HERNIA DIAFRAGMÁTICA IATROGÉNICA POSTERIOR A TORACOSCOPIA. REPORTE DE CASO.

IATROGENIC DIAPHRAGMATIC HERNIA AFTER THORACOSCOPY. CASE REPORT.

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RESUMEN

Introducción: La hernia diafragmática es una complicación iatrogénica poco frecuente, con manifestaciones tardías e inespecíficas, lo que dificulta su diagnóstico. **Presentación del caso:** Se presenta un caso clínico en una mujer de 32 años con hernia diafragmática iatrogénica tras decorticación pulmonar por toracoscopia debido a tuberculosis pleural. **Conclusión:** Al tratarse de una complicación de muy baja frecuencia, es fundamental mantener un alto índice de sospecha para un diagnóstico precoz y una intervención inmediata.

Palabras clave: *Hernia diafragmática, cirugía mínimamente invasiva, cirugía toracoscópica, hernia diafragmática iatrogénica*

ABSTRACT

Introduction: Diaphragmatic hernia is a rare iatrogenic complication with late and nonspecific manifestations, making diagnosis difficult. **Case presentation:** We present a clinical case of a 32-year-old woman with iatrogenic diaphragmatic hernia following pulmonary decortication via thoracoscopy for pleural tuberculosis. **Conclusion:** Given the exceptionally low frequency of this complication, maintaining a high index of suspicion is essential for early diagnosis and immediate intervention.

Keywords: *diaphragmatic hernia, minimally invasive surgery, thoracoscopic surgery, Iatrogenic diaphragmatic hernia*

Introduction:

Diaphragmatic Hernia is defined as the passage of abdominal contents into the thoracic cavity through a defect in the diaphragm. Diaphragmatic hernias are classified as congenital and acquired [1]. The acquired ones are due to closed chest trauma with an incidence of 73 to 88% and

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penetrating trauma 12 to 23% of the cases [1]; the iatrogenic cause, secondary to surgical interventions, is still rare [2,3]. Cases have been reported after surgeries, including diverse types of approaches such as sternotomy, laparoscopy, thoracoscopy, and thoracotomy [4]; and procedures such as esophagectomy, gastrectomy, nephrectomy, hepatectomy, cholecystectomy, splenectomy, and lobectomy [1,2,4,5].

We present a female patient with a history of pulmonary decortication plus pleurectomy by means of video-assisted thoracoscopy (VATS) in relation to pleural tuberculosis, who consulted 2 months later due to intestinal pseudo-obstruction, where a left diaphragmatic hernia was diagnosed. She was taken to immediate surgical correction using a minimally invasive technique.

Case presentation

A 32-year-old woman underwent decortication by VATS in December 2021 for symptomatic left pleural effusion, at a hospital in the United States, Washington DC. She consulted again in Colombia in January 2022 for the same clinical picture, for which a chest CT scan was performed with evidence of left pleural effusion and pleural thickening on the lower left section. Pleural tuberculosis was suspected, so she was taken once again to decortication plus pleurectomy and insertion of a chest tube, with respective histological and microbiological studies.

The control X-ray showed complete lung expansion and well-positioned thoracostomy, with good clinical evolution, for which reason she was discharged with diagnosis of pleural effusion secondary to pleural tuberculosis.

The patient returned in March due to symptoms of intense abdominal pain, in the epigastrium, accompanied by nausea and involuntary abdominal defense. A CT scan was performed, in which the presence of colonic loops in the left hemithorax was observed, with secondary pulmonary atelectasis and left pleural effusion (Figure 1.a). Given the findings, diaphragmatic hernia with colonic elevation and secondary intestinal obstruction was diagnosed. She was taken to surgery for hernia correction by minimally invasive technique, where elevation of the left colon and omentum to the left pleural cavity was found, without signs of ischemia or perforation, in addition to severe pleural thickening and atelectasis (Figure 1.b and c). Initially, a thoracic approach was performed, removing pleural membranes by thoracoscopy, achieving adequate lung expansion. Then an abdominal approach by laparoscopy, peritoneal adhesions were released and the hernia content was reduced by traction.

The diaphragmatic defect was approximately 3 cm in diameter located in the anterolateral portion of the diaphragm. Subsequently, the defect was sutured, completing its correction, and a chest tube was inserted (Figure d). The postoperative course had a good clinical evolution, without signs of intestinal obstruction or respiratory symptoms. Control CT showed evidence of complete hernia correction, without signs of perforation of the hollow viscus or free fluid in the abdominal cavity, with minimal pleural effusion and residual pneumothorax associated with the intervention, for which she was discharged on the fourth day of hospitalization. Outpatient follow-up had a good clinical

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evolution, with absence of symptoms or sequelae related to the event.

Discussion

Iatrogenic diaphragmatic hernia is a rare event with an unknown incidence depending on the surgery performed [3,5,6]. These are frequently seen after esophagectomies and rarely after thoracoscopies like the one presented in this case [2.6]. Within the reviewed literature, only six reports were found after thoracic surgery [2,5,7-10].

Several theories of the possible etiology are presented, the direct injury to the diaphragm by incision during surgery inadvertently and then unidentified, the use of electrical elements such as electrocautery or coagulation scissors that cause direct damage to the diaphragm by diathermy with late necrosis, or by the insertion of drains such as thoracostomy [4,5,11,12].

The hernia can remain asymptomatic for a prolonged period, generating delays in the diagnosis, thus allowing the progressive extension of the hernial defect thanks to the pleuroperitoneal pressure gradient that allows the passage of viscera into the pleural cavity [1,3,7]. Symptoms can appear months or even years after the initial injury, as in this case where symptoms appeared 2 months after the thoracic surgery [1,7]. When these come out, they may be gastrointestinal symptoms such as abdominal pain, nausea, vomiting, gastroesophageal reflux, feeling of fullness, abdominal distension or frank symptoms of intestinal obstruction; respiratory symptoms such as dyspnea and cough may also occur and cardiac symptoms such as chest pain [1,2,5,12]. These non-specific symptoms lead to a delay in diagnosis in many cases with an increased incidence of acute complications such as incarceration, strangulation or perforation, and chronic complications such as weight loss, malnutrition and physical deconditioning, loss of functionality and aerobic capacity; which produce a high mortality rate, up to 30% in case of strangulation [1,5,7]. There is a risk of death secondary to respiratory failure or cardiac tamponade, due to chest compression, and infarction or visceral perforation, due to compromised intestinal blood supply, but with an unknown specific incidence [13].

Diagnosis is made through imaging studies, the most efficient and cost-effective test being computerized tomography (CT), with a sensitivity of 78% for left hernias and 50% for right hernias [14-16]. Although simple radiography, thoracic and abdominal ultrasound, nuclear resonance, and endoscopic studies have been used, they have lower performance or cost effectiveness than CT [13-16]. Lastly, there is laparoscopy as a diagnostic and therapeutic method, but with higher risks compared to diagnostic images, as it is an invasive technique [14-15].

The gold standard treatment is surgical correction, indicated when symptoms appear with evidence of diaphragmatic hernia by diagnostic images [1,6]. Ten percent mortality during surgery has been reported. 20 to 60% of surgeries are performed in emergency situations, in which case mortality can rise from 20 to 80% [1,5]. Minimally invasive surgery is preferred, even though more than 42% may be converted to open surgery due to complications such as intestinal gangrene,

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splenic injury, inability to reduce the hernia, and tension pneumothorax [6].

The surgical approach depends on the preference and expertise of the surgeon. With the advent of minimally invasive surgery, both thoracic and abdominal, it is considered the preferred technique given the advantages related to less bleeding, less postoperative pain, reduced risk of infection, shorter recovery time, better visualization of the hernia content and less need for mechanical ventilation compared to the open technique [1,5,6,15]. In this case, thoracoscopic plus laparoscopic approach was performed.

Treatment of asymptomatic hernia is still controversial, in some series expectant management has been indicated, which confers the risk of unpredictable complications [1,17]. The use of meshes to reduce recurrences is also controversial since they can cause more complications such as visceral erosion or infection [18]. For this reason, direct suture is still preferred as the standard method and the use of mesh is left only when the least possible tension on the suture is needed in large defects and the inability to correction due to loss of substance of the diaphragm or the presence of weak tissues, as it has been shown to reduce the risk of recurrence [6,13,14,18]. Early diagnosis is essential to avoid complications that can have catastrophic outcomes, even leading to the death of the patient [1].

To prevent iatrogenic diaphragmatic hernias, it has been proposed to minimize diaphragmatic injury during surgery by taking unusual care and attention now of insertion of the ports, always correcting pre-existing hernias and visualizing systematically the integrity of the tissues before leaving the cavity [6].

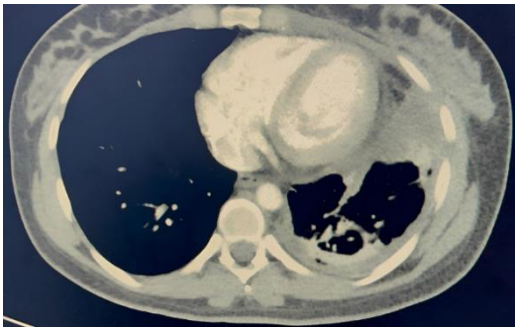

Figure 1.a. *CT scan that shows the presence of colonic loops in the left hemithorax, with secondary pulmonary atelectasis and left pleural effusion.*

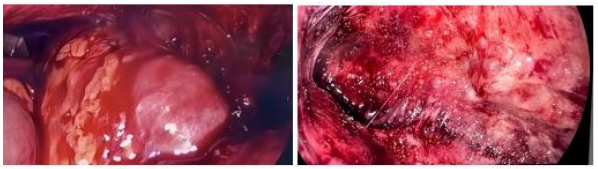

Figure 1.b and c. *Elevation of the left colon and omentum to the left pleural cavity, without signs of ischemia or perforation, in addition to severe pleural thickening and atelectasis.*

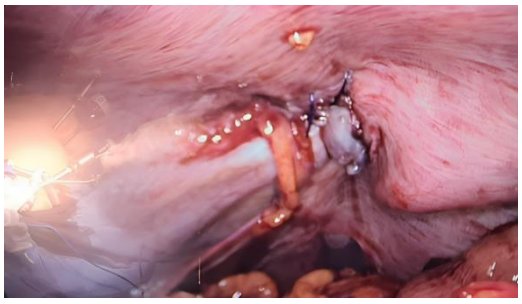

Figure d. The defect was sutured.

Conclusion

A case of iatrogenic diaphragmatic hernia secondary to thoracic surgery is presented, being a very infrequent event. It is important to detect it early, having a high index of suspicion when symptoms

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appear after thoracoabdominal interventions and with imaging control after surgical interventions that can compromise the diaphragm, to make an immediate intervention and avoid complications related to the procedure.

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