Case Report

Acute myocardial infarction following blunt chest trauma with intracranial bleed: A rare case report

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\textbf{A B S T R A C T}

A young male following road traffic accident (RTA) with head injury and parietal bleed was diagnosed with STEMI based on ECG findings which is rare occurrence. Coronary angiography showed thrombotic ostial occlusion of LAD. Successful primary angioplasty using thrombo-aspiration was done, in difficult clinical scenario. The case was challenging in terms of use of anticoagulation and antiplatelet strategy in a rare etiology of acute myocardial infarction following road traffic accident.

\section{1. Introduction}

Among the non-atherosclerotic etiologies of acute myocardial infarction (AMI) in young adults, blunt chest trauma is one of the extremely rare mechanisms.\textsuperscript{1,2} Earlier few case reports did not describe the true incidence of cases of traffic accidents leading to AMI and most of them were treated conservatively.\textsuperscript{3,4} This report describes a case of AMI following a blunt chest trauma due to road traffic accident resulting in severe left ventricular dysfunction and treated successfully with percutaneous coronary intervention (PCI).

\section{2. Case report}

A 36-year-old male rushed to emergency room with history of road traffic accident, complaining of headache, chest pain and inability to move right arm. On examination, patient was conscious and coherent with relatively stable vital parameters [pulse 98/min, blood pressure 100/70 mmHg, respiratory rate 36/min and temperature was 36.7 \degree F]. His general and neurological examination revealed blunt chest trauma, left parietal head injury, left orbital ecchymosis with red eye, grade 0 power in the right arm.

On cardio-respiratory examination, crackles were present in lung base without any murmur or rub. There was no distension, organomegaly or tenderness on abdominal examination. Cardiac monitor in ER showed ST elevation. ECG showed Q wave and 10 mm ST segment elevation in all precordial leads (Fig. 1). CT scan brain showed hemorrhagic contusions in left parietal area and fractures in the parietal bone and hemorrhage in left parietal area (Fig. 2). Bedside echocardiography revealed akinesia of apical and mid interventricular septal, apical and apico-anterior segments with...
preserved thickness and calculated LVEF of 32% (modified Simpson’s method).

It was difficult to convince the patient’s relatives about RTA’s role in etiology of AMI & the need for invasive procedure’. After persuasion, a diagnostic coronary angiogram was performed which revealed thrombotic occlusion of ostial LAD with extension of thrombus in Ramus. Right coronary artery and left circumflex artery were normal (Fig. 3a, b, c). After discussing with Neuro-surgeon and Cardiac-surgeon about benefit of procedure versus risk of further increase in intracranial bleed, primary PCI was opted as a strategy of revascularization. The loading dose of clopidogrel 300 mg (as an only antiplatelet agent) was given and intravenous heparin 5000 IU (as an anticoagulant under monitoring of ACT) at the time of procedure. Loading dose of aspirin was not administered.

After crossing occluded LAD and Ramus intermedius with floppy guide wires, initial thrombo-aspiration with Diver CE catheter (eV3, Inc., Plymouth, Minnesota, USA) could not retrieve much thrombus. The lesion was pre-dilated with 2.5 x 15 mm Voyager RX (Abbott Vascular) balloon. The check angiogram revealed mild dissection and some residual thrombus (Fig. 3d, e) with flow limitation (TIMI 2 flow). Hence, 4 x 23 mm bare metal stent was deployed at the ostio-proximal segment of LAD (Fig. 3f) without further dilatation attempts to seal dissection flap and improve flow in LAD. Check angiogram revealed dislodgment of thrombus to mid LAD segment, which was retrieved by Diver CE (eV3, Inc., Plymouth, Minnesota, USA) thrombo-aspiration catheter (Fig. 3g, h and Fig. 4). Finally TIMI III coronary flow was achieved with no residual stenosis (Fig. 3i). His neurological status was stable without any deterioration; patient improved significantly in terms of right arm power [Grade 3] and was discharged after 2 days. His echocardiography before discharge showed improvement in EF to 48%. Clopidogrel 75 mg OD was prescribed as a maintenance antiplatelet therapy without aspirin. Patient recovered well and completed one year of follow up without symptoms.

3. Discussion

Blunt chest trauma is a rare cause of cardiac damage including myocardial contusion, ventricular rupture, ventricular septal defect, valvular damage\(^2\) and coronary artery occlusion with myocardial infarction\(^2\) The most frequently injured vessel is the left anterior descending artery, followed by the right coronary and the circumflex coronary arteries.\(^1\) The mechanisms of injury contributing to infarction can include an intimal tear, subintimal hemorrhage, intra-luminal thrombosis, and spasm.\(^6\)

The treatment of acute myocardial infarction caused by blunt chest trauma may be complicated by the severity of accompanying injuries, and most of the cases in the literature have been managed conservatively.\(^3,7\) Successful thrombolytic treatments of coronary occlusions in patients with blunt chest trauma have been reported.\(^8,9\) However, many trauma patients will not be candidates for thrombolytic therapy because of the risk of hemorrhage from coexisting injuries.\(^10\) In complicated cases, immediate surgical corrections were often performed.\(^11\) Recently, direct PCI has been performed in

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Fig. 1 – ECG showing anterior wall MI [ST elevation in leads V1-4] with reciprocal ST depression in inferior leads.

Fig. 2 – CT scan brain showed hemorrhagic contusions in left parietal area and fractures in the parietal bone and hemorrhage in left parietal area.
some patients and a few cases of stent implantation were reported.\textsuperscript{10,12}

4. Conclusion

This case is a rare complication of blunt chest trauma leading to AMI. Clinically and technically there were challenges in the form of selection and doses of antithrombotics, for angioplasty ostial site of occlusion and coexisting intracranial bleeding. No remarkable long-term result has been reported about the prognosis of the coronary artery occlusion caused by the trauma. Considering the overall condition of this patient, angioplasty with stenting appeared to be the only option of therapy.

Conflicts of interest

All authors have none to declare.
REFERENCES


