Impact of the left atrial posterior wall isolation in conjunction with pulmonary vein isolation using cryoballoon ablation in patients with persistent atrial fibrillation: A single center experience

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Introduction: Ablation of persistent atrial fibrillation (PerAF) usually requires substrate modification in addition to pulmonary vein isolation (PVI). The purpose of this study was to assess the efficacy, safety and short-term outcome of substrate modification in addition to PVI using cryoballoon ablation in patients with PerAF.

Methods: We examined the periprocedural parameters; (1) procedure and fluoroscopy time, (2) the rate of first pass electric isolation and time-dependent/adenosine-induced dormant conduction, (3) periprocedural complication, and short-term outcome in 48 patients with PerAF who underwent a first-time substrate modification, as isolation of the posterior wall isolation of left atrium (PWI) including PVI (box isolation) using cryoballoon ablation (CBA; n=24) versus radiofrequency catheter ablation (RFA; n=24).

Result: Acute box isolation, as first pass electric isolation was achieved in 87.5% of overall patients (CBA=100% versus RFA=75%; P=0.022). Using 4.3±0.7 applications (4.5±0.9 applications at the roof of left atrium and 4.2±0.8 applications between left and right inferior PV) of CBA for PWI, patients with CBA had significantly shorter procedure time (192.7±25.3 minutes versus 248.5±47.7 minutes; P<0.01), and less dormant conduction rate (0% versus 20.8%; P=0.0496) compared with those with RFA. During the median follow-up of 272 days, 1 CBA patient versus 3 RFA patient had recurrent atrial tachyarrhythmias (Log rank P=0.85). Both fluoroscopy time and complication rate were comparable between the groups (68.4±16.1 minutes versus 73.2±30.3 minutes; P=0.52, and pericardial effusion not requiring drainage in 1 CBA patient versus periesophageal vagal nerve injury in 1 RFA patient).

Conclusion: Substrate modification as PWI using CBA can be achieved safely, effectively, and appears comparable short-term outcome to RFA in PerAF.