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Fractures and Dislocations of the Cervical Spine

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3 rules of 3

- The predentate space should be < 3mm
- The prevertebral soft tissue at C3 is usually 3 mm
- Anterior wedging of 3mm or more suggests a fx

Atlanto-axial Dislocation

- Hyperextension injury
- Children>adults
- Head slips forward on C1
- Usually fatal

Neural Arch Fracture of C1

- Most common fracture of C1
- Hyperextension injury
- Not associated with neurologic deficit
- Confused with congenital anomaly

Jefferson Fracture of C1

- Burst fracture
- Caused by compressive force
- Bilateral breaks in anterior and posterior arches
- Open mouth view shows bilateral offset of C1 on C2
- Not associated with neurologic deficit

Hangman's Fracture of C2

- Most common fracture of C2
  - Most common cervical spine fracture
- Hyperextension/compression fracture
- Fractures through the pedicles of C2 with anterior slip of C2 on C3
- Not associated with neurologic deficit
- Teardrop fracture of inferior aspect of C2 or C3 is clue to dx of Hangman's fx

Dens Fractures

- Hyperextension injuries
- Most associated with forward subluxation of C1 on C2
- High incidence of non-union (60%)
- Stable

Dens Fractures
Types

- Tip of dens — Rare (5%)
- Base of dens — Common (65%)
- Sub-dentate — Uncommon (30%)

Dens Fractures
Pitfalls in Diagnosis

- Mach line
- Congenital non-union
- Non-union of previous fracture

Flexion-Teardrop Fracture

- Combination of flexion and compression, e.g. MVA
- Teardrop fragment comes from anteroinferior aspect of body
- Remainder of body displaced backward into spinal canal

Flexion-Teardrop Fracture

- Facet joint and interspinous distances usually widened
- Disk space may be narrowed
- 70% have associated neurologic deficit

Simple Compression Fracture

- Flexion injury
- Anterior wedging of 3mm or more suggests fracture
- Usually involves superior endplate of vertebral body

Clay-Shoveler's Fracture

- Avulsion fracture of spinous process of C6 or C7
- Occurs as result of rotation of trunk relative to neck
- No neurologic deficit

Ligamentous Injuries

- Mechanism is flexion/distraction
- Disk space narrower anteriorly than posteriorly
- Widening of the interspinpous distance
- Widening of the facet joint
  - Usually the posterior aspect

Ligamentous Injuries

- Subluxation of vertebral body
- Perched facet
- Locked facets
  - At least 50% subluxation
- 85% neurologic deficits with locked facets

Unilateral Locked Facets

- Mechanism is flexion/distraction and rotation
- Only 30% associated with neurologic defect
- On lateral, some bodies appear lateral, some oblique
- Spinous processes do not line up on frontal film

Unstable Fractures

- Jefferson fracture
- Hangman’s fracture
- Flexion teardrop fracture
- Extension teardrop fracture
- Bilateral locked facets