The prognostic impact of catheter ablation for atrial fibrillation after heart failure hospitalization on long-term mortality – Propensity-score matching analysis

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Background: In the last two decades, catheter ablation (CA) for atrial fibrillation (AF) including pulmonary vein isolation (PVI) has been developed as a standard and effective treatment for atrial fibrillation (AF). In patients with chronic heart failure with reduced left ventricular ejection fraction (LVEF) (HFrEF), PVI CA for AF dramatically improves LVEF, resulting in better clinical prognoses. On the contrary, there still has been no data that PVI CA for AF improves the prognosis in heart failure patients with preserved LVEF (HFpEF).

Purpose: The aim of this study was to evaluate the prognostic impact of PVI CA for AF after the hospitalization due to decompensation of heart failureHF, focusing on LVEF.

Methods: From the database including 1,793 consecutive patients who were hospitalized due to congestive HF, we ultimately analyzed 624 AF patients who were discharged alive. They were assigned into two groups due that PVI CA for AF procedure done after the index hospitalization for HF; the PVI CA group (n=62) and Non-PVI CA group (n=562). For the two groups, we performed propensity-score (PS) matching using variables as follows: age, sex, LVEF, brain natriuretic peptide (BNP), blood urea nitrogen (BUN) and estimated glomerular filtration rate (eGFR) at discharge. Further analysis was performed separately in HFrEF (LVEF $<$50%) and HFpEF (LVEF $>$50%). The primary endpoint of this study was death from any cause.

Results: In unmatched patients, Kaplan-Meier analysis showed that patients in the PVI CA group had a significantly lower all-cause mortality than those in the Non-PVI CA group during 678 median follow-up period (Log-rank test: P=0.003, Figure A). In 96 PS-matched patients, patients in the PVI CA group still had lower mortality rate than those in the Non-PVI CA group (hazard ratio 0.28, 95% confidence interval 0.09–0.86, p=0.018, Figure B). When the whole study population was classified into HFrEF and HFpEF, HFrEF patients who received PVI showed a significantly lower mortality than those who did not (p=0.007); whereas, in HFpEF patients, PVI CA for AF did not make statistical difference in all-cause mortality (p=0.061).

Conclusions: In this observational study, PVI CA for AF may improve the mortality in HF patients with reduced LVEF. However, the prognostic impact of PVI CA for AF was not observed in HF patients with preserved LVEF.