EXTRA ORAL RADIOGAPHS

Extra oral radiographic examination

Extra oral radiographs include all views made of orofacial region with film positioned extra orally. The dentists often used these views to examine area not fully covered with intra oral films or to visualize skull and facial structures.

Skull Projections

Radiographic examination of the skull requires patience, attention to detail, and practice to achieve satisfactory results.

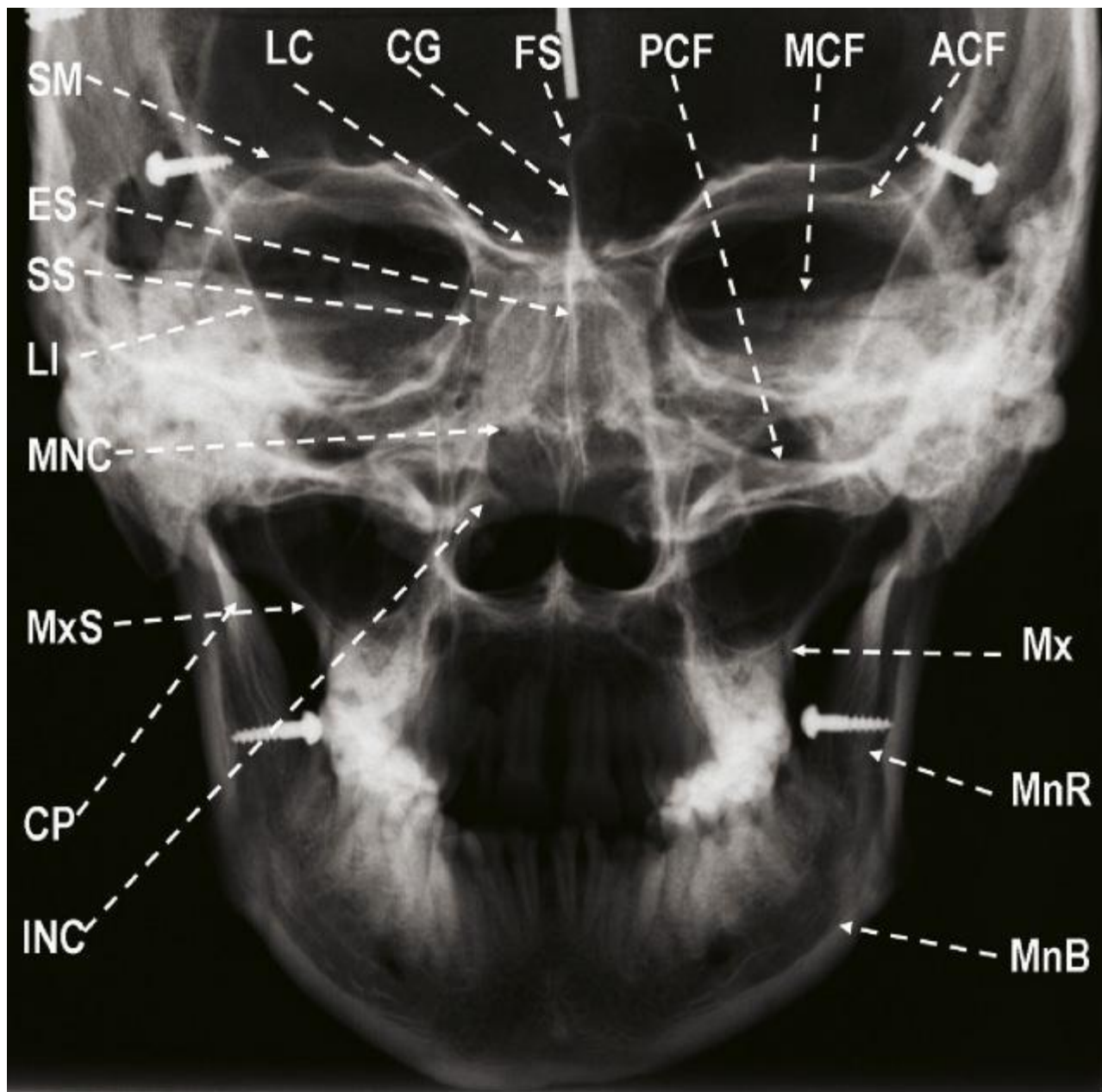# 1-POSTEROANTERIOR   PROJECTION

 * The straight posteroanterior (PA) projection is so named because the x-ray beam passes in a posterior-toanterior direction through the skull.
 *This projection is used **to examine the skull for disease,trauma,ordevelopmentalabnormalities**.
 * It also provides a good record for detecting progressive changes in the mediolateral dimensions of the skull, including asymmetric growth.
 *In addition, the PA projection offers good visualization of facial structures, including **the frontal and ethmoid sinuses, nasal fossae, and orbits**.

Representative image obtained from the posteroanterior skull projection (Frankfort horizontal parallel). LC, lamina cribrosa; CG, crista galli; FS, frontal sinus; PCF, posterior cranial fossa; MCF, middle cranial fossa (petrous temporal); ACF, anterior cranial fossa; Mx, maxilla; MnR, mandibular ramus; MnB, mandibular body, INC, inferior nasal conchae; CP, coronoid process of mandible; MxS, maxillary sinus; MNC, middle nasal conchae; LI, linea innominata (innominate line); SS, sphenoid sinus; ES, ethmoid sinus; SM, supraorbital margin.

3-WATERS'PROJECTION (*Inclined PA,*)

 *The Waters' projection (also called the occipitomental projection) is a variation of the PA view.

 * It is particularly useful for evaluating **the maxillary sinuses**.

 * In addition, it demonstrates **the frontal and ethmoid sinuses, the orbit, the zygomaticofrontal suture, and the nasal cavity.**

*It also demonstrates the position of the coronoid process of the mandible between the maxilla and the zygomatic arch.
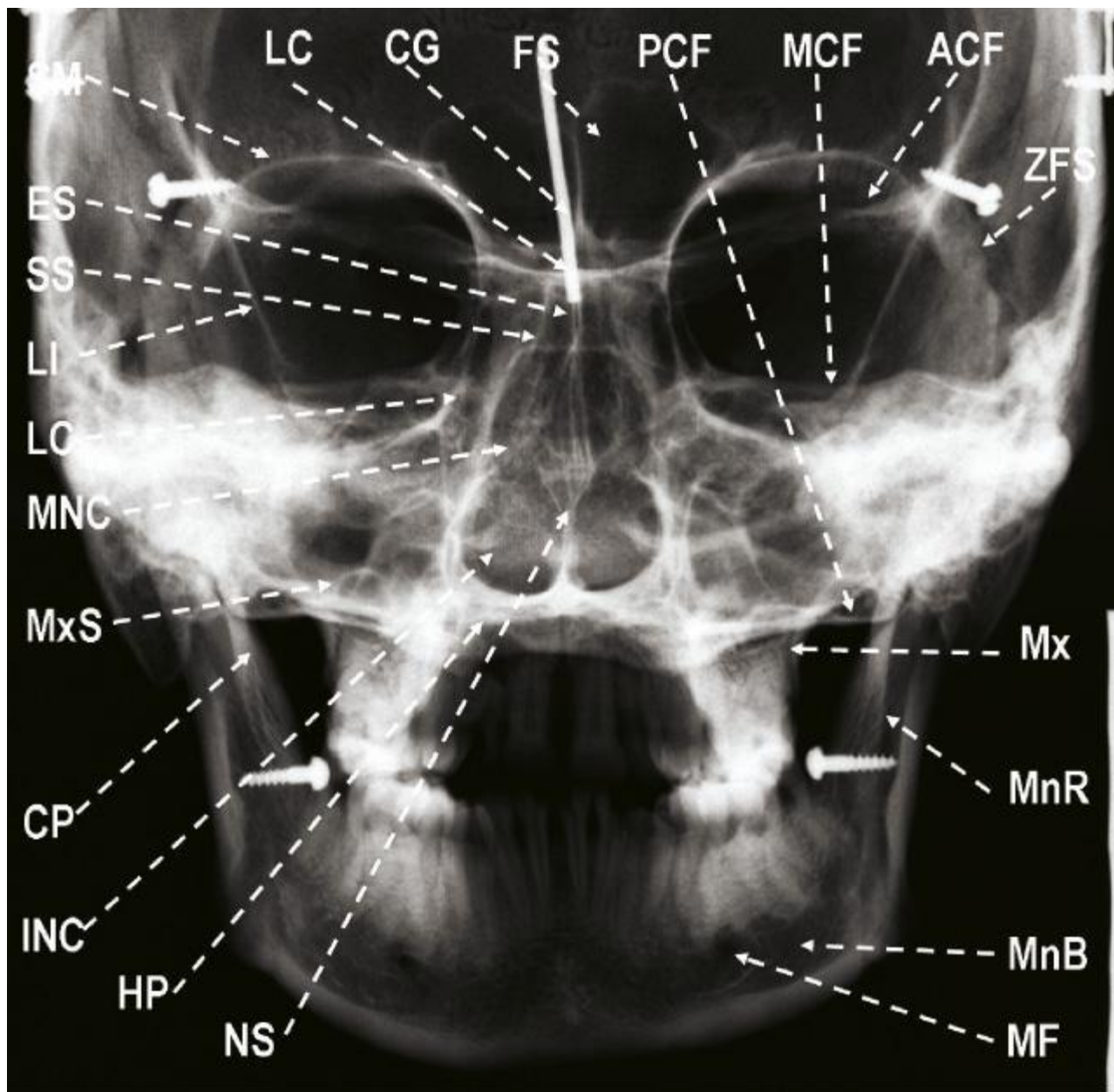
Representative image obtained from the posteroanterior skull projection (tragocanthal line parallel). LC, lamina cribrosa; CG, crista galli; FS, frontal sinus; PCF, posterior cranial fossa;
MCF, middle cranial fossa (petrous temporal); ACF, anterior cranial fossa; Mx, maxilla; MnR, mandibular ramus; MnB, mandibular body;
MF, mental foramen; INC, inferior nasal conchae; CP, coronoid process of
mandible; MxS, maxillary sinus; LC, lacrimal canal; MNC, middle nasal
conchae; LI, linea innominata (innominate line); SS, sphenoid sinus; ES,
ethmoid sinus; SM, supraorbital margin; ZFS, zygomaticofrontal suture;
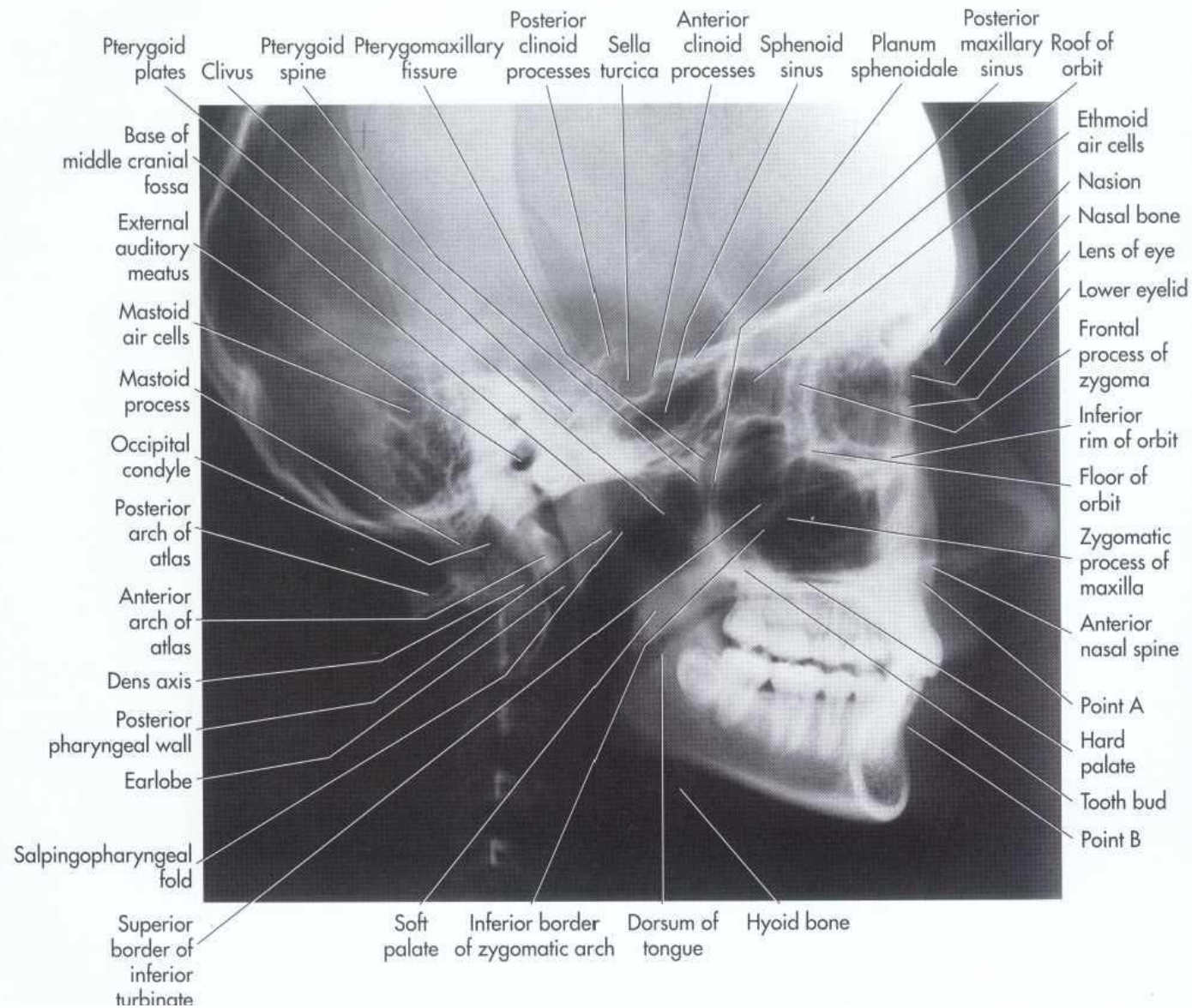NS, nasal septum; HP, hard palate.

2- LATERAL SKULL PROJECTION (LATERAL CEPHALOMETRIC PROJECTION)

*The lateral skull projection is used to **survey the skull and facial bones for evidence of trauma, disease, or developmental abnormality**.

* **This view reveals the nasopharyngeal soft tissues, paranasal sinuses, and hard palate**.

*Orthodontists use it to assess **facial growth**, and it is used in oral surgery and prosthetics to es-tablish pretreatment and posttreatment records.

*The lateral cephalometric projection reveals the facial soft tissue profile but otherwise is identical to the lateral skull view

Pterygoid plates · Clivus · Pterygoid spine · Pterygomaxillary fissure · Posterior clinoid processes · Sella turcica · Anterior clinoid processes · Sphenoid sinus · Planum sphenoidale · Posterior maxillary sinus · Roof of orbit

Base of middle cranial fossa

External auditory meatus

Mastoid air cells

Mastoid process

Occipital condyle

Posterior arch of atlas

Anterior arch of atlas

Dens axis

Posterior pharyngeal wall

Earlobe

Salpingopharyngeal fold

Superior border of inferior turbinate

Soft palate · Inferior border of zygomatic arch · Dorsum of tongue · Hyoid bone

Ethmoid air cells

Nasion

Nasal bone

Lens of eye

Lower eyelid

Frontal process of zygoma

Inferior rim of orbit

Floor of orbit

Zygomatic process of maxilla

Anterior nasal spine

Point A

Hard palate

Tooth bud

Point B

4-REVERSE-TOWNE'SPROJECTION

*The reverse-Towne's projection is used to examine radiographically a patient suspected of having a **condylar fracture of the neck**.

*This projection is particularly suitable for revealing a **medially displaced condyle**.
The reverse-Towne's projection also reveals the **posterolateral wall of the maxillary antrum.**
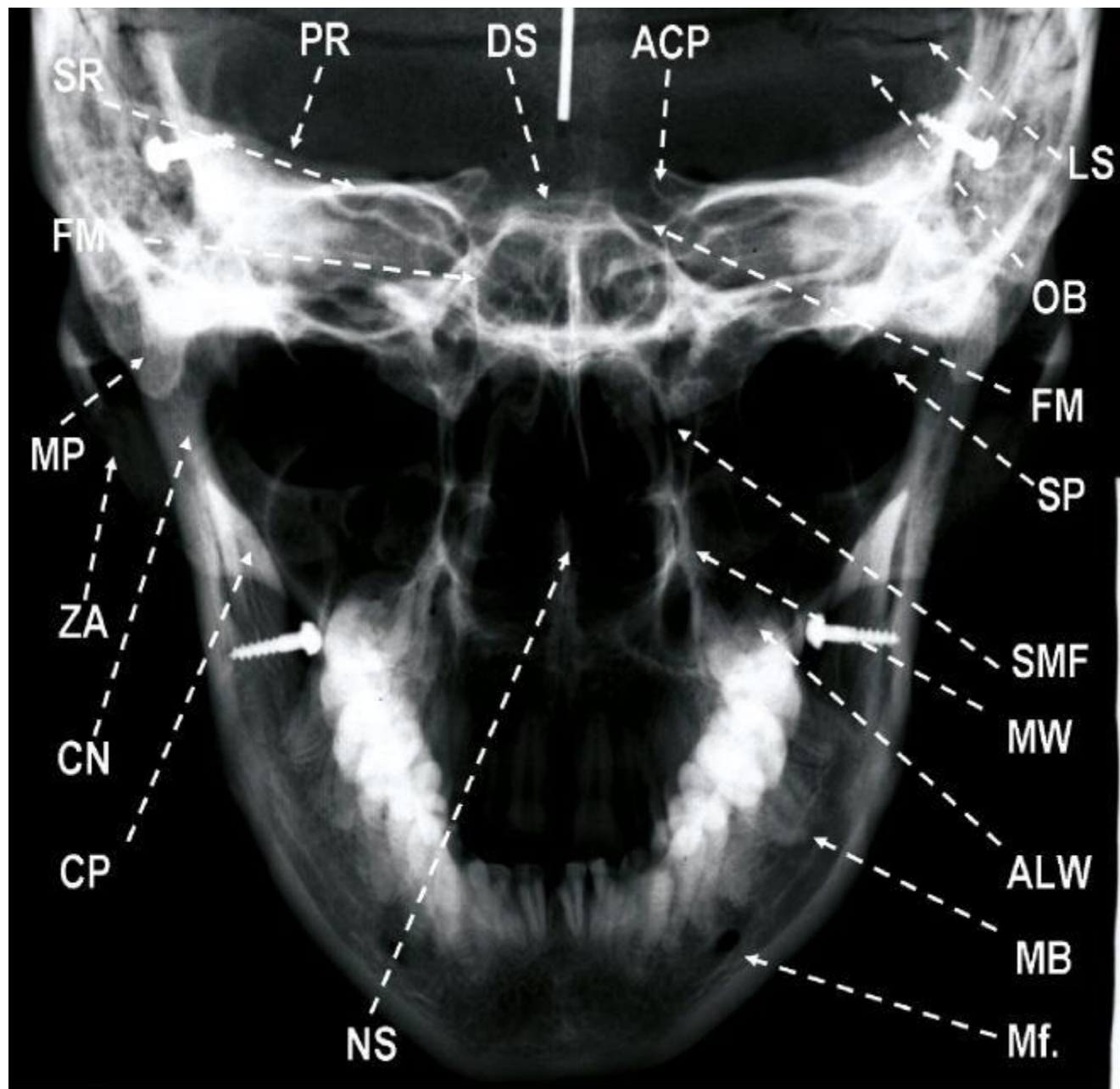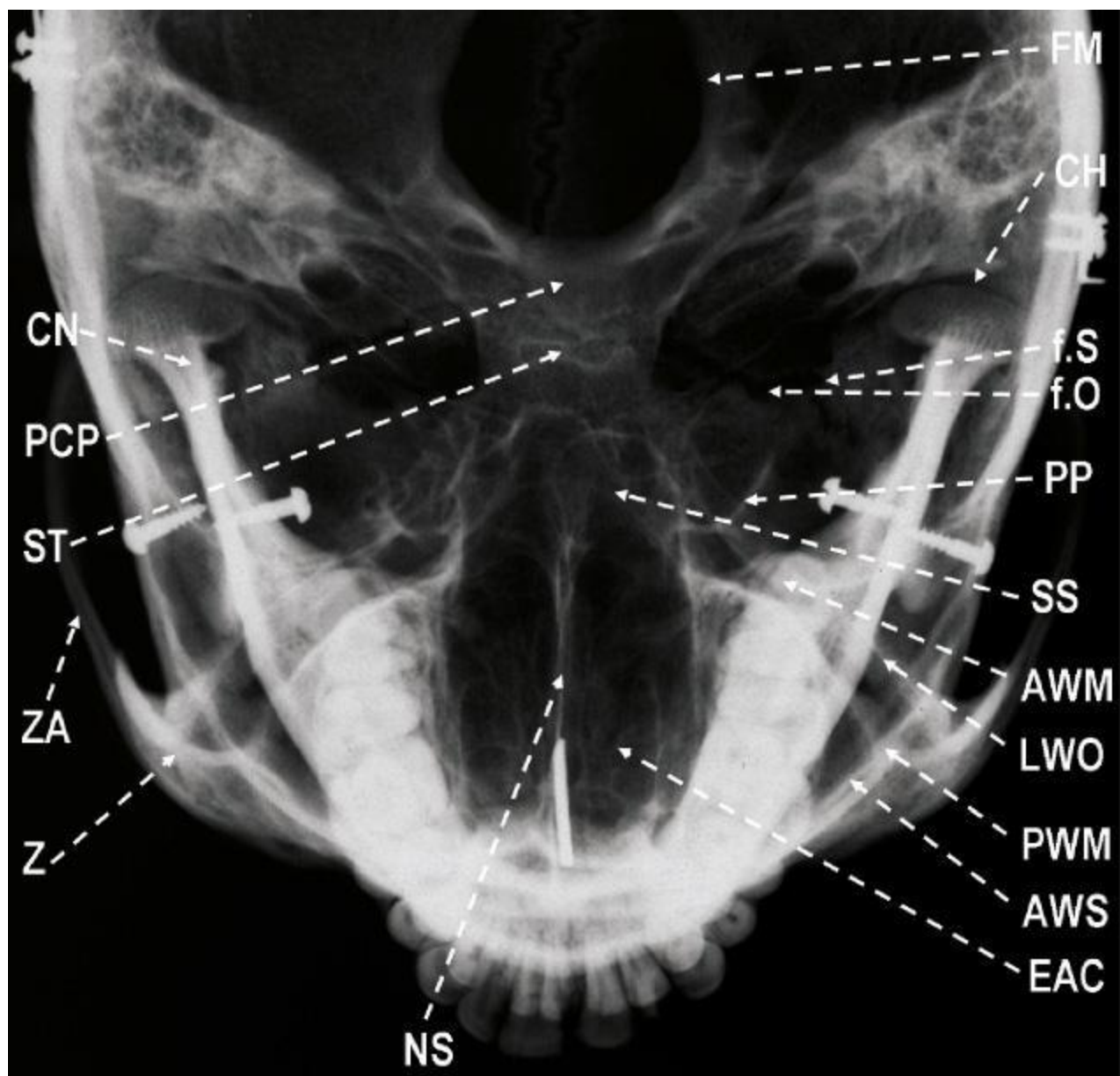
Representative image obtained from the reverse Towne projection. CN, condylar neck; CP, superimposed coronoid process and ascending ramus of mandible; ZA, zygomatic arch; PR, petrous ridge of the temporal bone; DS, dorsum sella; LS, lambdoid suture; ACP, anterior clinoid process; FM, foramen magnum; OB, occipital bone; SP, styloid process; ALW, anterolateral wall, maxillary antrum; MW, medial wall, maxillary antrum; Mf, mental foramen; NS, nasal septum; SMF, sphenomaxillary fissure; SR, supraorbital ridge of the orbit; MP, mastoid process; MB, mandibular body; SS, sphenoid sinus.

5-SUBMENTOVERTEX PROJECTION

*The submentovertex projection (also called the *base* or full *axial projection)* is used to demonstrate the **base of the skull**, **the position and orientation of the condyles, the sphenoid sinus, the curvature of the mandible, the lateral wall of the maxillary sinuses, and any displacement of a fractured zygomatic arch**.

*Often this view also displays the medial and lateral pterygoid plates and foramina in the base of the skull.

FM

CH

CN

f.S

f.O

PCP

PP

ST

SS

ZA

AWM

LWO

Z

PWM

AWS

EAC

NS

Representative image obtained from the SMV projection. EAC, ethmoidal air cells; NS, nasal septum; PP, pterygoid process; fO, foramen ovale; fR, foramen rotundum; fS, foramen spinosum; CN, condylar neck; CH, condylar head; FM, foramen magnum; ZA, zygomatic arch; Z, zygoma; ST, sella turcica; PCP, posterior clinoid process; SS, sphenoid sinus; LWO, lateral wall of the orbit; PWM, posterior wall of the maxillary sinus; AWM, anterior wall of middle cranial fossa; AWS, anterior wall of maxillary sinus.
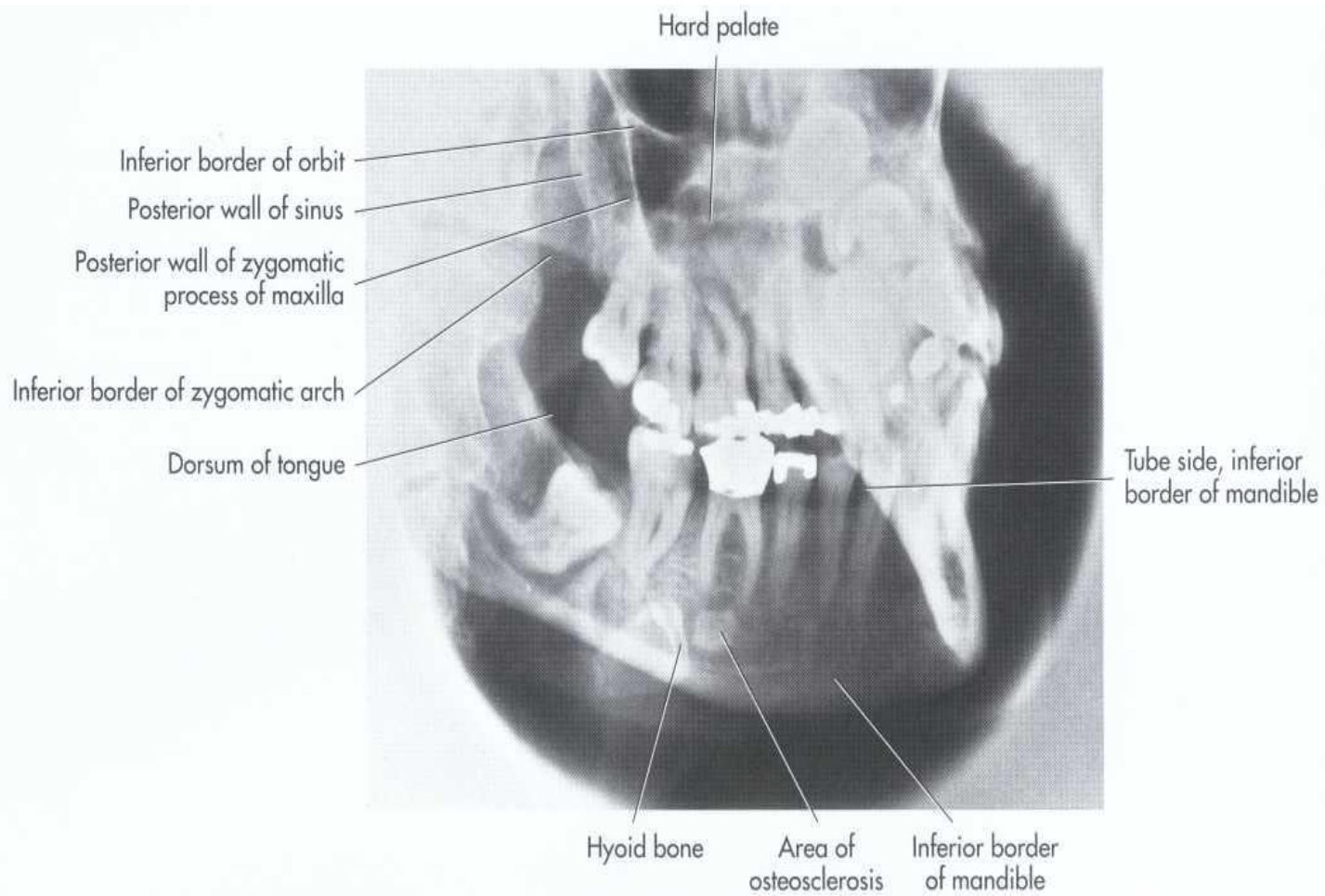
Mandibular Oblique Lateral Projection
Two oblique lateral projections commonly are used to examine the mandible, one for the body and one for the ramus.
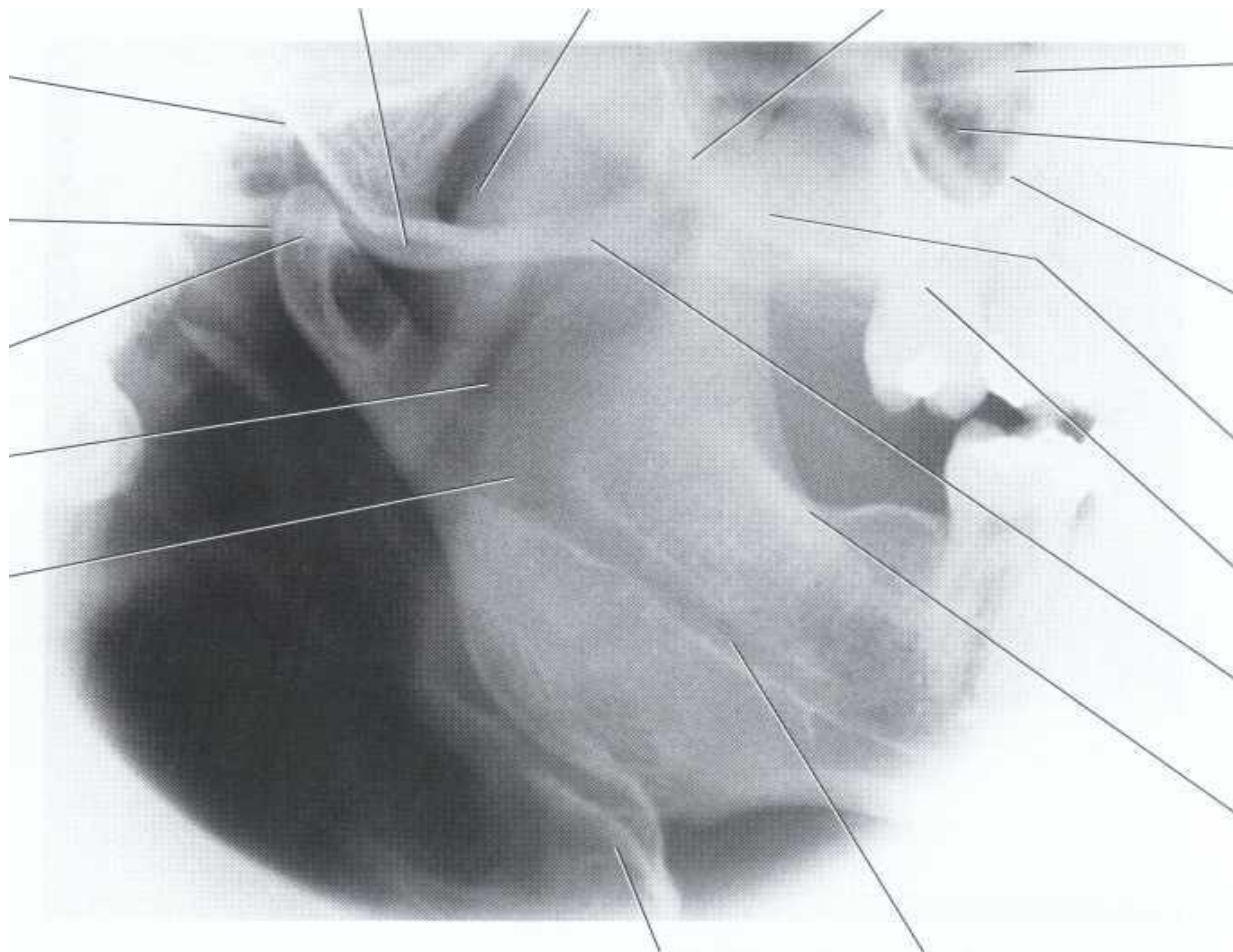
MANDIBULAR BODY PROJECTION

The mandibular body projection demonstrates **the premolar-molar region and the inferior border of the mandible**. It provides much broader coverage than is possible with periapical projections

Hard palate

Inferior border of orbit

Posterior wall of sinus

Posterior wall of zygomatic
process of maxilla

Inferior border of zygomatic arch

Dorsum of tongue

Tube side, inferior
border of mandible

Hyoid bone

Area of
osteosclerosis

Inferior border
of mandible

MANDIBULAR RAMUS PROJECTION

The mandibular ramus projection gives a view of **the ramus from the angle of the mandible to the condyl.** It often is very useful for examining the **third molar regions of the maxilla and mandible.**

TemproMandibulat-joint-projections

TMJ tomography help in visualization of the condyle, articulator eminence and glenoid fossa. It can be also used to determine the joint space and to evaluate the extent of movement of condyle when the mouth is open.

1-Transcranial-view:

It used in visualization the **superior surface of the condyle and the articulator eminence, the joint space also seen**

2-Transorbital view:

It demonstrate the **entire latero-medial articulating surface of the body, the condyle and articulator eminence and the condylar neck.**

3-Transpharyngeal view:

It also called infra cranial view, it demonstrate **the angular process from the mid mandibular ramus of the condyle** . This tech. helps in diagnosis of facture of the condyle of and condylar neck and in detection alteration in condyle morphology.

THANK YOU