Imaging methods of the head and neck

Overview of methods

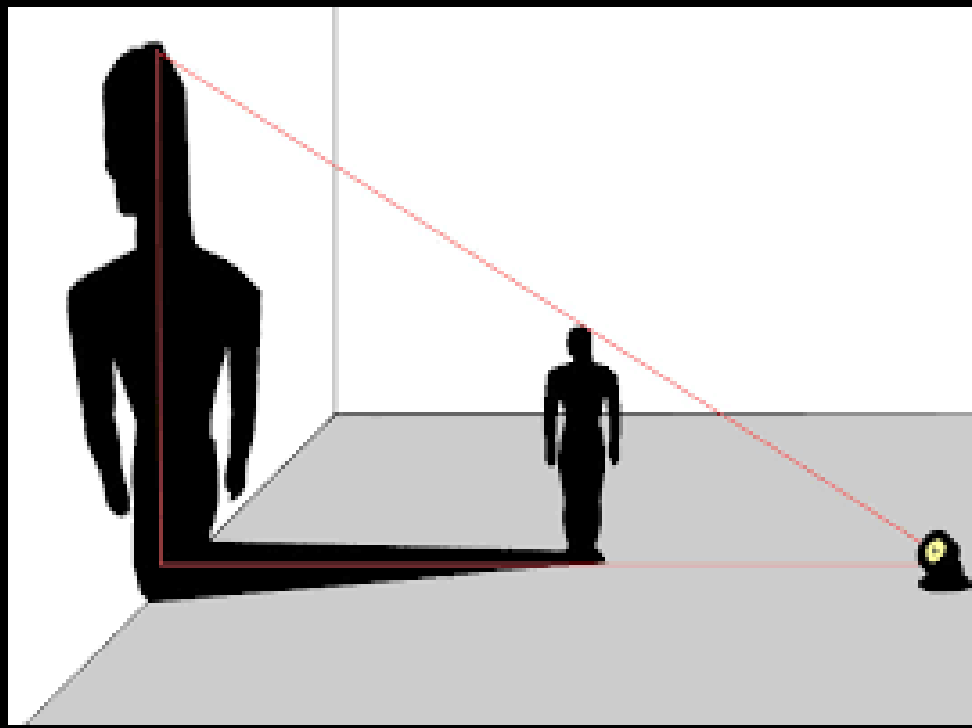
- X-ray
  - Extraoral projection
  - Intraoral projection
- CT
- MRI
- USG
- Arthroscopy

X-ray - extraoral

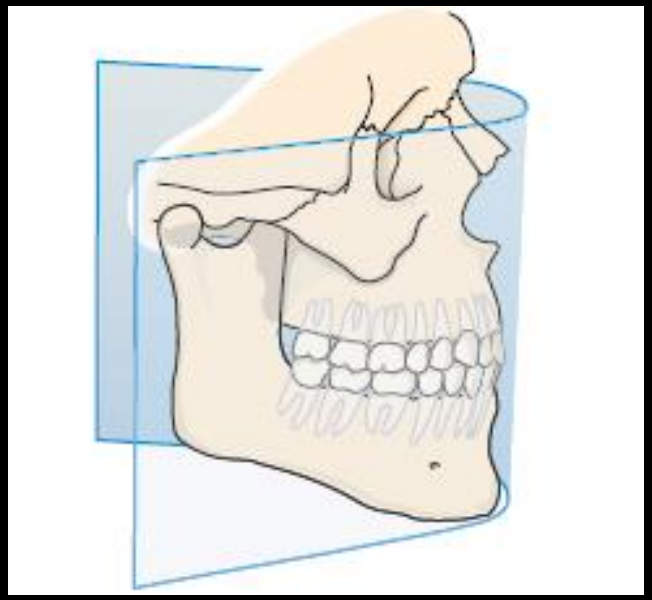
- OPG
- Lateral projection
- Posteroanterior projection
- Oblique posterior, semi-axial, caudally eccentric projection (according to Clementschitsch)
- Oblique posterior, semi-axial, cranially eccentric projection (according to Waters)
- Special targeted projections (eg TMJ)

X-ray - principle

- Summation imaging, displays 3D structures as 2D photography
- disadvantage radiation , X rays (RTG)
- a range of shades of grey depending on the exposure (negative)



1. Orthopantomography (OPG)



- Panoramatic extraoral technique

- Used to examine both jaws, TMJ, maxillary sinuses and the teeth together **on one image**

- Convenient and inexpensive method with low radiation exposure

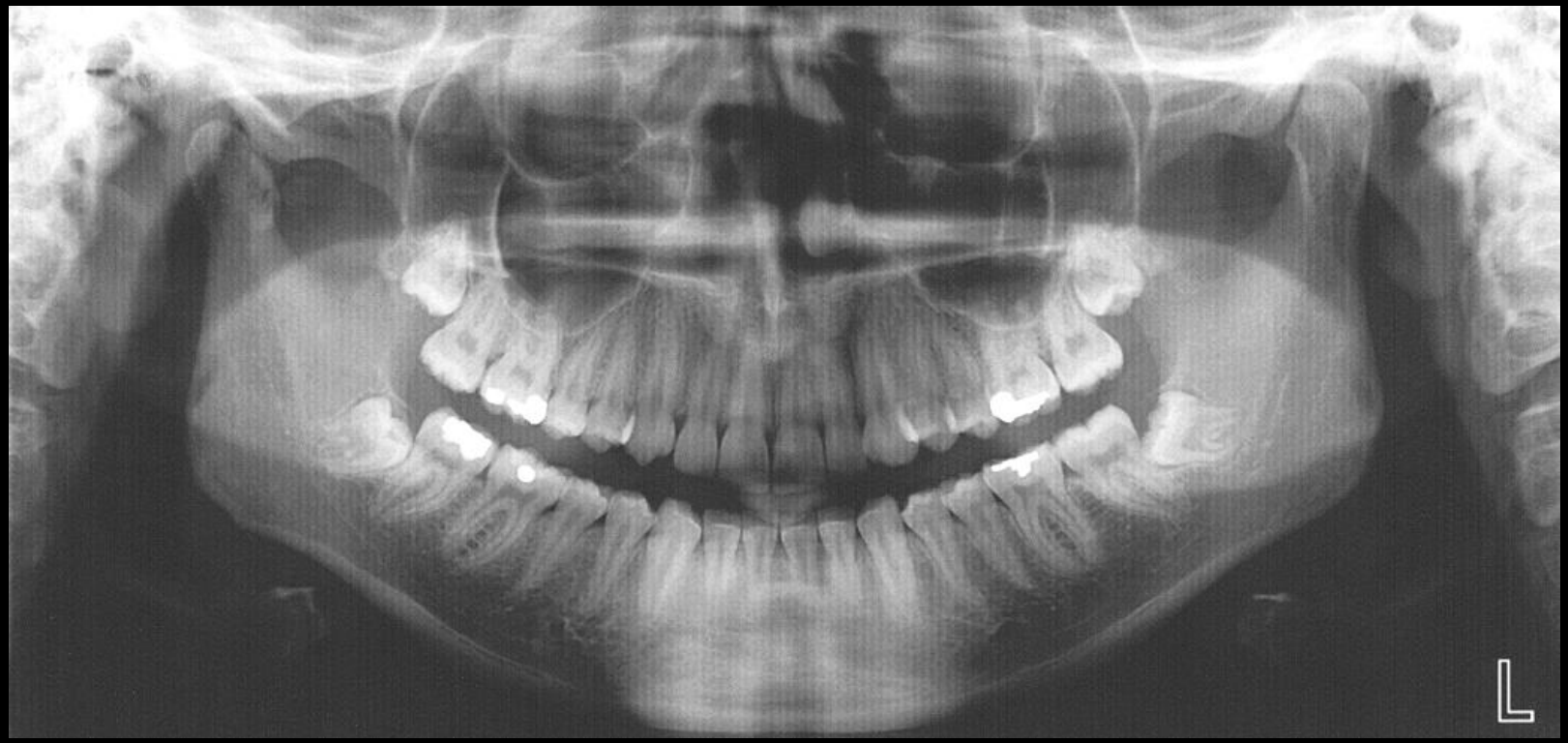
Disadvantages: inaccuracy (two-dimensional display -> summation of structures)

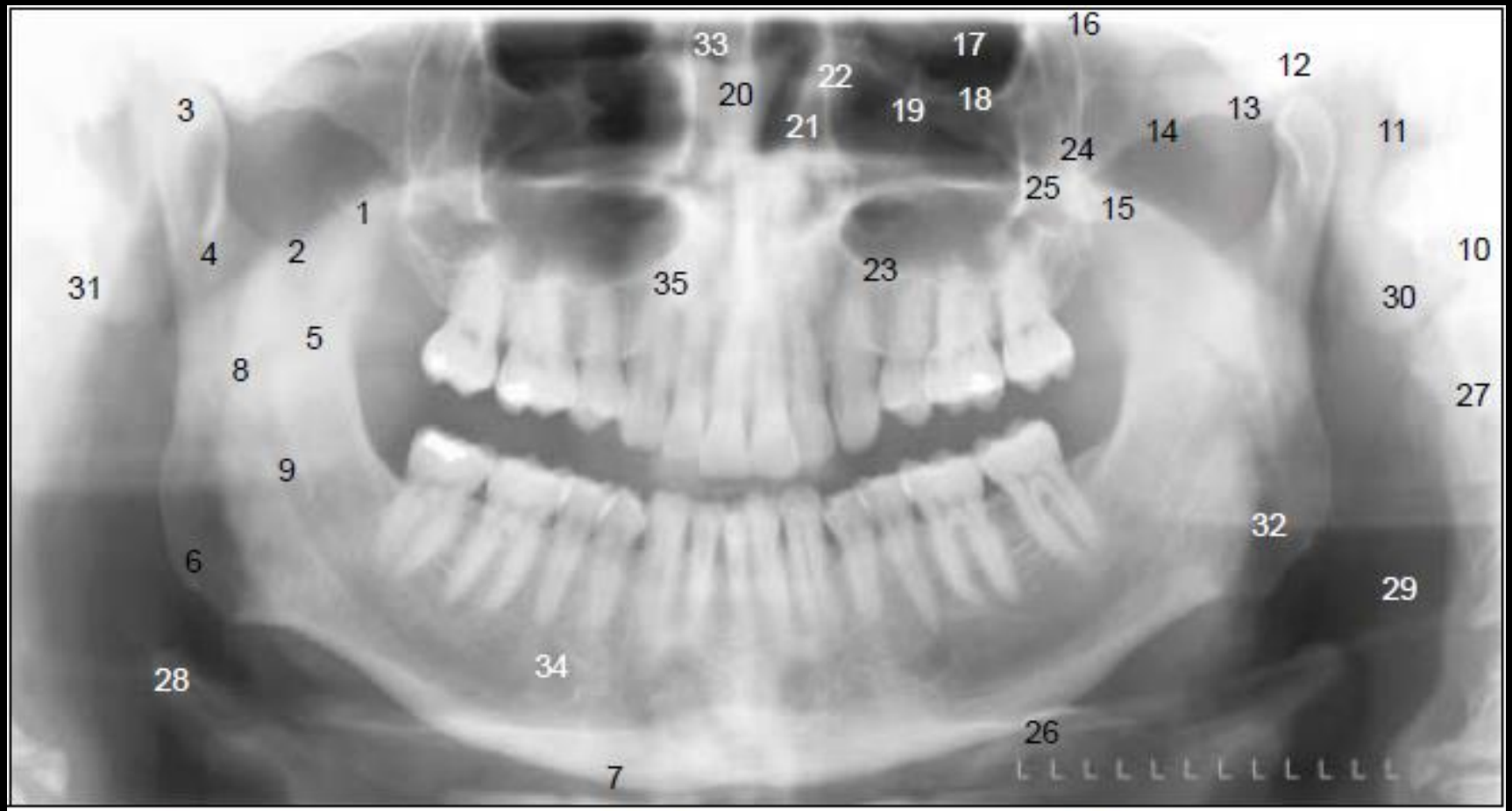
- Patient is positioned with the Frankfort plane horizontal, bite peg between the anterior teeth and the chin positioned on the chin support

- The film and the tubehead (X-ray source) rotate around the patient and produce a series of individual images on a single film

- position!
- prepare the patient well

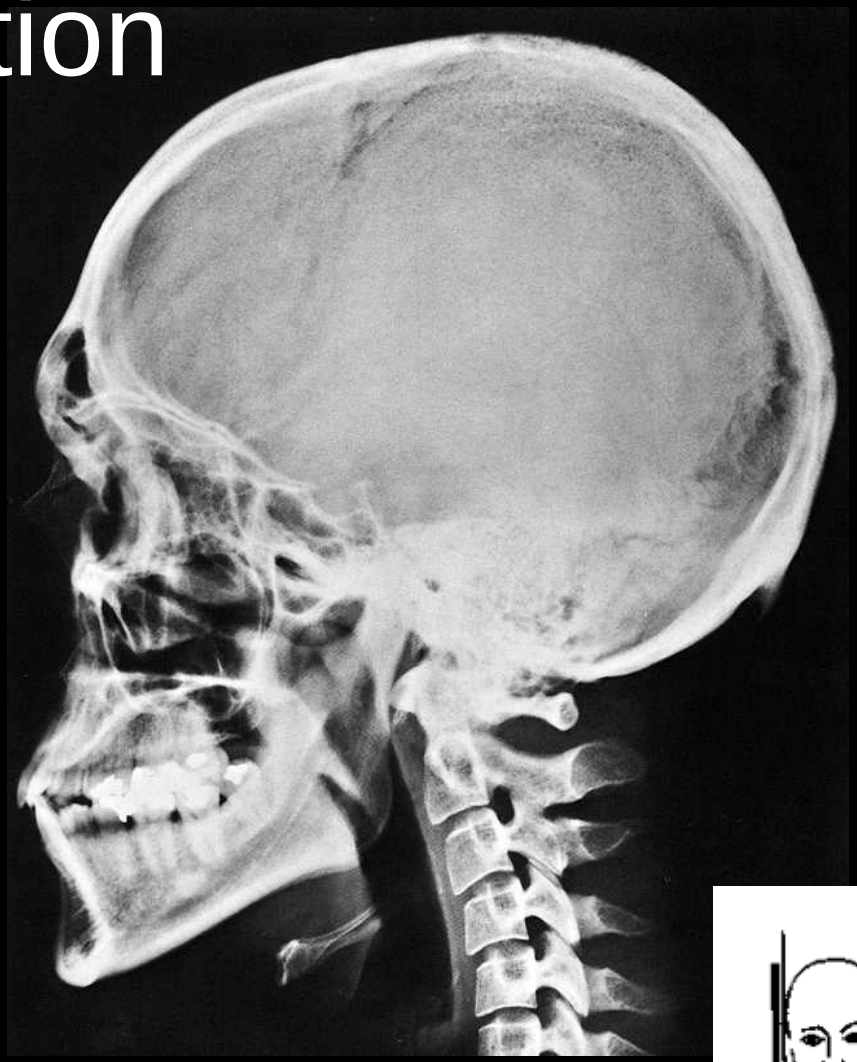
- description

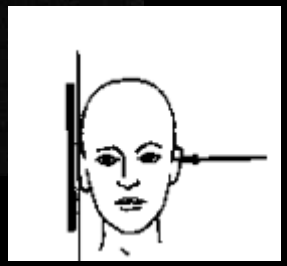




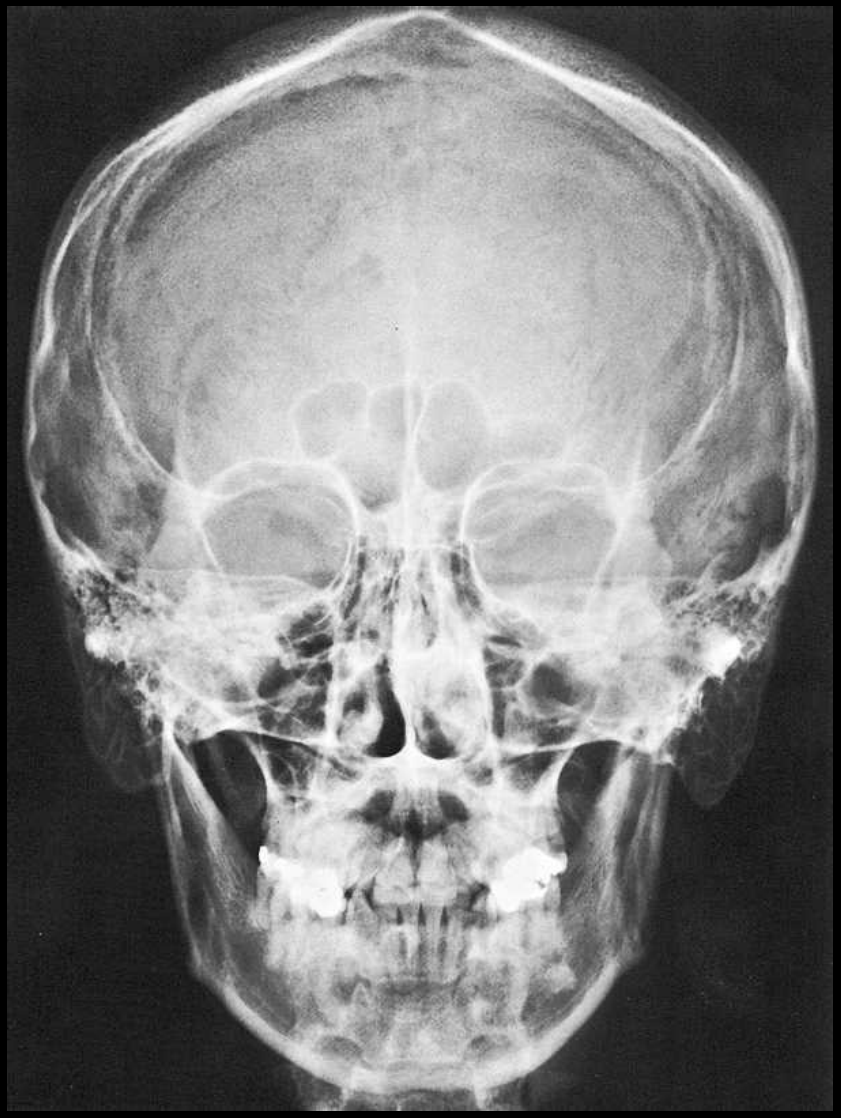
1. Coronoid Process
2. Sigmoid Notch
3. Mandibular Condyle
4. Condylar Neck
5. Mandibular Ramus
6. Angle of Mandible
7. Inferior Border of Mandible
8. Lingula
9. Mandibular Canal
10. Mastoid Process
11. External Auditory Meatus
12. Glenoid Fossa
13. Articular Eminence
14. Zygomatic Arch
15. Pterygoid Plates
16. Pterygomaxillary Fissure
17. Orbit
18. Inferior Orbital Rim
19. Infraorbital Canal
20. Nasal Septum
21. Inferior Turbinate
22. Medial Wall of Max. Sinus
23. Inferior Border of Max. Sinus
24. Posterolateral Wall of Max. Sinus
25. Malar Process
26. Hyoid Bone
27. Cervical Vertebrae 1- 4
28. Epiglottis
29. Soft Tissues of Neck (Look Vertically For Corotid Artery Calcifications Here)
30. Auricle
31. Styloid Process
32. Oropharyngeal Air Space
33. Nasal Air Space
34. Mental Foramen
35. Hard Palate

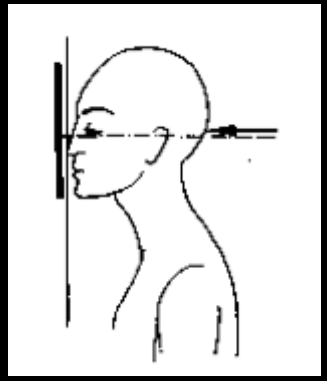
Lateral projection





Posteroanterior projection





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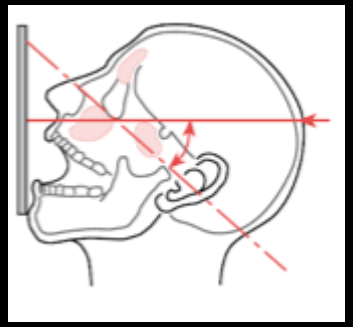
Oblique posterior, semi-axial, caudally eccentric projection (according to Clementschitsch)

- Middle and lower facial floor
- Examination of joints, shoulders and body of the lower jaw

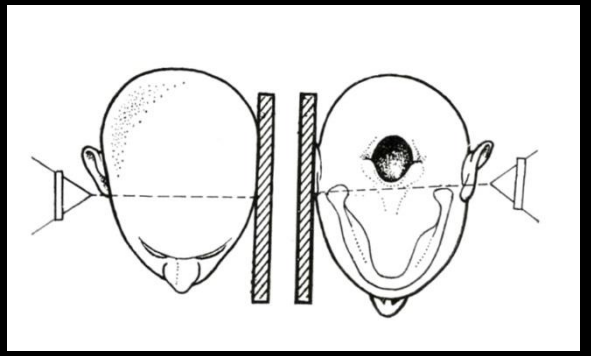
Oblique posterior, semi-axial, cranially eccentric projection (according to Waters)

- Upper and middle facial floor
- Paranasal sinuses

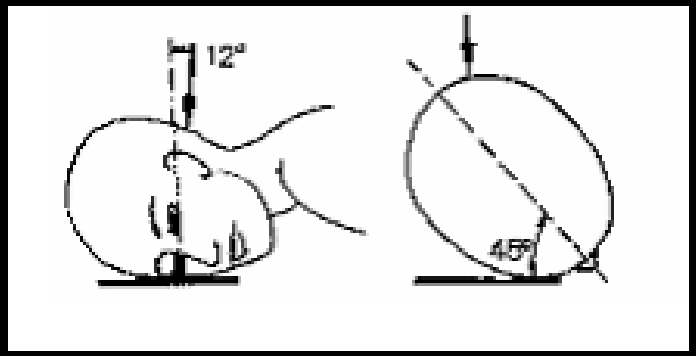


Targeted X-ray projections

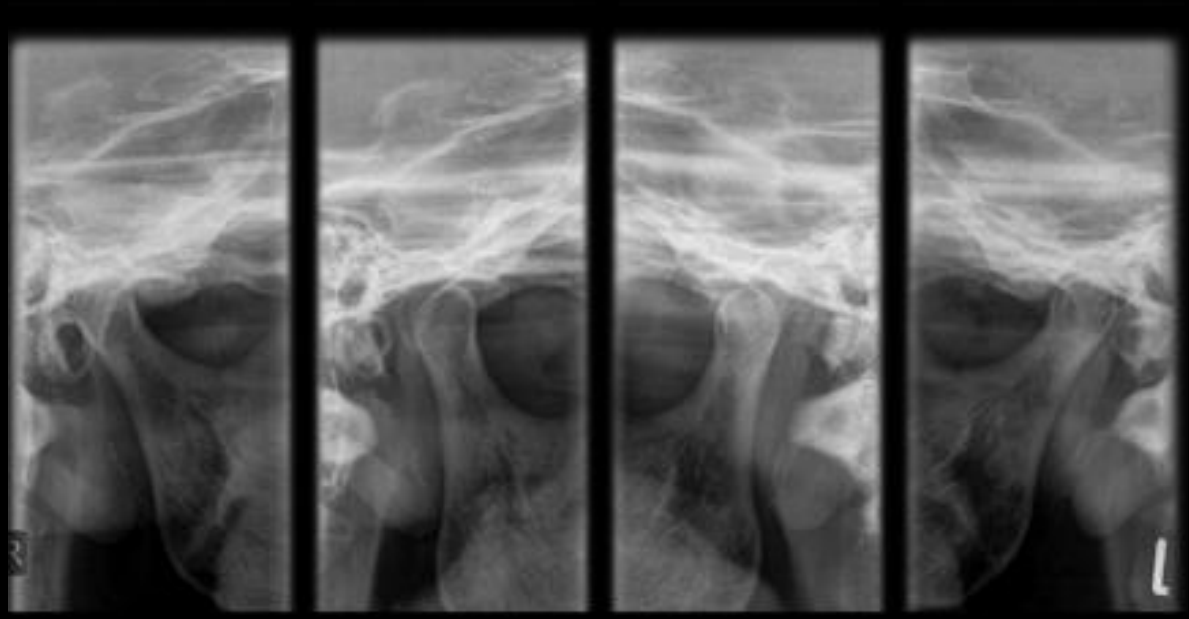
Albers-Schönbergova

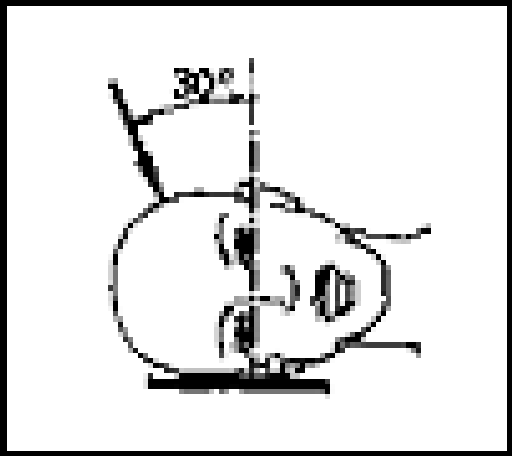


Semisagit. projection (Stenvers)



Semilat. projection (Schüller)





X-ray - intraoral

- Complementary overall finding on OPG (targeted) - only when we ask something specific
- Different types (division according to the passage of the central beam):
  - Apical projection
  - Parodontal projection
  - Coronal projection
  - Occlusal projection

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Bundle bone

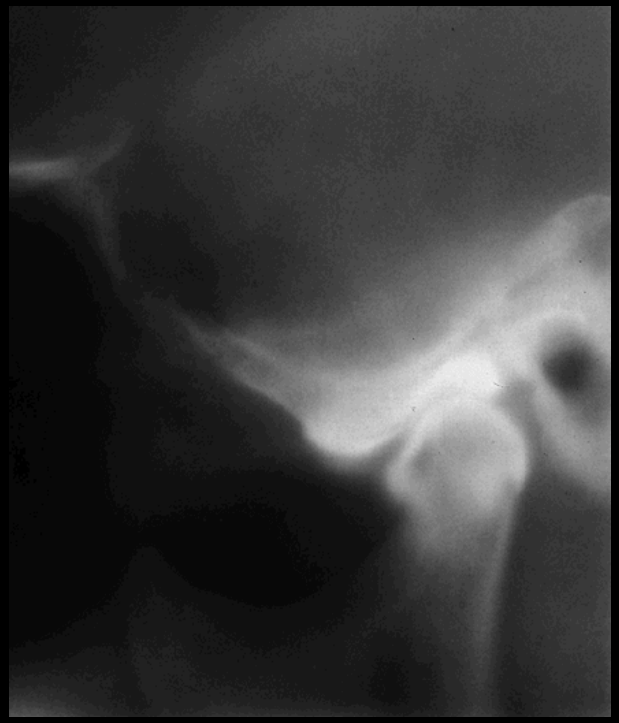
= the inner portion of the bone of the alveolus that surrounds teeth and into which the collagen fibers of the periodontal ligament are embedded

- Radiographically, the bundle bone is the **lamina dura**

Arthrography

X-ray picture after filling with a contrast agent

Disadvantages: invasive method

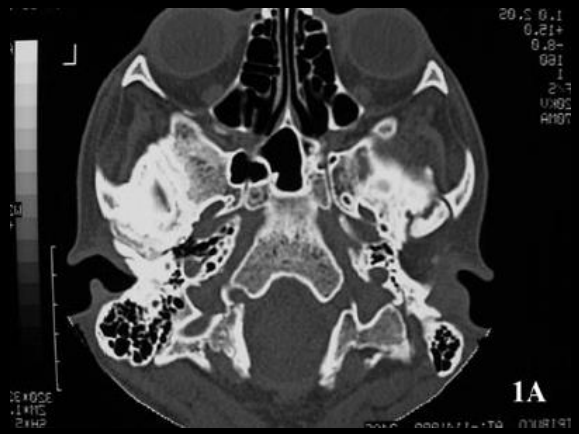


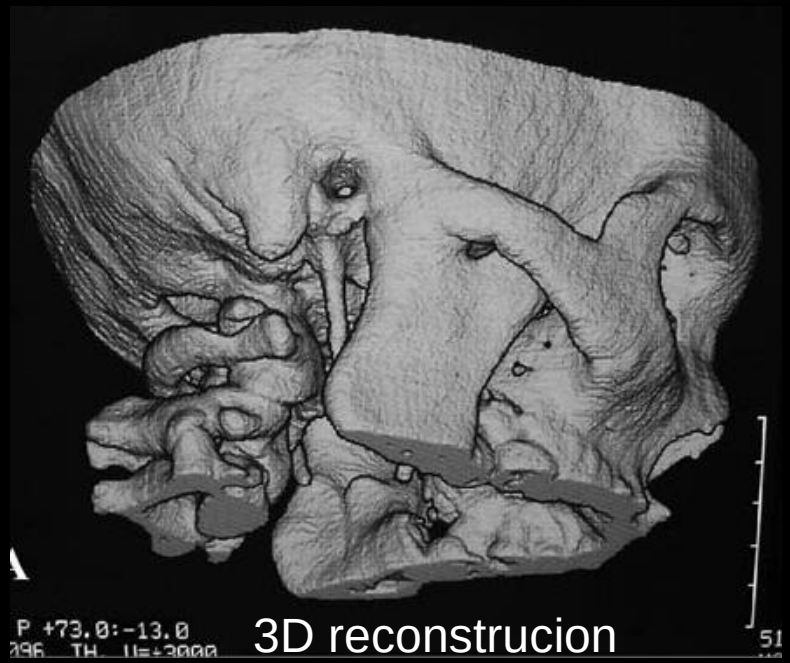
Computed tomography(CT)

- A non-invasive x-ray technique
- More sensitive than conventional X-rays
- In the axial or coronary plane,

3D reconstruction

Disadvantages: lower availability,
higher radiation dose





3D reconstrucion

Magnetic resonance (MRI)

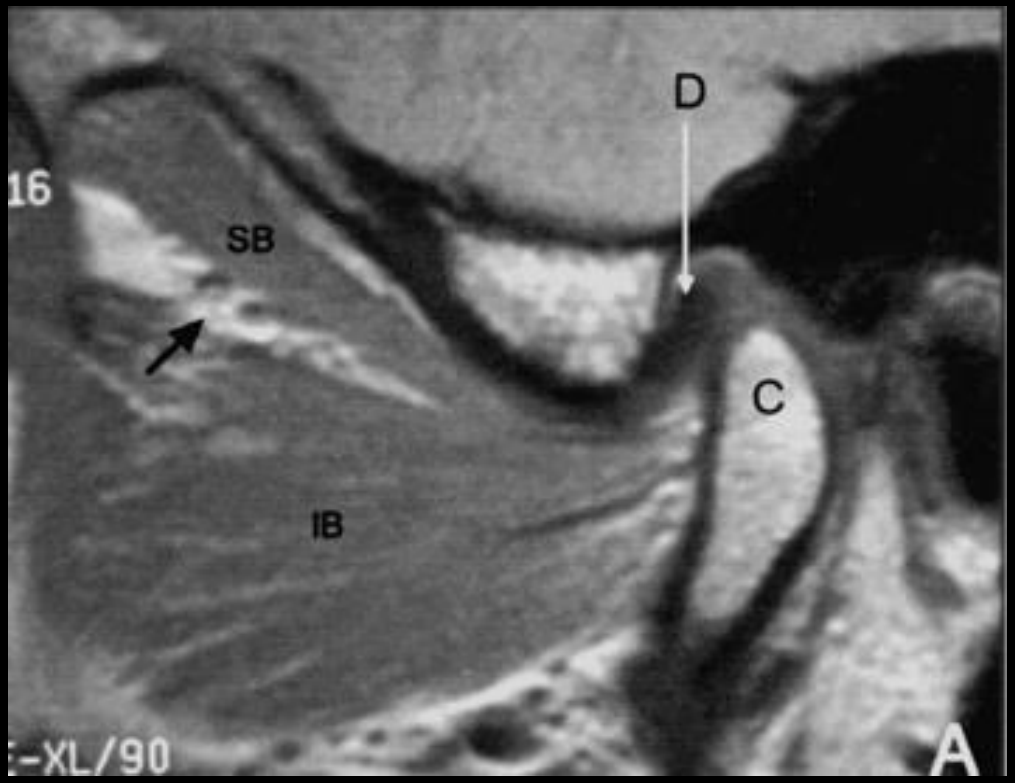
MRI allows visualization of soft tissue (muscles, fat, and internal organs) without the use of x-rays

Magnetic resonance (MRI)

Advant.: high resolution (soft tissues)

Disadvant.: availability

medical conditions of the patient - KI: PACEMAKER, COCH. IMPLANT, METAL MAT. IN THE HEAD AND NECK AREA

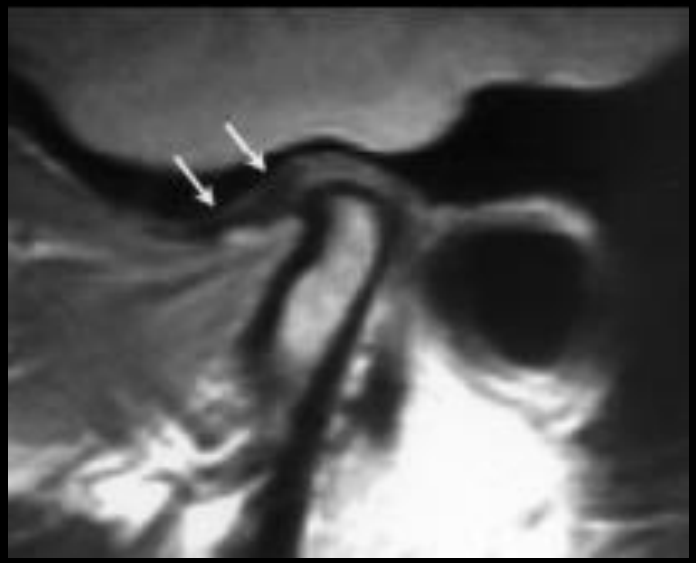


Ultrasonography

Adv. Compared to MRi:
lower examination costs
less time consuming
less discomfort for the patient

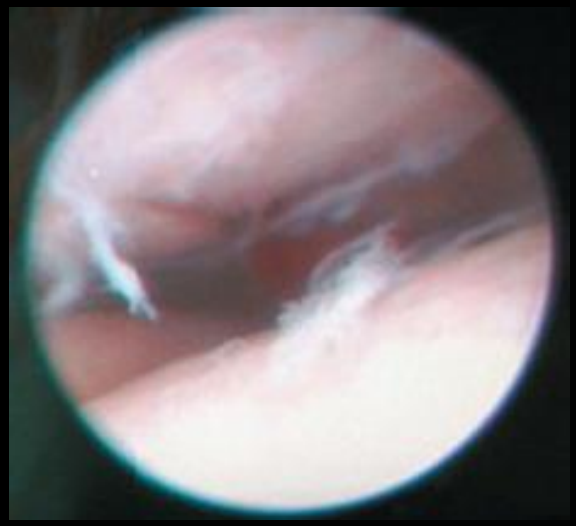
Disadv: lower diagnostic accuracy

US



MRi

Arthroscopy - accurate dg of joint changes, but also the implementation of adequate surgery is needed
Endoscopic examination
Disadvant: invasive method
need for general anesthesia
possibility of damage n. auriculotemp.



Types of arthroscopy:
1. upper articular cleft
2. lower articular cleft

Adhesion in ATM