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Case Report
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A Unique Case of an Idiopathic Transdiaphragmatic Intercostal Hernia (Most Probable Following Chronic Heavy Load Lifting)

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Abstract

Transdiaphragmatic Intercostal Hernia (TDIH) is a rare condition. Most cases reported in the literature are a result of penetrating or severe blunt trauma. The management of TDIH can involve conservative treatment or surgical repair.

Conservative treatment may be considered for elderly patients with comorbidities or asymptomatic patients. Surgical management typically involves reducing the contents of the hernia and effectively closing the defects, with or without the use of a mesh. In this case report, we present the case of a 75-year-old male who visited the outpatient surgery clinic complaining of a painful, reducible bulge in the right intercostal area. The patient had no history of previous trauma or intense coughing. Based on physical examination and the patient's complaints, he was diagnosed with an intercostal hernia. He underwent a successful double mesh repair of the intercostal hernia, along with primary repair of a large diaphragmatic defect. It has now been 6 months since the surgery, and there has been no recurrence of the hernia.

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Introduction

Transdiaphragmatic Intercostal Hernia (TDIH) is a rare entity [1]. The majority of cases described in the literature result from penetrating or severe blunt trauma (18.5%), while falls account for 7% to 13% [2]. Other causes described are coughing and sneezing (46%) [2,3]. TDIH usually appears on the left chest side in 68.5% of cases and in the right side in 24.2% [4,5]. From an anatomical perspective, rib dislocation due to expulsive mechanism(coughing, sneezing, or retching) usually occur at the 9th costal cartilage, while traumatic mechanisms affect the 7th cartilage [2]. Clinically, patients suffering from TDIH present with reducible soft tissue bulging following Valsalva [2,4], it shouldn't be mistaken with lipoma. Patients without a history of trauma could present a clinical challenge. However, TDIH could be widely misdiagnosis by CT scan [2]. The management of TDIH can be conservative or involve surgical repair. Conservative treatment may be considered in elderly patients with comorbidities, as well as asymptomatic patients. Furthermore, surgical management require reduction of contents, and well performed closure of defects with or without using a mesh [6,7]. Although non-mesh repair is associated with a high risk of recurrence [7], most of the intercostal hernia are associated with rib instability which necessitates fixation. Surgical repair options for TDIH include two layers suturing of diaphragmatic rupture with continuous or interrupted sutures. In acute cases of Intercostal Hernia (IH), primary repair is possible, while mesh repair is usually used in chronic settings for a tension-free repair [2]. We present an extremely rare case of spontaneous TDIH associated with a diaphragmatic defect without a history of previous trauma or intensive coughing. The patient also denied any previous symptoms of dysphagia, dyspnea or chest pain related to transdiaphragmatic hernia. Considering that this hernia results following a lengthy period of time working with heavy load, we also discuss other documented cases in the literature.

Case Presentation

A 75-year-old male presented to the outpatient surgery clinic complaining of right intercostal reducible painful bulging. the patient reported that he was admitted to emergency room three

months prior to the current admission at another institute complaining lateral chest pain, denying trauma or previous coughing. Physical examination was unremarkable, so computer tomography was ordered revealing fracture/dislocation of 8th rib, without any other associated findings including Hiatal hernia. Upon discharge he was advised to take an analgesic as needed for managing the chest pain. His medical history included, Hypertension (HTN), Chronic Obstructive Pulmonary Disease (COPD) hyperlipidemia, Ischemic Heart Disease (IHD), S/P coronary artery bypass grafting CABG, Chronic Renal Failure (CRF). The patient mentioned a history of right intercostal bulging associated with an intermittent pain, during the last few months, which has worsened during recent weeks. There was no recent history of shortness of breath, high fever, or other complaints. On outpatient clinic his physical examination was unremarkable except for intercostal bulging, Respiratory sounds were normal. The patient was diagnosed with an intercostal hernia based on physical examination and complaints and was scheduled for surgery. In the operating room the patient was intubated, and was positioned in the decubitus position, right lateral thoracotomy was performed, revealing intercostal hernia between 9th and 10th intercostal space and the 9th rib was displaced. We observed a huge, herniated sac and a 10 cm ruptured diaphragmatic defect on the right anterior aspect. Intercostal hernia with abdominal content including small bowel reduced back, diaphragmatic defect was closed with vicryl suture, displaced rib was fixed with prolene suture, and Sublay UltraPro mesh was placed beneath external oblique, the fascia of the intercostal and external oblique was approximated, and a second Ethicon UltraPro mesh was placed and fixed onlay with vicryl sutures to secure the defect. A drain was placed. Following surgery, the patient's vital signs were normal. He was mobilized early and underwent daily pulmonary rehabilitation. Two days later, the patient started coughing, and lung auscultation revealed crackles. A Chest X-ray was performed, which showed a small amount of bilateral pleural effusion and mild pneumonia. Antibiotics were initiated. Over the next two days, the patient continued to cough without fever, and his vital signs remained stable, (SPo2 level) around 90%. A CT Angiogram (CTA) was performed on the 5th day after surgery to rule out Pulmonary Embolism (PE) and evaluate any other postoperative findings. The CTA revealed right lower lobe atelectasis without any other abnormalities, and the diaphragm and intercostal space were intact. The patient continued to undergo intensive daily respiratory physiotherapy, and over the next few days, he showed significant improvement. The surgical site was satisfactory. The patient was discharged after 9 days following surgery. Currently, it has been 6 months since the surgery, and there has been no hernia recurrence (Figure 1).

Discussion

We present a patient with a transdiaphragmatic intercostal hernia and a large diaphragmatic defect. The patient has no history of trauma or coughing and denies any previous surgical intervention. We believe that this hernia is the result of an extended period of several years working with heavy loads. TDIH is a rare condition typically associated with trauma or intensive coughing [1,3]. Although extremely rare, cases of TDIH caused by trauma, a long period of coughing, or sneezing have been reported [2,4]. To the best of our knowledge, this is the first case report describing TDIH resulting from an extended period of several years working with heavy loads, without a history of trauma or other causes documented in the literature. The appearance of a large diaphragmatic rupture on the right side is extremely rare and presents a challenge in making the diagnosis based solely on clinical findings.

In conclusion, TDIH should be suspected following blunt or penetrating trauma. A high clinical suspicion along with a CT scan, will provide an accurate diagnosis. Surgical repair of the defect, with the placement of double mesh, can help reduce the risk of recurrence. Our case emphasizes the importance of accurate physical examination. however, physical examination alone may be sufficient to make an accurate diagnosis, and intercostal hernia can be suspected even without a history of trauma, chronic cough, or violent coughing.

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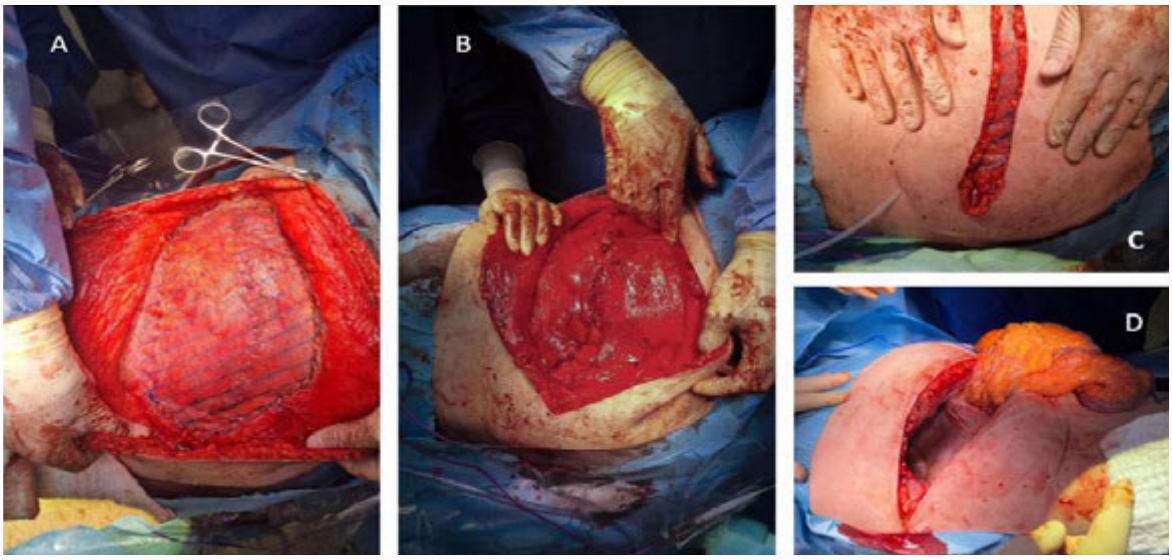

Figure 1: A) Intraoperative reconstruction of intercostal defect with an UltraPro mesh above the muscle approximation (onlay) B) approximation of intercostal fascia and external oblique. C) final incisional appearing D) intraoperative view of the diaphragmatic defect with intestinal content.

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