Cervical facet fractures


The surgical management of unilateral cervical facet fractures without subluxation remains a topic of debate as the spectrum of injuries within this category is wide and variable. The decision to intervene operatively is usually driven by the presence of discoligamentous disruption seen on STIR MRI, as these fractures are at a higher risk of subluxation, delayed kyphosis, worsening pain, and neurological injury when managed with rigid bracing.

In the absence of discoligamentous injury and neurological deficit, many surgeons elect to brace these fractures. In their retrospective article, Aarabi et al. compared the outcomes of patients with unilateral facet fractures without subluxation that were either managed conservatively or operatively. The integrity of the discoligamentous complex in their patients was either normal or indeterminate. The authors found that operative treatment failed in only 1 (10%) of 10 patients who underwent surgery while conservative therapy failed in 9 (60%) of 15 treated with bracing (failure was defined as progressive translation or kyphosis or not attaining solid fusion). The mean time until failure was 38.4 days (range 5–103 days) from injury. Of note, none of the patients in whom treatment failed presented with a neurological deficit. All of the patients in whom conservative treatments failed then underwent internal fixation.

This high percentage of patients in whom conservative treatment failed might be confounded by the presence of a larger percentage of patients with higher degrees of discoligamentous disruption (assessed by the injury severity score) within this subcategory compared to those patients who were successfully managed with bracing. Moreover, the decision to operate in patients initially treated with brace therapy was driven by radiographic evidence of translation or kyphosis, which in the absence of pain, dislocation, or neurological deficit does not necessarily warrant surgical intervention.

In our experience we find that rigid bracing for at least 3 months is an effective and successful method of managing patients with unilateral facet fractures without subluxation as long as the integrity of the discoligamentous complex is normal. Close follow-up with radiography and assessment of fusion with CT scanning or dynamic flexion and extension radiography is warranted to confirm fracture healing prior to the discontinuation of the hard collar or the crown halo vest (Fig. 1). Since May of 2013, we have assessed and managed 9 neurologically intact patients with unilateral facet fractures without instability. None of these patients has required surgery.

This study further confirms the complexity and spectrum that this injury represents. Spine surgeons should pay careful attention to what seems to be a benign fracture and further assess the severity of this injury with MRI. Furthermore, other risk factors such as age and...
bone health should be taken into account. Lastly, future studies directed at the understanding and the assessment of the degree of discoligamentous disruption would help predict successful treatment strategies.

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The authors report no conflict of interest.

Reference

RESPONSE: We appreciate the critical review of our manuscript by Drs. Dahdaleh, Smith, Lindley, and Hitchon. The primary objective of our investigation was to define the natural history of a nondisplaced unilateral facet fracture under physiological loads. Other researchers have had the same purpose in their studies. Halliday et al.2 evaluated the integrity of the discoligamentous complex (facet capsule, interspinous ligament, anterior longitudinal ligament, and posterior longitudinal ligament) in relation to the probability of instability and the need for surgical intervention. Spector et al.3 endeavored to relate the probability of subluxation or kyphotic deformity to the size of the fragment.

We agree with the statement that the “decision to intervene operatively is usually driven by the presence of discoligamentous disruption seen on STIR MRI, as these fractures are at a higher risk of subluxation, delayed kyphosis, worsening pain, and neurological injury when managed with rigid bracing” but could not understand the statement that the “high percentage of patients in whom conservative treatment failed might be confounded by the presence of a larger percentage of patients with higher degrees of discoligamentous disruption.” In our paper we clearly mention that we used MRI to confirm lack of spinal cord injury and to grade the level of injury severity of 7 ligaments of the cervical spine discoligamentous complex (anterior longitudinal ligament/anterior anulus, disc, posterior anulus/posterior longitudinal ligament, ligamentum flavum, joint capsule on right side, joint capsule on left side, and interspinous ligament). The injury severity score of a specific ligament was 0 if the ligament was intact, 0.5 if the injury was indeterminate, and 1 if the ligament was completely disrupted. For all 7 ligaments, the score ranged from 0 to 7. The mean instability score was 3.2 (SD 1.5) (3.6 in the surgical group and 3.0 in the nonoperative group, with no statistical difference). We were not able to replicate Spector and colleagues’ evaluation of the size of the facet fragment because the fracture lines were basal, transverse, and coronal.3 In addition we did not find any significant differences in Subaxial Injury Classification (SLIC) and Severity score between the two groups (see Table 2 in our article).

Dr. Dahdaleh and his colleagues opined that “the decision to operate in patients initially treated with brace therapy was driven by radiographic evidence of translation or kyphosis, which in the absence of pain, dislocation, or neurological deficit does not necessarily warrant surgical intervention.” While we understand their concern for unnecessary surgery, our view was that waiting for a neurological deficit or pronounced subluxation to develop might leave the patient with permanent nerve root or spinal cord injury and protracted pain and unhappiness.

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Axial fractures

To The Editor: I found the article by Shinbo et al.8 very interesting (Shinbo J, Sameda H, Ikenoue S, et al: Simultaneous anterior and posterior screw fixations confined to the axis for stabilization of a 3-part fracture of the axis [odontoid, dens, and hangman fractures]. Report of 2 cases. J Neurosurg Spine 20:265–269, March 2014). The authors described 2 cases of multiple fractures confined to the axis (odontoid Type II fracture associated with a Type IA traumatic spondylolisthesis without involvement of C2–3 disc space). The authors treated both patients with anterior odontoid screws and additional posterior bilateral C2 pedicle screws, with favorable outcomes and good osteosynthesis. Shinbo et al. also reported that there is no strong consensus for the treatment in such cases, justifying a combined approach.

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