

ORIGINAL ARTICLE

# Unilateral Locked Facet after Cervical Spinal Column Trauma: The Role of Cervical Spine CT Scan

Ali Nazemirafie<sup>1</sup>

<sup>1</sup> Department of Neurosurgery, Arak University of Medical Sciences, Arak, Iran.

**Keywords:** Locked facet, Missed patients, Cervical AP, Lateral radiography

## ABSTRACT

**Introduction:** Because there is often only minimal displacement at the site of dislocation in unilateral locked facet, it is possible to not only miss the locking of facets but also even to conclude that no fracture or dislocation is present. If the diagnosis is not promptly made, neurological recovery will be impaired and deformity will result

**Methods:** We reviewed 450 patients with cervical spinal column trauma and with focal neurological deficit. All patients underwent AP and lateral cervical radiography. Patients with severe local tenderness, focal neurological deficit, limited cervical movement or abnormal simple radiography underwent CT scan with sagittal and coronal reconstruction.

**Results:** Fifty cases (11%) had unilateral locked facets. Translation of the cervical vertebral body above the level of dislocation resulted in a diagnostic appearance on the lateral views. Translations were so minimal or adjacent to cervicothoracic junction in one-fourth of cases that had missed in primary evaluation. Rotation of the spinous processes was observed in the Ap view in only half of the cases. All missed cases demonstrated on CT-scan with sagittal and coronal reconstruction.

**Conclusion:** The necessity of obtaining CT-scan with sagittal and coronal reconstruction, which adequately demonstrates the cervical spine locked facet, is emphasized. *JOURNAL OF IRANIAN CLINICAL RESEARCH* 2016;2(1):160-162

## INTRODUCTION

Unilateral facet dislocation is generally the result of flexion-rotation forces. If the diagnosis is not promptly made, neurological recovery will be impaired and deformity will result. Lateral radiographs demonstrate anterior subluxation of the upper vertebral body on the lower of less than 25% of the anteroposterior dimension of the vertebral body. On the AP radiographs, there is a shift in alignment of the spinous process at the involved level. The facet dislocation or locking is readily appreciated on a plain radiograph but recent authors have advocated using CT or MRI in these patients but there are no conclusive data regarding this practice (1-4).

In this study, we emphasized the necessity of obtaining CT-scan with sagittal reconstruction in patients with probable locked facet (5-9).

## MATERIALS AND METHODS

who sustained trauma to the cervical spinal cord were seen in our spinal injuries unit. All patients underwent AP and lateral cervical radiograph. They were with abnormal radiographs, with local tenderness, severe cervical movement or focal neurological deficit underwent CT-scan with sagittal and coronal reconstruction. All AP and lateral radiography and cervical CT scans with sagittal and coronal reconstruction were interpreted with author.

## RESULTS

Fifty patients (11%) of 450 cases of cervical spinal column had unilateral locked facet. Twenty-five patients with unilateral locked facet (50%) missed with primary simple AP radiography. On the other hand, 12 patients of them (25%) missed with lateral simple

\*Correspondence: Ali Nazemirafie, Department of Neurosurgery, Arak University of Medical Sciences, Arak, Iran, e-mail: nazemirafie.ali@gmail.com

radiography. Five of them (10%) missed in both AP and lateral radiography. All missed cases diagnosed in cervical spine CT scan with sagittal and coronal reconstruction. All cases were managed properly with open reduction and then with internal fixation with posterior or anterior surgical approaches.

### DISCUSSION

Unilateral locked facet of cervical spine is significant since they occur in 4% to 16% of patients with cervical spine injury referring to emergencies (1-4). Facet injuries can present in a range from subtle facet subluxations to overt facet dislocations. A facet joint subluxation does not imply full dislocation. A dislocation was defined as a displacement of a bone in relation to the opposing bone at the joint, resulting in a complete loss of continuity of the joint (5-8).

Since there is often only minimal forward displacement at the site of dislocation in unilateral locked facet, it is possible to not only miss the locking of facets but also to conclude that no fracture or dislocation is present (9-12). If the diagnosis is not promptly made, neurological recovery will be impaired and deformity will result. Researchers summarized three reasons for delayed diagnosis of unilateral locked facet injuries (13-16). First, there is inadequate radiographic evaluation. Second, associated injuries may lead the concern of the physician away from the cervical spine. Third, there is usually a lack of serious symptoms associated with unilateral facet dislocation or fracture-dislocation (17-20). An adequate radiographic series is crucial for an accurate diagnosis of whiplash-associated disorders (21-25). As demonstrated in our study, radiographic findings of facet subluxation are minimal in all missed cases on routine radiographs.

### Conclusion

This study emphasizes the importance of obtain cervical spinal column CT scan with sagittal and coronal reconstruction in patients with normal cervical radiography but local cervical tenderness and or significant limitation of cervical movement. Further study should be planned for evaluation of MRI rule in cervical unilateral locked facet.

### ACKNOWLEDGEMENTS

Thanks to the colleagues of the emergency department of valiasr hospital.

### REFERENCES

1. Braakman R, Vinken PJ. Unilateral facet interlocking in the lower cervical spine. *J Bone Joint Surgery*. 1967; 49B:249-57.
2. Scher AT. Unilateral locked facet in cervical spine injuries. *AJR*. 1977; 129:45-48.
3. Young JWR, Resnik CS, DeCandido P, Mirvis SE. The laminar space in the diagnosis of rotational flexion injuries of the cervical spine. *AJR*. 1989; 152:103-7.
4. Rogers LF. *Radiology of Skeletal Trauma*. New York: Churchill Livingstone, 1982:38.
5. Taveras JM, Ferrucci JT. *Radiology*. New York: Lipincott-Raven Publishers, 1996:7.
6. Mirvis SE, Young JWR. *Imaging in Trauma and Critical Care*. Baltimore: Williams and Wilkins, 1992:312.
7. Harris JH, Edeiken MB. *The Radiology of Acute Cervical Spine Trauma* 2nd ed. Williams and Wilkins, 1987:119-21.
8. Spitzer WO, Skovron ML, Salmi LR, Cassidy JD, Duranceau J, Suissa S, Zeiss E. Scientific monograph of the Quebec Task Force on whiplash-associated disorders: Redefining "Whiplash" and its management. *Spine*. 1995; 20(8s):supplement.
9. Dvorak J, Panjabi MM, Gerber M, Wichman W. CT-functional diagnostics of the rotatory instability of upper cervical spine. An experimental study on cadavers. *Spine*. 1987b; 12:197-205.
10. Bachulis BL, Long WB, Hynes GD, Johnson MC. Clinical indications for cervical spine radiographs in the traumatized patient. *Am J Sur*. 1987; 153:473-78.
11. Rorabeck CH, Rock MG, Hawkins RJ, Bourne RB. Unilateral facet dislocation of the cervical spine: an analysis of the results of treatment in 26 patients. *Spine* 1987; 12:23-27.
12. Andreshak JL, Dekutoski MB. Management of unilateral facet dislocations: a review of the literature. *Orthopaedics*. 1997; 20:917-26.
13. Beyer CA, Cabanela ME. Unilateral facet dislocations and fracture-dislocations of the cervical spine: A review. *Orthopedics*. 1992; 15(3):311-15.
14. Allen BL Jr, Ferguson RL, Lehmann TR, O'Brien RP. A mechanistic classification of closed, indirect fractures and dislocations of the lower cervical spine. *Spine*. 1982; 7:1-27.
15. Clark CR, Ingram CM, El-Khoury GY, Ehara S. Radiographic evaluation of cervical spine injuries. *Spine*. 1988; 13:742-47.
16. White AA, Southwick WO, Panjabi MM. Clinical instability in the lower cervical spine: a review of past and current concepts. *Spine*. 1976; 1:15-27.
17. Ross SE, Schwab CW, David ET, Delong WG, Born CT. Clearing the cervical spine: initial radiologic evaluation. *J Trauma*. 1987; 27(9):1055-60.
18. Cotler HB. Fractures and dislocations of the subaxial cervical spine. *Spine*. 1991;5(2):203-16.

19. Cybulski GR, Douglas RA, Meyer PR, Rovin RA. Complications in three-column cervical spine injuries requiring anterior-posterior stabilization. *Spine*. 1992; 17(3):253–56.
20. Doris PE, Wilson RA. The next logical step in the emergency radiographic evaluation of cervical spine trauma: The five-view trauma series. *J Emerg Med*. 1985; 3(5):371–85.
21. Beatson TR. Fractures and dislocations of the cervical spine. *J Bone Joint Surg*. 1963; 45B:21–35.
22. Clark WM, Gehweiler JA, Laib R. Twelve significant signs of cervical spine trauma. *Skeletal Radiol*. 1979; 3:201–05.
23. Harris JH. The radiology of acute cervical spine trauma. Baltimore, Williams and Wilkins, 1978: 25–26, 61–70.
24. Scher AT. Anterior cervical subluxation: an unstable position. *Am J Roentgenology*. 1979; 133:275–80.
25. Murphy MD, Batitzky S, Bramble JM. Diagnostic imaging of spinal trauma. *Radiol Clin North Am*. 1989; 27:855–72.