

Axis fracture management

- Treatment with Locking Intramedullary Nailing for Intertrochanteric Fracture of the Femur Utilizing a New Awl with a Distal Positioner
- Exosomal miRNAs in muscle-bone crosstalk: Mechanistic links, exercise modulation and implications for sarcopenia, osteoporosis and osteosarcopenia
- Craniocervical Junction and Upper Cervical Spine Fractures: Historical Systems and Advancements with the AO Spine Classification
- Comprehensive Review of Multidetector Computed Tomography (MDCT) in the Assessment of Blunt Cervical Spine Trauma in Adults
- Hip axis length and non-hip cortical fragility fractures in young postmenopausal nonobese Caucasian women
- Treatment of clavicle fractures in children and adolescents : Conservative and surgical treatment options with a focus on the figure-of-eight style brace and intrafocal intramedullary nail osteosynthesis
- Imageless robotic-assisted total knee arthroplasty allows intra-articular correction of severe extra-articular deformities using functional alignment and desired under-correction
- Traumatic odontoid fracture - Proposal of a treatment algorithm

Suppose an [axis fracture](#) involves the adjacent segment instability and even dislocation. In that case, it can easily lead to high cervical spinal cord injury and vertebro-basilar artery insufficiency, thus resulting in quadriplegia and even a life-threatening condition. The principle for the surgery is that the axis fracture type should be considered, and the adjacent unstable segments should be fixed to restore the stability between C1/2/3. A personalized surgical method should be selected for each patient, thus achieving an effective fixation and preserving the movement phase of the spine as much as possible ¹⁾

Management of axis fractures in the elderly remains controversial.

Umbrella reviews

Joaquim et al. performed an [umbrella review](#) of [systematic reviews](#) evaluating studies about the [axis fracture management](#) that identify potential modifiers in the [axis fracture treatment](#). These [modifiers](#) were grouped according to the new AO UCIC. Eight systematic reviews were included.

They were divided into three groups: (1) [Axis body fractures](#) - one study, (2) [Hangman's fractures](#) - one study, and (3) [Odontoid fractures](#), six studies. For axis body fractures, most injuries were treated non-operatively, except some [Benzel type 3 fractures](#) ([AO Spine Upper Cervical Injury Classification System type A](#)) with displacement or severe comminution (M1). [Hangman's fractures](#) classified as [Levine and Effendi classification I](#) and [Levine and Edwards classification I](#) and II were successfully treated non-operatively, with no modifiers identified for non-union or instability. For Levine-Edwards type IIA and III, surgery was generally recommended, but these should be classified as [AO Spine Upper Cervical Injury Classification System type B](#) and [AO Spine Upper Cervical Injury Classification System type C](#), respectively, without a need for modifiers. For [odontoid fractures](#), fractures in the dens base, with [displacement](#), or in elderly patients were associated with non-union (M1), and patients' specific factors (surgical condition) seem to affect the decision of treatment (M3) for considering surgery. They identified from the literature some [axis fracture](#) characteristics that seem to affect the [treatment decision](#) in historical series. Knowledge of these modifiers may further

enhance the system's clinical utility ²⁾.

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Tan MS, Zhang GB. Thoughts on therapies and surgical indications for atlantoaxial instability. Chinese Journal of Spine and Spinal Cord. 2006;16:330-331.

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Joaquim AF, Bigdon SF, Camino-Willhuber G, Öner CF, Schnake KJ, Bransford R, Chhabra HS, El-Skarkawi M, Vaccaro AR, Schroeder GD; AO Spine Knowledge Forum Trauma & Infection. The [AO Spine Upper Cervical Injury Classification System](#) (AO UCIC) - An [Umbrella Review](#) of Traumatic Axis Injuries Factors that May Affect Treatment Decision. Global Spine J. 2025 Mar 29;21925682251333300. doi: 10.1177/21925682251333300. Epub ahead of print. PMID: 40156313.

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