

Late Presentation of Incarcerated Diaphragmatic Hernia after Blunt Abdominal Trauma. Clinical Case and Review of the Literature

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Abstract

Introduction: Traumatic diaphragmatic hernias occur in 0.5 - 8% of patients that suffer from multiple trauma. Some patients are diagnosed immediately after the trauma, but most of them are diagnosed weeks later presenting as complicated hernias. Additionally, post-traumatic diaphragmatic hernias might be associated with serious complications such as bowel obstruction and peritonitis; therefore, an early diagnosis is essential to reduce the subsequent morbidity and mortality.

Case Presentation: A 53-year-old male presented to the emergency unit complaining of pain in his upper abdomen and left hemithorax the last 24 hours. He had suffered blunt trauma to the left chest as a result of an accidental fall at home one month earlier. Abdominal Computer Tomography (CT) imaging revealed a left-sided diaphragmatic hernia with incarceration of the splenic angle of the colon through the left diaphragm. The patient underwent an urgent laparotomy. Findings in the operating room confirmed large bowel obstruction. The colon was incarcerated through a left diaphragmatic defect but was viable. A primary repair of the defect was performed with nonabsorbable suture. The patient recovery was uneventful and he was discharged home on postoperative day five.

Discussion: Diaphragmatic hernias in adulthood are frequently related to a previous trauma. In this patient, symptoms showed up one month after the trauma. Large bowel incarceration through the diaphragm is a life-threatening situation due to the risk of strangulation and ischemia. A computer tomography must be carried out as soon as possible to diagnose the patient. Prompt surgical treatment was performed to reduce the risk of morbidity. Nevertheless, a minimally invasive approach might have been carried out. The laparoscopic approach was considered initially as a good option for this patient, however, his previous heart medical history and his current dyspnoea secondary to his acute abdominal process changed our minds to an open approach to reduce the operative time.

Conclusions: Intestinal occlusion secondary to diaphragmatic traumatic hernias is unusual. Early diagnosis is essential for good results. The surgical approach can be either open or laparoscopic. The surgeon has to choose the most suitable approach for the patient according to his clinical condition.

Keywords: *Posttraumatic Diaphragmatic Hernia; Large Bowel Occlusion*

Introduction

Traumatic diaphragmatic hernias were described for the first time in 1541 by Sennertus [1]. Eventually, Riolfi carried out successfully surgical treatment for this pathology in 1886 [1].

The incidence of diaphragmatic hernias associated with multiple trauma vary from 0.5 to 8% [2]. In most cases these hernias are secondary to high impact trauma such as traffic accidents or high-rise falls. Diaphragmatic hernias are related to mild traumatism less frequently. Diaphragmatic lesions are caused by blunt and penetrating trauma in 75% and 25% of patients respectively [3].

Large bowel occlusion secondary to post-traumatic diaphragmatic hernia is rare. However, doctors should consider this condition in patients with a previous history of abdominal or chest trauma since these hernias are frequently asymptomatic. In fact, when symptoms occur, they are caused by complications that increase the morbidity and mortality of the process.

Case Presentation

A 53-year-old male presented acutely to the emergency unit complaining of pain in his upper abdomen and left hemithorax during the last 24 hours. The previous month he had suffered blunt trauma to the left of his chest as a result of an accidental fall at home. The physical exam revealed a distended, tympanic abdomen, with tenderness to palpation in the middle quadrants. After performing a chest X-Ray and a Computed Tomography (CT) with contrast (Figures 1-3), the patient was diagnosed with intestinal occlusion secondary to a diaphragmatic hernia that contained the splenic angle of the colon. The patient underwent an urgent left subcostal laparotomy. A left diaphragmatic defect of about 2 x 2 cm in diameter was found. The splenic angle of the colon and some greater omentum was incarcerated through the diaphragmatic defect. This explains the patient's large bowel obstruction. Once the colon was reduced from the left thorax into the abdominal cavity, a primary repair of the diaphragm was performed with a nonabsorbable suture. The colon was viable thus resection was not necessary. The patient's recovery was prompt and without complications. Oral intake was resumed and the patient was discharged home on postoperative day five. The patient has remained asymptomatic during the follow-up.

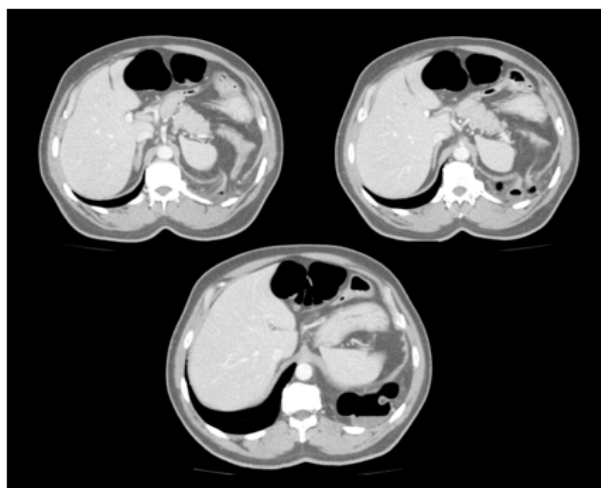


Figure 1: CT scan image where it can be seen some large bowel incarcerated into the left chest.



Figure 2: CT scan lateral image.



Figure 3: CT scan front image

Discussion

Large diaphragmatic hernias are frequently diagnosed during the acute episode of an abdominal trauma due to the clinical repercussion they usually cause. However, small diaphragmatic defects are often unnoticed initially but over time they tend to grow in size allowing the bowel to move up into the chest even a long time after the trauma.

Late clinical presentation is usually related to unspecific abdominal and chest symptoms. In fact, they are frequently diagnosed years later [4,5]. In our patient, the trauma took place a month before he presented to the emergency department with bowel obstruction. He remained asymptomatic until then. Probably, his recent history of an abdominal trauma caused him an asymptomatic hernia that enlarged progressively and led him to colon incarceration with occlusion.

Depending on the time of the trauma and the beginning of symptoms, diaphragmatic hernias can be classified as acute or early when symptoms appear during the first 14 days from the traumatism; latent, or those diagnosed by radiology as an incidental finding; and late or chronic, when the hernia is diagnosed because of complications such as occlusion or perforation [6,7]. In our case, we can consider it a late or chronic hernia.

According to the literature, traumatic diaphragmatic hernias are left-sided in 80 - 90% of patients [6]. However, several studies have shown that the incidence is similar in both sides [1,2]. It seems that the real incidence of right-sided hernias is likely underestimated due to the anatomically protective location of the liver. Therefore, left-sided hernias would be more easily diagnosed because of its symptomatology and right-sided hernias seem to be more underreported. Moreover, right diaphragmatic traumas are associated with higher mortality because of the liver lesions [9,10], which reduce even more the diagnosis of symptomatic right-sided diaphragmatic hernias.

Depend on the hernia content. According to literature, the stomach is the organ most frequently affected [4,9]. The symptoms are usually nonspecific or vague when the hernia is not complicated [8,13]. Chest pain, nausea, vomiting and dyspnoea are the most frequent symptoms. The main symptoms of our patient were abdominal pain and distension associated with vomiting.

A chest radiograph should be the first radiological investigation to be performed [10,12]. It has a sensibility of 46% to detect lesions in the left diaphragm and 17% in the right side [9,10]. The typical findings are the presence of air-fluid level above the diaphragm (more specific) or pleural effusion, elevation of more than 4 cm of the hemi-diaphragm compared with the opposite site, abnormalities in the contour or atelectasis (unspecific findings) [3,12]. Our patient's chest radiograph showed some air-fluid levels above the left diaphragm.

The gold standard in patients hemodynamically stable is the computer tomography (CT) studies. It offers a diagnosis and also provides information about the size of the defect, the organs involved in the hernia and possible complications associated, such as an intestinal perforation. The CT imaging offers a sensibility of 71% and a specificity of 100% [9,13]. In our patient, a chest radiograph and a CT scan was enough to diagnose the patient and to indicate an urgent need for intervention. A delayed diagnosis and treatment in patients presenting with symptoms can result in a high rate of morbidity and mortality [11,14].

According to the literature, the surgical approach could be abdominal, thoracic or combined. Moreover, the surgery might be carried out by a minimally invasive technique or an open approach. When the diagnosis is made during the acute period, it is advisable to perform an open approach in order to achieve an early damage control. The hernia has to be reduced and the diaphragmatic defect repaired with nonabsorbable sutures [2]. When it is not possible to achieve a tension-free primary closure with sutures, a mesh repair is indicated [4,15]. In our patient we decided an open approach due to his previous heart medical history, his current respiratory situation and his dilated bowel. According to the CT scan, the large bowel was incarcerated and it was not clear whether the vascularization was affected or not. Finally, the colon was viable and it was not necessary to perform any bowel resection. It is crucial for these patients to be diagnosed early during the acute phase and to carry out a prompt intervention in order to reduce the risk of morbidity and mortality.

Conclusion

Diaphragmatic traumatic hernias are a rare cause of intestinal occlusion. Since an early diagnosis is essential for good results, it is important to rule out a complicated diaphragmatic hernia in any patient presenting with bowel obstruction and a personal history of abdominal or thoracic trauma. A CT scan is important to diagnose the patient and a chest radiograph can also be helpful in the process. The surgical approach might be either open or laparoscopic. The surgeon has to choose the most suitable approach for the patient according to his or her clinical condition.

Conflict of Interest

We declare that we do not have any conflict of interest.

Bibliography

1. Goh B., *et al.* "Delayed presentation of a patient with ruptured diaphragm complicated by gastric incarceration and perforation after apparently minor blunt trauma". *Canadian Journal of Emergency Medicine* 6.4 (2004): 277-280.
2. Crandall M., *et al.* "Posttraumatic hernias: historical overview and review of the literature". *American Surgeon* 73.9 (2007): 845-850.
3. Lal S., *et al.* "Delayed presentation of post traumatic diaphragmatic hernia". *Journal of Surgical Case Reports* 7 (2011): 6.
4. Bhatti UH and Dawani S. "Large bowel obstruction complicating a posttraumatic diaphragmatic hernia". *Singapore Medical Journal* 56.4 (2015): 56-58.
5. Toliczenko-Bernatowicz D., *et al.* "Colon volvulus displaced into de chest-right-sided posttraumatic hernia or congenital malformation?" *Kadiochirurgia i Torakochirurgia Polska* 13.2 (2016): 159-161.
6. Kumar S., *et al.* "An undiagnosed left sided traumatic diaphragmatic hernia presenting as small intestinal strangulation: A case report". *International Journal of Surgery Case Reports* 4.5 (2013): 446-448.
7. Yetkin G., *et al.* "Traumatic diaphragmatic hernia resulting in intestinal obstruction". *BMJ Case Reports* (2009).
8. Alimoglu O., *et al.* "Delayed traumatic diaphragmatic hernias presenting with strangulation". *Hernia* 8.4 (2004): 393-396.

9. Kumar A., *et al.* "Missed diaphragmatic injury after blunt trauma presenting with colonic strangulation: a rare scenario". *BMJ Case Reports* (2017).
10. Menéndez-Sánchez P., *et al.* "Obstrucción intestinal tardía como consecuencia de una hernia diafragmática postraumatismo". *Cirugía y Cirujanos* 80 (2012): 72-75.
11. Nicholson F. "Diaphragmatic hernia". *Annals of Surgery* 136.1 (1952): 174-182.
12. Cruz CJ and Minagi H. "Large-bowel obstruction resulting from traumatic diaphragmatic hernia: imaging finding in four cases". *American Journal of Roentgenology* 162.4 (1994): 843-845.
13. Koh H., *et al.* "Incarcerated diaphragmatic hernia as a cause of acute abdomen". *Journal of Surgical Case Reports* 10.4 (2012): 1-3.
14. Moore CM., *et al.* "A case of congenital eventration of the diaphragm mimicking traumatic diaphragmatic rupture". *Injury* 32.6 (2001): 508-509.
15. Singh S., *et al.* "Delayed presentation of strangulated congenital diaphragmatic hernia: learning from our experience". *Hernia* 17.3 (2013): 403-407.

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