

NSTEMI in a patient admitted for multiple spinal fractures: a clinical case report

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Abstract

Non-ST-elevation myocardial infarction (NSTEMI) is defined by the presentation of acute chest pain with no persistent ST-segment elevation. It is a common disease in the elder population. There are some dates that correlate vascular factors to osteoporosis and the augmented fracture risk in patient with cardiovascular disease but there are few information about a link between a bone fracture and NSTEMI. We described a male patient, with no history of coronary artery disease, hypertension, dyslipidemia. He was admitted to our emergency room after a car accident. A head CT showed no active bleeding and a Total Body CT showed no acute organ damages and vertebral fractures at the D11 and L1-L2, confirmed with a MRI of the spine. An orthopedic surgery was scheduled but the following day he started complaining mild chest pain with elevated high sensitive troponin I value. A coronary angiography was performed and percutaneous coronary intervention with placement of two drug eluting stents in LADA and two in RCA allowed for restoration of the flow. In consideration of the planned surgery, he was initially treated only with aspirin and enoxaparin. However, because of two episodes of in-stent restenosis, a treatment with aspirin and clopidogrel was obligatorily started. A patient with fractures can develop an acute coronary syndrome because of several reasons and in this case we hypothesize that the stress caused by the trauma have destabilized a nonsignificant plaque. DAPT therapy is another element that we have to consider in these patients.

Keywords: NSTEMI, bone fractures, DAPT, stent restenosis.

Introduction

Acute myocardial infarction (AMI) defines cardiomyocyte necrosis with at least one value above the 99th percentile of the upper reference limit of the cardiac biomarkers, preferably high-sensitivity cardiac

Riassunto

L'infarto miocardico senza sopraslivellamento del tratto ST (NSTEMI) si presenta con dolore toracico oppressivo in assenza di sopraslivellamento del tratto ST. È una patologia frequente nella popolazione anziana. Diversi studi hanno dimostrato come, in pazienti con malattia cardiovascolare, esista una correlazione fra fattori vascolari ed osteoporosi ed aumentato rischio di frattura; tuttavia vi sono pochi dati sulla correlazione tra frattura ossea ed NSTEMI. Descriviamo il caso clinico di un uomo, senza storia di malattia coronarica, ipertensione o dislipidemia. Il paziente veniva trasportato presso il pronto soccorso a seguito di un incidente automobilistico. La TC cranio non evidenziava emorragie in atto e la TC Total Body evidenziava multiple fratture vertebrali a carico di D11 ed L1-L2 che venivano confermate dalla Risonanza Magnetica della colonna vertebrale. Veniva pertanto programmato l'intervento chirurgico ortopedico ma il giorno successivo il paziente sviluppava dolore toracico con aumento delle troponine I ad alta sensibilità. Pertanto veniva eseguito uno studio coronarografico e successiva angioplastica percutanea con impianto di due stent medicati a livello della discendente anteriore e due stent medicati a livello della coronaria destra, con ripristino del flusso. In considerazione dell'intervento chirurgico in programma, il paziente veniva inizialmente trattato con aspirina ed enoxaparina. Tuttavia, a causa di due episodi successivi di restenosi intrastent, veniva impostata la terapia antiaggregante con aspirina e clopidogrel. Un paziente con fratture può dunque sviluppare una sindrome coronarica acuta per diversi motivi ed in questo caso ipotizziamo che lo stress del trauma abbia destabilizzato una placca originariamente non significativa. La doppia terapia antiaggregante (DAPT) è un altro elemento da valutare in questa tipologia di pazienti.

Parole chiave: NSTEMI, fratture ossee, DAPT, restenosi intrastent.

troponin, and one of the followings: 1) Symptoms of ischemia; 2) new or presumed new significant ST-T wave changes or left bundle branch block on 12-lead ECG; 3) Development of pathological Q waves on ECG; 4) Imaging evidence of new or presumed new

loss of viable myocardium or regional wall motion abnormality; 5) Intracoronary thrombus detected on angiography or autopsy⁽¹⁾. Non-ST-elevation myocardial infarction (NSTEMI) is defined by the presentation of acute chest pain with no persistent ST-segment elevation with an electrocardiogram (ECG) that may be normal or include changes such as transient ST-segment elevation, persistent or transient ST-segment depression, T-wave inversion, flat T waves or pseudo-normalization of T-waves⁽²⁾. There are some dates that correlate vascular factors to osteoporosis and fractures⁽³⁾, especially about the augmented fracture risk in patient with cardiovascular disease⁽⁴⁾. At the same time, there are few information about a possible link between a bone fracture – spontaneous and after a trauma – and an acute coronary syndrome (ACS). We describe a patient with multiple fractures after a car accident who developed NSTEMI.

Case Study

We described a case of a 71-year-old man with no cardiological history of coronary artery disease (CAD), hypertension, dyslipidemia. He was delivered to the Emergency Room (ER) of our hospital after a car accident. A head CT scan was immediately performed showing a subdural hematoma with no active bleeding and no indication to brain surgery. The patient was admitted to the Orthopedic Unit and a Total Body CT Scan was performed showing no acute organ damages and vertebral fractures at the D11 and L1-L2 (Fig. 1). A MRI of the spine was subsequently performed, confirming what previously seen at the CT Scan (Fig. 1). For this reason, an orthopedic surgery was scheduled. The following day, the patient started complaining mild chest pain. The ECG showed inverted T waves in anterior-lateral leads. The time 0 high-sensitive troponin I level was elevated at 1086.8 ng/L. A CT Angiography was performed and didn't show acute aortic syndrome (AAS). The patient was transferred to the cath-lab and the coronary angiogram showed a sub-occlusive stenosis of the right coronary artery (RCA) with a TIMI-1 flow (Fig. 3) and a severe stenosis of the proximal tract of the left anterior descending artery (LADA) with TIMI-1 flow (Fig. 4). Percutaneous coronary intervention (PCI) with placement of two drug eluting stents (DES) in LADA and two DES in RCA allowed for restoration of the flow with TIMI 3. Treatment with 100 mg aspirin and enoxaparin bid was started, taking

into account the surgical indication. During the recovery in cardiac intensive care unit (CICU) the patient developed a new chest pain episode with increasing in the troponin levels. The emergency coronary angiogram showed sub-occlusion of the DES in RCA and of the DES in LADA. Drug-coated balloon (DCB) was performed and a DES was implanted in the LADA. The same day, because of a new chest pain episode, an emergency coronary angiogram was performed and because of a RCA in-stent restenosis, a DES was implanted with a TIMI-3 flow. In consideration of the recurrent in-stent restenosis, a treatment with 100 mg aspirin and 75 mg clopidogrel was started and the patient was admitted to the Orthopedic Unit to continue the surgical program.

Discussion

This clinical case describes two apparently unrelated diseases. Cardiovascular disease (CVD) and especially myocardial infarction are the most common cause of hospitalization and this is related with the aging⁽⁵⁾. At the same time, the same older population can suffer more frequently spontaneous or induced fractures and osteoporotic disease. In literature, few dates are available about a possible relation between these two classes. They both share the same classic risk factors such as hypertension, smoking and diabetes⁽⁶⁾ and the physical inactivity after the surgery⁽⁷⁾ or the precipitation of some cardiovascular risk factors triggered by the disease⁽⁸⁾ can partially explain the link between them. On the other hand, it is unclear why, after a car accident or a big trauma, there is a bigger prevalence of coronary disease even in a younger population. AMI is a possible consequence of a blunt chest trauma, with a direct laceration or injury of the LADA as the most frequent mechanism⁽⁹⁾. Sometimes the anemia secondary to an important bleeding event can determinate a type two myocardial infarction. This case report, instead, describe a myocardial infarction secondary to an atherosclerosis plaque after a big trauma with fractures. We can only hypothesize that the stress caused by the trauma have destabilized a non-significant plaque, leading to a NSTEMI. Other aspect to analyze is the management of the dual antiplatelet therapy (DAPT) in consideration of the scheduled surgery. After the first PCI we decided to set a therapy with an antiplatelet and an anticoagulant. However, in consideration of the acute in-stent restenosis episodes,

we were forced to set a DAPT and to postpone the orthopedic surgery.

Conclusion

In conclusion, AMI after a bone fracture or trauma is not as rare as it looks like considering the literature. It's a relevant argument in consideration of the

tricky diagnosis and administration. The only use of biomarkers can lead to a wrong or sometimes misunderstood diagnosis. The DAPT after a PCI forces to postpone the surgery and the decision of an alternative therapy can cause a in-stent restenosis. For these reason, the only possibility we have is to analyze every single case with a multidisciplinary team.

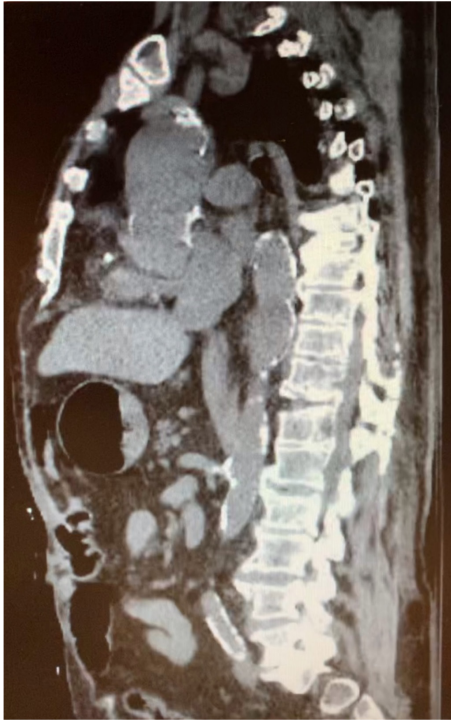


Fig. 1. Spinal CT Scan showing fracture at D12.



Fig. 2. Sagittal T2 magnetic resonance imaging showing fracture at L4.



Fig. 3. Right coronary artery (RCA) showing a proximal sub-occlusive stenosis.



Fig. 4. Left anterior descending artery (LADA) showing a severe proximal stenosis.

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