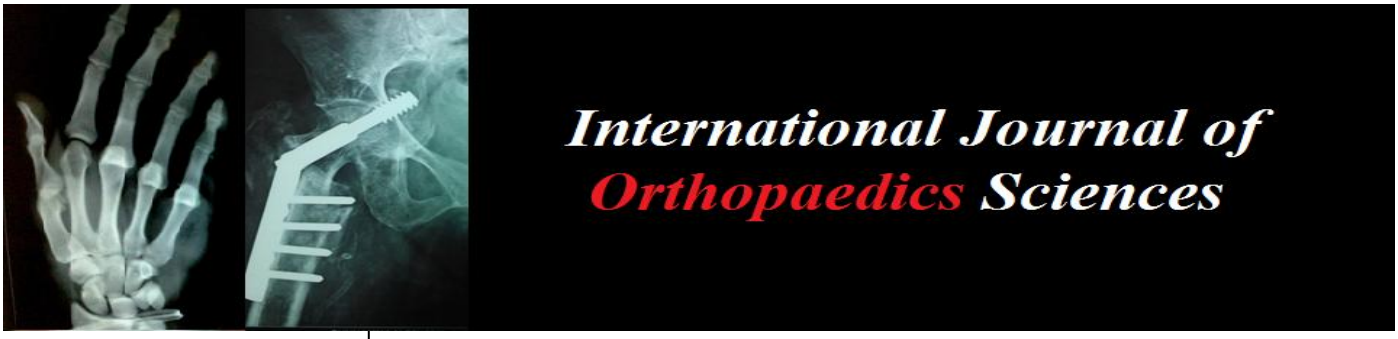

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Clinical profile of thoracolumbar spine fracture in adult

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Abstract
Most common site of injury was L1 vertebra. There was an increase in incidence of spinal cord injuries during summer and rainy season. All those cases of unstable dorsolumbar fractures were included in the study that fulfilled following criteria. In our series, most common type was wedge compression fractures, accounting for 56% of the cases. Next common type is burst fracture 44%.In percutaneous pedicle screw fixation group, wedge compression fracture 64% were operated, compared to 48% of conventional pedicle fixation group. Burst fractures, which constituted 36% was the in percutaneous pedicle fixation group compared to 52% of conventional pedicle fixation group. Most common type was wedge compression fracture.

Keywords: Thoracolumbar Spine Fracture**,** percutaneous pedicle fixation, conventional pedicle fixation

1. Introduction
The first written proof of treatment of spinal fractures was found in the "Edwin Smith Surgical Papyrus" (1550 years before Christ). Highly specialized doctor-priests took care of the patients with spinal fractures. They performed wound treatment, put on bandages and prescribed rest in the horizontal position. In those days probably only open fractures and fractures with kyphotic deformity were recognized as there were no imaging tools. The famous Egyptologist, Dr. J.H. Breasted who translated the document "The Edwin Smith Surgical Papyrus" and classified injuries into 3 categories:

a) Sprain in a cervical vertebra – "An ailment which I will treat"
b) A gaping wound in a cervical vertebra – "An ailment with which I will contend"
c) Dislocation of a cervical vertebra – "An ailment not to be treated"

Hippocrates (460-377 BC) described treatment of spinal injuries by *manipulative reduction* in Corpus Hippocraticum. Hippocrates distinguished spinal feature with and without neurological deficit. Hippocrates believed that forward dislocations were necessarily fatal and that spinal cord could withstand a circular, but not an angular distortion. Patients with paralysis would die due to complications of prolonged recumbency. Spinal fractures without paralysis were treated by *distraction*, *manual reduction* and *rest* in spine position. Special tables were designed and used for these treatments by Hippocrates and Oribasius [1, 2].

Incidence of spinal cord injuries is increasing day by day due to rapid industrialization and road traffic accidents. Approximately 20,000 new cases are added every year in India. Most of them sustain injury by fall from unprotected roofs, trees or fall into wells, and road traffic accidents, most of which are preventable causes. Males are the predominant victim due to their increase mobility, and their involvement of strenuous and hazardous activities. An epidemiological study was carried out on traumatic spinal cord injuries in which the variables studied were: age, sex, mode of injury, level of vertebral involvement, associated trauma, duration of hospital stay, and socio-economic status. They reported 483 new spinal cord injury patients in year 2000-01. Male to female ratio was 2.96:1 and average age was 35.4 years. The prevalent age group was 20-29 years, followed by 30-39 years, fall from height was the most common cause (44.5%), followed by road traffic accidents (34.7%). Most common site of injury was L1 vertebra. There was an increase in incidence of spinal cord injuries during summer and rainy season. Average hospital stay was 39.5 days [3, 4].

Methodology

Selection of Cases for operative treatment

All those cases of unstable dorsolumbar fractures were included in the study who fulfilled following criteria:

- All closed dorsolumbar junction injuries between D-10 to L-5.
- Patient's age more than 18 years.
- Duration of injury less than 1 to 7 days.

Criteria for exclusion of cases for operative treatment

- Multilevel injuries.
- Those unable to cooperate in post-operative rehabilitation because of psychosis, mental retardation, head injury or cerebrovascular accidents.
- Poor anesthetic or general risk patients or patient's refusal for surgery

C**riteria for Instability (Benson *et al*. 1992):**

- Loss of 50% body height.
- Angulation > 30°
- Canal compromise > 50%
- Failure of at least 2 columns
- Kyphotic deformity > 20^0

Indication for surgical stabilization

- Patient with one of the following were considered to have an indication for surgical stabilization of spine -
- Presence of neurological involvement caused by fracture.
- All neurological stable patient within instability criteria Loss of 50% body height of vertrebra.
- Angulation > 30^0
- Kyphotic deformity > 20^0
- Canal compromise > 50^0
- Failure of at least 2 column

Results

Table 1: Mode of injury

Mode of injury	No. of patients	%
Fall from height	34	68
RTA	10	20
Gunshot injury	0	0
Others	6	12
Total	50	100

Fall from height was the most common mode of injury accounting for 68% of the cases; road traffic accident was the next most common cause (20%). Other causes (12%) are sport injury, accident, gunshot injury, fall of heavy object on back.

Table 2: Age incidence

Age (years)	No. of patients	%
0-10	0	0
10-20	10	20
20-30	18	36
30-40	14	28
40-50	6	10
50-60	2	6
Total	50	100

Maximum number of patients (36%) were in age group 20-30 years with age ranging from with 18 to 54 years. Mean age of the patients under study was 29.5 years.

Table 3: Classification of fractures [5]

Type of fracture	No. of patients	%	Percutaneous Pedicle screw fixation	Conventional pedicle screw fixation
Wedge compression fracture	28	56	16	12
Burst fracture	22	44	9	13
Flexion distraction injuries	0	0	0	0
Fracture dislocation	0	0	0	0
Total	50	100	25	25

In our series, most common type was wedge compression fractures, accounting for 56% of the cases. Next common type is burst fracture 44%.

In percutaneous pedicle screw fixation group, wedge compression fracture 64% were operated, compared to 48% of conventional pedicle fixation group.

Burst fractures, which constituted 36% was the in percutaneous pedicle fixation group compared to 52% of conventional pedicle fixation group.

Table 4: Sex ratio

Sex	No. of patients	%
Male	38	76
Female	12	24
Total	50	100

Male female ratio in our series was 3:1 with males being involved about twice more commonly than females.

Discussion

Majority of the patients in our study were male, 38 patients compared to 12 female patients. sex distribution in this study shows an increased incidence of spinal injuries in males, due to their increased mobility, and involvement in strenuous and hazardous activities. The ratio of male to female of 3:1 in this study correlates well with Indian literature. In the study of sex ratio was 2.96:1 which is quite comparable to our observation.

The present study shows the thoracolumbar injuries are more common between 20-30 years of age, signifying higher incidence in young, active and productive population of the society. The average age of 29.5 years correlates well with similar findings in other epidemiological studies. In our series, most common type was wedge compression fracture, 28 patients, accounting for 56% of the cases. Next common type is burst fracture, 22 patients, accounting for 44%.

In percutaneous pedicle screw fixation group, wedge compression fracture 16 patients (64%), which is most common in our study, compared to 12 patients (48%) of conventional pedicle fixation group.

Burst fractures: - In percutaneous pedicle fixation group, 9 patients (36%). compared to 13 patients (52%) of conventional pedicle fixation group.

According to classification [5]11 (44%) patients sustained burst fractures, 9 (36%) wedge compression fractures, and rest (20%) fracture dislocations. Wedge compression fractures are the most common vertebral fractures is most common type of fracture in our study. This can be explained by the fact that

wedge compression fractures are low energy fractures and are rarely complicated by neurological deficit.

In this study most of the fractures were located around thoraco-lumbar junction. Most common vertebra involved was L1 (40%), followed by T12 (36%) and L2 (12%) in that order. Similar observation was seen in other studies [6,] the L1 vertebra was most common affected in both studies (45% and 50% respectively).

Fall from height was the most common mode of injury accounting for 68% of the cases; road traffic accident was the next most common cause (20%). Other causes (12%) are sport injury, accident, gun shot injury, fall of heavy object on back. This observation is comparable to other epidemiological studies carried in which fall from height accounted for 66% of cases, followed by road traffic accidents [7].

Conclusion

- Age group it is more common between 20-30 years of age.
- Majority of the patients in our study were male.
- Most of the fractures were located around thoraco-lumbar junction. Most common vertebra involved was L1.Fall from height was the most common mode of injury

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