Radiological evaluation of the cervical spine in practice

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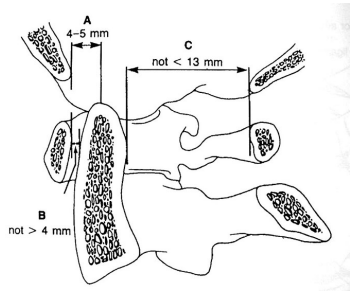
Sion

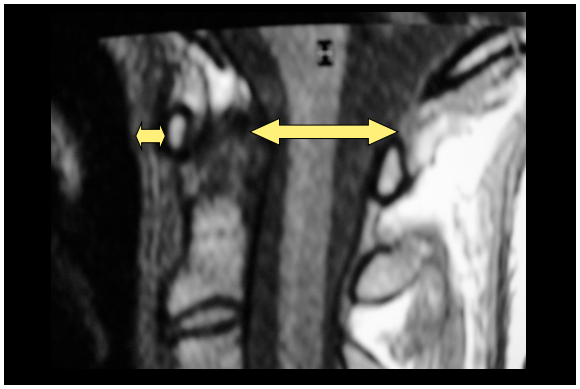
16th FIMM International Scientific Conference 2016 Varna

Radiographic examination

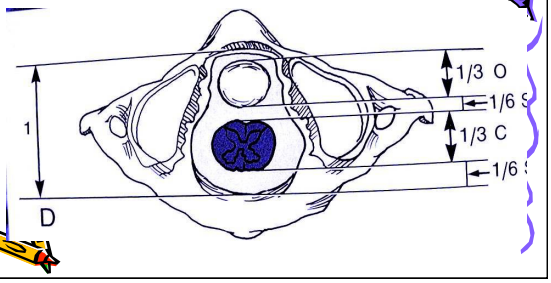
- A-P view with10 degrees cephalad angulation.
- Transbuccal view (5 degrees cephalad)
- Profil view (if possible FFD 2.0 m).

Upper cervical measurements





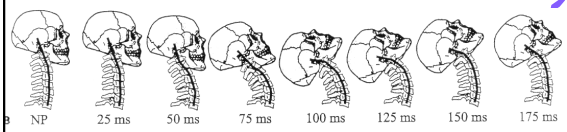
Spinal Canal: 1/3 + 1/3 + 1/3



Classification based on mechanism

- Hyperflexion injuries
- Hyperextension injuries
- Hyperrotation injuries
- Lateral hyperflexion injuries
- Axial compression injuries

The cervical spine in Whiplash



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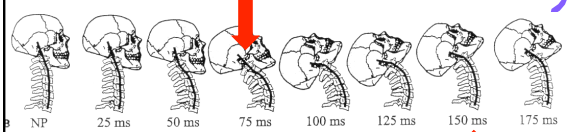
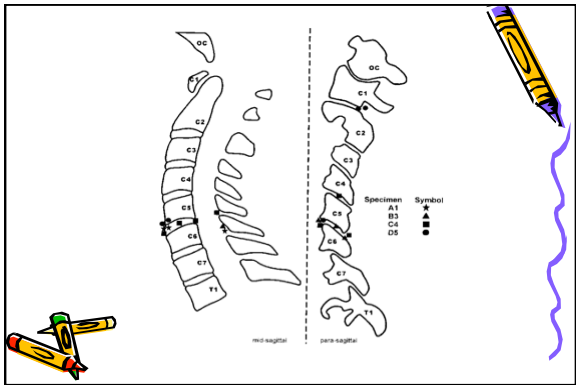


Whiplash Injury Determination With Conventional Spin Imaging and Cryomicrotomy

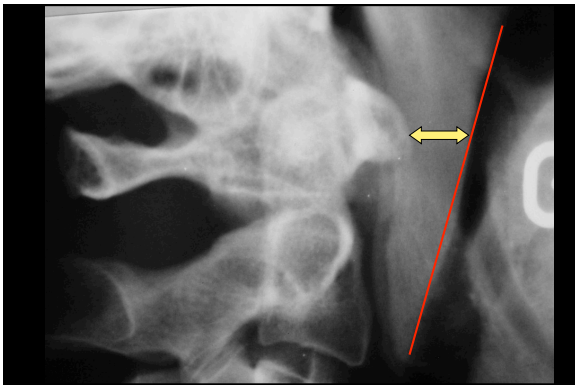
Narayna Yoganandan et al
Spine 2001;26:2443-2248

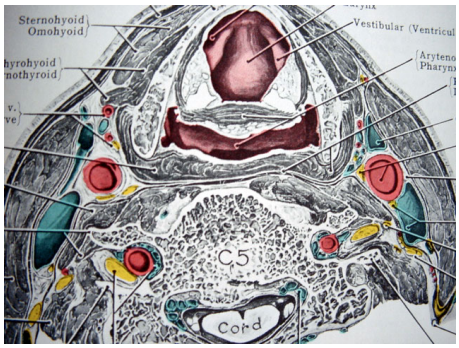


Significant signs of cervical spine trauma

1) Abnormal soft tissues
   - widened retropharyngeal space
   - widened retrotracheal space
   - displacement of prevertebral fat stripe
   - Tracheal displacement and laryngeal dislocation

From: The Radiology of Vertebral Trauma, Gehweiler et al. Monograph in clinical radiology No 16, Saunders, 1980



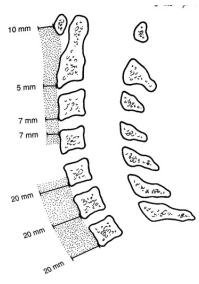


Normal cervical prevertebral soft tissue value.

Level	Flexion	Neutral	Extension
C1	11mm	10 mm	8 mm
C2	6 mm	5 mm	6 mm
C3 + C4	7 mm	7 mm	6 mm
C5+C6+C7	20 mm	20 mm	20 mm

Essential of Skeletal Radiology, Yochum, Rowe, p 155

Retropharyngeal space: normal value



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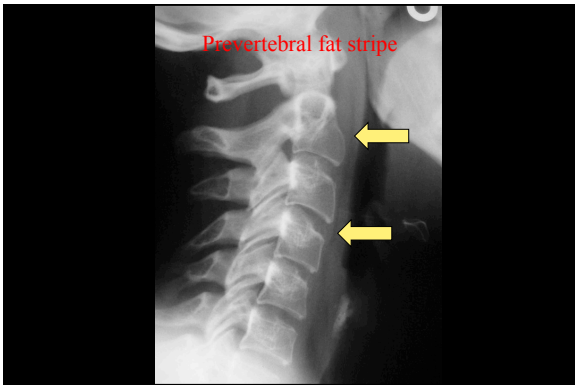

Significant signs of cervical spine trauma

2) Abnormal vertebral alignment

- loss of lordosis
- acute kyphotic hyperangulation
- torticollis
- widened interspinous space
- rotation of vertebral bodies

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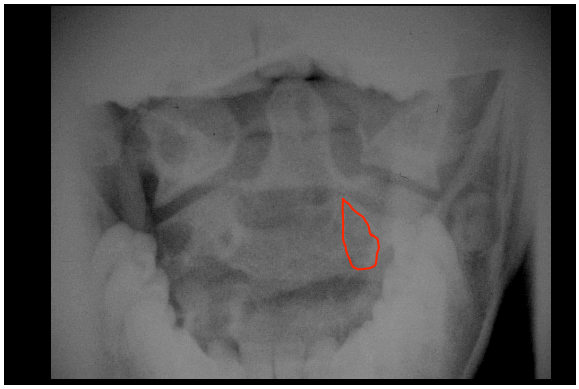

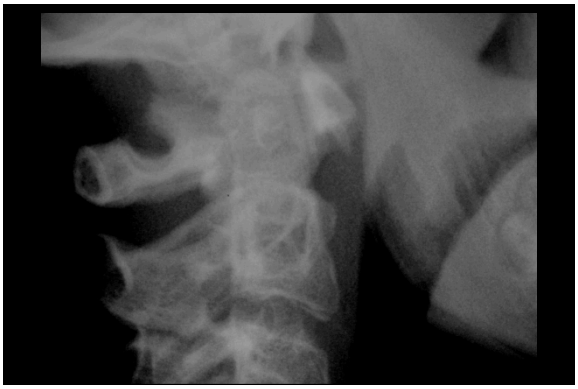

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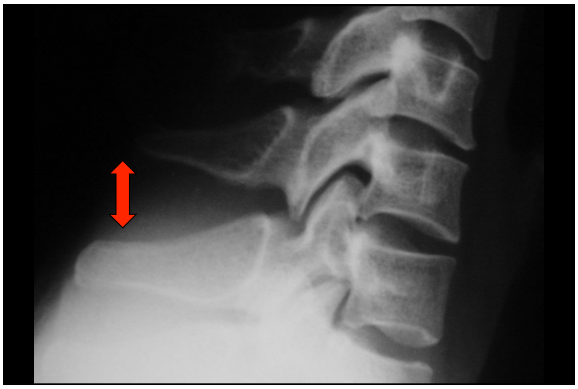

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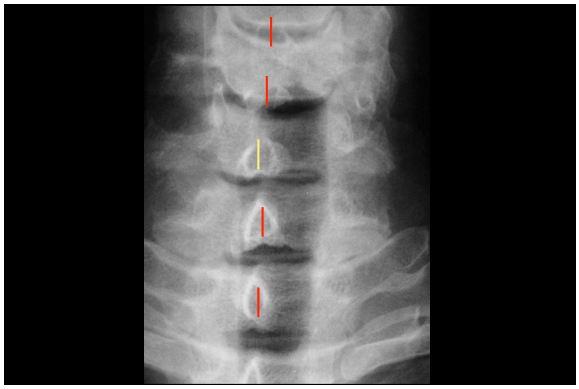
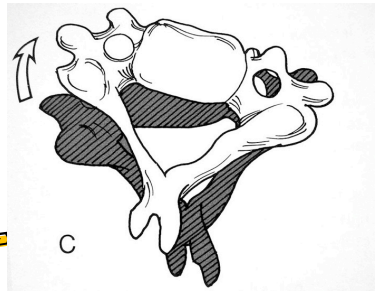


Unilateral luxation

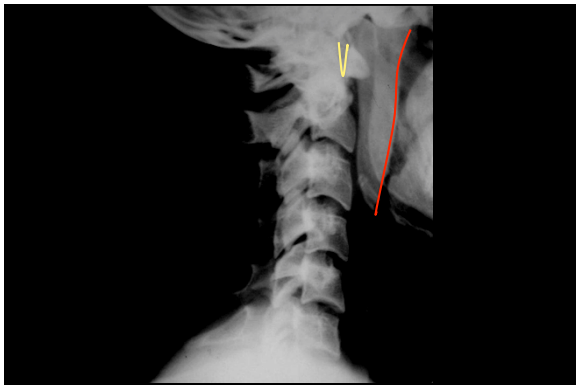


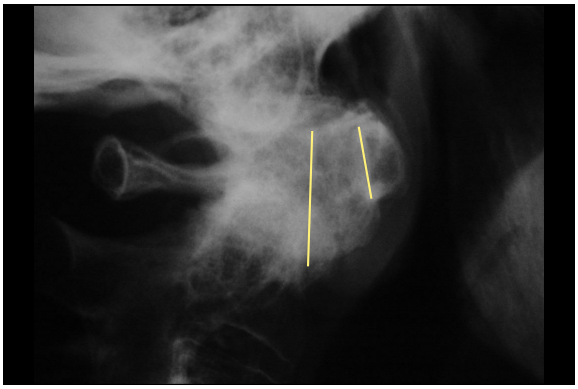
Significant signs of cervical spine trauma

3) Abnormal joints

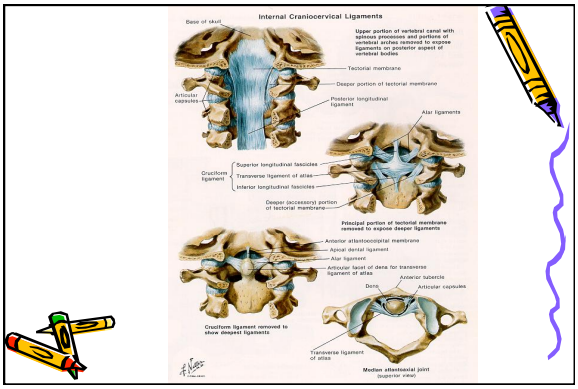
- widened middle atlantoaxial joint
- abnormal intervertebral disk
- widening of apophyseal joints

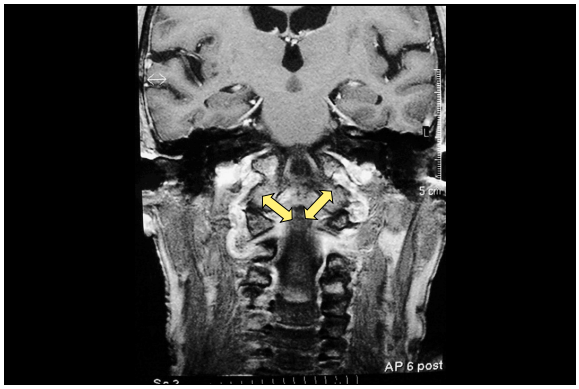
From: The Radiology of Vertebral Trauma, Gehweiler et al. Monograph in clinical radiology No 16, Saunders, 1980



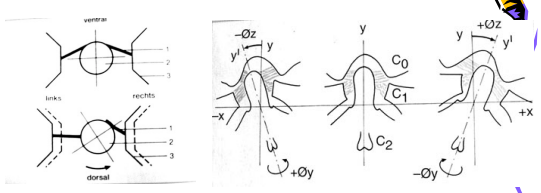


Biomechanics



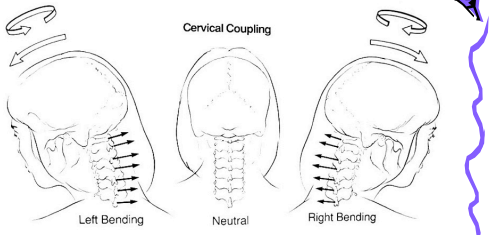


Ligamentum alaria



From: Dvorak, Manuelle Medizin Diagnostik

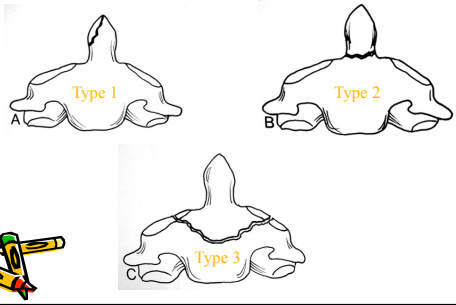
Cervical coupling



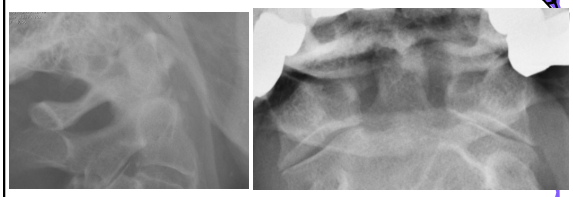
From White and Panjabi, Clinical Biomechanics of the Spine

Axis fractures

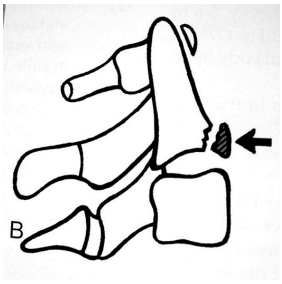
Fractures of the odontoide



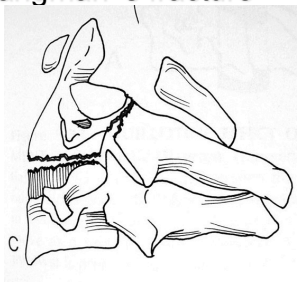
Type 2

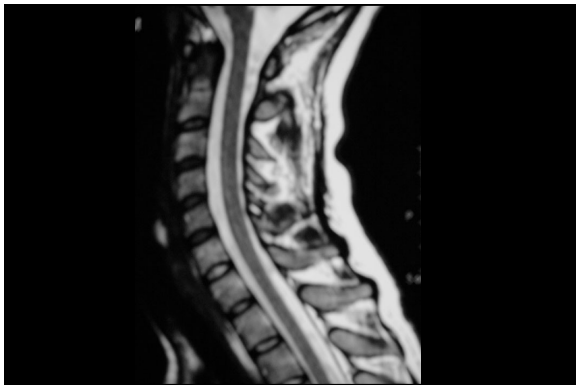


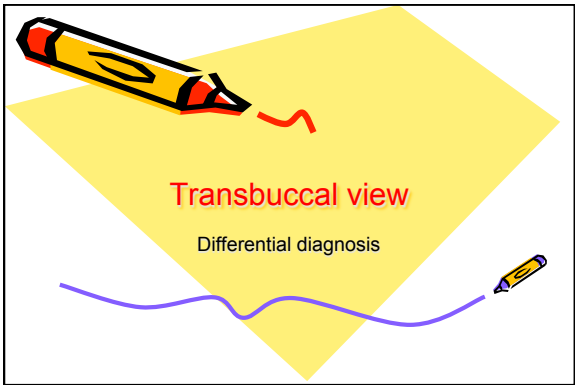
Tear drop fracture

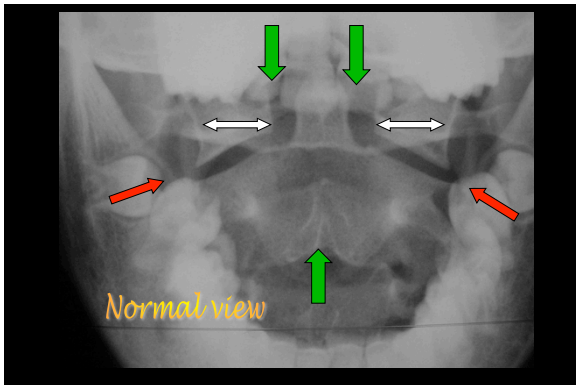


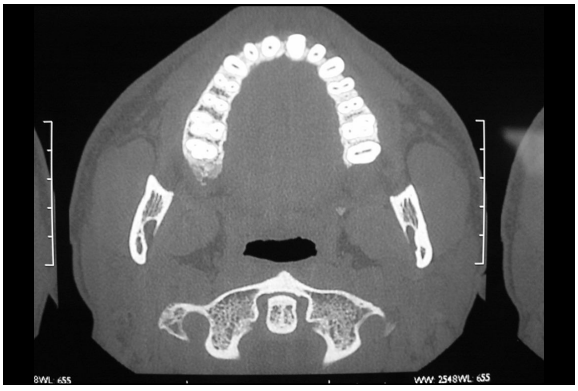
Traumatic spondylolisthesis : Hangman's fracture

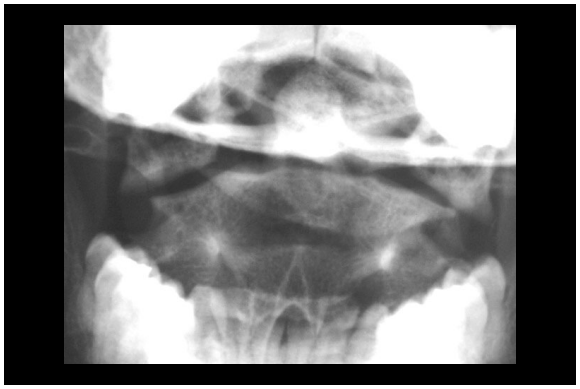


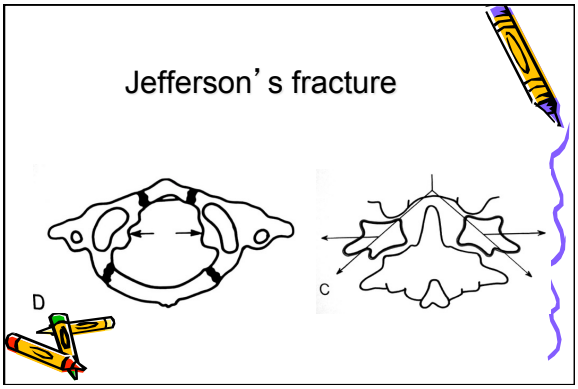



Transbuccal view
Differential diagnosis


Normal view






Jefferson's fracture
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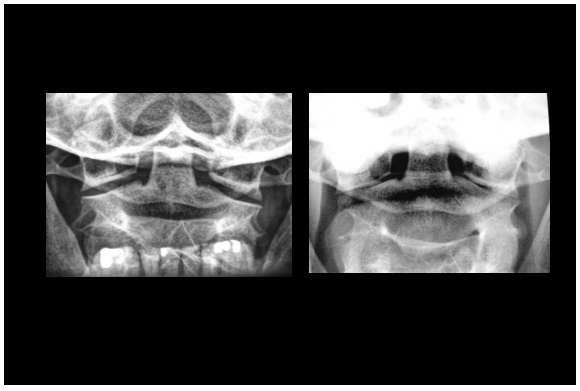
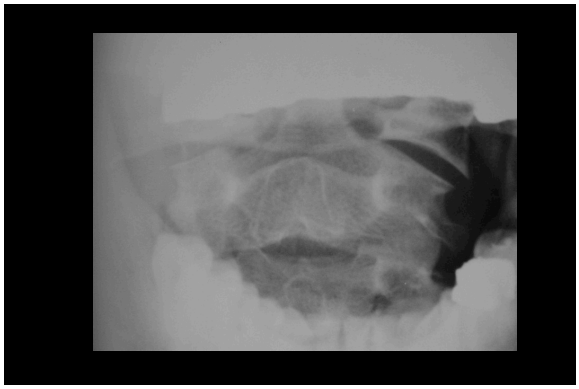
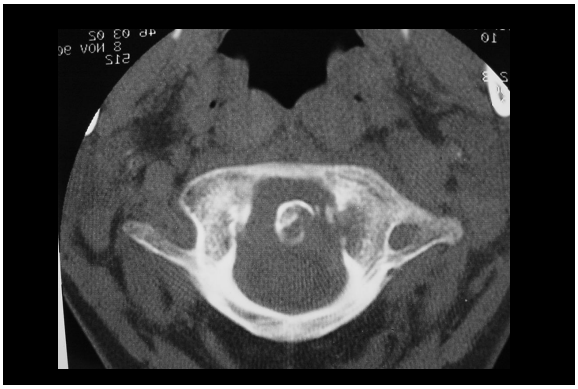
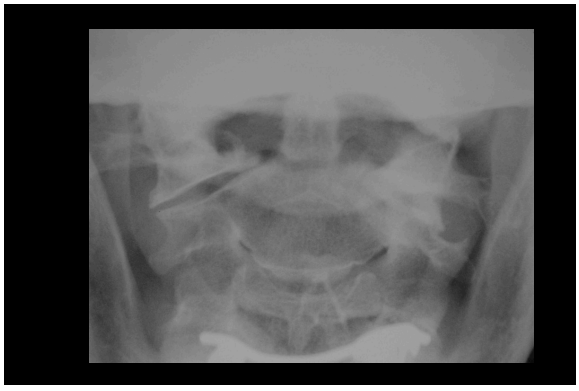
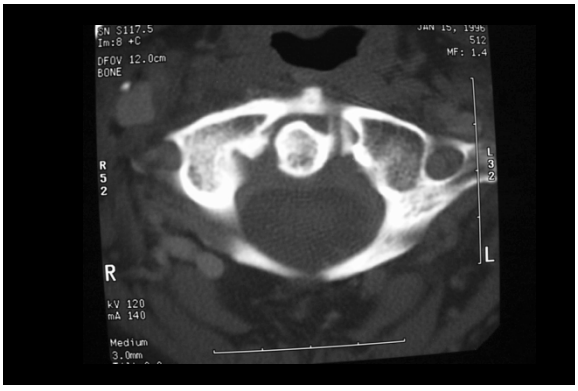
C







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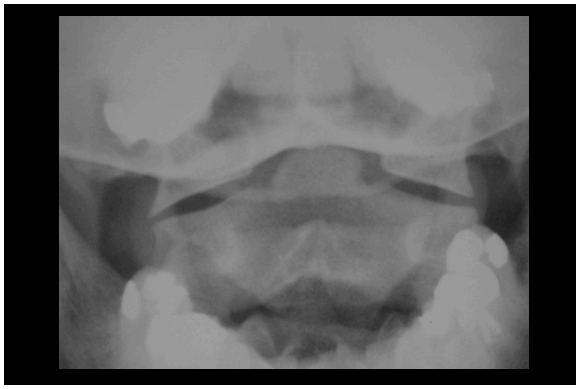
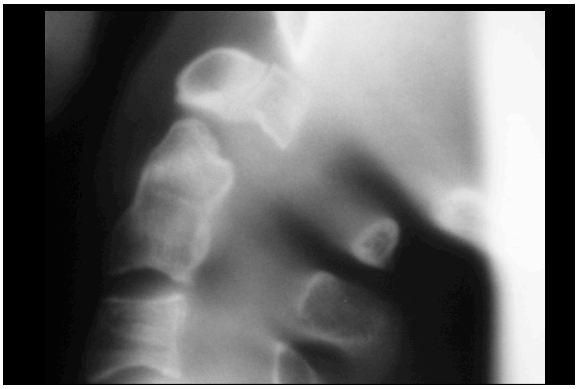
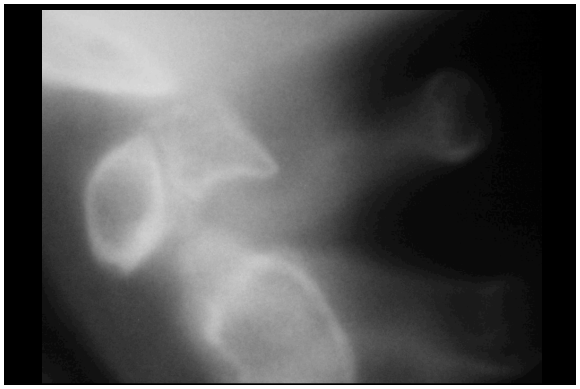
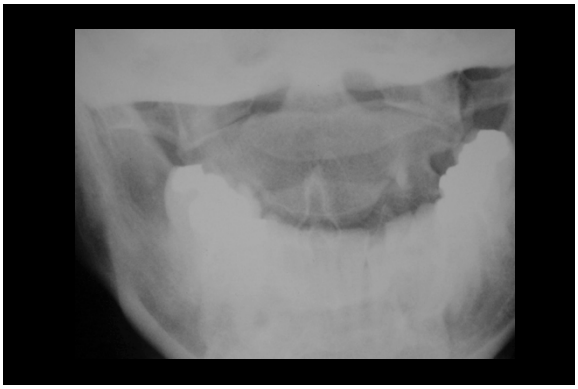
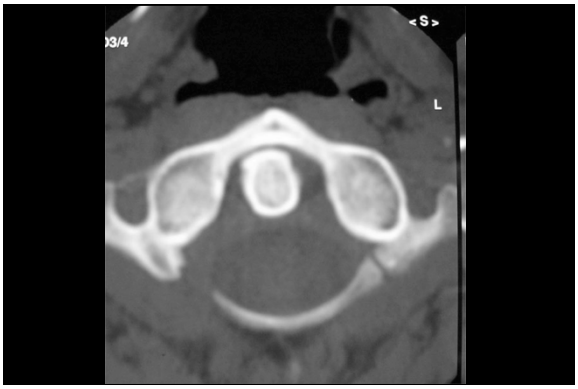
MF: 1.4
R
kV 120
mA 140
Medium
3.0mm
L







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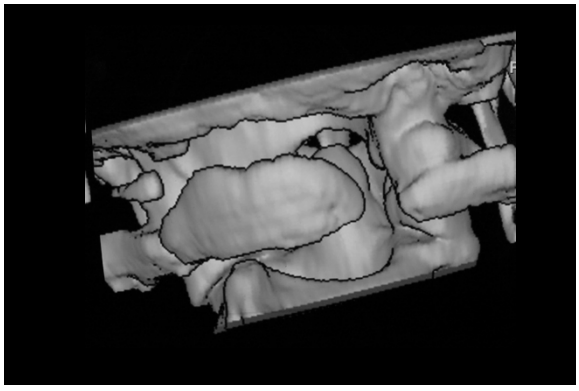

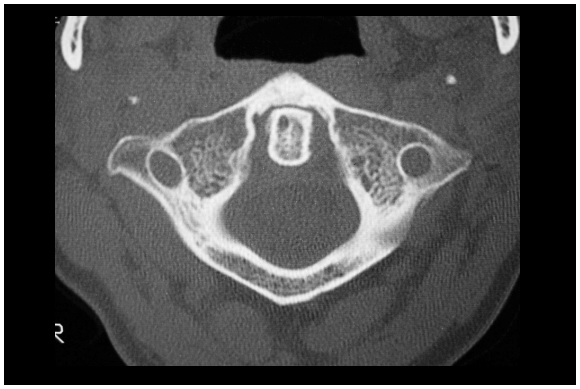
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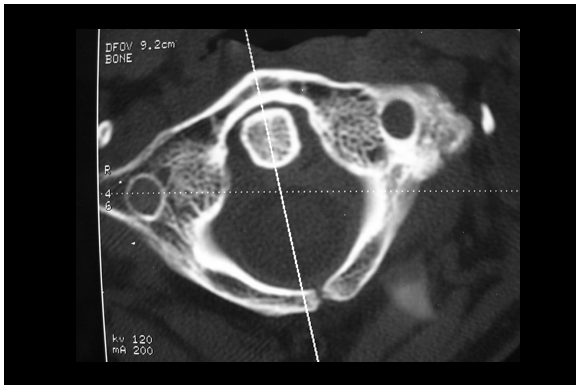
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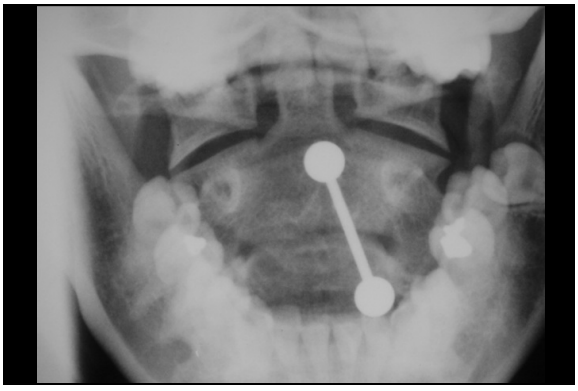

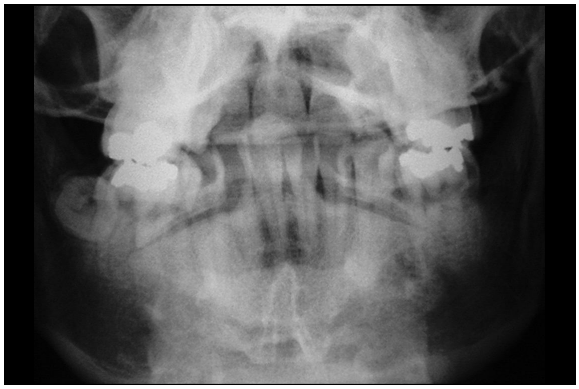

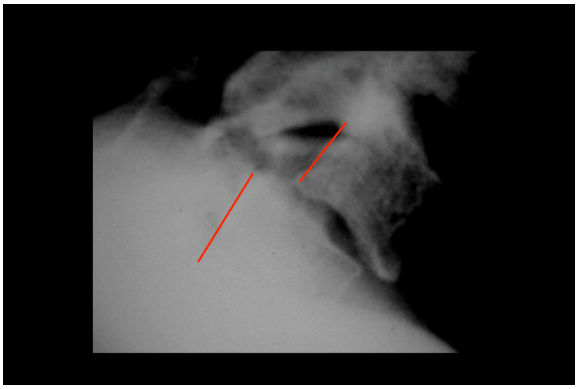

Take home messages

- You see only what you are looking for!
- You have to be systematical and thorough!
- You have seen the first lesion, look for the second one!
- Good correlation between clinical exam and radiographic exam.