Fecopneumothorax: a Rare Case of Delayed Colon Diaphragmatic Herniation Following Esophagectomy

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Abstract Diaphragmatic hernia after esophagectomy and, particularly, eventual fecopneumothorax is a rare complication. Furthermore, a delayed manifestation 10 years after esophagectomy is an extremely rare situation. Herein, we report a surgical case of fecopneumothorax resulting from the perforation of intrathoracically herniated transverse colon 10 years after McKeown esophagectomy.

Keywords Hiatal hernia · Esophageal neoplasm · Esophageal surgery · Pneumothorax

Introduction

Fecopneumothorax is an extremely rare clinical entity, which typically occurs following strangulation of a diaphragmatic hernia. We report a surgical case of fecopneumothorax resulting from the perforation of intrathoracically herniated colon 10 years after McKeown esophagectomy. To the best of our knowledge, this is the second report of such a case.

Case Report

A 60-year-old woman presented to the emergency department with dyspnea and left chest and abdominal pain. She had a history of McKeown esophagectomy for an adenocarcinoma

of the esophagus 10 years previously at another hospital. Clinical examination revealed tachycardia, tachypnea, and diminished respiratory sounds in the left hemithorax. Leukocytosis and elevated C-reactive protein were also identified. Chest X-ray showed left tension hydropneumothorax (Fig. 1). A chest tube was inserted into the left pleural cavity and a large amount of fecal content was drained. Chest computed tomography (CT) demonstrated a large amount of complicated fluid and diaphragmatic hernia of large bowel, the wall of which had a focal defect in its intra-thoracic segment (Fig. 2). Under the impression that the strangulation of colon herniated through diaphragmatic defect resulted in perforation, we planned the exploration of the abdominal and pleural cavities.

Exploratory laparotomy revealed that there were no intra-abdominal adhesions, and a portion of the transverse colon was herniated directly adjacent to the gastric tube through the diaphragmatic hiatus. When inspecting the herniated colon after it was withdrawn into the abdominal cavity, a long necrotic segment including a perforation site was confirmed. After a segmental resection of necrotic portion and colo-colostomy, cruroplasty with suturing of the gastric tube to the crus muscle was performed. After changing the patient's position, thoracoscopic exploration was done. The left pleural cavity was filled with fecal contents, and no other pathologic findings were found. Meticulous irrigation and debridement of the pleural cavity were performed, and three chest tubes were inserted. Post-operatively, she had antibiotic therapy for 37 days. She was discharged on day 38 and has continued to remain symptom free over a 7-month follow-up.

Discussion

Diaphragmatic hernia is a rare complication following esophagectomy, and its incidence is known to be 0.4 to 6 % after

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Fig. 1 Chest X-ray showed a collapsed lung with a large effusion in the left pleural cavity and mediastinal shifting to the right side

open procedure [1]. Although this complication can occur either in the early or late postoperative period [1], Price et al. reported the median time between the original esophagectomy and repair of the hernia was 21 months in 15 patients (0.69 % in their series) [2]. Thus, the present case in which the hernia occurred and was surgically repaired in the extremely late postoperative period (10 years after esophagectomy) is especially rare. In addition, a tension fecopneumothorax resulting from the perforation of the herniated colon after esophagectomy, which was first reported in 2007 by Markogiannakis et al. [3], is also a very rare condition. To the best of our knowledge, fecopneumothorax after esophagectomy has not been reported since then, and the present case is the second known.

Diaphragmatic hernia after esophagectomy may be caused by excessive hiatal manipulation and extension or development of fewer peritoneal adhesions postoperatively [2]. Actually, Kent et al. reported the incidence of diaphragmatic hernia after esophagectomy to be 0.8 % with an open approach and 2.8 % with a minimally invasive esophagectomy, which decreases the amount of postoperative adhesions and requires a wider hiatus [1, 2]. Thus, to prevent this complication, extended hiatal enlargement should be avoided and a gastric tube should be fixed to the hiatal crura with sutures during operation.

Although affected patients may present with various symptoms, even an asymptomatic hernia may progress due to continued hiatal dilation promoted by increased intra-abdominal pressure and negative intra-thoracic pressure [2]. In this case, the chest X-ray, which was taken 2 years previously, showed no remarkable findings during 8 years following surgery. Although it is still unclear why rapid progression occurred 10 years after esophagectomy, it is of great importance to be aware that this complication could occur in the very late postoperative period, and in this context, regular postoperative follow-up in this period may be justified in the long-term survivors.

Once diagnosed by these tests, even in asymptomatic patients, surgical repair should be considered at the time of diagnosis [2] because the hernia may progress to serious and potentially life-threatening situations such as strangulation and perforation. During surgical repair, the hiatus should be made smaller to minimize the chance of recurrent hernia, but not to the extent of compressing the gastric conduit too tightly [2]. In case of fecopneumothorax, meticulous cleansing and debridement of pleural cavity are essential to minimize the incidence of postoperative empyema.

Fig. 2 Chest computed tomography demonstrated **a** herniation of the transverse colon and omentum into the left pleural cavity and **b** a defect of herniated colon wall (*white arrow*)

Conclusion

Diaphragmatic hernia after esophagectomy and, particularly, fecopneumothorax is a rare but life-threatening complication of esophagectomy. Because this complication may occur in the late postoperative period like the present case, a long-term regular follow-up and a high index of suspicion are necessary. Once diagnosed, even in asymptomatic patients, surgical repair should be considered to prevent progression and eventual catastrophic outcome.

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