CASE REPORT

A case of spontaneous transdiaphragmatic intercostal hernia of bowel loops and omentum with herniation of lung – A very rare entity

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Abstract Herein we report a case of spontaneous transdiaphragmatic intercostal hernia of bowel loops and omentum with lung herniation in an elderly gentleman with Chronic Obstructive Pulmonary Disease (COPD). Initially he presented with severe cough followed by pain and small fluctuating swelling over the right chest wall. In-patient investigations were suggestive of hemothorax without any chest wall abnormality. Later the swelling gradually increased to a significant size for which he was further evaluated. Detailed imaging studies revealed it was a case of spontaneous intercostal hernia of bowel loops and omentum with herniation of lung. The patient is kept under regular follow up for optimization for his obstructive airway component for the required surgical repair of the parietal defect.

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Introduction

Intercostal hernia with herniation of lung is a very rare entity. Trauma is the most common etiology [1]. Trauma may be external in the form of a penetrating injury or blunt trauma or may be internal in the form of raised intra abdominal pressure due to cough, sneeze, defecation, weight lifting etc [2]. It is a very uncommon entity and there is no specific signs and symptoms directed to the diagnosis. Thus, this case failed to raise the suspicion of the clinicians to reach the diagnosis at a very initial stage. Imaging studies specially Contrast enhanced computed tomography (CECT) of thorax and upper
abdomen along with oral contrast was used to confirm the diagnosis.

**Case report**

An 81 year old gentleman, former smoker (20 pack years, quit 20 years earlier) diagnosed COPD without hypertension and diabetes, was admitted due to sudden onset chest pain followed by ecchymosis and localized chest wall swelling on the right side following a severe bout of cough 9 months earlier. He was then admitted in a hospital and investigated. There was no history suggestive of any external trauma. Chest radiograph (Fig. 1A) showed right sided pleural effusion [Pleural fluid hematocrit: 54.4%, Adenosine Deaminase (ADA) 28.8 IU/liter, no acid fast bacilli or malignant cell]. High resolution Computed tomography (HRCT) of the thorax (Fig. 1B and C) was suggestive of compression atelectasis of the right lower lobe with pleural effusion without any mediastinal lymph nodes or chest wall abnormality. Therapeutic aspiration about 450 ml was done. Pain was managed with analgesics. Fine needle aspiration from the swelling revealed blood elements. Ultrasound of abdomen was unremarkable.

Finally he was admitted in our hospital and thoroughly examined. The swelling (Fig. 2A) was located on the right infra axillary area, 4 cm below the nipple line, the center of the swelling was located over the mid axillary line, 13 cm x 10 cm on its fullest. Fluctuation was present (Fig. 2B). Other features are: normal temperature, smooth surface, cystic consistency without any visible pulsation or venous prominence. It was partially reducible with inspiration (Fig. 2C) and fully reducible with manipulation (Fig. 2D). Cough reflex was prominent. Respiratory system findings were decreased respiratory movements on right side and diminished breath sounds, decreased vocal resonance in right basal region and scattered rhonchi. Abdomen and other system examination were unremarkable. In this context imaging studies were performed.

Chest Radiograph revealed fracture of 7th, 8th and 9th ribs with callus formation (Fig. 3).

USG of the abdomen was done and it indicated bowel loops and omentum inside the swelling. Contrast enhanced computed tomography (CECT) of thorax and upper abdomen with oral contrast was performed and it showed herniation of large gut specially hepatic flexure and omentum including its vessels (Fig. 4A and B) to the parietes through a diaphragmatic defect (Fig. 4B, red arrow head) in lower thoracic and upper abdominal regions. There is also herniation of part of the lung (Fig. 4C, red arrow head). There was no evidence of strangulation.

The case was finally diagnosed as cough induced spontaneous transdiaphragmatic intercostal hernia with herniation of lung and rib fracture on the right side in a case of COPD.

**Discussion**

Transdiaphragmatic intercostal hernia occurs when weakened diaphragmatic muscle disrupts and abdominal contents pass...
through the rent resulted by the disruption. Lung can also pass through an associated pleural defect but in a very rare occasion. They can be congenital or acquired. In acquired hernia trauma is the most common cause [1]. Trauma may be external or internal. External trauma may be caused by penetrating injury or blunt trauma [2]. Herniation may occur spontaneously as well. The rise of intra abdominal and intra thoracic positive pressure occurs with expiration, cough, sneeze, defecation, vomiting, weight lifting and other similar activities and forces the abdominal or thoracic content out of the abdominal or thoracic cavity respectively through weakened areas of chest wall [3,4]. Rib fracture is not unusual when there are severe bouts of cough. Typical location of the rib fracture is between the fifth and ninth rib at the lateral aspect of the rib cage due to opposing muscular forces in the middle of the ribs at the axillary line from the serratus anterior and external oblique muscles and lack of support of the chest wall muscles in this area [5]. Strangulation may occur in long standing cases and strangulation even may be the first presentation.

No specific signs or symptoms are diagnostic for this condition. Thus it is very difficult for clinicians to suspect initially. Diagnosis can be made by finding a palpable defect of the thoracic wall through which a reducible lump can appear. Peristaltic sounds can be audible intermittently on careful auscultation. Ultrasound imaging can lead to a clue. Contrast enhanced computed tomography (CECT) of thorax and upper abdomen with use of oral contrast usually can confirm the diagnosis [6].

Cough induced rib fracture and intercostal hernia is a very rare entity. Around 10 cases are reported in the literature and very few of them are associated with herniation of lung [3].

Definitive treatment is surgery. Suturing the defect and approximation of ribs are the surgical steps and reinforcement by a prosthetic mesh is preferable [7,8,11].

In our case the traumatic herniation was ruled out because there was no history of any external trauma. Diagnosis of this rare entity is often delayed due to lack of specific clinical signs and symptoms. Therefore clinical suspicion should be raised in similar cases for early detection to prevent complications [9].

Figure 2  (A) Swelling is located on right infra axillary region; (B) Fluctuation of swelling is evident; (C) The swelling is partially reducible with inspiration; (D) swelling is reducible with manipulation.

Figure 3  Chest Radiograph showing fracture of 7th, 8th and 9th ribs with callus formation.
References


Further reading


Figure 4  (A and B) CECT of thorax and upper abdomen with oral contrast showing herniation of large gut specially hepatic flexure and omentum including its vessels; (B) Tear of the diaphragm; (C) Herniation of lower lobe of the right lung.