Investigation of recurrence after atrial fibrillation ablation assessed by PentaRay catheter

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Introduction: The left atrium (LA) volume and the LA voltage are said to be predictors of recurrence after ablation for atrial fibrillation (AF). We measured LA volume and LA voltage using CARTO 3 system PentaRay catheter, and evaluated recurrence group and nonrecurrence group.

Methods: In consecutive 234 patients (pts) with AF who underwent pulmonary vein isolation (PVI) from Jun 2016 to December 2017, we evaluated 128 pts (mean age 66.3±11.8, Male 66%), that LA was constructed by Fast Anatomical Mapping using PentaRay catheter during LA pacing. We measured LA total volume (LATV), RightPV+antrum volume (RPAV), LeftPV+antrum volume (LPAV), LA central volume (LACV) and the LA bipolar voltage. We followed the observation with 0 days as the day of ablation. Recurrence was defined as AF detected by electrocardiogram.

Result: Out of 128 pts, 26 were PerAF (recurrence: 4pts) and 102 were PAF (recurrence: 7pts). The observation period was 137 ± 80 days on average. In PAF, the median value of the proportion of LPAV to LATV was divided into two groups (Median value of LPAV/LATV×100: 8.67%, low<8.67%; n=51, high≥8.67%; n=51). 6 out of 7 pts who relapsed PAF were included in the high group. Although there was no significant difference in each volume between recurrence group and nonrecurrence group in PerAF, LA bipolar voltage in recurrence group was significantly lower than nonrecurrence group (0.50±0.17 vs. 0.73±0.23mV, p<0.05).

Conclusion: The higher proportion of LPAV to LATV in PAF, the more likely it is for relapse. In addition, it was considered that a decrease in LA voltage was involved in recurrence for PerAF.