Isolated fracture of the first rib without associated injuries: a case report

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Isolated fractures of the first rib are extremely rare and are more commonly associated with either multiple rib fractures or life threatening injuries.¹ First rib fractures are commonly caused by direct trauma, violent muscular contraction or by chronic stress. We present a case of isolated first rib fracture in a young healthy patient, where the mechanism of injury appears to be indirect trauma.

Case report

A 33 year old man presented to the accident and emergency department with severe pain on the left side of his upper chest immediately after lifting a weight. His job involved lifting of heavy milk crates.

Examination revealed tenderness around the medial end of the clavicle extending into the base of the neck. There was no swelling or deformity. Pain was accentuated by left shoulder movements. There was no abnormal physical sign in the chest or any distal neurovascular deficit. Radiography revealed an undisplaced fracture of the left first rib (fig 1).

He was treated with a sling support and analgesics and subsequently followed up in the outpatient department. Recovery was uneventful.

Discussion

Isolated fracture of the first rib remains the rarest of all rib fractures, being deeply placed and protected from all sides by the shoulder girdle and muscles. Great forces are required

to fracture this rib and hence this fracture when recognised must always raise the suspicion of associated serious thoracic injuries and the possibility of damage to the closely related subclavian vessels and the brachial plexus.²

However, papers have drawn attention to this injury arising from various types of sports that involve repetitive activity, for example, baseball and basketball.^{1 3}

Stress fractures of the first rib often present with a history of sudden onset of pain with a "snap" from the shoulder. Symptoms are, however, very variable⁴ and include pain in the region of the shoulder girdle, upper chest and base of neck. A careful history including sporting and occupational details may, as in this case, support the diagnosis.

Characteristically, stress fractures occur at the thinnest portion of the rib where the subclavian artery crosses it. A postulated mechanism is sudden violent contraction of the scalenus anterior while the arm is heavily loaded.⁵

In contrast with first rib fractures as a consequence of injury, the stress induced fracture is very rarely associated with injury to adjacent structures and aggressive diagnostic procedures are unnecessary following unremarkable clinical examination of the neck and chest.

In conclusion, the treatment of uncomplicated first rib fractures is symptomatic and directed towards providing analgesia and support for the injured area. A period of observation on an outpatient basis is warranted in view of the risk of associated complications.

Contributors

S Sinha contributed in literature search and writing of the paper. S K Mummidi initiated the study idea and did the patient follow up. S Londhe contributed in literature search. A C Campbell was responsible for reviewing the initial draft of the paper, overall supervision and will also act as guarantor for this paper.

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Figure 1 Radiograph showing an undisplaced fracture of the left first rib.