Prediction of Atrial Fibrillation Recurrence in Patients with Pulmonary Vein Isolation by P-Wave Signal-Averaged Electrocardiogram

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Background: The noninvasive methods for predicting atrial fibrillation (AF) recurrence after the first pulmonary vein isolation (PVI) has not been well described. The aim of this study was to assess the usefulness of the P-wave signal-averaged electrocardiogram (P-SAECG) in predicting the recurrence of AF after the first PVI.
Methods: P-SAECG was recorded within 1 week, before (pre) and after (post) the first PVI session in consecutive 87 idiopathic AF patients (EF ≧ 50 %, BNP ≦ 200 pg/ml). Filtered P-wave duration (FPD) and root mean square voltages in last 20 msec of the filtered P-wave (LP20) were measured.
Results: After the PVI session, the mean follow-up periods was 12 ±7 months. During the follow-up period, 22 of 87 patients experienced recurrence of AF (n = 11 : Paroxysmal-AF, n = 11 : Persistent-AF). Pre-FPD or Pre-LP20 was not significantly different between non-recurrence group and recurrence group. However, Post-FPD of paroxysmal-AF recurrence group was significantly shorter than non-recurrence group and Post-LP20 of paroxysmal-AF recurrence group was significantly larger than non-recurrence group. As a result, the Post-LP20/FPD of paroxysmal-AF recurrence group was significantly higher than non-recurrence group (0.024 ± 0.009 vs. 0.015 ± 0.007 μV/msec, $p < 0.05$).
Conclusion: The post-LP20/FPD may be useful for predicting a paroxysmal-AF recurrence in idiopathic AF patients with PVI.