



Case Report

Traumatic unilateral jumped facet joint in the upper thoracic spine: Case presentation and literature review

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ABSTRACT

Background: A jumped facet joint is defined by when the inferior articular process of the superior vertebra becomes locked anterior to the superior articular process of the inferior vertebra. These typically traumatic lesions are exceedingly rare in the thoracic spine. Here, we present a patient with a unilateral jumped facet joint in the upper thoracic spine treated with open reduction and an instrumented fusion.

Case Description: A 45-year-old male presented after a significant motor vehicle accident. In the emergency room, he had a Glasgow Coma Score of 13 without any neurologic deficit. The thoracic computed tomography (CT) showed a significant jumped left facet at the T2-T3 level. Two days later, utilizing intraoperative CT-guided navigation and neuromonitoring, he underwent open reduction of the T2-T3 jumped facet plus an instrumented T1-T5 fusion. X-rays taken 3-month postoperatively showed a stable construct. Six months postoperatively, he remained neurologically intact.

Conclusion: A unilateral jumped thoracic facet may be present in patients with fractured ribs. The mechanism of injury is most likely axial rotation. Both CT and magnetic resonance imaging studies allow for early detection of these very rare lesions and warrant open reduction and instrumented fusion.

Keywords: Jumped facet, Spinal trauma, Thoracic spinal dislocation, Unilateral thoracic facet dislocation

INTRODUCTION

A jumped facet joint occurs when the inferior articular process of the superior vertebra is locked anteriorly to the superior articular process of the inferior vertebra. A unilateral jumped facet reflects biomechanical disruption of the posterior spinal column with/without instability that can lead to cord injury.^[6] Here, we present the rare case of a patient with a unilateral jumped facet joint in the upper thoracic spine treated with open reduction and instrumented fusion.

CASE DESCRIPTION

History and examination

A 45-year-old male presented to the emergency room following a front-end motor vehicle collision. The patient's baseline Glasgow Coma Score was 13 (E:4, V:4, M:5); there were no

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reports of loss of consciousness or signs of head trauma and he remained neurologically intact.

Imaging

The thoracic computed tomography (CT) showed an anterior inferior corner fracture of the T2 vertebral body, jumped left T2-T3 facet, T2-T3 vertebral distraction (i.e., Arbeitsgemeinschaft für Osteosynthesefragen classification T2-T3C (T2: A1; N0),^[10] and Grade I anterolisthesis. The right facet was normal [Figure 1]. Right-sided rib fractures involving ribs 1–5 and 7–8, and a fractured posterior left third rib was also present. The magnetic resonance imaging (MRI) showed no significant cord compression or hematomyelia, but did identify soft-tissue edema in the anterior longitudinal ligament, posterior longitudinal ligament, ligamentum flavum, and interspinous ligaments at T2-T3 consistent with a 3-column injury [Figure 2].

Surgical treatment

Two days later, the patient underwent an open reduction at T2-T3 with an instrumented fusion from T1 to T5. This was performed under CT-guided navigation and neuromonitoring. Polyaxial pedicle screws were placed bilaterally from T1 to T5. The left jumped superior articular process of T3 was identified and drilled off with a matchstick high-speed electric drill, allowing for open reduction of the jumped facets. Two contoured titanium 5.5 mm rods were cut to length, put into the screw heads, and fixed with set screws and tightened. The bony surfaces were decorticated and packed with a mixture of cancellous bone chips and demineralized bone matrix allograft.

Postoperatively, the patient remained neurologically intact. X-rays taken at 3-month follow-up showed a stable construct with no significant anterolisthesis [Figure 3]. At the 6-month follow-up, the patient had no neck pain or new neurologic symptoms.

DISCUSSION

Unilateral jumped facets are much rarer than bilateral jumped facets in the thoracic spine due to the large amount of axial rotation required for the dislocated facet to rotate about the undisrupted facet joint. All but one previously reported cases of unilateral jumped thoracic facets have been associated with ipsilateral rib fracture at the same level or sternal fracture.^[2,3,5,7]

Unilateral thoracic jumped facets rarely cause cord compression or neurologic symptoms due to a lack of significant listhesis. Bilateral jumped facets have a considerably higher risk of neurologic symptoms or paraplegia.^[4,8] In the cervical spine, patients with unilateral jumped facets have only 25% chance of neurologic injury.^[1] In the thoracic spine, patients were completely neurologically intact in all but one reported case^[2,3,5,7] [Table 1].

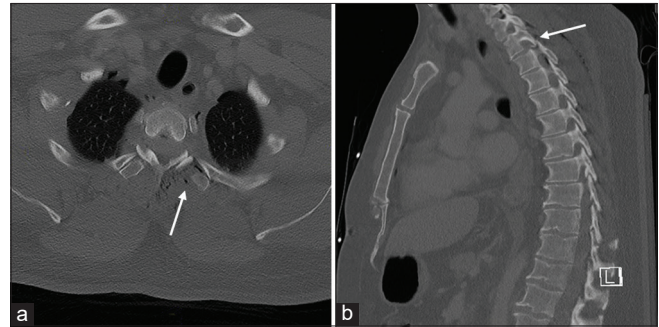


Figure 1: Computed tomography from time of presentation. (a) Axial section at the T2-T3 level. The solid arrow points at the left T2-3 jumped facet showing the classic “empty facet sign” at the left facet joint. (b) Left paramedian sagittal section. The solid arrow shows the superior articulating facet of T3 situated superficial to the inferior articulating facet of T2, creating the “jumped” facet at T2-T3 and mild anterolisthesis.

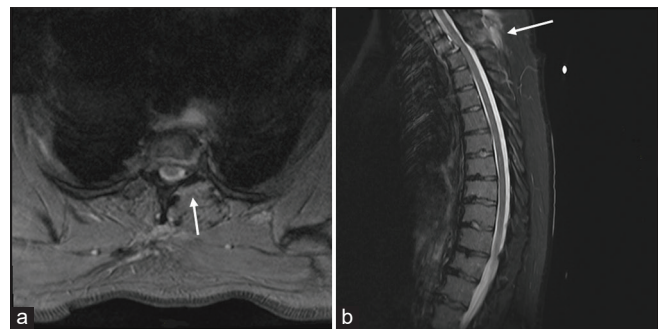


Figure 2: Magnetic resonance imaging from time of presentation. (a) Axial T2 section image at T2-T3 level. The solid arrow shows the significant edema around the left T2-3 facet joint, the disruption of the joint capsule, and the jumped facet on the left. (b) Mid sagittal short T1 inversion recovery image, showing no cord compression. The solid arrow points out the significant disruption of the ligamentum flavum and interspinous ligament and the associated vasogenic edema.

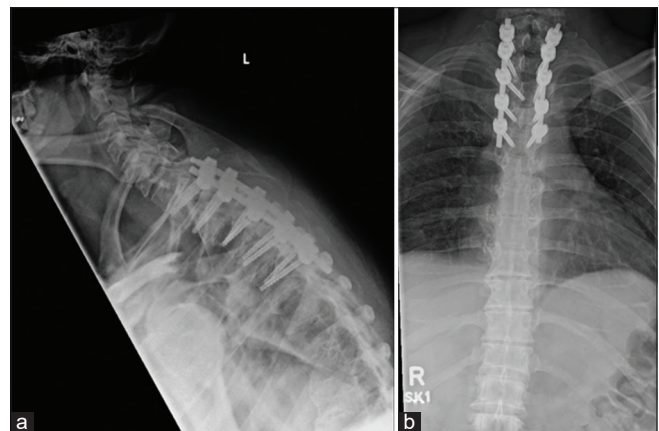


Figure 3: Three-month postoperative films showing stable hardware. (a) Lateral view. (b) Posteroanterior view.

Table 1: Characteristics of the other reported cases of unilateral jumped thoracic facets.

Reference	Level	Side	Age and gender	Injury mechanism	Other bony injuries	Neurologic status	Treatment
Denis, 1991	T3-T4	L	22 Male	MVC	“Multiple rib fractures”	Intact	Open reduction and T2-T6 fusion with Harrington instrumentation
Denis, 1991	T6-T7	R	34 Female	MVC	“Multiple rib fractures”	Intact	Open reduction and T5-T8 fusion with Harrington instrumentation
Berg, 1991	T8-T9	L	19 Male	MVC	Left 9 th rib fracture	Intact	Open reduction and T8-T9 fusion with Harrington instrumentation
Lucas, 1997	T2-T3	R	24 Male	MVC	Right 3 rd -5 th rib fracture	Intact	Open reduction and T2-T4 fusion with sublaminar wires
Lucas, 1997	T8-T9	L	19 Male	MVC	Left 5 th rib fracture	Intact	Open reduction and T8-T9 fusion with Knodt compression wires
Lucas, 1997	T9-T10	L	16 Male	MVC	T5, T9, T10 compression fractures; Sternal fracture	Intact	Bed rest and thoracolumbar sacral orthosis
Gharib, 2002	T3-T4	R	20 Male	MVC	T3 vertebral body fracture	Paraplegic	N/A: radiologic report
This case	T2-T3	L	45 Male	MVC	Right 1 st -5 th rib fracture; Left 3 rd rib fracture; T2 vertebral body fracture	Intact	Open reduction and T1-T5 fusion with pedicle screws and rods

MVC: Motor vehicle crash

Unilateral thoracic jumped facets should be considered unstable due to the lesions that result from the large amount of rotational force required for facet dislocation. Treatment guidelines for jumped facets in the thoracic spine involve open reduction in almost all cases. Although Lucas presents a case of a jumped left T9-T10 facet with minimal anterolisthesis that was treated nonoperatively,^[7] all other reported cases – including ours – were treated with open reduction and instrumented fusion. Early surgery should be the first line of treatment for unilateral jumped facets in the thoracic spine because of spinal instability.^[9]

CONCLUSION

A unilateral jumped thoracic facet should be considered in patients with fractured ribs in the setting of trauma and is attributed to axial rotation. CT and MRI allow early detection of these lesions allowing for timely open reduction and instrumented fusion to optimize outcomes.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

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