

Gastric Mallory–Weiss tear after cardiopulmonary resuscitation: a case report

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Abstract

Mallory–Weiss tear is a rare complication that could result following cardiopulmonary resuscitation, leading to vigorous upper gastrointestinal bleeding. We illustrate a case of an 84-year-old male patient, admitted to the hospital for investigation of lung nodules and bilateral pleural effusion. The patient developed cardiac arrest during pleural aspiration, and cardiopulmonary resuscitation was done, which was followed shortly by an attack of acute upper gastrointestinal bleeding. Urgent upper endoscopy revealed a mucosal tear with submucosal oozing of blood and two large vessels in its floor, which were successfully managed endoscopically with both injection and hemoclips. This case report emphasizes the importance of considering this potential complication, especially after performing a successful cardiac resuscitation.

Keywords:

acute upper gastrointestinal bleeding, gastric Mallory–Weiss, postcardiopulmonary resuscitation

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Introduction

Mallory–Weiss syndrome is characterized by acute upper gastrointestinal bleeding (UGIB) secondary to longitudinal mucosal lacerations (known as Mallory–Weiss tears). It is commonly observed at the gastroesophageal junction but may rarely occur at the gastric cardia. Furthermore, a sudden rise in the intragastric pressure or gastric prolapse into the esophagus, including antecedent transesophageal echocardiography, may be considered as another added factor [1].

Cardiopulmonary resuscitation (CPR) is the best way to restore spontaneous circulation in patients with cardiac arrest; however, it could result in multiple complications, especially if performed by nonmedical personnel and outside the hospital situation. Some of these complications may lead to life-threatening conditions such as fractures (rib and/or sternum), lung injury (pneumothorax), solid organ injuries (the liver and spleen), and cardiac injuries (contusions). Additionally, rupture of the stomach post-CPR may occur, but unfortunately, it has been scarcely described in the literature. It may be caused by the ventilator and external cardiac life support that is applied to the patients after a cardiac arrest [2]. It is estimated that gastric mucosal tears following CPR occurred in 9–12% of patients [3]. Surely, the risk of complications should be balanced against the potential benefits of restoration of spontaneous circulation successfully in a cardiac arrest patient. Currently, endoscopic treatments offer better

therapeutic outcomes in more cases than conventional conservative treatments [4].

Case report

An 84-year-old male patient presented with vigorous UGIB in the form of an acute attack of hematemesis and fresh rectal bleeding. The patient was known to be hypertensive, have ischemic heart disease with pericardial effusion, and have atrial fibrillation rhythm. He had a history of lung nodules and bilateral pleural effusion for which he was admitted to the hospital for investigation. He was receiving daily acetylsalicylic acid and apixaban, which were started recently, as well as pantoprazole 40 mg twice daily. The attack of the vigorous UGIB has shortly followed a cardiac arrest that happened during pleural aspiration. Return of spontaneous circulation was achieved after 5 min of advanced life support and injection of a total of 3 mg epinephrine (two cycles of CPR were done). A nasogastric tube (NGT) was inserted without difficulty to decompress the gastric distension that occurred after CPR and 24 h before the attack of UGIB took place. After that, the patient was admitted to the ICU and placed on mechanical ventilation. His blood pressure was 90/60 mmHg and

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pulse was 120 beats/min. His blood tests were normal apart from hemoglobin %, which dropped from 13 to 9 in 4 h. The bleeding took place almost 24 h after the resuscitation. Urgent bedside upper endoscopy was done and revealed a mucosal tear with submucosal oozing of blood and two large vessels in its floor at the lesser curvature of the stomach (Fig. 1). Transabdominal ultrasound, abdominal radiograph, and computed tomography was done to exclude any collection or pneumoperitoneum, and all were normal.

The condition was successfully managed endoscopically with both injection of diluted adrenaline and four hemoclips (Fig. 2). The bleeding was stopped completely. After resuscitation, his blood pressure was 120/80 mmHg and pulse was 80

beats/min; the patient was extubated and regained full consciousness.

Discussion

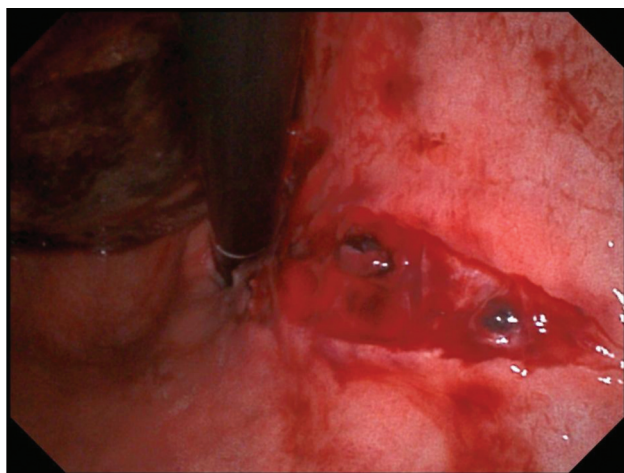
Gastric mucosal tear, also named gastric Mallory–Weiss tear, is considered as one of the rare complications that could follow CPR. It represents ~3–10% of cases of UGIB, and usually the tear heals spontaneously even without any endoscopic or surgical intervention [5]. To our knowledge, the incidence of gastric Mallory–Weiss tear is not well established till now. In theory, gastric Mallory–Weiss tear could be explained by overdistension of the stomach that may have occurred during mouth-to-mouth ventilation or bag-mask ventilation during CPR, resulting in a marked increase in the gastric pressure [6]. Moreover, chest wall compressions of the resuscitated patient could increase the intragastric pressure, which in itself can induce a tear in the gastric mucosa and in turn a Mallory–Weiss syndrome [7]. Owing to the rarity of this complication, it could result in life-threatening bleeding in such resuscitated patients.

Kim *et al.* [8] reported a similar case of a 62-year-old female patient who presented with severe Mallory–Weiss tear, which occurred after a successful CPR that was performed by health care providers in the emergency department. They explained that the hyperventilation by the bag-mask ventilation caused overdistension of the stomach, which together with chest compressions without endotracheal intubation also might have led to a higher intragastric pressure [8].

Furthermore, NGT insertion may be associated with complications such as tube knotting, misplacement into the bronchus, and/or arterial-esophageal fistula, although it is not that a common cause for UGIB [9,10]. Interestingly, Mullady and McGee [11] demonstrated an interesting case of iatrogenic acute UGIB from mucosal tears resulting from gastric overdistention after missed esophageal intubation.

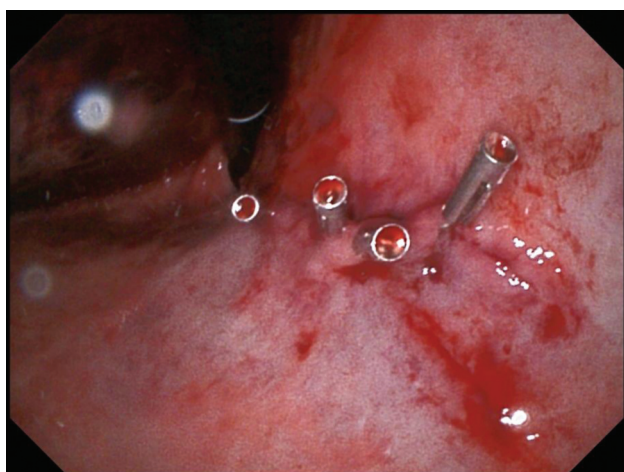
In our case, we explained the mucosal tear at the lesser curvature of the stomach owing to the cylindrical shape of the stomach, which could help the longitudinal tears to occur more easily than the circumferential one. These could be explained by a rapid increase in intragastric pressure and distention, which causes an increase in the forceful fluid ejection through the esophagus, or might be due to a significant change in the transgastric pressure

Figure 1



A mucosal tear with submucosal oozing of blood and two large vessels in its floor at the lesser curvature of the stomach.

Figure 2



After complete homeostasis with both injection and hemoclips.

owing to the negativity of the intra-thoracic pressure that is contradictory to the positive intragastric pressure, which leads to distortion of the gastric cardia, resulting in a gastric tear, facilitated by the hypoperfused gastric mucosa in a critically ill patient, which makes the mucosa weak and vulnerable to this break. On the contrary, NGT induced tear which progressed the bleeding to the vigorous uncontrollable form may be another explanation; however, NGT induces esophageal ulcers usually when ignored for more than 2 weeks, but the smooth insertion and the position of the tear on the lesser curvature and not on the greater curvature (usually where the NGT hits) may be against this explanation. Owing to the rarity of this condition, there is a great need to consider the occurrence of this potential and maybe lethal complication after initial successful resuscitation [8].

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Nil.

Conflicts of interest

There are no conflicts of interest.

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