Additional ablation to pulmonary vein isolation for persistent atrial fibrillation does not reduce recurrence

L. Riis-Vestergaard1, J. Tonnesen1, C. Zorner1, J. Pallisgard1, M. Ruwald1, P. Rasmussen1, C. Middelfart1, R. Hein1, G. Gislason1, M. Hansen1

1Herlev and Gentofte Hospital, Copenhagen, Denmark

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Introduction: Treatment with catheter ablation (CA) as rhythm control is increasingly used in atrial fibrillation (AF). Pulmonary vein isolation (PVI) alone is less effective in patients with persistent AF (peAF) compared to patients with paroxysmal AF (PAF). Strategies and methods to optimize outcome for peAF is still an ongoing challenge. Additional ablation to pulmonary vein isolation (PVI plus) compared to PVI alone has so far shown conflicting evidence and has yet to be tested in a large unselected, real-life population with longtime follow-up.

Purpose: To examine AF recurrence by PVI or PVI plus for CA for peAF.

Method: This nationwide retrospective registry study was conducted using large real-life data from Danish mandatory registries. All patients above 18 years of age, that underwent first-time CA for peAF from January 1st 2010 to December 31st 2018, were identified and included at the date of ablation. Exposure of interest was CA, and patients were stratified into PVI or PVI plus. PVI plus was defined as either roofline, mitral linear ablation, posterior wall isolation (PWI), complex fractionated atrial electrograms (CFAE) or ganglionic plexi ablation (GP).

Primary endpoint was recurrent AF after a 3-months blanking period, defined by a composite endpoint of first-reached endpoint of either use of antiarrhythmic drugs (AAD), AF-admission, electrical cardioversions or AF re-ablation.

5-year risk of recurrent AF was examined by the Aalen-Johansen estimator, taking the competing risk of death into account. The relative rates of recurrent AF by ablation strategy (PVI or PVI plus) were examined by Cox proportional models using PVI as reference. The analysis was adjusted for clinically important baseline characteristics including age, sex, diagnosis-to-ablation time, procedural year, body mass index, size of left atrium, heart failure, ischemic heart disease, chronic obstructive pulmonary disease, chronic kidney disease, hypertension and diabetes.

Results: The study cohort consisted of 2,444 patients with peAF undergoing first-time CA, of which 2,069 received PVI and 375 received PVI plus. Median age was 63 for the PVI group and 64 for the PVI plus group. The PVI plus group had longer diagnosis-to-ablation-time and enlarged left atrium compared to the PVI group. 5-year cumulative incidence of recurrent AF was 55% for the PVI group and 71% for the PVI plus group in the unadjusted analysis (Figure 1). The relative risk of recurrent AF showed hazard ratio of 1.11 (95% CI: 0.95-1.29) for the PVI plus group compared to the PVI group (Figure 2).

Conclusion: Strategies to reduce AF recurrences after CA for peAF is an ongoing challenge. This study did not find any significant reduction in recurrence of AF using PVI plus strategy compared to PVI alone.

The increased absolute risk of AF recurrence in the PVI plus group is most likely accounted for by longer diagnosis-to-ablation-time and enlarged left atrium compared to the PVI group.

Figure 1
Figure 2