The Association Between Hyperuricemia and Atrial Fibrillation Recurrence After Catheter Ablation

Introduction: It is well-known that hyperuricemia (HUA) is associated with the incidence of atrial fibrillation (AF). However, its prognostic significance of AF recurrence after the catheter ablation (CA) remains unknown. The purpose of this study was to assess the association between HUA and AF recurrence after the CA.

Methods: A total of 320 consecutive AF patients (male: 281, mean age: 58±10 years, paroxysmal/persistent AF [PAF/PsAF]: 160/160) who underwent the initial CA was enrolled. PsAF was defined as AF lasting for >7 days with/without anti-arrhythmic drugs. HUA was defined as serum uric acid (SUA) level >7.0 mg/dl in this study. We measured SUA levels 1-day before (pre-SUA) and 1-month after the CA (post-SUA). Second generation 28-mm Cryoballoon was used for pulmonary vein isolation (PVI) in PAF, while PVI plus linear ablation (Roof and mitral isthmus lines) using irrigated radiofrequency catheter were performed in PsAF. The relationship between pre/post-SUA levels and subsequent AF recurrence after 3 months of blanking period after the initial CA was investigated.

Result: All PVs were successfully isolated in PAF/PsAF patients. During 52±12 months follow-up, AF recurred in 21% (34/160) and 41% (65/160) of patients in PAF and PsAF, respectively (p<0.001). Pre-SUA level was significantly higher in PsAF than PAF (6.6±1.3 vs. 5.8±1.2 mg/dl, p<0.001), and incidence of HUA before the CA (pre-HUA) was significantly higher in PsAF than PAF (36.9% vs. 23.8%, p=0.015). SUA level was significantly decreased after the CA in both PAF and PsAF patients (PAF: 5.7±1.2 vs. 5.6±1.2 mg/dl; p<0.01, PsAF: 6.6±1.3 vs. 6.0±1.2 mg/dl; p<0.0001, respectively). Pre-SUA level and the presence of pre-HUA were not associated with AF recurrence after the CA in both PAF and PsAF. However, the incidence of HUA after the CA (post-HUA) was significantly higher in patients with AF recurrence than those without in PsAF (36% vs. 13%, p<0.005). In addition, AF free survival rate was significantly higher in PsAF patients with post-HUA than those without during follow-up (logrank test: p=0.001), but there was no difference in PAF patients (logrank test: p=0.94) (Figure).
Conclusion: SUA level was significantly higher in PsAF than PAF. The association between HUA and clinical outcome was not identified in PAF patients, while the presence of post-HUA strongly related to a poor clinical outcome after the CA in PsAF patients.