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The difference in the prognosis among three categories of the post-procedural left ventricular ejection fraction in patients undergoing atrial fibrillation ablation

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Background: Atrial fibrillation (AF) ablation has been known to contribute to a good prognosis in heart failure patients and improve their systolic function. However, the impact of the post-procedural systolic function on the prognosis in them remains unclear.

Purpose: To investigate the impact of the left ventricular ejection fraction (LVEF) following AF ablation in patients with systolic dysfunction.

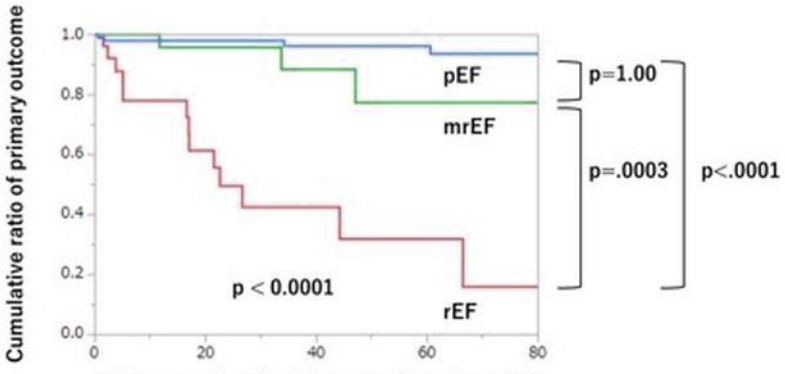
Methods: Out of 1078 consecutive patients who underwent AF ablation including extensive pulmonary vein and superior vena cava isolation, 170 with an impaired pre-procedural LVEF (< 50%) were evaluated. They experienced at least one echocardiographic follow-up within one year after the index procedure. The primary outcome was the composite of all-cause death or heart failure hospitalisations (HFHs). In addition, we categorised the patients into three groups according to the post-procedural LVEF within one year to evaluate the outcome: reduced LVEF (rEF, LVEF < 40%), mid-range EF (mrEF, 40% ≤ LVEF < 50%) and preserved LVEF (pEF, LVEF > 50%).

Results: After the index procedure, the patients' LVEF improved with an average increase of 8%, and the post-procedural LVEF consisted of an rEF in 27 (16%), mrEF in 41 (24%), and pEF in 102 (60%) patients. During a median follow-up of 31 months, a total of 22 (13%) patients experienced the composite outcome, including 18 (11%) HFHs and 10 (6%) all-cause deaths (5 with cardiac issues, 2 any malignancies, and 3 other issues). In the Kaplan-Meier analysis using a Bonferroni correction, there was a significant difference in achieving the outcome between the rEF and mrEF, and rEF and pEF, but not between the mrEF and pEF groups (Figure). In a univariate analysis, the hazard ratio of the outcome was shown as follows: an age ≥ 65 years (hazard ratio, HR: 3.4 [95% confidence interval, CI: 1.4–8.5], p = 0.006), history of HFHs for AF (HR: 1.7 [95%CI: 0.7–4.0], p = 0.25), known underlying heart disease (HR: 1.9 [95%CI: 0.8–1.2], p = 0.13), pre-procedural LVEF < 40% (HR: 3.1 [95%CI: 1.3–7.5], p = 0.009), atrial tachyarrhythmia recurrence (HR: 3.0 [95%CI: 1.2–7.8], p = 0.01), and the post-procedural LVEF category (mrEF and rEF, compared with pEF) (HR: 2.0 [95%CI: 0.4–7.7], p = 0.34; and HR: 8.6 [95%CI: 2.7–37.5], p < 0.0001). Furthermore, in a multivariate analysis, patients with a rEF was the sole independent predictor of the composite outcome after adjusting for confounders including an age≥65 years and pre-procedural LVEF < 40% (HR: 12.0 [95%CI: 3.9–40.0], p < 0.0001), whereas those with a mrEF was not (HR: 1.8 [95%CI: 0.4–7.3], p = 0.42), as compared to those with a pEF.

Conclusions: Patients with a mrEF had a comparable prognosis to those with a pEF in a relatively long follow-up, while those with a rEF had the poorest outcome of the three categories, regardless of the pre-procedural LVEF severity.

Abstract Figure. The difference in the rate of outcome

Figure



No. at risk					
pEF	92	80	53	39	20
mrEF	41	19	9	6	5
rEF	27	12	6	4	2

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