AO Spine Classification Of Upper Cervical Spine Injuries: It`s Really that Simple!

Naga Ramesh Chinapuvvula MD,

Patel Rajan MD, Bawa Pritish MD,

Beckmann Nicholas MD, Suresh Cheekatla MD,

Khanpara Shekhar MD

UTHealth®
The University of Texas
Health Science Center at Houston

McGovern
Medical School

Authors have no disclosures

AO Spine Upper cervical Spine Classification System

Occipital condyle & craniocervical junction

- A- Isolated bony injury (condyle)

- B- Non-displaced ligamentous injury (craniocervical)

- C- Any injury with displacement on spinal imaging

C1 ring and C1-2 joint

- A- Isolated bony injury (arch)

- B- Non-displaced ligamentous injury (transverse atlantal ligament)

- C- Atlantoaxial instability/Translation in any plane

C2 and C2-3 joint

- A- Bony injury only. No ligamentous, tension band or discal injury

- B- Tension band/ Ligamentous injury +/- bony injury

- C- Any injury that leads to vertebral body translation in any directional plane
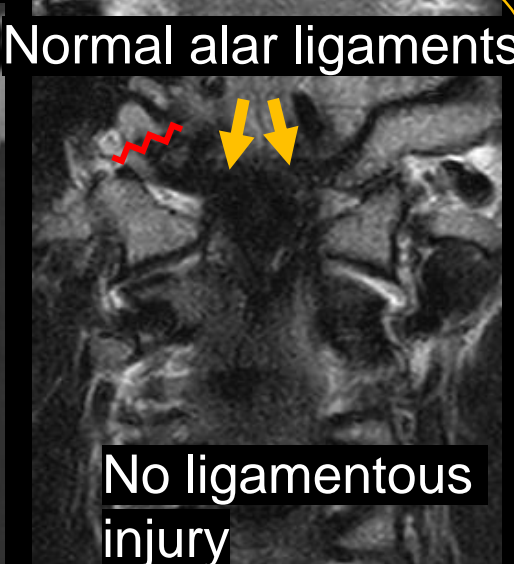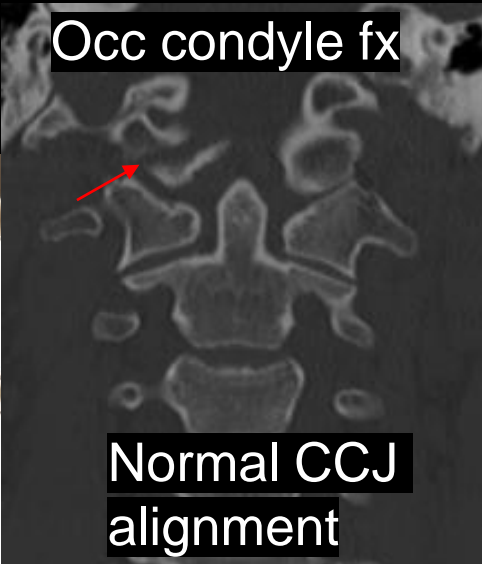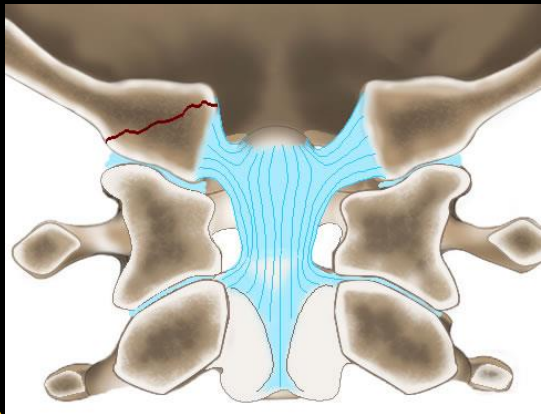
- Neurological status modifier

- Case-specific modifiers

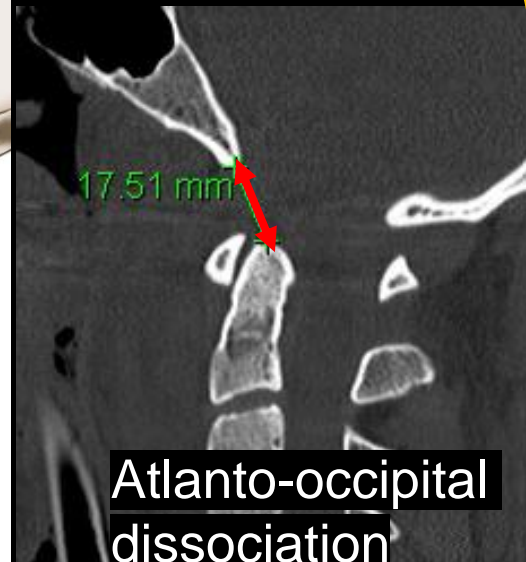Proposed by the AO foundation in 2018

References: 1. https://aospine.aofoundation.org/clinical-library-and-tools/aospine-classification-systems. 2. Anderson PA, Montesano PX. Morphology and treatment of occipital condyle fractures. Spine. 1988;13(7):731-736. 3. Anderson LD, D'Alonzo RT. Fractures of the odontoid process of the axis. J Bone Joint Surg Am. 1974;56(8):1663-1674.

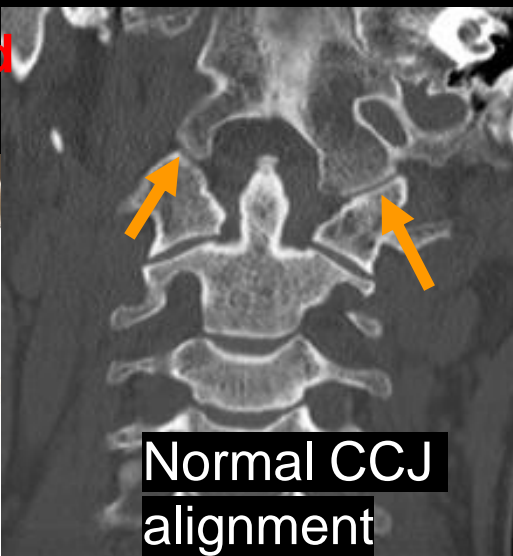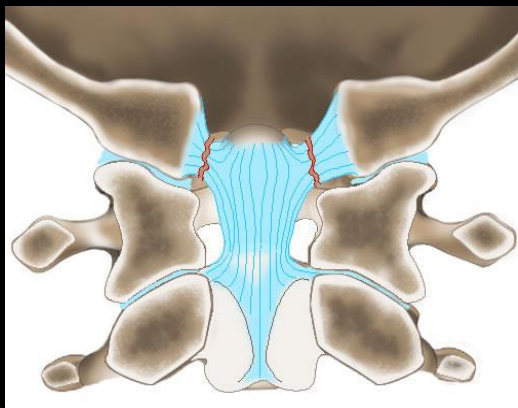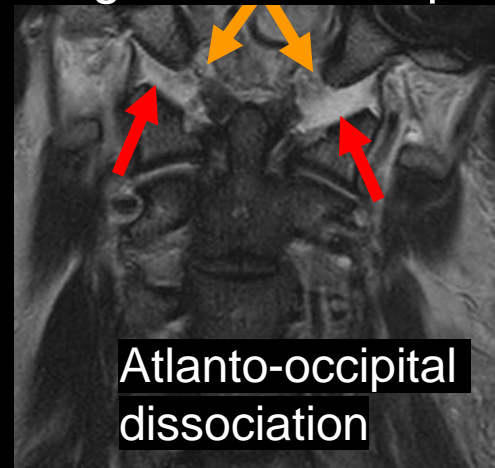# Occipital condyle and Craniocervical junction

OC- A: Isolated bony injury

Occ condyle fx

Normal CCJ alignment

Normal alar ligaments

No ligamentous injury

OC-B : Non-displaced ligamentous injury

Normal CCJ alignment
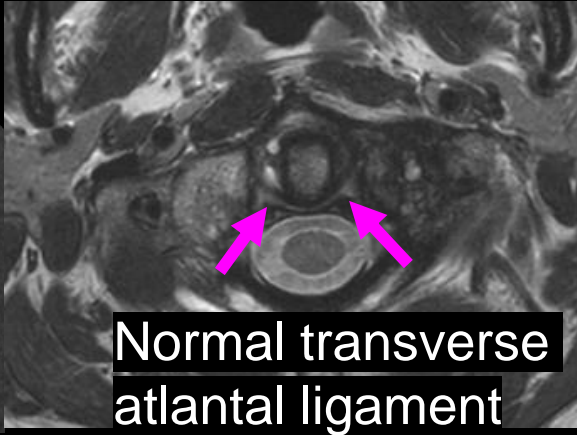
Rt Alar Ligament Sprain

OC- C: Any injury with displacement

17.51 mm

Atlanto-occipital dissociation

Alar ligaments disruption

Atlanto-occipital dissociation
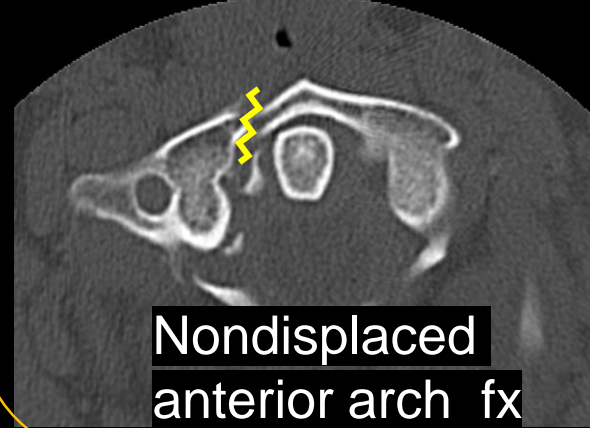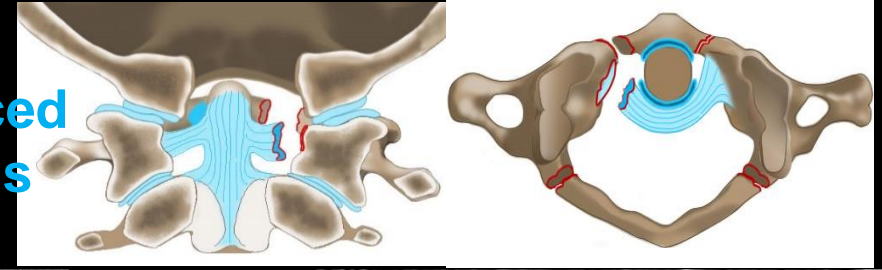
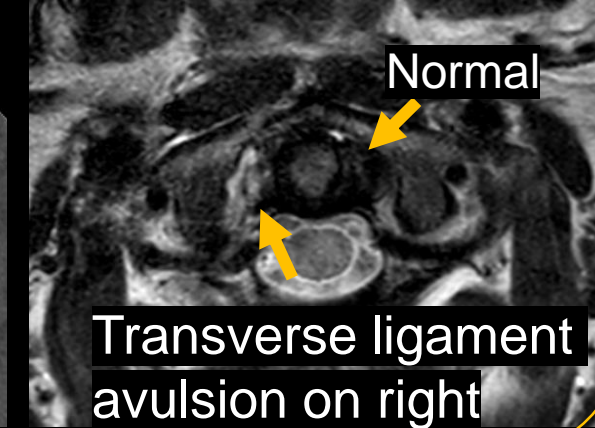# C1 ring and C1-2 joint

C1-A: Isolated Bony injury
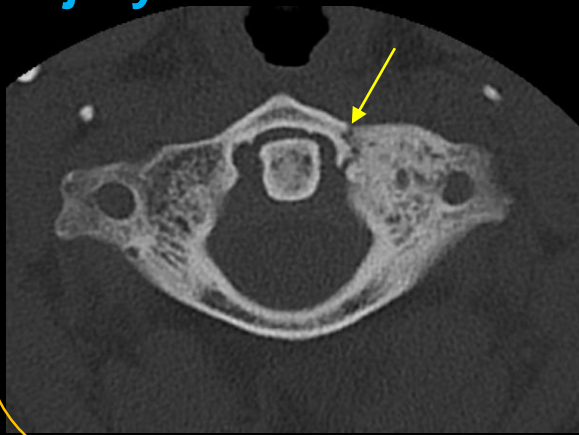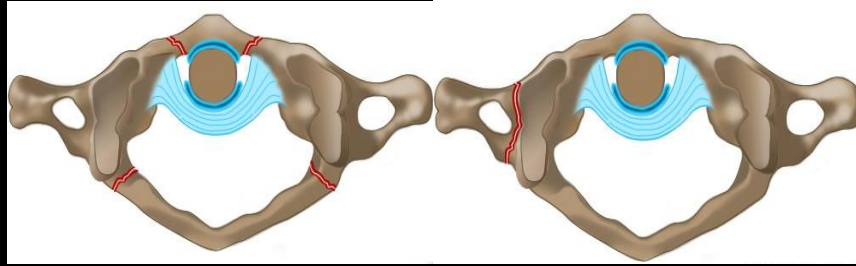
Normal transverse atlantal ligament

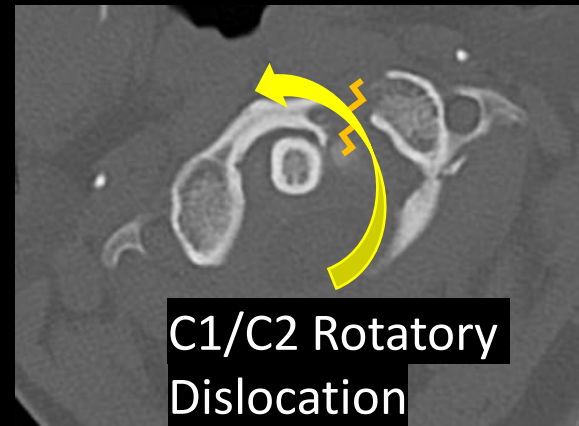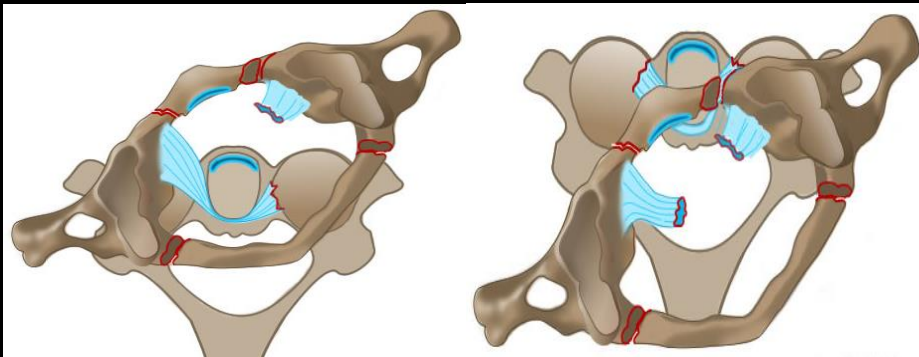**C1-B: Nondisplaced ligamentous injury**

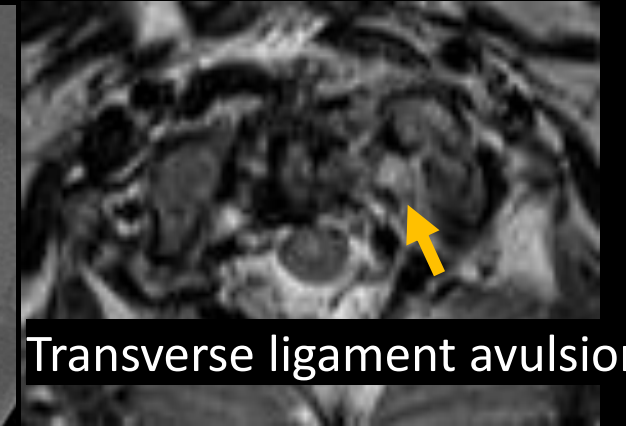Nondisplaced anterior arch fx

Normal

Transverse ligament avulsion on right

C1-C: Atlantoaxial instability/ Translation in any plane

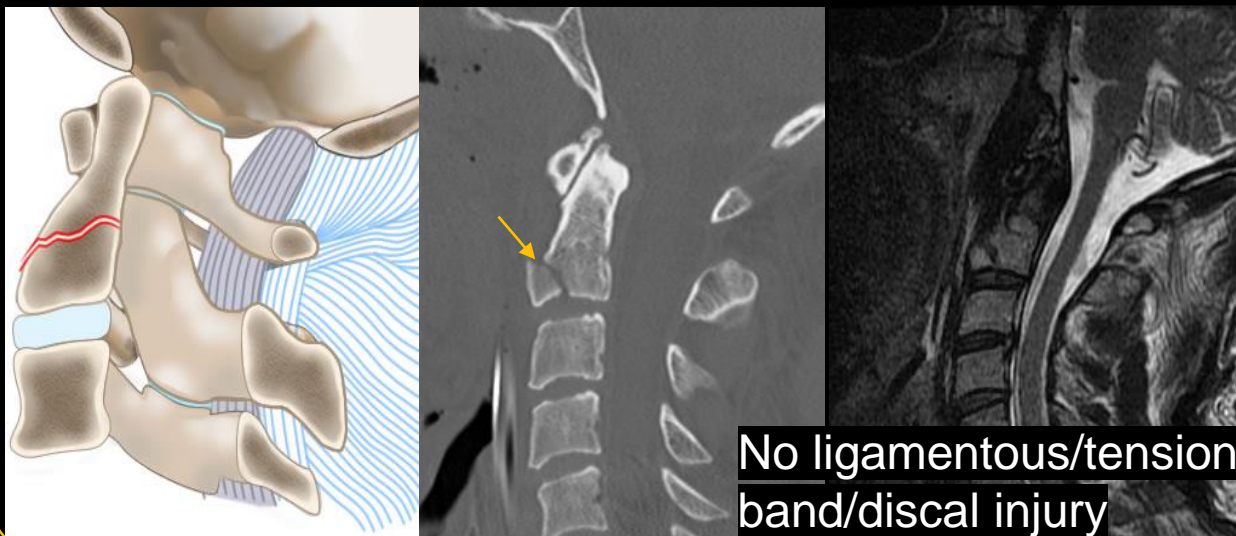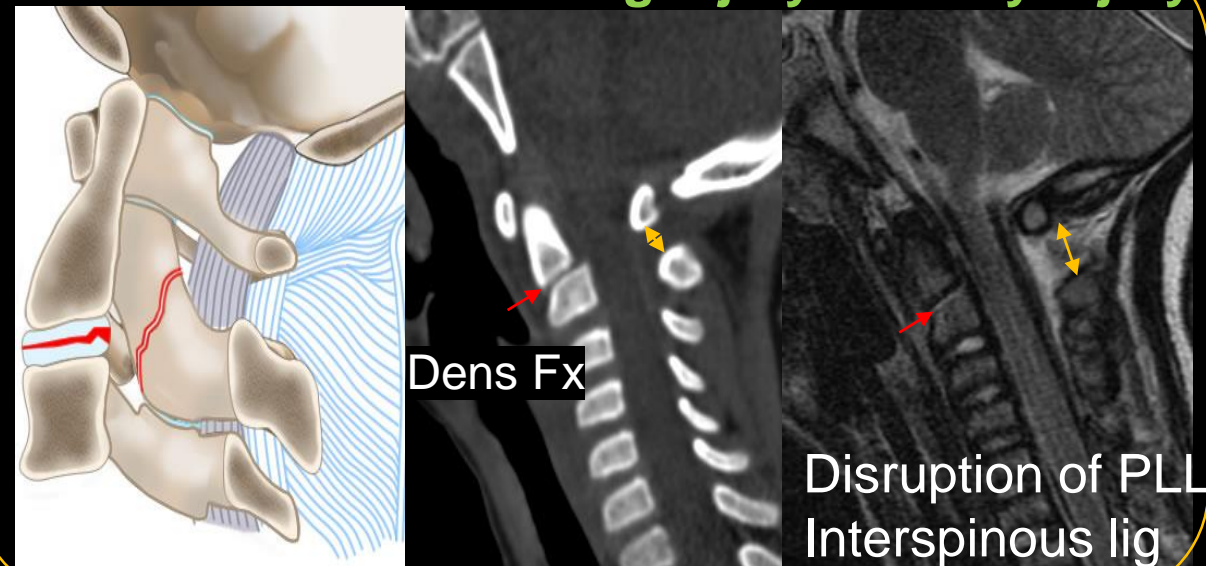C1/C2 Rotatory Dislocation
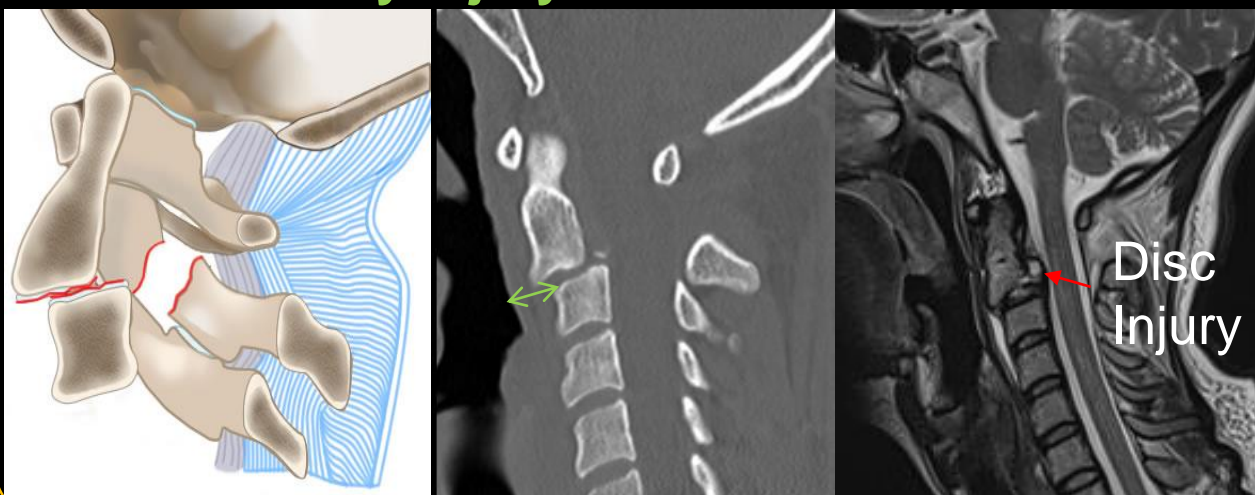
Transverse ligament avulsion

C2 and C2-3 joint

C2-A : Isolated Bony injury

No ligamentous/tension band/discal injury

C2-B : Tension band/lig injury +/- bony injury

Dens Fx

Disruption of PLL Interspinous lig

C2-C : Any injury with vertebral translation

Disc Injury

Classification Nomenclature

For eg: Bilateral atlanto-occipital dissociation + complete cord injury is represented as follows:

OC Type C,   N4

Primary Injury

Neurologic status & modifiers