Cryoballoon Ablation is Superior to Conventional Point-by-Point Procedure in Reduction of Gap Related to Atrial Tachyarrhythmias Recurrence

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Introduction: Cryoballoon pulmonary vein isolation (CPVI) is known to be effective and useful for drug-refractory paroxysmal atrial fibrillation (AF). However, electrical and anatomical features in recurred patients after initial ablation procedure of CPVI strategy reminds unclear, compared to these patients after conventional PVI strategy.

Methods: We examined electroanatomical and echocardiographical parameters in patients with recurred atrial tachyarrhythmias after initial procedure by CPVI or conventional PVI using irrigated ablation catheter with 3D mapping systems.

Result: There were no significant differences in echocardiographic features including LA dimension (39.7±6.2 vs 40.6±4.5 mm, P=NS) and LV ejection fraction (66.6±10.7 vs 59.8±11.9 %, P=NS) between 2 strategies. We performed subsequent ablation session for recurrences of atrial tachyarrhythmias after initial ablation procedure in CPVI (n=11/150) and conventional PVI (n=33/137), respectively. Atrial tachycardia or Flutter (AT/AFL) were detected after CPVI (N=4) and conventional PVI (N=11), respectively. Among them, seven AT/AFL after conventional PVI were gap-related, but no gap-related AT/AFLs were in CPVI. Three AT/AFLs after CPVI consisted of macro-reentries (2 LA- and 1 typical RA flutter). The number of ablation application to gap of left PVs after CPVI were fewer than those after conventional PVI (LPV:15.9±18.0 vs 6.0±5.8 P=0.08) in subsequent ablation procedures.

Conclusion: Compared to conventional PVI, CPVI procedure, not point-by-point procedure, is more effective for successful elimination of AT/AFL, probably due to reduction of the degree of gap in the vicinity of PV ostia and making secure facial ablated lesion.