Print ISSN: 2321-6379
Online ISSN: 2321-595X
DOI: 10.17354/ijss/2017/141

Case Report

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

Pravin Deokate[1], Swapnil Bhise[1], A S Chandanwale[2], S S Shintre[3], Ambarish Mathesul[4]

[1]Assistant Professor, Department of Orthopaedics, BJGMC & Sassoon General Hospitals, Pune, Maharashtra, India, [2]Professor and Dean, Department of Orthopaedics, BJGMC & Sassoon General Hospitals, Pune, Maharashtra, India, [3]Professor and Head, Department of Orthopaedics, BJGMC & Sassoon General Hospitals, Pune, Maharashtra, India, [4]Associate Professor, Department of Orthopaedics, BJGMC & Sassoon General Hospitals, Pune, Maharashtra, India

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%.[1-9] Previously, it was defined by the presence of at least 3 intact vertebrae between 2 injured or fractured vertebrae.

However, Iencean[2] 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[3] 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

Access this article online

www.ijss-sn.com

Month of Submission : 01-2017
Month of Peer Review : 02-2017
Month of Acceptance : 02-2017
Month of Publishing : 03-2017

Corresponding Author: Swapnil Bhise, Greens Society, Maple F401, Opp Padmji Paper Mill, Thergaon, Chinchwad, Pune - 411 033, Maharashtra, India. Phone: +91-9922913082. E-mail: swapnl.bhise@gmail.com

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 pulsed fragment 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.*[1] 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[3] 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.

Table 1: Definite patterns of injuries

Pattern	Primary injury	Secondary injury
A	C5-C7	T12 or in lumbar spine
B	T2-T4	Cervical spine
C	T12-L2	L4-L5

Table 2: Multiple noncontiguous injuries

Pattern	Primary injury	Secondary injury
1	T1-T6	C1-C2
2	C1-C3	C6-C7
3	C1-C3	C4-C7
4	C6-C7	T4-T7
5	C3-C5	C1-C2
6	L1-L3	C4-T2
7	L1-L3	L5-Coccyx

Kewalramani and Taylor[4] 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.[4]

Comatose patient poses critical problems in diagnosis for possibility of MNCV injury. Therefore, radiographic scanning is essential in them.[1] In addition, early recognition of the secondary or tertiary level of injury is essential for appropriate therapy and to minimize the extent of neurodeficit.[1] Care should be taken to include craniovertebral and lumbosacral junction in radiography.

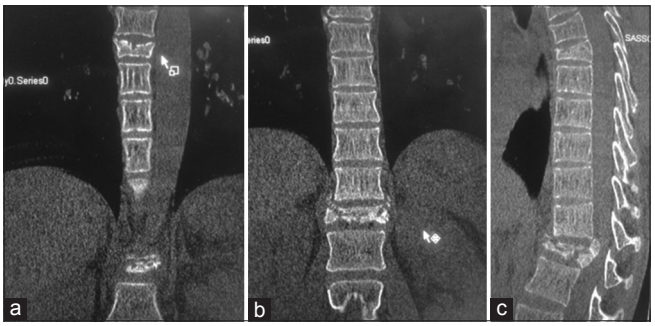

Figure 1: Preoperative computerized tomography images. (a) Coronal section showing D6 fracture, (b) coronal section showing D12 fracture, (c) saggital section showing D6 fracture and D12 fracture

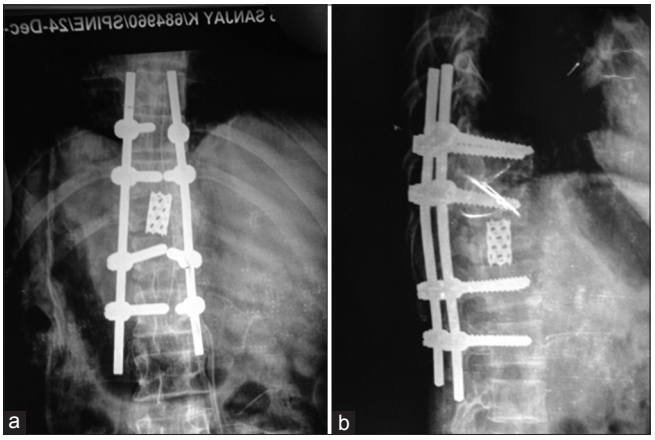

Figure 2: (a and b) Postoperative radiographs

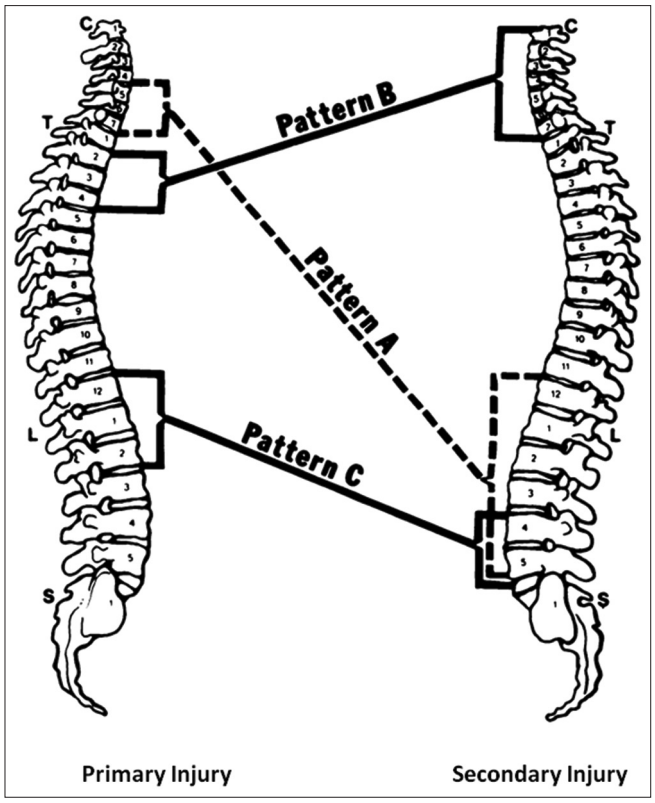

Figure 3: Fracture pattern described by Calenoff *et al*.

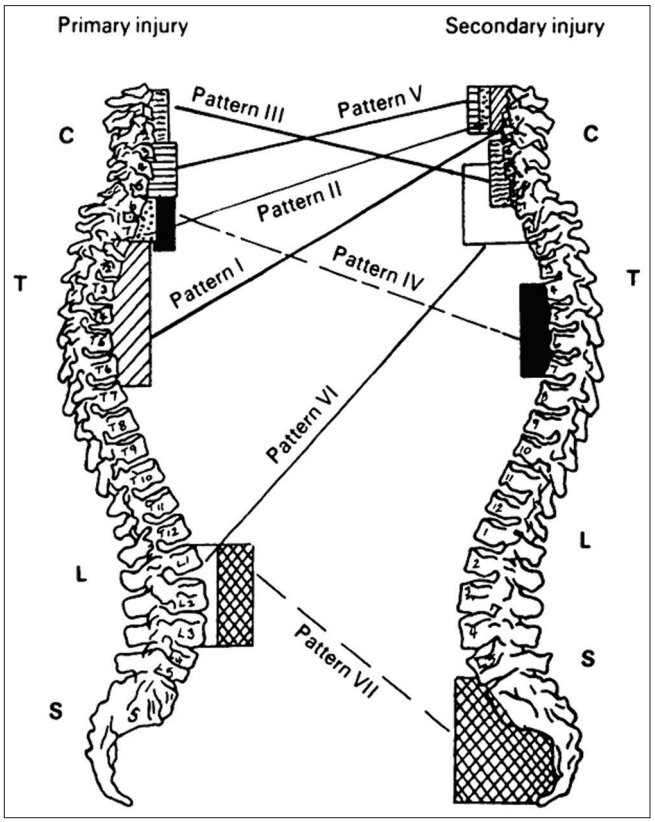

Figure 4: Fracture pattern described by Gupta *et al.*

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

1. Calenoff L, Chessare JW, Rogers LF, Toerge J, Rosen JS. Multiple level spinal injuries: Importance of early recognition. AJR Am J Roentgenol 1978;130:665-9.
2. Iencean SM. Double noncontiguous cervical spinal injuries. Acta Neurochir (Wien) 2002;144:695-701.
3. Gupta A, el Masri WS. Multilevel spinal injuries. Incidence, distribution and neurological patterns. J Bone Joint Surg Br 1989;71:692-5.
4. Kewalramani LS, Taylor RG. Multiple non-contiguous injuries to the spine. Acta Orthop Scand 1976;47:52-8.
5. O'hEireamhoin S, Devitt B, Baker J, Kiely P, Synnott K. Segmental fracture of the lumbar spine. Spine (Phila Pa 1976) 2010;35:E1141-3.
6. Powell JN, Waddell JP, Tucker WS, Transfeldt EE. Multiple-level noncontiguous spinal fractures. J Trauma 1989;29:1146-50.
7. Wittenberg RH, Hargus S, Steffen R, Muhr G, Bötel U. Noncontiguous unstable spine fractures. Spine (Phila Pa 1976) 2002;27:254-7.
8. Dai LY, Jia LS. Multiple non-contiguous injuries of the spine. Injury 1996;27:573-5.
9. Sixta S, Moore FO, Ditillo MF, Fox AD, Garcia AJ, Holena D, *et al.* Screening for thoracolumbar spinal injuries in blunt trauma: An Eastern Association for the Surgery of Trauma practice management guideline. J Trauma Acute Care Surg 2012;73 5 Suppl 4:S326-32.

How to cite this article: Deokate P, Bhise S, Chandanwale AS, Shintre SS, Mathesul A. A New Fracture Pattern of Noncontiguous Fracture of Dorsal Spine: A Case Report. Int J Sci Stud 2017;4(12):262-264.

Source of Support: Nil, **Conflict of Interest:** None declared.