CASE REPORT

Perforated Strangulated Roux Limb in Diaphragmatic Hernia—A Rare Complication after Laparoscopic Total Gastrectomy for Gastric Cancer: A Case Report

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Abstract

Aim: To report a case of a perforated strangulated roux limb in diaphragmatic hernia as a rare complication following laparoscopic total gastrectomy for gastric cancer.

Background: As minimally invasive surgery (MIS) becomes increasingly performed for esophagogastric cancers, diaphragmatic hernias (DHs) pose new challenges for surgeons.

Case description: We report the case of a 59-year-old patient who presented with hematemesis, epigastric pain, and hemodynamic instability. The patient had a history of gastric adenocarcinoma and had undergone a laparoscopic total gastrectomy 3 years before. The computed tomographic scan demonstrated a diaphragmatic hernia with a strangulated and perforated roux limb. The patient underwent staged resection of the necrotic roux limb to manage sepsis, followed by restoration of alimentary continuity.

Conclusion: A diaphragmatic hernia (DH) is a challenging complication of MIS for esophagogastric cancers and may be difficult to prevent. A staged approach was invaluable, allowing for careful assessment, expert opinion, and reconstruction.

Clinical significance: As MIS becomes increasingly performed, cases of complicated DH may become more apparent. Preventing DH may be difficult. A sutured crural repair with or without pexy of the roux limb may be performed if DH is identified at the time of gastrectomy. The value of mesh is unclear, and erosion remains a main concern.

Keywords: Case report, Diaphragmatic hernia, Gastric cancer, Laparoscopic gastrectomy.

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Background

As minimally invasive surgery (MIS) becomes increasingly performed for esophagogastric cancers, diaphragmatic hernias (DHs) pose new challenges for surgeons.

Case Description

Three years after laparoscopic total gastrectomy for adenocarcinoma, a 59-year-old male presented with hemodynamic instability. Imaging confirmed a DH with a strangulated roux limb and perforation into the mediastinum and left upper quadrant (Fig. 1).

A staged approach was taken with the goals of controlling contamination, restoring normal physiology, and definitive reconstruction. An emergency gastroscopy and laparoscopy were performed. Hernia contents were reduced, 20 cm of ischemic roux limb resected, ends left stapled off, and extensive lavage performed. Drains were placed into the mediastinum and subdiaphragmatic space. The patient was admitted to ICU and commenced on broad-spectrum antibiotics, antifungals, and total parenteral nutrition. Ongoing sepsis on day 2 prompted a repeat CT, revealing an undrained posterior mediastinal collection (Fig. 2). To avoid pleural contamination with a thoracoscopic approach, an interventional radiologist successfully drained the collection using CT guidance along a paravertebral trajectory (Fig. 3). Relook laparoscopy on day 4 proved technically challenging due to dense hiatal adhesions. A further small segment of the jejunum was resected back to a healthy esophagus at 39 cm. To establish GI continuity, a laparotomy was undertaken on day 6 because of the technical challenges encountered at the previous laparoscopy. A retrocolic OJ anastomosis was performed using an OrVil® circular stapler.[1]

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Fig. 1: Coronal contrast-enhanced CT on presentation showing incarcerated and perforated alimentary limb within a recurrent diaphragmatic hernia

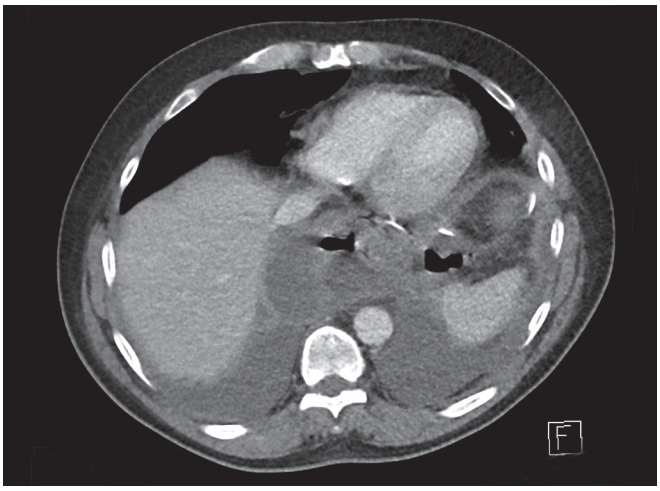

Fig. 2: Axial contrast-enhanced CT showing a posterior mediastinal collection situated posterolateral to the esophagus

The roux limb was lengthening and pexied to the crura to prevent future herniation. Remained well 2 years post-discharge with normal swallowing and stable weight.

Discussion

A review of the literature (MEDLINE and EMBASE) demonstrates the incidence of up to 9% of DH, 6 months after laparoscopic total gastrectomy, with symptomatic DH occurring in 1.6–3.8%.[2–4] Strangulation is rare, as identified in three cases necessitating resection of the small bowel or transverse colon.[2,3,5] Predisposing factors include division of the left crus, regardless of the type of anastomosis and MIS due to reduced adhesion formation.[2,4,6] It has been theorized negative intrathoracic pressure acts as a suction effect, progressively dilating the hiatus.[3] As MIS becomes increasingly performed, cases of complicated DH may become more apparent, particularly in gastric cancer-endemic countries.

Prevention of DH may be difficult. Avoiding disruption of the crura and phreno-esophageal ligament may reduce the suction effect from the intrathoracic cavity. This may not be avoidable in very proximal tumors necessitating extended total gastrectomy or cases with pre-existing hiatus hernia. Where preexisting hiatus hernias are identified at surgery, if feasible, we recommend a sutured crural repair with or without crural pexy of the roux limb. The value of mesh is unclear based on limited supporting evidence, and erosion remains our main concern.[3]

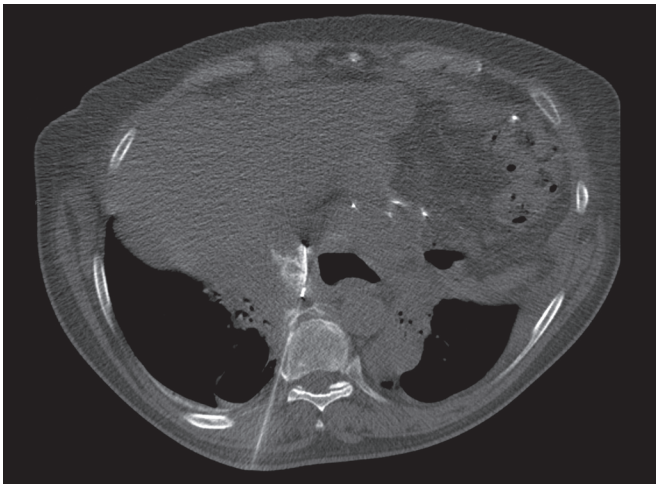

Fig. 3: Axial CT showing CT-guided micropuncture and hydrodissection technique demonstrating extrapleural route into mediastinal collection

Clinical Significance

As MIS becomes increasingly performed, cases of complicated DH may become more apparent. A staged approach was invaluable, allowing for careful assessment, seeking expert opinion, and reconstruction planning. A sutured crural repair with or without pexy of the roux limb may be performed if DH is identified at the time of gastrectomy in an attempt to prevent further DH. The value of mesh is unclear, and erosion remains a main concern.

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