Decreased Recurrence of Atrial Fibrillation Following Extensive Encircling Circumferential Pulmonary Vein Isolation Using Information from Preprocedural Multidetector Computed Tomography

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Purpose:
Myocardial thickness is particularly thick at the ridge between the left pulmonary vein (PV) and the left atrial appendage (LAA) by dissection. We investigated whether the atrial fibrillation (AF) ablation outcome was influenced by altering ablation strategies according to the thickness of the PV-LAA ridge using preprocedural multidetector computed tomography (MDCT).

Methods:
Patients with AF scheduled for extensive encircling circumferential pulmonary vein isolation (EEPVI) (110 pts) were divided into two groups. In the nonmodulation group (32 pts), EEPVI lines were created using a 3.5-mm tip irrigated catheter at a maximum power of 30 W for 15-20 s at each site. In the modulation group (78 pts), ablation was extended (30-40 s) at the PV-LAA ridge if its thickness was >4.0 mm on MDCT.

Results:
In the modulation group, extended ablation at the PV-LAA ridge was observed in 37 pts. During 25 ± 9 months of follow-up, the recurrence was significantly less in the modulation group (10% vs. 28%, p = 0.018). Logistic regression analysis demonstrated that modifications in the ablation time and LA volume index were independent predictors of arrhythmia-free recovery after ablation.

Conclusion:
Recurrence following EEPVI could be reduced by modifications in the ablation time at the PV-LAA ridge.

Keywords:
atrial fibrillation, multidetector computed tomography, ridge