



Case Report

Bochdalek hernia in a young adult successfully treated with a laparoscopic approach, a case report



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ABSTRACT

Background: Bochdalek hernias are a rare form of diaphragmatic hernias; they are frequently found in children; however, they have been discovered in completely asymptomatic adults in exceptional situations. Being such a unique pathology, they can be easily confused and misdiagnosed, exposing patients to unnecessary treatments. **Case report:** Patient is an otherwise healthy 30-year-old patient without past medical history; after vigorous physical activity, a Bochdalek hernia was discovered and successfully treated; on follow-ups, he is doing well without signs of recurrence.

Conclusions: In adults, Bochdalek hernia is an uncommon form of diaphragmatic hernia. As most cases are asymptomatic, a high index of suspicion is needed since diagnosis is challenging. Modern surgical techniques can improve patient recovery and short hospital stay with minimal morbidity or mortality.

1. Introduction

Congenital hernias that occur from the posterolateral diaphragmatic foramina's failure to fuse correctly were first described by Bochdalek in 1848 [1]. Most Bochdalek's hernias are diagnosed in children who exhibit symptoms caused by associated pulmonary insufficiency [2]. In adults, it is likely that most Bochdalek hernias are asymptomatic and are discovered incidentally on imaging studies for other pathologies, as symptoms are often vague and nonspecific [1,2]. Asymptomatic Bochdalek hernias are extremely rare, with less than 100 cases reported in the literature [2,3].

We report the case of a healthy 30-year-old male; after physical activity, he developed mild pain, and a left Bochdalek hernia was discovered; after successful surgery, he completely recovered. On follow-ups, the patient is doing well.

This manuscript adheres to CARE guidelines [9].

2. Case report

Patient is a 30-year-old male without past medical history. He had no respiratory or gastrointestinal problems, did regular exercise, and was otherwise a healthy person. After a vigorous physical activity in the gym, he developed mild acute left thoracoabdominal pain and few episodes of dyspnea on exertion. Thus he presented it to our office. During his physical examination we detected bowel sounds in the left hemithorax with reduced air entry. Chest radiograph revealed a raised left hemidiaphragm, mediastinal shift to the right, and the presence of air-filled bowel loops in the left thoracic cavity. A contrast-enhanced computed tomography (CT) revealed a 65 mm × 44 mm left-sided posterolateral diaphragmatic hernia, the stomach fundus, splenic flexure of the transverse colon, upper lobe of the spleen, and several loops of bowel were within the thorax. The left lung was displaced and compressed. (Fig. 1A and B). With these findings, and although the patient remained for the most part asymptomatic, as there was an extensive hernia involving several organs, laparoscopic surgery

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Fig. 1A. CT, revealing a left-sided posterolateral diaphragmatic hernia with bowel.

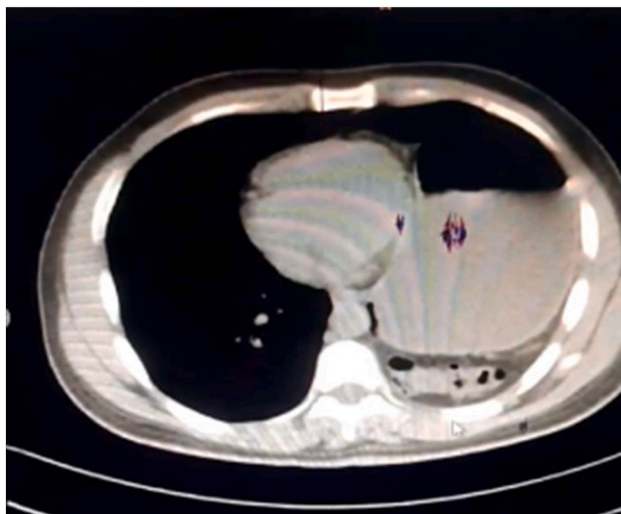


Fig. 1B. CT, revealing Bochdalek hernia.

was decided.

Due to the surgical procedure's technical complexity, the support of an expert surgeon in laparoscopic and abdominal wall surgery was needed. He had more than ten years of experience, and his help was invaluable for the medical team to treat the patient properly.

On laparoscopy, a 5 × 6 cm posterolateral defect in the left diaphragm was discovered, and through it, most of the abdominal contents (stomach, bowel, spleen, and omentum) were herniated. (Fig. 2A y 2B). The organs were pulled into the abdominal cavity, and the multiple adhesions were released with the aid of an ultrasonic energy device (Harmonic, Ethicon Endo-Surgery, Inc., Cincinnati, Ohio).

The collapsed lung completely re-expanded, and a 28 French chest tube was placed (Fig. 3A and B). After this, the diaphragmatic defect was sutured with a self-locking barbed suture (V-Loc 90; Covidien, Mansfield, Massachusetts), and 10 × 5 cm expanded polytetrafluoroethylene mesh was placed and secured (Proceed, Ethicon, Somerville, NJ, USA). The remainder of the surgery was completed without complications (Fig. 4A and B).

His postoperative course was uneventful; sips of liquids were initiated on the first postoperative day and followed by a full diet. The chest tube was removed on the third postoperative day, and he was discharged

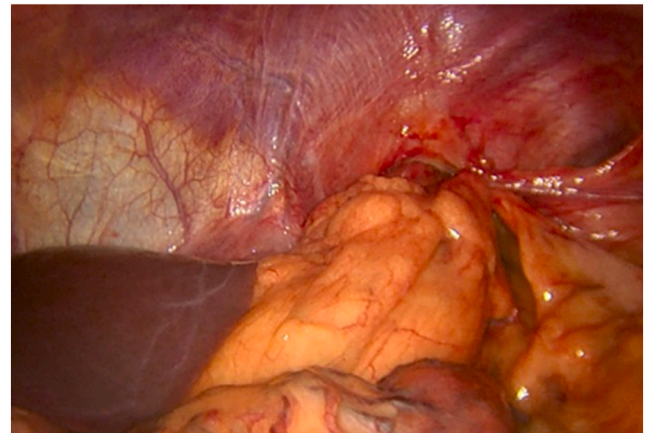


Fig. 2A. Laparoscopy, revealing organs through the diaphragmatic defect.

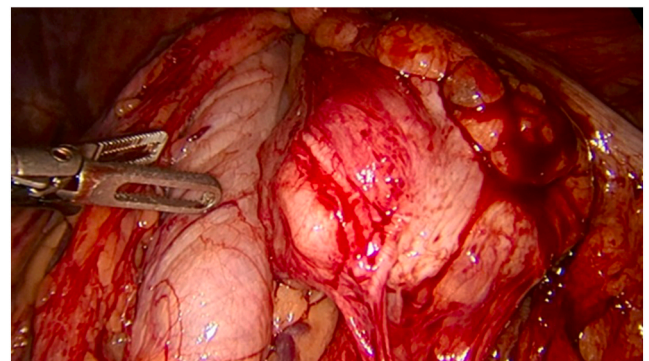


Fig. 2B. Laparoscopy, the colon is being reduced from the diaphragmatic defect.

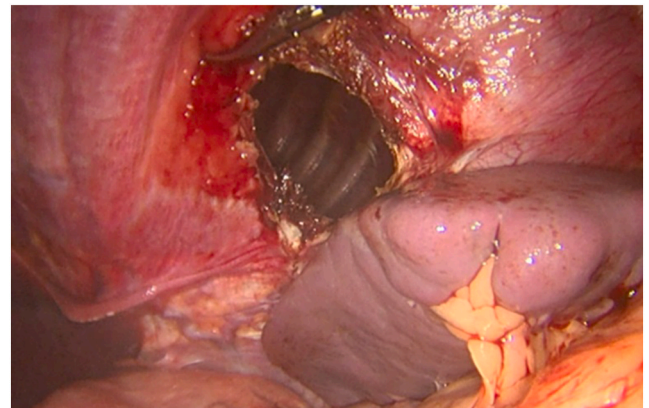


Fig. 3A. The left sided, diaphragmatic defect is seen.

with proton pump inhibitor therapy, analgesics, an incentive spirometer and was scheduled for frequent follow-ups in the clinic. During one year of follow-up at the hospital, no medical problems were encountered; 4 months after surgery, he remained completely asymptomatic and resumed his regular physical activity. One year after surgery, a new chest CT was normal without any sign of recurrences.

3. Discussion

Bochdalek hernia is an extremely unusual condition; it has an incidence of 1:2000–1:12,500 live births and usually presents in neonates,



Fig. 3B. The collapsed lung is seen with a chest tube.

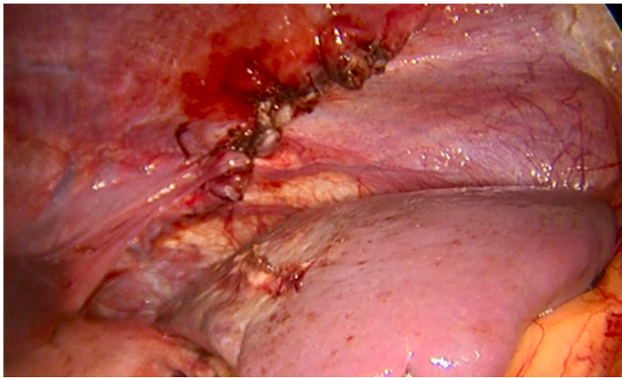


Fig. 4A. The diaphragmatic defect after closure.



Fig. 4B. A mesh is placed over the diaphragmatic defect.

causing respiratory distress with a high mortality rate (40–50%) [1]. Although McCauley first described it in 1754, it further was characterized and popularized by Vincent Alexander Bochdaleck in 1848 [1,2]. It is a congenital diaphragmatic defect that occurs from the pleuroperitoneal canal's failure to close during the ninth or tenth week of fetal life [2,3]. Most cases appear on the left side as the right pleuroperitoneal canal closes earlier [1,2]. Only 5% of all Bochdalek hernias are diagnosed in adults, and it is believed that they appear as the pleuroperitoneal ducts reopen following the extension of intrabdominal or perirenal fat due to an increase of intrabdominal pressure [3]. These patients usually have other congenital defects (11%), including intestinal malrotation, hepatic hypoplasia, pulmonary hypoplasia, and Down syndrome [1,3].

Asymptomatic Bochdalek hernia in the adult is rare (0.17% of the adult population) [2]. It tends to affect women (77%) and

predominantly appears on the right side. (68%) [1,3] When symptoms arise, a precipitating factor is found in 25% of cases, and most of the time, it is due to an increase in intra-abdominal pressure. (Pregnancy, constipation, cough, laughter, physical activity, etc.) [4]. In our case, the patient was a middle-aged man who presented with symptoms after physical activity [1,5]. Other patients can present with vague symptoms, including abdominal or thoracic pain and acute bowel obstruction [1,2]. The diaphragmatic defect can contain several organs including, the colon, stomach, omentum, and small bowel [1,6]. As our patient experienced.

Diagnosis is incredibly challenging due to the wide variation in presenting symptoms combined with this disease's rarity [1,3]. Misdiagnosis is common and can be as high as 38% leading to severe consequences as chest tubes can be placed erroneously [4]. Physical examination may reveal diminished breath sounds or bowel sounds within the chest [1,5]. Chest x-ray and CT usually confirm the diagnosis, and most patients are diagnosed incidentally [2,3]. As we did in our patient. When strangulation appears, prompt diagnosis and treatment are necessary as delay can lead to severe complications or even death [1, 7].

Surgery is needed to repair the diaphragmatic defect and to avoid complications even in asymptomatic patients [6]. Many approaches are available, including open, thoracoscopic, and laparoscopic techniques [1,6]. In any case, reducing the abdominal contents and repairing the diaphragmatic defect must be achieved [6,7]. The mesh reinforcement of the repair depends on the defect size and may be considered when the defects are larger than 8 cm in size as primary repair can not be possible in 53% of the cases [7,8]. Also, the diaphragm's continuing stress resulting from respiratory and cardiac movements and cardiac can potentially affect the primary repair [1,7]. In any approach, the possibility of intraoperative and postoperative pneumothorax should be present by the surgical team. A cannula or a chest tube can be placed to prevent this complication [8]. In our patient, the diaphragmatic defect was exposed after the hernia was reduced, and a mesh was fixed without complications; due to the high risk of postoperative pneumothorax, a chest tube was placed and was removed during the postoperative period.

4. Conclusion

Asymptomatic bochdalek hernia is an uncommon condition that can easily be misdiagnosed. A high index of suspicion is needed in order to diagnose these rare hernias correctly. Treatment should not be delayed as there is an increased risk of complications if this condition is left untreated. A high degree of laparoscopic and thoracoscopic skills are needed to plan an individualized surgical intervention for these unusual conditions.

Patient perspective

At first, the patient was unsure about his treatment, how long it would last, whether it would hurt, and whether he could be normal again without any disability; nonetheless, since surgery was successful, he was grateful to the medical team.

Ethical approval

This article does not contain any studies with human participants or animals performed by any of the authors, and has been approved by the ethics committee or our hospital.

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None.

Author contribution

JT analyzed and interpreted the patient data. MR, SE and GM were a major contributor in writing the manuscript. FZ and JM and HG revised the manuscript and reviewed all the available data.

All authors read and approved the final manuscript.

Registration of research studies

1. N/A.

Guarantor

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Provenance and peer review

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Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review.

Declaration of competing interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest, or non-financial

interest in the subject matter or materials discussed in this manuscript. We have no conflict of interest to disclose.

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