

Achalasia Patient Successfully Treated with Transthoracic Approach of Esophagomyotomy and Belsey Mark IV Fundoplication

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Abstract

Background: Achalasia is a primary esophageal motility condition defined by and thought to be caused by selective loss of inhibitory neurons in the myenteric esophageal plexus. Achalasia is a rare condition with an annual incidence of 1–1.6 cases per 100,000 people and a frequency of 10 instances per 100,000. Current treatment options include non-surgical and surgical approaches, each with its benefits and drawbacks.

Objective: The purpose of this study was to present a case of achalasia and to emphasize the use of the transthoracic approach as an alternative for abdominal surgical options.

Methods: We report a 23-year-old male who presented with chief complaints of progressive difficulty swallowing food and drinking for about eight years. He was diagnosed with achalasia. In addition, a chest computed tomography (CT) scan and esophagogastroduodenoscopy were performed, and the results showed achalasia with megaesophagus. Later, the achalasia was confirmed intraoperatively. The patient underwent thoracotomy, esophagomyotomy, and Belsey mark IV fundoplication for his condition.

Results: He could swallow solid food without difficulty on postoperative day 3 (POD). Subsequently, on the same day, his chest drainage was removed. On POD 4, he was discharged uneventfully. Neither reflux, complications, nor a recurrence of his complaint were found during the one-month follow up.

Conclusion: Despite of its benefits and drawbacks, this report suggests that the transthoracic approach, compared to VATS and other surgical technique, of esophagomyotomy and Belsey mark IV fundoplication for achalasia patients can be performed safely and effectively. Postoperative follow-up showed a good result with no symptoms of recurrence or reflux.

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Background

Achalasia is a primary esophageal motility condition defined by and thought to be caused by selective loss of inhibitory neurons in the myenteric esophageal plexus. Patients may have intermittent dysphagia for solids and liquids, frequently accompanied by regurgitation (1, 2). It has an incidence of 1-1.6 cases per 100,000 individuals and a frequency of 10 cases per 100,000 individuals (2, 3). Both men and women are impacted equally. The cause of achalasia is unknown; however, it is likely to be multifactorial (4).

Current treatment options include laparoscopic Heller myotomy (LHM) with partial fundoplication, per oral endoscopic myotomy (POEM), pneumatic dilatation (PD), endoscopic botulinum toxin injection (EBTI), and transthoracic approach esophagomyotomy, each with its own set of benefits and drawbacks (5).

Objective

The purpose of this study was to present a case of achalasia and to emphasize the use of the transthoracic approach as an alternative for abdominal surgical options.

Methods

We reported a 23-year-old male who presented with chief complaints of progressive difficulty swallowing food and drinking for about eight years. Based on severity level of dysphagia, our patient could not swallow solid food; thus, his complaint was at level 1. No significant results from the physical examination and laboratory evaluation were found. The patient underwent esophagogastroduodenoscopy (EGD), and the result showed a megaesophagus (Fig.1). He was diagnosed with achalasia. Chest x-ray and chest computed tomography (CT) scan were performed, and the result showed megaesophagus and achalasia (Fig. 2 and 3).

The patient underwent left thoracotomy, esophagomyotomy, and Belsey mark IV fundoplication for his condition. Under general anesthesia, the patient was positioned in left lateral decubitus with a monitor connected. The surgery region was then treated for asepsis and antisepsis. We then made a left posterolateral thoracotomy incision (Fig.4a). The 7th intercostal space was opened, and the esophagus was examined. The esophagus was then separated from the surrounding connective tissue at the diaphragm level (Fig. 4b). Then, from 1 cm of the stomach fundus to 5 cm above the diaphragm, an esophagomyotomy was done (a total of 6 cm) (Fig. 4c). The Belsey mark IV fundoplication was used (Fig. 4d). We controlled the bleeding

and then closed the ribs. Layer by layer, the surgical incision was closed. Finally, the surgery was completed.

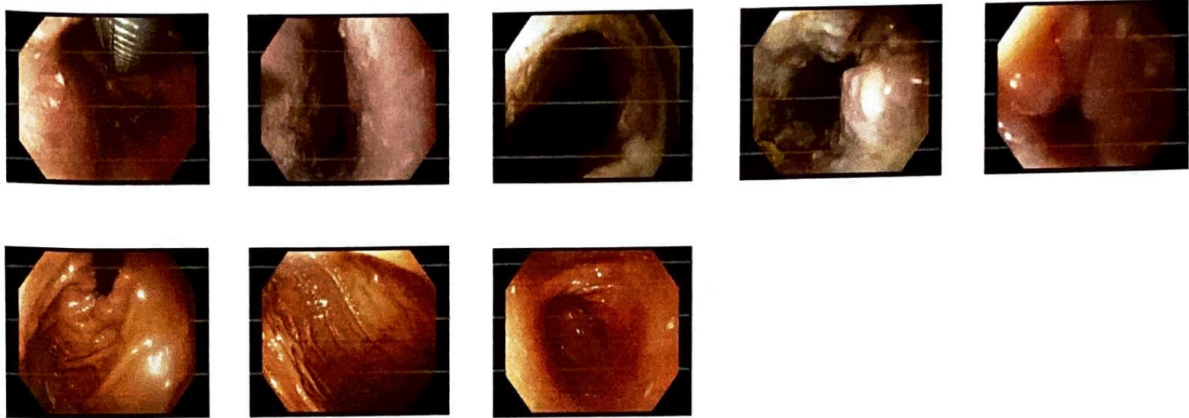


Figure 1. Esophagogastroduodenoscopy revealed megaesophagus, and the endoscope passed through esophagus until pylorus

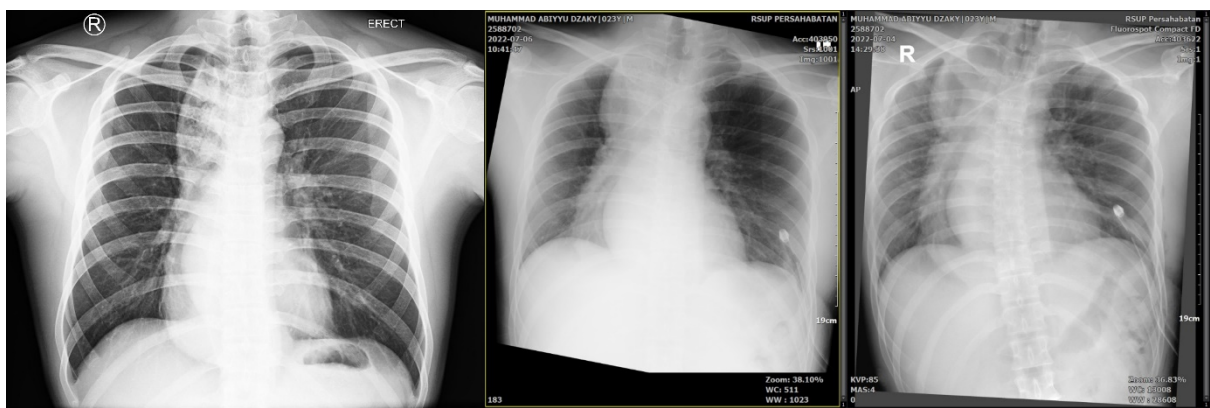


Figure 2. Preoperative chest x-ray (left); POD 0 (middle), and POD 3 (right)





Figure 3. Chest CT scan showed megaesophagus and achalasia

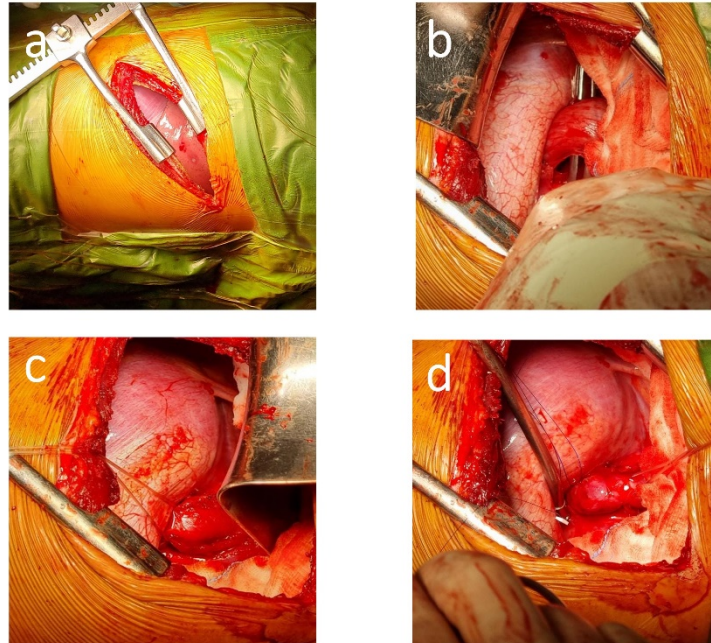


Figure 4. a) Left thoracotomy approach, b) Esophagus is separated from the surrounding connective tissue at the diaphragm level, b) esophagomyotomy, c) Belsey mark IV procedure

Results

On postoperative day (POD) 3, he can swallow solid food without any problem. Subsequently, on the same day, his chest drainage was removed. On POD 4, he was discharged uneventfully. Neither complication nor recurrence of his complaint was found during the one-month follow up.

Discussion

Achalasia is most common in young people, while occurrences have been reported in infants and the elderly. It has a low incidence in children under 16, with 0.18 per 100,000 persons each year, but the average age of diagnosis in adults is above 50 years (6). The severity of dysphagia is classified into five levels, as follows: (a) Level 0: normal; (b) Level 1: unable

to swallow solid food; (c) Level 2: unable to swallow fine meat; (d) Level 3: unable to swallow soup or liquid food; (e) Level 4: unable to swallow saliva. Regurgitation, burning and substernal discomfort, weight loss, and a full sensation of fullness in the substernal area are all signs of acute reflux with regurgitation caused by food retention and persistent vomiting (6).

The pathophysiology underlying the development of achalasia is the chronic and progressive degeneration of inhibitory nerve cells in the myenteric plexus of the lower esophageal sphincter, as well as accompanying local and systemic inflammation, resulting in a loss of vasoactive intestinal peptide (VIP) and nitric oxide (NO). The excitatory neurotransmitter acetylcholine's unopposed activation leads to lower esophageal sphincter (LES) relaxation failure and aperistalsis (3, 7-9).

Several research on the etiology of achalasia has failed to establish the underlying cause of ganglion cell degeneration in the Myenteric plexus in most patients. Chagas disease, caused by *Trypanosoma cruzi* infection, is a recognized cause of myenteric plexus ganglion cell degeneration in the LES (10).

Approaches of therapy are incurable but aimed at alleviating the related symptoms. These treatment strategies aim to lower LES pressure, improve esophageal transit by removing obstructions, and improve esophageal emptying (8, 11, 12). Pharmacological treatments, pneumatic dilatation, and surgical myotomy are currently available as treatment options (11).

Esophagomyotomy, also known as Heller myotomy, divides the LES's circular muscle layer without damaging the mucosa. Heller myotomy was done through a thoracotomy and afterwards via laparotomy, with great results in 60% - 93% of patients (8).

Many surgeons prefer the abdominal technique. Abir et al. used this strategy on 2680 patients in a study. The success rate was reportedly 83%, with a low mortality rate. The sole problem was a small esophageal perforation during cardiomyotomy and postoperative gastroesophageal reflux disease (GERD) (13).

Many surgeons consider that using a transabdominal approach increases the risk of GERD due to manipulation of the hiatus and esophago-phrenic ligament. Those who opt for a transthoracic approach say it is easier and more precise. The success rate was 91% in a study by Gaisert et al. on 64 individuals with achalasia who had transthoracic surgery. They claim they have a low death and morbidity rate. Antireflux surgery is seldom required (14). However, in comparing the success rates of these two procedures (transthoracic or transabdominal), Abir et al. found no difference in these approaches, although morbidity was greater in the abdominal treatment (13).

We performed left thoracotomy instead of video-assisted thoracoscopic surgery (VATS) because we also did Belsey Mark IV antireflux procedure simultaneously, which was hard to do with the VATS technique. The rigid rib cage restricts exposure with minimally invasive trocars and instruments, further challenging the surgeon's skills. These considerations account for lengthier operating times and lengths of stay and would be sufficient to counteract the thoracoscopic technique (15). Furthermore, in a previous study on patients with GERD, thoracoscopic Belsey fundoplication was linked with a significant morbidity and recurrence rate (16). Various plication procedures, such as Nissen, Toupet, and Belsey mark, existed today. However, the Belsey Mark IV procedure was chosen as prevention for postoperative GERD because we used the transthoracic approach (17).

The Belsey transthoracic approach is preferable because of its wide mobilization to reduce shortening, extended myotomy to the aortic arch to split more of the obstructive smooth muscle, and reliance on a partial fundoplication to avoid reflux and limit iatrogenic dysphagia (18).

Conclusion

Despite of its benefits and drawbacks, this report suggests that the transthoracic approach, compared to VATS and other surgical technique, of esophagomyotomy and Belsey mark IV fundoplication for achalasia patients can be performed safely and effectively. Postoperative follow-up showed a good result with no symptoms of recurrence or reflux.

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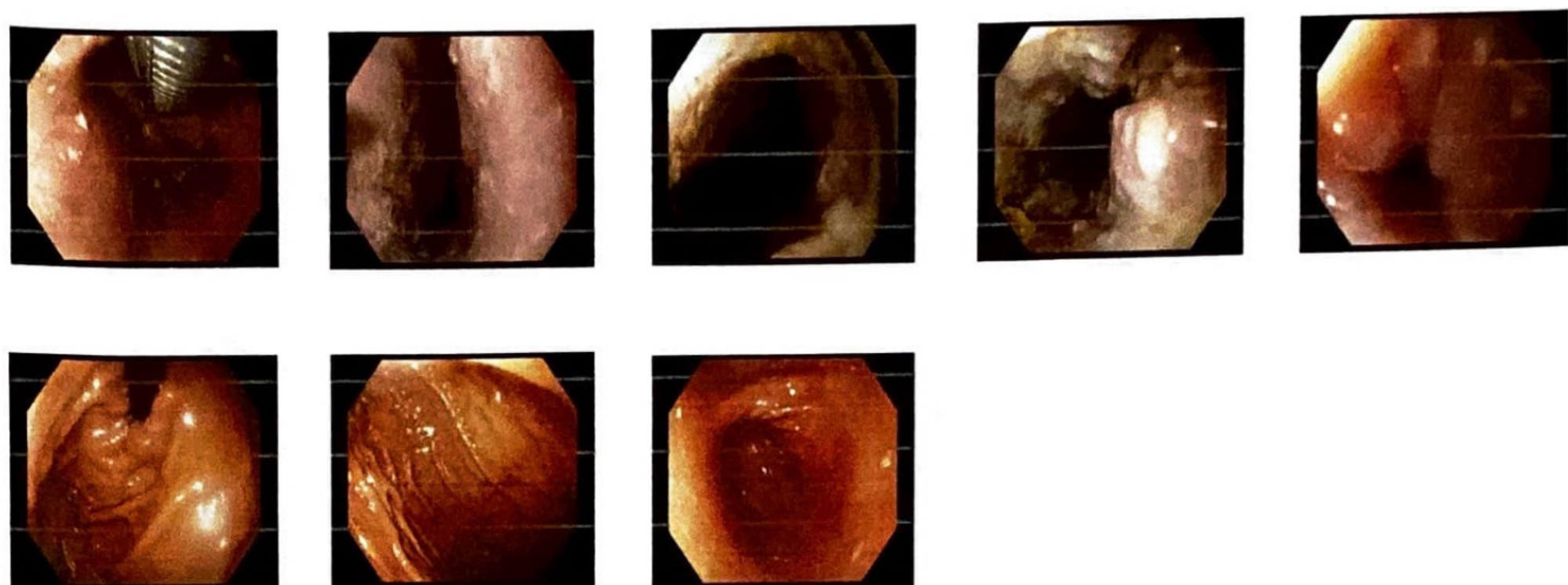


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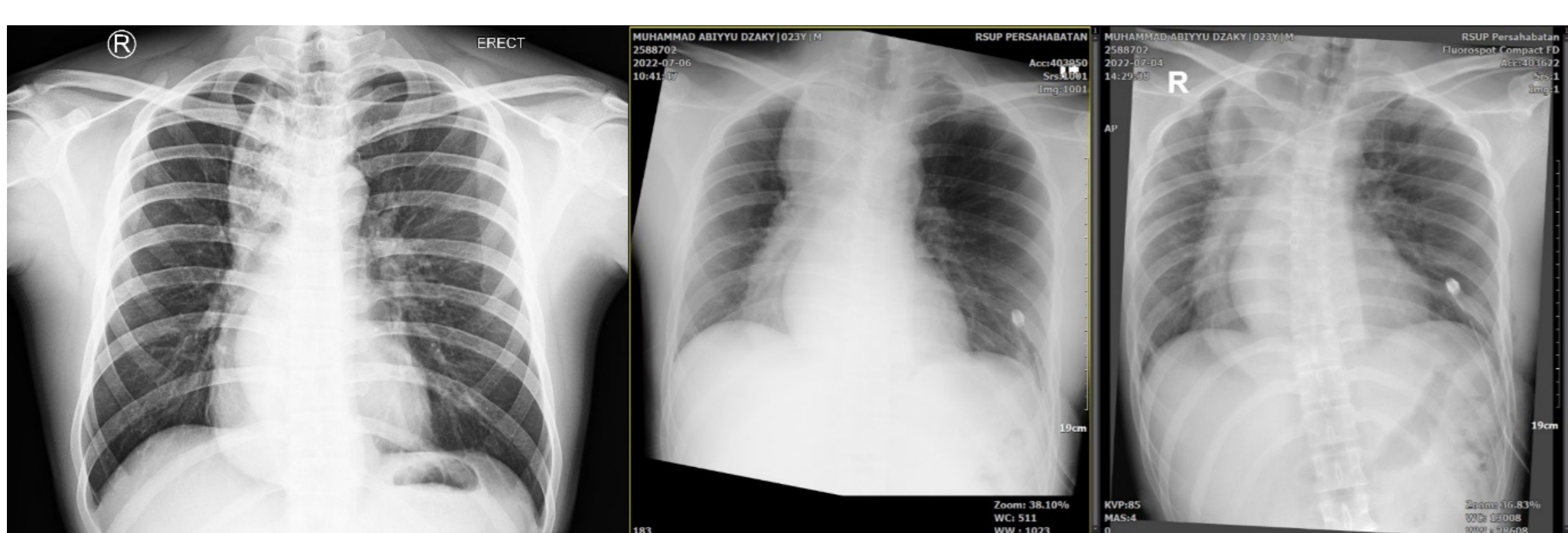


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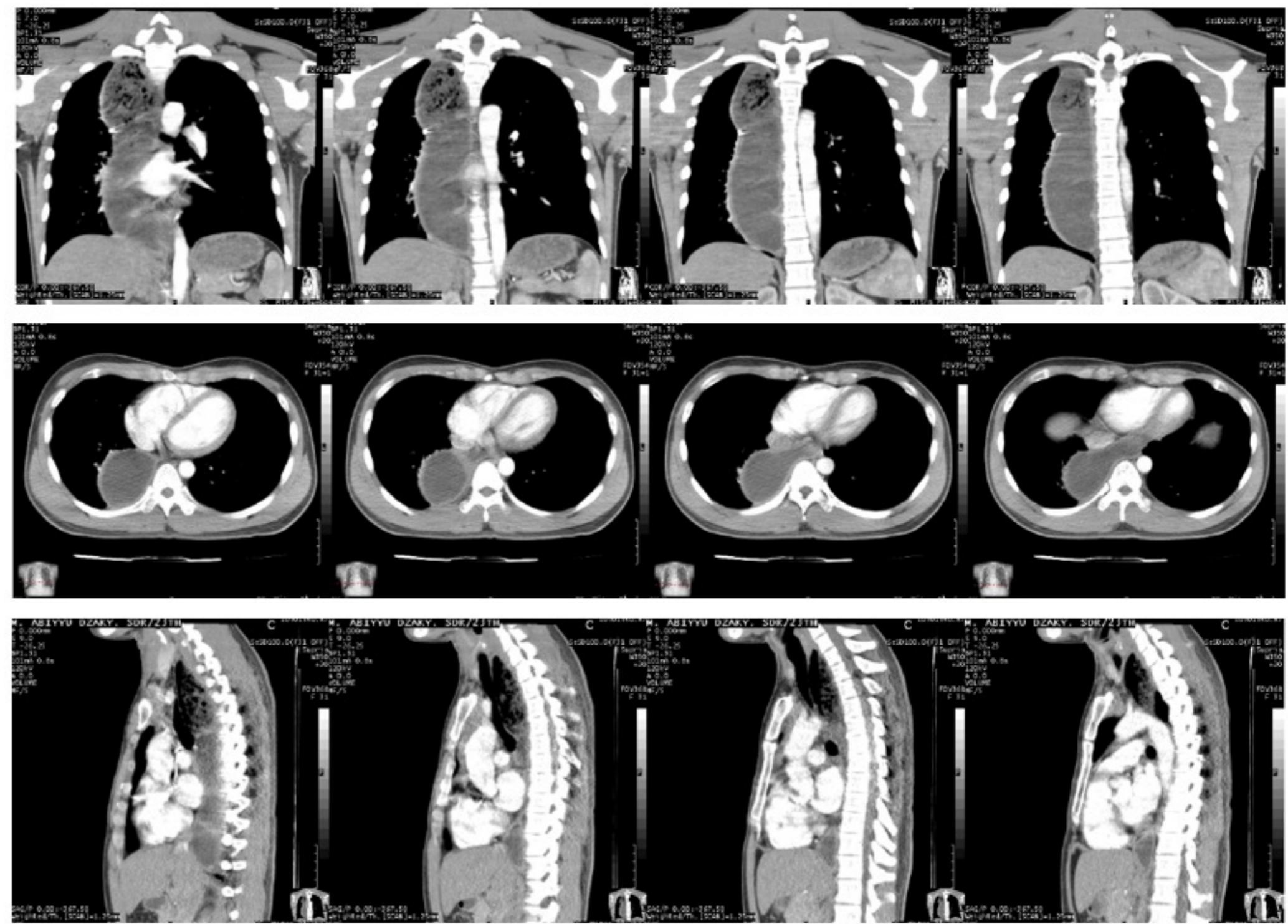


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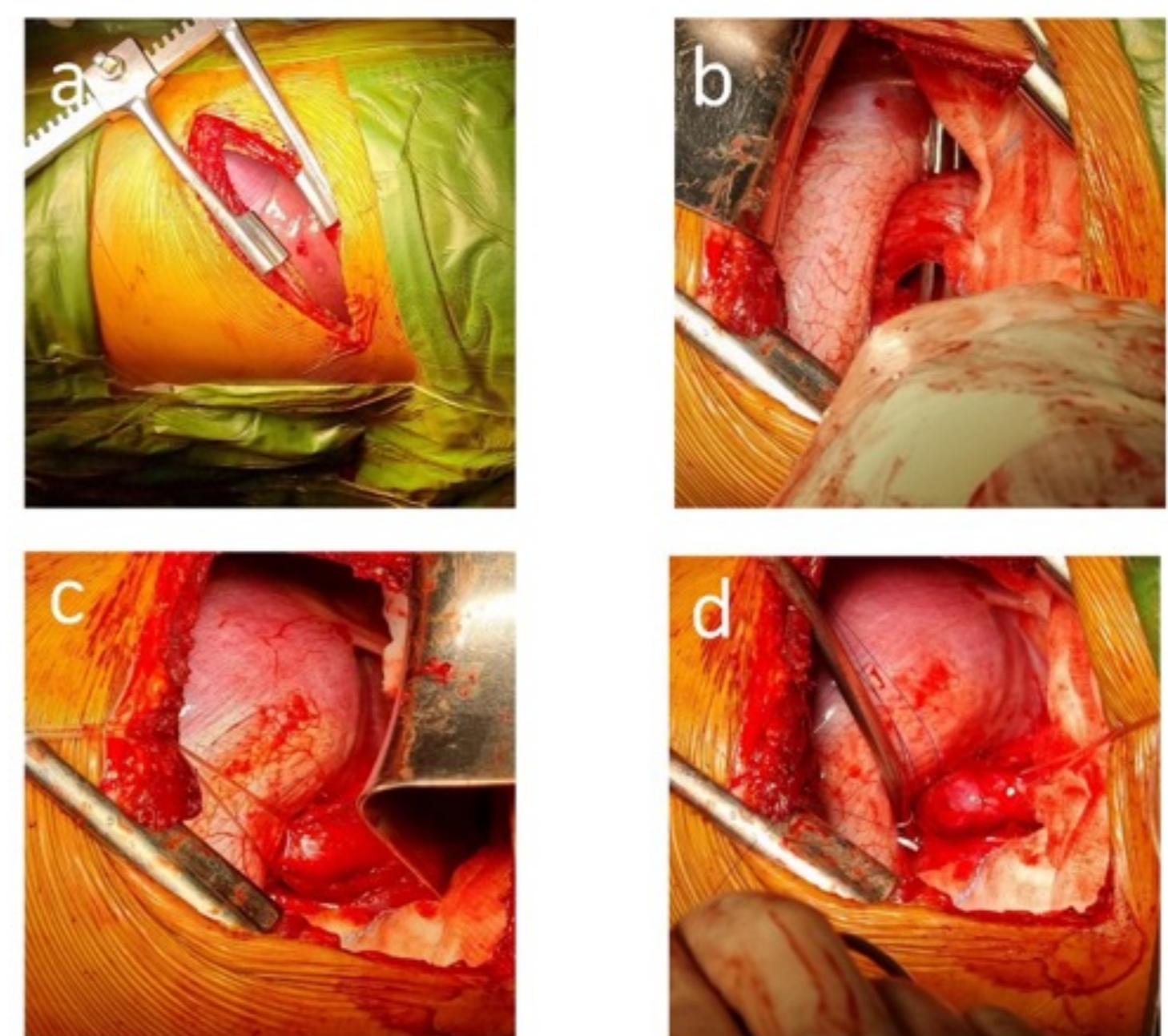


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