Transition of heart rate and atrial premature complex after Cryoballoon vs. Radiofrequency Ablation for Paroxysmal Atrial Fibrillation

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Introduction: Various devices such as cryoballoon (CB) and radiofrequency (RF) are widely used for catheter ablation in paroxysmal atrial fibrillation (AF). Ambulatory monitoring is repeatedly performed to confirm AF recurrence after the catheter ablation, temporal changes in ambulatory monitoring findings after CB ablation has not been well elucidated. The aim of this study is to compare the details of follow-up ambulatory monitoring after CB ablation for paroxysmal AF with that after RF ablation.

Methods: Of 1157 consecutive patients with paroxysmal AF who underwent the initial pulmonary vein isolation using CB or RF catheter, 431 patients who had taken medications with chronotropic effects after ablation were excluded. Of remaining 726 patients, 508 patients (RF 254 patients, CB 254 patients) were extracted using propensity score matching. The matching variables were as follows: sex, age, body mass index, left atrium diameter, left ventricular ejection fraction, estimated glomerular filtration rate, B-type natriuretic peptide, history of AF, hypertension, diabetes mellitus, CHADS2 score and number of failed anti-arrhythmic drugs. Number of PAC and total heart beats were evaluated on ambulatory monitoring 1, 3, 6, 12, 24 and 36 months after the procedure. APC burden was defined as daily PAC number divided by the daily total heart beats.

Result: After the propensity score matching, baseline characteristics were similar between RF and CB groups. After 1, 3 and 6 months, the number of total heart beats was larger in CB group than the RF group (110377±17566 vs. 106758±15285, P=0.04; 108701±16170 vs. 104775±17566, P=0.02; 111069±15794 vs. 106456±13840, P =0.046, respectively). One year after the ablation, total heart beats gradually decreased and total heart beats were statistically similar between two groups in 12, 24 and 36 months after the ablation. (Figure A) APC burden was higher in RF group than CB group in 3 months after the procedure. (1.07%±2.52% vs. 0.79%±2.23%, P = 0.003) (Figure B) APC burden gradually decreased by 12 months after the ablation both in RF and CB groups.

Conclusion: There was significant difference in transition of total heart rate and APC burden between after RF and CB ablation. In CB group, the number of daily heart beats was larger than RF groups until 6 months after the ablation procedure and then gradually decreased.