

## Hepatothorax: a rare entity in blunt trauma

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### Abstract

Post-traumatic right -sided diaphragmatic hernia occurring after diaphragmatic rupture is a very rare condition because the right diaphragm is protected by the liver. However, its incidence increases after severe trauma on the right side. Liver herniation through ruptured diaphragm is one of the causes of severe atelectasis in the right lung which may cause respiratory distress and hemodynamic impairment. Diaphragmatic rupture is an emergency. Herein, we present a 56-year-old male patient with right-sided diaphragmatic rupture and hepatothorax developed three years after a traffic accident happened three years

**Keywords:** diaphragmatic hernia; hepatothorax; diaphragmatic rupture

### Introduction

Diaphragmatic rupture is a clinical condition that occurs after a sudden increase in intra-abdominal pressure. Diaphragmatic rupture is detected in 1-7% of patients with major blunt, and 10-15% of patients with penetrating trauma. Left diaphragmatic ruptures are more common [1]. Intrathoracic herniation of abdominal organs following diaphragmatic injury is rare and difficult to identify. Stomach, spleen, and colon are mostly herniated organs [2]. In this study, we present a 56-year-old male patient who was operated for Right-sided diaphragmatic rupture and hepatothorax.

### Case Presentation

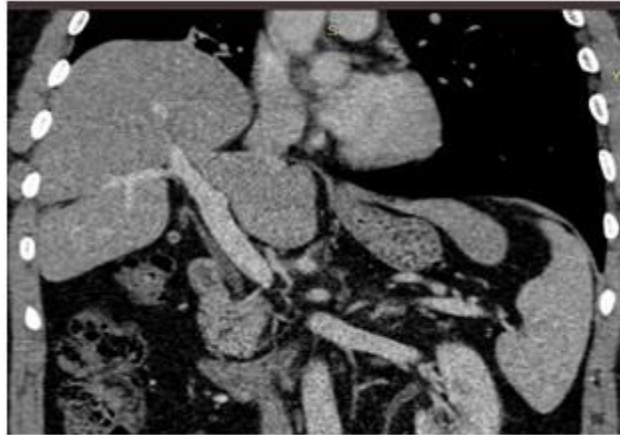
A 56-year-old male patient was admitted to our clinic with shortness of breath and pain on his right side. He was hemodynamically stable despite the presence of hypertension. The patient's heart rate ( 98 bpm: sinus rhythm), blood pressure (110/70 mmHg), and arterial oxygen saturation (93%) were as indicated. He had a motor vehicle accident three years previously.. His breathing sounds decreased during auscultation of the right hemithorax. Elevated right hemi-diaphragm was seen on posterior anterior chest radiograms (**Figure 1**).



Figure 1

The subsequent thoracic CT demonstrated the rupture of the right hemidiaphragm and hepatic herniation into the right hemithorax (**Figure 2**). Due to this life-threatening emergency situation of the hemodynamically unstable patient, thoracotomy was performed through the 6th intercostal space. Diaphragmatic dislocation was observed extending from the hemidiaphragmatic chest wall to the anterior lateral rib cage. The liver

was completely surrounded by the chest wall, with the upper part of the chest wall facing upwards (**Figure 3**). After positioning the liver back into the abdominal cavity, the diaphragmatic rupture side was closed with silk 2-0 sutures, and the diaphragm was then repositioned in the rib cage. Any adverse event was not detected during the 14-month follow-up period.



**Figure 2**



**Figure 3**

## Discussion

Diaphragmatic rupture is a rare complication of abdominal or thoracic trauma. It has been reported in 10-15% of penetrating trauma, and 10-15% of blunt trauma patients. Approximately 1% of all diaphragmatic tears occur spontaneously and occur with sudden increase in abdominal pressure due to severe physical exertion, sudden bending movements, birth and severe cough. The incidence of diaphragm rupture after thoracoabdominal trauma is 0.8-5% in the early period and 30% in the late period. [3]. The case also occurred late after the traffic accident. A systematic review of the literature shows that there were only 6 cases of right-sided diaphragmatic rupture and 13 cases of liver hernia, and a delayed rupture of 24 hours to 50 years from trauma in the literature. In studies of non-traumatic diaphragmatic rupture, the overall rupture of the diaphragm is approximately 1% [4]. Right-sided diaphragm ruptures are a rare condition with nonspecific clinical and radiological findings and rapid diagnosis. Interestingly, early detection can often lead to serious complications. Various hypotheses have been made for late diaphragm rupture. The first hypothesis suggests that the diaphragm muscle develops

a process of lifelessness that occurs several hours or days after trauma. The most likely explanation is that diaphragmatic injuries occur clinically only after intrathoracic herniation of the abdominal organs [5]. The case presented with pain complaints in the right abdominal region. The radiological images were compatible with the clinic. Complicated with intrathoracic herniation of an abdominal organ, diaphragmatic rupture was first described by Sennertus in 1541 by autopsy of a patient who died of a herniated colon due to a diaphragm defect caused 7 months ago [6]. The clinical features of patients with diaphragm rupture are asymptomatic or non-specific. In the acute phase, patients are often considered an emergency with existing injuries that may impair their diagnosis. Chest pain, cough, mania, and shortness of breath are the most common symptoms [7]. There is shortness of breath and pain on the right side of the patient. Computed tomography is a very special tool for the preoperative diagnosis of abdominal thoracic scans in the acute phase. Therefore, if right diaphragm rupture is suspected, a direct abdominal CT should be performed. In this case, abdominal tomography and abdominal USG Surgical repair of hepatotrax should be urgent and should consist of transthoracic or transabdominal approach and liver reduction and

diaphragmatic defect repair. The use of intrathoracic or intrathoracic sutures in thoracic tubes represents a classic strategy [8]. The diaphragm was repaired with 2-0 silk sutures. In conclusion, we present a delayed rupture of the right diaphragm complicated by hepatothorax. Pre-operative detection of diaphragm rupture is very important in preventing life-threatening complications such as hepatothorax. Therefore, physicians should develop a later detective trial for rare cases and meet patients with respiratory distress or abdominal symptoms who show signs of sudden abdominal symptoms beginning a few days, months, or years later.

## Reference

1. Baek SJ, Kim J, Lee SH. (2012). Hepatothorax due to a right diaphragmatic rupture related to duodenal ulcer perforation. *World Journal of Gastroenterology*. **18**:5649-5652.
2. Vilallonga R, Pastor V, Alvarez L, Charco R, Armengol M, Navarro S. (2011). Right-sided diaphragmatic rupture after blunt trauma. An unusual entity. *World Journal of Emergency Surgery*.
3. Porcelli M, Prychyna O, Rosenthal A, Decostanza J. . (2011). Hepatothorax: a rare outcome of high-speed trauma. *Care Rep in Emerg Med*. 2011:905641.
4. Kastanakis M, Anyfantakis D, Kokkinos I, Petrakis G, Bobolakis E. (2013). Delayed post-traumatic diaphragmatic rupture complicated by total hepato-thorax: a case report. *Int J Surg Case Rep*. 4(6):537-539
5. Shah, M. Y., Abdrabou, A. A., & Obalappa, P. (2022). Delayed Presentation of Post-traumatic Multiorgan Left Diaphragmatic Hernia: A Case Report and Literature Review. *Cureus*, 14(7).
6. Alharmoodi, F., Ghabra, S., & Alharthi, S. (2022). Incidental traumatic right diaphragmatic rupture: a missed case after trauma. *Journal of the Korean Society of Traumatology*.
7. Shreck GL, Toalson TW. (2003). Delayed presentation of traumatic rupture of the diaphragm. *Journal of the Oklahoma State Medical Association*. **96**:181-183.



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