



Post-Traumatic Left Diaphragmatic Hernia of Late Presentation: Case Report

Alejandro Flores Uribe^{1*}, Heriberto Ochoa Cantú¹, Lucia Patricia Cano Pérez¹, Graciela Roxana Rock de la Peña¹, Eduardo Chávez Ornelas¹, Rogelio Alejandro Sifuentes Gallardo¹, Juan de Dios López Montero¹ and Arturo Reyes Esparza²

¹Department of General Surgery, Christus Muguerza Alta Especialidad Hospital, Mexico

²Department of General Surgery, Christus Muguerza Del Parque Hospital, Mexico

Abstract

This case report reveals the importance of laparoscopic management and the successful evolution of a 33-year-old patient with a 1.5 cm long left diaphragmatic hernia due to a car crash that occurred 7 years earlier, who presented with a week of intense stabbing pain in the epigastrium, accompanied by multiple vomiting. For this reason, in patients with a history of thoracoabdominal injury, the diagnosis of diaphragmatic hernia should be considered.

Keywords: Delayed diaphragmatic hernia; Rupture; Traumatic; Laparoscopic; Thoracic Injuries

Introduction

Diaphragmatic hernia is a benign entity that can become life-threatening [1] and is defined as a defect in the continuity of muscle fibers, which allows communication between the abdominal and thoracic cavities, which can be life-threatening [2,3]. It can be of congenital or acquired origin [4], of traumatic origin, which will always produce restrictive pulmonary alterations [3]. It is estimated that its incidence varies from 0.8% to 5.8%, [2,5-7] with an average of 3% in all traumatic abdominal-thoracic injuries; in the case of trauma, the left hemidiaphragm is injured in between 50% and 80% of cases, [3] while injuries on the right side occur less frequently, since it is more resistant to ruptures due to the size of the liver. Which has a protective effect [3] and in 1.5% of cases they can be bilateral; [3,8,9] about 0.9% of ruptures are pericardial [10]. It is estimated that 30% of traumatic hernias they are late, and symptoms may present 24 h after the trauma [11] or may go unnoticed for up to 50 years [12]. The clinical presentation is more frequently related to intense acute pain of sudden onset in the epigastrium, accompanied by nausea and/or vomiting. CT is considered the gold standard imaging study for its diagnosis and classification, [3] the laparoscopic approach is the surgical management of choice [3] for primary closure of the defect or with mesh placement, depending on its size. Generally, respond well to surgical treatment and present a favorable evolution and prognosis.

Case Presentation

A 33-year-old male patient, Mexican, professional, married with economic independence and a BMI of 25.7, reports having a history of left rib fracture due to a car crash 7 years ago, began 7 h prior to admission to the emergency department to present intense stabbing pain, located in the epigastrium, accompanied by vomiting on multiple occasions, upon admission. It has a father with type 2 diabetes mellitus and a mother without chronic degenerative diseases, the patient reports consumption of alcohol and occasional tobacco.

He presents stable signs, on physical examination the abdomen with decreased peristalsis, painful on palpation in the epigastrium, without signs of peritoneal irritation. Laboratories show a hemoglobin figure of 13.7 (14 g/dl to 18 g/dl), Mean Corpuscular Volume (MCV) of 89.4 (80 fL to 94 fL), Mean Corpuscular Hemoglobin (MCH) of 31.2 (28 pg to 32 pg), leukocytes of 9,150 (4,500 to 11,500) with neutrophils of 59.5% (50% to 70%), eosinophils of 1.8% (1% to 3%), other studies within normal parameters. A thoracoabdominal CT scan was requested, which reported a 1.5 cm defect at the left diaphragmatic level with protrusion of fat. Omentum, portion of the transverse colon and splenic flexure, which is why it is scheduled for laparoscopic diaphragmatic plasty.

The procedure was performed by an external doctor with five years of experience as a general surgeon; the procedure was performed in a high specialty hospital in northern Mexico. There were no changes in planning or management in the preoperative and trans-operative period.

OPEN ACCESS

*Correspondence:

Alejandro Flores Uribe, Department of General Surgery, Christus Muguerza Alta Especialidad Hospital, Universidad de Monterrey (UDEM), Av Ignacio Morones Prieto 4500, Jesús M Garza, San Pedro Garza García, NL 66238, Mexico, Tel: +52-8116813399; E-mail: alexfloresuribe@gmail.com

Received Date: 11 Jan 2023

Accepted Date: 01 Feb 2023

Published Date: 06 Feb 2023

Citation:

Uribe AF, Cantú HO, Pérez LPC, Rock de la Peña GR, Ornelas EC, Gallardo RAS, et al. Post-Traumatic Left Diaphragmatic Hernia of Late Presentation: Case Report. *World J Surg Surgical Res.* 2023; 6: 1448.

Copyright © 2023 Uribe AF. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

A preoperative scheme was initiated with cephalothin (1 g IV every 12 h), acetaminophen (1 g IV every 8 h), and ketorolac (30 mg IV every 8 h), there was no pre-existing disease type preparation that will indicate a special type of preparation for this procedure.

The presence of a left diaphragmatic hernia with omental and colonic content is visualized, which is presented as a surgical technique for its definitive management. For its laparoscopic approach, It was performed with balanced general anesthesia, an approach that began with the patient in a supine position, performing a wash with chlorhexidine at the incision site, 4 trocars are placed: one of 11 mm transumbilical and three of 5 mm, one in epigastrium, other in left hypochondrium and left flank, after this the content is reduced inside the intraabdominal space and the hernia was gently placed, a left pneumokit was placed due to secondary pneumothorax, a 1.5 cm defect was presented and primary closure was performed with a 1-0 barbed suture with continuous suture, finally hemostasis was performed and adequate drainage's placement without acute complications (Figure 1). In the postoperative period, cephalothin (1 g IV every 12 h), ketorolac (30 mg IV every 8 h), acetaminophen (1 g IV every 8 h) and omeprazole (40 mg IV every 24 h) were used.

One of the difficulties at the time of making the diagnosis was the presence of a non-specific and insidious clinic, coupled with the lack of routine studies. The differential diagnosis in early stages is important with traumatic history, clinic and imaging studies.

This patient evolved successfully and satisfactorily, where he began to channel gases at 48 h and began a progressive tolerance to the diet at 72 h postoperatively, with an initial drainage of 20 cc serohematic, without data of systemic inflammatory response. She was discharged on the 4th postoperative day, with indications for monitoring and assessment of oxygen saturation. A private follow-up consultation was summoned on days 7 for an adequate assessment.

No laboratory or imaging studies were requested at the consultation. Postoperative instructions were relative rest, normal diet, no heavy carrying, wound healings with antiseptic every 8 h, and acetaminophen (500 mg VO every 8 h for 7 days) for pain management and cephalexin (500 mg every 8 h for 10 days) as antimicrobial prophylaxis.

The patient only reported having mild pain related to surgical

wounds. No scale was used to assess quality of life. There was no increase in morbidity/mortality after 30 days of hospital discharge.

Discussion

It has been reported that late diaphragmatic hernias that can go unnoticed for a long time, presenting symptoms only after 24 h, [8] 4 days, [13] 9 days, [14] 10 days, [8] 11 days, [8,15] 6 months, [16-18] 7 months, [19] 1 year, [20,21] 1 year 6 months, [22] 2 years, [23,24], 4 years, [3] 5 years, [25,26] 6 years, [3,10] 8 years, [27] 10 years, [28] 20 years, [29] 26 years, [30] 28 years, [31] 40 years, [32] and up to 50 years [12].

The symptoms with which patients come to the consultation are very varied and it has been found that severe symptoms are commonly present in left and bilateral ruptures, some of which have ended fatally due to visceral strangulation [3]. The rupture of the left hemidiaphragm presents acutely obstructive gastrointestinal symptoms, chronic dyspnea, recurrent pain in the thoracoabdominal area, postprandial fullness, and vomiting, with a tendency to cardiorespiratory failure [3]. Rupture of the right hemidiaphragm is commonly limited to respiratory difficulties; the liver can hinder the further herniation of the viscera due to its partial displacement [3].

Radiographically, radiopacities are found in the hemithorax, indicating which viscera have been strangled, accompanied by a displacement of the mediastinum towards the contralateral side [3].

Depending on the type of injury (acute or chronic), the laterality of the injury, associated abdominal or thoracic injury, the surgeon's experience and the availability of equipment, the surgical approach will be (laparotomy, thoracotomy, combined laparotomy and thoracotomy, thoracoabdominal, laparoscopy), and Video-Assisted Thoracic Surgery or thoracoscopy) [9]. Laparoscopic management has been classified as a safe treatment by several authors [3,30,33], since it consists of a minimally invasive technique that is particularly useful for diagnosing and repairing small tears [9,34].

The clinical case presented is one of the few reported with such a late symptomatological latency and differs from the others due to its laparoscopic surgical approach with five trocars and a pneumokit, demonstrating that it is a highly indicated approach for small ruptures, safe, practical and effective [3] with which visceral-pleural adhesions and intrathoracic visceral puncture that can lead to

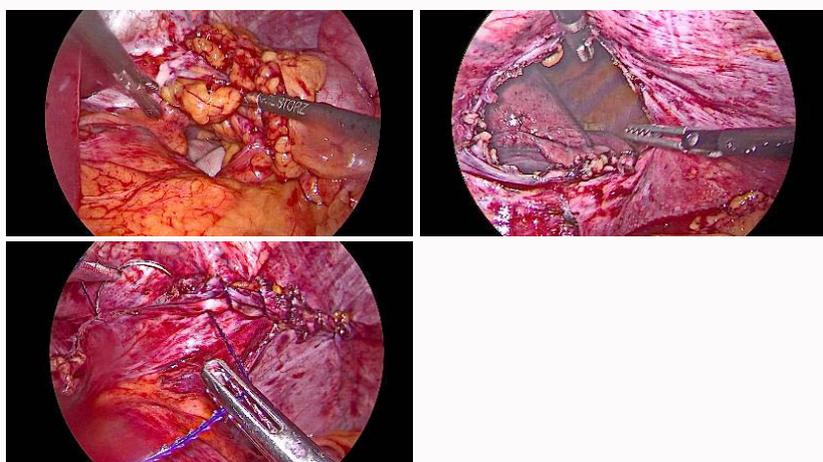


Figure 1: Left diaphragmatic hernia with omental and colonic content. A: content reduction. B: presence of a 1.5 mm defect. C: primary closure with continuous suture.

disastrous complications are avoided [35].

Patient perspective

The perspective of the patient regarding the clinical problem was that he did not expect it to be a case of post-traumatic hernia, since in her family no one had presented something similar, that at first he felt a non-specific pain in his abdomen, after this during its evolution was increasing the intensity of pain and dyspnea, for this reason they decided to go to the emergency department to consultation for its assessment, and with this same after the thoracoabdominal CT the diagnosis was made, the patient after the surgical procedure reported a significant improvement in her general condition and pain, based on this, it is necessary to emphasize the importance of going to a routine and at the same time timely medical evaluation when presenting any type of pain located in either abdomen regardless of age, so in turn avoid long-term complications, said the patient and his family who are grateful for the management, evolution and well-being of the same.

Methods

This case report has been reported in line with the SCARE Criteria [12].

Conclusion

The knowledge of the possible appearance on this pathology makes it essential when taking it into account in our differential diagnoses. Diaphragmatic hernias are known to be conditions of acute presentation, in this case it presents late, 7 years after rib trauma, the clinical presentation will depend on the structures that are compromised in it, the laparoscopic approach is considered today nowadays its gold standard, also depending on the size of the defect, it would be closed primarily or with mesh placement, its prognosis is generally favorable for these cases. We strongly invite our lectors to read the discussion as well as read accompanying literature to learn or remember the ideal management of these patients.

Authors Contribution

Alejandro Flores Uribe: Patient care, clinical case, writing. Heriberto Ochoa Cantú: Writing and translation. Lucia Patricia Cano Pérez: Patient care, clinical case. Graciela Roxana Rock de la Peña: Writing and translation. Eduardo Chávez Ornelas: Writing and translation. Rogelio Alejandro Sifuentes Gallardo: Patient care, clinical case. Juan de Dios López Montero: Patient care, clinical case. Arturo Reyes Esparza: Patient care, clinical case.

References

- Tessely H, Journé S, Therasse A, Hossey D, Lemaitre J. A case of colon necrosis resulting from a delayed traumatic diaphragmatic hernia. *J Surg Case Rep.* 2020;2020(6):rjaa101.
- Brito G, Iraizoz AM. [Catastrophic traumatic diaphragmatic hernia with subtotal section of the pylorus: Case report]. *An Sist Sanit Navar.* 2020;43(3):411-5.
- Testini M, Girardi A, Isernia RM, De Palma A, Catalano G, Pezzolla A, et al. Emergency surgery due to diaphragmatic hernia: Case series and review. *World J Emerg Surg.* 2017;12:23.
- Pástor-Romero SA, Vélez-Bastidas GG. Manejo laparoscópico de hernia diafragmática traumática: Reporte de un caso. *Revista Eugenio Espejo.* 2020;14(2):92-101.
- Reber PU, Schmied B, Seiler CA, Baer HU, Patel AG, Buchler MW. Missed diaphragmatic injuries and their long-term sequelae. *J Trauma.* 1998;44(1):183-8.
- Shaban Y, Elkbuli A, McKenney M, Boneva D. Traumatic diaphragmatic rupture with transthoracic organ herniation: A case report and review of literature. *Am J Case Rep.* 2020;21:e919442.
- Beltrán SMA, Oyarzún S JD, Castro GD, Andrade LP, Fernández RC. Hernia diafragmática secundaria a trauma: Presentación tardía. *Rev Chil Cir.* 2018;70(5):409-17.
- Sirbu H, Busch T, Spillner J, Schachtrupp A, Autschbach R. Late bilateral diaphragmatic rupture: Challenging diagnostic and surgical repair. *Hernia.* 2005;9:90-2.
- Okyere I, Mensah S, Singh S, Okyere P, Kyei I, Brenu SG. Surgical management of traumatic diaphragmatic rupture: Ten-year experience in a Teaching Hospital in Ghana. *J Cardio Thorac Surg.* 2022;19(1):28-35.
- Çipe G, Genç V, Uzun Ç, Atasoy Ç, Erkek B. Delayed presentation of a traumatic diaphragmatic rupture with intrapericardial herniation. *Hernia.* 2012;16:485-8.
- Rashid F, Chakrabarty MM, Singh R, Iftikhar SY. A review on delayed presentation of diaphragmatic rupture. *World J Emerg Surg.* 2009;4:32.
- Singh S, Kalan MMH, Moreyra CE, Buckman RF. Diaphragmatic rupture presenting 50 years after the traumatic event. *J Trauma.* 2000;49(1):156-9.
- Machaku D, Gnanamuttupulle M, Wampembe E, Chilonga K. A rare case report of perforated viscerothorax in a traumatic diaphragmatic rupture. *Int J Surg Case Rep.* 2022;99:107688.
- Launey Y, Geeraerts T, Martin L, Duranteau J. Delayed traumatic right diaphragmatic rupture. *Anesthesia Analgesia.* 2007;104(1):224-5.
- Goh BKP, Wong ASY, Tay KH, Hoe MNY. Delayed presentation of a patient with a ruptured diaphragm complicated by gastric incarceration and perforation after apparently minor blunt trauma. *CJEM.* 2004;6(4):277-80.
- Kelly J, Condon ET, Kirwan WO, Redmond HP. Post-traumatic tension faecopneumothorax in a young male: Case report. *World J Emerg Surg.* 2008;3:20.
- Pojarliev T, Tzvetkov I, Blagov J, Radionov M. Laparoscopic repair of traumatic rupture of the left diaphragm cupola with prosthetic mesh. *Surg Endosc.* 2003;17(4):660.
- Di Muzio B. Traumatic diaphragmatic hernia - delayed presentation. *Radiopaedia.org.* 2018.
- Kumar KJ, Jagadish K, Anil Kumar MG. Delayed presentation of traumatic diaphragmatic hernia. *Indian Pediatr.* 2013;50:709-10.
- Walchalk LR, Stanfield SC. Delayed presentation of traumatic diaphragmatic rupture. *J Emerg Med.* 2010;39:21-4.
- Mousa W, Lapa C, Grossart C, Haq A. Delayed presentation of traumatic diaphragmatic rupture with tension colothorax and strangulation of the transverse colon. *BMJ Case Rep.* 2020;13(5):e233336.
- Rossetti G, Bruscianno L, Maffettone V, Napolitano V, Sciaudone G, Del Genio G, et al. Giant right post-traumatic diaphragmatic hernia: Laparoscopic repair without a mesh. *Chir Ital.* 2005;57(2):243-6.
- Xiao JC, Ma LY, Li BL. Late traumatic diaphragmatic rupture complicated by haemothorax and strangulation of the stomach: A case report. *J Int Med Res.* 2020;48(6):300060520930864.
- Al-Mashat F, Sibiany A, Kensarah A, Eibany K. Delayed presentation of traumatic diaphragmatic rupture. *Indian J Chest Dis Allied Sci.* 2002;44(2):121-4.
- Toh PY, Parys S, Watanabe Y. Traumatic diaphragmatic rupture: Delayed presentation following a SCUBA dive. *BMJ Case Rep.* 2020;13(9):e234040.
- Alsuwajj AH, Al Nasser AH, Al Dehailan AM, Alburayman AZ, Alhuwajji KA, Binsifran KF, et al. Giant traumatic diaphragmatic hernia: A report of delayed presentation. *Cureus.* 2021;13(12):e20315.

27. Kafih M, Boufettal R. [A late post-traumatic diaphragmatic hernia revealed by a tension fecopneumothorax (a case report)]. *Rev Pneumol Clin.* 2009;65(1):23-6.
28. Christie BD, Chapman J, Wynne JL, Ashley DW. Delayed right-sided diaphragmatic rupture and chronic herniation of unusual abdominal contents. *JACS.* 2007;204(1):176.
29. Shreck GL, Toalson TW. Delayed presentation of traumatic rupture of the diaphragm. *J Okla State Med Assoc.* 2003;96(4):181-3.
30. Popovic T, Nikolic S, Radovanovic B, Jovanovic T. Missed diaphragmatic rupture and progressive hepatothorax, 26 years after blunt injury. *Eur J Trauma.* 2004;30:43-6.
31. Hariharan D, Singhal R, Kinra S, Chilton A. Posttraumatic intra thoracic spleen presenting with upper GI bleed! A case report. *BMC Gastroenterol.* 2006;6:38.
32. Faul JL. Diaphragmatic rupture presenting forty years after injury. *J Trauma.* 1998;29(6):479-80.
33. Bergeron E, Clas D, Ratté S, Beauchamp G, Denis R, Evans D, et al. Impact of deferred treatment of blunt diaphragmatic rupture: A 15-year experience in six trauma centers in Quebec. *J Trauma.* 2002;52(4):633-40.
34. Ferguson MK. Difficult decisions in thoracic surgery: An evidence-based approach. *Springer Sci Business Media.* 2011. p. 504.
35. Mansour KA. Trauma to the diaphragm. *Chest Surg Clin N Am.* 1997;7(2):373-83.