

# Post Traumatic Diaphragmatic Hernia Revealing a Colonic Tumor

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## Abstract

Post traumatic diaphragmatic injuries have long been known. However their varied clinical, expressions lead to difficulties which cause its delay. The occurrence of herniation of hollow viscera in the thoracic cavity followed by its necrosis or perforation, is a delayed complication, a rare entity with a poor prognosis. The discovery of a colonic tumor in a diaphragmatic hernia is an exceptional clinical circumstance. Here we report the case of a patient with a complicated diaphragmatic hernia, whose symptoms are precipitated by the presence of a colon stenosing tumor. The management consisted of an exclusive laparotomy had allowed dealing in one surgical intervention with both the abdominal and thoracic injuries.

## Keywords

Diaphragmatic Hernia, Gastrointestinal Tumor, Surgery

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## 1. Introduction

Post traumatic diaphragmatic injuries have long been known, but their varied clinical expressions lead to difficulties and delay in diagnosis [1] [2]. The occurrence of hernia hollow viscera intra-thoracic followed by necrosis or perforation, is a delayed complication rare and frightening prognosis. The discovery of a colonic tumor in a diaphragmatic hernia is an exceptional clinical circumstance [3].

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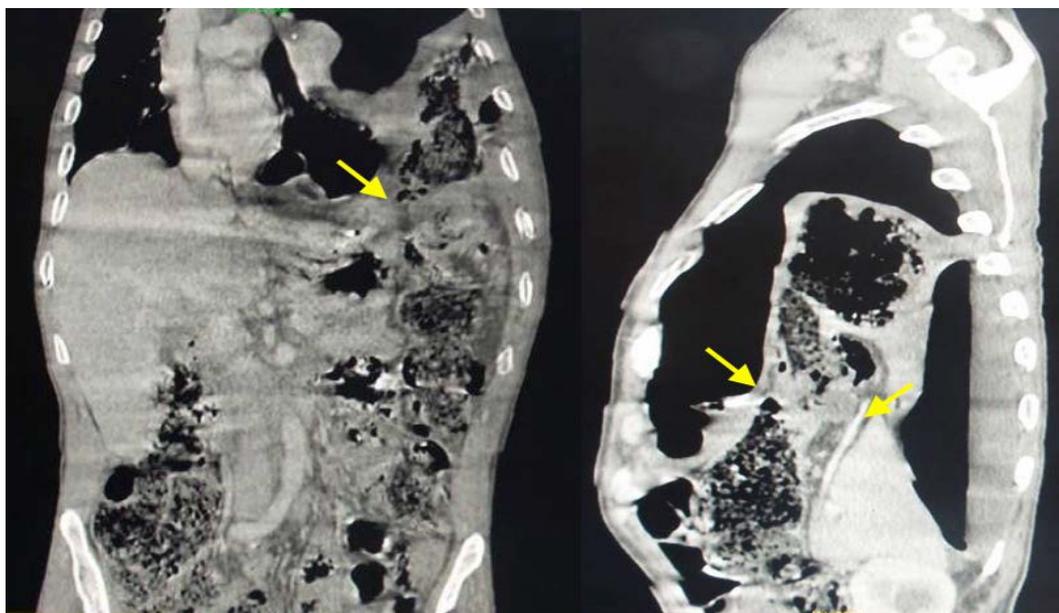
## 2. Case Report

Mr M is a 63-year-old patient, admitted to the emergency room for a stage III SADOUL dyspnea associated with abdominal distension, with a bowel obstruction syndrome. His history revealed a traumatic event 3 years ago, he fell from 2 m height.

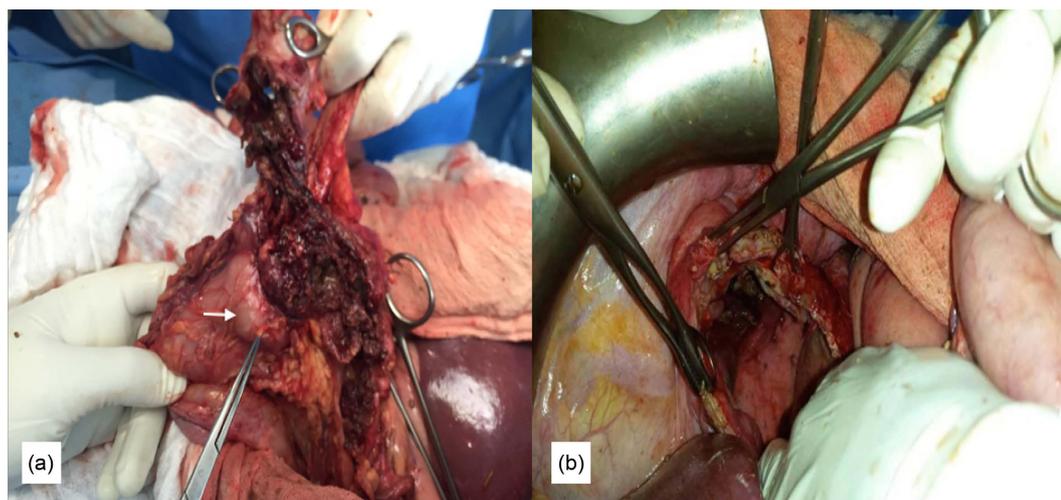
The patient was feverish presenting a polypnea at 32 cycles/min with a blood pressure of 90/60 mmHg and a weak pulse. The physical examination revealed the absence of breath sounds in the left hemithorax leading to a pleural effusion. Chest X-ray showed a left hydro pneumothorax with mediastinal shift to the right (**Figure 1**). The plain abdominal X ray showing the presence of air-fluid levels adjacent to an intrathoracic image (**Figure 1**). Biological tests revealed an infectious syndrome with elevated C-reactive protein to 20 times normal. According to this data, we suggest the diagnosis of complicated left diaphragmatic hernia. The investigation was completed by a thoraco abdominal CT scan with contrast injection, which showed that the hernia contained the splenic flexure, a stenosis and an irregular thickening of tumoral appearance (**Figure 2**). Surgical exploration through laparotomy showed a hernia of the left diaphragmatic cupola containing the transverse colon, where a tumor is located at 15 cm from the splenic flexure. The goal of the intervention was the conservative management of the hernia, through the release of the colonic segment and the tumor protruded, cleaning the pleural cavity through the diaphragmatic breach. A left hemi colectomy was performed carrying the tumor, followed by the repair of the diaphragm in interrupted sutures with non-resorbable surgical silk thread No. 1 (**Figure 3(a)** and **Figure 3(b)**). A left colostomy was crafted and the wall closed on 2 abdominal drains and one chest tube. The post operative outcome was represented by the appearance of a respiratory distress requiring ICU care, with a notable improvement. Histological analysis of the specimen concluded to a moderately differentiated adenocarcinoma infiltrating and with healthy resection margins (**Figure 4(a)** and **Figure 4(b)**). All lymph nodes removed were healthy. The file was discussed at the multidisciplinary reunion: the tumor was classified pT4N0Mx requiring adjuvant chemo-therapy before the restoration of digestive continuity.



**Figure 1.** Chest and abdomen X-ray showing left hydro pneumothorax with mediastinal shift to the right and the presence of air-fluid levels adjacent to an intrathoracic image.



**Figure 2.** CT scan with contrast injection, showed adiaaphragmatic hernia associated with left hydro pneumothorax with mediastinal shift to the right.

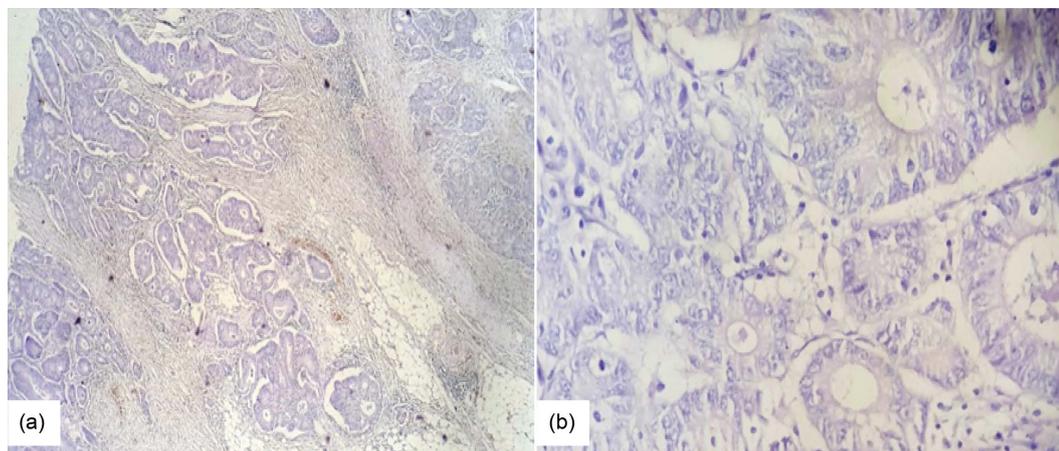


**Figure 3.** (a) Intraoperative view showing the tumor (clip) after release of the herniated bowel segment; (b) Intraoperative view showing the diaphragmatic breach before phrenorrhaphy.

### 3. Discussion

Post traumatic diaphragmatic hernia is the result of a muscle breach of diaphragmatic cupola, that can be complicated with an intra thoracic of the abdominal viscera. It represent specific lesions in trauma and often reflect the severity of the injury [4].

As in the case in our patient, the etiologies are represented by multiple trauma and thoraco-abdominal wounds; it is rarely a difficult child birth, a crash or a postoperative hernia [5]-[10]. In 70% - 90% of the cases, the hernia interests the left diaphragmatic hernia, given the protective role of the right liver. The hernia content is variable, the most frequent compounds are: gastric (31.8%), colon (27.2%), omentum (15.9%), the small intestine (13.6%), spleen (6.8%) and liver (4.5%) [11]. A colon tumor revealed by a post traumatic diaphragmatic hernia has never been described to our knowledge. On the histological level, it's difficult to determine which feature preceded, the timing of the tumor relative to the hernia is a real challenge. The presence of colonic tumor can precede the development of diaphragmatic hernia. It can also be a colon tumor developed within the hernia. In the specific



**Figure 4.** (a) HES  $\times$  50 showing the histology of the tumor showing a massive provision and glands, serous infiltrating colic; (b) HES  $\times$  400 showing the histology of the tumor with cyto-nuclear atypia.

case of our patient we suspected intra thoracic gradual migration of an existing tumor of the left colon following a traumatic rupture of the diaphragm during a fall from a height of 2 m, 4 years before. Clinically, the presence of tumor by its stenosing character accelerates certain symptoms including the bowel obstruction syndrome, Dyspnea betrays mediastinal compression by the intra thoracic herniated organs. The stercoral pleuritis is due to the perforation of the colon necrosis in the pleural cavity. This necrosis is secondary to ischemia of colonic segment strangled at the diaphragmatic defect. If the thoracoabdominal tomography allows to suspect the presence of the tumor, the diagnosis can only be obtained after a well conducted surgical exploration. The management of the stercoral pleuritis is an extreme emergency [12] [13]. The exclusive laparotomy is the most commonly used surgical approach to deal with diaphragmatic hernia and intra thoracic damage arising therefrom in one surgical intervention. It allows the management of the hernia, the anatomical resection of the colonic segment and the tumor, plus the pleural drainage through the diaphragmatic lesion. The occurrence of adhesions of the plura through the hernia defect justifies the thoracic surgical approach [13]. In order to shorten the operative time, we did not perform a thoracotomy in our patient, due to his precarious hemodynamic status. The repair of the diaphragm must be performed by interrupted sutures in nonabsorbable surgical thread [5]. The postoperative outcome was mainly represented by the appearance of septic complications. The pyothorax is the most common complication that can secondarily require surgical decortication [14]. The occurrence of mortality in diaphragmatic hernia remains frequent, despite immediate surgical care. It can reach 25% to 66% of cases. [12] In the specific case of our patient, the postoperative outcome was presented by a respiratory distress associated with empyema requiring ICU stay. The outcome was favorable under appropriate antibiotic therapy with pluridaily chest physiotherapy sessions. A classification of the tumor is possible through a histological study of the specimen. The follow up should be discussed case by case in the multidisciplinary consultation meetings. Pending the outcome of the histological study, confirming the presence of a moderately differentiated adenocarcinoma infiltrating and with resection margins that are healthy and negative nodes, the patient received adjuvant chemotherapy.

#### 4. Conclusion

Post traumatic diaphragmatic lesions are typically little-known; it can be responsible of major digestive complications which are sometimes lethal. The exclusive laparotomy is the most adequate procedure, allowing the management of the diaphragmatic hernia in one surgical intervention, which allows achieving all therapeutical objectives with minimal complications.

#### Conflict of Interest

The authors had no conflict of interest to declare.

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