

Management of Thoraco-Lombar Spine Trauma in the Orthopedic-Traumatology Department of the Aristide Le Dantec Hospital in Dakar About 46 Cases

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ABSTRACT

Objective: To evaluate the outcomes of treatment for thoracolumbar spine trauma patients.

Patient and Method: This was a retrospective, descriptive, analytical, and single-center study. It included a population of 46 patients admitted for thoracolumbar spine trauma between January 2016 and July 2022. The mean age was 33.2 years, and 79% were male. Admission to the department was within 6 hours of the injury in 22% of cases. Upon admission, 56% presented with a neurological deficit. ASIA stage E was found in 43% of cases. The L1 vertebra was affected in 34% of cases and the thoracolumbar junction in 66% of cases. Type A1 lesions were the most common (34%). The mean vertebral kyphosis was 21.35° and the mean regional kyphosis was 21.58°. The mean regional traumatic angle was 25.54°.

Results: Surgical treatment was performed in 54% of patients followed by orthopedic treatment in 29.5%. Patients operated before the 10th day represented 39%. The Spine system osteosynthesis with a posterior approach was used in all operated patients and laminectomy was performed in 22/25 of them. 5-level fixation was performed in 15 patients and 4-level fixation in 5 patients. The average follow-up at evaluation was 114 days for 33 patients. Among them, 9 had neurological improvement, one patient had worsening and 7 remained stationary (5 of which were classified ASIA A on admission). Complications were noted in 13% of patients such as pressure sores (3 cases), urinary tract infection (1 case), surgical site infection (1 case), implant failure (1 case) and death (2 cases).

Conclusion: Thoracolumbar spine injuries are serious, often compromising the functional prognosis of the lower limbs, and sometimes even life-threatening. Early and appropriate management can prevent complications and increase the chances of recovery in those with partial neurological deficits.

Keywords

Arthrodesis, Laminectomy, Osteosynthesis, Lumbar spine, Thoracic.

Introduction

Thoracolumbar spine injuries range from T1 to L5. They include

post-traumatic injuries to the container (osteo-disco-ligamentous system) and/or the content (spinal cord and nerve root) of this segment of the spine [1]. These injuries threaten the integrity of the spinal cord and require rapid and appropriate treatment [1,2]. The objective of this study was to evaluate the outcomes of treatment for thoracolumbar spine injuries.

Materials and Methods

This was a retrospective, descriptive, analytical, and single-center study. It included a population of 46 patients hospitalized for thoracolumbar spine trauma between January 2016 and July 2022 in the Adult Orthopedics-Traumatology Department of Aristide Le Dantec Hospital in Dakar.

Thoracolumbar spine injuries accounted for 0.18% of all traumatic conditions seen in the department. The average age was 33.2 years, and 79% were male. The majority of patients came from the Dakar region, accounting for 52% of cases. Admission to the department occurred within 6 hours of the injury in 22% of cases, and the average admission time was 6.29 days. Falls accounted for 64% of the injuries. Axial compression accounted for 64%. At admission, 56% presented a neurological deficit. ASIA (American Spinal Injury Association) stage E classification was found in 43% of cases. Traumatic injuries were associated in 59% of cases, 73% of which involved the limbs with 12 cases of polytrauma. All patients had a standard X-ray and 79% had a CT scan. The L1 vertebra was the most affected in 34.1% of cases. The thoracolumbar junction was affected in 66% of patients. Type A1 lesions were the most found (34%). The mean vertebral kyphosis was 21.35° . The mean regional kyphosis was 21.58° . The mean regional traumatic angle was 25.54° .

Results

Surgical treatment was performed in 54% of patients, followed by orthopedic treatment in 29%. Orthopedic treatment consisted of the placement of a thoracolumbar cast for 3 months. Patients operated before day 10 represented 39% (Table 1). The *Spine system* osteosynthesis with a posterior approach was used in all operated patients, and laminectomy was performed in 22/25 of them. Five-level fixation was performed in 15 patients and four-level fixation in 5 patients (Figures 1, 2, 3). The mean follow-up at evaluation was 114 days for 33 patients. Among them, 9 showed neurological improvement, one patient worsened, and 7 remained stationary (5 of whom were classified ASIA A at admission). Complications were noted in 13% of patients such as bedsores (3 cases), urinary tract infection (1 case), surgical site infection (1 case), implant failure (1 case) and death (2 cases).

Table 1: Distribution of patients according to surgical delay.

Surgical delay	Frequency	Percentage
Less than 10 days	10	40
10 to 20 days	8	32
20 to 30 days	1	4
30 to 60 days	5	20
Greater than 60 days	1	4
Total	25	100

Table 2: Complications reported in the literature.

Authors	bedsores (%)	Implant failure (%)	Surgical site infection (%)	Urinary tract infection (%)	death (%)
El Hail K ¹³	10	-	1,5	-	3
Derhem N ²	3	1,3	3,8	2,5	2,5
Diome M ¹⁴	10	-	6,7	8,3	3,3
Notre série	6	2	2	2	4

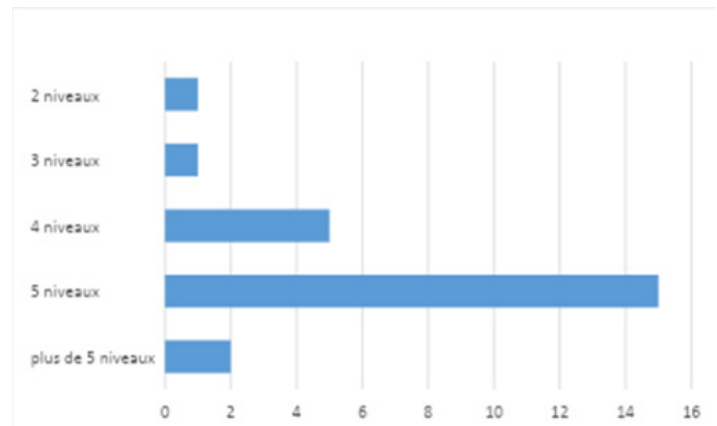


Figure 1: Distribution of patients according to the number of levels of fixation.



Figure 2: Thoracolumbar spine surgery under fluoroscopy in the prone position.

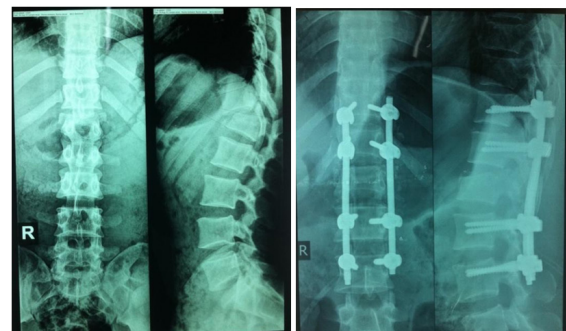


Figure 3: B1 lesion with major disco-ligamentous instability; treated by T11-L3 arthrodesis.

Discussion

Therapeutic indications depended not only on the presence of neurological deficits but also on osteo-ligamentous lesions [1,2].

Orthopedic treatment was performed for patients with stable bone lesions without neurological deficits using a thoracolumbar cast with three supports (pubic, thoracic, and lumbar) [1].

Surgical treatment was the most used type of treatment (54% of our patients) as reported by some authors [2-4]. Only 39% of our patients were operated before the 10th day. Most authors report fairly short operative delays. This delay would increase the chances of recovery of incomplete neurological deficits [5,6]. McKinley et al. believe that early surgery had no influence on neurological recovery and only reduced the rate of postoperative complications and hospitalization time [7]. The long operative delay can be explained by the delay in admission (6.29 days), but also the lack of financial coverage extending the time to cover the costs related to the intervention.

All our patients were operated on using the posterior approach as in Chatellier et al. [8]. The position was performed in the prone position on a frame or with pubic and thoracic supports, with the feet elevated. This is the gold standard approach to spinal trauma. It allows for the reduction of certain displacements, the approach to the medullary canal with laminectomy and discectomy, osteosynthesis with pedicle screws, and the performance of interbody or posterolateral or even purely posterior arthrodesis. It can be used alone or combined with the anterior approach [9,10]. In some fractures, the anterior approach may be preferred to a posterior approach because it allows direct visualization of the dural sac and neurological decompression. However, anterior surgery is technically demanding with a significant risk of complications, particularly vascular and thromboembolic [11].

Osteosynthesis was performed at 5 levels for most of our patients, bridging the most affected vertebra. Other authors prefer to limit the procedure to 3 levels [8,12].

Thirty-five patients were evaluated at the final follow-up. Among those with neurological deficits, 9 improved their condition, and 7 remained stable. Chatellier et al. reported a more significant percentage of improvement (68%) [8].

None of our patients classified as ASIA A showed any improvement in their neurological status. Moreover, among the 07 patients with no improvement, 05 were classified as ASIA A. Some authors have found a low rate of improvement in patients classified as ASIA A [3,5].

Complications found in spinal trauma patients were numerous and dominated by pressure ulcers [2,13,14]. Cases of death were also reported in the literature, such as two of our patients who had associated injuries or who presented fairly late after the trauma (Table 2) [2,13,14].

Conclusion

Thoracolumbar spine injuries are serious, often compromising the functional prognosis of the lower limbs, and sometimes even life-threatening. Early and appropriate management can prevent complications and increase the chances of recovery in those with partial neurological deficits.

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