

Covid positive patient - Anterior wall myocardial infarction with Complete heart block pacing or revascularization?

1. **Dr Prashant Kashyap**, Resident Cardiology, Dr. D.Y. Patil Medical College and Hospital, Pune, Maharashtra, India. Email- prashantkashyap2804@gmail.com
2. **Dr Preeti Raj**, Resident Anaesthesiology, Dr. D.Y. Patil Medical College and Hospital, Pune, Maharashtra, India. Email- hipreeti20@gmail.com(**corresponding author**)
3. **Dr Fathima Fasil**, Resident Anaesthesiology, Dr. D.Y. Patil Medical College and Hospital, Pune, Maharashtra, India. Email- drfthma@gmail.com

Abstract-

Complete heart block can be either congenital or acquired. Among acquired causes common ones are drugs, degenerative diseases, infectious causes, rheumatic diseases, infiltrative processes, neuromuscular disorders, ischemic causes, metabolic causes, toxins and iatrogenic causes. RCA occlusion has high incidence of AV block which resolves promptly after revascularization. AV block in the setting of LAD territory occlusion has a more ominous prognosis. In our patient with anterior wall MI with complete heart block was treated by revascularization of LAD.

Keywords- Myocardial infarction(MI), Left anterior descending(LAD), Temporary cardiac pacing (TPI), Intra-aortic balloon pump(IABP).

INTRODUCTION-

Acute ST-segment elevations in the inferior leads generally suggest acute occlusion of the right coronary artery (RCA). Occlusion of the left anterior descending coronary artery (LAD) may cause infarction of the anterior wall of the left ventricle, manifested as precordial ST-segment elevations. Inferior ST-segment elevations due to occlusion of a LAD may reflect an ischemia of wrapped LAD artery [1,2]. We describe a patient with ST elevation in anterior leads with complete heart block subsequently caused by acute occlusion at the proximal segment LAD.

CASE REPORT-

This is a case of a 42 years old male who came to our casualty with chief complaints of cough with expectoration, shortness of breath (NYHA class III), orthopnoea and atypical chest pain with no radiation, associated with palpitations, not associated with sweating since 6 hours. No history of syncope.

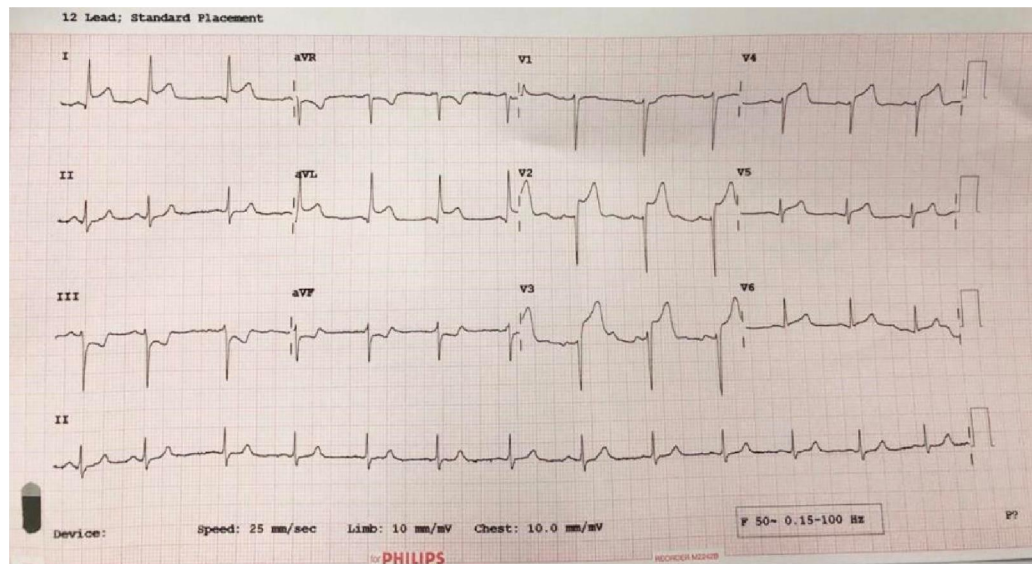
On examination the Blood pressure was 150/110mmHg, Pulse rate was 110bpm, SpO2 was 97% on room air and was afebrile to touch.

On respiratory system examination, air was reduced in bases bilaterally, with presence of end inspiratory crepitations. In cardiovascular system, S1 and S2 heart sounds were heard normally with no added sounds or murmur. Per abdomen was soft and non tender. Patient was conscious and oriented to time, place and person.

He is a known case of hypertension since 2 years and type II diabetes mellitus since 4 years, managed with oral medications.

ECG showed normal sinus rhythm with ST elevation from V2 to V6 and ST depression in leads II, III and aVf. (Fig 1)

Fig1- ECG showed normal sinus rhythm with ST elevation from V2 to V6 and ST depres-



sion in leads II, III and aVf. (Fig 1)

Echocardiogram showed normal cardiac chamber size and wall thickness, LAD territory was hypokinetic at all levels, Moderately depressed LV, LVEF-35-40%, with mild MR.

Patient was started on oxygen therapy, and thrombolysis was done with inj recombinant tissue plasminogen activator (TNK-tPA) 40mg IV bolus and it was successful, chest pain settled and ST segment settled by more than 50%

As per the routine protocol of the hospital, Rapid Antigen test for Covid was done for patient which tested positive so patient was shifted to Covid isolation ICU and throat swab was sent for RT-PCR.

Patient was started on conservative management with IV infusion of inj Nicorandil at 2mg/hr, tablet clopidogrel(75mg/day), aspirin(75mg/day), Rosuvastatin(40mg/day), Ramipril(5mg/day), Carvedilol(6.25mg/day) and inj Clexane 60mg s.c twice a day.

Cardiac enzymes CK-MB and Troponin I was elevated and rest other laboratory tests were within the normal range

Arterial blood gas analysis revealed oxygen partial pressure of 67 mmHg and oxygen saturation of 94%.

A chest radiograph showed no abnormality. Oxygen supplementation and antibiotic therapy were started.

The patient was doing well till Day3 of admission, when he started having giddiness and chest pain f/b which he had an episode of syncope lasting for around 30secs.

ECG during first episode was similar as previous one, after few hours patient had another episode of syncope and the ECG this time revealed complete heart block with qRBBB pattern (Fig 2) and his heart rate eventually dropped from 90 to 26bpm. Inj atropine 0.6mg given IV stat and then patient was started on Isoprenaline infusion at 2mg/hr.

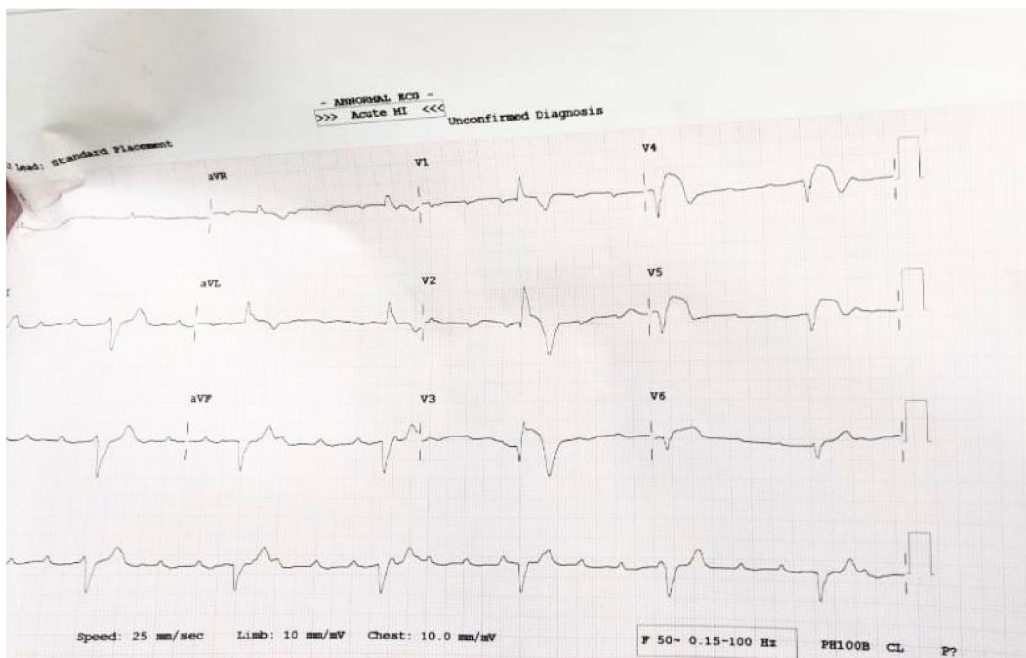


Fig 2- Complete heart block with q right bundle branch block (qRBBB) pattern

Patient's pulse was 50bpm but feeble so was started on Noradrenaline (Double strength at 4ml/hr) and Dopamine infusion (16ml/hr). Inj Tirofiban 0.5mg was given stat followed was infusion of 0.85mg/hr.

Patient subsequently had asystole on ECG, CPR was started as per standard ACLS protocols, and patient was intubated.

After two cycles of CPR, ECG rhythm showed Ventricular tachycardia, at this moment isoprenaline infusion was stopped and prompt defibrillation was performed with a biphasic shock of 200 Joules. Patient's carotid pulse was now palpable and ECG rhythm was of complete heart block with all vitals under acceptable range with all ongoing infusions. Isoprenaline infusion was started again.

With a plan of rescue angioplasty patient was shifted to cardiac catheterization lab on portable ventilator under monitoring.

Temporary cardiac pacing (TPI) was done through right femoral vein. Coronary angiography revealed proximal 100% occlusion of Left anterior descending coronary artery, 70% lesion of proximal segment of left circumflex artery. (Fig 3)

80% lesion of obtuse marginal, and 50% plaque in proximal to mid segment of right coronary artery.

Fig 3- Coronary angiography revealed proximal 100% occlusion with distal segment not seen of Left anterior descending coronary artery.

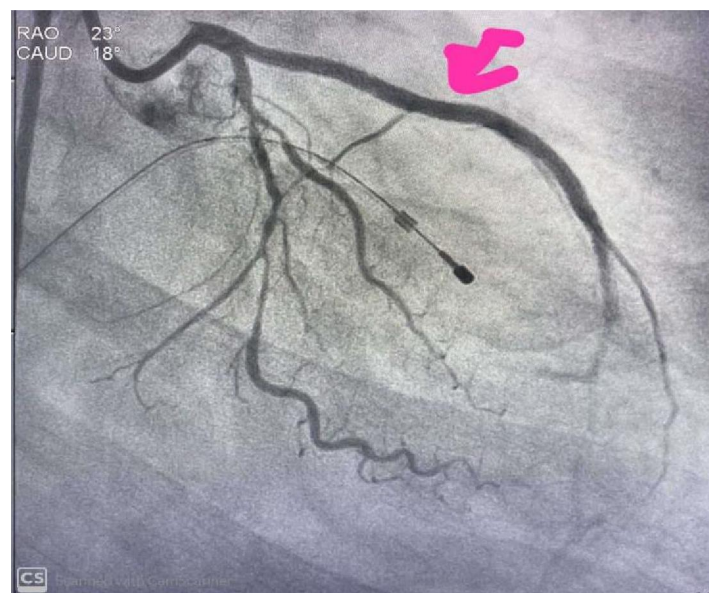
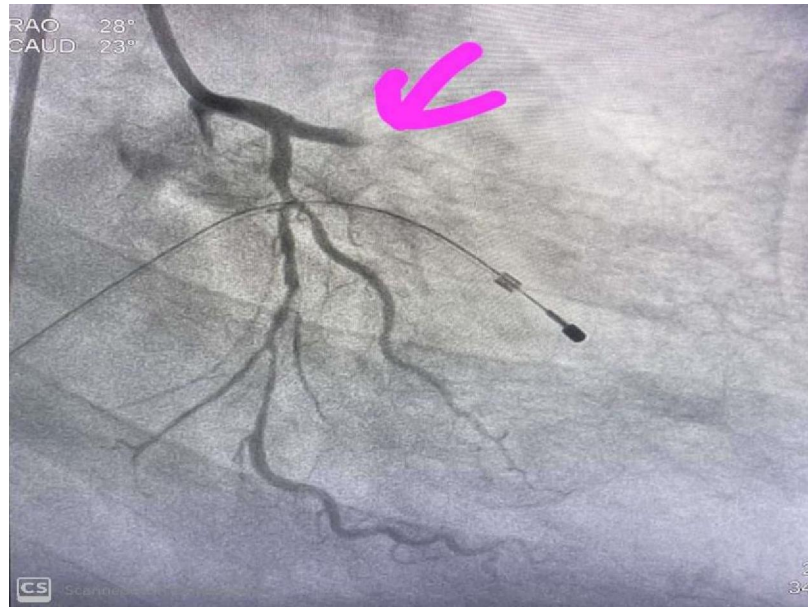


Fig 4- Rescue percutaneous transluminal coronary angioplasty (PTCA) with stent to LAD which lead to complete revascularisation.

Percutaneous transluminal coronary angioplasty (PTCA) was done with stent to LAD which lead to good result of 100% revascularisation. (Fig 4)

Intra-aortic balloon pump support was given, with ECG gating at 1:1 augmentation.

Patient was shifted back to covid ICU and with all infusions on going.

On day 1 post procedure, patient was extubated and was continued on noradrenaline and dopamine infusion, which was tapered gradually as per the vitals. Noradrenaline and dopamine infusion was stopped by day 2.

Patient developed 2:1 AV block on day 2 but later he achieved sinus rhythm and TPI was removed on day 3.(Fig 5 , 6)

Fig 5 :- ECG showing 2:1 AV block post PTCA

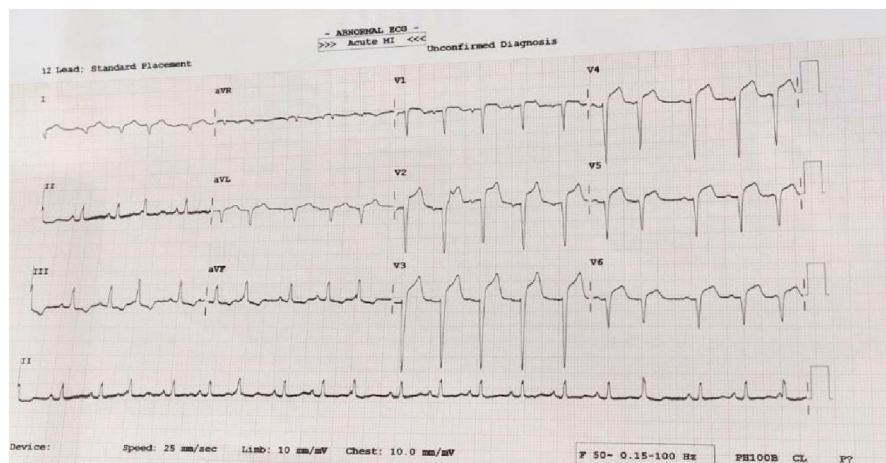


Fig 6 :- ECG showing sinus rhythm post PTCA

Intra aortic balloon pump was changed to 1:2 augmentation on day 2 and to 1:3 on day 3. Since patient was able to maintain to his blood pressure without any supports so IABP was put on stand by mode on day 3 and removed on day 4.

Patient was monitored in ICU care for another 3 days and later discharged.

DISCUSSION-

Patients with high degree AV block complicated by MI had more incidence of recurrent high degree AV block or sudden [3] death in the first year of life CHB in the setting of acute myocardial infarction had higher incidence of decreased LV function and anterior wall MI had higher 30 day mortality to the tune of 60 % as compared to inferior wall MI with 10 to 25%. [4]

According to 2013 ACC AHA guidelines for management of acute myocardial infarction Temporary pacing is indicated for symptomatic bradyarrhythmias unresponsive to medical treatment. (Class 1 Level of Evidence:C) [5]

According to 2012 ACCF/AHA/HRS update of 2008 ACCF/AHA/HRS guidelines after acute myocardial infarction transient advanced second or third degree infranodal AV block and associated bundle-branch block is an indication for permanent ventricular pacing. Resolution of complete heart block after revascularization has been reported in cases of [6] right coronary artery occlusion and anomalous dual LAD[7] occlusion.

Sinus bradycardia is the most common complication of inferior wall MI occurring in upto 20% cases attributed to increase in vagal tone in the first 24 hrs also because of sinus nodal or atrial ischemia. AV block may occur secondary to increase susceptibility on AV node to acetylcholine. RCA also supplies AV node by AV nodal artery .LAD artery is known to supply below the AV node and it occlusion should be suspected when broad complexes are associated with heart [8] block.

On reviewing of literature instances of CHB were found after [9-12] blockage of first septal branch of LAD during angioplasty . Our case displayed how opening blocked LAD can prevent insertion of permanent pacemaker.

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