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## Temporal Trends and Outcomes of Same-Day Discharge After Left Atrial Appendage Occlusion: Insight from National Readmission Database

Left atrial appendage occlusion (LAAO) is an accepted alternative to anticoagulation for patients with atrial fibrillation and contraindications to anticoagulation.<sup>1,2</sup> In the National Cardiovascular Data Registry LAAO Registry, procedural complications are as low as 2.2%.<sup>2</sup> With such a low risk of complications, it is thought that same-day discharge may be a feasible option. Given the paucity of available data to inform on the safety of this approach,<sup>3,4</sup> we evaluated 30-day readmission and associated hospitalization costs after LAAO using the Nationwide Readmission Database.

We accrued data from the Nationwide Readmission Database between the years 2016 and 2019. We identified hospitalized patients who underwent LAAO and divided them into 2 groups on the basis of discharge day: same day (day 0) and late discharge (day  $\geq 1$ ). Hospitalizations were excluded if age

was less than 18 years, the procedure was done after the first day, December discharges to allow 30-day follow-up, or had any periprocedural complications (bleeding, stroke, tamponade, and vascular injury).

The primary outcome was 30-day all-cause readmissions. The secondary outcomes were the cost of the index hospitalization and 30-day readmission with pericardial effusion. We used STATA 17 (STATA CORP, College Station, Texas) for analysis. A multivariate regression analysis was used to adjust for confounding variables.

We identified a total of 50,253 hospitalizations with LAAO, of whom 621 had same-day discharge and 49,632 patients had late discharge. There were no significant differences in the baseline characteristics between the same-day and late-discharge groups in age ( $76.5 \pm 8.3$  vs  $76.1 \pm 7.2$  years,  $p = 0.56$ ) or major co-morbidities hypertension (85% vs 86%  $p = 0.46$ ), diabetes (32% vs 35%  $p = 0.38$ ), congestive heart failure (34% vs 38%  $p = 0.43$ ). The 30-day readmission rate was similar among the same-day versus late-discharge groups (adjusted odds ratio 1.01, 95% confidence interval 0.7 to 1.4,  $p = 0.92$ ). On multivariate

regression analysis, same-day discharge was associated with decreased total cost of hospitalization of ( $-\$4,070$ , 95% confidence interval  $-6,810$  to  $-1,330$ ,  $p = 0.004$ ), relative to late-discharge group. There was a trend toward increased same-day discharge after LAAO procedure from 2 versus 19 per 1,000 LAAO admissions in 2016 compared with 2019, respectively ( $p_{\text{trend}} = 0.001$ ) (Figure 1).

In this contemporary analysis of patients who underwent LAAO, same-day discharge was not associated with difference in 30-day readmission with lower hospitalization costs. Importantly, a steady increase in same-day discharge was noted from 2016 to 2019.

A safety and feasibility study by Marmagkiolis et al<sup>3</sup> on 112 patients who underwent LAAO between 2019 and 2020 concluded that it is safe to discharge patients on the same day. However, this study was used electronic chart review without a comparator arm. Later, a retrospective study from a single-center tertiary hospital from 2016 to 2019 with same day versus delayed discharge on 72 versus 118 patients, respectively, without procedural complications have found no significant difference in a composite of stroke, systemic embolism, major bleeding, vascular complications, or procedure-related death.<sup>4</sup> The present nationwide study confirmed the aforementioned results in a larger cohort, representative of the population in the United States with 621 patients in the same-day discharge group. Furthermore, decreased total expenditure which was implicated in previous studies was confirmed in the present study.

It is interesting to note that there is an increasing trend of same-day discharge from 2016 to 2019. This increase in trend could be attributed to the use of moderate conscious sedation compared with general anesthesia in these patients.<sup>3,5</sup> This trend of same-day discharge may increase further during the pandemic given the need to preserve hospital beds for patients with COVID-19.

Those patients who undergo elective LAAO without immediate procedural complications could be discharged on the same day despite advanced age and co-morbidities. Given the advanced age

Outcome	Watchman discharge day		P value
	Late discharge (n=49,632)	Same-day discharge (n=621)	
30-day readmission(n)	4255 (9%)	52 (8%)	0.85
Adjusted odds ratio	Reference	1.01 95% CI (0.7 – 1.4)	0.92
Mean total cost (USD)	26,208	21,994	
Adjusted mean total cost difference (USD)	Reference	-4070 95 % CI -6810 – -1330	0.004

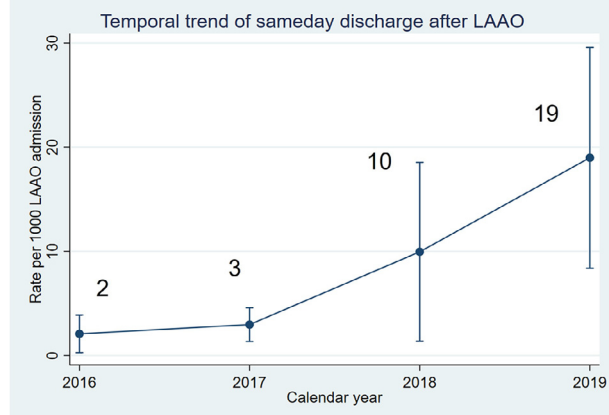


Figure 1. Outcomes of the study and trend of same-day discharge. CI = confidence interval; USD = US dollar.

of patients who undergo LAO, it is important to consider social and environmental factors of patients and their ability to identify and convey subjective symptoms of associated procedure-related complications in the decision for same day versus delayed discharge. Overall, our study results suggest that early discharge may be an option in noncomplicated LAO procedures. Further randomized trials are needed for incorporation in current practice.

This study is limited by the administrative nature of the data source, and we could not determine granular details such as type of anesthesia, laboratory and imaging results, and vital signs. Furthermore, being an observational study, the contribution of confounding factors is unknown despite rigorous statistical adjustment.

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## Declaration of Competing Interest

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