

NEGLECTED SUB-AXIAL CERVICAL SPINE BI-FACET DISLOCATION: A CASE REPORT

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ABSTRACT

Bi-facet dislocation is a serious sub-axial cervical spine injury that is often accompanied by neurological deficits. We present a 54-year-old male with a one-month-old C5/6 bi-facet dislocation with intractable upper limb radiculopathic pain but intact neurological examination findings. The patient underwent combined posterior and anterior approaches to the cervical spine and 360-degree fusion with immediate resolution of his radiculopathy and intact neurology post operatively.

Key words: Bi-facet dislocation, Sub-axial cervical spine, 360-degree fusion

INTRODUCTION

Ninety percent of bi-facet dislocation of the cervical spine are associated with neurological deficit (1). The mechanism of injury often involves a flexion-distraction type of force. During the dislocation, the inferior facet of the vertebra above moves anteriorly to the superior facet of the one below and becomes locked into that position. During this process the spinal cord is often compressed between the neural arch of the dislocated vertebra above and the posterior aspect of the vertebral body below. In the rare event that the patient also sustains lamina fractures during the dislocation, then this serves as an auto-decompression at the time of injury - this explains why some patients, albeit rarely, do not have neurological deficits despite the dislocation, as in our presented case.

CASE REPORT

A 54-year-old male was struck on the posterior aspect of the neck by falling debris while digging a ditch. Subsequently, he developed bilateral upper limb radiculopathy that ran along the lateral aspect of both his forearms and thumbs. He also had significant neck pain and stiffness. He presented himself to a local rural hospital where a cervical spine X-ray was done, and a hard neck collar was prescribed. The patient was eventually referred to our centre, albeit delayed, due to challenges in access to quality healthcare.

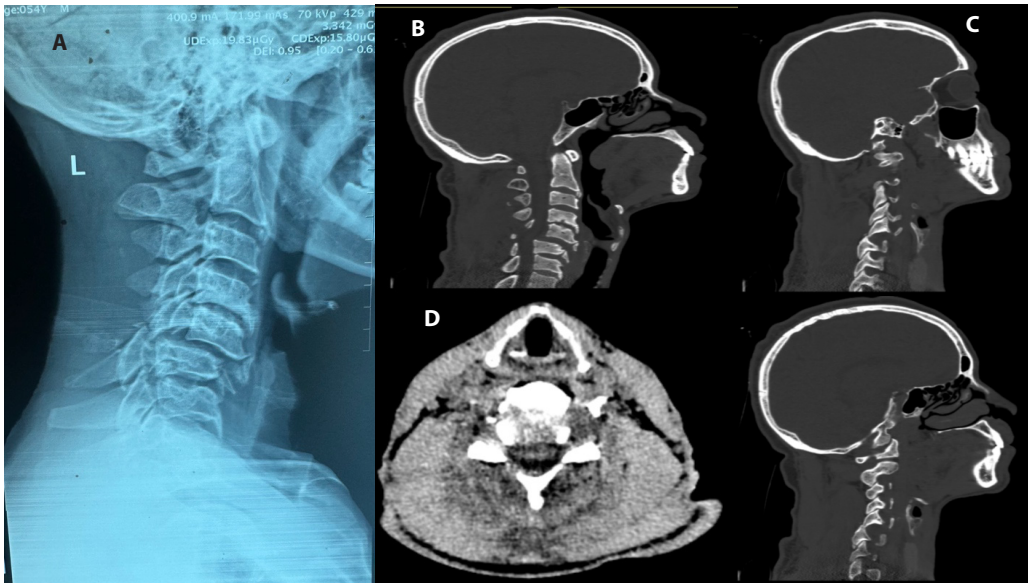
When we examined him, one month after the injury, he complained of intractable bilateral upper limb radiculopathy and significant neck stiffness.

He was surprisingly on examination, neurologically intact with all the myotomes having power grade 5 and all dermatomes being essentially intact. He had no myelopathic signs. The cervical spine X-ray he was referred with showed C5/6 bi-facet dislocation. A Computerized Tomography (CT) scan was ordered, and this further revealed the presence of C5 bi-laminar fractures in addition to the C5/6 bi-facet dislocation (Figure 1). No Magnetic Resonance Imaging (MRI) was available at that time, but the soft tissue window of the CT scan did not reveal any disc herniation at the C5/6 level. The patient consented for surgery after the risks and benefits were explained to him. No pre-operative traction was applied.

Intra-operatively, a trial of closed reduction under fluoroscopy was first attempted - this unsurprisingly failed given the dislocation was one month old. A decision was made to approach the C5/6 dislocation posteriorly first. A standard posterior approach to the C5/6 level was done. Immediate intra-operative findings were the presence of the C5 bi-laminar fractures. The dislocated C5/6 facet joints were also located. The fractured C5 laminae were removed from their soft tissue attachments and the cord was visualised. Fibrous tissue was then excised from both C5/6 facet joints and an attempt to reduce the dislocation was done - this failed. A decision was made to do a partial bilateral C6 superior facetectomy to aid in reduction - once this was completed, the dislocation easily reduced. The reduction was then held in place with lateral mass screws into the C5 and C6 vertebrae and secured by two rods. Due to the partial facetectomy that

Figure 1

Pre-operative imaging. (a) Lateral cervical spine X-ray showing C5/6 bi-facet dislocation with translation of the C5 vertebrae over C6, (b) Sagittal CT scan showing C5 vertebral body translation over C6, (c) Axial CT scan showing bilateral lamina fractures of the C5 vertebra with no herniated disc compressing the cord anteriorly, (d and e) Sagittal CT scan images showing dislocated left and right C5/6 facets



was done bilaterally on the C6 vertebra, an intra-operative decision was made to supplement the posterior fixation with an anterior discectomy and fusion. The posterior wound was thus closed, and the patient flipped supine. A standard Smith-Robinson approach to the C5/6 level was done, C5/6 discectomy then followed and a 6mm cage with autograft harvested from the fractured C5 lamina used. A 25mm anterior plate was then

used. The anterior incision was closed. The patient was successfully reversed from anaesthesia and immediate examination after the reversal showed he remained neurologically intact. The patient was freely independently mobile the following day and he was discharged home in stable condition on a hard cervical collar. He continues to do well post-operatively (Figure 2).

Figure 2

Intra-operative fluoroscopy images showing completed posterior fixation via lateral mass screws, and anterior cervical discectomy and fusion at the C5/6 level

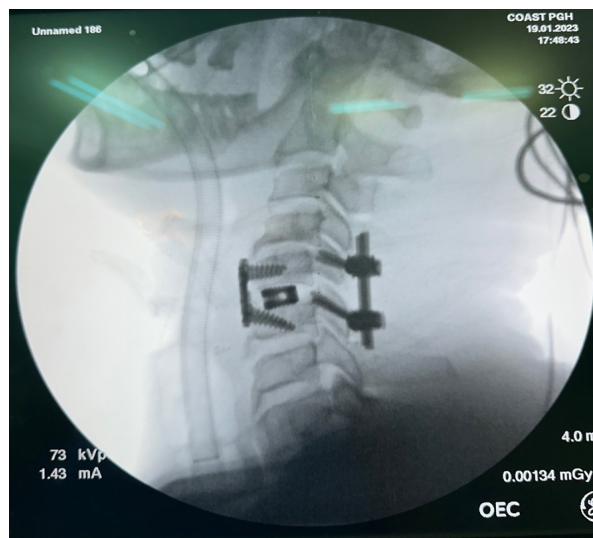


Figure 3

Post-operative CT scan showing well placed implants and good reduction

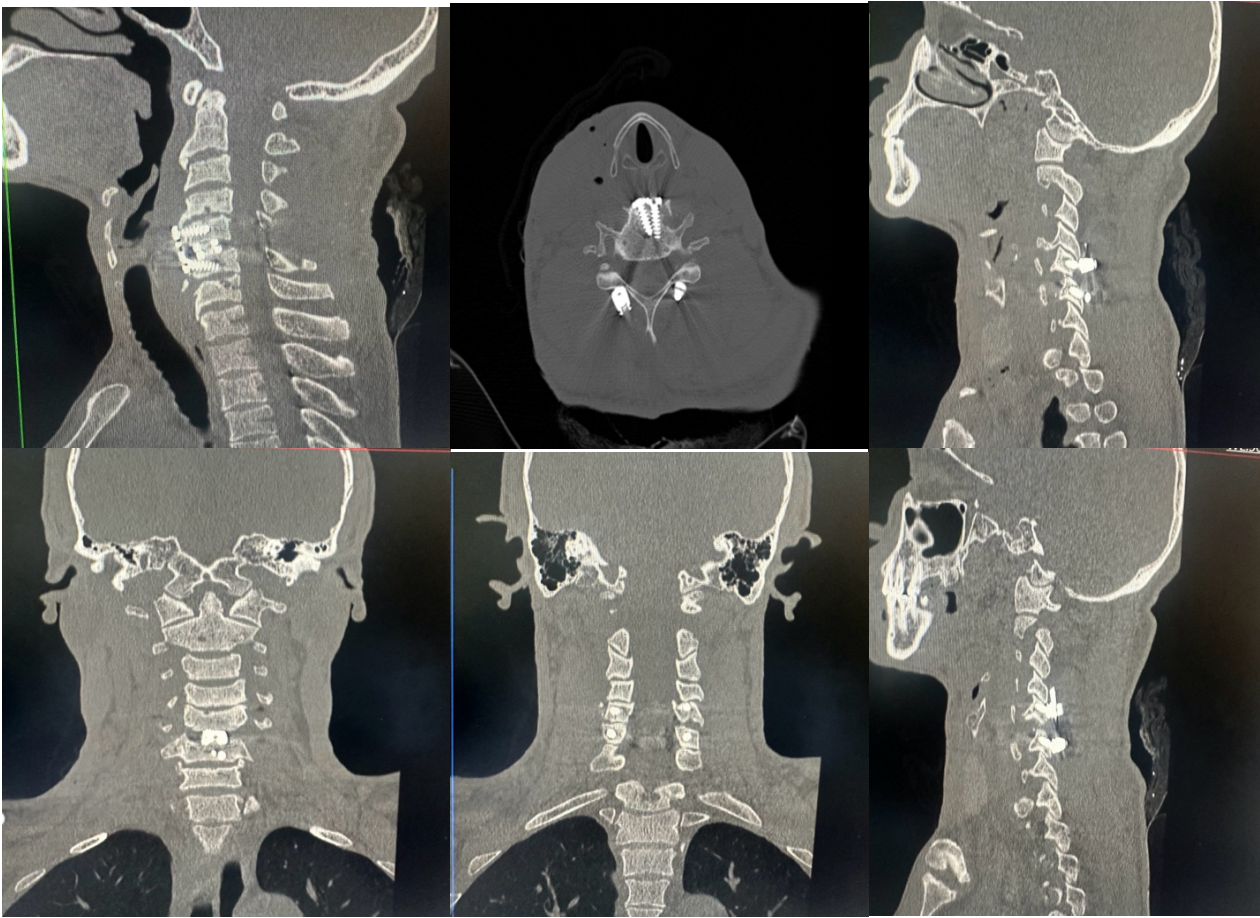


Figure 4

Post-operative day 1 prior to discharge, the patient showed no neurological deficit and complete resolution of his bilateral C6 radiculopathy



DISCUSSION

Bilateral facet dislocation of the sub-axial cervical spine is associated with 90% incidence of neurological deficit, with 84% of cases being a complete cord injury (1). Our patient did not have any motor or sensory deficits as he had also sustained concomitant bi-laminar fractures of C5 which provided an auto-decompressive mechanism during the injury.

Neglected bi-facet dislocation poses a serious challenge as in many cases, closed reduction often fails and there is often a need to perform open reduction (2,3). This is mainly due to buildup of fibrous tissue in the dislocated facets. Our current healthcare system has challenges in access to specialized healthcare and thus our patient was referred late with the intervention being delayed by over one month.

We decided to surgically intervene in our neglected neuro-intact patient because the dislocated C5/6 facets posed a future risk to possible neurological injury (4). In addition, the patient had severe intractable C6 radiculopathic pain and neck stiffness. Several studies have shown neuro-intact patients with neglected sub-axial facet dislocations have satisfactory short-term outcomes if surgical intervention is performed with improved neck pain scores and easier rehabilitation (5-7).

No pre-operative cervical traction was done in our case despite it being shown to be effective in some neglected unilateral facet dislocation cases (8).

Srivastava *et al.* (9) in his series came up with an excellent algorithm that guides on the management of neglected cases. In his paper, he defines a neglected case as one whose presentation was > 3 weeks late and suggests a trial of closed reduction first. If this was successful, then an Anterior Cervical Discectomy and Fusion (ACDF) is indicated. If closed reduction fails, then a need to perform a posterior release arises, this is then followed by posterior stabilization or ACDF if there were neurological deficits pre-operatively. We decided to perform an ACDF in our case despite the patient having no neurological deficits because a facetectomy was needed to reduce the dislocation. This inherently destabilizes the spine as the facet joints play a crucial role in the stability of a segment. We thus decided to add an anterior stabilization procedure to the construct to aid stability.

Jain *et al.* (10) in his case report had to combine both posterior releases and anterior releases to achieve reduction. In our case the posterior release and facetectomy were sufficient to achieve reduction and the anterior procedure was merely added to improve stability and fusion.

CONCLUSION

Neglected cases of bi-facet dislocation may require posterior release involving a partial facetectomy to aid in reduction. An anterior stabilization procedure may be added to improve the stability of the construct and aid also aid in fusion.

Declaration of patient consent

The authors certify that the patient consented to use of his clinical images for publication of his case in a journal.

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