Subaxial Injury Classification and Severity Scale

- Vertebral Fracture
- Comparison of Anterior Cervical Discectomy Fusion Combined with Lateral Mass Screw and with Cervical Pedicle Screw Fixation Surgery under O-Arm Navigation for Single-Stage Management of Severe Lower Cervical Fracture Dislocation
- Dynamic Radiographs in Assessing Stability of Cervical Spine Fractures: A Multicentre Study
- A Prognostic Factor for Prolonged Mechanical Ventilator-Dependent Respiratory Failure after Cervical Spinal Cord Injury : Maximal Canal Compromise on Magnetic Resonance Imaging
- Establishing the Injury Severity of Subaxial Cervical Spine Trauma: Validating the Hierarchical Nature of the AO Spine Subaxial Cervical Spine Injury Classification System
- External Multicenter Study of Reliability and Reproducibility for Lower Cervical Spine Injuries Classification Systems-Part 2: An Analysis of the Subaxial Cervical Spine Injury Classification and Cervical Spine Injury Severity Score Scale
- When is the circumferential stabilization necessary for subaxial cervical fracture dislocations? The posterior ligament-bone injury classification and severity score: a novel treatment algorithm
- Reliability of Allen Ferguson classification versus subaxial injury classification and severity scale for subaxial cervical spine injuries: a psychometrics study

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The Subaxial Cervical Spine Injury Classification System (SLICS) is a commonly used algorithm for diagnosing and managing subaxial cervical spine trauma. A SLIC score 4 suggests either surgery or non-surgically treatment depending on the surgeon's experience and patient's conditions.

Objective: Prognosis and treatment results were analyzed in patients with SLIC score 4.

Methods: The patients with SLIC score 4 were retrospectively reviewed from 2012 to 2019. Forty-one patients were included and divided into two groups: non-surgically treated and surgically treated. Demographic data and radiographs were analyzed. Statistical analysis was performed to determine the difference between the two clinical groups.

Results: Twenty-two patients were non-surgically treated, and nineteen patients were surgically treated. There was no neurological deterioration in both groups. However, there was no statistically significant difference in the last follow-up AISA and Nurick grade ($p > 0.05$). There was no significant difference in the number of patients who showed improvement when comparing the initial and the last follow-up neurological status ($p > 0.05$).

Conclusion: Regardless of the treatment method, the spinal cord injury patients with SLICS point 4 showed a relatively good prognosis. Patients with SLIC score 4 could be treated non-surgically or surgically based on the surgeon's experience and factors associated with the patient's acute health

status and chronic comorbidities [1)]

The Subaxial Injury Classification (SLIC) is a system that aids in injury classification and helps guide the decision-making process of conservative versus surgical treatment. Though promising, the SLIC system requires further validation.

To create the scale, a systematic review of the surgical treatment of subaxial cervical spine trauma was conducted, and a treatment algorithm was created with the evidence-based consensus of a group of specialists.

This classification of lower cervical spine injuries takes into account the following characteristics:

Morphology.

Status of the disco-ligamentous complex.

Neurological assessment.

Based on these parameters, a table is used to assign scores to each injury: individuals with a score lower than 4 do not require surgical intervention; a score of 4 means the treatment could be either surgical or conservative (often, the decision is made based on the personal experience of the surgeon); and a score higher than 4 normally means that surgical intervention is required

Subaxial Injury Classification (SLIC) scale.

	Points
Morphology	
No abnormality	0
Compression + burst	1 + 1 = 2
Distraction (e.g., facet perch or hyperextension)	3
Rotation or translation (e.g., facet dislocation, unstable teardrop, or advanced-stage flexion-compression injury)	4
Disc-ligamentous complex	
Intact	0
Indeterminate (e.g., isolated interspinous widening or MRI signal change only)	1
Disrupted (e.g., widening of the anterior disk space or facet perch or dislocation)	2
Neurological status	
Intact	0
Root injury	1
Complete cord injury	2
Incomplete cord injury	3
Continuous cord compression (neuromodifier in the setting of a neurological deficit)	+ 1

General information

The subaxial injury classification (SLIC) [2)] assesses injuries to the disco-ligamentous complex (DLC) in addition to neurologic and bony injuries.

Inter-rater reliability intraclass correlation coefficient is 0.71.

▶ DLC integrity . The DLC includes: anterior longitudinal ligament (the strongest component of the anterior DLC), posterior longitudinal ligament, ligamentum flavum, facet capsule (the strongest component of the posterior DLC), interspinous and supraspinous ligaments. The DLC is the hardest SLIC parameter to evaluate. Largely inferred indirectly from MRI findings. Healing is less predictable than bone healing in the adult. More data needs to be accrued before this parameter can be reliably quantified.

Injury (rate *the most severe injury* at that level)	Points
Morphology	
No abnormality	0
Simple compression (compression fx, endplate disruption, sagittal or coronal plane VB fx.)	1
Burst fracture	2
Distraction (perched facet, posterior element fx.)	3
Rotation/translation (facet dislocation, teardrop fx., advanced compression injury, bilateral pedicle fx., floating lateral mass (p.1034). Guidelines: relative axial rotation ≥ 11°[4] or any translation not related to degenerative causes	4
Discoligamentous complex (DLC)	
Intact	0
Indeterminate (isolated interspinous widening with < 11° relative angulation & no abnormal facet alignment, ↑ signal on T2WI MRI in ligaments...)	1
Disrupted (perched or dislocated facet, < 50% articular apposition, facet diastasis > 2 mm, widened anterior disc space, ↑ signal on T2WI MRI through entire disc...)	2
Neurologic status	
Intact	0
Root injury	1
Complete spinal cord injury	2
Incomplete spinal cord injury	3
● Continuous cord compression with neuro deficit	+1

SLIC score 4

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Regardless of the treatment method, the spinal cord injury patients with SLICS point 4 showed a relatively good prognosis. Patients with SLIC score 4 could be treated non-surgically or surgically based on the surgeon's experience and factors associated with the patient's acute health status and chronic comorbidities [3].

[1] [3]
Kang JH, Im SB, Kim JH, Jeong JH. Is it true that treatment in patients with Subaxial Cervical Spine Injury Classification System (SLICS) 4 is the surgeon's choice? J Back Musculoskelet Rehabil. 2023 Aug 17. doi: 10.3233/BMR-220428. Epub ahead of print. PMID: 37661866.

[2]
Vaccaro AR, Hulbert RJ, Patel AA, et al. The subaxial cervical spine injury classification system: a novel approach to recognize the importance of morphology, neurology, and integrity of the disco-ligamentous complex. Spine. 2007; 32:2365–2374