CASE REPORT

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Intraoperative Endoscopy as Guidance for Adequate Myotomy in Laparoscopic Heller Procedure: A Rare Case Report

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ABSTRACT

Background: Esophageal achalasia is a rare disorder characterized by the absence of lower oesophagal sphincter (LES) relaxation. The cardinal symptom is progressive dysphagia. Laparoscopic Heller myotomy (LHM) for achalasia offers long-term symptom improvement. However, a precise length or landmark must be needed for adequate myotomy. The intraoperative endoscopy has been proposed as a tool to measure the adequacy of the myotomy. To our knowledge, no previous report of intraoperative endoscopy during LHM in Indonesia exists.
Case Presentation: A 30-year-old female patient complained of progressive dysphagia and significant weight loss due to oesophagal achalasia for the last two months. She underwent LHM after a week of preoperative nutritional support. The endoscopic was conducted after the myotomy to ensure the adequacy of the myotomy and prevent excessive myotomy.
Conclusion: The use of intraoperative endoscopy offers many advantages for LHM. It ensures adequate myotomy, minimizing the risk of repeat or additional procedures. Moreover, endoscopy can help identify mucosal perforation. We propose using an intraoperative endoscopy as a routine procedure for LHM.

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1. Introduction

Oesophageal achalasia is a rare neurodegenerative motility disorder characterized by the abnormal oesophagus peristaltic and the absence of lower oesophagal sphincter (LES) relaxation. Annual achalasia incidence is approximately 0.5 - 1.2 per 100,000.[1] The cardinal symptom is progressive dysphagia, which can be accompanied by regurgitation, chest pain, heartburn, and weight loss.

[2] Esophageal manometry is the primary diagnostic tool for achalasia. Other diagnostic tools that can be used are endoscopy and "bird-beak" appearance in barium meal study.[1,2] The therapy aims to reduce lower oesophagal sphincter resting pressure using medicine, endoscopy, or surgery. Heller myotomy is the extra mucosal myotomy of LES, which was initially done by open surgery in 1913 and then by laparoscopy in 1991.[3] Laparoscopic Heller myotomy (LHM), either with or without an antireflux procedure, is now widely accepted as a standard treatment for a patient who fits for surgery due to its long-term palliation of symptoms.[4] However, a precise length or landmark must be needed for adequate myotomy. The usual myotomy length is between 4 to 8 cm on the oesophagus and 0.5 to 2 cm on the stomach.[5] Short myotomy results in an inadequate reduction of resting pressure, whereas excessive myotomy, mainly on the proximal gaster, may cause post-operative regurgitation.[6] An adequate myotomy can be checked by using intraoperative endoscopy. This technique is also helpful to check if there is any mucosal perforation.[4-6] In this article, we present our case of endoscopic assessment during LHM for achalasia in our institution. This case report

This is important because this is the first case report, to the best of our knowledge, of intraoperative endoscopy during LHM in Indonesia. There were no previous reports on this topic. We hope this report can become a primary data source for future studies and health services in Indonesia.

2. Case Presentation

A female, 30-year-old, has been complaining of progressive dysphagia for the last two months. She could not swallow a solid and liquid diet when she came to our institution. She also experienced food regurgitation after swallowing. Her weight decreased by 27 kg, from 83 kg to 56 kg. There was no chest pain or heartburn. The barium meal study has shown a "bird-beak" appearance (Fig. 1). We performed upper endoscopy and found food retention, dilatation, and thickening of the oesophagal mucosa. The scope was difficult to pass through the LES, but no anatomical obstruction was found. The stomach tube was inserted to optimize the patient's nutrition preoperatively (Fig. 2).

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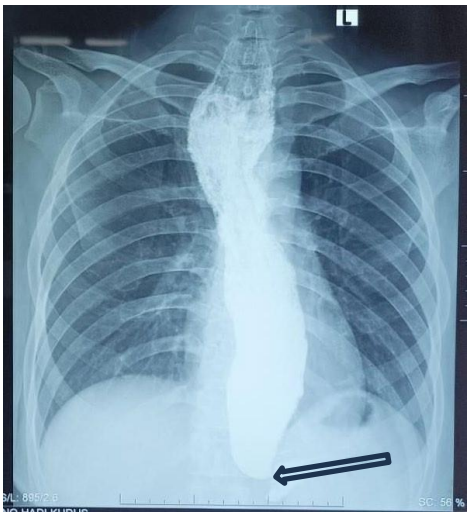

Figure 1 A "bird-beak" appearance in barium meal study (arrow)

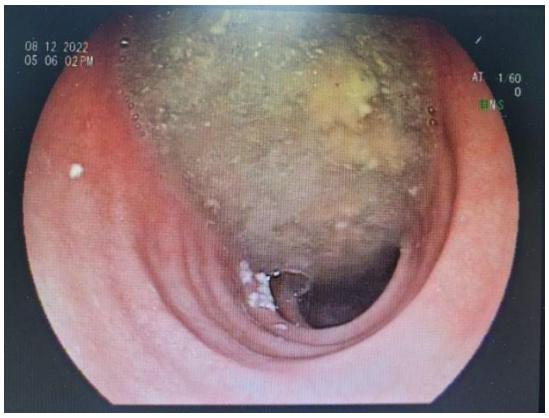

Figure 2 Endoscopic result

We performed LHM after a week of preoperative nutritional suppo rt. The patient's position was supine with leg abduction. We used a supraumbilical 10 mm port for the camera, a 5 mm subxiphoid port for the Nathanson retractor, and two 5 mm working ports for the surgeon in the left subcostal. We left the paramedian the last 5 mm working port for assistance in the left subcosta below the surgeon's right hand. (Fig. 3)

Figure 3 Surgical Port

We retracted the left lateral liver segment using the Nathanson retractor. We identified the gastroesophageal junction (GEJ) and vagal nerve. We began the dissection at GEJ cranially after vagal nerve preservation. We used a combination of blunt dissection and advanced bipolar for myotomy. The oesophagal mucosa was bulging out after the myotomy; the myotomy was continued cranially for approximately 4-5 cm. The myotomy of the proximal gaster was started at GEJ and continued caudally for approximately 1-2 cm. We dissected transverse gastric muscle fibre with blunt and sharp dissection.

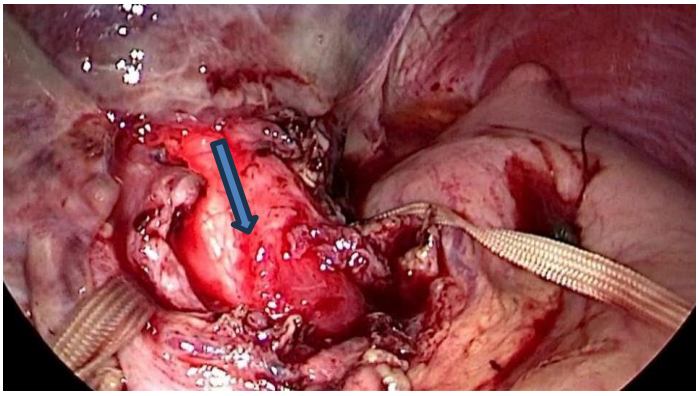

Figure 4 Surgical view Scope light was observed within the mucosa (arrow)

We checked the adequacy of myotomy using endoscopy; the scope was quickly passed the LES, and the scope's light was seen in the laparoscopic monitor within the mucosa, suggesting no mucosal perforation (Fig. 4). We then performed an antireflux procedure using anterior partial fundoplication. The patient started to take a liquid diet soon after regaining consciousness. The diet was increased gradually based on patient tolerability.

The patient had an uneventful recovery. She was observed for three days after surgery and was discharged with the education of a gradual increase in her diet at home. Three weeks after surgery, she came to our outpatient clinic. She was able to eat solid food, had no dysphagia, and there were no complaints of heartburn, chest pain, or regurgitation. She has gained 2 kilograms since the surgery.

3. Discussion

Esophageal achalasia is a rare benign disorder caused by LES neurodegeneration. This condition fails LES relaxation and leads to the high resting pressure of the LES. The primary cause of achalasia is unknown, whereas secondary achalasia may be caused by autoimmune disease.[3-5] The primary diagnostic tool is oesophagal manometry, supported by barium meal study and endoscopy.[1-2] Unfortunately, there is no oesophagal manometry at our institution, so in our case, the diagnosis was based on barium meal with a bird's beak appearance and endoscopy to remove pseudoachalasia.

Heller's procedure for the treatment of achalasia offers long-term symptom improvement. The myotomy is performed in the LES and proximal stomach to reduce the LES resting pressure. Intraoperative manometry can be used to achieve an adequate myotomy.[5] However, the

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intraabdominal pressure from the laparoscopic pneumoperitoneum may intervene in the result. In our report, we used intraoperative endoscopy during LHM to identify the adequacy of the myotomy. The surgeon who performed the endoscopy before and during the LHM was the same. The scope was quickly passed the gastroesophageal junction compared to the preoperation.

The use of intraoperative endoscopy has been recommended in Heller's management guidelines of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). This technique ensures that the resting pressure of the LES is low enough to allow the scope to enter the stomach quickly.[7] In addition, endoscopy can identify mucosal perforations during surgery by the presence.

of light coming out of the mucosa or by immersing the distal oesophagus with water to see any air bubbles from the scope's air insufflation when there was any mucosal perforation. We used the light to identify the mucosal perforation; the light was within the mucosa, suggesting no perforation. The endoscopy is also helpful in identifying the exact location of GEJ to start the myotomy, resulting in minimal dissection around the angle of His. This minimal dissection will minimize the damage of natural antireflux and allow the selective use of the antireflux procedure.[4] There is a debate about the routine use of intraoperative endoscopy for LHM, and the authors suggested no difference in outcome and perforation identification in using or leaving the intraoperative endoscopy. However, the necessity of the antireflux procedure was different from that study.[8]

We used the intraoperative endoscopy to check the adequacy of myotomy and mucosal perforation signs. We did the dissection around the GEJ and decided to add the antireflux procedure using dor fundoplication. In our case, the one-month outcome was good, and there was no dysphagia, chest pain, or heartburn complaint. She even gained five kilograms of body weight. The use of intraoperative endoscopy to identify the GEJ should be considered as one of the considerations for the necessity of antireflux procedure, which remains a debate to date.

4. Conclusion

Achalasia is a rare case, whereas LHM is only performed on achalasia patients who are fit for surgery. The LHM became an infrequent procedure. The use of intraoperative endoscopy offers many advantages for LHM. Intraoperative endoscopy ensures adequate myotomy, minimizing the risk of repeat or additional procedures. The light and air from the scope can aid in identifying any mucosal perforation. The excessive proximal gastric myotomy, which leads to post-operative regurgitation, can be avoided. The usage for locating the GEJ area effectively, resulting in a minimal dissection of the angle of His, could also be considered. We propose a routine use of intraoperative endoscopy in LHM.

Ethical Approval

The authors need to state ethical approval for this research. For example: “There is no ethical approval." or the authors can put an Ethical Clearance Number (if any).

Conflicts of Interest

The authors declare no conflict of interest.

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Author Contributions

Conceptualization, Ahmad Fathi Fuadi and Ahmad Za'im Muhtar; software, Ahmad Za'im Muhtar; validation, Ahmad Fathi Fuadi; resources, Ahmad Fathi Fuadi and Ahmad Za'im Muhtar; writing—original draft preparation, Ahmad Fathi Fuadi and Ahmad Za'im Muhtar; writing—review and editing, Ahmad Fathi Fuadi and Ahmad Za'im Muhtar; visualization, Ahmad Fathi Fuadi and Ahmad Za'im Muhtar; supervision, Ahmad Fathi Fuadi.

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