



Muscles of Mastication and TMJ

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Muscles of Mastication

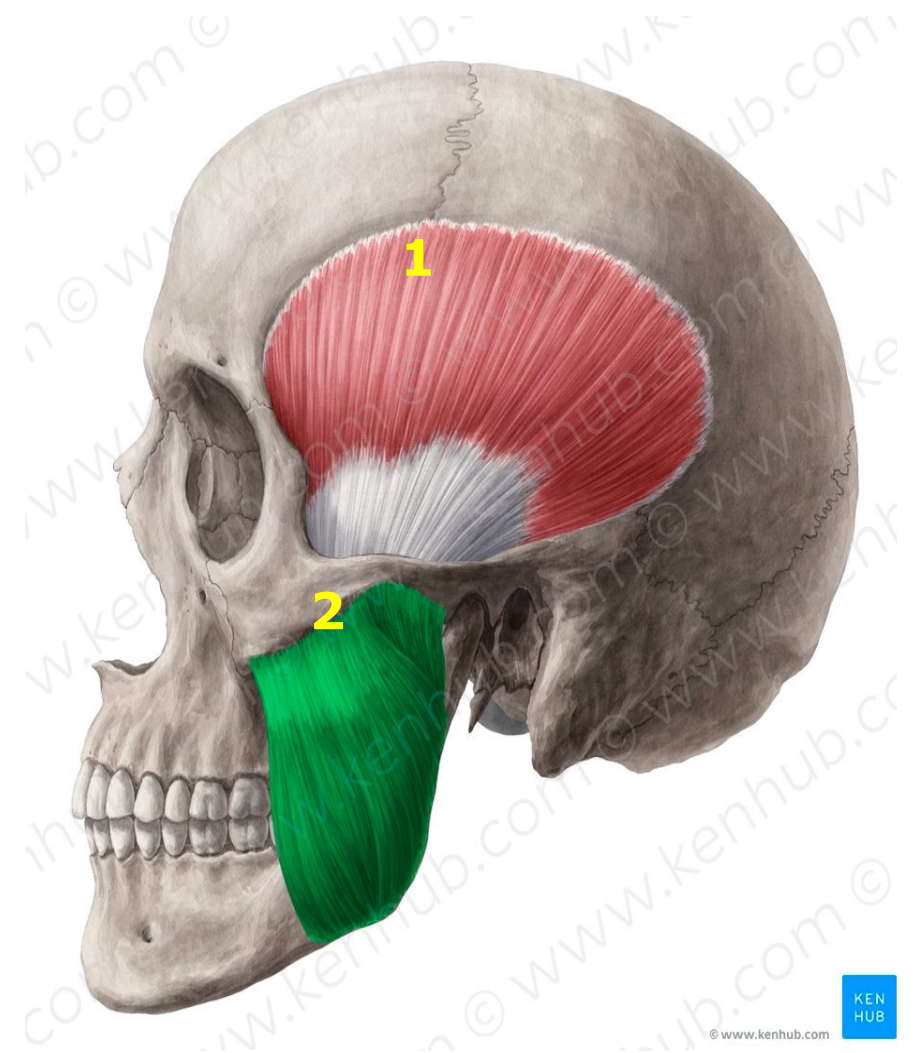
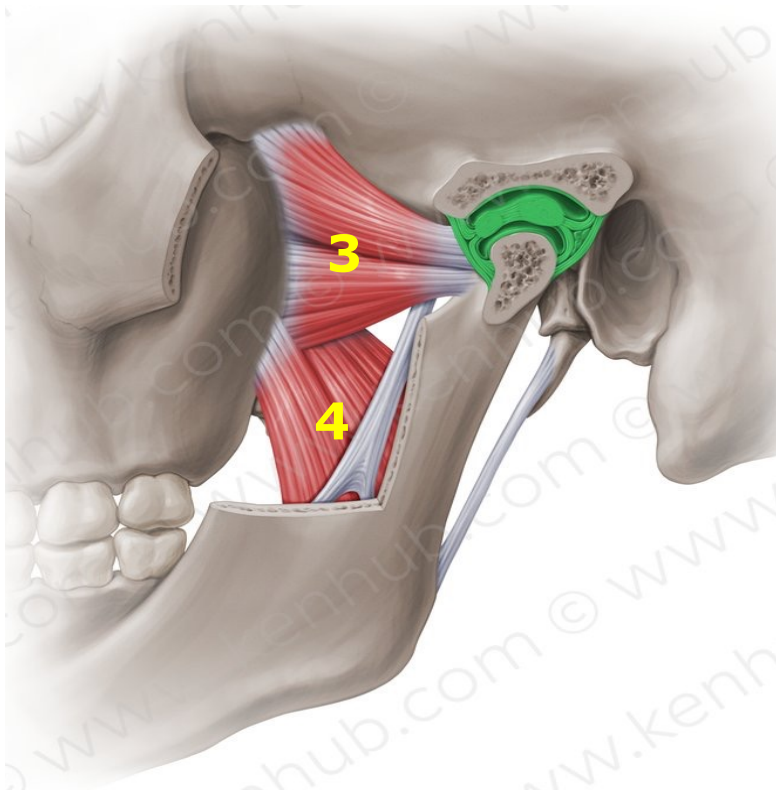
Four muscles

1- Temporalis

2- Masseter

3- Lateral Pterygoid

4- Medial Pterygoid



Temporalis

Origin : From floor of temporal fossa and temporal fascia.

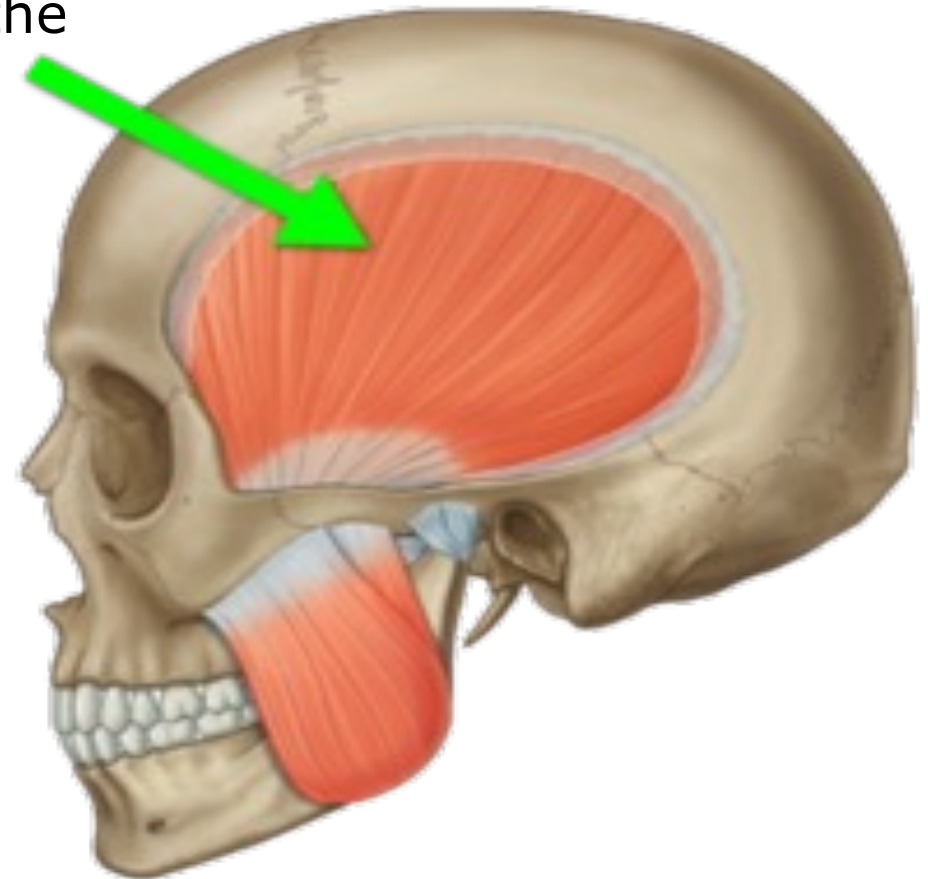
Insertion : Into coronoid process of the mandible and anterior border of the mandibular ramus down to the last molar tooth.

Nerve Supply : mandibular N. (anterior division).

Action :

-Anterior and superior fibers elevate mandible.

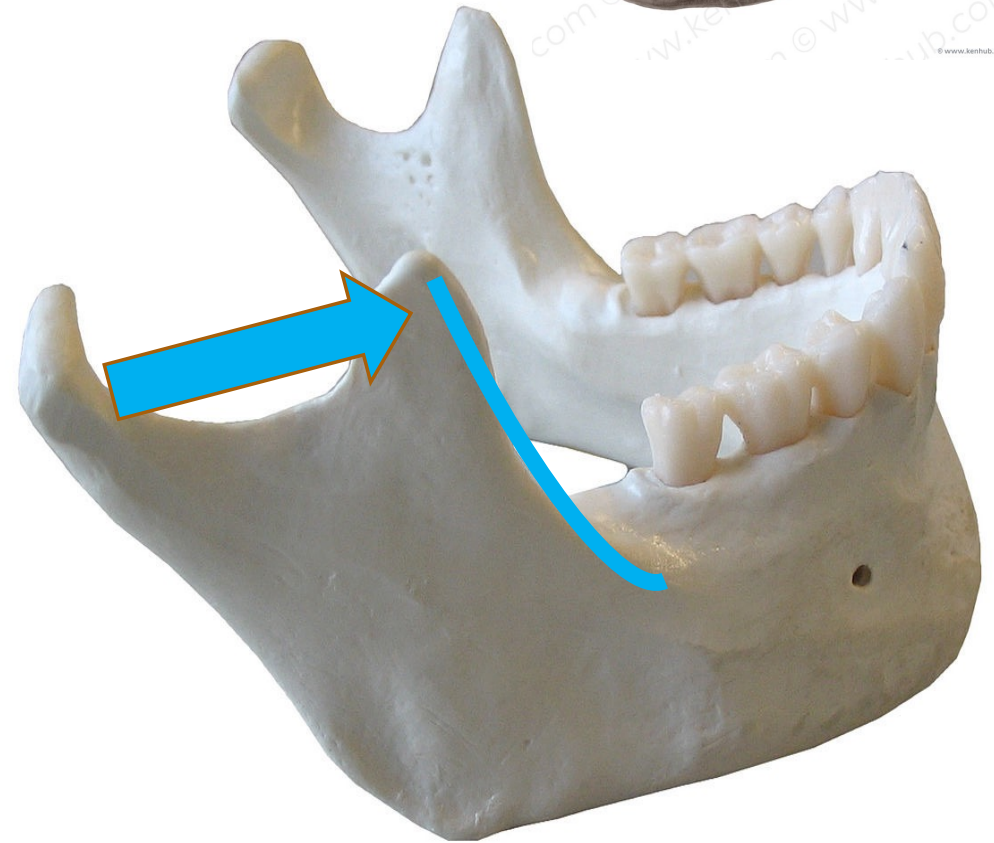
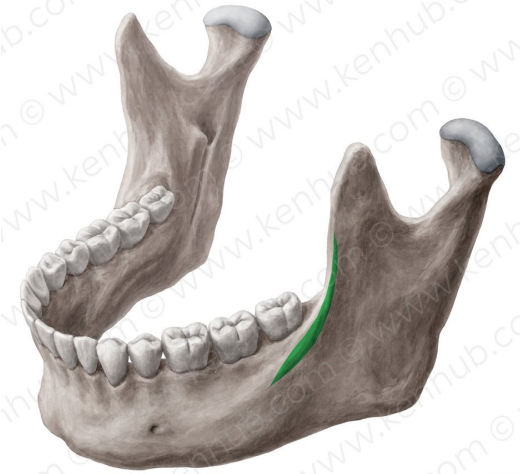
-Posterior fibers **retract** the **protruded** mandible



Temporalis Muscle



Origin



Insertion

2- Masseter Muscle

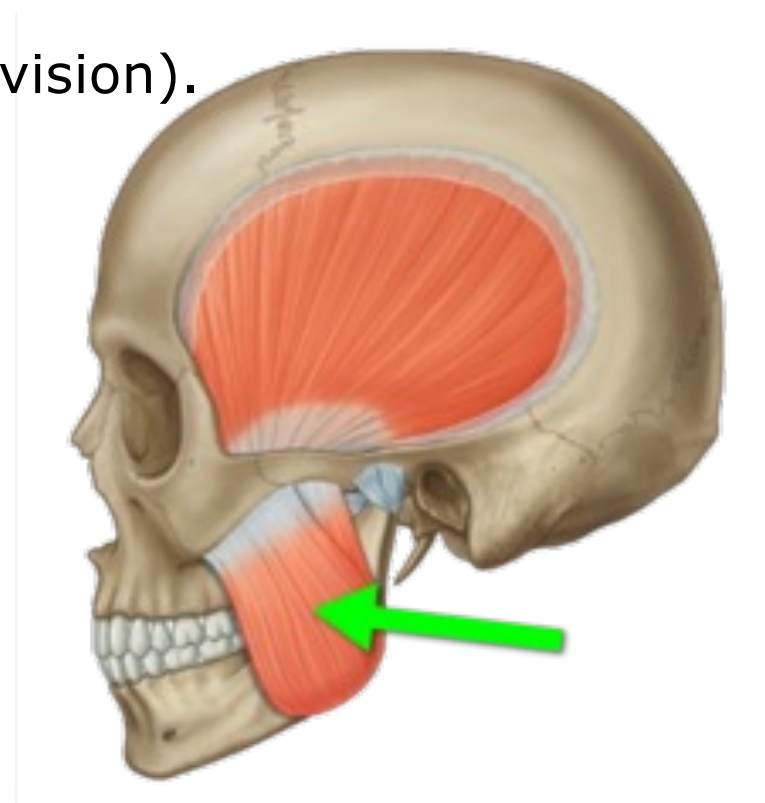
Origin : from inner surface and lower border of zygomatic arch.

Insertion : into outer surface of the mandibular ramus.

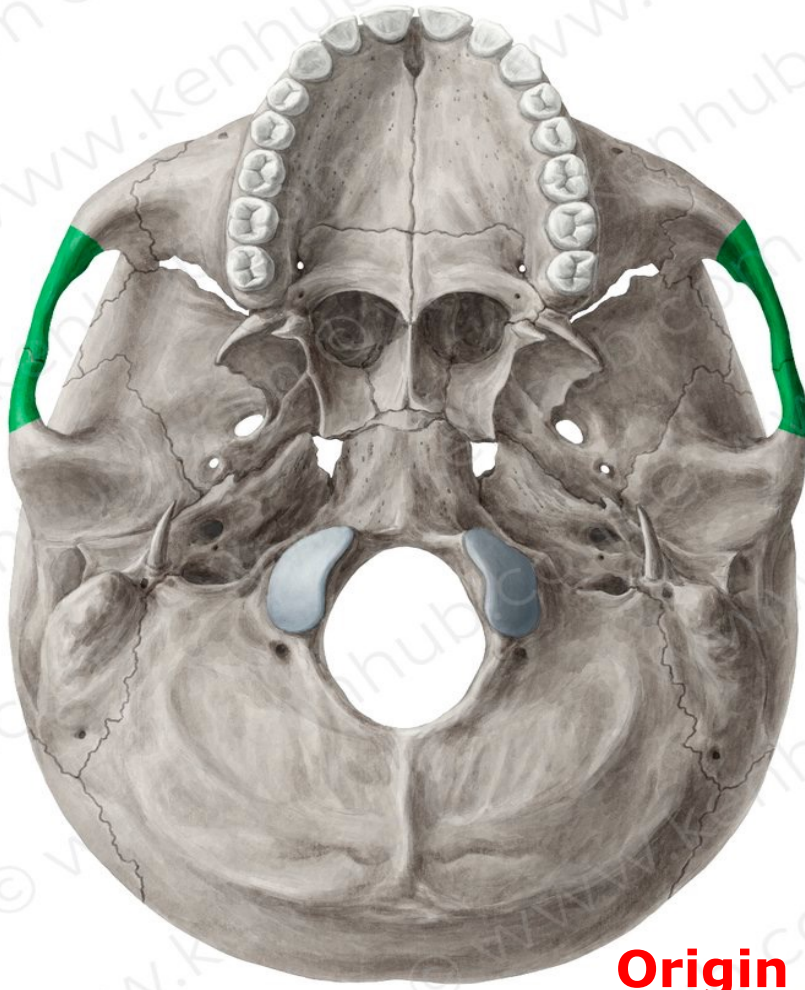
Nerve Supply : mandibular N, (Anterior division).

Action :

elevation of mandible to close the mouth,
Plays a role in biting and chewing.



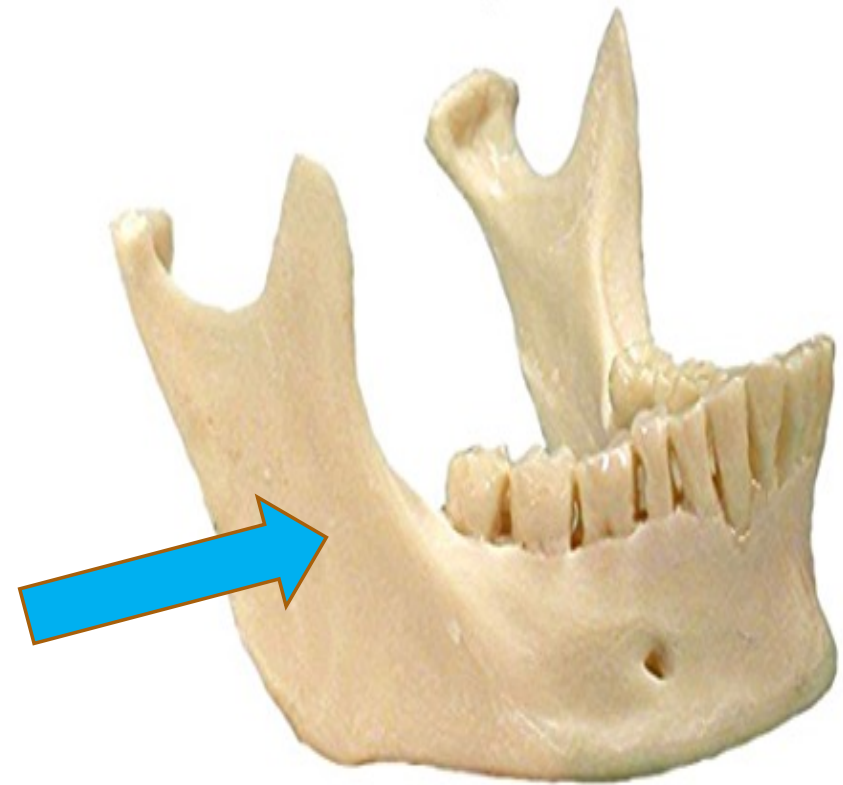
Masseter Muscle



Origin

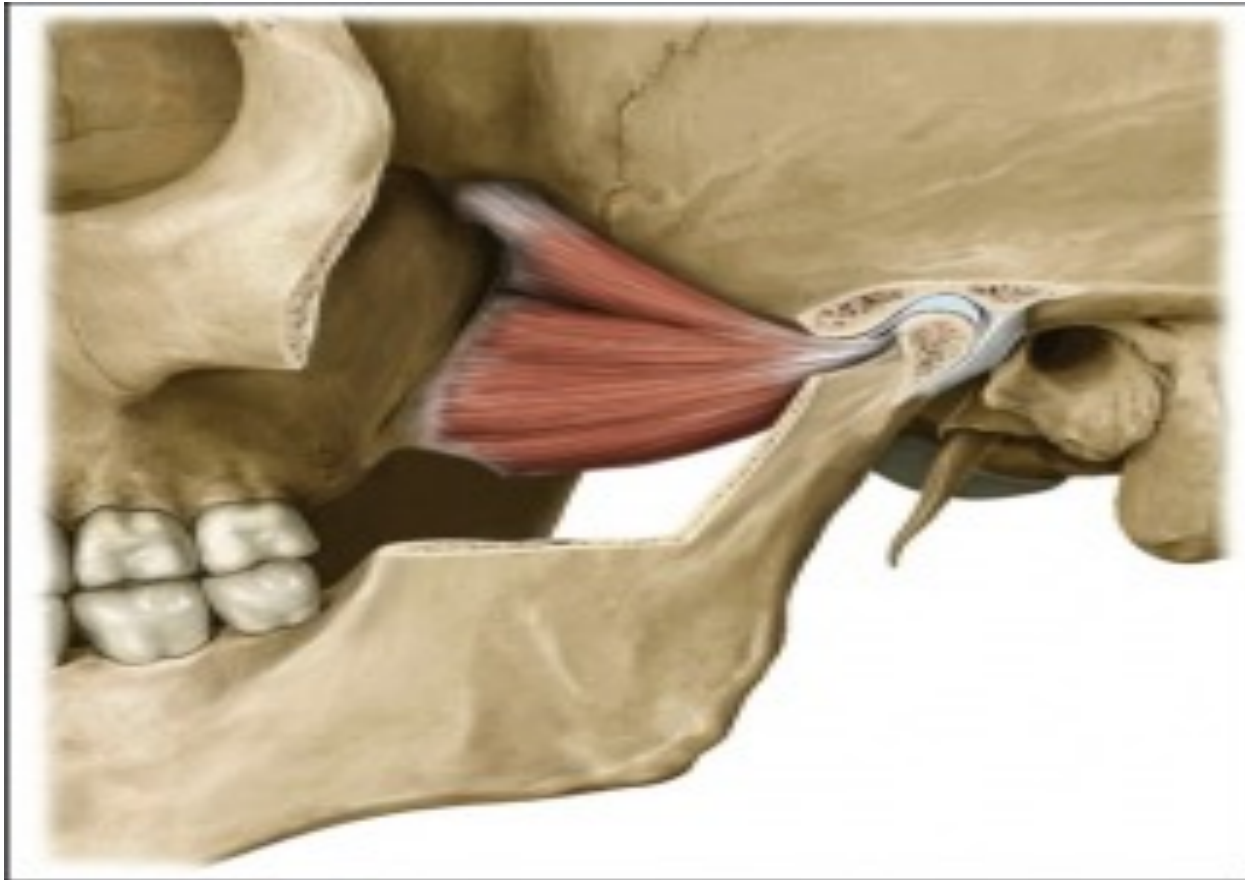


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Insertion

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).

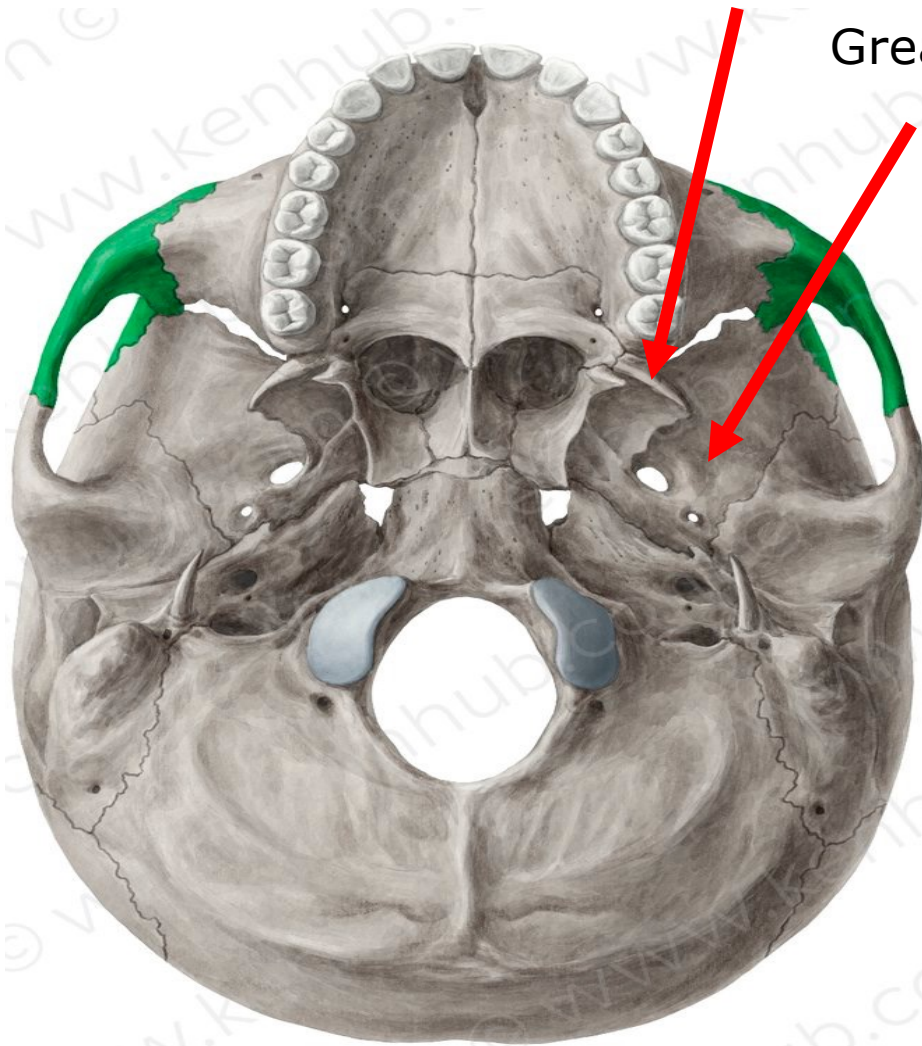
Actions :

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

Lateral pterygoid plate

Lateral Pterygoid

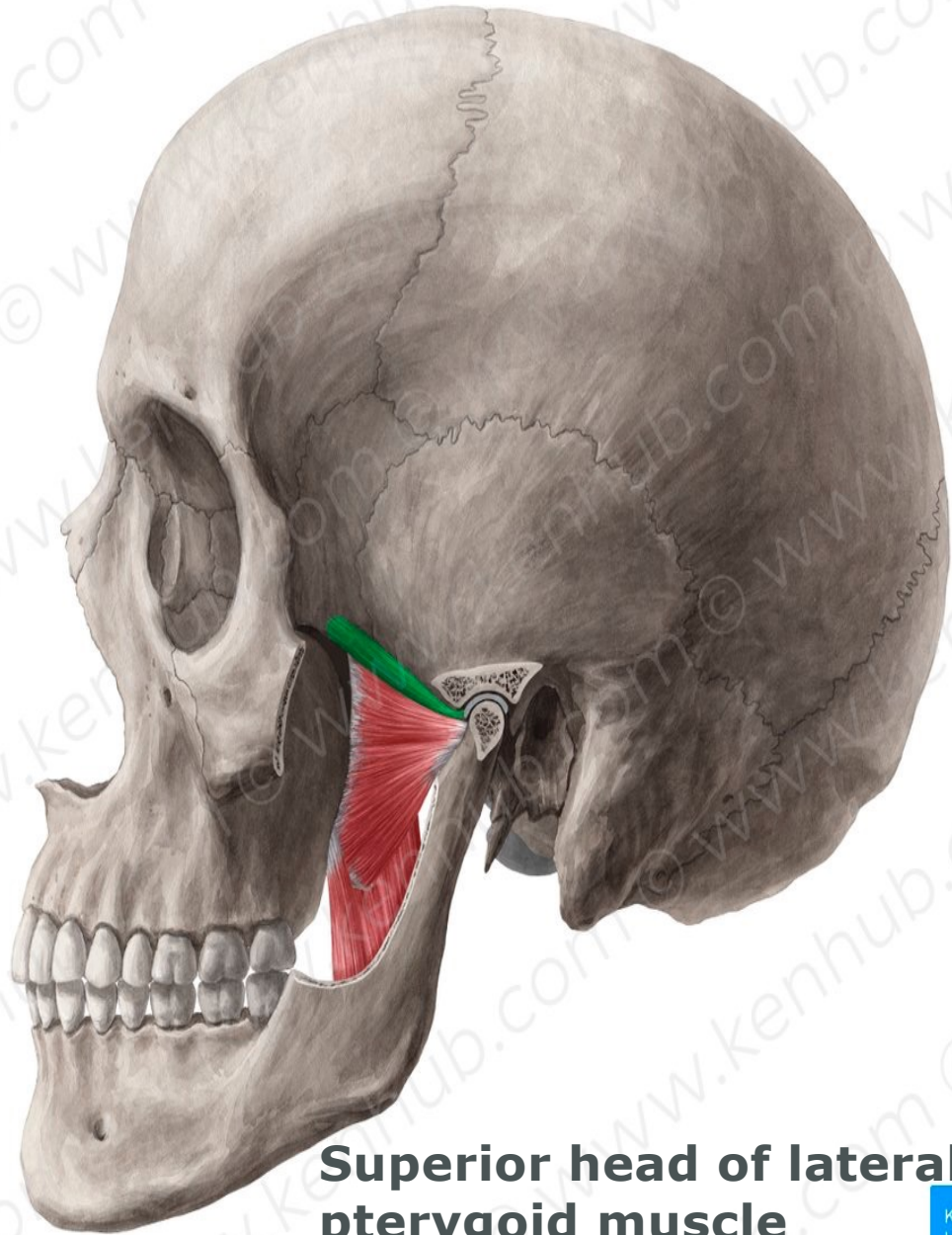
Greater wing of sphenoid



Origin



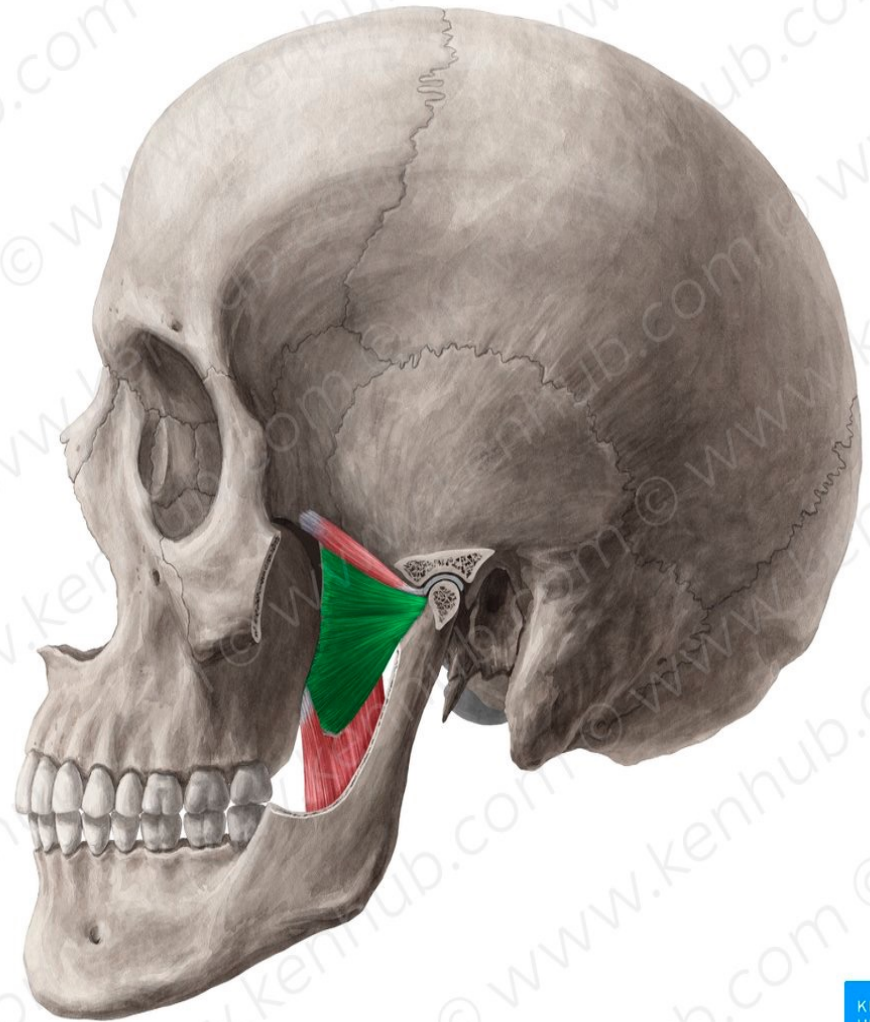
Insertion



Superior head of lateral pterygoid muscle

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Inferior head of lateral pterygoid muscle

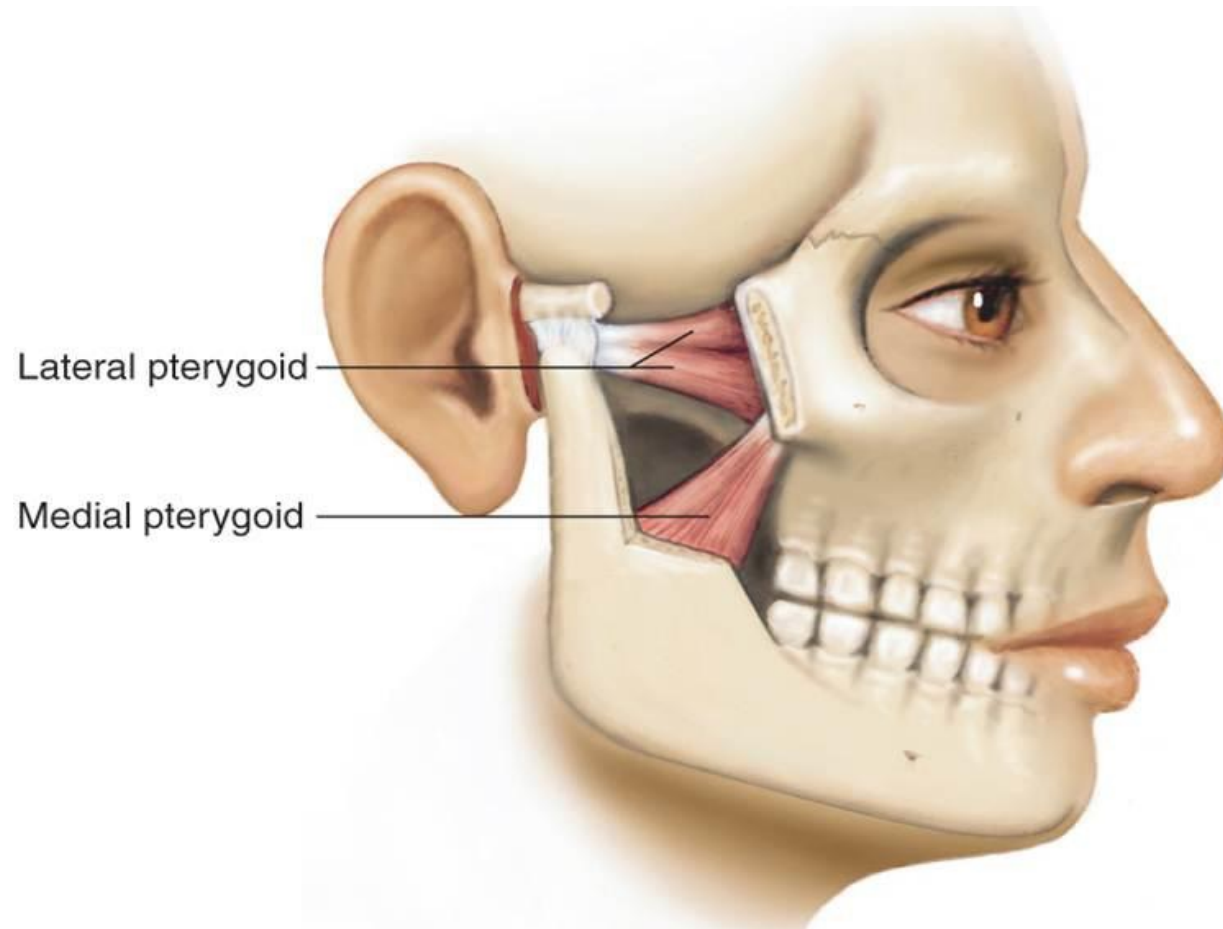
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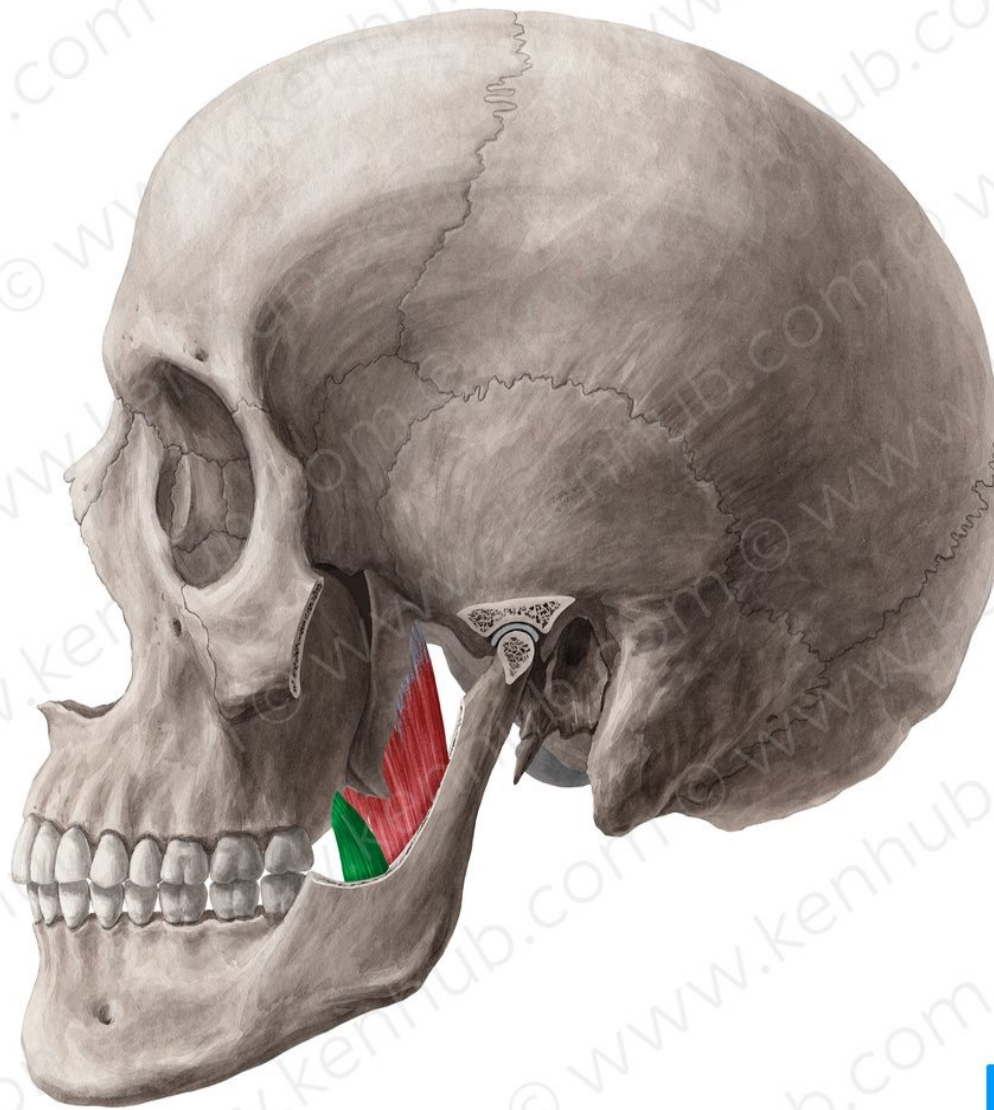
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4- Medial Pterygoid

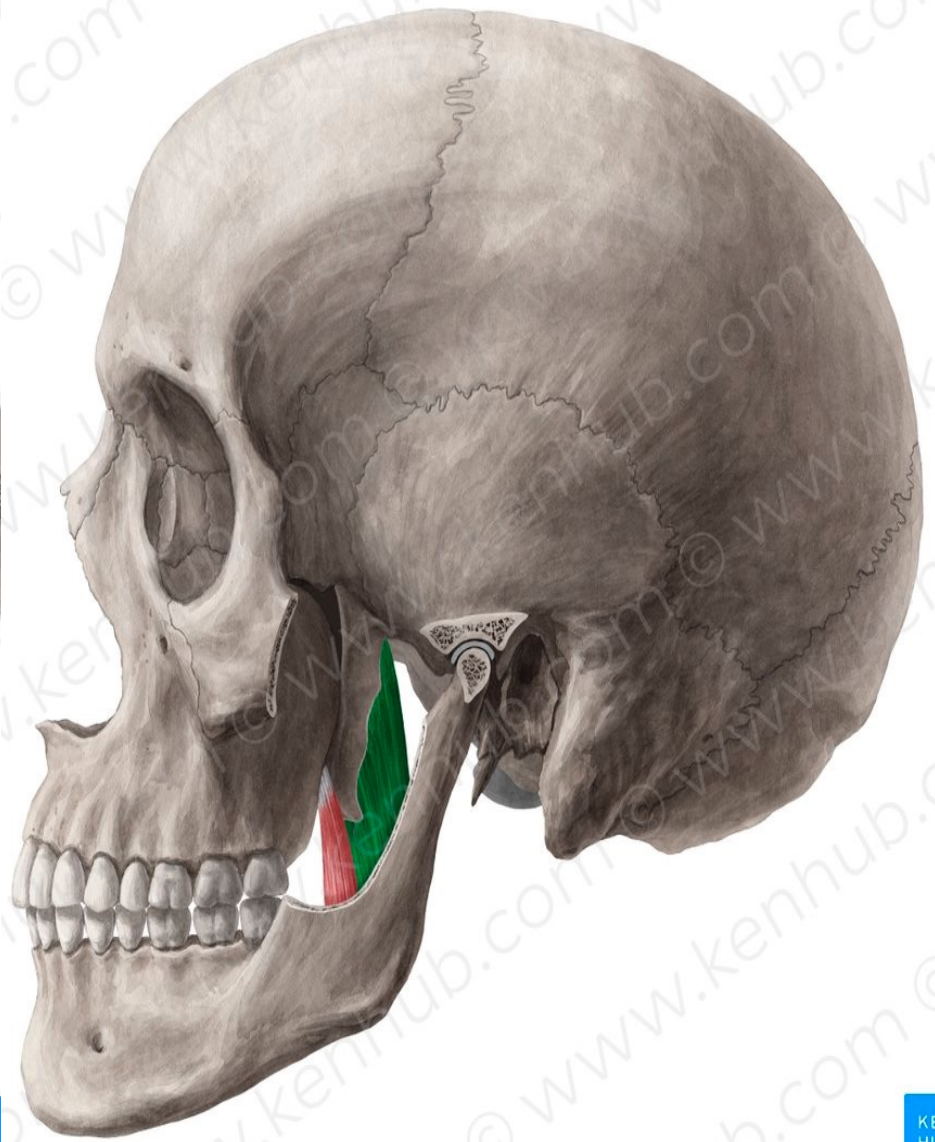
Superficial and deep heads

Me !!!!!!!





Superficial head of medial pterygoid muscle



Deep head of medial pterygoid muscle

4- Medial Pterygoid

Origin : it arises by 2 heads

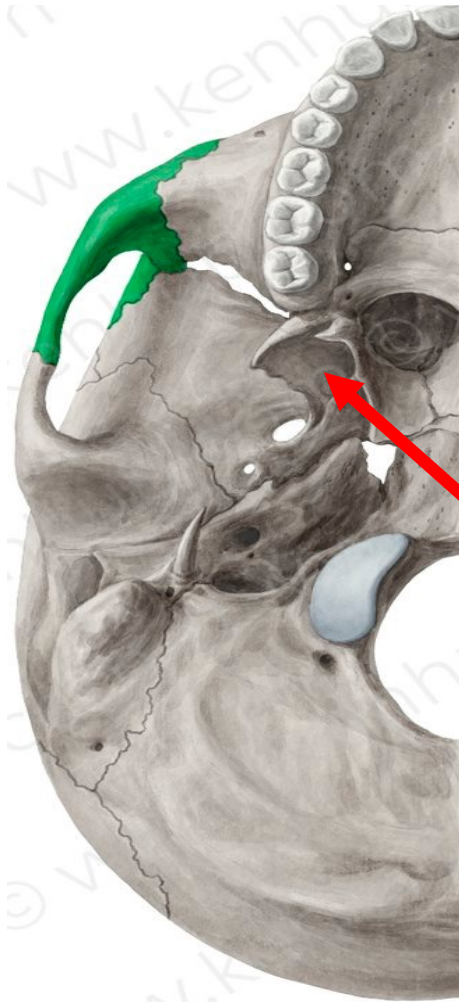
- **The superficial head :** arises from the maxillary tuberosity.
- **The deep head :** arises from medial surface of the lateral pterygoid plate.

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

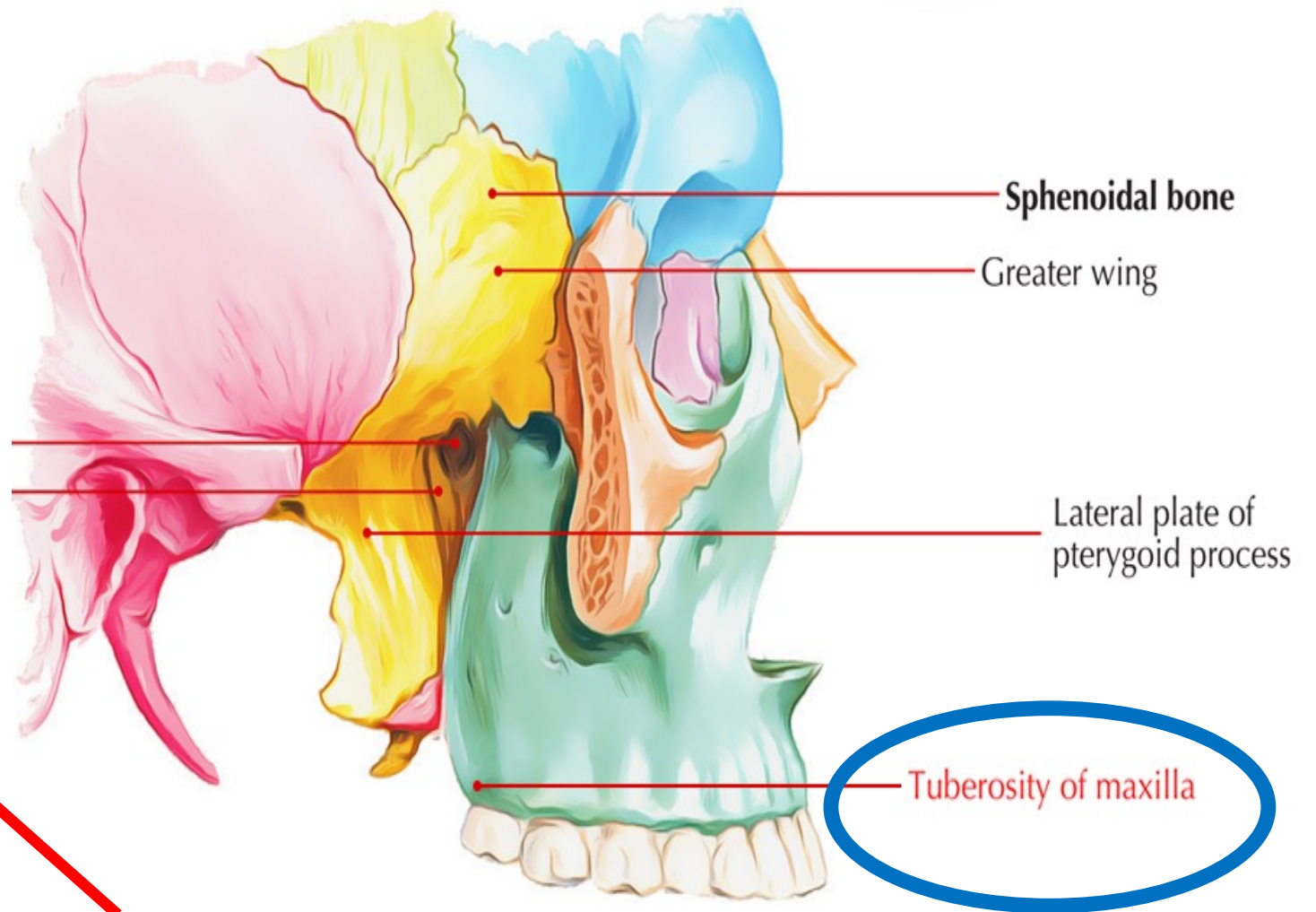
Nerve supply : From the trunk of the mandibular N.

Actions :

- With masseter, elevate and close the mandible.



lateral pterygoid plate

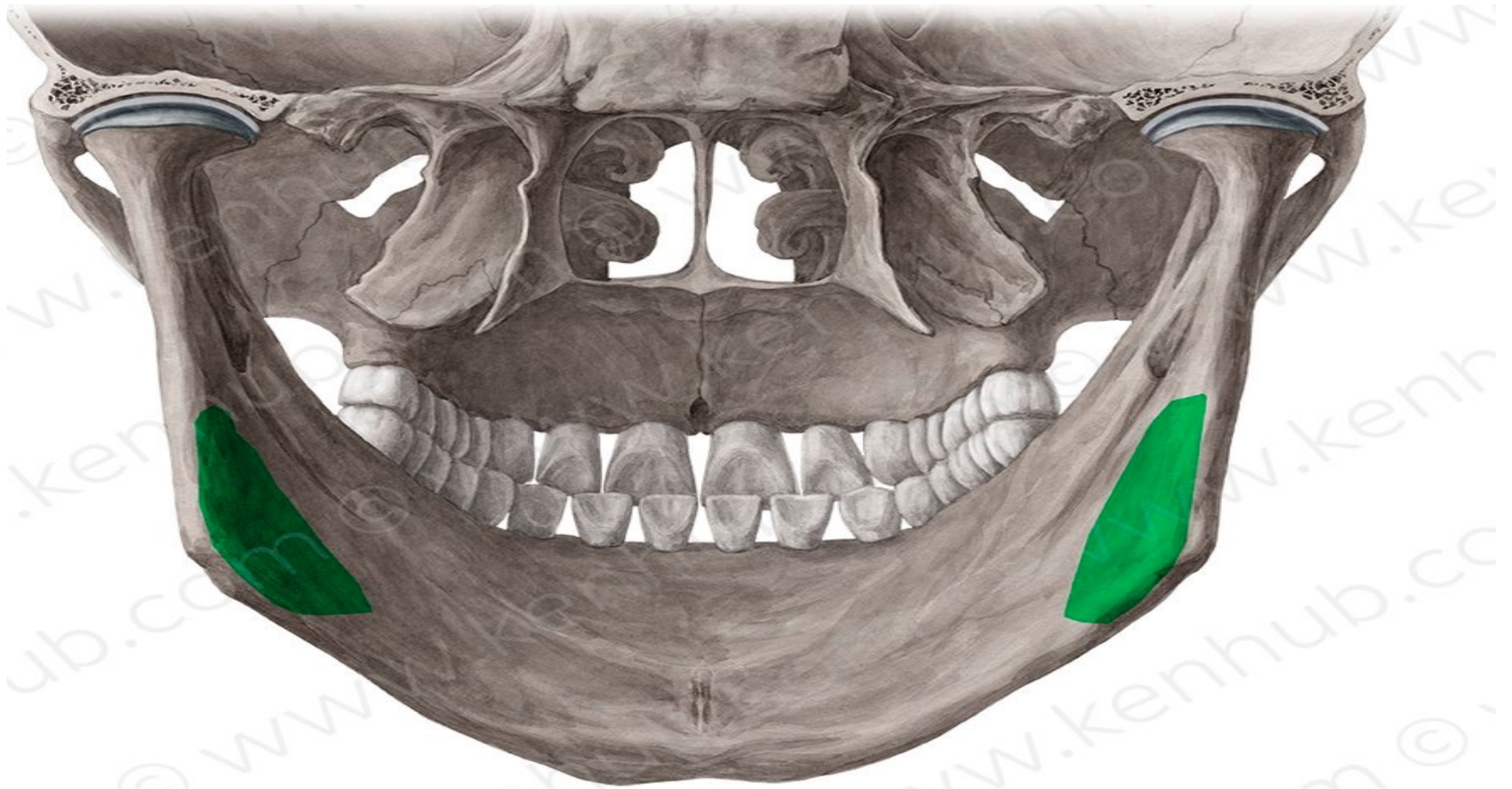


Sphenoidal bone

Greater wing

Lateral plate of pterygoid process

Tuberosity of maxilla



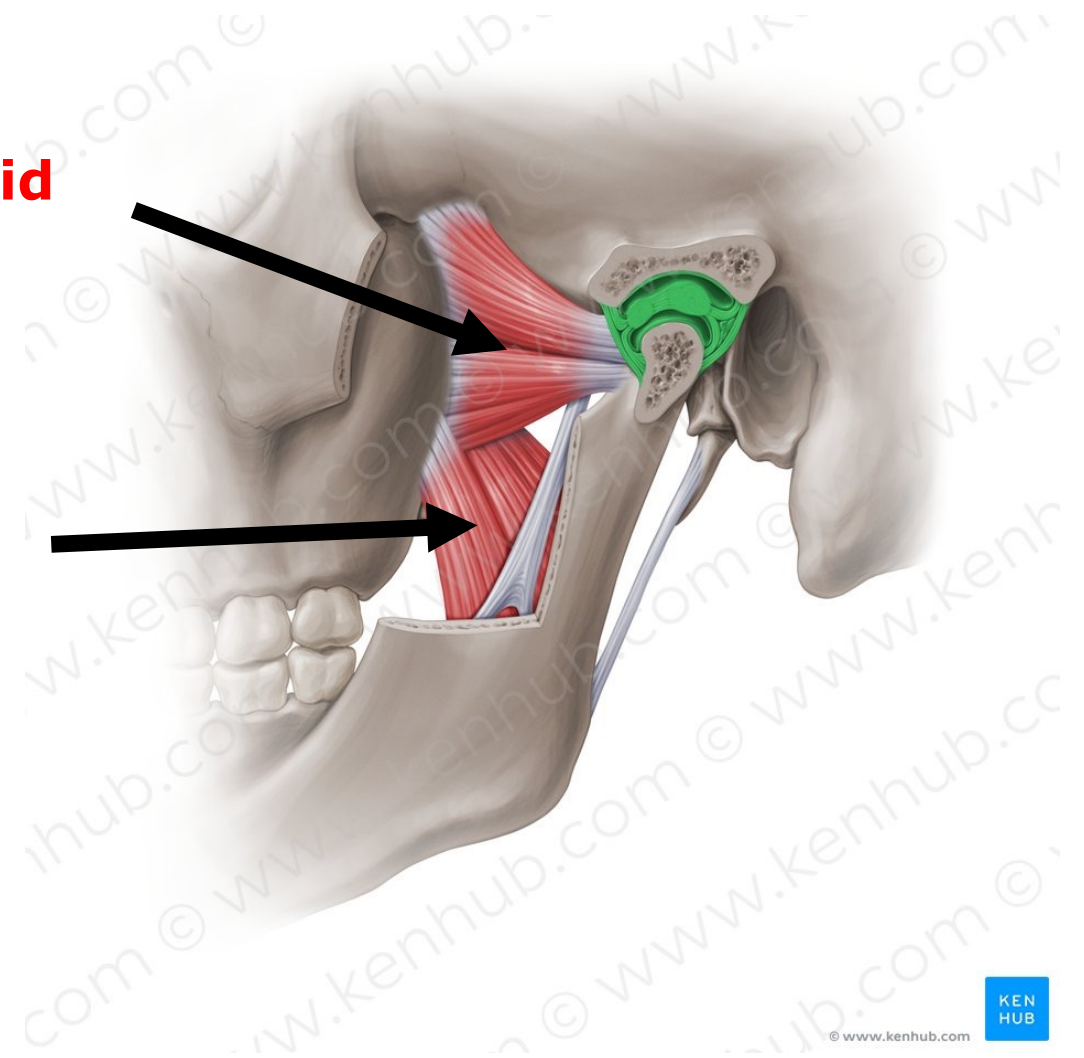
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Insertion of Medial Pterygoid

Lateral Pterygoid

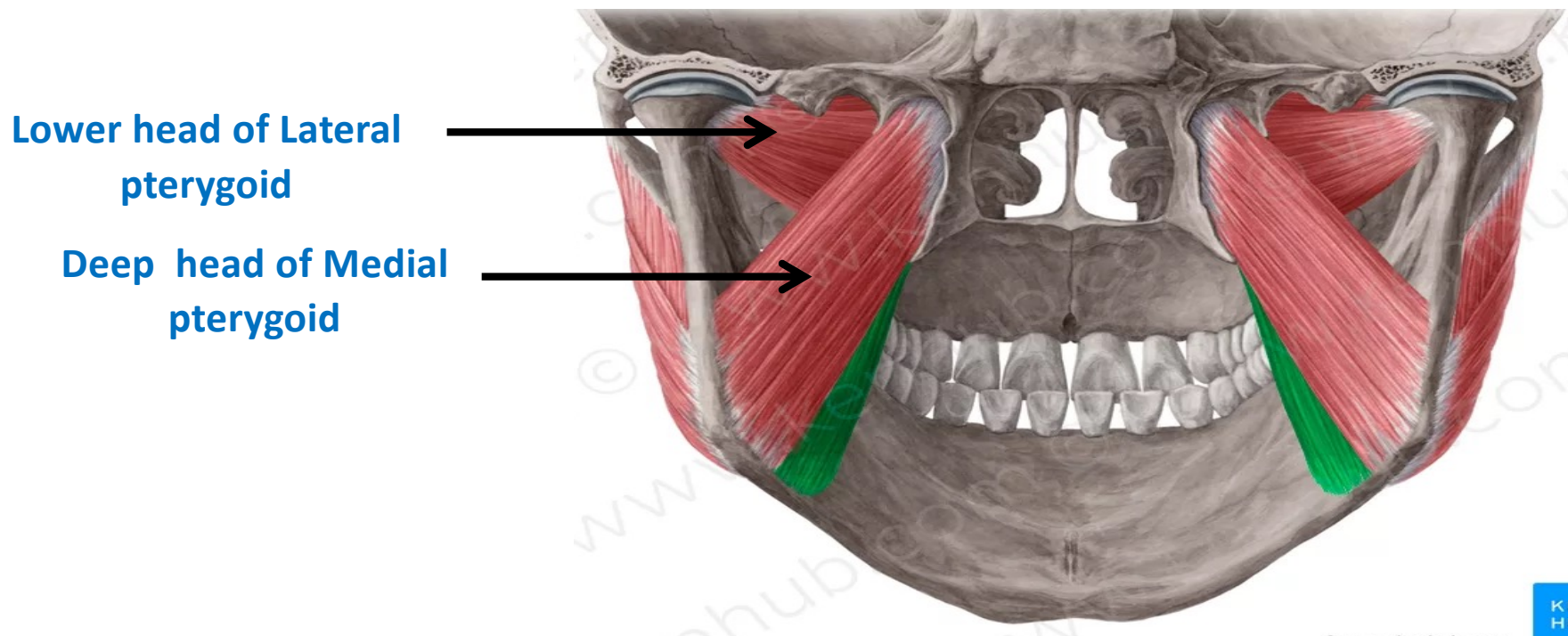
Medial Pterygoid



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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.

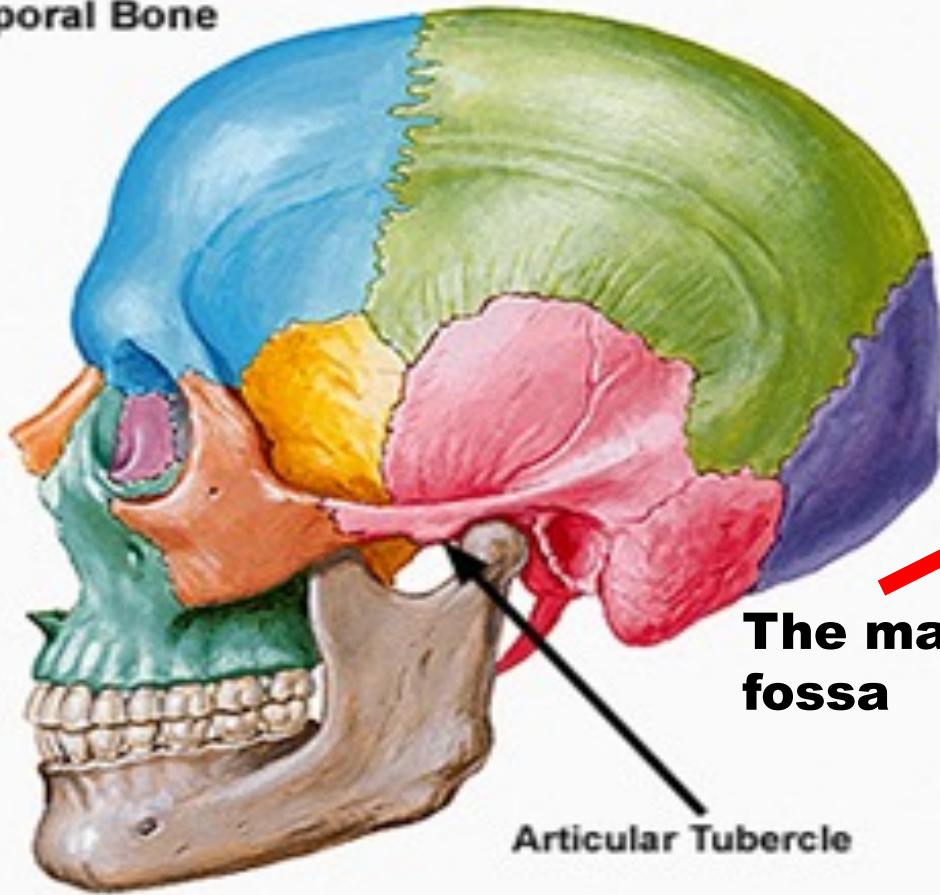
Shape : its upper surface is *concavoconvex* to fit the articular tubercle and mandibular fossa respectively.

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

N.B.

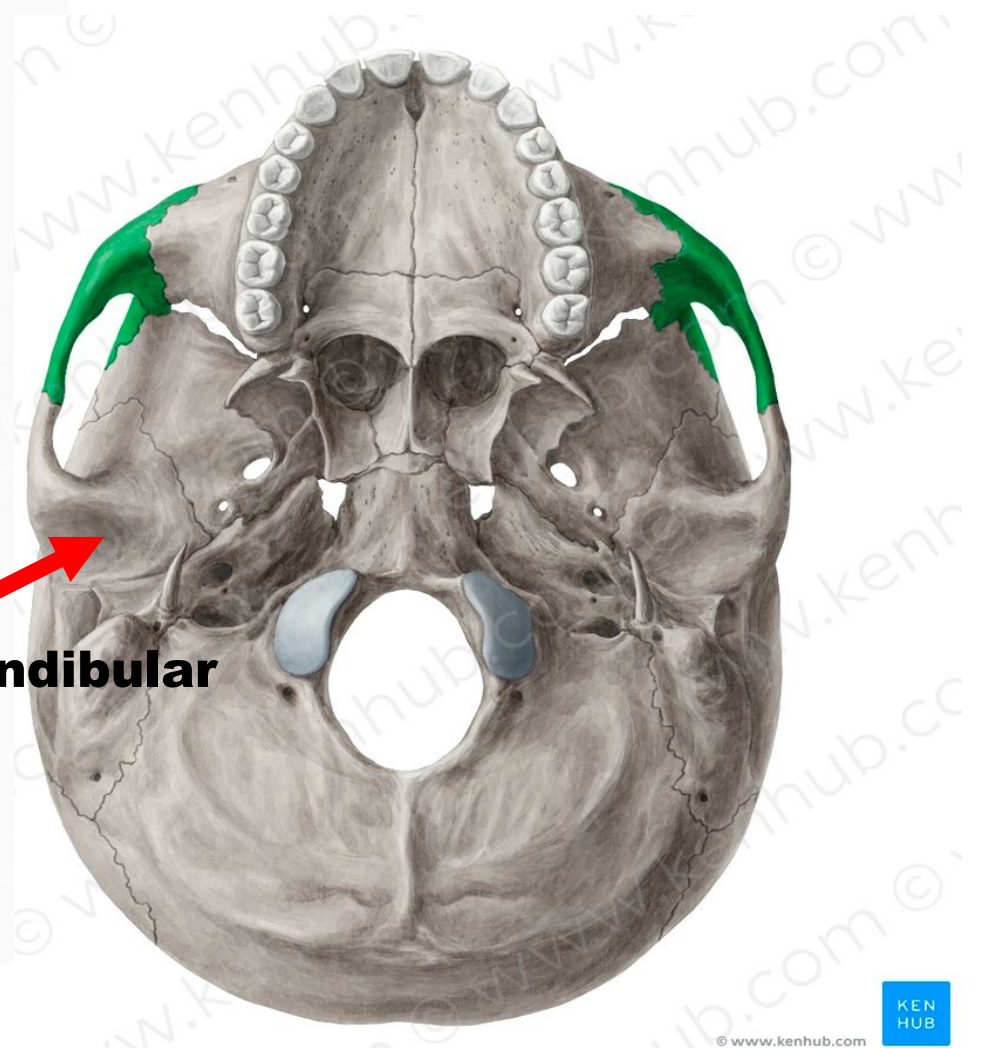
- ✓ The gliding movement of protraction and retraction are occur in the superior cavity
- ✓ The hinge movement of elevation and depression occur in the inferior cavity .

Temporal Bone



Articular Tubercle

The mandibular fossa



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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

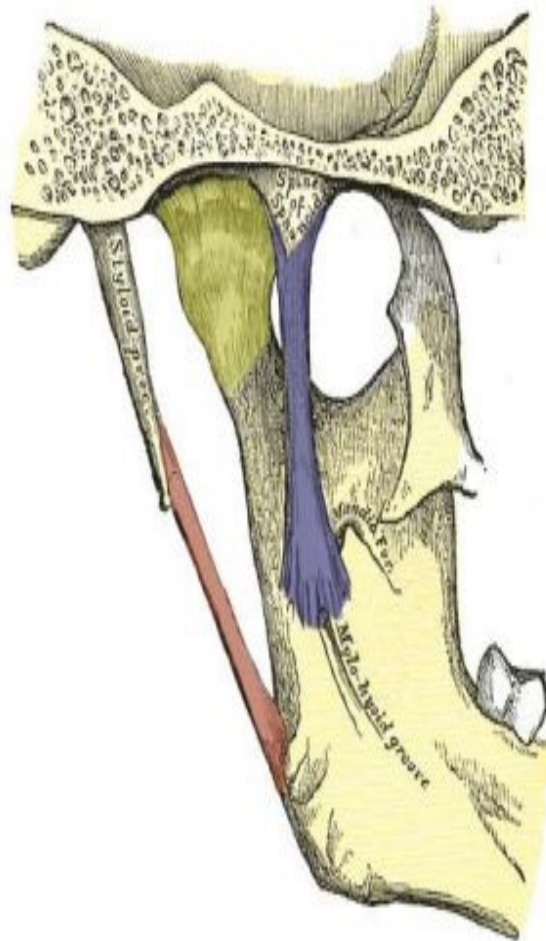
Site : medial to the joint.





Attachments :

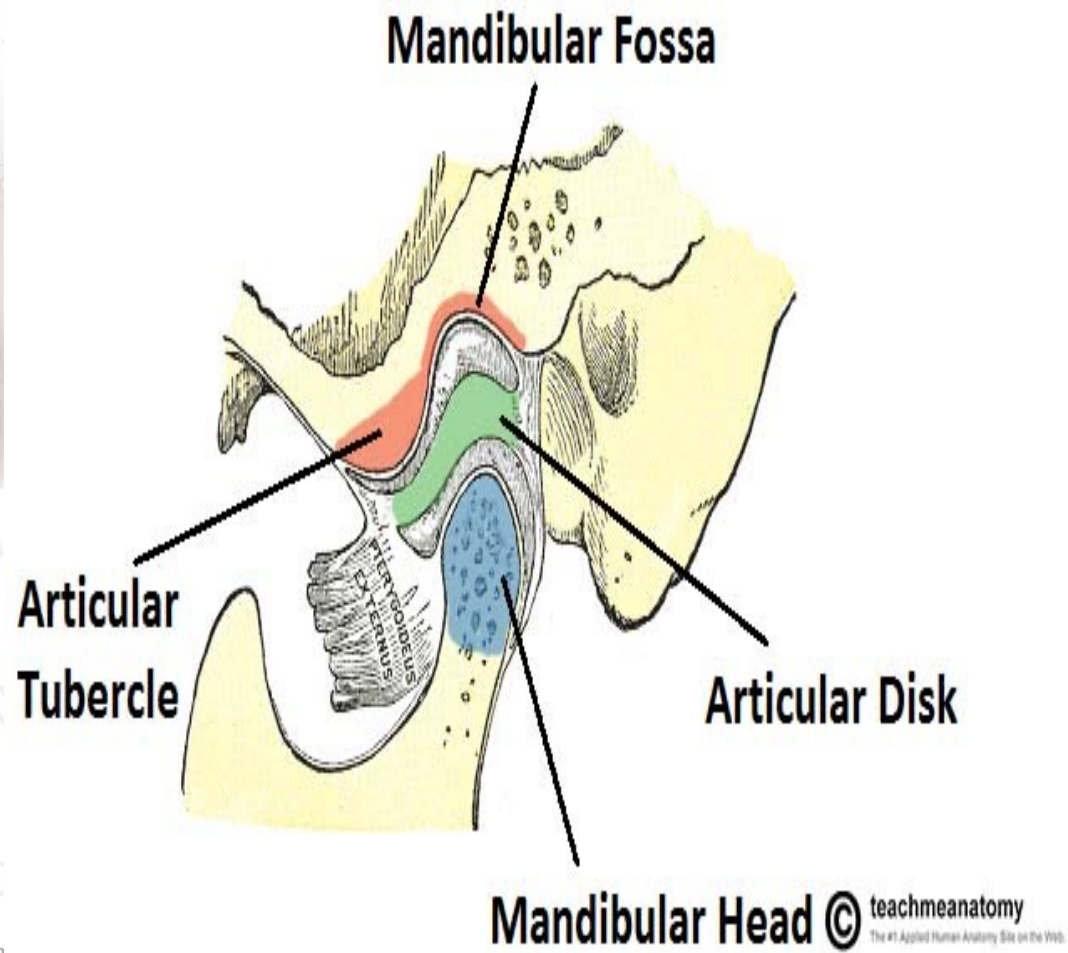
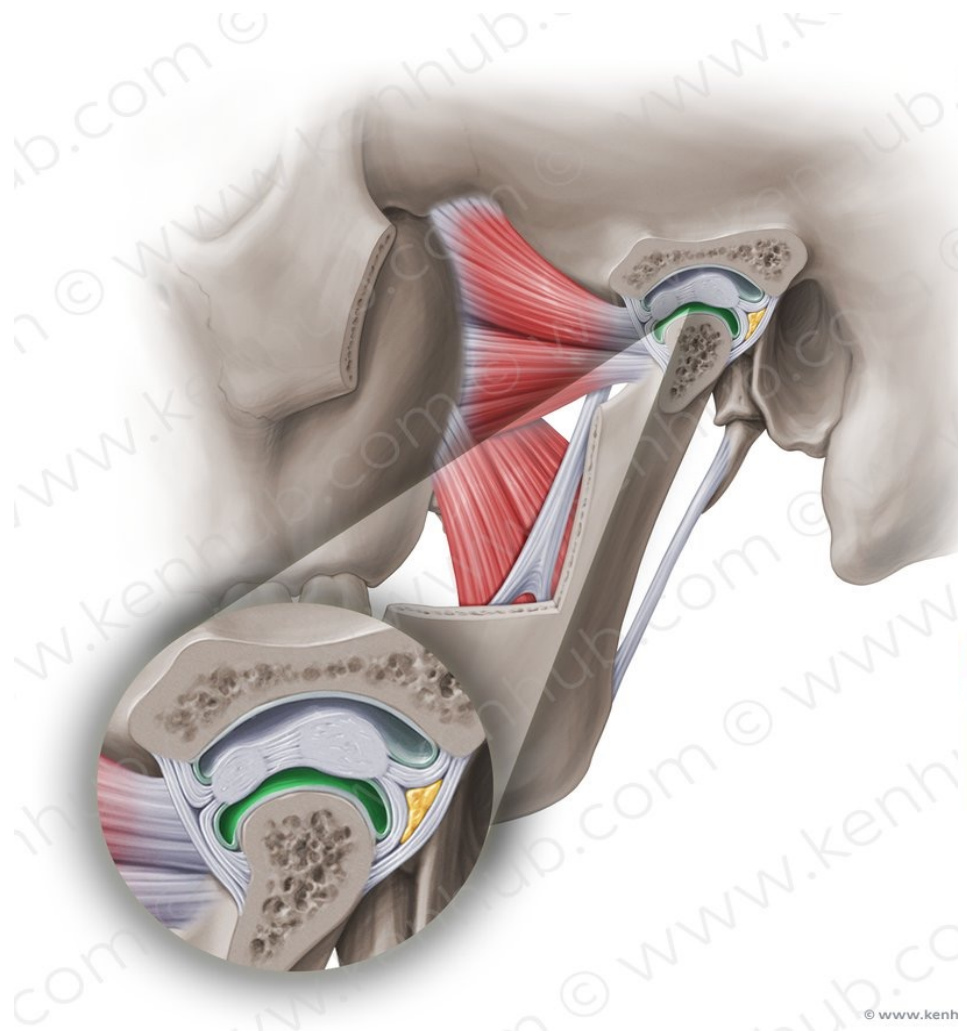
Above : spine of sphenoid

Below : the lingula of the mandible.

Significance : it supports the weight of the jaw



-  Joint Capsule
-  Lateral ligament
-  Sphenomandibular ligament
-  Stylomandibular ligament



Superior and inferior articular cavities

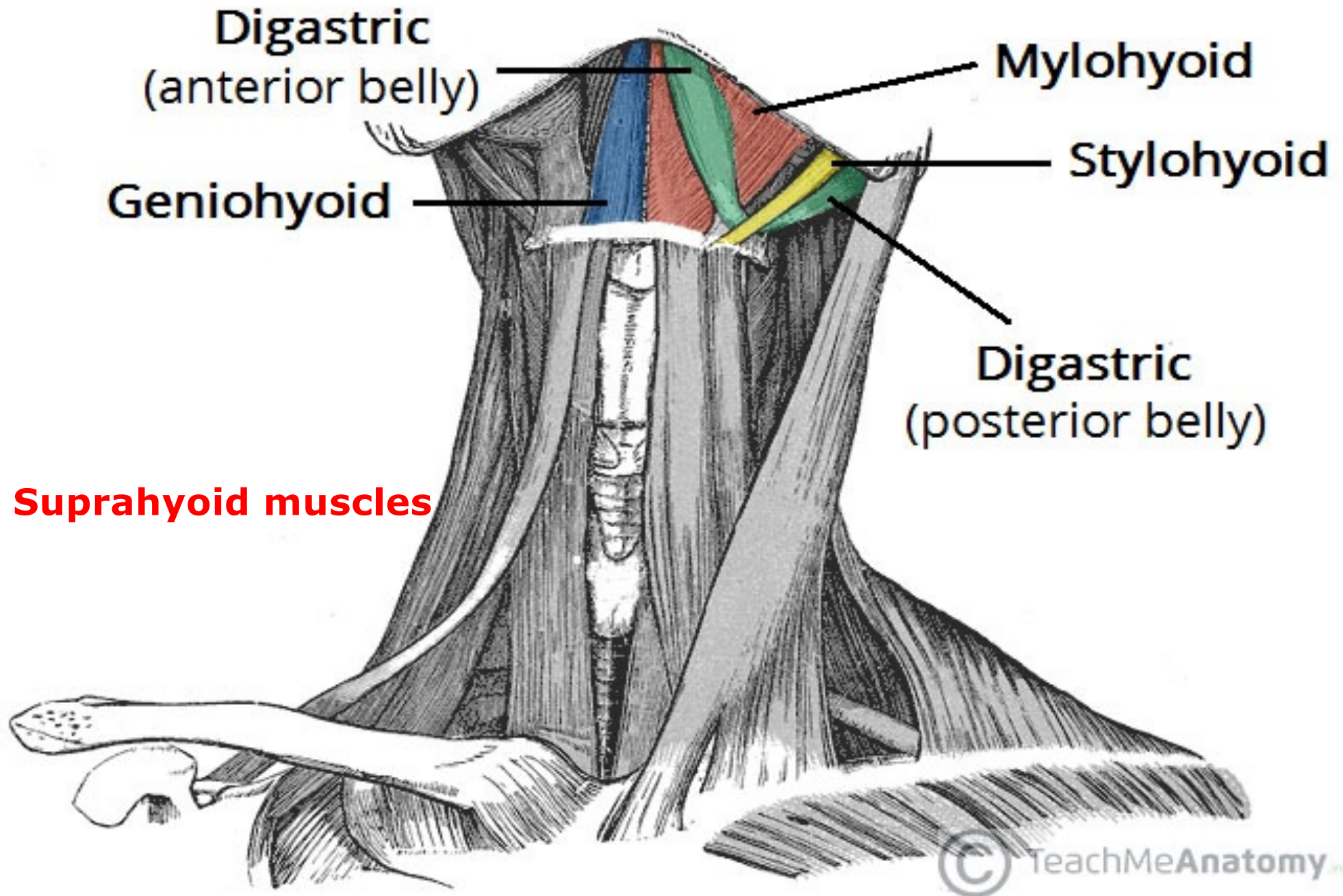
3. The synovial membrane :

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.



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.

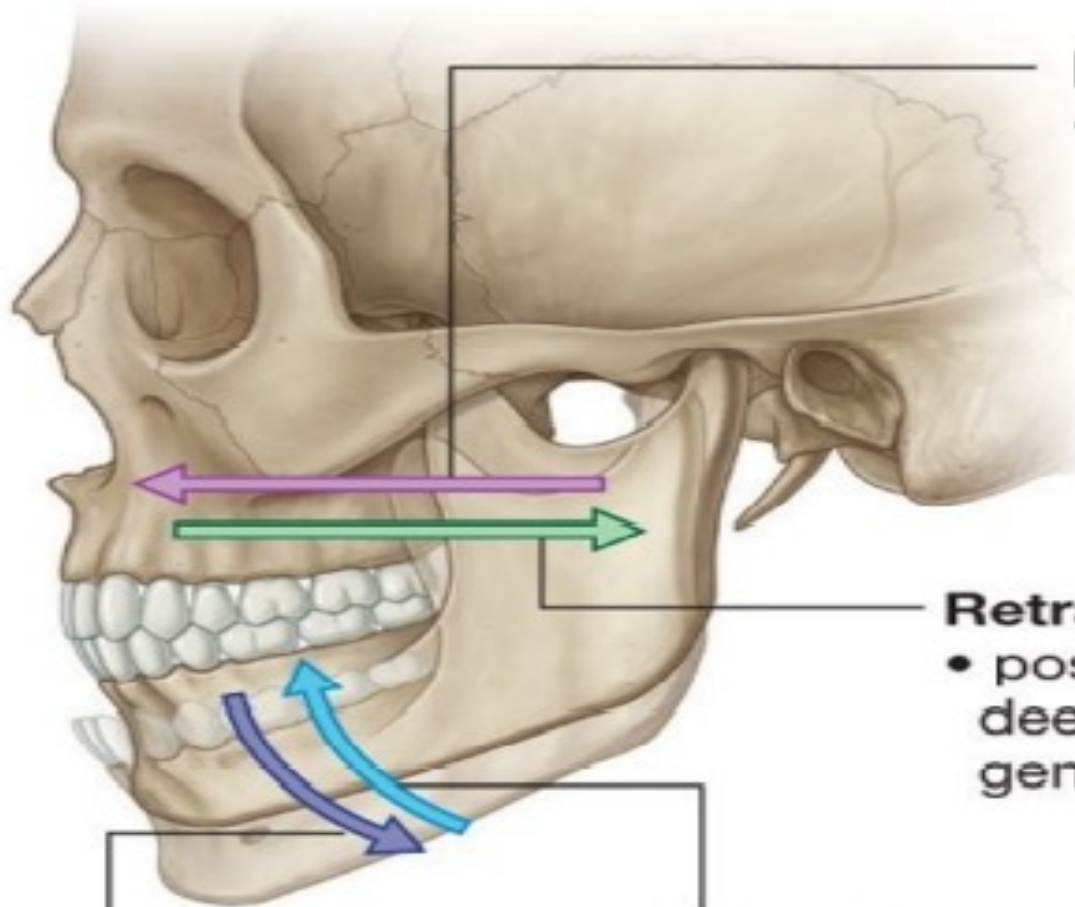
4. Retraction of the protruded mandible

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

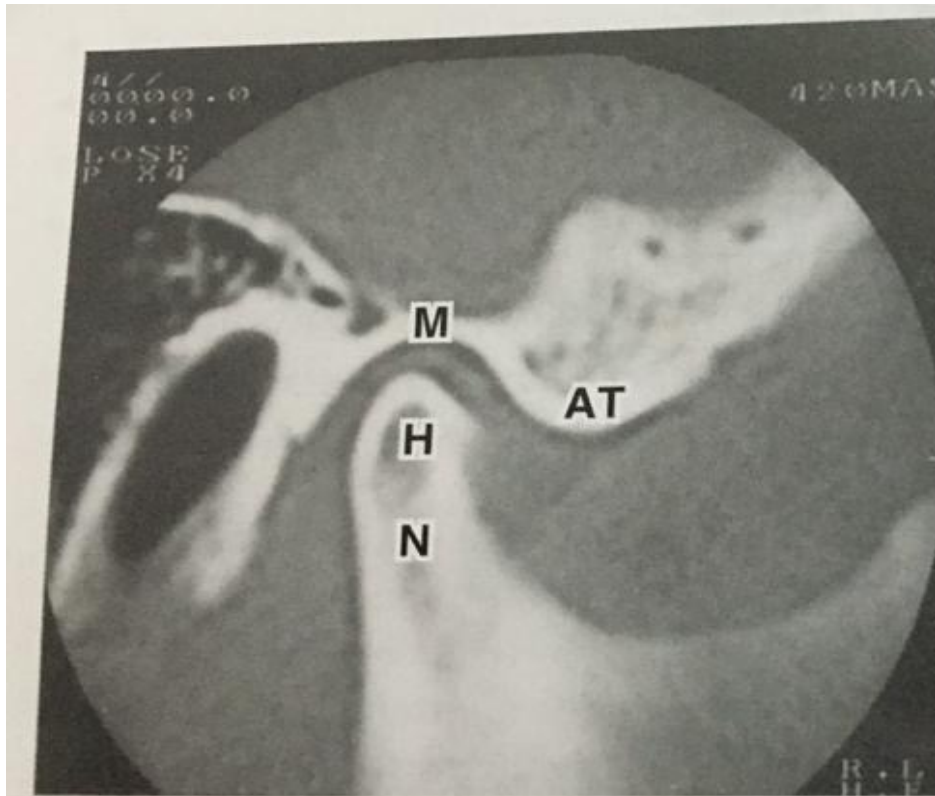
- gravity
- digastric, geniohyoid, and mylohyoid muscles

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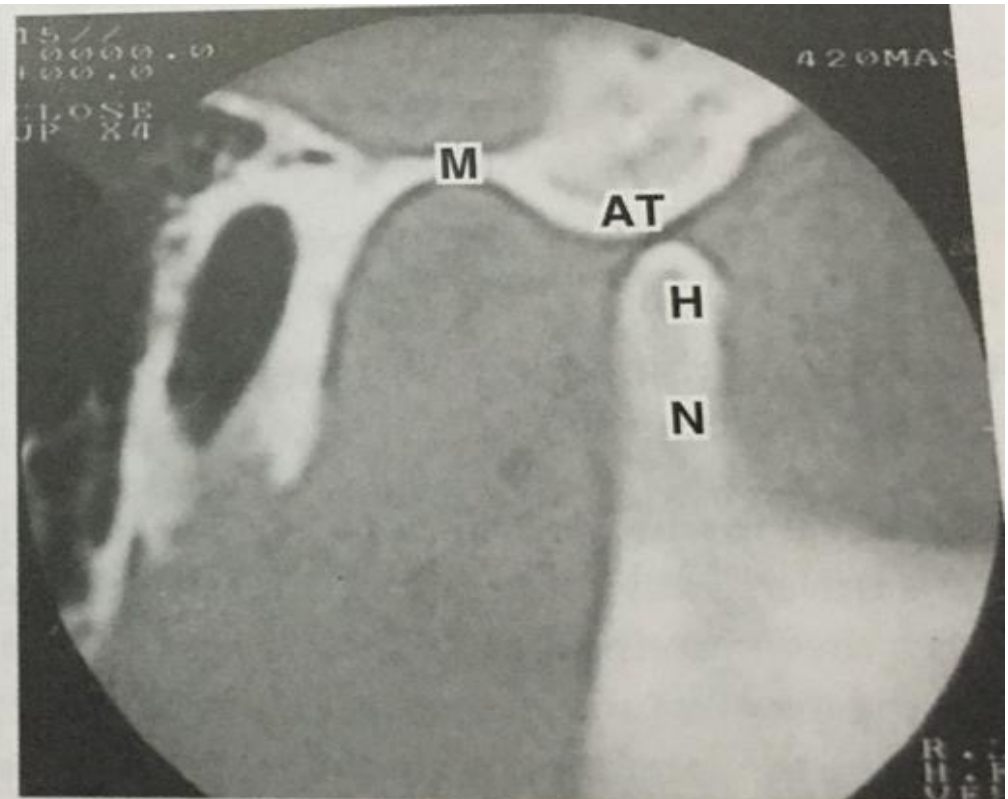
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The anterior movement of the head of the mandible and articular disc on the articular surface until the head lies inferior to the articular tubercle is referred to as "**translation**" by dentists

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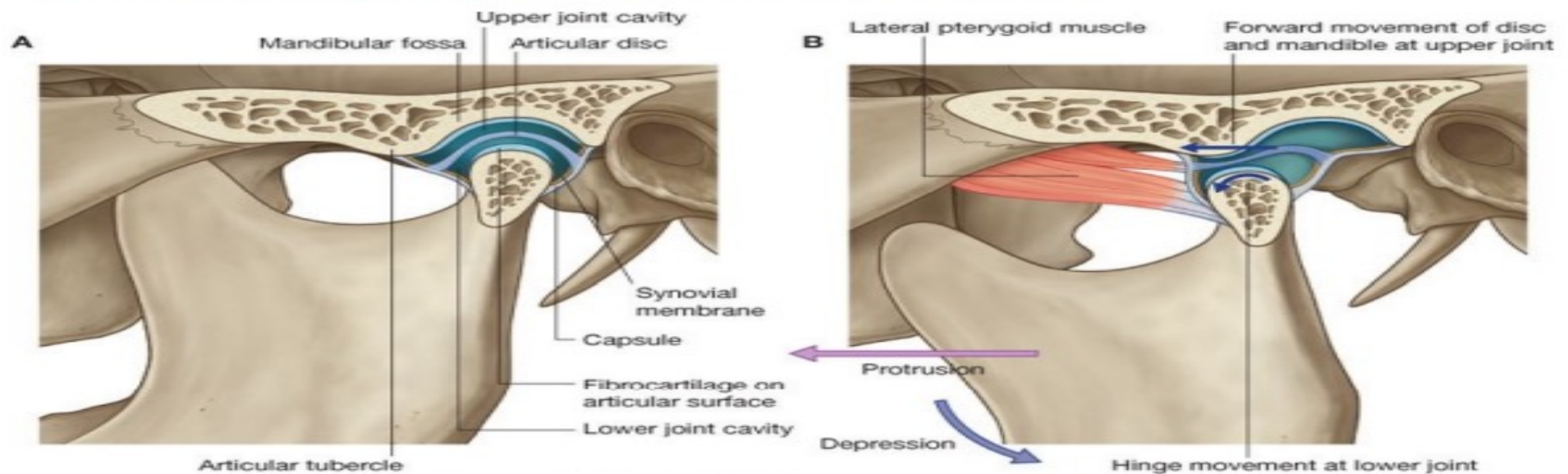


(C) Sagittal CT, mouth closed



(D) Sagittal CT, mouth widely-opened

- 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



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

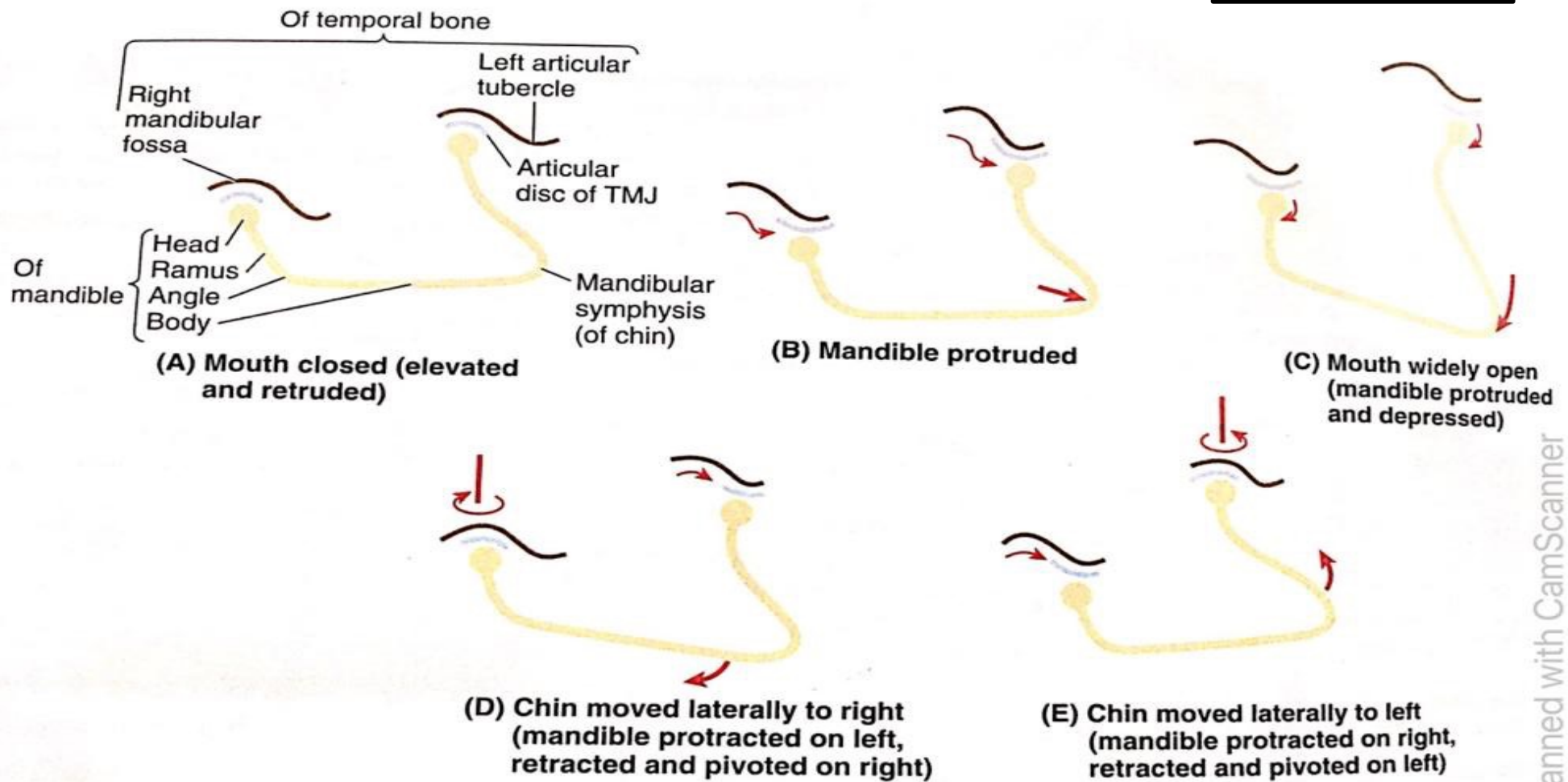


FIGURE 8.71. Movements of mandible consequent to movement at TMJs.



Thank you!