

Surgical Left Atrial Appendage Exclusion During Open Cardiac Surgery in Patients without Atrial Fibrillation Provides 4 Year Ischemic Stroke and Mortality Benefit

Objective: The impact of a surgical left atrial appendage exclusion (LAAE) device on ischemic stroke in non-atrial fibrillation (AF) patients undergoing open cardiac procedures is unknown. The current retrospective study assessed LAAE in non-AF patients during open cardiac surgery and long-term ischemic stroke and all-cause mortality.

Methods: Real World Data Insights, a US national all payers' claims database which covers approximately 80% of the insured population was utilized. Non-AF patients (>65 years) who underwent coronary artery bypass (CAB) or valve procedures with or without concomitant surgical epicardial LAAE between 2015-2020 with a minimum of 2-year follow-up were included. Inverse probability treatment weighting (IPTW) was employed to balance confounders between groups, and logistic regression was utilized for comparisons.

Results: After IPTW adjustment there were no differences in patient demographics, oral anticoagulant (OAC) use, age (74.4 vs. 75.3 years) and CHA₂DS₂-VASc score (4.8 vs. 4.8 points). Patients treated with isolated open CAB represented 48.8% in both arms of the study (n=29,953.6) and those with any type of open valve with/without CAB procedure represented 51.3% of patients (n=31,465.3). Post operative atrial tachyarrhythmia (AT) was higher for LAAE (13.6%, n=144.0 vs. 6.8%, n=4,106.0; P<0.001), and remained higher through 4-year (29.3%, n=310.0, vs. 23.7%, n=14,316.0; p<0.001). Any OAC use in the first year after surgery was greater for LAAE (24.8%, n=186.0, vs. 17.0%, n=7,459.0; p<0.001), which persisted into follow-up. The primary outcome, ischemic stroke had lower event rates and odds ratios (OR) for LAAE at 30 days (4.3%, n=45.7, vs. 5.9%, n=3,556.2, OR 0.75, confidence interval (CI) 0.53 – 0.98, p=0.03), 31 days to 4 years (7.7%, n=81.2, vs. 10.1%, n=6,093.9, OR 0.76, CI 0.58 – 0.93, p=0.008), and index through 4 years (12.0%, n=126.9, vs. 16.0%, n=9,660.2, OR 0.75, CI 0.54 – 0.95, p=0.02) (Table 1). Secondary outcomes event rates and OR were lower through 4 years for LAAE, including ischemic stroke and systemic embolism (p=0.03), thromboembolism (p=0.007), major bleed (p=0.01), and all-cause mortality (p<0.001) (Table1).

Conclusion: LAAE during open cardiac surgery in non-AF patients was associated with a reduction in ischemic stroke and all-cause mortality. Additional information from randomized trials is required to confirm these findings, as well as the interaction between OAC and surgical LA

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Table 1. IPTW Adjusted Cumulative Cerebral Vascular Events, All-Cause Mortality and Hospital Visits Through 4 Years in Non-AF Patients Undergoing Cardiac Surgery With and Without LAEE

Variable	Event Rate		OR Comparison [†]
	LAAE (N=1,040)	No LAAE (N=60,378)	
Number of patients with at least one event (%) ^{††}			
Primary Outcomes			
Ischemic stroke through 4 years	126.9 (12.0)	9,660.2 (16.0)	0.75 (0.54 – 0.95) [‡]
Ischemic stroke within the first 30 days after surgery	45.7 (4.3)	3,556.2 (5.9)	0.75 (0.53 – 0.98) [‡]
Ischemic stroke 31 days after surgery through 4 years	81.2 (7.7)	6,093.9 (10.1)	0.76 (0.58 – 0.93) [‡]
Secondary Outcomes			
Ischemic stroke or systemic embolism	137.4 (13.0)	10,062.7 (16.7)	0.75 (0.57 – 0.98) [‡]
Systemic embolism	11.1 (1.0)	544.2 (0.9)	1.17 (0.53 – 2.58)
Thromboembolism	193.3 (18.3)	14,118.5 (23.4)	0.73 (0.59 – 0.92) [‡]
All-cause mortality	104.2 (9.9)	8,104.5 (13.4)	0.66 (0.52 – 0.85) [‡]
Major Bleed	0.9 (0.1)	305.6 (0.5)	0.17 (0.04 – 0.71) [‡]
Myocardial infarction	185.4 (17.6)	12,180.4 (20.2)	0.86 (0.71 – 1.04)
All-cause readmission	660.8 (62.6)	37,664.9 (62.4)	1.00 (0.84 – 1.19)
All-cause ED visit	690.3 (65.4)	41,674.7 (69.0)	0.89 (0.74 – 1.06)

IPTW denotes inverse probability treatment weighting, LAEE denotes left atrial appendage exclusion, OR denotes odds ratio, ED denotes emergency department.

Thromboembolism is a composite measure consisting of ischemic stroke, systemic embolism and transient ischemic attack.

[†] All adjusted comparisons were completed with logistic regression with OR and 95% confidence interval.

^{††} N=385 patients eligible for follow-up at 4 years in LAEE and 27,971 for Non-LAAE.

[‡] P < 0.05.

^{‡‡} P < 0.01.