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Short vs long segment fixation of dorsolumbar burst fracture

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Abstract

The thoracic and lumbar areas account for over 90% of all traumatic spine injuries. The thoracolumbar region, located between the more stiff thoracic and the more flexible lumbar spines, is especially vulnerable to injury.o injury. The purpose of this research was to foresee the long-term effects of these fixations on patients in terms of pain, deformity, motor deficit, and handicap, as well as to identify the functional stability of the vertebral column following fixation. Twenty people participated in our research. Patients had their histories taken, were examined physically and neurologically, and had imaging studies such x-rays and CT scans of the spine and MRIs of the spine performed if needed. What we learn from the research is, Group A had a mean age of 34.8 while Group B had a mean age of 30.10. Males were impacted more severely than females. The thoracolumbar spine is the most often broken in falls from height, followed by car accidents (RTA). Most patients just had thoracolumbar fractures and no other concomitant injuries. On admission, L1 and L3 levels were the most prevalent neurological findings (30%), followed by L2 levels (50%). (25 percent). Clinically stable thoracolumbar spine fractures often presented with back discomfort at first.. No neurological deficit was reported in group A compared to 30% in group B. The median cobb's angle in group A was 9, ranging from 4 to 18, while in group B, the median cob's angle was 12, ranging from 2 to 35. About 85% of patients had minimal disability during follow up. The long segment and short segment fixation of thoracolumbar burst fractures are both applicable, reproducible techniques of surgical management with similar comparable results regarding postoperative pain rehabilitation, spinal mobility and cobbs angle. But long segment fixation gives more stability specially in multilevel fractures with minimal acceptable sacrifice of spine mobility.

Keyword: Short, long, segment fixation, dorsolumbar burst fracture

1. Introduction

The majority of thoracolumbar spine fractures, which make up a significant fraction of all musculoskeletal injuries worldwide, occurred at the thoracolumbar junction in 54.9% of the patients. Thoracolumbar injuries in children and adolescents are reported to occur anywhere from 5.4 and 34% of the time in other studies [1].

A common injury that can cause serious disability, deformity, and neurological deficiency is a fracture of the thoracolumbar spine. High-energy blunt trauma is typically the cause of injuries to the thoracolumbar spine. 65% of thoracolumbar fractures are caused by car accidents and high-angle falls.[2].

The classification of spinal fractures was carried out to promote the best treatment regimens. Different injury characteristics, such as the mechanism of damage, bony morphology, anatomic determinants of fracture stability, and neurological condition, have been utilized as the foundation for classification in proposed systems. Fracture classification systems should ultimately assist the surgeon in deciding whether surgery is necessary and what kind of surgical technique to use[3].

Type A fractures are compression injuries, Type B fractures are tension band injuries, and Type C fractures are translational injuries, according to the AO Spine's classification system for thoracolumbar spine injuries. There are five and three more kinds for type A and type B injuries, respectively. The patient's neurologic condition is next assessed and categorized: N0 stands for a patient who is neurologically uninjured, N1 for temporarily resolved neurological symptoms, N2 for persisting radicular symptoms, N3 for a spinal cord injury that has not fully developed or a cauda equina injury, N4 for a fully developed spinal cord injury, and NX for an inaccessible neurological exam. [4].

Spinal discomfort and/or a neurological deficit may indicate a vertebral fracture in patients with a preserved level of consciousness and help with spinal imaging. However, a useful physical examination cannot be performed on comatose patients to make a spinal cord injury diagnosis, hence these patients must initially be diagnosed with a spinal lesion. A spinal deformity, such as a bony step off when the patient is being rolled log-style, may be found during a physical examination, along with a hematoma, swelling over the spinous processes, or the existence of one. [5].

The goals of treatment of thoracolumbar fractures are leading to early mobilization and rehabilitation by restoring mechanical stability of fracture and inducing neurologic recovery, thereby enabling patients to return to the workplace according to Oswestry Disability Index. However, it is still debatable about the treatment methods. Neurologic injury should be identified by thorough physical examination for motor and sensory nerve system in order to determine the appropriate treatment. The mechanical fracture stability is evaluated by plain radiographs and computed tomography and also MRI in some cases and it is determined whether to use the conservative or operative treatment [6].

The management protocol (operative vs. conservative) or the type of surgery (posterior vs. anterior vs. combination) for thoracolumbar vertebral fractures are established. Treatment plans must be customized for each patient based on their clinical presentation, general health, and radiographic factors such as sagittal and coronal spine alignment, degree of vertebral body damage, spinal canal stenosis, and intervertebral disc lesion according to the AO Spine classification. [7].

In this study, we are aiming to to predict the outcome of these fixations on the patients and detect the functional stability of vertebral column after fixation regarding pain, deformity, motor deficit, and disability.

2. Patients and methods

This study has been conducted on 20 cases to compare long vs short segment fixation in patients with traumatic thoracolumbar spine fractures referred to Benha University Hospitals.

- **Inclusion criteria:**
  - ✓ Acute traumatic vertebral fractures of thoracolumbar spine.
  - ✓ Both genders are included without privilege to age
- **Exclusion criteria:**

Any cases the following criteria excluded

  - ✓ Pathological fractures; osteoporosis and malignancies.
  - ✓ inadequate radiological assessment.
  - ✓ type c unstable fracture
- **Methods of diagnosis:**

All Detailed case histories, physical and neurological exams, and standard laboratory tests were performed. Imaging examinations, including plain X-rays of the thoracolumbar spine (anterior-posterior and lateral views) and computed tomography (CT) of the thoracolumbar spine, were performed on all patients after first care was provided in accordance with the Advanced Trauma Life Support Protocol. Thoracolumbar magnetic resonance imaging was also performed when clinically necessary.

Evaluation of processes and results:

Examples of things that may be assessed and evaluated for results are:

Histories of the patient:

Background info:

Name. 2. Age. Thirdly, the gender distinction.

Smoking. 5. A preexisting condition.

The past history of the illness:

category of trauma.

Injury to correlated systems.

Intense or radiating pain in the back.

Diagnostic Procedures:

Analyzing the Big Picture:

Checking the patient's pulse, blood pressure, and respiration rate is essential.

To identify any other injuries, such as those to the head, chest, bones, or viscera.

Examine the patient's health and readiness for operation.

Tenderness in the spine or paravertebral muscles is checked locally during an examination of the back.

Deformity of the angulations.

Modest motions allowed.

Skin tears or bruises.

Examining the brain with the ASIA scale

X-ray diagnostics include an AP and lateral view.

CT Scan (Computerized Tomography):

Different perspectives such as the coronal, sagittal, axial, and terahertz

Imaging using a Magnet and Radio Waves (MRI)

Soft tissue injuries such as the spinal cord, nerve roots, traumatic disc herniation, and ligamentous damage were evaluated, and the procedure was performed on patients with probable neural injury.

Methods in surgery:

Surgical Readiness:

The patients' surgical readiness was determined by reviewing their medical histories and doing standard pre-op laboratory tests.

Patients gave their standard permission before participation.

Surgical Involvement:

Preparation for Surgery

A radiolucent operating table is used to position the patient prone in the operating room.

The whole operation is performed with the help of fluoroscopy C-arm.

All patients have had a posterior approach to the spine. In both the short and long segment techniques, the wound incision and exposure of lamina and facet procedure were identical; what set them apart was the length and number of lamina exposed.

Focus on the Details

Using C-arm guidance and a biplanar method, the transpedicular screws were introduced to all three levels after the laminae and facets of the index level were exposed. If necessary, a laminectomy was performed to relieve pressure on the canal, and subsequently a posterolateral fusion with bone graft was performed. In this rather short structure, screws were employed for the index levels rather than cross connections.

In a long-segment method, the laminae and facets of the index level, together with those of the two levels above and below it, are exposed, and then trans-pedicular screws are introduced under C-arm guidance to the levels above and below, while the index level is left untouched. Short-segment surgery, including laminectomy and lateral fusion, has previously been performed. Only two osteoporotic individuals employed cross connections above the index level.

Patients need post-operative care, which includes hospitalisation.

Antibiotics and pain relievers are given intravenously to the patients as needed. After surgery, patients are usually allowed to get out of bed the next day.

Patients were followed up on at regular intervals in the Outpatient Clinics at Benha University Hospitals. Patients were seen at predetermined intervals 6 weeks, 3 months, 6 months, and 1 year after surgery.

Infection at the surgery site or the need to modify the fracture fixation system were two examples of the types of problems that were noted throughout the follow-up period.

The Use of Statistics

Mean SD & range were used to summarise the quantitative data, while frequency & percentage were used to describe the qualitative data. The Chi-square test (2) and the Fisher Exact Test (FET) were used to compare proportions across the various research groups. Parametric data was analysed using the Paired Samples t Test, while non-parametric data was analysed using the Wilcoxon Signed Rank Sum Test.

Each test statistic was then compared to its associated distribution table in order to determine its "P." (probability value). P values less than 0.05 were considered significant. P values below 0.001 were deemed very significant, whereas those over 0.05 were deemed insignificant.

SPSS (Version 21) was used for the statistical analysis (Spss Inc, Chicago, ILL Company).

3. The Outcome:

Demographics

Twenty examples were used in this investigation. There was no statistically significant difference between groups A and B in terms of age (mean ages of 34.80 and 30.10. In this research, men made up a statistically insignificant majority (P = 0.628), with 80% of participants being male in Group I and 60% of participants being male in Group II (Table 1).

		Group A (n = 10)	Group B (n = 10)	P-value
Age (years)	Mean ±SD	34 ±8	30 ±10	0.297
Sex				
Males	n (%)	8 (80)	6 (60)	0.628
Females	n (%)	2 (20)	4 (40)	

Table (1) Demographics of the studied groups

Spinal level:

No significant differences were reported between the studied groups regarding spinal levels, including T8 (P = 1.0), T10 (P = 0.474), T11 (P = 0.474), T12 (P = 0.628), L1 (P = 0.628), L2 (P = 1.0), L3 (P = 0.628), L4 (P = 0.474) (Table 2).

		Group A (n = 10)	Group B (n = 10)	P-value
T8	n (%)	1 (10)	0 (0)	1.0
T10	n (%)	0 (0)	2 (20)	0.474
T11	n (%)	0 (0)	2 (20)	0.474
T12	n (%)	1 (10)	2 (20)	1.0
L1	n (%)	2 (20)	4 (40)	0.628
L2	n (%)	2 (20)	3 (30)	1.0
L3	n (%)	4 (40)	2 (20)	0.628
L4	n (%)	0 (0)	2 (20)	0.474

Table (2) Spinal level of the studied groups

Associated injuries & neurological deficit

Associated injuries were reported in 50% and 60% of groups I and II, respectively. No neurological deficit was reported in group A compared to 30% in group B. No significant differences were observed between the studied groups regarding associated injuries (P = 1.0) and neurological deficits (P = 0.211) **(Table 3).**

		Group A (n = 10)	Group B (n = 10)	P-value
Associated injury	n (%)	5 (50)	6 (60)	1
Neurological deficit	n (%)	0 (0)	3 (30)	0.211

Table (3) Associated injuries & neurological deficit in the studied groups

Mechanism of injury

The most frequent mechanism of injury was falling from height in groups A (50%) and B (70%), with no significant difference (P = 0.650). The median time since injury was 3 and 2 days in groups I and II, respectively (P = 0.579) **(Table 4).**

		Group A (n = 10)	Group B (n = 10)	P-value
Mechanism of injury				
Direct	n (%)	1 (10)	0 (0)	0.650
FFH	n (%)	5 (50)	7 (70)	
RTA	n (%)	4 (40)	3 (30)	
Time since injury (days)	Median (range)	3 (1 - 4)	2 (1 - 5)	0.579

FFH: Falling from height; RTA: Road traffic accident

Table (4) Mechanism of injury in the studied groups.

Operative and postoperative findings

Group A demonstrated significantly lower time of surgery (83 ±15 vs. 147 ±32 min, P < 0.001) and limitation of movement (0% vs. 80%, P < 0.001) than group B. No significant differences were reported regarding skin complications (P = 1.0) and pain (P = 0.115) (Table 5).

		Group A (n = 10)	Group B (n = 10)	P-value
Time of surgery (min)	Mean ±SD	83 ±15	147 ±32	<0.001*
Skin infection	n (%)	1 (10)	2 (20)	1.0
Limitation of movement	n (%)	0 (0)	8 (80)	<0.001*
Pain (VAS)				
No pain	n (%)	6 (60)	2 (20)	0.115
Mild	n (%)	4 (40)	5 (50)	
Moderate	n (%)	0 (0)	3 (30)	

*Significant P-value

Table (5) Operative and postoperative findings in the studied groups

Oswestry disability index

I. Pain

More than one-third (40%) of group A had mild pain compared to 50% in group B. No patients in group A had moderate pain compared to 30% in group B. No significant difference was reported (P = 0.115) **(Table 6).**

		Group A (n = 10)	Group B (n = 10)	P-value
Pain				
No pain	n (%)	6 (60)	2 (20)	0.115
Mild	n (%)	4 (40)	5 (50)	
Moderate	n (%)	0 (0)	3 (30)	

Table (6) Pain as a component of ODI in the studied groups

II. Personal care

A borderline significant difference was observed between the studied groups regarding personal care (P = 0.08), with All patients in group A being dependent compared to 60% in group B. Twenty percent in group B reported needing help or feeling pain during personal care (Table 7).

		Group A (n = 10)	Group B (n = 10)	P-value
Personal care				
Dependent	n (%)	10 (100)	6 (60)	0.087
Need help	n (%)	0 (0)	2 (20)	
Painful	n (%)	0 (0)	2 (20)	

table (7) Personal care as a component of ODI in the studied groups

III. Lifting

About two-thirds (60%) of group A could lift heavy weights compared to 30% in group B. No patients in group A reported an inability to lift compared to 20% in group B. No significant difference was observed between the studied groups (P = 0.204) **(Table 8).**

		Group A (n = 10)	Group B (n = 10)	P-value
Lifting				
Heavy weight	n (%)	6 (60)	3 (30)	0.204
Mild weight	n (%)	0 (0)	2 (20)	
Moderate weight	n (%)	4 (40)	3 (30)	
Cannot lift	n (%)	0 (0)	2 (20)	

Table (8) Lifting as a component of ODI in the studied groups.

IV. Walking

About two-thirds (60%) of group A reported no limitation in walking compared to 40% in group B. Walking distances up to one, 0.5, and 0.1 miles were reported by 30%, 10%, and 0%, respectively, in group A compared to 10%, 20%, and 30% in group B. No significant difference was observed (P = 0.274) **(Table 9).**

		Group A (n = 10)	Group B (n = 10)	P-value
Walking				
No limitation	n (%)	6 (60)	4 (40)	0.274
One mile	n (%)	3 (30)	1 (10)	
0.5 mile	n (%)	1 (10)	2 (20)	
0.1 mile	n (%)	0 (0)	3 (30)	

Table (9) Walking as a component of ODI in the studied groups

V. Sitting

About two-thirds (60%) of group A reported no limitation in sitting compared to 30% in group B. Sitting durations up to one and 0.5 hours were reported by 40% and 0%, respectively, in group A compared to 20% and 40% in group B. A borderline significant difference was reported (P = 0.068) **(Table 10).**

		Group A (n = 10)	Group B (n = 10)	P-value
Sitting				
No limitation	n (%)	6 (60)	3 (30)	0.068
1 hour	n (%)	4 (40)	2 (20)	
0.5 h	n (%)	0 (0)	4 (40)	
10 min	n (%)	0 (0)	1 (10)	

Table (10) Sitting as a component of ODI in the studied groups

VI. Standing

About three-quarters (70%) of group A reported no limitation in standing compared to 40% in group B. Standing durations up to one and 0.5 hours were reported by 20% and 10%, respectively, in group A compared to 30% and 20% in group B. No significant difference was observed (P = 0.550) **(Table 11).**

		Group A (n = 10)	Group B (n = 10)	P-value
Standing				
No limitation	n (%)	7 (70)	4 (40)	0.550
1 hour	n (%)	2 (20)	3 (30)	
0.5 h	n (%)	1 (10)	2 (20)	
10 min	n (%)	0 (0)	1 (10)	

Table (11) Standing as a component of ODI in the studied groups

VII. Sleeping

Most patients in group A (80%) reported no sleeping disturbances compared to 60% in group B. Disturbances of less than 6, 4, and 2 hours were reported by 10%, 10%, and 0%, respectively, in group A, compared to 10%, 10%, and 20%, respectively, in group B. No significant difference was reported (P = 0.851) (Table 12).

		Group A (n = 10)	Group B (n = 10)	P-value
Sleeping				
Not disturbed	n (%)	8 (80)	6 (60)	0.851
< 6h	n (%)	1 (10)	1 (10)	
< 4h	n (%)	1 (10)	1 (10)	
< 2h	n (%)	0 (0)	2 (20)	

Table (12) Sleeping as a component of ODI in the studied groups.

VIII. Sexual life

Most patients in group A (88.9%) reported normal sexual life compared to 62.5% in group B. Only 11.1% and 37.5% in groups A and B, respectively, reported restricted sexual life. No significant difference was observed (P = 0.294) (Table 13).

		Group A (n = 10)	Group B* (n = 10)	P-value
Sexual life				
Normal	n (%)	8 (88.9)	5 (62.5)	0.294
Restricted	n (%)	1 (11.1)	3 (37.5)	

* Two patients were not assessed in group B

Table (13) Sexual life as a component of ODI in the studied groups

IX. Social life

Most patients in group A (90%) reported normal social life compared to 50% in group B. Only 10% of group A reported impaired social life compared to 20% in group B. Restricted social life was not reported in group A compared to 30% in group B. No significant difference was observed (P = 0.178) **(Table 14).**

		Group A (n = 10)	Group B (n = 10)	P-value
Social life				
Not affected	n (%)	9 (90)	5 (50)	0.178
Restricted	n (%)	0 (0)	3 (30)	
Impaired	n (%)	1 (10)	2 (20)	

Table (14) Social life as a component of ODI in the studied groups.

X. Driving

Most patients in group A (80%) reported normal driving compared to 30% in group B. Driving hours of less than 2, 1, and 0.5 hours were reported in 10%, 10%, and 0%, respectively, in group A, compared to 30%, 20%, and 20%, respectively, in group B. No significant difference was observed (P = 0.184) (Table 15).

		Group A (n = 10)	Group B (n = 10)	P-value
Driving				
Normal	n (%)	8 (80)	3 (30)	0.184
< 2h	n (%)	1 (10)	3 (30)	
< 1h	n (%)	1 (10)	2 (20)	
< 0.5h	n (%)	0 (0)	2 (20)	

Table (15) Driving as a component of ODI in the studied groups

XI. ASIA score

The most frequently reported ASIA score in groups A and B was E (90% and 80%, respectively). Scores C and D were reported in 0% and 10%, respectively, in group A compared to 10% for each in group B. No significant difference was reported (P = 1.0) **(Table 16).**

		Group A (n = 10)	Group B (n = 10)	P-value
ASIA score				
C	n (%)	0 (0)	1 (10)	1.0
D	n (%)	1 (10)	1 (10)	
E	n (%)	9 (90)	8 (80)	

Table (16) Asia score as a component of ODI in the studied groups

XII. Cobb's angle

The median cobb's angle in group A was 9, ranging from 4 to 18, while in group B, the median cob's angle was 12, ranging from 2 to 35. No significant difference was observed (P = 0.353) (Table 17).

		Group A (n = 10)	Group B (n = 10)	P-value
Cobb's angle	Median (range)	9 (4 - 18)	12 (2 - 35)	0.353

Table (17) Cobb's angle as a component of ODI in the studied groups.

4. Discussion

In between April 2021 and September 2023, About 20 patients presented with traumatic burst thoracolumbar spine fractures were referred to Neuro trauma Unit of orthopedic surgery Department, Benha University Hospitals, Qalyobiya, Egypt.

The number of patients with traumatic thoracolumbar spine fractures in our study (92 patients) was more than Urrutia et al., [8] who collected 70 patients in their study, Klaus et al., [9] who collected 40 patients in their study, Sadiqi et al., [10] who collected 25 patients in their study and Elsayed et al., [11] who collected 18 patients in their study.

Regarding demographic data, the current study revealed that more than half of thoracolumbar spine fractures were males 70 % while females 30 %. , with the males being 80% and 60% in groups A and B, respectively Also, the studied cases mean age was (34 ±8 and 30 ±10 years).

Our results were similar in ratio to Bo Li et al., [12] with males to females' ratio of 1.4:1. Also, Courvoisier et al., [13] who collected 198 patients with more than half were males, and that agreed with Javier et al., [14] that about nearly half studied cases were males.

Regarding age, Ricardo et al., [15] revealed that the mean age was 35 years and Andrei et al., [16], the mean age was 37 years (ranged 17-72) that were similar to our study. But in Bo Li et al., [12] with a mean age of 49.

Regarding mode of trauma in thoracolumbar spines fractures, the most frequent mechanism of injury was falling from height in groups A (50%) and B (70%), with no significant difference (P = 0.650). The median time since injury was 3 and 2 days in groups I and II, respectively

Our results were similar to Yan et al., [17] that reported the incidence of falling from height was about two thirds of cases and nearly one quarter of cases was by road traffic accidents. Also, Elsayed et al., [11] that reported that half of their cases were due to falling from height followed by road traffic accidents in about one third of cases. As well, Hegde et al., [18] reported the most common mode of injury was falling from a height in three quarters of studied cases followed by road traffic accidents in nearly a quarter of cases. Also, Avanzi et al., [19] performed their study in Sao Paulo in Brazil and had nearly three quarters of cases caused by falling from height and nearly third of cases caused by road traffic accidents.

Ricardo et al., [15] differed from the current study as they reported that motor vehicle accident was the most common mechanism as reported in nearly half of their cases, followed by about third of cases due to falls from height. Also, Dogan et al., [20] reported that motor vehicle accident was the most common cause of injury in nearly two thirds of their cases that differed with our study. Liu et al., [21] differed with the current study, which reported that most injuries occurred during recreational or sport activities in more than half of their cases followed by motor vehicle accidents as about one quarter of cases and then few cases due to falls from a height.

Spinal trauma frequently is associated with concomitant systemic injuries, including head, intra-abdominal, thoracic injuries and long bone fractures as reported in Liu et al., [21].

The current study revealed that Associated injuries were reported in 50% and 60% of groups I and II, respectively. George et al., [22]reported a retrospective review of thoracolumbar trauma found in 151 patients with about one third of patients had associated trauma to other systems as intra-abdominal injuries and head injuries that agreed with our study. Also, Heidari et al., [23], reported that a total of 171 (27.6%) patients had associated non-spinal injuries.

In study of Bühren et al., [24], a review of hospital admissions of patients with spinal injuries identified the presence of associated injuries in nearly half of the cases that differed with our study.

Regarding fracture level of thoracolumbar spine fractures among studied patients, our current study reported that the L1& L3 levels were found to be the most common affected neurological level on admission detected in nearly half of cases followed by the L2 and D12 levels in nearly third of cases. So, the study revealed that thoracolumbar region was the most common susceptible level to be injured as reported in about majority of studied cases.

Hegde D. et al., [18] was similar to our results that the site of injury was at L1 level in nearly two thirds of studied cases followed by L2 & D12 levels in about one quarter of studied cases. Yan et al., [17] revealed that L1 was the most common affected vertebra representing more than one third of studied cases. With the study reported by S Rajasekaran et al., [2], reported predominance of L1 fracture as among the thoracolumbar injuries, two thirds of cases affected the transitional zone (T11-L2).

The current study showed that More than one-third (40%) of group A had mild pain compared to 50% in group B. No patients in group A had moderate pain compared to 30% in group B. Siebenga J. et al., [25], had a significant positive correlation as well as in conservative treated patients as in operative treated patients regarding back pain.

Diana et al., [26], reported that more than one third of patients with pain reported mild pain. Less than one third of patients complained moderate back pain. Also, more than one third of patients reported that they experienced severe pain. Few patients reported very severe pain or worst possible pain, with significant differences from admission and follow up.

The current study showed that The most frequently reported ASIA score in groups A and B was E (90% and 80%, respectively). Scores C and D were reported in 0% and 10%, respectively, in group A compared to 10% for each in group B. No significant difference was reported (P = 1.0)

El Behairy et al., [27], reported that patients with complete neurologic deficits ASIA A did not show any neurologic recovery. All ASIA B patients improved to ASIA C. Five ASIA C patients improved to ASIA E. The remaining five ASIA C patients improved to ASIA D. All ASIA D patients improved to ASIA B.

Our study reported that the mean of Cobb's angle on admission was 13.6 which decreased after 3rd month to 10.8 and decreased after 6th month to 9.2 ($p < 0.001$) that referred to decreased incidence of kyphosis on application of AO Spine injury classifications with statistically significant differences on admission and follow up that significantly decreased at 3rd and 6th month after application of AO Spine Injury Thoracolumbar Spine classification on studied patients ($p < 0.001$).

Elsayed et al., [11] reported that angle of kyphosis was 17.22 ± 8. Shah et al., [28] reported that the kyphosis angle values were as follows, average preoperative, 26.80 ± 14.50, immediate postoperative, 4.30 ± 8.70, and final follow-up, 5.50 ± 110.

The current study showed The median cobb's angle in group A was 9, ranging from 4 to 18, while in group B, the median cob's angle was 12, ranging from 2 to 35. No significant difference was observed.

According to Siebenga et al. [25], the average local (LSA) and regional (RSA) sagittal angles for the non-surgical group are 15.7° and 13.1°, respectively, and this group demonstrated throughout follow-up a rising kyphosis culminating in average LSA and RSA of 19.8° and 19.5° at final follow-up.

Both the present research and a previous one by Siebenga et al. [25] found that there was no statistically significant difference between the pre-operative LSA and RSA of surgical and non-surgical patients. Following surgical correction, the LSA and RSA angles reduced to 12.4 degrees and 9 degrees, respectively. Kyphotic deformity was greatly reduced in the surgically treated group at the last follow-up assessment before the trial was stopped.

Quality of life and disability following lumber radiculopathy may be assessed with the use of the Oswestry Disability Index, which was deemed to be the "gold standard" by Amjad et al. [29].

After 3 and 6 months post-discharge, the majority of patients in this research reported only mild impairments, whereas a small percentage reported substantial impairments.

One third of patients were fully rehabilitated and had returned to their previous occupation, less than one quarter of patients returned to the same occupation with minor impairment, and few patients had to change jobs due to the injury, which is consistent with our results and those of Reinhold et al. [30].

The proportion of patients in the surgical treatment group who returned to their old occupations was found to be considerably greater in the present research and a comparable study by Siebenga et al. [25].

Patients' quality of life and their capacity to return to work at the 3- and 6-month follow-ups in the present research were significantly better when the AO Spine Injury classification was used.

5. In sum:

Thoracolumbar burst fractures may be surgically managed in a variety of ways, and both long and short segment fixation provide equivalent outcomes in terms of postoperative pain rehabilitation, spinal mobility, and cobbs angle.

However, long segment fixation provides additional stability, particularly in multilevel fractures, while sacrificing only a modest amount of tolerable spinal motion.

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