

Spontaneous Diaphragmatic Hernia: A Case Report

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Abstract

Although acquired diaphragmatic rupture is often associated with trauma, rarely it may be spontaneous (atraumatic). Spontaneous diaphragmatic rupture is one of the rarest thoracoabdominal emergencies, and is harder to detect in patients without visceral damage. Diagnosis may be delayed by several months or even years. A sceptical approach, combined with thorough physical examination and the correct interpretation of the chest X-ray, are very important in diagnosis. In this report we present a patient who was admitted to the emergency department with stomach pain, nausea, vomiting and hiccups lasting for 3 days, and was diagnosed with spontaneous diaphragmatic rupture. The patient was treated with thoracotomy, and the defect was repaired primarily.

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Key words: Spontaneous diaphragmatic lesion, diaphragmatic hernia, radiological diagnosis, thoracotomy

Introduction

Diaphragmatic injuries usually occur as a result of penetrating or blunt chest trauma, with a prevalence of approximately 0.8-15% (1, 2). On the other hand spontaneous diaphragmatic rupture (DR) is much rarer; only 28 cases were identified by the year 2009 (3). Furthermore, although DR is a well-known and important complication of blunt or penetrating injuries that affect the diaphragm, it may be overlooked easily, and the diagnosis is even more difficult in patients with no history of trauma. In this report we present a patient who was admitted to an emergency department with stomach pain, nausea, vomiting and hiccups lasting for 3 days, who was diagnosed with spontaneous diaphragmatic rupture (SDR).

Case Presentation

A fifty-four-year-old male patient was admitted to the emergency room with stomach pain, nausea, vomiting, and persistent severe hiccups. The complaints of the patient suddenly began about 3 days previously while sitting at home, but although he received symptomatic treatment at various centres the complaints did not ameliorate. His blood pressure was 110/70 mmHg, heart rate was 86 beats/min, respiration rate was 15/min, and his body temperature was 36.3°C. Physical examination was unremarkable, except for decreased breath sounds in the basal region of the left lung and

epigastric tenderness. The patient was approximately 170 cm tall, and weighed 73 kilograms. Medical history was unremarkable. He had a history of heavy lifting one week previously, but he did not have a history of trauma. Complete blood count and biochemical parameters were normal. The left part of the diaphragm was seen to be elevated on the patient's chest radiography. On thoraco-abdominal computed tomography, severe ascension at the left hemi-diaphragm, loss of integrity and irregularities were detected at higher levels (Figure 1, 2). The total abdominal ultrasonography of the patient was normal. Emergency surgery was decided upon following consultation with the thoracic surgery department. The defect in the diaphragm was approximately 10 cm, and the stomach, small intestine and a portion of the omentum were found to be in the intrathoracic space. Intra-abdominal organs were returned to the abdomen gently by hand. The DR was repaired with No. 1 silk sutures. The patient was extubated and hospitalised. On follow-up, vital signs were stable and no additional pathology was detected upon radiological examination (Figure 3). The patient was discharged on the second day post-operatively. Consent was obtained from the patient.

Discussion

Spontaneous DR describes the rupture of the diaphragm due to increasing pressure in the abdominal cavity and chest wall without any direct trauma (4). It is difficult to diagnose SDR if there is no vis-

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Figure 1. Chest X-ray rise of the left hemidiaphragm



Figure 3. Chest x-ray after laparotomy: Return of raised left hemidiaphragm to a normal position

ceral organ injury or herniation. The diagnosis may be delayed by a few days or even several years as most of the symptoms are non-specific, even in the presence of trauma. The patient's history, symptoms, physical examination and CXR findings are very important in the diagnosis of DR. The presence of a thoracoabdominal trauma should be questioned in particular. In our case, there was no history of minor or major thoracoabdominal trauma; the patient had non-specific complaints such as nausea, vomiting, and hiccups. Diminution of breath sounds in the lower lobe of the left lung upon physical examination and diaphragmatic elevation on the CXR were the most important findings implicating the diagnosis of diaphragmatic rupture.

Clinically, DR has 3 phases according to the interval between injury and diagnosis: the initial or acute phase, the interval phase and the obstructive or late phase. In the acute phase, which continues for 2 weeks, clinical signs of DR may be obscured by the associated injuries (5). Classically reported symptoms, such as abdominal pain, shortness of breath, and chest pain, can often be overlooked (6). The interval phase may be relatively asymptomatic and DR may be dis-



Figure 2. Chest CT scan showing diaphragmatic rupture

covered only by incidental radiography. Finally, during the phase of obstruction and strangulation, most patients have acute symptoms secondary to acute respiratory or bowel obstruction problems. Also, patients most commonly have an acute abdomen secondary to incarceration and strangulation (5, 7). In our patient, who had non-specific complaints such as stomach pain continuing for 3 days, nausea, vomiting, and persistent severe hiccups, DR was diagnosed in the acute phase.

In cases of diaphragm ruptures even due to simple causes such as coughing, vomiting or nausea, the negative pressure in the thorax may lead to herniation of the intra-abdominal organs into the thoracic cavity (8, 9). The difference in pressure between the abdomen and thorax, which may reach up to 100 mmHg during respiration, is the most important factor contributing to herniation of abdominal organs to the thorax. The most frequently herniating organs due to a diaphragmatic defect are the stomach, small intestine and colon, and more rarely the liver and spleen. Clinically, organ-specific findings can be seen due to herniation, whereas respiratory and cardiac findings may also be in the foreground. In patients with herniation of the stomach, nausea and vomiting are evident. In our patient, the defect in the diaphragm was approximately 10 cm and the stomach, small intestine and a portion of the omentum had herniated to intrathoracic cavity. In particular, the herniation of the stomach explained the patient's complaints such as nausea, vomiting and hiccups.

Because of the protective effect of the liver on the right hemidiaphragm, and the possible increased weakness of the left posterolateral diaphragm, it was previously thought that the majority of diaphragmatic injuries following blunt trauma occurred on the left; however, the observed incidence of right- and left-sided DR is almost equal (10). In a study by Losanoff and colleagues, spontaneous rupture of the diaphragm was seen on the left more often (68%) (3). In the same study, the most commonly herniated organs were the stomach (43%), colon (29%) and omentum (29%), whereas the most common symptoms were abdominal or thoraco-abdominal pain, nausea, vomiting, and dyspnoea (3). The most common reasons for diaphragmatic ruptures were coughing (32%), physical exercise (21%), and vaginal child birth (14%) (3). In our case, the rupture was on the left, which is consistent with the literature, and the herniated organs were the stomach, omentum, and intestines. The patient had

a history of heavy lifting and his complaints were nausea, vomiting and abdominal pain.

Single or serial plain chest radiographs with a high index of suspicion are diagnostic in most cases of DR (11). On the chest X-ray radiography, degradation of the integrity of the diaphragm, visualisation of bowel haustras and gas shadows which may occur within the thorax, visualisation of the diaphragm above the normal anatomical position, mediastinal shift, atelectasis, pulmonary mass appearance, pleural effusion, pneumothorax, and hydropneumothorax can be observed. The computed tomography of the thorax is the second imaging modality of choice in these patients and the sensitivity varies between 71% and 90% (11, 12). In our patient, diaphragmatic elevation was detected initially on the chest radiography. We observed significant elevation on the left hemi-diaphragm, and irregularities and loss of integrity in the upper level on the tomography of the thorax. Complete abdominal USG, which we performed order to rule out any pathology of the abdomen, was normal.

The surgical approach is determined by the location and duration of the DR and whether intra-abdominal organs have herniated into thoracic cavity. The transthoracic approach is the most appropriate way of removing adhesions in the absence of any abdominal pathology or in delayed cases. The defect may be repaired primarily or by using prosthetic mesh (13). In our case, the transthoracic approach was performed because there was no history of trauma and no abdominal pathology was considered. The defect was repaired by one by one suturing, primarily with No-1 silk sutures.

Conclusion

Stomach pain, nausea, vomiting and hiccups are very common symptoms in the emergency room and may often be undervalued. However, these symptoms can be the only indicator of a very rare phenomenon such as SDR. Diaphragmatic rupture/herniation should be considered along with other possible diagnoses, especially in the presence of suspicious appearances on the chest radiography with respiratory and/or gastrointestinal symptoms.

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