Simultaneous acute myocardial infarction with ST elevation and gastrointestinal bleeding - A case report

Arambašić J1,2; Maričić L1; Lovrić M1,2; Jurić I1,2; Zebić Mihić P1,2

1University Hospital Centre Osijek, Osijek, Croatia.
2Faculty of Medicine, University J.J. Strossmayera Osijek, Croatia.

Abstract

Background: Acute myocardial infarction with ST elevation is a common life-threatening condition in emergency medicine, typically managed with percutaneous coronary intervention (PCI) that is followed by observation in a cardiac critical care unit. However, when a patient presents with accompanying another life-threatening condition, such as active gastrointestinal bleeding with hypotension, the established treatment protocol may need to be adjusted.

Case: We present the case of a 48-year-old male patient who experienced simultaneous gastrointestinal bleeding and myocardial infarction with inferior and posterior ST elevation. The patient was initially treated at General Hospital Vinkovci, a secondary hospital center, where an endoscopic sclerotherapy of gastric ulcers was performed. He was then transferred to the University Hospital Centre Osijek according to primary PCI network in Croatia. Multiple units of red blood cells were administered due to bleeding, while dual antiplatelet therapy was initiated due to PCI. The patient eventually experienced both complications of ischemia and bleeding, despite close monitoring and treatment effort.

Conclusion: This case is unique because both conditions presented simultaneously, making treatment challenging and requiring individualized decisions. It emphasizes the need for careful consideration and adaptation of standard protocols when managing patients with multiple life-threatening conditions. Despite the efforts of the medical staff, achieving an ideal outcome in such cases is very difficult.

Introduction

Acute myocardial infarction with ST elevation is a common life-threatening condition in emergency medicine, typically managed with percutaneous coronary intervention (PCI) that is followed by observation in a cardiac critical care unit [1]. This procedure usually involves the administration of aspirin, P2Y12 inhibitor and heparin, which poses a risk of bleeding for the patient.

On the other hand, management of active gastrointestinal bleeding typically involves the administration of proton pump inhibitors, fluid resuscitation and subsequent endoscopy, ideally performed within the initial 24 hours following the patient’s admission [2]. In some cases, there may also be a need for red blood cell transfusions, which can increase a risk of ischemic events.

When these two conditions occur simultaneously, it is imperative to carefully consider each step and make appropriate adjustments to these well-established protocols.

Case report

We present the case of a 48-year-old male patient who experienced simultaneous gastrointestinal bleeding and myocardial infarction with ST elevation in inferoposterior leads. The patient’s condition began with the emergence of black stools three days before admission to the hospital. Subsequently, he experienced vomiting a bloody content, leading to a sudden collapse. An emergency call was placed, and the patient was rapidly transported to the General Hospital Vinkovci, a secondary medical center in Croatia.

During the initial assessment, an electrocardiogram (ECG) was performed that showed ST segment elevation and horizontal ST depression that in anterior and lateral leads (Figure 1). In some cases, there may also be a need for red blood cell transfusions, which can increase a risk of ischemic events.

When these two conditions occur simultaneously, it is imperative to carefully consider each step and make appropriate adjustments to these well-established protocols.

An urgent upper gastrointestinal tract endoscopy was performed, revealing a bleeding ulcer in the gastric antrum. Ulcer sclerotherapy was carried out, with simultaneous transfusion of two units of red blood cells and fluid resuscitation, resulting in the patient’s hemodynamic stabilization. Following this intervention, the patient was promptly transferred to the University Hospital Centre Osijek, as a part of primary PCI network in Croatia. Coronarography was performed, demonstrating occlusion in the proximal segment of the left circumflex artery and intermediate stenosis in the left descending artery (Figure 2.). Percutaneous coronary intervention was conducted, involving the placement of two drug-eluting stents in the left circumflex artery to establish optimal flow. Loading doses of aspirin and Clopidogrel were administered to ensure stent patency, along with proton pump inhibitors for gastroprotection.

Unfortunately, on the same day, the patient experienced hypotension accompanied by extensive melena. A gastroenterologist was promptly consulted, and an urgent endoscopy was conducted, revealing a bleeding ulcer in the antrum, which was treated with the application of 9 hemostatic clips. Multiple units of red blood cells were administered, ultimately leading to hemodynamic stabilization. The patient underwent close monitoring. He did not report any chest pain and single antiplatelet therapy with Clopidogrel was continued, along with proton pump inhibitors.

The early recovery phase progressed smoothly. The patient was discharged from the hospital and a coronary angiography was repeated six weeks later, which was indicated to measure fractional flow reserve of the left anterior descending artery (LAD). The repeat coronary angiography revealed occlusion of the proximal stent in the left circumflex artery (LCx) that had persisted for more than 48 hours (Figure 3.). The fractional flow reserve assessment of the LAD showed no hemodynamically significant stenosis. Subsequently, a myocardial scintigraphy was conducted, indicating the absence of viable myocardial infarction.
dial cells in the myocardium supplied by the LCx. As a result, no percutaneous coronary intervention (PCI) was thought to be beneficial.

Discussion

This case is unique as the patient presented to the emergency department with simultaneous acute bleeding from the upper gastrointestinal tract and a myocardial infarction, raising the crucial question of which condition should be prioritized for treatment. Literature on this subject is limited, primarily because most cases of bleeding occur as complications during the treatment of ischemic events. Yachimski and Hur developed a decision-analytic model to compare the outcomes of different treatment strategies for these complex patients. The first strategy involved conducting an upper endoscopy before proceeding with cardiac catheterization, while the second strategy involved immediate cardiac catheterization alongside conservative management of gastrointestinal bleeding. Their study showed that the first strategy resulted in fewer fatalities and complications when compared to the strategy of proceeding directly to catheterization [3]. Despite limited literature on this matter, other case reports also support prioritizing endoscopy in patients with acute bleeding [4,5].

The second question concerns the transfusion of red blood cell units, taking into account their prothrombogenic potential and proinflammatory effects. In the context of acute coronary syndrome (ACS), a blood transfusion is associated with nearly four-fold increase in early mortality and a three-fold increase in the risk of death or myocardial infarction (MI), irrespective of any bleeding complications in these patients [6,7]. The specific hemoglobin level that justify the transfusion has not been universally standardized and can vary between hospitals. The recent guidelines from the European Society of Cardiology (ESC) have not provided a definitive attitude on this matter. According to the ESC Guidelines, there are two standpoints on this subject: one advocating for a restrictive strategy, where blood transfusion is recommended when hemoglobin is less than 70 g/L and the other promoting a liberal strategy, suggesting transfusion when hemoglobin is less than 90 g/L [1]. Some observational studies have shown that the liberal approach is associated with increased complications and death [8]. Notably, the randomized REALITY trial demonstrated that a more liberal transfusion strategy, applicable to patients with myocardial infarction and hemoglobin levels below 100 g/L, is as safe as the previously mentioned restrictive approach [9].

It is important to emphasize that the first study did not sub-analyze bleeding patients [8], while the latter did. The results showed that the presence or absence of preexisting anemia or active bleeding yielded results consistent with the main analysis [9]. However, the REALITY study excluded patients who presented with shock, defined as systolic blood pressure <90 mm Hg with clinical signs of low output or requiring inotropic drugs.

During the percutaneous coronary intervention in this patient, two drug-eluting stents were implanted, in accordance with the recommendations outlined in the ESC Guideline [1]. Nevertheless, it’s worth noting that in cases of bleeding patients, an alternative approach worth considering is the use of a drug-coated balloon (DCB). DCB usage in patients with de novo lesions in coronary vessels less than 3 millimeters is associated with a reduced incidence of bleeding events, primarily attributed to the shorter duration of dual antiplatelet therapy, however, this difference was not significant in patients with high bleeding risk [10]. Additionally, a significant finding from the BASKET-SMALL 2 trial is that all patients who experienced a complete thrombotic vessel occlusion did so following stent implantation, while none encountered such an event after undergoing a DCB intervention [11]. This potential advantage has also been highlighted in other case reports on this topic [4,5].

Conclusion

Based on our case report and a review of the relevant literature, we draw the following conclusions regarding acute coronary syndrome and acute bleeding from the upper gastrointestinal tract:

1. Endoscopy should be given priority as a diagnostic and therapeutic module.
2. A restrictive approach to red blood cell transfusion is a reasonable consideration.
3. The use of drug-coated balloons should be considered in these patients.

Despite the close monitoring and the best efforts of the medical team, it is important to recognize that achieving an ideal outcome in such cases remains a significant challenge.
References


