

SYNTAX score predicts postoperative atrial fibrillation in patients undergoing on-pump isolated coronary artery bypass grafting surgery

Çetin Geçmen, Gamze Babür Güler¹, Emrah Erdoğan, Suzan Hatipoğlu, Ekrem Güler¹, Fatih Yılmaz, Tuba Unkun, Murat Cap, Ruken Bengi Bakal, Tülay Bayram, Rezzan Deniz Acar, Özkan Candan, Nihal Özdemir

Department of Cardiology, Kartal Koşuyolu Heart and Research Hospital; İstanbul-Turkey
¹Department of Cardiology, Faculty of Medicine, İstanbul Medipol University; İstanbul-Turkey

ABSTRACT

Objective: Atrial fibrillation (AF) is the most common arrhythmia following coronary artery by-pass graft surgery (CABG). The value of SYNTAX score to predict postoperative atrial fibrillation (PoAF) has not been clearly addressed. We aimed to evaluate this relationship in patients undergoing isolated CABG.

Methods: This study was designed as a single-center, non-randomized, observational, prospective study. Ninety-four patients undergoing isolated on-pump CABG, who had sinus rhythm and were older than 18 years, were enrolled. Demographic characteristics of the patients were recorded; SYNTAX score was calculated preoperatively for each patient. The univariate and multivariate logistic regression analysis were used to determine for predictors of PoAF.

Results: The median SYNTAX score of the enrolled patients was 21, (56–5). PoAF was observed in 31 (33.3%) patients. Univariate logistic regression showed that age, chronic obstructive pulmonary disease (COPD), red blood cell distribution width (RDW), urea, initial troponin I, peak postoperative troponin I, interventricular septum, left atrial diameter, and SYNTAX score were significantly associated with the frequency of PoAF following CABG. An independent association was identified with age [β : 0.088, p :0.023, OR: 1.092, 95% CI (1.012–1.179)], COPD [β : 2.222, p :0.003, OR: 9.228, 95% CI (2.150–39.602)], and SYNTAX score [β : 0.130, p :0.002, OR: 1.139, 95% CI (1.050–1.235)].

Conclusion: This study showed that a higher SYNTAX score was related to more frequent PoAF in patients undergoing isolated on-pump CABG. (*Anatol J Cardiol* 2016; 16: 655-61)

Keywords: postoperative atrial fibrillation, SYNTAX score, coronary artery bypass grafting surgery

Introduction

Atrial fibrillation (AF) is the most common arrhythmia following coronary artery bypass graft surgery (CABG) with a reported incidence of 5%–40% (1–3). Despite the improvements in myocardial protection, cardiovascular anesthesia, and surgical techniques, atrial fibrillation is still frequently observed postoperatively after CABG probably due to aging patient population (4). Postoperative atrial fibrillation (PoAF) adversely affects mortality and morbidity and also increases the costs because it prolongs the duration of hospitalization (5). SYNTAX score (synergy between percutaneous coronary intervention with Taxus and cardiac surgery) is a scoring system evaluating the complexity of the lesions in coronary angiography (6). Its prognostic value was studied in patients with 3-vessel or left main coronary artery disease who need to decide between percutaneous coronary intervention (PCI) and CABG (7–10). It was reported that SYNTAX

score reflected coronary complexity and helped the clinician to predict major complications after PCI and CABG (11, 12). We hypothesized that increasing coronary lesion complexity may be associated with PoAF. The value of SYNTAX score to predict PoAF has not been clearly addressed. Thus, we aimed to evaluate this relationship in patients undergoing isolated CABG.

Methods

This study was designed as a single-center, non-randomized, observational, prospective study. It was conducted to evaluate the relationship between preoperative SYNTAX score and PoAF in patients undergoing isolated on-pump CABG. Ninety-four patients undergoing isolated CABG at our institution were included. The study was approved by the local institutional Ethical Committee; oral and written informed consent was obtained from all study participants.

Address for correspondence: Dr. Çetin Geçmen, Kartal Koşuyolu Kalp Araştırma Hastanesi, Kardiyoloji Bölümü, 34846 Kartal, İstanbul-Türkiye
Phone: +90 505 445 06 91 Fax: +90 216 500 15 00 E-mail: drcetingecmen@hotmail.com

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Study design and participants

Isolated on-pump CABG patients older than 18 years with sinus rhythm were consecutively enrolled. Patients with ST-elevation myocardial infarction (STEMI); those undergoing off-pump coronary surgery; those with a history of previous arrhythmia (including permanent AF and paroxysmal AF); those who had postoperative bleeding; those with current use of sotalol, amiodarone, non-steroidal anti-inflammatory drugs, or corticosteroid; and those with concomitant valvular pathology requiring surgery and ischemic mitral regurgitation, left atrial diameter >50 mm (13), hyperthyroidism, neo-plastic and rheumatic disease, hepatic failure, or serious infection were excluded.

Surgical revascularization was performed in the presence of at least 70% stenosis lesion on at least one epicardial coronary artery including left anterior descending coronary artery or at least 50% stenosis on left main coronary artery (LMCA).

Patients with LMCA stenosis were labeled as 2-vessel disease when the right coronary system was dominant and 3-vessel disease when the left coronary system was dominant.

Patients who had ≥ 20 minutes resting angina, new-onset Canadian Cardiovascular Society (CCS) Class II-III angina, increased anginal severity to CCS III-IV in patients with stable angina pectoris and post-myocardial infarction (post-MI) angina, and cardiac biomarker-positive patients with ischemic angina were diagnosed with non-ST-elevation acute coronary syndrome (non-STE-ACS) (14).

Stable coronary artery disease was defined according to the current guidelines of European Society of Cardiology (ESC) (15). Hypertension was defined as arterial blood pressure >140/90 mm Hg or receiving antihypertensive treatment. Diabetes mellitus (DM) was defined as fasting plasma glucose level ≥ 126 mg/dL or random plasma glucose ≥ 200 mg/dL plus diabetic symptoms or 2-hour plasma glucose ≥ 200 mg/dL in oral glucose tolerance test or HbA1C level ≥ 6.5 .

A diagnosis of chronic obstructive pulmonary disease (COPD) was established using spirometry test in patients with chronic cough, sputum, and dyspnea, based on the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines (16).

Demographic and baseline clinical characteristics, two-dimensional (2D) echocardiographic parameters, and laboratory tests were performed the day before surgery, and preoperative medications were recorded.

Surgical technique

All patients were given morphine and diazepam (0.1 mg/kg) preoperatively. General anesthesia was induced by using etomidate (0.3 mg/kg), midazolam (0.1 mg/kg), and sufentanil (1–2 μ g/kg). The operations were performed by standard midline sternotomy. The left internal mammary artery (LIMA) was used to graft the left anterior descending coronary artery and saphenous vein grafts were used for the remaining coronary arteries. Intravenous bolus of heparin was administered (150 IU/kg) to obtain activated clotting time (ACT) of ≥ 480 seconds. Additional bolus

of heparin was injected when required to keep ACT at the appropriate level. Myocardial protection was achieved with antegrade or retrograde cold blood cardioplegia with high potassium level. After completion of the anastomosis, protamine sulfate was administered to neutralize the effect of heparin. Cardiopulmonary bypass time, temperature, and cross-clamp times were recorded for each patient. After the surgical procedure, patients were followed up at the cardiovascular intensive care unit and extubated when hemodynamic stabilization, normothermia, an adequate pain control, and consciousness were achieved. All patients were given antiplatelet therapy for the first 24 hours.

Atrial fibrillation (AF)

After surgery, subjects were followed for at least 72–96 hours by continuous telemetry. A 12-lead electrocardiography (ECG) was obtained from the subjects every 12 or 24 hours at the intensive care and in-patient units, respectively. Additional 12-lead ECG was taken when the subjects complained of dyspnea, palpitation, or angina. Rhythm monitoring was continued until the discharge of the patients from the hospital. PoAF was described as irregular, fast oscillations, or fibrillatory waves instead of regular P waves at ECG. An AF episode lasting longer than 5 minutes was accepted as PoAF (17). Standard treatment was given to patients with PoAF. Medical cardioversion was conducted with amiodarone (5 mg/kg) for 30 minutes, followed by 1200 mg/day. Systolic blood pressure under 90 mm Hg was defined as hemodynamic instability, and electrical cardioversion was performed. Standard anticoagulant therapy was established with heparin.

Laboratory examination

Laboratory parameters were studied from venous blood sampled before the surgery. The highest troponin value was recorded as the peak troponin level in the postoperative period, and the postoperative neutrophil/lymphocyte ratios for each patient were calculated.

SYNTAX score

SYNTAX score was calculated from coronary angiographic views before CABG for each patient using the SYNTAX score calculator, Version 2.11 (available at: <http://www.syntax-score.com>). The vessels with a diameter of ≥ 1.5 mm and the lesions with $\geq 50\%$ stenosis were scored. Scoring was performed for each patient according to the following parameters: coronary dominance; number of lesions; segments involved per lesion; the presence of total occlusion, trifurcation, bifurcation, aorto-osteal lesion, severe tortuosity, calcification, thrombus, and diffuse/small vessel disease; and lesion length >20 mm. Scoring was performed by an experienced interventional cardiologist.

Echocardiographic examination

Baseline echocardiographic examinations were performed with standard commercial ultrasound system (Vivid 3, General Electric Vingmed, Horten, Norway) using 2.5–3.5-MHz multi-

phase-array probe before the operation. Echocardiographic examinations were performed at patient's bedside by a single investigator. Left ventricular dimensions were measured using M-mode and parasternal long-axis view. Ejection fraction was calculated by the modified Simpson's method from apical 4- and 2-chamber views. Left atrial diameter was measured as the anteroposterior diameter from the parasternal long-axis. Interventricular septum and posterior wall thicknesses were measured from parasternal long-axis view at end-diastole. Diastolic parameters were measured according to the American Society of Echocardiography guidelines (18).

Statistical analysis

The data were expressed as mean (\pm SD) and median (range) for continuous variables and as percentage for categorical variables. Kolmogorov–Smirnov test was used to identify distribution of variables. Unpaired t-test or Mann–Whitney U test were used to compare continuous variables as appropriate. Fisher's exact and continuity correction (Yate's correction) tests were used to compare categorical variables.

The baseline variables which were found significant ($p < 0.05$) in the univariate analysis were included in the multivariate logistic regression analysis (forward stepwise model) to determine the independent components of PoAF. The results of the model were reported as odds ratio (OR), 95% confidence interval, beta, and p values. Receiver-operating characteristic (ROC) curve for the prediction of PoAF after CABG was constructed and the area under the curve (AUC) was calculated for SYNTAX score. The cut-off value for SYNTAX score was calculated using the sensitivity and specificity estimates. For all tests, a p value of < 0.05 was considered statistically significant. Statistical Package for the Social Sciences (SPSS version 11.0, SPSS Inc., Chicago, IL, USA) software was used to perform analysis.

Results

In all, 143 consecutive patients referred for CABG were evaluated. The following patients were excluded: 8 with STEMI, 6 with AF, 12 who underwent off-pump coronary surgery, 5 with renal failure, 7 who required concomitant valvular surgery, and 11 who were using antiarrhythmics or non-steroidal anti-inflammatory drugs. Mean age of the 94 (22 female, 72 male) patients enrolled was 62 ± 8 years. Patients' clinical characteristics and drug uses are presented in Table 1. The median SYNTAX score of the patients enrolled was 21 (5–56). PoAF was observed in 31 (33.3%) patients. In two of these patients, sinus rhythm was restored with electrical cardioversion because they had hemodynamic instability.

In Table 2, the clinical, laboratory, and echocardiographic variables of patient with and without PoAF were compared. Age (59 ± 8 vs. 66 ± 8 , $p < 0.001$), COPD (9% vs. 48%, $p < 0.001$), Red blood cell distribution width (RDW), (15 ± 1.2 vs. 15 ± 1.4 , $p < 0.032$), urea mg/dL (37 ± 11 vs. 44 ± 15 , $p < 0.013$) creatinine mg/dL [0.78 (4.30 – 0.39) vs. 0.90 (7.80 –

Table 1. Clinical characteristics of the study population

	Patient group n=94
Age, years	62 \pm 8
Gender, n (male %)	72 (75.8)
Hypertension, n (%)	57 (61.3)
Diabetes mellitus, n (%)	41 (43.6)
Current smoking, n (%)	51 (54.8)
Hyperlipidemia, n (%)	21 (22.3)
Previous MI, n (%)	29 (30.9)
Previous CHF, n (%)	25 (26.6)
Chronic renal failure, n (%)	3 (3.2)
Previous stroke, n (%)	11 (11.8)
PAD, n (%)	4 (4.3)
COPD, n (%)	21 (22.3)
Carotid artery disease, n (%)	12 (12.8)
Stable angina pectoris, n (%)	55 (59.1)
Non-STE-ACS, n (%)	38 (40.9)
Post-op MI, n (%)	54 (58.7)
Post-op AF, n (%)	31 (33.3)
AF duration (h)	9 (72–1)
Three or more stenotic vessels, n (%)	48 (51.6)
ACEIs - angiotensin converting enzyme inhibitors; AF - atrial fibrillation; CHF - congestive heart failure; COPD - chronic obstructive pulmonary disease; h - hour; MI - myocardial infarction; Non-STE ACS - non-ST-elevation acute coronary syndrome; PAD - peripheral artery disease; Post-op - postoperative	

0.51), $p < 0.012$], left atrial diameter (3.6 ± 0.3 cm vs. 3.8 ± 0.3 cm, $p < 0.013$) septum thickness [1 (1.4 – 0.6) vs. 1.1 (1.6 – 0.7), $p < 0.047$], and SYNTAX score (18 ± 7 vs. 28 ± 11 , $p < 0.001$) were different between two groups.

Univariate logistic regression showed that age, COPD, red blood cell distribution width (RDW), urea, initial troponin I, peak postoperative troponin I, left atrial diameter, interventricular septum, and SYNTAX score were significantly associated with the frequency of PoAF following CABG (Table 3). A multivariate logistic regression analysis was performed to determine the independent predictors of PoAF. Age [β : 0.088, $p < 0.023$, OR: 1.092, 95% CI (1.012–1.179)], COPD [β : 2.222, $p < 0.003$, OR: 9.228, 95% CI (2.150–39.602)], and SYNTAX score [β : 0.130, $p < 0.002$, OR: 1.139, 95% CI (1.050–1.235)] were independently associated with PoAF (Hosmer and Lemeshow Test; $p < 0.602$, Nagelkerke R Square: 0.522) (Table 4).

An ROC curve analysis was used to determine a cut-off value for SYNTAX score (Fig. 1). SYNTAX score > 18.75 had 85.7% sensitivity and 55.1% specificity to predict PoAF (area under curve: 0.756, $p < 0.001$, 95% CI (0.645–0.868)).

Discussion

With this study we observed that advanced age, COPD, and SYNTAX score were independent predictors of PoAF in patients

Table 2. Comparison of variables between postoperative AF negative/positive groups

	Postop AF (-) n=63	Postop AF (+) n=31	P		Postop AF (-) n=63	Postop AF (+) n=31	P
Age, years	59±8	66±8	0.001	CRP, mg/dL	0.85 (9.21–0.12)	1.11 (11.2–0.17)	0.192
Gender, n (male %)	44 (71)	27 (87)	0.142	Urea, mg/dL	37±11	44±15	0.013
Hypertension, n (%)	35 (57)	22 (71)	0.297	Creatinine, mg/dL	0.78 (4.30–0.39)	0.90 (7.80–0.51)	0.012
Diabetes mellitus, n (%)	29 (46)	12 (38)	0.605	LDL-C, mg/dL	130±40	125±36	0.653
Current smoking, n (%)	33 (54)	17 (54)	1	HDL-C, mg/dL	40±9	38±9	0.285
Hyperlipidemia, n (%)	17 (27)	4 (12)	0.187	TG, mg/dL	186±94	153±55	0.110
Previous MI, n (%)	16 (25)	13 (41)	0.178	Initial Troponin I, ng/mL	0.01 (1.52–0)	0.02 (22–0)	0.091
Previous CHF, n (%)	16 (25)	9 (29)	0.934	Pre-op peak Troponin I, ng/mL	0.01 (50–0)	0.05 (29–0)	0.133
Chronic renal failure, n (%)	1 (1.6)	2 (6)	0.257	Post-op peak Troponin I, ng/mL	5.1 (50–0)	4.6 (50–0.52)	0.346
Previous stroke, n (%)	6 (9)	5 (16)	0.498	LVEF, %	55 (65–30)	55 (65–20)	0.403
PAD, n (%)	3 (4)	1 (3)	1	LVESD, cm	3.1 (5.5–2.4)	3.3 (5.2–2.8)	0.082
COPD, n (%)	6 (9)	15 (48)	<0.001	LVEDD, cm	4.96±0.48	5.07±0.53	0.320
Stable angina pectoris, n (%)	41 (66)	14 (45)	0.086	LAD, cm	3.6±0.3	3.8±0.3	0.013
Non STE ACS, n (%)	21 (33)	17 (54)	0.086	Septum, cm	1 (1.4–0.6)	1.1 (1.6–0.7)	0.047
Post-op MI, n (%)	34 (54)	20 (66)	0.397	E wave, mm/sn	99±17	101±21	0.627
Three or more stenotic vessels, n (%)	30 (48)	18 (58)	0.509	A wave, mm/sn	91±17	95±19	0.337
Laboratory				E' wave, cm/sn	10±1.9	10±1.8	0.765
WBC, µL	8.3±2.2	8.1±2.2	0.620	E/A ratio	1.14±0.34	1.14±0.46	0.942
Hemoglobin, g/dL	13.5±1.5	13.1±1.5	0.261	E/E' ratio	9.8±1	9.9±2.3	0.673
Platelet, 10 ³ /µL	231±57	253±68	0.105	Posterior wall, cm	1 (1.3–0.8)	1 (1.7–0.8)	0.061
Mean platelet volume, fL	7.4±0.9	7.5±0.9	0.600	Syntax Score	18±7	28±11	<0.001
Red cell distribution width, %	15±1.2	15±1.4	0.032				

A wave - late ventricular filling velocity; AF - atrial fibrillation; CHF - congestive heart failure; COPD - chronic obstructive pulmonary disease; CRP - C reactive protein; E wave - early ventricular filling velocity; E' - left ventricular tissue Doppler early diastolic velocity; HDL-C - high-density lipoprotein cholesterol; LAD - left atrial diameter; LDL-C - low-density lipoprotein cholesterol; LVEDD - left ventricle end-diastolic diameter; LVEF - left ventricle ejection fraction; LVESD - left ventricle end-systolic diameter; MI - myocardial infarction; Non-STE-ACS - non-ST-elevation acute coronary syndrome; PAD - peripheral artery disease; Pre-op - preoperative; Post-op - postoperative; TG - triglycerides; WBC - white blood cells
Unpaired t-test or Mann-Whitney U test were used to compare continuous variables as appropriate. Fisher's exact and continuity correction (Yate's correction) tests were used compare categorical variables

undergoing isolated on-pump CABG surgery. Additionally, a SYNTAX score of >18.75 predicted PoAF with a sensitivity of 85.7% and a specificity of 55.1%. To the best of our knowledge, this is the first study reporting that the SYNTAX score is associated with PoAF incidence in this patient population.

Atrial fibrillation is the most common arrhythmia after cardiac surgery. Despite improved surgical, myocardial protection, and anesthetic techniques, atrial fibrillation is still frequently observed in the elderly patients undergoing cardiac surgery (4). The incidence of postoperative atrial fibrillation following CABG surgery is seen in 25%–40% of cases. However, its frequency reaches to 62% following combined coronary artery bypass grafting and valve surgery (19). As a consequence of PoAF mortality and morbidities like embolic events increase and the duration of hospitalization is prolonged (20). The risk of PoAF in valvular and combined surgery, including coronary and valvular,

was reported to be higher than that in coronary surgery alone. Mariscalco et al. (21) identified the PoAF rates as 22.9%, 39.8%, and 45.2% for the isolated CABG, valve surgery, and combined surgery, respectively. PoAF is more frequent during cardiac surgery than during non-cardiac surgery (22). In a meta-analysis by Møller et al. (23), on-pump and off-pump CABG were compared in terms of PoAF and was reported to be lower in patients undergoing off-pump surgery. In our study patients, the incidence of PoAF was 33%, which is consistent with the previous reports.

Among the parameters that were mentioned in previous reports, decline in renal functions, RDW, left atrial size, left ventricular hypertrophy, and perioperative troponin I were univariate predictors in our study; however, they were not significant in multivariate analysis (24–28). Likewise, in our study, age had been reported as a major predictor of PoAF and the incidence of PoAF increases progressively after the age of 70 years (29).

Table 3. Univariate analysis of postoperative AF frequency

	OR	95% CI		OR	95% CI
Age, years	1.103	1.038–1.173	Platelet	1.006	0.999–1.013
Gender	2.761	0.845–9.028	Mean platelet volume	1.127	0.724–1.755
Hypertension	1.816	0.719–4.588	Red cell distribution width	1.410	1.013–1.964
Diabetes mellitus	0.719	0.299–1.730	Syntax score	1.131	1.058–1.210
Current smoking	1.030	0.432–2.455	CRP	1.155	0.897–1.487
Hyperlipidemia	0.392	0.119–1.288	Urea	1.041	1.006–1.077
Previous MI	2.076	0.834–5.171	Creatinine	1.662	0.745–3.708
Previous CHF	1.176	0.450–3.077	Initial Troponin I	4.928	1.076–22.562
Chronic renal failure	4.207	0.366–48.30	Pre-op peak Troponin I	0.936	0.953–1.045
Previous stroke	1.763	0.492–6.310	Post-op peak Troponin I	1.037	1.001–1.075
PAD	0.720	0.065–6.574	LVEF	0.973	0.935–1.012
COPD	8.750	2.919–26.22	LAD	4.878	1.313–18.120
Stable angina pectoris	0.422	0.175–1.018	E wave	1.006	0.983–1.029
Non STE ACS	2.371	0.982–5.724	A wave	1.012	0.988–1.037
Post-op MI	1.647	0.664–4.088	E wave	1.035	0.829–1.291
Three or more stenotic vessels	1.477	0.619–3.525	E/E' ratio	1.060	0.812–1.384
WBC	0.951	0.781–1.158	Septum	53.369	1.630–1949
Hemoglobin	0.853	0.646–1.125	Posterior wall	26.595	0.626–1130.5

A wave - late ventricular filling velocity; AF - atrial fibrillation; CHF - congestive heart failure; COPD - chronic obstructive pulmonary disease; CRP - c reactive protein; E wave - early ventricular filling velocity; E' - left ventricular tissue Doppler early diastolic velocity; LAD - left atrial diameter; LVEF - left ventricle ejection fraction; MI - myocardial infarction; Non STE ACS - non ST elevation acute coronary syndrome; PAD - peripheral artery disease; Pre-op - pre-operative; Post-op - post-operative; WBC - white blood cells
Multivariate logistic regression analysis to determine the independent components of PoAF

With advanced age, atrial physiology, stiffness, and atrial excitation are affected (30, 31). Age-related changes, including atrial fibrosis and accumulation of amyloid, can cause intraatrial re-entry, which leads to the development of AF (32). Co-morbid conditions increase with advanced age, and this is another reason for more frequent AF in the elderly (33). There was not a hard limit for age in our study, and PoAF increased in parallel with the patient age. This finding is not surprising since age is a risk factor for many cardiovascular pathologic conditions. Our patients' population was younger than the studies mentioned above; however, the incidence of PoAF was similar. This may have resulted from our inclusion of patients with non-STE-ACS in addition to elective CABG. The pathophysiologic mechanisms in acute coronary syndromes might have also interfered in our study with the enrollment of patients with non-STE-ACS. We think that in a younger patient population atrial ischemia/infarct, elevated end-

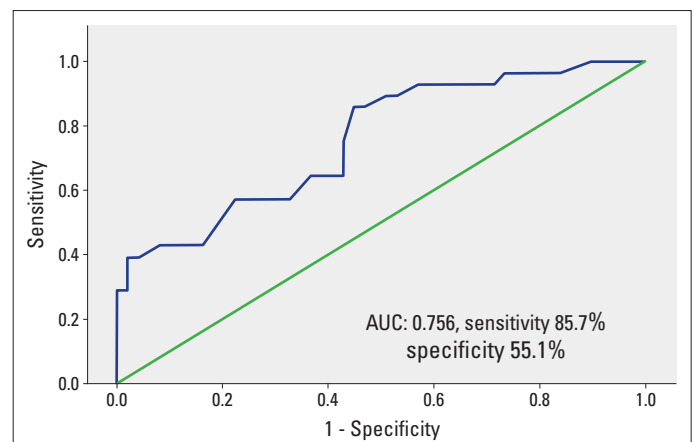
Table 4. Multivariate analysis for independent predictors of post-operative atrial fibrillation after coronary artery bypass graft surgery

	β	P	OR	95% CI
Age, years	0.088	0.023	1.092	1.012–1.179
COPD	2.222	0.003	9.228	2.150–39.602
Syntax score	0.130	0.002	1.139	1.050–1.235

COPD - chronic obstructive pulmonary disease

diastolic pressures, and decreased ejection fraction resulted in AF frequency, which was similar to elderly patients.

In our patient population, COPD was an independent predictor of PoAF, which is also consistent with previous studies. The incidence of PoAF increased to 43% in the presence of COPD (29). Mathew et al. (29) have showed that COPD increased the incidence of both persistent and paroxysmal atrial fibrillation. Post-operative hypoxemia was showed to be the most common cause of cardiac arrhythmias (34). However, the exact mechanism that

**Figure 1. ROC analysis for SYNTAX score with cut-off. Area under curve (AUC), 95% CI, and P were reported**

causes development of PoAF in COPD patients remains unclear.

SYNTAX score shows the complexity of coronary artery disease and is able to predict the rate of major advanced cardiovascular events (MACE) after revascularization (6, 7, 35). SYNTAX score has also been shown to predict short- and long-term adverse events following revascularization (7). However, the relationship between the SYNTAX score and PoAF is poorly addressed. Interestingly, SYNTAX score was also an independent predictor of PoAF in our study. In a study by Fukui et al. (12), the combination of SYNTAX score and EUROSCORE 2 was reported to predict early adverse events in patients undergoing CABG. But contrary to our findings, there was no significant difference between high and low SYNTAX score groups for the development of PoAF. However, they used off-pump surgical technique for almost all of their patients and incidence of AF is lower in patients undergoing off-pump surgery (23, 36).

SYNTAX score was established to grade anatomic complexity of the lesions and decide on the re-vascularization strategy; however, its association with major adverse cardiac and cerebrovascular events led us to design this study (37). It is obvious that it is not possible to explain the increased incidence of PoAF with a single scoring system, but SYNTAX score was one of the independent factors in multivariate analysis.

Study limitations

The main limitations of this study are the relatively small sample size and the non-randomized nature of the study. Also, left atrial volume was not calculated and long-term clinical course of the patients is not recorded. In the in-patients unit, electrocardiograms were recorded daily, which could have resulted in missing some of the paroxysmal AF episodes. Inflammatory markers were not measured in our study, although predictive role of those for PoAF had been shown in previous studies. Additionally, all CABG operations were not performed by a single operator or surgical team and this may also be a confounding factor.

Conclusion

In our study, we showed that SYNTAX score was higher in patients with PoAF. SYNTAX score might be helpful for the prediction of PoAF in patients undergoing isolated on-pump CABG.

Conflict of interest: None declared.

Peer-review: Externally peer-reviewed.

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