

# Correlation between the Thoracolumbar Injury Classification and Severity Score (TLICS) and Delayed Surgery for Acute Thoracolumbar Compression and Burst Fractures in Patients without Neurologic Injury

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## Introduction

Thoracolumbar spine trauma is very common and treatment of these injuries can range from observation to surgical correction. The Thoracolumbar Injury Classification and Severity Score (TLICS) was created to aid in medical decision making. The most common injury pattern is the compression and burst fracture, resulting from axial loading forces, and the majority of these patients are without neurologic deficit.

## Methods

We maintain a prospective registry of all spine fractures treated at our institution through an IRB-approved protocol. The need for delayed operation for increasing pain or kyphosis was analyzed in a large group of patients without neurologic injury who suffered an acute thoracolumbar compression or burst fracture. Special attention was paid to the TLICS classification, level of injury, and time to delayed surgery.

### Thoracolumbar Injury Classification and Severity Score (TLICS)

Parameter	Points
<b>Morphology</b>	
Compression fracture	1
Burst fracture	2
Translational/rotational	3
Distraction	4
<b>Neurologic involvement</b>	
Intact	0
Nerve root	2
Cord, conus medullaris	
Incomplete	3
Complete	2
Cauda equina	3
<b>Posterior ligamentous complex</b>	
Intact	0
Injury suspected/indeterminate	2
Injured	3

## Results

Between 2006 and 2010, one hundred and forty-two patients suffered an acute thoracolumbar compression or burst fracture without resulting neurologic injury. TLICS ranged from 1 to 5. Thirty-five patients were in the TLICS 1 group. All TLICS 1 patients (100%) were treated without initial surgical intervention. Two patients (5.7%) required delayed operation for increasing kyphosis or pain. The TLICS 2 group consisted of 55 patients. Forty patients (72.7%) were initially treated conservatively, with delayed surgery performed in 4 patients (10.0%). There were no patients with TLICS 3. There were 37 patients in the TLICS 4 group, 12 (32.4%) of whom were initially treated conservatively. Delayed surgery was performed in 3 of these patients (25.0%). The TLICS 5 group had 15 patients, 1 (6.7%) treated with conservative management; this patient did not require delayed surgical intervention. The most common level injured in patients who required delayed surgery was L1 (5 patients). Other levels involved included T11 (2 patients), T12 (2 patients), L2 (2 patients), and T8 (1 patient). Three patients (33%) had injury to 2 consecutive levels. Surgical intervention was performed at an average of 6 months after the initial injury (range 1-18 months). Eight patients (88.9%) had surgery within 9 months, and 5 patients (55.6%) within 4 months.

## Conclusions

Delayed operation rate is much higher in TLICS4 compared to TLICS1 or TLICS2. This trend towards, without reaching, significance is due to the small number of TLICS4 patients that were initially treated conservatively. Injury at the thoracolumbar junction carries the highest risk of the need for delayed operation. The rate of surgery is greatest within nine months of injury. This analysis supports the recommendation of initial conservative management of TLICS1 and 2, but suggests stronger consideration be given to surgical management of TLICS4 acute thoracolumbar compression or burst fractures in neurologically intact patients.

## Learning Objectives

By the conclusion of this session participants should be able to: 1) Classify neurologically intact patients with acute compression and burst fractures into TLICS categories, 2) Have further understanding which of these patients warrant strong initial surgical consideration, and 3) Identify which patients are at greatest risk for needing delayed surgery after initially conservative management of the fracture.

## References

Vaccaro AR, Zeiller SC, Hulbert RJ, Anderson PA, Harris M, Hedlund R, et al. The thoracolumbar injury severity score: a proposed treatment algorithm. J Spinal Disord Tech 2005;18:209-15.

Lee JY et al. Thoracolumbar injury classification and severity score: a new paradigm for the treatment of thoracolumbar spine trauma. J Orthop Sci. 2005 Nov;10(6):671-5.

