Non-operative Management of Subaxial Unilateral Cervical Facet Fractures without Subluxation

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Introduction

Cervical facet fractures are encountered with some frequency in hospitals that see spine trauma patients. There is controversy as to the management of those patient's with unilateral cervical facet fractures without subluxation. Many advocate surgical intervention for stabilization. The effectiveness of non-operative management of these patients is not known.

Methods

We reviewed 109 patients with cervical facet fractures treated at our level 1 trauma center from January 2008 to December 2012. All patients with single or multi-level unilateral non-displaced subaxial cervical facet fractures with at least one follow-up visit were included in this study.

Demographic and clinical data on admission to the hospital, discharge from hospital, and at the last clinic visit was obtained from chart review. Facet fractures were graded according to the classification published by Dvorak et al. Follow-up imaging (flexion-extension lateral cervical spine x-rays) were reviewed to document any listhesis or subluxation.

Outcome at follow-up was dichotomized as successful or unsuccessful conservative management. Successful conservative management was defined as the presence of no new neurological deficits or radiographic instability at follow-up. Unsuccessful conservative management was defined as the presence of new neurological deficits or the development of spinal instability determined on lateral cervical spine radiographs. Patients undergoing conservative management are fitted with a hard cervical collar, provided analgesics and asked to follow up in clinic in 2-4 weeks with lateral cervical spine radiographs.

Results

Twenty-seven patients (26 men, 40.7±2.9) were included in this study. Clinical and radiologic characteristics are displayed in table 1.

Twenty-two patients (81.5%) had successful conservative management. Follow-up cervical radiographs were not available for 6 patients. In two patients, the cervical collar was discontinued due to patient non-compliance during the same admission, and in 4 other patients the cervical collar was removed at follow-up. All patients did not exhibit new neurological deficits at follow-up. Conservative management was unsuccessful in 5 patients in this series (Table 2).

No significant difference in age (41.6 vs 36.4 years, p=0.49), length of hospital stay (9.3 vs 13.4 days, p=0.53) or follow-up duration (15.1 vs 9.6 weeks, p=0.35) was found when comparing patients with successful and unsuccessful conservative management respectively. No significant association was found between the type of facet fracture and outcome (Chi-square test 2.8, p=0.4).

Among 5 patients with type 3 fractures, two patients had unsuccessful conservative management. One patient (C5, A3 type; C6, A1 type) developed symptoms of C5,C6 radiculopathy, showed new listhesis of C5 over C6 on dynamic cervical spine radiographs and underwent posterior cervical fusion at the initial admission. Another patient (C4, A3 type) had 5 mm listhesis of C4 on C5 at follow-up, and though surgery was recommended, the patient declined. The 3 patients with successful conservative management of A3 type fractures showed no listhesis on follow-up cervical spine imaging. The presence of A3 type fractures was not associated with an increased risk of failing conservative management (Chi-square test 1.1, p=0.28).

Learning Objectives

By the conclusion of this session, participants should be able to understand the outcomes of non-operative management of unilateral facet fractures of the subaxial cervical spine without subluxation.

Table 1. Clinical and radiological characteristics of 27 patient non-displaced or minimally displaced facet fractures

	n (%)
Level of facet injury	
C3	1 (3.7)
C4	3 (11.1)
C5	5 (18.5)
C6	14 (51.8)
C7	12 (44.4)
Side of facet injury	
Right	12 (44.4)
Left	15 (55.6)
Injury involving superior and inferior articular facet at the same level	8 (29.6)
Dvorak Type[5]	
A1	8 (29.6)
A2	6 (22.2)
A3	5 (18.5)
A1, A2	7 (25.9)
A1, A3	1 (3.7)
Neurological deficits at admission	
No	25 (92.5)
Yes	2 (7.4)
Mechanism of injury	
Motor vehicle accident	20 (74)
- auto/motorcycle	16 (59.2)
-pedestrian	4 (14.8)
Fall	6 (22.2)
Assault	1 (3.7)
Associated injuries	
No	6 (22.2)
Yes	21
- Intracranial injury (subdural/epidural/contusion)	5
- Other cervical spine injuries	6

Table 2. Clinical and radiological data for 5 patients with unsuccessful conservative management of facet fractures

	Age	Sex	Mechanism of injury	Location of fracture	Dvorak type of fracture	Initial neurological deficits related to facet fractures	Follow-up duration (weeks)	Radiological outcome
Patient 1	23	M	MVA- auto	Right C4	A3	No	2.4	C4-5 subluxation – 5mm
Patient 2	46	M	MVA- auto	Right C7	A1	No	2	C5-6 retrolisthesis- 4.3 mm
Patient 3	43	F	MVA- auto	Right C6 Right C7	A2 A1	No	34.1	C6-7 anterolisthesis – 4mm
Patient 4	23	M	MVA- motorcycle	Right C5 Right C6	A3 A1	No*	2.2	C4-5 anterolisthesis - 4mm; C5-6 anterolisthesis - 5mm
Patient 5	47	M	MVA- auto	Right C5 Right C6	A2 A1	No	7.5	C5-6 anterolisthesis - 8mm

Conclusions

In our series, more than 80% of the patients with acute unilateral, non-displaced cervical facet fractures underwent successful conservative management with external immobilization.

References

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