

Pulmonary vein isolation by different setting of high-power short-duration radiofrequency application: feasibility, short term efficacy and safety in patients with atrial fibrillation

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Aims: Pulmonary vein (PV) isolation (PVI) by point-by-point radiofrequency application (PPRF) results in longer procedures than cryoballoon ablation. In addition, it is associated with more esophageal lesions. The aim of this study was to evaluate the feasibility and safety of PVI by high power short duration (HPSD) PPRF in patients with atrial fibrillation.

Methods: PPRF around the PVs was done in 125 consecutive patients distributed in two chronologically successive groups. Conventional PPRF with 30W for ≤ 30 s under luminal esophageal temperature monitoring was performed in the first 47 patients (Group 1). 68 patients were enrolled in the HPSD (Group 2). Power was set to 50 W and delivered to reach a pre-defined lesion index value (LSI ≥ 5 or Abl-I ≥ 350) in the first 18 patients (Group 2A). 30 patients underwent PPRF with 60W for 7–10 s (Group 2B) and the last 30 patients underwent PPRF with 70W for 9 s (Group 2C). Esophageal endoscopy was performed after ablation in all patients.

Results: PVI of all targeted veins was achieved in 96% and 100% of patients of groups 1 and 2 respectively ($p=0.6$). Total RF time was 30 [27–43], 25 [20–29], 16 [14–20] and 14 [11–16] min in groups 1, 2A and 2B and 2C respectively ($p<0.001$). RF was delivered for 12 [9–17] s vs 9 [8–9] s vs 9 [8–9] s per application in groups 2 A, 2B and 2C respectively ($p<0.001$). To-

tal number of RFA to completely isolate all PV was 105 [90–126] in group 2A, 113 [90–135] in group 2B and 94 [79–112] in group 2C ($p=0.12$).

First-pass PVI was achieved in 56%, 57% and 85% of left PV ($p=0.038$) and in 56%, 60% and 82% of right PV ($p=0.13$) in groups 50W, 60W and 70W respectively. The carina was the most frequent location of persistent conduction when first-pass failed. Reconnections occurred in 6%, 3% and 11% of left PV ($p=0.6$) and in 6%, 7% and 4% ($p=0.63$) of right PV in groups 50W, 60W and 70W respectively. Adenosine test was systematically used in groups 60W and 70W: the incidence of dormant conduction was 23% and 22% ($p=0.9$) in left PV and 20% and 22% ($p=0.8$) in right PV respectively.

The incidence of esophageal lesions was 28% in Group 1, 2% in Group 2A, and 0% in groups 2B and 2C ($p<0.001$). No other intraprocedural complications occurred in the high-power group.

Conclusions: PVI is feasible with HPSD PPRF in most patients using shorter total RF times. This approach appears associated with very low incidence esophageal damage than the conventional one, especially when 60W/70W and shorter application time are used.

