Electrocardiographic abnormalities can predict new-onset atrial fibrillation after cavo-tricuspid isthmus dependent atrial flutter ablation

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Introduction: Atrial fibrillation (AF) and cavo-tricuspid isthmus (CTI) dependent atrial flutter (AFL) are two separate entities that coexist in a significant ratio of patients. In patients with CTI ablation for AFL, the decision to hold oral anticoagulation often becomes an issue. The purpose of the study was to describe the incidence of the development of AF after CTI ablation in patients without history of AF and to identify the risk predictors for the occurrence of AF after CTI ablation.

Methods: The present study included 111 consecutive patients (97 males, 69±12 years) who underwent radiofrequency catheter ablation (RFCA) for typical AFL since 2010. Patients with any history of AF prior to RFCA were excluded. P wave and QRS morphology, characteristics, duration, and amplitude were evaluated by 12-lead electrocardiography in sinus rhythm. The parameters of echocardiography before the CTI ablation and comorbidities were also evaluated.

Result: During 3.2±2.4 years of follow-up after RFCA, 48 patients (43%) developed new-onset AF. Univariate analysis revealed that the presence of interatrial block, defined as a P-wave duration \( \geq 110 \) ms and biphasic morphology in the inferior leads (Odds ratio[OR], 10.97; 95%confidence interval[CI] 2.98-40.31, p<0.001), the fragmentation of QRS complexes (OR, 10.28; 95%CI 4.21-25.08, p<0.001), hypertension (OR, 2.85; 95%CI 1.30-6.22, p=0.009), and CHADS2 score (OR, 1.42; 95%CI 1.02-1.98, p=0.04) were the predictors of new-onset AF. Multivariate analysis showed that the interatrial block (OR, 5.03; 95%CI 1.12-22.50, p=0.04) and the fragmentation of QRS complexes (OR, 7.83; 95%CI 2.99-20.50, p<0.001) were the independent predictors. There were no differences in the other electrocardiographic and echocardiographic parameters, including left atrial volume index (41±15 vs. 38±12 mL/m2, p=0.21) and right atrial area (17±4 vs. 18±6 cm2, p=0.60) between the patients with and without AF.

Conclusion: The present study indicated that new-onset AF developed in a significant proportion of patients undergoing AFL ablation. The presence of interatrial block and the fragmentation of QRS complexes were the predictors of new-onset AF.