CASE REPORT

A SURVIVAL STORY OF 47 YEARS OLD MALE WITH ACUTE TOTAL OCCLUSION OF LEFT MAIN AND COEXISTING OSTIAL RIGHT CORONARY ARTERY LESION

Shahid Murtaza1,*, Bishnu Mani Dhital2, Shyam Raj Regmi3, Shovit Thapa4

1Department of Cardiology, College of Medical Science, Bharatpur, Nepal
2Department of Cardiology, Chitwan Medical College and Teaching Hospital, Bharatpur, Nepal
3Department of Cardiology, Chitwan Medical College and Teaching Hospital, Bharatpur, Nepal
4Manmohan Cardiothoracic Vascular and Transplant Center, T.U. Institute of Medicine, Kathmandu, Nepal

ABSTRACT

Left main coronary artery (LMCA) thrombus occlusion causing acute coronary syndrome is an uncommon event and associated with severe life-threatening presentations. The clinical outcome depends on the age of the patients, presence of cardiogenic shock and the presence of dominant Right Coronary Artery (RCA). Early reperfusion is associated with improved outcomes.

A 47-years man presented with sudden substernal burning sensation and dry cough for 1 hour. Coronary angiography revealed an acute totally occlusion of ostial left main (LM) with TIMI flow grade 0 and dominant RCA with ostial 80% stenosis having TIMI flow grade 3 and Grade 1 contralateral collaterals from RCA to left system. Emergency percutaneous coronary intervention (PCI) was performed to ostial LMCA toward the proximal LAD to cover the whole LMCA and stage PCI was performed to ostial RCA. Patient was discharge on 7th day with good general condition. An electrocardiographic pattern is associated with collateral filling territories in unprotected left main (ULM) occlusion. In our case diagnosis was completely made after diagnostic coronary angiogram.

Acute total occlusion of LMCA is associated with arrhythmias, cardiogenic shock and sudden death. However, Patient was hemodynamically stable that showed indubitably the importance of dominant RCA with TIMI 3 flow and Grade 1 contralateral collaterals to left coronary circulation. We perform successful primary PCI of acute total occluded LMCA which shortened the ischemic time to salvage the ischemic myocardium.

INTRODUCTION

The left main coronary artery (LMCA) provides two thirds of the myocardial blood supply, and LMCA thrombus occlusion causing acute coronary syndrome is an uncommon event and usually associated with severe life-threatening presentations including arrhythmias, cardiogenic shock, and sudden death.1

The incidence of acute total obstruction of LMCA is 0.025% to 0.13% in patients with Acute Myocardial infarction undergoing coronary angiography.2,3 The clinical outcome depends on the age of the patients, presence of cardiogenic shock with pulmonary oedema and dominant Right Coronary Artery (RCA).3 Most patients die without immediate treatment. Early reperfusion is associated with improved outcomes in patients with myocardial infarction complicated with shock.4,5

CASE REPORT

A 47-years old Nepalese man with history of Smoking and chewing tobacco for 10 years has no history of hypertension, diabetes, dyslipidaemia or family history for cardiovascular diseases, presented to local hospital with sudden subternal burning sensation and dry cough since 1hr. He was referred to cardiologist at district head quarter for cardiac evaluation, The ECG revealed ST elevation in aVR, V1-5 and ST depression in I and aVL (Figure-1).

Figure 1: Electrocardiography : A; Before PCI . B; After PCI

An echocardiogram showed Hypokinetic mid-anteroseptal, anterior septal, apical septal and anterior wall, Mild concentric LV hypertrophy, Grade 2 Left ventricular diastolic dysfunction, LV ejection fraction was 32%. Patient was shifted immediately to Chitwan medical college for coronary angiography, On arrival his BP 160/100mmHg, Pulse 85 bpm, RR 26 breath/
min and SpO2 89% at room air. On examination Bilateral basal crepitation was present (Killip Class II). He was loaded with Aspirin 300mg, Clopidogrel 300mg and Atorvastatin 80mg and transfer to catheterization laboratory. Coronary angiography revealed an acute totally occlusion of ostial left main (LM) with TIMI flow grade 0, Dominant RCA with ostial 80% stenosis having TIMI flow grade 3 and Grade 1 contralateral collaterals from RCA to left system (Figure 2).

The Whisper guide wire passed through the LMCA to left anterior descending artery (LAD) and a Percutaneous Transluminal Coronary Angioplasty (PTCA) was performed with a 1.5 mm balloon at 8 atm. TIMI 2 flow revealed a large thrombus in proximal and distal LAD. The second guide wire was inserted into the non-dominant circumflex artery (LCx).

Simultaneously, PCI was performed by implantation of a zotarolimus-eluting stent, Resolute Integrity (4.0 x 12 mm) at 12 atm into the ostial LMCA toward the proximal LAD to cover the whole LMCA without residual stenosis with TIMI 3 flow (Figure 3). Tirofiban bolus and infusion (0.15mcg/kg/min) for 18hr was initiated as large thrombus burden distal to stent and shifted to coronary care unit. Subsequently on second day his antplatelet regime was changed into daily dose of Aspirin 150mg and Ticagrelor dose 90 mg twice a daily with other medications. During mobilization, patient still complained substernal burning sensation. On 5th day stage PCI was performed (Resolute Integrity; 4.0 x 12 mm at 14 atm) to ostial RCA (Figure 4). During procedure and hospital stay patient was hemodynamically stable. Patient was discharge on 7th day with good general condition.

DISCUSSION

An electrocardiographic pattern is associated with collateral filling territories in patients with unprotected left main (ULM) occlusion. ST elevation (STE) in the anterior leads indicated the absence of collateral circulation, STE in both leads aVR and aVL predicted the presence of contralateral collateral circulation to LAD. STE in aVR predicted the presence of collateral circulation from the RCA to both LAD and LCX territory. Furthermore, Non-ST elevation in lead aVR, and STE in lead I in STEMI indicate absence of collateral.7

However, in our case ST elevation in aVR, V1-5 and ST depression in I and aVL, which is not well described the presence of total occlusion of LMCA with RCA involvement and presence of collateral circulation. The diagnosis was completely made after diagnostic coronary angiogram.

Coronary angiography finding in acute coronary syndrome patient with acute total occlusion of LMCA is considered a high-risk with poor clinical outcome due to lethal arrhythmias and cardiogenic shock. Once the event occurs, the presence of right dominant artery and collateral blood flow may help to preserve the left ventricular function. In patients with total occlusion of LMCA the incidence of cardiogenic shock can be as high as 85%, which is significant independent predictor of mortality. The left dominance in the setting of acute LMCA total occlusion could be incompatible with life.8,9

In our case, even acute total occlusion of LMCA with ostial RCA 80% stenosis, patient was hemodynamically stable that might be due to presence of dominant RCA with TIMI 3 flow and Grade 1 contralateral collaterals.
Most of studies regarding therapeutic strategies for left main coronary artery disease have been done in stable coronary artery disease and limited studies available in the case of acute coronary syndrome ACS due to acute total occlusion of LMCA. The 2018 ESC/EACTS Guidelines recommended PCI is an appropriate alternative to coronary artery bypass graft (CABG) in LM disease and low-to-intermediate anatomical complexity.\textsuperscript{10} In general, PCI offers more rapid recovery and a lower early adverse event rate, whereas CABG offers a more durable procedure.\textsuperscript{11}

Furthermore, recent meta-analysis of landmark randomized controlled trials demonstrated similar long-term mortality after PCI with drug eluting stents (DES) compared with CABG, there were no significant long-term differences between PCI and CABG for cardiac death, MI, or stroke in patients with LMCA disease.\textsuperscript{12} However, this evidence supports the management of stable coronary artery disease.

In case of Acute total occlusion of left main coronary artery PCI with DES provides better choice of treatment than CABG with regard to the time to reperfusion and thus improve hemodynamic stability, yet in-hospital mortality remains quite high.\textsuperscript{7,8,13}

Our primary goal in this patient was to achieve reperfusion of the occluded LMCA as soon as possible to salvage the ischemic myocardium and thus to maintain the systemic circulation.

We were able to perform successful primary PCI of acute total occluded LMCA and stage PCI to RCA without any complication and patient was hemodynamically stable during hospital stay and discharge on 7th day.

This case shows beyond doubt the importance of dominant RCA with TIMI 3 flow and collateral circulation for survival of patient with acute total occlusion of LMCA.

**CONCLUSION**

We conclude the following regarding successful treatment of our patient: Even in catheterization laboratory with limited facilities, prompt recognition of ECG for ST-elevated Myocardial infarction cause by acute total occlusion of LMCA and wise decision regarding emergency PCI shortened the ischemic time, which play crucial role in terms of clinical outcome. Moreover, Dominant RCA with TIMI 3 flow and adequate collateral circulation to left coronary circulation required to maintain hemodynamic status as well as survival of patient.

**REFERENCES:**