THE ATLANTIC
Journal of Medical Science and Research

Atlantic J Med Sci Res 2026;6(3):368-76
DOI: 10.5455/atjmed.2026.06.061

Original Article

Postoperative atrial fibrillation after isolated coronary artery bypass grafting: The role of previous clinically silent SARS-CoV-2 infection

Emre Kulahcioglu[1], Ali Baran Budak[2]

[1]Kilis Prof. Dr. Alaeddin Yavaşca Hospital, Department of Cardiovascular Surgery, Kilis, Türkiye
[2]İstanbul Aydın University, Faculty of Medicine, Department of Cardiovascular Surgery, İstanbul, Türkiye

Received: 05 June, 2026
Accepted: 07 August, 2026
Published: 14 September, 2026

Corresponding Author: Emre Kulahcioglu, Kilis Prof. Dr. Alaeddin Yavaşca Hospital, Department of Cardiovascular Surgery, Kilis, Türkiye
Email: emrekulahcioglu@gmail.com

CITATION
Kulahcioglu E, Budak AB. Postoperative atrial fibrillation after isolated coronary artery bypass grafting: The role of previous clinically silent SARS-CoV-2 infection. Atlantic J Med Sci Res. 2026;6(3):368-76. DOI: 10.5455/atjmed.2026.06.061

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Abstract

Aim: Postoperative atrial fibrillation (POAF) is a common complication after coronary artery bypass grafting (CABG). Although the cardiovascular effects of symptomatic COVID-19 are well described, whether prior asymptomatic SARS-CoV-2 infection increases postoperative atrial vulnerability remains uncertain.
Materials and Methods: This retrospective cohort study included 64 adults who underwent isolated CABG in 2021 – 2022. Patients were classified as having prior asymptomatic SARS-CoV-2 infection (n = 34) or no documented prior infection (n = 30). The primary endpoint was new-onset POAF during the index hospitalization. Additional observations included POAF onset, discharge rhythm, and atrial fibrillation-related readmission within 10 days. No a priori sample-size calculation was performed for this fixed cohort. Analyses were unadjusted because only nine POAF events occurred, precluding reliable multivariable modeling.
Results: POAF occurred more frequently in patients with prior asymptomatic SARS-CoV-2 infection than in those without documented infection (8/34, 23.5% vs 1/30, 3.3%; two-sided Fisher's exact p = 0.029). The absolute risk difference was 20.2 percentage points. The unadjusted odds ratio was 8.92 (95% CI, 1.04 – 76.24), and the relative risk was 7.06 (95% CI, 0.94 – 53.22). Confidence intervals were wide, and the relative-risk interval included the null. All POAF episodes in the prior-infection group occurred within 24 postoperative hours. At discharge, 4 of 8 patients had returned to sinus rhythm; 4 had rate-controlled atrial fibrillation and received a non – vitamin K antagonist oral anticoagulant for 3 months. One patient was readmitted with AF within 10 days.
Conclusion: POAF was more frequent among patients with documented prior asymptomatic SARS-CoV-2 infection, but the small event count and wide confidence intervals preclude a definitive estimate of risk. These hypothesis-generating findings require confirmation in larger prospective studies with standardized rhythm monitoring.

Keywords: Atrial fibrillation, coronary artery bypass, COVID-19, SARS-CoV-2, asymptomatic infections

INTRODUCTION

Postoperative atrial fibrillation (POAF) is one of the most common complications after cardiac surgery and remains particularly relevant after coronary artery bypass grafting (CABG). Reported POAF incidence varies according to case mix, monitoring intensity, operative technique, and endpoint definition, but it remains a persistent complication after cardiac surgery and isolated CABG (1-4). Its occurrence reflects the interaction between a susceptible atrial substrate and acute perioperative triggers, including inflammation, catecholamine exposure, atrial manipulation, cardiopulmonary bypass, electrolyte disturbance, and postoperative hemodynamic stress (1,4,5).

The clinical importance of POAF extends beyond transient rhythm instability. POAF has been associated with thromboembolic risk, readmission, increased hospital costs, and adverse long-term outcomes after CABG and other cardiac surgical procedures (6-12).

Despite decades of investigation, perioperative identification of patients at increased risk for POAF remains imperfect. Risk models and observational studies have identified conventional predictors such as older age, chronic obstructive pulmonary disease, atrial structural disease, ventricular dysfunction, and operative complexity, yet these variables do not fully explain postoperative rhythm vulnerability (3,4,13,14).

The pathophysiology of POAF is multifactorial. Established contributors include advanced age, male sex, hypertension, chronic obstructive pulmonary disease, ventricular dysfunction, atrial enlargement, oxidative stress, inflammatory activation, and autonomic imbalance (1,4,5).

Although the acute phase of the COVID-19 pandemic has ended, its cardiovascular and perioperative consequences remain clinically relevant. A substantial number of patients undergoing contemporary cardiac surgery have a documented history of SARS-CoV-2 infection, including individuals who experienced the infection without overt symptoms. Even in the absence of acute respiratory illness, prior SARS-CoV-2 exposure may be associated with persistent inflammatory activation, endothelial dysfunction, autonomic imbalance, and altered thromboinflammatory responses. These mechanisms are particularly relevant in coronary artery bypass grafting, where cardiopulmonary bypass, surgical trauma, and postoperative systemic inflammation may collectively increase susceptibility to atrial arrhythmias.

SARS-CoV-2 infection provides a biologically plausible additional substrate for atrial arrhythmogenesis. COVID-19 has been linked to myocardial injury, endothelial dysfunction, inflammatory activation, autonomic disturbance, and persistent cardiovascular symptoms in a subset of patients after the acute phase (15-22).

Importantly, asymptomatic infection should not be equated with absence of biological effect. Even clinically silent infection may theoretically leave a residual inflammatory or endothelial footprint that becomes clinically relevant only when the patient is exposed to a major physiologic stressor such as cardiopulmonary bypass and surgical myocardial revascularization (18-22).

The perioperative consequences of active or symptomatic COVID-19 have been widely investigated, including the timing of surgery after SARS-CoV-2 infection, but the clinical relevance of previous asymptomatic SARS-CoV-2 infection remains less clearly defined in cardiac surgery (23). In patients undergoing isolated CABG, previous clinically silent infection may not be apparent during routine preoperative assessment but may still influence early postoperative rhythm outcomes.

This study evaluates the association between previous asymptomatic SARS-CoV-2 infection and new-onset POAF after isolated CABG. We hypothesized that patients with prior asymptomatic SARS-CoV-2 infection would have a higher incidence of new-onset POAF than patients without documented previous SARS-CoV-2 infection, while recognizing that any observed association would require cautious interpretation because of the limited event count.

MATERIALS AND METHODS

Study Design and Population

This retrospective cohort study was conducted at the Cardiovascular Surgery Clinic of Ankara City Hospital. Adult patients who underwent isolated CABG between 2021 and 2022 were evaluated. The analytic cohort included 64 patients who met the inclusion and exclusion criteria: 34 patients with previous asymptomatic SARS-CoV-2 infection and 30 patients without documented previous SARS-CoV-2 infection. This study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board of Ankara Bilkent City Hospital (Approval No: E1-22-2555; approval date: 06 April 2022).

The present POAF-focused analysis was developed subsequently, and the interval between data collection and the present report reflected completion of data verification, rhythm-specific analysis, manuscript preparation, submission, and the peer-review process.

Because the primary endpoint was rhythm-related, special emphasis was placed on separating patients with newly detected postoperative atrial fibrillation (AF) from those with possible pre-existing atrial arrhythmia. The analysis was restricted to the index CABG hospitalization in order to maintain a consistent observation window across both groups and to avoid differential follow-up bias. Owing to the retrospective design and summarized dataset, the exact method of control-group assembly and some operative or treatment details could not be reconstructed uniformly for all patients and are acknowledged as limitations.

The study focused on isolated CABG procedures. Patients who underwent combined valve, aortic, congenital, or other additional cardiac procedures were excluded. Patients with active infection, fever, active COVID-19 at the time of surgery, symptomatic previous COVID-19, known preoperative atrial fibrillation, or incomplete essential perioperative rhythm documentation were excluded from the POAF analysis. Consecutive inclusion and full screening-flow reconstruction could not be verified from the summarized retrospective dataset.

Exposure Definition

The exposure of interest was previous asymptomatic SARS-CoV-2 infection before isolated CABG. Patients were assigned to the previous asymptomatic SARS-CoV-2 infection group if they had documented SARS-CoV-2 polymerase chain reaction

DOI: 10.5455/atjmed.2026.06.061

(PCR) positivity before surgery and no reported COVID-related symptoms. Patients without documented previous infection were assigned to the comparison group.

Patients in the previous asymptomatic SARS-CoV-2 infection group had documented SARS-CoV-2 positivity before surgery and no reported COVID-19-related symptoms during the infection period. Patients in the comparison group had no documented history of SARS-CoV-2 infection before CABG. Because systematic serological screening was not performed, previously unrecognized asymptomatic infection in the comparison group cannot be completely excluded. The interval between documented SARS-CoV-2 PCR positivity and surgery in the exposed group was 170.0 ± 188.6 days; the median interval was 123.0 days, and the range was 13 to 783 days.

Primary and Secondary Endpoints

The primary endpoint was new-onset POAF during the index postoperative hospitalization. POAF was defined as atrial fibrillation or atrial flutter documented by postoperative electrocardiography, telemetry, continuous intensive care unit (ICU) rhythm monitoring, serial ward electrocardiographic assessment, cardiology consultation, or treatment records after CABG in a patient without known preoperative AF.

For endpoint adjudication, POAF required documented atrial fibrillation or atrial flutter on postoperative electrocardiography, telemetry, or clinical rhythm documentation. Episodes were considered postoperative only if they occurred after completion of CABG during the index hospitalization. Rhythm events occurring before surgery or documented as chronic, persistent, paroxysmal, or previously known AF were not intended to be classified as new-onset POAF. This distinction is essential because postoperative AF represents a distinct complication with different prognostic and mechanistic implications than pre-existing AF (1,24,25).

Secondary rhythm-related observations included POAF timing, discharge rhythm status, and AF-related readmission within 10 days after discharge. General postoperative outcomes included postoperative complication status, reintubation, rehospitalization, non-invasive ventilation requirement, ward oxygen requirement, transfusion requirement, length of stay, and in-hospital mortality.

Surgical and Postoperative Management

Most patients underwent conventional CABG using cardiopulmonary bypass, with beating-heart or minimally invasive approaches used selectively according to clinical indication and surgeon preference. Myocardial protection was achieved with del Nido cardioplegia. Standard postoperative ICU care included continuous rhythm monitoring during the early postoperative period, electrolyte correction, hemodynamic monitoring, respiratory management, and institution-specific antiplatelet, beta-blocker, statin, and anticoagulation practices. Beta-blocker therapy was routinely used as part of standard perioperative management unless clinically contraindicated. After transfer from the ICU, patients requiring ongoing rhythm follow-up underwent electrocardiographic assessment six times daily until sinus rhythm was restored or discharge decisions were finalized. Among patients with POAF, those who remained in AF at discharge were managed with rate control and prescribed non-vitamin K antagonist oral anticoagulant (NOAC) therapy for 3 months.

Statistical Analysis

Categorical variables were summarized as number and percentage, and continuous variables were summarized as mean and standard deviation or median with interquartile range according to distribution. Between-group comparisons used the chi-square test or Fisher's exact test for categorical variables and the independent samples t test or Mann-Whitney U test for continuous variables, as appropriate. The primary POAF comparison used Fisher's exact test because of the small number of events. Effect size was reported as odds ratio, relative risk, and absolute risk difference with 95% confidence intervals, where applicable. All statistical tests were two-sided, and statistical significance was accepted at $p < 0.05$. Statistical analyses were performed using IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, NY, USA).

Because POAF event counts were small, Fisher's exact test was prioritized for the primary between-group comparison. Effect size estimates were reported to complement p values and to provide a clinically interpretable measure of association. Given the limited number of POAF events, multivariable modeling was intentionally restricted to avoid overfitting. No a priori power analysis was performed because this was a retrospective analysis of a fixed cohort; therefore, the results should be interpreted as exploratory and hypothesis-generating.

Only unadjusted analyses are presented. With only nine POAF events, inclusion of multiple covariates in a conventional multivariable regression model would have produced unstable estimates and a substantial risk of overfitting; therefore, no adjusted model was performed. The results should consequently be interpreted as exploratory and should not be considered evidence of an independent effect.

RESULTS

Baseline and Operative Characteristics

The study included 64 patients undergoing isolated CABG: 30 patients in the comparison group without documented previous SARS-CoV-2 infection and 34 patients in the previous asymptomatic SARS-CoV-2 infection group. The mean age of the overall cohort was approximately 63 years, and most patients were male. Age, sex, left ventricular ejection fraction, European System for Cardiac Operative Risk Evaluation II (EuroSCORE

II), operative priority, cardiopulmonary bypass time, cross-clamp time, and number of bypassed vessels were comparable between groups (Table 1). In the previous asymptomatic SARS-CoV-2 infection group, the time from documented SARS-CoV-2 PCR positivity to surgery was 170.0 ± 188.6 days, with a median of 123.0 days and a range of 13 to 783 days.

Table 1. Baseline and operative characteristics of the patient cohort

Variable	No documented prior SARS-CoV-2 infection (n = 30)	Prior asymptomatic SARS-CoV-2 infection (n = 34)	p value
Age, years	63.2 +/- 8.1	63.5 +/- 8.9	0.889
Female sex	5 (16.7%)	7 (20.6%)	0.761
Hypertension	17 (56.7%)	22 (64.7%)	0.604
Diabetes mellitus	13 (43.3%)	22 (64.7%)	0.087
Chronic obstructive pulmonary disease	2 (6.7%)	5 (14.7%)	0.425
Left ventricular ejection fraction, %	51.8 +/- 8.1	51.9 +/- 8.5	0.962
EuroSCORE II, %	0.91 (0.69-1.15)	0.88 (0.68-1.06)	0.700
Cardiopulmonary bypass time, min	118.7 +/- 34.2	105.1 +/- 23.3	0.071
Cross-clamp time, min	69.5 +/- 20.0	70.3 +/- 20.1	0.874
Bypassed vessel number, median	3 (3-4)	3 (3-4)	0.978
Elective surgery	25 (83.3%)	28 (82.4%)	0.923
Thoracic computed tomography involvement among patients with previous asymptomatic SARS-CoV-2 infection	Not applicable	5 (14.7%)	–

The cohort retained the intended comparative structure of the original dataset while focusing specifically on the rhythm endpoint. The comparison group included 30 patients without documented previous SARS-CoV-2 infection, and the exposure group included 34 patients with previous asymptomatic SARS-CoV-2 infection. However, the summarized retrospective dataset did not allow complete reconstruction of screening flow, atrial structural variables, or all perioperative prophylactic treatment details; these limitations should be considered when interpreting between-group comparability.

Comorbidity profiles were broadly comparable. Hypertension and diabetes mellitus were frequent in both groups. Chronic obstructive pulmonary disease, chronic kidney disease, and previous cerebrovascular disease were uncommon. Operative parameters did not show clinically important imbalances that would independently explain the observed rhythm outcome difference.

New-Onset Postoperative Atrial Fibrillation

New-onset POAF occurred in 8 of 34 patients (23.5%) in the previous asymptomatic SARS-CoV-2 infection group and in 1 of 30 patients (3.3%) in the comparison group without documented previous infection. This difference was statistically significant by two-sided Fisher's exact test ($p = 0.029$). The absolute risk difference was 20.2 percentage points. Previous asymptomatic SARS-CoV-2 infection was associated with a higher unadjusted odds ratio (OR) for POAF (OR, 8.92; 95% confidence interval [CI], 1.04 – 76.24), whereas the relative risk (RR) estimate was 7.06 and its 95% CI included the null value (RR, 7.06; 95% CI, 0.94 – 53.22). Accordingly, the effect estimate should be interpreted as imprecise rather than definitive.

Because only nine total POAF events occurred, the magnitude of association should be interpreted cautiously. The point estimates were large, but the confidence intervals were wide, reflecting limited statistical precision and an underpowered sample for robust effect-size estimation.

All documented POAF episodes in the previous asymptomatic SARS-CoV-2 infection group were recorded within the first 24 postoperative hours. At discharge, 4 of 8 affected patients (50.0%) had returned to sinus rhythm, whereas the remaining 4 were discharged with rate-controlled AF and prescribed NOAC therapy for 3 months. One patient was readmitted with atrial fibrillation within 10 days after discharge. These findings should nevertheless be interpreted descriptively because the study was retrospective and detailed rhythm-management variables were not captured in a prospectively standardized format.

The concentration of documented events within the first 24 postoperative hours may indicate early postoperative rhythm vulnerability; however, it may also partly reflect the greater intensity of rhythm monitoring in the ICU compared with later ward-based surveillance. Accordingly, the timing pattern should be interpreted descriptively.

The primary rhythm-related findings are summarized in Table 2. The between-group incidence of POAF is illustrated in Figure 1, and the cohort flow and primary endpoint distribution are shown in Figure 2.

Table 2. New-onset POAF and rhythm-related postoperative observations

Outcome	No documented prior SARS-CoV-2 infection (n = 30)	Prior asymptomatic SARS-CoV-2 infection (n = 34)	Effect / p value
New-onset POAF	1 (3.3%)	8 (23.5%)	Fisher p = 0.029
No POAF	29 (96.7%)	26 (76.5%)	–
POAF within first 24 postoperative hours	1/1 (100%)	8/8 (100%)	Descriptive
Returned to sinus rhythm before discharge	Not separately analyzed	4/8 (50.0%)	Descriptive
AF-related readmission within 10 days	0/1 (0%)	1/8 (12.5%)	Descriptive
Absolute risk difference	--	20.2 percentage points	–
Unadjusted odds ratio	Reference	8.92 (95% CI 1.04 – 76.24)	–
Unadjusted relative risk	Reference	7.06 (95% CI 0.94 – 53.22)	–

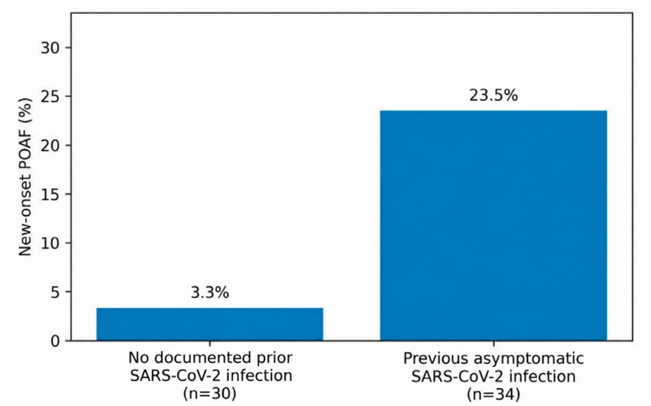

Figure 1. Incidence of new-onset postoperative atrial fibrillation according to previous asymptomatic SARS-CoV-2 infection status

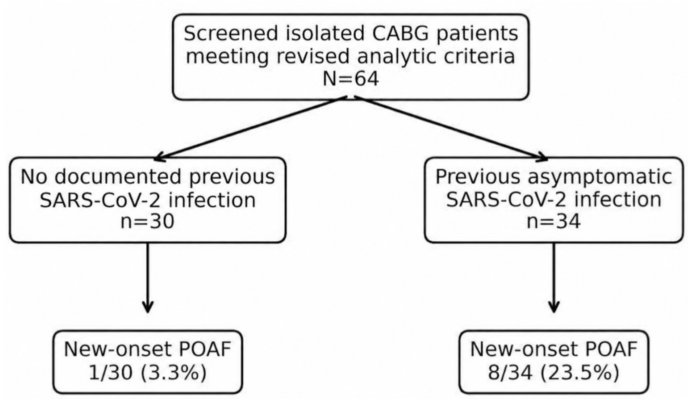

Figure 2. Cohort flow and primary POAF endpoint distribution

Other Postoperative Outcomes

General postoperative outcomes were interpreted in the context of the primary rhythm finding. Extubation time, ICU stay, hospital stay, reintubation, non-invasive ventilation requirement, ward oxygen requirement, transfusion requirement, and mortality did not differ significantly between groups. Overall postoperative complications were more frequent in the previous asymptomatic SARS-CoV-2 infection group, but individual non-rhythm complications were uncommon (Table 3). No between-group difference in length of stay was observed; however, this comparison was performed according to previous infection status rather than according to persistence of POAF or time to conversion to sinus rhythm, and therefore it cannot explain why documented return to sinus rhythm did not appear to track with hospitalization duration.

Table 3. Postoperative outcomes and complications

Outcome	No documented prior SARS-CoV-2 infection (n = 30)	Prior asymptomatic SARS-CoV-2 infection (n = 34)	p value
Extubation time, min	450.0 (360.0 – 540.0)	450.0 (395.0 – 532.5)	0.884
ICU stay, days	2.0 (1.0-3.0)	1.0 (1.0-2.0)	0.307
Total hospital stay, days	14.0 +/- 4.9	13.0 +/- 4.7	0.379
Postoperative hospital stay, days	6.9 +/- 2.3	6.7 +/- 2.0	0.231
Reintubation	0 (0%)	2 (5.9%)	0.493
Rehospitalization	2 (6.7%)	5 (14.7%)	0.434
Non-invasive ventilation requirement	5 (16.7%)	3 (8.8%)	0.457
Ward oxygen requirement	12 (40.0%)	18 (52.9%)	0.444
Any postoperative complication	0 (0%)	6 (17.6%)	0.026
In-hospital mortality	0 (0%)	1 (2.9%)	1.000

The unadjusted effect estimates for the association between previous asymptomatic SARS-CoV-2 infection and new-onset POAF are shown in Figure 3.

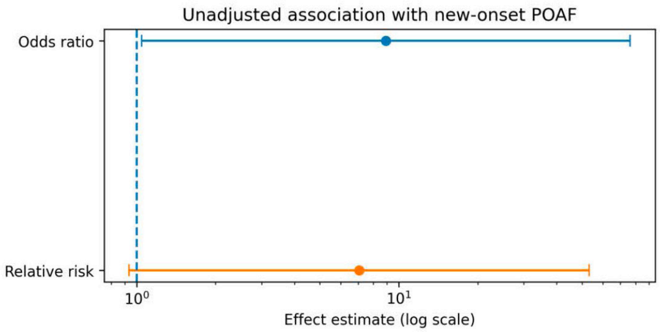

Figure 3. Unadjusted effect estimates for the association between previous asymptomatic SARS-CoV-2 infection and new-onset POAF

The rhythm-specific finding should not be interpreted as evidence that previous asymptomatic SARS-CoV-2 infection uniformly worsens all postoperative outcomes after CABG. Rather, the present data suggest a possible selective association with early postoperative atrial vulnerability in a small retrospective cohort.

DISCUSSION

In this cohort of 64 patients undergoing isolated CABG, POAF was observed more frequently in patients with previous asymptomatic SARS-CoV-2 infection than in patients without documented previous SARS-CoV-2 infection. However, only nine total POAF events occurred, and the effect estimates were highly imprecise. Although the between-group distribution differed by two-sided Fisher's exact test, the 95% confidence interval for the relative risk included 1.0. The findings should therefore be interpreted as exploratory and hypothesis-generating rather than as evidence of a definitive or precisely quantified increase in risk.

The principal contribution of this study is the identification of a specific postoperative rhythm outcome in a patient group that may otherwise appear low risk from a COVID-19 standpoint. Patients with asymptomatic infection would typically not be expected to have major residual cardiopulmonary impairment, and many would not be treated differently once acute infection had resolved. The present findings suggest that previous asymptomatic infection may nevertheless be relevant when evaluating early postoperative AF susceptibility after CABG, but this observation requires confirmation in larger prospective cohorts.

This finding remains clinically relevant because the studied infection phenotype was asymptomatic. Most COVID-cardiac surgery literature has focused on active infection, symptomatic infection, perioperative PCR positivity, respiratory complications, or global postoperative morbidity and mortality. The current analysis raises the possibility that even clinically silent SARS-CoV-2 infection may be relevant to postoperative rhythm outcomes after CABG; however, exposure misclassification and residual confounding cannot be excluded.

The absence of symptoms during the index SARS-CoV-2 infection reduces, but does not eliminate, the possibility of residual systemic effects. COVID-19 has been associated with cardiovascular inflammation, endothelial dysfunction, myocardial injury, microvascular disturbance, and autonomic imbalance (15-19). Even when these effects are subclinical, they may lower the threshold for atrial arrhythmia during the early postoperative period. At the same time, routine inflammatory laboratory measurements were not used to define the exposure and do not establish mechanism in this cohort.

A biological relationship between previous SARS-CoV-2 infection and postoperative atrial vulnerability is plausible but remains unproven in this cohort. POAF reflects the interaction between a vulnerable atrial substrate and perioperative stressors, including systemic inflammation, catecholamine release, oxidative stress, atrial ischemia, electrolyte changes, pericardial irritation, and volume shifts (1,2,6,7,13,14). SARS-CoV-2 infection can promote endothelial dysfunction, inflammatory activation, autonomic dysregulation, and microvascular injury (15-19). In CABG patients, such residual effects could theoretically lower the threshold for early postoperative atrial arrhythmia, but the present data cannot distinguish this possibility from residual confounding or chance.

Several mechanisms may connect previous SARS-CoV-2 infection to POAF. Endothelial dysfunction and microvascular inflammation may impair atrial perfusion and promote local conduction abnormalities. Systemic inflammatory activation can alter atrial electrophysiology through cytokine-mediated effects on ion-channel behavior and calcium handling. Autonomic imbalance may increase adrenergic tone in the immediate postoperative period. Platelet activation and thromboinflammatory signaling may amplify the inflammatory response already induced by cardiopulmonary bypass (1,15-19). These mechanisms are not mutually exclusive, but they were not directly measured in this study.

The early timing of POAF in this series is also noteworthy. POAF is commonly described during the early postoperative period and often peaks within the first several postoperative days, although the arrhythmogenic substrate begins immediately after surgery as inflammatory, autonomic, ischemia-reperfusion, and atrial stretch mechanisms develop (1,2,4,5). In the present cohort, all documented events in the previous asymptomatic SARS-CoV-2 infection group occurred within the first 24 postoperative hours, but this finding should be regarded as descriptive.

The predominance of first-24-hour POAF may also reflect the clinical monitoring environment after cardiac surgery. Continuous intensive care monitoring increases the likelihood of

Atlantic J Med Sci Res 2026;6(3):368-76
DOI: 10.5455/atjmed.2026.06.061

detecting early rhythm disturbances, whereas ward surveillance in this cohort relied on repeated electrocardiographic assessment six times daily rather than uninterrupted telemetry. Accordingly, the apparent temporal clustering should not be overinterpreted, although early POAF remains clinically relevant because it often prompts immediate management decisions, including beta-blocker optimization, electrolyte correction, amiodarone use, anticoagulation discussion, and discharge planning.

The clinical course of POAF in the previous asymptomatic SARS-CoV-2 infection group was heterogeneous. At discharge, 4 of 8 affected patients had returned to sinus rhythm, whereas the remaining 4 were discharged with rate-controlled AF and prescribed NOAC therapy for 3 months. One patient was readmitted with AF within 10 days. These observations are clinically relevant because postoperative AF may be transient in some patients, whereas others require continued rhythm surveillance, rate control, anticoagulation, and early post-discharge reassessment.

The observation that only half of the affected patients had returned to sinus rhythm by discharge highlights that POAF after CABG is not a uniform event. Some episodes are transient and self-limited, whereas others may persist, recur, or require pharmacologic rate control and temporary anticoagulation. Because hospital length of stay did not differ between the exposure groups, but was not analyzed according to discharge rhythm or time to conversion, the current dataset cannot determine whether longer inpatient observation influenced rhythm restoration.

The results may have practical implications for perioperative assessment. Patients with previous asymptomatic SARS-CoV-2 infection may benefit from careful review of baseline electrocardiography, correction of reversible postoperative triggers, continuation of guideline-supported beta-blockade when appropriate, electrolyte optimization, and early rhythm monitoring after CABG (10,22,24,25). However, the present study does not establish previous asymptomatic SARS-CoV-2 infection as an independent indication for a distinct prophylactic antiarrhythmic strategy.

From a practical perspective, the findings do not imply that CABG should be delayed solely because of a history of asymptomatic SARS-CoV-2 infection. Instead, they support enhanced rhythm awareness and consistent application of established POAF-prevention principles. Reasonable measures may include strict correction of potassium and magnesium abnormalities, continuation or early reinstitution of beta-blocker therapy when not contraindicated, avoidance of unnecessary catecholamine exposure, and low threshold for telemetry in patients with additional POAF risk factors. These measures are already compatible with standard cardiac surgical care and do not require a major change in operative strategy.

This study should be interpreted as hypothesis-generating. The event count was small, which limits statistical stability and precludes robust multivariable adjustment. The wide confidence intervals around effect estimates reflect this major limitation. The sample was also underpowered for definitive inference, and no a priori sample-size calculation was possible because the analysis was retrospective and based on a fixed cohort. Accordingly, the two-sided Fisher's exact p value should not be equated with a precise or independently adjusted risk estimate.

The magnitude of association observed in this study should therefore be interpreted cautiously. The odds ratio is large, but the confidence interval is wide because only nine total POAF events were observed in the cohort. Such a finding is best understood as a signal warranting confirmation in larger multicenter cohorts with standardized rhythm monitoring, preoperative left atrial measurements, detailed perioperative medication data, and longer post-discharge rhythm follow-up.

Important potential confounders could not be incorporated into an adjusted model. Left atrial size and left atrial volume index were not calculated, and inflammatory markers were not systematically analyzed in relation to POAF. Although beta-blocker therapy was routinely used, patient-level adherence, dose, perioperative interruption, timing of postoperative reinstitution, and contraindications were not standardized for comparative analysis. In addition, the interval from PCR positivity to surgery varied widely from 13 to 783 days, and the study was not powered to determine whether this interval modified POAF risk. Each of these factors may have influenced the observed association independently of previous SARS-CoV-2 infection.

Strengths and Limitations

A major strength of this study is its focused endpoint. By isolating new-onset POAF as the primary outcome, the study addresses a clinically specific postoperative cardiovascular complication rather than combining heterogeneous morbidity outcomes. The groups were also broadly comparable with respect to major demographic and operative characteristics available in the summarized dataset.

Another strength is the use of a clearly defined exposure group: patients with documented previous asymptomatic SARS-CoV-2 infection. This avoids combining asymptomatic, symptomatic, and active COVID-19 cases into a single heterogeneous exposure category. The study also focuses on isolated CABG, thereby reducing confounding from combined valve or aortic procedures, which can independently increase POAF risk.

Several limitations must be acknowledged. First, the study was retrospective and single-center. Second, the sample size was modest, and only nine POAF events were recorded, which represents a major limitation and restricted both statistical precision and adjusted modeling. Third, POAF ascertainment depended on the completeness of ECG, telemetry, ICU, ward, and treatment documentation rather than on a prospectively standardized monitoring protocol. Fourth, unmeasured variables

DOI: 10.5455/atjmed.2026.06.061

such as left atrial size or left atrial volume index, preoperative beta-blocker adherence, postoperative electrolyte values, sleep apnea, and detailed inflammatory cytokine profiles may have influenced POAF risk. Fifth, although the interval from SARS-CoV-2 infection to surgery was available, it varied widely and the study was not powered to evaluate its modifying effect. Sixth, although del Nido cardioplegia and routine perioperative beta-blocker use were confirmed, more granular intraoperative and postoperative management details were not uniformly available for comparative analysis. Finally, the results should not be interpreted as proof of causality. Because the study reports only unadjusted analyses, residual confounding remains substantial and the observed association cannot be interpreted as an independent effect.

Additional limitations include the absence of systematic long-term ambulatory rhythm monitoring and the lack of calculated atrial structural variables such as left atrial size or left atrial volume index in the dataset. Vaccination status was recorded during initial data collection; however, because it was not systematically standardized across the cohort and was incomplete for analytic stratification, vaccination percentages were not included in the final results analysis. The study also cannot determine whether SARS-CoV-2 variant or residual inflammatory marker patterns modified POAF risk. Because systematic serological testing was not performed, previously unrecognized asymptomatic infection in the comparison group cannot be excluded. Finally, because the analysis is observational, the results demonstrate association rather than causation.

CONCLUSION

In patients undergoing isolated CABG, POAF was observed more frequently in those with documented previous asymptomatic SARS-CoV-2 infection than in those without documented previous infection (8/34, 23.5% vs 1/30, 3.3%; two-sided Fisher's exact $p = 0.029$). However, only nine POAF events occurred, and the relative-risk estimate was imprecise (RR, 7.06; 95% CI, 0.94 – 53.22). All documented POAF episodes in the previous asymptomatic SARS-CoV-2 infection group occurred within the first 24 postoperative hours; by discharge, 50.0% of affected patients had returned to sinus rhythm, whereas the remainder were discharged with rate-controlled AF and prescribed NOAC therapy for 3 months, and one patient was readmitted with AF within 10 days.

These findings suggest that clinically silent SARS-CoV-2 infection may have perioperative rhythm relevance, but they should be regarded as hypothesis-generating rather than definitive. Larger prospective studies are needed to confirm the association, clarify mechanisms, capture left atrial structure and medication data, and determine whether intensified rhythm surveillance or targeted POAF-prevention strategies improve outcomes in CABG patients with previous asymptomatic infection.

Conflict of Interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that there is no financial support.

Ethical Approval
This study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board of Ankara Bilkent City Hospital (Approval No: E1-22-2555; approval date: 06 April 2022).

Informed Consent
Individual informed consent was obtained from all patients included in the study.

REFERENCES

1. Dobrev D, Aguilar M, Heijman J, et al. Postoperative atrial fibrillation: mechanisms, manifestations and management. Nat Rev Cardiol. 2019;16:417-36.
2. Greenberg JW, Lancaster TS, Schuessler RB, Melby SJ. Postoperative atrial fibrillation following cardiac surgery: a persistent complication. Eur J Cardiothorac Surg. 2017;52:665-72.
3. Mathew JP, Fontes ML, Tudor IC, et al. A multicenter risk index for atrial fibrillation after cardiac surgery. JAMA. 2004;291:1720-9.
4. Echahidi N, Pibarot P, O'Hara G, Mathieu P. Mechanisms, prevention, and treatment of atrial fibrillation after cardiac surgery. J Am Coll Cardiol. 2008;51:793-801.
5. Maesen B, Nijs J, Maessen J, et al. Post-operative atrial fibrillation: a maze of mechanisms. Europace. 2012;14:159-74.
6. Benedetto U, Gaudino MF, Dimagli A, et al. Postoperative atrial fibrillation and long-term risk of stroke after isolated coronary artery bypass graft surgery. Circulation. 2020;142:1320-9.
7. LaPar DJ, Speir AM, Crosby IK, et al. Postoperative atrial fibrillation significantly increases mortality, hospital readmission, and hospital costs. Ann Thorac Surg. 2014;98:527-33.
8. Gaudino M, Di Franco A, Rong LQ, et al. Postoperative atrial fibrillation: from mechanisms to treatment. Eur Heart J. 2023;44:1020-39.
9. Taha A, Nielsen SJ, Bergfeldt L, et al. New-onset atrial fibrillation after coronary artery bypass grafting and long-term outcome: a population-based nationwide study from the SWEDEHEART Registry. J Am Heart Assoc. 2021;10:e017966.
10. Gillinov AM, Bagiella E, Moskowitz AJ, et al. Rate control versus rhythm control for atrial fibrillation after cardiac surgery. N Engl J Med. 2016;374:1911-21.
11. Mariscalco G, Klersy C, Zanobini M, et al. Atrial fibrillation after isolated coronary surgery affects late survival. Circulation. 2008;118:1612-8.

DOI: 10.5455/atjmed.2026.06.061

12. Butt JH, Xian Y, Peterson ED, et al. Long-term thromboembolic risk in patients with postoperative atrial fibrillation after coronary artery bypass graft surgery and patients with nonvalvular atrial fibrillation. JAMA Cardiol. 2018;3:417-24. Erratum in: JAMA Cardiol. 2018;3:505.

13. Seo EJ, Hong J, Lee HJ, et al. Perioperative risk factors for new-onset postoperative atrial fibrillation after coronary artery bypass grafting: a systematic review. BMC Cardiovasc Disord. 2021;21:418.

14. Aranki SF, Shaw DP, Adams DH, et al. Predictors of atrial fibrillation after coronary artery surgery. Current trends and impact on hospital resources. Circulation. 1996;94:390-7.

15. Nishiga M, Wang DW, Han Y, et al. COVID-19 and cardiovascular disease: from basic mechanisms to clinical perspectives. Nat Rev Cardiol. 2020;17:543-58.

16. Xiong TY, Redwood S, Prendergast B, Chen M. Coronaviruses and the cardiovascular system: acute and long-term implications. Eur Heart J. 2020;41:1798-800.

17. Inciardi RM, Adamo M, Lupi L, et al. Characteristics and outcomes of patients hospitalized for COVID-19 and cardiac disease in Northern Italy. Eur Heart J. 2020;41:1821-9. Erratum in: Eur Heart J. 2020;41:4591.

18. Libby P, Lüscher T. COVID-19 is, in the end, an endothelial disease. Eur Heart J. 2020;41:3038-44.

19. Nalbandian A, Sehgal K, Gupta A, et al. Post-acute COVID-19 syndrome. Nat Med. 2021;27:601-15.

20. Puntmann VO, Carerj ML, Wieters I, et al. Outcomes of cardiovascular magnetic resonance imaging in patients recently recovered from coronavirus disease 2019 (COVID-19). JAMA Cardiol. 2020;5:1265-73. Erratum in: JAMA Cardiol. 2020;5:1308.

21. Carfì A, Bernabei R, Landi F; Gemelli Against COVID-19 Post-Acute Care Study Group. Persistent symptoms in patients after acute COVID-19. JAMA. 2020;324:603-5.

22. Gluckman TJ, Bhave NM, Allen LA, et al. 2022 ACC expert consensus decision pathway on cardiovascular sequelae of COVID-19 in adults: myocarditis and other myocardial involvement, post-acute sequelae of SARS-CoV-2 infection, and return to play: a report of the American College of Cardiology Solution Set Oversight Committee. J Am Coll Cardiol. 2022;79:1717-56.

23. COVIDSurg Collaborative, GlobalSurg Collaborative. Timing of surgery following SARS-CoV-2 infection: an international prospective cohort study. Anaesthesia. 2021;76:748-58.

24. Hindricks G, Potpara T, Dagres N, et al. 2020 ESC guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS): the Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC) developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC. Eur Heart J. 2021;42:373-498. Erratum in: Eur Heart J. 2021;42:507. Erratum in: Eur Heart J. 2021;42:546-7. Erratum in: Eur Heart J. 2021;42:4194.

25. January CT, Wann LS, Calkins H, et al. 2019 AHA/ACC/HRS focused update of the 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society in collaboration with the Society of Thoracic Surgeons. Circulation. 2019;140:e125-51.