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Case Report

LARGE BILATERAL MORGAGNI HERNIA IN ADULT PATIENT WITH REVIEW OF LITERATURE

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ABSTRACT

Background: While presence of congenital diaphragmatic defects is fairly common, presence of anterior defects, with herniation through the Foramen of Morgagni is rare, especially large bilateral defects. Due to the variability of presentation and the rarity of pathology, diagnosing it is challenging and no standard surgical techniques have been described in literature and patient management is based on the patient condition.
Case Presentation: In this study, we present a case of a large bilateral anterior diaphragmatic defect with herniation of stomach, intra-abdominal fat, small bowel and transverse colon, precipitated by a trauma incurred nearly 6 months prior to the patient presentation.
Conclusion: Imaging is crucial for the diagnosis, ascertaining the size of the defect, contents of the hernia sac and associated complications. It is also needed to guide the surgeons. Immediate recognition of the Morgagni hernia with prompt treatment is critical to prevent significant complications like strangulation.

INTRODUCTION

Foramen of Morgagni hernia is defined as an erratic parasternal or retrosternal hernia due to a defect in the anterior diaphragm [1], located between the muscle fibres originating from the xiphisternum and the costal margin of the diaphragm, protruding into the central tendon. The most common contents of the herniating sac includes omentum most commonly, colon, small bowel, stomach and portions of liver, least commonly [2]. Right sided diaphragmatic hernias are common anteriorly, and are usually caused by penetrating or blunt trauma [3].

Most cases are asymptomatic and incidence in paediatric age group is rare [4]. A majority of the cases are diagnosed accidentally. Symptomatic patients present with symptoms of intestinal obstruction and consequent bowel ischemia or dyspnoea due to herniation into thoracic cavity [5].

The mechanism of development of Morgagni hernia is ambiguous, with some studies claiming that it develops due to an acquired process through a congenital defect [6], buttressed by recording of previously normal chest radiographs. A high index of suspicion is required to evaluate for these hernias [5]. The diagnosis is usually confirmed on lateral chest radiographs, barium studies or CT scan of the chest [7]. A frontal chest radiograph after passage of nasogastric tube may also aid in the diagnosis, in case of doubt. A missed diagnosis could lead to significant morbidity and considerable mortality, especially when present with secondary complications [7].

In this study we report a predominantly left sided Morgagni hernia, secondary to a trauma incurred 6 months back, with herniating contents spilling over to the right and involving omentum, small and stomach. Post-operative follow up relieved the patient's symptoms but revealed a remnant defect in the left side of the diaphragm with herniation of the omentum and stomach; showing the failure of surgical repair in large defects.

CASE REPORT

A 65 year old Indian female presented to the OPD with recurrent episodes of vomiting, weakness in the limbs and mild generalized abdominal pain, predominantly in the epigastric region. She also complained of dyspnoea at rest. The patient had undergone a road trauma accident, with fracture of the proximal shaft of femur, for which she was admitted and a metallic fixation implant had been inserted.

No symptoms of bowel obstruction were present. She was passing stools and flatus regularly, and denied snoring or daytime sleepiness. There was no family history of congenital diaphragmatic hernia. Radiographs acquired during her previous hospitalization were not available for this study, however, discharge notes claim that they were within normal limits.

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She underwent blood tests to assess sodium and potassium levels. She had hypokalaemia with potassium levels around 3.2 mmol/L. Her calcium and sodium levels were within normal limits. An ultrasound scan was performed. It revealed no significant abnormalities. As a part of routine investigation, a chest radiograph was acquired. It showed the stomach bubble on the right side, well above the level of the diaphragm. However, the imaging findings were not confirmatory. A possible differential diagnosis of pneumatocele was also considered.

To confirm the diagnosis, a nasogastric tube was passed through the nose, with its tip in the stomach and another chest radiograph was acquired. *(Figure 1).*

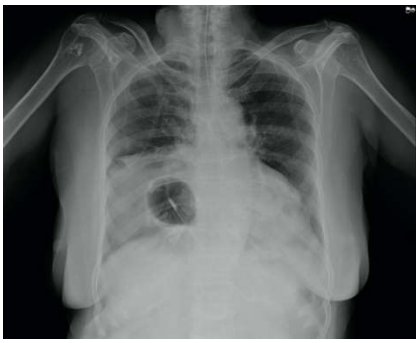

Figure 1 Frontal chest radiograph with nasogastric (NG) tube in situ. The tip of the NG tube lies in the stomach, on the right side of the midline, and above the level of the diaphragm.

A CT scan was advised, based on the radiograph findings, to ascertain the contents of the herniating sac and the size of the diaphragmatic defect before surgical repair.

A 5.3 x 4.7 cm sized defect is noted in the anterior aspect of the left diaphragm. Herniation of pylorus and antrum of stomach, small bowel loops, transverse colon and intraabdominal fat through this defect is noted. *(Figures 2,3).*

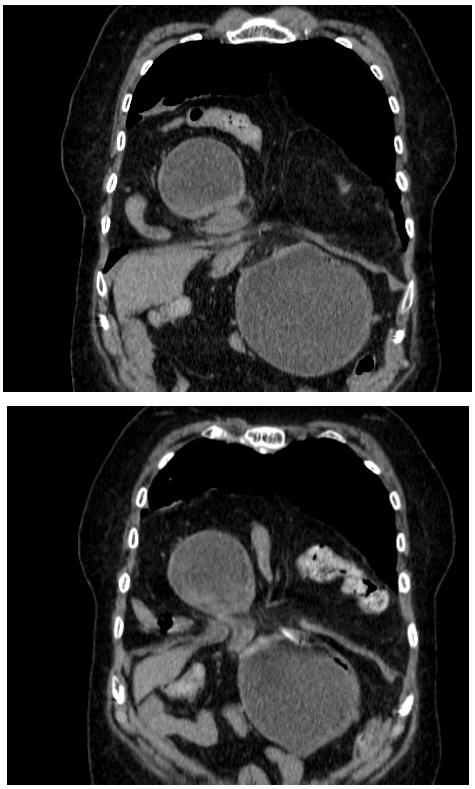

Figure 2 Coronal section of plain CT abdomen: Herniation of stomach, intra-abdominal fat (omentum), transverse colon, and portions of the small bowel through the defect in the diaphragm.

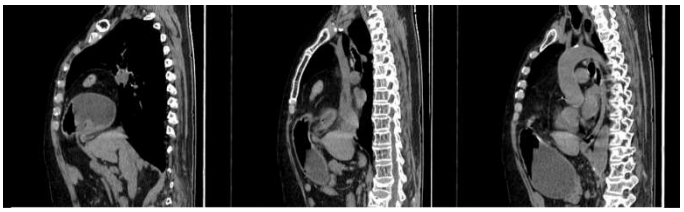

Figure 3 Sagittal sections of plain CT abdomen: Anterior diaphragmatic defect, predominantly on the left side (ascertained by the arch of aorta) with superior herniation of the hernia sac containing stomach, intra-abdominal fat and bowel loops, into the thoracic cavity.

The herniated contents were seen spilling over to the right hemithorax. Passive subsegmental atelectasis of the of the right middle lobe is seen, explaining the dyspnoea of the patient. The herniated stomach and bowel loops show normal calibre and density. Contrast study was not done, hence, strangulation and bowel ischemia could not be ruled out. No stranding of herniating fat is seen. There was no free -fluid within the hernia sac.

Post-operative: One week after the surgery, another chest radiograph was acquired for follow up. A remnant defect could be seen with herniating stomach bubble and omentum through the defect, on the left side. *(Figure 4).*

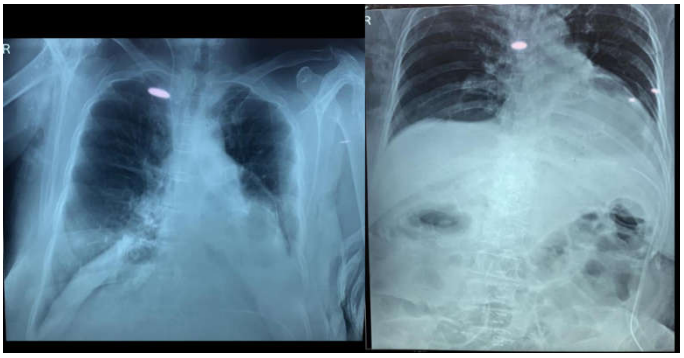

Figure 4 Post-operative frontal chest radiographs showing persistent defect in the diaphragm, on the left side, after mesh repair. Herniation of the stomach bubble through the defect is noted. Intercostal drainage tube is noted in situ. No spilling of hernia sac across the midline, towards the right is noted.

DISCUSSION

Congenital diaphragmatic hernias are an idiopathic malformation. However, Morgagni hernias rarely present in the paediatric age groups [4]. Most of them are right sided, and very few bilateral or left sided Morgagni hernias have been reported in literature. Overall Morgagni hernias constitute only about 2 percent of reported diaphragmatic defects [8].

Anatomy of Diaphragm

The diaphragm is constituted of a central tendon and a peripheral muscular component. Anteriorly, it is attaches to the xiphisternum, while the lateral parts attach to the inner margins of 6th to 12th ribs. Posteriorly, the lumbar part of the diaphragm attaches to the lateral and medial arcuate ligaments [9].

Diaphragmatic defects

Herniation through the Foramen of Bochdalek is more common, with most of them being left sided. The liver on the right acts as a barrier against herniation [9]. In-utero diagnosis through careful ultrasound evaluation is possible, and foetuses generally present with respiratory distress. The major clinical problem is pulmonary hypoplasia, as a result of underdevelopment of lung.

Congenital diaphragmatic defects have also been described in the adult population. Widespread use of CT and other cross sectional imaging has made it possible to diagnose some rare and often asymptomatic hernias. A number of cases are diagnosed incidentally when patients are scanned for other pathologies.

Diaphragmatic injury may occur to due blunt or penetrating trauma, wherein the type of acquired defect depends on the geographical location. The incidence of post-traumatic blunt diaphragmatic injury varies from 0.16 to 5% [9] . Very few cases of delayed presentation of congenital diaphragmatic hernia in asymptomatic adults, like the one described in this study, are reported in literature. Some studies also claim that obesity can be a precipitating factor in development of Morgagni hernia [10].

Clinical presentation of Morgagni hernia can be variable and range from respiratory complaints like dyspnoea and cough to signs of bowel ischemia and peritonitis, requiring hospital admission [4]. The rarity of Morgagni hernia, the variability, and the non-specificity of symptoms contribute to the difficulties in establishing diagnosis, especially if the hernia sac is empty or contains solid parts only [4].

Imaging

CT scan with coronal and sagittal reconstruction allows excellent evaluation of the defects, hernia sac and its contents, complications and greatly helps the treating surgeons. Various signs have been described on CT imaging in diaphragmatic defect /rupture and are as follows:

- Diaphragmatic discontinuity
- segmental non-recognition of diaphragm
- Dangling diaphragm sign
- Dependent viscera sign
- Intrathoracic herniation of abdominal contents
- Collar sign
- Elevated abdominal organs
- Thickened diaphragm
- Thoracic fluid abutting intra-abdominal viscera
- Hypo attenuated hemidiaphragm and associated fracture of ribs in trauma [9].

The most feared complication of Morgagni hernia is strangulation [4]. On rare occasions, gastric volvulus with small intestine diverticulosis may occur concurrently [11].

MRI scan can be done in more stable patients and allows superior soft-tissue resolution, which allows visualization of individual muscles in diaphragm. It has a low signal intensity as compared to the other skeletal muscles on all MR sequences (T1 and T2 sequences)[12].

Treatment

Surgical repair is the only established management, however due to the rarity of this pathology, no widely accepted guidelines on a standardized surgical technique is available [13]. Surgical repair is always indicated to prevent risk of strangulation. The techniques currently available are open abdominal approaches, open thoracic approaches and minimally invasive techniques like laparoscopy and thoracoscopy. Each comes with its own advantage and disadvantages [13]. Trans-abdominal approach is preferred in complicated cases, or those with bilateral hernias like the one described in this study. Laparoscopy is preferred in emergency situations when patients present with respiratory insufficiency or bowel obstruction. Trans-thoracic approach is used for large right sided hernias and enables easier dissection of the hernia sac [14]. Mesh repair is controversial and used only when there is considerable tissue loss or notable thinning of diaphragm, or when primary repair is not possible [15]. Our patient's defect was repaired using mesh to reinforce the primary repair. However, recurrence was noted within one week in the post-operative period.

CONCLUSION

Morgagni hernia is rarest congenital diaphragmatic hernia with bilateral cases being even rarer. Most of these defects may be present congenitally, but present following trauma or increased abdominal pressure and are generally diagnosed as incidental findings. However, a large number of cases, when left untreated are known to undergo complications, most common being strangulation and bowel ischemia. Standard surgical techniques have not been recorded in literature, due to the rarity of the pathology and the procedures done have their own pitfalls. Imaging is of paramount importance to diagnose the condition, rule out complications, and to guide the surgical intervention.

Conflicts of Interest: None

Ethical Approval: It was not required for the passive imaging diagnosis and study of the case, in our institution.

Consent: Informed consent was taken from the patient

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