The University of Jordan
Faculty Of Medicine

Temporal and Inratemporal Fossae

DR. AHMED SALMAN

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Temporal Fossa

Boundaries and Bony Landmarks :

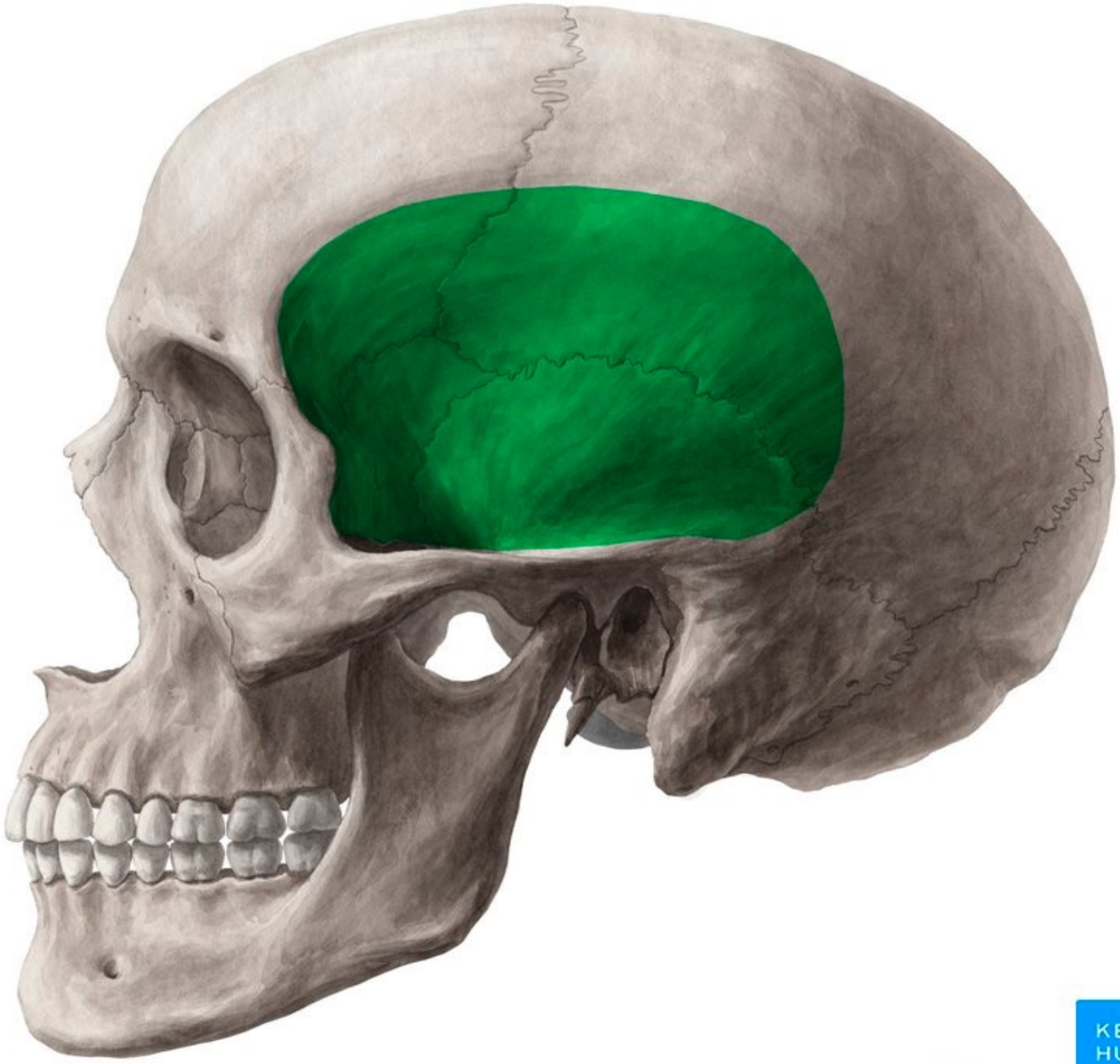
Superiorly : Superior temporal line

Inferiorly : Zygomatic arch

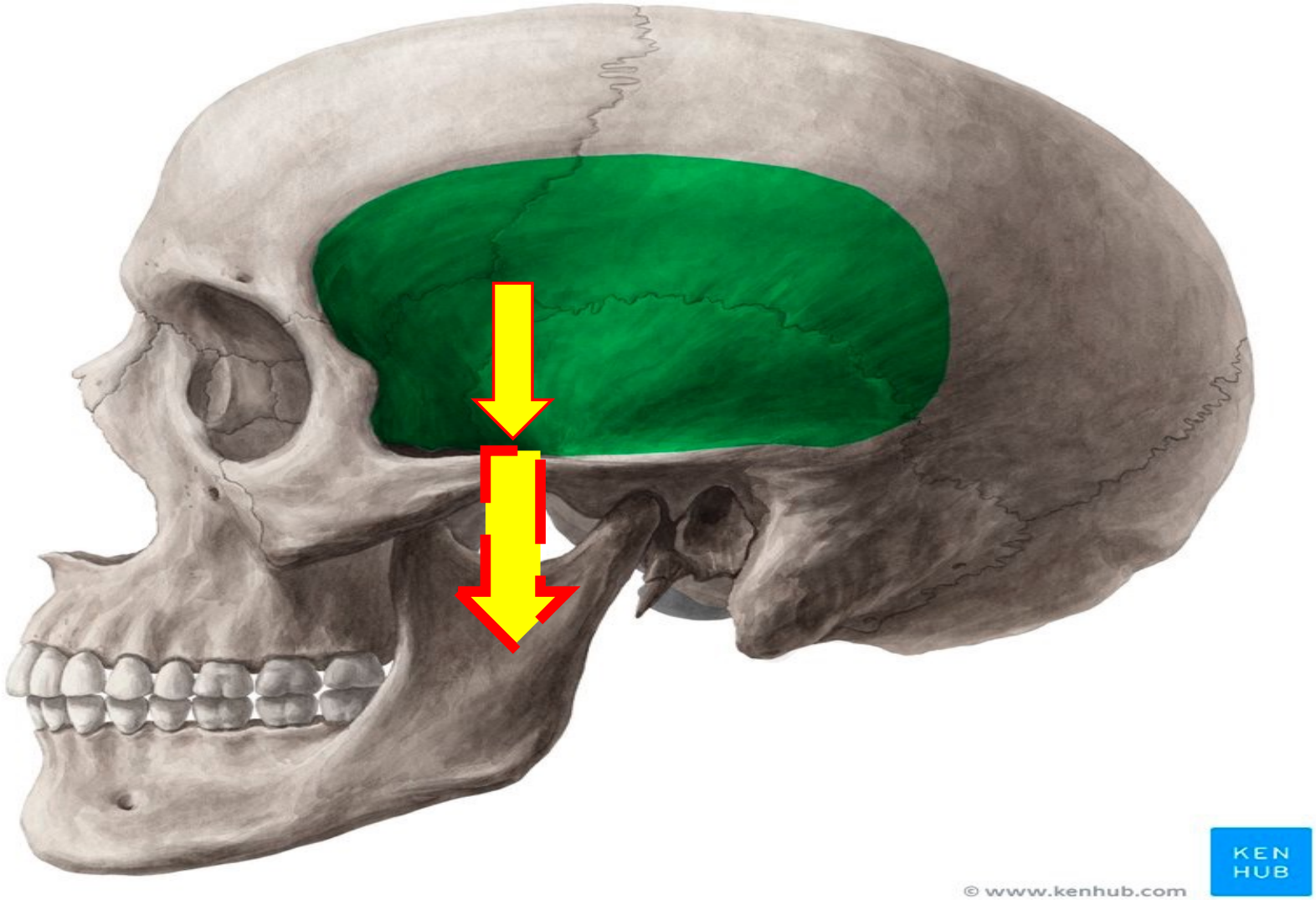
Anteriorly : Frontal process of zygomatic bone and zygomatic process of frontal bone

Floor: Pterion (H-shaped suture between frontal, parietal, squamous temporal and greater wing of sphenoid).

Temporal Fossa

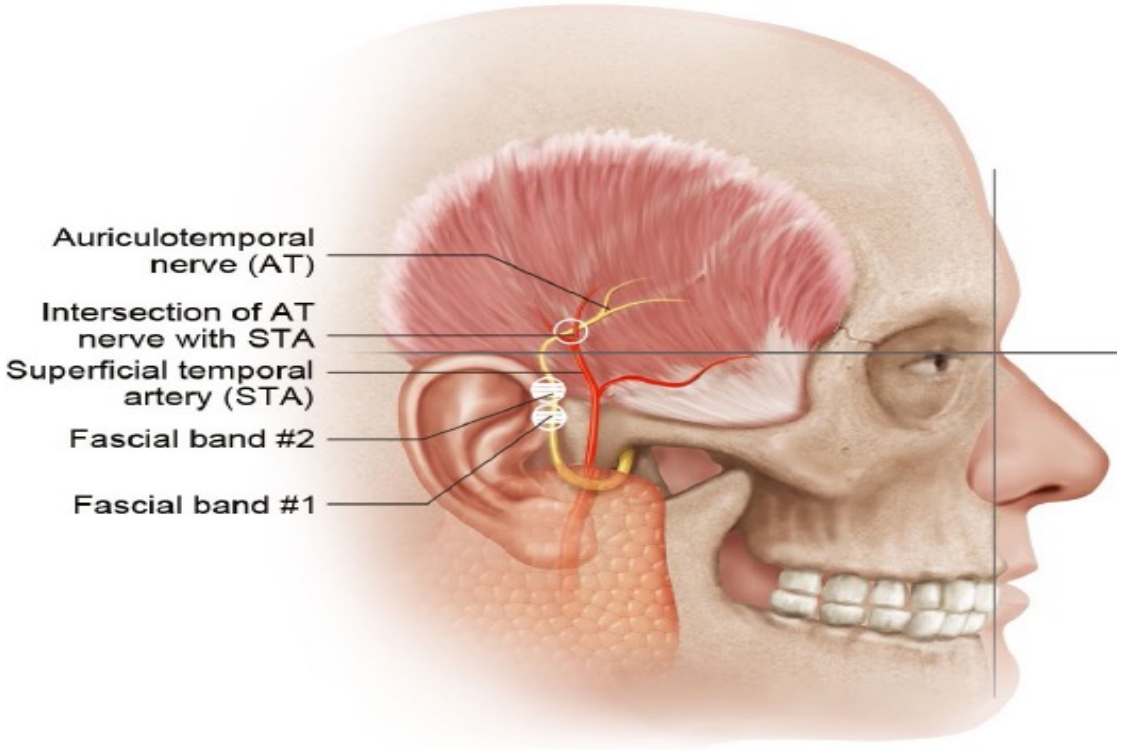


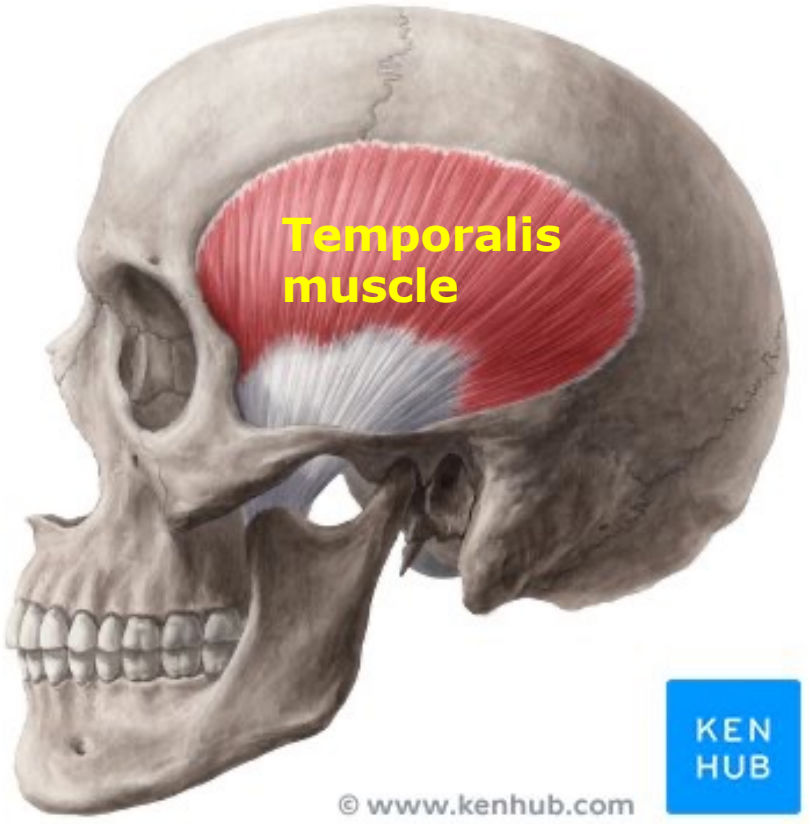
Communication : It communicates with infratemporal fossa through the gap deep to the zygomatic arch.



Contents :

1. Temporalis muscle covered with temporal fascia.
2. Auriculotemporal nerve and superficial temporal vessels are superficial to the temporal fascia.
3. Two deep temporal nerves and vessels are deep to the temporalis muscle.





Infratemporal fossa

Boundaries :

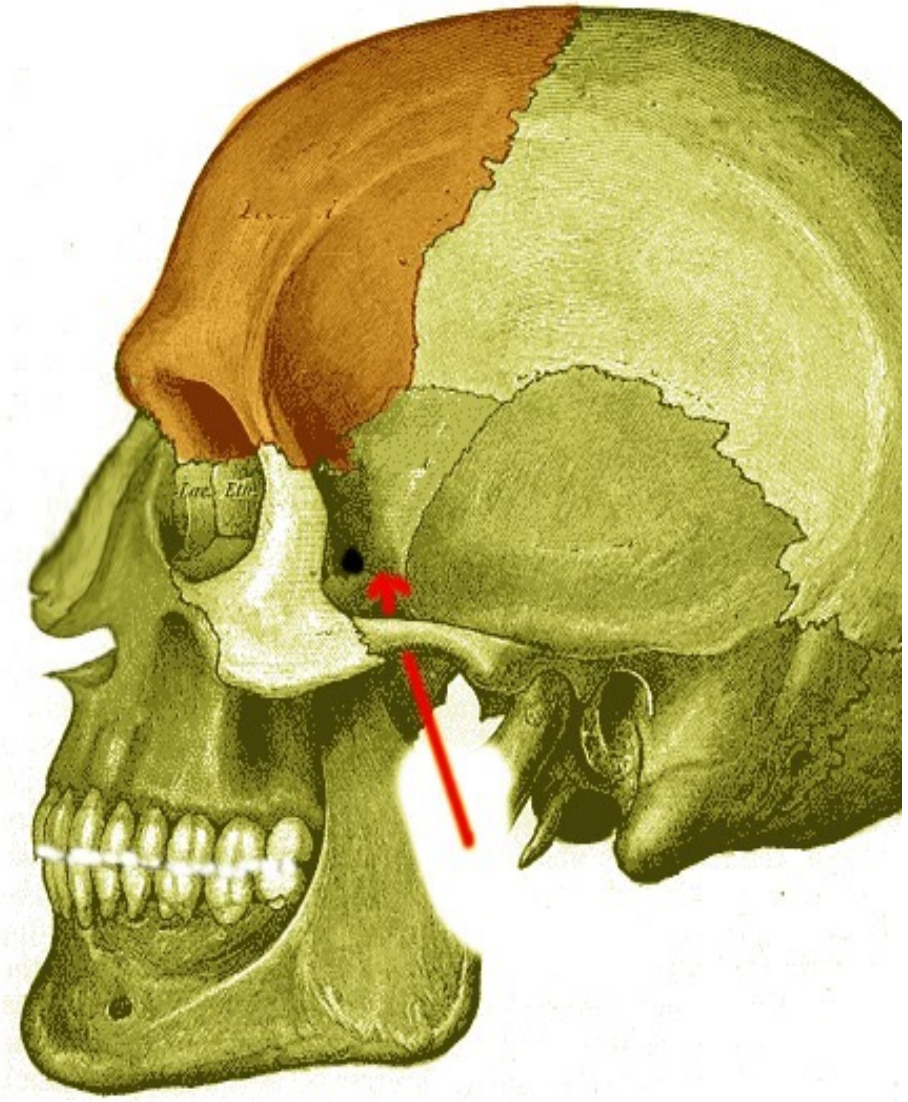
Medially : Lateral pterygoid plate and side wall of the pharynx.

Laterally : Ramus of the mandible and masseter muscle .

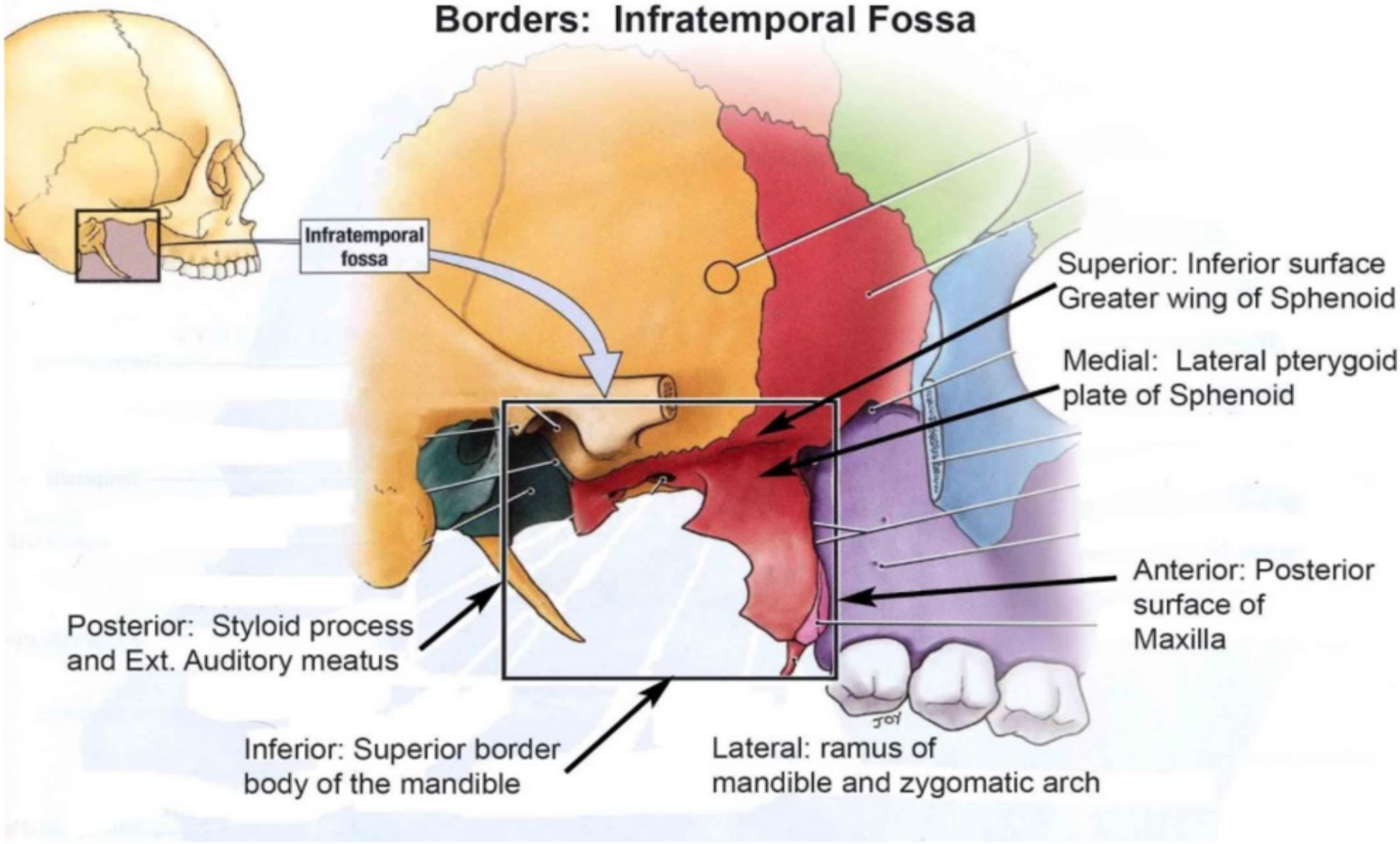
Anterior wall : Posterior surface of the maxilla.

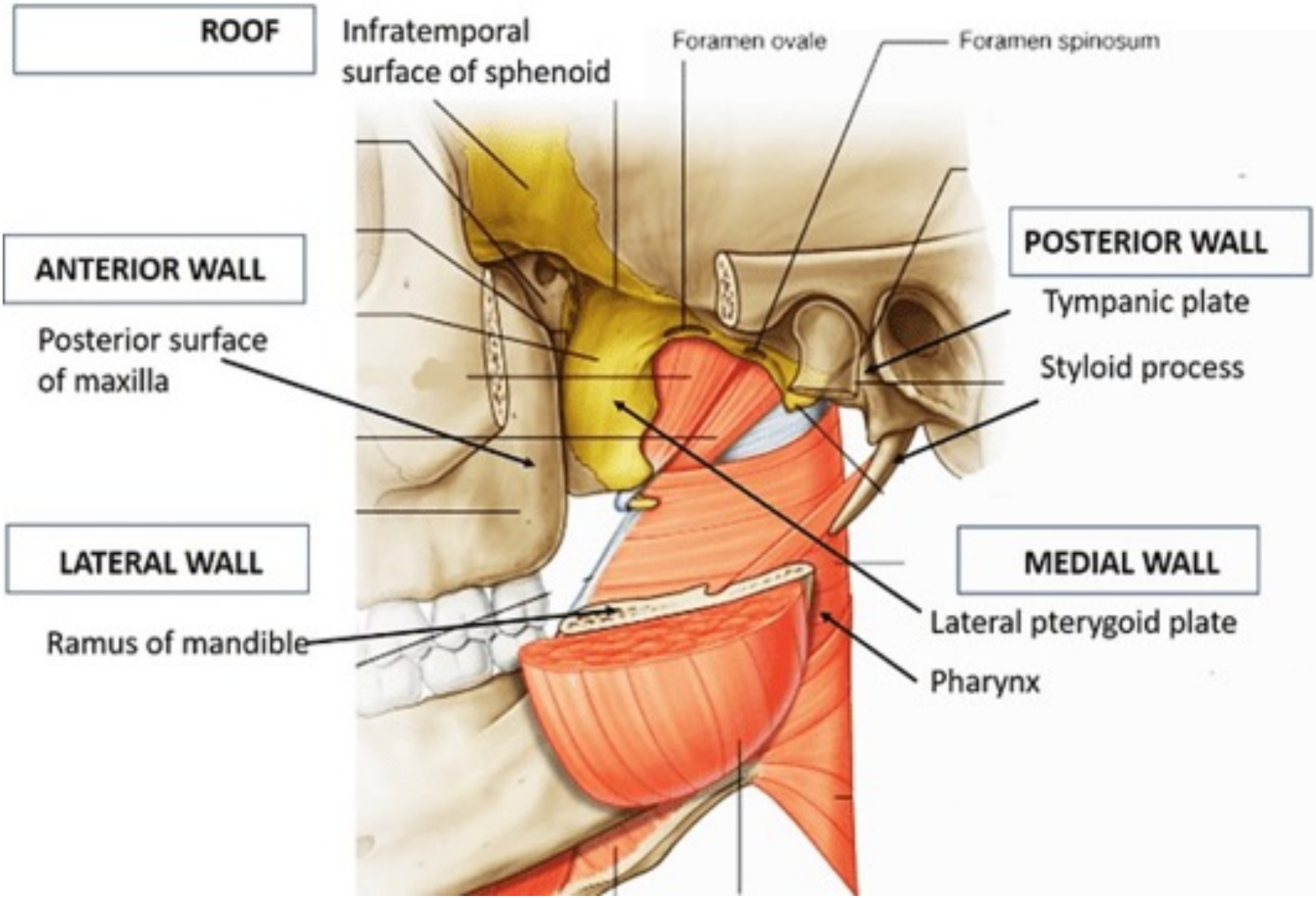
Posterior wall : Styloid apparatus and carotid sheath.

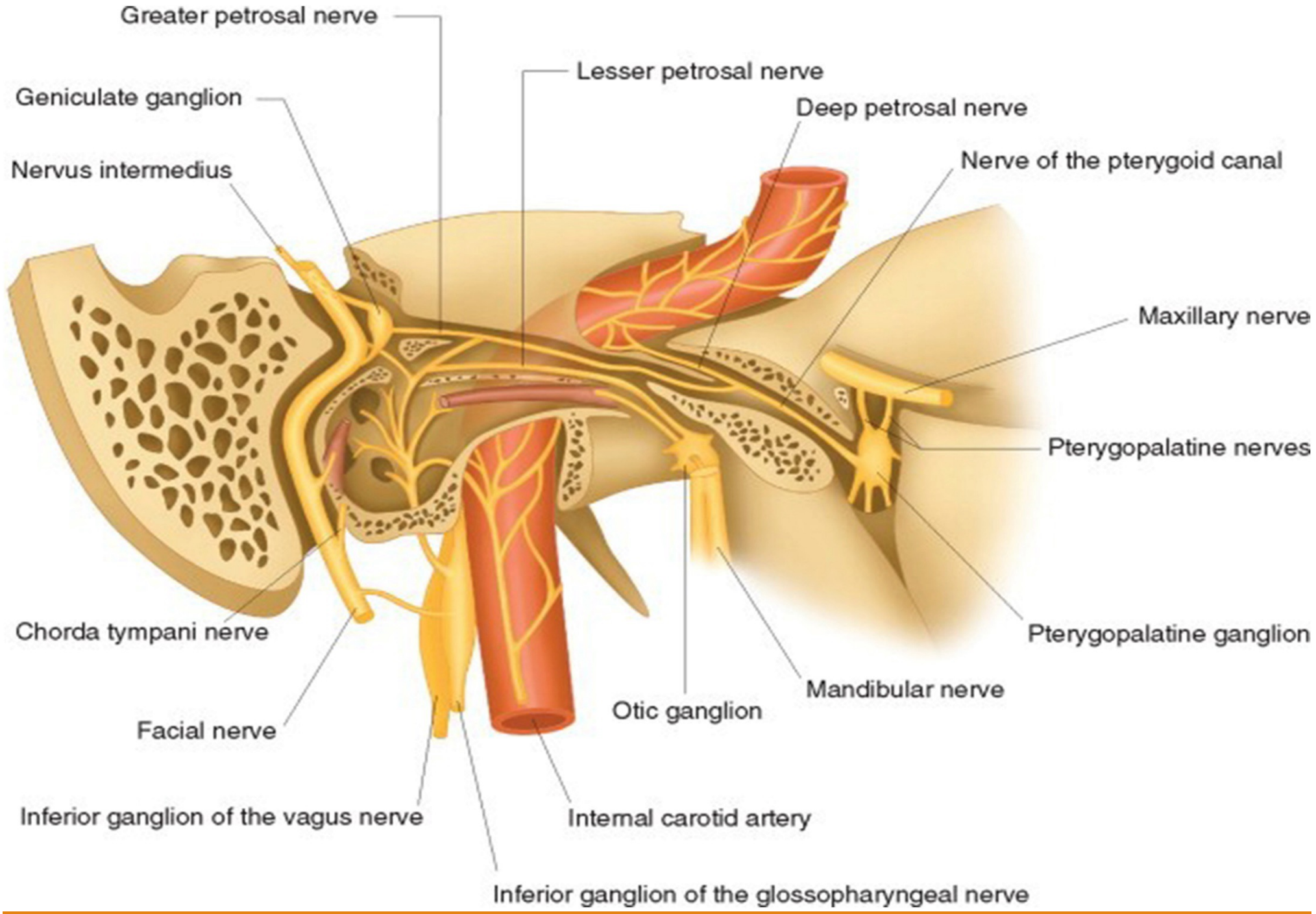
Roof: Infratemporal part of the greater wing of the sphenoid.

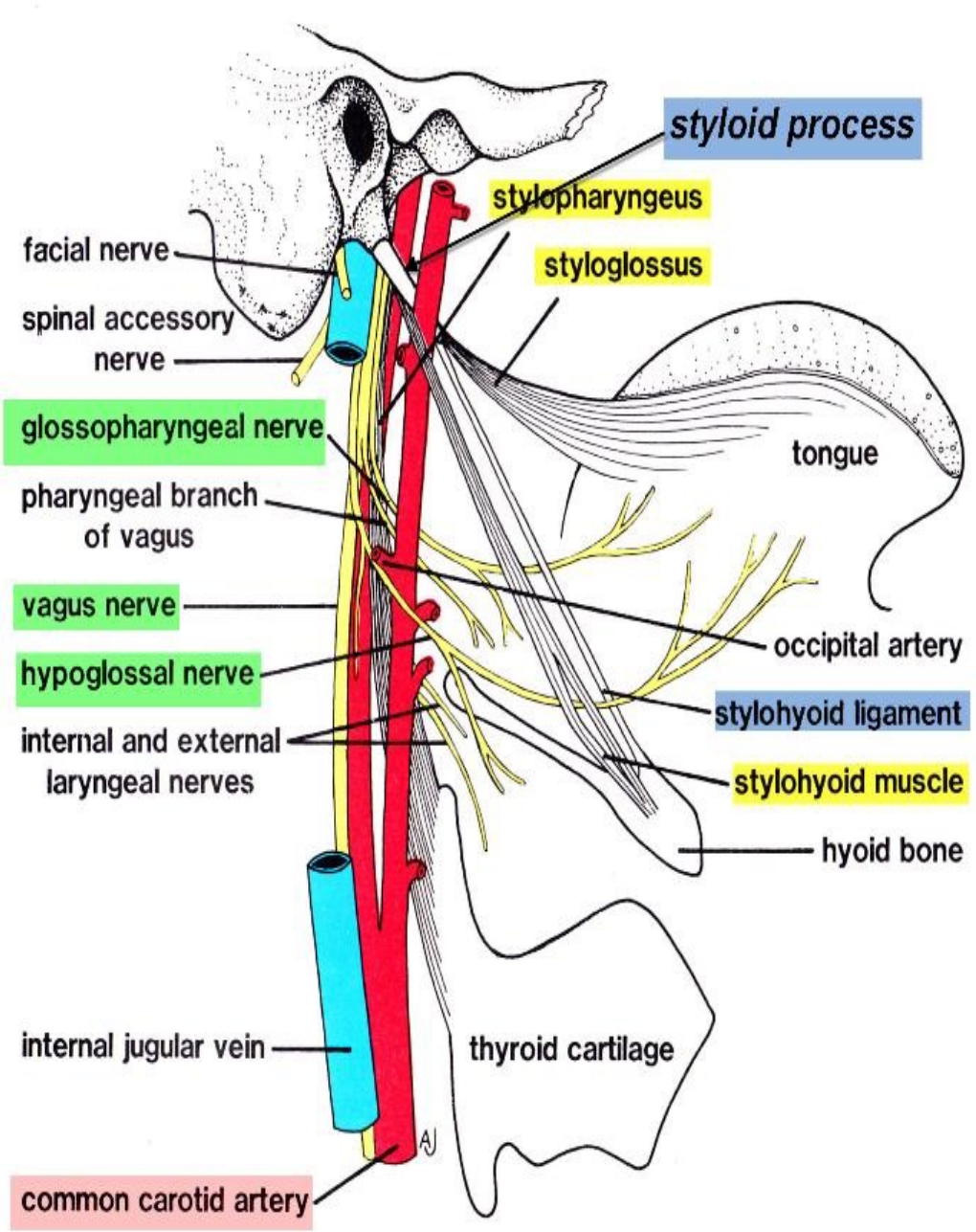


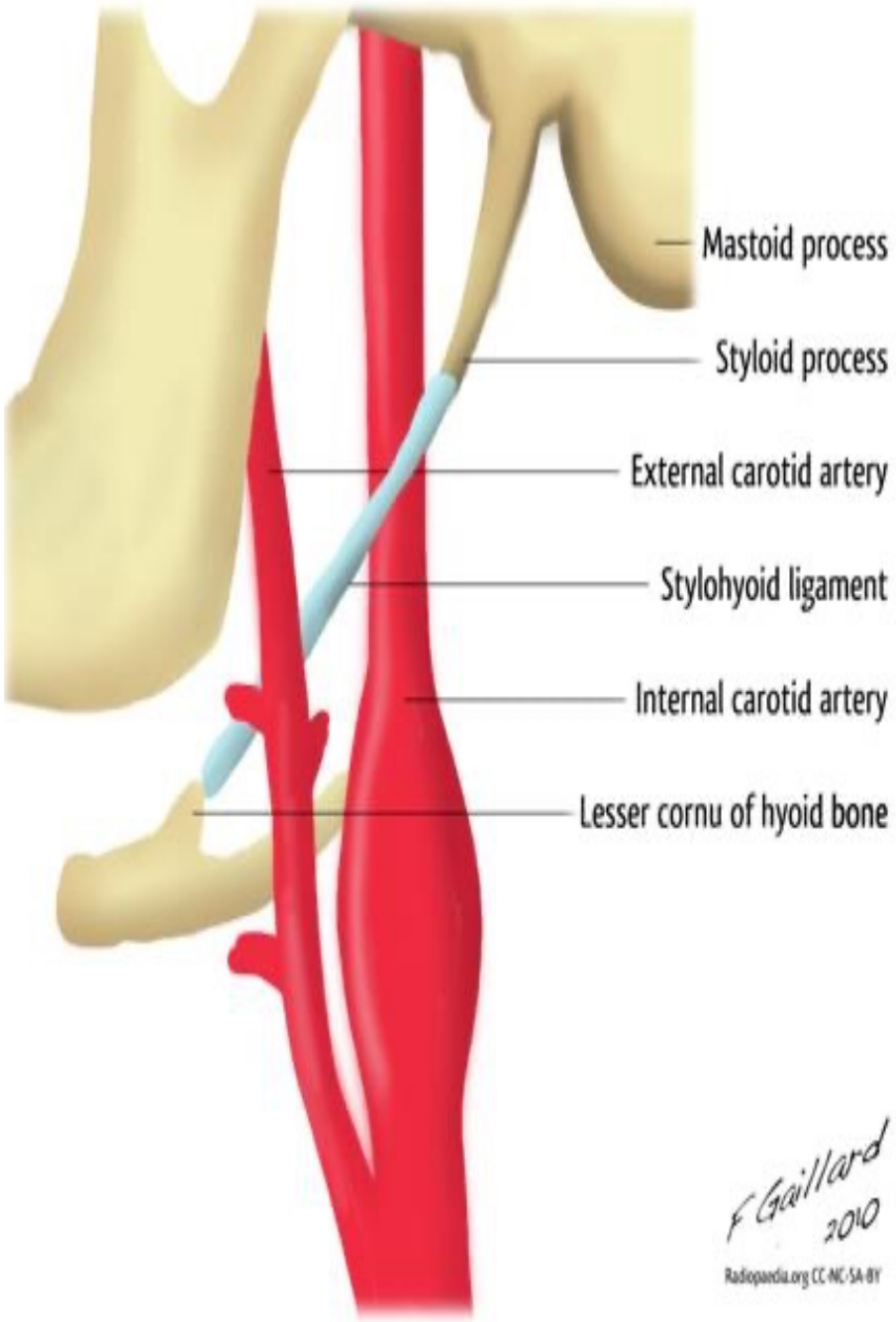
Borders: Infratemporal Fossa




ROOF
Infratemporal surface of sphenoid
Foramen ovale
Foramen spinosum
ANTERIOR WALL
Posterior surface of maxilla
POSTERIOR WALL
Tympanic plate
Styloid process
LATERAL WALL
Ramus of mandible
MEDIAL WALL
Lateral pterygoid plate
Pharynx


Greater petrosal nerve
Lesser petrosal nerve
Geniculate ganglion
Deep petrosal nerve
Nervus intermedius
Nerve of the pterygoid canal
Maxillary nerve
Pterygopalatine nerves
Chorda tympani nerve
Pterygopalatine ganglion
Mandibular nerve
Otic ganglion
Facial nerve
Inferior ganglion of the vagus nerve
Internal carotid artery
Inferior ganglion of the glossopharyngeal nerve


styloid process
stylopharyngeus
styloglossus
facial nerve
spinal accessory nerve
glossopharyngeal nerve
tongue
pharyngeal branch of vagus
vagus nerve
occipital artery
hypoglossal nerve
stylohyoid ligament
internal and external laryngeal nerves
stylohyoid muscle
hyoid bone
internal jugular vein
thyroid cartilage
common carotid artery


Mastoid process
Styloid process
External carotid artery
Stylohyoid ligament
Internal carotid artery
Lesser cornu of hyoid bone
F Gaillard 2010
Radiopaedia.org CC-NC-SA-BY

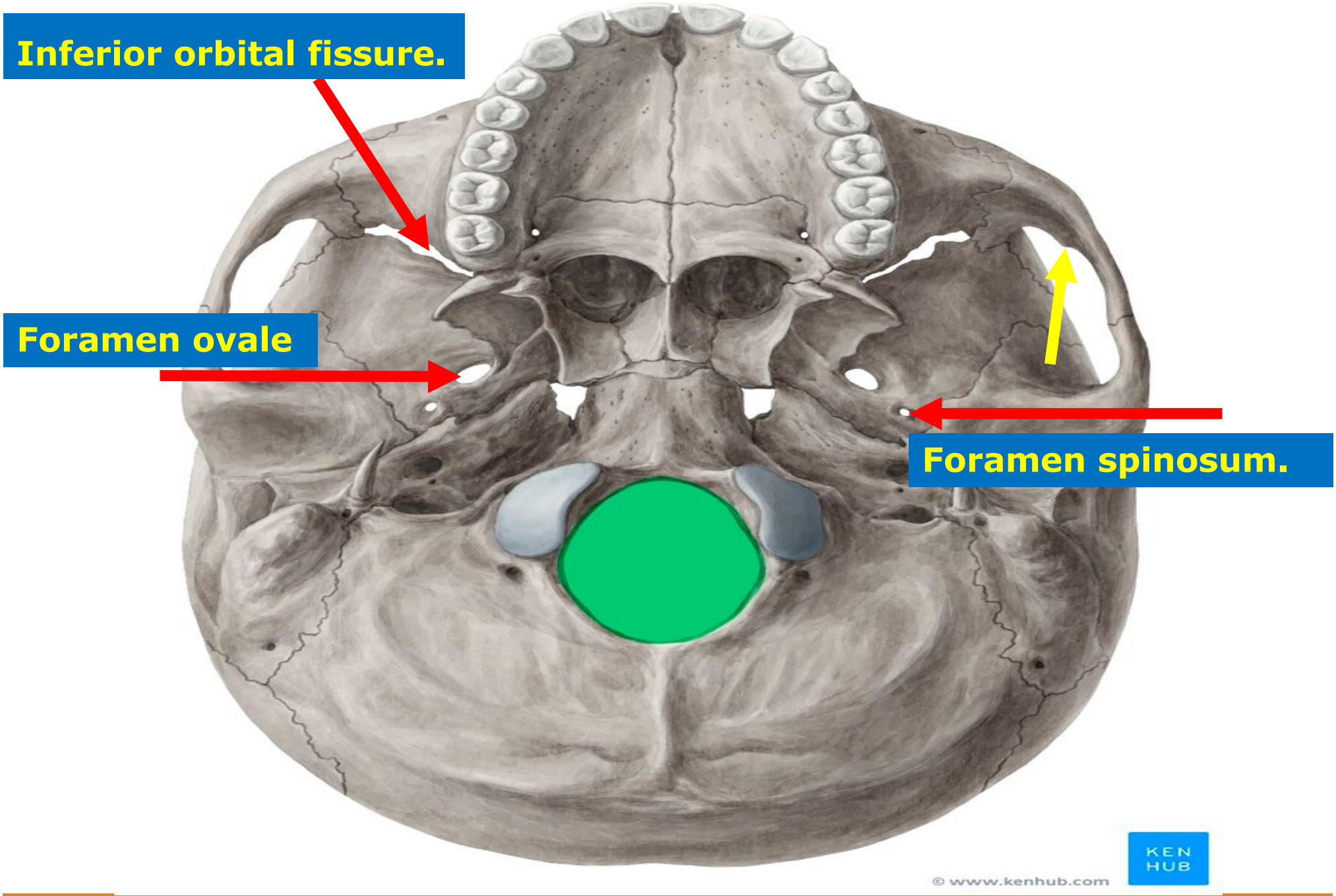
Communications :

Superolaterally : with temporal fossa, deep to the zygomatic arch.

Superomedially : with the orbit via inferior orbital fissure.

Above through its roof: with middle cranial fossa via foramen ovale and foramen spinosum.

Medially : with pterygo-palatine fossa via pterygomaxillary fissure.


Inferior orbital fissure.
Foramen ovale
Foramen spinosum.
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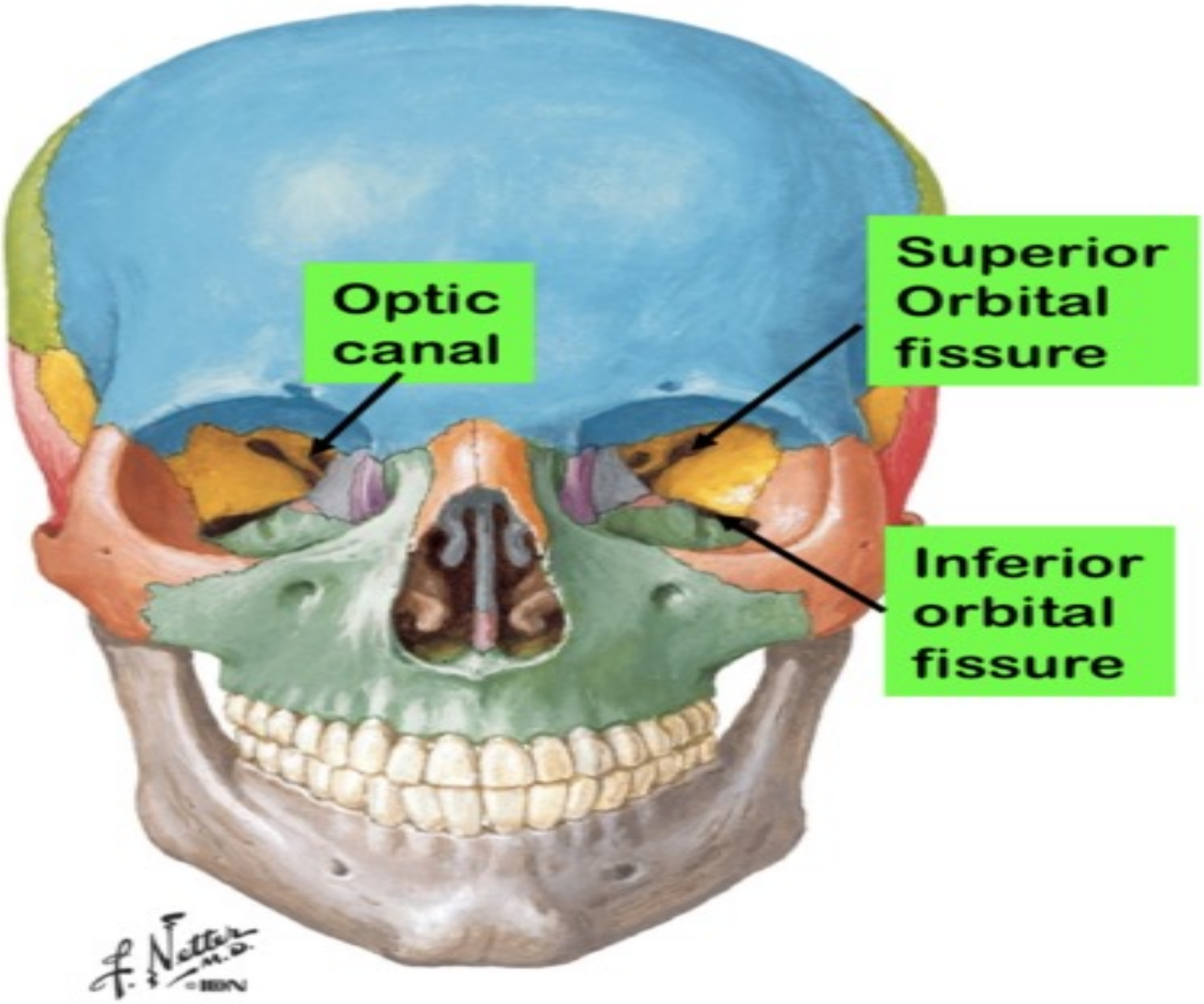
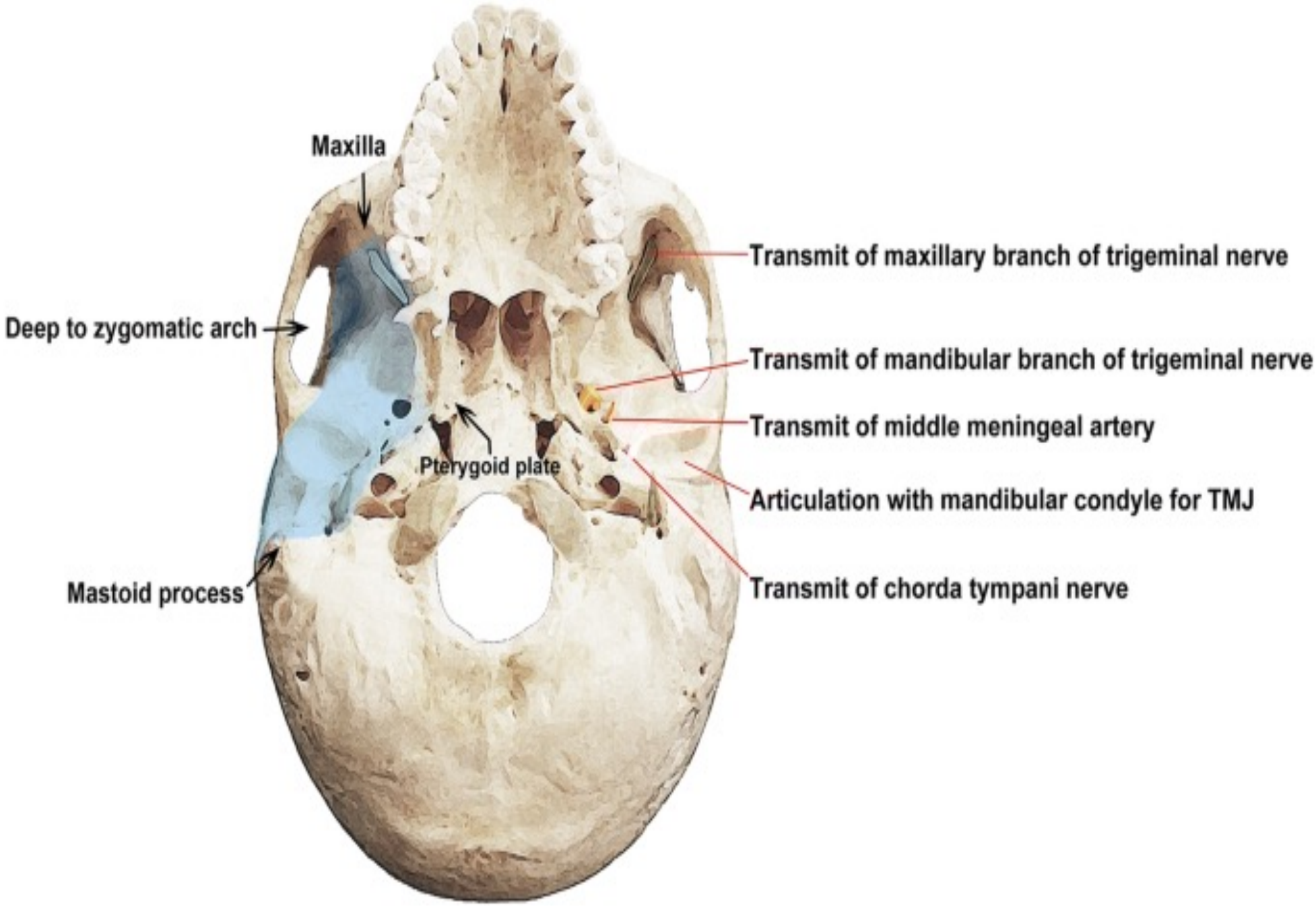
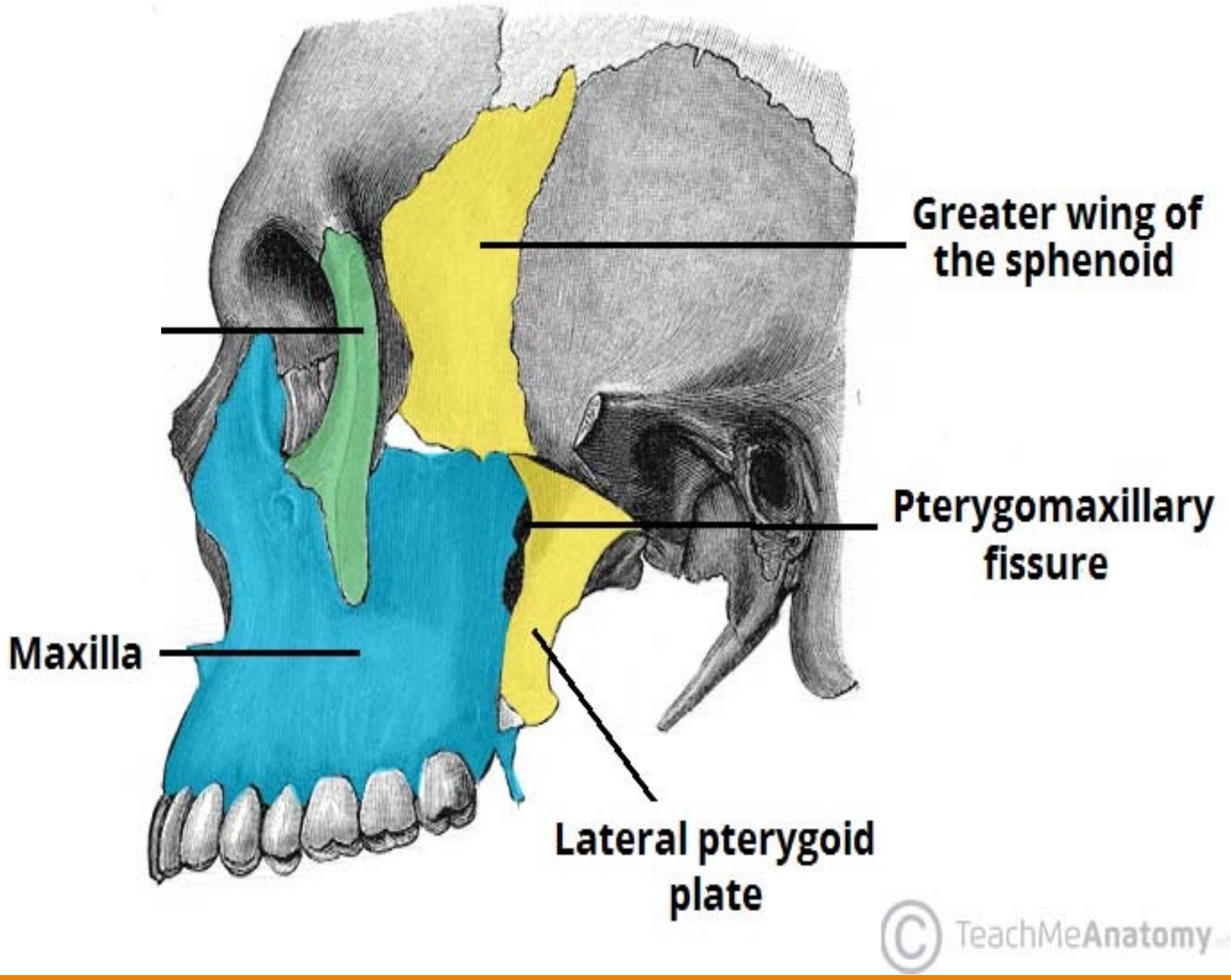
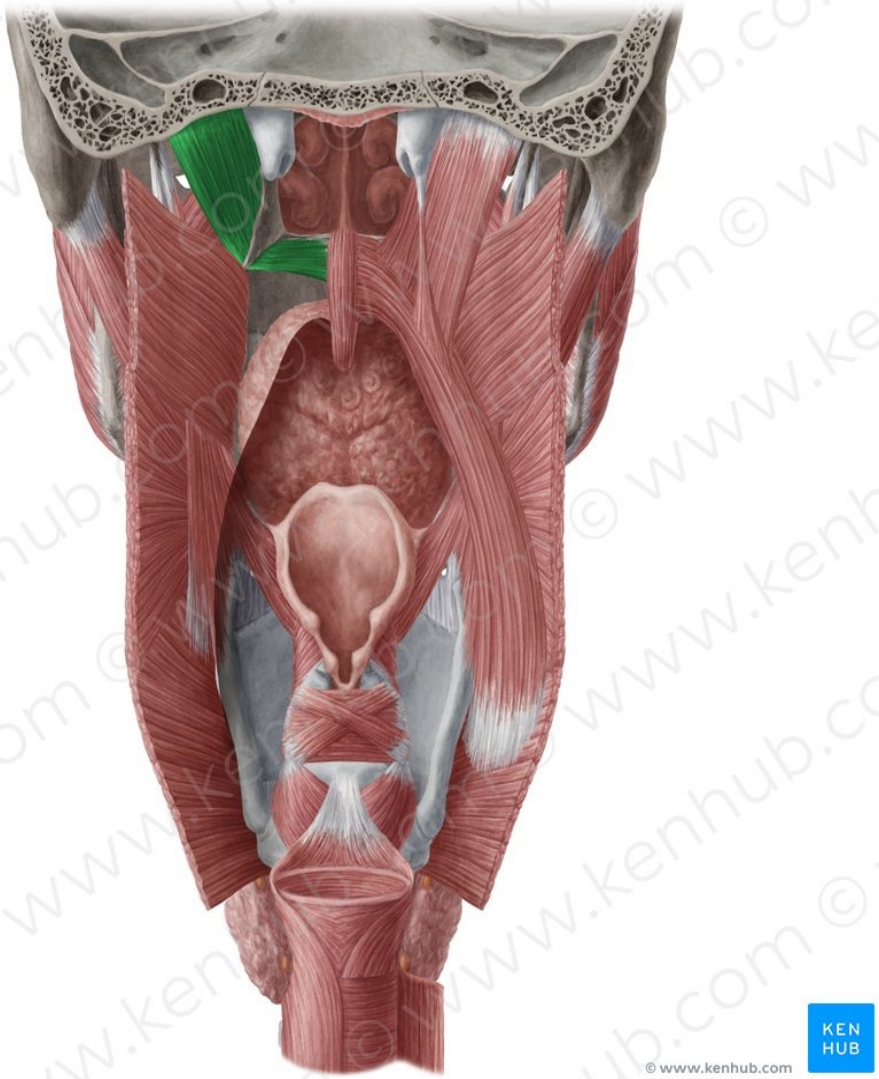

Optic canal
Superior Orbital fissure
Inferior orbital fissure

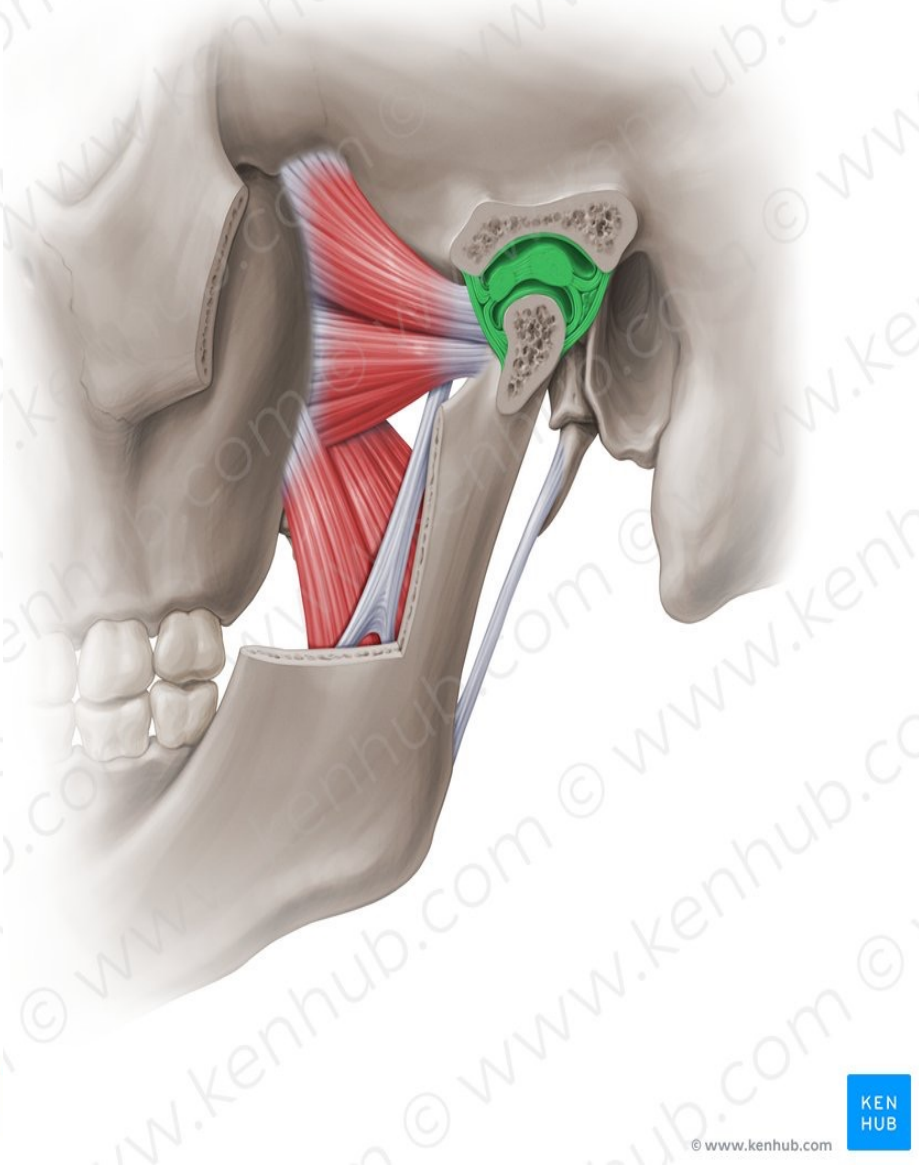

Maxilla
Deep to zygomatic arch
Pterygoid plate
Mastoid process
Transmit of maxillary branch of trigeminal nerve
Transmit of mandibular branch of trigeminal nerve
Transmit of middle meningeal artery
Articulation with mandibular condyle for TMJ
Transmit of chorda tympani nerve


Greater wing of the sphenoid
Pterygomaxillary fissure
Maxilla
Lateral pterygoid plate
TeachMeAnatomy

Contents of infratemporal fossa

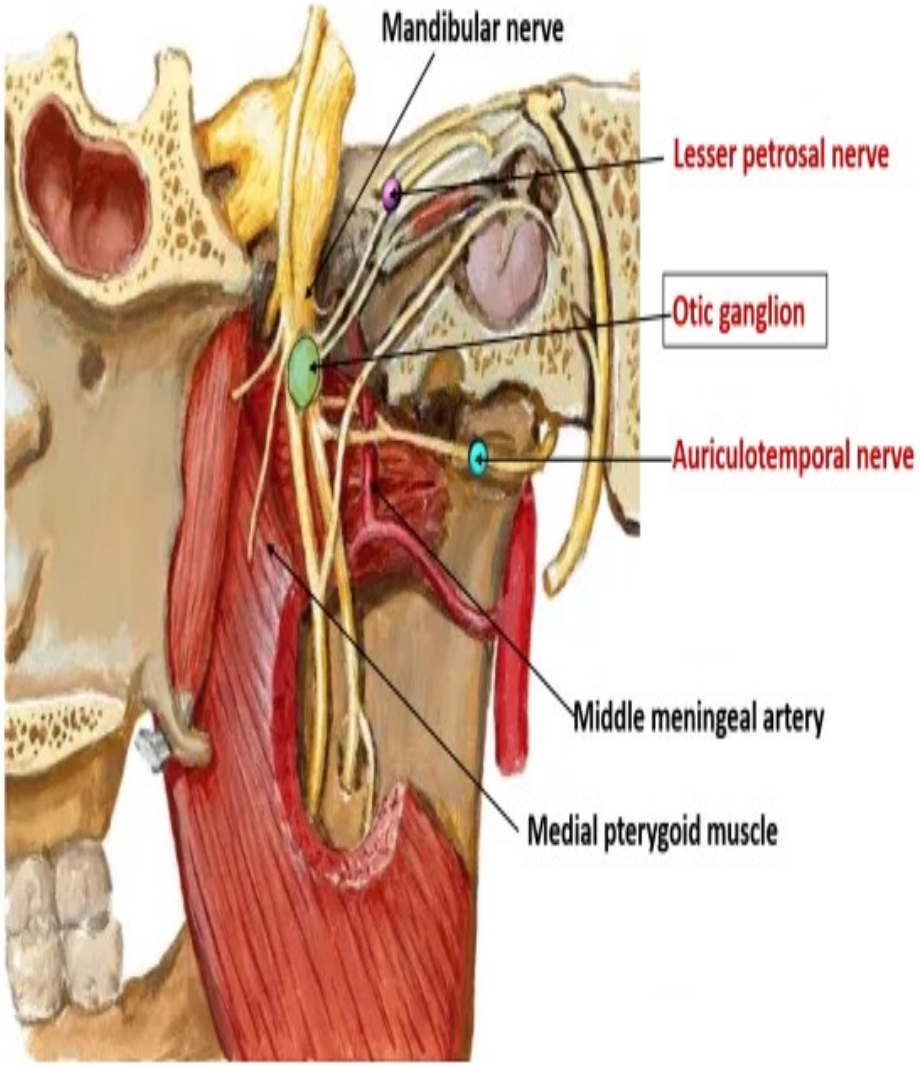
Superficial contents	Deep contents
Muscles 1. Lateral pterygoid muscle 2. Medial pterygoid muscle	Tensor palati muscle
Nerves Branches of the mandibular Nerve	1. Trunk of the mandibular Nerve 2. Otic ganglion 3. Chorda tympani
Vessels 1. Maxillary A. (first and second parts only). 2. Pterygoid venous plexus	Middle and accessory meningeal arteries
	Sphenomandibular ligament

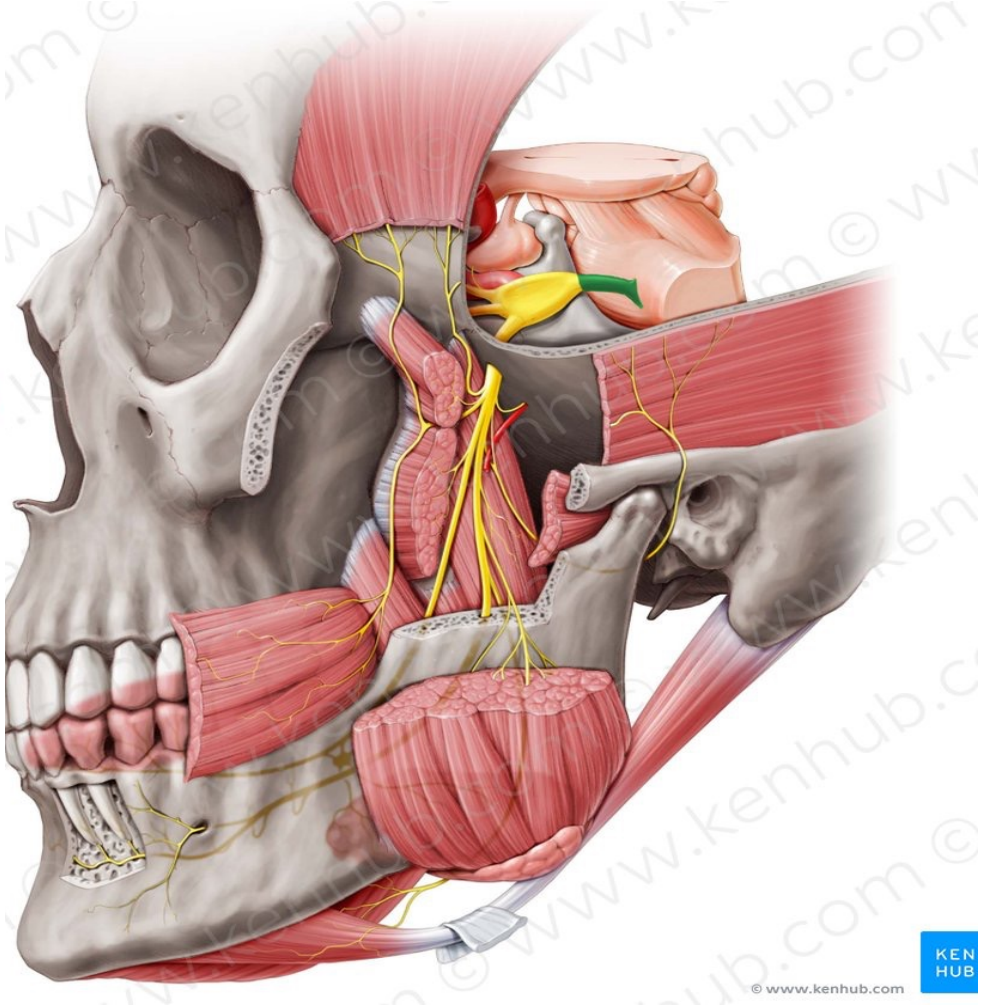




Tensor palati muscle

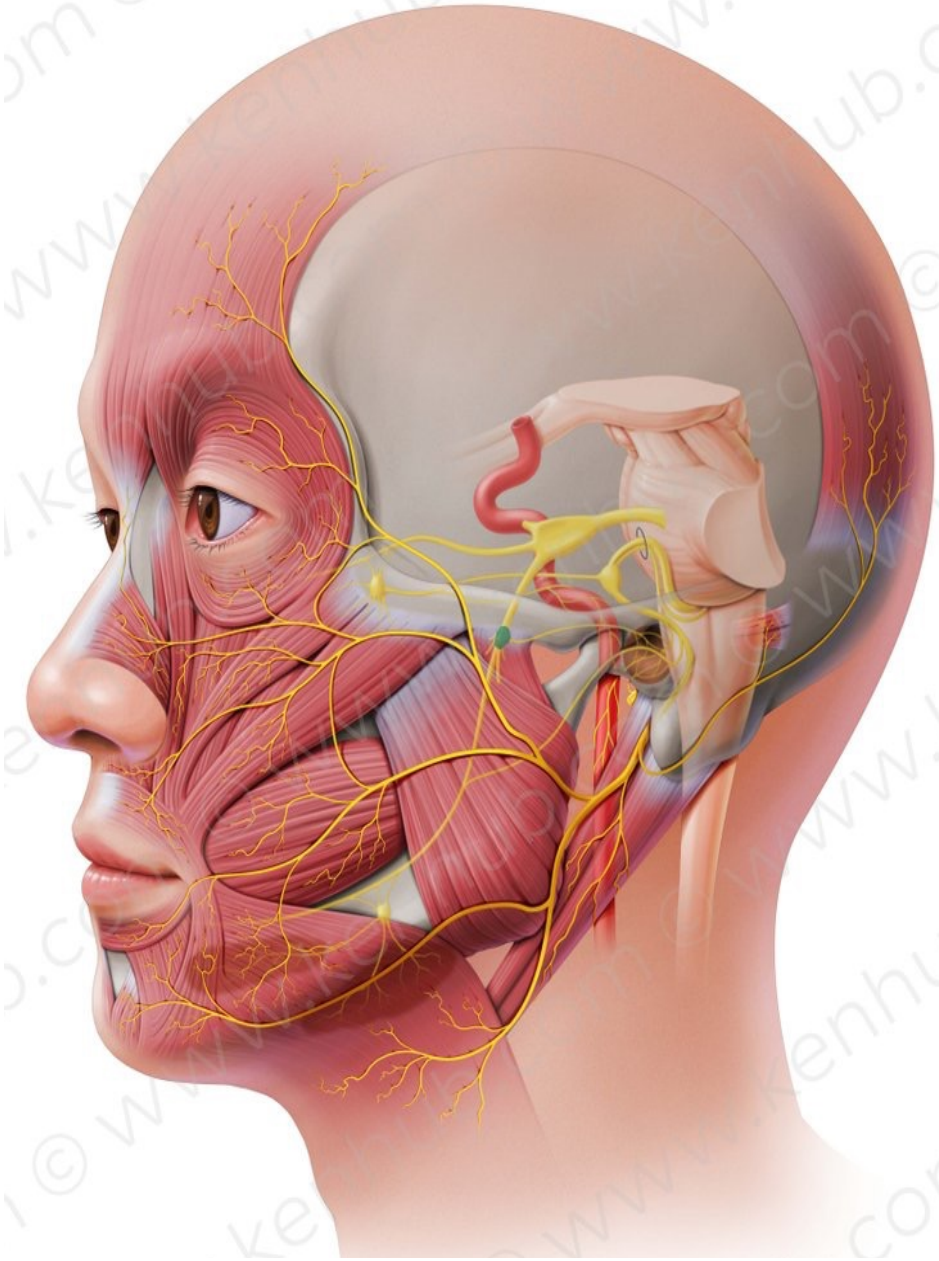
Lateral and medial pterygoid muscles



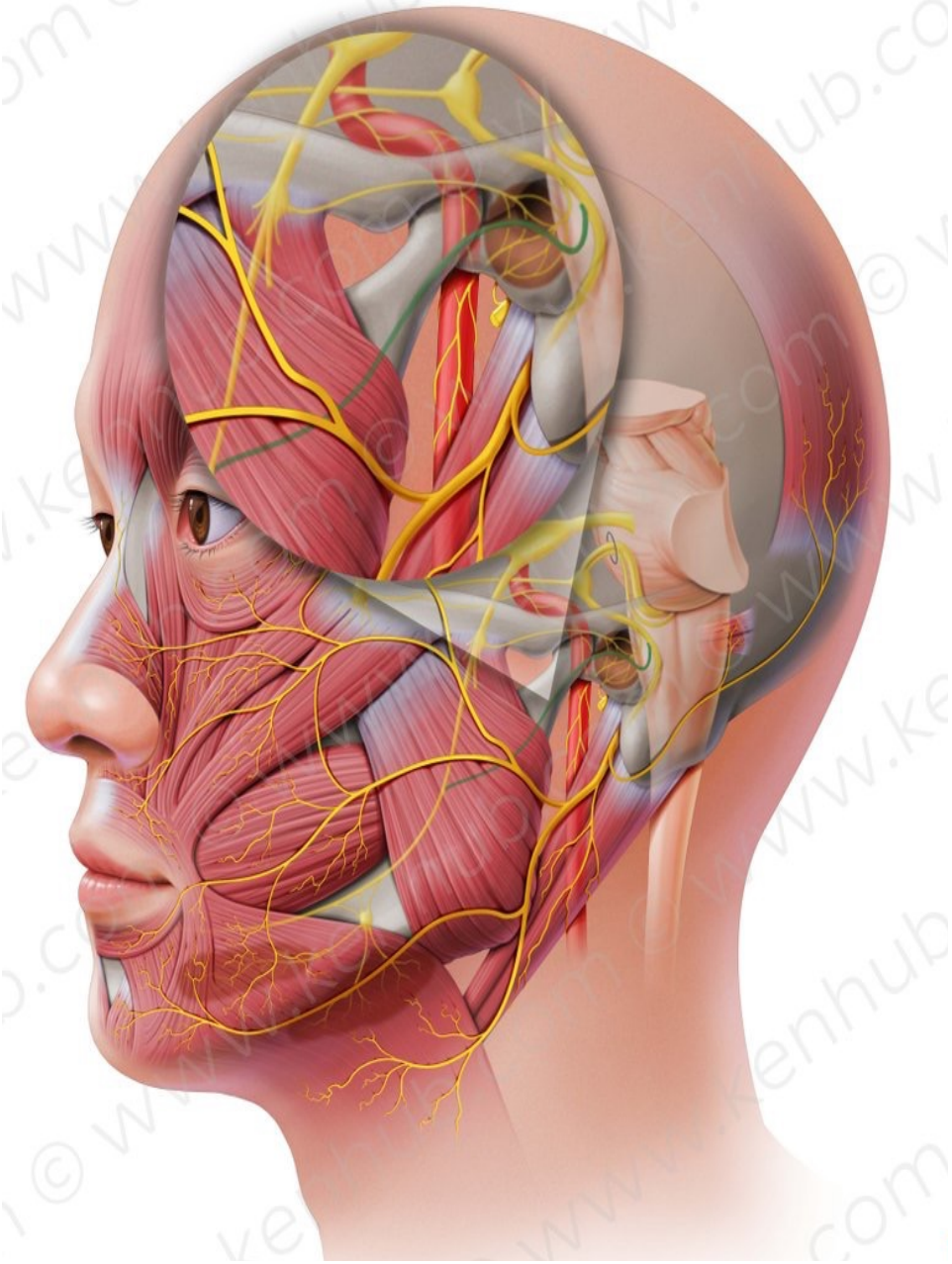


Otic ganglion

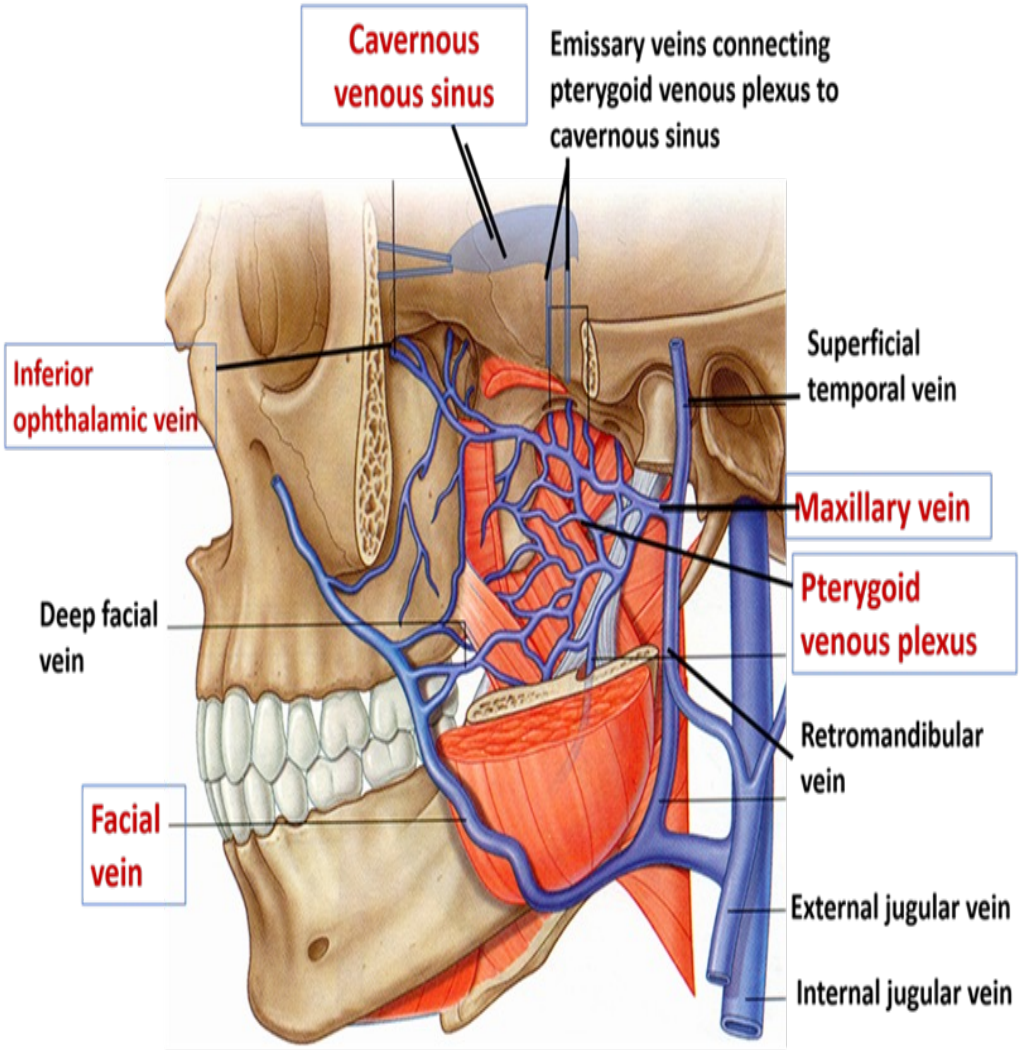
Trunk of the mandibular Nerve

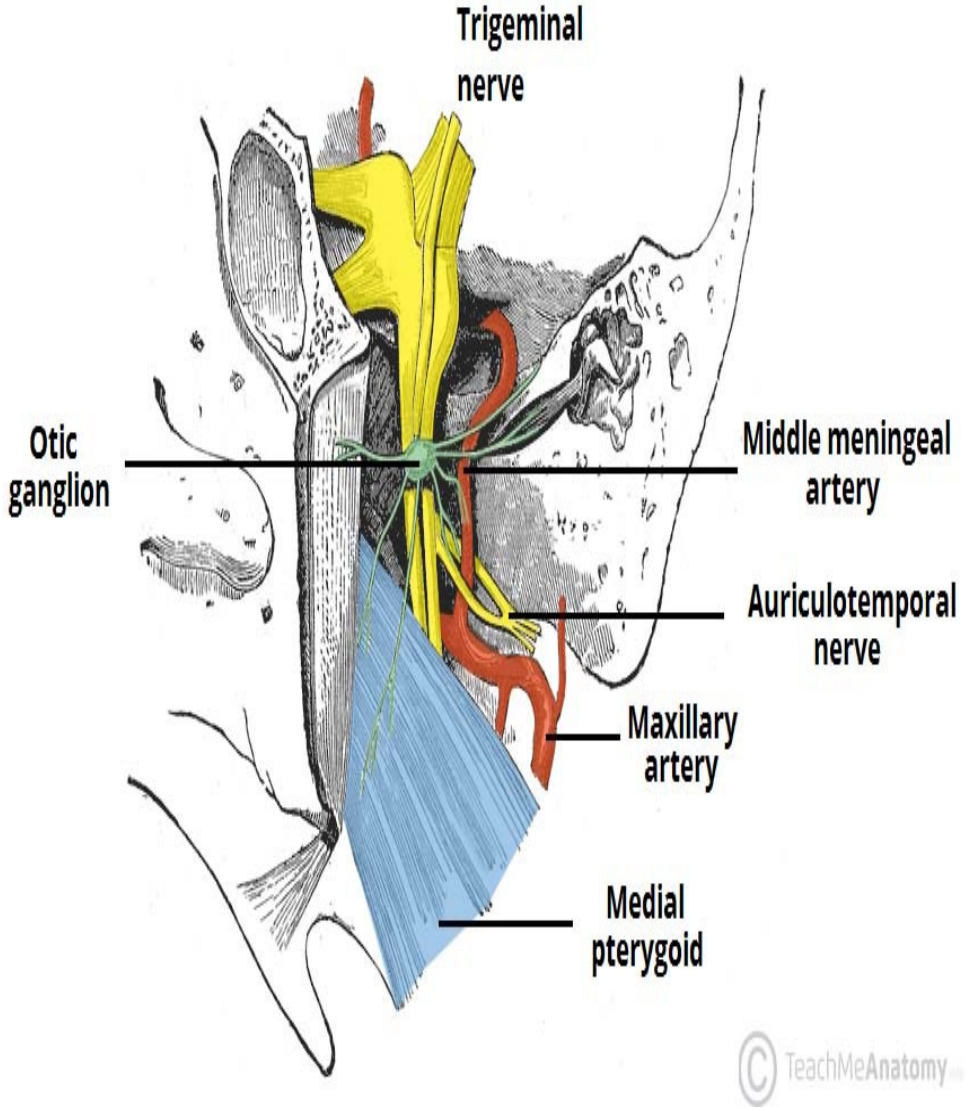


Otic ganglion



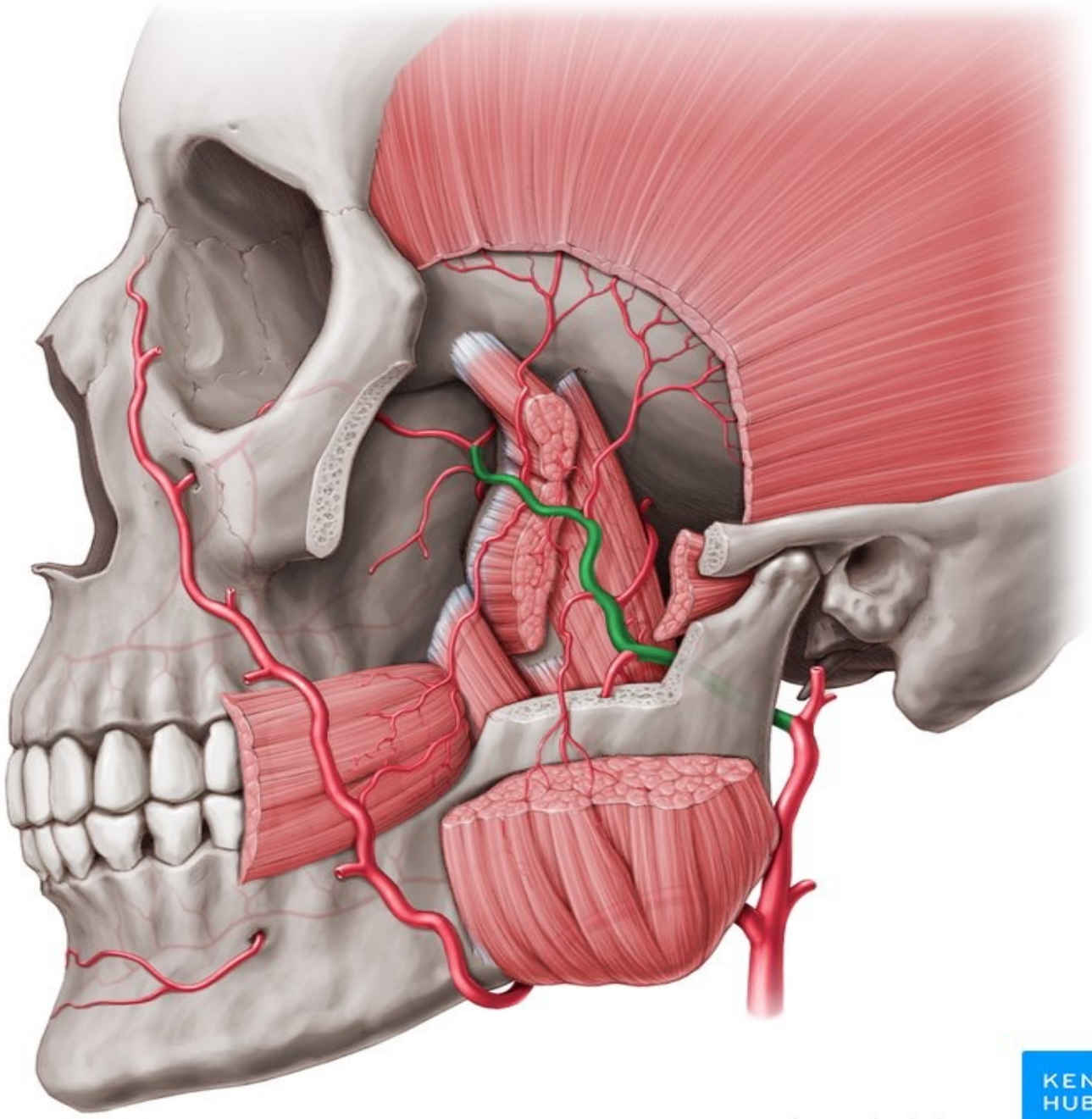
Chorda tympani



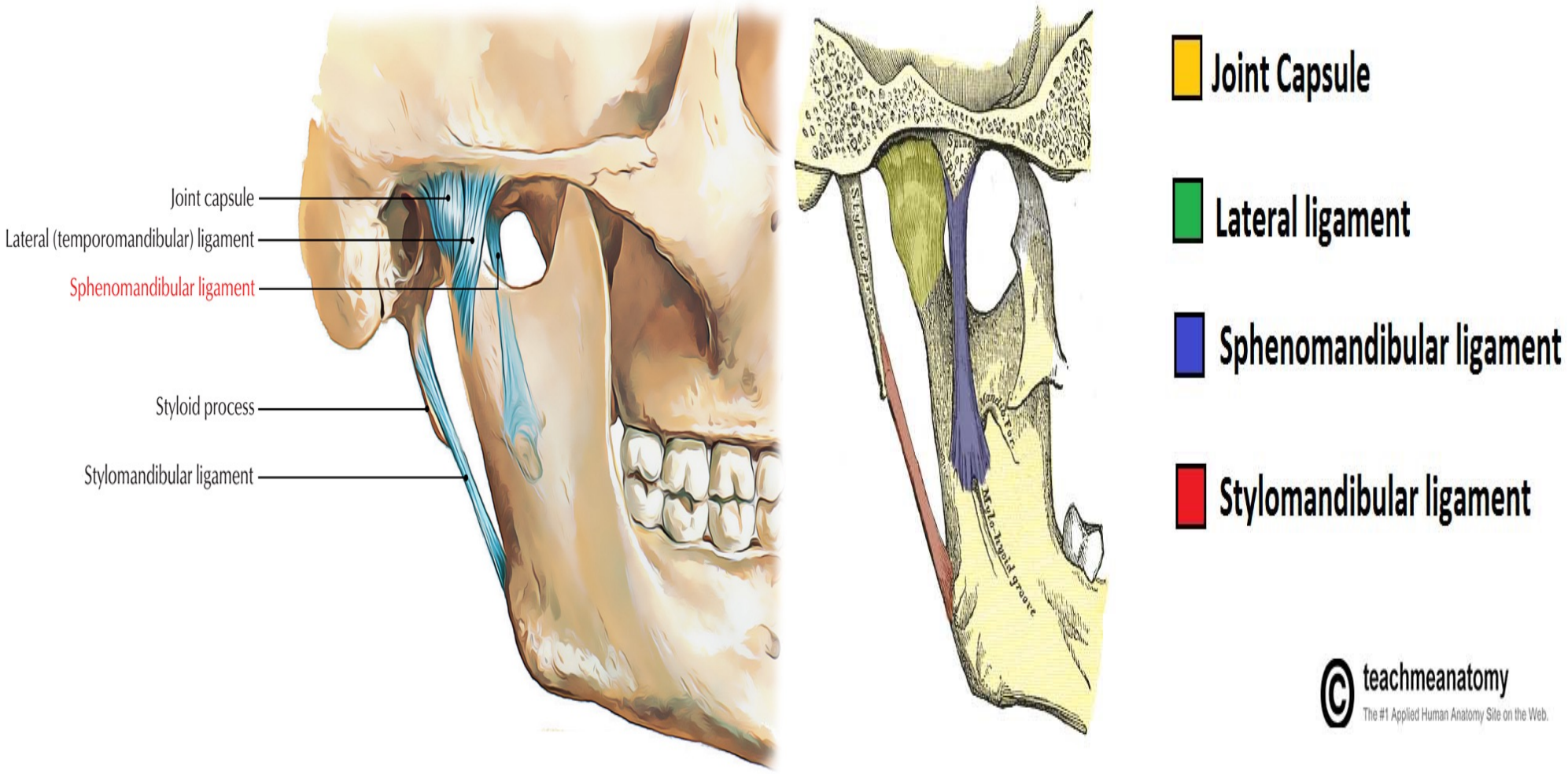


Pterygoid venous plexus

Maxillary A.



Maxillary A.



Sphenomandibular ligament

The University of Jordan
Faculty Of Medicine

Muscles of Mastication and TMJ

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Associate professor of anatomy & embryology

Muscles of Mastication

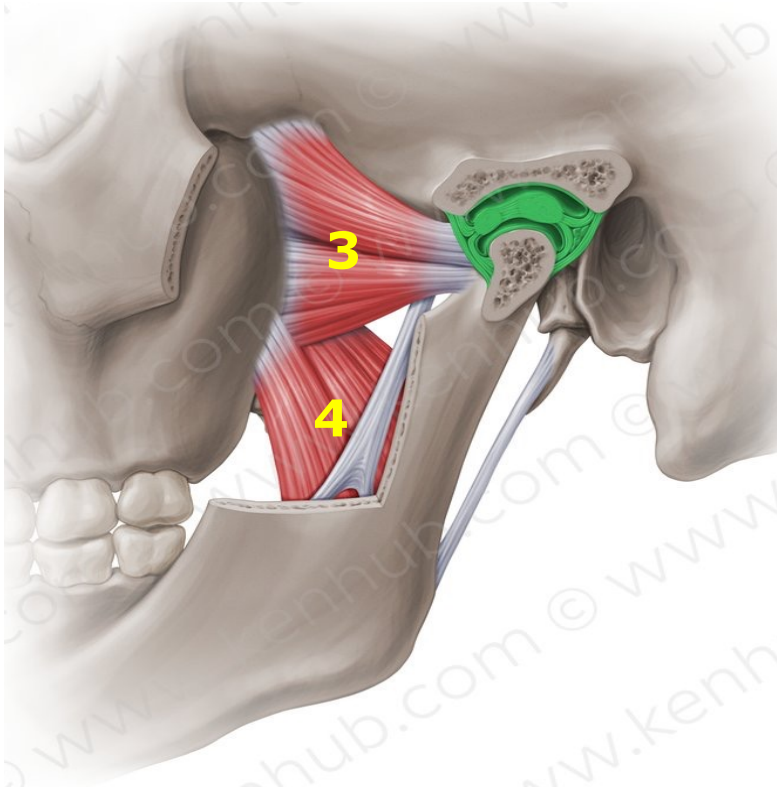
Four muscles

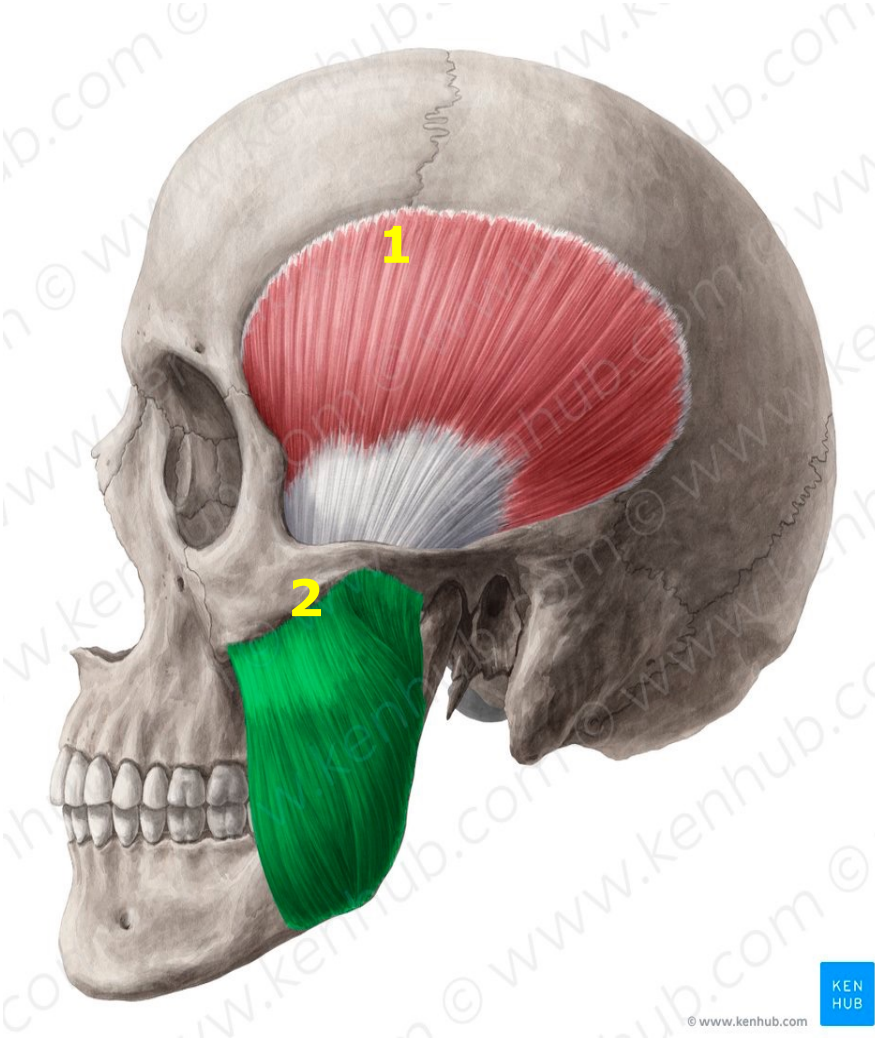
1- Temporalis

2-Masseter

3- Lateral Pterygoid

4- Medial Pterygoid





Temporalis

Origin : From floor of temporal fossa and temporal fascia.

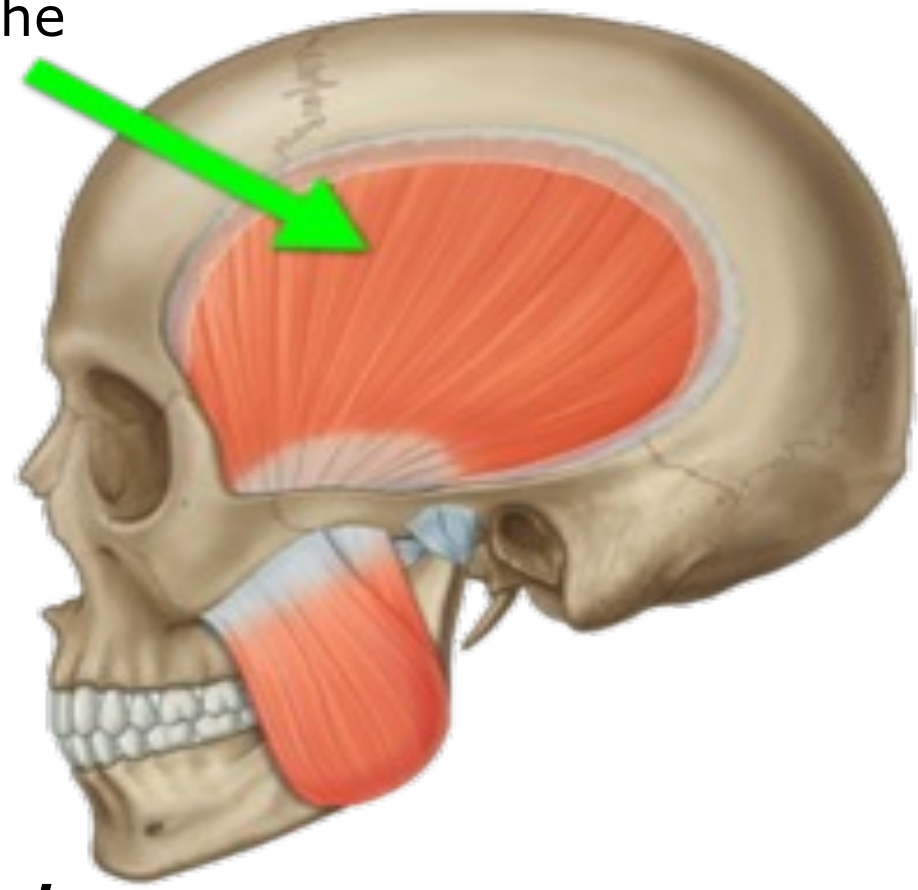
Insertion : Into coronoid process of the mandible and anterior border of the mandibular ramus down to the last molar tooth.

Nerve Supply : mandibular N. (anterior division).

Action :

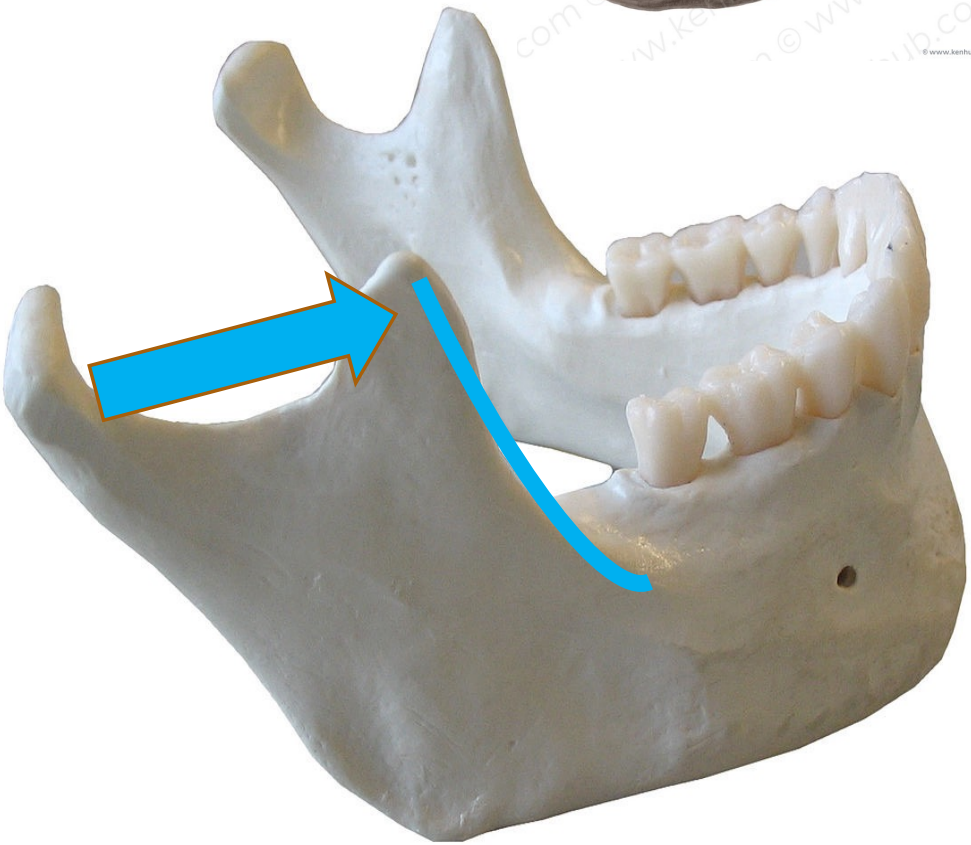
-Anterior and superior fibers elevate mandible.

-Posterior fibers **retract** the ***protruded*** mandible



Temporalis Muscle

Origin



Insertion

2- Masseter Muscle

Origin : from inner surface and lower border of zygomatic arch.

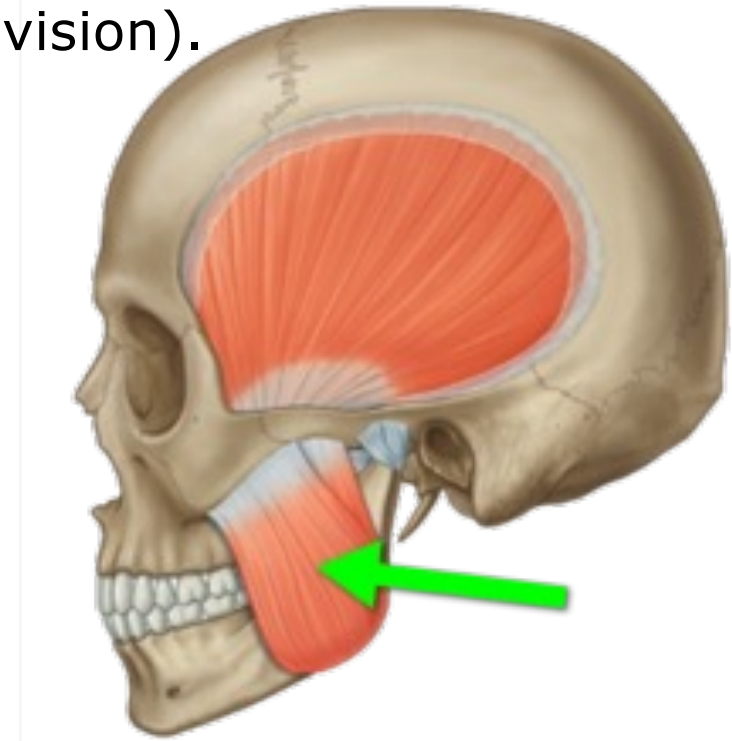
Insertion : into outer surface of the mandibular ramus.

Nerve Supply : mandibular N, (Anterior division).

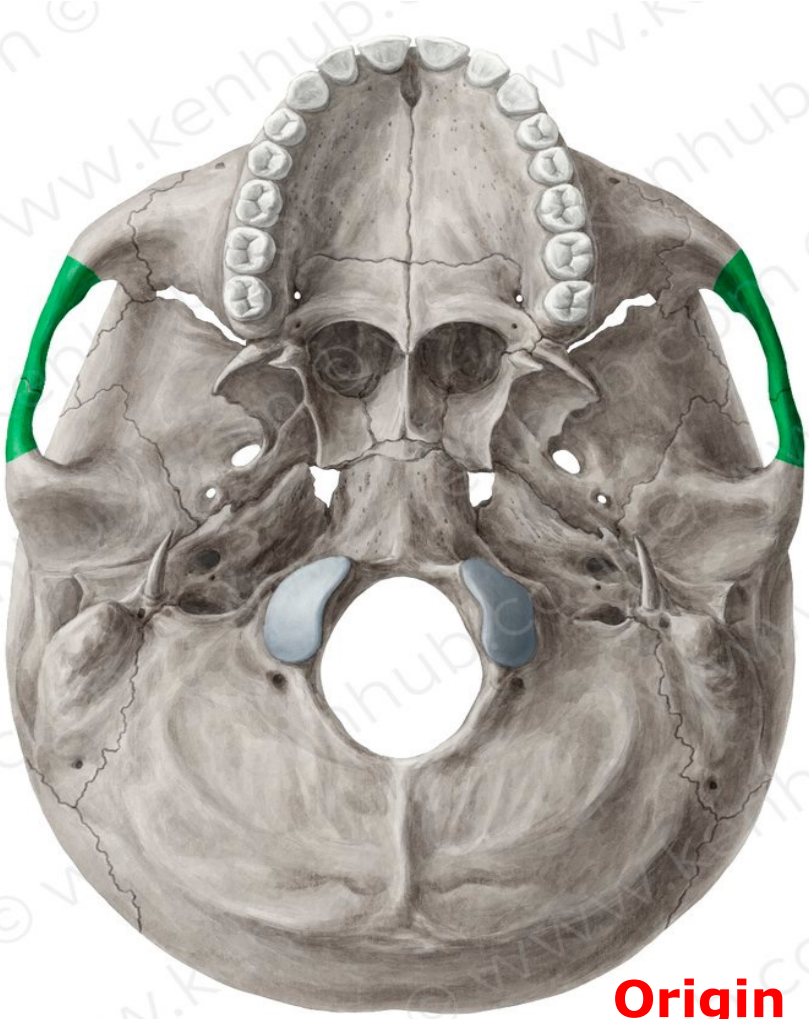
Action :

elevation of mandible to close the mouth,

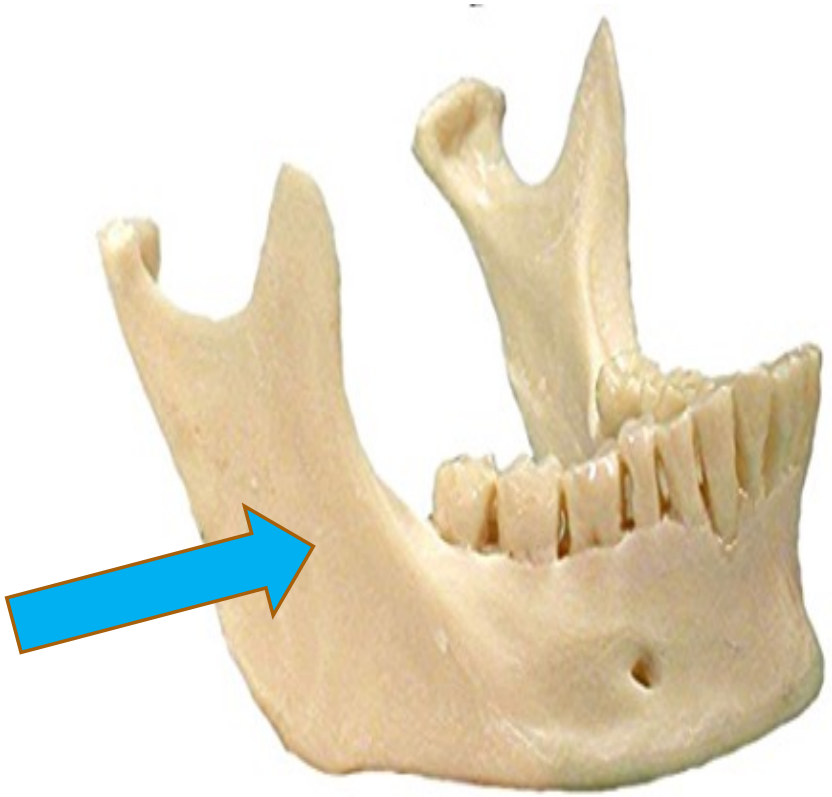
Plays a role in biting and chewing.



Masseter Muscle



Origin

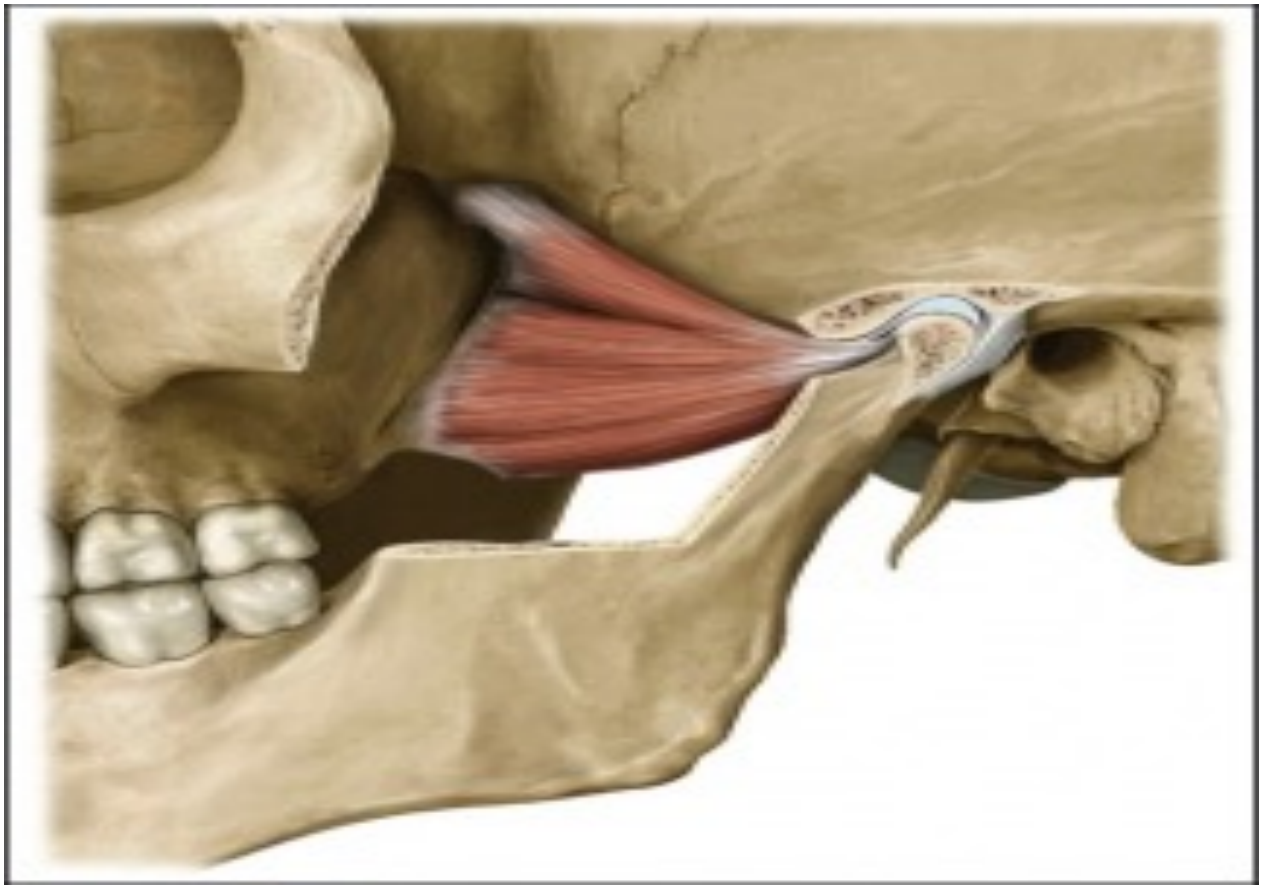


Insertion

3- Lateral Pterygoid

Upper and lower heads

LA !!!!!!



3- Lateral Pterygoid

Origin : the muscle arises by 2 heads : upper and lower :

The upper head from the infratemporal surface of the greater wing of sphenoid.

The Lower head: from the **L**ateral surface of the lateral pterygoid plate.

Insertion :

- Into the front of the neck of the mandible.
- Into the capsule and the *articular disc* of the Temporomandibular joint

Nerve supply : mandibular N. (anterior division).

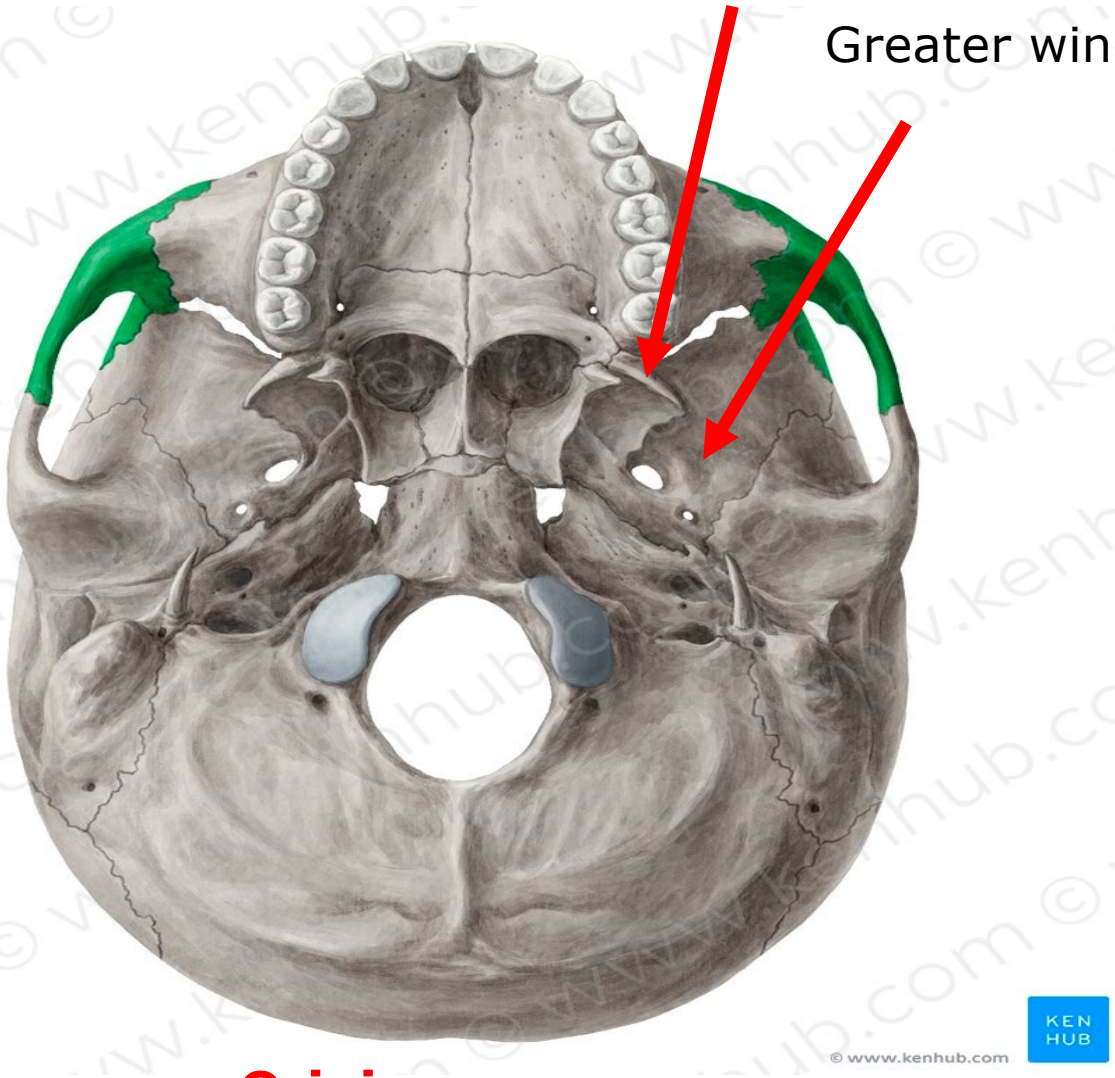
Actions :

- It opens the mouth by forward pull of the mandibular condyle and disc (it is the main opener of the mouth).

Lateral Pterygoid

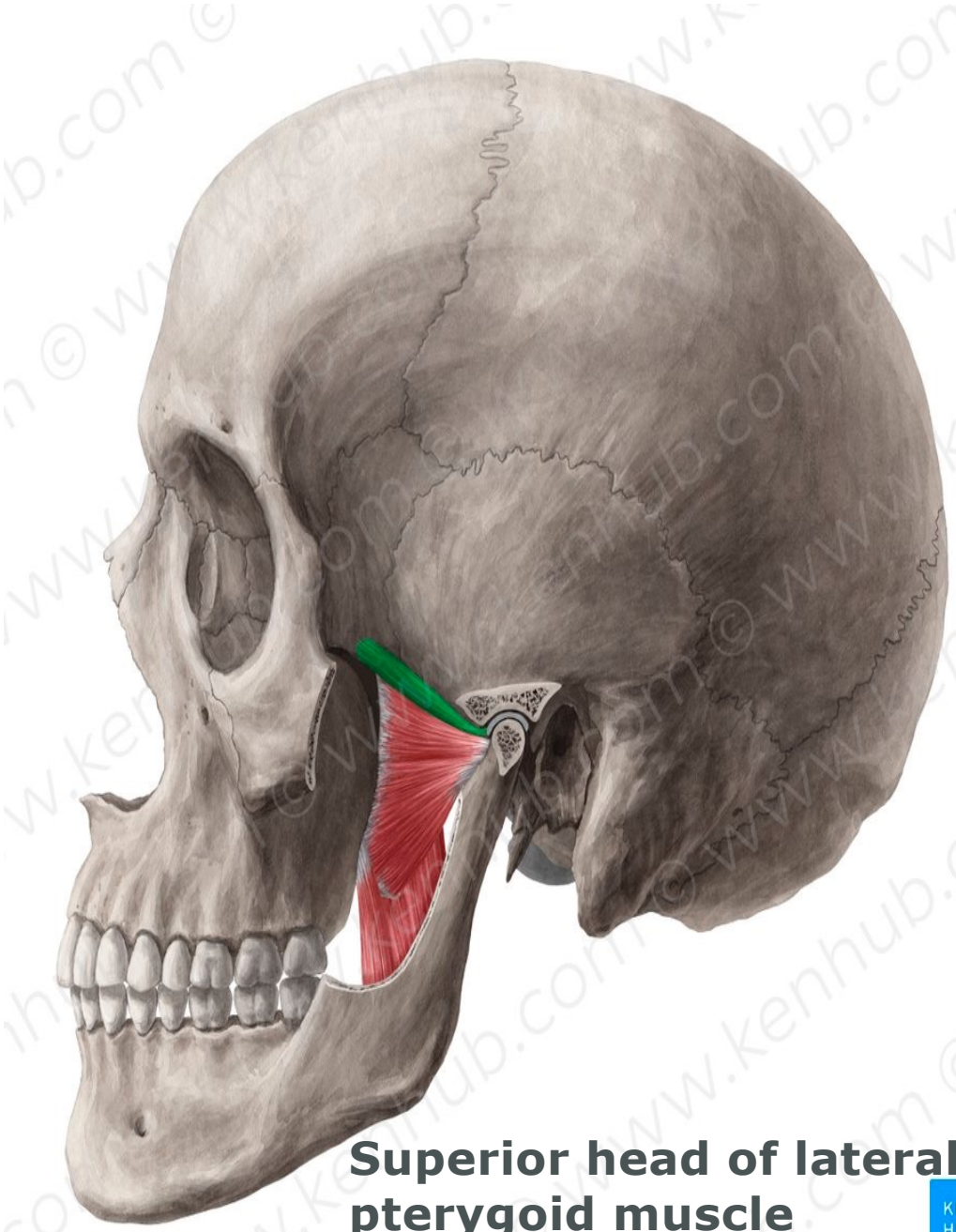
Lateral pterygoid plate

Greater wing of sphenoid

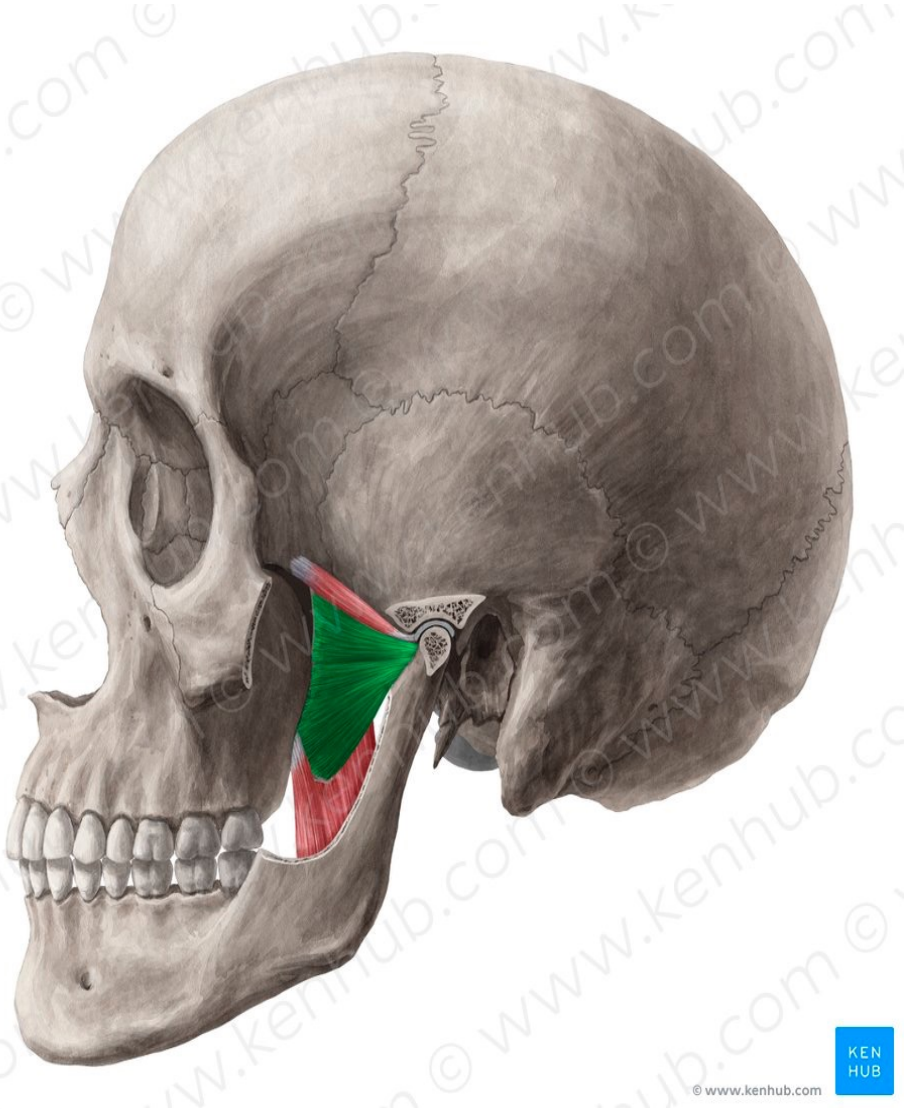


Origin

Insertion



Superior head of lateral pterygoid muscle

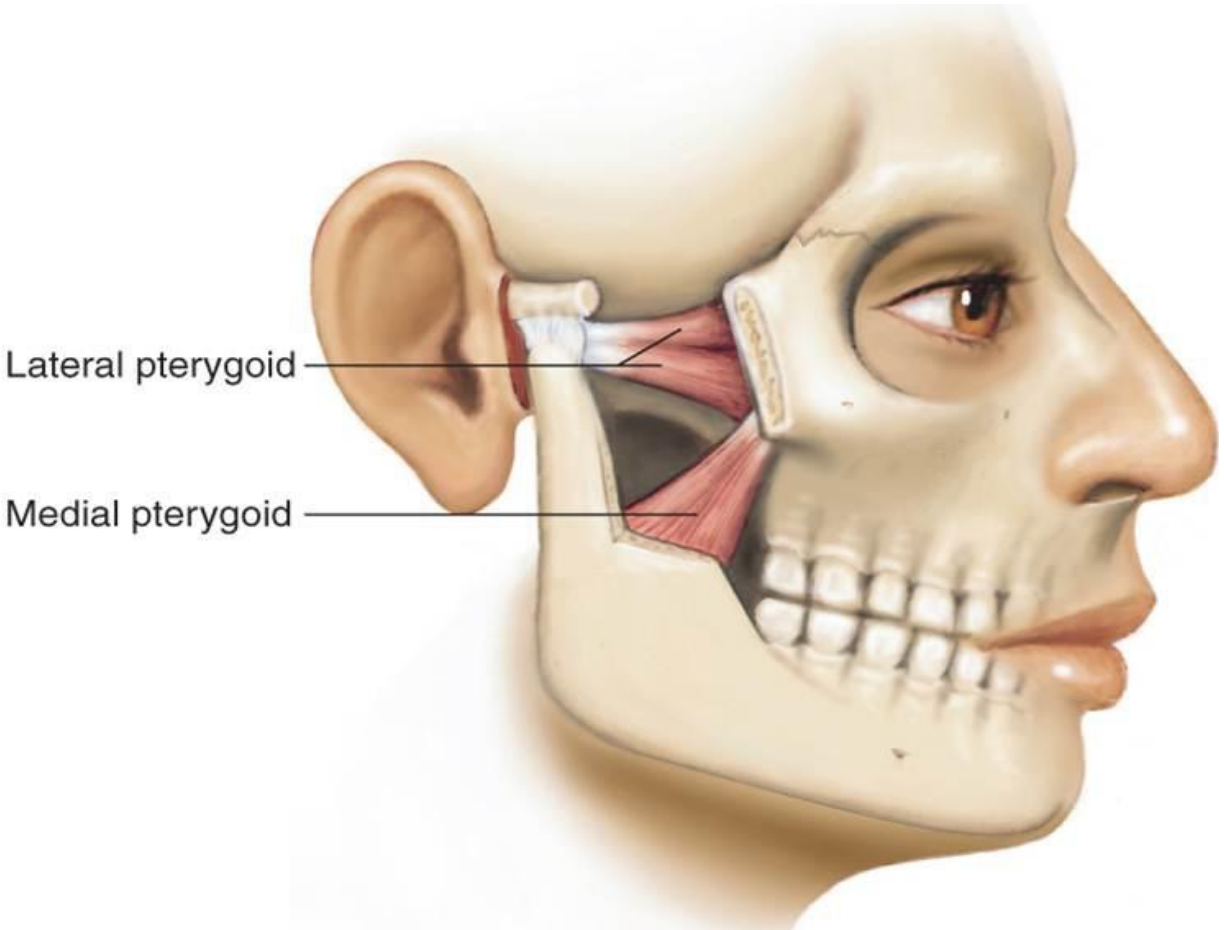


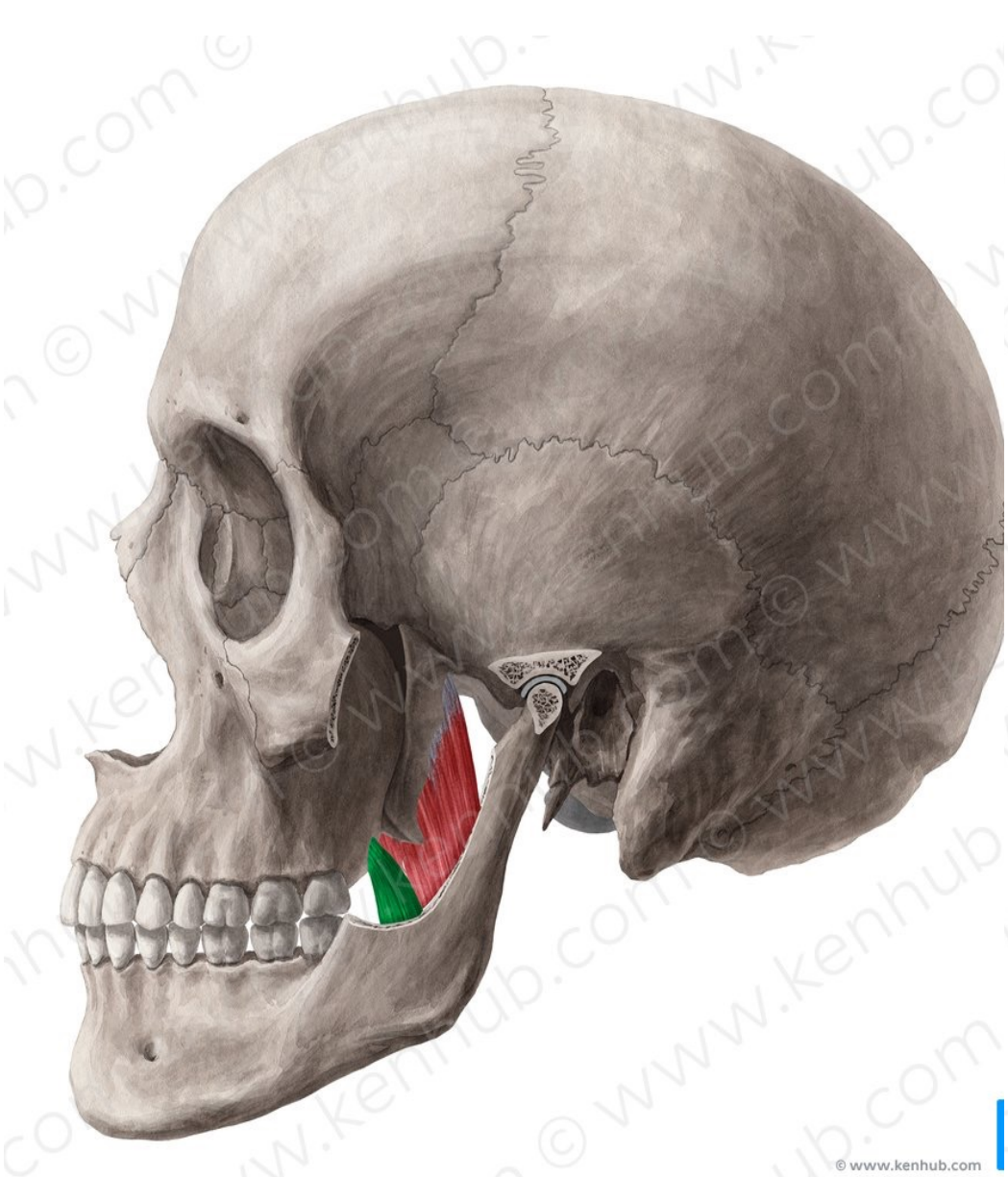
Inferior head of lateral pterygoid muscle

4- Medial Pterygoid

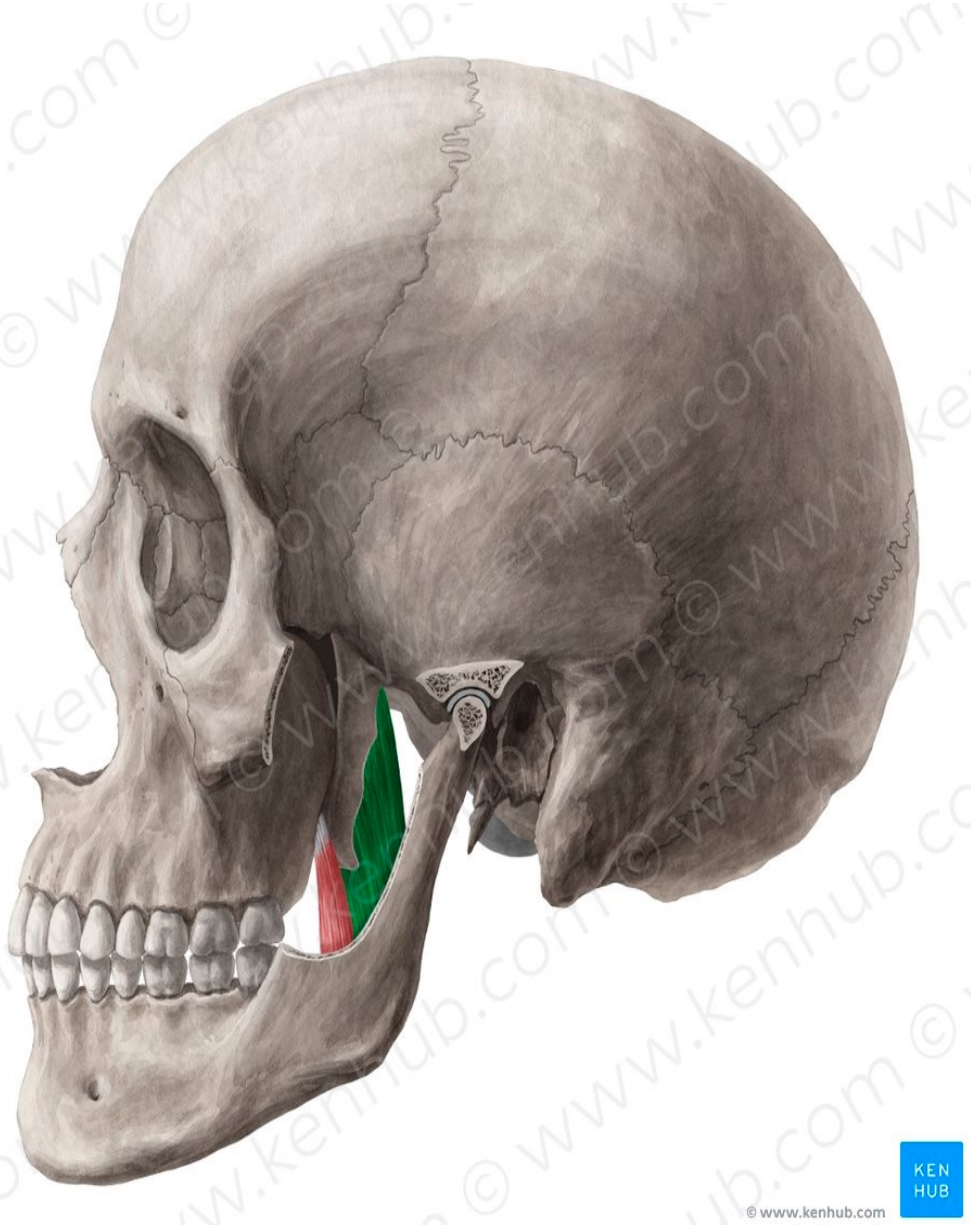
Superficial and deep heads

Me !!!!!!!





Superficial head of medial pterygoid muscle



Deep head of medial pterygoid muscle

4- Medial Pterygoid

Origin : it arises by 2 heads

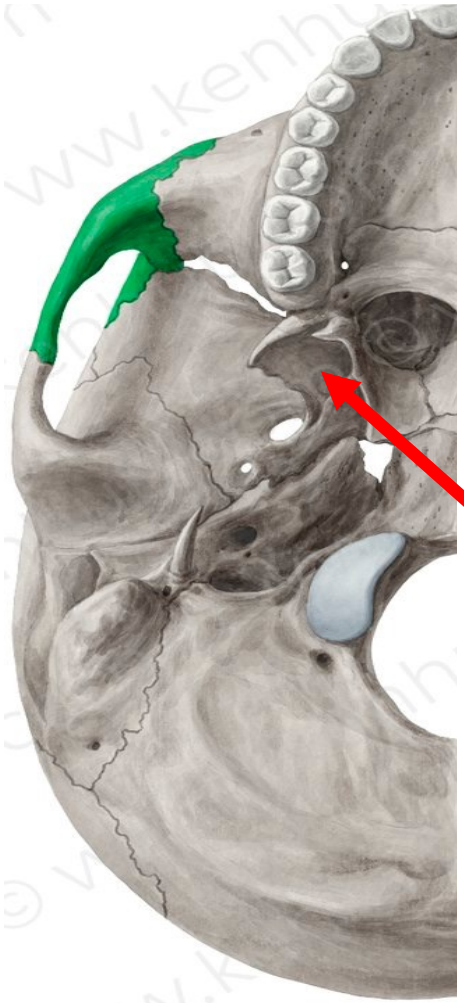
- **The superficial head :** arises from the maxillary tuberosity.
- **The deep head :** arises from medial surface of the lateral pterygoid plate.

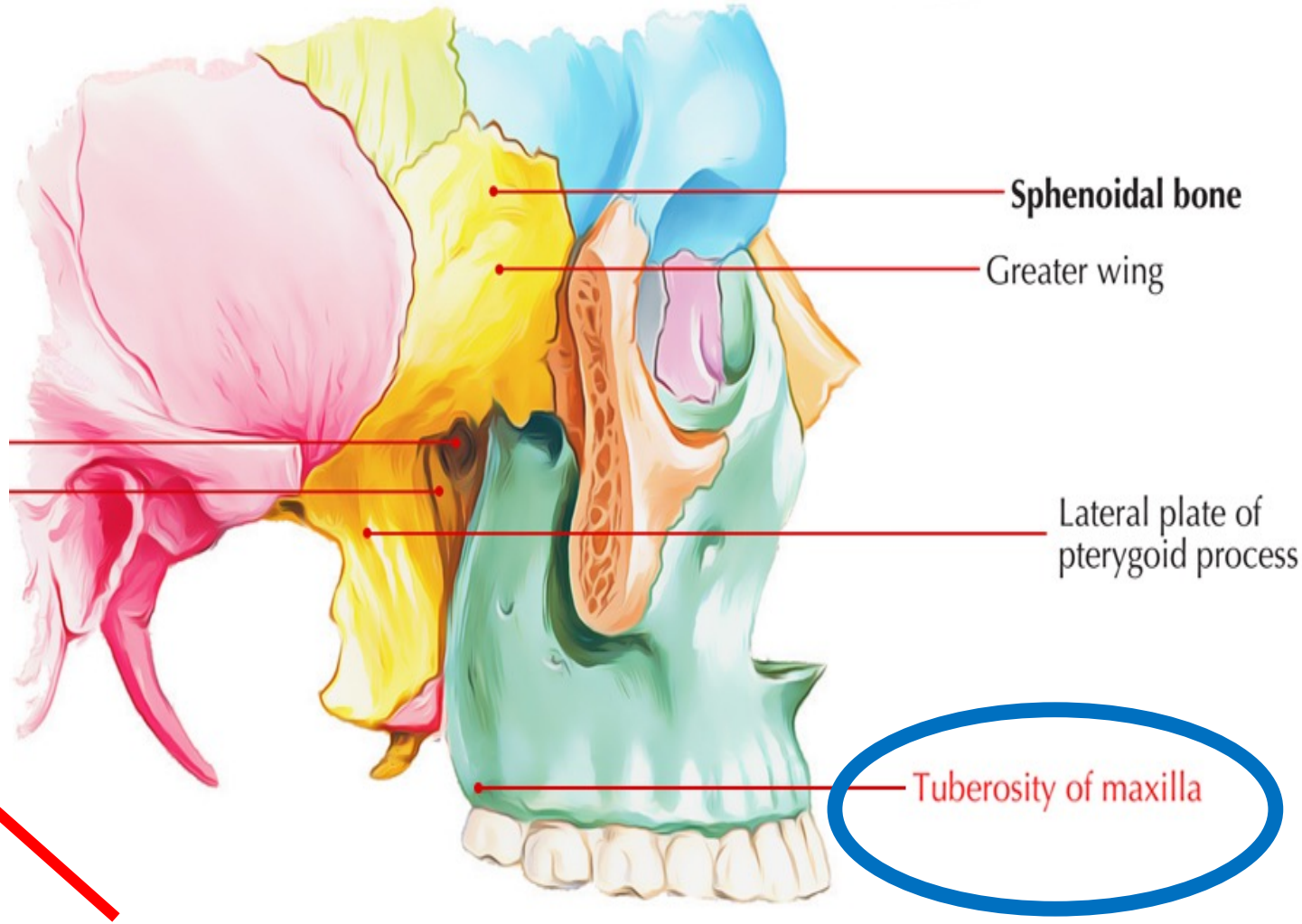
Insertion : into the lower part of the medial surface of the mandibular ramus. (Angle of the mandible)

Nerve supply : From the trunk of the mandibular N.

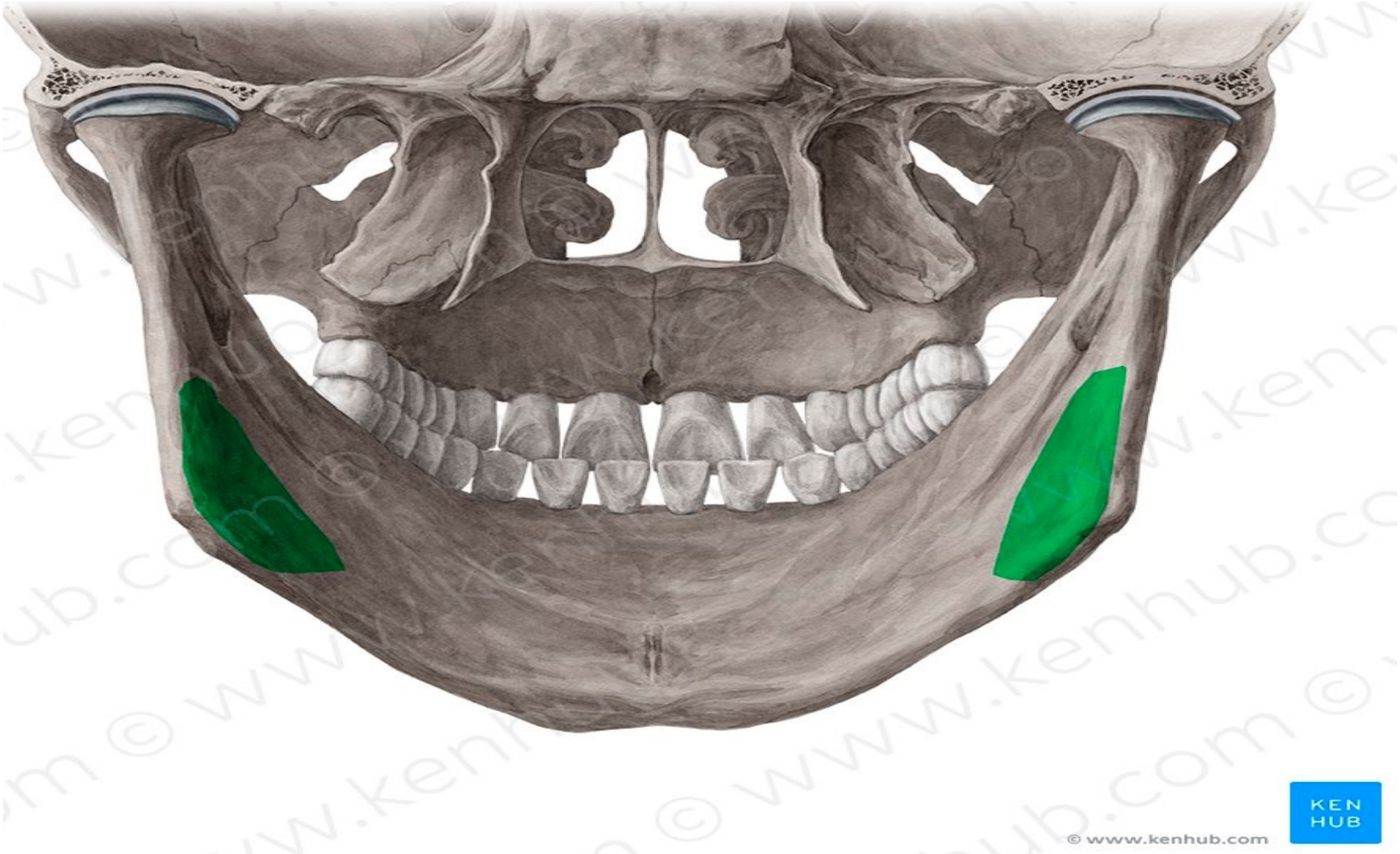
Actions :

- With masseter, elevate and close the mandible.





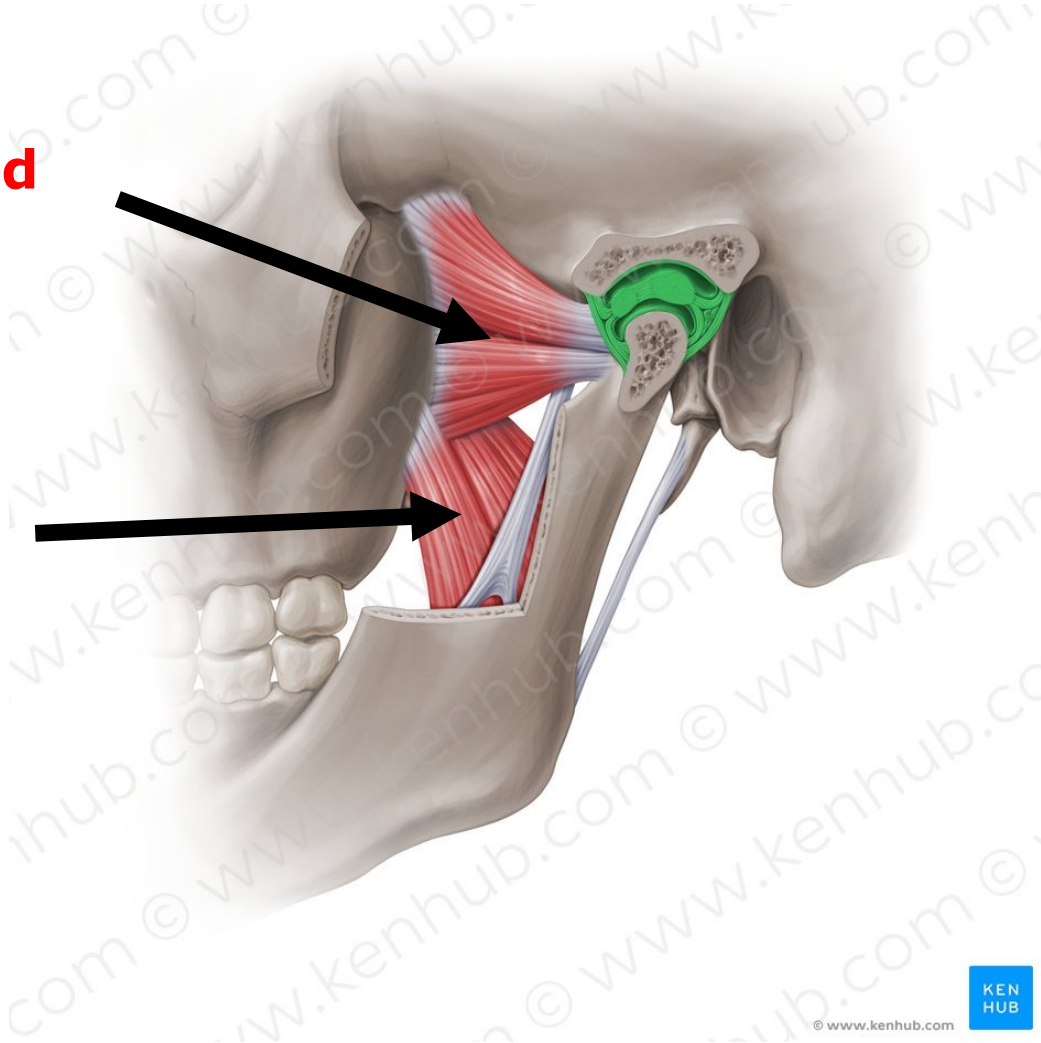
lateral pterygoid plate



Insertion of Medial Pterygoid

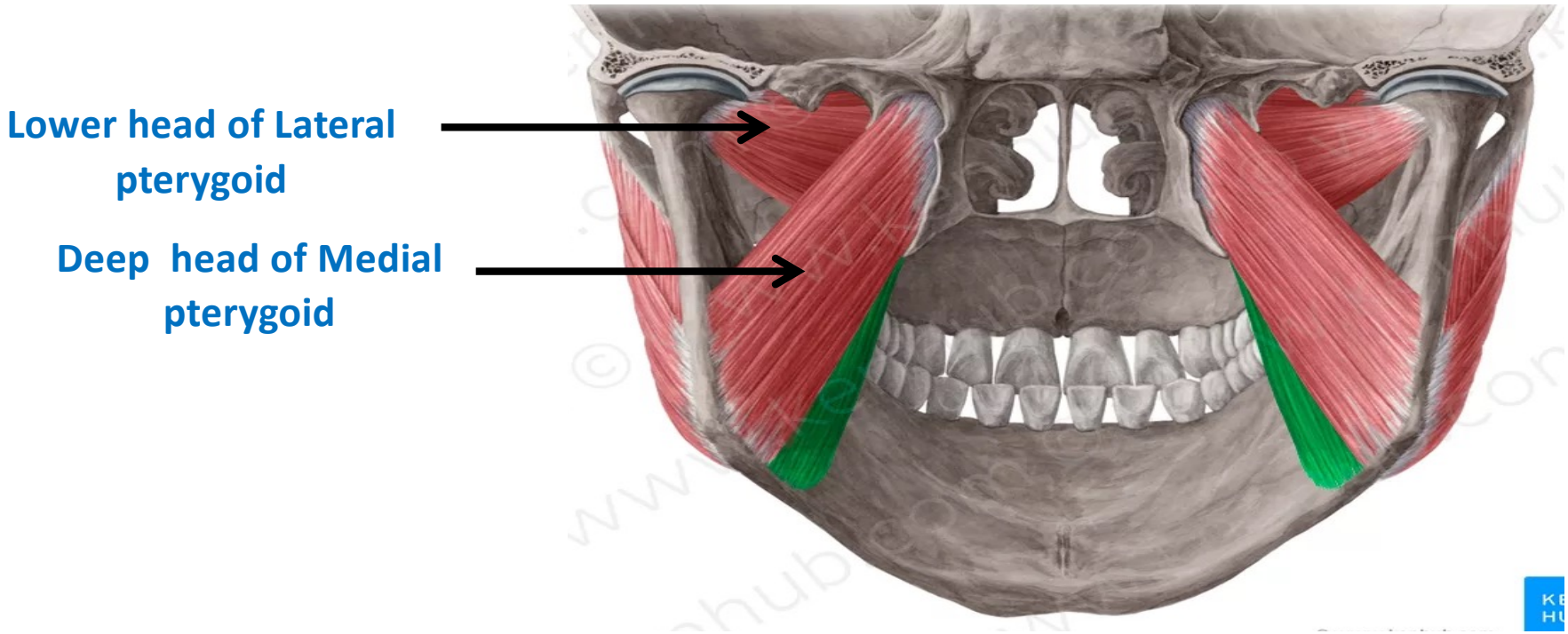
Lateral Pterygoid

Medial Pterygoid



Action of Medial and Lateral pterygoids :

- M and L. pterygoids ***of both sides*** acting together protrude the mandible.
- M and L. pterygoids of ***one side*** acting together to produce side to side ***grinding*** movement of the mandible.



The four muscles of mastication

1- Temporalis

2-Masseter

3- Lateral Pterygoid

4- Medial Pterygoid

All supplied by anterior division of mandibular of nerve

EXCEPT medial pterygoid by the trunk of mandibular nerve

Action : All these muscles close the mouth **Except** Lateral Pterygoid opens the mouth

Temporomandibular Joint

Type :

Ellipsoid (Bicondylar) synovial

Articular Surface :

The mandibular fossa and articular tubercle of the temporal bone **superiorly** and the head of the mandible **inferiorly.**

Structure of T.M.J. :

A. The fibrous capsule : is attached to

Above : Articular tubercle and the margins of the mandibular fossa.

Below : Mandibular neck.

1. The articular disc :

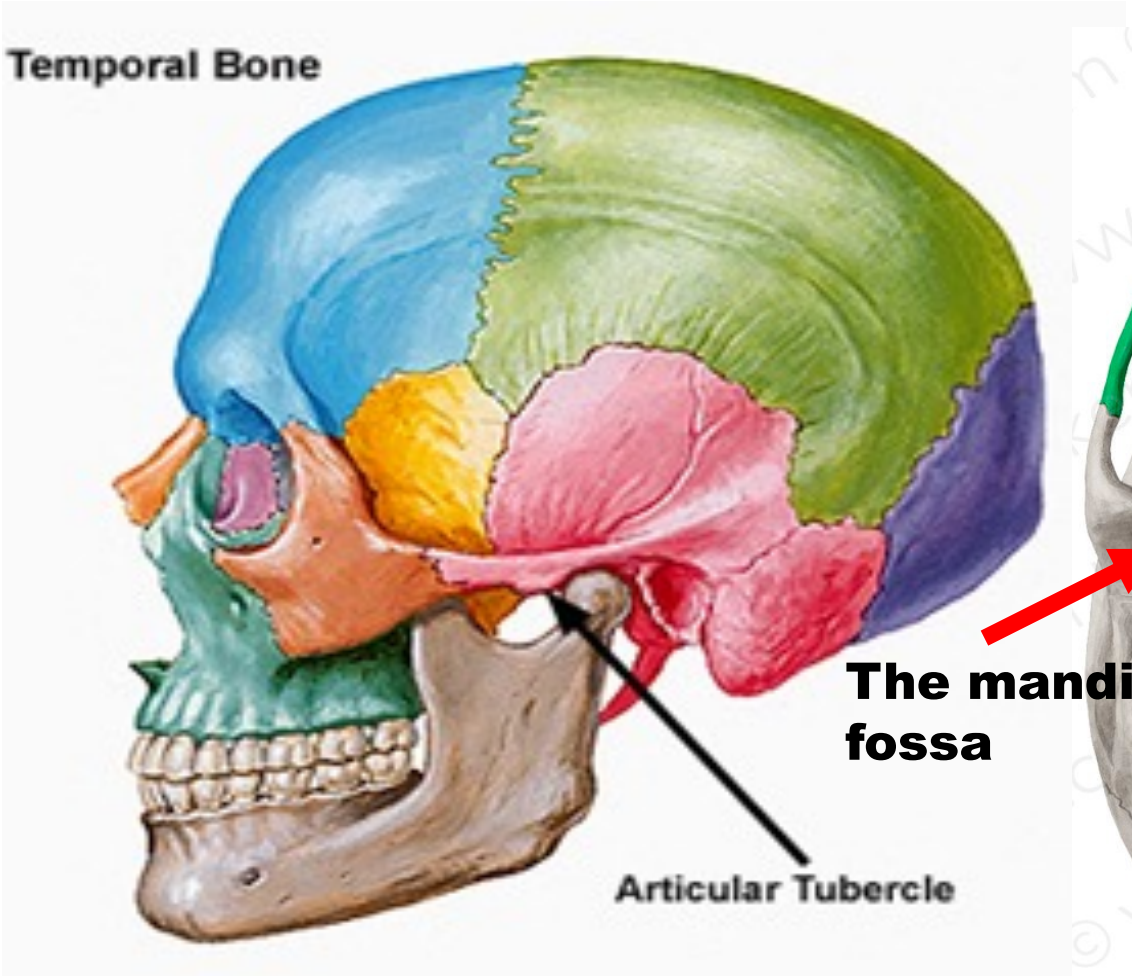
It is a fibrous disc which divides the joint cavity into superior and inferior parts.

Shape : its upper surface is *concavoconvex* to fit the articular tubercle and mandibular fossa respectively.

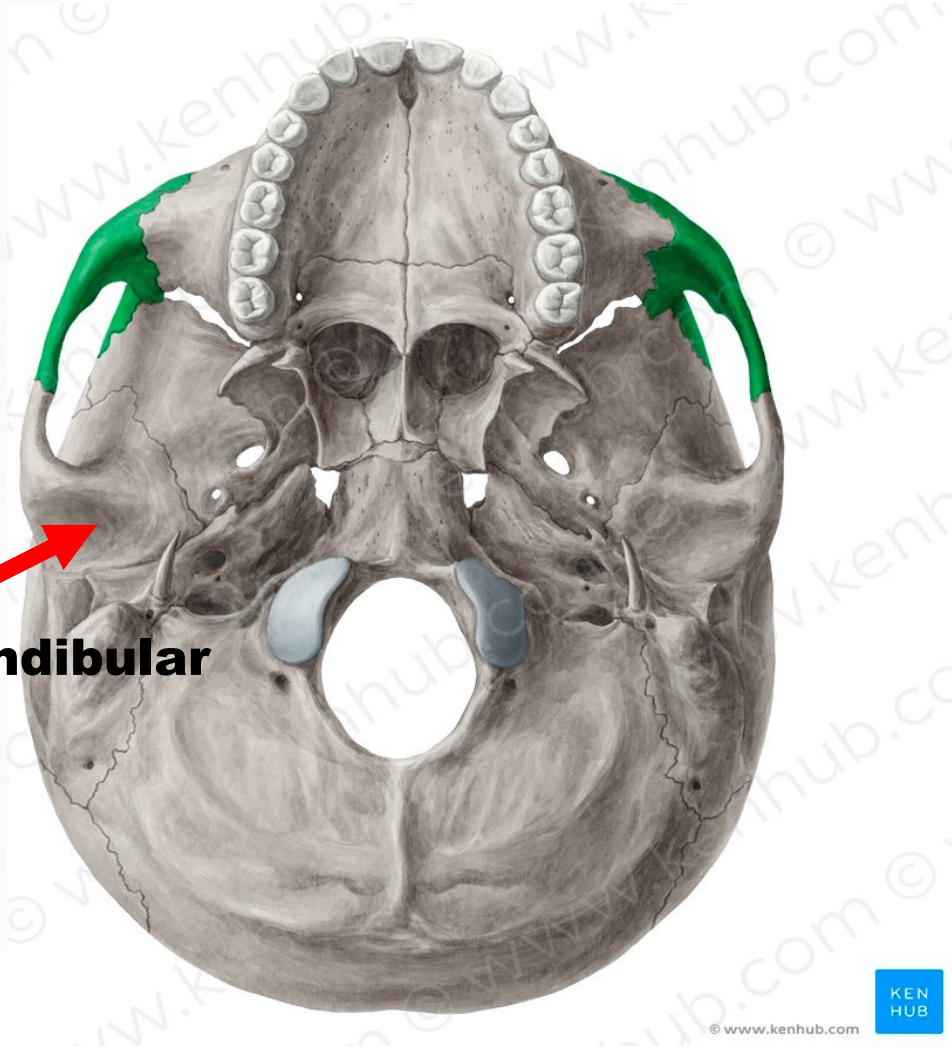
Its lower surface is *concave* for the head of the mandible.

N.B.

- ✓ The gliding movement of protraction and retraction are occur in the superior cavity
- ✓ The hinge movement of elevation and depression occur in the inferior cavity .



The mandibular fossa



B. Extracapsular and related ligaments :

1. Lateral temporomandibular ligament:

Site : ***lateral*** to the fibrous capsule.

Attachments :

Above : the root of the zygomatic arch

Below : the lateral side of the mandibular neck.

Significance : it prevent posterior dislocation of the joint.

2. Stylomandibular ligament

Site : Posterior to the joint.

Attachments :

Above : the tip of the styloid process

Below : the angle and posterior border of the mandible.

3- The sphenomandibular ligament

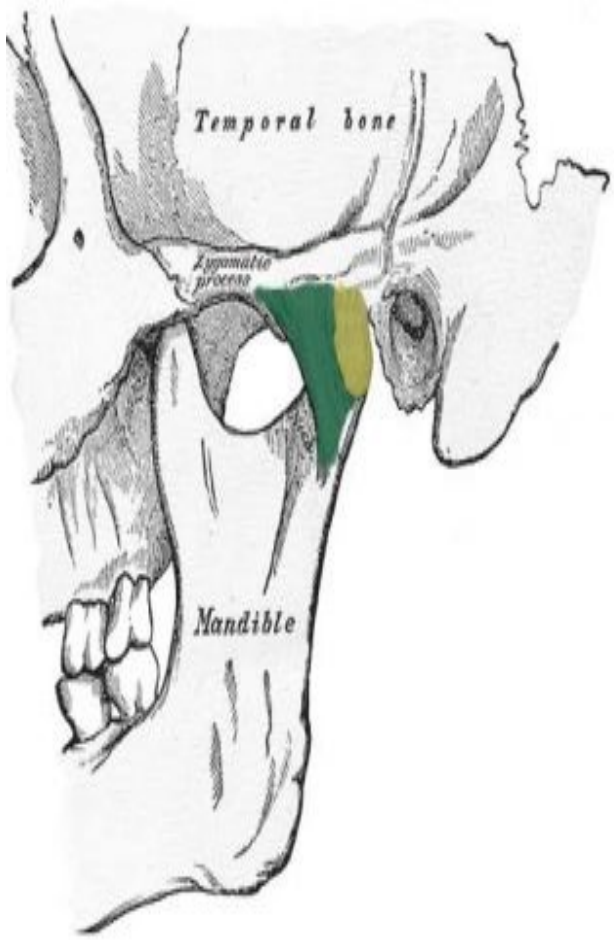
Site : medial to the joint.

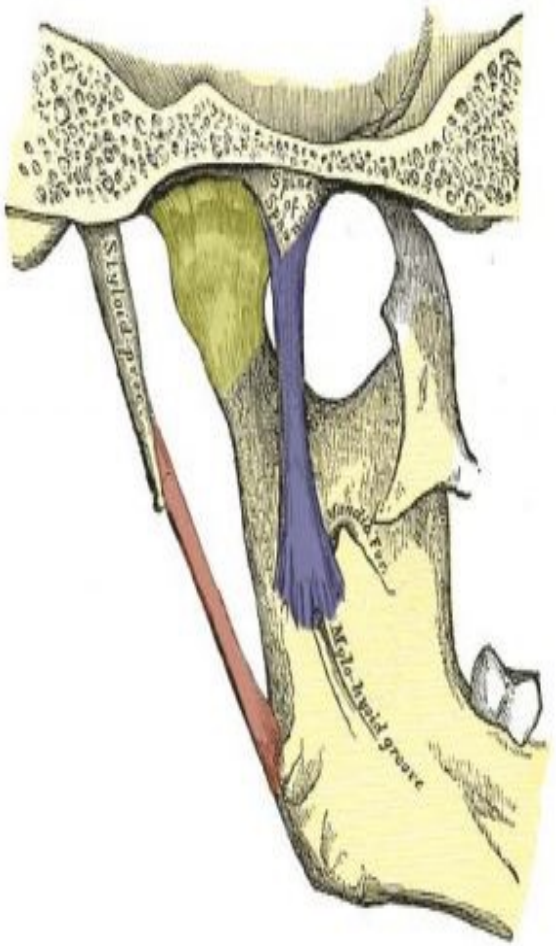
Attachments :

Above : spine of sphenoid

Below : the lingula of the mandible.

Significance : it supports the weight of the jaw





Joint Capsule

Lateral ligament

Sphenomandibular ligament

Stylomandibular ligament

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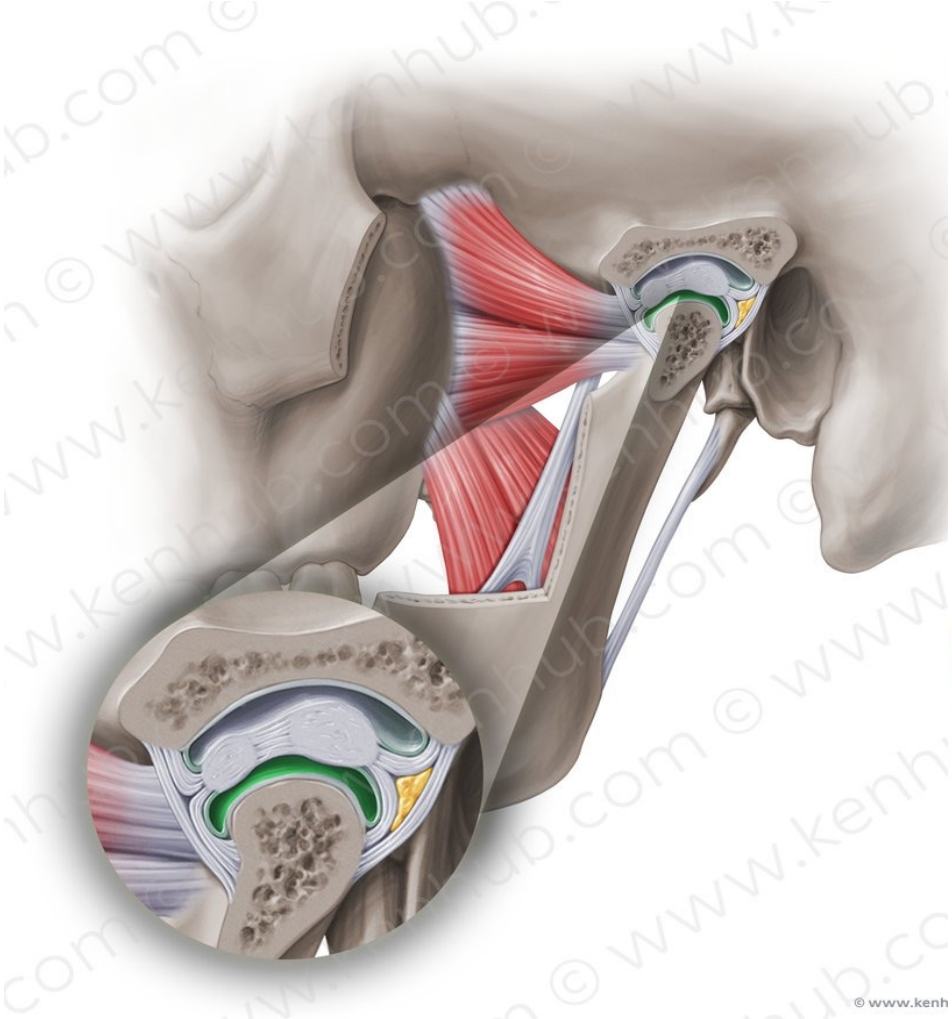
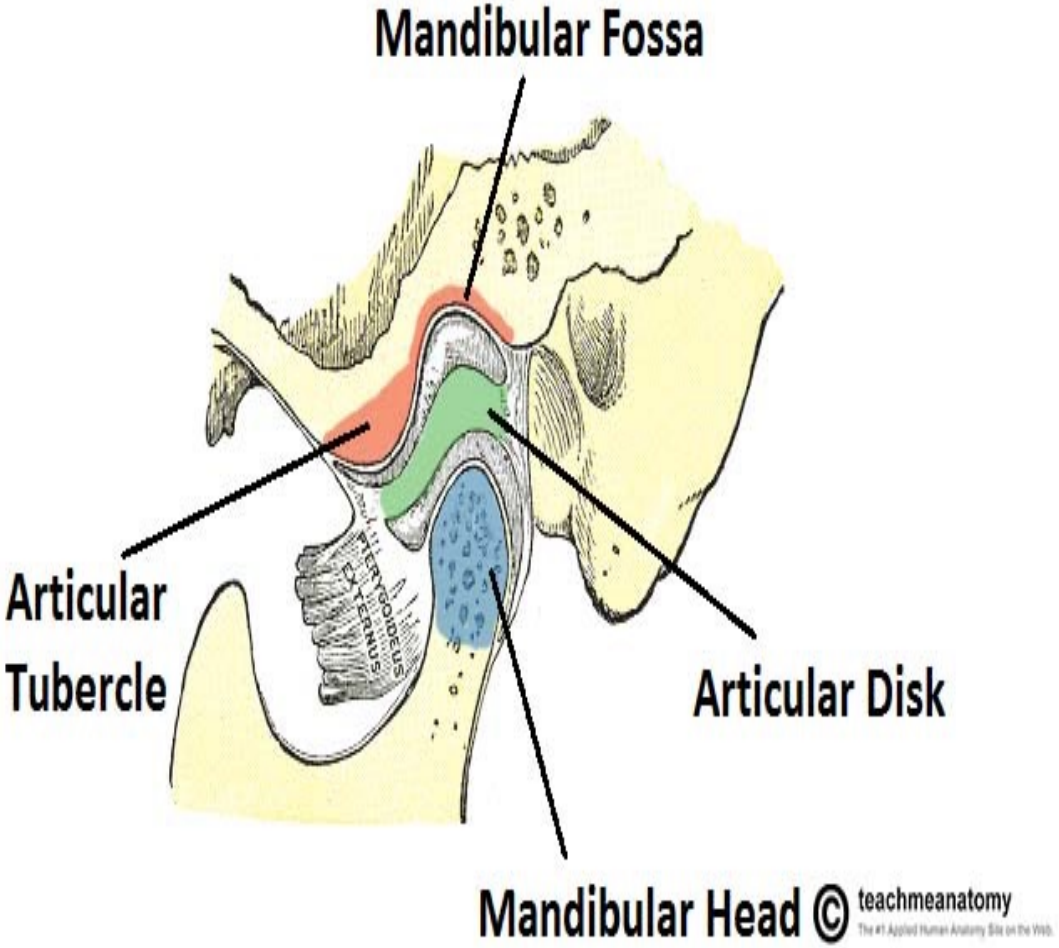




Superior and inferior articular cavities

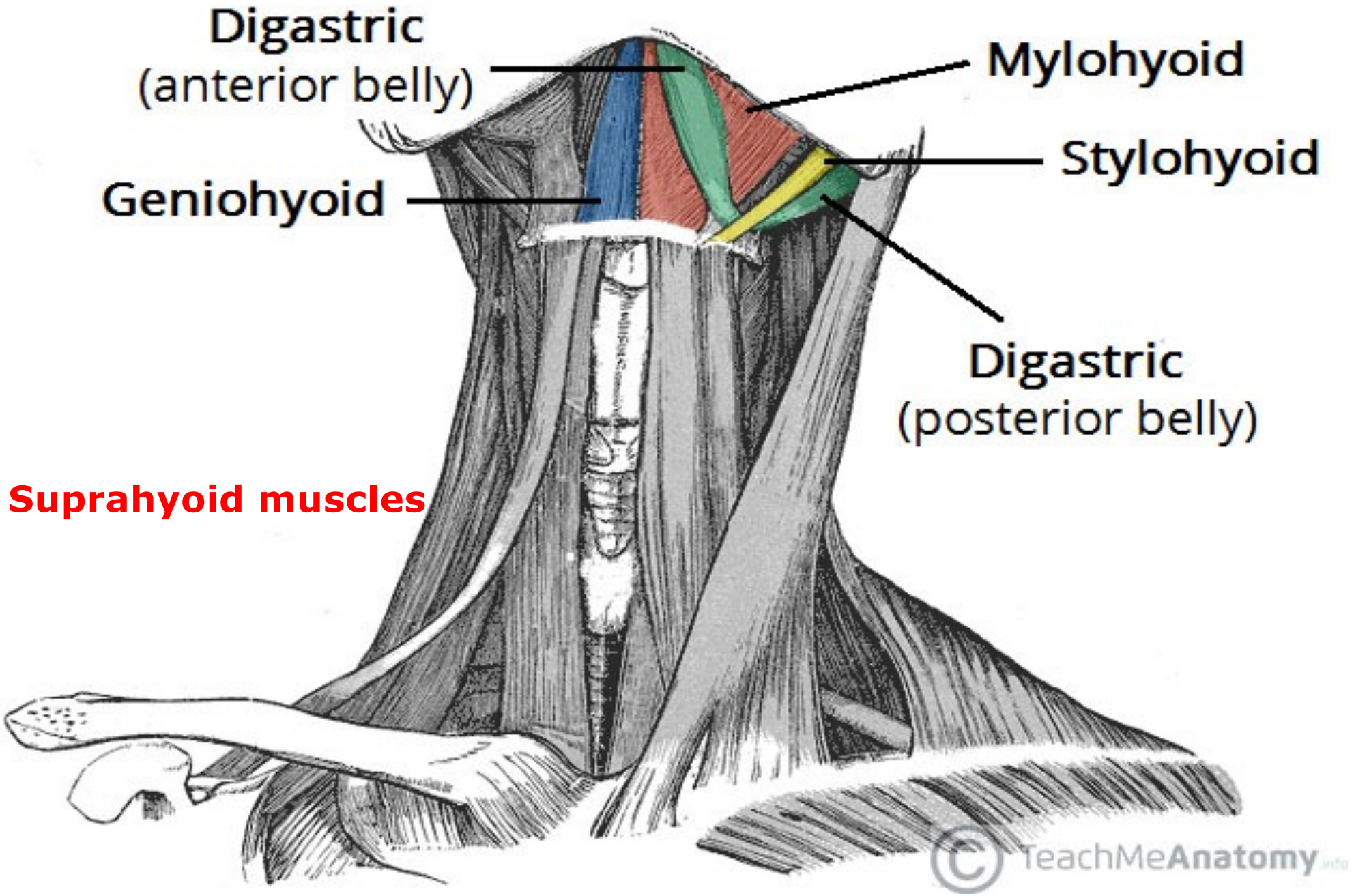
3. The synovial membrane :

It lines the capsule in the upper and lower parts of the joint cavity.

It does not cover the articular surfaces of bones or the surfaces of the articular disc.

Blood supply of TMJ : Superficial temporal and maxillary arteries.

Nerve supply of TMJ : Auriculotemporal and masseteric nerves.



Suprahyoid muscles

Movement :

1. Opening the mouth :

L. pterygoid muscles assisted by the suprahyoid muscles ; digastric, geniohyoid and mylohyoid.

2. Closing the mouth :

Temporalis, masseter and M. pterygoid muscles.

3. Protraction :

Both lateral pterygoids *assisted* by both medial pterygoids.

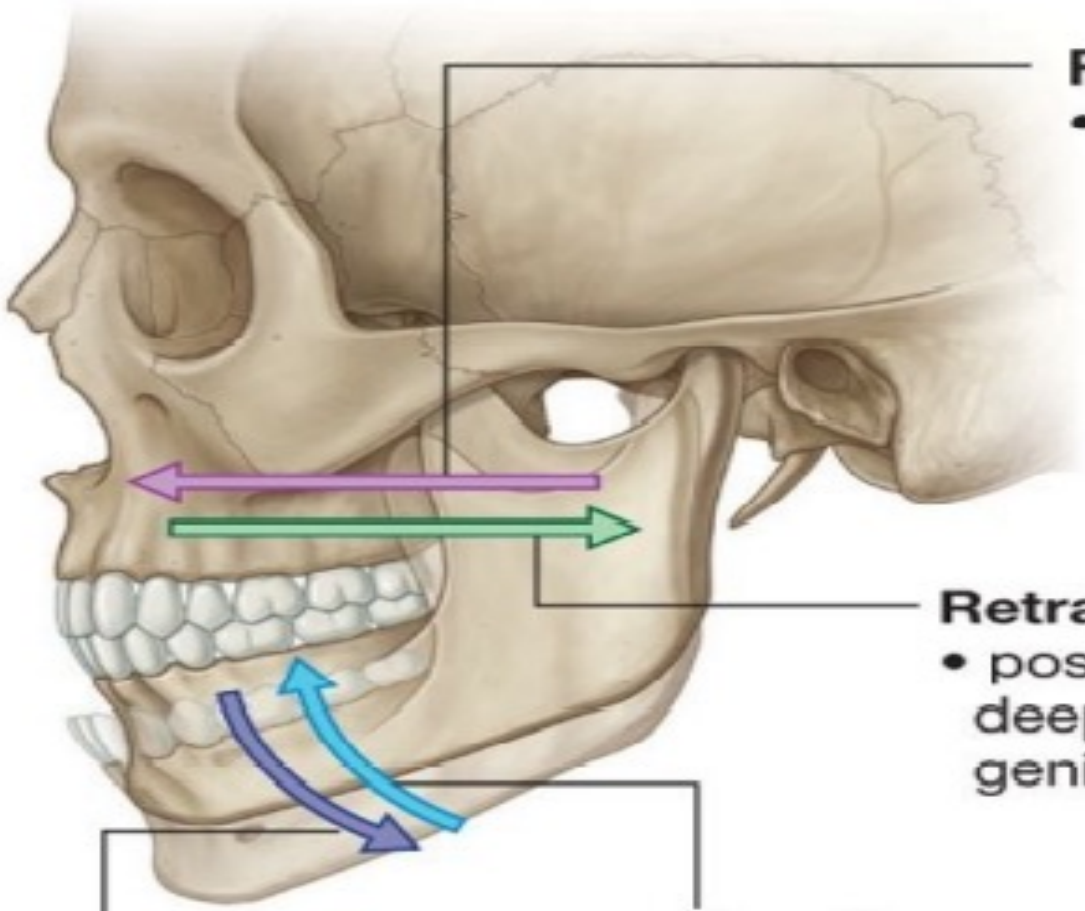
4. Retraction of the protruded mandible

Posterior horizontal fibers of temporalis.

5. Side to side movement :

Lateral and medial pterygoids of one side alternating with those of the opposite side

ALL these muscle are supplied by mandibular nerve EXCEPT geniohyoid by C1



Protrusion
- lateral pterygoid assisted by medial pterygoid

Retraction
- posterior fibers of temporalis, deep part of masseter, and geniohyoid and digastric

Elevation
- temporalis, masseter, medial pterygoid

Depression
- gravity
- digastric, geniohyoid, and mylohyoid muscles

The anterior movement of the head of the mandible and articular disc on the articular surface until the head lies inferior to the articular tubercle is referred to as "**translation**" by dentists

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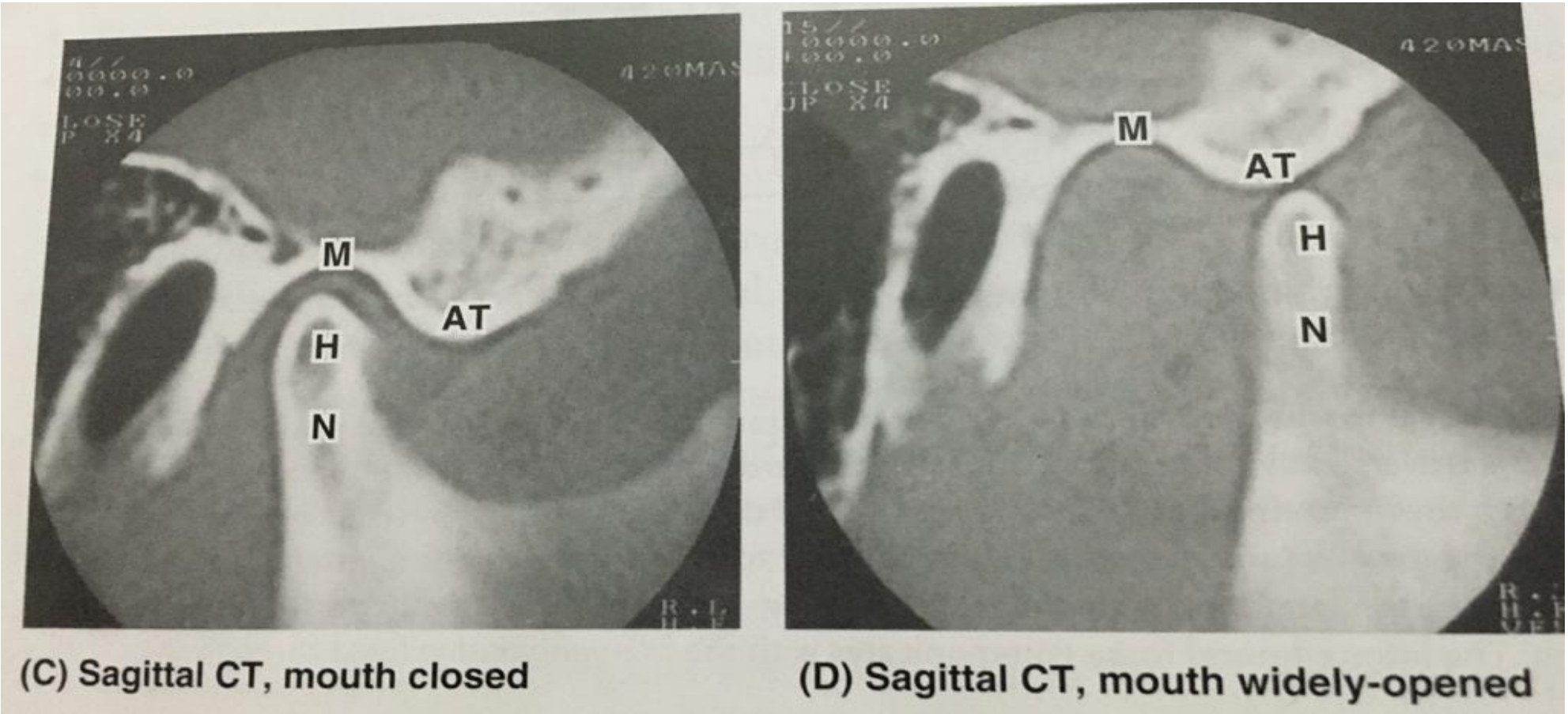

(C) Sagittal CT, mouth closed

(D) Sagittal CT, mouth widely-opened

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- To open the mouth wider than just separating the upper and lower teeth the mandible should be depressed and translation movement occurs
- If translation movement occurs unilaterally, the head of the mandible on the retracted side rotates (pivots) on the inferior surface of the articular disc, permitting simple side-to-side chewing or

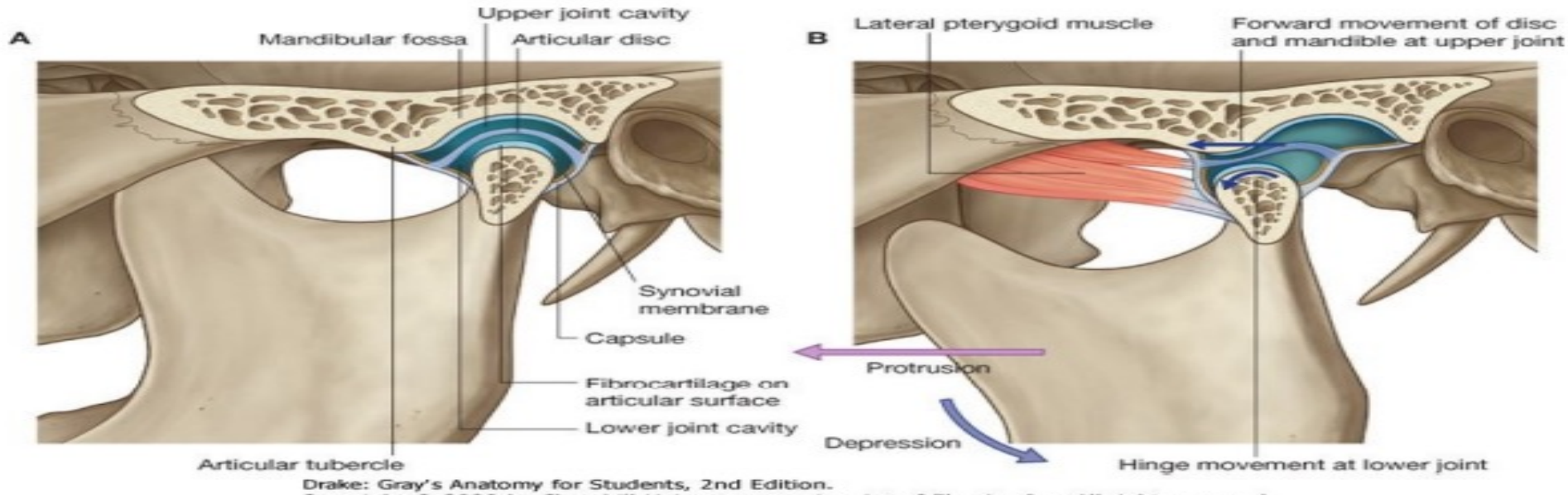

Figure 8.129 Temporomandibular joint. **A.** Mouth closed. **B.** Mouth open.

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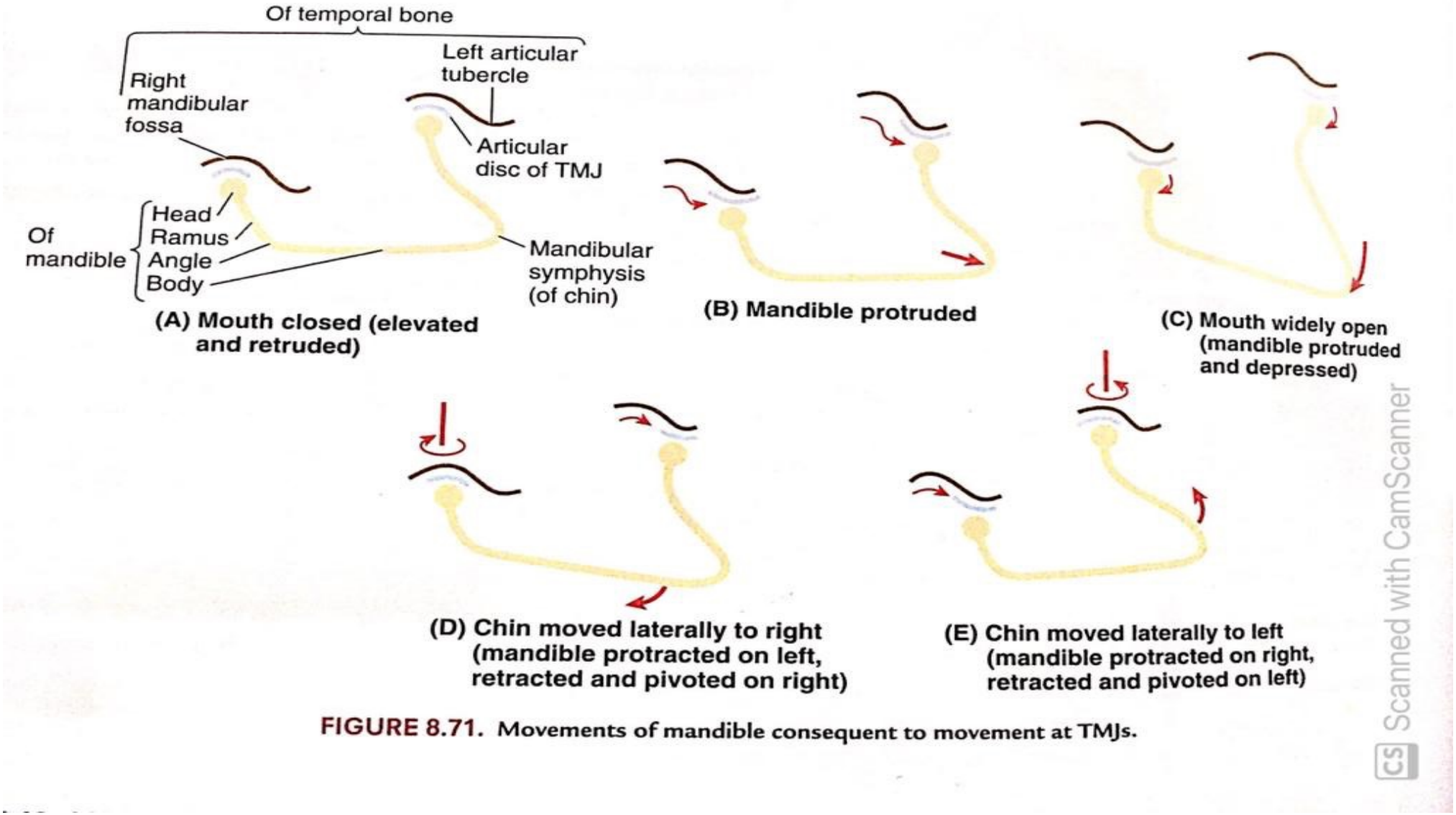

FIGURE 8.71. Movements of mandible consequent to movement at TMJs.

Clinically Oriented Anatomy. Keith Moore


Thank You!