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Case Report

Surgery Section

Right-sided Congenital Diaphragmatic Hernia (Morgagni Hernia)- A Rare Clinical Manifestation in an Adult

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ABSTRACT

Congenital Diaphragmatic Hernia (CDH), usually presents in the childhood period. It presents as an idiopathic human malformation. It is a condition, where the organs of the abdomen enter the thorax due to a defect in the diaphragm, that is, herniation from the pleuroperitoneal fistula. Morgagni hernias are commonly incidentally diagnosed on a chest radiograph or a patient may have cardiorespiratory or abdominal symptoms. Repair of hernia without the use of mesh is advised in asymptomatic cases also due to feared complications like strangulation and incarceration. The treatment of Morgagni Hernia is primary surgical repair which can be done either transthoracically or transabdominally. It is advised that, surgical repair should be done even in asymptomatic cases. The present case report is about a 66-year-old female patient with a right-sided Morgagni hernia, who presented with abdominal pain and vomiting. Since the patient was symptomatic, surgical approach was preferred and she underwent laparoscopic abdominal surgery which was converted to open abdominal approach. Postoperatively, the patient recovered from her symptoms and had no complications.

Keywords: Anteromedial subcostosternal defects, Omentum, Transverse colon

CASE REPORT

A 66-year-old female patient presented with pain in the upper abdomen, for one week, radiating to the anterior chest. History of vomiting was present for last five days with the frequency of three episodes per day and also patient complaint of decreased appetite. There was no history of trauma or symptoms such as constipation, fever, ascitis suggesting obstruction. On examination, there were decreased breath sounds in the right lower lobe of the chest. Per abdomen examination revealed a soft abdomen, tenderness in the hypogastrium and left hypochondrium region, guarding in the left hypochondrium region. Bowel sounds were present.

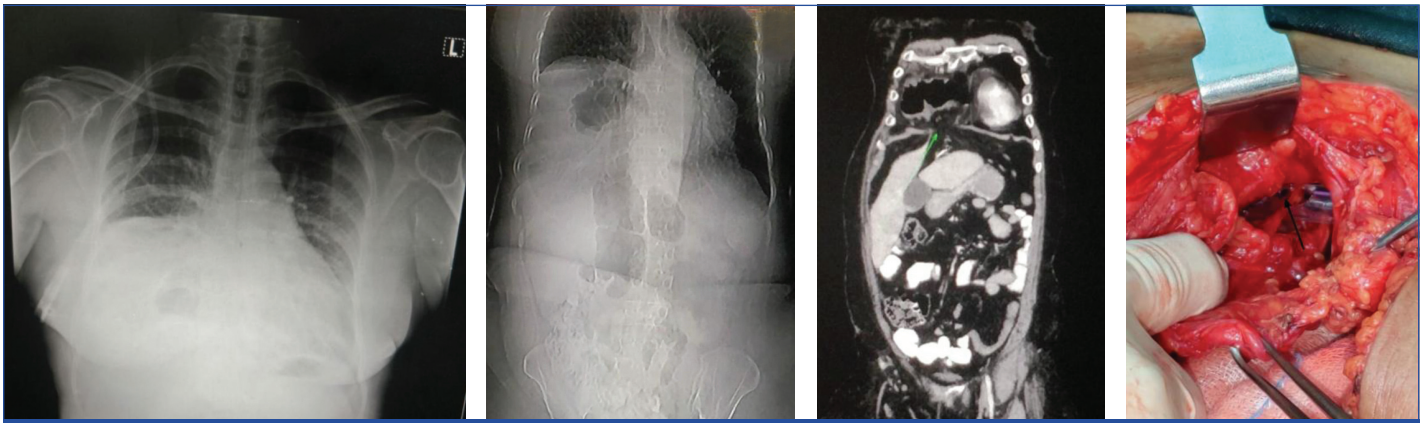
Complete Blood Count (CBC), Renal Function Test (RFT), urine routine profile, coagulation profile, and serum electrolytes were normal. Serology was non reactive. Electrocardiography (ECG) was normal. Chest, and abdomen radiographs showed elevation of the right hemi-diaphragm (as indicated by the arrow) with diaphragmatic hernia and bowel shadow in the thoracic cavity, respectively [Table/Fig-1,2].

Contrast Enhanced Computed Tomography (CECT) abdomen revealed a defect of size 3×2.8 cm in the foramen of Morgagni (right side), with herniation of transverse colon, mesenteric fat into the thoracic cavity. Minimal fluid within hernial sac was noted. No evidence of bowel thickening or ischaemia was noted within the hernial sac [Table/Fig-3].

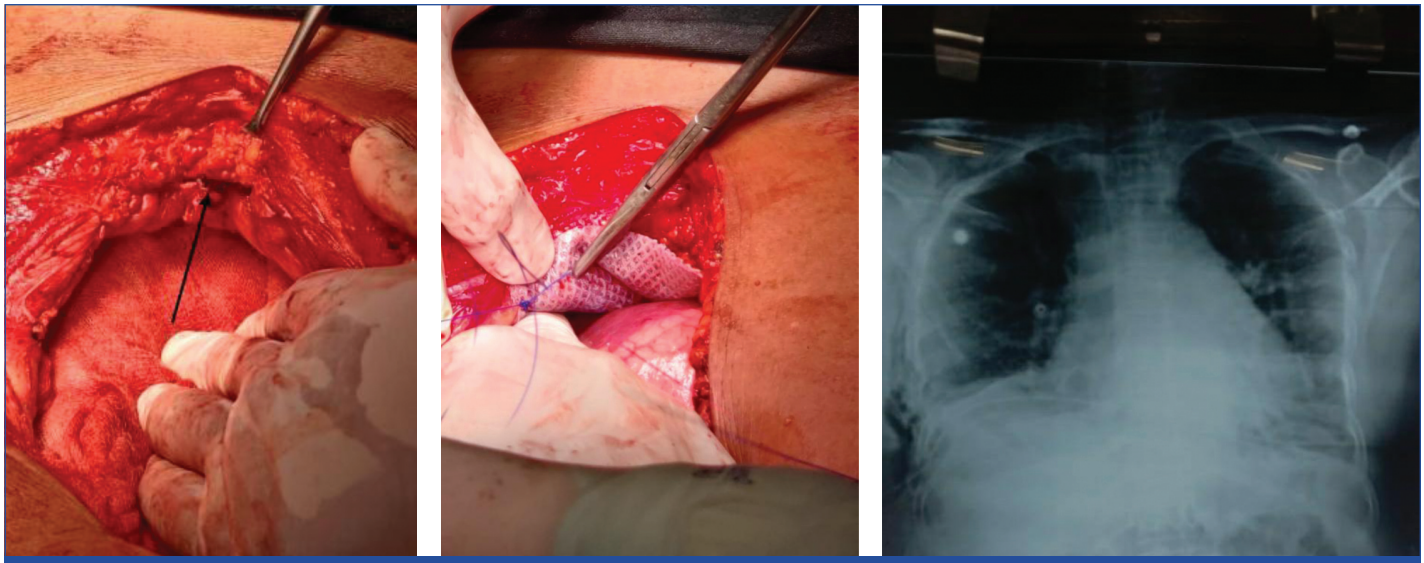
Diagnostic laparoscopy was done. A defect of size 2×3 cm was seen in the medial aspect of the ligamentum teres, and the content was ligamentum teres, a part of transverse colon, and omentum. Adhesions to the sac were present [Table/Fig-4]. Because of the adhesions and inability to reduce the contents via laparoscopic approach, it was converted to a midline vertical laparotomy approach. Rectus sheath and muscle were divided, defect identified, contents reduced, and the excess hernial sac was excised. The defect was closed with prolene [Table/Fig-5]. Dual mesh was used to cover the defect [Table/Fig-6]. The wound was closed in layers. Patient responded well postoperatively, is on regular follow-up, and is symptomatically better post surgery, as was also depicted by the follow-up chest X-ray [Table/Fig-7].

DISCUSSION

A diaphragmatic hernia is the herniation of the bowel (abdominal content) in the thoracic cavity. The aetiology remains unclear, but many describe it to be multifactorial [1]. Types of CDH are 1) Bochadalek, which is the posterolateral hernia 2) Morgagni hernia, which is located anteriorly, and 3) Hiatus hernia. The



[Table/Fig-1]: Chest x-ray showing elevation of the right diaphragm. **[Table/Fig-2]:** Abdominal radiograph showing bowel shadow in the thoracic cavity.
[Table/Fig-3]: Contrast Enhanced Computed Tomography (CECT) abdomen showing defect in the right foramen of Morgagni.
[Table/Fig-4]: Intraoperative image showing defect in connecting peritoneum and the pleural cavity (as indicated by the black arrow). (Images from left to right)



[Table/Fig-5]: Intraoperative image showing closure of the defect (as indicated by the black arrow). **[Table/Fig-6]:** Intraoperative image showing placement of the mesh. **[Table/Fig-7]:** Postoperative chest radiograph. (Images from left to right)

diagnosis of this condition is usually done shortly after birth and it is most commonly associated with pulmonary hypoplasia as well as pulmonary hypertension. These conditions can be life-threatening. The incidence of neonatal age is 0.8 to 5 in every 1000 births [2]. CDH presenting in the adulthood period is very uncommon. Approximately 10% of CDH patients are diagnosed in adulthood [3].

Morgagni hernia can sometimes be associated with Ladd's band. This condition presents in adulthood. Some of the aetiological factors include genetic, weakness in the diaphragmatic muscle which is usually very small. But, the defect enlarges as the patient's age progress, hence, leading to increased intra-abdominal pressure [4]. Commonly, the patients remain asymptomatic. But, it can also lead to acute conditions, like, intestinal obstruction or respiratory distress [5]. Hence, the diagnosis is very important.

Morgagni hernias are rare and constitute about 2% of all diaphragmatic hernias [6]. It was first described in 1769 by Italian anatomist and pathologist Giovanni Battista Morgagni [6,7]. A three-patient case series from Italy reported delayed presentation of CDH [8]. In this series, the first case was of a 75-year-old Caucasian Italian woman who underwent CT chest for her lung parenchyma disease and was found to have hypereosinophilia. Axial CT scan of the chest showed gas-filled large bowel loops behind the heart, laying anteriorly to the spine and the aorta, with part of the abdominal fat. But no surgery was done for the patient as she was asymptomatic. Another patient from the same series was a 32-year-old Caucasian Italian man, whose CT chest showed part of the stomach, adjacent to the heart. Surgical repair with a tension-free patch of Gore-Tex was proposed to the patient. The third patient was a 72-year-old female with abdominal pain, vomiting, and respiratory distress. He underwent laparotomy, reduction of the bowel (content), closure of the defect. No mesh was placed [9], unlike the index case report presented in which after the reduction of contents and closure of the defect, mesh placement was done.

Yet another report [10] presented an 82-year-old man with the complaints of progressively increasing upper abdominal pain for three days and multiple episodes of vomiting for the last eight hours. The pain was constant in nature and no previous episodes were reported. Reduced air entry was noted in the right lung base along with the presence of bowel sounds. CT chest findings were suggestive of diaphragmatic herniation of the omentum, pylorus, colon, and suspected duodenum into the thoracic cavity. He underwent exploratory laparotomy and was found to have a defect size of around 6×5 cm; the contents were reduced and the defect closed with non absorbable sutures.

The diagnosis of CDH is made radiologically. A CT scan is often the next step in the diagnosis. Due to the risk of incarceration, it is recommended that all Morgagni hernias be surgically repaired [11]. The two main surgical approaches, that have been described are: transabdominal (open or laparoscopic) and transthoracic (open or thoracoscopic). In a study, conducted in Helsinki University Hospital in a single tertiary centre between 2010 to 2019 [12], 30 patients diagnosed with Morgagni hernia and seven with a Bochdalek's hernia underwent surgical repair. Minimally invasive approach was preferred over an open approach for the hernial repair (73.0% involving laparoscopic and 2.7% thoracoscopic operations). The present study concluded that laparoscopic approach for CDH results in a shorter postoperative hospital stay duration and lesser postoperative pain. In another study [13], 21 adult CDH patients were included-three patients were diagnosed with Morgagni's hernia and 12 with Bochdalek's hernia, other patients had eventeration (3) and chronic traumatic hernia (3) All the patients were treated with the laparoscopic approach. The authors concluded that, in laparoscopic approach, apart from excellent view of the surgical field and access to it, the return of pulmonary function to normalcy is earlier, than with the open method.

In the present case, after diagnosis, laparoscopic approach was tried but converted to an open transabdominal approach because of irreducibility of the contents. Postoperatively, the patient had full relief from her symptoms and showed no recurrence.

CONCLUSION(S)

Congenital diaphragmatic hernia presenting as a late onset hernia in adulthood is a very tricky and difficult diagnosis with misleading symptoms and signs, hence careful examination is done. Abdominal x-ray showing a sign of stomach or bowel gas shadow within the thoracic cavity usually points out towards the diagnosis of suspected diaphragmatic hernia. Surgery should be performed immediately to prevent further complications and to provide relief to the patient from the presenting symptoms (often associated with pulmonary hypoplasia and pulmonary hypertension causing life-threatening condition).

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