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Short and Intermediate Term Clinical Outcomes of Patients with Unprotected Left Main Coronary Artery Stenting

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ABSTRACT

Background: Unprotected left main coronary artery disease was defined as having a left main coronary artery stenosis of greater than 50% and the absence of bypass grafts to the left anterior descending or left circumflex coronary arteries.
Objective: The purpose of this study was to assess major adverse cardiovascular events (MACE) and its relationship to syntactic score in connection to short and intermediate term clinical outcomes of Percutaneous Coronary Intervention (PCI) in unprotected left main coronary artery (LMCA) illness.
Patients and methods: A total of 50 patients with unprotected left main coronary artery (ULMCA) disease were enrolled in a prospective study and received drug-eluting stent (DES) implantation at Cardiology Department, Mansoura University Hospital, and National Heart Institute, Egypt from June 2018 to December 2019.
Result: ROC curve analysis showed that Syntax score was the best method as a marker for prediction of MACE; it had sensitivity of 73.3%, specificity of 77.1% at AUC of 0.770 with cut off value >32.5. On univariate analysis, age, ST-elevation myocardial infarction (STEMI), osteal, mild, distal, as well as all LM length disease were risk factors of MACE (P <0.05). However, on multivariate analysis, osteal, all LM disease, STEMI, and high SYNTAX score were significant predictors of MACE (P <0.05).
Conclusion: ULMCA stenosis can be successfully treated by stenting. Stenting of distal LM lesions with low or intermediate SYNTAX scores by site evaluation, PCI with drug-eluting stents, and short- and intermediate-term follow-up, results in a lower incidence of mortality, stroke, or myocardial infarction.
Keywords: Clinical outcomes, LMCA, PCI, Syntax score.

INTRODUCTION

Unprotected left main coronary artery disease was defined as a left main coronary artery stenosis of less than 50% and a lack of bypass grafts placed on either the left circumflex or left anterior descending arteries [(1)]. Left main stem illness was progressively recognized during the 1960s, the age of regular coronary angiography, and individuals with this ailment were quickly classified as a "high-risk" category [(2)].

Early study found that performing coronary angiography on persons with left main stem disease was dangerous, with a fatality rate of 10%-15% [(3)]. The large-bore catheters in use at the time, which had a higher risk of injuring the left main stem and rupturing plaque, were primarily to blame for this. Coronary bypass surgery was used to treat left main coronary artery disease in the early 1970s. People quickly realized that surgery offered a survival benefit over the course of this fatal condition [(4)].

Andreas Gruentzig employed the first balloon angioplasty in 1977, which was a success, to treat left main stem disease [(5)]. Despite the initial enthusiasm for a percutaneous treatment for this condition, early reports of balloon angioplasty for left main coronary artery disease were connected with high procedural mortality and exceedingly poor long-term survival, which led to the practice's discontinuance [(6)].

The development of coronary stents in the early 1990s revived interest in percutaneous coronary intervention for left main stem disease, but high restenosis rates with bare-metal stents produced disappointing outcomes, and stenting was mostly reserved for patients who couldn't afford surgery [(7)]. The use of drug-eluting stents has significantly reduced restenosis rates, transforming the therapeutic landscape and rekindling interest in percutaneous left main intervention in the modern era [(8)]. Recent studies using both first- and second-generation drug-eluting stents have started to put surgery's dominance in the management of left main stem disease under scrutiny [(9)].

The purpose of this study was to assess major adverse cardiovascular events (MACE) and its relationship to syntactic score in connection to short and intermediate term clinical outcomes of percutaneous coronary intervention (PCI) in unprotected left main coronary artery (LMCA) illness.

PATIENT AND METHODS

A total of 50 patients with unprotected left main coronary artery (ULMCA) disease were enrolled in a prospective study and received drug-eluting stent (DES) implantation at Cardiology Department, Mansoura University Hospital, and National Heart Institute, Egypt, from June 2018 to December 2019.

According to syntax score all included Patients were divided into 2 groups:

- ***Group I*** included 31 patients with mean age 59.71 years old and their syntax <33 (low and intermediate syntax).
- ***Group II*** included 19 patients with mean age 64.74 years old and their syntax > 33 (high syntax) [(10)].

Inclusion criteria: Patients with significant ostio-proximal lesions of the LAD or LCX that have a MEDINA Class of 1:1:1, 1:1:0, 1:0:1, OR 0:1:1 and

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were anticipated to be treated with LMCA to LAD or LMCA to LCX stent placement due to favorable lesion angulation, patients with LMCA stenosis greater than or equal to 50% and clinical symptoms or objective evidence of myocardial ischemia [11,12]. Stenting of unprotected LMCA stenosis has been attempted in some patients when surgery was contraindicated or very high risk due to non-cardiac comorbidities (low syntax 0-22, intermediate 23-32, and high syntax >33), and the syntax score is an angiographic grading tool to assess the complexity of coronary artery disease [13]. The SYNTAX score is calculated using computer software made up of sequential and interactive self-guided questions [14].

Exclusion criteria: Patients with a NYHA functional class greater than two [15], those in cardiogenic shock, those who have survived ventricular tachycardia or cardiac arrest, and those with mechanical myocardial infarction sequelae that have been validated by echocardiography, patients with ejection fraction (EF) less than 30%, recent thromboembolic stroke, acute infection processes, and patients with significant comorbidities are all contraindications to antiplatelet therapy (advanced renal failure or advanced liver cell failure).

All patients and controls included in the study were subjected to:

Full Detailed History: Age, sex, history of typical chest pain and evaluation of CAD risk factors (DM, HPN, Dyslipidemia) due to its correlation and impact on outcome.

Full Clinical Examination: Focusing on general examination vital signs (pulse and blood pressure), and local cardiac examination (sign of left side heart failure and pulmonary edema).

Laboratory Investigation: Cardiac enzyme at acute stage, evaluation of complete lipid profile, serum creatinine (a blood measurement) is an important indicator of kidney function, echocardiography and coronary angiography.

Ethical Consideration:

This study was ethically approved by the Institutional Review Board of the Faculty of Medicine, Mansoura University. Written informed consent was obtained from all participants. This study was executed according to the code of ethics of the World Medical Association (Declaration of Helsinki) for studies on humans.

Statistical Analysis

Statistical Program for Social Science (SPSS) version 25.0 for Windows was used to analyze the data (SPSS Inc., Chicago, IL, USA). Qualitative data were defined as numbers and percentages. Chi-Square test and Fisher's exact test were used for comparison between categorical variables as appropriate. Quantitative data were tested for normality by Kolmogorov-Smirnov test. Normal distribution of variables was described as mean and SD, and independent sample t-test was used for comparison between groups. Also, a predictive model's sensitivity, specificity, positive and negative predictive values, together with ROC (receiver operating characteristic) curves were used. P value ≤ 0.05 was considered to be statistically significant.

RESULTS

Figure 1 displays a CONSORT flowchart of the research population. A total 50 of 57 patients with unprotected left main coronary artery (ULMCA) disease were included in the study. The patients visited the Cardiology Department at Mansoura University Hospital and the National Heart Institute in Egypt, from June 2018 to December 2019. Of 7 patients who were excluded from the study, 3 did not meet the inclusion criteria and 4 declined. Thus, 50 patients were analyzed and classified to 31 patients with low and intermediate syntax (*Group I*) and 19 patients with high syntax (*Group II*).

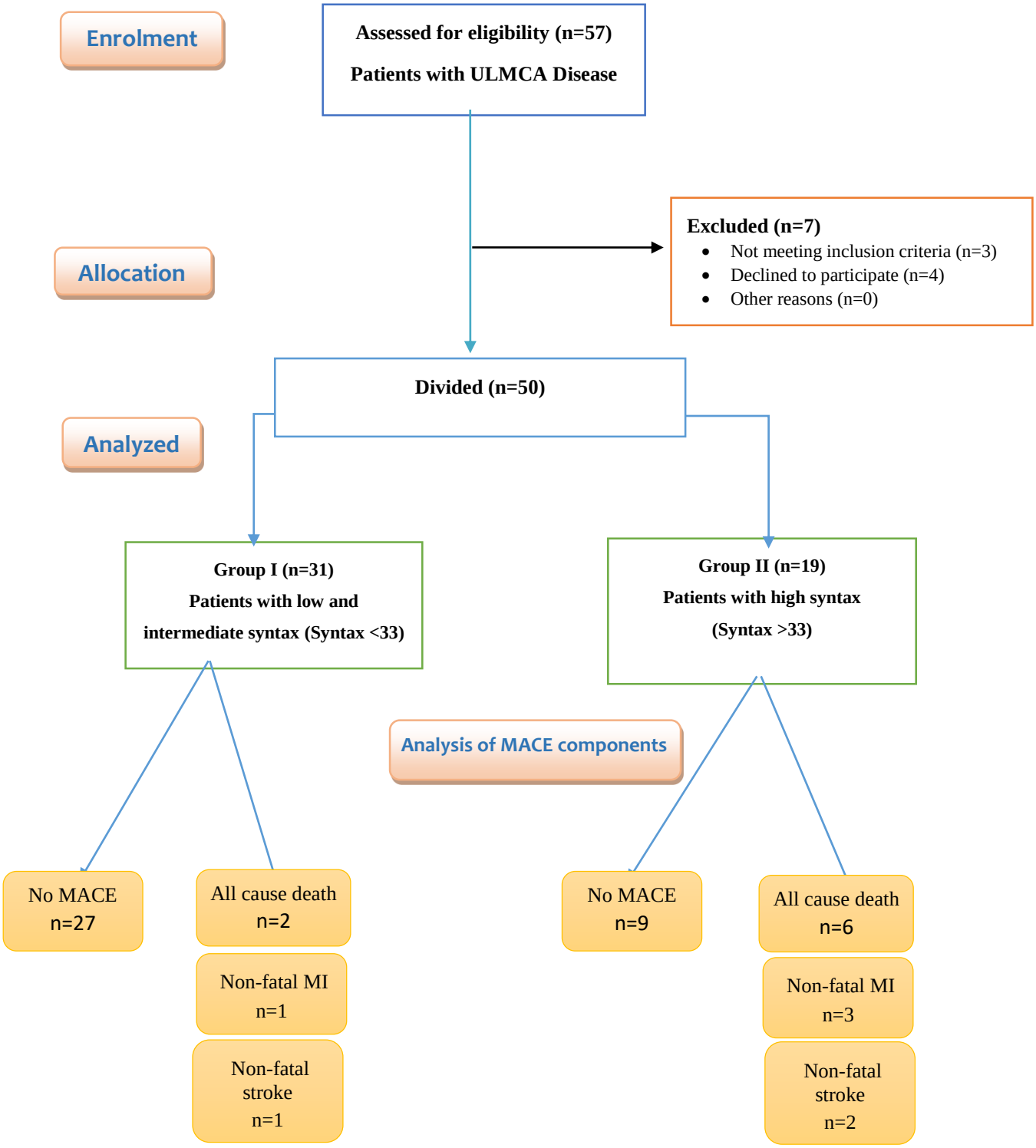

Figure (1): Flowchart of the studied patients.

In the current study, the mean age of the included cases was 59.71 and 64.74 years in SYNTAX <33 and >33, respectively. Age differences across the examined groups were significantly different (P-value 0.046). While gender, diabetes mellitus, hypertension, smoking, dyslipidemia, family history, ST elevation myocardial infarction, non-ST ACS, and CCS did not significantly differ across the study groups (P >0.05) (**Table 1**).

Table (1): Analysis of demographic data, medical history, risk factors and ECG findings in the 2 study groups**.**

Variable		Groups				Test of significance
		SYNTAX <33 (N=31)		SYNTAX ≥33 (N=19)		
Age (years)		59.71 ± 8.14		64.74 ± 8.88		t= -2.204 P= 0.046*
Gender	**Male**	8	25.8%	6	31.6%	χ^2= 0.195 P= 0.659
	Female	23	74.2%	13	68.4%	
DM		21	67.7%	12	63.2%	χ^2= 0.110 P= 0.740
HTN		20	64.5%	14	73.3%	χ^2= 0.455 P= 0.501
Smoking		18	58.1%	9	47.9%	χ^2= 0.543 P= 0.461
Dyslipidemia		28	90.3%	15	78.9%	χ^2= 1.266 P= 0.261
Family history		5	16.1%	1	5.3%	χ^2= 1.317 P= 0.257
STEMI		4	12.9%	5	26.3%	χ^2= 1.436 P= 0.231
Non-ST ACS		8	25.8%	2	10.5%	χ^2= 1.719 P= 0.190
CCS		19	61.3%	12	63.2%	χ^2= 0.017 P= 0.895

P: probability. *: significant.

Also, no significant difference was detected between the study groups regarding EF. It had a mean of 49.94 and 46.42% in both groups respectively (P-value 0.123). Other clinical and laboratory parameters did not differ between the two groups **(Table 2)**.

Table (2): Analysis of clinical, laboratory and echo data in the two study groups.

Variable	Groups		t	P-value
	SYNTAX <33 (N=31)	SYNTAX ≥33 (N=19)		
SBP (mmHg)	133.23 ± 21.97	124.74 ± 24.58	1.268	0.211
DBP (mmHg)	78.71 ± 14.77	76.32 ± 15.71	0.543	0.590
HR (B/m)	78.42 ± 13.51	85.26 ± 13.17	-1.775	0.086
LDL (U/L)	150.06 ± 36.45	135.11 ± 32.61	1.163	0.251
Creatinine (mg/dl)	0.94 ± 0.22	0.91 ± 0.21	0.315	0.754
EF (%)	49.94 ± 6.49	46.42 ± 8.22	1.678	0.123

Regarding the diseased arterial segments, it did not constitute a significant difference between the two groups (P>0.05), apart from distal LM, LM LAD LCX, LAD, and LCX lesions which were more prevalent in cases with higher SYNTAX scores (P values 0.041, 0.001, 0.041, and 0.002, respectively) **(Table 3).**

Table (3): Analysis of site of arterial affection in the two study groups.

Variable	Groups				χ^2	P-value
	SYNTAX <33 (N=31)		SYNTAX ≥33 (N=19)			
Osteal LM	6	19.4%	2	10.5%	0.683	0.409
Mid LM	4	12.9%	5	23.6%	1.436	0.231
Distal LM	25	80.6%	19	100%	4.179	0.041*
Osteal Mid-LM	1	3.2%	0	0%	0.625	0.429
Mid distal LM	3	9.7%	3	15.8%	0.417	0.519
All LM	0	0%	2	10.5%	3.399	0.065
LM LAD	19	61.3%	8	42.1%	1.746	0.186
LM LCX	1	3.2%	0	0%	0.625	0.429
LM LAD LCX	4	12.9%	11	57.4%	11.355	0.001*
LAD lesion	25	80.6%	19	100%	4.179	0.041*
LCX lesion	5	16.1%	11	57.9%	9.443	0.002*
RCA lesion	3	9.7%	4	21.2%	1.266	0.261

*: significant

Also, there were significant differences among SYNTAX <33 and SYNTAX ≥33 studied groups regarding over all MACE, all cause death, no MACE, and time of MACE (P<0.05), while there was no significant differences among the studied groups regarding IVUS, non-fatal MI and non-fatal stroke (P>0.05) **(Table 4).**

Table (4): Analysis of IVUS use, MACE and Time of MACE in the two study groups.

Variable	Groups				χ^2	P value
	SYNTAX <33 (N=31)		SYNTAX ≥33 (N=19)			
IVUS	6	19.4%	4	21.05%	0.009	0.923
Overall MACE	4	12.9%	11	57.9%	11.355	0.001*
Analysis of MACE components						
All cause death	2	6.5%	6	31.9%	5.534	0.019*
Non-fatal MI	1	3.2%	3	15.8%	2.526	0.112
Non-fatal stroke	1	3.2%	2	10.5%	1.113	0.291
No MACE	27	87.1%	9	47.4%	15.753	0.001*
Time of MACE						
Between 1-3 months	0	3%	3	15.8%	12.861	0.012*
Between 4-6 months	2	6.5%	6	31.6%		
Between 7-9 months	1	3.2%	2	10.5%		
Between 10-12 months	1	3.2%	0	0%		

*: significant

Additionally, the application of IVUS did not affect MACE rates, although it occurred in 32.5% of cases in no IVUS group, while it was occurred in 20% of case in the IVUS group (P-value 0.659) **(Table 5).**

Table (5): Analysis of MACE according to IVUS

Variable		Groups				χ^2	P-value
		No IVUS (N=40)		IVUS (N=10)			
MACE	Absent	27	67.5%	8	80%	0.195	0.659
	Present	13	32.5%	2	20%		

*: significant.

Moreover, ROC curve analysis showed that SYNTAX was the best method as a marker for prediction of MACE; it had sensitivity of 73.3%, specificity of 77.1% at AUC of 0.770 with cut off value >32.5 **(Table 6, Figure 2)**.

Table (6): Analysis of diagnostic criteria of SYNTAX in prediction of MACE.

Variable	SYNTAX
AUC	0.770
Cut off point	>32.5
Sensitivity	73.3%
Specificity	77.1%
NPV	75.4%
PPV	78.8%
ACCURACY	75.4%
P-value	0.003*

AUC: Area under curve, PPV: positive predictive value, NPV: Negative predictive value.

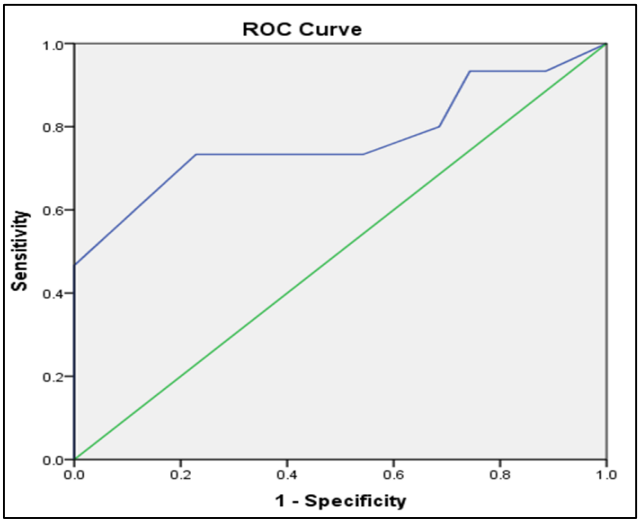

Figure (2): ROC analysis of SYNTAX in prediction of MACE.

On univariate analysis, age, STEMI, osteal, mild, distal, as well as all LM length disease were risk factors of MACE (P<0.05). However, on multivariate analysis, osteal, all LM disease, STEMI, and high SYNTAX score were significant predictors of MACE (P<0.05) **(Table 7).**

Table (7): Univariate and multivariate analysis of predictors of MACE.

Variables	Univariate analysis	Multivariate analysis		
		B	95% CI	P value
Age	0.038*	0.528	0.398 – 1.05	0.362
Gender	0.659	---		
DM	0.559			
HTN	0.429			
Dyslipidemia	0.068			
Smoking	0.107			
Family history	0.019			
STEMI	0.002*	1.517	1.241 - 2.28	0.034*
Non-ST ACS	0.062	---		
CCS	0.117			
Osteal LM	0.016*	2.176	1.78 - 2.835	0.031*
Mid LM	0.004*	0.736	0.428- 1.328	0.165
Distal LM	0.008*	0.528	0.398 – 1.05	0.362
Osteal Mid-LM	0.055	---		
Mid distal LM	0126			
All LM	0.002*	3.987	3.426-4.876	0.003*
SBP (mmHg)	0.138	---		
DBP (mmHg)	0.445			
HR (B/m)	0.058			
LDL (U/L)	0.315			
creatinine (mg/dl)	0.177			
EF (%)	0.341			
SYNTAX	0.005*	4.68	3.13-5.67	0.001*

CI: confidence interval. *: statistically significant (P<0.05). B: regression coefficient.

DISCUSSION

In some patient subgroups, coronary stenting is becoming more widely accepted as a viable therapy option for unprotected left main disease. But, long-term results might differ [16]. In most of related studies, SYNTAX score was classified into 3 groups: <22, 22-32, and >32. However, we divided it into two categories only in our study (<33 and >33) to make data presentation simpler.

In our study, the mean age of the included cases was 59.71 and 64.74 years in SYNTAX <33 and >33 respectively. Older age was associated with higher SYNTAX score (P-value 0.046). Other authors also confirmed our findings as the mean age of the included cases was 63, 66, and 68 years for the three SYNTAX groups respectively. Like ours, significantly older age was detected in the group with highest SYNTAX scores (P-value 0.004) [17]. Another study found that higher SYNTAX scores were present in older population (P-value 0.07). The mean age of the three SYNTAX groups was 67.6, 71.8, and 72.4 years, respectively [16].

In the current study, no significant difference was detected between the two study groups regarding patient gender (P-value 0.659). Males represented 25.8 and 31.6% of cases in both groups respectively. Our study had a higher proportion of female sex compared to other studies. Another study also reported no significant difference between SYNTAX groups regarding gender (P-value 0.733). This comes in line with our findings. Nevertheless, the proportion of males in that study was 78, 70, and 77% in the three groups respectively, which was significantly higher than our male candidates [18]. Conversely, another study has reported that the group with highest SYNTAX percentile had significant larger proportion of males (P-value 0.0008). Males represented 43.1, 59.8, and 74.3% of the three groups, respectively [16].

In our study, there was no significant difference between SYTAX score groups regarding systemic comorbidities including diabetes and hypertension (P values 0.740 and 0.501, respectively). **Capodanno *et al.* [17],** also reported results similar to ours. The prevalence of diabetes and hypertension did not significantly differ between different SYNTAX scores (P values 0.309 and 0.481, respectively). In another investigation, the presence of either diabetes or hypertension did not differ across the SYNTAX groups (P values 0.8 and 0.64, respectively) [16].

Our research found no discernible change in dyslipidemia between the two groups (P-value 0.261). In both groups, it was present in 90.3 and 78.9% of instances, respectively. According to a different research, there were no appreciable differences in the lipid profiles of the three SYNTAX groups. In the three groups, hyperlipidemia was observed in 69.2, 75.6, and 70.3% of patients, respectively [16].

In the current study, positive family history of IHD did not differ significantly between the three groups (P-value 0.257). It was positive in 16.1 and 5.3% of cases in both groups respectively. Other authors have also confirmed our findings regarding family history. It was positive for IHD in 21.5, 17.1, and 11.1% of cases in the three groups, respectively [16].

According to our study, smoking did not substantially differ across the study groups (P-value 0.461). According to other authors' reports, there was no discernible change in the research groups' smoking behaviors. It was positive in 17, 18, and 15% in the three SYNTAX groups respectively (P-value 0.516) [18]. On the contrary, another study reported a significant difference between SYNTAX score cases according to smoking history (P-value 0.008). Surprisingly, smoking was more prevalent in cases with lower SYNTAX scores (57, 44, and 33% in the three groups respectively) [19].

Between the two groups, there was no difference in the clinical presentation of our patients (P >0.05). The most frequent presentation was chronic coronary syndrome in both groups (61.3 and 63.2%, respectively). Another research found no change in clinical presentation across the three SYNTAX groups that was statistically significant (P-value 0.604). However, the most frequent presenting symptom in the three groups was stable angina (38.8, 37.4, and 46.6% of patients in each group, respectively) [20].

No discernible change in EF between the study groups was seen in the current investigation. In both groups, it had a mean of 49.94 and 46.42%, respectively (P-value 0.123). In a different research, the group with greater SYNTAX scores saw a noticeable decline in ejection percent (P-value 0.02). In the three groups, EF 20% was found in 3.1%, 2.4%, and 12.2% of instances, respectively [16].

Regarding the diseased arterial segments in the current study, it did not constitute a significant difference between the two groups (P >0.05), apart from distal LM, LM LAD LCX, LAD, and LCX lesions which were more prevalent in cases with higher SYNTAX scores (P values 0.041, 0.001, 0.041, and 0.002, respectively). Another study has reported that LMCA with two or more vessel disease was more prevalent in group with highest SYNTAX score (P <0.001), [17]. Other authors reported that there was no significant difference between the affected vessels between SYTAX groups (P >0.05) [20].

In our study, there was no discernible difference between the two groups in terms of having RCA illness (P-value 0.261). In both groups, it was found in 9.7 and 21.2% of cases, respectively. Similar to this, another research found no difference between SYNTAX groups in terms of RCA illness (P-value 0.878). In the three groups, the prevalence of RCA illness was 51.5, 49.6, and 48.3% of patients, respectively [20]. On the other hand, according to a different research, there was a significant difference between the SYNTAX group and RCA illness (P-value 0.03). In the three groups, it was present in 7.7, 23.2, and 18.9% of cases, respectively [16]. According to a different research, patients with

higher SYNTAX scores were considerably more likely to have RCA disease (70%, P-value 0.001), in 56 and 44% of cases in the other two categories, RCA affection, respectively [18].

There was a considerable difference in major adverse cardiac and cerebrovascular event (MACE) between the two groups in the current investigation. When SYNTAX was greater than 33, the MACE rate increased from 12.9% to 57.9% (P-value 0.001). A substantial increase in all-cause mortality was also seen in the same group (31.69 vs. 6.5% in SYNTAX 33; P-value 0.019). However, there was no discernible difference between the two groups in terms of non-fatal MI or stroke. SYNTAX score exhibited a sensitivity of 73.3% and a specificity of 77.1% in predicting MACE with a cut-off value of 32.5.

In the ARTS II (Arterial Revascularization Therapies Study part II) experiment, which included patients with multivessel coronary disease, the usefulness of the SYNTAX score was initially evaluated [21]. When compared to the prior angiographic categorization used by the American College of Cardiology/American Heart Association, the SYNTAX score demonstrated a greater capacity to predict both the short-term and long-term risks of MACE. Studies on patients with ULMCA stenosis provided additional evidence that the SYNTAX score can accurately predict myonecrosis after PCI [17, 22] or death following PCI or CABG [23].

Patients who underwent Percutaneous Coronary Intervention or Coronary Artery Bypass Grafting for severe coronary artery disease and ULMCA had a higher risk of developing MACE than those with lower or intermediate SYNTAX scores, according to a study comparing the two procedures. Therefore, there was statistical significance in the interaction between the therapy type and SYNTAX score groups. The results of this study indicate that medical professionals may utilize the SYNTAX score to help them decide on the best suitable course of therapy [24]. In a different research, patients with higher SYNTAX scores had higher rates of mortality and MACEs (7.7, 9.8, and 21.6% of cases in the three groups, respectively; P-value 0.04) and 7.7, 14.6, and 23.3% of cases in the three groups, respectively; P-value 0.03). The same results were also observed after a long-term follow-up. Death occurred in 36.9, 50, and 59.5% of the three groups' cases, respectively, whereas MACE was found in 56.9, 69.5, and 77% of cases [16].

Also, a MACE rate of 10.6% at 450 days was observed by the FRIEND registry. According to **Biondi-Zoccai *et al.*** [25] comprehensive review and meta-analysis of 1278 patients, using drug-eluting stents to treat ULMCA lesions is linked to a 5.5% (3.3-7.7%) risk of mortality, a 16.5% (11.7-21.3%) MACE rate, and a 6.5% (3.7-9.2%) TLR rate.

However, the likelihood of MACE was, the same for patients in the CABG group with low, medium, and high scores (14.7, 12.0, and 10.9%, respectively; P >0.05). MACE rates were equal across participants in the CABG and PCI groups [27]. But, those with strong SYNTAX scores experienced a significantly higher event rate in the PCI group (P-value 0.01; significant interaction between SYNTAX and treatment group). A three-year follow-up revealed the same outcome [28].

In the ARTS II research, 306 patients received PCI for three-vessel disease, and the SYNTAX was also employed to treat 1292 lesions in these patients. When compared to the lowest tertile group (SS16; 5-year MACE-free rate: 80.1%), the intermediate (SS: 16–24) and high (SS>24) tertile groups exhibited similar decreased MACE-free survival rates (intermediate: 70.1%, log-rank P-value 0.02; high: 67.1%; P-value 0.001) [29].

The LEADERS study also classified the risk of 1707 all-comer patients receiving PCI using the SYNTAX score [30]. The potential of the SYNTAX SCORE to identify patients who are at highest risk of adverse events, regardless of clinical presentation, was recently demonstrated in the biggest assessment of the SYNTAX score in 6508 patients treated with PCI from seven contemporary coronary stent trials [31]. These results suggest that the SYNTAX may be beneficial for those with CAD at any stage. According to current recommendations, the SYNTAX should be used to determine whether a patient with MVD is a good candidate for PCI or CABG [32].

Age, STEMI, osteal, mild, distal, as well as all LM illness were risk variables for MACE in the current research on univariate analysis (P-value 0.05). However, osteal, all LM illness, STEMI, and SYNTAX score were significant predictors of MACE (P-value 0.05) on multivariate analysis. According to univariate analysis in another study, age was a significant risk factor for MACE in CAD (P-value 0.034). Additionally, the same study found that STEMI and high SYNTAX scores were also significant risk factors for MACE [20]. In a recent study, CABG and PCI for multi-vessel and unprotected left main coronary artery disease were compared using stents as a comparison tool (LMCAD). There was no statistically significant difference between PCI and CABG in terms of 30-day mortality (0.6% vs 1.1%, P-value 0.15), one-year mortality (3% vs 3.7%, p=0.18), or long-term mortality (8.1% vs 8.1%). However, PCI had a lower incidence of stroke than CABG (0.3% versus 1.5%, P-value 0.001). The two factors that had the most negative effects on PCI findings were diabetes and having a high SYNTAX score [33].

In the current study, the application of IVUS did not affect MACE rates, although it occurred in 32.5% of cases in no IVUS group, while it was 20% in the IVUS group (P-value 0.659). In order to determine the size of the conduit, the extent of the stent expansion, and the absence of stent malapposition, intravascular ultrasonography (IVUS) guidance is useful [34]. After propensity-score matching and adjustment, a subgroup analysis from the MAIN-COMPARE registry revealed

that IVUS guidance was linked to lower 3-year mortality compared to a traditional angiography-guided procedure (6.3% IVUS vs. 13.6% angiography, log-rank P-value 0.063, hazard ratio (HR): 0.54; 95% CI, 0.28-1.03) [35]. In comparison to angio-guided PCI, IVUS-guided PCI for patients receiving DES had a significantly decreased 3-year incidence of mortality (4.7% IVUS vs. 16% angiography, log-rank P-value 0.048, HR: 0.39; 95% CI: 0.15-1.02) [35].

CONCLUSION

In properly chosen patients, ULMCA stenting can be successfully performed. The selection of patients must take into account medical and surgical advice (Heart Team concept). It is possible to stent the LM with satisfactory short- and intermediate-term outcomes, and without significant technical challenges. Stenting of distal LM lesions with low or intermediate SYNTAX scores by site evaluation, PCI with drug-eluting stents, and short- and intermediate-term follow-up, results in a lower incidence of mortality, stroke, or myocardial infarction.

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