



## **AOSpine Classification and Injury Severity System for Traumatic Fractures of the Thoracolumbar Spine**

This is the present form of the classification and injury severity system the AOSpine Knowledge Forum (KF) SCI & Trauma has developed (status June 13, 2013). It is the aim of the KF to develop a system, which can in the future be used as a tool for scientific research and a guide for treatment. This system is being subjected to a rigorous scientific assessment.

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Disclaimer:

1. Endorsed by AOSpine International Board as the AOSpine TL fracture classification on April, 1st, 2013
2. Accepted for publication by Spine, on May, 15, 2013
3. Validation process running, to be completed by July, 2013

This classification and injury severity system is based on the evaluation of three basic parameters:

1. **Morphologic classification of the fracture**
2. **Neurologic injury**
3. **Clinical modifiers**

### 1. Morphologic classification

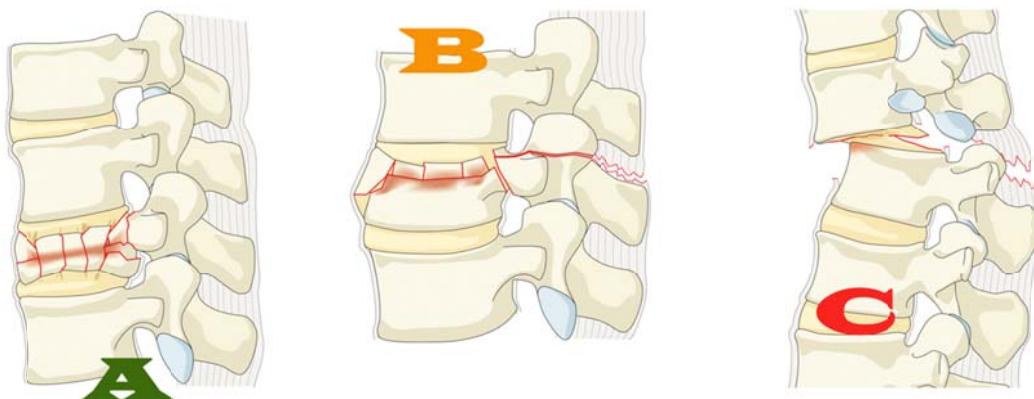
This is based on the Magerl classification modified by the AOSpine Classification Group. For this evaluation radiograms and CT scans with multiplanar reconstructions are essential. In some cases additional MR images might be necessary.

Three basic types are identified on the basis of the mode of failure of the spinal column.

**Type A:**      **Compression injuries. Failure of anterior structures under compression**

**Type B:**      **Failure of the posterior or anterior tension band**

**Type C:**      **Failure of all elements leading to dislocation or displacement.**

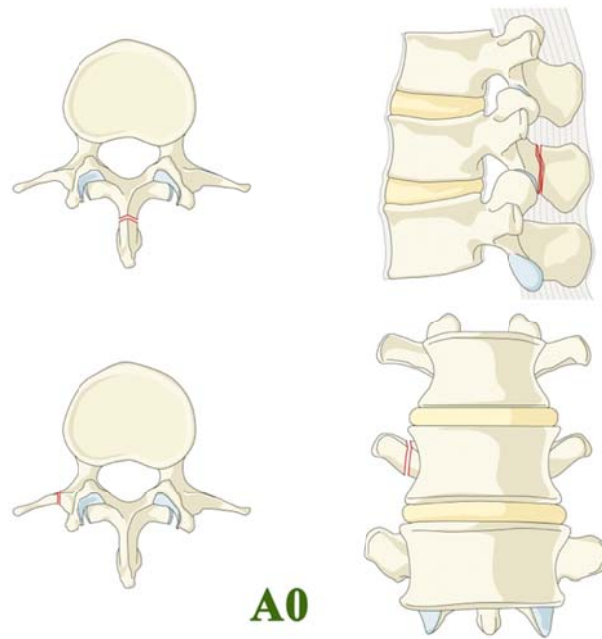


## TYPE A

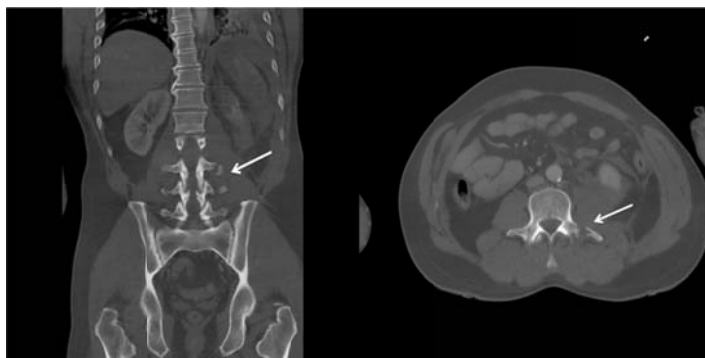
**Type A:** Describe injury to the vertebral body without tension band (PLC) involvement. There are five subtypes and no further sub-classification. These subtypes are also used as description of vertebral body fracture in B and C Types.

### A0 / minor, nonstructural fractures

Fractures, which do not compromise the structural integrity of the spinal column such as transverse process or spinous process fractures

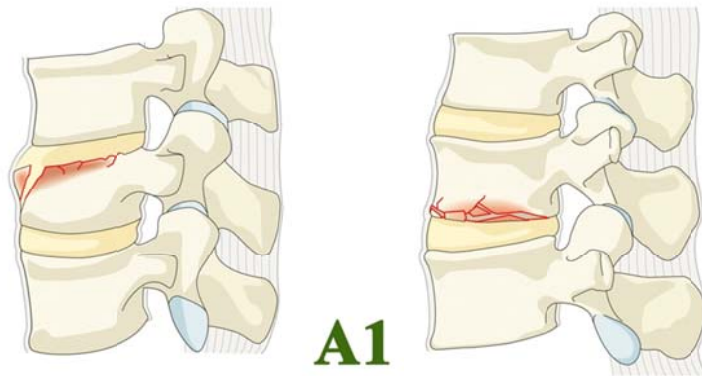


*Example:*



### A1 / Wedge-compression:

Fracture of a single endplate without involvement of the posterior wall of the vertebral body.

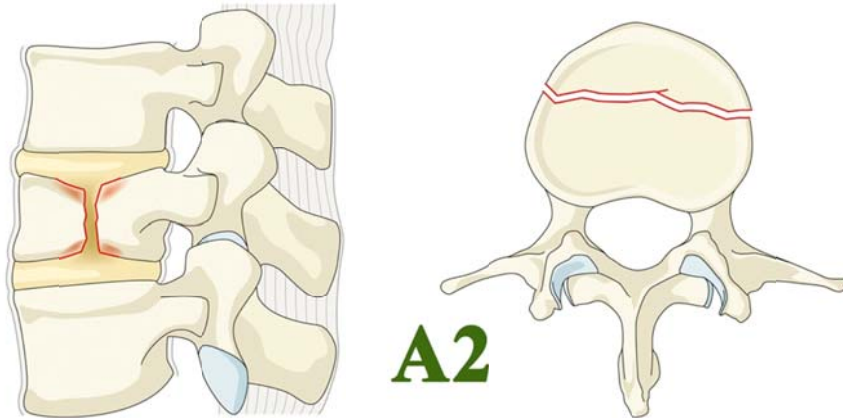


*Example:*



**A2 / Split:**

Fracture of both endplates without involvement of the posterior wall of the vertebral body.

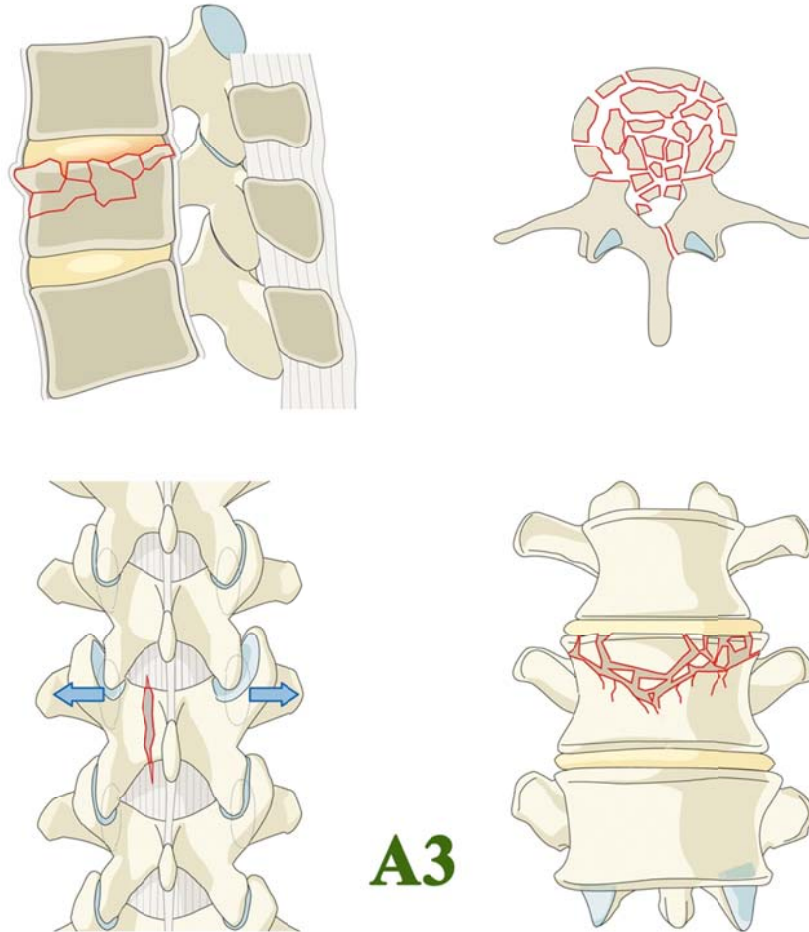


*Example:*

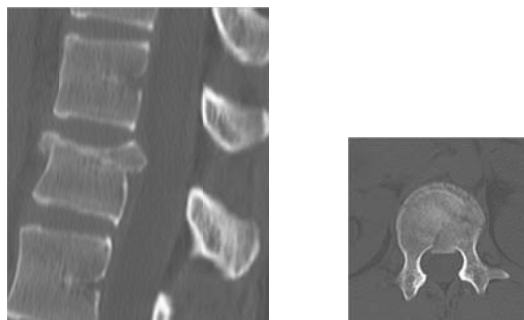


### A3 / Incomplete burst

Fracture with any involvement of the posterior wall; only a single endplate fractured. Vertical fracture of the lamina is usually present and does not constitute a tension band failure.

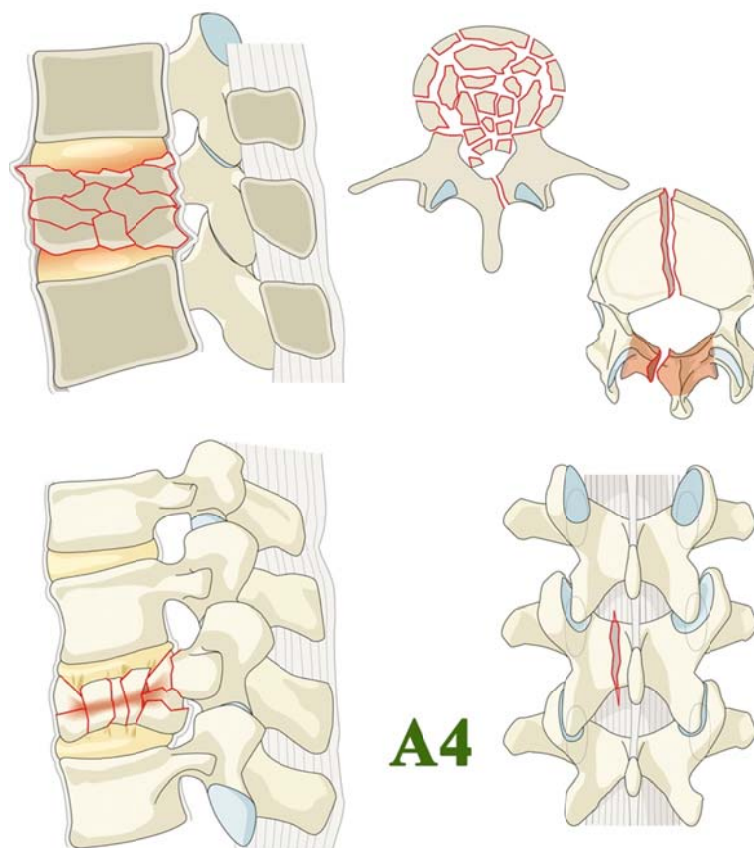


*Example:*



#### A4 / Complete burst

Fracture with any involvement of the posterior wall and both endplates. Vertical fracture of the lamina is usually present and does not constitute a tension band failure.



*Example:*



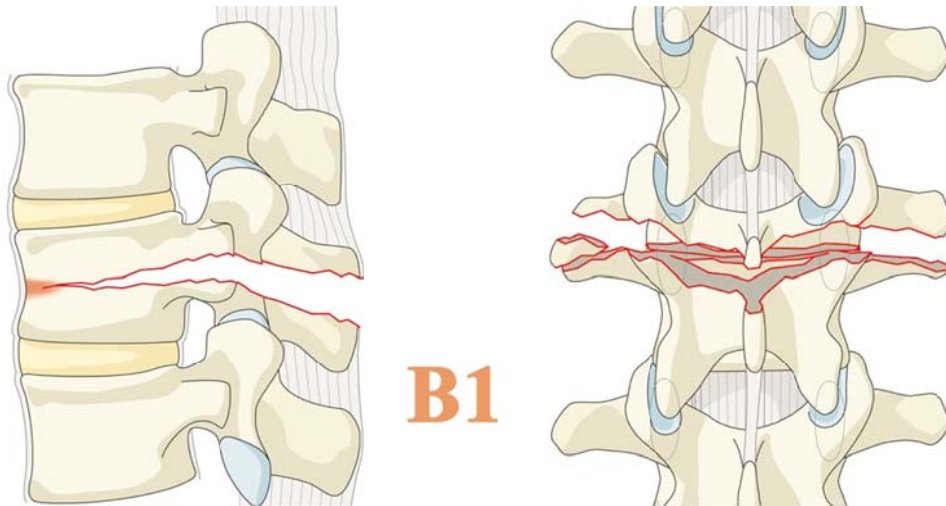


## TYPE B

**Type B:** Describe the failure of posterior or anterior constraints (in case of TL this is the tension band or PLC / Posterior Ligamentary Complex or the anterior longitudinal ligament). Is to be combined with subtypes A when appropriate. There are three subtypes:

### B1 / Transosseous tension band disruption / Chance fracture

Monosegmental pure osseous failure of the posterior tension band. The classical Chance fracture.



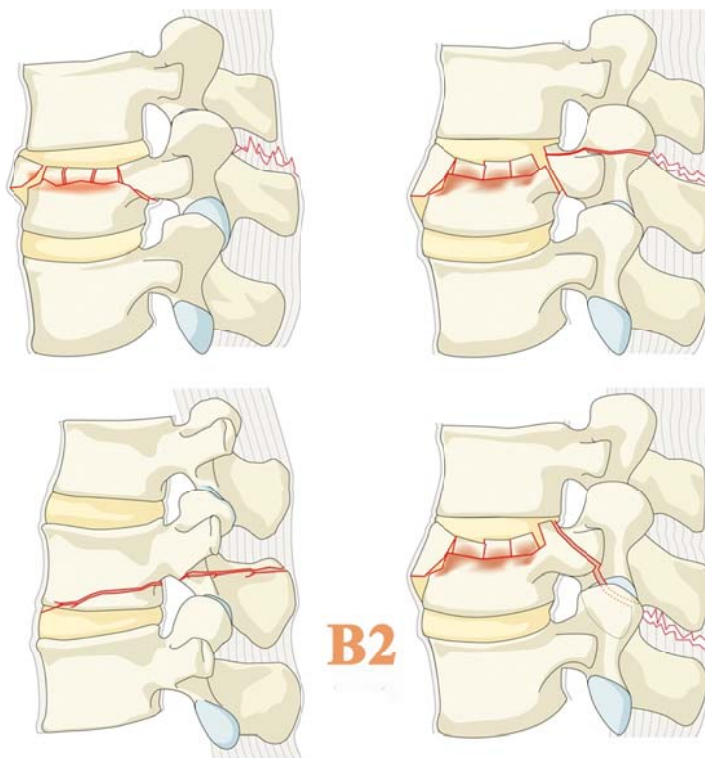
*Example:*



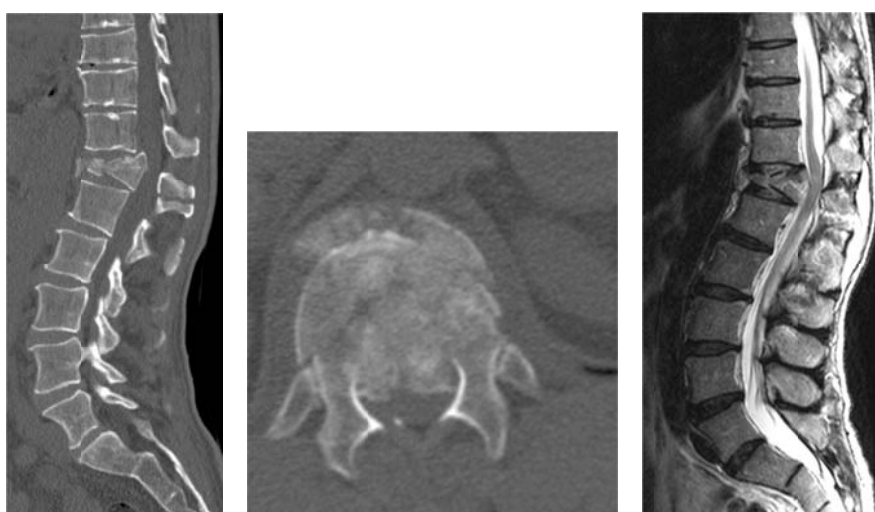


### **B2 / Posterior tension band disruption**

Bony and/or ligamentary failure of the posterior tension band together with a Type A fracture. Type A fracture should be classified separately.



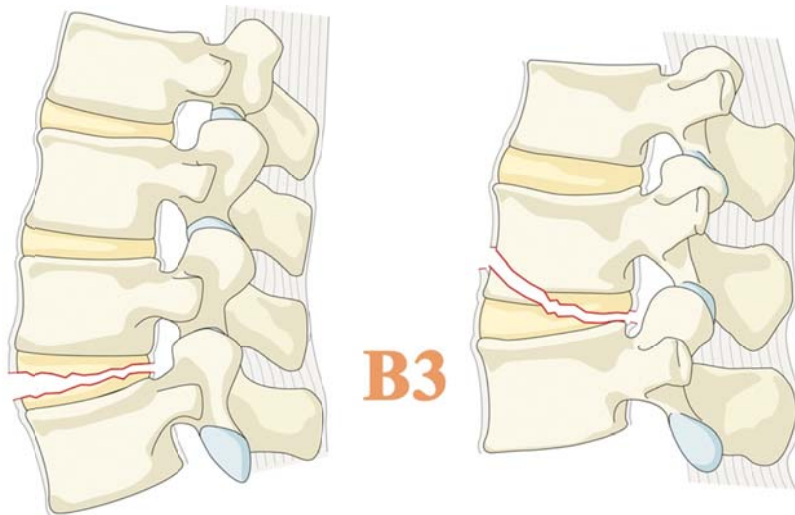
*Example:*



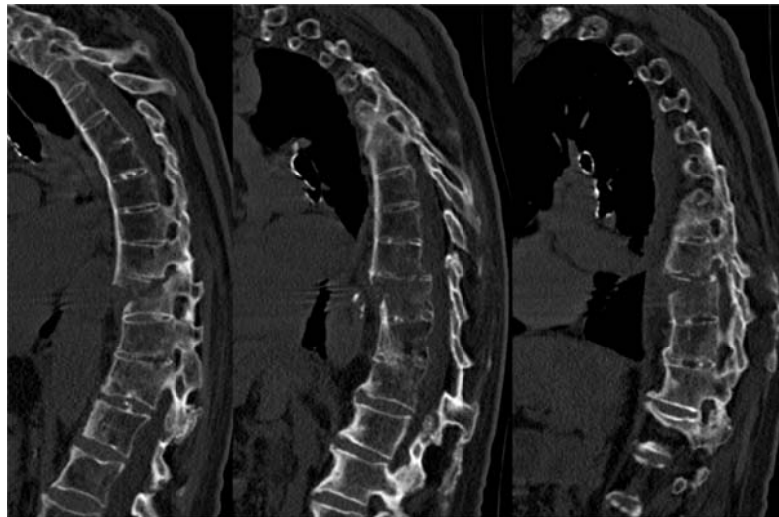
*This should be classified as: T12-L1 Type B2 with T12 A4 according to the combination rules.*

### B3 / Hyperextension

Injury through the disk or vertebral body leading to a hyperextended position of the spinal column. Commonly seen in ankylotic disorders. Anterior structures, especially the ALL are ruptured but there is a posterior hinge preventing further displacement.

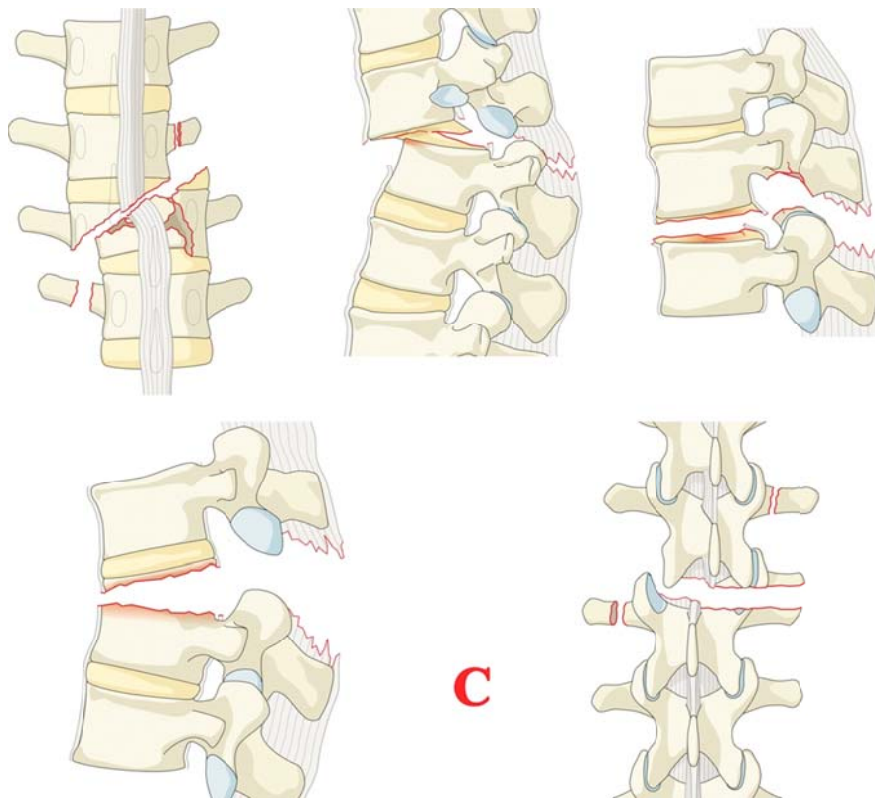


*Example:*



### TYPE C

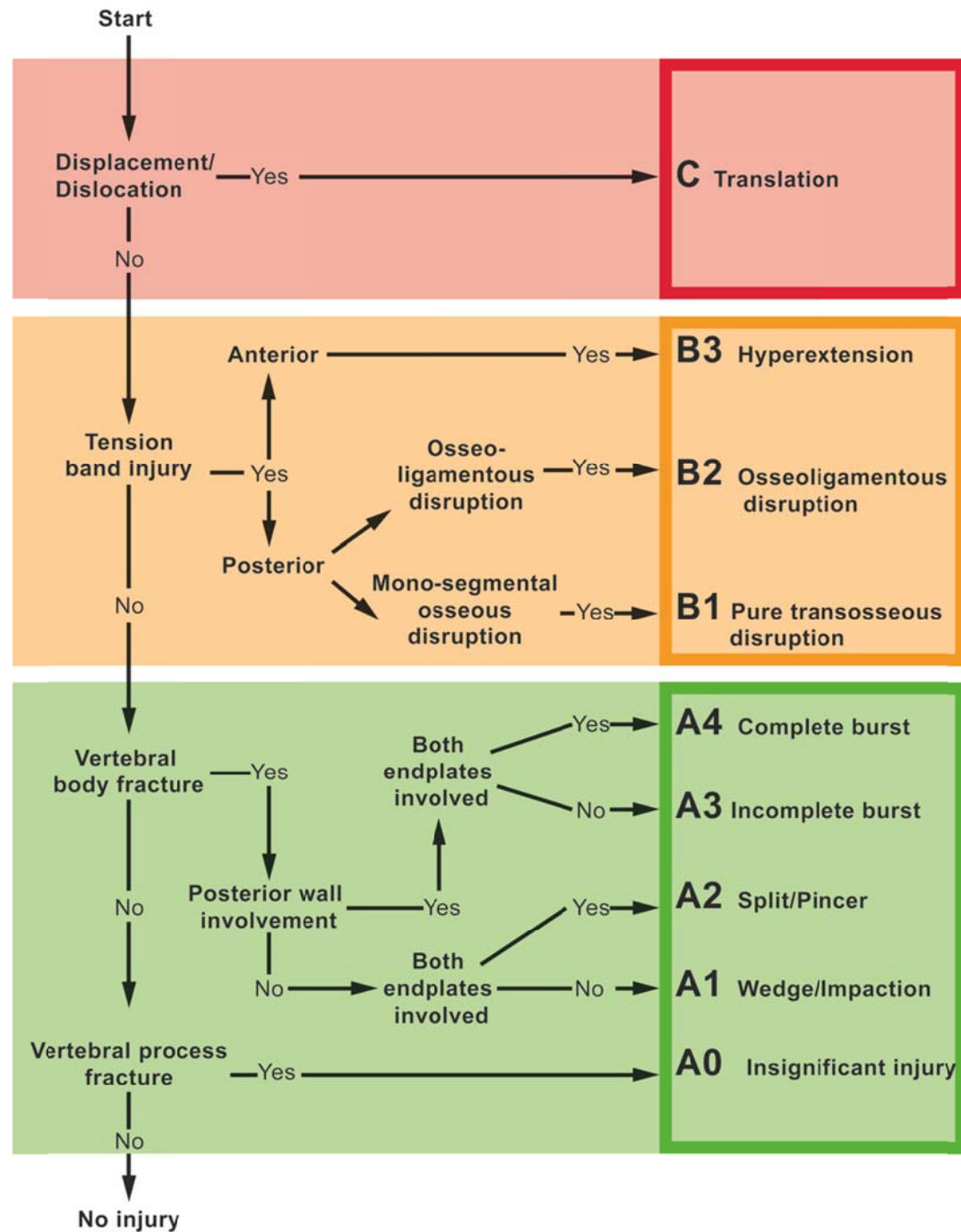
**Type C:** Describe *displacement* or *dislocation*. There are no subtypes as because of the dissociation between cranial and caudal segments various configurations are possible in different images. Is combined with subtypes of A if necessary.



*Example:*



## ALGORITHM FOR MORPHOLOGIC CLASSIFICATION



## 2. Neurologic injury

Neurologic status at the moment of admission should be scored according to the following scheme:

N0: *Neurologically intact*

N1: *Transient neurologic deficit, which is no longer present*

N2: *Radicular symptoms*

N3: *Incomplete spinal cord injury or any degree of cauda equina injury*

N4: *Complete spinal cord injury*

NX: *Neurologic status is unknown due to sedation or head injury*

## 3. Modifiers

There are two modifiers, which can be used in addition to ad 1 and 2:

M1: *This modifier is used to designate fractures with an indeterminate injury to the tension band based on spinal imaging with or without MRI. This modifier is important for designating those injuries with stable injuries from a bony standpoint for which ligamentous insufficiency may help determine whether operative stabilization is a consideration.*

M2: *is used to designate a patient-specific comorbidity, which might argue either for or against surgery for patients with relative surgical indications. Examples of an M2 modifier include ankylosing spondylitis or burns affecting the skin overlying the injured spine.*