

Left atrial appendage size is a marker of atrial fibrillation recurrence after radiofrequency catheter ablation in patients with persistent atrial fibrillation

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Background: Catheter ablation is an established therapy for rhythm control in patients with drug-refractory atrial fibrillation (AF), however, recurrence is frequent particularly in persistent AF. There are no consistently confirmed predictors of AF recurrence after catheter ablation. The left atrial appendage (LAA) potentially plays an important role in AF recurrence, although the exact mechanism and pathophysiology are still unclear.

Purpose: We aimed to study whether LAA volume (LAAV) and function influence the long-term recurrence of AF after point-by-point radiofrequency catheter ablation, depending on AF type.

Methods: AF patients who underwent point-by-point radiofrequency catheter ablation after preprocedural cardiac computed tomography (CT) and transthoracic and transesophageal echocardiography (TEE) were included in this retrospective analysis. LAAV and LAA orifice area were measured by CT and LAA flow velocity assessed by TEE and was used as a surrogate marker of LAA function. Uni- and multivariable Cox proportional hazard regression models were performed to determine the predictors of AF recurrence.

Results: In total, 561 AF patients (61.9±10.2 years, 34.9% females) were included in the study. Recurrence of AF was detected in 40.8% of the cases

(34.6% in patients with paroxysmal and 53.5% in those with persistent AF) with a median recurrence-free time of 22.7 [9.3–43.1] months. Patients with AF recurrence had significantly higher body surface area-indexed left atrial volume (iLAV), LAAV and LAA orifice area, as compared to those without recurrence. Moreover, patients with persistent AF had significantly higher iLAV, LAAV, LAA orifice area and lower LAA flow velocity, than those with paroxysmal AF. After adjustment for the main cardiovascular risk factors and comorbidities left ventricular ejection fraction (LVEF) <50% (HR=2.17; 95% CI=1.38–3.43; p<0.001) and LAAV (HR=1.06; 95% CI=1.01–1.12; p=0.029) were independently associated with AF recurrence in persistent AF, while no independent predictors could be identified in paroxysmal AF.

Conclusions: The current study demonstrates that beyond left ventricular systolic dysfunction, LAA enlargement is associated with higher rate of AF recurrence after catheter ablation in persistent AF, but not in patients with paroxysmal AF. Our results suggest that preprocedural assessment of LVEF and LAAV might contribute to optimal patient selection and aid to improve long-term results of ablation procedures in patients with persistent AF.