Electrocardiogram Predictors of New-onset Atrial Fibrillation After Typical Atrial Flutter Ablation

Maiko Kuroda
Suguru Nishiuchi
Takeshi Harita
Yukihiro Hamaguchi
Maki Hamasaki
Hidekazu Kojuima
Hibiki Mima
Seita Yamasaki
Yuki Obayashi
Hiromi Okamoto
Akinori Tamura
Yoichi Nakashima
Soichiro Enomoto
Makoto Miyake
Hirokazu Kondo
Toshihiro Tamura

Introduction: Atrial fibrillation (AF) is frequently observed after cavitricuspid isthmus (CTI) ablation for typical atrial flutter (AFL). However, the appropriate approach is unclear for typical AFL without a previously documented AF. The objective of this study was to assess the incidence and predictors of new-onset AF after CTI ablation for typical AFL without prior history of AF.

Methods: This retrospective observational study included subjects with typical AFL and no prior history of AF undergoing CTI ablation from January 2006 to July 2018. New-onset AF was identified from 12-lead electrocardiogram (ECG), Holter monitoring and device interrogations. We investigated the baseline characteristics and measured P-wave parameters in the limbs lead (II) and the precordial lead (V1) during sinus rhythm after CTI ablation.

Result: A total of 375 subjects underwent CTI ablation in our institute during the entry period. 286 subjects were excluded, because of exclusion criteria: previously documented AF, insufficient follow-up period, uncommon AFL, and so on. Finally, this study included 89 subjects. After 2-year follow-up period, 14 subjects (16%) developed new-onset AF. The mean duration until new-onset AF after CTI was 7.93+/−7.57 months. There were no significant differences in age, sex, hypertension, structural heart disease, left atrial diameter, left ventricular dysfunction, or duration of AFL before CTI between subjects with new-onset AF (New-onset AF group) and those without AF after CTI ablation (No AF group). In II-lead of ECG, the sinus P-wave duration after CTI ablation was significantly longer in New-onset AF group (135+/−14ms vs 116+/−22ms, p<0.01). The most powerful cut-off point of P-wave duration in II-lead is 123ms achieved sensitivity of 100% and specificity of 64%. On the other hand, in V1-lead positive portion and negative portion P-wave, both duration and amplitude didn't reach statistical differences.
Conclusion: Long-duration P-wave in lead II could be a clinical predictor of new-onset AF after CTI ablation without prior history of AF.