E-ISSN 2250-0944

ISSN 2250-1150
doi: 10.48047/ijprt/15.02.04

Comparative Outcomes of Catheter Ablation and Antiarrhythmic Drugs in Elderly Patients with Atrial Fibrillation

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Abstract

In a prospective cohort of 400 elderly patients (≥70 years) with symptomatic atrial fibrillation (AF), 200 underwent catheter ablation (CA) and 200 received antiarrhythmic drugs (AAD). Baseline demographics and stroke risk (CHA_2DS_2-VASc) were comparable. Over a median 24-month follow-up, freedom from AF recurrence was higher in the CA group (68% vs 42%; $p < 0.001$). CA was associated with lower rates of stroke/TIA (4% vs 9%; adjusted HR 0.54, 95% CI 0.30–0.97; $p = 0.04$) and all-cause hospitalization (28% vs 43%; $p = 0.002$), with no significant difference in major bleeding. Acute procedural complications in CA were 5% (including pericardial effusion), while AAD-related adverse events occurred in 15% (proarrhythmia, bradycardia). CA improved quality of life (6-point increase in SF-36; $p < 0.001$) versus AAD. These findings suggest that CA offers superior rhythm control, stroke prevention, and symptom relief in elderly AF patients, with acceptable safety compared to AAD therapy.
Keywords: atrial fibrillation; catheter ablation; elderly; rhythm control

Introduction

Atrial fibrillation (AF) substantially increases with age and carries high risk of stroke, heart failure, and mortality. Rhythm control strategies in elderly patients remain debated due to concerns around treatment-related risks and efficacy.1-3 Antiarrhythmic drugs (AAD) have variable success and carry proarrhythmic risks in the elderly.

Catheter ablation (CA) has shown promise in younger AF patients, reducing recurrence rates and enhancing quality of life (QoL). However, data in those aged ≥70 are limited and mixed. Observational studies suggest CA reduces stroke and mortality versus AAD, but are subject to selection,bias4-5.

Randomized trials in general populations, including CABANA, show CA lowers AF recurrence but yield mixed results on mortality and stroke—age subgroup analyses suggest attenuated benefits in older patients[8]. Recent meta-analyses support reduced AF recurrence and rehospitalization with CA, but emphasize higher procedural risks in the elderly.

Given a growing elderly AF population and emerging evidence, there is a clear need for prospective comparative studies assessing rhythm efficacy, hard outcomes, and safety in this demographic. The present study evaluates CA versus AAD in patients ≥70 years, hypothesizing superior rhythm control, stroke reduction, QoL improvement, and an acceptable safety profile with CA 6-10.

Methodology

In this multicenter prospective study (Jan 2022–Jan 2024), we enrolled 400 symptomatic AF patients aged ≥70 referred for rhythm-control therapy at Bolan medical college. Exclusion criteria included prior CA, severe valvular disease, left atrial thrombus, or contraindications to AAD or anticoagulation. Patients selected either CA (radiofrequency pulmonary vein isolation) or AAD based on preference and clinician judgment, then propensity-matched 1:1 by age, CHA_2DS_2-VASc, left atrial size, and AF type. The final analysis included 400 matched patients (CA n=200; AAD n=200).

Follow-up visits occurred at 3, 6, 12, and 24 months; primary endpoints were freedom from atrial arrhythmia (>30 sec) without repeat intervention. Secondary endpoints: stroke/TIA, all-cause hospitalization, major bleeding (per ISTH criteria), and change in QoL (SF-36). Adverse events were recorded and adjudicated. Data were analyzed using Kaplan–Meier survival, Cox regression adjusted for CHA_2DS_2-VASc and HAS-BLED, and chi-square/t-tests. SPSS v26 analyzed data; statistical significance set at $p<0.05$.

Results

Table 1. Baseline Characteristics

Variable	CA (n=200)	AAD (n=200)	p-value
Age (years)	74.5 ± 3.8	74.8 ± 3.7	0.42
Female, n (%)	102 (51%)	98 (49%)	0.68
Paroxysmal AF, n (%)	110 (55%)	108 (54%)	0.84
CHA_2DS_2-VASc score	3.6 ± 1.1	3.6 ± 1.0	0.90
HAS-BLED score	2.2 ± 0.8	2.1 ± 0.9	0.38

No significant differences observed across matched variables.

Table 2. Clinical Outcomes at 24 Months

Outcome	CA	AAD	p-value
AF recurrence-free survival	68%	42%	<0.001
Stroke/TIA incidence	4%	9%	0.04
All-cause hospitalization	28%	43%	0.002
Major bleeding	7%	9%	0.42
QoL (ΔSF-36 score)	+6.2 ± 3.5	+2.3 ± 3.1	<0.001

CA group achieved better rhythm control, fewer strokes, hospitalizations, and improved QoL.

Table 3. Procedural and Drug-Related Safety

Event	CA (%)	AAD (%)
Procedural complication (pericardial effusion, stroke)	5%	—
AAD adverse events (proarrhythmia, bradycardia)	—	15%

CA had acceptable 5% procedural risk while AAD resulted in higher drug-related adverse events.

Discussion

This study demonstrates that CA offers superior rhythm innovation in elderly AF patients, with recurrence-free survival of 68% vs. 42% at two years ($p < 0.001$), echoing prior meta-analyses showing a 53% reduction in recurrence with CA11-12.
The lower stroke/TIA risk (4% vs 9%) aligns with observational data (HR 0.62; $p = 0.005$) and suggests CA's potential cerebrovascular benefit among the elderly[73]. While randomized trial data remains less conclusive, this study adds rigor with propensity matching.

Despite a 5% procedural complication rate (similar to the 1–7% range reported), AAD-related adverse events were significantly more frequent (15%), mirroring meta-analysis findings of higher long-term safety burden with drug therapy[106]. QoL improvements among CA patients further support improved functional outcomes 12-15
Limitations include non-randomized design, residual confounding, and a 24-month follow-up. However, strength lies in robust matching, real-world applicability, and comprehensive endpoints. Future RCTs targeting elderly populations are warranted.
In summary, CA in elderly AF patients was associated with enhanced rhythm control, stroke reduction, fewer hospitalizations, and QoL improvement, with acceptable safety—supporting its consideration as a frontline rhythm-control strategy.

Conclusion

Catheter ablation in elderly AF patients provides superior long-term rhythm control, significant stroke reduction, and improved quality of life compared to antiarrhythmic drugs with acceptable safety. It should be considered a viable rhythm-control option in appropriately selected elderly individuals.

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