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

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Introduction: Atrial fibrillation (AF) is frequently observed after cavo-tricuspid 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.