

Left-sided Versus Biatrial Surgical Ablation In Patients With Atrial Fibrillation: Keep It Simple?

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Background

The optimal lesion set for concomitant surgical atrial fibrillation ablation remains controversial. While biatrial MAZE offers more extensive atrial substrate modification, its clinical advantage over a left-sided lesion set remains unclear. **We evaluated whether biatrial ablation was associated with improved long-term freedom** from anticoagulation, atrial fibrillation recurrence, and survival compared with left-sided ablation.

Methods

Patients with atrial fibrillation undergoing concomitant surgical ablation between 2011 and 2025 were retrospectively identified from a prospectively maintained institutional database. Patients were stratified by left-sided (LS) versus biatrial (BA) lesion sets. The primary outcome was long-term freedom from anticoagulation reinitiation following discharge. Secondary outcomes included survival, atrial fibrillation recurrence, stroke, major bleeding, postoperative catheter ablation, and perioperative morbidity. Propensity-score matching was performed using 1:1 nearest-neighbor matching to adjust for baseline differences between cohorts.

Results

A total of 835 patients underwent concomitant surgical atrial fibrillation ablation, including 441 LS and 394 BA patients. Following propensity-score matching, 344 matched pairs were analyzed. In the matched cohort, 30-day mortality was similar between groups (4.4% LS vs 4.7% BA, P=0.85), as were postoperative stroke (4.1% vs 4.1%, P>0.99), major bleeding (13.7% vs 14.2%, P=0.83), prolonged ventilation (13.6% vs 16.7%, P=0.45), and overall postoperative complications (42.7% vs 47.7%, P=0.21). Long-term survival was comparable between groups (log-rank P=0.90). Cumulative incidence analyses demonstrated no significant differences in atrial fibrillation recurrence, stroke, major bleeding, or anticoagulation reinitiation during follow-up.

Conclusions

Left-sided and biatrial ablation demonstrated comparable perioperative and long-term outcomes following concomitant surgical atrial fibrillation ablation. Rates of survival, atrial fibrillation recurrence, and anticoagulation reinitiation were similar between groups, suggesting that a left-sided lesion set may provide durable clinical benefit in appropriately selected patients.

Figure: Kaplan–Meier estimates of long-term survival (Figure A) and re-anticoagulation (Figure B) following surgical atrial fibrillation ablation, adjusted for paroxysmal atrial fibrillation and diabetes. Survival curves compare patients undergoing biatrial ablation (black) versus left-sided ablation (blue).

