

A rare cause of myocardial infarction: Blunt chest trauma

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Abstract. Blunt chest trauma is a rare cause of myocardial infarction. If the diagnosis is delayed, serious complications may occur. To prevent them, electrocardiography should be performed to all patients with chest pain after blunt chest trauma. In the event of myocardial infarction, coronary angiography should be performed as soon as possible and appropriate management interpreted according to clinical situation.

Key words: Blunt chest trauma, ST-elevation myocardial infarction

1. Introduction

Blunt chest trauma (BCT) may cause various injuries to the heart, including myocardial contusion, cardiac rupture, pericardial effusion/pericarditis, valve damage, arrhythmia and coronary artery injury (1). Patients might present with different clinic settings from transient chest pain to cardiac shock/sudden death (1). Chest pain after the trauma is considered usually due to chest wall injury, so, cardiac diagnosis is delayed (1). We report a STEMI developed after a punch in the epigastrium during a fight.

2. Case report

A 34-year-old male presented to our hospital with retrosternal chest pain for two hours. A few hours ago, he was beaten in a fight and punched in the epigastrium and head. Apart from being a light cigarette smoker, he had no coronary risk factor. Physical examination was normal except sutures at the head and ecchymosis on the epigastric area. Blood pressure was normal. Electrocardiography (ECG) showed normal sinus rhythm with a heart rate of 73 bpm and ST

segment elevations in the inferior leads (Figure 1). Echocardiography showed inferobasal left ventricular akinesis. The patient was immediately referred to the catheterization laboratory for coronary angiography (CAG) with a diagnosis of acute inferior MI. Selective CAG revealed totally-occluded left anterior descending artery (LAD) and circumflex artery (Cx) with intensive thrombus accumulations at the distal portions (Figure 2). After the intracoronary tirofiban bolus dose, 24-hour infusion was administered. When the infusion was over, control CAG revealed normal Cx and small thrombus particles in the LAD distal portions (Figure 3). At the end of the three days, the patient was discharged from hospital with a prescription of acetylsalicylic acid, beta-blocker and statin combinations.

3. Discussion

Significant cardiac damage after BCT occurs in about 5-15 % (1). Because it has a low incidence, high suspicion is essential in patients with chest pain presenting after BCT. ECG is most useful initial method for diagnosis. Although up to 63% of patients with BCT have some ECG abnormalities, classical STEMI pattern occurs just 2% of them (2). Cardiac markers, i.e. troponin and CK-MB, may also be useful but they may rise in both conditions of myocardial contusion and STEMI. Echocardiography may be helpful in this situation, but may not also differentiate contusion from STEMI. The mechanisms of acute STEMI in the BCT setting include intimal tear, dissection, spasm, vessel

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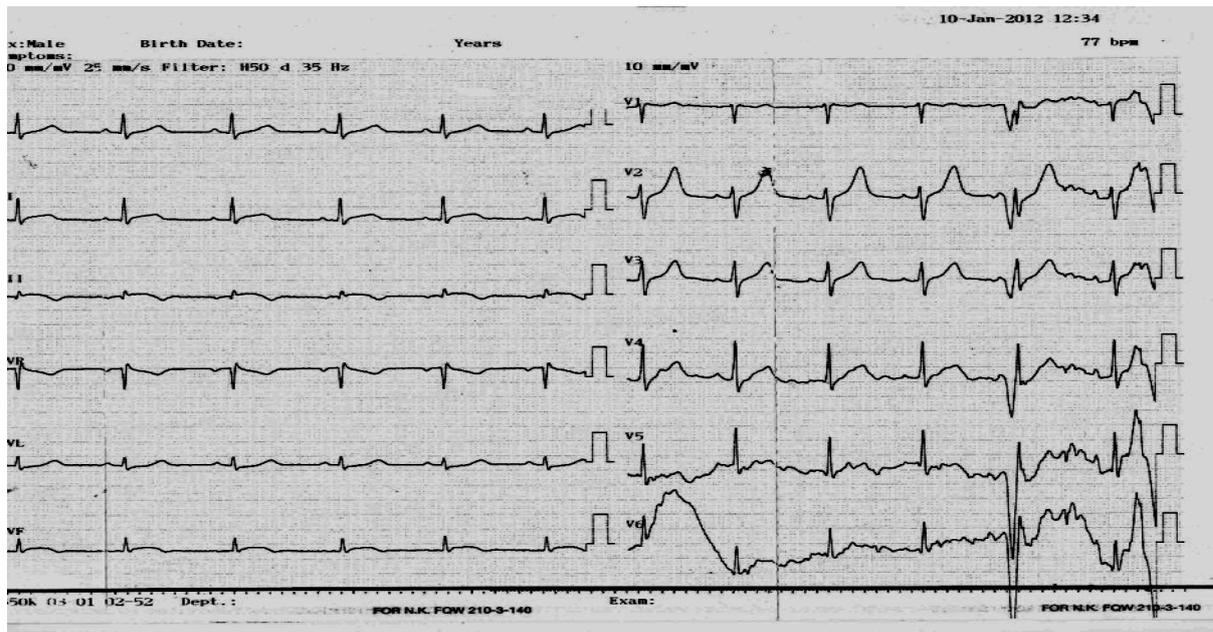


Fig. 1. An 12-lead electrocardiography shows ST-segment elevation in inferior leads.

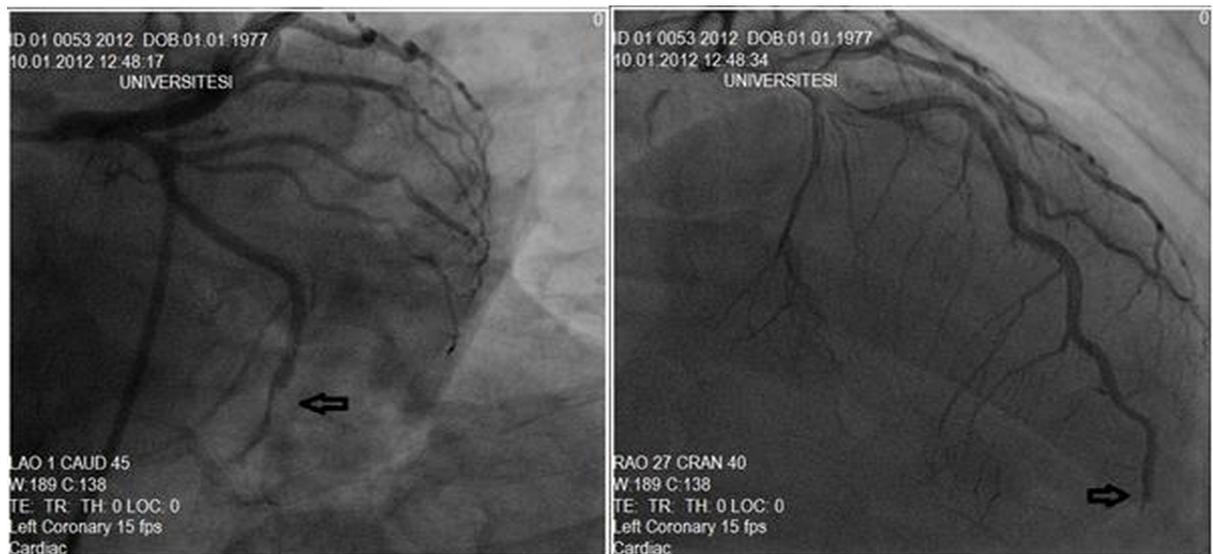


Fig. 2. Left anterior descending artery and circumflex artery are occluded totally at the distal portions.

rupture, plaque rupture, external compression from epicardial hematoma (3). The mechanism causing coronary damage may be direct contusion, or acceleration/deceleration force (4,5). Age and sex distribution is different from ordinary STEMI: 82% of the patients are less than 45 years old and male to female ratio is 5/1. The affected arteries are LAD, right coronary artery (RCA) and Cx, in descending order (3). Therapeutic options are coronary angioplasty-stenting, by-pass surgery, thrombolytic and conservative treatment.

The patients with STEMI in regard to BCT have usually single vessel disease. A few patients

were reported as two-vessel disease, one of which was a patient with LAD and Cx lesions reported by Lai et al. (6). In our patient, both LAD and Cx arteries have been occluded just as Lai CH et al.'s patient had. On the contrary, our case is the first one in which LAD and Cx lesions were treated with medically by tirofiban and heparin whereas the aforementioned patient was treated by coronary by-pass surgery (CABG). The distal thrombi in the LAD and Cx explain us where the punch came from: the inferio-apical border of the heart, adjacent to the epigastric area. Because there was intensive thrombus burden, we thought it would be more logical to wait for the thrombus

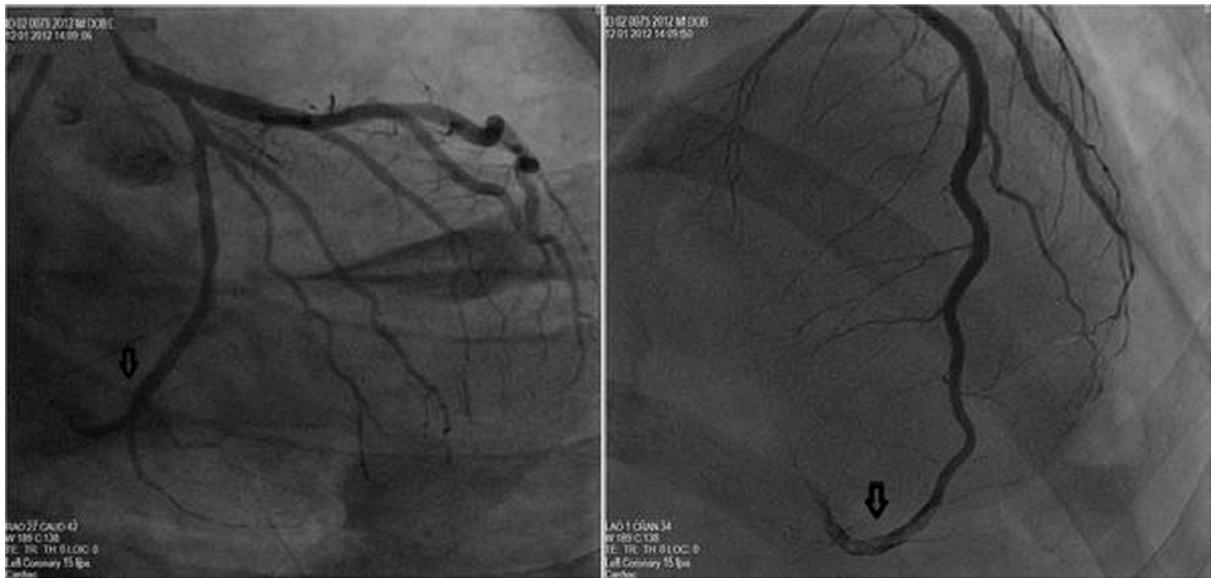


Fig. 3. Circumflex artery is normal but left anterior descending artery has small thrombi particles at the distal portion.

to be dissolved, rather than to perform percutaneous coronary revascularization (PCI). Indeed, at the end of the tirofiban infusion, the thrombi were almost dissolved and PCI was not needed. Therefore, we confirmed the opinion that if there was intensive thrombus at the coronary artery, medical treatment might be more effective than PCI. In the Christensen's review (3), CAG usually was not performed immediately, i.e. it was performed in 1 to 6 months in most patients (17%) due to bleeding problem of other organ damages, or chest pain was considered to originate from just a local injury or myocardial contusion. According to the STEMI guidelines, PCI of a totally occluded infarct artery 24 hours after symptom onset in stable patients without signs of ischaemia is class-III recommendation (7). Therefore, CAG/PCI after some days or months after the STEMI does not provide mortality and morbidity benefit to a patient. We recommend that if there is any suspicion of STEMI, coronary angiography should be performed immediately and treatment should be planned accordingly.

Chest pain after BCT may be related to local injury but cardiac damage should be kept in mind and be sought by some diagnostic tools, firstly by ECG. If the diagnosis of STEMI is made, CAG should be performed as soon as possible and management be given to a patient according to

type of coronary artery lesion. PCI, CABG, thrombolytic and medical treatments are available. In the situation of intensive thrombus burden in the coronaries, medical treatment adjunct to tirofiban infusion is a logical option.

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