

Traumatic Cervical Spine Conditions in Children

Jonathan H Phillips MD

Orlando

ICEOS 2016

Trauma

- Spinal fractures rare in children (about 1 % of adult incidence)
- C spine fractures commoner area in children than T / L spine
- C1 / 2 fractures / dislocations commoner than subaxial
- After age 8 - 10 more caudal fractures happen

TRAUMA

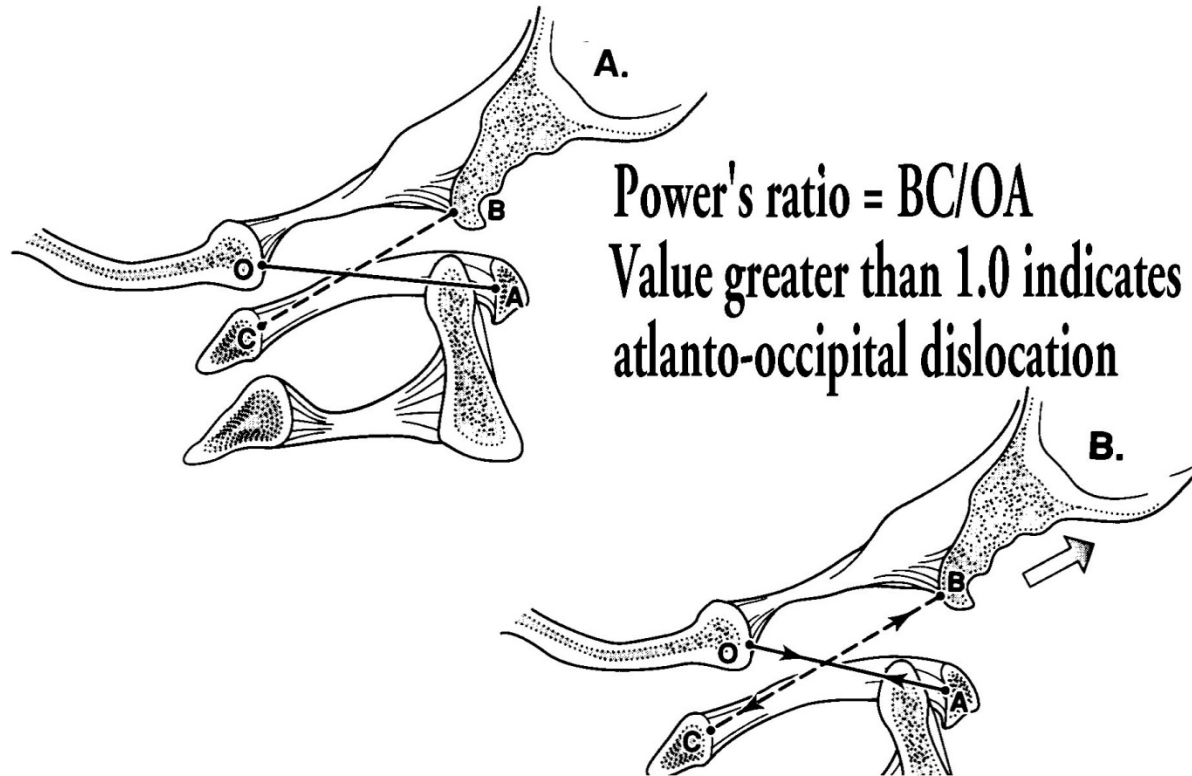
- Occiput C1
- C1
- C2
- The rest



AOD

- AKA Occipito Cervical Dissociation
- Was thought to be non survivable
- Warner's work from Memphis taught us otherwise
- Thought to be present in 60% of fatal childhood MVAs

Atlanto - occipital dislocation



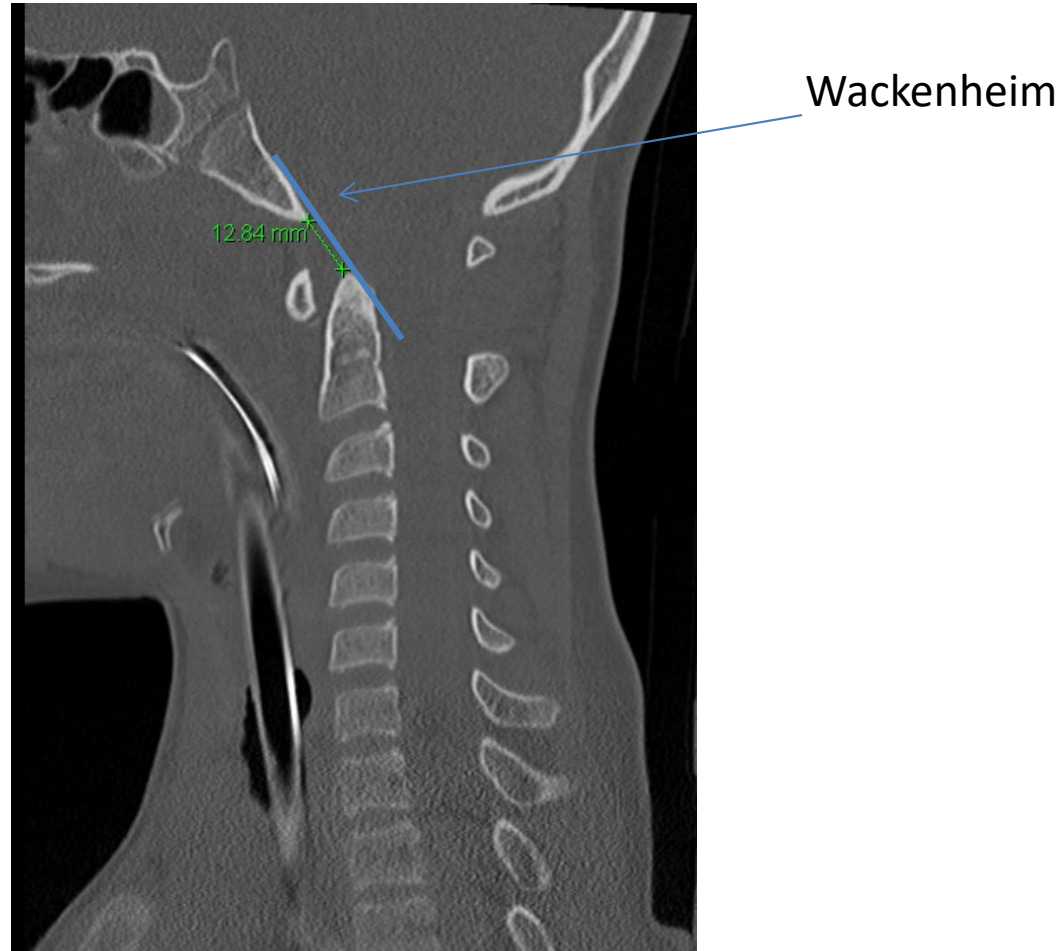
Power's Ratio

- Difficult to measure in practice
- Most kids in trauma room will have a CT
- Much easier to see skull base to c spine relationship on CT

12 year old male, hit by car

- Tetraplegic, resuscitated CT and MRI

Huge separation of clivus from dens



MRI



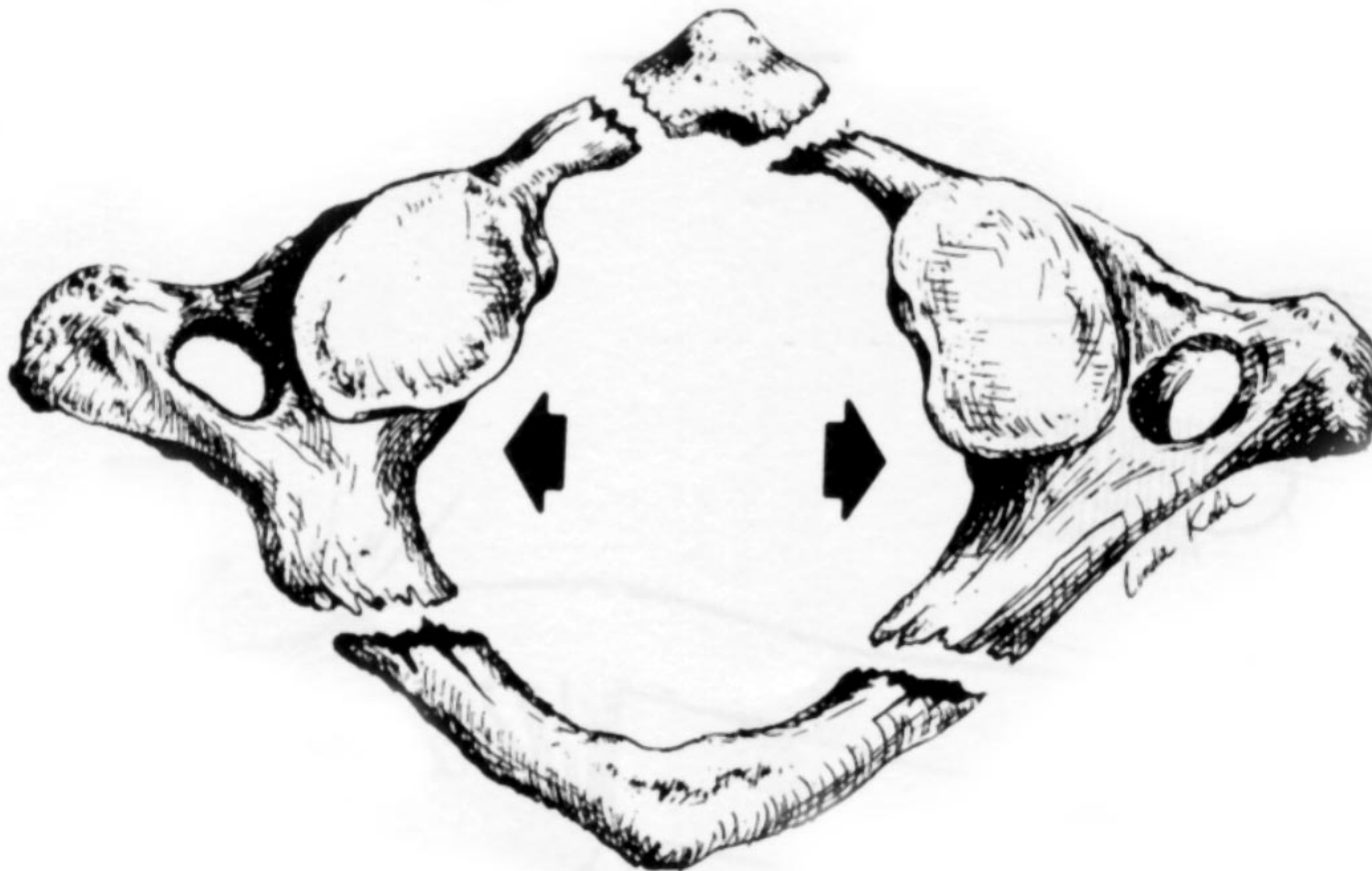
Occiput C2 fusion, no recovery



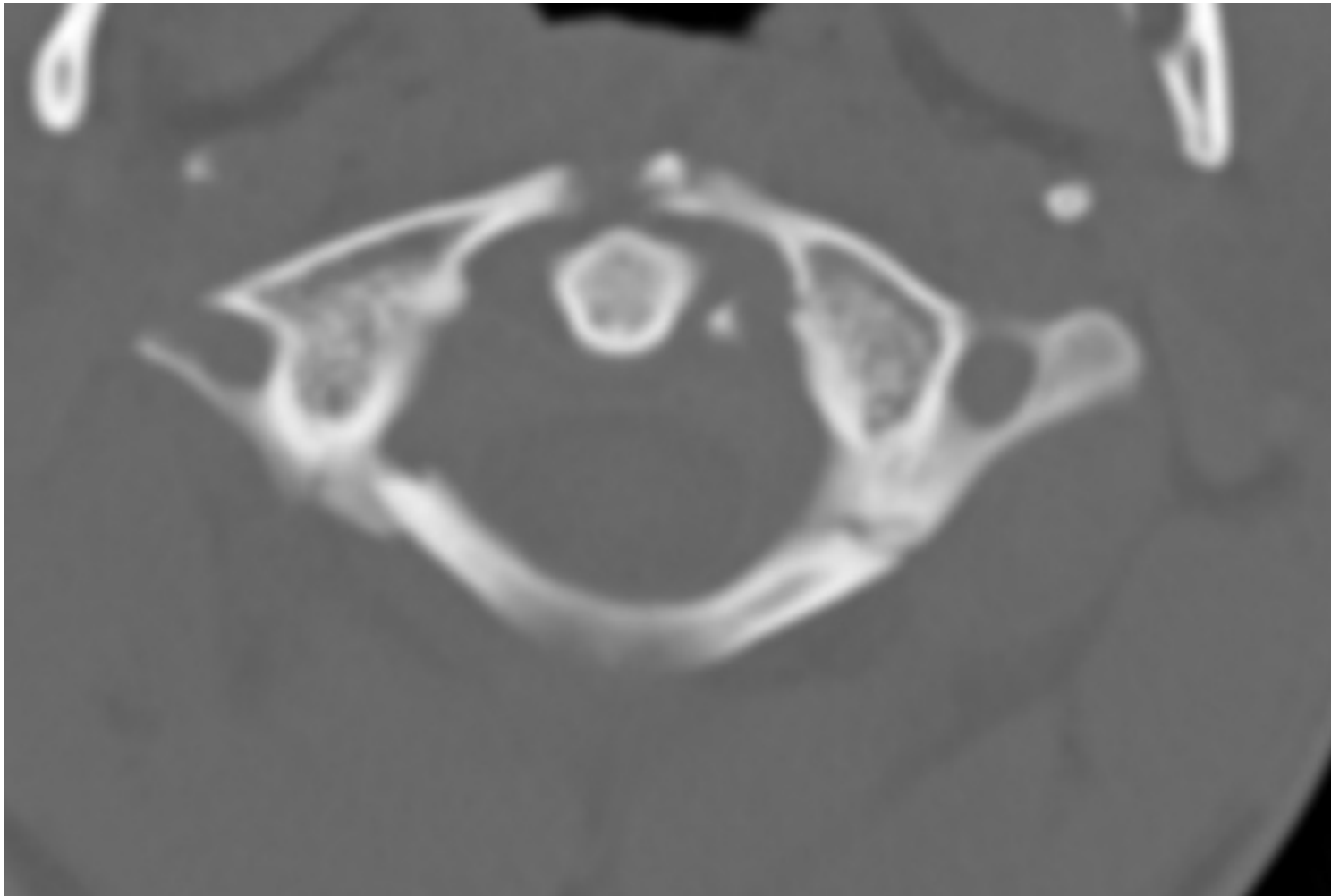
C1 fractures

- Jefferson
- Burst fracture of Ring
- Rx Minerva / Halo vest
- Surgery rarely needed

Jefferson Fracture



14 year male, Football tackle



14 yr male



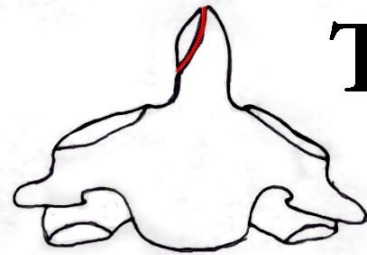


C2 Fractures

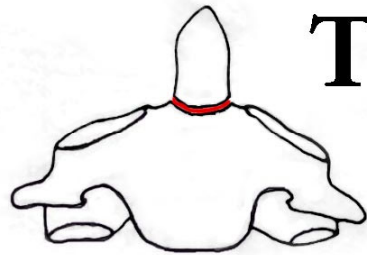
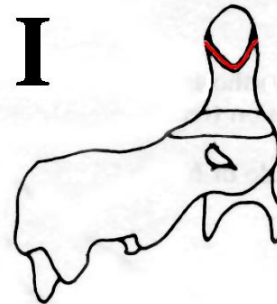
Dens

- Type I
- Type II
- Type III

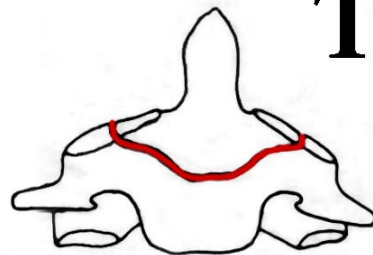
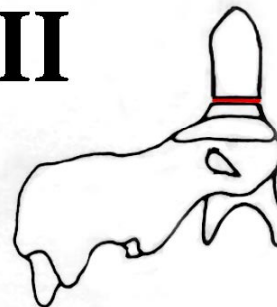
Dens Fractures



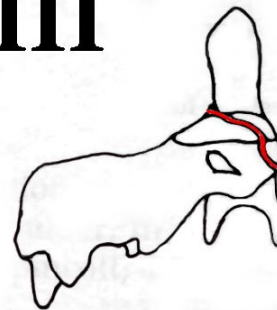
Type I



Type II



Type III



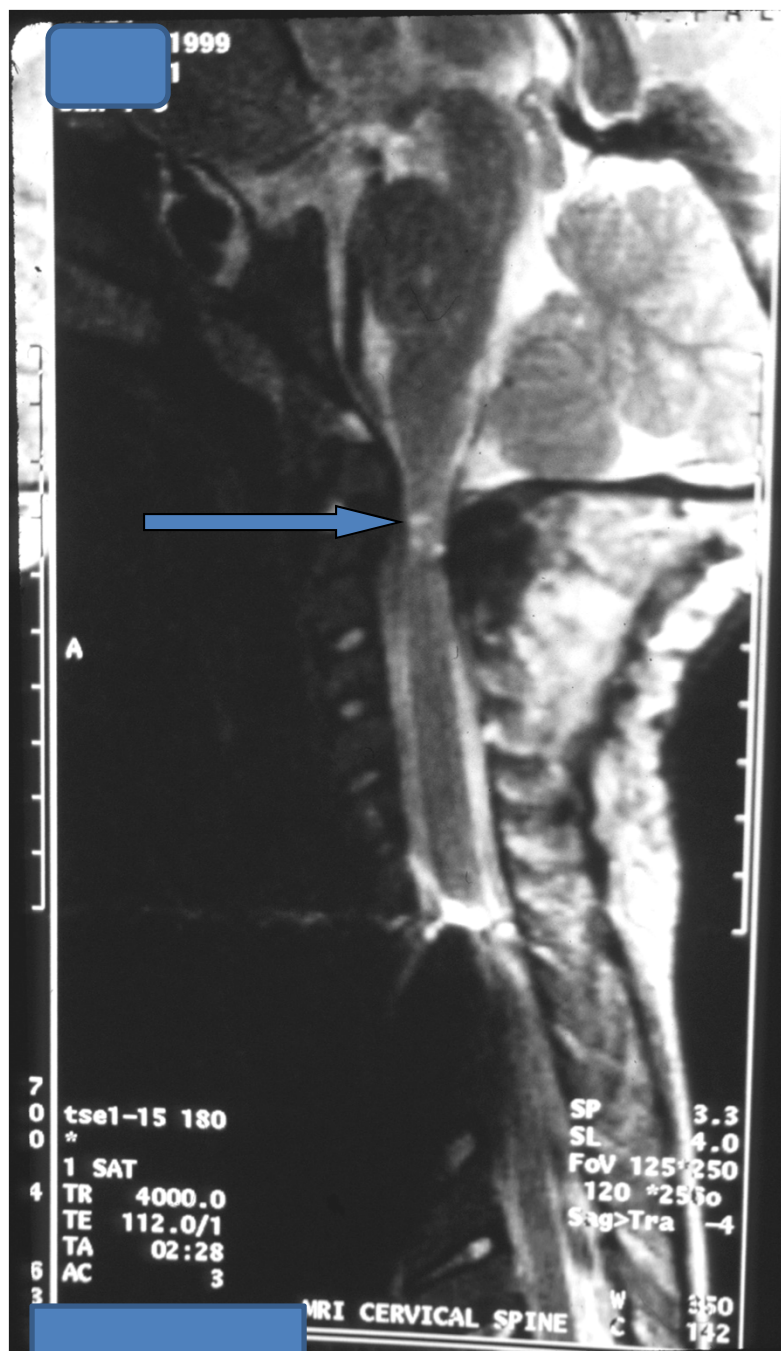
Dens Fractures

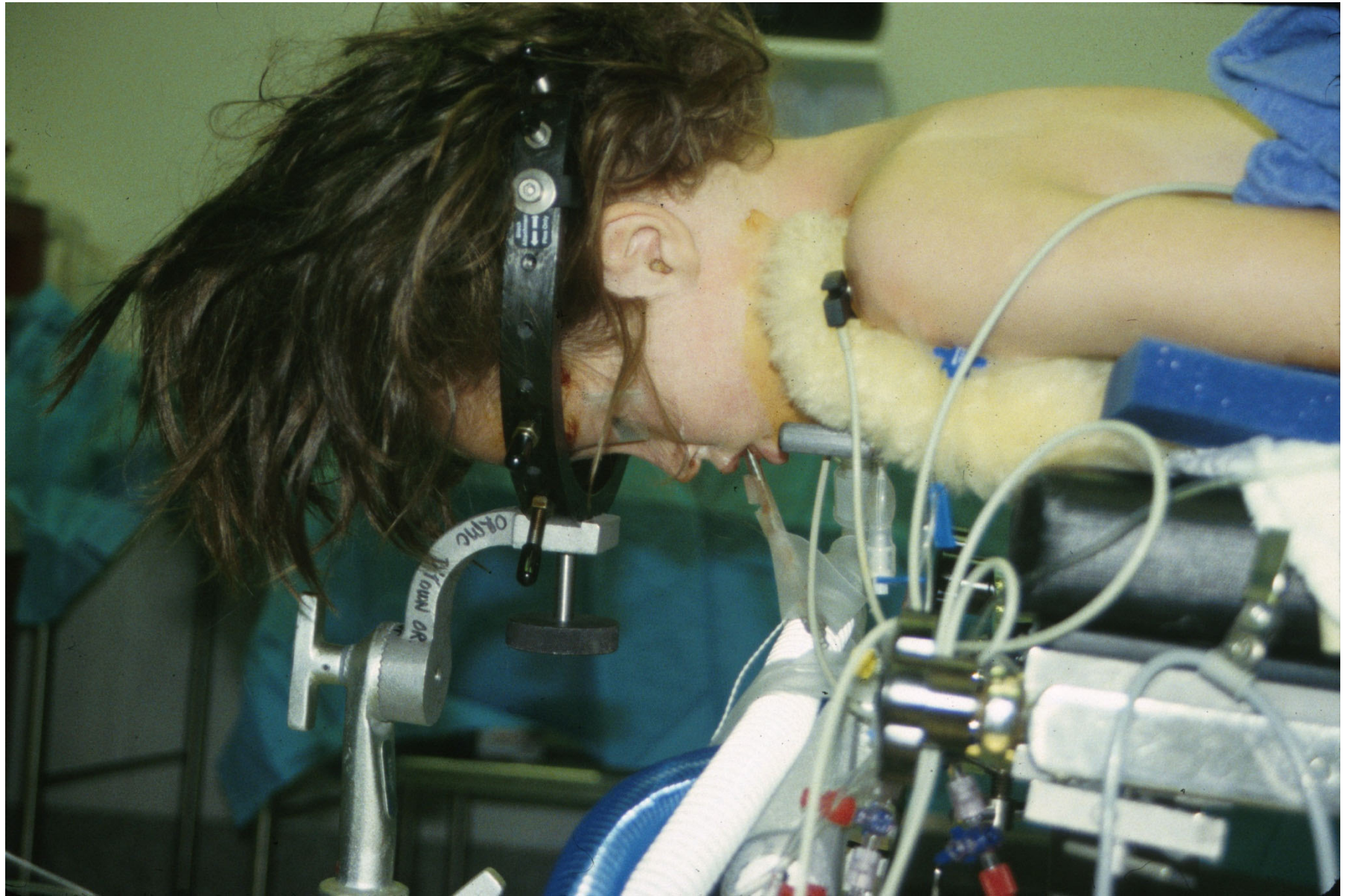
- Rx: Gentle traction
- Immobilisation with Halo vest
- Occasionally C1 / 2 fusion

Dens Fracture

- Seven year female
- Trampoline injury
- Quadriplegic (C3) at scene
- Resuscitated
- Failure of traction





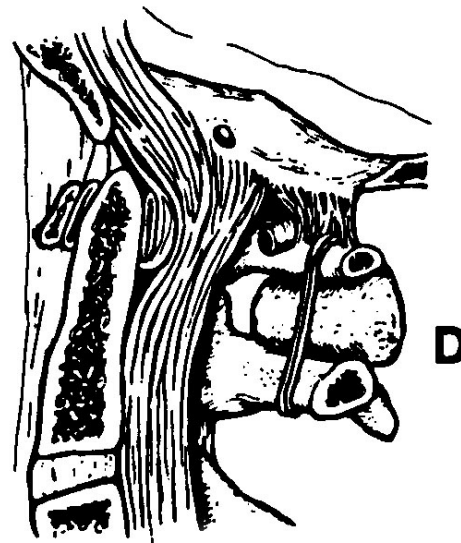
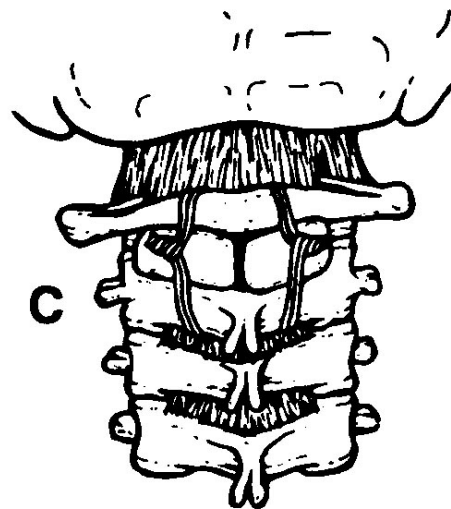
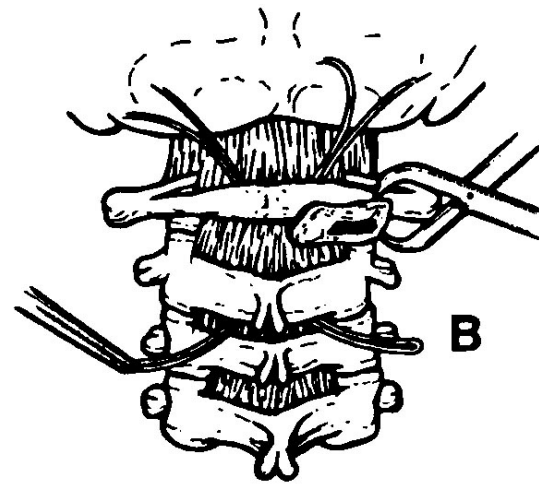
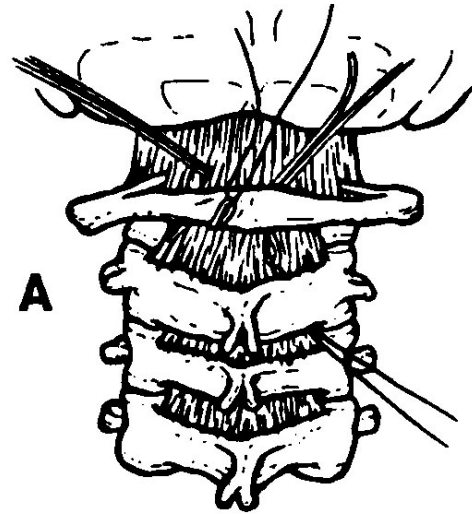




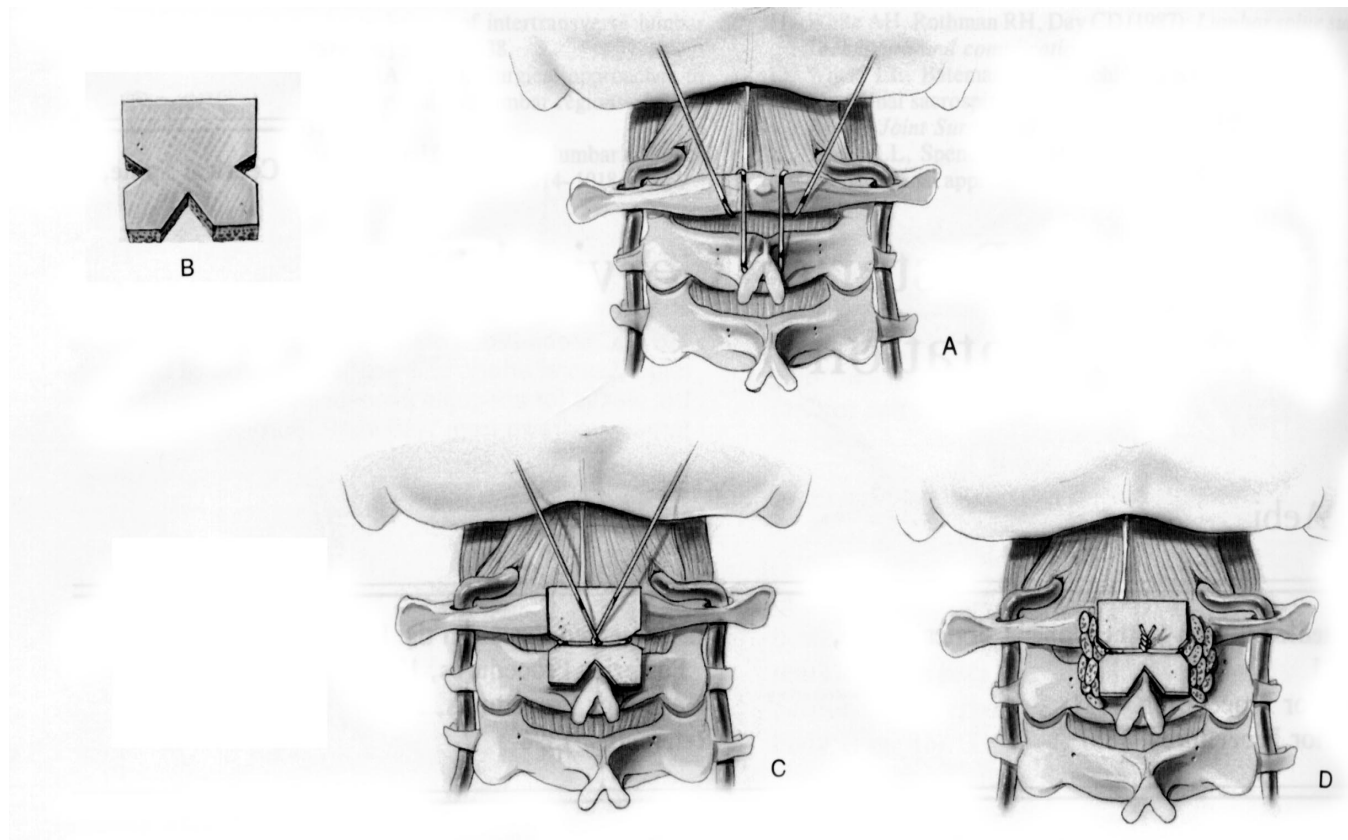
Dens fracture

- 1 year later, walked into ICU to say hello to her nurses
- Slight weakness one hand

Brooks Fusion of C1 / C2



Gallie Fusion of C1 - C2

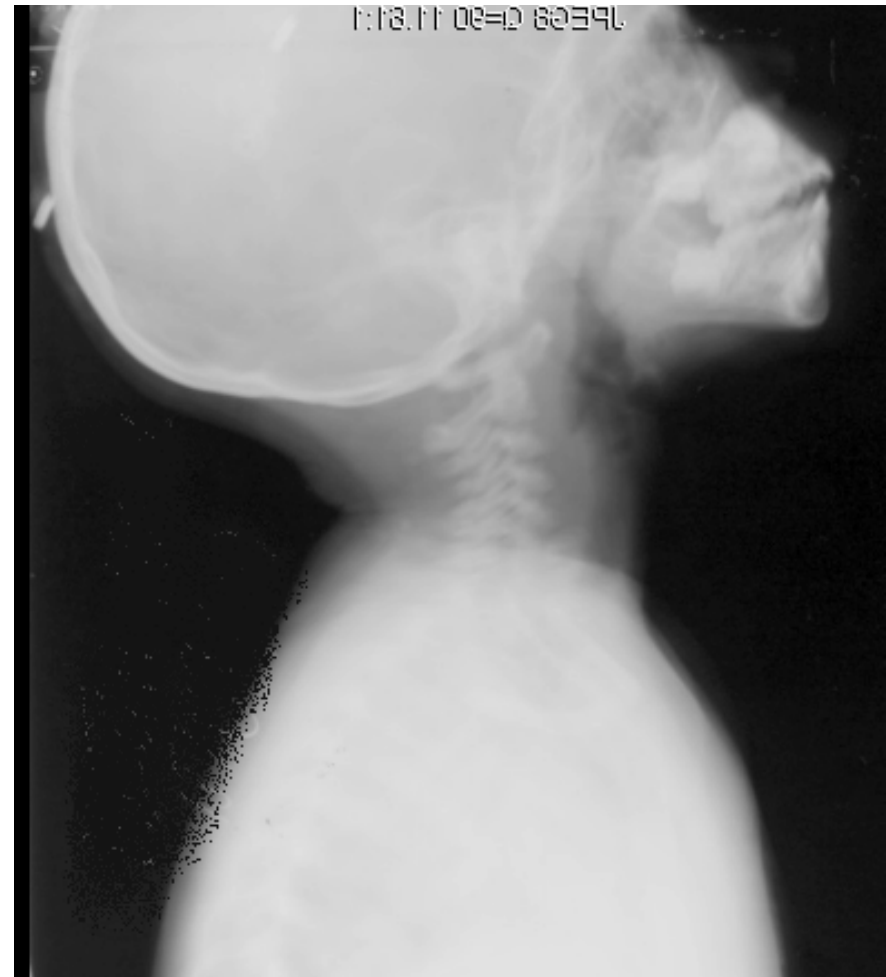


3 + 9 year old

Pulled from the Rubble in Haiti after
the Earthquake

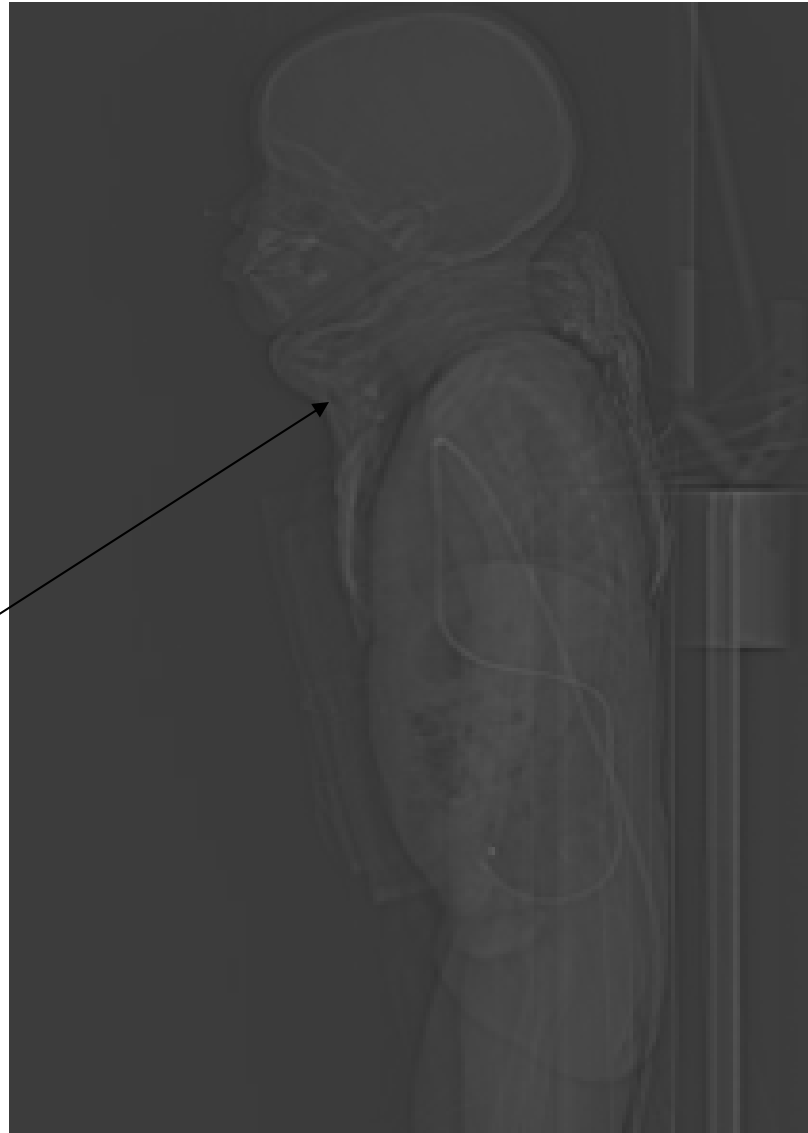
C/O neck pain

University of Miami Tent Hospital: 2/15 /2010



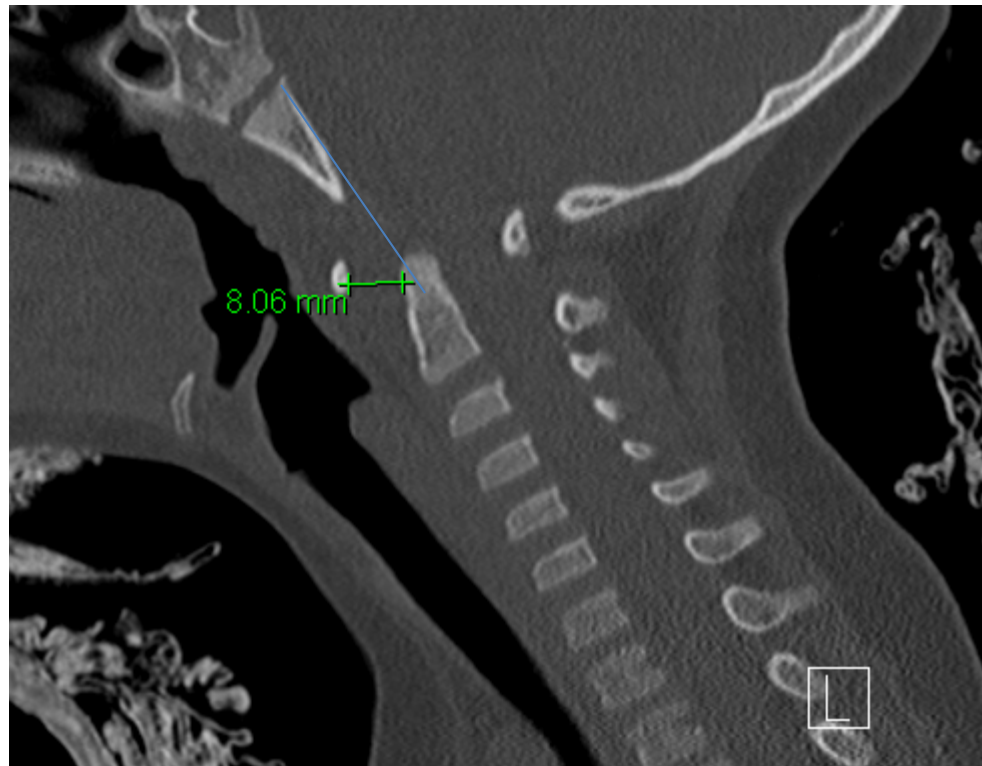
Plaster collar
placed
Totally intact
neuro.

- CT Scout:



CT:

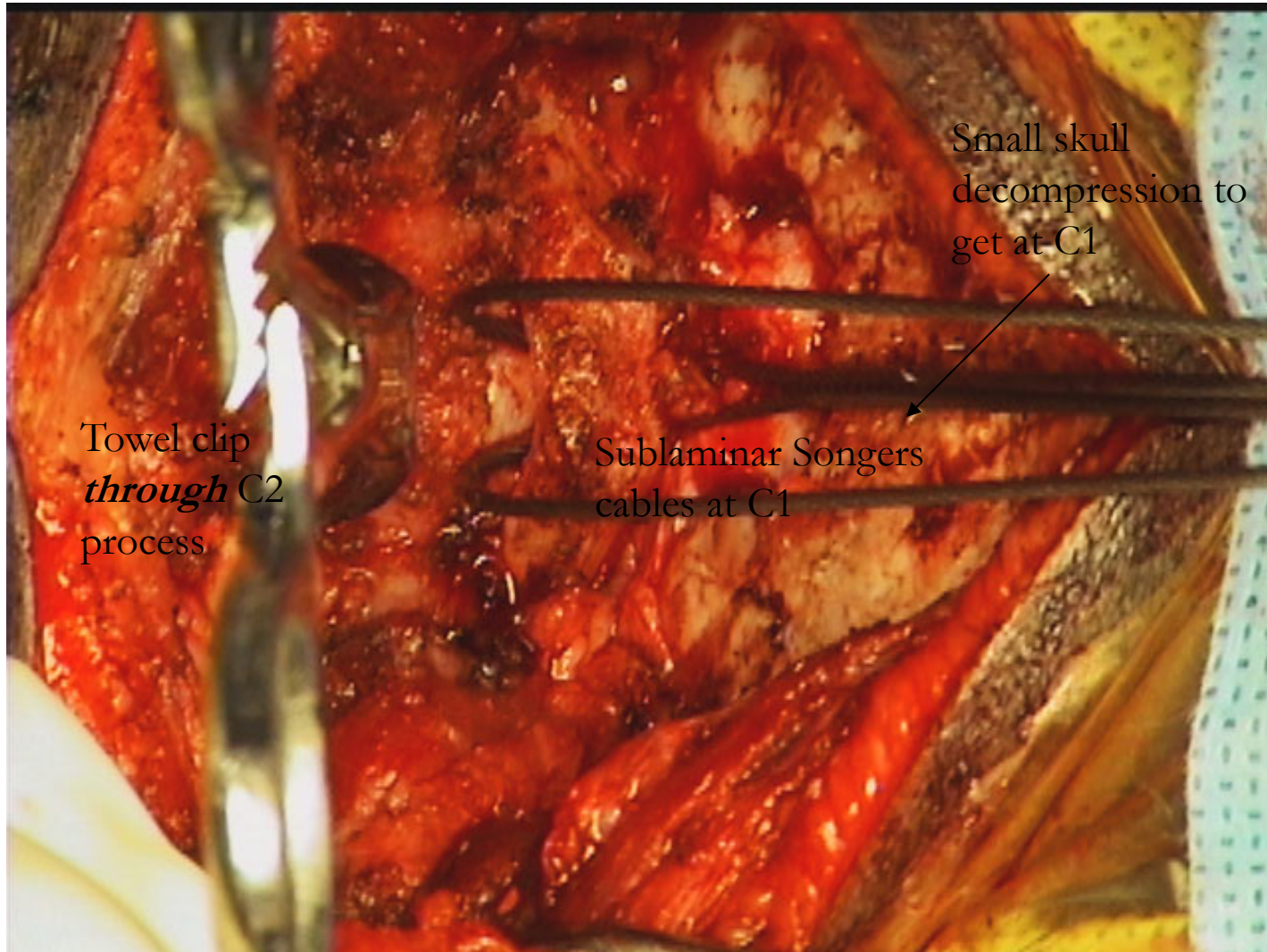
- 8mm ADI in neutral
- Running round and bouncing off the walls



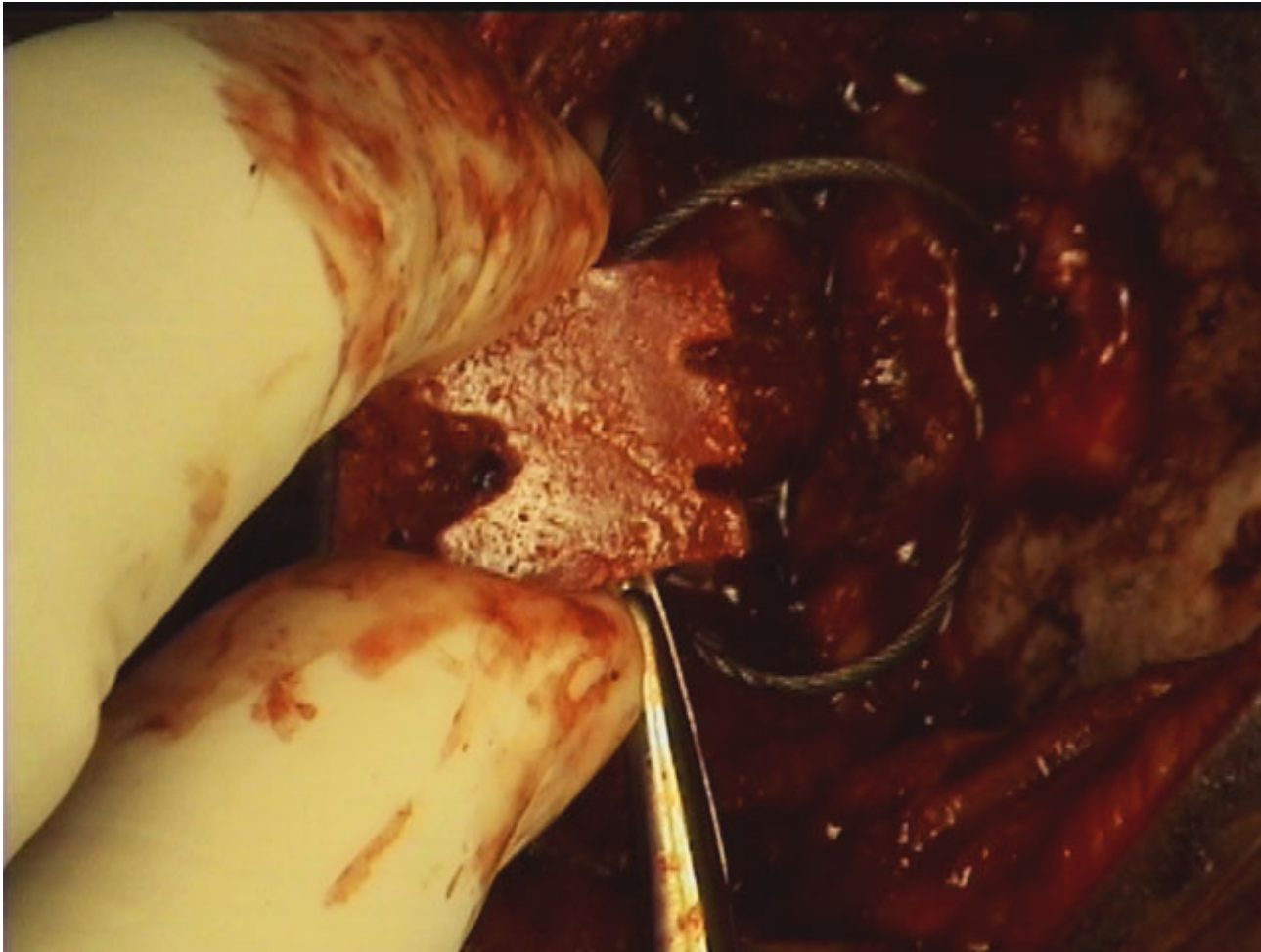
Options

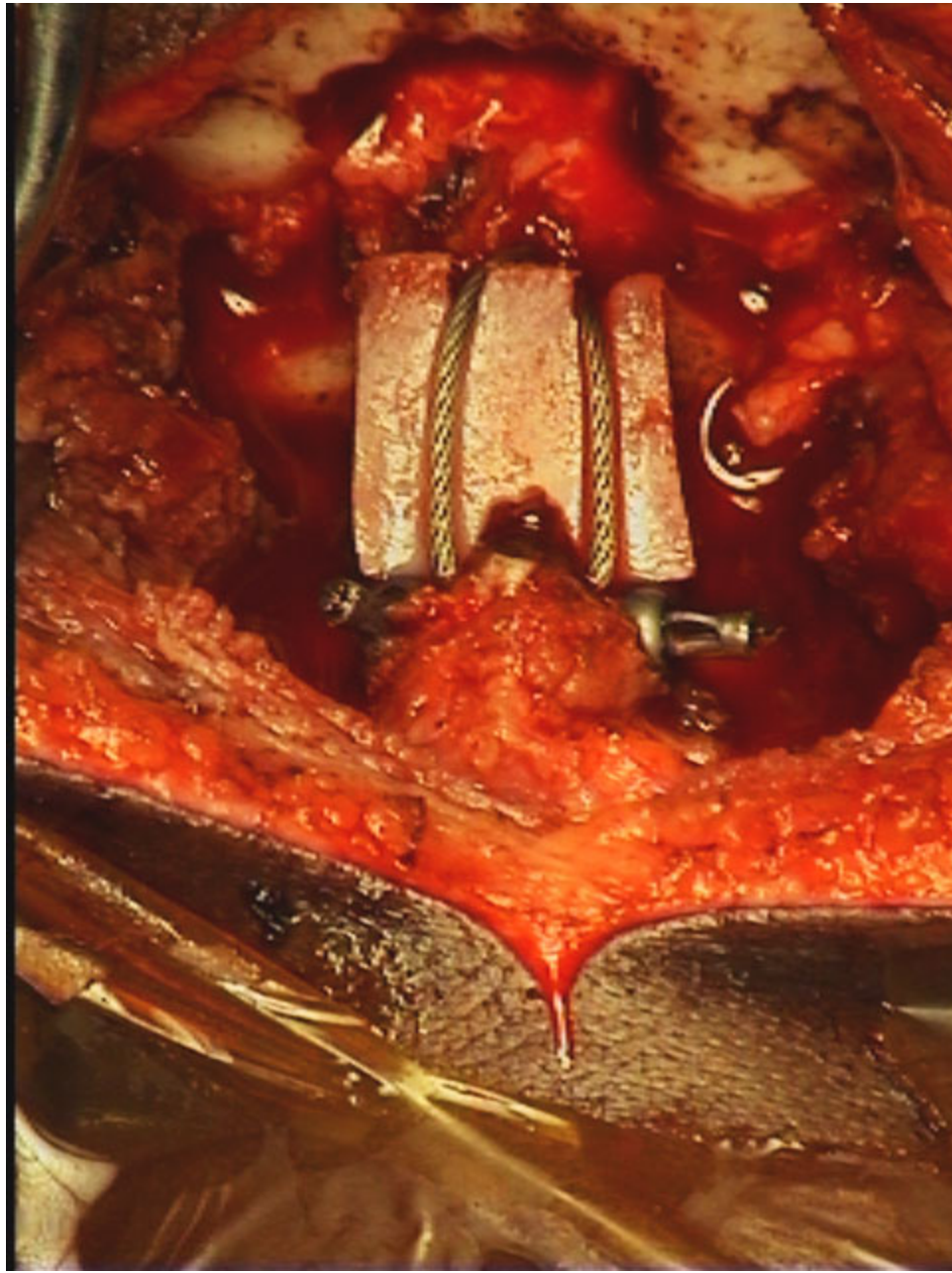
- Brooks
- Gallie
- C1/2 transarticulars plus Gallie

Gallie fusion, halo



Important to shape the graft just right

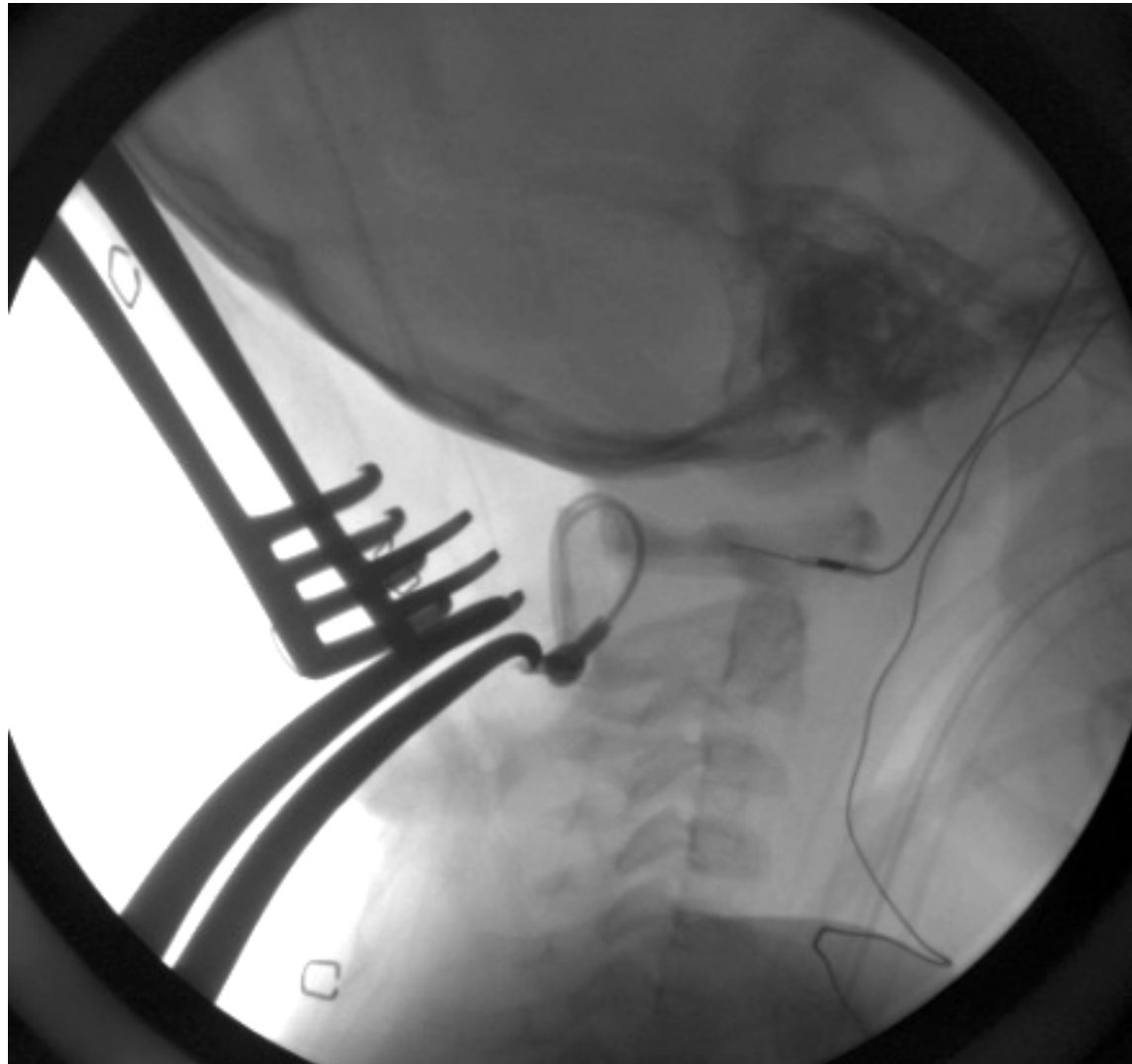




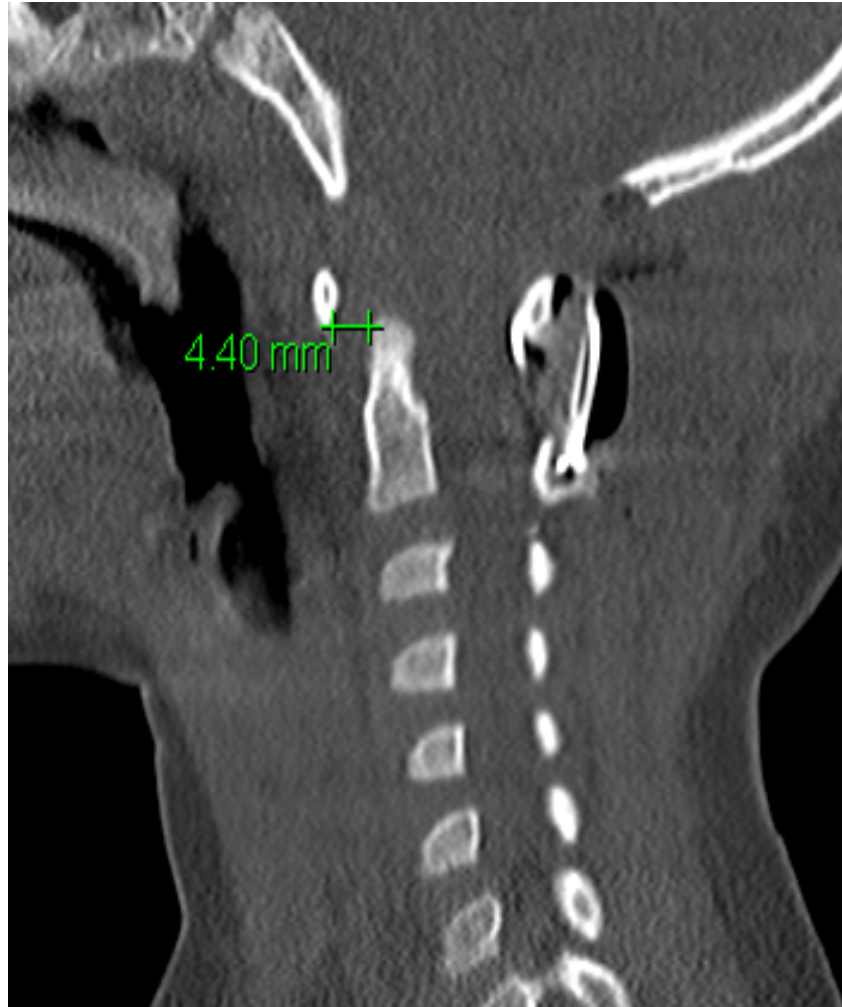
Eight pin halo at 2 pounds torque



Intraop



Postop



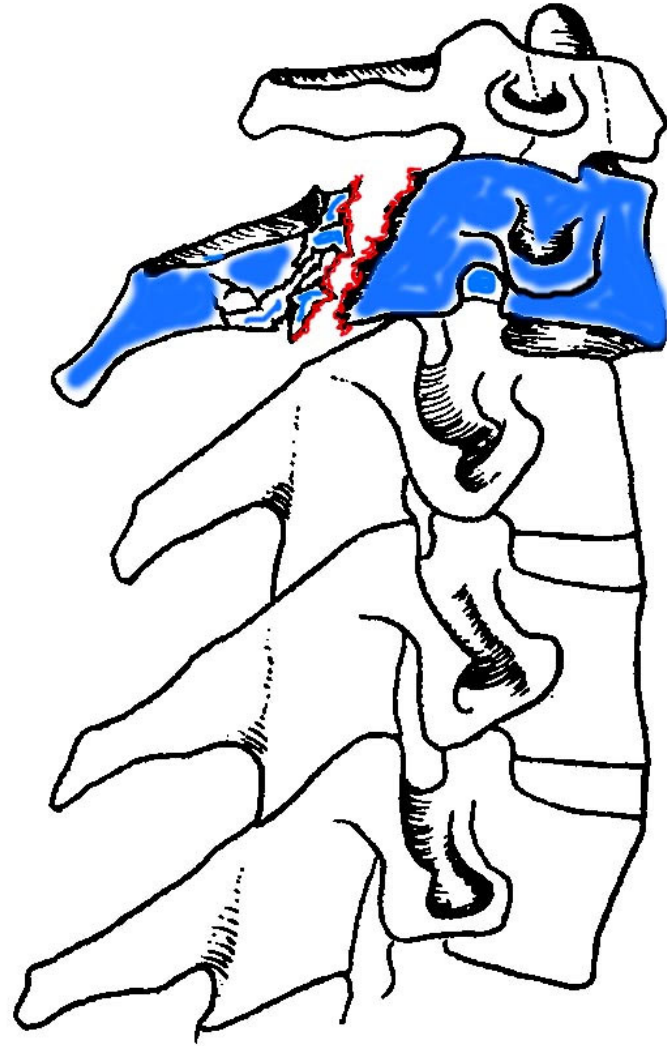
2 months postop



Hangman's fracture

- Traumatic spondylolysis C2
- High impact trauma
- Rx: traction
- Immobilisation Halo vest / minerva

Hangman's Fracture



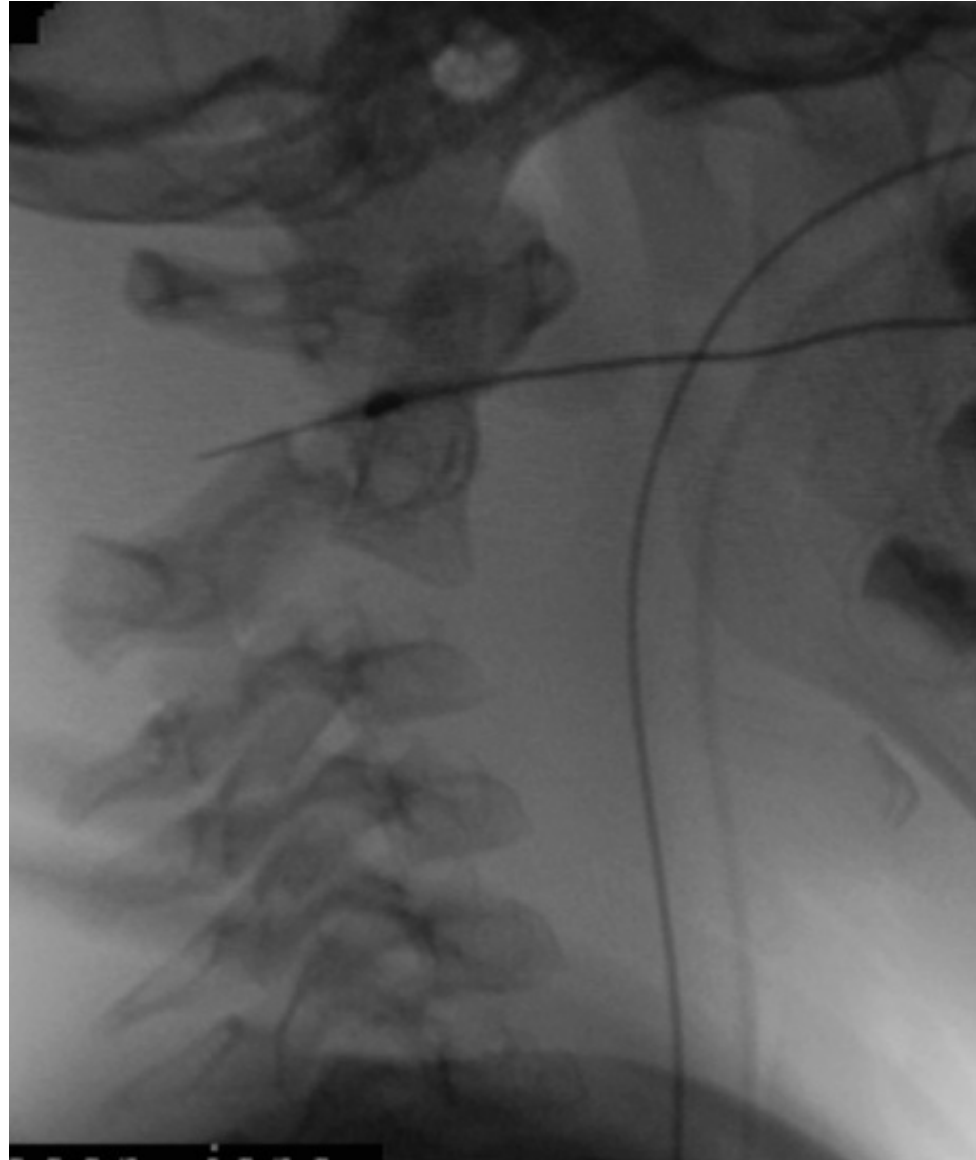
Hangman's



Hangman's



Hangman's Fracture



Hangman's



C3 - 7 fractures

- Ligamentous / SCIWORA
- Compression
- Distraction / shear
- Fracture dislocation
- Jumped facet

12 yr old, water slide neck flexion



MRI at time of injury



4 weeks in collar



1 yr postop psf at 4/5

