Post-Traumatic Diaphragmatic Hernia Late Diagnosed: A Case Report

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ABSTRACT
The Post-Traumatic Diaphragmatic Hernia (PTDH) is relatively uncommon and may be caused by blunt, penetrating or iatrogenic trauma. The most commonly herniated abdominal structures are stomach, omentum and colon. The diagnosis is challenging because of nonspecific and low sensibility clinical features; so most cases are diagnosed after an asymptomatic or oligosymptomatic period, allowing visceral strangulation and higher morbidity in chronic phase. This report presents a case of a left posterolateral PTDH diagnosed late in latency phase, after 19 years of the trauma occurrence, manifesting clinically with unspecific and progressive respiratory symptoms.

Keywords: diaphragm, diaphragmatic hernia, diagnosis, diagnostic imaging.

INTRODUCTION
Post-Traumatic Diaphragmatic Hernia (PTDH) consists of protrusion of abdominal organs into the thoracic cavity through a traumatic diaphragm injury[1]. It is uncommon, with a global incidence varying from 0.8% to 5.8[2] and present in 3% to 5% of cases of closed abdominal trauma[3]. There are three phases to the natural history of PTDH.
The acute phase corresponds to the occurrence of the lesion, which may have a variable clinical manifestation or be undiagnosed. In the latent phase, there is incarceration of the abdominal viscera in the thorax by constant negative pleural pressure, with symptoms of epigastric pain, nausea, vomiting or intestinal obstruction. In the chronic phase, complications such as obstruction and intestinal strangulation may occur[4]. Bowditch in 1853 published the first clinical criteria for the diagnosis of PTDH[5]. The diagnosis of PTDH should be considered in cases where the patient with trauma history presents a complaint of chest or abdominal pain, decreased ipsilateral thoracic expandability, right displacement of cardiac mass; tympanic percussion, absent vesicular murmur and bowel sounds present in hemi thorax; and still respiratory failure[6]. Signs and non-specific symptoms such as productive cough, burping and hiccups, gastric vomiting and left hemi thorax pain were reported in a case of latent phase PTDH that evolved to sudden death after 11 months of trauma[7].

Chest X-ray reveals as main findings in posterior-anterior (PA) incidence: presence of stomach, small or large intestine on thoracic topography; presence of nasogastric tube above the left diaphragmatic dome; suggestive of persistent hemothorax even after thoracic drainage; contralateral deviation of the mediastinum; left diaphragmatic dome elevation and atelectasis in the lower lobe of the left lung[8]. Chest and upper abdomen Computed Tomography (CT) consists of an advanced method for the diagnostic imaging of diaphragm injuries; considered the first choice imaging test indicated for patients with hemodynamic stability and clinical and radiographic findings suggestive of HDPT[9]. The main tomographic findings are: loss of continuity of the diaphragmatic domes; displacement of abdominal viscera in thoracic topography; presence of the necklace signal; and contact of the liver, stomach or small intestine with the posterior ribs[10]. The necklace signal forms when a segment of the digestive tract is punctually compressed by the diaphragmatic cleft caused by the trauma; and has a specificity of 100% and a sensitivity of up to 50% in lesions of the left dome, with focal discontinuity of the diaphragm[11]. The pendant viscera signal is quite specific and represents the absence of pulmonary interposition between the upper part of the abdominal organs and the posterior wall of the thorax[12].

The PTDH treatment is surgical, preferably for median laparotomy in acute hernias and thoracotomy for late diagnosis hernias. Access through laparotomy allows the approach of abdominal lesions present in the acute phase[3,13,14] and thoracotomy indicated in late hernias favors the direct visualization of herniated contents and the incision of probable adhesions[3,13]. Most common operative complications are phrenic nerve lesions and
myocardium lesions[15]. The occurrence of postoperative complications ranges from 11% to 53%, and the most frequent are: pneumonia, urinary tract infection, empyema and ileum[6,8,13]. The HDPT mortality rate found in the literature is variable, with indices between 7-17%[3,6,13].

CASE PRESENTATION

A 29 years old female patient, was admitted in 2015 public referral hospital at São Paulo city, Brazil; complaining of pain when breathing for 3 days. It states that there are three months has chest pain, respiratory dependent, intensity 5/10 radiating to the left hemithorax. 3 days ago there was significant worsening of pain, which evolved into intensity 10/10 – using Pain Visual Analog Rating Scale; and associated with dyspnea, dry cough and feeling of fullness. He denies fever, weight loss, sweating and asthenia. Refers umbilical hernia repair for 18 years and important cycling trauma 19 years ago.

Physical general examination: good general condition, lucid and oriented, eupneic, normal color, hydrated, acyanotic, anicteric, afebrile, blood pressure 154x111mmHg, heartrate 96bpm, SpO₂ 98%, 36.1°C, breathing 14irpm, good peripheral perfusion, wrists present bilaterally and without swellings.

Cardiovascular: regular sinus rhythm in 2 clicks without murmurs.

Respiratory: missing vesicular murmur in the left lung base, with bowel sounds present.

Abdomen: globular without cambers or retractions, bowel sounds present, painless to palpation, with no palpable masses.

Imaging exams: Chest Radiography (Figure 1) and Computed Tomography (Figures 2 and 3).

DISCUSSION

About 14% of PTDH are late diagnosed[13], in the latency phase or even in the chronic phase, after months or years of trauma[19]. There are reports of diaphragmatic hernias diagnosed up to 28 years after trauma[16], but 85% of cases are diagnosed within 3 years[17]. In this case, considering the only history of trauma reported by the patient; the diagnosis was made 19 years later, in latency phase; because it presented vague signs and symptoms, mainly of pleuropulmonary affection and without occurrence of obstructive complications or intestinal strangulation, which would configure the chronic phase.

Although both diaphragmatic domes are susceptible to injury, the majority of lesions occur in left dome, with prevalence reports of up to 94%[3]. In this case, the lesion occurred specifically in the left posterolateral region, which corresponds to the greatest point of embryological weakness of the diaphragm muscle, converging with the literature. Gastrointestinal and cardiorespiratory clinical signs manifest themselves with greater intensity in the latency phase or in the chronic obstructive phase[18] and the differential diagnosis must be made with atelectasis, neoplasms, pleural effusion and intestinal obstruction[19,20]. However, the differential diagnosis of PTDH should be considered in patients with those signs or symptoms: history of thoracoabdominal trauma or abdominal wall hernia, presence of pleural effusion with intestinal obstruction, and colonic obstruction in young patients[21]. In this present case, the reported complaints were cardiorespiratory, consistent with data from the literature.

The diagnosis is challenging because of nonspecific and low sensibility clinical features[22] and most injuries are not diagnosed in
the acute phase. The latency period may persist for months or years; remaining asymptomatic or oligosymptomatic with progressive evolution of intrathoracic herniation, allowing visceral strangulation and morbidity from 30% to 50% in the chronic phase[21]. In Chest Radiography - Figure 1: left lung base elevation, presence of gastric bubble in chest topography, contralateral mediastinum deviation and lower lobe atelectasis of the left lung[4]. Chest Computed Tomography - Figures 2 and 3: continuity loss of diaphragmatic domes; displacement of abdominal viscera into the chest topography[12] in contact with the posterior costal arches[10]; and the presence of necklace and pendant viscera signals[12]. The necklace signal is defined by gastric constriction sliding through diaphragmatic rupture; and pendant viscera signal, which is the absence of lung interface between the upper region of abdominal viscera and the posterior rib cage[12].

CONCLUSION

The case report mentions a rare late complication of trauma on the thoracoabdominal transition region, who is scarce and sometimes non-existent clinical manifestations for long periods can lead to a delayed diagnosis or even the complications that are manifested by acute conditions endangering the patient's life. The diagnosis should be considered whenever there are reports of previous trauma affecting the chest and abdomen topography.

REFERENCES

10. Iochum S, Ludig T, Walter F, Sebbag H, Grosdidier G, Blum AG. Imaging of