Delayed presentation of cervical facet dislocations

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Purpose. To review treatment outcomes of 19 patients with delayed presentation of cervical facet dislocations.

Methods. Records of 17 men and 2 women aged 21 to 63 (mean, 39) years who presented with unilateral (n=14) or bilateral (n=5) cervical facet dislocation after a delay of 7 to 21 (mean, 14) days were reviewed. The most common level of dislocation was C5-C6 (n=9), followed by C4-C5 (n=6), C3-C4 (n=2), and C6-C7 (n=2). The neurological status was graded according to the Frankel classification. One patient (with bilateral facet dislocation) had complete quadriplegia (grade A), 11 had incomplete spinal cord injury (grades C and D), and 7 had nerve root injury. Closed reduction using continuous skull traction for 2 days was attempted. In patients achieving closed reduction, only anterior discectomy and fusion was performed. Those who failed closed reduction underwent posterior partial/complete facetectomy and fixation. If there was traumatic disk prolapse, anterior decompression and fusion was then performed.

Results. The mean follow-up was 46 (range, 12–108) months. 10 of 14 patients with unilateral facet dislocation were reduced with traction and then underwent anterior discectomy and fusion. The remaining 4 patients who failed closed reduction underwent posterior facetectomy and fixation; 3 of them had traumatic disk prolapse and thus also underwent anterior discectomy and fusion with cage and plate. Four of the 5 patients with bilateral facet dislocations failed closed reduction and underwent posterior facetectomy and lateral mass fixation, as well as anterior surgery. The remaining patient achieved reduction after traction and hence underwent only anterior discectomy and fusion. All patients achieved pain relief and sufficient neck movement for normal activities. All 7 patients with nerve root injury improved completely; 9 of the 11 patients with incomplete spinal cord injury improved by one Frankel grade, and the remaining 2 by 2 grades. The patient with complete quadriplegia showed no improvement.

Conclusion. Preoperative traction is a safe and
effective initial treatment for neglected cervical facet dislocation, as it reduces the need for extensive (anterior and posterior) surgery. If closed reduction is successful, anterior discectomy and fusion is the surgery of choice. If not, posterior facetectomy and fusion followed by anterior surgery is preferred.

Key words: cervical vertebrae; diskectomy; dislocations; traction

INTRODUCTION

Unilateral or bilateral subaxial cervical spine dislocations with locked facets are quite common. Success rates of closed reduction using rapid skull traction vary in unilateral and bilateral types. Early management is essential; delayed presentation makes treatment challenging, especially in economically disadvantaged countries. Guidelines for delayed/neglected cases are unclear. We reviewed treatment outcomes of 19 patients with delayed presentation of cervical facet dislocations.

MATERIALS AND METHODS

Records of 17 men and 2 women aged 21 to 63 (mean, 39) years who presented between 2003 and 2008 with unilateral (n=14) or bilateral (n=5) cervical facet dislocation with a delay of 7 to 21 (mean, 14) days were reviewed. The causes of the injury were falls from height (n=11), road traffic accidents (n=7), and fall while carrying a heavy load on the head (n=1). The most common level of dislocation was C5-C6 (n=9), followed by C4-C5 (n=6), C3-C4 (n=2), and C6-C7 (n=2). The neurological status was graded according to the Frankel classification. One patient (with bilateral facet dislocation) had complete quadriplegia (grade A), 11 had incomplete spinal cord injury (grades C and D), and 7 had nerve root injury. Radiography, computed tomography, and magnetic resonance imaging of the cervical vertebrae were performed.

Closed reduction was attempted with the patients being awake using continuous skull traction for a mean of 2 (range, 1–4) days. Traction weight was initiated at 10 lbs and increased gradually to a maximum of one third of the body weight. Neurological status was monitored during the course. If reduction was achieved, the traction weight was reduced by 50%.

Depending on the success of the initial traction, subsequent treatment was performed according to a predefined protocol (Fig. 1). In patients achieving closed reduction, only anterior discectomy and fusion

![Figure 1](algorithm.png)  
*Figure 1  Algorithm for the management of neglected cervical facet dislocations.*
was performed. Those who failed closed reduction or were unilaterally reduced underwent posterior partial/complete facetectomy and fixation. If there was traumatic disk prolapse, anterior decompression and fusion was then performed.

Postoperatively, the neck was immobilised with a hard cervical collar, which was removed after one month. Intravenous antibiotics were given for 2 days. Intensive physiotherapy/rehabilitation was started early. Patients were followed up at one, 3, 6, and 12 months, and yearly thereafter.

RESULTS

The mean follow-up was 46 (range, 12–108) months. 10 of 14 patients with unilateral facet dislocation were reduced with traction and then underwent anterior discectomy and fusion. Only anterior discectomy and fusion is performed.

Figure 2  (a) Unilateral facet dislocation at the C5-C6 level in a 27-year-old man with left C6 and C7 radiculopathy. (b) Complete reduction is achieved after traction. Only anterior discectomy and fusion is performed.
disectomy and fusion (Fig. 2). The remaining 4 patients who failed closed reduction underwent posterior facetectomy and fixation; 3 of them had traumatic disk prolapse and thus also underwent anterior discectomy and fusion with cage and plate. Four of the 5 patients with bilateral facet dislocations failed closed reduction and underwent posterior facetectomy and lateral mass fixation, as well as anterior surgery and fusion to address the anterior compression (Fig. 3). Intra-operatively, bilateral facet dislocations of all 4 patients were noted to be unilaterally reduced. The remaining patient achieved reduction after traction and hence underwent only anterior discectomy and fusion.

All patients achieved pain relief and sufficient neck movement for normal activities. There were no graft-related problems. No patients had neurological deterioration. All 7 patients with nerve root injury improved completely. Nine of the 11 patients with incomplete spinal cord injury improved by one Frankel grade, and the remaining 2 by 2 grades. The patient with complete quadriplegia showed no improvement.

**DISCUSSION**

For non-acute bilateral cervical facet dislocations, the operating sequence of posterior-anterior-posterior is recommended. The success rate of closed reduction for dislocations in patients presenting after 72 hours is approximately 20%, compared with 64% in fresh dislocations. Most late-presenting patients failed closed reduction after traction using a maximum weight of 40 lbs. Adequate reduction was achieved after traction in only 2 of 12 patients with >1.5-month-old cervical spine dislocations. Reduction was then stabilised by anterior fixation with a plate, and thus avoiding posterior surgery.

In patients with cervical facet dislocation with concomitant disc herniation, neurological deterioration can occur during traction. Nonetheless, no neurological worsening has ever been documented following closed reduction in awake, cooperative patients even if there is disc herniation.

Posterior and anterior surgeries should be mandatory for cervical facet dislocations. Posterior-anterior procedure for neglected traumatic bifacet dislocation of the subaxial cervical spine can achieve sagittal alignment with less risk of iatrogenic neurological injury, reduced operating time, decreased blood loss, and a shorter hospital stay. In addition, it enables anatomic reduction for old distractive flexion injury of the subaxial cervical spine.

In terms of neurologic recovery, patient outcome, and pseudarthrosis, either an anterior or posterior surgical approach is safe and effective for traumatic cervical injuries associated with neurologic injury. The posterior technique using pedicle screw...
instrumentation for cervical disc herniation enables restoration of the space for the neurologic elements with no neurologic deterioration. However, cervical pedicle screw fixation remains technically demanding.

In our series, most patients were successfully treated with the anterior approach alone, which is technically less demanding. In cases of failed closed reduction, the posterior approach was used first to address any concurrent disc herniation, followed by anterior discectomy and fusion. This protocol achieved good spinal alignment and avoided neurologic deterioration. Surgical time and the extent of surgery was reduced as compared to 3-stage procedures.

CONCLUSION

Preoperative traction is a safe and effective initial treatment for neglected cervical facet dislocation, as it reduces the need for extensive (anterior and posterior) surgery. If closed reduction is successful, anterior discectomy and fusion is the surgery of choice. If not, posterior facetectomy and fusion followed by anterior surgery is preferred.

REFERENCES