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Case report

A RARE PRESENTATION OF A CONCOMITANT LUMBAR SPINE BURST FRACTURE WITH A DISTAL CORPUS STERNI FRACTURE DUE TO A FLEXION DISTRACTION INJURY

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ABSTRACT

Sternum fractures are a rare entity and occur either due to direct trauma or indirectly associated to a flexion compression injury. Earlier literatures used to describe the association of sternum fractures with upper thoracic vertebral fractures. To the best of our knowledge very few cases have been described in literature with concomitant lumbar vertebral fracture with associated sternum fracture. We hereby report a rare presentation of a flexion distraction injury leading to a concomitant sternum fracture with a L1 vertebral burst fracture.

Keywords: Lumbar spine burst fracture, Corpus sterna fracture, Flexion distraction injury

INTRODUCTION

Sternum fractures in the literature has been described as a marker for a high velocity trauma with many associated injuries^[1]. Other than cases with a direct trauma to sternum, rarely an isolated sternal fracture is seen. In the literature the rib sternum complex has been described as a fourth column to the spine suggesting a high chances of associated spine injury with a sternum fracture^[2,3]. But most of the cases described in the literature involve only the upper thoracic vertebrae. According to a study done by Fowler^[4], flexion compression force leads to displaced fractures of sternum with the distal fragment displaced anterior to the proximal fragment and opposite for distraction injuries. Such injuries are more commonly seen during high velocity road traffic accidents.

The level of sternum involvement with the associated level of vertebral involvement was described by Max J. Scheyerer et al in their study with statistically significant association of manubrium sterni i.e. upper sternum involvement with upper thoracic and lower

sternum i.e corpus sterni part 3 (distal one third) with lumbar spine fractures^[5].

In our study we hereby describe a rare case with a distal one third corpus sterni fracture with L1 vertebral burst fracture suggesting a flexion distraction injury following a fall from height and landing on both feet sustaining associated bilateral talus fractures, right bimalleolar and calcaneum fractures.

CASE REPORT

A 28yr old male patient presented to us following a fall from a height of around 12metres. According to the patient, he slipped while working on a construction site and had a fall; he landed on the ground on both feet. Patient was not able to stand/bear weight following fall. On presentation, he complained of severe pain in feet, ankle and back. He had no breathing difficulty or pain in the chest. He had sustained no open injuries, head injury (GCS: 15/15) and was haemodynamically stable. On clinical

examination, swelling was noted over ankle, range of movement in the ankle was tender bilaterally with severe tenderness over the heel of right foot.

No distal neurological deficits were present but tenderness was elicited in lumbar spine and the chest. Full evaluation using plain radiographs[Fig 1a, Fig1b] and CT scans[Fig 2, Fig3] was done initially and bilateral talus fracture, right bimalleolar fracture, L1 vertebral burst fracture with distal one third corpus sterni fracture was noted. Further MRI was done[Fig 5a, 5b,5c,5d] for evaluating the lumbar spinal injury and association of posterior elements with the L1 fracture.

As the right talus had a comminuted fracture with bimalleolar fracture, it was initially fixed using contoured talus locking plate and cancellous screws, one third tubular plate was applied for the lateral malleolus and cancellous screw and K-wiring for medial malleolus. Left talus and right calcaneal fractures were undisplaced and so were planned to be managed conservatively.

Patient was explained for need for surgical intervention for the lumbar spinal injury but patient wanted to undergo conservative management and so was advised absolute bed rest for 2 months.

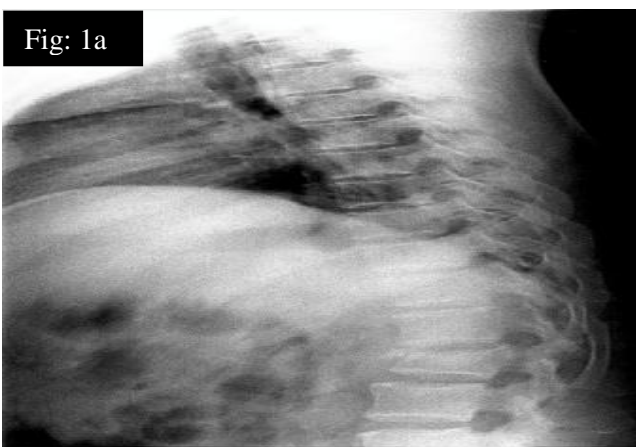


Fig 1a, 1b: Plain radiographs showing L1 vertebral burst fracture

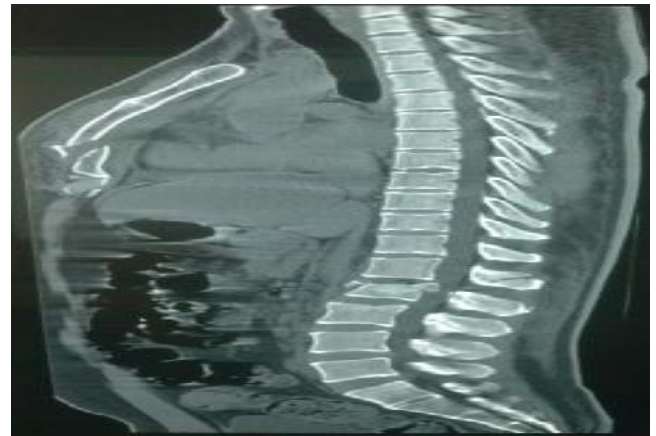


Fig 2: Sagittal CT image showing L1 burst fracture with sternum fracture



Fig 3: Axial CT scan of L1 vertebra

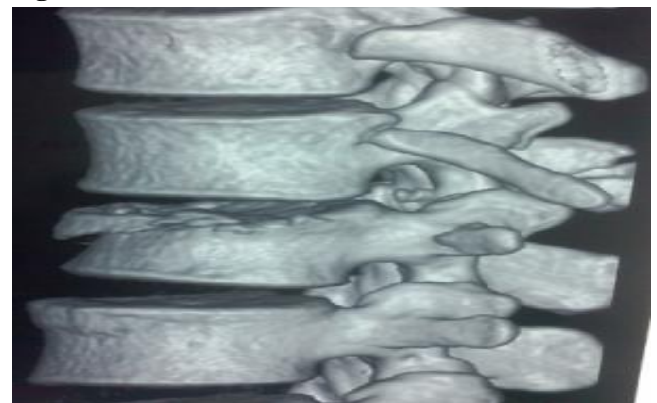


Fig 4: 3D CT image of L1 vertebral body

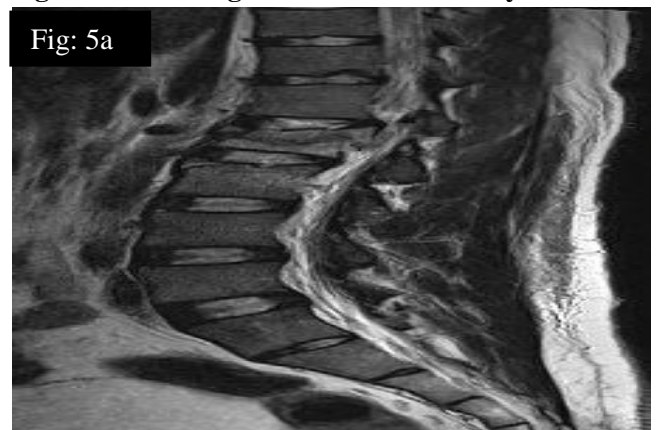


Fig: 5a

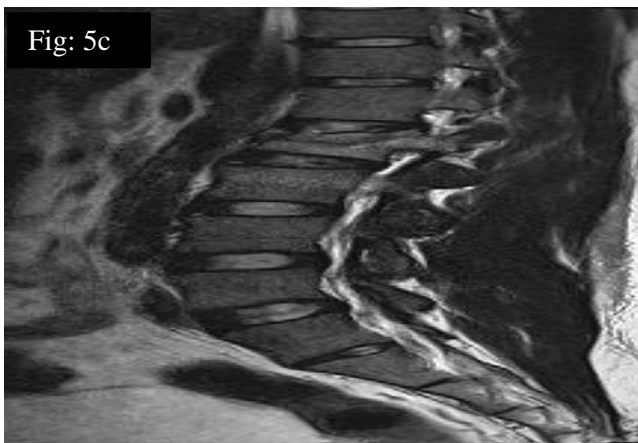
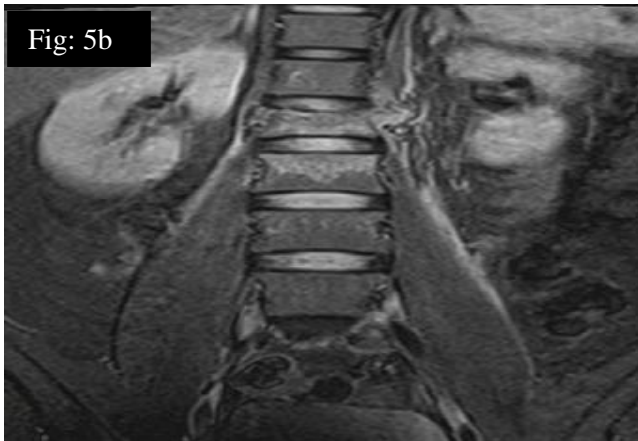


Fig 5a, 5b,5c,5d: MRI Lumbar spine showing L1 compression fracture

DISCUSSION

Sternum fracture is a rare fracture and is usually associated with multiple injuries^[6,7]. Isolated sternal fracture may occur in direct traumatic injuries^[8]. The sternal fracture component is commonly missed because of it being comparatively less symptomatic compared to the other associated injuries. Thus making it essential to examine and investigate for an associated sternum fracture with a spine injury^[9].

Most fractures are secondary to a flexion compression injury and are associated with a spine injury. Upper thoracic vertebrae may be involved in such cases but rarely lumbar spine involvement may also be seen.

But literature suggests that the site of sternal fracture^[10] and the displacement pattern² can suggest the mechanism of injury.

In our case patient was diagnosed a concomitant lumbar spine burst fracture with a distal corpus sternal fracture following fall from height. The fracture pattern in L1 vertebral body with fracture extension into lamina and spinous process suggests a flexion distraction mechanism which also coincides with Fowler's study on mechanism of concomitant sternum and spinal injury.

Also the sternum fracture involves the distal 1/3rd with posterior displacement of distal fragment confirming the mechanism of injury.

Although the incidence of such injuries is less but a high index of suspicion for such fractures must be there when such patients are being evaluated. Delay in diagnosis may lead to increase morbidity and mortality in these patients.

CONCLUSION

A concomitant lumbar spine injury with a sternum fracture is a rare entity, but it is essential for all orthopaedic surgeons to be aware of such injury patterns and its associated complications. Such rare injuries also help us to understand the mechanism of trauma. Missing or delay in diagnosing such fractures may lead to undue complications and increase mortality.

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Conflict of Interest: Nil

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