

Unusual clinicoradiological presentation of paraesophageal hernias: A case series

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ABSTRACT

Type IV hiatus hernias, or paraesophageal hernias, are rare. They involve the herniation of the stomach and other abdominal organs, such as the colon, small intestine, and pancreas, into the chest through a large esophageal hiatus. These hernias may cause a range of symptoms, including gastrointestinal and respiratory issues and, in severe cases, gastric volvulus. We present three cases of hiatus hernia with unusual clinico-radiological features.

INTRODUCTION

Hiatus hernias involve the protrusion of the abdominal organs, including the stomach, into the thoracic cavity through the esophageal hiatus of the diaphragm (1, 2). Broadly, they are divided into sliding (type I) and paraesophageal (type II, III, and IV) (3, 4). Type I hernia occurs when the gastro-esophageal (GE) junction is displaced above the diaphragm. This is the most common type of hiatus hernia, which accounts for more than 95% of all hiatus hernias (5). Type II hiatus hernias are paraesophageal hernias where the gastric fundus herniates parallel to the esophagus. The GE junction is not displaced in a type II hernia. Type III hiatus hernias are mixed type hernias when a paraesophageal hernia (type II) is combined with a sliding hernia (type I). Here, both the GE junction and a portion of the stomach are protruded into the mediastinum. Of the paraesophageal hernias, more than 90% are type III. Type IV hiatus hernia is a massive herniation, where, besides the stomach, other abdominal organs, such as the colon, small intestine, pancreas, or spleen, also herniate into the thoracic cavity. Type IV hiatus hernias are considered rare, accounting for less than 5% of all hiatus hernias (2, 5). The etiology of most hiatus hernias is speculative; the proposed mechanisms include age-related degeneration, trauma, congenital malformation, and iatrogenic factors (6). These three cases of type IV hiatal hernias, which we have reported, presented to us with unusual clinical and radiological features.

Key Words: Hiatus Hernia, Paraesophageal hernia, Stomach, Esophageal hiatus

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CASE REPORT 1

A 65-year-old lady presented with a history of dyspnea on exertion for the last two years. Dyspnea was progressive in nature. She had no other complaints except mild, occasional symptoms associated with postprandial gastroesophageal reflux, like heartburn. The patient did not give any history of cardiac problems. She was a non-smoker and had no history of exposure to any other environmental smoke. There was no history of cough or any respiratory allergy. On physical examination, her pulse rate was 78/m, respiratory rate 20/m and BP- 130/84. SPO2 was 90%. No abnormal physical examination findings were observed. Laboratory

investigations showed Hb 13g%, TLC 86X10⁹/L neutrophils 62%, lymphocytes 36%, eosinophils 2%, blood glucose (random) 128 mg/dl, serum creatinine 1.0 mg/dl, and blood urea 25 mg/dl. Serum sodium, potassium, and chloride were 132mEq/L, 5.43mEq/L, and 97.90mEq/L, respectively. Liver function tests were as follows: S. bilirubin 0.84 mg/dl, SGOT 54.3 U/L, SGPT 34.0 U/L, and alkaline phosphate 84 U/L. Her previous chest radiograph, done two years back, demonstrated a small hiatus hernia confined to the mediastinum only (Figure 1). At that time,

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she was advised to use only an H2 antagonist whenever required. Her hernia kept increasing, but she did not notice any other symptoms except for increasing dyspnea. Her latest chest radiograph showed a massive hiatus hernia extending to both hemithoraces (Figure 2). Computed tomography confirmed a massive paraesophageal hiatus hernia (Figure 3, 4). The stomach, colon, and omentum were noticed in the hernia sac. Her echocardiography was also performed, which showed a normal ejection fraction and other parameters.

Patient refused any further workup and any surgical intervention. She was advised pantoprazole whenever required and hernia physiotherapy. Physiotherapy strategies advised to her were: abdominal strengthening exercises, diaphragmatic breathing, core strengthening, and lifestyle modifications like maintaining a healthy weight, dietary changes, and avoiding activities that strain the abdomen. She was advised to consult her physician immediately if she develops new symptoms.



Fig 1: X ray Chest PA view showing a small hernia sac in mediastinum. This radiograph was taken on April 4, 2023

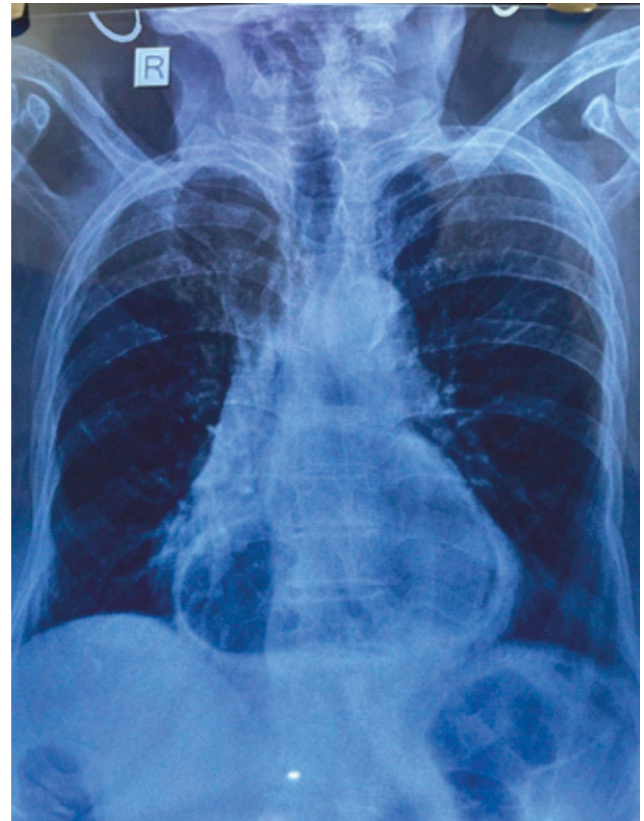


Fig 2: Radiograph of the same patient taken on Feb 21, 2025, showing a massive increase in hernia size



Fig 3: CT scan of the same patient showing a paraesophageal type IV hernia having stomach and colon.

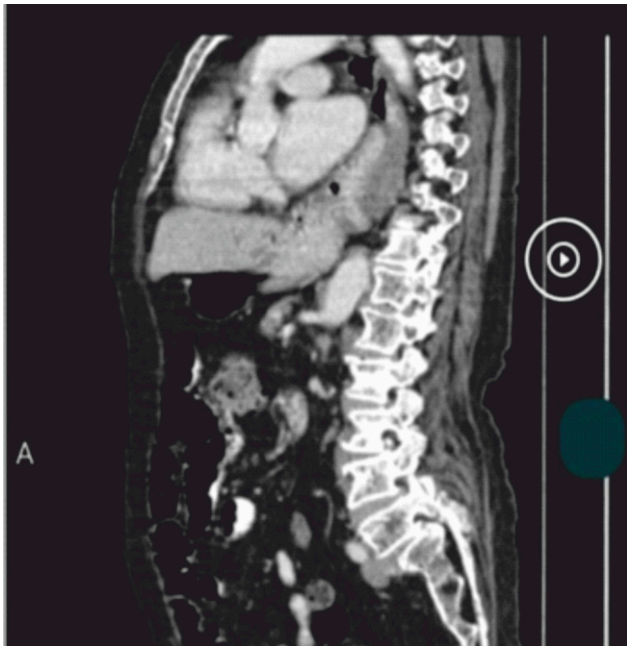


Fig 4: CT scan coronal view of the same patient also showing stomach, gastro-esophageal-junction (GEJ) and colon.

CASE REPORT II

A 62-year-old lady presented with complaints of heaviness in the chest and occasional retrosternal burning and nausea for the last six months. She had no other complaints. The patient did not give any history of cough, fever, night sweats, dyspnea, or weight loss. On physical examination, vital signs were as follows: pulse rate 72, respiratory rate 22, BP 138/78. SPO₂ was 94%. Examination of the respiratory system revealed diminished respiratory sounds and impaired dullness on the right lower paracardiac region. Her complete blood count (CBC) showed Hb 14g%, TLC 90X10⁹/L, neutrophils 66%, lymphocytes 26 %, eosinophils 4%, and basophils 4%. Metabolic profile was as follows: blood glucose (PP) 148 mg/dl, serum creatinine 0.87 mg/dl, and blood urea 22 mg/dl. Serum sodium, potassium, and chloride were 135mEq/L, 5.44mEq/L, and 99.72mEq/L, respectively. Liver function tests were S. bilirubin 0.87, mg/dl, SGOT 44.3 U/L, SGPT 36.0 U/L, and alkaline phosphate 88 U/L. Electrocardiogram and echocardiography also did not show any abnormality. Her chest X-ray PA view (Fig. 5) showed an opacity with having air-fluid level on the right side. This radiological finding appears to be a lung abscess. A mass-like opacity was also observed in the mediastinum. CT scan (Fig. 6) confirmed

the type IV paraesophageal hernia showing stomach, gastro-esophageal junction (GEJ), and colon in the hernia sac.

Since the patient did not want surgery, she was observed and given pantoprazole and physiotherapy for her hernia. She was told to see her doctor right away if new symptoms occurred.

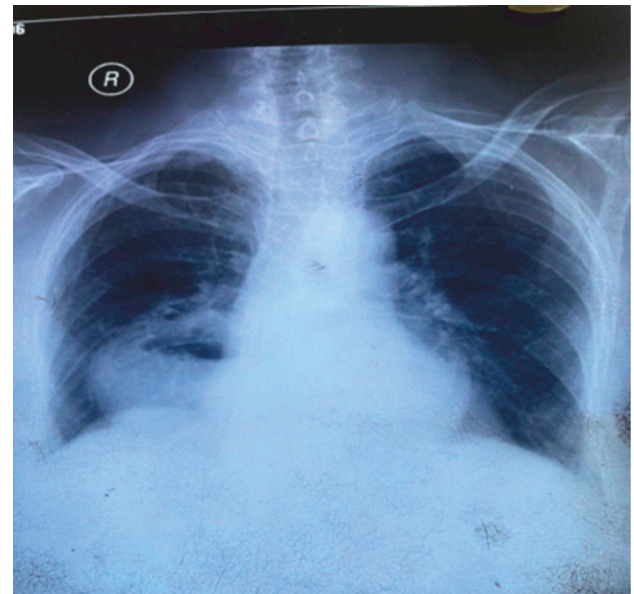


Fig 5: X Ray Chest PA view showing a rounded opacity in mediastinum Fluid level is visible in the opacity on right side

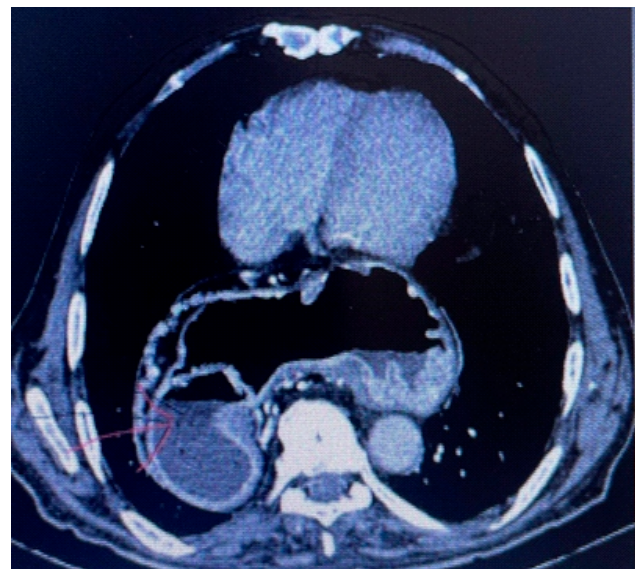


Fig 6: CT scan shows a massive paraesophageal hernia with stomach and colon inside hernia sac. No lesion in lung parenchyma.

CASE REPORT III

This 40-year-old lady presented with complaints of abdominal pain and nausea for the last three days. She had dyspnea on exertion and frequent retrosternal burning for 4-5 months. There was no history of trauma or any surgery. Patient did not give any history of cough, chest pain, or sudden onset of dyspnea or fever. On physical examination, pulse rate was 84, respiratory rate 24, and BP 110/76. SPO2 was 94%. Examination of the respiratory system revealed diminished respiratory sounds and impaired note on the left side. Blood investigations showed Hb 13g%, TLC 96X10⁹/L, neutrophils 72%, lymphocytes 26%, eosinophils 2%, blood glucose (random) 138 mg/dl, serum creatinine 1.10 mg/dl, blood urea nitrogen (BUN) 12.4 mg/dl, and blood urea 24mg/dl. Serum sodium, potassium, and chloride were 134mEq/L, 5.28mEq/L, and 92.0mEq/L, respectively. Liver function tests were as follows: total serum bilirubin 0.94 mg/dl, SGOT 34.3 U/L, SGPT 34.0 U/L, and alkaline phosphatase 94 U/L. ECG and echocardiography also did not show any abnormality. Her x-ray chest PA view (Fig 7) showed a hyperlucent area occupying the whole of the left hemithorax, sparing a strip on the left costal margin. It appears to be a pneumothorax. X-ray chest left lateral view (Fig. 8) also showed the same finding. Computed tomography confirmed a paraesophageal hernia showing herniation of the stomach, omentum, and part of the colon through the esophageal hiatus (Fig. 9). Trans-thoracic open surgery was performed for hernia repair. There was no post-operative complication. Patient was discharged in satisfactory condition.

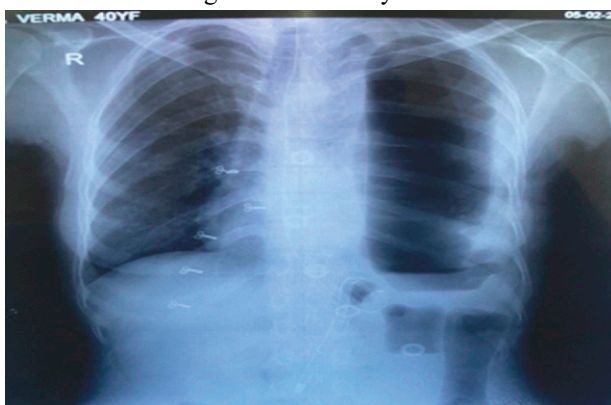


Fig 7: X ray Chest PA View showing hyper lucent area occupying whole of the left hemi thorax sparing a strip on left costal margin. Lucency is coming from below the diaphragm

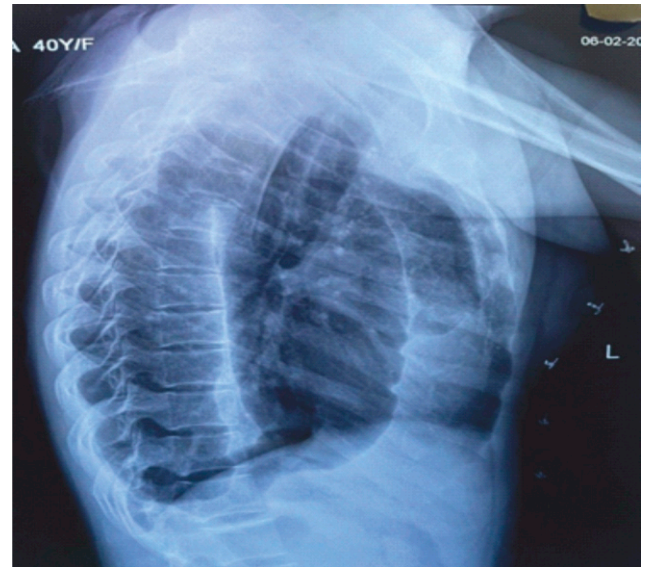


Fig 8: X ray Chest left lateral view showing a hyper lucent area occupying whole of the left hemi thorax extending below the left diaphragm.



Fig 9: CT scan showing a massive paraesophageal hernia

DISCUSSION

Hiatus hernia refers to the herniation of elements of the abdominal cavity into the mediastinum through the esophageal hiatus of the diaphragm. Hiatus hernias are divided into sliding (type 1) and paraesophageal (type II, III, and IV). Type 1 or sliding hernia is characterized by displacement of the esophago-gastric junction (EGJ) above

the diaphragm. The fundus remains below the EGJ. It results from progressive disruption of the EGJ.⁷ Widening of the hiatus and laxity of the phreno-esophageal membrane allow a portion of the gastric cardia to herniate upward.⁷ A sliding hernia does not have a hernia sac and slides into the chest since the EGJ is not fixed inside the abdomen. The Paraesophageal hernias are true hernias where there is an upward displacement of the gastric fundus through a defect in the phreno-esophageal membrane.⁸ They are associated with abnormal laxity of the gastro-splenic and gastro-colic ligaments. Large defects in phreno esophageal membrane and widening and increased laxity of the esophageal hiatus, and repeated occurrences of increased intra-abdominal pressure have been recognized as the main causes of paraesophageal hernias^{9,10}.

Type 1 hiatus hernias are often associated with reflux esophagitis and symptoms of gastro-esophageal reflux disease (GERD)^{11,12}. Patients with paraesophageal hernias can be asymptomatic or have only vague intermittent symptoms.⁸ The most common symptoms are epigastric or sub-sternal pain, nausea and retching, postprandial fullness and progressive dysphagia, and chest pain¹³. Gastric volvulus can occur with large paraesophageal hernias, causing dysphagia, postprandial pain, ischemia, and rarely strangulation.¹⁴ A patient with a hiatus hernia may have milder pulmonary manifestations, such as temporary dyspnea, or with more serious complications, such as severe bronchoconstriction and acute respiratory failure¹⁵. The patients who develop aspiration pneumonia can present with bronchiolitis, centrilobular wall thickening, lung opacities, and ground-glass infiltrates on imaging¹⁶. The common radiological presentation of paraesophageal hernias includes retro-cardiac air-fluid level or sometimes a mass in the mediastinum¹⁷. Presentation of our case-1 was unusual as, despite a massive hernia, she did not have any gastrointestinal symptoms. Presentation of case 2 was also unusual in the sense that she did not have any prominent gastrointestinal symptoms, and the radiological presentation was like a lung abscess on the right side. Radiological presentation of case 3 was highly unusual as it looked like a pneumothorax. We could not find any case report of such type presentation in the literature.

Multiple diagnostic techniques, including imaging of the chest or abdomen with plain radiograph, CT scan, or MRI,

and upper gastrointestinal endoscopy, are of use. Barium swallow can diagnose both types of hiatus hernias and determine the anatomy and size of the hernia, orientation of the stomach, and location of the EGJ. It is the most sensitive diagnostic test for type II and type III paraesophageal hernias¹⁸. CT scans are very useful in visualizing hiatus hernias and provide valuable information on the type of hiatus hernia and involved organs¹⁹. We also diagnosed our cases with the help of X-ray chest and a CT scan. High-resolution manometry can be used to assess hiatus hernias by measuring the separation between the lower esophageal sphincter (LES) and the crural diaphragm. It may be the most accurate modality for diagnosing hiatus hernia^{20,21}.

Asymptomatic sliding hernias do not require any surgical intervention. Treatment of symptomatic sliding hernias consists of medical treatment for reflux esophagitis and anti-reflux surgery, particularly in patients with documented GERD who have refractory symptoms despite maximal medical therapy²². Treatment of asymptomatic paraesophageal hernias is controversial. Some experts suggest elective surgical repair to improve life expectancy²³ while other experts prefer waiting for most asymptomatic patients because lack of good evidence for the superiority of early surgical intervention^{24,25}. In patients with symptomatic paraesophageal hernias, surgical repair is indicated²⁶. In patients with complications like volvulus, uncontrolled bleeding, strangulation, perforation, or dyspnea secondary to paraesophageal hernia, an emergent surgical repair is required^{8,26}. Laparoscopic trans- abdominal paraesophageal hernia repair is the preferred approach in nearly all elective primary repairs^{27,28}. Prior to laparoscopic surgery, paraesophageal hernias were addressed via open abdominal and transthoracic approaches^{29,30}. Increasingly, paraesophageal hernia repairs are being performed with the aid of robotics; however, compared with a laparoscopic approach, morbidity and readmission rates are higher with the use of robotics^{31,32}.

For patients who are kept on watchful watching, physiotherapy plays a crucial role in managing symptoms and improving overall symptoms, though it does not directly treat hiatus hernias. Strengthening core muscles like abdominal muscles and diaphragm, improving breathing technique, diaphragmatic breathing, maintaining a healthy weight, and dietary modifications, etc., are

effective in alleviating the hernia symptoms^{33,34}

CONCLUSION

Type IV paraesophageal hiatus hernia is a complex condition that may lead to life-threatening complications. Patients may have an unusual clinico-radiological presentation. Prompt diagnosis and appropriate management are important to alleviate symptoms and to avoid complications. These case reports underline the importance of considering a hiatus hernia in patients who present with minimal or no hernia-related symptoms or unusual radiological presentation. Patients who are unwilling to undergo surgery should be advised of appropriate medical therapy and physiotherapy to minimize the symptoms and to minimize the chances of complications. A regular follow-up is also very important.

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