

Epiphrenic oesophageal diverticulum managed via laparoscopic transhiatal approach

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SUMMARY

Epiphrenic oesophageal diverticulum is a rare disorder affecting the distal oesophagus. Surgical techniques for this condition evolve over time from open transthoracic and trans-abdominal approaches to minimally invasive surgery. We report a case of an 82-year-old male who presented with symptomatic epiphrenic oesophageal diverticulum over the last 1 year. He underwent laparoscopic transhiatal diverticulectomy, myotomy and anterior partial fundoplication and was discharged well. He remains asymptomatic after a follow-up of 6 months.

INTRODUCTION

Epiphrenic diverticulum (ED) of the oesophagus is an outpouching of the oesophageal mucosa and submucosa through the muscular layers in the distal 10cm of the oesophagus.¹ This is a rare pathology associated with an underlying oesophageal motility disorder. Majority of patients (75-100%) have achalasia or other oesophageal motility disorder such as diffuse oesophageal spasm or a nutcracker esophagus.² Surgical treatment involves addressing the diverticulum as well as the underlying motility disorder and is recommended for symptomatic patients. In the literature surgical techniques for this condition vary from transthoracic to laparoscopic approaches.³ We report a case of right epiphrenic oesophageal diverticulum which was successfully managed using laparoscopic transhiatal approach.

CASE PRESENTATION

An 82-year-old man presented with troublesome dysphagia, heartburn, postprandial vomiting and chronic cough for one year. Physical examination did not reveal any significant abnormality. Oesophagogastroduodenoscopy (OGDS) showed a lower oesophageal diverticulum located next to the gastroesophageal junction (GEJ) (Figure 1A). Barium swallow demonstrated a right lateral distal oesophagus ED measuring 4.2 x 5.4cm with dilated oesophagus (Figure 2A). Contrast enhanced computed tomography (CT) scan of the neck, thorax and abdomen showed a paraoesophageal hiatal hernia with an outpouching of the distal oesophagus. Surgery using laparoscopic approach was discussed in view of incapacitating nature of his symptoms.

Surgery was performed under general anaesthesia with the patient placed in a modified lithotomy position. The surgeon

stood between the legs in a French position, with the camera assistant on the patient's right and the second assistant on his left. Five trocars were used: one supraumbilical 12mm camera port, one 12mm and one 5mm working port at left and right hypochondrium respectively, one 5mm left anterior axillary retraction port and one 5mm subxiphoid stab to accommodate Nathanson liver retractor (Cook Medical, Bloomington, USA). The surgery started with mobilization of the abdominal oesophagus and the GEJ was encircled with a nylon tape to facilitate retraction of oesophagus during mediastinal dissection. The diverticulum was fully mobilised with more than 5cm of intra-abdominal oesophagus length achieved. OGDS was performed intra-operatively prior to diverticula stapling using endo linear stapler (Figure 1B and 1C). The stapler line was reinforced with V-LocTM90 3-0 (Covidien, Mansfield, USA) (Figure 1D). Primary closure of the hiatus posterior to the oesophagus was performed using two interrupted Ethibond 2/0 sutures (Ethicon, Cincinnati, USA), followed by Heller myotomy extending upward on the oesophagus and distally onto the stomach wall. A methylene blue test was done via nasogastric tube to check for leak from stapler line. The procedure was completed with anterior partial fundoplication. Post operatively the patient was well and gastrograffin at day-1 showing no leak with good passage (Figure 2B). He was allowed soft diet and discharged uneventfully. Histopathological findings were consistent with ED. At a follow-up review of six months, he was very satisfied with the outcome with no relapse of symptoms.

DISCUSSION

Epiphrenic oesophageal diverticulum is a rare disorder mainly affecting elderly population with 20% of patients being symptomatic.⁴ Since the recognition of oesophageal motility disorder as the underlying cause of oesophageal diverticulum 50 years ago, this surgical technique has evolved from open transthoracic and trans-abdominal approaches to minimally invasive surgery.¹ Since the first report by Rosati et al., in 1998, the use of laparoscopy in the treatment of ED is now considered as the approach of choice in most cases.⁵

The diagnostic workup includes barium swallow, upper endoscopy and oesophageal manometry. Barium swallow defines the characteristics of the diverticulum such as the location (right or left chest), the distance from the diaphragmatic hiatus, the size of the diverticulum and the width of its neck.¹ Upper endoscopy is necessary to exclude

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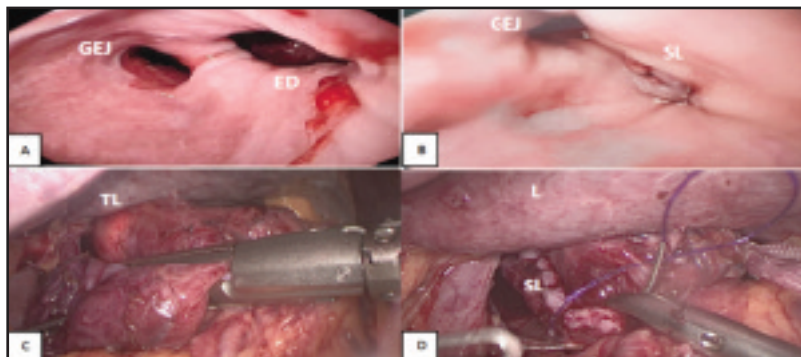


Fig. 1: Endoscopic and laparoscopic view. (A) Pre-operative endoscopy showing a right ED located next to the GEJ; (B) Intra-operative endoscopy showing the stapler line of resected diverticulum with patency of GEJ; (C) Laparoscopic application of stapler to the diverticulum guided by intraoperative endoscopy; (D) SL reinforcement using V-LocTM90 3-0. GEJ - gastroesophageal junction; ED - epiphrenic diverticulum; L - Liver; TL - Transilluminated light from intraoperative endoscopy; SL - Stapler line.

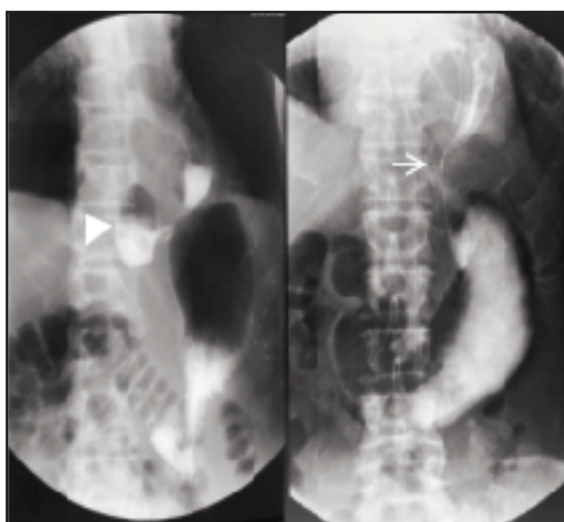


Fig. 2: Barium swallow. (A) Pre-operative barium swallow showing a right ED (White arrowhead). (B) Post-operative showing good successful resection of diverticulum with good contrast flow (white arrow).

malignancy of the distal oesophagus as most of the patients are elderly with dysphagia being one of the presenting symptoms.¹ In addition, it allows evaluation of additional pathology in the upper gastrointestinal tract and facilitates placement of the oesophageal manometry catheter.^{1,2} Manometry is performed to identify and confirm the presence of an underlying motility disorder. The requirement of this test is debatable in view of the underlying oesophageal dysmotility a fundamental to the pathophysiology of oesophageal diverticulum and its result would not alter the patient's management.^{1,2} Surgical treatment is generally indicated for symptomatic patients with incapacitating symptoms related to an ED.^{1,2}

Increase in the life expectancy of the people results in increasingly aging population presenting as surgical emergency. Elderly patients (age 65 and older) often represent the largest cohort of surgical patients with ED. Quality of life is an important factor when deciding whether to pursue surgery for elderly patients. Chronological age alone should not be the sole criterion when assessing surgical risks in elderly patients undergoing surgery. Careful considerations must be given to the comorbid conditions of the patients, their functional and cognitive status which could adversely affect the outcome of the surgery. Our patient had no comorbidity and lives independently with good functional and cognitive status. However, the troublesome symptoms that he experienced had left him emotionally distraught that adversely affected his livelihood. Laparoscopic approach, with the advantages of enhanced recovery and fewer complications, should be the treatment of choice for the elderly when the expertise is available and there is no specific contraindication.

Laparoscopic transhiatal diverticulectomy, myotomy and partial fundoplication is probably the most effective surgical treatment with a low complication rate and a mortality rate ranging from 0 to 7%.⁵ It produces a good symptomatic relief in 85-100% of the cases.⁵ It is our initial approach of choice when encountered such clinical entity. The location and size of the diverticulum in this patient were the considerations before the surgery. Nevertheless, he was informed of the possibility of trans-thoracic approach preoperatively in the event of technical difficulties and the anaesthetists were made aware of it as well. The advantages of laparoscopic approach include better visualization of gastroesophageal junction, easier application of endostapler longitudinally along the main axis of oesophagus, greater ease in performing both cardiomyotomy onto the stomach and a partial fundoplication.² A combined thoracoscopic approach

can be added for patients with larger and high epiphrenic diverticula, dense adhesions between the diverticulum and adjacent mediastinal structures, and those requiring a more proximal myotomy.^{2,4} Performing an appropriate myotomy is important for resolution of symptoms as most symptoms such as dysphagia, regurgitation and chest pain are attributable to the motility disorder rather than the diverticulum itself.² In addition, myotomy protects the staple line which will be subjected to the same motor discoordination that caused the diverticulum initially.^{2,3} Myotomy is made contralateral to the diverticulum and extending proximally above the epiphrenic diverticulectomy and distally below the GEJ.² The procedure is followed by partial fundoplication to provide control of postoperative reflux. In this case, we have chosen the Dor fundoplication as it also helps to protect the myotomy site. In addition, an intraoperative OGDS was performed prior to the stapling of diverticulum to ensure adequacy of resection and avoidance of stapling of GEJ. At the end of procedure, it was also used to check for stapler line leakage and any inadvertent mucosal injury during myotomy.

CONCLUSION

Laparoscopic transhiatal approach for epiphrenic oesophageal diverticulum is associated with excellent outcomes with minimal low morbidity. It is often combined with intraoperative OGDS to ensure adequacy of resection while avoiding GEJ stenosis.

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DECLARATIONS

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

1. Soares R, Herbella FA, Prachand VN, Ferguson MK, Patti MG. Epiphrenic diverticulum of the esophagus. From pathophysiology to treatment. *J Gastrointest Surg* 2010; 14(12): 2009-15.
2. Fisichella PM, Jalilvand A, Dobrowolsky A. Achlasia and epiphrenic diverticulum. *World J Surg* 2015; 39(7): 1614-9.
3. Hirano Y, Takeuchi H, Oyama T, Saikawa Y, Niihara M, Sako H et al. Minimally invasive surgery for esophageal epiphrenic diverticulum: the results of 133 patients in 25 published series and our experience. *Surg Today* 2013; 43(1): 1-7.
4. Fernando HC, Luketich JD, Samphire J, Alvelo-Rivera M, Christie NA, Buenaventura PO et al. Minimally invasive operation for esophageal diverticula. *Ann Thorac Surg* 2005; 80(6): 2076-80.
5. Herbella FA, Patti MG. Achalasia and epiphrenic diverticulum. *World J Surg* 2015; 39(7): 1620-4.