

Case Series

CONSECUTIVE UNPROTECTED LEFT MAIN PCI FOR PATIENTS PRESENTING WITH ACS

Sharma Mukesh Kumar¹, Ameta Deepak², Singh Anuraj³, Ranawat Yogendra Singh⁴

¹Sr. Professor and HOD, Department of Cardiology, RNT Medical College and Hospital, Udaipur, Rajasthan, India.

²Assistant Professor, Department of Cardiology, RNT Medical College and Hospital, Udaipur, Rajasthan, India.

^{3,4}Senior Resident, Department of Cardiology, RNT Medical College and Hospital, Udaipur, Rajasthan, India.

Received : 09/02/2025
Received in revised form : 05/03/2025
Accepted : 17/03/2025

Corresponding Author:

Dr. Anuraj Singh,
Senior Resident, Department of
Cardiology, RNT Medical College and
Hospital, Udaipur, Rajasthan, India.
Email: dr.anuraj84@gmail.com

DOI: 10.70034/ijmedph.2025.3.352

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (3); 1909-1912

ABSTRACT

Objective: The study aimed to evaluate the clinical outcomes of consecutive patients undergoing unprotected left main percutaneous coronary intervention (ULMPCI) for acute coronary syndrome (ACS) at a single center.

Materials and Methods: This prospective case series included 10 patients with ACS undergoing ULMPCI between January 2021 and June 2022 at RNT Medical College, Udaipur. Significant left main stenosis (>50% diameter reduction) was identified via angiography. Patients were pre-treated with aspirin and clopidogrel, received unfractionated heparin during PCI, and were managed post-procedure with dual antiplatelet therapy. Most underwent provisional stenting strategies with a focus on culprit-only intervention. Follow-up included monthly outpatient visits and treadmill stress testing. Procedural success was defined as achieving <20% residual stenosis with TIMI III flow and no major complications.

Results: The cohort consisted entirely of men, with a mean age of 53.72 years. Clinical presentation included NSTEMI (40%), STEMI (40%), and unstable angina (20%). 50% had left ventricular dysfunction, and all were Killip class I at presentation. 60% had bifurcation lesions; provisional stenting was the main strategy. Procedural success was 100%, with no in-hospital deaths. One cardiac death (10%) occurred within the first month post-PCI. At a mean follow-up of 7.6 months, most surviving patients demonstrated negative treadmill stress tests, indicating favorable ischemic outcomes.

Conclusion: ULMPCI for ACS patients can be performed safely and effectively by experienced operators, offering a life-saving alternative when CABG is not feasible or declined by patients. In cases of bifurcation lesions, a provisional stenting strategy appears to enhance long-term outcomes. However, larger studies with longer follow-up are needed to confirm these findings.

Keywords: PCI, Acute Coronary Syndrome (ACS), Coronary Intervention.

INTRODUCTION

Significant unprotected left main coronary artery (ULMCA) disease occurs in 5–7% of patients undergoing coronary angiography and patients with ULMCA disease treated medically have a 3-year mortality rate of 50%.^[1] studies has found that the survival advantage for PCI over medical therapy in patients with left main CAD was identical to the survival advantage for CABG over medical therapy. RCTs and meta-analyses evaluating outcomes of PCI versus CABG in SIHD patients with low-to-medium anatomic complexity of CAD and left main disease

that is equally suitable for surgical or percutaneous revascularization, have reported similar survival with PCI and CABG.^[2] unlike patients with stable angina, limited data is available on outcomes of patients undergoing unprotected left main percutaneous interventions for acute coronary syndrome (ACS).^[3]

MATERIALS AND METHODS

Patients

Data from consecutive patients undergoing LM PCI were prospectively collected from a single centre (RNT medical college Udaipur). Between January

2021 and June 2022, a total of 11 consecutive patients undergone LM PCI including one patient with previous CABG. 10 patients with UPLMPCI presented with ACS included. The patients provided written informed consent before the intervention.

A visually estimated diameter stenosis severity of >50% for left main disease has been used to define significant stenosis. Following angiography, the decision to perform PCI was taken after discussing therapeutic options with patients, based on contemporary practice guidelines. Most of the patients are offered CABG as first line option but undergo PCI considering their preferences as they were not willing for CABG. Revascularization strategies were finally determined by due consideration to coronary anatomy, hemodynamic condition, comorbidities and urgency of the situation.

Procedure

Patients presenting with ACS (NSTEMI and STEMI) scheduled for PCI received loading dose of aspirin and clopidogrel (300mg of each) as soon as possible. During the procedure, unfractionated heparin (100 U/kg) was administered to all patients. Gp IIb/IIIa inhibitors were used in majority of patients. All patients were put on dual antiplatelet treatment as per the guidelines.

Only culprit artery was stented in most of the patients. Stent placed in left main coronary either for disease in left main or for ostial LAD and circumflex lesions. The choice of the type of stent, the technique was decided on an individual basis by the operator. Bifurcation stenting was done as per standard guidelines with High pressure post dilatation, final balloon kissing and proximal optimization, when indicated.

Procedural success determined by successful deployment of stent in left main with less than 20% residual stenosis and TIMI III flow without major peri procedural complications like shock, stroke, revascularization (CABG surgery) or cardiac death.

Follow up

A prospective clinical follow-up done every month at the outpatient clinic. All patients underwent treadmill

Stress test before drafting the report at the end of study period. Deaths were classified as cardiac and non-cardiac. If cause was indeterminate, death considered cardiac.

RESULTS

A total of 10 patients were included in the study. Mean age of the patients was 53.72 years with range of 40 to 66 years. All patients were Men (100%). One (10%) patient was diabetics, Hypertension was present in 4(40%) patients. Clinical presentation was non-ST elevation myocardial infarction (NSTEMI) in 4 (40%) patients and ST elevation myocardial infarction (STEMI) in 4(40%) patients, 2(20%) patients present with unstable angina. One patient had H/O previous myocardial infarction. A total of 5 patients had LV dysfunction, moderate in 1(10%) and severe in 4(40%). All patients were in Killips class I at the time of presentation.

Among 10 patients 8 PCI were done by femoral rout and 2 by radial rout. All PCI were done with 6F guiding catheter, XBU 3.5 used in most of the cases follow by JL 3.5. The mean syntax score was 15.2 ± 4.39 . Among patients 6(60%) had terminal/bifurcation lesions and 4(40%) patients had ostial /shaft lesion. The single-stent procedure was done in 3 patients and two-stent procedure was done in 6 Patients. One patient deployed with 3 stents. Mean stent length (LM stent) was 17.2 ± 6.74 mm and mean stent diameter was 3.9 ± 0.21 mm. Provisional stenting strategy was deployed for bifurcation lesions. Final kissing inflation was done in 4 patients after main branch stenting. Side branch stent implantation was done in two patients.

Procedural success was 100%. There was no in-hospital death. The mean follow-up period was 7.6 ± 3.6 months. At the end of follow-up, the incidence of Cardiac death was 1 out of 10 study patients who died within first month of PCI, death considered cardiac. 7/10 patients go through treadmill stress test at the end of study and found to be test-negative.

Table 1: Baseline Characteristics of the ACS Patients

Age	53.72 \pm 10.90
Sex (male)	100%
Hypertension	4(40%)
DM	1(10%)
H/O CAD	1(10%)
H/O Previous stenting	0
LV dysfunction	
Moderate	1(10%)
Severe	4(40%)
Clinical presentation	
UA	2(20%)
NSTEMI	4(40%)
STEMI	4(40%)

Table 2: Angiographic and procedural characteristics

Lesion site	
Ostial and shaft LM	4(40%)
Distal LM (bifurcation)	4(60%)
Ostial LAD bifurcation (bail out LM stenting)	2(20%)

Access site	
Femoral	8(80%)
Radial	2(20%)
Syntax score	
<22	10 (100%)
22-32	0
>32	0
Vessel stented	
LM only	4(40%)
LM and LAD	6(60%)
LM and LCX	2(10%)
Stent	
Single stent	6(60%)
Two stents	3 (30%)
> two stents	1 (10%)
Mean stent length	17.2 ± 6.74 mm
Mean stent diameter	3.9± 0.21 mm
Final Kissing balloon	4 (50%)

Table 3: Follow-up

Procedural success	100%
In hospital mortality	0%
Mean follow-up period	7.6 ± 3.6 months
No cardia event during clinical follow-up	9/10(90%)
Death	1(10%)
Treadmill test negative	7 (100%)

DISCUSSION

A number of randomized controlled trials have compared the long-term clinical outcomes of patients with LMCA disease undergoing revascularization. The EXCEL,^[4] and PRECOMBAT,^[5] study showed similar rate of long-term adverse events between patients undergoing LMCA PCI or CABG, while NOBLE trial⁶ findings suggested that CABG might still be a better option for these patients.

For SIHD patients with significant LM disease undergoing revascularization, 2021 ACC/AHA/SCAI Coronary Revascularization Guideline recommended that PCI is reasonable to improve survival in selected patients in whom PCI can provide equivalent revascularization to that possible with CABG.(IIa B-NR).^[2] However, ACS population were excluded from these studies and studies on long-term clinical outcomes of LMCA PCI in acute coronary syndrome (ACS) patients are relatively limited and mainly from registry data.

AMIS plus registry indicate that emergent LM PCI in the context of acute myocardial infarction has a remarkably high overall in-hospital survival, despite specific subsets of patients (including old, hemodynamically unstable patients, and those undergoing concurrent LM and non-LM PCI) having a significantly increased risk.^[7] In the DELTA all-comer, multinational registry, PCI for ACS in ULMCA is associated with comparable clinical outcomes to those observed with CABG at long-term follow-up, despite the use of first-generation DES.^[8] A recent analysis from the EXCEL trial has found that patients with LMCA disease undergoing PCI or CABG had similar rate of adverse events irrespective of the acuity of clinical presentation.^[9]

The procedural success rate and the 30 days incidence of cardiac death (CD) in our study is

comparable to The DELFT (Drug Eluting stent for LeFT main) Registry¹⁰ {which had technical success 100%, procedural success in 89.6%, In-hospital death 3% and 30-days incidence of CD 3.3%} and to other similar studies.^[11]

In a study by Venkata R.S.S. Sarma et al., which had 95% patients with distal bifurcation conclude that provisional strategy is better than Elective Double Stent in treatment of left main bifurcation lesions in the ACS population.^[2] In our study, bifurcation constituted 60% cases, provisional strategy used in all with lower rates of in hospital and follow up event rates.

CONCLUSION

PCI in an unprotected left main coronary artery in patients presented with ACS can be performed with reliable results and is life-saver in the hand of skilled and experienced operator. In bifurcation lesion Provisional strategy improves the long-term outcomes.

Limitations

1. Small sample size
2. Short term follow up
3. No female patients
4. All stable (Killip I) patients
5. All patient with syntax score <22.

REFERENCES

1. Jean Fajadet, Alaide Chieffo; Current management of left main coronary artery disease; European Heart Journal 2012; 33(1): 36–50.
2. Jennifer S. Lawton, Jacqueline E. Tamis-Holland, Sripal Bangalore; 2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization 2022; 79(2).
3. Venkata R.S. Subrahmanya Sarma, Gopalakrishna, K. Purnachandra Rao; A study of unprotected left main

- intervention in the ACS population 2013-2018; 0019-4832/© 2021 Cardiological Society of India.
4. G. W. Stone, J. F. Sabik, P. W. Serruys et al. Everolimus eluting stents or bypass surgery for left main coronary artery disease. *New England Journal of Medicine* 2016; 375(23): 2223–35.
 5. J. M. Ahn, J. H. Roh, Y. H. Kim et al. Randomized trial of stents versus bypass surgery for left main coronary artery disease: 5-year outcomes of the PRECOMBAT study. *Journal of the American College of Cardiology*, 2015;65:2198–2206.
 6. T. Mäkikallio, N. R. Holm, M. Lindsay et al. Percutaneous coronary angioplasty versus coronary artery bypass grafting in treatment of unprotected left main stenosis (NOBLE): a prospective, randomised, open-label, non-inferiority trial. *The Lancet* 2016; 388(10061): 2743–52.
 7. Giovanni B. Pedrazzini, Dragana Radovanovic, Giuseppe Vassalli; Primary Percutaneous Coronary Intervention for Unprotected Left Main Disease in Patients with Acute ST-Segment Elevation Myocardial Infarction the AMIS (Acute Myocardial Infarction in Switzerland) Plus Registry Experience; *JACC: Cardiovascular interventions* 2011 June; 4(6):627–3.
 8. Stylianos A. Pyxaras, Lukas Hunziker, Alaide Chieffo; Long-term clinical outcomes after percutaneous coronary intervention versus coronary artery bypass grafting for acute coronary syndrome from the DELTA registry: a multicentre registry evaluating percutaneous coronary intervention versus coronary artery bypass grafting for left main treatment; *Euro Intervention*, August 2016. DOI: 10.4244/EIJV12I5A102
 9. S. Doucet, E. M. Jolicœur, P. W. Serruys et al. Outcomes of left main revascularization in patients with acute coronary syndromes and stable ischemic heart disease: analysis from the EXCEL trial. *American Heart Journal* 2019; 214: 9–17.
 10. Meliga E, Garcia-Garcia HM, et al. Longest available clinical outcomes after drug-eluting stent implantation for unprotected left main coronary artery disease, the DELFT (Drug Eluting stent for Left main) Registry. *J Am Coll Cardiol* 2008; 51: 2212-19.
 11. Gurunath Parale, Left main PCI in a peripheral centre in India: A unique challenge, *Interv. Cardiol.* 2020; 12(5): 148-54.