Multiple Level Thoracolumbar Burst Fractures – How to Manage?

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INTRODUCTION: Thoracolumbar fractures have an annual incidence of 160000, with thoracolumbar burst fractures comprising up to 50% of such cases. Thoracolumbar burst fractures, which involve the fracture of the affected vertebra in 2 or more directions, are well-characterized. However, little is known about the presentation and treatment of thoracolumbar burst fractures presenting at multiple levels. We seek to examine the incidence, presentation, diagnosis, and management of multiple level thoracolumbar burst fractures (MLTCBFs).

METHODS: We performed a literature search on PubMed using the terms ((thoracolumbar burst fractures) AND (multiple levels)) and examined the literature present. After our inclusion and exclusion criteria, we reviewed the papers present for data regarding incidence, case presentation, diagnostic criteria, and management criteria.

RESULTS SECTION: MLTCBFs can be divided into two classifications – contiguous, where all affected vertebrae are sequential, and non-contiguous, with non-affected vertebrae in between the affected levels. MLTCBFs occur primarily through two mechanisms – fall from height and motor vehicle accidents. Diagnostic workup involves radiographic assessment, including stability, and assessing for neurologic symptoms. Operative indications include fracture instability, neurologic involvement, and fracture contiguity, the third of which is not currently assessed in the thoracolumbar injury classification and severity score (TLICS). Conservative management options include thoracolumbosacral orthosis, body casting, and simple bed rest. Operative treatment entails either posterior or anterior approach, with better outcomes seen in an anterior approach, such as resolution of neurological symptoms and restoration of sagittal alignment and fewer complications.

DISCUSSION: We characterize the two types of MLTCBFs, contiguous and non-contiguous, along with their epidemiology and incidence. We propose a modification to the current TLICS grading system to incorporate scoring for MLTCBFs, with contiguous fractures serving as a new addition and requiring operative treatment. Operative treatment for non-contiguous fractures relies on previously established criteria – fracture instability and neurological involvement. Whenever operatively treating a fracture, we recommend utilizing an anterior approach whenever possible, given similar risks to a posterior approach with superior resolution of neurological symptoms. With changes to the TLICS system, contiguous MLTCBFs will receive operative treatment, thus providing a clear management algorithm for the treatment of these lesions.

SIGNIFICANCE/CLINICAL RELEVANCE: (1-2 sentences): Multiple-level thoracolumbar burst fractures are a rare and poorly characterized and classified injury pattern. We explore the literature to examine etiologies, diagnosis, management recommendations, and outcomes in rare injury pattern.

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