter ablation of atrial fibrillation: A propensity score matching study

Pak HN.; Yang SY.; Kim M.; Yu HT.; Kim TH.; Uhm JS.; Joung BY.; Lee MH.; Park JW.

Yonsei University Health system, Seoul, Korea (Republic of)

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Introduction: Although high-power short-duration (HPSD) radiofrequency (RF) energy is commonly utilized in atrial fibrillation (AF) catheter ablation (CA), its efficacy, safety, and autonomic neural effects have not yet been evaluated in a large patient number. We compared HPSD-AFCA and conventional power (ConvP)-AFCA after propensity score matching.

Methods: Among 3,221 consecutive AF ablation patients, we included 1,720 patients (74.4% male, 59 ± 10 years old, 56.5% paroxysmal type) who underwent AFCA after propensity score matching: 430 in 50~60W HPSD group vs. 1,290 in the ConvP group. We evaluated the procedural factors, complication risk, rhythm outcome, and 3-month heart rate variability (HRV) between the two groups and subgroups.

Results: Procedure times were significantly shorter in the HPSD group ($p < 0.001$), but the complication rate ($p = 0.088$) and the 3rd-month HRV did not differ between the two groups. At the 12-month follow-up, rhythm outcomes did not differ between the two groups (Overall, Log-rank $p = 0.212$; anti-arrhythmic drug off Log rank $p = 0.246$). These efficacy and safety outcomes were consistently similar regardless of the AF type or ablation lesion set. In the Cox regression analysis, the left atrium volume index measured by computed tomography (HR 1.009 [1.003-1.015]), $p = 0.005$) and extra-pulmonary vein triggers (HR 1.587 [1.033-2.440], $p = 0.035$) were independently associated with 1-year clinical recurrence, while the HPSD strategy was not (HR 1.188 [0.903-1.564], $p = 0.218$).

Conclusions: HPSD-AFCA significantly shortened the procedure time with similar rhythm outcomes, complication risks, and autonomic neural effects as ConvP-AFCA, regardless of the AF type or ablation lesion set.

Abstract Figure.

Figure. The comparisons of procedure time and ablation time between HPSD and conventional power groups

