

Stratifying Stroke Risk in CABG: A Single-Centre Retrospective Study

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Abstract:

Background: Postoperative stroke is a serious complication after coronary artery bypass grafting (CABG). Methods: This retrospective cohort study reviewed adults undergoing isolated CABG at Saveetha Medical College and Hospital, Chennai, from April 2024 to March 2025.

Results: Six of 50 patients (12%) developed postoperative stroke. Hypertension, diabetes, and prolonged cardiopulmonary bypass (CPB) time were the key associated factors.

Conclusion: Stroke-risk assessment may support targeted preventive strategies; inferential results require verification because the source data do not yet include the underlying contingency tables or regression estimates.

Keywords: Coronary artery bypass grafting (CABG); Postoperative stroke; Cardiopulmonary bypass (CPB); Hypertension; Diabetes mellitus; Stroke risk; Cardiac surgery; Retrospective cohort study.

INTRODUCTION

CABG is a cornerstone of treatment for advanced coronary artery disease. However, postoperative stroke can substantially affect patient outcomes [1]. This study aimed to identify preoperative and intraoperative factors associated with postoperative stroke and thereby inform risk stratification and preventive care [2,4].

Objectives

- Determine the incidence of postoperative stroke following CABG.
- Identify significant preoperative and intraoperative predictors of stroke.
- Differentiate modifiable from non-modifiable risk factors.
- Support development of improved risk-stratification and preventive strategies.

MATERIALS AND METHODS

This retrospective cohort study included adults aged 18 years or older who underwent isolated elective or urgent CABG, with either on-pump or off-pump techniques, between April 2024 and March 2025. Patients undergoing concomitant surgery, emergency CABG for shock, or procedures with incomplete data were excluded. Extracted variables included age, sex, diabetes, hypertension, atrial fibrillation, previous stroke, carotid disease, surgical technique, cross-clamp time, aortic manipulation, and CPB time. Postoperative stroke was defined as a new focal neurological deficit confirmed by imaging within 30 days.

Statistical Analysis

Descriptive statistics were calculated for all variables. Univariable comparisons used the chi-square or Fisher exact test for categorical variables and the t test or Mann–Whitney U test for continuous variables. Multivariable logistic regression was used to identify independent predictors. Because only six stroke events were observed, the multivariable model was necessarily parsimonious, and its estimates should be interpreted with caution given the low number of events per variable. A two-sided p value < 0.05 was considered statistically significant.

RESULTS

Six of 50 patients (12%) developed postoperative stroke. Patients who developed stroke had a higher prevalence of

comorbidities, particularly hypertension and diabetes. Prolonged bypass or cross-clamp times and mechanical support were also more frequent among stroke cases. Raw counts for each risk factor, odds ratios, confidence intervals, and the multivariable model were not available from the source poster and should be added before publication (Table 2).

Table 1. Summary of reported findings.

Measure	Result
Total cohort	50 patients
Postoperative strokes	6 patients (12%)
Reported key preoperative associations	Hypertension and diabetes
Reported key intraoperative association	Prolonged CPB time (>120 minutes)

Discussion

In this cohort, postoperative stroke occurred in 12% of patients, within the range of previously reported incidences after CABG [3,5]. The associations with hypertension, diabetes, and prolonged CPB time are clinically plausible and may reflect embolic burden and hypoperfusion [1]. The small number of events limits precision and precludes a reliable point-based prediction score without external validation [2].

CONCLUSION

Hypertension, diabetes, and prolonged CPB time were the key predictors of postoperative stroke after CABG in this cohort. These findings should be validated in a larger cohort before a risk score is proposed for clinical use.

REFERENCES

1. Laimoud M, Maghirang M, Alanazi M, et al. Predictors and clinical outcomes of post-coronary artery bypass grafting cerebrovascular strokes. *Egypt Heart J.* 2022;74(1):76.
2. Fukuda I, Unno H, Kaminishi Y. Strategies for preventing stroke after coronary artery bypass grafting. *Gen Thorac Cardiovasc Surg.* 1998;46(1):38–45.
3. Shah SMA, Rehman MU, Awan NI, Jan A. To determine the frequency of stroke and common factors leading to it after coronary artery bypass grafting. *Pak J Med Sci.* 2021;37(1). [page range to be completed]
4. Eruyar E, Kaya K. Predictors associated with stroke after coronary artery bypass grafting in the Turkish population. *Neurol Asia.* 2023;28(4). [page range to be completed]
5. Islam N, Iqbal M, Malik A, et al. Incidence risk of stroke after coronary artery bypass grafting (CABG). *Khyber J Med Sci.* 2022;15(2):93–98.