

CASE REPORT

Delayed presentation of left traumatic diaphragmatic hernia with displacement of spleen and stomach to left hemi thorax

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Abstract

We presented a case of late onset of left traumatic diaphragmatic hernia with displacement of spleen and stomach to the left hemi thorax, a year after the trauma. Gastric and respiratory complications along with herniation should be immediately managed, in order to reduce the risk of cardiac arrest and mortality.

KEYWORDS

cardiac arrest, diaphragmatic hernia, spleen, stomach, thorax, traumatic

1 | INTRODUCTION

The diaphragm is a lymphatic-muscular membrane that separates the abdominal cavity from the chest and is surrounded, on the right, by the liver and on the left by the abdominal cavity.¹ The diaphragm may rupture in penetrating and non-penetrating abdominal traumas, most of which are based on lesions on the left side.^{2,3} The displacement of the viscera caused by this rupture is divided into two stages: early and late stage.⁴ The late stage of diaphragmatic hernia gradually develops due to the pressure of the elements inside the abdominal cavity into the thoracic cavity,⁵ along with the adhesion of the abdominal organs to the lungs, the chest wall, and the pericardium.⁶ Surgery, in these cases, requires initial thoracotomy and the release of adhesions and repositioning of the viscera inside the abdomen and repair of the diaphragm.⁷

2 | CASE PRESENTATION

We present a case of a 53-year-old veteran who was wounded in the war in 1986. During the war, the patient

had shrapnel wounds on the left side of the chest. The patient had vascular myelopathy during the war, without spinal fracture, and had been suffering from paraplegia of both lower limbs and was referred to sanatorium for his treatment. A year ago, he suffered a fracture of the right femur and left ankle due to falling from a wheelchair. He was presented to the medical facility with nausea, vomiting, pain, and dry mouth.

Primary physical examination of the abdomen revealed abdominal distention and tenderness at epigastrium and his radiograph duodenal double bubble signs. His body temperature was 36.5°C, and blood pressure was 130/70 mm Hg. His symptoms were improved following intravenous fluid therapy. Twenty-four hours after hospitalization, the distention and tenderness of the patient's abdomen also decreased. An endoscopy was performed, according to which the patient was diagnosed with sliding hiatal hernia of esophagus and mesenteroaxial volvulus of stomach was seen, and therefore, patient was candidate for the surgery. The spiral CT of abdominal and pelvis showed thickness of left hemi diaphragm with upward displacement and a large diaphragmatic hernia. Intrathoracic part of stomach fundus showed volvulus as well

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as an isodense oval structure in favor of accessory spleen along with focal fat was seen (Figure 1).

Initially, central venous line was placed, and patient underwent surgery with general anesthesia. During the operation, the left thoracotomy was performed in the fifth intercostal space using the right double lumen tube, and the lower lip of the lung was released. Due to the fact that the spleen and stomach are located in the chest, the abdominal wall was opened with the upper midline incision and the stomach was released. Then, by performing the left thoracoabdominal incision, along with the abdomen, the left half of the chest was raised by the trap-door method, and splenectomy was performed. For repairing the diaphragm, a proline mesh was placed on the diaphragm on the left thoracic floor. The chest wall was closed by inserting two chest tubes, at 6th rib and intercostal space and periepidural catheter. The patient was transferred to the ICU under following conditions:

Tidal volume: 600 cc, respiratory rate: 12, pressure support: 14, FIO₂: 60%, PEEP: 5

IV fluid and two packaged cells were administered to the patients due to anemia and hypotension (Table 1). Subsequent injections of norepinephrine and dopamine stabilized the patient's symptoms, which led to a reduced need of pressure support ventilation, and patients were switched to continuous positive airway pressure (CPAP) and T-piece system, eventually. Later, the patient was extubated.

As a result of splenectomy, patient was presented with leukocytosis, for which he underwent blood counseling. Due to the patient's specific physical condition and paraplegia, as well as his history of femoral and ankle fractures and his lower limb splint, crepe bandage was tied on both the legs to prevent deep vein thrombosis (DVT). During the hospitalization, the patient experienced sudden shortness of breath and chest pain, as a result of which he was examined for the possibility of pulmonary embolism. Multislice spiral chest CT

angiography, axial coronal, and sagittal views with 3D reconstruction showed no evidence of pulmonary thromboembolic event, but air space consolidation at posterior basal segment of lower lobe associated with large pleural effusion was seen bilaterally along with abscess of about 60 × 35 × 60 mm at upper segment of right lower lobe. X-ray showed bilateral pleural effusion for which pleural catheter was placed to drain the fluid. Patient's respiratory status was better after the drainage of 500 cc of the fluid (Figure 2).

Follow-up fluoroscopy using barium-based contrast material showed no wall defects and fullness along the esophagus. The esophageal mucosa was intact with complete and natural emptying of substance into stomach. Additionally, no evidence of ulcer or outpouching was seen.

In postoperative follow-up, the respiratory volume increased with the placement of the organs in their anatomical position, and oral nutrition was initiated. The patient was discharged in the healthy condition on 15th postoperative day.

3 | DISCUSSION

When misdiagnosed at the time of trauma, diaphragmatic injuries are likely to be presented after months and years after the trauma in 9.5%-61% cases.^{8,9} This case involves a 34-year-old history of penetrating trauma of a veteran who was diagnosed with left traumatic diaphragmatic hernia with displacement of spleen and stomach to the left hemithorax. The patient was surgically treatment following pulmonary complication, which was managed too. A number of cases studies have indicated delayed diagnosis of diaphragmatic hernia following the trauma, where most of these are diagnosed during the evaluation of other pathologies. The diagnosis of diaphragmatic hernia is accomplished by laparotomy.¹⁰

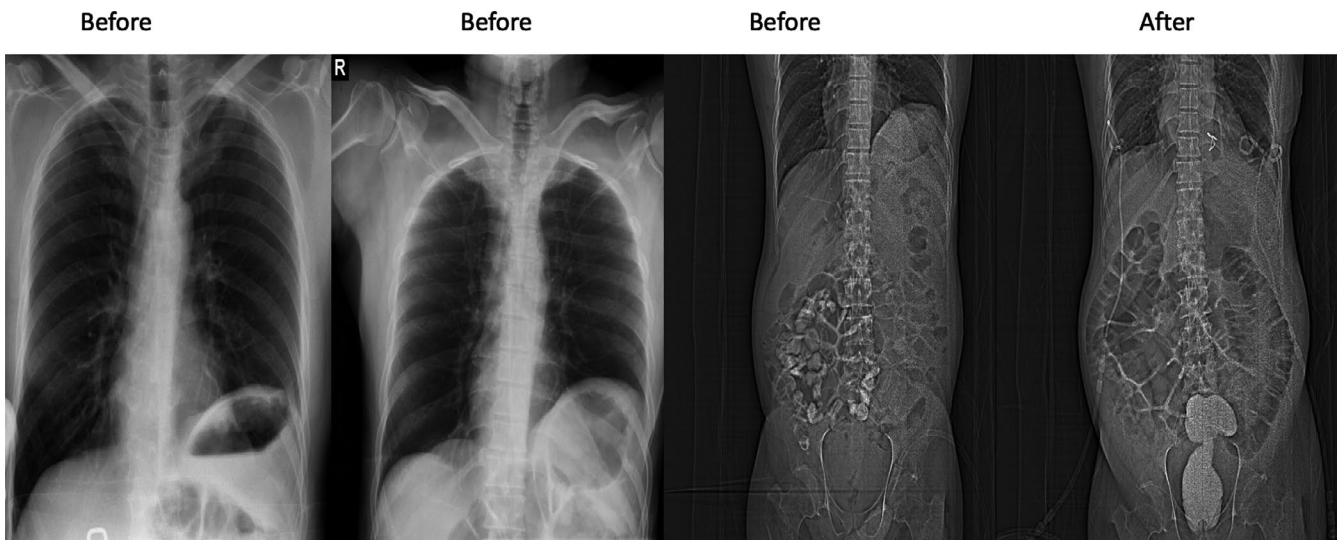
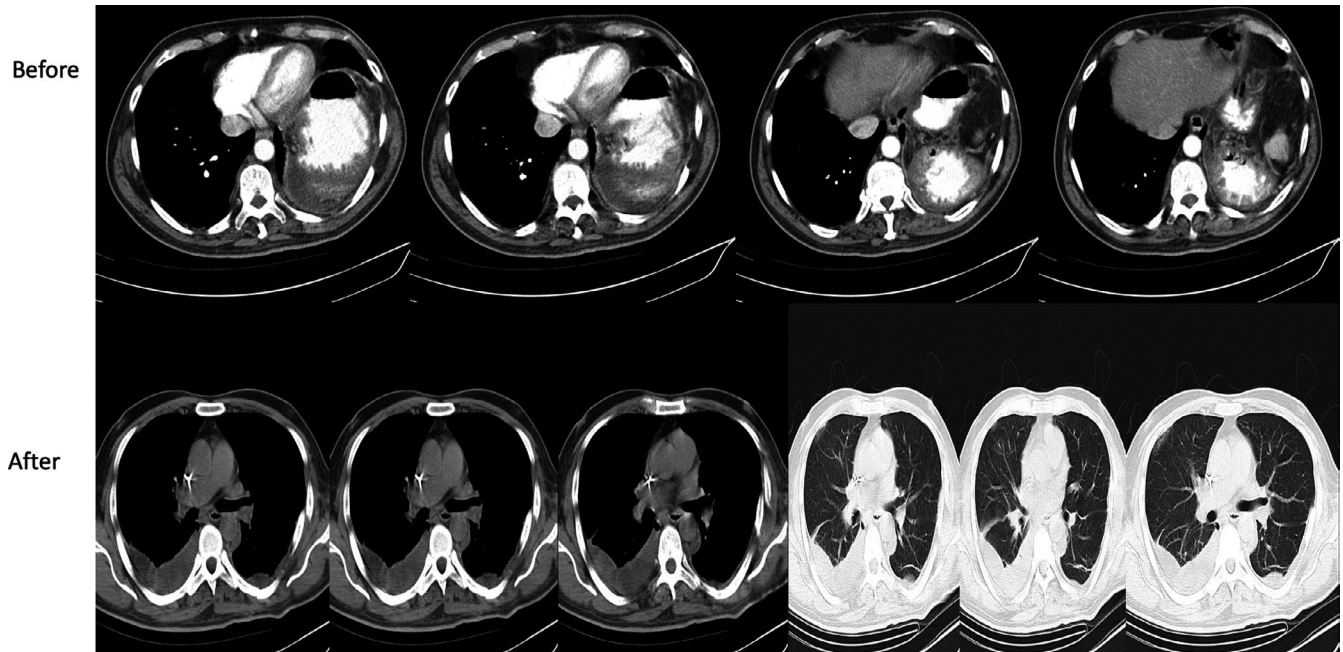


FIGURE 1 Spiral CT scan of abdomen and pelvic with contrast before and after operation

TABLE 1 The result of laboratory test before and after operation

	Hb Gr/ dL	WBC 10 ³ / mm ³	Albumin	Creat mg/dL	BUN	Ca mg/ dL	U/A	ALT	AST	ESR mm/h	K meq/L	Na meq/L	BS mg/ dL
Before operation	3.6	0.7	6	8.7	Glu+ Prot++	14	10	19	3.8	142	237	13.4	6.5
After operation	2.3	130		9.7	26					0.7	16	7.2	

**FIGURE 2** Multislice spiral chest CT angiography, axial coronal, and sagittal views with 3D reconstruction before and after operation

Dinc, et al¹¹ presented two cases of late onset of diaphragmatic herniation 3 and 28 years following chest trauma, respectively. The hernia was complicated by bowel obstruction and acute pancreatitis and was successfully managed surgically. Ganie, et al¹⁰ presented cases of late diaphragmatic tears where patients with left side hernia were had stomach and spleen herniations, whereas left side diaphragmatic hernia was seen with liver herniation. The overall mortality was 27%. A recent case report by da Costa, et al¹² reported diaphragmatic hernia with the displacement of abdominal viscera and two accessory spleens in a patient who had a history of stab trauma 9 years back. At the time of the injury, the trauma was managed with chest drainage without any evidence of abdominal injury. History taking, timely diagnosis with the onset of symptoms, and management can reduce morbidity and mortality, similar to the case presented.

4 | CONCLUSION

According to this case, it seems that if the symptoms of cardiopulmonary arrest occur in chest X-ray, it is possible

to distinguish between pneumothorax and herniation pressure of the organs of the body into the chest and their displacement. In patients who are diagnosed with herniated abdominal herniation of the thorax caused by past trauma, after diagnostic procedures such as X-ray radiography of the chest, CT scan with absorbable contrast can be helpful, to detect the adhesion of organs. However, immediate surgical management following the diagnosis is recommended.

CONFLICT OF INTEREST

The authors deny any conflict of interest in any terms or by any means during the study.

AUTHOR CONTRIBUTIONS

SMR: Conceptualized and designed the study, drafted the initial manuscript, and reviewed and revised the manuscript. PS: Designed the data collection instruments, collected data, carried out the initial analyses, and reviewed and revised the manuscript. HRT: Coordinated and supervised data collection, and critically reviewed the manuscript for important intellectual content.

ETHICAL APPROVAL

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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REFERENCES

1. Nano M, Dei MP, Mossetti C, Maggi G. Traumatic diaphragmatic hernias. *Surg Gynecol Obstet*. 1980;151(2):191-192.
2. Demetriades D, Kakoyiannis S, Parekh D, Hatzitheofilou C. Penetrating injuries of the diaphragm. *Br J Surg*. 1988;75(8):824-826.
3. Kuhn R, Schubert D, Marusch F, Lippert H, Pross M. Repair of diaphragmatic rupture by laparoscopic implantation of a polytetrafluoroethylene patch. *Surg Endosc*. 2002;16(10):1495b-b1595.
4. Nursal T, Ugurlu M, Kologlu M, Hamaloglu E. Traumatic diaphragmatic hernias: a report of 26 cases. *Hernia*. 2001;5(1):25-29.
5. Vermillion J, Wilson E, Smith R. Traumatic diaphragmatic hernia presenting as a tension fecopneumothorax. *Hernia*. 2001;5(3):158-160.
6. Pomerantz M, Rodgers BM, Sabiston DC. Traumatic diaphragmatic hernia. *Surgery*. 1968;64(3):529-534.
7. Hood RM. Traumatic diaphragmatic hernia. *Ann Thorac Surg*. 1971;12(3):311-324.
8. Christophi C. Diagnosis of traumatic diaphragmatic hernia: analysis of 63 cases. *World J Surg*. 1983;7(2):277-280.
9. Alizadeh R, Aghsaeifard Z, Marzban-rad Z, Marzban-rad S. Pregnancy with diaphragmatic and stomach rupture: lessons from a case report. *Clin Case Rep*. 2020;1-3. <https://doi.org/10.1002/ccr3.2878>
10. Ganie FA, Lone H, Lone GN, et al. Delayed presentation of traumatic diaphragmatic hernia: a diagnosis of suspicion with increased morbidity and mortality. *Trauma Mon*. 2013;18(1):12-16.
11. Dinc T, Kayilioglu SI, Coskun F. Late onset traumatic diaphragmatic herniation leading to intestinal obstruction and pancreatitis: two separate cases. *Case Rep Emerg Med*. 2015;2015:549013.
12. da Costa KG, da Silva RTS, de Melo MS, et al. Delayed diaphragmatic hernia after open trauma with unusual content: case report. *Int J Surg Case Rep*. 2019;64:50-53.

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