A New Fracture Pattern of Noncontiguous Fracture of Dorsal Spine: A Case Report

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Abstract

Spinal injury at more than one level is not uncommon. Patients with severe trauma may have multiple noncontiguous vertebral (MNCV) injuries which are defined as injuries to vertebral column at more than one site with these sites being separated by an area of normal spine. A 30-year-old male laborer presented with a history of fall from staircase with sudden onset weakness of both lower limbs with bowel and bladder involvement. He was diagnosed to have fracture of D6 and D12 vertebrae by radiographs and computerized tomography scan. The patient was treated surgically at D12 level by decompression of spinal cord with D12 corpectomy and stabilization by pedicular screws at D10, D11, L1, L2 vertebrae and interbody cage at D12 by total posterior approach, whereas fracture at D6 level was treated non-operatively. Now 6 months postoperatively, the patient shows partial recovery in motor and sensory function of both lower limbs. This case is being presented on account of its unusual pattern of MNCV injuries involving D6 and D12. This type of fracture pattern has not been reported in previous literature.

Key words: Corpectomy, Dorsal spine, Fracture pattern, Noncontiguous

INTRODUCTION

Multiple noncontiguous vertebral (MNCV) fractures are special type of spinal injuries most frequently occurring due to fall from height or traffic accident. Diagnosis of second lesion is frequently delayed. In addition, definition of these injuries is not clear in the literature resulting in variable incidence rates varying from 1.6% to 16.7%.

Previously, it was defined by the presence of at least 3 intact vertebrae between 2 injured or fractured vertebrae. However, Iencean suggested that in MNCV fractures there should be at least a normal spinal segment between lesions of same structural type as injured segments. Such lesions are always caused by very high-energy trauma and have consequences ranging from local pain to quadriplegia and even death. In such type of injuries location of fractures were found primarily at extremes of junctures of the spine.

Gupta and el Masri described the level of injury as primary and secondary. The primary lesion is the lesion which seemed to be responsible for patient’s symptoms and neurological signs on admission. The secondary lesion is an injury which contributed to patient’s neurological deficit or symptoms.

Various patterns of injuries have been described. We are presenting a different type of pattern not described in previous literature.

CASE REPORT

A 30-year-old male chronic alcoholic presented with a history of fall from staircase under the influence of alcohol followed by sudden onset weakness in both lower limbs and unable to get up. There was no history of head injury or loss of consciousness.

Clinical examination revealed tenderness at upper dorsal spine and dorsolumbar junction and complete paraplegia.
with motor and sensory involvement below D12 level with bowel and bladder involvement.

Radiographs and computerized tomography (CT) scan of whole spine showed fracture of D6 and D12 vertebrae. At D6 level, anterior wedge compression fracture with intact posterior cortex. At D12 level, burst fracture with retro pulsing segment compressing spinal cord.

The patient was operated on next day under general anesthesia at D12 level by decompression of spinal cord and D12 corpectomy through posterior approach and stabilization with pedicular screws at D10, D11, L1, L2 level with reconstruction of D12 by interbody cage and bone graft. Patient managed conservatively for fracture D6. Therefore, advised bed rest for 6 weeks. After that, he was mobilized with Taylor’s brace and anterior spinal hyperextension (ASH) brace on wheelchair.

Currently, the patient is 6-month postoperative with partial recovery in the form of Grade 2 power in both lower limbs with recovery in touch, pain, and temperature sensation and is being mobilized with wheelchair and ASH and Taylor’s brace (Figures 1 and 2).

**DISCUSSION**

Various patterns have been described in multiple noncontiguous spinal injuries in literature. Calenoff et al. studied 35 multiple noncontiguous vertebral injuries. He did analysis of vertebral levels at which primary and secondary injuries occurred and found 3 definite patterns of injuries as described in Table 1 and Figure 3.

Gupta and el Masri studied 935 patients of spinal injuries, out of which 71 patients had multiple noncontiguous spinal injuries. He had found 7 patterns of multiple noncontiguous injuries as described in Table 2 and Figure 4.

Kewalramani and Taylor studied 5 types of MNCV injuries which showed cervical vertebrae as primary lesion and Dorsal and lumbar spine as secondary lesion.

We are presenting this case as a different pattern of MNCV injury as in this case primary lesion is at D12 level and secondary lesion at D6 level. This pattern has not been described in literature.

Thus, we conclude that this is a new pattern of MNCV injury, in which there is primary lesion is at D12 and secondary lesion is at D6. In addition, it is least expected pattern as dorsal spine is relatively stable due to attachment of rib cage.

Thus, recognizable pattern of injury proved to be no substitute for careful examination of injury and total spinal radiography, including CT scan at initial assessment. Comatose patient poses critical problems in diagnosis for possibility of MNCV injury. Therefore, radiographic scanning is essential in them. In addition, early recognition of the secondary or tertiary level of injury is essential for appropriate therapy and to minimize the extent of neurodeficit. Care should be taken to include craniovertebral and lumbosacral junction in radiography.

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**Table 1: Definite patterns of injuries**

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Primary injury</th>
<th>Secondary injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>C5-C7</td>
<td>T12 or lumbar spine</td>
</tr>
<tr>
<td>B</td>
<td>T2-T4</td>
<td>Cervical spine</td>
</tr>
<tr>
<td>C</td>
<td>T12-L2</td>
<td>L4-L5</td>
</tr>
</tbody>
</table>

**Table 2: Multiple noncontiguous injuries**

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Primary injury</th>
<th>Secondary injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T1-T6</td>
<td>C1-C2</td>
</tr>
<tr>
<td>2</td>
<td>C1-C3</td>
<td>C6-C7</td>
</tr>
<tr>
<td>3</td>
<td>C1-C3</td>
<td>C4-C7</td>
</tr>
<tr>
<td>4</td>
<td>C6-C7</td>
<td>T4-T7</td>
</tr>
<tr>
<td>5</td>
<td>C3-C5</td>
<td>C1-C2</td>
</tr>
<tr>
<td>6</td>
<td>L1-L3</td>
<td>C4-T2</td>
</tr>
<tr>
<td>7</td>
<td>L1-L3</td>
<td>L5-Coccyx</td>
</tr>
</tbody>
</table>
Any suspicious areas should be clarified by additional projection, including tomography.¹

**CONCLUSION**

This is a new pattern of MNCV injury, in which there is primary lesion is at D12 and secondary lesion is at D6. In addition, it is least expected pattern as dorsal spine is relatively stable due to attachment of rib cage. Thus, to recognize the pattern of injury and its proper treatment total spinal radiography and screening with CT scan is essential in suspected cases.

**Clinical Message**

Radiographic screening with CT scan is essential in suspected cases for early appropriate diagnosis and treatment. Early recognition of the secondary or tertiary level of injury is essential for appropriate therapy and to minimize the extent of neuro deficit.

**REFERENCES**


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