**Introduction:** Paroxysmal atrial fibrillation (PAF) commonly recurs after radiofrequency catheter ablation (RFCA). This study aimed to assess left atrial appendage (LAA) volume and function by transesophageal echocardiography (TEE) and to explore its value in predicting PAF recurrence after RFCA.

**Methods:** 160 patients with PAF were recruited. The left atrial (LA) and LAA volume and function were measured by transthoracic echocardiography (TTE) and TEE before ablation. Patients were followed up for 12 months after RFCA, and recurrence was recorded. Odds ratios of candidate risk indicators were determined by logistic regression analysis. Prediction model was constructed using logistic regression with backward selection. Receiver operating characteristic (ROC) curve with area under curve (AUC) was performed to evaluate the prediction efficiency.

**Result:** 48 (30%) PAF patients had recurrence (R group), and 112 (70%) patients had no recurrence (NR group). Compared to NR group, LA dimension (LAD), LA volume index (LAVI), LAA maximum volume (LAAVmax), and LAA minimum volume (LAAVmin) were significantly higher in R group, while LAA peak emptying flow velocity (LAAeV), LAA peak filling flow velocity (LAAfV), and LAA ejection fraction (LAAEF) significantly declined in R group. According to multivariate analysis and backward selection, LAVI, LAAEF, and LAAeV were significant risk factors for PAF recurrence. The LAVI + LAAEF + LAAeV joint model could effectively predict PAF recurrence with AUC of 0.893 (95% confidence interval = 0.816, 0.970), sensitivity of 0.75, and specificity of 0.929.

**Conclusion:** This study demonstrated that LAVI, LAAEF, and LAAeV were significant predictors of PAF recurrence after RFCA.