42 year old male presents after head trauma

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Follow up after cervical collar placement
Follow up after cervical collar placement
Follow up extension cervical spine radiograph
Follow up flexion cervical spine radiograph

A: 11.6mm (Unknown)
Atlantoaxial instability

Imaging findings:
- In adults, widening of the atlantoaxial interval >2 mm.
- In children, >~5mm widening considered abnormal.
- Atlantoaxial interval defined as distance from posterior cortex of the anterior arch of the atlas to the anterior cortex of the dens.
- If suspected or borderline, perform neutral lateral, flexion lateral, and extension lateral radiographs of the cervical spine – if present, will reveal dynamic change in the atlantoaxial interval, indicating instability.
- Thin-section CT is most sensitive and specific for associated fractures.
- MR is most sensitive and specific for the characterization of associated ligamentous injuries.
- Can also have rotary subluxation/instability, though rare.
Atlantoaxial instability

Etiology:
• Related to ligamentous disruption or laxity.
• Primary ligamentous stability provided by the cruciate ligament and tectorial membrane.
• Related ligamentous stability of the atlanto-occipital joint provided by the alar ligaments.
  – Acquired:
    • Trauma, Grisel syndrome, surgery, arthritides (rheumatoid, psoriatic, reactive, ankylosing spondylitis, SLE)
  – Congenital:
    • Os odontoideum, Down syndrome, Morquio syndrome, Spongyloepithelial dysplasia, Osteogenesis imperfecta, Marfan disease, NF1.
Atlantoaxial instability
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Radiographics
Atlantoaxial instability

Significance:
• Instability and posterior subluxation of the dens relative to the atlas results in narrowing of the spinal canal with possible injury to the thecal sac and contents.

Treatment:
• Varies depending on severity and etiology. Importantly, in traumatic cases, mechanical stabilization with C1-C2 fusion typically performed to avoid cervical cord injury.
References


2. Statdx.com