Surgical anatomy of the periodontium and related structures

INDEX

Anatomy of Maxilla

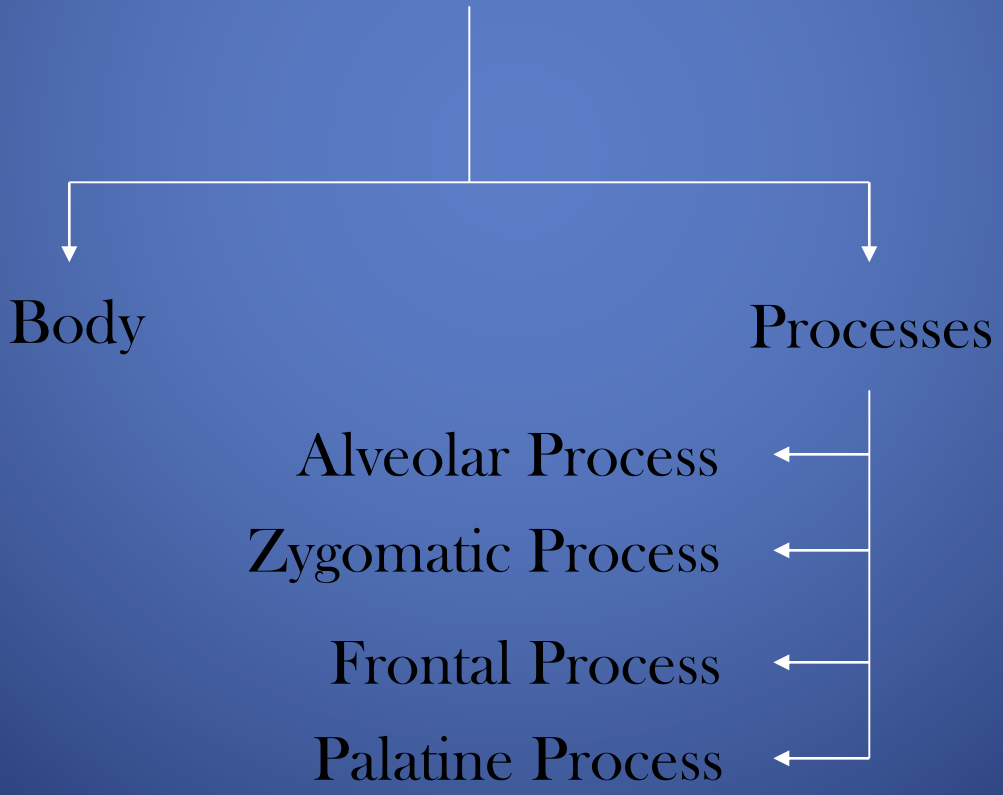
Anatomy of Maxilla

- Each maxilla takes part in the formation of,
  - Orbital floor
  - Lateral wall of the nasal cavity
  - Greater part of the hard palate
  - Roof of the oral cavity

- The alveolar margin carries the teeth of the upper jaw.

Anatomy of Maxilla

- Mainly two parts:



Anatomy of Maxilla

- Four surfaces of the body that enclose the *maxillary air sinus :*
  - Anterior or Facial
  - Posterior or Infratemporal
  - Superior or Orbital
  - Medial or Nasal

Anatomy of Maxilla

- Anterior/Facial surface:

– Directed forwards & laterally.

1. *Incisive fossa :* slight depression above the incisor teeth which gives origin to…
   - *Depressor septi.*
   - *Incisivus :* arises from the alveolar margin below the fossa.
   - *Nasalis :* superolateral to the fossa along the nasal notch.

Anatomy of Maxilla

- Anterior surface:
  2. Canine Fossa: Lateral to Incisive fossa separated by Canine eminence.

Anatomy of Maxilla

- Anterior surface:
  3. Canine Eminence: A bony ridge separating the incisive and canine fossa.

Anatomy of Maxilla

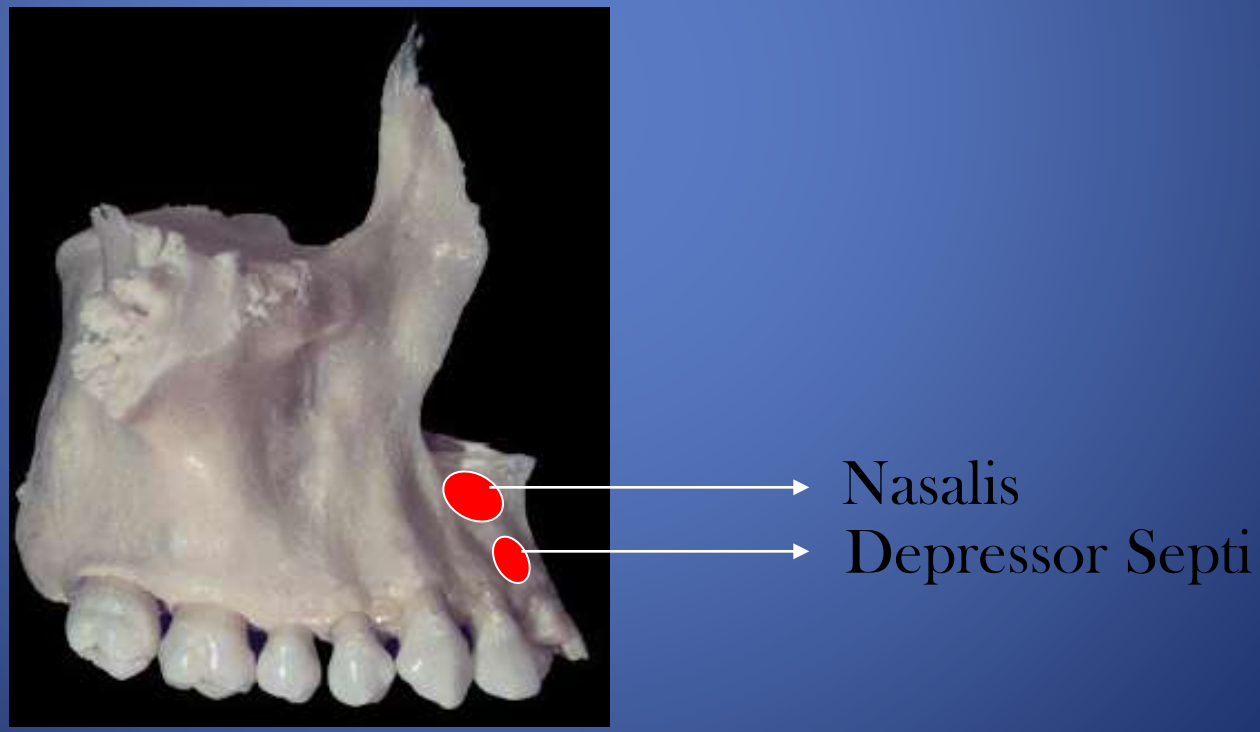
- Anterior surface:
  4. Infra-Orbital Foramen:
  - Transmits : Infraorbital nerve and vessels

Anatomy of Maxilla

- Anterior surface:
  5. Levator Labii superioris Muscle origin: between the Infraorbital foramen and the inferior margin of the orbit

Anatomy of Maxilla

- Anterior surface:
  6. Nasal Notch



Anatomy of Maxilla

- Anterior surface:

7. Anterior Nasal Spine:

Anatomy of Maxilla

- Posterior surface:
  - Convex
  - Faces backward and laterally
  - Forms anterior wall of the infra temporal fossa

Anatomy of Maxilla

- Posterior surface:
  - Presents,
    - Foramina of Alveolar canals
    - Maxillary tuberosity
    - Smooth surface on the upper and posterior part: presents a shallow groove for *Maxillary Artery*

Anatomy of Maxilla

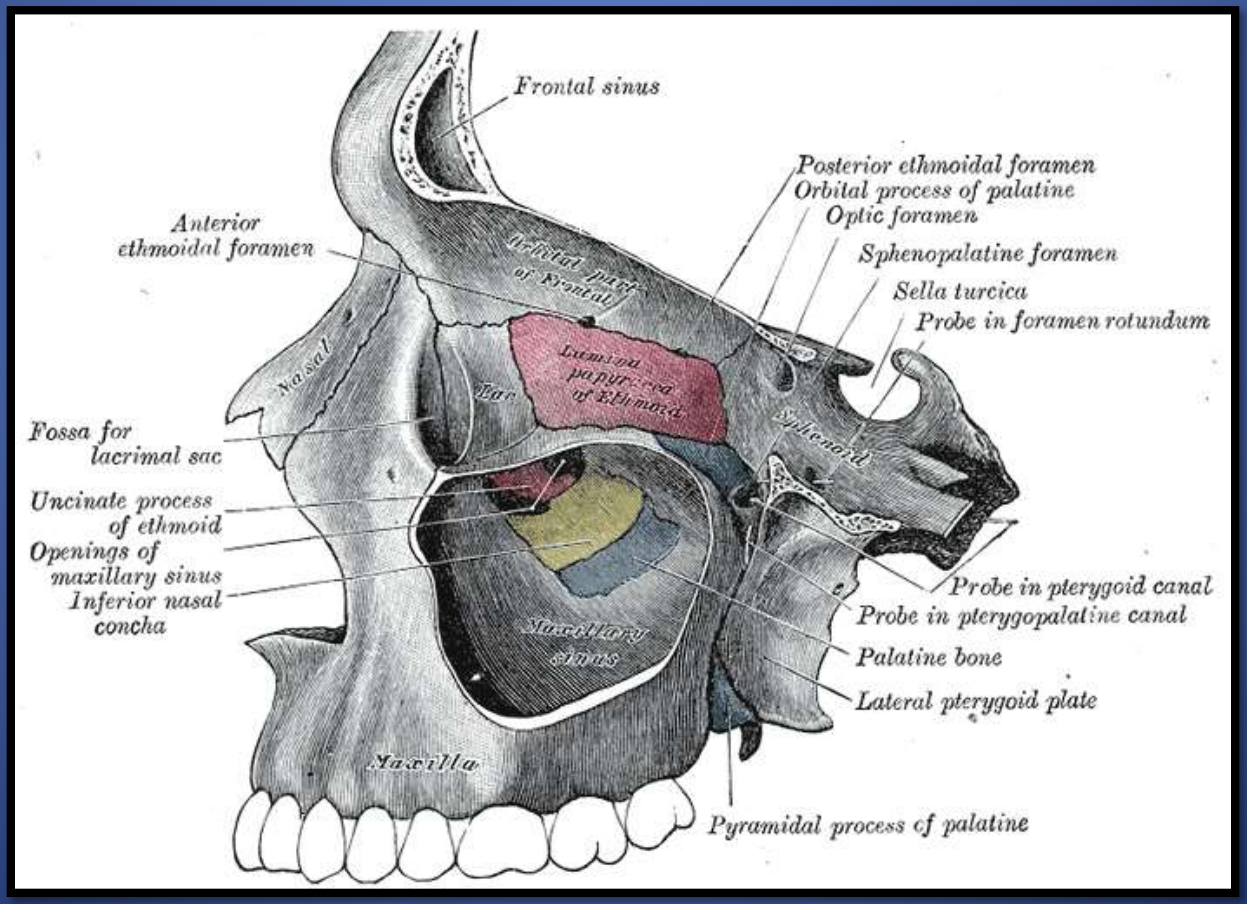
- Alveolar process:
  - Sockets for the roots of teeth of half of the upper jaw.
  - Origin of buccinator muscle: from the lateral aspect opposite the three molar teeth.

Anatomy of Maxilla

- Palatine process:
  - Irregular pits for lodgment of palatine glands.
  - Groove for greater palatine vessels and anterior palatine nerves
  - Incisive fossa - A funnel shaped depression in the median plane, formed when two maxilla are articulated.
  - Incisive canal - Transmits,
    - Terminal branches of greater palatine vessels
    - Nasopalatine nerves

Anatomy of Maxilla

- Maxillary Sinus :



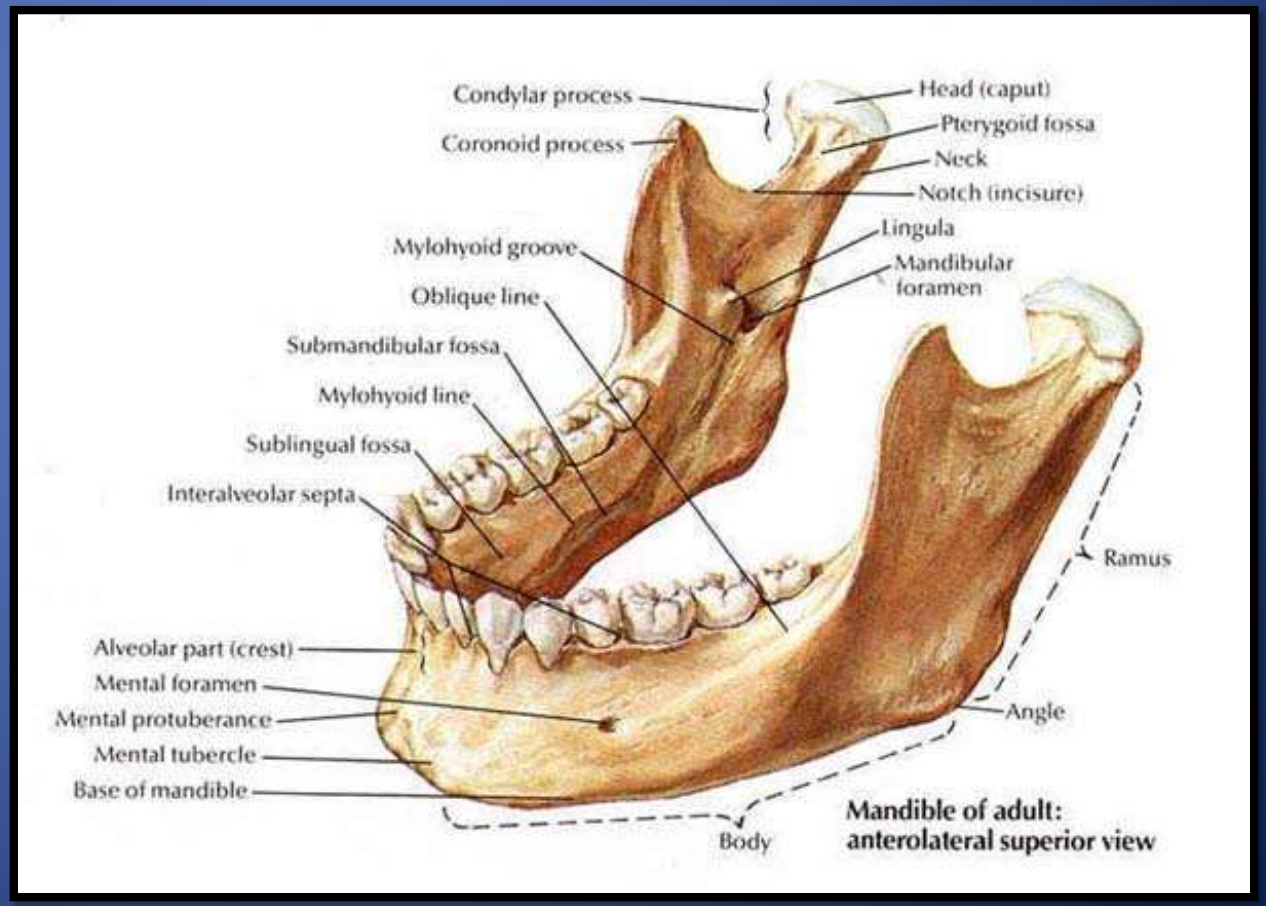
Anatomy of Maxilla

- Maxillary Sinus :

- Large cavity in the body of maxilla.
- Pyramidal in shape.
- Size : height = 3.7cm , width = 2.5cm, anteroposterior depth = 3.7 cm.
- Floor: Roof of the mouth.
- Opens into the middle meatus of nose.

Anatomy of Mandible

- Largest & Strongest facial bone
- Two parts :
  - Body
  - Ramus



Anatomy of Mandible

- 1.) External Surface :
  – Mental Protuberance – prominence of chin

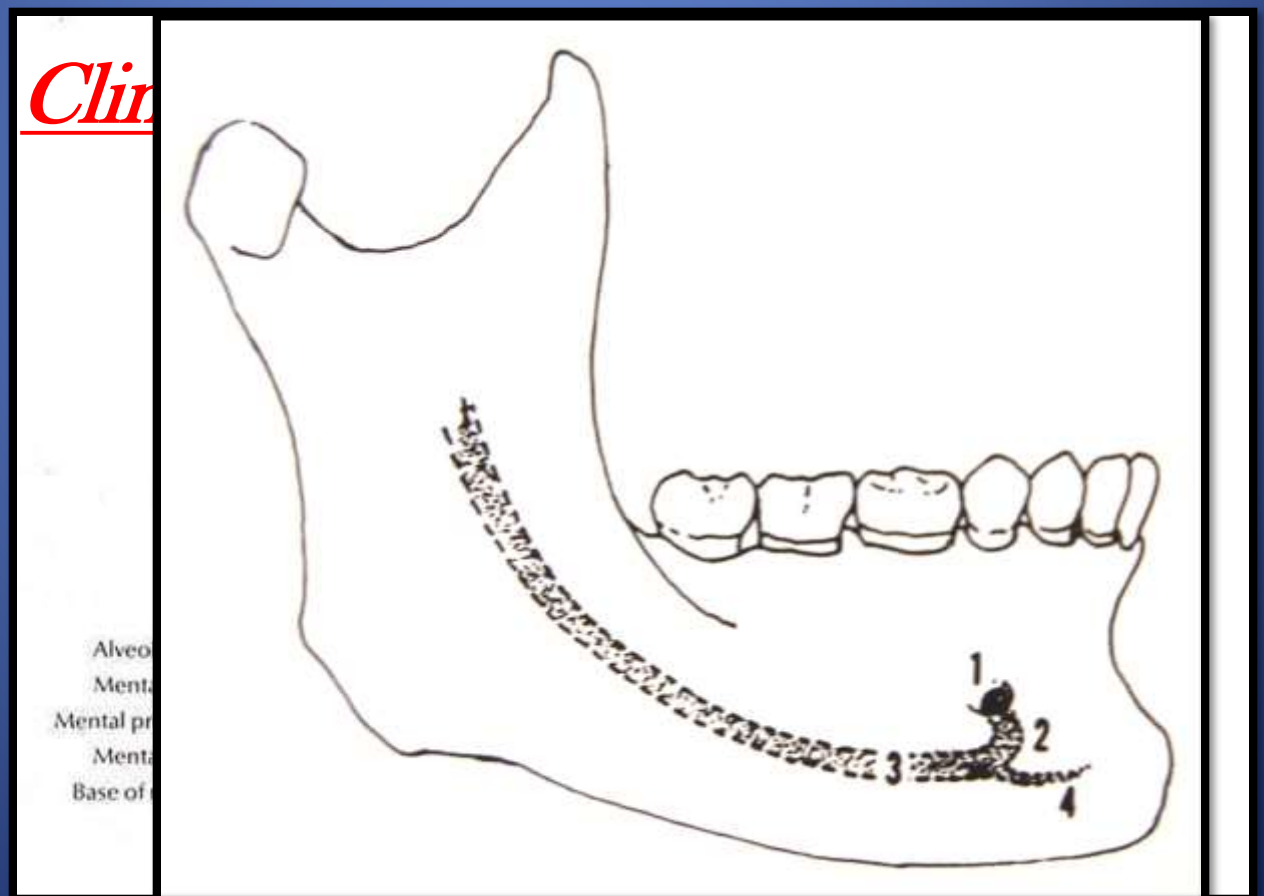
Clinical Implication :

Area of relatively thick bone.

The Thickness extends back along the lower border of the mandible passing slightly upward to become continuous with the anterior border of the ramus.

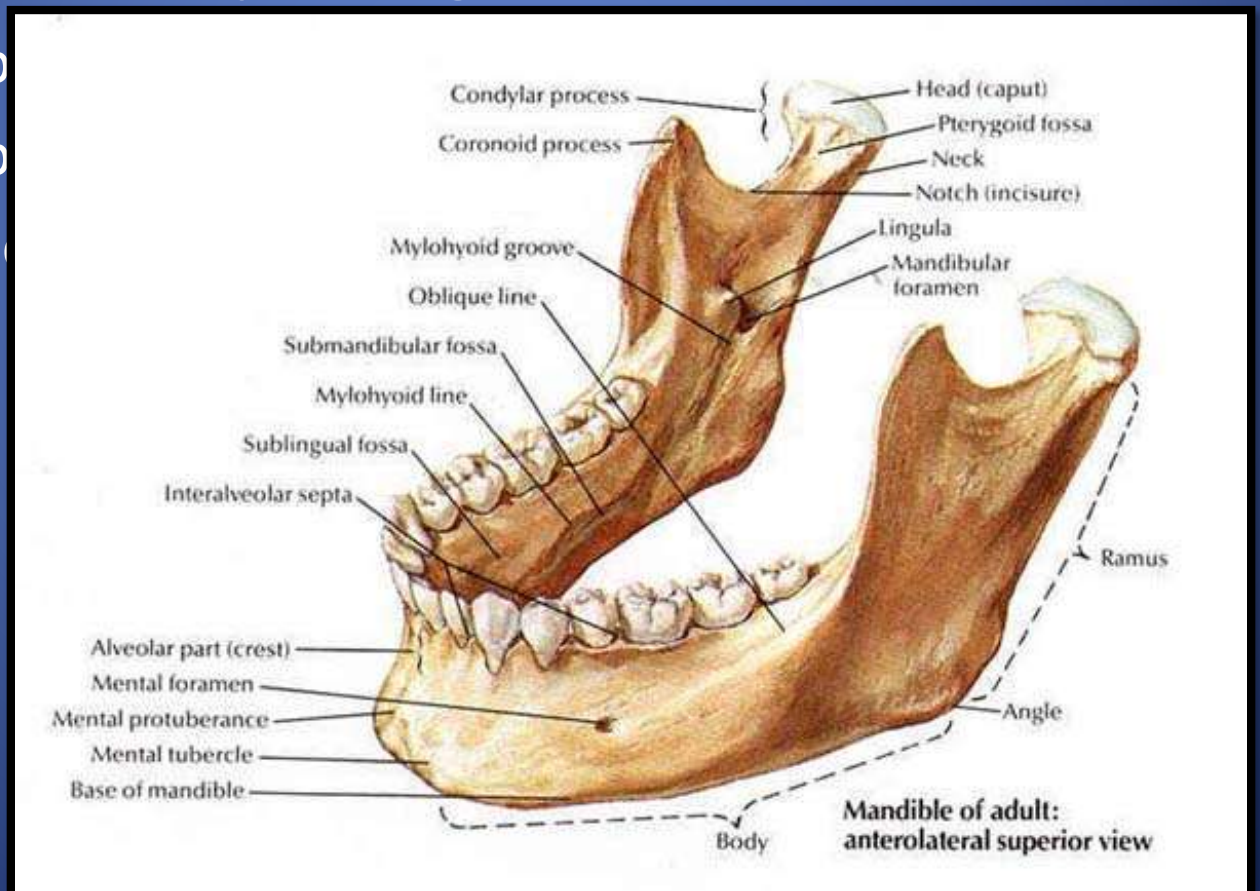
Anatomy of Mandible

- 1.) External Surface :
  - Mental tubercle & Mental foramen



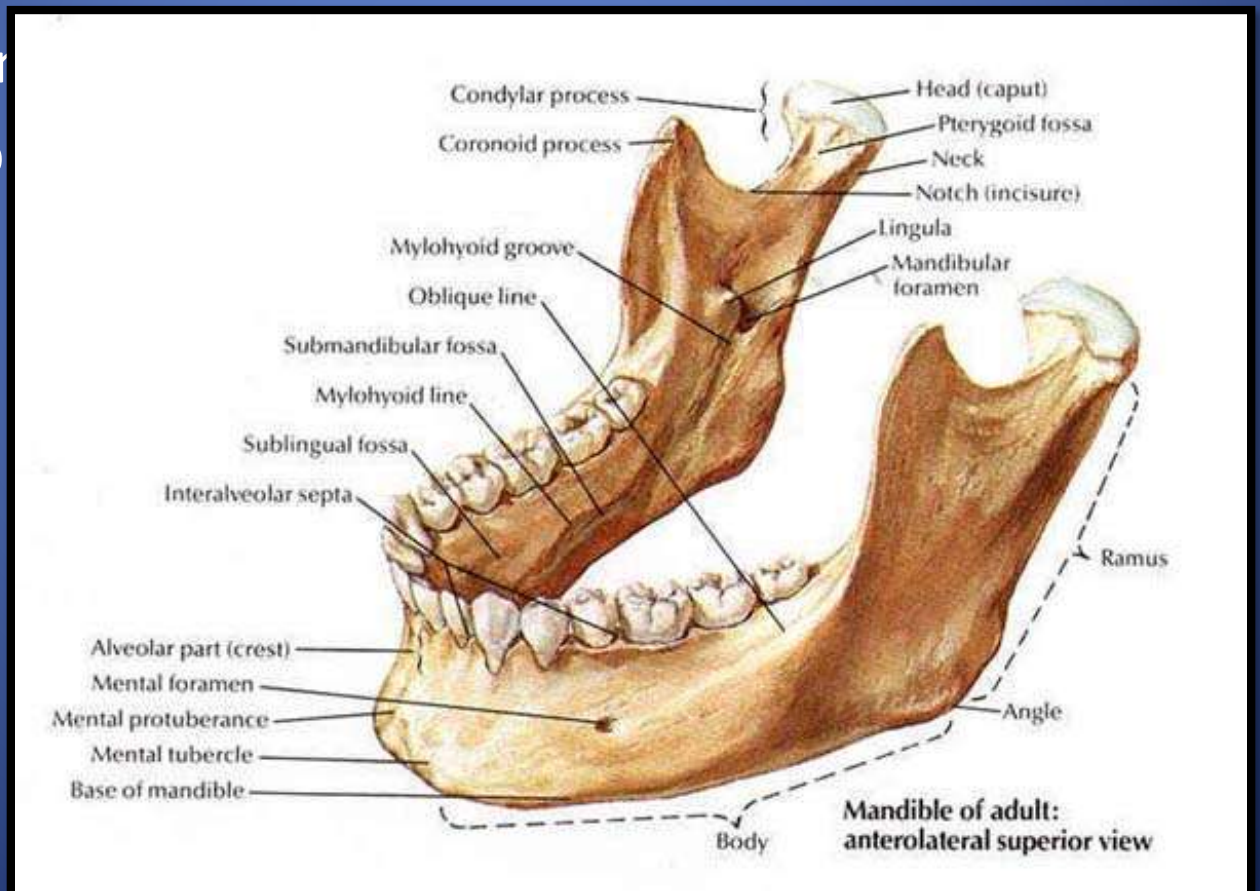
Anatomy of Mandible

- 1.) External Surface :
  - External Oblique Ridge
    - Dep
    - Dep
    - Buc



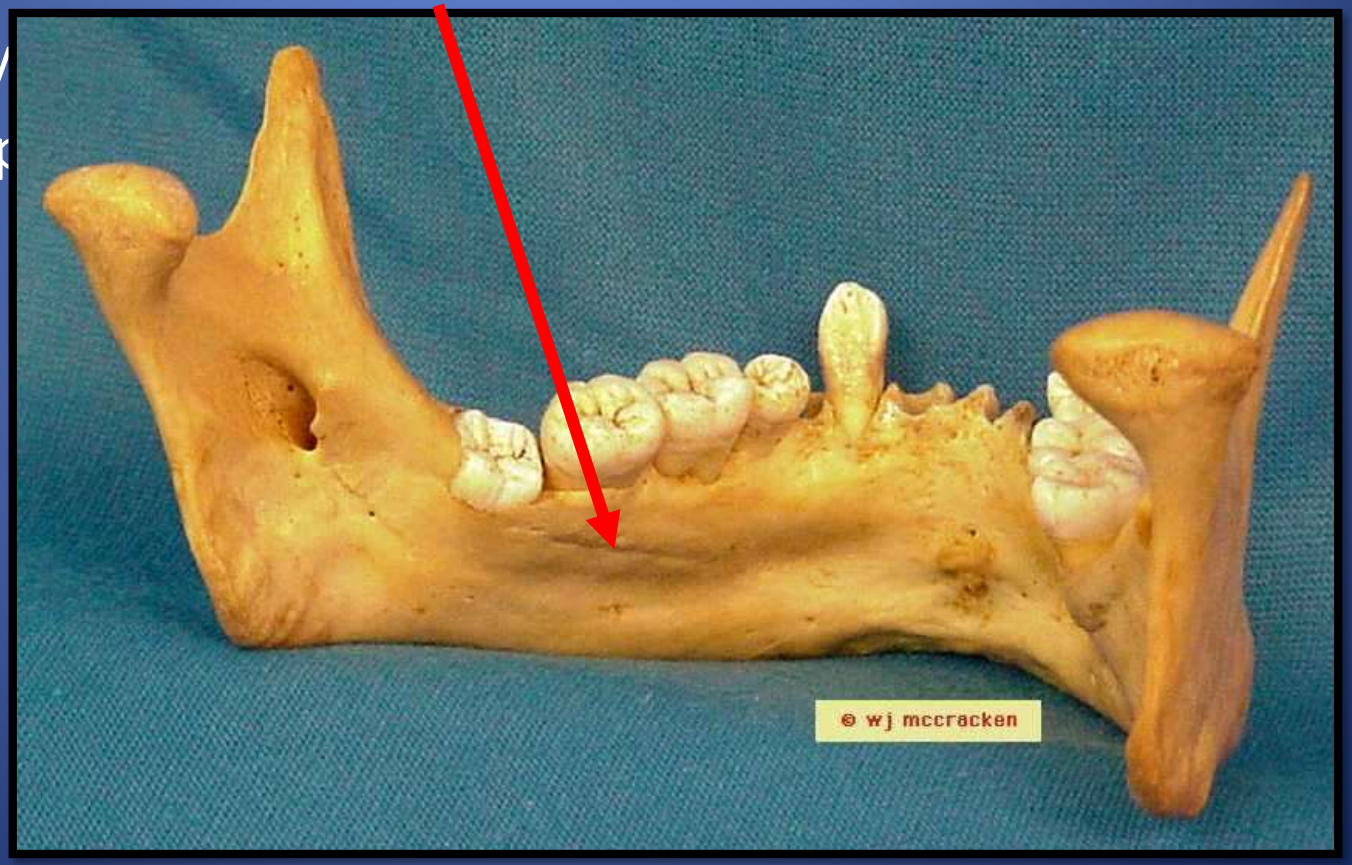
Anatomy of Mandible

- 1.) External Surface :
  - – Incisive fossa:
    - Mer
    - Orb



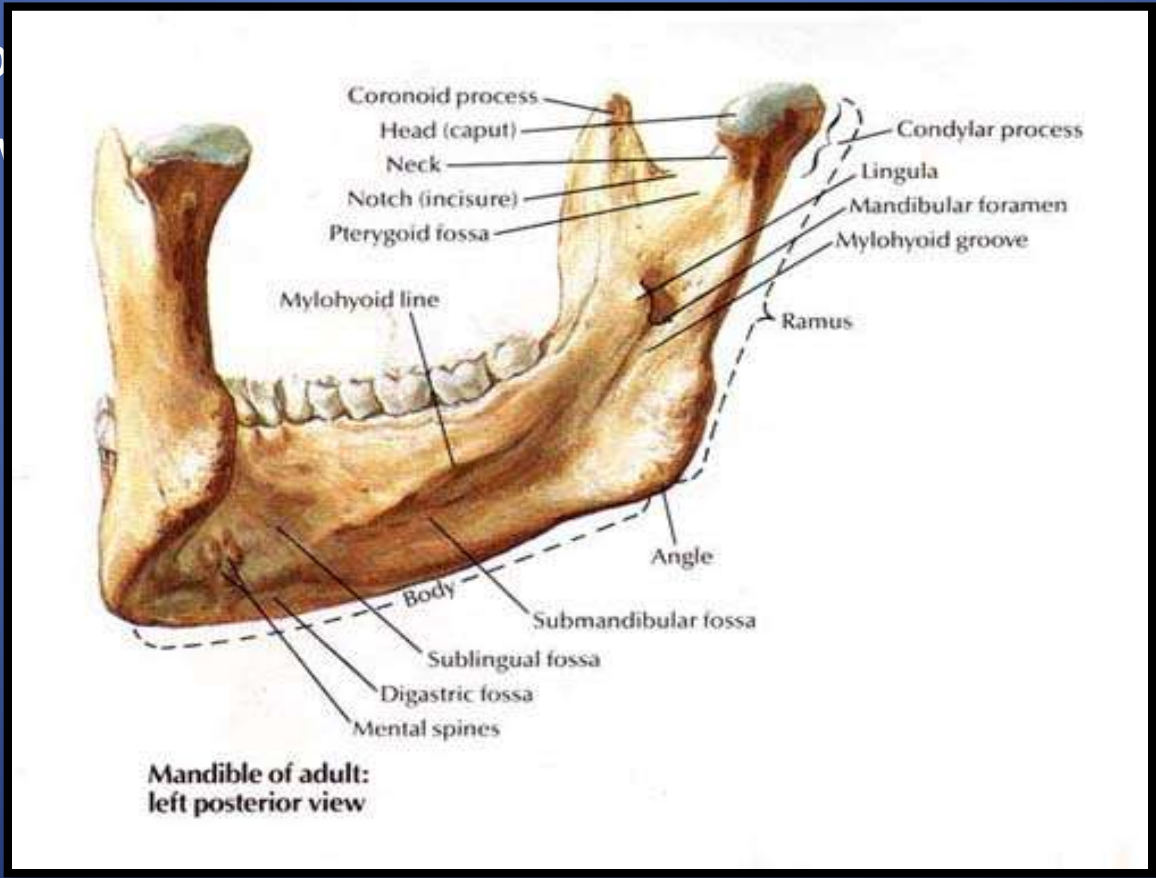
Anatomy of Mandible

- 1.) Internal Surface :
  - Mylohyoid Ridge:
    - My
    - Sup



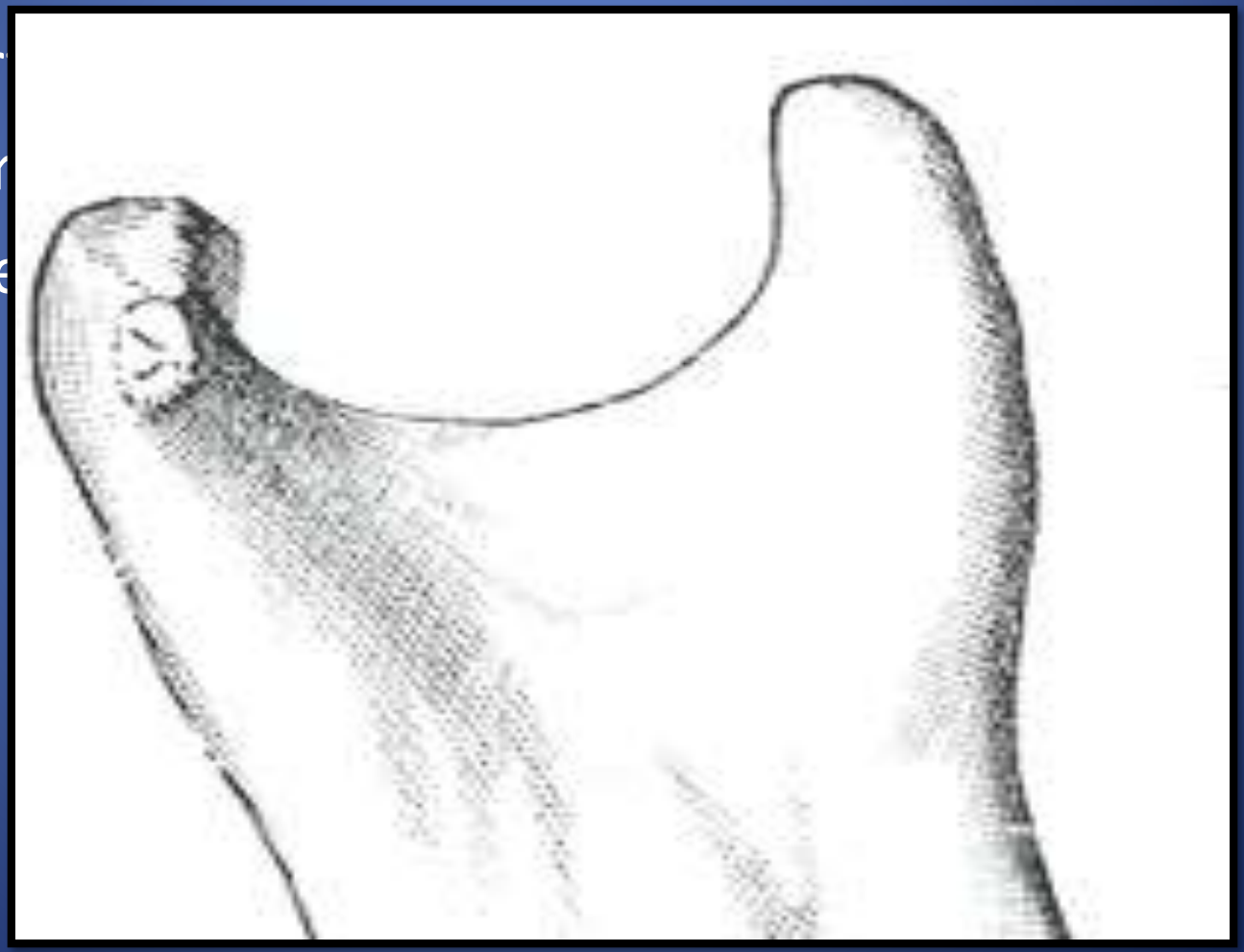
Anatomy of Mandible

- 1.) Internal Surface :
  - – Genial Tubercals:
    - Up
    - Lo



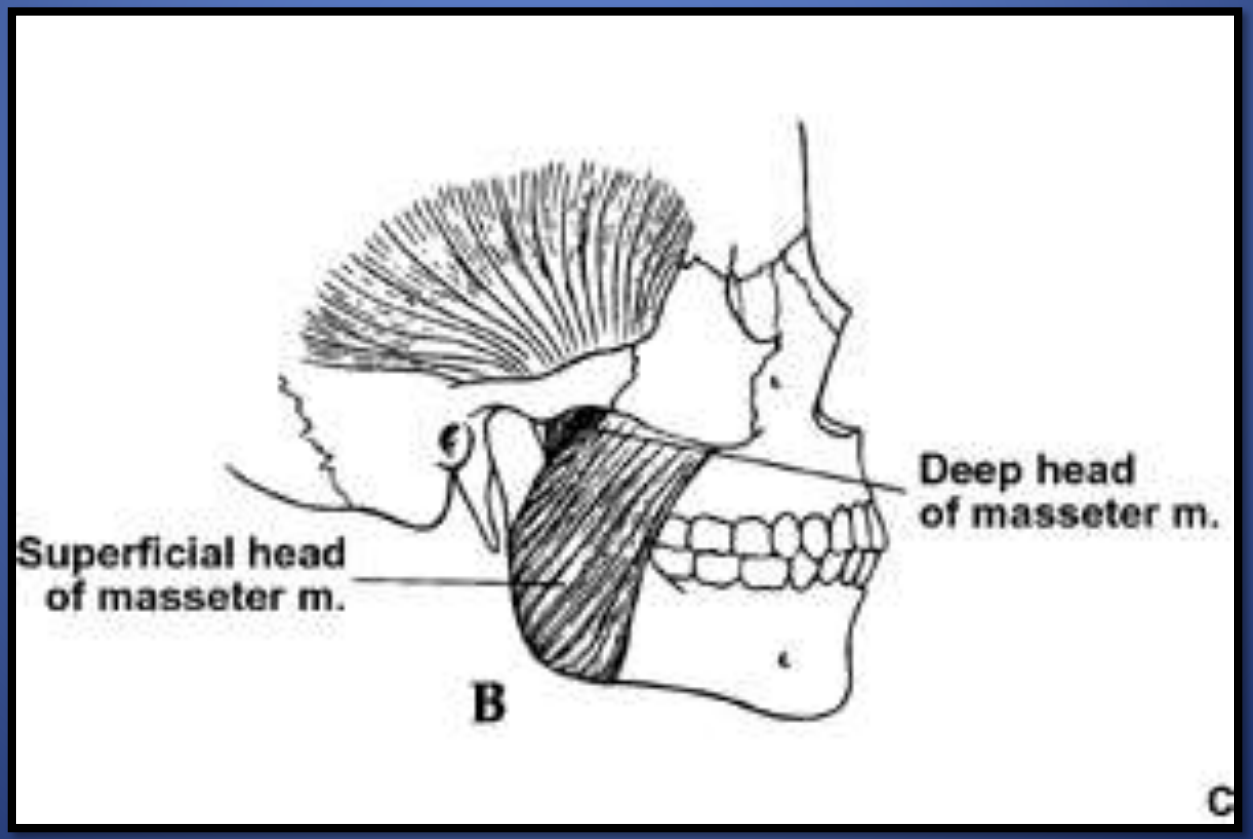
Anatomy of Mandible

- 1.) Ramus :
  - 2 sur
  - 4 bor
  - Proce



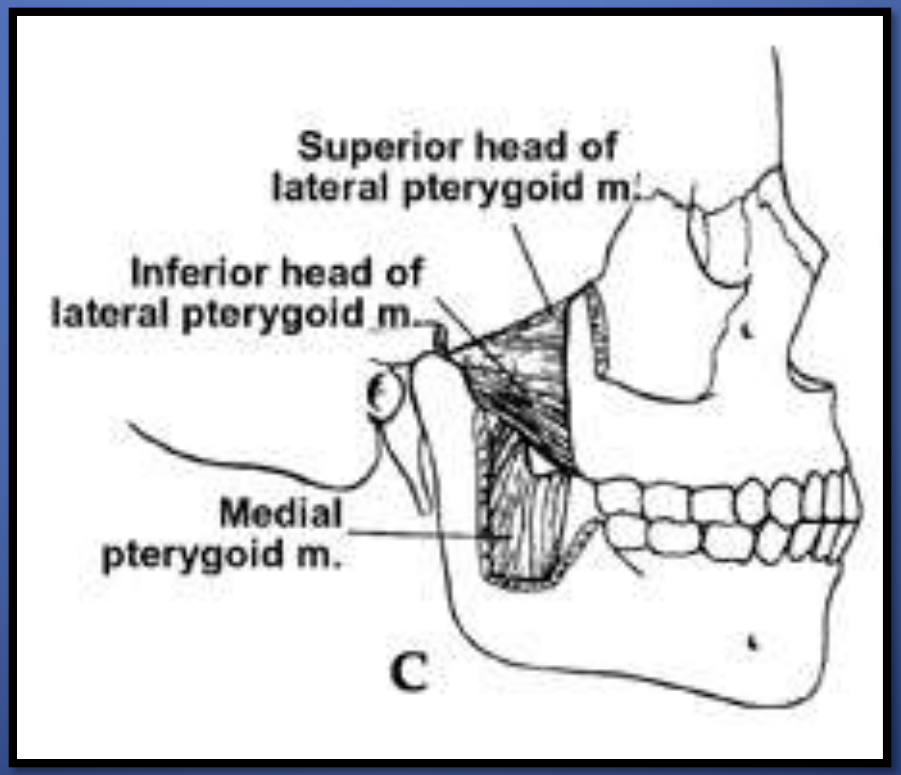
Anatomy of mandible

- Surfaces :
  - Lateral Surface –rough area – Masseter



Anatomy of mandible

- Surfaces :
  - Medial Surface : Insertion of Medial Pterygoid muscle.

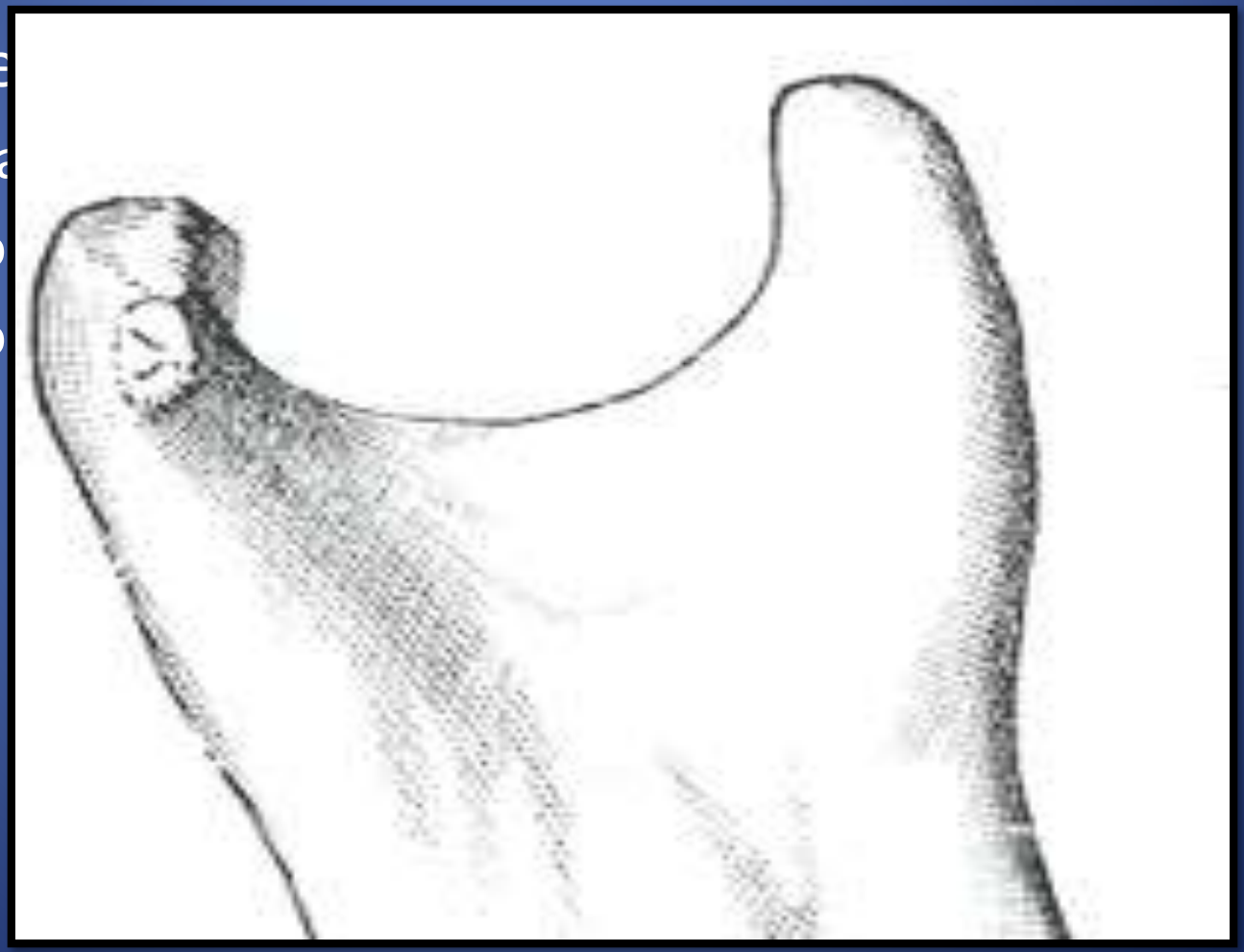


Anatomy of mandible

- Surfaces :
  - – Medial Surface :
    - Ma
    - Lin
    - My

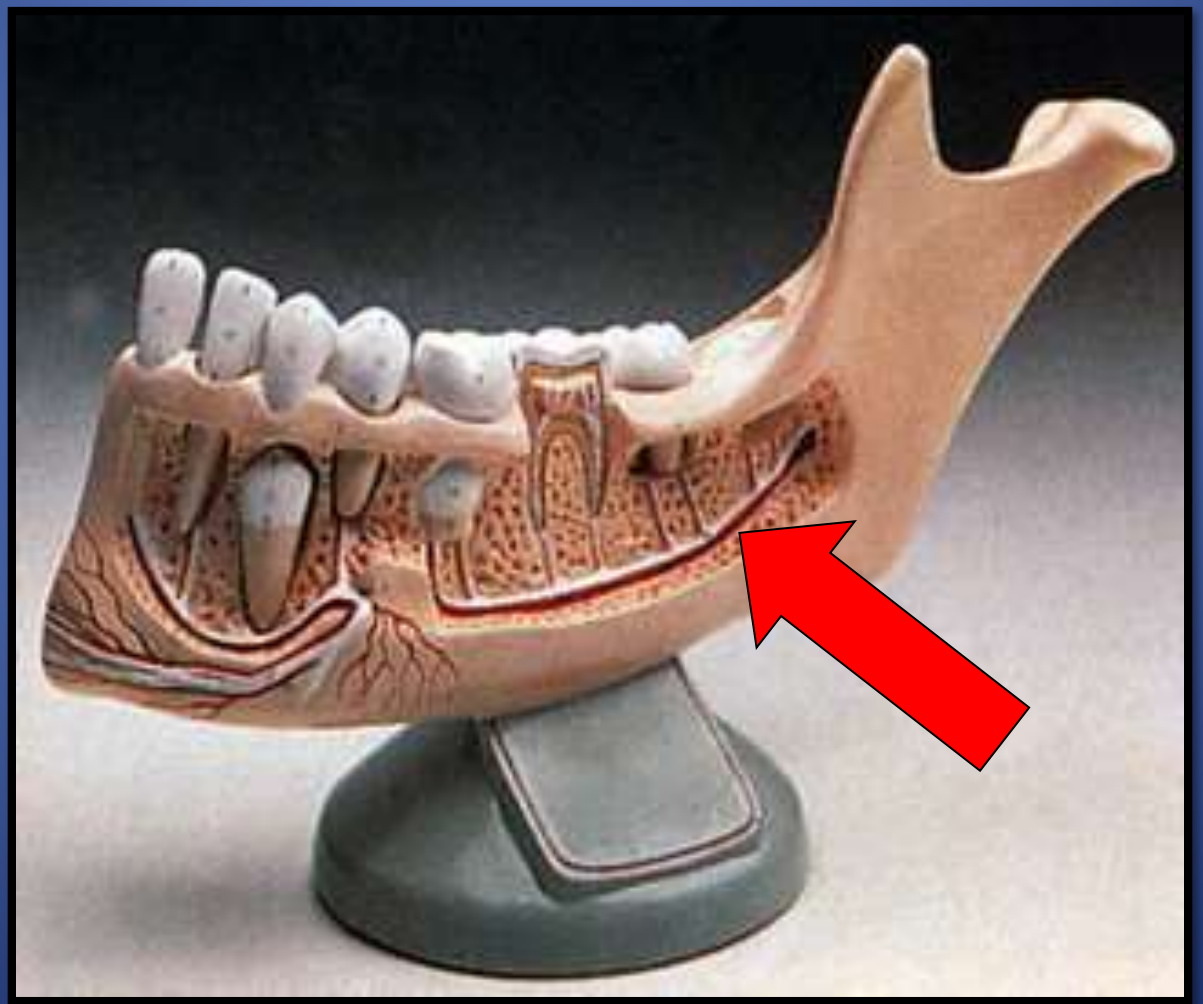
Anatomy of mandible

- Borders :
  - – Uppe
    - Ma
    - Co
    - Co



Anatomy of Mandible

- Mandibular Canal :

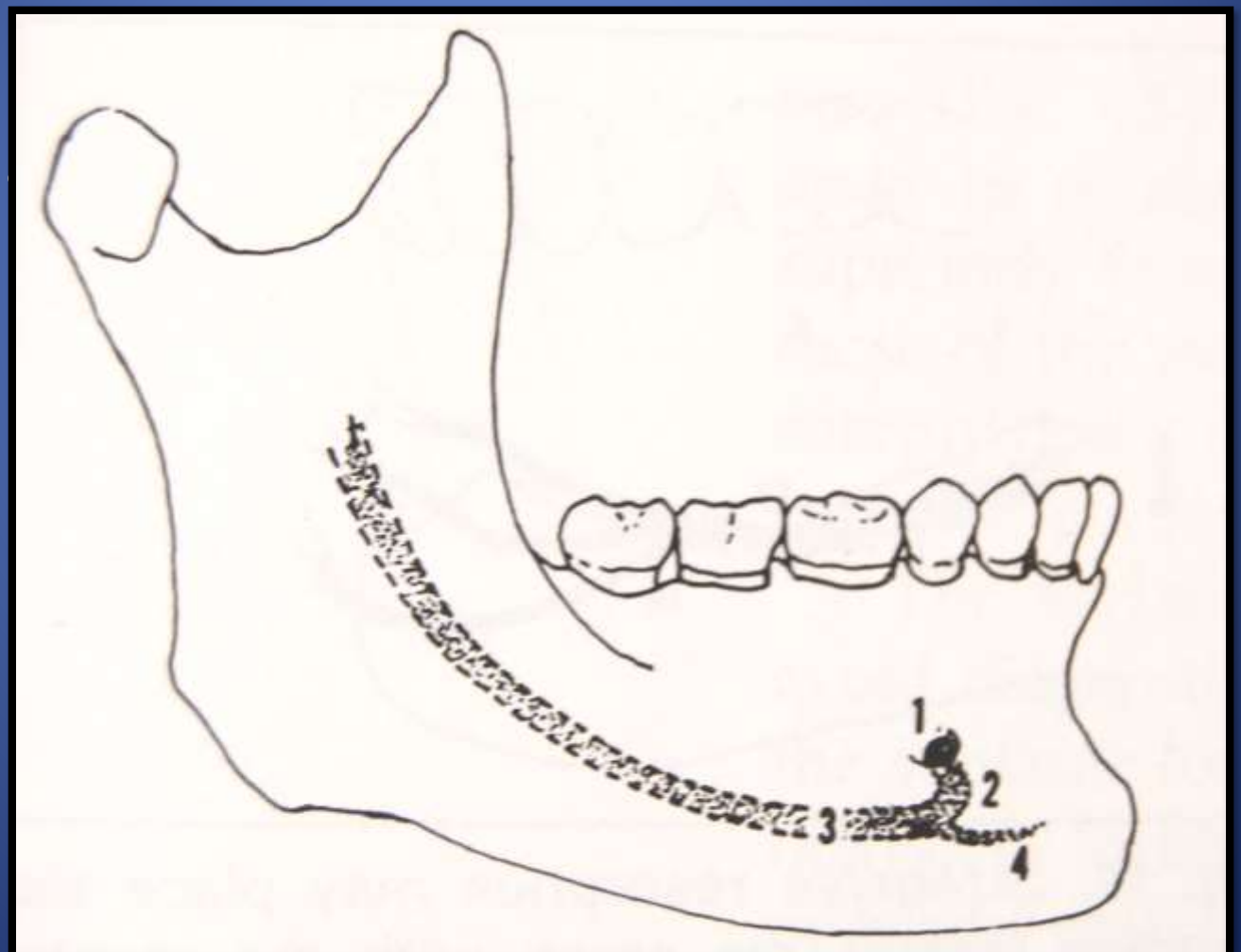


Anatomy of Mandible

- Mandibular Canal :
  - The major mandibular feature to be avoided during Implant placement.
  - Typically, uniform in width.
    - 3mm – from lingula to mental foramen
  - Flared areas (or apparently compressed areas) may exist along the canal's course.
  - The bone between the alveolar crest and the wall of the canal – Spongy – highly responsive to surface stresses

Anatomy of Mandible

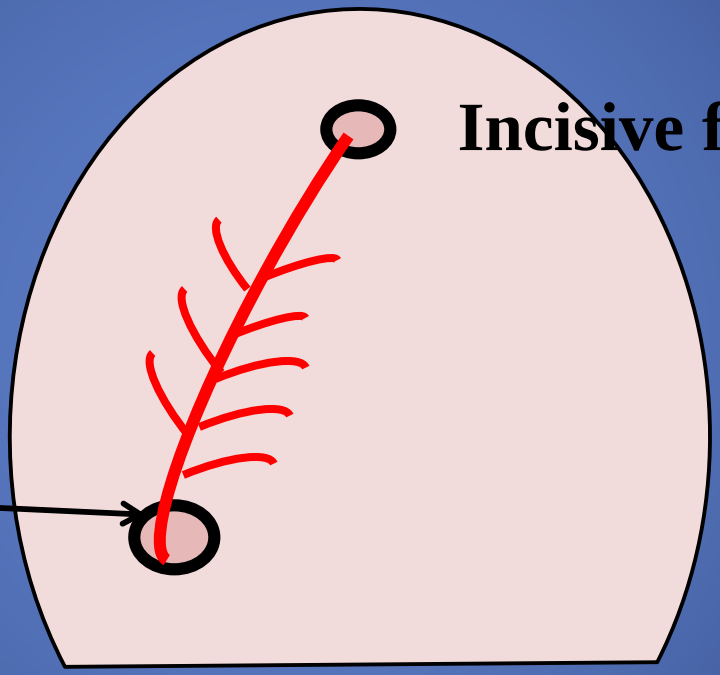
- Mandibular Canal :
  - Most teeth



Clinical Implications of the Structures of Maxilla

Maxilla

Greater palatine foramen: usually 1 cm medial to the 2nd molar



- Palatal flaps and donor sites should be carefully performed and selected to avoid invading these areas, as **profuse haemorrhages** may ensue
- Ideal site for harvesting graft material

- **Maxillary tuberosity**

- **Maxillary sinus:** important to avoid creation of oroantral communication particularly in relation to implant placement

- **Torus**

Clinical implications of the structures of Maxilla

- Maxillary Sinus :
  - In adult – Large : Usually the deepest portion lies over the 2nd Premolar and 1st Molar teeth.
  - The floor may extend anteriorly till the canine and posteriorly till the last molar tooth.

Clinical implications of the structures of Maxilla

- Maxillary Sinus :
  - The r
    mola
    sinus
  - The n
    sever
    - An
    - Mi
    - Pos
  - Heigh

Clinical Implication :

Proper diagnosis before planning the Implant surgery is mandatory.

Distance between the alveolar crest margin and the floor of the sinus has to be evaluated.

Clinical implications of the structures of Maxilla

- Goal of Sinus Elevation :
  - To lift the Schneiderian membrane without tearing or perforating the floor of the sinus.
  - To augment the bone
  - Newly located floor

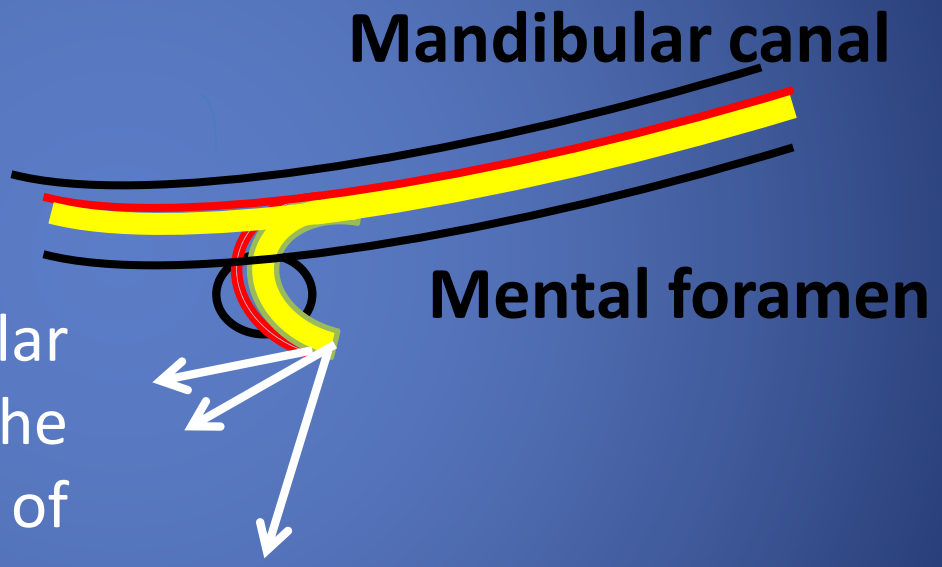
Clinical implications of the structures of Maxilla

- Infratemporal fossa :
  - Posterior to the Maxilla
  - Presence of…
    - Pterygoid Venous Plexus
    - Maxillay Artery
  - Site of PSA nerve block

Mandible

Mandibular Canal

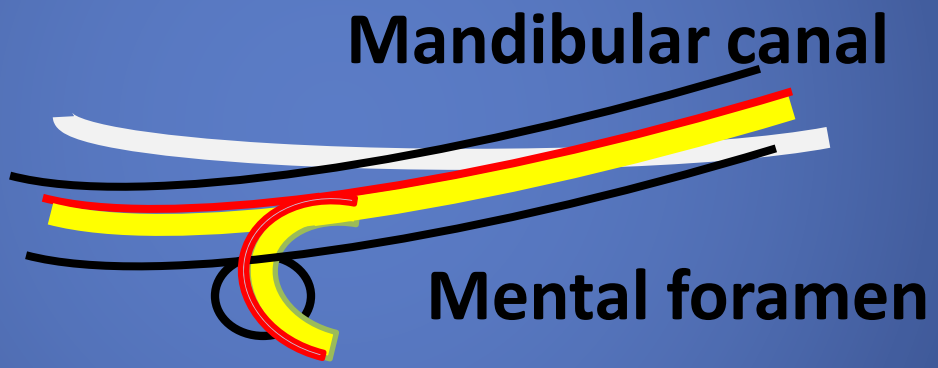
- **Inferior alveolar nerve & blood vessels**



To the skin & alveolar mucous membrane of the lower lip and mucosa of labial alveolar surface

Clinical significance: Paraesthesia of lower lip on trauma

Lingual nerve



Clinical significance: damage during injections, third molar surgeries/operculectomy, partial thickness flaps or releasing incision

- **Alveolar process**
- **External oblique ridge:**
- **Resective osseous surgery** may be difficult or impossible in this area owing to the amount of bone that would have to be removed

- ***Retromolar triangle:*** glandular & adipose tissue covered by unattached nonkeratinized gingiva

- If space exists distal to the last molar, a band of attached gingiva may be present; only then **distal wedge procedure** can be performed

Anatomic spaces

- These are potential spaces which do not exist in healthy individuals
- These contain **loose connective tissue**
- Can be easily **distended** by inflammatory fluid and infection
- Most of the infections penetrate the bone to become vestibular abscesses while some erode into fascial spaces
- **'Path of least resistance'**; dependant on the muscle attachment, root length, thickness of bone
- Surgical invasion of these areas may result in dangerous infections and should be carefully avoided

- **Primary maxillary spaces** (adjacent to the tooth-bearing portion)
  - Canine
  - Buccal
  - Infratemporal

- **Primary mandibular spaces**
  - Submental
  - Buccal
  - Submandibular
  - Sublingual

Canine space

- Etiology: maxillary canine infection
- C/f: swelling of upper lip, obliteration of nasolabial fold
- Spontaneous drainage occurs just inferior to the medial canthus of eye

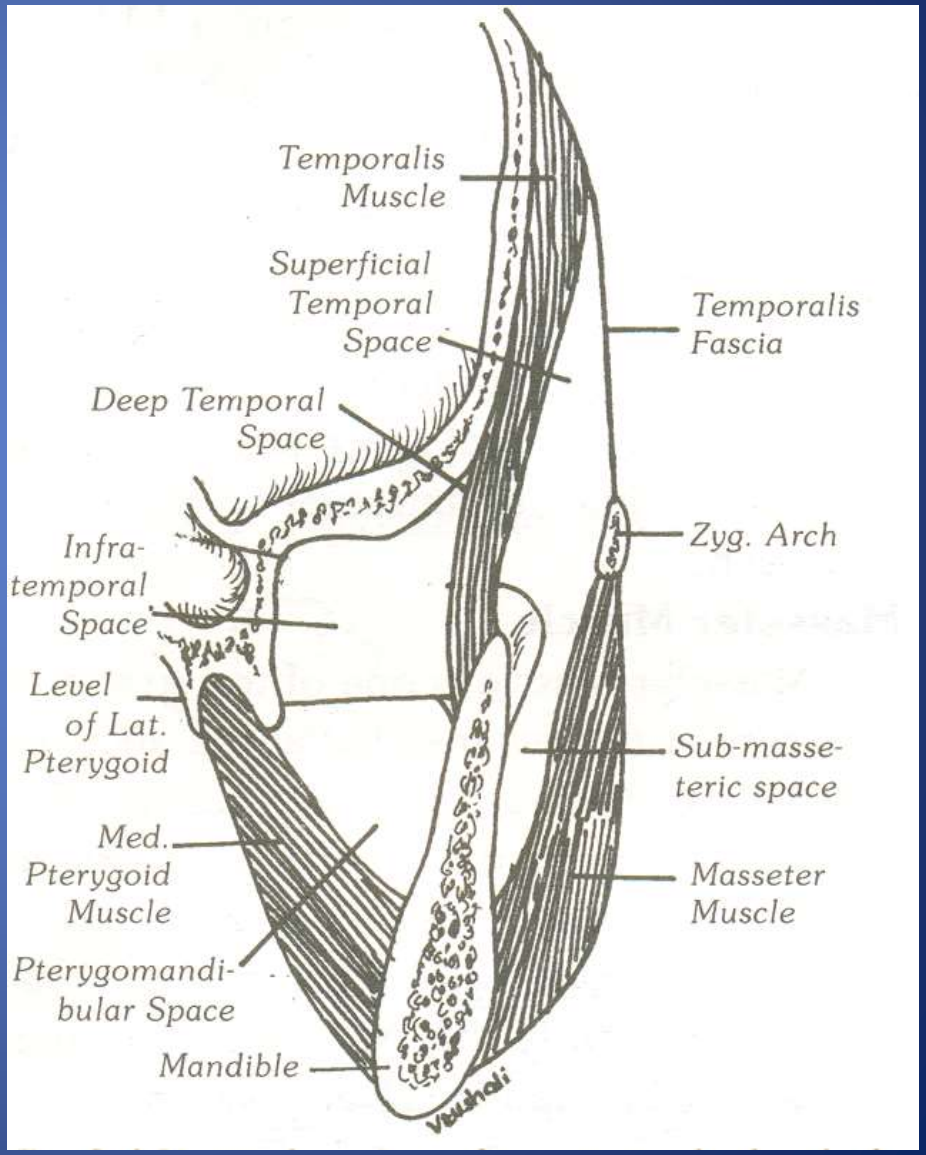
Buccal space

- Etiology: maxillary or mandibular teeth

- C/ f: swelling below zygomatic arch till lower border of mandible

Infratemporal space

- Etiology: maxillary 3rd molar

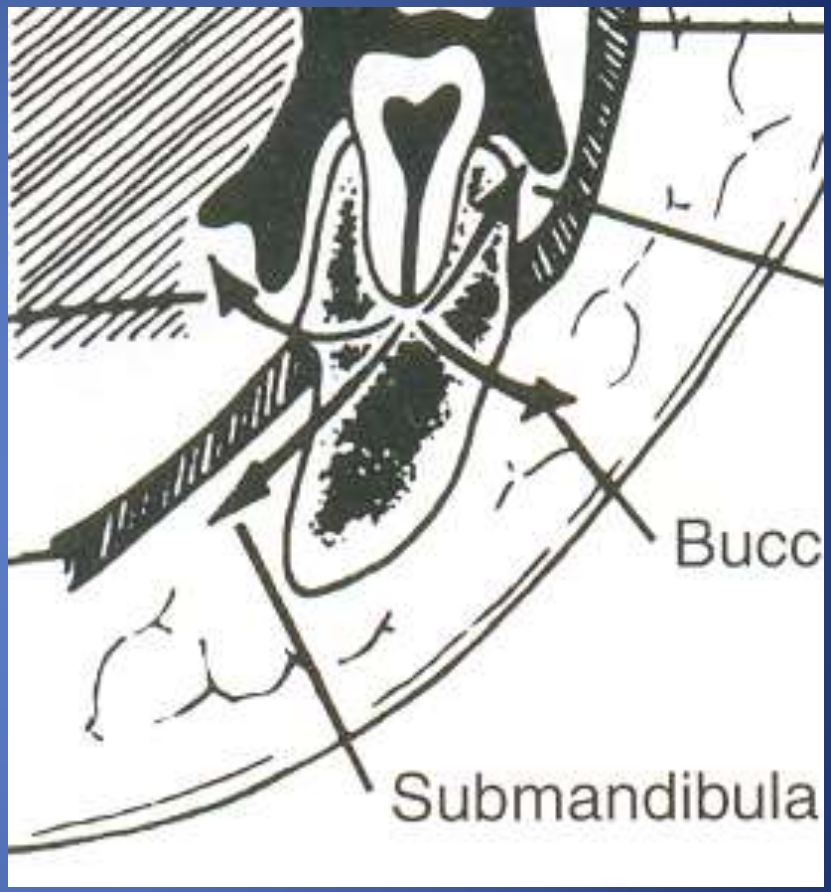


Submental space

- Etiology: mandibular anterior teeth

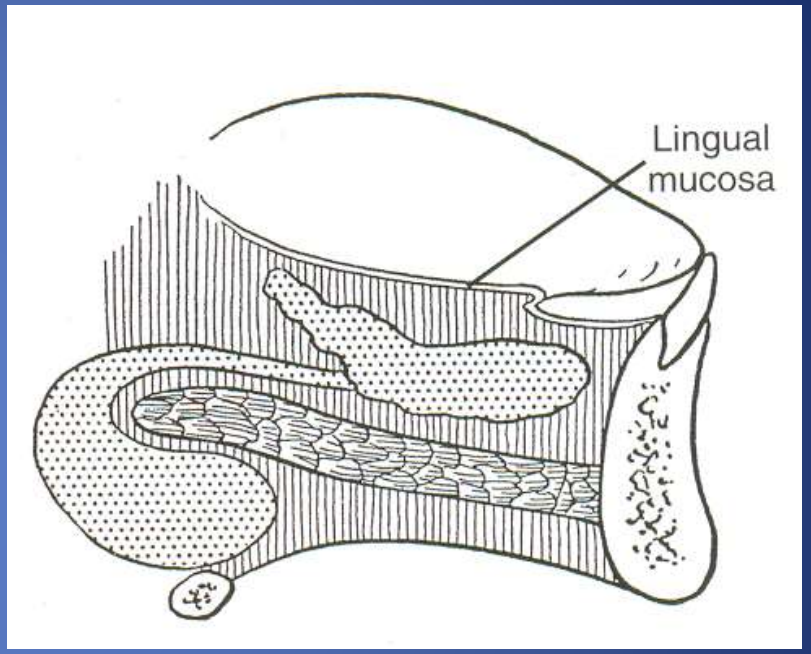
Submandibular space

- Etiology: mandibular molar infections
- Mylohyoid is the key muscle
- Below it: submandibular
- Above it: sublingual space

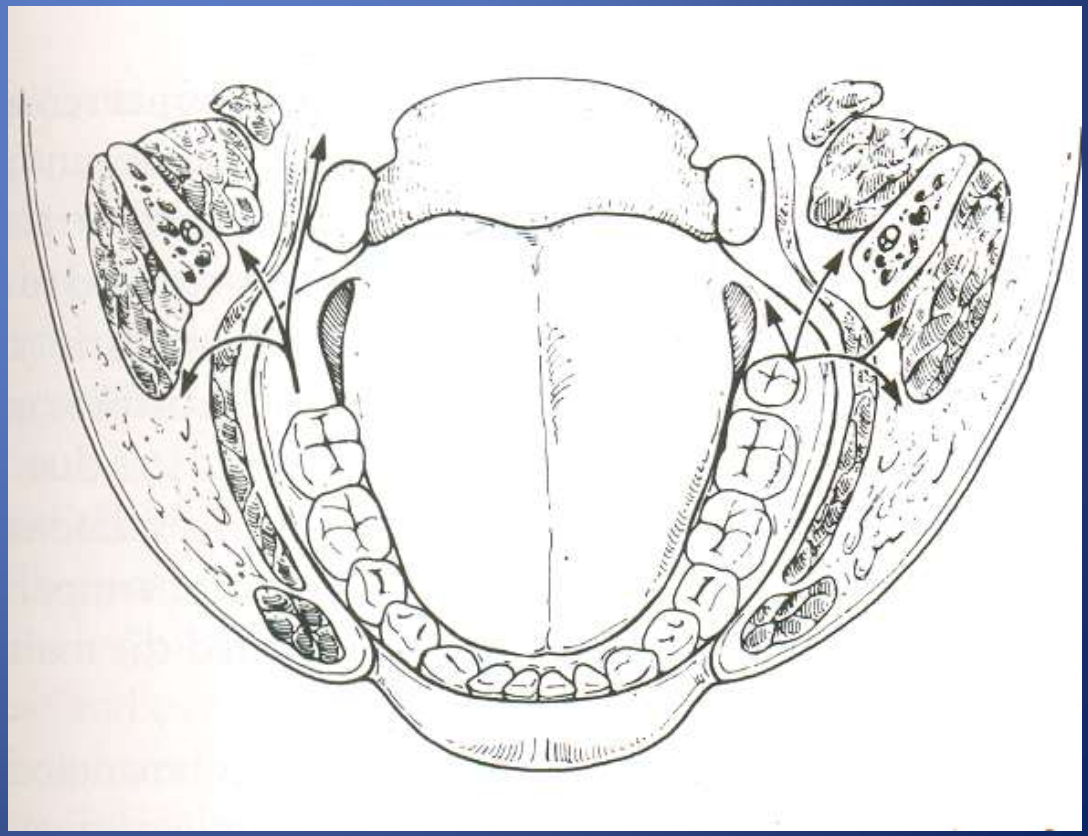


Sublingual space

- Etiology: lower premolars & molars
- C/ f: elevation of tongue



- ***Secondary spaces***
- Massetric
- Pterygomandibular
- Superficial & deep temporal
- Lateral pharyngeal
- Retropharyngeal
- Prevertebral



General Principles of PDL Surgery

- Patient Preparation:
  - Re-evaluation
  - Informed Consent
  - Premedication
  - Medical Evaluation
  - Emergency Drugs
  - Measures to Prevent Transmission.
  - Anesthesia and Sedation

- Surgical Plan
- Tissue Management:
  - Operate gently and carefully
  - Sharp Instruments
  - Proper Instruments.
- Thorough Debridement

- Management of Bleeding :
  - Cotton
  - Absorbable gelatin sponge
  - Oxidised cellulose

Periodontal Dressings

- Functions:
  - Controls Post-op Bleeding
  - Minimizes Infection
  - Provides some splinting
  - Facilitates Healing
  - Protects against Pain

- Types of Pack :
  - ZoE Pack: Wondr Pak by Ward
  - Non Eugenol : Coe Pak
  - Zinc Oxide and Glycal Alcohol
  - Tissue Conditioners.

Zinc oxide Eugenol packs Wondr Pak

- Accelerators – Zn acetate (working time)
- Binders – Asbestos (Lung Ds.)
- Fillers – Tannic acid (Liver Damage)

- powder and liquid form mixed prior to use

- not used causes allergic reaction that produces reddening of area and burning.

Non Eugenol Packs

- Reaction between a metallic oxide and fatty acids is the basis for Coe Pak.
- - 2 tubes : mixed until uniform color is obtained
- One tube contains
  - Zn oxide an oil (for plasticity)
  - Gum (cohesiveness)
  - Lorotridol (a fungicide)

- Other tube contains :
  - Liquid coconut fatty acids
  - Thickened with colophony resin (or rosin)
  - Chlorotrimol (Bacteriostatic Agent)

Cyanoacrylates

- Al Butyl Cyanoacrylate :
  - Applied in Drops or as Spray.
  - Solidifies in 5 -10 secs.
  - Polymerisation is catalysed by moisture, heat and pressure.
  - Adheres to smooth and irregular surfaces for 2 – 7 days.

Zn O & Glycol Alcohol

- Powder : ZnO + resin, Tannic acid and Kaolin.
- Liq. : Ethylene Glycol, Butyl Alcohol

Tissue Conditioners

- Methacrylate Gels.
- Antibacterial Substances : CHX.

Post-Operative Instructions

- Anesthesia wear off
- Medications
- Periodontal Pack
- Avoid Hot and Hard Food
- Chew on non-operated side
- Avoid citrus and spicy foods
- No alcohol and smoking
- Brushing

Post-Operative Instructions

- Ice-Application
- Avoid excessive exertion
- Swelling
- Bleeding : 4-5hrs.

Complications

- Persistent Bleeding
- Sensitivity to percussion
- Swelling
- Feeling of weakness

Findings at Pack Removal

- Gingivectomy
- Flap Procedure
- Fragments of calculus delay healing
- Tooth mobility

- CONCLUSION

- THANK YOU ….