Population rates and contemporary outcomes of atrial fibrillation ablation among older adults: a nationwide cohort study


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Background: Atrial fibrillation (AF) is the most common sustained arrhythmia, with pulmonary vein isolation (PVI) increasingly recommended as first-line therapy. Limited data suggest increasing use of PVI as well as increasing rates of post-PVI complications, but contemporary real-world outcomes among older adults remain unclear.

Purpose: To evaluate patient characteristics, population rates and 30-day clinical outcomes for PVI in a nationwide sample of adults aged >65 in the United States.

Methods: First-time PVIs were identified among US Medicare fee-for-service beneficiaries using CPT procedural codes, and comorbidities were ascertained using ICD-10 diagnosis codes associated with each procedural claim. Study outcomes included rates of PVI use, procedural complications, all-cause re-hospitalizations, and all-cause mortality at 30 days.

Results: From January 2017 through December 2020, 156,601 patients underwent first-time PVI performed by 2,791 unique operators. The mean patient age was 72.5 ± 5.2 years, 42.6% were female and the majority (92.7%) Caucasian. The rate of PVI increased from 2.48 per 100,000 beneficiaries in the first quarter of 2017 (performed by 2,113 operators) to 3.01 per 100,000 beneficiaries in the last quarter of 2020 (performed by 2,415 operators) – a 4.8% relative increase per year (p=0.02). This growth was driven primarily by outpatient elective procedures, which represented the majority (85.0%) of all PVIs. Concurrent with this increase in PVI use, there was a significant decrease in complication rates (3.9% in 2017 vs 3.1% in 2020, p<.0001) and re-hospitalizations (8.8% vs 7.1%, p<0.001) at 30 days, with no significant change in mortality at 30 days (0.36% vs 0.40%, p=0.38). Bleeding was the most common peri-procedural complication (1.4%), followed by pericardial effusion requiring intervention (1.2%) and access site vascular complications (0.55%).

Conclusions: This large nationwide cohort study shows that the use of PVI has steadily increased in contemporary clinical practice. Despite the widespread adoption of this procedure by a growing number of operators, cumulative complication and re-hospitalization rates at 30 days have decreased over time, with stable and very low rates of short-term mortality – even among older patients, who are ordinarily considered to be at higher risk. These findings contrast with those from previously published studies of non-representative cohorts. Results from our study should reassure both patients and providers on the overall safety of PVI as an increasingly common first-line procedure for rhythm control. Forthcoming analyses will be finalized by the time of presentation to evaluate whether hospital and operator volume further influence procedural outcomes.

Central Figure: PVI Trends and Outcomes