

A Case of Intraabdominal Bleeding Presented with Massive Hemothorax

Özlem Güler¹, Fatoş Kozanlı²

¹Kahramanmaraş Sütçü İmam University School of Medicine Department of Emergency Medicine

²Kahramanmaraş Sütçü İmam University School of Medicine Department of Thoracic Surgery

Abstract

Massive hemothorax is generally occurred due to intercostal artery injury, lung laceration, major vessel injury, or diaphragmatic rupture. Diagnosing a diaphragm injury can be difficult and requires high suspicion, especially when the patient has other related serious injuries. Diaphragm injury is often discovered in patients undergoing laparotomy to examine other abdominal injuries. Here we report a case of abdominal bleeding that occurred after blunt trauma resulted in massive hemothorax because of blood drainage into the thorax through the ruptured diaphragm without radiological abnormality and its successful treatment.

Keywords: Massive hemothorax, diaphragmatic rupture, liver laceration, inferior vena cava injury.

Introduction

Blunt chest trauma is the cause of approximately 25% of traumatic deaths and massive hemothorax is one of the most important causes of death. Massive hemothorax is generally occurred due to intercostal artery injury, lung laceration, major vessel injury, or diaphragmatic rupture^{1,2}. Diaphragmatic injuries of various degrees are detected in 0.8% - 1.6% of the patients who apply to hospitals due to blunt chest trauma³. Diagnosing diaphragm injury can be difficult. Recognition requires high suspicion, especially when the patient has other related serious injuries. Diaphragm injury is often discovered in patients undergoing laparotomy to examine other abdominal injuries. Diaphragm injury rarely life-threatening in the acute phase; however, injuries associated with diaphragm rupture are commonly life-threatening⁴. In this article we report a case of abdominal bleeding that occurred after blunt trauma resulted in massive hemothorax because of blood drainage into the thorax through the ruptured diaphragm without radiological abnormality and its successful treatment.

Case

A twenty-one-year-old male was brought to our emergency department due to a car accident. The general condition of the patient was moderate, conscious, orientated, and cooperative.

Vital findings were measured as TA:100/60mmHg, pulse: 110/min, SPO2:90%, and respiratory rate:24/min. The patient had respiratory distress and breath sounds were reduced in the right hemithorax in the physical examination. Dulness was detected in the percussion of the right hemithorax. Other system findings were normal. Laboratory parameters were within normal limits. The patient had hypotension and tachycardia and thoracentesis was performed. Thoracentesis fluid was hemorrhagic so the patient underwent tube thoracostomy and isotonic fluid therapy was started. Computerized tomography revealed a right massive pleural effusion (Figure 1,2). There was no significant radiological finding in the brain and abdominal tomography (Figure 3). Hypotension didn't improve with intravenous fluid therapy and a blood transfusion was started. Thoracic surgery consultation was requested because of hemorrhagic drainage from the tube thoracostomy over 1000 mL and the patient was taken to emergency surgery. There was no focus to explain the bleeding in the thoracic organs and the thorax wall in the patient underwent right thoracotomy. A total rupture in the right hemidiaphragm and approximately 1 cm deep throughout laceration in the dome of the liver were observed. There was a partial injury in the abdominal part of the vena cava inferior. The patient underwent diaphragmatic and liver repair through the thoracotomy incision and primary repair was performed to the bleeding area of the inferior vena cava. The patient was followed up on the first postoperative day in the intensive care unit. The patient's vital signs remained stable on the second postoperative day and he was discharged on the 5th day with healing.

Corresponding Author: Özlem Güler e-mail: ozlemguler81@yahoo.com

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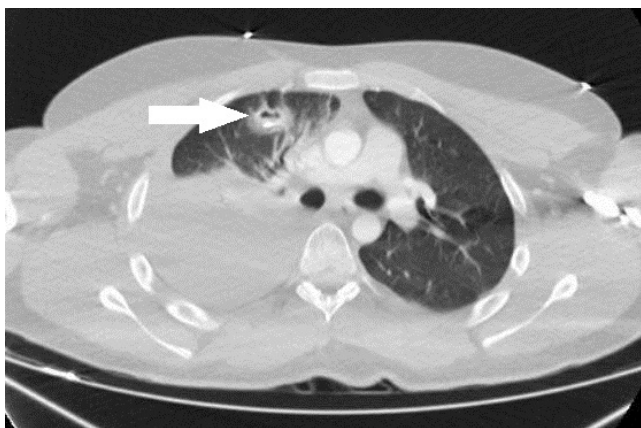


Figure 1. Right-sided massive hemothorax is seen. The white arrow indicates the chest tube.



Figure 3. CT axial view of the abdomen shows no pathological finding.

Discussion

As it is known hemothorax is the accumulation of blood in the space between the visceral and the parietal pleura. The clinical importance of hemothorax depends on the amount, rate, and etiology of the bleeding and according to the injuries accompanying hemothorax⁵. The generally accepted first approach in traumatic hemothorax is the application of a thorax tube⁶. Drainage over 1,500 ml after tube thoracostomy or continuous bleeding amount of 200 ml/h for at least 4 hours is defined as massive hemothorax. Massive hemothorax is usually seen at the time of admission or in the early period after trauma and emergency thoracotomy is applied for its treatment².

Hemothorax often occurs as a result of penetrating or blunt chest trauma. ⁷Mortality rate of blunt chest trauma is higher than that of penetrating chest trauma. Because the probability of additional organ injuries is higher in blunt trauma. ³ Diaphragmatic rupture occurs in 1-7% of victims of

blunt chest trauma and in 10-15% of patients with penetrating lower chest trauma⁴. Zhang et al. reported that 5.5% of patients had pneumothorax together with hemothorax and 0.4% only had hemothorax in their study including 4168 blunt thoracic trauma patients. Diaphragm rupture was detected in 3 of 604 patients who underwent surgery. When comorbid injuries were evaluated, abdominal injuries ranked second with 2.9%. ⁸Rib fractures in the lower level are often accompanied by spleen, liver, and diaphragm injuries. ⁸ This was an unusual case of hemothorax because there was no fracture in the lower ribs. No evidence of diaphragm and intra-abdominal organ injury was observed in the radiological examinations. The diagnosis was determined perioperatively. Diagnosis of diaphragm injuries is still not easy if conditions requiring exploration are not accompanied. The sensitivity of tomography is 60-71% and the specificity is 87-100% in the diagnosis of an acute traumatic diaphragm rupture⁹. Shah et al. reported that the diagnosis of diaphragm injury was made only in 44% of the cases before surgery and the diagnosis was missed initially in 14.6% of the patients in a multi-center analysis involving 980 patients¹⁰. The underlying mechanism of diaphragm rupture in blunt trauma is a sudden increase in intraabdominal pressure caused by the acceleration-deceleration effect derived from high energy. Abdominal viscera herniate into the thorax through the injured diaphragm because the pressure inside the chest cavity is lower than normal abdominal pressure⁹. In this case, abdominal bleeding was directly drained into the thorax without intra-thoracic organ herniation due to positive pressure in the abdomen and negative pressure in the thoracic cavity



Figure 2. Antero-posterior CT scanogram of chest showing right-sided massive hemothorax.

Conclusion

When traumatic hemothorax is detected in a patient, care should be taken for organ injuries that may accompany. A multidisciplinary approach has vital importance in patients even when tomographic imaging is normal.

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