Case Report

Acute mediastinitis after gastric rupture due to blunt trauma: A case report

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ABSTRACT

Acute mediastinitis after gastric rupture due to blunt trauma is very rare. In such cases, the esophageal hiatus widens due to elevated intra-abdominal pressure, and spillage of gastric contents causes acute posterior mediastinitis. The present report describes the case of a 30-year-old man who injured his left flank, which resulted in gastric rupture. During emergency laparotomy, a ruptured stomach was observed and the abdominal cavity and posterior mediastinum were found to be filled with gastric contents. Following partial gastrectomy, multiple loculated fluids were detected around the esophagus. Irrigation and drainage around the esophagus were performed via video-assisted thoracic surgery. After surgery, the patient recovered from acute mediastinitis and was discharged without any significant complications. In patients with upper gastric rupture, acute mediastinitis should be suspected, and video-assisted thoracic surgery may be an appropriate treatment strategy in such patients.

Introduction

Gastric rupture is relatively rare in cases of blunt trauma to the abdomen. The stomach is a capacious organ with a muscular thick wall. Especially when empty, the stomach is relatively resistant to blunt injuries because of its relatively protected anatomical position and high degree of mobility [1]. However, blunt trauma to the upper abdomen may lead to increase in intragastric pressure, leading to gastric rupture when the stomach is distended, similar to balloon bursting [1,2]. The majority of the above complications are directly related to massive intraperitoneal contamination with undigested food and gastric acid, causing chemical peritonitis [1]. The mortality rate due to gastric injury is up to 66%, and the high mortality associated with gastric rupture is not directly associated with trauma but rather with intra-abdominal septic complications [1]. Such septic conditions mainly occur due to chemical peritonitis induced by the spillage of gastric acid [1]. A previous report has described pericarditis that may have occurred due to concomitant ruptures in the stomach and central diaphragm [3]. In general, the mortality rate in cases of acute mediastinitis due to esophageal rupture is up to 20% [4]. However, acute mediastinitis after gastric rupture due to blunt trauma is very rare. Here, we report the case of a man who developed acute mediastinitis following gastric rupture due to injury to the left flank and was successfully managed via video-assisted thoracic surgery.

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Case report

A 30-year-old male injured his left flank due to being accidentally stuck in a compressor machine in a factory. He complained of diffuse flank pain on his left side. The patient was hemodynamically stable and fully conscious. Abdominal examination revealed severe left upper quadrant tenderness and guarding. Focused assessment with sonography of the trauma of his left abdomen yielded a positive result. Computed tomography (CT) revealed an abnormal shadow on the low paraesophagus (Fig. 1A), absence of the gastric great curvature wall (Fig. 1B), infarcted spleen and left kidney, and hemoperitoneum. Emergency exploratory laparotomy revealed the peritoneal cavity filled with blood clots and partially digested food materials. After four quadrants were packed, the left lateral stomach wall was found to have burst along the fundus to the great curvature, approximately 12 cm in length, and the fundus and great curvature of the stomach were not recognizable. The esophageal hiatus was widened, and the posterior mediastinum was filled with partially digested food materials. However, lower esophageal injury was not detected. The spleen was bisected, and the artery to the left kidney showed aneurysmal change. Splenectomy and partial gastrectomy were performed along the great curvature using staplers (DST Series™ GIA™ 60 mm, Covidien®, Mansfield, MA, USA). We decided the close surgical observation for left infarcted kidney. After massive irrigation of the whole abdominal cavity including the posterior mediastinum, the abdomen was closed. We took two large bore hole JP drains in post mediastinum, and two JP drains in peritoneum.

Postoperatively, leukocytosis lasted for several days, but the patient was afebrile. CT on postoperative day 10 revealed multiple loculated fluids in the left paraesophagus and left pleural cavity (Fig. 2). Thoracic exploration via video-assisted thoracic surgery (VATS) was performed to verify the paraesophageal space. Multiple loculated fluids in the left pleural cavity were relatively clear, but the loculated fluid around the low paraesophagus was grossly pus. The pus around the paraesophagus was evacuated. After massive irrigation, evidence of esophageal injury was not found although severe inflammation around the low paraesophagus was present. The chest was closed with two large bore hole (32 French) chest tube drainages. The patient made an uneventful postoperative recovery. CT revealed decreased loculated fluid around the low paraesophagus (Fig. 3A), and the leukocytosis was restored at 7 days after pus drainage. The chest drain and JP drains were removed at 2 weeks after pus drainage. The patient was discharged in good general condition at 30 days post trauma.

Discussion

We report a very rare case of acute mediastinitis after gastric rupture due to blunt trauma. In the present case, the accident occurred when the patient's stomach was full, judging from the partially digested food found spilled throughout his entire peritoneal cavity and posterior mediastinum through the esophageal hiatus. Negative pressure in the thoracic cavity, positive pressure in the abdominal cavity, and high pressure-induced injury of the abdomen might have easily led to the spillage of gastric contents into the posterior mediastinum. In addition, the ruptured site encompassed the fundus and great curvature of the stomach, close to the esophageal hiatus. These irritants were likely to have been the cause of mediastinitis.

The esophageal hiatus was widened, and a pus pocket was formed on the left side of the esophagus. We approached the pus pocket via left VATS. Distal esophageal rupture with the spillage of upper gastrointestinal contents into the chest is most frequently encountered on the left side due to the anatomical position of the esophagus [4]. Therefore, the best approach to the distal esophagus would be VATS as an alternative to thoracotomy [4]. To the best of our knowledge, acute mediastinitis after gastric rupture due to blunt trauma has not been reported yet. In patients with upper gastric rupture, acute mediastinitis should be suspected and VATS

Fig. 1. Computed tomography revealed abnormal shadow (*) on the low paraesophagus (A), absence of the great curvature wall of the stomach (arrows), infarcted spleen (*) and left kidney, and hemoperitoneum (B).
would be an appropriate treatment strategy in such patients.

**Conclusion**

Acute mediastinitis occurred through the esophageal hiatus, and the primary cause of mediastinitis was the spillage of acidic gastric contents despite our efforts at massive irrigation of the posterior mediastinum. Prompt diagnosis and proper surgical drainage are essential in such patients. We could save the patient because of our suspicion of mediastinitis due to persistent leukocytosis. In patients with upper gastric rupture, acute mediastinitis should be suspected. VATS would be an appropriate treatment strategy for such patients.
List of abbreviations

CT computed tomography
VATS video-assisted Thoracic Surgery

Declarations

Ethics approval and consent to participate; this study was approved by Pusan National University Hospital ethics committee.

Consent for publication

Not applicable.

Availability of data and materials

Not applicable.

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The authors declare that they have no fundings.

Authors’ contributions

DN analyzed the patient data and was a major author in writing the manuscript. CIP analyzed the patient data. JHK interpreted the patient data and is a corresponding author. All authors read and approved the final manuscript.

Declaration of competing interest

The authors declare that they have no competing interests.

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