

Letters to the Editor

NEUROSURGICAL FORUM

Thoracolumbar Injury Classification and Severity Score

TO THE EDITOR: We are very interested in the recently published article by Joaquim et al.¹ (Joaquim AF, Ghizoni E, Tedeschi H, et al: Clinical results of patients with thoracolumbar spine trauma treated according to the Thoracolumbar Injury Classification and Severity Score. *J Neurosurg Spine* 20:562–567, May 2014).

The Thoracolumbar Injury Classification and Severity Score (TLICS)¹² was first introduced by Vaccaro in 2005. It uses 3 variables for classification: fracture morphology, posterior ligamentous complex (PLC) integrity, and neurological status. Points are assigned for each category, and the final total suggests a possible treatment option. Patients with a TLICS of less than 4 are considered nonoperative candidates, whereas patients with a score greater than 4 are operative candidates. Patients with a total score of 4 fall into an indistinct category, where either nonoperative or operative treatment may be considered.

The validity and high reliability of the TLICS have been described in several publications.^{2,7,10} We agree that patients with a total score of more than 4 points should undergo surgery for reconstruction of a stable spinal structure. For patients with total scores lower than 4, however, clinical decision making is not always as clear, and conservative treatment may not be optimal in all cases.

According to our clinical experience, the TLICS highlights the integrity of the posterior complex while underestimating the importance of anterior parts of the spine.

According to the TLICS system, conservative treatment is the first choice for a patient who sustains a thoracolumbar spinal burst fracture without involvement of the PLC or compromise of neurological function and therefore has a total score of 2. However, anterior vertebral support is very important for maintaining spine stability. Pal and Routal⁶ and Nachemson⁵ found that about 80% of total weight was borne by the anterior and middle columns of the spine.

The support of the anterior and middle columns collapses in vertebral body fracture, and conservative treatment, such as the use of a thoracolumbar orthosis, cannot correct the resulting kyphosis. Although current literature does not demonstrate a relationship between the severity of kyphosis and pain or back dysfunction,^{9,11,14} we believe that kyphosis changes the loading line of the spinal axis,

which ultimately causes pathological change and dysfunction of the affected vertebral region. Other authors have also suggested that a significant increase of fracture angle or pain is an indication for surgery.⁴ Progression of kyphosis is more common in young patients with spinal fractures; Joaquim et al.¹ reported that 2 (7%) of 28 conservatively treated young patients eventually underwent surgery to relieve focal kyphosis. We suggest that young patients who have a TLICS of less than 4 with severe kyphosis (> 10°) and back pain should be surgical candidates. In our experience, these young patients can return to previous work well following surgical treatment, with minimal loss of correction during long-term follow-up.

In our opinion, the severity of kyphosis and the patient's age (especially for a young patient engaged in heavy manual labor) should also be parts of the TLICS classification. Whatever the TLICS is, we strongly suggest that for patients who are young (age < 50 years) and/or have a fracture Cobb angle greater than 10°, operative treatment should be the first-line choice; this recommendation is in agreement with Rea and Zerick.⁸

What's more, there is a Subtype A2 (split or pincer-type) spinal fracture, which is characterized by fracture of both endplates without involvement of the posterior wall of the vertebral body.¹³ This type of fracture should be treated nonsurgically according to TLICS classification, but the AOSpine Classification Group recommends that the majority of these fractures be considered for surgical treatment due to the interposition of discal tissue within the fracture, which interferes with the consolidation.³ Our practice is in accordance with the AO Group recommendation.

As we mentioned above, the decision based on TLICS may not be appropriate for all spinal fractures. Special attention should be paid to young patients, those with severe kyphosis, and those with Subtype A2 fractures.

We are looking forward to further studies from the authors.

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DISCLOSURE

The authors report no conflict of interest.

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Response

We thank Drs. Tong and Wu very much for their interest in our manuscript. They raise points that are important to discuss with respect to the management of thoracolumbar injuries.

Although the authors proposed surgery for Subtype A2 fractures and for young patients with a fracture Cobb angle greater than 10°, there is no strong level of evidence confirming the benefits of surgery over conservative treatment of burst fractures without neurological deficits.^{1–3,14,15} Drs. Tong and Wu present a well-thought-out concern for patients with thoracolumbar fracture, including the possibility of long-term dysfunction. However, the suggestions

they make both about treatment and the natural history of conservatively treated fractures are anecdotal and not supported by the literature.

Other authors have already stated that the TLICS does not consider the degree of anterior column injury, or kyphosis, as an indication for surgery, proposing for instance the concomitant use of the load-sharing classification in patients with burst fractures without neurological deficits.^{10,11}

The TLICS is based on the best available medical evidence of management of burst fractures.^{13–15} Routine surgical treatment of all patients with burst fractures is not recommended. Local kyphosis can occur without correlation to patient outcomes.^{12,14} Moreover, those patients who require late surgery could potentially have misdiagnosed PLC injuries at the onset of care, and such patients would therefore not have typical thoracolumbar burst fractures.^{4–9} Our study demonstrates that the TLICS is safe, although we do agree that a perfect classification system does not exist.

In this context, we believe that until best evidence supports, with detail and statistical power, the benefits of surgery for specific patterns of burst fractures, the TLICS proposal score can be used effectively and safely.

We are concerned that the angulation of 10° recommended by the authors, contrary to the best available evidence, will lead to a large number of patients undergoing surgery—and being exposed to the documented risks of surgical treatment—without clinical benefit. We would strongly encourage the authors to pursue, and would eagerly anticipate, a prospective, well-powered randomized study with validated, standardized patient-reported outcomes comparing surgical to nonsurgical treatment with their proposed criteria.

The authors also suggest that Subtype A2 split fractures require surgical treatment because of the risk of nonunion from disc fragments. Similarly, the evidence for this suggestion is limited.⁸ Furthermore, a trial of nonsurgical management, in the setting of an intact PLC and normal neurological function, poses little risk to the patient, as shown in our study, and would not adversely affect surgical outcomes in the rare circumstances in which surgery becomes required.

We are grateful for the opportunity to clarify the issues raised by Drs. Tong and Wu and thank them again for their interest in our study.

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DISCLOSURE

Dr. Patel reports direct stock ownership in Amedica, Vital5, and Cytonics and a consultant relationship with Amedica, DePuy Spine, Biomet Spine, Stryker Spine, and Zimmer Spine.

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