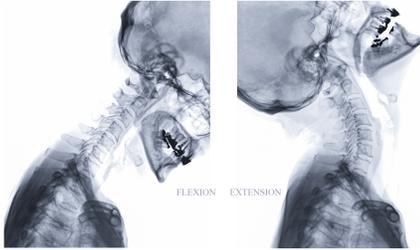


Spine Management Report

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Injury and Causally Related Instability in the Human Spine



Diagnosing a traumatic spine injury is only the first step in the process of managing the care path in a patient with a spinal injury. Often, the downstream effects of the injury are only considered well after the fact, once the patient is stabilized. A recent study by Liebsch et al (2021) reported “The aim of this review therefore was to summarize and quantify multiplanar instability increases due to spinal injury from experimental studies.” (pg 1) This is an important paper since it “reviews” all the prior papers published related to spinal injury and instability.

The paper states, “Traumatic injuries of the spine represent common results of severe traffic, fall, and sports accidents, which all were found to be predictors for spinal fractures and dislocations in adult major trauma patients.”(pg 1) In many cases the mechanism of injury is similar between patients, however that is where the similar often ends. Each patient responds differently to the treatment and potential ongoing problems with permanent spinal conditions. The authors continue, “Despite the clinical relevance of traumatic spinal injuries and hence the need for an

optimum surgical treatment protocol, the effect of traumatic spinal injury on spinal instability has not been sufficiently investigated so far.” (pg 2) What they are focusing on is, what part of the functional system of the spine is negatively impacted when there is an injury? They state, **“White and Panjabi first postulated clinical instability as incapability of the spinal column to preserve the physiological motion pattern under normal loading together with displacement, neurologic deficit, incapacitating pain, or spinal deformity.”** (pg 2)

Of particular importance to the management of spinal trauma, the authors revealed, “Overall, the findings might indicate that instability predominantly increases in flexion/extension direction **after ligamentous injury of the posterior elements, as especially seen in case of flexion-distraction injury.**” (pg 16) In this part of the discussion, it is the injury to the ligaments that is difficult to manage, this is even more apparent when the patient is either not a candidate for surgical intervention post trauma or is non-responsive to conservative care.

The paper concludes by reporting, “In conclusion, the degree of instability after spinal trauma depends on the injury type, the spinal level, and the injury morphology, while specific traumatic spinal injuries produce characteristic three-dimensional degrees of instability.” (pg 19) “Furthermore, neutral zone and translation should be measured besides from the range of motion and mechanical injury simulation should be performed to ensure high comparability with the clinical situation.” (pg 19)

We see now that a full diagnostic work up for spine injuries must include BOTH the regional range of motion as well as an analysis of the individual vertebral segments in that region. Stress radiographs, (flexion and extension) are the standard to address segmental analysis in the human spine.



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REFERENCE:

1. Liebsch, C., & Wilke, H. J. (2021). Which traumatic spinal injury creates which degree of instability? A systematic quantitative review. The Spine Journal.