Commentary on “Thoracic and lumbar spine trauma classification systems fail to predict post-traumatic kyphotic deformity”

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Thoracolumbar spinal fractures may result in kyphosis, which has been associated with back pain, decreased daily function, and adjacent segment degeneration. Classification systems have been developed over the years to describe such fractures and facilitate treatment recommendations. The paper by Crim et al. sought to assess the ability of trauma classification systems to predict the development of kyphotic deformity.

This retrospective study examined all patients who underwent MRI for acute thoracic and lumbar spine trauma at a single Level 1 trauma center between January 2014 and December 2017. The study excluded patients for whom fracture was related to neoplasm or infection. Patients were included if imaging demonstrated traumatic thoracic or lumbar vertebral body fractures, and follow-up upright radiographs were available. Fractures were classified based on the Denis, Thoraco-Lumbar Injury Classification and Severity Scale (TLICS), AO, and load sharing classification systems. Reliability of measurements and change in kyphosis between injury and follow-up studies were assessed.

In total, 62 patients with injury at 67 levels were included in the study. These were in a mix of different fracture types, patients were treated nonoperatively (n = 30) or with percutaneous posterior fixation (n = 37), some were potentially osteoporotic based on age (n = 17), some had multiple levels involved (n = 13 had at least 3 contiguous levels).

Kyphosis measuring ≥ 10° developed despite an intact posterior ligamentous complex (PLC) in 6/14 patients treated nonoperatively, and 3/7 of patients treated surgically. In patients with partially injured PLC, kyphosis measuring ≥ 10° developed in 6/10 cases. In patients with complete disruption of the PLC as determined on MRI, kyphosis measuring ≥ 10° developed in 3/6 treated nonoperatively, and 8/24 treated surgically. Notably, there was variability in the interpretation of the status of the PLC between observers.

When interpreting their findings, the authors concluded that thoracolumbar spine trauma classification systems and injury of the PLC according to MRI were not predictive of development of kyphosis. Rather, the number of adjacent levels injured and the presence of anterior longitudinal ligament disruption were identified risk factors for the development of kyphosis.

The findings of this study are provocative in that they question the predictive ability of currently used thoracolumbar classification systems when considering the development of kyphotic deformities. However, the retrospective nature of the study and mix of nonsurgical and surgical management based on current treatment algorithms are clear limitations. Furthermore, the clinical outcomes of patients who developed kyphosis were not assessed. Additionally, it is noted that the status of the PLC was variably assessed, and they additionally note that it could not be assessed intraoperatively due to the percutaneous nature of their interventions.

Overall, the study highlights the fact that it is difficult to define who will fall into kyphosis following thoracolumbar fracture and calls for further attention to this topic. Tying classification systems and management to functional outcomes is clearly an important goal.

Article reviewed

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Supplementary materials

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