Factors Associated with Esophageal Injury and preventing it after Catheter Ablation of Atrial Fibrillation

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Introduction: Esophageal injury (EI) is a serious complication occurs after catheter ablation of atrial fibrillation (AF), however predictable factor of EI is unclear. We investigated the factors associated with the occurrence of EI after catheter ablation and the usefulness of esophageal temperature monitoring for avoiding EI.

Methods: Among 465 patients who underwent catheter ablation of AF, endoscopy was performed the next day after catheter ablation to examine for EI. The incidence of EI was compared between 167 patients who used esophageal temperature probe (ETP) (ETP group) and 308 patients who did not used ETP (Non-ETP group) during catheter ablation. The Shortest Distance between esophagus and posterior left atrium measured on contrast Computed Tomography (SD-CT) was also compared between the ETP and Non-ETP groups.

Result: In all patients, EI was found in 35 patients (7.3%). SD-CT in patients with EI was significantly lower than that in patients without EI (2.4±0.4 vs 4.3±0.9 mm, p<0.001). No differences were observed between the two groups in total amount of radiofrequency energy applications, or the location of SD-CT. However, EI occurred more frequently in Non-ETP group (8/167 patients; 4.7 % vs 27/308 patients; 8.8 %, p=0.042). The severity diagnosed as moderate (erosion) in 3 patients and mild (erythema) in 5 patients of ETP group, and as severe (ulcer) in 23 patients and mild in 4 patients of Non-ETP group. There was no significant difference in SD-CT between ETP and Non-ETP group (3.96±0.98 vs 4.19±1.01 mm, p=0.54). However, SD-CT in patients with EI was significantly shorter than SD-CT in patients without EI, both in ETP (2.4±0.7 vs 4.3±0.9 mm, p<0.001) and in Non-ETP group (2.5±0.2 vs 4.2±0.9 mm, p=0.017), respectively. Multiple regression analysis revealed that only SD-CT significantly correlated with EI. The area under a receiver operating characteristic curve using SD-CT as a predictive marker in EI patients was 0.971 (p<0.001). When the cut-off value of EI was set at 2.8mm, the sensitivity and specificity for EI diagnosis were 96.6% and 87.5%.

Conclusion: The incidence of EI was significantly correlated with SD-CT. Esophageal temperature monitoring reduced EI and alleviated the severity of EI, especially in patients with short SD-CT.