

Laparoscopic Repair and Percutaneous Endoscopic Gastrostomy to Treat Giant Esophageal Hiatal Hernia with Gastric Obstruction: A Case Report

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ABSTRACT

We describe a 74-year-old man with repeated aspiration pneumonia who developed gastric obstruction due to giant esophageal hiatal hernia (EHH). We repaired the giant EHH by laparoscopic surgery and subsequently anchored the stomach to the abdominal wall by percutaneous endoscopic gastrostomy (PEG) using gastrofiberscopy. Thereafter, the patient resumed oral intake and was discharged on postoperative day 21. At two years after these procedures, the patient has adequate oral intake and lives at home. Because this condition occurs more frequently in the elderly with comorbidities, laparoscopic surgery contributes to minimally invasive treatment. Furthermore, the procedure combined with concurrent gastropexy via PEG is useful for treating patients who have difficulty swallowing and for preventing recurrent hernia.

Key words: *Esophageal hernia, Gastropexy, Laparoscopic surgery, Percutaneous endoscopic gastrostomy*

Giant esophageal hiatal hernia (EHH) has not been consistently defined, but any hernia through the esophageal hiatus that includes more than one-third to one-half of the stomach is generally considered as giant EHH^{1,10}. Such hernias occur more frequently among the elderly, and are usually symptomatic^{3,7}. Therefore, surgical repair is frequently required even for elderly patients, regardless of comorbidities.

We describe a patient with giant EHH in which the most gastric portions had penetrated the posterior mediastinum and caused gastric obstruction. The patient was treated by laparoscopic surgery and percutaneous endoscopic gastrostomy (PEG) with a good outcome.

CASE REPORT

A 74-year-old man diagnosed with repeated aspiration pneumonia was referred to our hospital to treat a giant EHH accompanied by gastric obstruction. He had received a tracheotomy with a tracheal speech cannula elsewhere and was under total parenteral nutrition without oral intake.

An upper gastrointestinal series through a nasogastric tube (Fig. 1a) and contrast enhanced

computer tomography (Fig. 1b) revealed extreme deformation of the stomach and prolapse of the gastric body and antrum into the mediastinum. Computed tomography images from the previous institution showed gastric obstruction due to incarceration of the antrum and the presence of massive amounts of stomach contents (Fig. 1c). The obstruction incarcerated in the gastric antrum might have been temporarily enhanced by stomach dilation due to oral intake.

The patient had multiple comorbidities and a medical history of hemiplegia due to cerebral infarction, Parkinsonian syndrome, stent grafting for a thoracic aortic aneurysm and partial lung resection to treat lung cancer. Therefore, he found activities of daily living challenging and had mild swallowing difficulties due to hemiplegia and Parkinsonian syndrome. His performance status according to the Eastern Cooperative Oncology Group was Grade 3. Essentially, however, he had no communication difficulties and wished to resume oral intake.

Therefore, we repaired the hernia with reefing of the hiatus by direct suture and fixed the stomach to the crus of the diaphragm via laparoscopic surgery and via the PEG using gastrofiberscopy.

First, a 12-mm port was introduced infra-umbil-

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ically using an open insertion technique, and pneumoperitoneum was established. Two 5-mm trocars were then placed immediately subcostal in the right and left mid-clavicular line, and two 12-

mm trocars were positioned about 7 cm below the right and left costal margin. A liver retractor was introduced via a 5-mm stab wound, which was made under the xiphoid. Almost the entire stom-

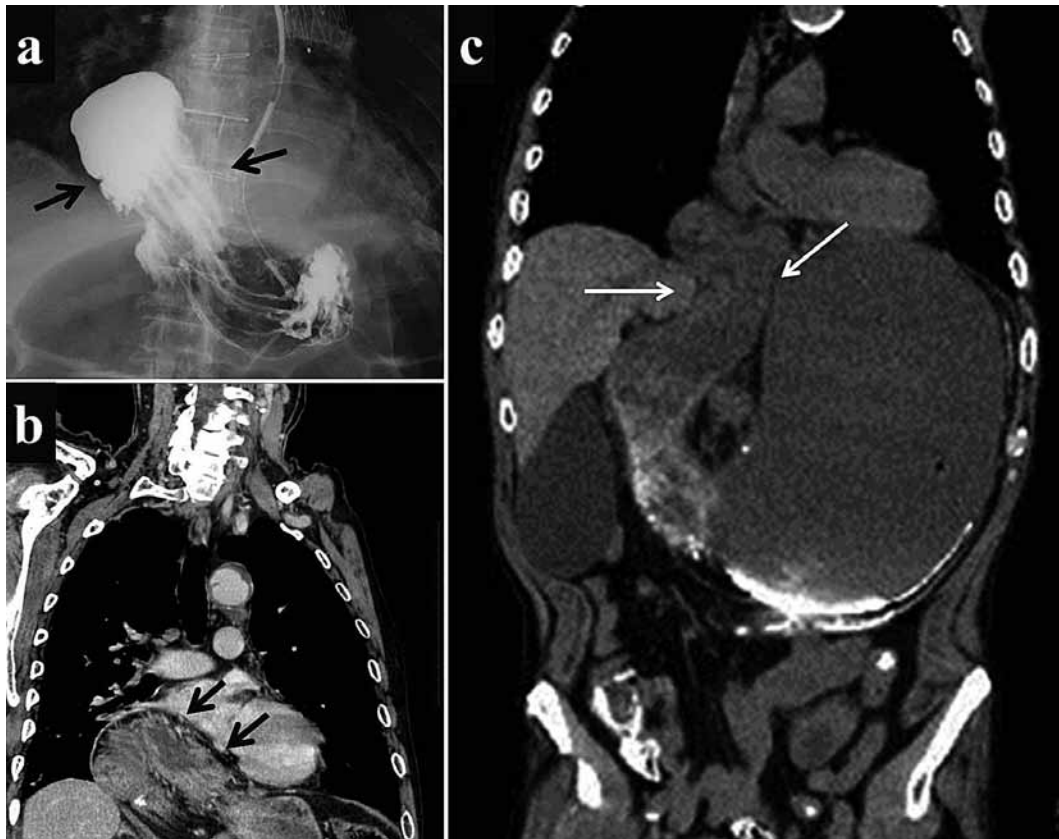


Fig. 1. Upper gastrointestinal series visualized via nasogastric tube and contrast enhanced computer tomography.

(a) Upper gastrointestinal series

(b) Contrast enhanced computer tomography. Arrows, extreme stomach deformation and prolapse of gastric body and antrum into mediastinum

(c) Computed tomography images from previous hospital. Gastric obstruction due to incarceration of antrum (arrow) and massive stomach contents.

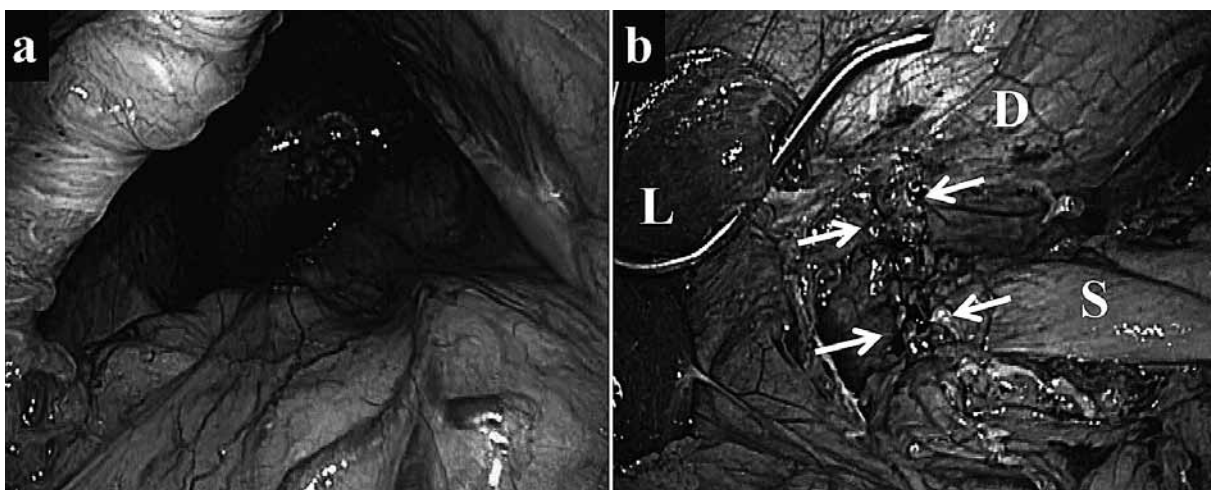


Fig. 2. Perioperative laparoscopic view.

(a) View from hernia orifice. Almost entire stomach and greater omentum thrust into hernia sac, and these hernial contents were relocated to their normal positions.

(b) View after hernia repair. Arrow, suture line of crus and stomach; D, diaphragm; L, liver; S, stomach.

ach and greater omentum were involved in the EHH (Fig. 2a). These hernial contents were relocated to their normal positions and the hernia sac was fully dissected to prevent the stomach from easily returning into the sac. The right and left crura of the diaphragm were then closed using non-absorbable sutures because the tension was normal. The stomach was also sutured to the crus and the EHH was corrected (Fig. 2b). Finally, gastrofiberscopy confirmed the absence of stenosis in the esophagogastric junction and PEG proceeded not only to address the patient's difficulties swallowing but also to anchor the stomach to the abdominal wall. The volume of blood loss was 10 ml and the surgical duration was 132 min.

The postoperative course was uneventful, oral feeding was started on postoperative day 12 and then the patient was discharged on postoperative day 21. Two years after the surgery, the patient has adequate oral intake of a soft diet, he remains free of recurrent hernia and is followed up as an outpatient.

DISCUSSION

Esophageal hiatal hernias are generally classified into four types^{1,6,10}. Type I comprises sliding hiatal hernias in which the esophagogastric junction migrates cephalad through the hiatus into the thorax. Type II comprises paraesophageal hernia in which the gastric fundus herniates through the hiatus into the thorax, but the esophagogastric junction remains in the abdomen. Type III is a combination of types I and II, in which the esophagogastric junction and the stomach herniate into the thorax. Type IV is a type III hiatal hernia with herniation of other organs into a mediastinum, such as the colon, omentum or spleen.

Giant EHH generally occupy at least one-third of the stomach in the mediastinum and are frequently classified as Types III or IV^{1,10}. They account for 0.3% to 15% of all EHH¹⁰. Giant EHH are frequently symptomatic and occur more frequently among elderly persons who present with pain, dysphagia, vomiting and anemia^{7,10}. Our patient was an elderly man with multiple comorbidities and repeated bouts of pneumonitis because of gastric obstruction by a Type IV giant EHH.

Any patient with a giant EHH should be considered a surgical candidate unless comorbidities are entirely prohibitive. Surgical repair of symptomatic hernias is generally recommended and largely results in relief of symptoms and an improved quality of life⁷. The laparoscopic approach to hernia repair has recently replaced open repair at most institutions because it has reduced postoperative morbidity and the length of the hospital stay^{3,5,8,15}. Therefore, laparoscopic hernia repair is effective especially in elderly and high-risk patients as the procedure is minimally invasive.

Although clinically significant recurrence after hernia repair with symptoms indicating re-intervention is less common, the reported incidence of anatomical recurrence after various surgical procedures is around 10%^{3,8,10}. Reinforcing a hiatal repair with mesh to create a tension-free repair might reduce recurrence rates and symptomatic outcomes. Randomized controlled trials have compared the results of procedures with and without mesh^{2,4,11}. Although the results of these trials appear promising, the follow-up remains short-term, and the primary outcome measures in all studies to date have comprised radiological appearance and not clinical outcomes¹⁵. Furthermore, mesh-related complications such as stricture, erosion into the esophagus and bleeding requiring removal of the mesh have been reported^{12,14,16}. Therefore, whether using mesh for EHH, including issues with selecting the optimal type of mesh and the type of repair procedure, will reduce the risk of subsequent re-intervention and not add new risks during long-term follow-up remains uncertain. We repaired the hernia in our patient by directly suturing the crus without mesh because the tension was sufficient.

Some reports have also described PEG as a feasible approach to treating giant EHH, because the stomach could be fixed to the abdominal wall by PEG^{9,13}. The stomach was in a good position under the diaphragm, even after PEG was removed⁹. Therefore, this procedure is considered to be useful not only for patients with difficulties swallowing, but also for preventing recurrent hernias by anchoring the stomach to the abdominal wall. Furthermore, adding an anterior gastropexy achieved by simply suturing the stomach to the abdominal wall during laparoscopic surgery might also prevent EHH recurrence even in patients without swallowing difficulties.

CONCLUSION

We treated a giant EHH by direct suture of the crus, securing the stomach to the crus under laparoscopic surgery and gastropexy via PEG. Although further long-term follow-up is needed, the patient had a good outcome and remains free of recurrent hernia. This minimally invasive procedure with gastropexy is very useful especially for elderly patients with EHH accompanied by comorbidities and inadequate oral intake because it allows nutritional support and can prevent recurrence.

(Received February 6, 2015)

(Accepted April 23, 2015)

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