

## Traumatic Cervical Spine Injury Management: Factors and Trends in The National Trauma Data Bank

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**Introduction:** Traumatic cervical spinal cord injuries (cSCI) often result in significantly impaired quality of life for those affected. Early decompression of spinal cord injuries has been associated with improved patient outcomes. Consequently, variations in time to emergency spinal decompression significantly impact patients' complication rate and postoperative recovery. This study aims to identify differences in time to surgical decompression of cSCI when comparing the presence or absence of cervical spine fracture.

**Methods:** Patients who experienced a traumatic cSCI from 2017-2020 were extracted from The National Trauma Data Bank (NTDB) using ICD-9 and ICD-10 codes. 13,738 patients, including 6,869 males and 6,869 females met inclusion criteria. Given the large number of participants included in this database study and the secondary use of existing, de-identified data, the IRB granted a waiver of informed consent (IRB #7141). Patients were propensity score matched 1:1 based on preexisting comorbidities. Outcome variables examined include time to surgical decompression, intraoperative complications, and postoperative complications. Patients with central cord syndrome were excluded.

**Results:** Patients who had a cSCI and concomitant fracture (SCI-VF) were older compared to patients without a fracture (SCI-NF). SCI-NF patients experienced longer times to decompression and lower rates of early and ultra-early decompression compared to SCI-VF patients ( $p < 0.0001$ ). SCI-NF patients spent longer time in the emergency department but less time on the ventilator, in the hospital, in the hospital, and in the ICU compared to SCI-VF patients ( $p < 0.0001$ ).

**Discussion:** Patients who experienced a cSCI without a concomitant fracture experienced delayed operative management at higher rates than SCI-VF patients. Comorbidities, injury presentation, and intrahospital events impact patients' risk for delayed decompression. This study relies on data from the NTDB, which consists of both chart-abstracted data and administratively coded data. As a result, inaccuracy in patient coding data and missing data may affect the reliability of observed outcomes. Future work is needed to optimize treatment algorithms and expedite surgical intervention.

**Significance/Clinical Relevance:** Recognizing fracture status as a predictor of surgical delay can inform treatment algorithms and support timely intervention to improve patient recovery.