Self-assessment corner

Cough, chest pain and rash

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A 50-year-old man presented with a one-month history of fever, severe spasmodic cough and syncopal attacks. An episode of strenuous coughing during the current ailment had also resulted in development of excruciating right-sided chest pain. A few days after the onset of the chest pain, he discovered blackish brown discolouration of the skin over the chest that had rapidly spread to other regions. There was no history of external trauma or any drug intake.

Physical examination revealed a sick-looking, obese, patient in significant distress. His pulse rate was 90 beats/min, blood pressure was 120/80 mmHg, respiratory rate was 22 breaths/min and temperature was 38.3°C. Huge brownish patches could be seen over the right chest, abdomen, back, buttocks and both thighs (figures 1 and 2). Clinical examination of the chest revealed diffuse tenderness over the right lower ribs but without any evidence of subcutaneous emphysema or rib crepitus. Air entry was markedly diminished on the right side. Abdominal examination was suggestive of some degree of guarding along with minimal tenderness in the right hypochondrial region. The cardiovascular system was, however, normal. Chest X-ray revealed haziness in the right lower zone.

Baseline laboratory investigations showed haemoglobin of 11.7 g/dl, white cell count of $14.6 \times 10^9/l$ and erythrocyte sedimentation rate of 70. Arterial blood gasses, serum electrolytes, serum creatinine, blood urea, blood sugar, liver functions, coagulation profile, bleeding time, platelet adhesiveness and protein C levels were all within the normal range. Over the following days the skin discolouration worsened and extended down the calves.

Figure 1 Photograph showing brownish discolouration over right lower chest and abdomen

Figure 2 Photograph (right posterolateral view) showing discolouration extending to the back, buttocks and thighs

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Questions

- 1 What is the differential diagnosis?
- 2 What is the most probable diagnosis?
- 3 What factors could help in reaching the true diagnosis?

Answers

QUESTION 1

The various aetiologies to be considered in the differential diagnosis are trauma, bleeding diathesis, use of anticoagulant medication, use of non-anticoagulant drugs prone to enhance bleeding tendencies, viral haemorrhagic fevers, and cough-induced rib fractures.

QUESTION 2

Cough-induced rib fractures.

QUESTION 3

Cough-induced rib fractures, by virtue of their rarity, can generate enormous diagnostic anxieties. The unusual presentation can hamper attempts to reach the correct diagnosis. However, a high degree of suspicion of the existence of the condition, careful physical examination looking for localised tenderness over ribs and radionuclide bone scintigraphy may help clinch the correct diagnosis.

Management

Intravenous broad-spectrum antibiotics in conjunction with oxygen supplementation and cough suppressants brought some improvement in the patient's condition but the symptoms did not abate completely. Attempted aspirations of the right pleural collection were unsuccessful and only a few drops of haemorrhagic fluid could be obtained. Thoracoscopic examination revealed a huge chunk of clotted blood in right pleural cavity with collapse of right lower lobe. The clotted blood was forming a thick peel over the surface of the lung and was adherent to it. Through a mini-thoracotomy the blood clot was evacuated and decortication was performed to help expand the collapsed right lower lobe. The right 5th and 6th ribs were found to be fractured close to their anterior ends. The intercostal muscles in the 5th space were completely torn and the subcutaneous tissue and the external oblique muscles were also traumatised.

Discussion

Rib fractures are most often sustained by direct impact as a result of the application of disproportionate external forces to the chest wall. However, on occasions, apparently trivial acts like coughing, by inducing strong muscular contractions, may result in such an eventuality. Rib fractures, though apparently a simple injury, have the potential to lead to major deterioration in pulmonary functions and enhanced morbidity. The magnitude of the respiratory embarrassment consequent to rib fractures is determined by ensuing sequelae such as pneumothorax, haemothorax, lung collapse and pain. The pain arising from the movement of spiky fractured ribs in conjunction with the other factors, ultimately leads to shallow tidal volumes, alveolar collapse and hypoxaemia. The problem is further exacerbated by the symptoms of the pulmonary diseases predisposing to chronic cough.

Repeated trauma such as that produced by persistent cough has been documented previously to induce rib fractures.¹ By virtue of the chronicity of the symptoms, pulmonary tuberculosis has been implicated quite often in the induction of cough fractures.² However, non-tuberculous diseases are no less hazardous and afford no protection against such an eventuality. A wide variety of pulmonary disorders such as bronchitis,³⁻⁴ asthma,⁵ emphysema⁶ have been incriminated as predisposing factors in cough-induced rib fractures. Mitchell⁷ has reported an incidence of 7.6% in nontuberculous cases.

There is higher preponderance amongst women. Wynn-Williams has reported a female incidence of 67% and 61% in two separate series published in 1951 and 1959.^{3,8} No age is considered immune and patients in their 70s as well as neonates have been found to suffer from cough fractures.⁶

Ordinarily, cough-induced rib fractures, since they are rarely displaced, result in minor complications. However, injury of some magnitude with serious sequelae can occur, as in our case, and can pose considerable difficulties in diagnosis. In an extensive subcutaneous haemorrhage unrelated to trauma it is natural to consider bleeding diathesis as the prime cause; indeed we directed our initial work-up on this assumption, although the battery of tests performed ruled out this possibility. The complications arising from rib fractures may be so overwhelming, rapid in onset and varied in presentation that the injury initiating these events may be masked and a high degree of suspicion is needed to elucidate the cause of the symptoms. A good deal of reliance must be placed on the clinical examination, since radiological confirmation is often lacking. In the face of nonvisualisation of the rib fractures

Cough rib fractures: common associations

- pulmonary tuberculosis
- bronchitis
- pneumonia
- bronchiectasis
- sarcoidosis
- bronchiolitis
- emphysema
- pertussis
- asthma
- pregnancy
- psychogenic cough

Box 1

Cough rib fractures: associated complications

- pneumothorax
- haemothorax
- lung contusion
- lung collapse
- subcutaneous haemorrhage

Box 2

radiologically, it may be difficult to convince oneself that a trivial act like coughing could inflict such a serious injury. Radionuclide bone scanning has been found to be effective in highlighting the fracture sites as regions of abnormal accumulation of activity.⁹

Final diagnosis

Cough-induced rib fractures.

Keywords: cough fracture of ribs

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Gastric outlet obstruction – with a difference

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A 64-year-old man presented with a six-week history of upper abdominal distension and vomiting, exacerbated after meals, with a recent loss of weight. On examination, the only abnormal finding was some fullness in the epigastrium. Oesophagogastroduodenoscopy, abdominal ultrasound scan and a barium enema were normal. Barium meal and hypotonic duodenography revealed narrowing at the duodenojejunal flexure, possibly due to extrinsic compression but computed tomography (CT) revealed no masses. At laparotomy, the clinical diagnosis was confirmed and a gastrojejunostomy performed. Post-operatively the patient continued to vomit, necessitating a second laparotomy two-weeks later. Following a second procedure, the patient made a good recovery and was reviewed six months later, having gained weight and being symptom free.

Questions

- 1 What was the diagnosis?
- 2 What is the treatment of this condition?
- 3 Why was a second laparotomy needed?
- 4 What was the second procedure performed?

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