

Traumatic thoracolumbar spine fracture management

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Abstract

Spinal injuries are one of the most common and leading problems encountered by orthopaedic surgeons. Thoracolumbar segment is second most commonly involved segment in spinal cord following spinal cord injury. Operative intervention is intended to convey immediate stability to the spine, allow for correction of deformities, and optimize neurological improvement by directly or indirectly relieving any residual impingement of the neural elements. Surgical treatment can be performed by various approaches, but the posterior approach is the most common. This approach allows for posterior fixation of fractures and decompression of the spinal canal.

AIM: To compare functional outcome treatment in traumatic thoracolumbar spine fractures. Material and methods: An observational study was conducted in the department of Orthopaedics at a tertiary care teaching

hospital among patients with traumatic thoracolumbar spine fractures. Enrolled patients were divided into two groups, conservative and operative, and were evaluated clinically and radiologically for outcome. In the statistical analysis, data was recorded in a predesigned case record form, compiled in Microsoft Excel version 2018, and then analysed.

Results: Mean age among surgical group was 34.8 and conservative was 47.5 years. Male predominance was seen among both groups. Most common reason for injury was road traffic accidents and self-fall among both the groups.

Conclusion: The present study concludes, as seen in previous studies, that the operative modality is associated with good recovery, early mobilization, fewer complications, and a good functional outcome. The conservative modality, as it is used for less severe fracture types with no neurological involvement, gives a

good functional outcome, but mobilization in these patients is delayed.

Keywords: functional outcome, operative, non-operative, traumatic, thoracolumbar spine fractures

Introduction

Thoracolumbar segment is second most commonly involved segment in spinal cord following spinal cord injury. It constitutes 30 to 60% of all spinal injuries (1). Such injuries are very common among young people, between 20 and 40 years old, and the most common causes of such spine trauma are motor vehicle accidents, falls, and gunshot injuries (2). Sports and recreational activities are also the cause of a large number of these injuries. It constitutes a spectrum of injuries ranging from simple, undisplaced fractures to complex fracture dislocations. They are reported to be more common in men (3). Historically, thoracolumbar fractures have been treated with recumbency, i.e., bed rest, for a period of 8–12 weeks (4,5). Surgical treatment can be by anterior, posterior, lateral, or anteroposterior approaches, with posterior being the most commonly used and fixation with pedicular screws being preferred (3, 6). In general, surgical stabilization is indicated for biomechanically unstable fractures such as flexion distraction injuries, unstable burst fractures, and fracture dislocations, whereas simple compression fractures are treated conservatively according to TLICS scoring, which is based on morphology, neurology, and posterior element integrity.

AIM

To find out the functional outcome of treatment in traumatic thoracolumbar spine fractures.

Material and methods

An observational study was conducted in department of Orthopaedics at tertiary care, teaching hospital among

patients with traumatic thoracolumbar spine fractures having inclusion criteria of

1. Patients with traumatic thoracolumbar spine fractures
2. Patients with age >18 years
3. Patients willing to participate in the study
4. Patients willing to sign written informed consent

Patients with an A0 type of fracture according to AO spine classifications are excluded from the study.

A detailed history was obtained for evaluating the mode of trauma, ASIA grading, sensory level, and checking for any spinal deformity. They were clinically and radiologically evaluated for the thoracolumbar fracture. Plain X-rays in anteroposterior and lateral views were obtained, and the instability of the spine was confirmed using the Thoracolumbar Injury Classification and Severity Score. Laboratory investigations were carried out before surgery. Enrolled patients were divided into two groups, conservative and operative, and were evaluated clinically and radiologically for outcome. In the statistical analysis, data was recorded in a predesigned case record form, compiled in Microsoft Excel version 2018, and then analysed. Results:

Group I: Operative Group; Surgical

Group II: non-operative group; conservative

Table 1: Age distribution

Age in years	Group I	Group II	Total
18 to 30	16	6	22
30 to 60	12	16	28
>60	2	8	10
Total	30	30	60
Mean	34.96	47.53	41.25
SD	13.59	16.88	16.46

Mean age among surgical group was 34.96 and conservative was 47.53 years with average mean age of

presentation 41.25 years. Male predominance was seen among both groups.

Table 2: Mechanisms of Injury

Mechanism of injury	Group I	Group II	Total
Accidental injury	2	1	3
Assault	2	2	4
Fall from height	16	19	35
Road traffic accident	10	8	18
Total	30	30	60

Most common reason for injury was fall from height among both the groups.

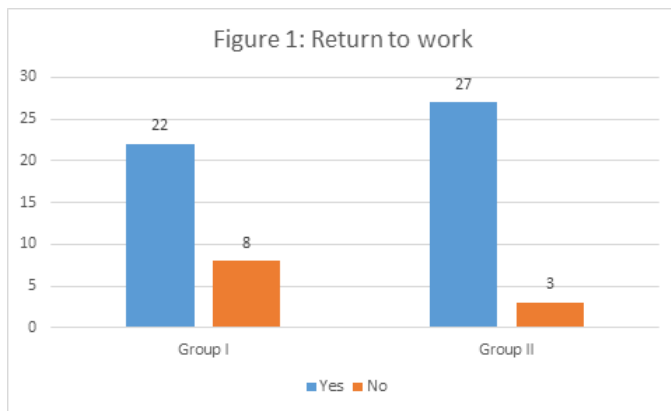


Figure 1: Return to work

Figure shows that group II cases (conservatively managed cases) returned to work more i.e. 90% of the patient managed conservatively returned to work unlike the group with operative management where 26.66% patient failed to return to work.

Table 2: Complications

Complications	Group I	Group II
Yes	13	21
No	17	9
Total	30	30

Table 2 shows that conservatively treated cases (70%) had more complications than surgically treated ones (56.66%).

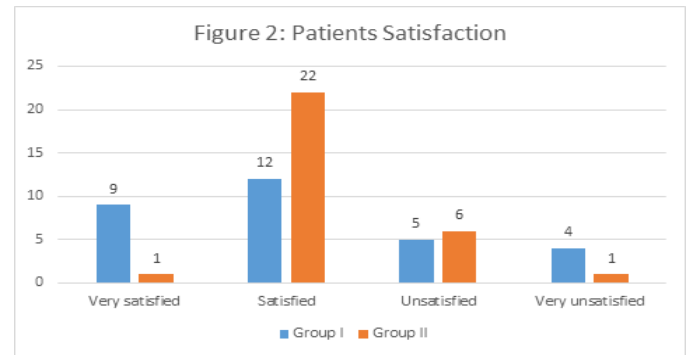


Figure 2 shows that the majority of cases had satisfactory outcomes, and among them, group II (conservatively treated) had more than group I, but the cases that were very satisfied were mostly from group I (operative). Patient coming with complete paraplegia at presentation was having no improvement in neurology after operative / conservative procedures giving a very unsatisfied outcome of the patients.

Mobility outcome	Group I	Group II	total
Community Ambulatory	14	12	26
Limited Outdoor Mobility	6	13	19
Limited Indoor Mobility	3	3	6
Wheelchair Mobility	4	1	5
Bed Mobility	3	1	4
Total	30	30	60

majority of patients (46.66%) from Group I, i.e., operative patients, had community ambulatory outcomes. patient managed conservatively was having 83.33% of patients either with community ambulatory or limited outdoor mobility. As a patient with paraplegia was reported to have a more severe TLICS score, he was operated on and showed bed or wheelchair mobility, accounting for 23.33% of patients.

Mean duration of hospitalization in days	Group I	Group II
Mean	22.5	21
SD	14.7	31.8

Patient with operative had a longer mean duration of hospital i.e 22.5 days but standard deviation of patients was greater in cases of conservative group i.e 21+/- 31.8 accounting for other injuries/ morbidities.

Discussion

In present study mean age of presentation was 41.25 years (+/-16.46) with majority of cases belonging to middle aged population i.e 30-60 years.

Male predominance was seen among both groups. Helal Sayeed U et al. (7) showed that the mean age was 30 years. Most common reason for injury was fall from height among both the groups. Liao YI et al. (9) showed that motor vehicle accidents are the most common cause of injury, followed by falls and sports-related injuries. this discrepancy is explained by more labour work involving fall from heights in developing countries where as developed nations major share of injuries are due to road traffic accidents. Previous Indian research confirmed what had already been seen in our study: that falls from height are the leading cause of spine trauma in poor nations, whereas in the West, road traffic accidents (RTAs) are the leading cause of spine trauma [11].

Figure shows that group II cases (conservatively managed cases) returned to work more i.e 90% of the patient managed conservatively returned to work unlike the group with operative management where 26.66% patient failed to return to work. Helal Sayeed U et.al. (7) showed that spinal fixation showed better recovery. Liao YI et al (9) showed that was no difference between the two treatment strategies in the

number of people returning to work. Here the biased is observed as patient with AIS grading A, was operated as per TLICS scoring giving more number in paraplegic patients being operated. and the least amount of motor score change in a year occurs in individuals with complete neurological Spinal cord injury¹². Patients with more neuro logic deficits are least likely to return to work.

Table 2 shows that conservatively treated cases had more complications than surgically treated ones. Nonoperative treatment of these fractures might worsen back discomfort and accelerate the development of a kyphotic deformity. Patients are quite likely to develop vertebral body collapse as well as sustain more fractures in the future; 14; and long-term immobilisation can cause muscle wasting and bedsores, which are more common with conservative management.

Figure 2 shows that the majority of cases had satisfactory outcomes, and among them, group II (conservatively treated) had more than group I. but the cases that were very satisfied were mostly from Group I (operative). Patient coming with complete paraplegia at presentation was having no improvement in neurology after operative / conservative procedures giving a very unsatisfied outcome of the patients. Here patient with AIS E operation after operation was mobilized early hence giving greater satisfaction and those with AIS A didn't showed improvement leading to very unsatisfied patient.

Helal Sayeed U et al. (7) showed that there was no significant difference in the functional outcome after therapy between the two groups. Rometsch E (8) did not find differences in disability or pain outcomes between operative and nonoperative treatment of A3 and A4 TL fractures in neurologically intact patients. Specific and

uniform outcome parameters need to be defined and enforced for the evaluation of TL trauma. Surgical and conservative treatments significantly reduced the pain score in the fracture area. There was no significant difference in the functional outcome after therapy between the two groups. 7

Conclusion

In the present study, we concluded that thoracolumbar spine fractures can be managed both conservatively and operatively, according to TLICS scoring, and that neurology acts as an important guide for treatment.

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