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A Rare Case of Blunt Chest Trauma Causing an Acute Myocardial Infarction

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ABSTRACT: Chest trauma accounts for about 10% of all trauma admissions and 25–50% of trauma deaths globally.[1]
Blunt chest trauma causing an acute myocardial infarction is a very rare but fatal phenomenon. A few reports have presented cases of myocardial infarction after blunt chest trauma, but only a few these cases were confirmed by coronary angiography (CAG).[2]
We present a rare case of Blunt chest trauma in a 41 year old previously healthy male following a motor vehicle collision, which led to Acute ST segment elevated Myocardial Infarction and Ventricular Dysrhythmia, he was resuscitated in the Emergency Room and underwent emergency percutaneous coronary intervention. Myocardial infarction following blunt chest trauma is a rare but fatal condition. Management includes timely recognition, use of adjuncts like electrocardiograph and early percutaneous coronary intervention can be lifesaving as seen in our case. We conclude that a multidisciplinary approach with early recognition and intervention helps significantly reduce morbidities, mortality and improve clinical outcomes.

KEYWORDS: Blunt Chest trauma, Cardiac Injury, Traumatic STEMI, Coronary angiography

I. INTRODUCTION

Acute myocardial infarction (AMI) is usually a complication of coronary artery disease (CAD). Blunt cardiac injury is a common complication after blunt chest trauma, which can lead to various injuries to the heart including mild arrhythmia, severe chamber or valvular rupture, myocardial contusion, pericardial effusion/pericarditis, coronary artery injuries or even death. However, Blunt Chest trauma causing Acute ST- elevation Myocardial Infarction (STEMI) is very rare, with only a very few cases reported in literature.

Chest pain after trauma is commonly misdiagnosed as due to chest wall injury, and hence, cardiac diagnosis is often delayed. Myocardial infarction following blunt chest trauma is a very rare but fatal condition.Among trauma victims, cardiovascular injuries are the second most common cause of death.Injuries of the coronary artery after blunt chest trauma are caused by different mechanisms such as vascular spasm, dissection and intimal tear or rupture of an existing thrombus formation. Here, is one such rare case of a 41 year old previously healthy male who presented to the Emergency Room following a motor vehicle collision, which led to Acute ST segment elevated Myocardial Infarction and Ventricular Dysrhythmias, who was resuscitated in the emergency and an Emergency Percutaneous Coronary intervention was undertaken and yielded excellent results.

II. CASE REPORT

A 41 year old, previously healthy male, chronic smoker, presented to the ER with complaints of left sided chest pain and diaphoresis since half an hour. The complaints started suddenly after meeting with a road traffic accident one hour prior to presentation. Patient was a two wheeler rider who had a low velocity head on collision with a four wheeler.

On Primary Survey ABCD was normal, E – excessive sweating was noted. As an adjunct ECG revealed – sinus arrhythmia with ST segment elevations in Anterior Chest leads. (Fig – 1) Simultaneous Head to Toe examination – Normal.

Immediately, patient developed Ventricular Fibrillation for which **Defibrillation** with 200 Joules was administered and the Rhythm reverted.

Following which a 12-lead ECG showed more prominent ST segment elevations in Anterior chest leads. (Fig – 2)

Patient was immediately transferred to Cath-Lab for Percutaneous Coronary Intervention, which revealed Single Vessel Disease with Proximal Left Anterior Descending Artery thrombus and 90 % Ostial stenosis. (Fig – 3)

For which **Intracoronary Thrombolisation** was done using INJ. UROKINASE 500000 IU. Procedure was

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uneventful and patient was discharged on Day 3 in a hemodynamically stable condition.

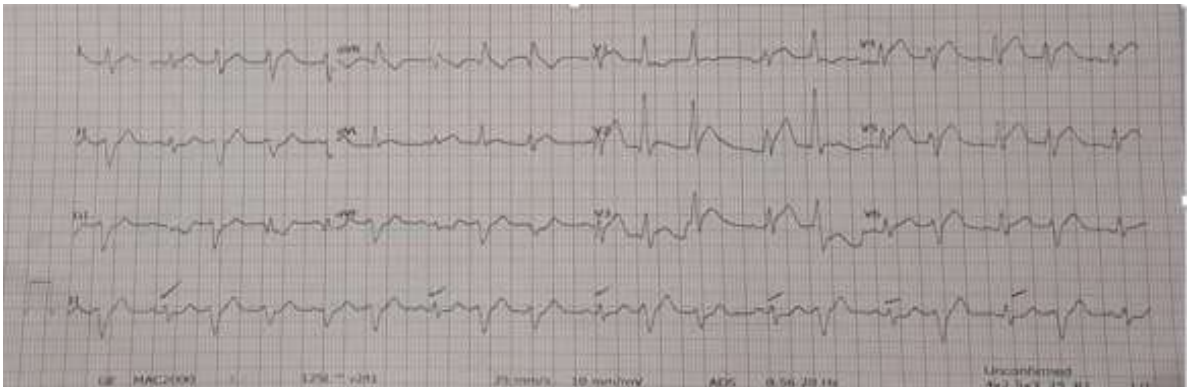

Fig – 1 Sinus arrhythmia with ST segment elevations in Anterior Chest lead

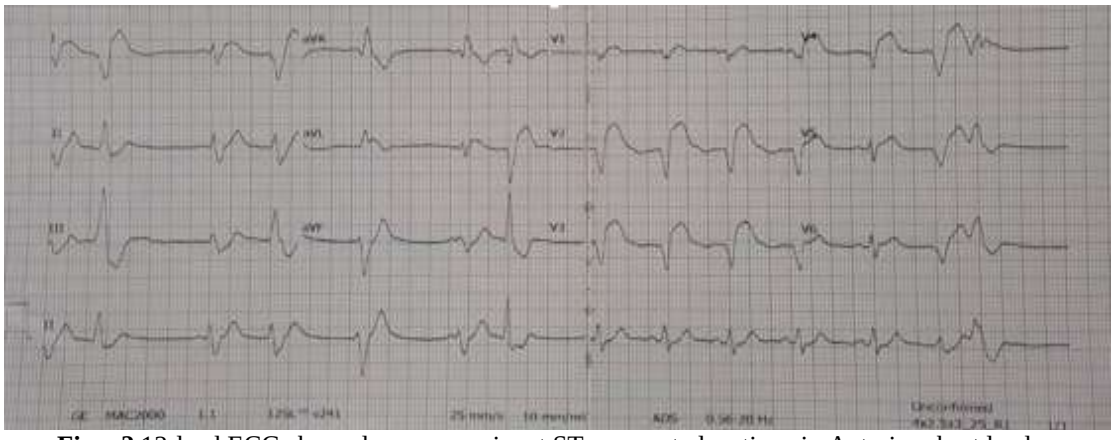

Fig – 2 12-lead ECG showed more prominent ST segment elevations in Anterior chest leads.

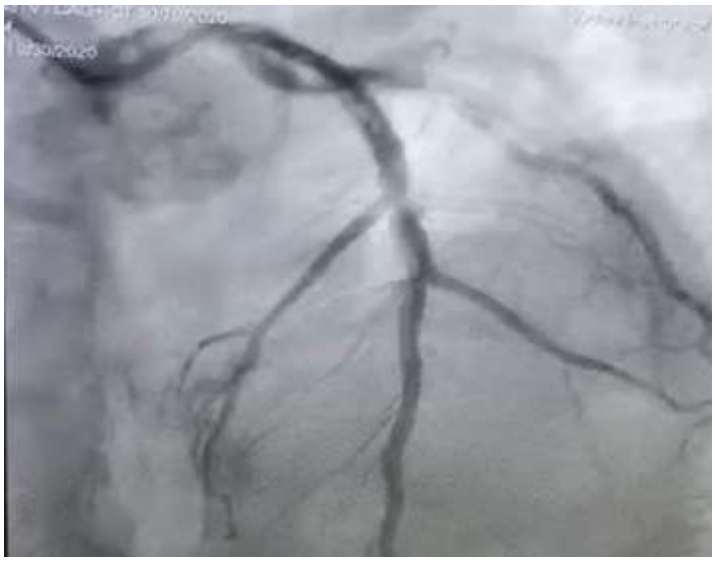

Fig – 3 Single Vessel Disease with Proximal Left Anterior Descending Artery thrombus and 90 % Ostial stenosis.

III. CASE DISCUSSION

Acute myocardial infarction (AMI) is a rare but catastrophic complication of BCT.Significant cardiac damage after Blunt chest trauma occurs in about 5-15 %.[3] Duetoits low incidence, high suspicion is essential in patients

with chest pain presenting after Blunt chest trauma. ECG is the ideal initial method for diagnosis. Although up to 63% of patients with BCT have some ECG abnormalities, classical STEMI pattern occurs just 2% of them.[4]

The Left Anterior Descending (LAD) artery is most commonly involved and the mechanism of injury include: 1) Intimal dissection with resultant thrombosis, 2) Vessel rupture, 3) Fissuring of a pre-existing atherosclerotic plaque, 4) Embolism (clot, marrow, air) to the coronary arteries, 5) Vessel spasm at the site of direct mechanical impact.[5]According to the practice guidelines of the Eastern Association for the Surgery of Trauma, all patients suspected of having BCI should undergo ECG during admission (Level I evidence).[6]

This avoids the increased delay in diagnosis of cardiac injuries following Blunt Chest trauma. All patient suspected of having a Myocardial Infarction following a Blunt chest trauma must be taken up for emergency Coronary angiogram (CAG) to identify the culprit vessel and administer appropriate treatment. Emergency percutaneous coronay intervention (PCI)is the ideal treatment choice for patients as it allows rapid revascularization of the culprit vessel and is minimally invasive.

Even though not quite common, Emergency physicians should always have a high suspicion for cardiac injury following blunt thoracic trauma. Workup should include, at a minimum, ECG, allow for early identification of AMI, i.e., need for coronary intervention, which is critical for improved outcomes.

IV. CONCLUSION

After any blunt chest trauma, a high clinical suspicion and systematic evaluation of thepatient by the ER physician is of paramount importance for the timely diagnosis of Myocardial Infraction.Blunt chest trauma may be complicated with coronary vasospasm and subsequent Acute Myocardial Infarction.

Electrocardiography (ECG) should be done in every patient with Blunt Trauma. Timely identification, dynamic resuscitation and appropriate intervention can avoid catastrophic events in patients with Blunt Chest trauma with cardiac injury.

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