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NAVIGATING DUAL CHALLENGES: ACUTE ST-ELEVATION MI COMPLICATED BY ACUTE GI BLEED AND PCI - A CASE REPORT

Cardiology

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ABSTRACT

Managing a critical scenario where a patient experiences life-threatening gastrointestinal bleeding concurrent with acute coronary syndrome (ACS) poses significant challenges. Enhancing the efficacy of rescue interventions relies on multidisciplinary team coordination, strategic treatment planning, and prompt execution. Urgent gastric interventions to achieve haemostasis, becomes necessary in certain cases. Herein, we present our successful management of a case involving ACS requiring emergency PCI by massive gastrointestinal haemorrhage, necessitating endoscopic intervention to achieve haemostasis.

KEYWORDS

Acute Coronary Syndrome, Gastrointestinal Bleed, Anti-platelets, Anti-coagulants, Case Report, Anterior Wall Myocardial Infarction, Angioplasty, St Elevation, Proton Pump Inhibitors, Haemoclip.

INTRODUCTION

Acute coronary syndrome (ACS) refers to a group of conditions resulting from sudden compromise in blood flow to the heart. This includes unstable angina, non-ST elevation myocardial infarction & ST-elevation myocardial infarction. ACS is a manifestation of coronary heart disease (CHD) and is typically caused by plaque disruption in coronary arteries (atherosclerosis). Common risk factors for ACS include smoking, hypertension, diabetes, hyperlipidaemia, male sex, physical inactivity, family history of CHD, obesity, and poor nutrition.[1] Treatment includes thrombolytic, Nitro-glycerine, Antiplatelet drugs, Beta blockers, Angiotensin-converting enzyme (ACE) inhibitors, Angiotensin receptor blockers (ARBs), Statins (Cholesterol-lowering medications). Procedures for Restoring Blood Flow: Angioplasty and Stenting, Coronary Artery Bypass Surgery.[2] Gastrointestinal bleeding is broadly classified into two categories: upper and lower sources of bleeding. The anatomic landmark that distinguishes between upper and lower bleeds is the ligament of Treitz, also known as the suspensory ligament of the duodenum. This peritoneal structure suspends the duodenojejunal flexure from the retroperitoneum. Bleeding that originates above the ligament of Treitz typically manifests as hematemesis or melena, while bleeding that originates below it commonly presents as hematochezia. Hematemesis refers to the regurgitation of blood or blood mixed with stomach contents. On the other hand, melena is characterized by dark, black, and tarry feces, which typically have a strong odor due to the digestive enzyme activity and intestinal bacteria on hemoglobin. Hematochezia, meanwhile, is the passing of bright red blood through the rectum[3].

Case Presentation:

A 54-year-old male with Type 2 diabetes mellitus, managed with oral hypoglycaemic agents, suffered chest pain which is epigastria and sub sternal burning discomfort from 1:00 AM lasted till 4:00 AM on January 3, 2024. He immediately attended a local hospital, where he was diagnosed with an acute coronary syndrome (ACS) anterior wall ST elevation myocardial infarction (AWMI) and was thrombolysed with streptokinase. Post-thrombolysis, he experienced two large bouts of hematemesis with altered colour one at 2:00 PM and other at 4:00 PM on the same day. From there he was shifted here for further management and presented to Emergency department (ER) with vitals signs as follows: Blood pressure 120/80 mmHg, Pulse rate 80 bpm, Respiratory rate 18breaths/min, and SpO2 99%. An electrocardiogram (ECG) showed persistent ST elevation, and the patient reported on-going pain.

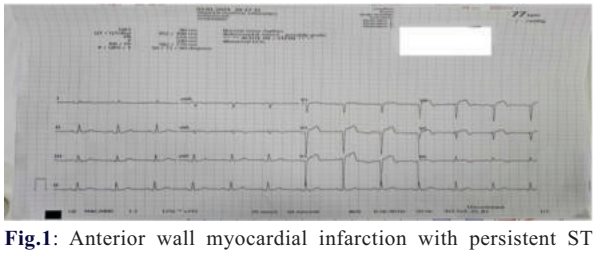


Fig.1: Anterior wall myocardial infarction with persistent ST elevation.

Gastroenterologist (GE) opinion was obtained prior to percutaneous coronary intervention (PCI) and took the patient for procedure under intravenous pantoprazole infusion. Coronary angiography through right radial route (CAG) revealed discrete triple vessel disease, and ad-hoc percutaneous transluminal coronary angioplasty (PTCA) with drug-eluting stents placed in the mid-left anterior descending (LAD) (Fig.3) artery and distal right coronary artery (RCA) (Fig.4) was done with periprocedural heparin 6000 units guided by activated clotting time. The following morning, the patient exhibited signs of restlessness, perspiration, cold extremities, and tossing in the bed. Haemoglobin levels dropped from 11.5 g/dL to 7.2 g/dL. His blood pressure dropped to 75/50 mmHg, while his pulse rate increased to 118 beats per minute and he was in shock. Urgent gastroenterologist review was taken and immediately initiated resuscitation with IV fluids, nor-adrenaline and a 2-units blood transfusion in the advanced medical care unit (AMCU). Upper gastrointestinal endoscopy revealed a Mallory-Weiss tear with active bleeding, as well as a large quantity of blood in the stomach which was fixed by Injecting adrenaline plus saline (1:10,000) around the tear followed by the application of three hemoclips Fig:2. Ticagrelor was temporarily discontinued due to the bleeding risk. Bedside 2D echocardiography demonstrated moderate left ventricular dysfunction. During this episode patient experienced ventricular tachycardia (VT) on 3rd day and was treated with IV lignocaine hydrochloride injection (2ml) and IV amiodarone (150 mg). Following consultation with the critical care team and medical gastroenterologist Ticagrelor 90 mg was crushed and administered sublingually due to the patient's mechanical ventilation.

Fig.2: Endoscopic examination revealed long linear tear with oozing of blood. 3 hemoclips applied after injecting with saline and adrenaline (1:10000) and haemostasis secured

Subsequent check endoscopy revealed no active bleeding, and the hemoclips remained in place. Endoscopy-guided RT placement was performed, and pantoprazole infusion was continued alongside antibiotics (piperacillin and tazobactam), Metoprolol 25 mg was added thrice daily via RT. The patient experienced a fever spike to 102°F, with a total leukocyte count of 10,000cumm. On 4th day after a period of stabilization, the patient was planned for extubation, and noradrenaline was slowly weaned off. Haemoglobin levels stabilized at 9 g/dL. Pantoprazole infusion was transitioned to injections twice a day. On 5th day patient then experienced four episodes of melena, one episode of haematuria, and haemoglobin dropped from 8 g/dL to 7.8 g/dL. International normalized ratio (INR) was 1.29 and check endoscopy showed no active bleeding, with two hemoclips in place. Urological assessment did not reveal any abnormalities, with Foley catheter placement intact and a normal anal tone. Prostate was noted to be grade III, while glove staining indicated melena. On 6th day one unit

of blood transfusion was administered, and ticagrelor was continued, while aspirin was withheld. Haemoglobin levels subsequently increased from 8.5 g/dL to 11 g/dL. The patient exhibited stable hemodynamic, and Foley catheter was removed. Finally, on 9th day the patient was discharged from the hospital in haemodynamically stable condition.

Case Discussion:

The pathophysiology underlying acute coronary syndrome (ACS) typically involves the disruption of a vulnerable plaque within a coronary artery, leading to the formation of a thrombus. This thrombus can either partially or completely occlude the artery, resulting in different forms of ACS, such as unstable angina, non-ST elevation myocardial infarction (NSTEMI), or ST-elevation myocardial infarction (STEMI) [1]. In the case presented, the patient experienced a STEMI, with the culprit vessel identified as the left anterior descending artery, indicative of an anterior wall myocardial infarction. However, managing this particular case posed a significant clinical challenge due to concurrent issues related to clotting and bleeding. The patient exhibited active bleeding from the gastrointestinal (GI) tract, presenting as hematemesis (vomiting of blood) and melena (black, tarry stools). This bleeding, likely stemming from an underlying condition such as acid peptic disease or gastroesophageal reflux disease (GERD), had been on-going but unnoticed and untreated for approximately two years.

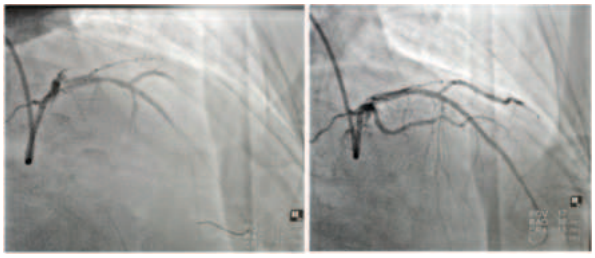
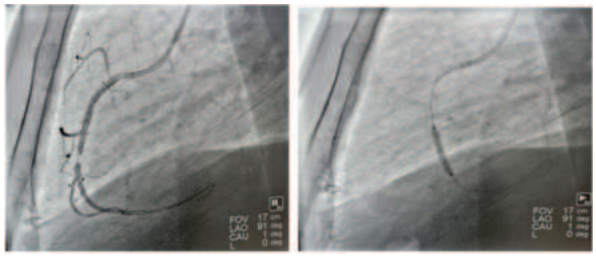


Fig.3: (A) Stent across culprit lesion in proximal LAD (B) Proximal LAD post stenting

Additionally, the patient reported experiencing two types of chest discomfort: sub sternal pain that radiated across the chest, indicative of angina, and tearing discomfort originating from the epigastrium and radiating upwards into the throat, particularly noticeable when the stomach was empty or after eating. Given the simultaneous occurrence of ACS and active GI bleeding, primary treatment options such as antiplatelet and anticoagulant therapy presented a dilemma. These medications are typically essential for managing ACS, as they help prevent further thrombus formation and reduce the risk of recurrent cardiovascular events. However, administering them in the presence of active bleeding could exacerbate the situation and lead to further complications. In this complex scenario, a careful and tailored approach to treatment was necessary. The primary goal remained the resolution of the ACS, either through balloon angioplasty or stent placement to restore blood flow in the affected coronary artery. However, these procedures inherently involve the use of anticoagulants and antiplatelet agents to prevent stent thrombosis and recurrent ischemic events. To navigate this challenge, a strategy was devised to minimize the risk of exacerbating the GI bleeding while addressing the ACS. This involved judicious use of anticoagulants during the procedure, with close monitoring of clotting parameter activated clotting time (ACT). Post-procedure, antiplatelet therapy was initiated cautiously, with careful consideration given to the patient's bleeding risk. Dual antiplatelet therapy, which is standard in ACS management, was avoided due to the heightened risk of bleeding. Throughout the treatment course, close monitoring of the patient's clinical status was essential.

Antiplatelet therapy was adjusted or temporarily suspended if active bleeding was observed, with a focus on managing the underlying cause of the GI bleeding concurrently. Despite the complexities involved, the case provided valuable lessons in managing similar scenarios in the future, emphasizing the importance of a tailored approach that balances the need for cardiovascular intervention with the risk of bleeding complications. Antiplatelet therapy plays a vital role in treating acute coronary syndrome (ACS), regardless of whether medical therapy or percutaneous coronary intervention (PCI) is utilized for myocardial reperfusion. Dual-antiplatelet therapy (DAPT) involving aspirin and a P2Y12 receptor inhibitor has been shown to enhance outcomes in ACS. However, severe bleeding in patients on antiplatelet treatment significantly increases mortality risk. Therefore, before initiating DAPT, it's crucial to assess bleeding risk. The European Society of Cardiology (ESC) guidelines recommend combining DAPT with a proton pump inhibitor (PPI) for ACS patients at high risk of gastrointestinal bleeding.



C (D)

Fig.4: (C) Wired critical lesion in mid RCA (D) Stent being deployed across the lesion in mid RCA

Depending on bleeding severity, treatment adjustments may include switching to a single P2Y12 inhibitor or discontinuing antiplatelet drugs altogether. Research suggests that patients with certain genetic mutations, particularly in the platelet CYP2C19 gene, may have reduced response to clopidogrel, necessitating alternative P2Y12 inhibitors for optimal benefit. Additionally, platelet function testing (PFT) can guide de-escalation of antiplatelet therapy for ACS patients, ensuring a balance between ischemic and bleeding events.[4]

CONCLUSION

The patient experienced a complex clinical course due to an acute coronary syndrome Anterior wall ST elevation myocardial infarction (AWSTEMI) and immediate gastrointestinal bleeding from a Mallory-Weiss tear. Thrombolysis was initially effective for managing the coronary event, but led to significant complications including hematemesis and a marked drop in haemoglobin. The patient required close multidisciplinary management, involving cardiology, gastroenterology, and critical care teams. Interventions included blood transfusions, resuscitative measures, and medications such as adrenaline around the tear, pantoprazole infusion and antibiotics. A comprehensive approach with regular reassessment and coordination across specialties ensured the patient's successful recovery and stable hemodynamic. Ultimately, despite the complexities of his presentation and the risks of concurrent medical issues, the patient responded well to treatment and stabilization efforts, resulting in a safe discharge. His outcome highlights the importance of vigilant, multidisciplinary care and continuous monitoring to promptly address complications and adjust treatment plans as needed. Follow-up care will be essential for on-going management of his cardiac and gastrointestinal health.

Informed consent

Patient (or their proxies/legal guardians) provided informed consent for the publication of their anonymized case details and images.

Data availability statement

All data generated or analysed during this case report are included in this article.

Declaration of competing interest

We declare that we don't have any competing financial interests or personal relationships that would appear to influence the work reported in this paper.

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