A Case of Acute ST elevated Myocardial Infarction Managed with Primary PCI: Launched Case of University Cardiac Center

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Abstract:

Coronary reperfusion with primary percutaneous coronary intervention (PPCI) or fibrinolytic therapy improves outcomes in patients with acute ST elevation myocardial infarction (STEMI) or an MI with a new or presumably new left bundle branch block or a true posterior MI. If performed in a timely fashion, PPCI is the reperfusion therapy of choice compared to fibrinolysis because it achieves a higher rate of TIMI 3 flow. Here we describe a case of acute ST elevated inferior myocardial infarction managed with primary percutaneous coronary intervention as a launching case in the University Cardiac Center ofBangabandhu Sheikh Mujib Medical University.

Introduction:

Primary percutaneous coronary intervention (PCI) has become the predominant reperfusion strategy for ST-segment elevation myocardial infarction (STEMI). This dramatic switch from thrombolytic therapy to primary PCI was the result of several studies conducted in the early 1990s that demonstrated the superiority of primary PCI at reducing stroke and reinfarction as well as an absolute reduction in mortality by 2%. The likelihood of pre-discharge positive exercise test is also reduced by primary angioplasty. In hospital where facilities for primary angioplasty are available, it should be considered over fibrinolytics. These benefits were achieved despite a median door-to-balloon time (D2BT) of 120 min in many of the studies. Elective CAG, PCI, Right heart catheterization, PTMC, Temporary and permanent Pacemaker all are routinely done in the University Cardiac Center for the last one decade, but this is the first casemanaged with primary percutaneous coronary intervention in the University Cardiac Center of Bangabandhu Sheikh Mujib Medical University.

Case Summary:

A 60 years old man, ex college teacher was admitted at CCU in BSMMU with the complains of sudden severe central chest pain for last 5 hours, which was compressive in nature, radiates to back and left arm, associated with profuse sweating and nausea. He denies any H/O cough, breathlessness or syncope. He is hypertensive for last 1 year with irregular medication and follow up. He is non diabetic, non smoker and he has no H/O ischemic heart disease in his first degree relatives.
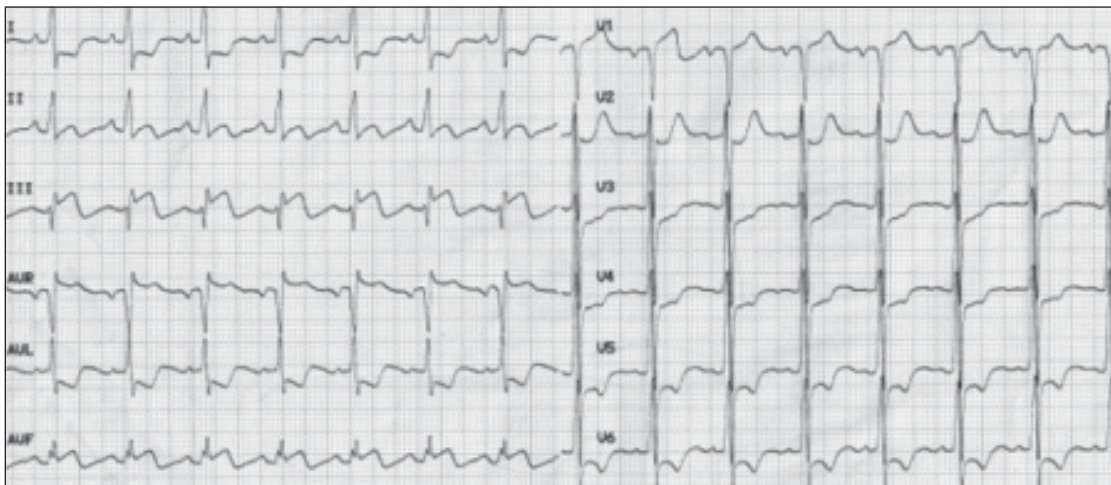

Fig.-1: *ST segment elevation in the inferior leads before primary PCI.*

Fig.-2: *Resolution of ST changes in the inferior leads after primary PCI.*

On examination, he was anxious, pulse 92 beats/min, blood pressure 140/90 mmHg, temperature 98 F, respiratory rate was 18 breaths/min, heart sounds were audible and normal without any added sound, lungs were clear in both side.12 lead ECG showed acute ST elevated myocardial infarction in the inferior leads with anterolateral ischemic changes. Cardiac markers revealed CK-MB 65 U/ml and Troponin I was 17 U/ml. Bed side echocardiogram denoted concentric hypertrophy with mild inferior wall hypokinesia with LVEF 60%.

After adequate preparation patient was sent to Cardiac Cath Lab for primary Percutaneous Coronary Intervention (PCI). Coronary angiography revealed there is a 100% stenosis in mid part of the Right Coronary Artery (RCA). Other vessels were normal. A bare metal stent (BMS) was diploid in this lesion following balloon inflation. Revascularization completed with good TIMI 3 flow. The total procedure was uneventful. After procedure patient was shifted to CCU. There was no post procedure complication, patient's chest pain was relieved and he was discharged 3 days after primary PCI.
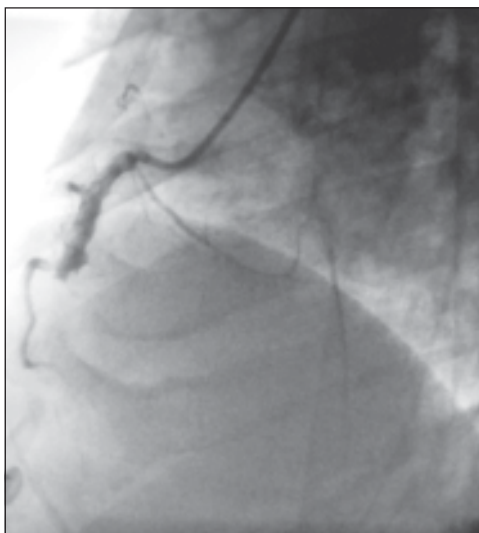

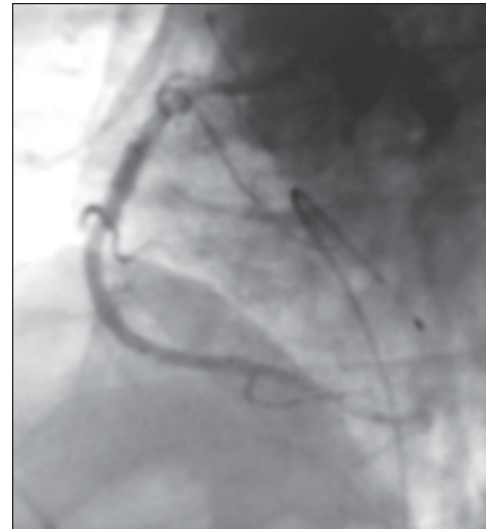**Fig.-3:** *CAG before PCI (100% stenosis in RCA after RV branch).*

Fig.-4: *CAG after PCI (after deployment of stent).*

Discussion:

Now a days Primary Percutaneous Coronary Intervention (PCI) of the infarct artery is the treatment of choice in acute ST elevated myocardial infarction when time-to-treatment delays are short and the patient presents to a high-volume, well-equipped center with experienced interventional cardiologists and skilled support staff. It is preferred to fibrinolytic therapy as primary PCI produces higher rates of infarct artery patency, TIMI 3 flow, and access site bleeding and lower rates of recurrent ischemia, reinfarction, emergency repeat revascularization procedures, intracranial hemorrhage (ICH), and death. Early successful PCI also greatly decreases the complications of STEMI that result from longer ischemic times or unsuccessful fibrinolytic therapy, allowing earlier hospital discharge and resumption of daily activities.[1,2]

Primary PCI should be performed in patients with STEMI and ischemic symptoms of less than 12 hours' duration or who have contraindications to fibrinolytic therapy, irrespective of the time delay from FMC or patients with STEMI and cardiogenic shock or acute severe HF,

irrespective of time delay from MI onset or patients with STEMI if there is clinical and/or ECG evidence of ongoing ischemia between 12 and 24 hours after symptom onset.[3]

Once the decision has been made to perform reperfusion with primary PCI, patient should be moved to cardiac catheterization laboratory and undergo angiography as rapidly as possible. After the culprit lesion has been identified, reperfusion should be achieved with standard PCI techniques such as Platelet IIb/IIIa inhibitors (Abciximab,Tirofiban, Eptifibatide), Thrombus aspiration, distal embolic protection device (EPDs), Coronary Stenting.

Potential complications of primary PCI include problems with the arterial access site; adverse reactions to volume loading, contrast medium, and antithrombotic medications; technical complications; and reperfusion events. No-reflow is associated with a reduced survival rate. Treatment and prevention strategies have included use of the GP IIb/IIIa antagonist abciximab, vasodilators (nitroprusside, verapamil, adenosine), and inhibitors of various metabolic pathways (nicorandil, pexelizumab), albeit without consistent effect. Manual thrombus aspiration at the time of primary PCI results in improved tissue perfusion and more complete ST resolution, though not all studies have shown positive results.

Coronary stents are used routinely at the time of primary PCI. Compared with balloon angioplasty, Bare metal stent (BMS) implantation during primary PCI decreases the risk for subsequent target-lesion and target-vessel revascularization and possibly the risk for reinfarction, but is not associated with a reduction in the mortality rate. Compared with BMS, drug eluting stent (DES) implantation decreases restenosis rates and the need for reintervention but does not definitively reduces rates of death or reinfarction. Notably, DES in this setting does not increase the risk of early or late stent thrombosis. The lowest rates of stent thrombosis have been reported with cobalt-chromium everolimus-eluting stents. DES should be avoided in the presence of financial or social barriers that may limit patient compliance, elevated bleeding risk, the anticipated need for invasive or surgical procedures in the subsequent 1 year, or an independent indication for long-term anticoagulant therapy.x

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