Comparison of periprocedural complication between radiofrequency ablation and second-generation cryoballoon ablation undergoing first pulmonary vein isolation in patients with paroxysmal and persistent atrial fibrillation.

Reisuke Yoshizawa
Takashi Komatsu
Jun Kawakami
Marie Nakamura
Shingen Owada
Yoshihiro Morino

Introduction: The purpose of this study is to compare periprocedural complication between radiofrequency ablation (RF) and second-generation cryoballoon ablation (CB) undergoing first pulmonary vein isolation in patients with paroxysmal and persistent atrial fibrillation (AF).

Methods: This study included consecutive 518 AF patients (359 male, mean age 62±10years) who underwent RF (N=240) and CB (N=278) ablation from January 2013 to March 2019.

Result: (1) Periprocedural complication occurred in a total of 32 patients (6.2%), whereas there was no significant difference in the incidence of periprocedural complication between RF-group (7.9%) and CB-group (5.4%) (P=0.185). (2) Bleeding complication and blood transfusion were significantly higher in RF-group (5.0% and 3.8%, respectively) than those in CB-group (0.7% and 0%, respectively) (both, P<0.01). In 32 patients with periprocedural complication, fluoroscopy time, radiation dose per ablation and hospital stay were also significantly higher in RF-group (17±8 days, 96±76 minutes and 0.78±0.77 Gy, respectively) than those in CB-group (7±5 days, 36±13 minutes and 0.45±0.18 Gy, respectively) (all, P<0.05). (3) In a multivariate logistic regression analysis adjusted for the potentially confounding variables, plasma concentrations of brain natriuretic peptide (odds ratio [OR] 1.005, 95% confidence interval [CI] 1.002-1.009, P=0.002) was associated with periprocedural complication in CB-group. In contrast, weight (OR 0.920, 95%CI 0.853-0.993, P=0.032) were associated with periprocedural complication in RF-group.

Conclusion: The incidence of periprocedural complication seems to be similar between RF and CB, whereas the degree of periprocedural complication does not. Our study suggested further caution should be paid to undergoing RF ablation in patients with paroxysmal and persistent AF.