

Thoracolumbar Spine Trauma-An Update of the Current Classification Systems

Andrei Fernandes Joaquim

Andrei Fernandes Joaquim, Department of Neurology, State University of Campinas, Campinas-SP, Brazil

Correspondence to: Andrei Fernandes Joaquim, MD, PhD, Department of Neurology, State University of Campinas, Campinas-SP, Brazil

Email: andjoaquim@yahoo.com

Telephone: +55-19-32525442

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ABSTRACT

Classification is probably one of the most important steps in the management of thoracolumbar spine trauma (TLST). An adequate classification is of paramount importance to compare treatments, estimating patient's outcome and provide a common language among healthcare providers. In this paper, we discuss the evolution of the most important classification systems, such as the Denis system, the Magerl classification, the Thoracolumbar Injury Classification System and Severity Score, among many others proposed to treat TLST. As final conclusions, considering the limitations and potential benefits of each classification used are a critical point to propose an adequate treatment for our patients and improve clinical results.

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Key words: Classification; Spinal cord injury; Lumbar trauma; Thoracic trauma; Thoracolumbar

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EDITORIAL

Thoracolumbar spine trauma (TLST) comprises injuries of the thoracic, the thoracolumbar region itself, and the lumbar spine (L3-5)^[1].

An important step in the management of TLST is its classification. An adequate classification is important to compare treatments, for estimating patient's outcome and to provide a common language among healthcare providers.

The ideal system needs to be reproducible and clinically useful and also has to be connected to patient's outcome.

Over the years, many classification systems have been proposed, such as the proposed by Böhler in 1929, Nicoll in 1949, Holdsworth in 1970, Louis in 1977, McCormack in 1994 (the Load Sharing Classification), among many others. The three column model proposed by Denis *et al* in 1983 was probably one of the most used systems throughout the 1980's^[2-7].

In 1994, Magerl *et al* published a patho-mechanistic classification system adopted for the AO Spine Group, widely used in 1990's and 2000's^[8]. The system was comprehensive, with three main fracture types (A, B and C) and more than 50 subtypes. Although widely accepted and used, the system was criticized by some authors for having a low reproducibility and for not having the neurological status in the treatment decision.

In this context, the Spine Trauma Study Group proposed in 2005 a new consensus classification named TLISS, the thoracolumbar injury severity scale, based on three major characteristics to guide treatment: (1) mechanism of injury, (2) integrity of the posterior ligamentous complex (PLC) and (3) neurological status^[9]. Although the system had good construct validity, due to low reproducibility of injury mechanism, it was modified to the TLICS, the Thoracolumbar Injury Classification and Severity Score. The mechanism of injury used in the TLISS score was replaced by the morphological description of the injury on radiographic images^[10]. In the last years, the TLICS has been tested regarding its reliability and safety, with some papers confirming its validity in clinical context^[11-15]. The TLICS is probably the most used system used to help surgeons to decide to intervene surgically or not, especially in North America.

However, although a clear evolution from its predecessors, the TLICS did not propose a detailed and accurate morphological characterization of the spinal injuries, as well as did not consider posttraumatic factors for late kyphosis and is imprecise in the description of posterior ligamentous complex injuries. Considering this, the AO Spine Study Group recently published a newer AO Spine

System^[16]. The newer system also has three subtypes, A (anterior compression fractures), B (disruption of the posterior tension band) and C (displacement or dislocation of the vertebrae). Seven subtypes were proposed (four in the A group, three in the B group and one in C). This classification is clearly derived from the “old” AO system (Magerl), as well as received some influence of the TLICS in an attempt of solve the potential shortcomings of the osteo-ligamentous injuries grading system-the PLC status, which had a low reliability in some studies addressing the TLICS reproducibility. The newer AO system is based on CT scan image, once MRI is not used routinely in many trauma centers around the world. Clinical studies validating the safety of the newer AO system and its potential contribution remains necessary prior to its adoption.

In conclusion, TLST classification is continuously evolving. Constant updating is required for spinal surgeons who managed patients with spinal cord injury. Understand the limitations and potential benefits of each classification used are of paramount importance to propose an adequate treatment for our patients and improve clinical results.

CONFLICT OF INTERESTS

There are no conflicts of interest with regard to the present study.

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Peer reviewer: Amit Wasudeo Bhandarkar, 70 Slate Creek Dr Apt 6 Cheektowaga, NY 14227, Buffalo, USA; Mehmet Zileli, Ege University Faculty of Medicine, Dept of Neurosurgery, 1421 sok 61-5 Alsancak Izmir 35230 Turkey; Santino Ottavio Tomasi, Department of Neurosurgery Christian-Doppler-Medical Center, Laboratory for Microsurgical Neuroanatomy, Paracelsus Medical University, Ignaz-Harrer-Str. 79, 5020 Salzburg, Austria; Timo Stübiger, Medical School Hannover, Trauma Center, Carl-Neuberg-Strasse 1, 30625 Hannover, Germany.