Clinical applications

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High-power and short-duration radiofrequency ablation for atrial fibrillation: feasibility, safety and one-year results.

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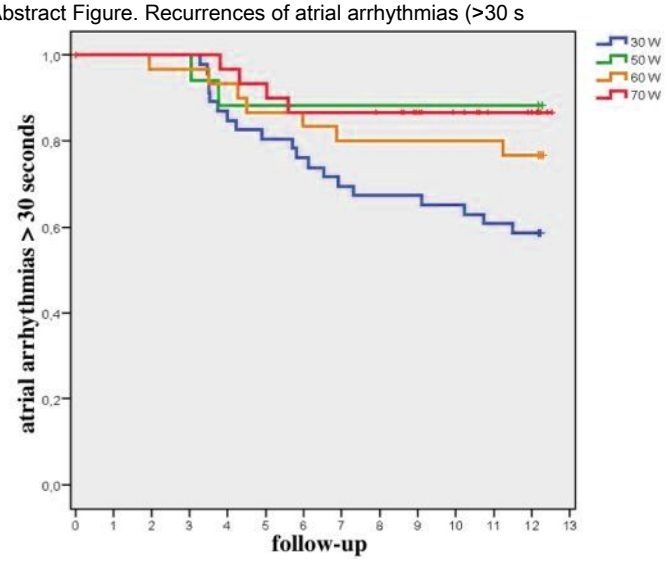
Pulmonary vein (PV) isolation (PVI) by point-by-point radiofrequency application (PPRF) results in longer procedures than cryoablation. In addition, it is associated with more oesophageal lesions. The aim of this study was to evaluate the feasibility, safety and 1-year efficacy of PVI by high power short duration (HPSD) PPRF in patients with atrial fibrillation (AF).

METHODS: PPRF around the PV was performed in 125 patients (P) distributed in two groups. Conventional PPRF with 30W/≤30 s under luminal oesophageal temperature monitoring was performed in the first 47 P (Group 1). 68 P were enrolled in the HPSD (Group 2). Power was set to 50 W and delivered to reach a predefined lesion index value (LSI≥5 or AI≥350) in the first 18 P (Group 2A). 30 P underwent PPRF with 60 W for 7-10 s (Group 2B) and the last 30 P underwent PPRF with 70W for 9 s (Group 2C). Oesophageal endoscopy was performed after ablation in all P.

RESULTS: 17 (36%) P in Group 1 and 30 (38%) in Group 2 had persistent AF. PVI of all targeted veins was achieved in 96% and 100% of P in both groups (p = 0,6). Total RF time was 30 [27-42], 25[20-29], 16 [14-20] and 13 [11-16] in Groups 1, 2A, 2B and 2C respectively (p < 0.01). RF duration per target lesions was 12[9-17], 9[8-9] and 9[9-9] s in Groups 2A, 2B and 2C respectively (p < 0.001). First-pass PVI was achieved in 35% 56%, 57% and 85% of left PV circles (p < 0.001) and in 46%, 56%, 60% and 82% of right PV circles (p = 0.04) in groups 30W, 50W, 60W and 70W respectively. Reconnections occurred in 8% of PV circles in Group 1 and in 6.5% of PV circles in Group 2 (p = 0.8). Dormant conduction was tested with adenosine in Groups 2B and 2C and the incidence was 30% and 25% of PV circles respectively (p = 0.31). The carina was the most frequent location of conduction gaps, reconnections and dormant conduction in all groups. The incidence of oesophageal lesions was 28% in Group 1, 22% in Group 2A and 0% in groups 2B and 2C (p < 0.002). The 1-year efficacy (freedom from any atrial tachycardia recurrences >30 s) was 59% in Group 1, 88% in group 2A, 77% in group 2B and 87% in group 2C (p = 0.019).

CONCLUSIONS: PVI by HPSD PPRF is feasible and results in high 1-year efficacy in P with AF. This approach appears safe and associated with low incidence of oesophageal damage especially when short application time and 60 or 70W are used. However, this latter power setting is associated with slightly better 1-year efficacy than HPSD PPRF using 60W.

Abstract Figure. Recurrences of atrial arrhythmias (>30 s



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