Left Atrial Appendage Volume Measured by Multi-Detector Computed Tomography Predicts Long Term Outcome Following Atrial Fibrillation Ablation

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Introduction: Left atrial (LA) volume multi-detector computed tomography (MDCT) is useful in predicting prognosis of atrial fibrillation (AF) following catheter ablation. However, there is limited data regarding role of Left atrial appendage (LAA) volume using MDCT for risk stratification of AF recurrence after catheter ablation.

Methods: Consecutive 287 patients who underwent catheter ablations for AF and MDCT prior to the ablation were retrospectively enrolled from K. Circumferential PV isolation was performed guided by electroanatomical mapping system and additional ablation lesions were made at the discretion of the operators. To determine optimal cut-off value for predicting recurrence, Receiver operating characteristic (ROC) curve analysis was performed.

Result: During a mean follow-up of 5.75 years, The AF recurrence was documented in 109 patients (37.9%). LA volume index (LAVI; 46.9[36.8-55.7] vs. 52[41.2-66.5]; p=0.001) and LAA volume index (LAAVI; 4.9[3.5-6.0] vs. 5.8[4.3-7.3]; p=0.005) were significantly larger in the recurrence group. ROC curve analysis showed that LAAVI of 5.75 ml/m3 and LAVI of 63.35 ml/m3 were optimal cut-off values for predicting recurrence of AF, respectively. In the Kaplan Meier analysis, Patient who had both LAVI and LAAVI greater than the cut-off value showed the highest recurrence rate of AF recurrence following catheter ablation. The predicting model using both LAVI and LAAVI yielded time-dependent C-index of 0.64 at 1 year after catheter ablation and 0.62 at 3 years following catheter ablation. Multivariate logistic regression showed that LAA volume index was an independent predictor of AF recurrence with an adjusted HR of 1.10 for every 1 mL/m2 increase (95% confidence interval 1.01-1.22).

Conclusion: In corporate with LAVI assessment, LAAVI measurement can be useful for predicting AF recurrence among AF patients who underwent catheter ablation.