

Case report of A 72-year-old Man with Diaphragmatic Hernias and Thoracic Gastropericardial Fistula after Esophagectomy for 18 Years

Xinjian Xu

Hebei Medical University Fourth Affiliated Hospital and Hebei Provincial Tumor Hospital

Zhaoyang Yan

Hebei Medical University Fourth Affiliated Hospital and Hebei Provincial Tumor Hospital

Ming He (✉ hemingwork88@163.com)

Hebei Medical University Fourth Affiliated Hospital and Hebei Provincial Tumor Hospital

<https://orcid.org/0000-0001-9559-0733>

Case report

Keywords: Esophagectomy, Diaphragmatic hernias, Thoracic gastropericardial fistula, Case report

Posted Date: April 21st, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-431864/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published at Journal of Cardiothoracic Surgery on July 7th, 2021. See the published version at <https://doi.org/10.1186/s13019-021-01574-z>.

Abstract

Background: Both diaphragmatic hernias and thoracic gastropericardial fistula rarely occurred simultaneously on patients with radical esophagectomy.

Case presentation: A 72-year-old man presented to our hospital with one day of nausea, vomiting and acute left chest pain. He had radical esophagectomy for esophageal cancer 18 years ago. Computed tomography (CT) of the chest revealed diaphragmatic hernias and air collection within pericardial space. While an operation of diaphragmatic hernia repair was decisively performed to prevent further serious complications, the thoracic gastropericardial fistula was also found unusually.

Conclusion: Diaphragmatic hernias and thoracic gastropericardial fistula may occasionally coexist in patients with esophagectomy. Upper GI radiograph with water-soluble contrast agent is a better diagnosis tool than CT in visualizing the fistula.

Background

Esophageal replacement with gastric conduit is a common surgical method of radical esophagectomy. While anastomotic leakage and conduit ischemia are mostly presented in the early postoperative period of patients with esophagectomy, however, diaphragmatic hernias and conduit ulceration, as well as conduit fistula are often separately shown up at emergency room as they have relative longer survival time^[1]. Both diaphragmatic hernia and thoracic gastropericardial fistula complications rarely occurred simultaneously and could miss the diagnoses especially in the emergency setting.

Case Presentation

A 72-year-old man, who had radical esophagectomy for esophageal cancer 18 years ago, was presented to emergency department with one day of nausea, vomiting and acute left chest pain. Computed tomography (CT) revealed diaphragmatic hernias and air collection within the pericardial space (Fig. 1a). Oral meglumine amidotrizoate was taken by the patient, however, the following CT did not reveal any contrast agent leak into the pericardial space for the fistula diagnosis while a gastric wall ulcer and unspecific low density in the thoracic gastric cavity were noticed (Fig. 1b). At emergency room, his heart rate was 110, BP was 93/68 mmHg and labs showed HGB 101.8 g/L, WBC $11.1 \times 10^9/L$, NE $10.18 \times 10^9/L$, NE% 91.2%, RBC $3.97 \times 10^{12}/L$. Based on these results, a diaphragmatic hernia could be diagnosed while the etiology of presenting pneumopericardium was unknown. Given that the diaphragmatic hernias needed urgent surgery and it was possibly related to the pneumopericardium, we took a right transthoracic approach to perform a hernia repair and found that there was no strangulation of intestine. The patient recovered quickly after the surgery until on the third day he complained of new chest pain. New CT was ordered and showed moderate pericardial effusion and right pleural effusion, which led us suspect the existence of thoracic gastropericardial fistula (Fig. 2a). The following contrast roentgenogram confirmed the thoracic gastropericardial fistula (Fig. 2b). A 1cm diameter fistula tract was visually found in the

following pericardium surgery through the left thoracotomy (Fig. 3a). In the surgery, we removed a nearly 5cm diameter pericardium around the fistula and part of gastric wall and two bezoars were found in the gastric tract (Fig. 3b-c). After we took out the bezoars and placed a jejunal feeding tube, we repaired the gastric wall and covered it with mediastinal fat tissue. A fine tube was finally placed in the pericardium for the postoperative rinse purpose and a drainage tub was also placed at the pericardial defect region. With the daily pericardial flush, the patient recovered quickly after starting to take oral food at the 7th day.

Discussion And Conclusions

Esophageal replacement with gastric conduit is a common surgical method of radical esophagectomy. In these patients, anastomotic leakage or conduit ischemia often develop in the early postoperative period, while diaphragmatic hernias, anastomotic stricture, conduit ulceration, and dysfunctional conduit are frequently seen as the late complications. Among these, the gastric conduit ulceration could progress to a life-threatening gastropericardial fistula and diaphragmatic hernias clearly require urgent surgical care^[2].

Gastropericardial fistula is a rare and severe complication of radical esophagectomy with mortality rate greater than 50%^[3]. Clinical presentation of gastropericardial fistula is often non-specific and includes dyspnea, chest pain and sudden death^[4]. Our patient complained of left chest pain, nausea and vomiting, which were also the clinical manifestations of diaphragmatic hernias. Therefore, the gastropericardial fistula could be missed for diagnosis while it coexists with diaphragmatic hernia especially at the emergency setting.

Imaging and endoscopy can be used to make the diagnosis of gastropericardial fistula. CT imaging often shows the cardiac enlargement, air or air fluid level in the pericardial cavity, while radiography with water soluble contrast can make the fistula tract visualized. Also, gastroscopy can accurately reveal the ulceration or fistula tract^[5]. In this case, the gastroscopy could have provided a greater assistance to the diagnosis although it was obviously very difficult to have it at the emergency setting.

Surgical treatment is usually considered as an effective way to quickly improve the prognosis of gastropericardial fistula^[6]. In this case, we had resected a part of pericardium and repaired the gastric wall and the patient recovered rapidly.

In conclusion, diaphragmatic hernias and thoracic gastropericardial fistula could be presented simultaneously at patients with a relative long history of radical esophagectomy. CT in combination with radiography with water-soluble contrast can make their diagnosis readily.

Abbreviations

CT: Computed tomography

WBC: White cell count

NE: Neutrophil count

NE%: Neutrophil ratio

RBC: Red cell count

HGB: Haemoglobin

Declarations

Ethics approval and consent to participate: Not applicable.

Consent for publication: We have got a consent for publication.

Availability of data and materials: Not applicable.

Competing interests: The authors declare that they have no competing interests.

Funding: No funding supported.

Authors' contributions: Authors are equally contributed to this study.

Acknowledgements: Thanks to Dr Zhensheng Li for his assistance of language.

References

1. Servais EL, Stiles BM, Spector JA, Altorki NK, Port JL. Gastropericardial fistula: a late complication of esophageal reconstruction. *Ann Thorac Surg.* 2012;93(5):1729–31.
2. Hennessy M, Ivanovski M, Spartalis I, Chrysikos E, Athanasiou D. A. Diaphragmatic hernia following esophagectomy for esophageal cancer: A systematic review. *J BUON.* 2019;24(5):1793–800.
3. West AB, Nolan N, O'Briain DS. Benign peptic ulcers penetrating pericardium and heart: clinicopathological features and factors favoring survival. *Gastroenterology.* 1988;94:1478–87.
4. Murthy S, Looney J, Jaklitsch MT. Gastropericardial fistula after laparoscopic surgery for reflux disease. *N Engl J Med.* 2002;346:328–32.
5. Kim WJ, Choi EJ, Oh YW, Kim KT, Kim CW. Gastropericardial fistula-induced pyopneumopericardium after esophagectomy with esophagogastrectomy. *Ann Thorac Surg.* 2011;91(1):e10–1.
6. Kato T, Mori T, Niibori K. A case of gastropericardial fistula of a gastric tube after esophagectomy: a case report and review. *World J Emerg Surg.* 2010;5:20.

Figures

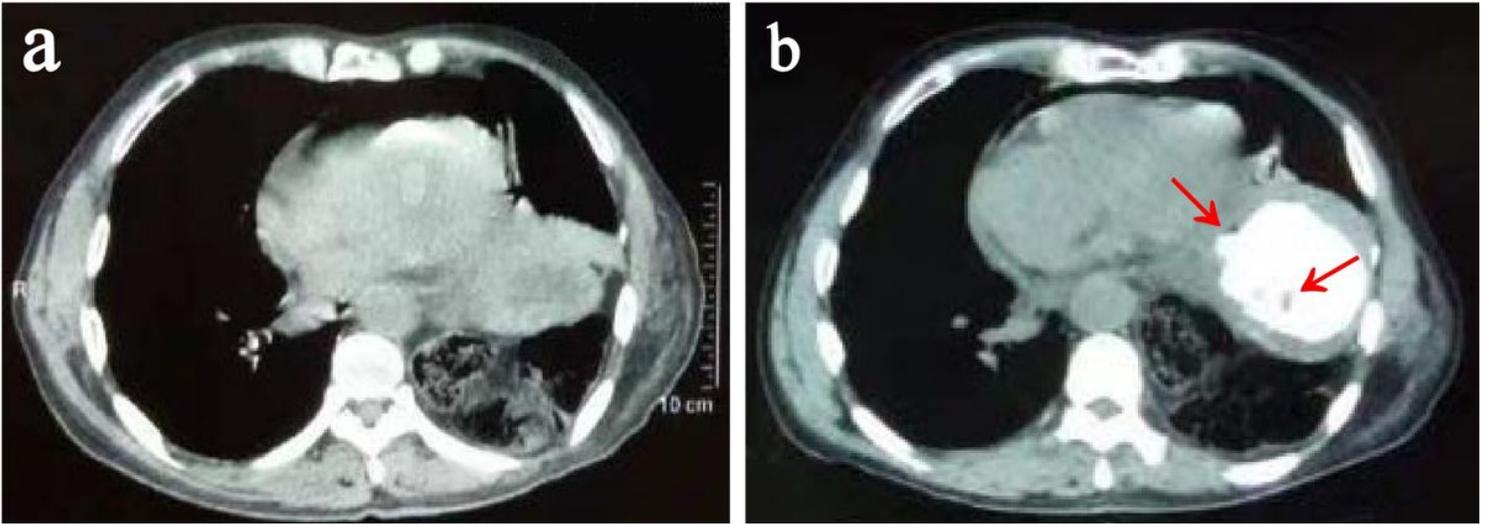


Figure 1

CT revealed the diaphragmatic hernias and air collection within the pericardial space.

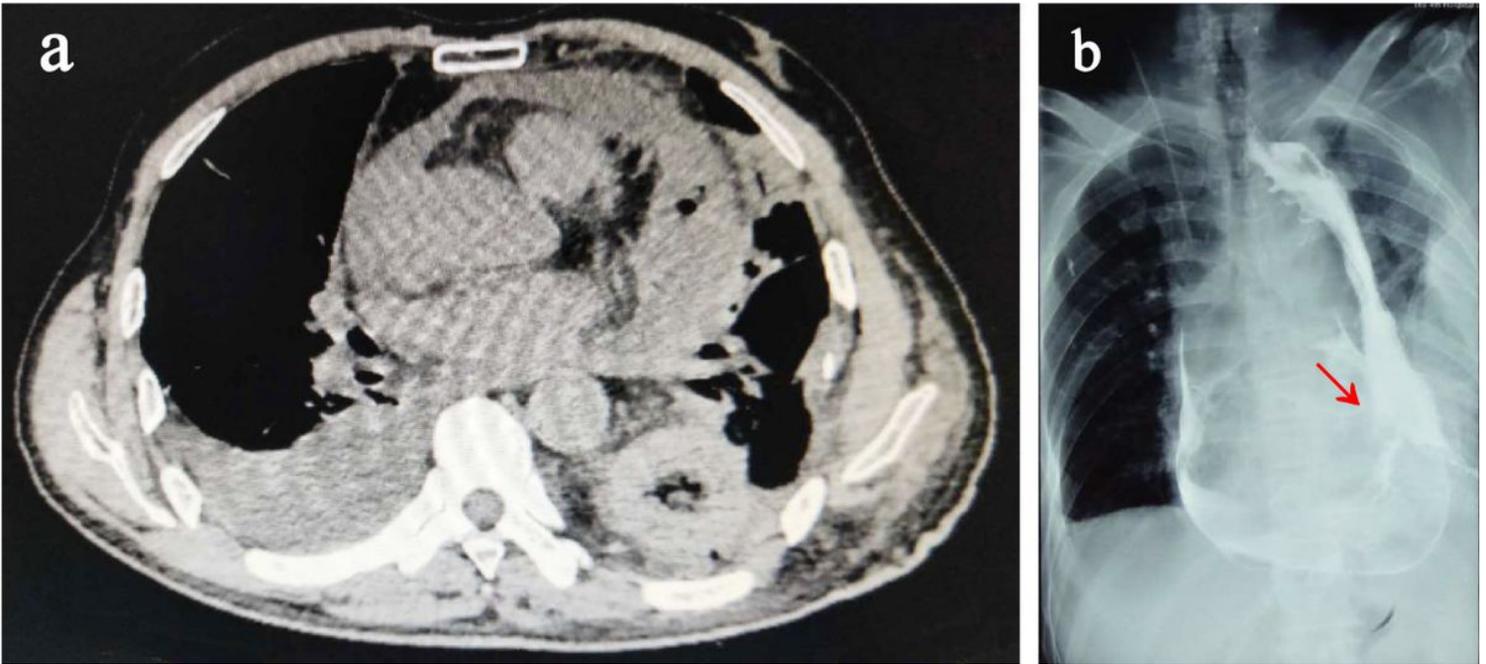


Figure 2

CT and contrast radiography revealed a thoracic gastropericardial fistula.

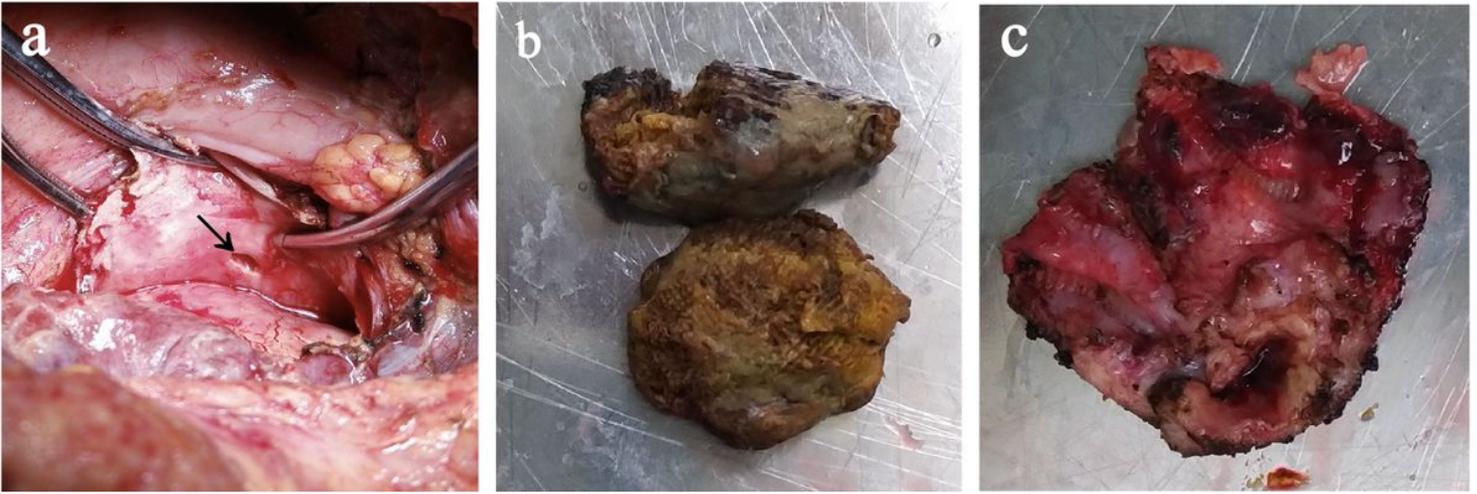


Figure 3

Thoracic gastropericardial fistula and bezoars during operation.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [CAREChecklist82cb6cc23446de30895c7e4d1563e71.jpg](#)