Introduction: Limited comparative data exist regarding catheter ablation (CA) of atrial fibrillation (AF) using second-generation cryoballoon (CB-2) ablation versus radiofrequency (RF) ablation in elderly patients (>75 years). This study aims to compare the costs and periprocedural outcomes in elderly patients using these two strategies.

Methods: This was a single-center, retrospective study of 324 patients aged >75 years with paroxysmal and Short-lasting AF who underwent Pulmonary vein isolation (PVI) by RF or CB-2 between September 2016 and April 2019. The endpoint of this study was costs, atrial arrhythmia at the 12-month and 24-month follow-up. (PVI) was performed in all patients by CB-2 or RF.

Result: 324 elderly patients with symptomatic drug-refractory paroxysmal/short-lasting persistent AF received PVI using RF (n=176) and CB-2 (n=148) from September 2016 to April 2019. The CB-2 was associated with shorter procedure duration and left atrial dwell time (128.9±18.3 vs. 152.8±18.9 minutes, P<0.001; 89.4±18.4 vs. 101.9±22.2 minutes, P<0.001), but greater fluoroscopy utilization (24.3±10.9 vs. 19.2±7.5 minutes, P<0.001). Periprocedural complications occurred in 3.4% (CB-2) and 6.3% (RF) of patients (P=0.037). There was no significant difference between 2 groups for AF/atrial tachycardia (AT) recurrence until discharge (16.2 vs. 18.7%, P = 0.552). Kaplan-Meier estimates revealed no significant difference between clinical outcomes following PVI. The length of stay after ablation was shorter, but the costs were greater in the CB-2 group (P<0.001).

Conclusion: Both CB-2 and RF ablation appear to be safe and effective for AF in elderly patients (>75 years). In addition, CB-2 is associated with shorter procedure time, left atrial dwell time, and length of stay after ablation, with similar complication rate, but its costs and fluoroscopy time are greater than those of the RF group.