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CASE REPORT

A Case of Mistaken Identity: Diaphragmatic Hernia Masquerading as Pneumothorax

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ABSTRACT

A 25-year-old female presented with acute left-sided chest pain for one hour. She reported a history of dull chest pain for three days, which had worsened in the past hour. On examination, she was tachypneic, hypoxic, and had decreased air entry on the left side of chest. Point of care ultrasonography (POCUS) suggested absent lung sliding. Based on physical examination and POCUS findings suggestive of a possible pneumothorax, tube thoracostomy was considered. However, a history of prior fundoplication for a hiatus hernia led to suspicion of a left diaphragmatic hernia. Prompt imaging with chest X-ray and non-contrast CT of the thorax confirmed the diagnosis of diaphragmatic hernia, thereby ruling out pneumothorax. Surgical intervention was promptly undertaken. This case emphasizes the importance of a thorough history and imaging before invasive procedures. Misdiagnosing a diaphragmatic hernia as a pneumothorax and proceeding with tube thoracostomy could have led to severe complications. Clinicians should maintain a high index of suspicion for alternative diagnoses in patients with a history of upper abdominal surgery presenting with chest pain and respiratory distress.

KEYWORDS

• Chestpain • Young women • Diaphragmatic hernia

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INTRODUCTION

Chest pain is a common presentation in the emergency department (ED) and can have a wide range of causes, from benign musculoskeletal pain to life-threatening conditions such as pneumothorax, myocardial infarction, aortic dissection, pulmonary embolism, or oesophageal rupture. Rapid and accurate diagnosis is crucial, often requiring a combination of clinical assessment, bedside imaging, and detailed history-taking[1].

Point-of-care ultrasound (POCUS) has become an essential tool in the ED for diagnosing pneumothorax, with findings such as absent lung sliding and the barcode sign being highly suggestive[2]. However, these findings must always be interpreted in the clinical context to avoid misdiagnosis.

In this case, a 25-year-old female with left-sided chest pain and respiratory distress was initially suspected to have a pneumothorax. However, her history of fundoplication for a hiatus hernia led to reconsideration of the diagnosis. Imaging ultimately revealed a left diaphragmatic hernia, which required surgical intervention. This case underscores the importance of integrating POCUS, clinical history, and advanced imaging before proceeding with invasive procedures like tube- thoracostomy.

CASE PRESENTATION

A 25-year-old female presented to the Emergency Department at 5:30 AM with complaints of left-sided chest pain for the past 1 hour. She reported a history of dull, aching pain in the same location for the past 3 days, which had aggravated in the last hour. She also described radiation of pain to her back. Her initial pain score was 10 out of 10 on the numerical rating scale, and IV analgesics were administered.

On initial assessment, her airway was patent. She was tachypneic with a respiratory rate of 24 breaths per minute and an oxygen saturation of 88%. Oxygen was administered via a nasal cannula at 2 litres per minute. On auscultation, there was decreased air entry on the left side of chest. Her blood pressure was 138/88 mmHg, and her heart rate was 122 beats per minute. Peripheral pulses were felt equally in all four limbs.

Simultaneous bedside lung ultrasound was performed to assess for pneumothorax or hemothorax. POCUS revealed absent lung sliding in the left side, with a barcode sign (Figure 1). There was no pleural effusion identified. A primary diagnosis of left pneumothorax was made, and tube thoracostomy was planned.

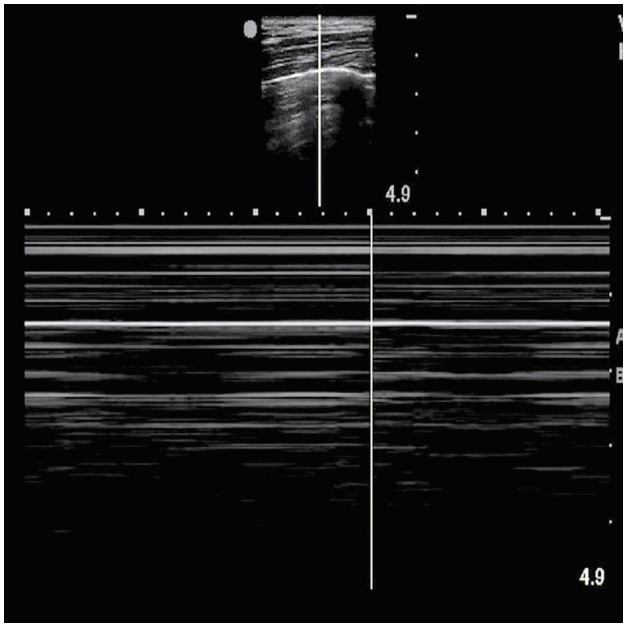


Figure 1: Ultrasonography image in a transverse plane, located on the left anterior chest showing stratosphere sign

Simultaneously, a detailed history was taken, which revealed that the patient had a history of a hiatus hernia and had undergone fundoplication for the same 1 year ago. There was no history of difficulty in breathing, cough, or tuberculosis. After learning about the fundoplication history, the next immediate differential diagnosis considered was a possible left diaphragmatic hernia. In view of this, the decision to proceed with immediate tube thoracostomy was withheld, and imaging of the chest was planned.

Chest X-ray PA view showed features suggestive of a left-sided diaphragmatic hernia, including an elevated left hemidiaphragm, air-fluid level in the left hemithorax, and mediastinal shift to the right. This was followed by a non- contrast CT (NCCT) of the thorax, which confirmed the diagnosis. The chest X-ray (Figure 2) and NCCT thorax (Figure 3, 4) provided further insights. A consultation with the gastrointestinal surgery team was done immediately, and the patient was shifted to the operating theatre (OT) for further management.

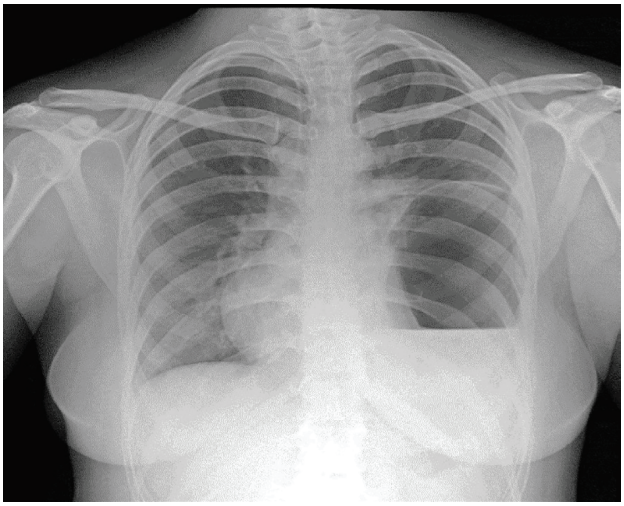


Figure 2: Chest X-ray PA view showing intra-thoracic herniation of stomach

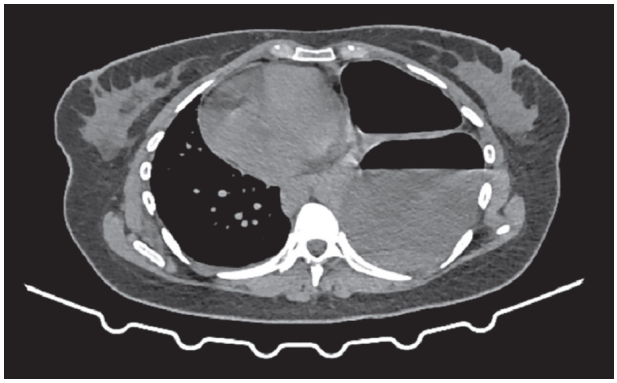


Figure 3: Computed tomography image: Axial view of the chest showing Intra thoracic herniation of stomach into left hemi thorax with cardio-mediastinal shift towards right and partial compressive collapse of left lung



Figure 4: Computed tomography image: coronal view of the chest showing Intra thoracic herniation of stomach into left hemi thorax with cardio-mediastinal shift towards right and partial compressive collapse of left lung

DISCUSSION

This case describes a 25-year-old female with acute left-sided chest pain, initially suspected to have a left-sided pneumothorax based on physical examination and POCUS findings. However, her history of prior fundoplication for hiatus hernia raised suspicion of a diaphragmatic hernia, leading to further imaging and ultimately surgical intervention instead of a chest tube insertion.

The most common differential diagnosis for a patient presenting with sudden-onset chest pain, as described in this case report include acute coronary syndrome, pneumothorax, pulmonary embolism, oesophageal rupture, aortic dissection. In this case her initial symptoms, including acute onset of chest pain, tachypnea, hypoxia, and absent breath sounds, initially pointed toward a pneumothorax. Bedside ultrasound revealed absent lung sliding and a barcode sign, further supporting this diagnosis.[3] Sensitivity of lung ultrasound in detecting pneumothorax is higher than that of conventional anterior-posterior chest radiography and comparable to that of computerized tomography.[4]

However, spontaneous pneumothorax is uncommon in young females without an underlying lung disease or history of smoking.[5] Given her history of prior abdominal surgery, an alternative diagnosis was considered before proceeding with tube thoracostomy. Diaphragmatic hernias may occur postoperatively due to suture dehiscence or trauma, leading to bowel herniation into the thoracic cavity.[6] Patients with diaphragmatic hernia may present with chest pain, absent breath sounds, and dyspnoea often mimicking pneumothorax. However, misdiagnosis and tube thoracostomy can lead to bowel perforation and severe complications.[7]

Computed tomography is the gold standard for diagnosing diaphragmatic hernia, showing abdominal contents herniating into the thorax and differentiating it from a pneumothorax.[8] Given the risk of bowel strangulation, urgent surgical repair is required for diaphragmatic hernia. Delaying treatment may lead to ischemia and necrosis of the herniated organs.[9] Since a pneumothorax was suspected initially, avoiding unnecessary tube thoracostomy prevented severe complications, such as

iatrogenic bowel perforation. This case highlights the critical role of clinical suspicion and imaging in preventing misdiagnosis.

Detailed history-taking and a high index of suspicion among emergency physicians are essential for diagnosing diaphragmatic hernia in patients presenting with acute chest pain, as relying solely on ultrasound may lead to unnecessary tube thoracostomy insertion. Postoperative iatrogenic diaphragmatic hernias have been reported sparingly after several thoracic and abdominal surgeries.[10]

CONCLUSIONS

This case underscores the critical role of thorough history-taking and imaging in patients presenting with acute chest pain in the emergency department. While bedside ultrasound initially suggested a left pneumothorax, the patient's history of previous fundoplication prompted reconsideration of the diagnosis. The case highlights the importance of keeping a broad differential diagnosis, especially in patients with a history of abdominal or thoracic surgery and the early use of POCUS as a valuable tool, but imaging confirmation is essential when atypical features are present.

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Consent to Participate: A written informed consent for has been obtained from the participant.

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