

Editorial

Commentary on “Contiguous-Level Unilateral Cervical Spine Facet Dislocation—A Report of a Less Discussed Subtype”

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Introduction

Unilateral facet dislocations (UFDs) of the cervical spine comprise 6 to 10% of all cervical spinal injuries.¹ The mechanism causing such injuries namely flexion distraction with a rotational component is well described.² They may or may not be diagnosed by plain X-ray studies alone. If X-rays are normal but patients have persistent pain or neurological deficits, the standard practice is to get a magnetic resonance imaging (MRI) done. In our country, most surgeons would then go on to reduce the involved level, decompress neural elements, and fix the spine based on these radiological investigations alone. In this context, I read with interest the article by Das et al³ where they have described contiguous-level UFDs as a subtype of the larger spectrum of UFDs since the optimal treatment for these injuries has several areas of dispute.¹

Is There a Role for Conservative Treatment (Only Closed Reduction Followed by Immobilization) in UFDs?

In a systematic review of 176 adult patients in 6 studies of UFD with or without associated fractures, Dvorak et al¹ stated that treatment failure rates were higher in nonoperatively treated compared to surgically treated patients (80 vs. 2.6%) with an incidence of 5% neurological deterioration in the conservatively treated group. Long-standing cervical pain was also found to be more (30%) in conservatively treated patients than in those who were operated (10.3%).^{1,4} Rates of failed anatomical reduction or loss of reduction were also higher in patients who were subject to nonoperative treatment.^{1,5} While there is no study compar-

ing immobilization in a halo vest to that with a cervical collar, failures have been reported with both methods.¹

There has been a growing interest of late in the conservative management of select cases of facet fractures with no dislocation,^{6,7} and here too the failure rate of conservative treatment of nondisplaced unilateral facet fractures is reported to be 9% with 20% of patients showing radiological progression of listhesis at follow-up.⁶ Weight of the patient, comminution of fracture fragments, associated posterior element fracture, height of fracture, and multilevel facet fractures are all predictors of failure of conservative treatment.^{6,7}

The corollary we can draw from this is that not only is operative intervention mandatory in UFD, one must also look carefully for signs of covert adjacent segment injury like undisplaced facet fractures (which may be a milder form of the contiguous UFD described by Das et al³) and if found would mandate inclusion of more levels in the fixation.

Is an MRI Mandatory Prior to Attempted Closed Reduction of UFDs?

The danger of closed reduction in causing neurological deterioration in sedated patients was reported by Eismont et al⁸ and since then there is debate⁹ if a prerelief MRI is necessary for seeing impingement of the cord by an extruded disc fragment. Several studies have subsequently shown safety of closed reduction *in awake and fully conscious* patients without need for a preoperative MRI¹⁰ and there is evidence to show that during traction the disc reconstitutes itself into the disrupted disc space.¹¹ However, a survey among surgeons operating on spinal trauma showed that neurosurgeons had a greater predilection to order a

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prereduction MRI (76.7%) in compared to orthopaedic surgeons (57.5%).¹⁰

How Safe Are Closed Reductions of UFDs?

There is currently also no consensus as to what constitutes a “dangerous” disc herniation¹⁰ and the decision to subject the patient to closed reduction after seeing the MRI is at present a purely subjective one. The American Academy of Neurological Surgeons in a consensus statement declared that “there was insufficient evidence to support either treatment standards or treatment guidelines in regards to reduction of UFDs.”^{10,12} They noted the risk of permanent neurological complications after closed reduction in awake patients was approximately 1%, while transient injury occurred in 2 to 4%.¹² They have also cautioned against closed reduction in patients with an additional injury (as in the cases described by Das et al³) and in those who are obtunded.¹⁰

In both these cases, traction was given after anesthetic induction (personal communication) and Miao et al⁹ have recommended closed reduction under general anesthesia under neuromonitoring to prevent iatrogenic injury and this might be a useful tool in multilevel injury as the effects of traction and neural element stretching may be unpredictable in this scenario.

Is There Any Preferred Surgical Approach (Either Anterior or Posterior) in the Operative Management of UFDs?

There are very few papers comparing anterior and posterior approaches in the surgical management of UFDs.^{13,14}

The advantages of an anterior approach include:

1. Ability to directly decompress any prolapsed disc fragment in the canal^{2,15}
2. Less soft tissue dissection and decreased postoperative pain²
3. Better restoration of cervical lordosis^{2,9,16} and maintenance of disc height¹⁴
4. Lesser wound infection¹⁵
5. Complete^{14,15} and easily documentable radiological fusion.

Reduction is mandatory prior to instrumentation and can be achieved either by intraoperative traction or by intraoperative manipulation using a small osteotome in the disc space or with the help of distractor pins. *One important nuance of reduction is that rather than pressing the osteotome on the anterolisthesis vertebra upward, the pressure should be directed downward on the exposed end plate of the inferior vertebra and lever the upper vertebra backward by pushing back its anterior surface.*⁹ Inability to reduce the dislocation intraoperatively mandates change of surgical plan and unlocking the facet through a posterior approach.¹⁷ Other disadvantages of an anterior approach include recurrent laryngeal nerve injury, dysphagia, and esophageal injury.¹⁸

One of the main drawbacks of an anterior only approach is loss of radiographic alignment over time both in the form of

translation and change in angulation.^{15,19,20} Johnson et al²⁰ reported a 13% loss of radiographic correction in a series of 87 patients with unilateral and bilateral facet dislocations treated via an anterior approach only and noted that concomitant facet and end plate fractures are risk factors for the same. However, Anissipour et al¹⁵ report better results and hypothesize that this may be due to improved instrumentation over time.

The advantages of a posterior approach include:

1. Easier and direct reduction in dislocation by removing bone or soft tissue that may prevent traction from reducing the dislocation^{2,16}
2. Biomechanically stronger construct (useful in osteoporotic spine)^{2,16}
3. Lesser incidence of postoperative dysphagia¹⁶
4. Can address any bony fragment compressing the cord from behind like fractured lamina²
5. May be more useful in junctional areas where implant failure via only anterior approach is more common.¹⁶

However, *posterior surgery alone* may be risky if there is a large intraspinal disc fragment anteriorly as this may impinge on the cord during reduction and Lins et al²¹ state that presence of a large disc in a neurologically intact patient was “an absolute contraindication” to a posterior reduction and stabilization. Wound complications, blood loss, increased operative times, and postoperative pain are also relatively more with the posterior approach.¹⁶

Combined anterior and posterior approaches offer greatest biomechanical stability^{16,21,22} and are particularly suitable if there is extensive ligamentous damage (as seen in bilateral facet dislocations) or when accompanied by corpectomies for vertebral body fractures^{21,22} as happened in these cases too.³

The take-home points from this study³ would thus be:

1. The entity of multilevel UFDs (though uncommon) points toward the severity of trauma and these patients are likely to have gross hemodynamic instability with a poor neurological status unlike what is commonly seen with a single-level UFD where more than half are either asymptomatic or have only radicular symptoms.²¹
2. A full radiological study comprising X-rays, computed tomographic scan with reconstructed films, and MRI is mandatory in all cases of cervical dislocations to unmask any subtle signs of multilevel injury like other facet, end plate and laminar fractures, capsular disruptions, and discal compression in segments adjacent to the level of facet dislocation.
3. Finally a combined approach should probably be done if more than one level of injury is present (even if unilateral) as such an injury signifies more severe ligamentous damage. This is the strongest fixation biomechanically and can easily address multiple levels of injury.

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Conflict of Interest

None declared.

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