The incidence and origin of atrial tachycardia after cryoballoon ablation

Introduction: Atrial tachycardia (AT) recurrence after atrial fibrillation (AF) ablation with radiofrequency (RF) is not rare, and it is difficult to control in some cases. However, the incidence and origin of AT after cryoballoon ablation is not clear.

Methods: Two hundred eighty patients underwent second-generation cryoballoon (Arctic Front Advance, Medtronic, Inc., Minneapolis, MN, USA) ablation from July 2016 to February 2019 in our hospital and followed up for at least 3 months after ablation were included in this study. Pulmonary vein (PV) isolation was performed with cryoballoon. Additional left atrial (LA) linear ablation was not performed. We examined the origin of AT by electrophysiological study.

Result: Fifty patients (17.9%) had recurrence after cryoballoon ablation. Among them, recurrence of AF occurred in 38 patients (76%), AT in 8 (16%) and premature atrial contractions in 4 (8%). PV reconnection was observed in 21 patients. The distribution of reconnected PV was 11 LSPVs, 8 LIPVs, 12 RSPVs, 15 RIPVs. The origins of AT were 2 RIPVs, 1 RSPV, 1 both RPVs, 1 LSPV, 1 base of left atrial appendage, 1 posterior of LA and 1 carina.

Conclusion: The majority of AT after cryoballoon ablation were originated from RPV and carina. Our study shows that freezing of RPV was not enough due to the phrenic nerve palsy and incomplete occlusion of RIPV. Also, the carina area could not be ablated enough by cryoballoon. The LA voltage map after cryoballoon ablation and additional RF ablation for those areas might be the breakthrough.