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Management of thoracolumbar fractures: A prospective study

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Abstract

Thoracolumbar fractures are breakages in the vertebrae of the spinal column in the thoracic and lumbar regions. They may be associated with disruption of the ligamentous complexes, and can result in instability or compression of neural structures. Thoracolumbar fractures are the usual outcome of thoracolumbar trauma. In the present study, Thoracolumbar spine fractures are more common in 31-40 years of life with male predominance due to outdoor activities, the commonest mode of injury was road traffic accident, In the present study, Type A fracture is more common at the level of L1. In this series 12 patients polyaxial pedicle screws were used and in 4 patients monoaxial with polyaxial pedicle screws were used. Fracture-dislocations of the thoracic and lumbar spine are caused by very high-energy trauma. They can be extremely unstable injuries that often result in serious spinal cord or nerve damage.

Keywords: Thoracolumbar fractures, type a fracture, monoaxial with polyaxial pedicle screws

Introduction

Thoracolumbar fractures are breakages in the vertebrae of the spinal column in the thoracic and lumbar regions. They may be associated with disruption of the ligamentous complexes, and can result in instability or compression of neural structures. Thoracolumbar fractures are the usual outcome of thoracolumbar trauma. Other outcomes include traumatic disk prolapse, ligamentous injury, and epidural hematoma causing pressure on the spinal cord or nerve roots; these occur very rarely without a fracture. This monograph focuses on thoracolumbar spine fracture.

Usually occurs as a result of high-energy trauma (e.g., road traffic accidents, falls from heights). May occur spontaneously in patients with osteoporotic, neoplastic, or metabolic disorders of the spine. Initial on-the-scene evaluation involves performing primary survey with ABC assessment with C-spine immobilization and hemorrhage control. It is important to evaluate and assess thoracolumbar fractures for instability. If the decision to operate is made, this should occur earlier rather than later.

There are different types of spinal fractures. Doctors classify fractures of the thoracic and lumbar spine based upon the specific pattern of the fracture and whether there is a spinal cord injury. Classifying the fracture pattern will help your doctor determine the proper treatment.¹

The three major types of spine fracture patterns are:

- Flexion
- Extension
- Rotation

Flexion fracture pattern

Compression fracture: While the front (anterior) of the vertebra breaks and loses height, the back (posterior) part of it does not. This type of fracture is usually stable (the bones have not moved out of place) and is rarely associated with neurologic problems. Compression fractures commonly occur in patients with osteoporosis.

Extension fracture pattern

Flexion/distraction (Chance) fracture: The vertebra is literally pulled apart (distraction). This type of fracture can occur in a head-on car collision when the upper body is thrown forward while the pelvis is stabilized by a lap seat belt.

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Rotation fracture pattern

Transverse process fracture: This uncommon fracture results from rotation or extreme sideways (lateral) bending. It does not usually affect stability.

Objective: To determine the commonest modes, level, and type of fracture and to study radiological, radiological, and clinical outcome.

Methodology

A total of 20 cases were evaluated and assessed during the study period.

Inclusion criteria

1. Age group >18yrs
2. Traumatic thoracolumbar fractures.
3. Unstable fractures with or without neurological deficits.

Exclusion criteria

1. Age < 18 yrs.
2. Traumatic cervical spine fractures and sacral spinal fracture.
3. Spinal instability due to congenital spinal abnormality.
4. Patients not willing for surgery.
5. Medically unfit for surgery.

Results

Table 1: Age and Sex wise distribution of cases

Age group	Male	Female	Total
10 – 20 years	00	00	00
21- 30 years	03	00	03
31 – 40 years	06	01	07
41- 50 years	05	01	06
51 – 60 years	03	01	04
Total	17	03	20

Table 2: Manner wise distribution of cases

Manner	Number
Road traffic accident	12
Fall from height	08

Table 3: Distribution of cases based on Type

Type of fracture	Number
AO Type A	12
AO Type B	04
AO Type C	04

Table 4: Distribution of cases based on level of fracture

Level of fracture	Number
T 11	0
T 12	6
L 1	9
L 2	5

Table 5: Distribution of cases based on type of Implant

Implant	Number
Polyaxial	12
Monoaxial + polyaxial	08

Discussion

In the present study, Thoracolumbar spine fractures are more common in 31-40 years of life with male predominance due to outdoor activities. Gregory F. Alvine *et al* in their study found that average age was 31 years, with a male predominance.

Nasser M.G, *et al* in their study found that average age was 28.8 years with a male predominance. Rick C. Sasso *et al*, in their study had 77% males and 23% females with a mean age of 34 years. Razak M, *et al* in their study found that average was 30 years with a male predominance [2, 3].

In the present study, the commonest mode of injury was road traffic accident. Nasser M.G, *et al* in his study noted that the main cause of injury was fall from a height and road traffic accident was the second commonest. Gregory F. Alvine, *et al* noted that in 52% of patients injuries resulted form fall from a height, in 39% patients due to road traffic accidents and 9% due to fall of heavy objective. Razak M, *et al* in his study noted that 69% of injuries were caused from fall from height, 31% due to road traffic accident [3, 4].

In the present study, Type A fracture is more common at the level of L1. In this series 12 patients polyaxial pedicle screws were used and in 4 patients monoaxial with polyaxial pedicle screws were used. Nasser M.G. *et al.*, in their study noted 76% of patients with Type-A, 8% with Type-B and 16% with Type-C. Rick C.Sasso *et al.*, noted that 62.5% had AO Type-B and 37.5% had AO Type-A fractures. Gregory F.Alvine *et al* noted that Type-B fractures were seen in 57.5% of patients Type-A in 22.5% and 20% Type-C [5, 6].

Conclusion

Fracture-dislocations of the thoracic and lumbar spine are caused by very high-energy trauma. They can be extremely unstable injuries that often result in serious spinal cord or nerve damage. These injuries require stabilization through surgery. The ideal timing of surgery can often be complicated. Surgery is sometimes delayed because of other serious, life-threatening injuries.

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