

Laparoscopic Esophageal Epiphrenic Diverticulectomy With Cardiomyotomy and Anterior Partial Fundoplication

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1. Abstract

Epiphrenic Diverticulum (ED) is a rare entity of the distal esophagus. It is treated with laparoscopic transabdominal approach with excellent results. We report the case of a 59-year-old male with ED who presented with dysphagia over the last year. He was treated with laparoscopic diverticulectomy, cardiomyotomy and anterior partial fundoplication. He remains asymptomatic after 2 years follow up.

2. Keywords: Epiphrenic diverticulum; Achalasia; Cardiomyotomy; Anterior Partial Fundoplication

3. Introduction

Epiphrenic diverticulum is a rare disease, located usually in the distal esophagus on the right side. The majority are associated with achalasia. Surgery treats the diverticulum and the underlying motility disorder, thus the association: diverticulectomy, cardiomyotomy and wrap construction.

4. Case Presentation

A 59-year-old man presented to our department complaining of dysphagia for one year. Barium swallow (**Figure 1**) and esophagogastrosocopy showed a distal esophageal diverticulum located at 2 cm from the gastroesophageal junction on the right side. High resolution manometry revealed the presence of concomittent achalasia. Under general anaesthesia in a modified lithotomy position and the surgeon between patient's legs, five trocars were used :one supraumbilical 11mm camera port, one 12mm and one 5mm working ports at left and right hypochondrium respectively, one 5mm left anterior axillary retraction port and one 5mm subxiphoid for liver retraction. The abdominal oesophagus was fully mobilised with hiatal

dissection followed by a wide mediastinal dissection. The diverticulum was identified and dissected from the adjacent muscles (**Figure 2**). The posterior right vagus is identified (**Figure 3**) and dissected off the diverticulum base (**Figure 4**). After peroperative esophagoscopy (**Figure 5**), the ED was excised by a stapling device (**Figure 6**). Heller cardiomyotomy was done and extended 8 cm and 3 cm through the muscles of the esophagus and stomach respectively (**Figure 7**). Anterior partial fundoplication was done and fixed to the cruras (**Figure 8**). The patient was discharged uneventfully the third day with no signs of leak clinically or radiographically and was followed by our nutrition departement. Histopathological findings were consistent with ED. At 2 years follow up, the patient is still asymptomatic.



Figure 1: Right sided epiphrenic diverticulum

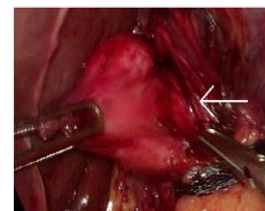


Figure 2: ED herniating through the esophageal muscles (arrow)

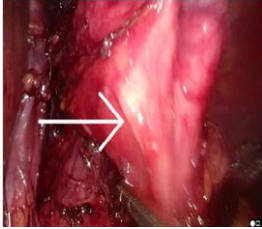


Figure 3: Right vagus nerve at the base of the ED

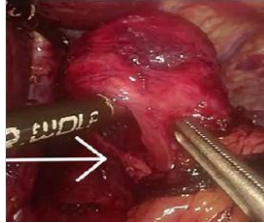


Figure 4: Vagus (arrow) dissected from the base of the ED (elevated by the grasper)



Figure 5: Esophagoscopy ruling out residual alimentary debris



Figure 6: Stapling and excision of the ED with preservation of the vagus nerve (arrow)



Figure 7: Cardiomyotomy

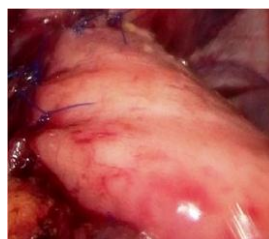


Figure 8: Anterior partial fundoplication

5. Discussion

Epiphrenic diverticulum is a rare entity with a prevalence between 0.0015% and 2% [1] usually located in the distal esophagus on the right side[2].It is a pulsion diverticula [3] with herniation of the mucosa and submucosa through the muscular layers. [4] Mainly asymptomatic, only 20% of patients are symptomatic. [5,6] Dysphagia, regurgitation, and chest pain can develop, with dysphagia being the most common.[7] Since the first report in 1998 by Rosati et al, surgery became the best curative option [8] varying from transthoracic to laparoscopic approaches[9]. Nowadays the use of laparoscopy is considered the approach of choice in most cases[10] as it is very efficient in improving symptoms[11] with laparoscopic transhiatal diverticulectomy, myotomy and anterior partial fundoplication producing symptomatic relief in 85-100% of cases,[8]thus making it the best surgical approach for this case.[12]Surgery is indicated to treat symptomatic patients and to prevent complications in asymptomatic ones.[4,13-15]Perforation, progression to carcinoma,[15,16] esophagopulmonary fistula [17] aspiration pneumonia, and lung abscess[18]are all possible complications that can appear if left untreated.

The diagnostic workup includes barium swallow to define the location and the size of the diverticulum[4], upper endoscopy to exclude malignancy of the distal oesophagus and oesophageal manometry to identify any underlying motility disorder[19] since the majority of ED are secondary to esophageal motility disorders[4,11,18] mainly achalasia [13].

5.1 Specific Technical Points Should be Considered in ED Surgery

Before stapling it is essential to dissect the posteriorly situated right vagus nerve off the ED base, to prevent encorching it and peroperative esophagoscopy must be done to exclude any residual alimentary debris that can be present due to the associated esophageal motility disorder.

The myotomy should be long enough to eliminate any residual intraesophageal hyperpressure that highers the risk of leak and mediastinitis. The mediastinal dissection should be very wide to eliminate upwards traction so that the esophagus can lie passively well below the diaphragm, under the abdominal positive pressure, decreasing the risk of postoperative reflux, and the wrap should be fixed to the crura.

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