

INSUFFICIENCY FRACTURE OF STERNUM

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Stress fracture of the sternum is rare. Marked osteoporosis or weakening by another pathology accounts for most fractures of this variety. Elderly women are particularly vulnerable. Spontaneous fracture of sternum with pain in the chest might mimic other medical conditions easily. Plain chest film in the postero-anterior view does not show the fracture. Therefore, the diagnosis might be missed unless particularly looked for and a lateral view taken. A case report is presented and literature is reviewed on the subject.

Case Report

A 79 year old lady was admitted to the Plastic Surgery Unit for the management of a pre-tibial laceration. She was asthmatic and used steroids almost regularly. The laceration was debrided and skin grafted. During her stay in the hospital, one morning, she complained of pain in the chest aggravated by deep breathing. The night before, she was given a bath by the nursing staff. The nurses used a particular technique of lifting the patient called Australian lift. In this technique the patient's arms rest on two nurses shoulders while the nurses get hold of the patient's thighs and thus lift the patient from the chair onto the bed or into the bath.

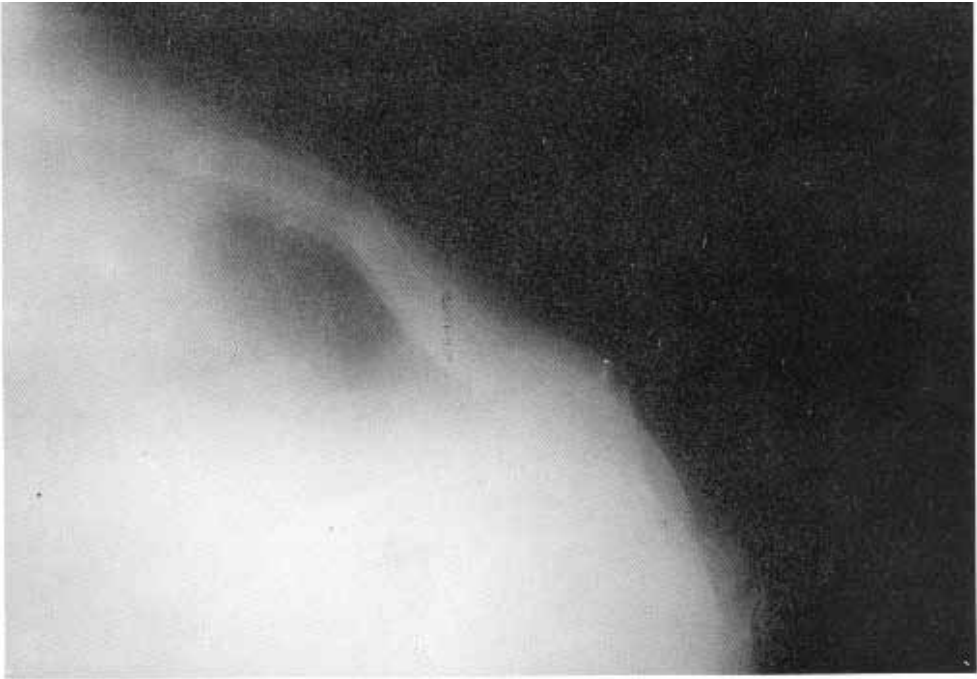
This lady felt a snap and severe pain in the chest during the lift. By next

morning a swelling had appeared on the front of the chest; it was not tender to palpation. AP view of the chest on radiography did not reveal any conclusive finding. However, a lateral view of the sternum clearly showed a transverse fracture of the body with little displacement. The X-ray also showed marked osteoporosis in this lady. She also had kyphosis of the thoracic spine.

Only symptomatic treatment was given with good analgesia and physiotherapy. She went home with good chest expansion and the pain was tolerable.

DISCUSSION

Stress fractures can be divided into two categories: fatigue fracture and insufficiency fracture. The former type results from applying excessive stress to a normal bone and occurs in athletes and army personnel. Insufficiency fractures occur in osteopaenoeic bones under normal stresses of life.¹ This osteopaenoea can be generalised as in elderly women, or localised one as in metastatic disease. It is of interest to know that Bence Jones first patient of multiple myeloma had deposits in the sternum and had spontaneous fracture.² Bone can also be weakened by bacterial osteomyelitis and pathological fracture due to osteomyelitis has been reported in the sternum.³



Sternum is an integral part of the thoracic cage and slight movement at the manubrio-sternal joint occurs during inspiratory movements of the chest allowing expansion.⁴ Sudden forward flexion of the thoracic spine transmits the stress to the sternum and the ribs.⁵ Similarly forceful protraction of the shoulders can also stress the sternum via clavicles.⁶ If the sternum is already weakened by osteoporosis, spontaneous sternal fracture with or without spinal collapse can occur. The degree of kyphosis determines the displacement of the fracture. Sternal insufficiency fractures may be displaced or undisplaced and buckling or non-buckling. Chen and colleagues discovered from their retrospective study that the non-buckling type of sternal fractures were asymptomatic and were discovered on routine lateral radiographs of the chest.⁷

Presentation of the sternal fracture is variable. Spinal collapse and sternal fracture can cause marked respiratory distress. With marked kyphosis, sternum is the only anterior support of the chest. When this collapses as well, chest movements become impeded. Localised sternal pain can mimic myocardial infarction⁸ or pulmonary embolism.⁹ Majority of such fractures, however, are unnoticed as symptoms are trivial.⁵ All such fractures should be fully investigated to exclude localised deposit from a tumour or multiple myeloma. The investigations should include lateral chest radiograph to show sternum as well as thoracic spine which might demonstrate anterior wedging of the vertebral bodies.

Treatment of uncomplicated cases is symptomatic with analgesics. However, internal fixation may be required if paradoxical movements of the sternum embarrass respiration.⁶

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