Extraoral radiography

MAIN MAXILLOFACIAL PROJECTION

Standard occipitomental 0º

30º Occipitomental

Posteroanterior of the skull

Posteroanterior of the jaw

Reverse Towne's

Rotated Posteroanterior

True lateral skull and cephalometrical lateral

Submentovertex

Extraoral Radiography

Extraoral radiographs (outside the mouth) are taken when large areas of the skull or jaw must be examined or when patients are unable to open their mouths for film placement.

Extraoral radiographs do not show the details as well as intraoral films.

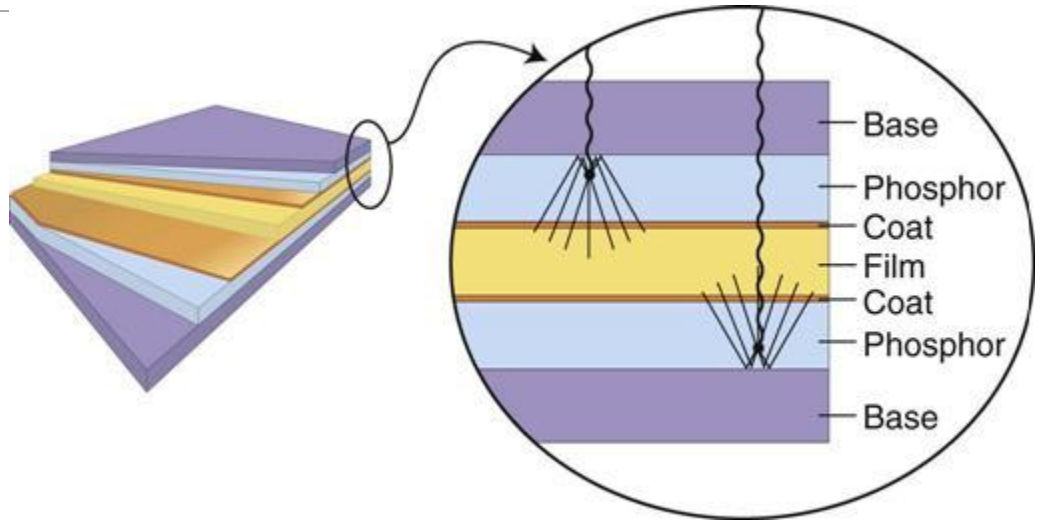
Extraoral radiographs are very useful for evaluating large areas of the skull and jaws but are not adequate for detection of subtle changes such as the early stages of dental caries or periodontal disease.

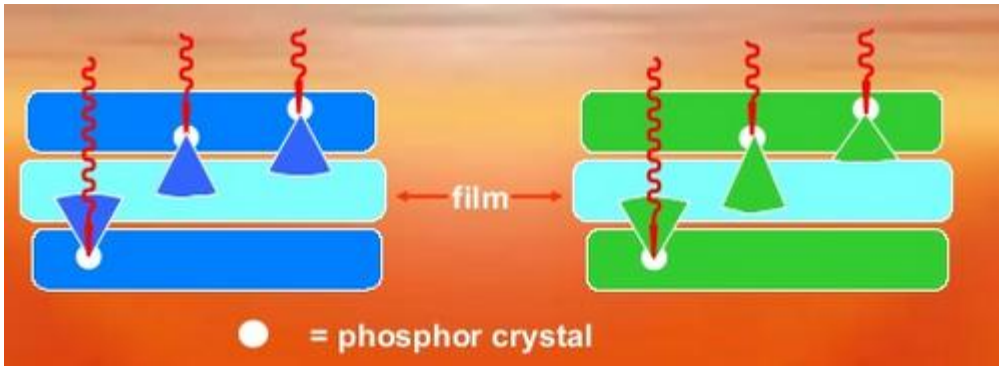
There are many type of extraoral radiographs. Some types are used to view the entire skull, whereas other types focus on the **maxilla and mandible.**

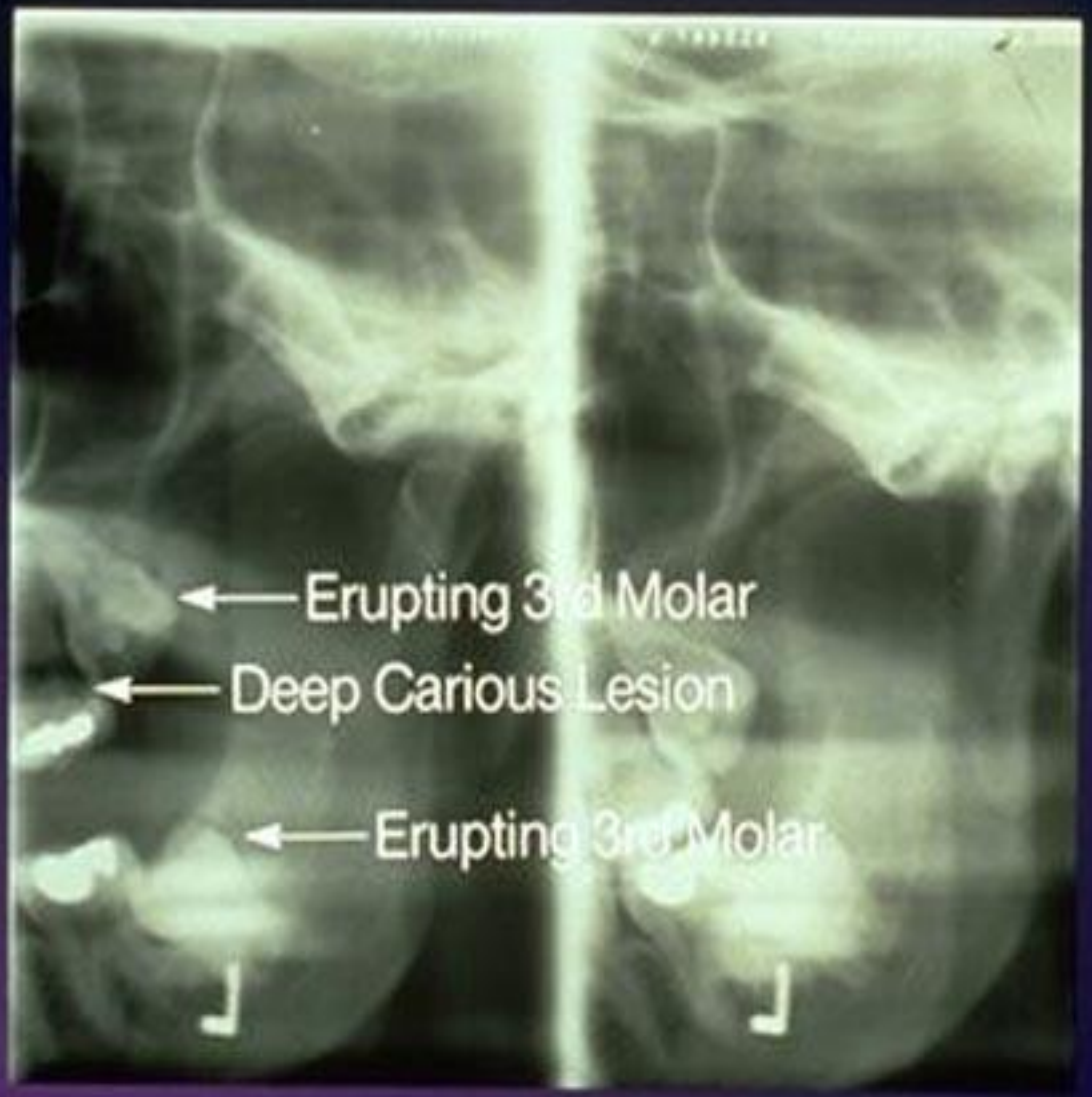
Extraoral Radiography

Intensifying Screen Technology

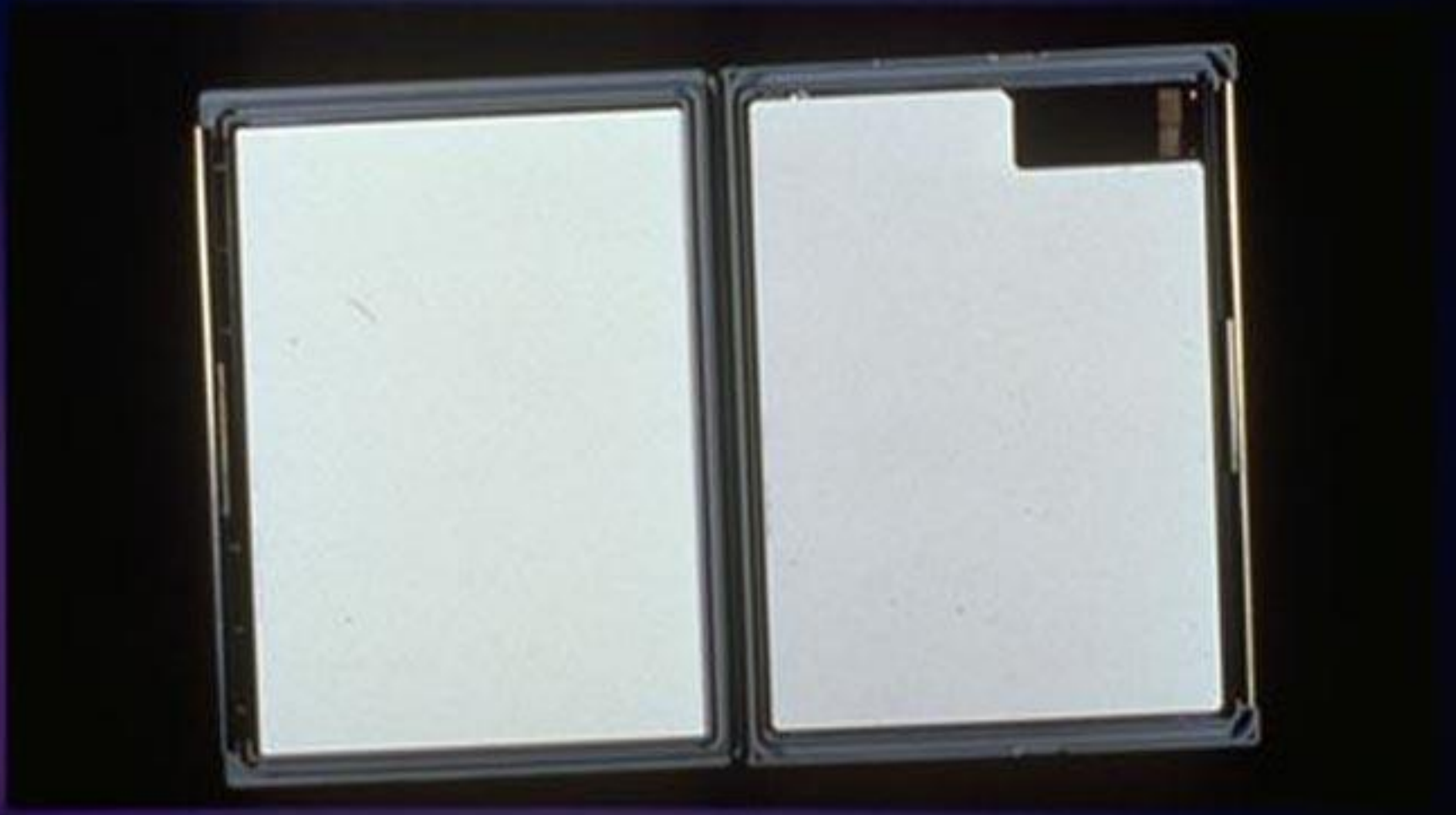
- Radiation dose
- Motion artefact






Erupting 3rd Molar
Deep Carious Lesion
Erupting 3rd Molar

Intensifying Screens



As

Low

As

Reasonably

Achievable

occipitomental 0º

Indications:

- **Middle third facial fracture**
- **Coronoid process fracture**
- **Maxillary,Ethmoidal and Frontal sinuses**

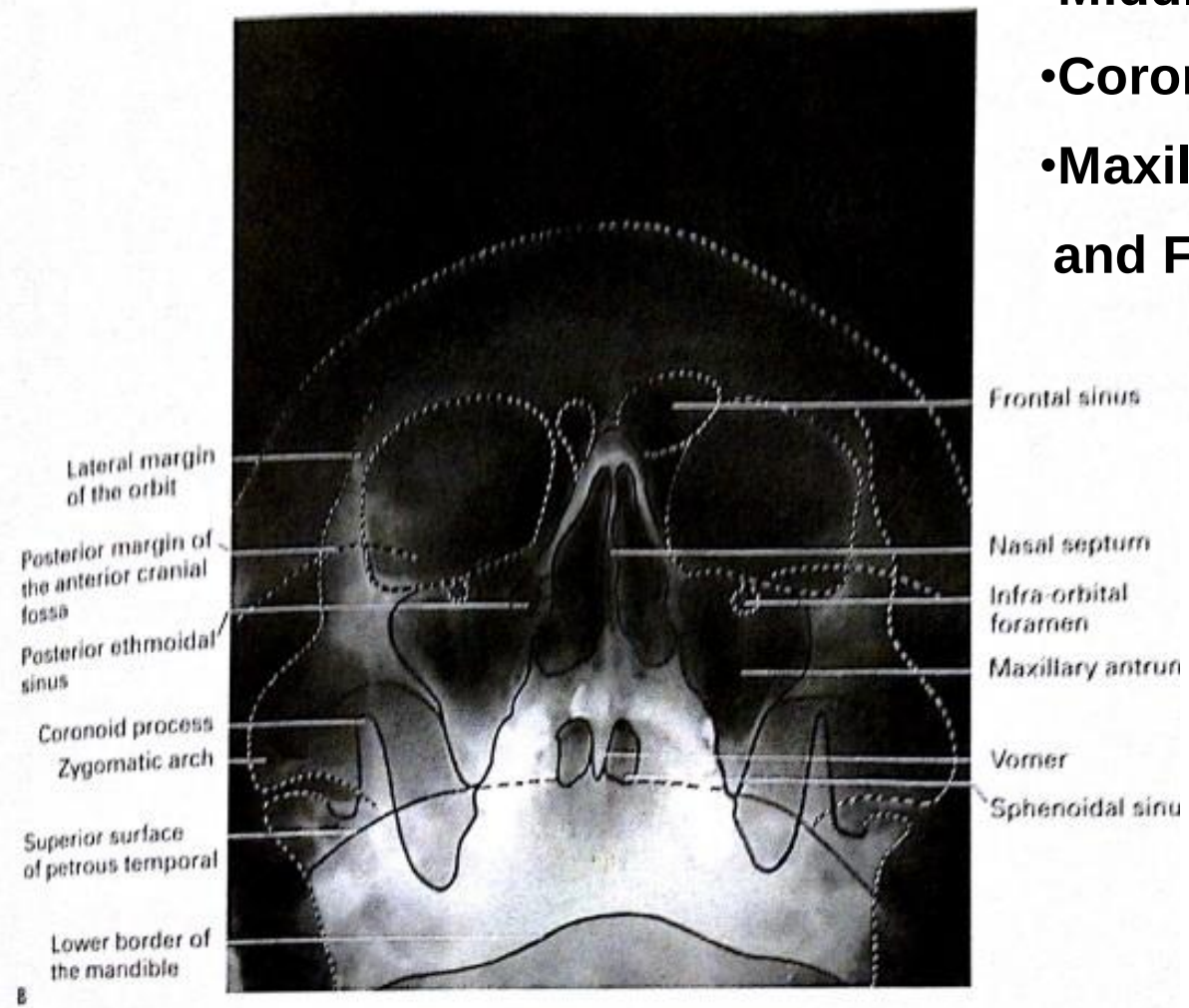
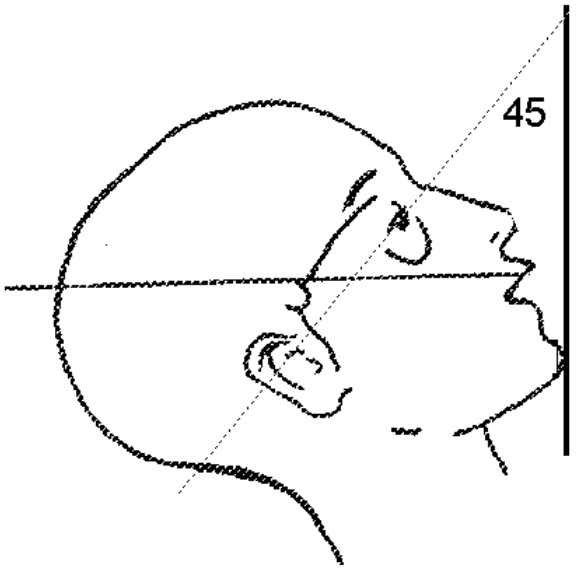
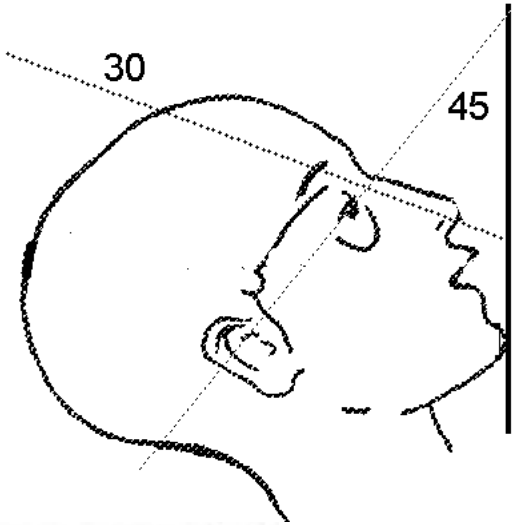


Fig. 14.6B The same radiograph with the major anatomical features drawn in.

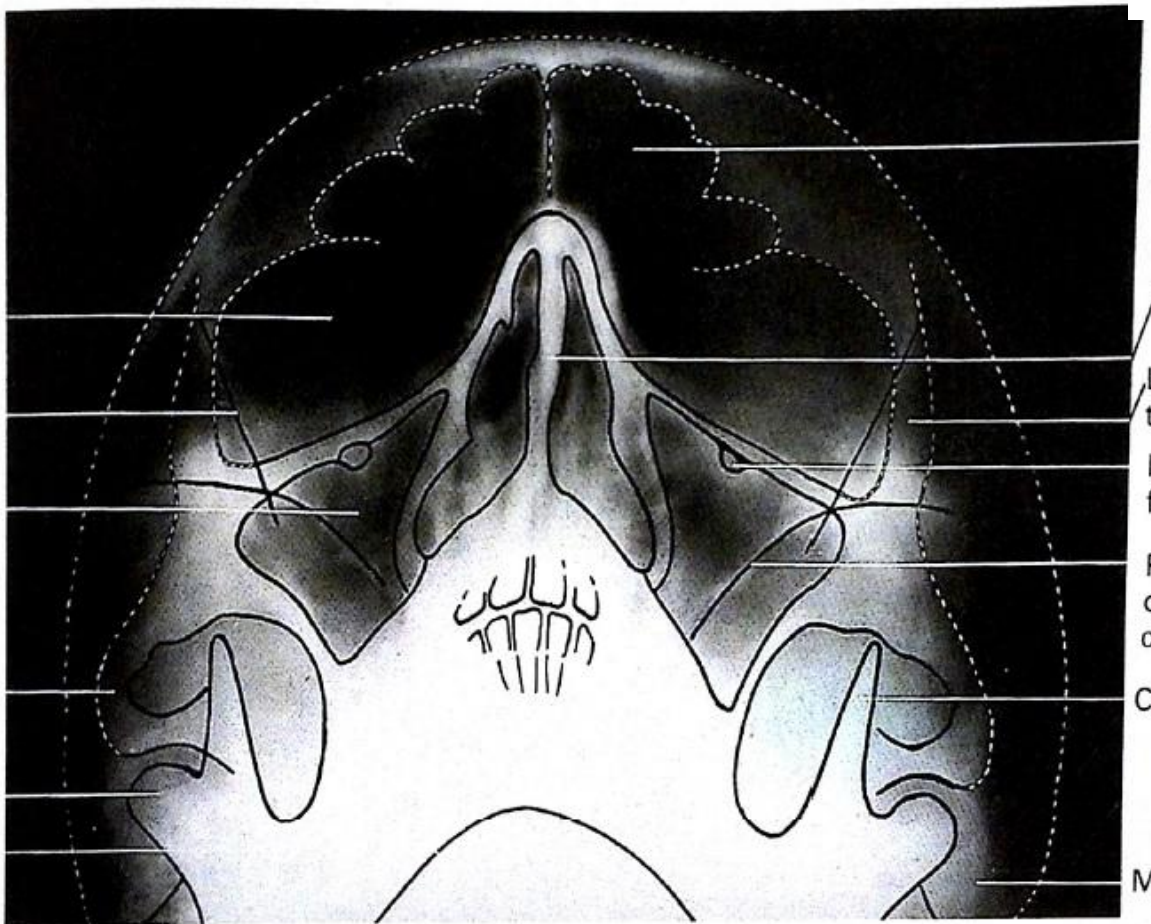


Occipitomental

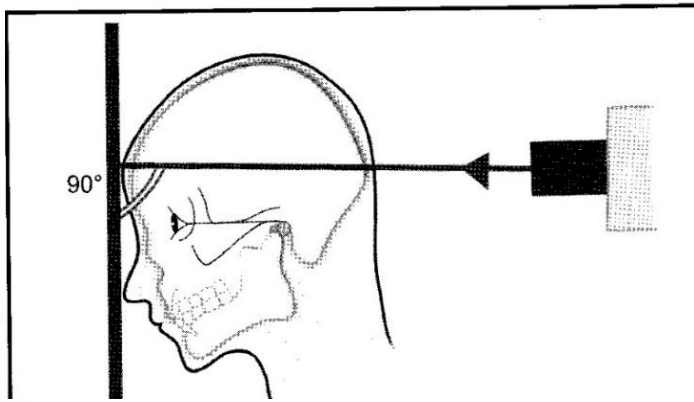


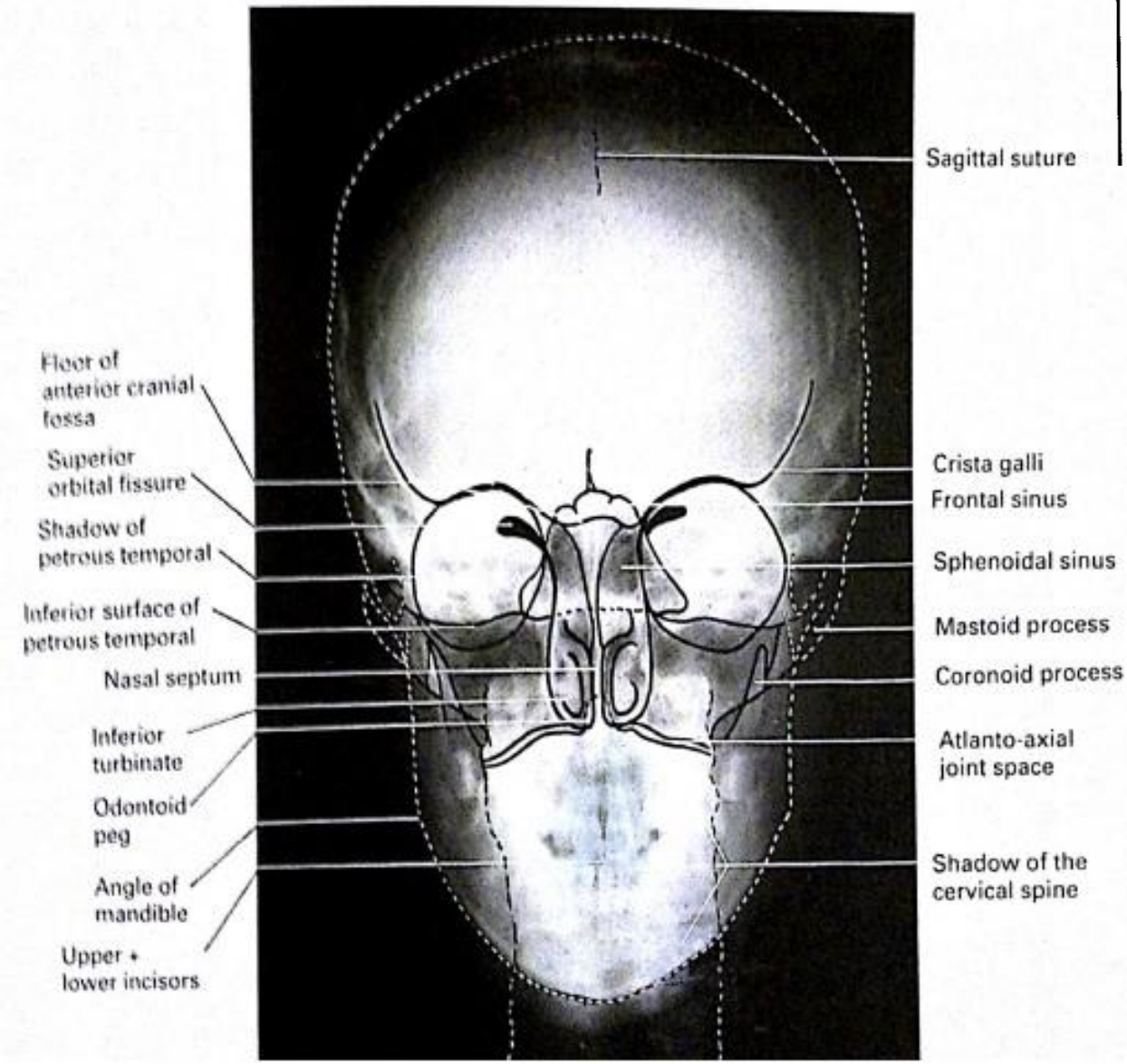
Indications:

- **Middle third facial facture**
- **Coronoid process fracture**
- **Maxillary and frontal sinuses**



Posteroanterior of the skull

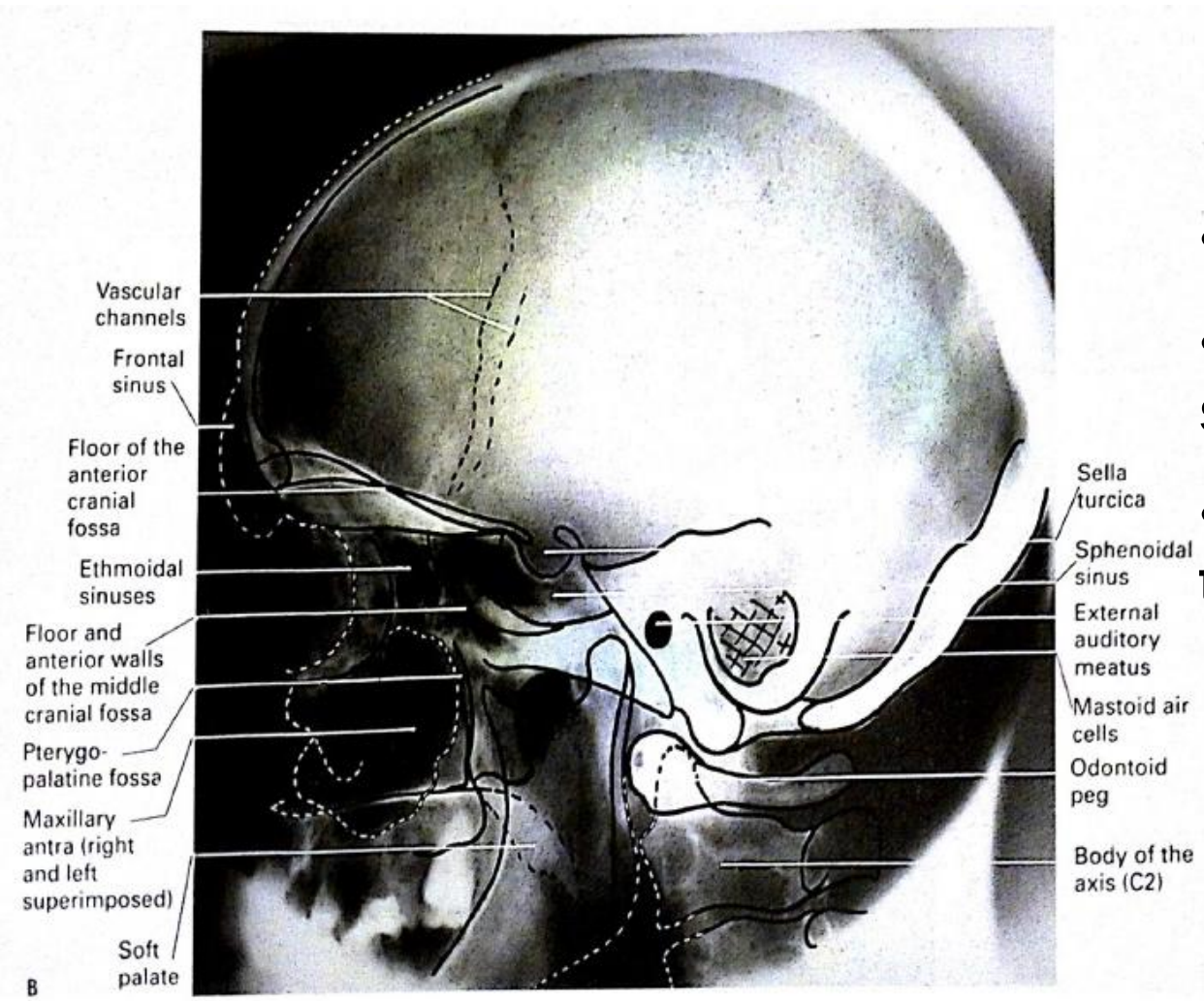




Indications:

- **Fractures of skull vault**
- **Frontal sinuses**
- **Condition os cranium (Morbus Paget Myeloma multiplex Hyperparathyroidism)**
- **Intracranial calcification**

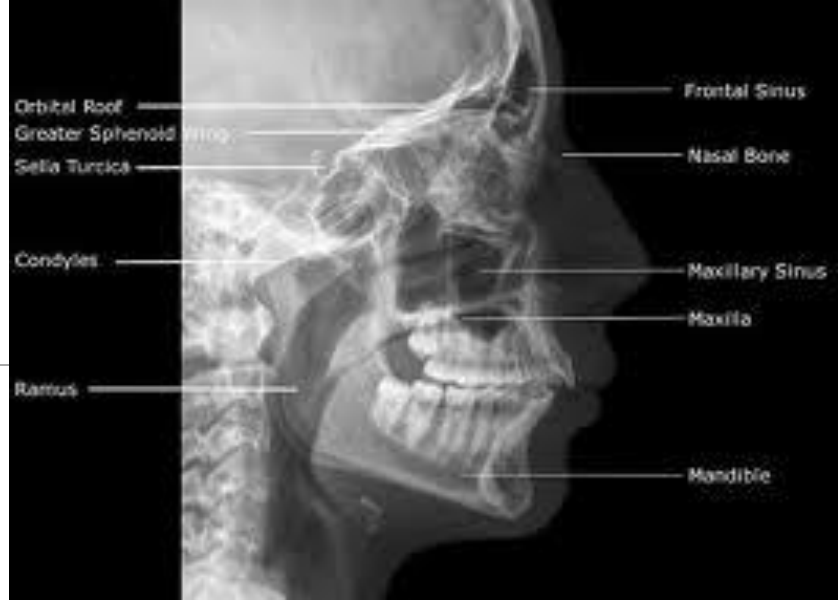
cephalometrical lateral



Indications:

- **Fractures of skull**
- **Ethmoidal and shpenoidal sinuses**
- **Condition of sella turcica**

Chepalometry



Measure relationship of cranial base to facial components

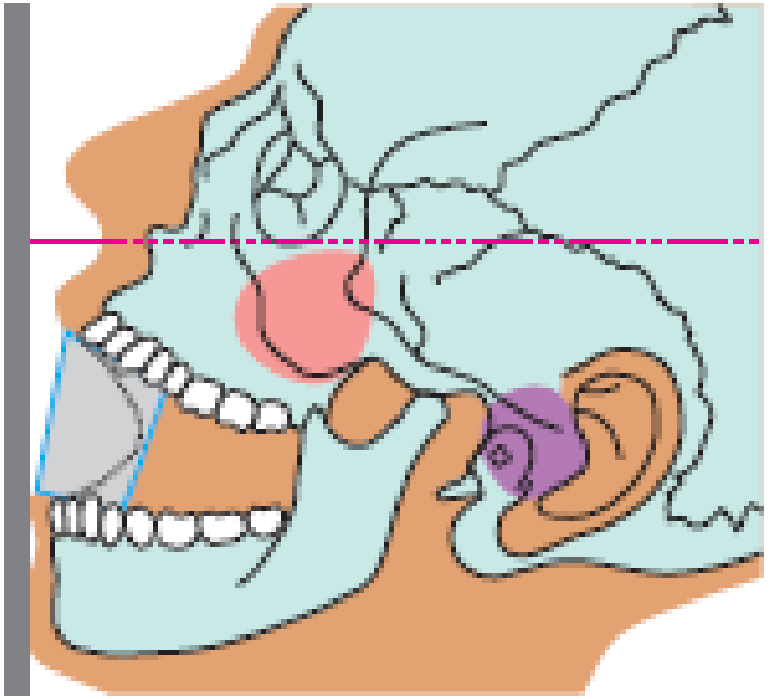
Create radiographic record of facial structural growht and development

Plan and monitor stages of treatment

Detect and diagnose abnormalities

PA Water's view (PNS)

- The image receptor is placed in front of the patient and perpendicular to the midsagittal plane.
- The patient's head is tilted upward so that the canthomeatal line forms a 37 degrees angle with the image receptor.
- If the patient's mouth is open, the sphenoid sinus will be seen superimposed over the palate.
- The central beam is perpendicular to the image receptor and centered in the area of maxillary sinuses.

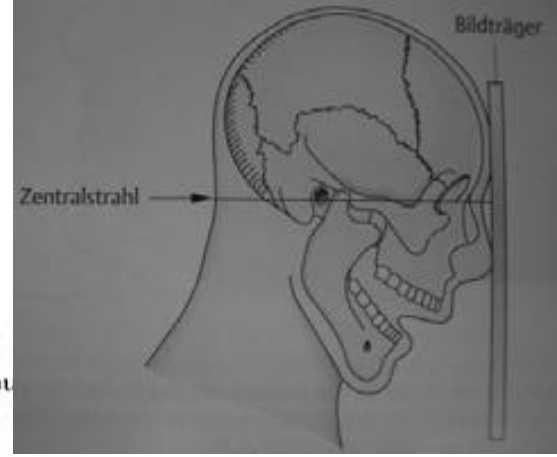


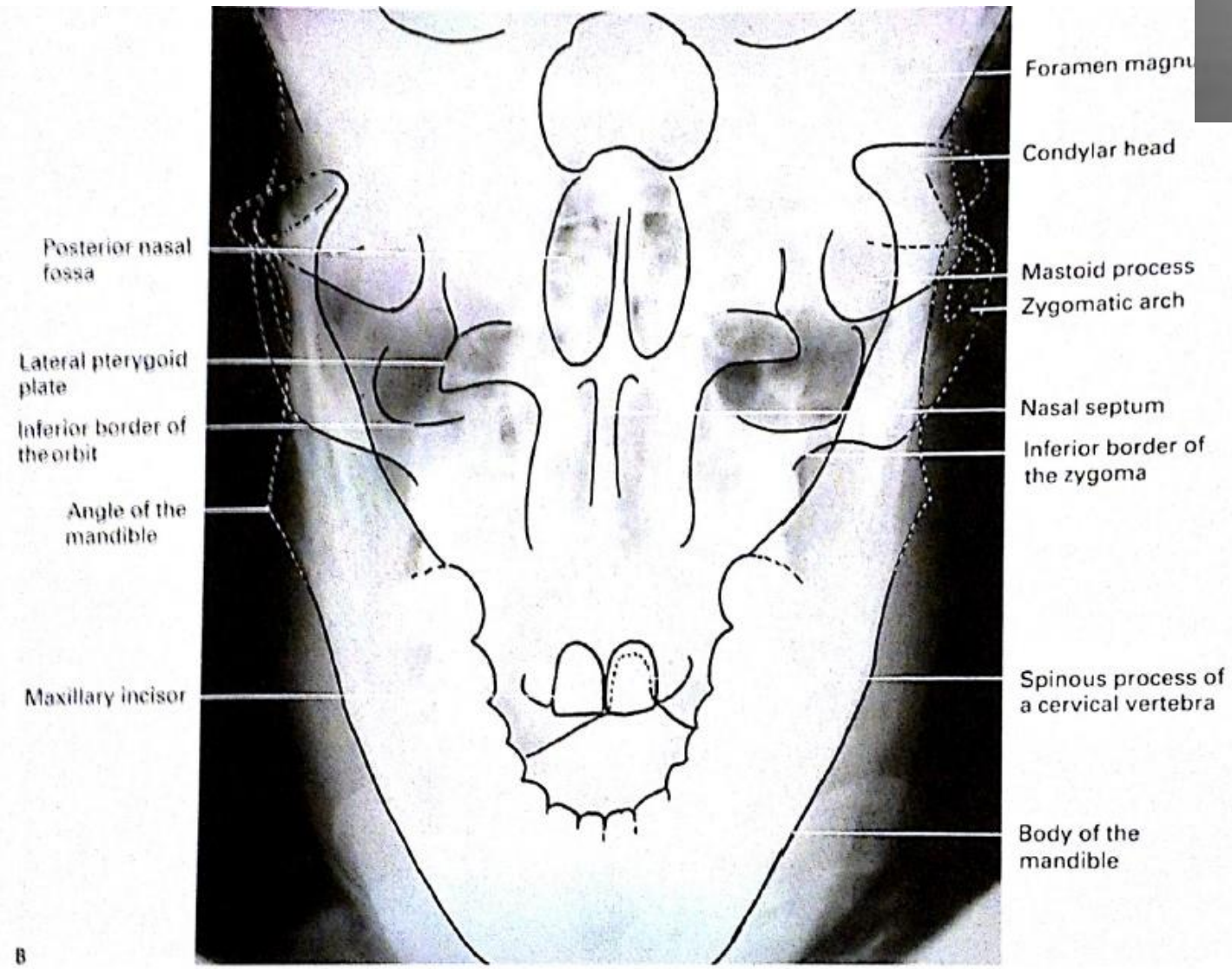
PA Water’s view (PNS)

Indikation:

- Sinus maxillaris
- Sinus frontalis

Reverse Towne's



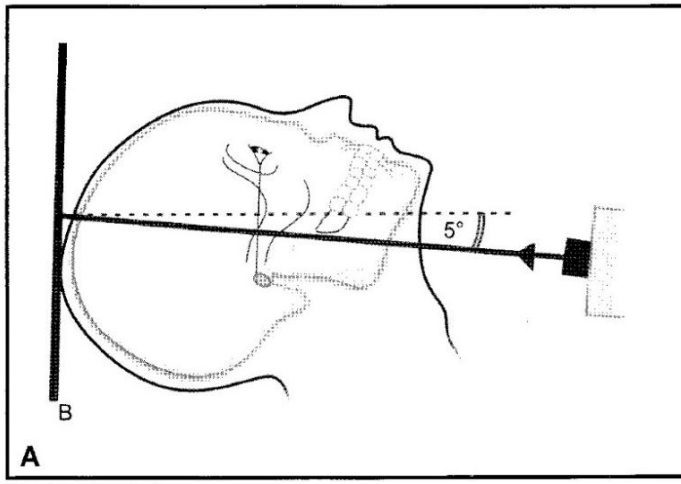


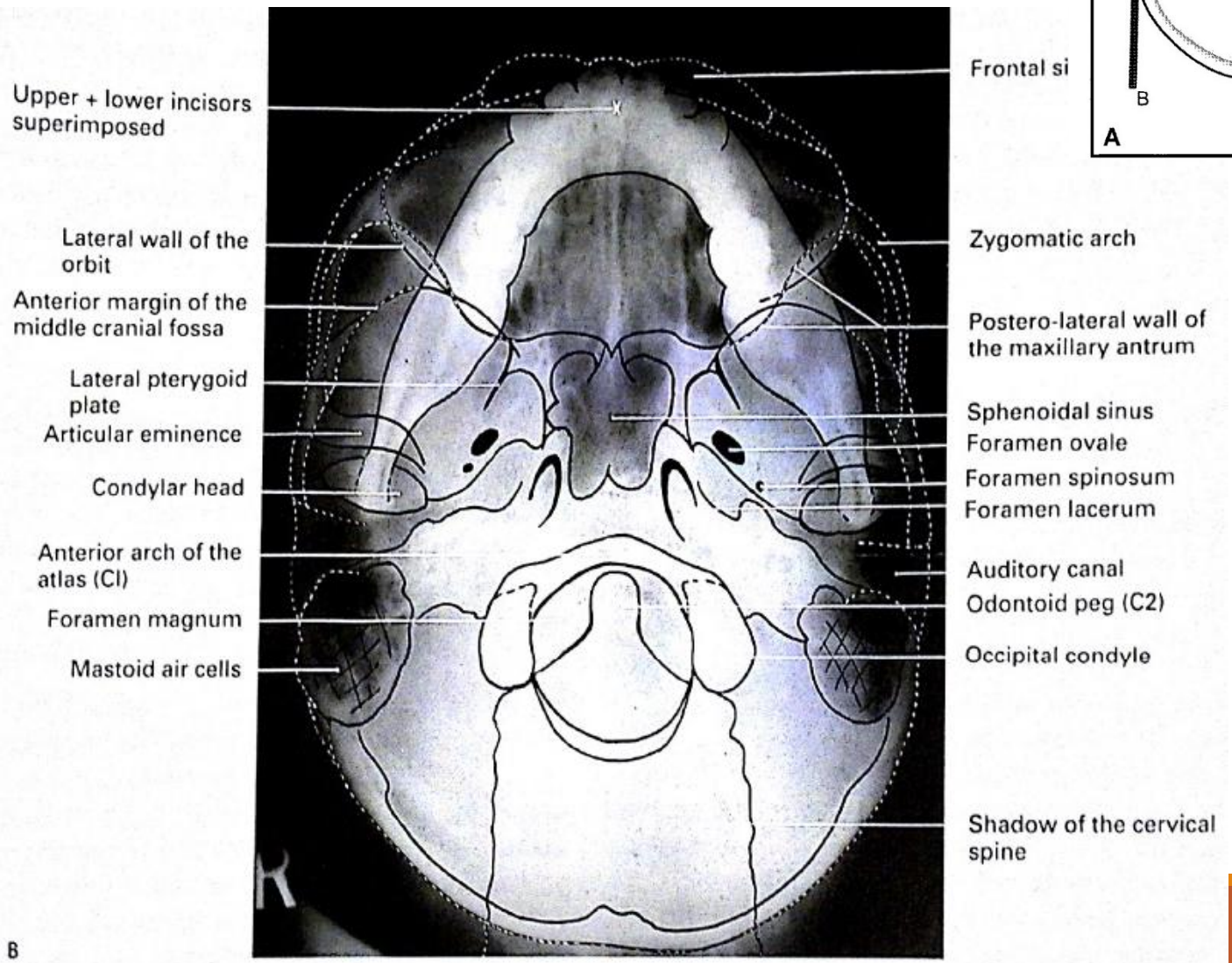
Indictaions:

- **Fracture of condylar neck**
- **Articular surface of**

  condylar head (TMJ d.)
- **Condylar hypoplasia**

Submentovertex



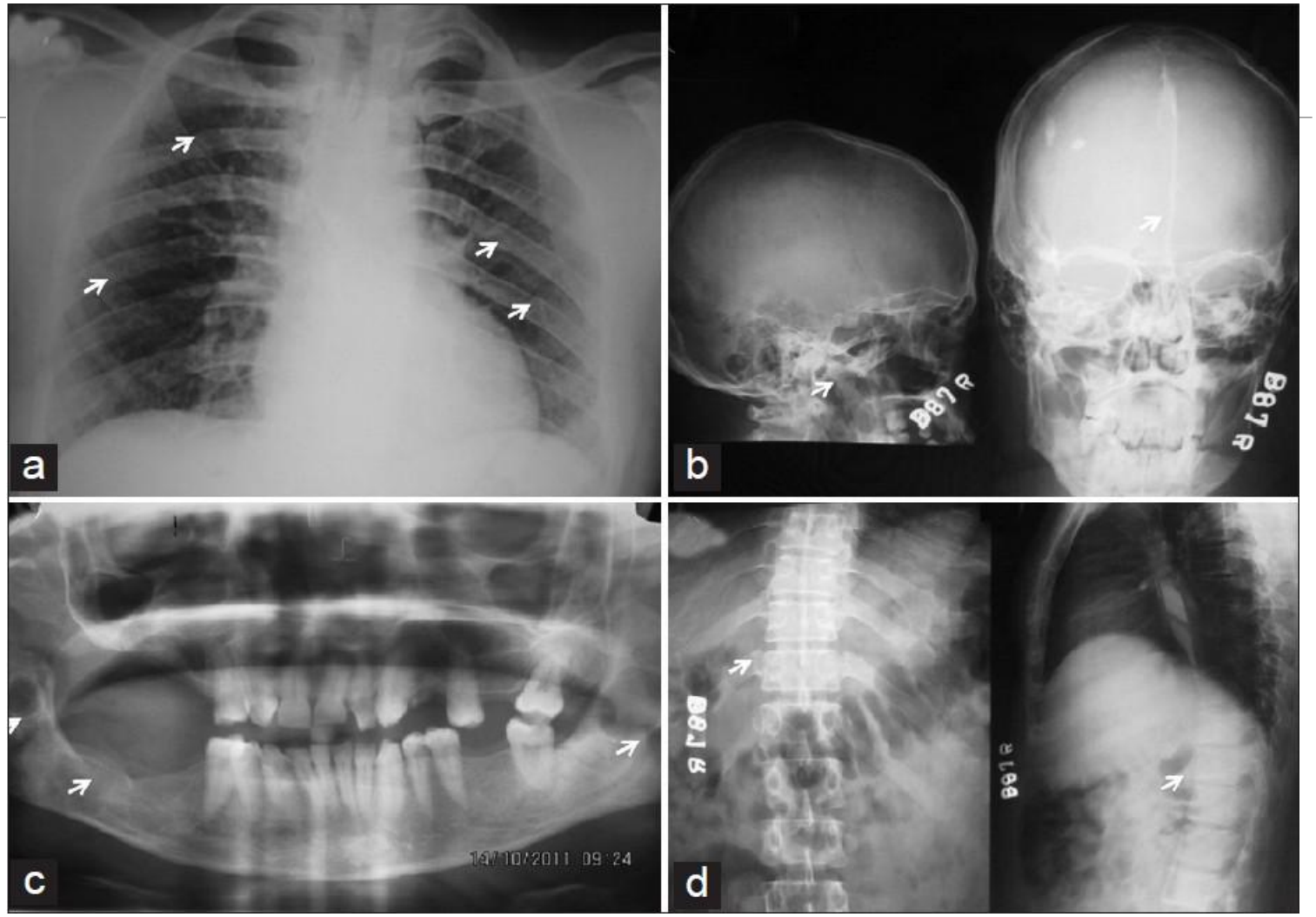


Indications:

- **Leasion of palate**
- **Sphenoidal sinus**
- **Fracture os zygomatic arches**

1.

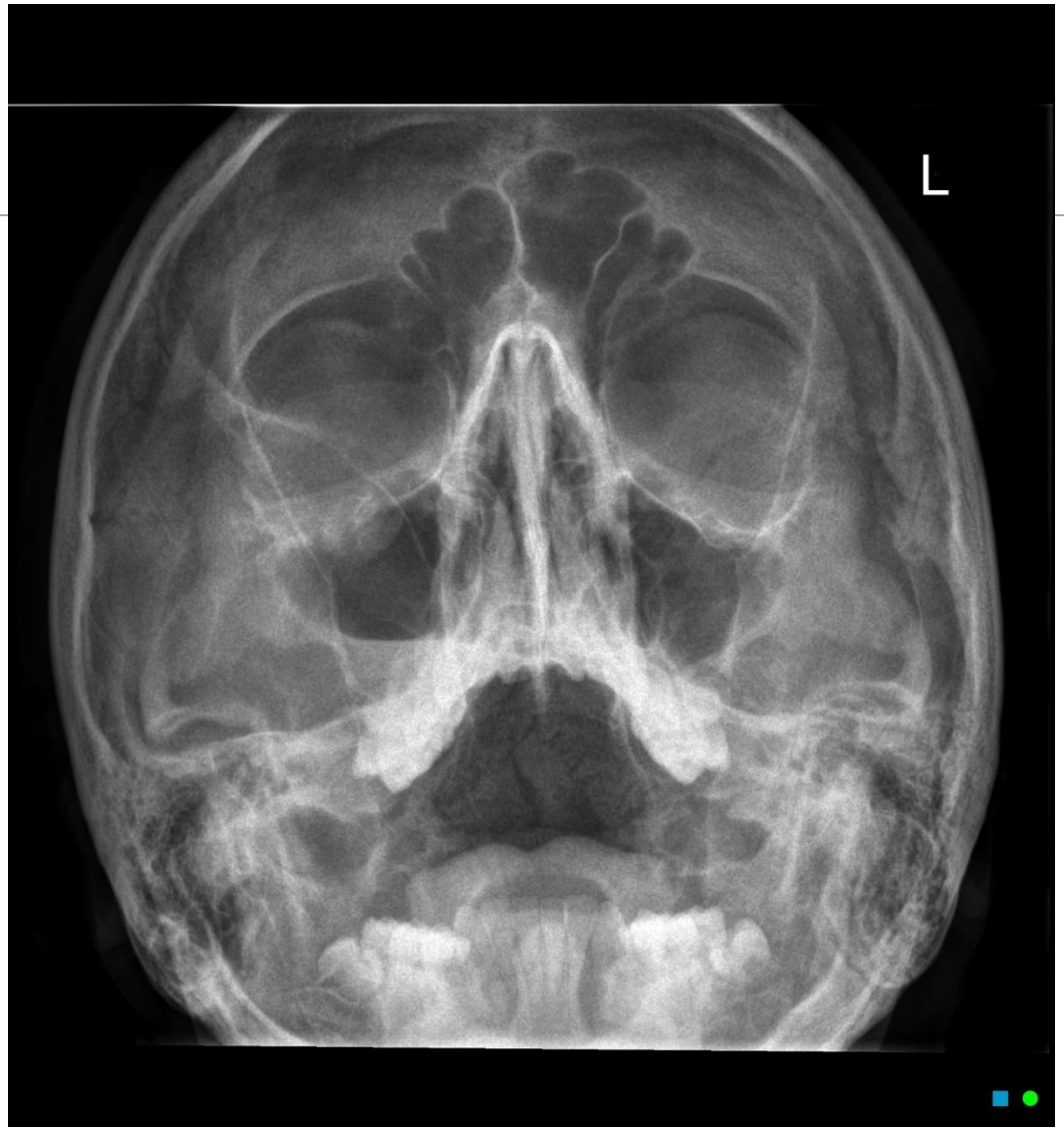
2



3.

4.

5.

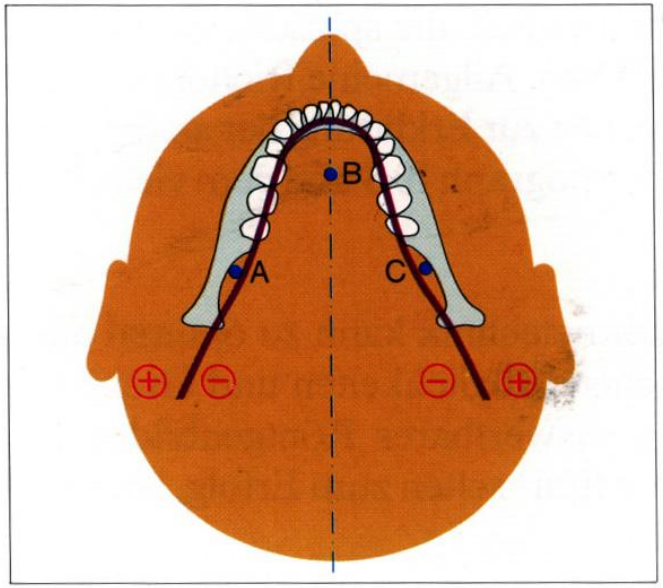


Panorama

Most common.

It is a technique for producing a single tomograp
image of facial structures that includes both ma
and mandibular arches and their supporting structures.

This is curvilinear variant of conventional tomography and is also used on the principle of the reciprocal movement of an x-ray source and an image receptor around a central point or plane called the image layer in which the object of interest is located.


B
A
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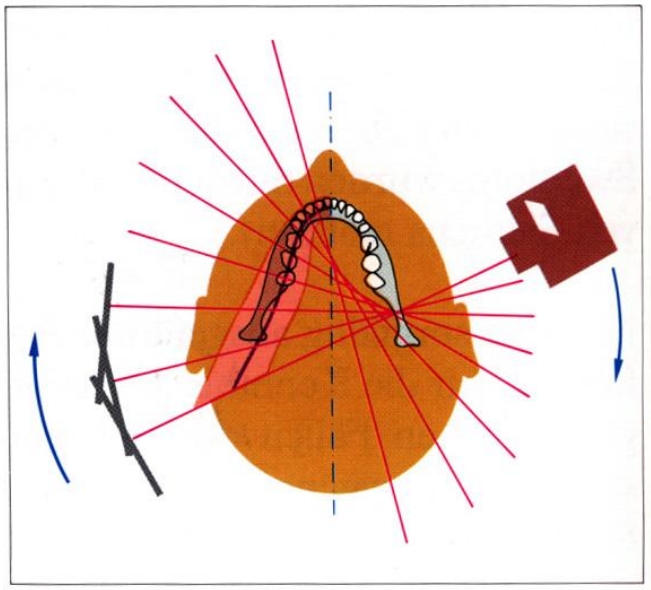
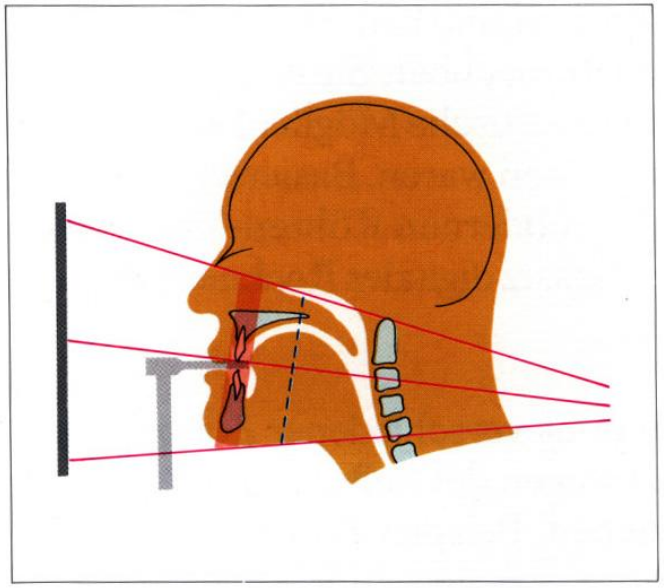
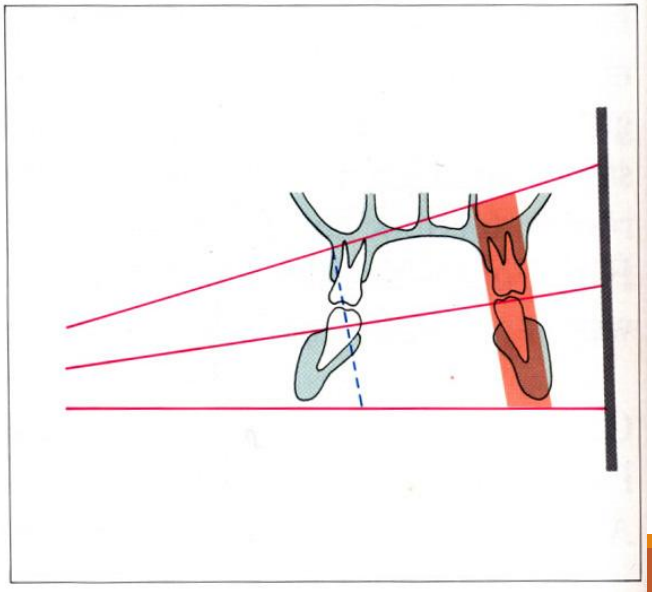
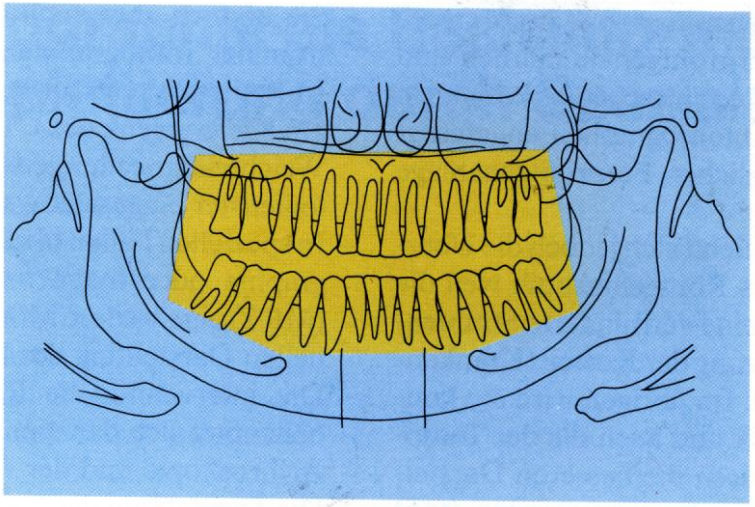
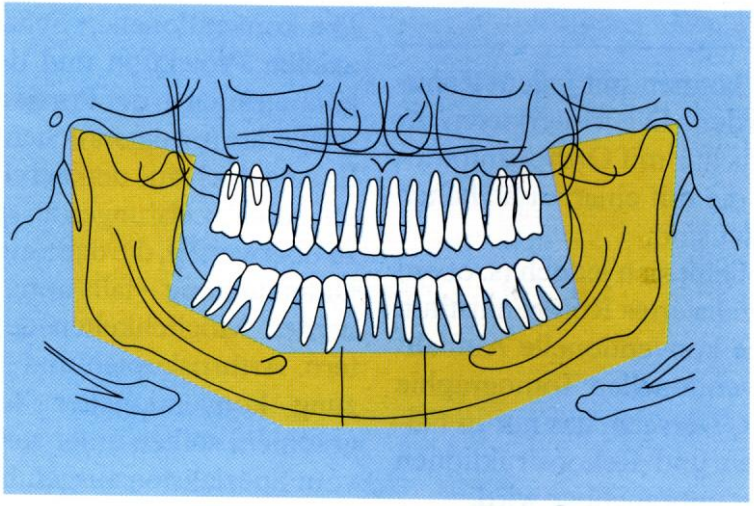
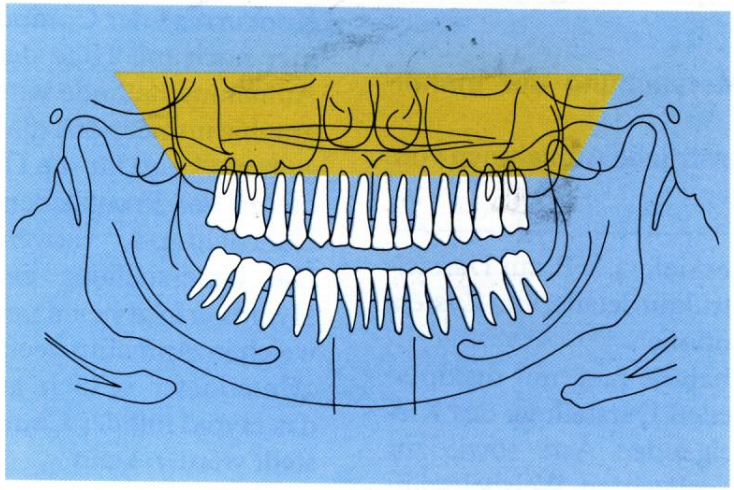


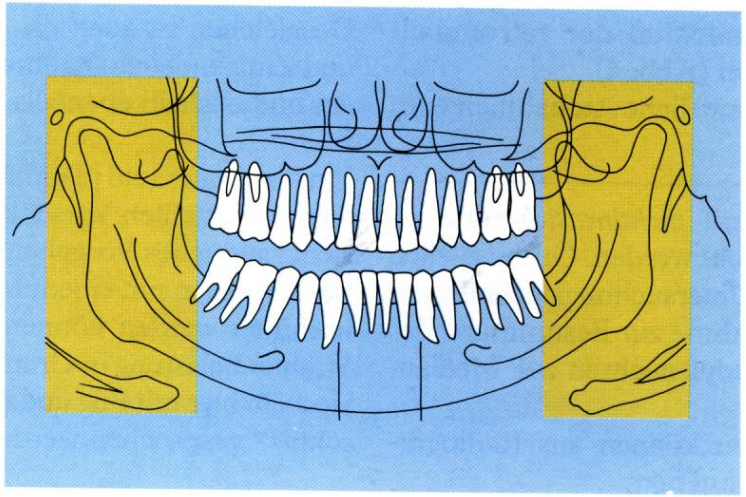












OPG

Indications-

Evaluation of-

Trauma

Location of third molars

Extensive dental or osseous disease

Known or suspected large lesions

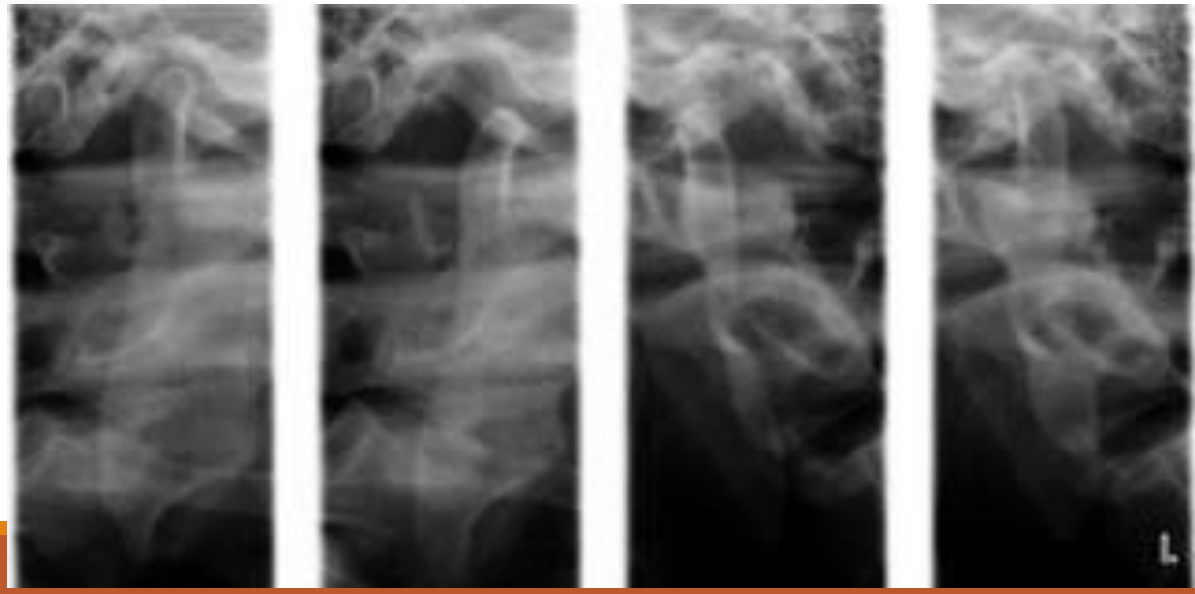
Tooth development

Retained teeth or root tips

TMJ pain

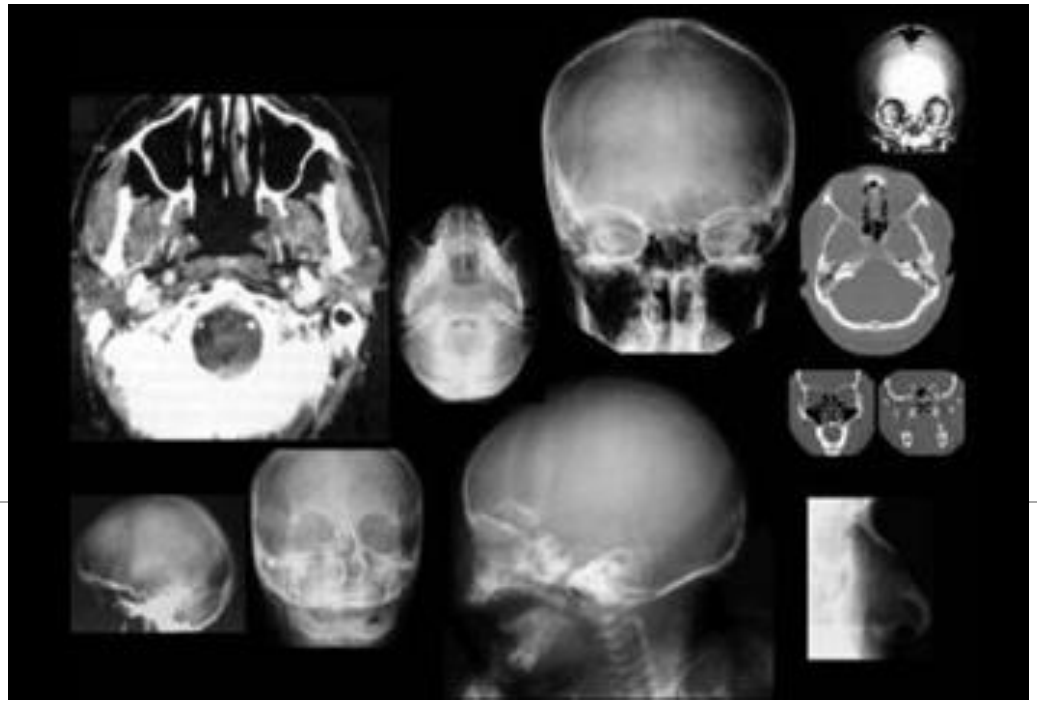
Dental anomalies etc.

OPG- TMJ



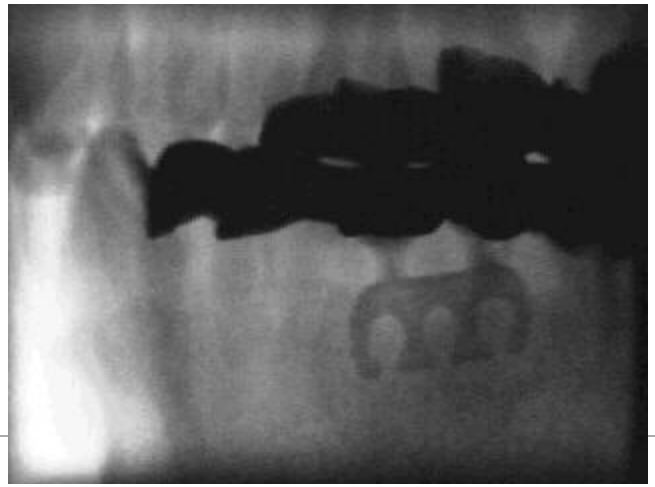
OTHER IMAGING MODALITIES

- **CBCT**
- **CT**
- **MRI**
- **USG**



Dental Cone Beam Computed Tomography

(CBCT)



Cone Beam Maxillofacial Imaging Systems

Imaging Sciences Int'l - I-Cat

Imtec Imaging - Iluma

Vatech - DCT

Hitachi - CB MercuRay

J. Morita - 3D Accuitomo

Yoshida/Terarecon - FineCube

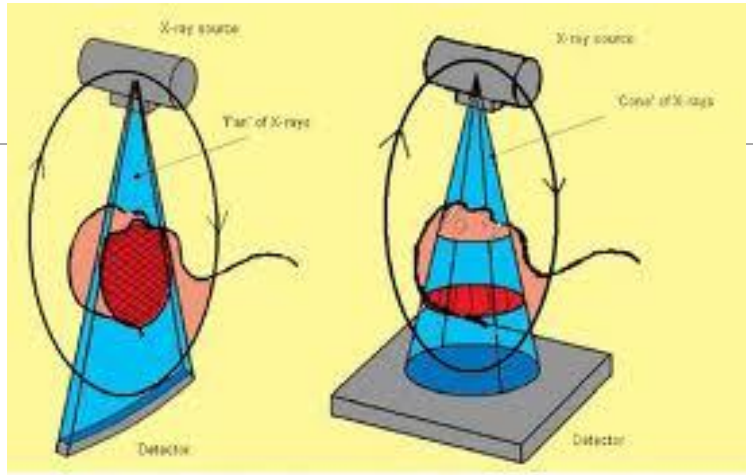
A voxel is the smallest distinguishable box-shaped part of a 3-D image. The term voxel is short for volume pixel.

Voxels serve as the building blocks of 3-D imaging such as dots per inch (dpi) in the computer industry

The distance between any two pixels is called inter-pixel distance and this represents real-world distance

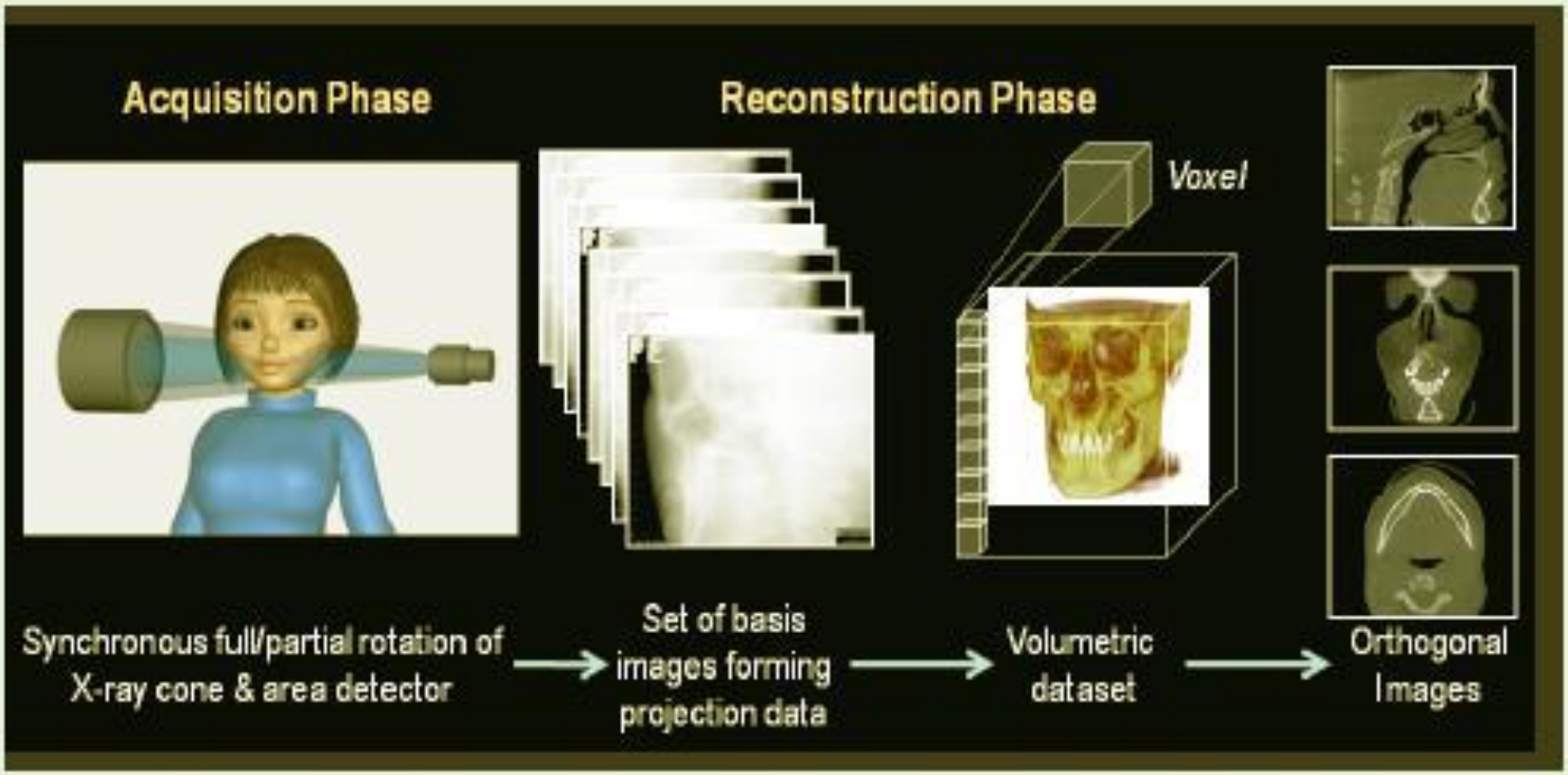
As an image is taken, it is presented in “slices” to represent vertical & horizontal depth

C B C T versus Medical C T



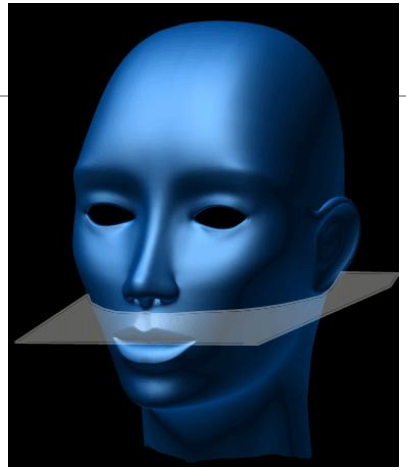
- Med CT
  - Conventional linear fan beam
  - Single row or a series (4, 8, 12, 32, 64) of solid state detectors
  - Provides a set of consecutive slices of the patient
- CBCT
  - Cone beam
  - Square 2 dimensional array of detectors
  - Provides a volume of data

FIGURE 1: THE MECHANICS OF CBCT ACQUISITION



Multiple basis projections form the projection data from which orthogonal planar images are secondarily reconstructed in cone beam geometry.

CBCT Reference Planes



Axial

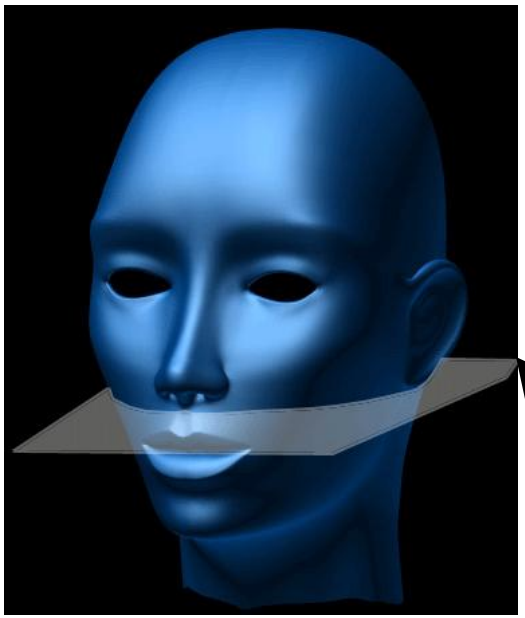
Sagittal

Coronal

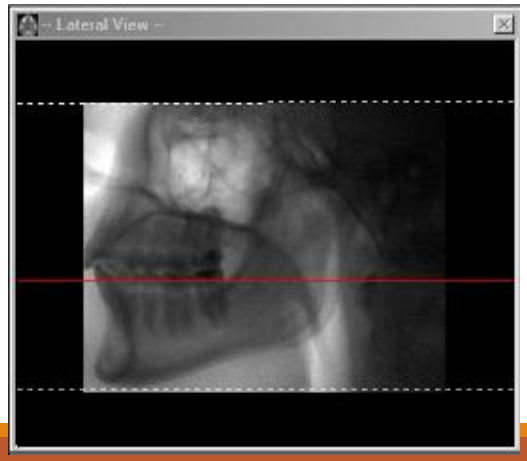
Transaxial

Axial Plane

(Transverse)



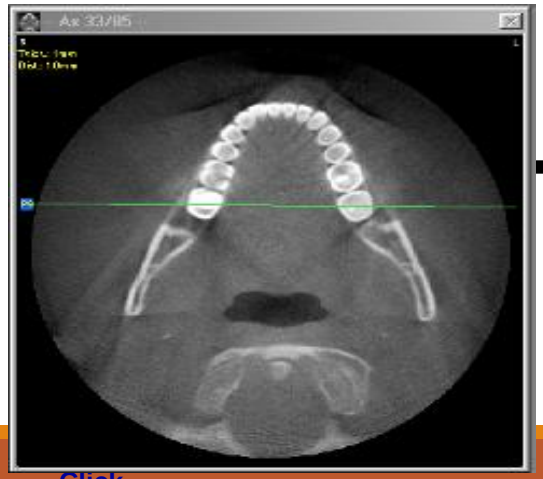
This is an Axial image..



…that represents this area of anatomy

Coronal Plane

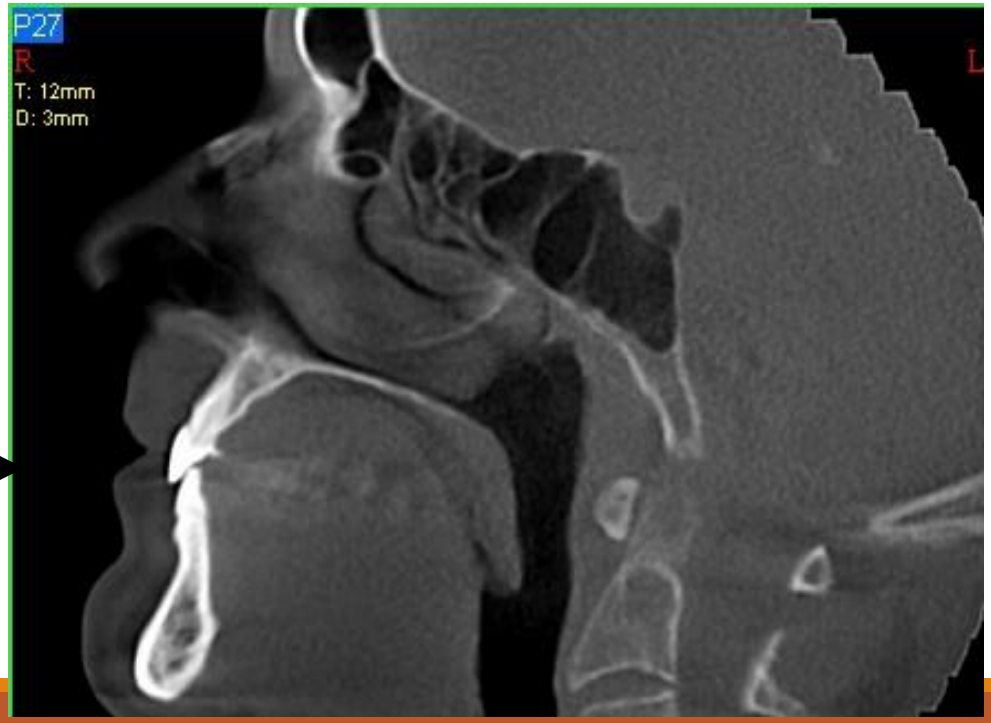
Coronal Plane slices through the anatomy from side to side.



Click

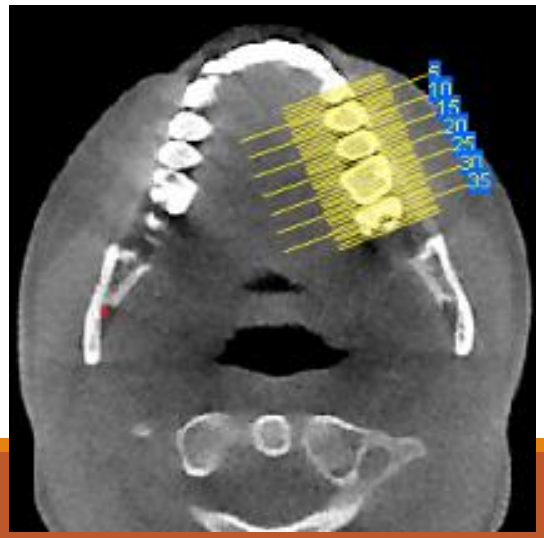
Sagittal Plane

Sagittal Plane is a slice through the anatomy from front to back



Click

Series of Cross-Sectionals/Transaxials

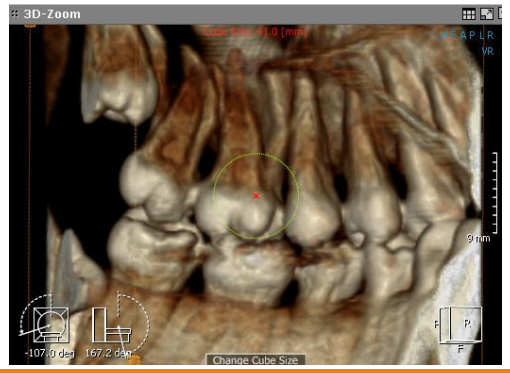


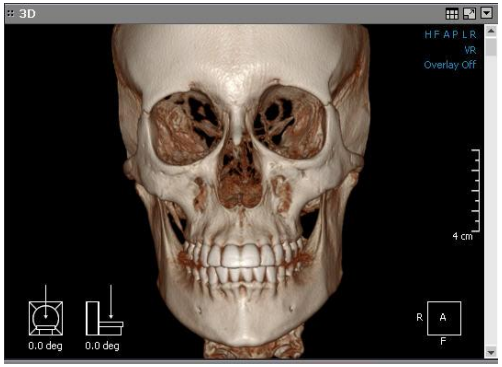
Cross sectional images of an area can be developed with .5 to 5mm spacing between images.


H
R
A

Clinical Applications of CBCT

- Dental Implant Planning & Guidance
- Temporomandibular Evaluation
- Pre-surgical Assessment
- Impacted Teeth
- Reconstructive
- Airway Assessment
- Orthodontic Assessment
- Periodontics
- Endodontics
- Pathology





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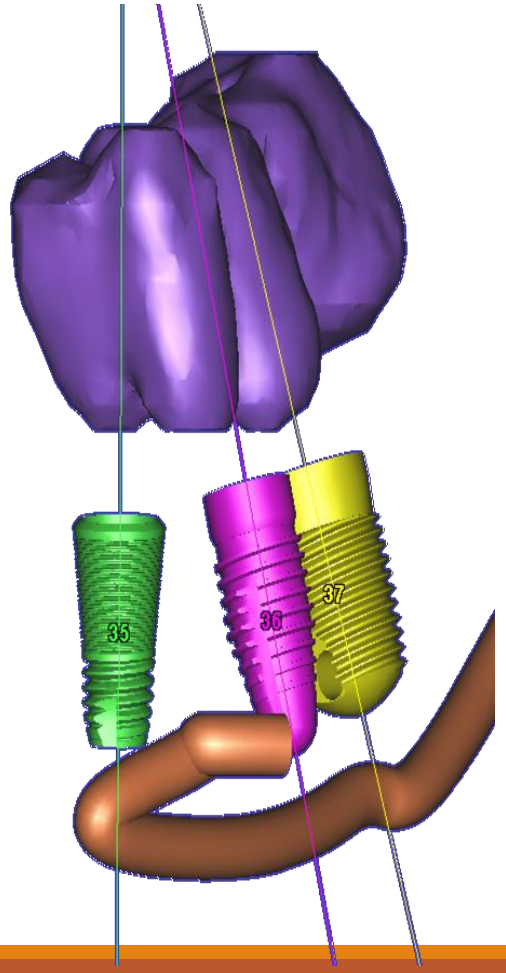

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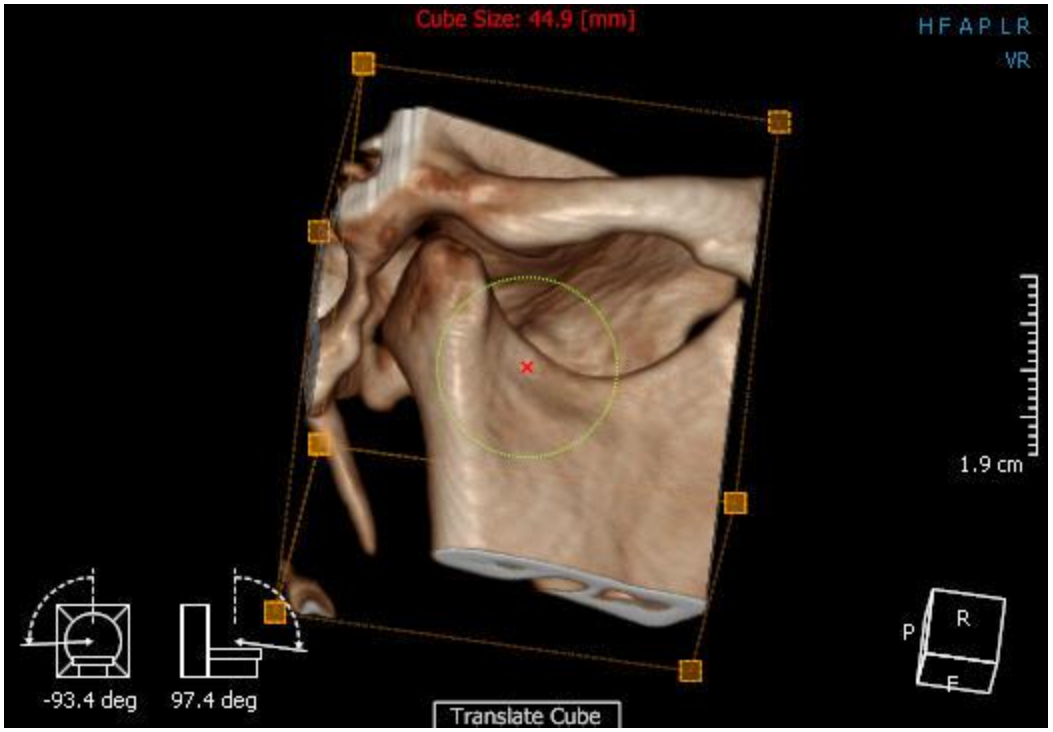
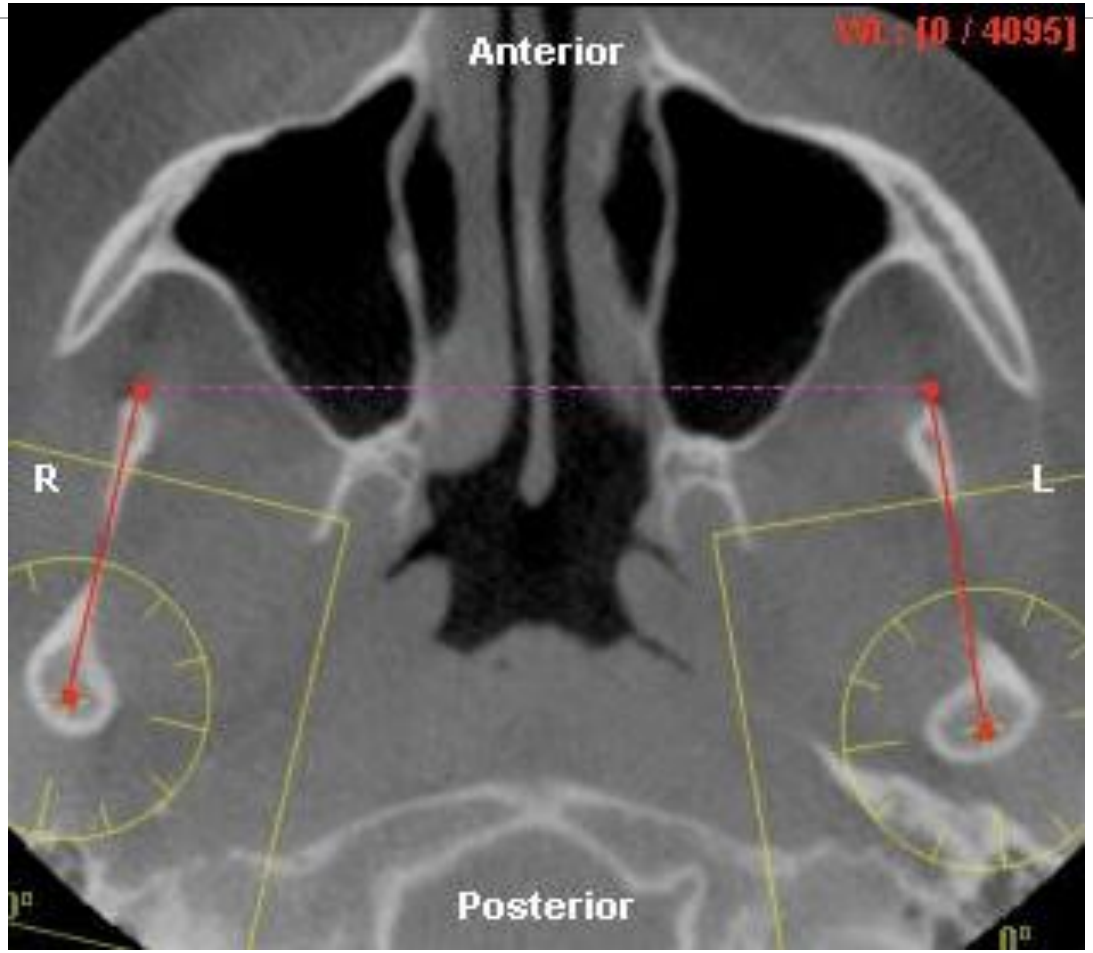


CBCT TMJ view



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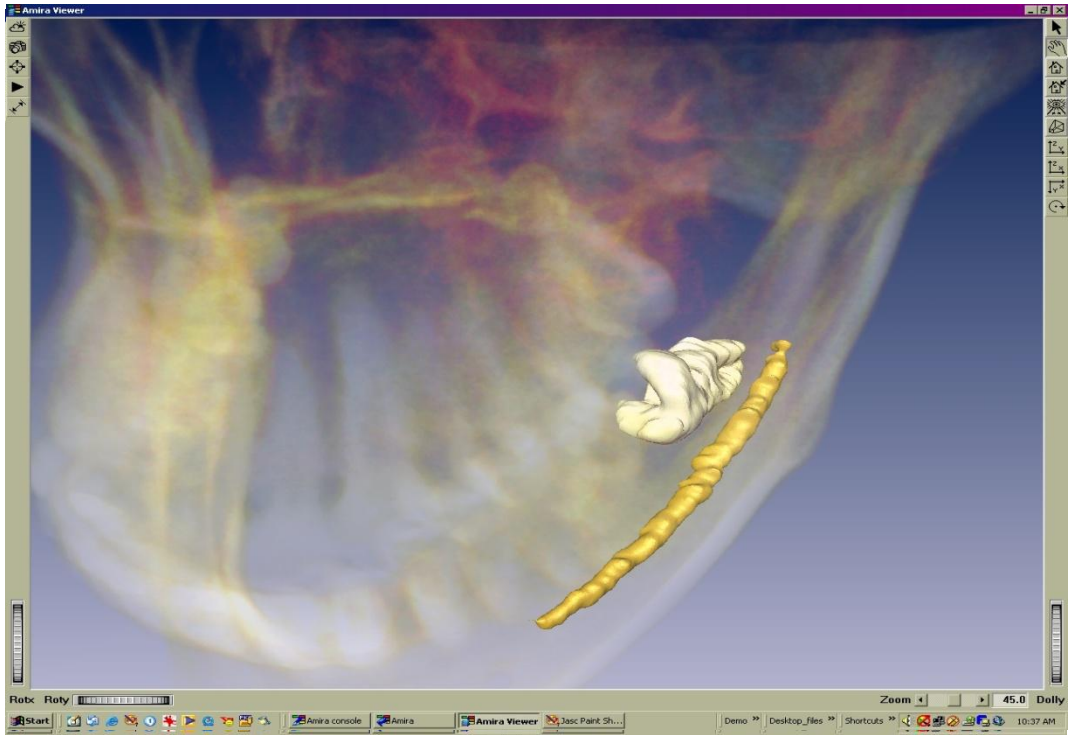
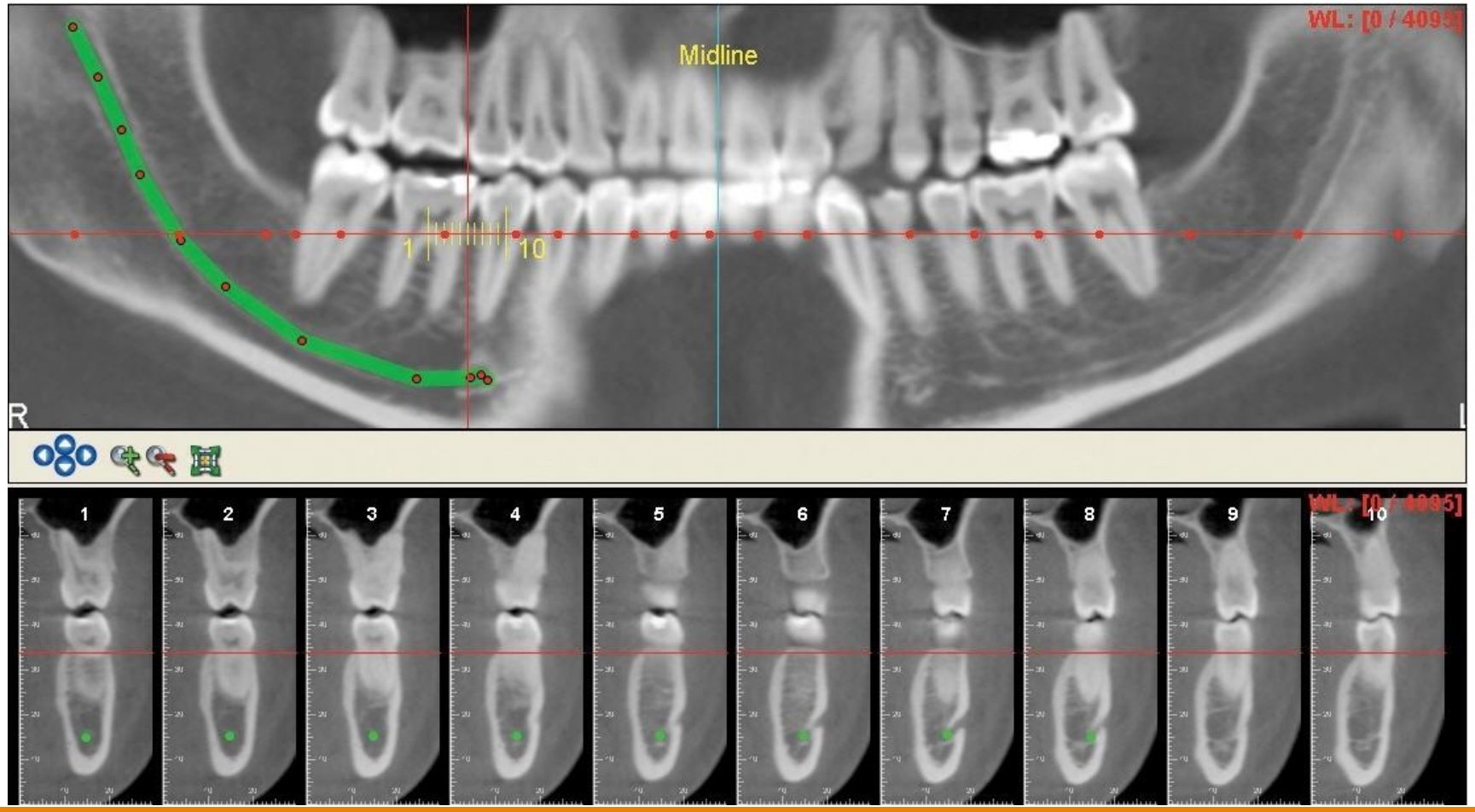


C B C T

Nerve Mapping



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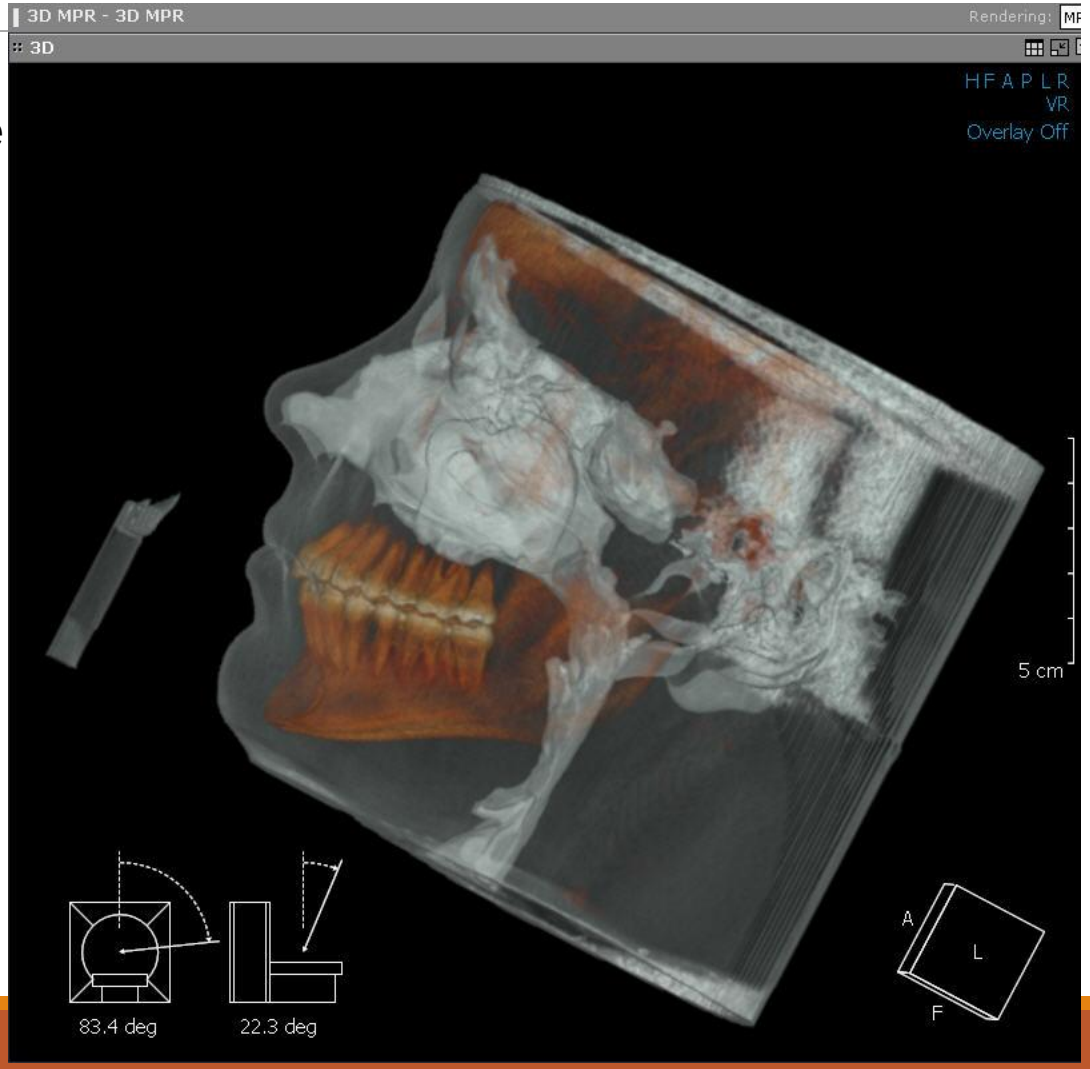

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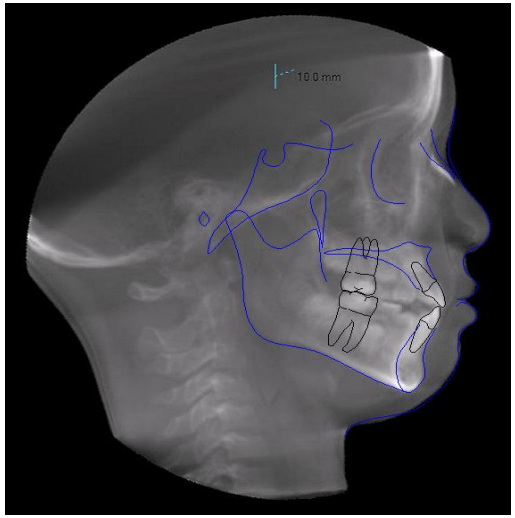
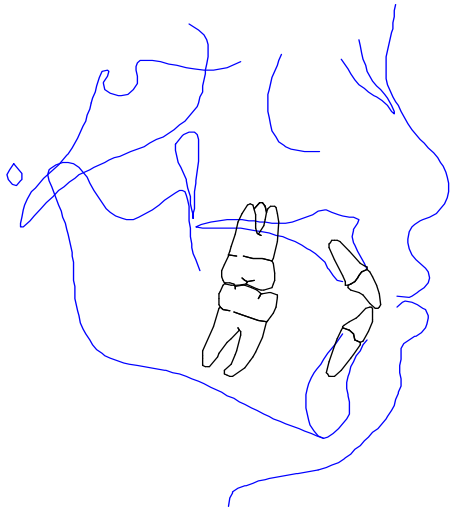
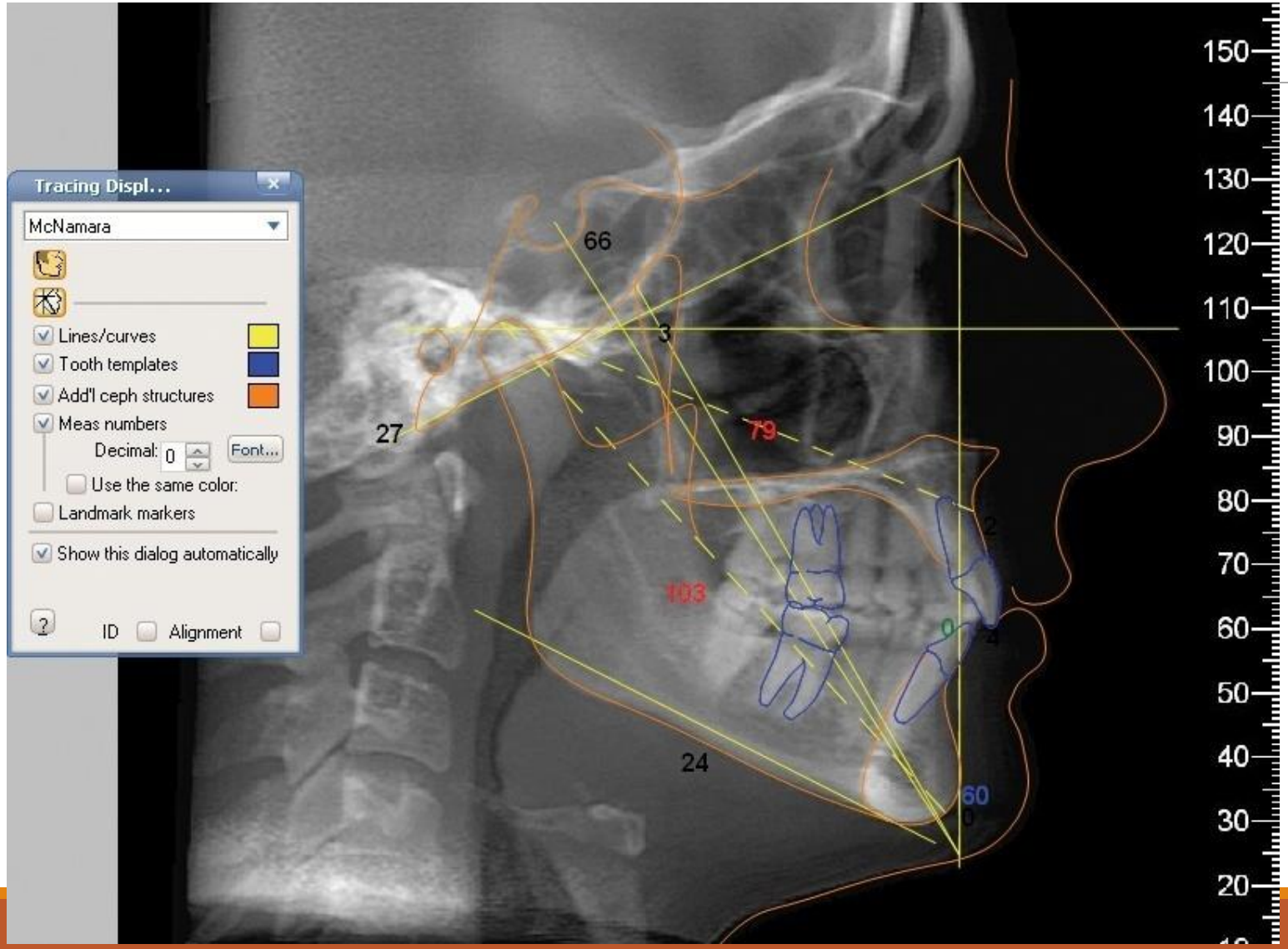
- Pathology





C B C T - ORTHO

Ceph Tracing



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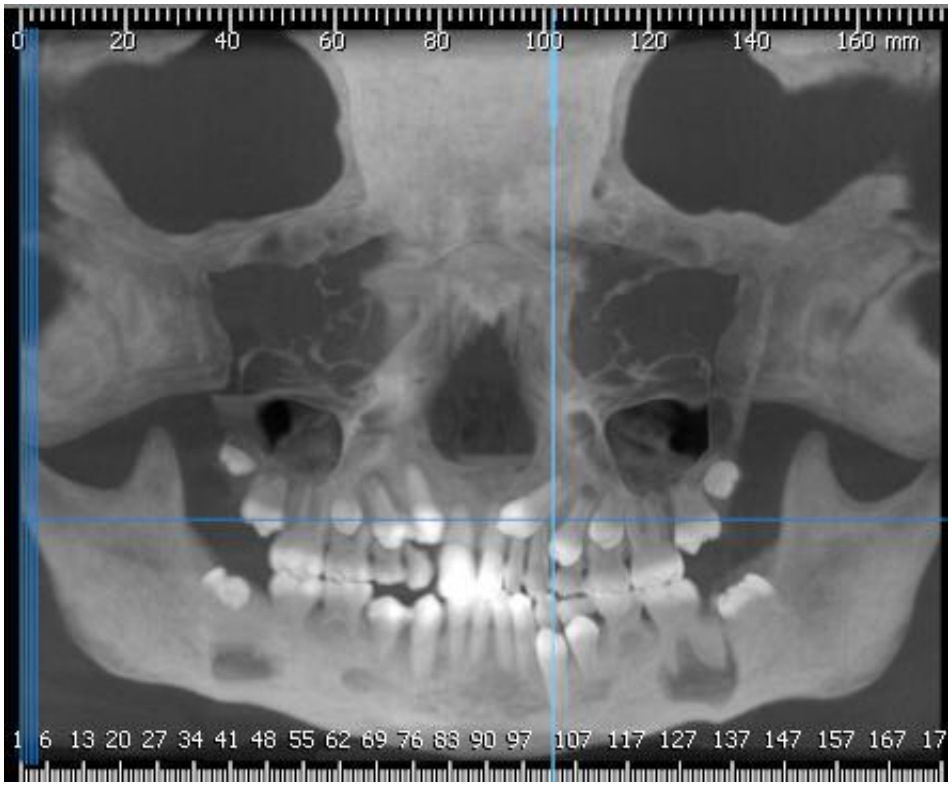
- Endodontics
- ***Pathology***



COMPUTED TOMOGRAPHY

Indications-

The diagnosis and extent of

Variety of infections

Osteomyelitis

Cysts

Benign and malignant tumors

Trauma in the maxillofacial region

Lesions involving the bone

3D CT has been applied to trauma and craniofacial reconstructive surgery and used for treatment of congenital and acquired deformities.

MRI

Indications-

To evaluate the position and integrity of the disk in the TMJ.

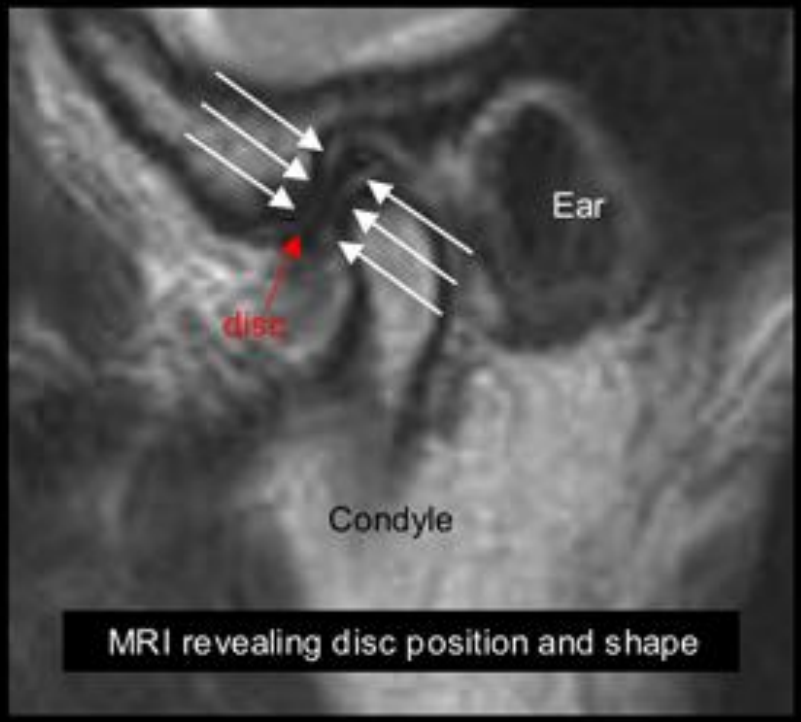
Neoplasia involving the soft tissues, such as tongue, cheek, salivary glands, and neck.

Determining malignant involvement of lymphnodes.

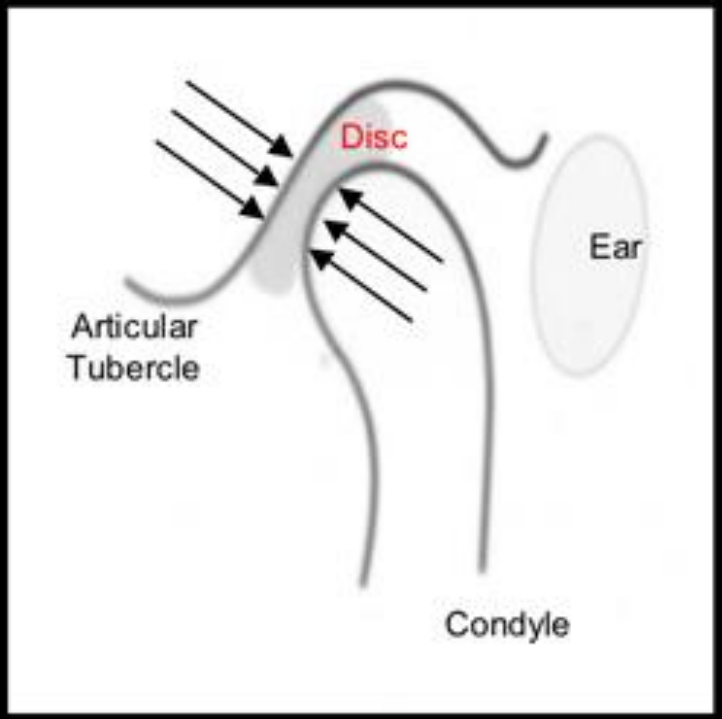
Determining perineural invasion by malignant neoplasms.

With contrast, enhances the image resolution of neoplasia.

The Maintenance of a Functional Disc Position Requires the Application of Force



MRI revealing disc position and shape



During mouth opening and closing, force needs to be directed to keep the disc engaged between the condyle and the posterior slope of the articular tubercle. That force should be directed in an anterior-superior direction based on anatomy.

ULTRASONOGRAPHY

Indications-

For the evaluation of

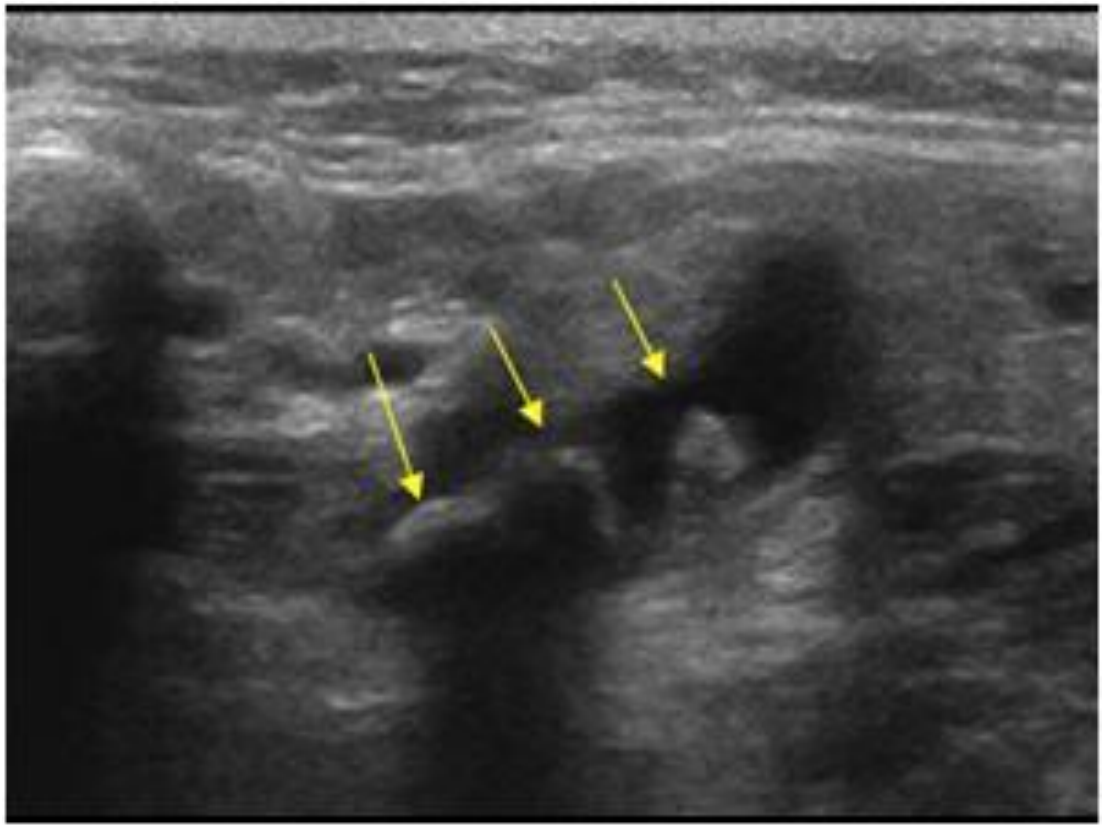
Neoplasms in the thyroid, paathyroid or salivary glands or lymphnodes.

Stones in salivary glands or ducts

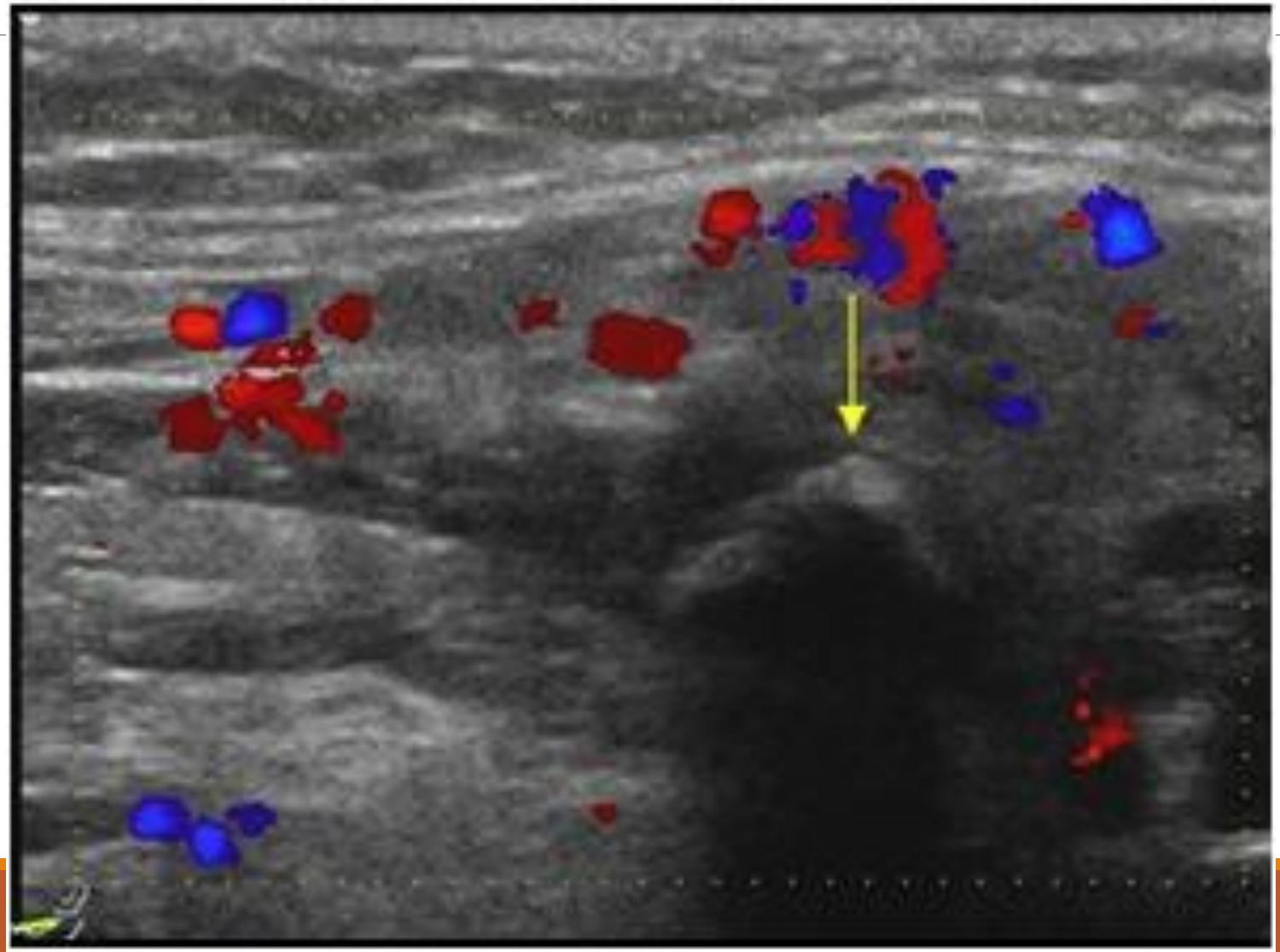
Vessels of neck

To guide fine-needle aspiration in the neck

Sialolithiasis and sialadenitis with a swollen hypervascularized submandibular gland and multiple stones in a dilatated Wharton's duct



Stone in the hilum of the gland



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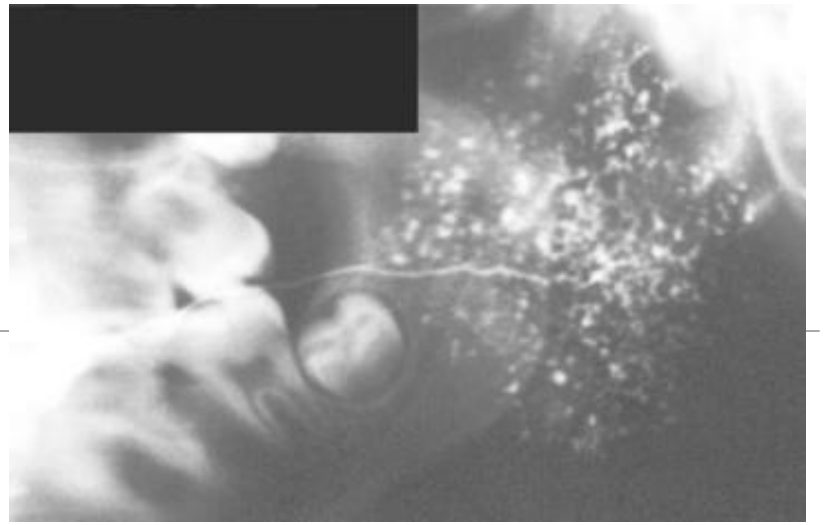
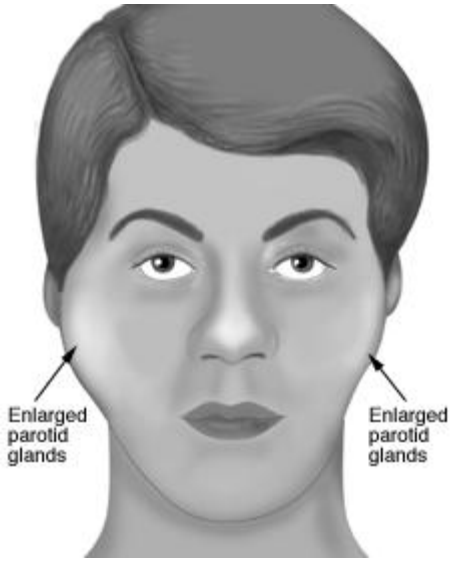



LT Parotid Long


Enlarged parotid glands
Enlarged parotid glands

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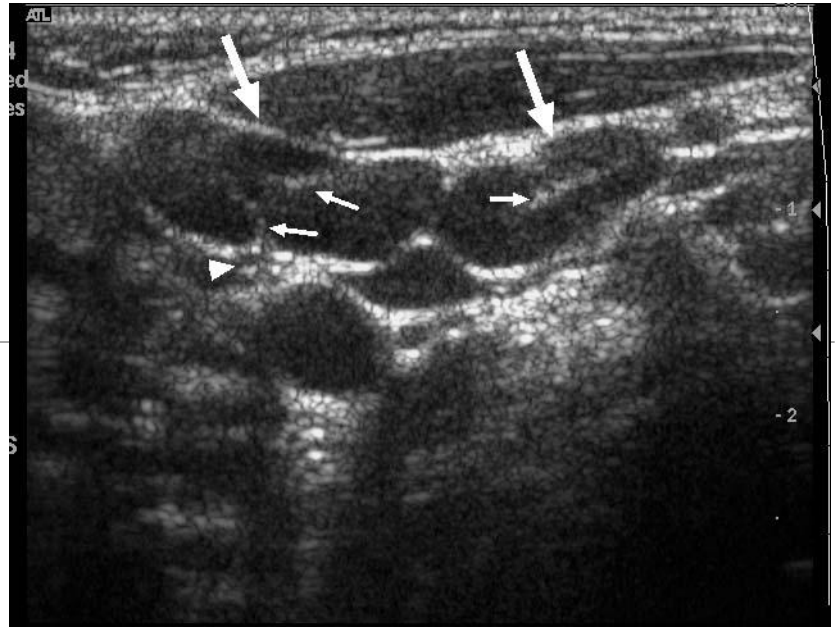

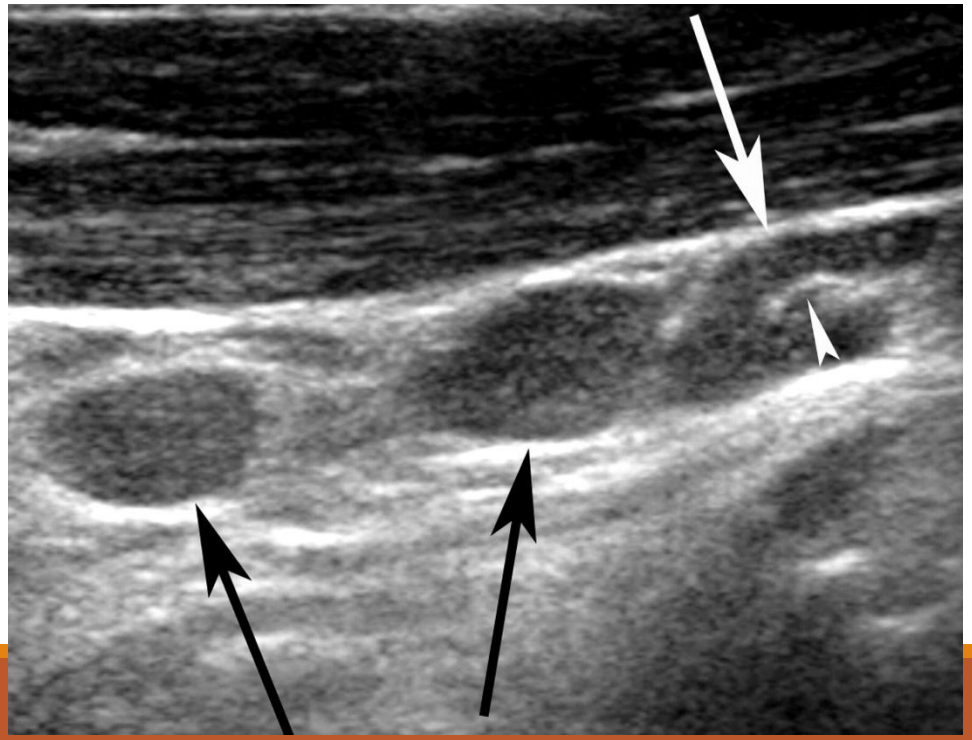

Better Understanding for Better Choices