

Chest Pain due to Bowel Adhesion accompanying Diaphragmatic Eventration

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Abstract: An eighty-five-year-old female lost consciousness after drinking hot water, following coughing. As she was found to be in a deep coma with bradypnea, she was transported to our Level 1 emergency and critical care center. She had hypertension, diabetes mellitus, dementia, cataracts, had undergone gastrectomy for gastric ulcers, cholecystectomy for cholelithiasis and had required admission for postoperative adhesive intestinal obstruction three times. Upon arrival 30 minutes from the initial call, her consciousness had improved. She complained of left chest pain and her left respiratory sounds revealed stridor and peristalsis. Her arterial blood gas under the inhalation of oxygen at 4 liters per minute revealed a pH of 7.210, PCO₂ of 65 mmHg, PO₂ of 102 mmHg, HCO₃⁻ of 25mmol/l and a lactate level of 3.8mmol/l. An electrocardiogram was negative for abnormalities. A chest roentgenogram revealed left diaphragmatic eventration with distension of colon gas. A computed tomography scan was negative for abnormalities, and a rupture of the diaphragm was ruled out. She received a diagnosis of carbon dioxide narcosis due to aspiration and chest pain due to bowel adhesion accompanying diaphragmatic eventration. She was treated in the intensive care unit with biphasic positive airway pressure, oxygen and antibiotics, which resulted in improvement of her respiratory function and consciousness. In cases with diaphragmatic eventration, the differential diagnosis of chest pain requires a thorough examination for intra-abdominal pathogenic disease.

Keywords: Chest pain, Diaphragmatic eventration, Bowel adhesion, Hernias, Diaphragmatic rupture, Differential diagnosis

INTRODUCTION

Chest pain is a common diagnostic challenge in primary care for clinical physicians. The major diagnostic measures are often aimed at ruling out lethal acute coronary syndrome, aortic dissection or pulmonary embolism; however, in primary care, less serious conditions frequently occur in patients with chest pain, such as thoracic musculoskeletal pain, dyspepsia and psychogenic disorders [1]. We herein present a rare case with the chest pain due to bowel adhesion accompanying diaphragmatic eventration.

CASE REPORT

An ambulance was called because an eighty-five-year-old female lost consciousness after drinking hot water, following coughing. As she was found to be in a deep coma with bradypnea, she was transported to our Level 1 emergency and critical care center. She had hypertension, diabetes mellitus, dementia, cataracts, had undergone gastrectomy for gastric ulcers, cholecystectomy for cholelithiasis and had required admission for postoperative adhesive intestinal obstruction three times. Upon arrival 30 minutes from the initial call, her consciousness had improved, with a Glasgow Coma Scale score of 13 in total, blood

pressure of 196/120 mmHg, a heart rate of 90 beats per minute (BPM), a 99% SpO₂ under 10 liters per minute of oxygen and a body temperature of 36.4 Celsius. She complained of left chest pain and her left respiratory sounds revealed stridor and peristalsis. Her arterial blood gas under the inhalation of oxygen at 4 liters per minute revealed a pH of 7.210, PCO₂ of 65 mmHg, PO₂ of 102 mmHg, HCO₃⁻ of 25mmol/l and a lactate level of 3.8mmol/l. An electrocardiogram was negative for abnormalities (Fig. 1). A chest roentgenogram revealed left diaphragmatic eventration with distension of colon gas (immobilization of the left diaphragm at the exhalation- inspiration phase was confirmed later, Fig. 2). A head computed tomography (CT) scan was negative for abnormalities, and a rupture of the diaphragm was ruled out by coronal images of the trunk by enhanced computed tomography (Fig. 3).

The results of the biochemical analyses of the blood on arrival were as follows: white blood cells, 6000/μl; hemoglobin, 11.2 g/dl; platelets, 21.2×10⁴/μl; aspartate aminotransferase, 81 IU/L; alanine aminotransferase, 47 IU/L; glucose, 282 mg/dl; blood urea nitrogen, 11.6 mg/dl; creatinine, 0.46 mg/dl; sodium, 131 mEq/L; potassium, 4.5 mEq/L; chloride,

95 mEq/L; creatine phosphokinase, 107 IU/L; C-reactive protein, under 0.3 mg/dl; fibrinogen degradation product, 18.2 µg/ml and Troponin T, negative. She received a diagnosis of carbon dioxide narcosis due to aspiration and chest pain due to bowel adhesion accompanying diaphragmatic eventration. She was treated in the intensive care unit (ICU) with

biphasic positive airway pressure, oxygen and antibiotics, which resulted in improvement of her respiratory function and consciousness. Her cervical magnetic resonance imaging study failed to find any pathogenic changes compatible with left phrenic nerve paralysis. After recovering from aspiration pneumonia, she was discharged to home(Fig-4).

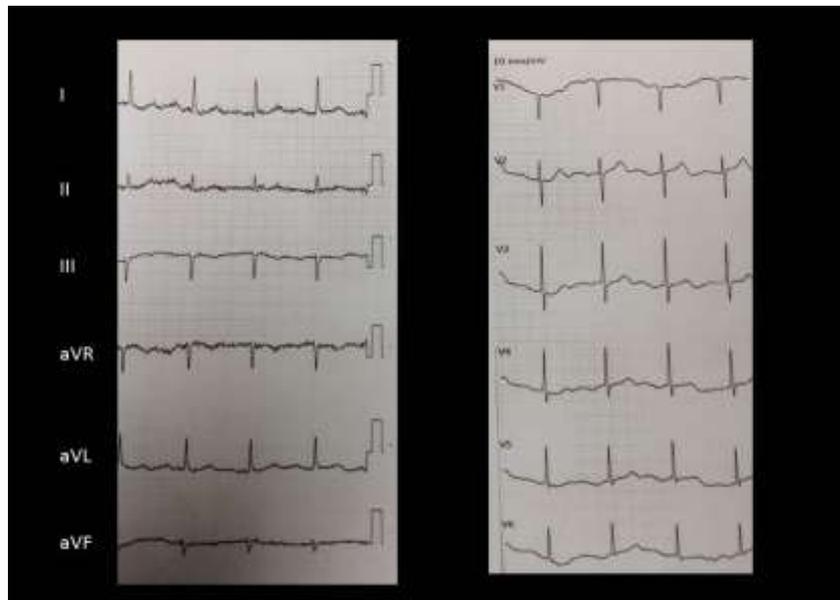


Fig. 1: The electrocardiogram on arrival. The ECG did not show any elevations of the ST segment.

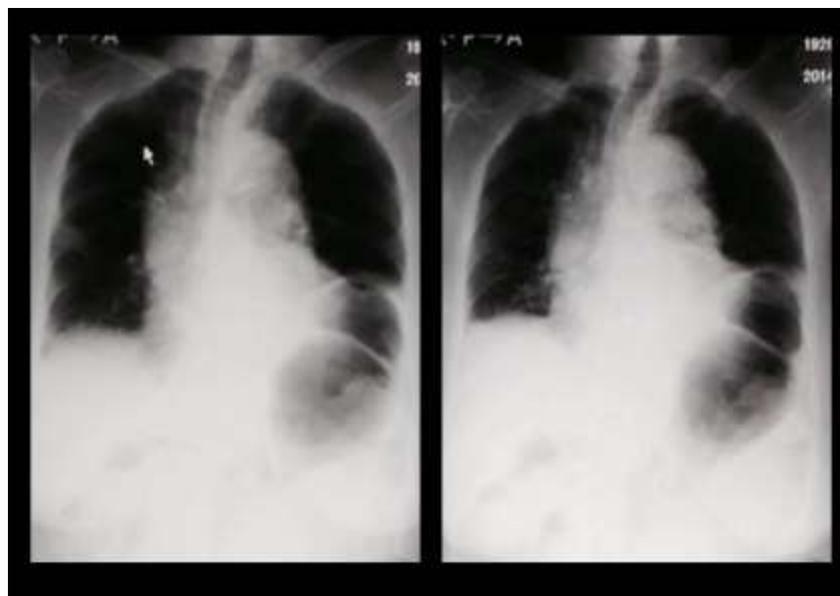


Fig. 2: A chest roentgenogram at the exhalation-inspiration phase. The level of the left diaphragm did not change (left; exhalation, right; inspiration)



Fig. 3: A coronal image of the trunk obtained by enhanced computed tomography. A rupture of the diaphragm was not seen.



Fig. 4: A cervical magnetic resonance image. There were no pathogenic changes compatible with phrenic nerve paralysis.

DISCUSSION

Most of the previous reports concerning chest pain due to diaphragm-related disease were hernias induced by diaphragmatic rupture [2]. Not only acute phase, but also delayed symptomatic diaphragmatic rupture, have been reported [3, 4]. Diaphragmatic rupture can be spontaneous [5], while in congenital cases, there were reports of chest pain induced by the diaphragmatic hernia [6, 7]. In the present case, a traumatic, spontaneous or congenital diaphragmatic hernia was ruled out by the CT examination. In rare cases, a tumor of diaphragm origin [8-11], ectopic

endometriosis at the diaphragm [12] or diaphragmatic spasms can also induce chest pain [13, 14]. In the present case, a thoracoscopic study was not performed, so we cannot rule out the possibility that one of these diseases co-existed with our patient's other conditions. Schoen *et al.* reported an unique case of elevation of the left-sided diaphragm which led to myocardial infarction due to compression of the left circumflex artery [15]. The present case was not direct diaphragmatic disease, but Chilaiditi syndrome, in which the colon inserts between the diaphragm and liver, or in which a gastric

cancer which induces elevation of the diaphragm also induces chest pain [16, 17].

Calvinho *et al.* reported the results of plication for diaphragmatic eventration [18]. In their reports, 20 patients (12 males) with diaphragmatic eventration underwent surgery using the postero-lateral approach and correction by radial plication. The mean age of the patients studied was 56.3±15.6 years (range: 13-74 years). A traumatic cause was identified in 13 patients; one patient had a congenital cause and the remainder were of idiopathic origin. Dyspnea was the most common complaint, being present in 75% of the patients, and thoracic pain was present in 25%. Most patients experienced significant clinical improvement with enhancement of the forced expiratory volume and vital capacity. The present case was elderly, so surgery was not selected, however, surgery may reduce her complaints.

CONCLUSION

In cases with diaphragmatic eventration, the differential diagnosis of chest pain requires a thorough examination for intra-abdominal pathogenic disease.

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