

Minimally invasive transthoracic repaired Morgagni hernia: A case report

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Received: 08.08.2023

Accepted/Published Online: 08.09.2023

Final Version: 30.09.2023

Abstract

Morgagni hernia (MH) is a congenital diaphragmatic hernia that is rarely seen, comprising 2-4% of diaphragmatic hernia cases. While it can remain asymptomatic, it has the potential to give rise to symptoms like cough, difficulty breathing and retrosternal pain. A chest X-ray and a computed tomography (CT) scan of the chest are sufficient for diagnosis. The only option in treatment is surgery. The objective of this study was to propose the treatment of a patient who sought our clinic due to right-sided chest pain and was diagnosed with MH, utilizing a minimally invasive surgical technique.

Keywords: Congenital Diaphragmatic Defect, Morgagni Hernia, VATS

1. Introduction

Congenital diaphragmatic hernias account for 8% of congenital malformations and occur due to a defect in the diaphragm between the abdominal and thoracic cavities. MH is a congenital hernia type situated within the anteromedial region of the diaphragm, comprising 2-4% diaphragmatic hernia cases. MH involves the herniation of intra-abdominal organs into the thoracic cavity. The condition is often asymptomatic, with the majority of cases being incidentally identified through radiological imaging. The most common symptoms are cough, difficulty breathing, and retrosternal pain (1). From the defect, typically colon and omentum, rarely stomach, small intestine, and a part of the liver herniate into the thoracic cavity (2). In MH, where surgical intervention is the sole treatment method, the approach can be either a transthoracic or transabdominal, although minimally invasive methods have been increasingly preferred in recent times (3).

In this article, we aimed to present a case diagnosed with MH and treated with minimally invasive video-assisted thoracic surgery (VATS) in light of the literature.

2. Case Presentation

A female patient, aged 48, visited our clinic with a complaint of stabbing-like right-sided chest pain that started approximately two weeks ago. In this patient, who does not have any gastrointestinal complaints, an opacity was detected in the right substernal area at the cardio-phrenic angle on the chest radiograph (Fig. 1a a, b). Contrast-enhanced thoracic computed tomography (CT) reported a well-defined hypodense lesion with dimensions of 60x44x62 mm in the right paracardiac area, indicative of fat density (lipoma?) (Fig. 1a c, d). Additionally, a consolidation appearance consistent

with subsegmental band atelectasis was observed in the right lung's middle lobe adjacent to the lesion.

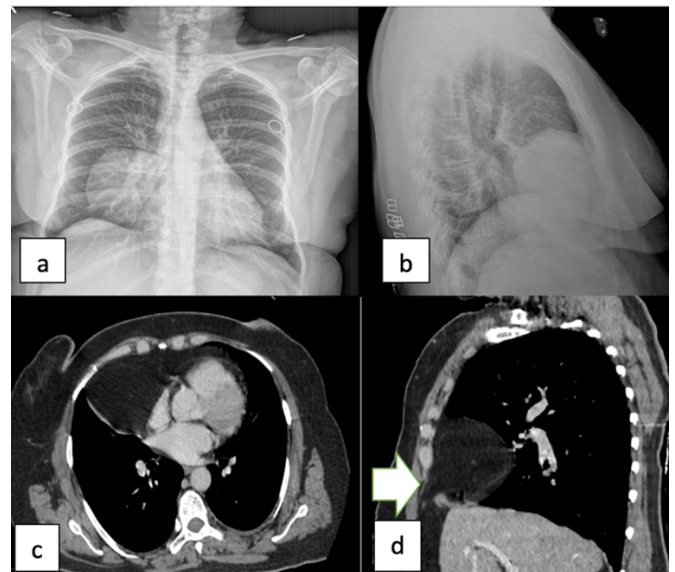


Fig. 1a. (a). Posteroanterior chest X-ray in a 48-year-old woman with Morgagni's hernia, shows a round right pericardiophrenic density. (b) Lateral chest radiograph localizes the opacity to the retrosternal area. (c) Axial computed tomographic scan showing a right retrosternal hernia containing omentum in the anterior cardiophrenic angle. (d) Sagittal computed tomographic scan showing the diaphragmatic defect (arrow).

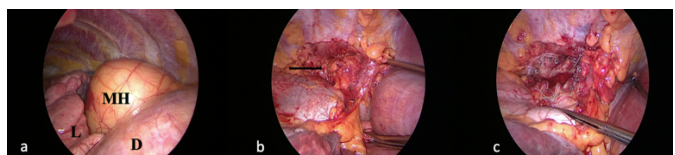


Fig. 1b. (a). Thoracoscopic view of hernia sac containing the omentum. L: Lung, D: Diaphragm, MH: Morgagni Hernia. (b)

Thoracoscopic view of defect of the diaphragm (arrow). (c) Repair of diaphragmatic defect with polymesh® and proTack™.

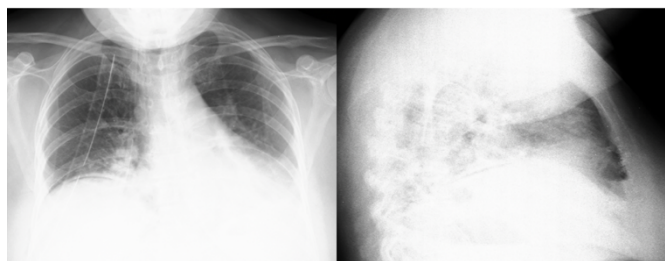


Fig. 1c. Postoperative posteroanterior and lateral chest X-ray of the patient.

The patient does not have any additional comorbidities and her physical examination revealed arterial blood pressure: 120/70 mmHg, pulse rate: 72 beat/min, and respiratory rate: 16 min. During auscultation, it was determined that breath sounds had decreased within the lower right zone. Laboratory findings showed a white blood cell count of 7670 / μ L, hemoglobin level of 13 g/dL, erythrocyte sedimentation rate of 31 mm/h, and C-reactive protein level of 35 mg/L.

VATS exploration was planned for the patient with suspected MH. Double-lumen intubation was performed by the anesthesia team, and after skin incision at the 7th intercostal space (ICS) along the right mid-axillary line, thoracic entry was achieved through scissor dissection. A thoracoscopic port was placed, and a 30° video camera was directed into the right hemithorax. An approximately 3 cm utility incision was made at the 5th ICS along the right anterior axillary line. During VATS exploration, a hernia sac containing omentum and jejunum with the sizes of approximately 8x6 cm was detected in the substernal region at the cardiophrenic angle. The hernia sac was completely excised by blunt dissection and ligation, and the omentum and jejunum were pushed back into the abdomen. The defect in the diaphragm, measuring 10x10 cm, was closed using polymesh® (Betatech, Turkey) and proTack™ (Medtronic, United Kingdom). After controlling for bleeding and leakage, a 32 French chest tube was placed in the right hemithorax, and the right hemithorax was closed according to the standard procedure. The patient, whose postoperative follow-ups were conducted in the room on the ward, had the chest tube removed on the 2nd day postoperatively due to the absence of active drainage and no pathological findings on the chest X-ray (Fig 1c). The patient, who had no active complaints, was discharged on the 3rd postoperative day.

3. Discussion

While classic Bochdalek hernia (BH) accounts for about 80% of all congenital diaphragmatic hernias, MH constitutes approximately 3-4% of both pediatric and adult diaphragmatic hernias. MH is rarely encountered as a congenital diagnosis during infancy. It is more prevalent in females and is typically diagnosed after the age of 50 (4). In MH, the defect is generally small, and the symptoms vary based on the size of the hernia and the organ involved in the herniation. Herniated organs most commonly include omentum and segments of the colon;

however, the stomach, liver, and small intestines can also become herniated (3). Radiologically, the presence of air-fluid levels from the stomach and intestines in the thorax is characteristic, but in cases where only omentum is present, an intrathoracic extrapleural mass appearance can also be observed. Unlike BH, MH generally has a hernia sac and in 90% of cases, it occurs on the right side, in 8% on the left side, and in 2% on both sides (3). In our case, the hernia was on the right side, and the omentum and jejunum were herniated into the thorax, accompanied by an intrathoracic extrapleural mass appearance and a hernia sac formed by both the thoracic and abdominal membranes.

In MH cases, predisposing factors such as pregnancy, trauma, obesity, chronic constipation, and chronic cough are present in 41% of cases. Difficulty in breathing, chest pain, and abdominal discomfort are commonly reported complaints. Nevertheless, gastrointestinal symptoms and respiratory symptoms like recurrent lung infections and acute respiratory distress syndrome can also be observed. During chest examination, the most notable indicators for diagnosis are the detection of decreased breath sounds or bowel sounds (4). In our case, the patient presented with a complaint of stabbing-like right-sided chest pain, and during the physical examination, only decreased breath sounds were noted in the lower right zone. Additionally, there was no presence of gastrointestinal symptoms.

Chest radiography, thoracic CT, and contrast-enhanced radiography of the gastrointestinal system are used in the diagnosis of Morgagni hernia. The absence of any tissue within the hernia sac or its containing solid organs like the liver can complicate the diagnosis (5). It has been documented that thoracic magnetic resonance imaging has been utilized for this purpose in cases where diagnosis is challenging (6). In our case, an opacity area was detected in the right paracardiac region on the chest radiograph, and contrast-enhanced thoracic CT revealed a fat pad in the paracardiac area.

Minimal invasive surgical techniques offer advantages such as reduced postoperative pain, shorter hospitalization duration, earlier return to daily activities, and better aesthetic outcomes. Thoracoscopic or laparoscopic repair of Morgagni hernia has been increasingly preferred in recent years. Pfannschmidt et al. reported that thoracic approach is superior in right-sided hernias due to better visualization of the diaphragmatic foramen and pericardial and pleural adhesions (5). Ambrogi et al. also recommended transthoracic repair of MH (7). In their study presenting their experiences with VATS repair of MH, Nakashima et al. advocate for a thoracoscopic approach as the first choice instead of a laparoscopic approach for patients with BH or MH and severe adhesions (8). We recommend an abdominal approach in cases where the diagnosis is uncertain, or when there is peritonitis and bilateral hernia. In other situations, VATS should be the first choice.

In MH cases, it is essential to excise the hernia sac and

thoroughly examine the diaphragmatic defect. If the defect is small and can be sutured without tension, primary suturing may be the preferred approach (9). Otherwise, the diaphragmatic defect must be sutured using mesh (such as polytetrafluoroethylene, polypropylene, etc.), which will help prevent potential recurrence. In our case, after the hernia sac was completely excised, it was deemed that the defect could not be closed primarily, so it was closed using a polypropylene mesh and proTack™.

As a result, MH cases, even if asymptomatic, should be treated surgically. Whenever possible, minimally invasive procedures should be preferred, especially when distinguishing them from mediastinal masses is challenging, VATS should be considered. If the defect in the diaphragm cannot be repaired with primary sutures, mesh should be used to prevent recurrence.

Conflict of interest

The authors declared no conflict of interest.

Funding

No funding was used for the study.

Acknowledgments

None to declare.

Authors' contributions

Concept: B.Ç., C.İ., Design: C.İ., Data Collection or Processing: C.İ., B.C.Ö., Analysis or Interpretation: M.G.P., B.Ç., Literature Search: M.G.P., Writing: C.İ., M.G.P.

Ethical Statement

Ethical committee approval is not required for this study.

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