Pleuroperitoneal Hernia in an Adult Patient

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ABSTRACT

Introduction: Pleuroperitoneal hernia is the most frequent diaphragmatic congenital hernia, appearing in 1 in 3,000 births. This diaphragmatic defect is located on the left side in 80% to 90% of cases. Pleuropertitoneal hernia is usually diagnosed in the first 8 weeks of life due to respiratory compromise caused by the herniation of abdominal organs into the thoracic cavity; therefore, adult presentation is a rare condition.

Case Presentation: We present a case of a 55-year-old man with a history of long-term cigarette smoking who arrived at the emergency department with a chronic cough. Initially, the patient was misdiagnosed as exacerbated chronic obstructive pulmonary disease, for which a contrast chest computed tomography was performed showing a left posterior pleuropertitoneal hernia that contained the upper pole of the ipsilateral kidney and adrenal fatty tissue. The surgical approach chosen in this case was through laparoscopy, resulting in an appropriate post-surgical evolution, for which the patient was discharged with a general surgery control appointment. The patient was evaluated 1 week and 1 month after surgery, showing a normal physical examination and resolution of the respiratory symptoms.

Conclusion: Pleuropertitoneal hernia symptoms in adults most commonly affect the gastrointestinal and the respiratory tract. The diagnosis is performed by computed tomography or magnetic resonance imaging, in which a diaphragmatic defect can be seen. Pleuropertitoneal hernia complications must always be discarded by computed tomography and transthoracic echocardiogram. The treatment is based on surgical repair of the diaphragmatic defect. The surgical approach chosen may vary according to the surgeon’s expertise.

INTRODUCTION

The pleuropertitoneal hernia, also called Bochdalek hernia, is the most frequent diaphragmatic congenital hernia presented in 1 in 3,000 births. Its embryological origin is not clearly understood; nevertheless, there are two main theories: 1) alteration in the migration of the kidneys due to limited mesonephric involution; and 2) the nonfusion of the mesenchymal component of the pleuropertitoneal folds during fetal development, which leads to a defect in the posterolateral region of the diaphragm that contributes to the displacement of the abdominal organs into the thoracic cavity. The diaphragmatic defect is located on the left side in 80% to 90% of cases. Pleuropertitoneal hernia is usually diagnosed in the first 8 weeks of life due to respiratory compromise caused by the herniation of abdominal organs into the thoracic cavity; therefore, adult presentation is a rare condition. The diagnosis of pleuropertitoneal hernia is performed by computed tomography (CT) or magnetic resonance imaging, in which abdominal content can be seen invading the thoracic cavity, leading to complications such as pneumonia, atelectasis, or volvulus. Due to its low incidence, pleuropertitoneal hernia is considered an exclusion diagnosis; therefore, the physician must rule out other diseases such as pneumonia, pulmonary cysts, pleural effusion, atelectasis, and mediastinal tumors. Pleuropertitoneal hernia treatment is based on reducing the hernial content into the abdominal cavity and repairing the diaphragmatic defect; the surgical approach may vary between open and minimally invasive surgery according to the patient’s condition.

This article presents a rare case of a 55-year-old man diagnosed with pleuropertitoneal hernia containing adrenal fatty tissue and the left kidney’s upper pole, making this case even more infrequent.

CASE PRESENTATION

A 55-year-old man with a history of systemic hypertension and long-term cigarette smoking, with no records of congenital diaphragmatic defects in the family, presented to the emergency department with a chronic cough, hyaline expectoration, wheezing, and moderate dyspnea during the last year. On physical examination, a patient in stable general condition was evident—alert, normal blood pressure, no tachycardia, mild desaturation (O2 saturation: 89%), and hypoventilation of the left lung field. The initial diagnostic impression was exacerbated chronic obstructive pulmonary disease, for which a contrast chest CT was performed showing a voluminous left posterior diaphragmatic hernial sac that contained the upper pole of the ipsilateral kidney and adrenal fatty tissue, suggesting pleuropertitoneal hernia (Figure 1).

Once the diagnosis was made, a transthoracic echocardiogram was performed, showing mild concentric remodeling of the left ventricle. The patient was referred to the surgical service for surgical intervention. The patient underwent an exploratory laparoscopy through a 5 mm port in the right iliac fossa, with identification of a left posterior diaphragmatic hernial sac containing the upper pole of the left kidney and adrenal fatty tissue. A 12 mm right subcostal port was placed, and a left posterior diaphragmatic hernial sac was identified and reduced. A single layer of nonabsorbable monofilament suture was placed on a nonabsorbable monofilament loop to secure the diaphragmatic repair. The patient was discharged with a general surgery control appointment. The patient was evaluated 1 week and 1 month after surgery, showing a normal physical examination and resolution of the respiratory symptoms.

Keywords: case report, congenital hernia, diaphragmatic hernia, laparoscopy, pleuropertitoneal hernia

Abbreviations: CT = computed tomography

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of the left ventricle and mild pulmonary hypertension (27 mmHg at rest) with normal right cavities. The patient was then referred to the general surgery department for surgical management.

The surgical approach chosen was through laparoscopy, in which the left posterior diaphragmatic hernial defect was visualized, the contour of the sac was dissected with harmonic, and then it was reduced identifying the edges of the diaphragm. The defect was closed with Ethibond 0 and polypropylene 2-0 using the X-stitch technique. A 15 cm mesh was introduced and placed over the defect, fixing it to the diaphragm and posterior muscular fascia with a 2-0 polydioxanone suture (Figure 2).

Three days after surgery, we found an asymptomatic patient with an adequate general condition, tolerating oral alimentation, and with no signs of respiratory distress. A chest CT was performed within normal parameters showing resolution of the diaphragmatic defect (Figure 3), for which discharge was given with a general surgery control appointment.

At the postsurgical control consultation 1 week and 1 month after surgery, the patient showed a normal physical examination and resolution of the respiratory symptoms.

**DISCUSSION**

The left diaphragm is the last to be formed during the embryonic period, leading to more defects during its development; thus, pleuroperitoneal hernia is shown more frequently on the left side. Pleuroperitoneal hernia in adults is only presented in 0.17% of cases, while the presentation with intrathoracic kidney is described in 0.25% of patients, making this case even more infrequent.2,8

This patient has a history of long-term smoking and chronic cough, which may have raised intra-abdominal pressure, precipitating the left kidney's upper pole and adrenal fatty tissue into the thoracic cavity through a congenital diaphragmatic defect, triggering pleuroperitoneal hernia symptoms in adulthood.9 In this case, the initial diagnosis was erratic because the clinical context was related to a pulmonary disease rather than an abdominal condition.

In 2016, Machado9 conducted a literature review describing the predominant symptoms in adults with pleuroperitoneal hernia, showing that abdominal pain was presented in 62% of cases, abdominal distension, vomiting, and constipation were presented in 36%, and hernial strangulation was presented in 26%. In contrast, pulmonary symptoms such as cough, chest pain, wheezing, and pneumonia were
reported by 40% of cases. Fourteen percent of patients were asymptomatic.⁹

The increased intrathoracic pressure caused by pleuroperitoneal hernia contributes to the development of pulmonary hypoplasia, which may lead to pulmonary hypertension, patent ductus arteriosus, patent foramen ovale, and heart hypoplasia.¹⁰,¹¹ In this case, the patient underwent a transthoracic echocardiogram in which only mild pulmonary hypertension and left ventricle remodeling were present; pulmonary hypertension could be explained due to chronic cigarette smoking and the increased intrathoracic pressure caused by the pleuroperitoneal hernia.

According to the literature, all patients with pleuroperitoneal hernia must be submitted to surgery due to severe complications derived from nonsurgical management. We can consider pleuroperitoneal hernia a disease with high morbidity and mortality.⁶,¹² The surgery approach depends on the size of the hernia, complications, and the patient’s condition (stable or unstable). When an emergency surgery is required, the preferred surgical approach is laparotomy or thoracotomy because it allows better visualization of the diaphragm and facilitates the repair of the malrotations. In contrast, when the patient is stable, a laparoscopy or thoracoscopy approach is preferred because it reduces hospital stay with minimal morbidity and mortality. Due to the absence of studies that compare the different surgical procedures, the technique chosen depends on the surgeon’s judgment.¹³

CONCLUSION
Pleuroperitoneal hernia is a congenital disease with high morbidity and mortality most commonly presented in the left hemithorax and usually diagnosed during the newborn period; adult presentation is a rare condition. Pleuroperitoneal hernia symptoms in adults most commonly affect the gastrointestinal and respiratory tracts. The diagnosis is performed by CT or magnetic resonance imaging, in which a diaphragmatic defect can be seen. Pleuroperitoneal hernia
complications should be detected by computed tomography and transthoracic echocardiogram. The treatment is based on surgical repair of the diaphragmatic defect. The surgical approach chosen may vary between laparotomy, thoracotomy, or thoracoscopy; nevertheless, the final decision depends on the surgeon’s expertise, the size of the hernia, and the patient’s condition. It is mandatory to develop clinical research focused on comparing the different surgical approaches for pleuroperitoneal hernia treatment.

Disclosure Statement
The authors have no conflicts of interest to disclose.

Funding Statement
There were no sources of funding for this manuscript.

Authors’ Contributions
Andrés Felipe Herrera Ortiz, MD, participated in the critical review, drafting, and submission of the final manuscript. Mario R Rodríguez, MD, Juan S González, MD, Karen L Alfonso, MD, Paula A Becerra, MD, and María C. Gaviria, MD, participated in the review and drafting of the final manuscript. All authors contributed equally to the development of the document.

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