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TRAUMATIC THORACOLUMBAR FRACTURES: ANALYSIS OF CLINICAL SERIES

TRAVMATİK TORAKOLOMBER KIRIKLAR: KLİNİK SERİLERİN ANALİZİ

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SUMMARY:

Introduction: The most common spinal fractures are seen at thoracolumbar region because it is the transition zone between the relatively rigid thoracic and more flexible lumbar spine. Our aim is to analysis our traumatic thoracolumbar fracture cases at this region.

Materials-Methods: Patients who had applied to the emergency clinic for thoracolumbar trauma were investigated. 44 patients who were operated for thoracolumbar trauma were collected for the study. The files and radiological data inspected retrospectively.

Results: The division of patients' histories are 77.30% falling down, 13.60 % traffic accident, 4.50 % gunshot wound and others are rare traumas. The diagnosis rates are 63.70 % compression fractures, 20.50 % burst fractures, 6.80 % burst + compression fractures and the rest is the other kind of fractures. The percentages of spinal region are 15.90 % thoracic, 45.50 % thoracolumbar and 38.60 % lumbar. When you look at the surgery rates, it is 63,70%stabilization and fusion, 31,80 % kyphoplasty and 4,50 laminectomies.

Conclusion: We try to analysis our experience on traumatic thoracolumbar fractures that completed with surgery.

Key words: Thoracolumbar fractures, Trauma, Thoracolumbar fracture management

Level of evidence: Retrospecive clinical study, Level III.

ÖZET:

Giriş: Spinal bölge kırıklarının en sık görüldüğü yer torakolomber bölgedir çünkü rijit torakal ve hareketli lomber bölge arasında geçiş bölgesidir. Amacımız travmatik torakolomber kırık vakalarımızı analiz etmektir.

Materyal-Metot: Acil servis kliniğine torakolomber travma nedeniyle başvuran hastalar araştırıldı. Torakolomber kırık nedeniyle ameliyat edilmiş 44 hasta seçildi. Dosyalar ve radyolojik veriler retrospektif olarak incelendi.

Bulgular: Hastaların başvuru hikayelerinin oranları % 77.30 düşme, % 13.60 trafik kazası, % 4.5 ateşli silah yaralanması ve kalanlar da nadir görülen travmalardan oluşmaktadır. Tanı oranları ise % 63.70 kompresyon kırıkları, % 20.50 patlama kırıkları, % 6.80 patlama + kompresyon kırıkları ve kalanlar ise diğer tip kırıklardır. Spinal kırık bölgeleri % 15.90 torakal, % 45.50 torakolomber ve % 38.60 lomber bölge olarak bulundu. Ameliyat oranları da % 63.70 stabilizasyon ve füzyon, % 31.80 kifoplasti ve % 4.50 laminektomi olarak saptandı.

Sonuç: Bu çalışmada omurga kırığı olan hastaların çoğunluğun yüksekten düşme sonucu yaralandığı, neredeyse yarısının torakolomber bölgeye lokalize olduğu, büyük çoğunluğunun kompresyon kırığı olmasına karşın % 60'ın üstünde opere edildiği saptanmıştır. Bu verilerin literatürle uyumlu olduğu, ancak cerrahi tedavi eğiliminin seride daha yüksek olduğu belirlenmiştir.

Anahtar kelimeler: Torakolomber kırıklar, Travma, Torakolomber kırık yönetimi

Kanıt düzeyi: Retrospektif klinik çalışma, Düzey III

INTRODUCTION:

By development of technology, high energy injuries are more often and spinal fractures are usually the result of these injuries. For example traffic accidents are seen 40 % to 45 %, 15 % to 30 % voluntary or involuntary falls (include suicides), 15 % to 25 % sport, work, leisure accidents[13]. Studies showed that, 230 of one million person have spinal fractures each year[17]. Spinal fractures can also seen attending by 30% cranial trauma, 16 % to 18 % thoracic trauma and 10% abdominal trauma[20].

The most common spinal fractures are seen at thoracolumbar region (60 %) because it is the transition zone between the relatively rigid thoracic and more flexible lumbar spine[12]. Also there is a major risk of neurologic deficit by this region[8]. Neurologic deficit rate is 15% to 30% in these cases[1].

The management of thoracolumbar fractures is still remaining controversial[21,25]. However, the main goal is keeping patients alive, protecting from neurologic deficits, stability of spinal column and early mobilization-rehabilitation of the patients[15].

Our aim is to analyze our traumatic thoracolumbar fracture cases by demographic features, history, diagnosis and type of surgery.

MATERIALS AND METHOD:

Patients who had applied to the emergency clinic for thoracolumbar trauma were investigated. 44 patients who were operated for thoracolumbar trauma were collected for the study. The files and radiological data inspected retrospectively.

RESULTS:

We evaluated 11 female (25 %) and 33 male(75 %) patients. Female patients ages were between 15 to 80 and males were 14 to 80.

The division of patients' histories are 77.30 % falling down, 13.60 % traffic accident, 4.50 % gunshot wound and others are rare traumas (Table-1).

The diagnosis rates are 63.70 % compression fractures, 20.50 % burst fractures, 6.80 % burst + compression fractures and the rest is the other kind of fractures as described at Table-1. The percentages of spinal region are 15.90 % thoracic, 45.50 % thoracolumbar and 38.60 % lumbar.

When you look at the surgery rates, it is 63.70 % stabilization and fusion, 31.80 % kyphoplasty and 4.50 % laminectomy. The details of the patients are shown on Table-1 as well.

Table-1. Data of thoracolumbar fracture cases

AGE	GENDER	HISTORY	DIAGNOSIS	SURGERY
80	F	Fall	T12 Compression fracture	T12 Kyphoplasty
63	M	Fall	T12 Compression fracture	T11-L1,2 Stabilization and Fusion
35	M	Traffic Accident	L1 Compression fracture	T11,12-L2,3 Stabilization and Fusion
50	M	Fall from height	L3 Burst fracture	L2,3,4 Stabilization and Fusion
19	M	Fall from height	L2 Compression fracture	T12-L1,3 Stabilization and Fusion
44	M	Fall from height	L1 Compression fracture	T11,12-L1,2 Stabilization and Fusion
16	M	Fall from height	T12-L1 Burst fracture	T10,11-L2-3 Stabilization and Fusion
29	F	Fall from height	L2 Burst fracture+T11-12 epidural hematoma	T12-L1,3,4 Stabilization and Fusion
30	F	Fall from height	L2 Burst fracture	T12-L1,3,4 Stabilization and Fusion
62	M	Fall from height	T12 Compression fracture	T10,11-L2,3 Stabilization and Fusion
56	M	Fall from height	L4 Burst fracture	L2,3,5 Stabilization and Fusion
37	M	Traffic Accident	T8-9 Compression fracture	T6,7,8,9,10 Stabilization and Fusion
51	M	Fall from height	L1,2 Compression fracture	T11,12-L1,2,3 Stabilization and Fusion
41	M	Fall from height	L1 Compression fracture	T11,12-L1,2 Stabilization and Fusion
19	M	Traffic Accident	L4 Compression fracture	L3,4,5 Stabilization and Fusion
14	M	Fall from height	L4 Compression fracture	L2,3,4,5-S1 Stabilization and Fusion
30	F	Elevator accident	L1 Burst fracture +L2 compression fracture	T12-L1,2,3,4 Stabilization and Fusion
29	M	Fall	L1,2+L4 Compression fracture	T12-L1-,2,3,4,5-S1 Stabilization and Fusion
15	M	Fall	T11-12 Dislocation	T10,11-L1,2 Stabilization and Fusion
15	M	Fall from height	L1 Burst fracture	T11,12-L2,3 Stabilization and Fusion
44	M	Fall from height	T2-3 Dislocation	T2,3,4 Stabilization and Fusion
17	F	Fall from height	L1 Compression fracture+L2 and L5 Burst fracture	T11-S1 Stabilization and Fusion

AGE	GENDER	HISTORY	DIAGNOSIS	SURGERY
45	M	Gun shot wound	T8,9 pedicle and lamina fracture+T10 spinous process fracture	T8,9 Total laminectomy
19	M	Traffic Accident	T9,10,11,12 Compression fracture	T9,10,11,12 Kyphoplasty
80	M	Fall from height	T12 Compression fracture	T12 Kyphoplasty
17	F	Fall from height	L1,2,3 Compression fracture	T4-L11 Stabilization and Fusion
37	M	Traffic Accident	T12 Compression fracture	T10,11-L1 Stabilization and Fusion
15	M	Fall from height	L2 Burst fracture	T12-L1-L3 Stabilization and Fusion
40	M	Squeeze in machine	T12 Burst fracture	T11-L1 Stabilization and Fusion
35	M	Fall from height	L1 Compression fracture	T11,12-L2,3 Stabilization and Fusion
29	M	Gun shot wound	T7-8 pedicle and lamina fracture	T7-8 Total laminectomy
81	M	Fall from height	L1 Compression fracture	L1 Kyphoplasty
19	M	Fall from height	L2 Burst fracture	T12-L1,2,3 Stabilization and Fusion
47	F	Fall	L3 Compression fracture	L3 Kyphoplasty
15	F	Fall from height	T12-L1 Compression fracture	T12-L1 Kyphoplasty
58	F	Fall	L1 Compression fracture	L1 Kyphoplasty
20	M	Fall from height	L1 Compression fracture, L2 Burst fracture	T12-L1,2,3 Stabilization and Fusion
18	M	Fall from height	T12-L1,2,3 Compression fracture	T12-L1,2,3 Kyphoplasty
28	M	Fall from height	T12 Compression fracture	T12 Kyphoplasty
44	M	Fall from height	T6,11,12 Compression fracture	T6,11,12 Kyphoplasty
78	F	Fall	L1 Compression fracture	L1 Kyphoplasty
42	F	Fall from height	L1,3 Compression fracture	L1,3 Kyphoplasty
30	M	Traffic Accident	T5,6,7 Compression fracture	T5,6,7 Kyphoplasty
50	M	Fall	L1,2 Compression fracture	L1,2 Kyphoplasty

DISCUSSION:

Thoracolumbar fractures are more frequent in man (2/3) than in woman (1/3) and peak between the ages of 20 and 40 years[5,16,22]. Between 15 % and 30 % of traumatic fractures occur at the thoracolumbar junction (T_{11}–L_2), whereas 9 – 16 % occur in the thoracic spine (T_1–T_{10})[6,9]. Spinal cord injury occurs in approximately 10 – 30 % of traumatic spinal fractures[7,14]. Gertzbein and Magerl et al.reported 22 % and 35.8 % neurological deficiencies in thoracolumbar spine fractures[10,18].

The susceptibility of the thoracolumbar transition is attributed mainly because the transition from a relatively rigid thoracic kyphosis to a more mobile lumbar lordosis occurs at T11-12 level. T11 and T12 thoracic ribs cannot provide enough stability at the thoracolumbar junction, because they do not make a joint with sternum. These ribs are floating free. In the thoracic region, the facet joints are limiting flexion and extension while providing substantial resistance to anteroposterior translation6. The facet joints in the lumbosacral region can increase the degree of potential flexion and extension at the expense of limiting lateral bending and rotation[23]. Axial compression, flexion-distraction, hyperextension, rotation, shear forces may act together to produce structural damage to the spine at the time of injury [6,23].

The key point of physical examination of a patient with a spinal injury is on the vital and neurological functions, because effective resuscitation is critical to the management of spinal cord injury[12].

There are several classification systems that reported for thoracolumbar injures in the literature[2]. Gomleksiz et al analyzed these classification systems and suggest that three of them are more helpful to evaluate the patient[11]. These are McCormack's, Vaccaro's and Dennis classifications[5,19,24]. They also reported that even though there are some objections about Denis classification particularly on burst fractures, classification completes those weak points[11].

The management of thoracolumbar fractures is controversial and there is no consensus about treatment. Stability of the vertebral column must be the focus of treatment. There are many treatment options varying from conservative treatment to surgery for thoracolumbar fractures[3]. The timing of surgery remains controversial. Early decompression(<12hour) resulted in better outcomes compared to both delayed decompression(>24hour) and conservative management in the literature[12,23,26]. Commonly performed surgical options are stabilization-fusion, vertebroplasty - kyphoplasty, laminectomy, discectomy and minimal invasive techniques like endoscopic and thoracoscopic approaches[4,22]. In our study we have the ratios of 63,70 % stabilization and fusion, 31,80 % kyphoplasty and 4,50 % laminectomy.

We try to analyze our experience on traumatic thoracolumbar fractures that completed with surgery. About 60 % of thoracic

and lumbar spine fractures are located at the transition T_{11}–L_1, 30% in the thoracic spine and 10 % in the lower lumbar spine. A thoracolumbar trauma patient must be evaluated based on up to date classification systems combined all together for ideal decision-making for treatment.

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