CASE REPORT PEER REVIEWED | OPEN ACCESS

Recurrent type IV hiatal hernia post-esophagectomy requiring hemicolectomy

Cambo Keng, Xin Yi Goai, Yahya Al-Habbal

ABSTRACT

Introduction: Hiatal hernia is an uncommon but potentially life-threatening complication of esophagectomies.

Case Report: We report a rare case of an incarcerated type IV hiatal hernia in a patient in his mid-70s, which is a recurrence occurring one year following an Ivor–Lewis esophagectomy and repair of his first postoperative hiatal hernia. He underwent successful laparoscopic hiatal hernia repair with mesh reinforcement, along with a right hemicolectomy due to concerns of strangulated colon. We discussed the challenges in diagnosis and the considerations and controversies relevant to the surgical management of such hernias.

Conclusion: There is an apparent scarcity of evidence to guide the management of these hernias. Nevertheless, a high index of suspicion and urgent surgical repair is warranted to improve patient outcomes.

Keywords: Colonic incarceration, Esophagectomy, Hiatal hernia, Mesh repair

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INTRODUCTION

Esophagectomy, although a well-established and effective surgical procedure for the management of esophageal cancer, carries high perioperative morbidity and mortality [1, 2]. While the usual postoperative complications include pneumonia, anastomotic leakage, infection, and necrosis of conduit, secondary hiatal hernia is an uncommon complication which occurs due to the widening of hiatus during esophagectomies [1–3]. It carries subsequent life-threatening consequences, including respiratory compromise, incarceration, and perforation [1]. We present a case of recurrent acute type IV hiatal hernia following esophagectomy, which required a hemicolectomy for a strangulated transverse colon.

CASE REPORT

A man in his mid-70s presented to the emergency department of a regional hospital on day 2 after a gastroscopy and pyloric Botox injection for delayed gastric emptying with sudden onset left shoulder tip pain followed by severe generalized abdominal pain radiating to his back.

This occurred in the context of a complex surgical history that began with an elective laparoscopic fundoplication for a paraesophageal hernia two years prior and an Ivor–Lewis esophagectomy for adenocarcinoma. The latter procedure was complicated by a paraconduit hiatal hernia on day 5 post-esophagectomy, with the redundant transverse colon and its omentum in the left hemithorax. The hernia was laparoscopically reduced, defect suture-repaired, and gastric conduit tacked to the hiatus. This postoperative hiatal hernia (HH) was distinct from his previous small sliding hernia, which had been addressed during his earlier fundoplication. He experienced an otherwise uneventful recovery and completed chemo-adjuvant therapy for T3N0M0 esophageal adenocarcinoma. Routine follow-up imaging post-esophagectomy thus far showed no evidence of HH recurrence.

In addition to his presenting symptoms, the patient reported left-sided pleuritic chest pain. He denied palpitations, diaphoresis, dyspnea, or any infective symptoms. He had no dysphagia, odynophagia, or signs and symptoms of gastrointestinal (GI) bleeding or bowel obstruction. His medical history includes obstructive sleep apnea, chronic back pain with a previous L3/4 laminectomy, and benign prostatic hyperplasia. He is from home with family and is functionally independent.

Upon examination, aside from an oxygen saturation of 89% on room air, he was hemodynamically stable and afebrile. Chest auscultation revealed decreased air entry in the left lung base. The abdominal exam was unremarkable, with a soft, non-tender abdomen, and a reducible right inguinal hernia.

Aside from a slightly raised lactate level of 2.0 mmol/L, the patient's laboratory values were generally unremarkable, including a normal white cell count 6.7 × 10^9/L, C-reactive protein 0.7 mg/L, creatinine 68 umol/L, lipase 85 U/L, and normal liver function tests. Bedsides electrocardiogram had no features of cardiac ischemia. Initial chest radiograph demonstrated an elevated left hemidiaphragm with evidence of previous gastric pull-through and a retrocardiac gaseous structure consistent with the presence of bowel (Figure 1). Computed tomography (CT) scan of the chest, abdomen, and pelvis confirmed herniation of the transverse colon through the diaphragmatic hiatus into the left hemithorax, without evidence of obstruction. There is associated compressive atelectasis in the left lower lobe and around the gastric pull-up. The CT also showed a potential extraluminal locule of gas with thickening of adjacent bowel wall and surrounding fat inflammation, suggestive of a contained perforation (Figure 2).

The patient was made nil-by-mouth, and initiated on intravenous (IV) crystalloids, analgesia, and antiemetics as required. Intravenous proton pump inhibitor (pantoprazole) and IV antibiotics (ceftriaxone and metronidazole) were administered. The patient was subsequently transferred to a metropolitan hospital under the upper gastrointestinal surgery team for specialist tertiary input and management. The patient underwent emergency laparoscopic exploration and reduction of the hiatal hernia containing the transverse colon and greater omentum. The transverse colon appeared bruised and gangrenous without macroscopic perforation. Concerned about compromised bowel, the surgeons proceeded with a right hemicolectomy and end-to-end anastomosis via midline mini-laparotomy. Intravenous antibiotics were discontinued after 48 hours, and drain tube removed on day 5. The patient received ongoing support from allied health professionals including dietetics, physiotherapy, and the acute pain service. He was discharged home on day 7 after an uneventful recovery.

The patient had satisfactory recovery during his clinic review two weeks postoperatively. He resumed regular bowel movements and was tolerating diet well, with only intermittent mild postprandial pain. The patient later underwent an uncomplicated elective right inguinal hernia repair.

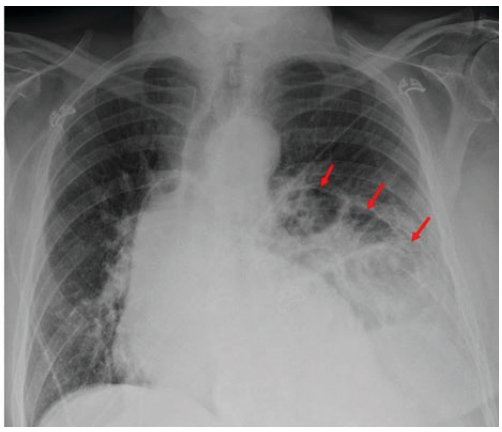

Figure 1: Chest radiograph demonstrating presence of bowel in the left hemithorax (red arrows).

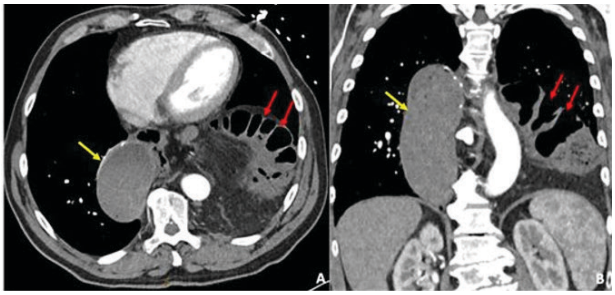

Figure 2: Computed tomography chest abdomen pelvis in (A) axial and (B) coronal views demonstrating gastric pull-up (single yellow arrow) and incarcerated transverse colon into left hemithorax (red arrows).

DISCUSSION

Secondary hiatal hernia (HH) is an uncommon complication of esophagectomy with an estimated incidence of 3%, with the majority necessitating surgical repair, including bowel resections [4]. In this report, we present a rare case of recurrent acute type IV hiatal hernia containing an incarcerated transverse colon, necessitating a right hemicolectomy, occurring two years after laparoscopic hiatoplasty in the early post-esophagectomy course and a prior fundoplication.

A spectrum of diseases has been observed in published literature, ranging from incidental findings on routine oncological follow-up to acute presentations with respiratory distress, bowel obstruction, or sepsis resulting from ischemia and perforation [5–16]. The extreme cases of fecopneumothorax [17] and obstructive shock secondary to tension colothorax have also been reported [18]. Like other reported cases, the patient exhibited vague symptoms of abdominal pain, chest pain, and some degree of respiratory compromise. These non-specific symptoms make a diagnosis or even the suspicion of a significant hiatal hernia difficult. Knowledge of

the patient's history of esophagectomy and HH repair, along with chest imaging, played a pivotal role in early detection and prompt surgical intervention. The timing of presentation also varies in previous case reports, ranging from two days post-esophagectomy [11] to 10-years later [17], underscoring the need for a high index of suspicion and possibly long-term follow-up.

There is limited evidence concerning predisposing factors for developing HH post-esophagectomy, and even fewer for developing recurrences. While minimally invasive esophagectomies (MIE), such as the Ivor–Lewis esophagectomy in our case, are associated with reduced surgical morbidity, they are associated with a higher incidence of HH at 4.5% (95% CI 2.8–6.2), compared to the open approach at 1.0% (95% CI 0.6–1.3), as reported in a systematic review [1]. While disruption of normal anatomy and hiatal widening during surgery are expected risk factors for HH, factors like insufflation and reduced peritoneal adhesions are believed to contribute to the higher incidence in MIE [19]. In fact, this is a growing concern as MIE becomes the mainstay of esophageal cancer treatment [20]. Surgical considerations for hiatal hernia repair, including the diaphragmatic or crural fixation of the gastric conduit and mesh reinforcement, remain controversial. Despite limited evidence of benefit, crural fixation of gastric conduit has been used in certain centers to reduce the likelihood of HH, with concerns regarding vascularity to the gastric conduit [1].

Similarly, there is conflicting evidence about the effectiveness of mesh augmentation in reducing HH recurrence compared to primary suture repair. A randomized-controlled trial reported no significant difference between the approaches in preventing recurrence [21]. While there is no evidence to support routine use, mesh repair may be beneficial in large HH where there is high tension and poor crural quality [22, 23]. In fact, a meta-analysis suggested that the use of mesh produces fewer recurrences than primary suture repair, with pooled incidence rates of 12.1% (95% CI 6.3–22.2) and 20.5% (12.9–13.0), respectively, in cases of giant HH without significant difference in complication rates [23].

Patient factors such as excessive weight loss perioperatively, malnutrition exacerbated by chemotherapy, lower body mass index (BMI) (<25 kg/m^2), as well as tissue fragility caused by adjuvant chemo- and/or radiotherapy have been reported as potential risk factors for HH [4, 16]. Increased colonic mobility in lower BMI patients due to reduced mesenteric fat [16, 19], together with the long colonic mesentery and skeletonization of the greater curvature [8], likely explain the displacement of the transverse colon into the thoracic cavity in most HH post-esophagectomy cases. The patient in our report exhibited these surgical and patient factors. His anatomy underwent multiple alterations from repeated dissections, from the first fundoplication, followed by its reversal during esophagectomy and gastric pull-up, and subsequent hiatal repair soon after. He also underwent a 6-month course of chemo-adjuvant therapy. His BMI declined from 26.2 kg/m^2 pre-esophagectomy to 21.8 kg/m^2 following treatment, remaining under 23 kg/m^2 at recurrence. Despite best efforts to prevent HH recurrence, including hiatal fixation of the gastric tube and biosynthetic mesh reinforcement, the patient developed recurrence two years later.

There is no doubt that this patient required an emergent reduction and hiatal hernia repair as he presented with a highly symptomatic HH, essentially an acute abdomen with ischemic colon and an impending risk of perforation. This was different from his first post-esophagectomy HH which was relatively asymptomatic. There is no consensus regarding prophylactic repair of asymptomatic or mildly symptomatic HH. While some authors advocate for a more conservative "watch-and-wait" approach and only operate on symptomatic hernias, others suggested elective repair regardless due to the risk of gradual progression into complicated HH [3, 4, 10, 16]. More data are needed to guide the length and frequency of surveillance in the case of conservative management and the decision to operate must be individualized based on patient's risk factors, comorbidities, and preferences.

CONCLUSION

Hiatus hernia (HH) following esophagectomy is an uncommon but significant postoperative complication with potentially life-threatening consequences. The presented case of a recurrent acute HH with an incarcerated colon is a rare and critical illustration of the complications associated with this operation. It also highlights the challenges in diagnosing and managing the condition, underscoring the importance of clinical vigilance, especially in patients presenting with non-specific symptoms. While there is still much to learn regarding the optimal approach to prevent, monitor, and surgically repair post-esophagectomy HH, timely diagnosis and urgent surgical intervention are critical to prevent catastrophic outcomes.

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Author Contributions

Cambo Keng – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Xin Yi Goai – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Yahya Al-Habbal – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

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Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.