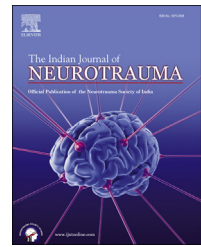


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Case Report

Isolated tear-drop fracture of the axis without neurological deficits



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ABSTRACT

The tear-drop fractures of the axis are uncommon and characterized by an avulsed fragment from the anterior inferior angle of the body of cervical spine. We report a case of 36-year gentleman who presented with history of road traffic accident. He had neck pain and inability to move the neck. There were no focal neurological deficits. Radiographs of the cervical spine and computed tomography (CT) scan showed tear-drop fracture of C2 vertebra. The patient was managed conservatively in a rigid cervical collar for a period of six weeks and recovered well.

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1. Introduction

The tear-drop fractures of the axis are extremely rare and characterized by an avulsed fragment from the anterior inferior angle of the body of cervical spine (C2) and can be of varying size.^{1–6} We report a case of 36-year gentleman who presented with history of road traffic accident.

2. Case report

A 36-year-old man presented with history of road traffic accident. He had loss of consciousness for 15 min. There was no history of ear, nasal or oral bleed, vomiting or seizures. When he regained consciousness he noticed severe neck pain. There was no history of weakness. There was no history of bowel

and bladder disturbances. At the time of examination in emergency room he was conscious and alert. Glasgow coma scale (GCS) was best eye opening-E4, best verbal response-V5 and best motor response M6. Pupils were equal and reacting to light. Motor and sensory examination was normal. Planters were flexor. He had neck pain and inability to move the neck. The cervical spine was stabilized in rigid cervical collar. Radiographs of the cervical spine showed tear-drop fracture of C2 vertebra (Fig. 1). Computed tomography (CT) scan and magnetic resonance imaging (MRI) of the cervical spine showed a fracture line in the C2 body and avulsion at the anterior inferior portion of the C2 body (Figs. 2 and 3). A diagnosis of C2 tear-drop fracture without a neurological deficit was made. The patient was managed conservatively in a rigid cervical collar for a period of six weeks and recovered well.

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Fig. 1 – Radiographs of the cervical spine showing tear-drop fracture involving C2 body.



Fig. 3 – CT 3D reconstruction nicely depicting the fractured fragment.

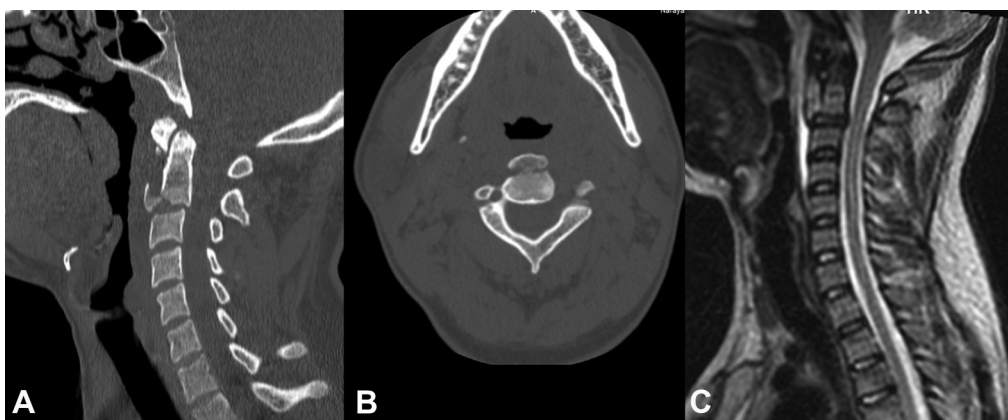


Fig. 2 – (A and B) CT scan cervical spine showing details of the fracture and (C) MRI showing presence of pre-vertebral hematoma.

3. Discussion

In elderly patients, tear-drop fractures of the upper cervical spine commonly occur following minor trauma, however, in adults' vehicular accidents and fall from heights are the commoner causes.^{1,6–9} Based on the mechanism of injury, the incidence of neurological deficits, management principles and outcome, two major groups of tear-drop fractures involving the cervical spine have been identified e.g. involvement of the upper (C1–C2) cervical spine and involvement of the lower (C3–C7) cervical spine.⁶ In upper cervical spine the axis (C2) is

commonly fractured with an incidence of tear-drop fractures around 3% of the cervical spine trauma.⁷ Tear-drop fractures of the axis are usually stable injuries not associated with neurological deficits unless there are associated with injuries at other levels.⁶ Imaging is the key to diagnosis of tear-drop fractures of the cervical spine. X-ray cervical spine is the primary investigation that will show pre-vertebral soft tissue swelling and fracture fragments.^{1,10,11} CT scan is the ideal investigation for demonstrating the sagittal fracture involving the vertebral body and posterior elements in patients with suspected tear-drop fractures of the cervical spine.^{6,10} MRI will help to demonstrate the extent of soft tissue and associated

spinal cord injury.⁶ Stable tear-drop fracture of C2 without neurological deficits are usually managed conservatively^{2,5,6,8} and surgery is reserved for unstable fractures or for patients in whom there are associated neurological deficits.^{3–6}

Conflicts of interest

All authors have none to declare.

REFERENCES

1. Lee JS, Harris Jr JH, Mueller CF. The significance of prevertebral soft tissue swelling in extension teardrop fracture of the cervical spine. *Emerg Radiol.* 1997;4(3):132–139.
2. Boran S, Hurson C, Gul R, et al. Functional outcome following teardrop fracture of the axis. *Eur J Orthop Surg Traumatol.* 2005;15(3):229–232.
3. Deniz FE, Cagli S, Zileli M. Compressive hyperextension injury of C2-C3 managed with anterior plate fixation: case report. *Turkish Neurosurg.* 2007;17(2):125–128.
4. Dhinsa B, Agarwal A, Prasad V, Morar Y, Hammer A. Anterior cervical plating for an axis teardrop fracture: a case report. *Eur Orthop Traumatol.* 2011;2(1–2):63–66.
5. Kim HJ, Lee KY, Kim WC. Treatment outcome of cervical tear drop fracture. *Asian Spine J.* 2009;3(2):73–79.
6. Motsitsi N, Bomela L. Tear-drop fractures of the cervical spine. *East Central Afr J Surg.* 2009;14(2):9–12.
7. Korres DS, Zoubos AB, Kavadias K, Babis GC, Balalis K. The “tear drop” (or avulsed) fracture of the anterior inferior angle of the axis. *Eur Spine J.* 1994;3(3):151–154.
8. Korres DS, Papagelopoulos PJ, Mavrogenis AF, et al. Multiple fractures of the axis. *Orthopedics.* 2004;27(10):1096–1099.
9. Burke JT, Harris JH. Acute injuries of the axis vertebra. *Skeletal Radiol.* 1989;18(5):335–346.
10. German JW, Hart BL, Benzel EC. Nonoperative management of vertical C2 body fractures. *Neurosurgery.* 2005;56(3):516–521.
11. Scher AT. ‘Tear-drop’ fractures of the cervical spine – radiological features. *S Afr Med J.* 1982;61(10):355–356.