

Laparoscopic totally transhiatal diverticulectomy of giant epiphrenic oesophageal diverticulum

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ABSTRACT

Epiphrenic diverticulum is a rare form of oesophageal diverticulum involving the distal part of the oesophagus. We report the case of a 51 year-old lady who initially presented with nocturnal coughing and volume reflux. Clinical examination was unremarkable as were initial routine blood investigations. A plain chest radiograph, barium swallow, and computed tomography were performed which demonstrated features of a large oesophageal diverticulum. Oesophagogastroduodenoscopy revealed a wide neck, single diverticulum within the lower third of the oesophagus. Oesophageal manometry undertaken revealed normal oesophageal peristalsis and lower oesophageal sphincter pressure. An elective total transhiatal laparoscopic diverticulectomy with Heller's cardiomyotomy and fundoplication was performed with good symptomatic improvement. The patient made an uneventful recovery and remains symptom free two years post-operatively.

Key Words: Fundoplication, diverticulectomy, endoscopic, cardiomyotomy; epiphrenic

Introduction

Epiphrenic diverticulum is a rare form of oesophageal diverticulum which involves the distal third of the oesophagus within 10cm of the oesophagogastric junction (1). Most patients with oesophageal diverticulum are asymptomatic, however a small proportion may complain of anorexia, epigastric pain, dyspepsia, nocturnal cough and weight loss. As a result there are frequent difficulties and delays in reaching a diagnosis.

We report a case of an epiphrenic diverticulum presenting in a lady with a history of reflux symptoms which was successfully treated with a diverticulectomy combined with Heller's cardiomyotomy and fundoplication via an exclusively laparoscopic transhiatal approach.

Case report

A 51 year-old fit and well female presented with progressively worsening post-prandial dyspepsia and as acid brash with vomiting for the past six months. The vomitus contained fluid and undigested food particles. Physical examination and routine blood investigations revealed no abnormalities.

A plain chest radiograph, barium swallow (Figure 1), and computed tomography performed demonstrated features of a large single oesophageal diverticulum. Oesophagogastroduodenoscopy (OGD) revealed a wide neck, single diverticulum within the lower third of the oesophagus (Figures 2 and 3). Oesophageal manometry was subsequently undertaken which revealed normal lower oesophageal sphincter (LOS) pressure and peristalsis. On the basis of these investigations, the patient underwent an elective laparoscopic diverticulectomy combined with Heller's cardiomyotomy and fundoplication.

The patient was placed on a reverse trendelenburg lithotomy position. Two twelve millimeter and five millimeter ports were inserted, and a twelve millimeter mercury pressured carbon dioxide pneumoperitoneum was created. The liver was retracted superiorly with a Nathanson retractor. The distal oesophagus was mobilized 360degrees to identify the diverticulum site, confirmed with intraoperative OGD. A wide-neck giant epiphrenic diverticulum was identified posterolaterally at 28cm from the incisors. Upon fully mobilizing the diverticulum, its wide neck was transected with an EndoGIA™ (COVIDIEN) sixty millimeters tanned coloured stapler cartridge

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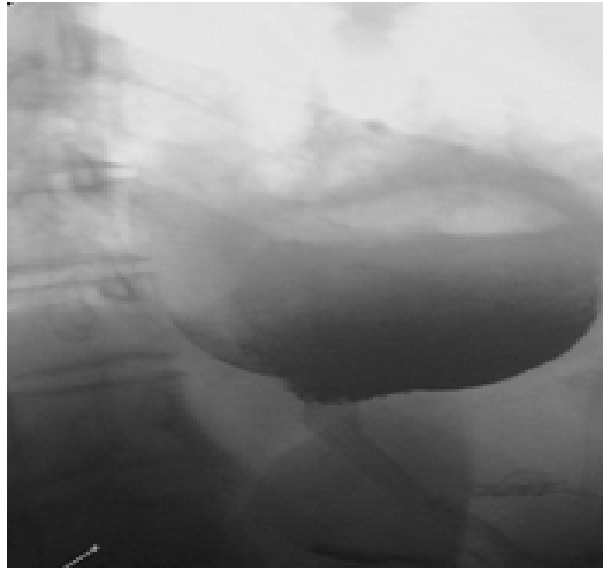


Fig. 1. Large Epiphrenic diverticulum on barium swallow.

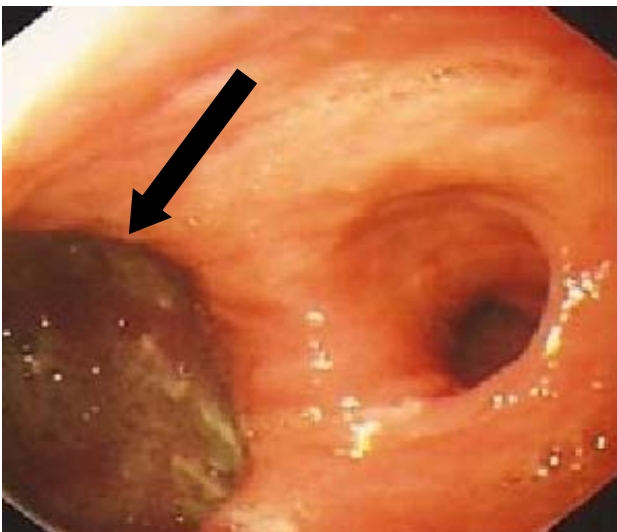


Fig. 2. OGD revealing a broad based giant epiphrenic oesophageal diverticulum (arrow) with oesophageal lumen on the right.

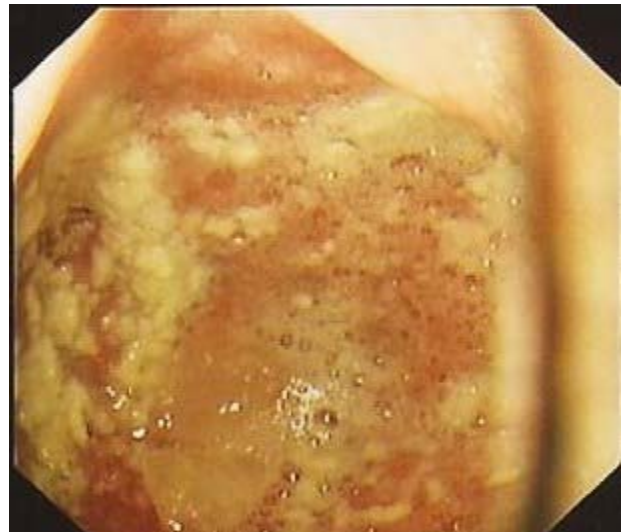


Fig. 3. OGD showing internal mucosa of broad base diverticulum with refluxed gastric contents.

without over sewing the stapler line (Figures 4 and 5). Subsequently, a cardiomyotomy was performed three centimeters distal to the gastroesophageal junction with a proximal extension to the superior neck of the diverticulum (Figure 6). A 180 degrees anterior Dor fundoplication was performed (Figure 7). An epiphrenic oesophageal diverticulum measuring 7x5x3cm in dimensions was resected (Figure 8). Air and methylene blue test showed no leak. The procedure was complicated by a simple pneumothorax which was treated successfully by insertion of a right intercostal chest tube.

Post-operatively the patient made an unremarkable recovery. She was commenced on

soft diet following a gastrograffin study on day two which demonstrated no leak (Figure 9). The chest tube was removed on day three and the patient was discharged home on post-operative day six. She remains asymptomatic at two years post-operatively.

Discussion

Most patients with oesophageal diverticulum are asymptomatic, however a small proportion may complain of anorexia, epigastric pain, dyspepsia, nocturnal cough and weight loss (2). Life threatening conditions such as aspiration pneumonia and malignancy are rare, however can

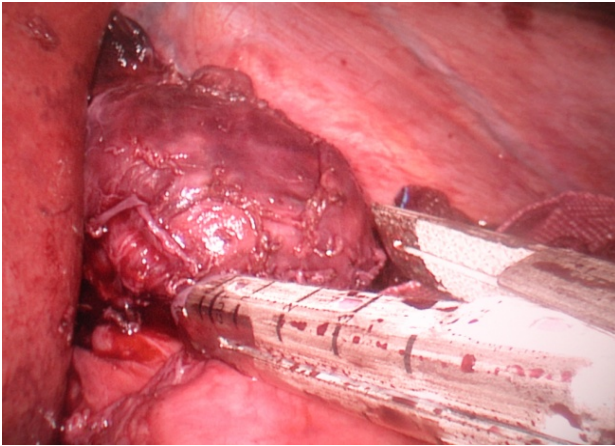


Fig. 4. Giant epiphrenic oesophageal diverticulum with laparoscopic stapler.

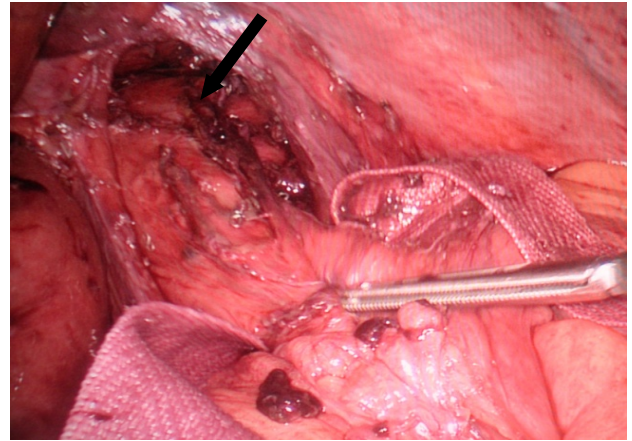


Fig. 5. Stapler line (arrow) visible following transection of diverticulum.

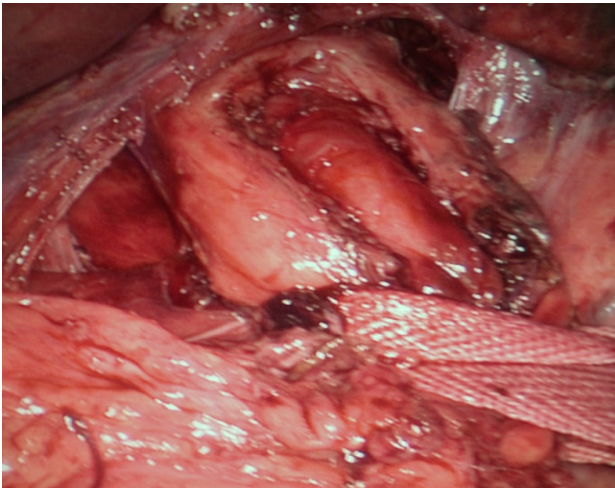


Fig. 6. Heller's oesophageal myotomy performed.

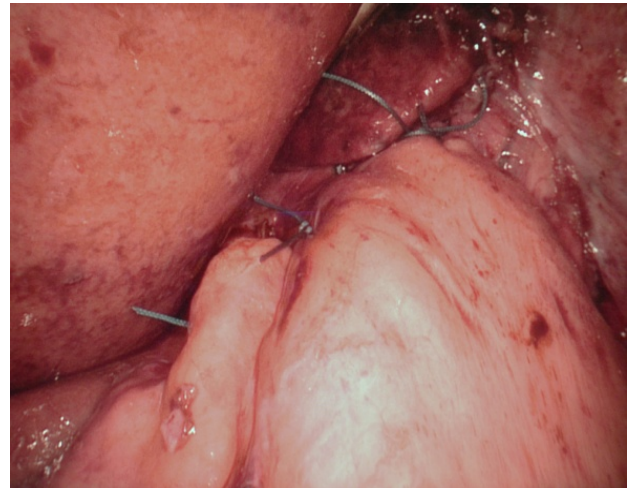


Fig. 7. An anterior dor partial fundoplication performed.



Fig. 8. Resected stapled giant epiphrenic oesophageal diverticulum measuring 7x 5x3cm in dimensions.

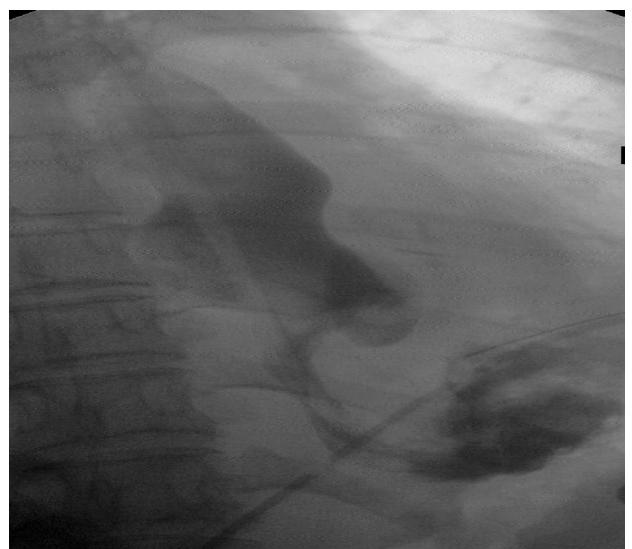


Fig. 9. Post-operative Gastrografin study showing no leak.

occur with delayed diagnosis (2). The condition is normally apparent on a plain chest radiograph, OGD, barium swallow and computed tomography scan. Oesophageal manometry should be performed to confirm the presence of oesophageal motility disorder, commonly the underlying pathophysiology of epiphrenic diverticulum.

Surgical intervention should be considered in large or symptomatic diverticulae. Such intervention can be accomplished either by an open or minimally invasive procedure, the latter of which may either be video assisted thoracoscopy (VAT) or laparoscopy or in combination. The procedure includes diverticulectomy with or without cardiomyotomy and fundoplication (1). However the absence of cardiomyotomy with fundoplication may lead to increased risks of recurrence and leak (1). It has been demonstrated that a minimally invasive approach to epiphrenic diverticulum results in reduced mortality, morbidity and length of stay with no significant difference in symptomatic improvement compared with open procedures (1).

Numerous comparisons have been made between VAT and laparoscopic approaches. Despite the fact that the VAT can offer a clearer visualisation of the entire diverticulum in patients with giant diverticulum, the use of double-lumen endotracheal tubes, single lung ventilation, and postoperative chest tubes makes this approach more complex with an associated increase in morbidity (3). It is also shown there are no significant differences in reported outcomes between the thoracoscopic and laparoscopic approaches in patients with small (five cm or less) diverticulae (4). Although the thoracoscopic, or combined thoracoscopic/laparoscopic approach, is thought to be preferable in patients with higher or giant diverticulum (1,2), our case demonstrates that in giant epiphrenic diverticulae surgical intervention can be safely completed with a totally transhiatal laparoscopic approach without any post operative complications and leak.

In cases of epiphrenic diverticulae it is thought that myotomy is not mandatory and should selectively be performed when LOS pressure is below normal (5). Although LOS pressure was normal on preoperative oesophageal manometry, given the nature of the diverticulum we did not believe that oesophageal motility disorder could be excluded as the underlying cause, given its intermittent nature. Since the underlying pathophysiology of epiphrenic diverticulum is most commonly oesophageal motility disorder, we would suggest that myotomy is considered in all cases of epiphrenic diverticulum.

Laparoscopic diverticulectomy is preferred to open surgery for the management of epiphrenic diverticulum, resulting in decreased length of stay, morbidity and mortality. It is a safer and more feasible alternative to thoracoscopic surgery whilst offering comparable outcomes. A cardiomyotomy with fundoplication should be considered in similar presentation with likely underlying motility disorder, even in the presence of normal LOS pressure on oesophageal manometry.

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