

Objective Learning :

At the end of the lecture you should be able to :

1. Define and Enlist the muscle of mastication
2. Identify the temporomandibular joint(TMJ) ,articulation ,,ligaments, movements, blood and nerve supply.
3. Know the causes and signs of dislocation of TMJ
4. Identify the temporalis muscle, its origin ,insertion action and nerve supply
5. Identify the masseter muscle, its origin ,insertion action and nerve supply
6. Identify the lateral pterygoid muscle, its origin ,insertion action and nerve supply
7. Identify the medial pterygoid muscle, its origin ,insertion action and nerve supply

The muscles of mastication are a group of muscles associated with movements of the jaw (temporomandibular joint).

There are four muscles of mastication – the masseter, temporalis, medial pterygoid and lateral pterygoid.

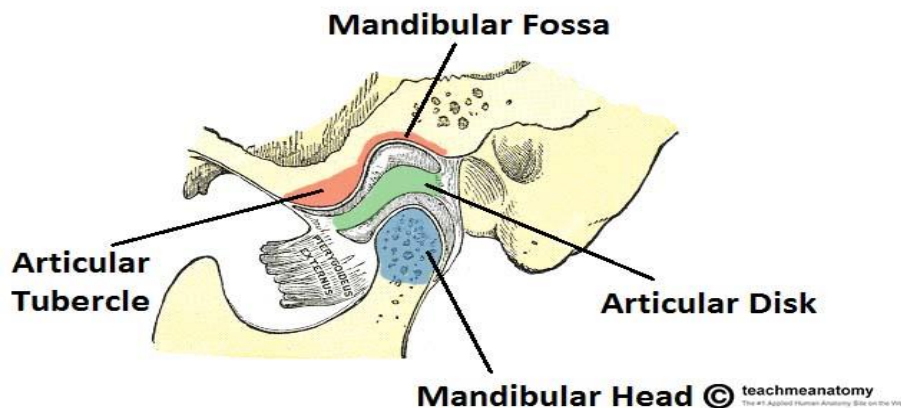
The temporomandibular joint

(TMJ) is synovial joint formed by the articulation of the mandible and the temporal bone of the cranium. It is located anteriorly to the tragus of the ear, on the lateral aspect of the face.

The articulating suraces are

- *Mandibular fossa
- * Articular tubercle (from the squamous part of the temporal bone),
- * Head of mandible.

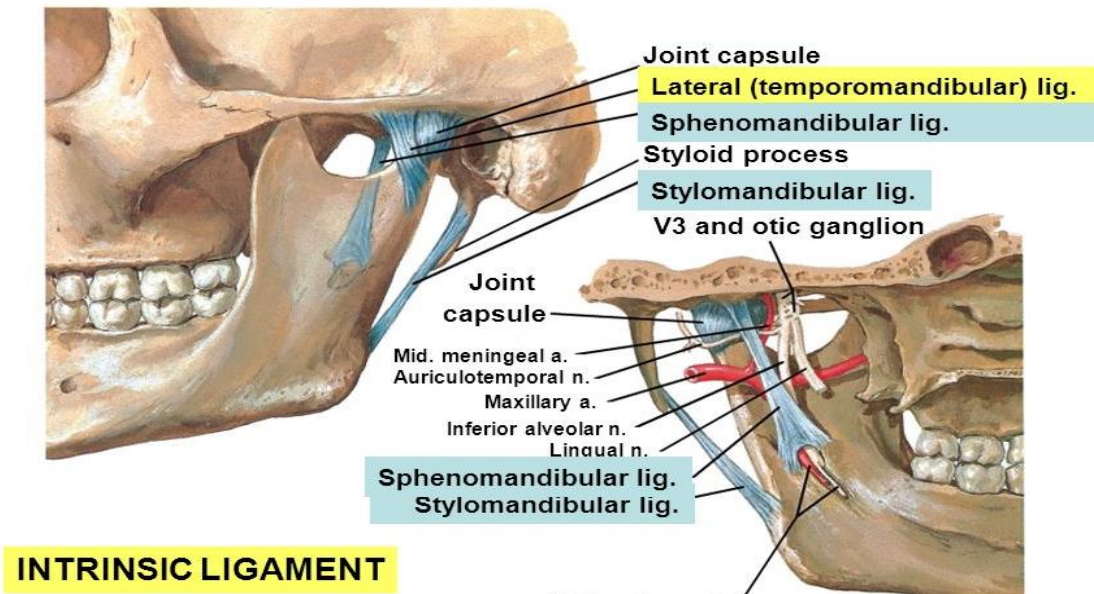
The articulating surfaces are separated by an articular disk. The presence of such a disk splits the joint into two synovial joint cavities, each lined by a synovial membrane. The articular surface of the bones are covered by fibrocartilage, not hyaline cartilage.



Ligaments Are

There are three ligaments. They act to stabilize the temporomandibular joint.

- Lateral ligament
- Sphenomandibular ligament
- Stylomandibular ligament



Movements

Movements at this joint are produced by the muscles of mastication, and the hyoid muscles. The two divisions of the temporomandibular joint have different functions.

Protrusion and Retraction
Elevation and Depression

The blood arterial supply

The arterial supply to the TMJ is provided by the branches of the external carotid, principally the superficial temporal branch. Other contributing branches include the deep auricular, ascending pharyngeal and maxillary arteries.

Nerve Supply

The TMJ is innervated by the auriculotemporal and masseteric branches of the mandibular nerve

Applied Anatomy

A dislocation of the temporomandibular joint can occur via a blow to the side of the face, yawning, or taking a large bite. The head of the mandible 'slips' out of the mandibular fossa, and is pulled anteriorly.

The patient becomes unable to close their mouth. The facial and auriculotemporal nerves run close to the joint, and can be damaged if the injury is traumatic.

Masseter

The masseter muscle is the most powerful muscle of mastication. It is quadrangular in shape, and can be split into two parts; deep and superficial.

The entirety of the muscle lies superficially to the pterygoids and temporalis

The Superficial Portion

Origin: maxillary process of zygomatic bone & anterior $\frac{2}{3}$ of the lower border of the zygomatic arch
Insertion: angle & lower $\frac{1}{2}$ of lateral surface of the ramus of the mandible

The Deep Portion

Smaller and more muscular in texture

Origin: posterior $\frac{1}{3}$ of lower border & whole of the medial surface of the zygomatic arch

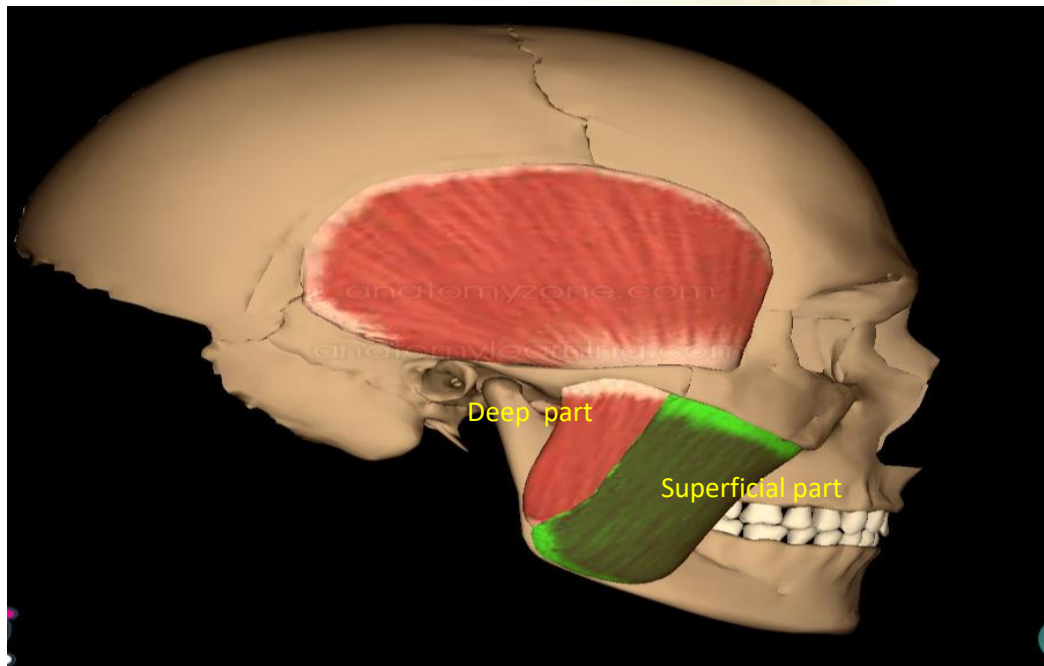
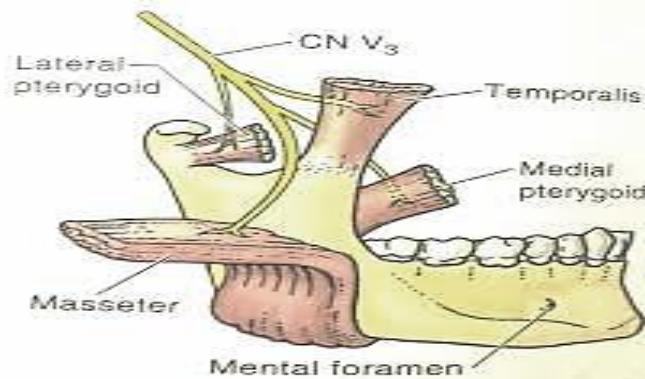
Insertion: the upper $\frac{1}{2}$ of the lateral surface of the ramus mandible.

Actions: Elevates the mandible, closing the mouth.

Innervation: Mandibular nerve (V_3).

Blood supply :

- Maxillary artery
- Superficial temporal artery
- Facial artery



Temporalis

The temporalis muscle originates from the temporal fossa – a shallow depression on the lateral aspect of the skull. The muscle is covered by tough fascia which can be harvested surgically and used to repair a perforated tympanic membrane (an operation known as a myringoplasty).

Origin :

*Superficial portion

From temporal aponeurosis, temporal line Insertion: the coronoid process of the mandible

*Zygomatic portion

superior and medial zygoma and zygomatic arch

*Deep portion

From bony surface of the frontal, sphenoid, parietal and temporal bones

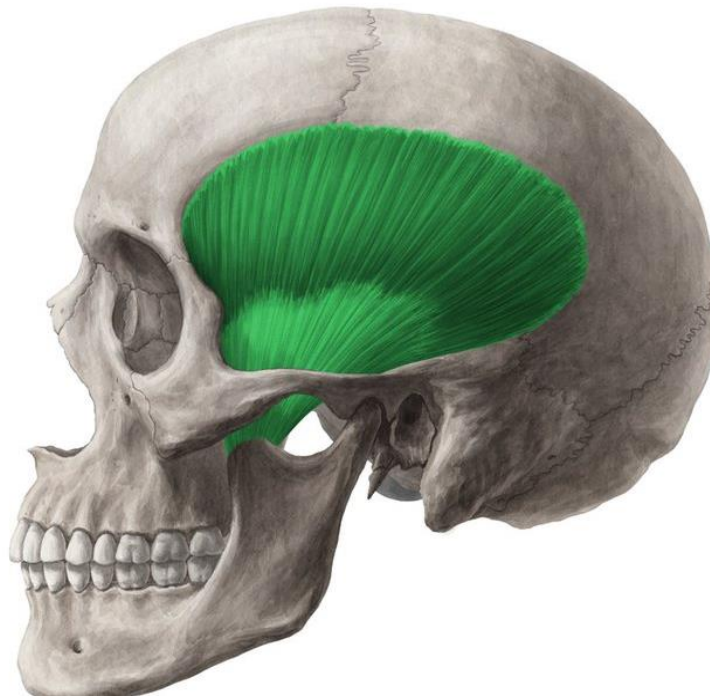
Insertion : all portion I condense into a tendon, which inserts onto the coronoid process of the mandible.

Actions: Elevates the mandible, closing the mouth. Also retracts the mandible, pulling the jaw posteriorly.

Innervation: Mandibular nerve (V₃).

Blood Supply :

- Maxillary artery
- Superficial temporal artery



Temporal fascia :

Covers the temporal muscle

Covers the temporal muscle

Originates from superior temporal line and inserted at zygomatic arch

Has two layers:

1. superficial inserted into the lateral border of the arch

2. deep inserted into the medial border of the arch

Between these layers is a small quantity of fat and attachment of the superficial fibres of the temporal muscle

Lateral Pterygoid

The medial pterygoid muscle has a quadrangular shape, with two heads; deep and superficial. It is located inferiorly to the lateral pterygoid.

Origin :

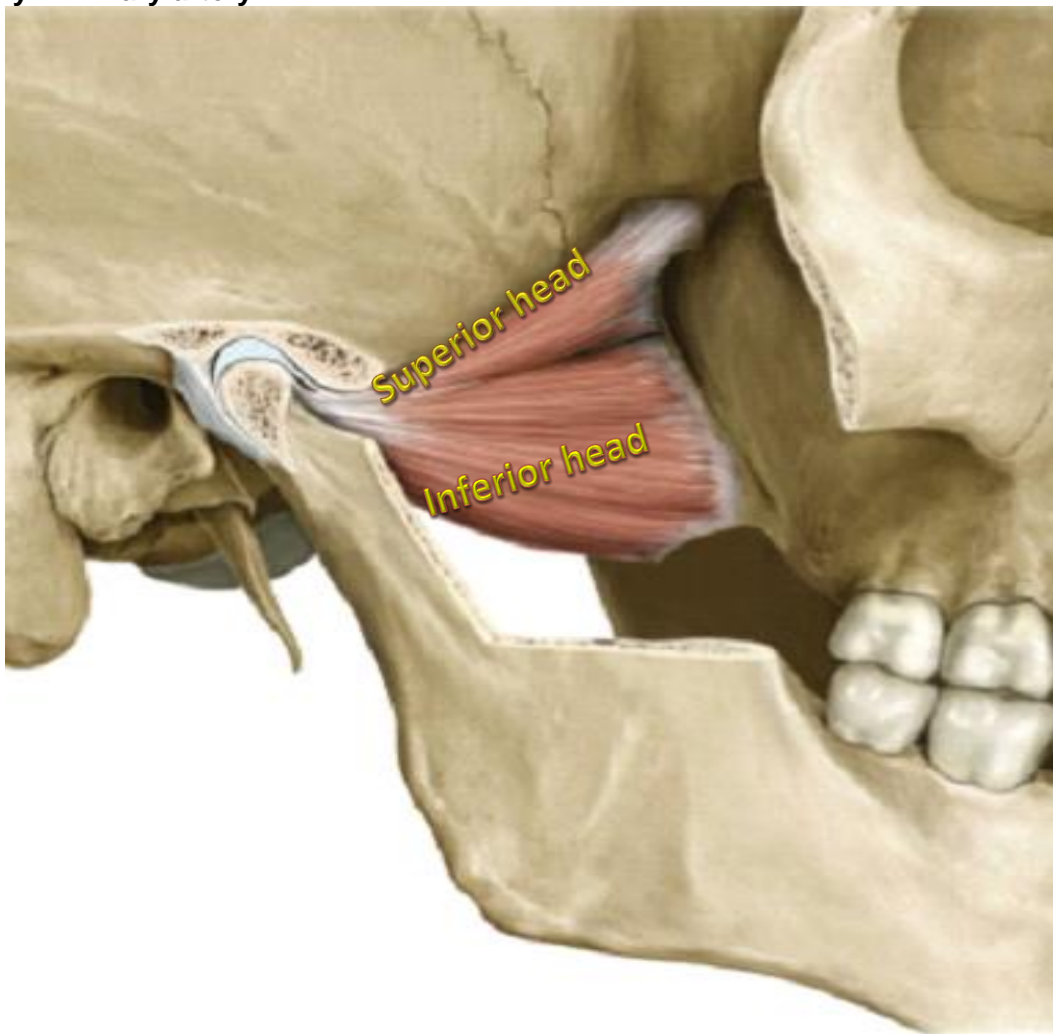
- The superior head originates from the maxillary tuberosity and the pyramidal process of palatine bone.
- The inferior head originates from the lateral pterygoid plate of the sphenoid bone.

Insertion Both parts attach to the ramus of the mandible, near the angle of mandible.

Actions: Elevates the mandible, closing the mouth.

Innervation: Mandibular nerve (V_3).

Blood supply : Maxillary artery



Medial Pterygoid

The lateral pterygoid muscle has a triangular shape, with two heads; superior and inferior. It has horizontally orientated muscle fibres, and thus is the major protractor of the mandible.

Origin

- : The superficial head originates from the greater wing of the sphenoid.
- The deep head originates from the lateral pterygoid plate of the sphenoid.

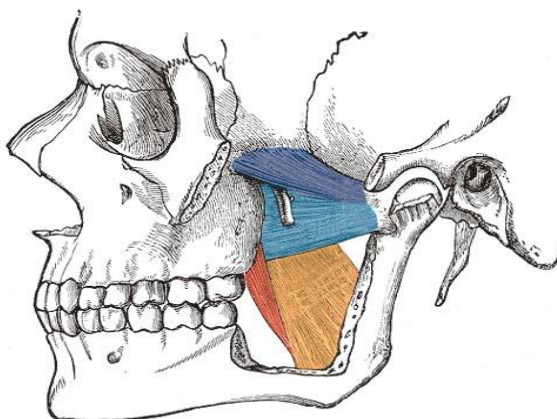
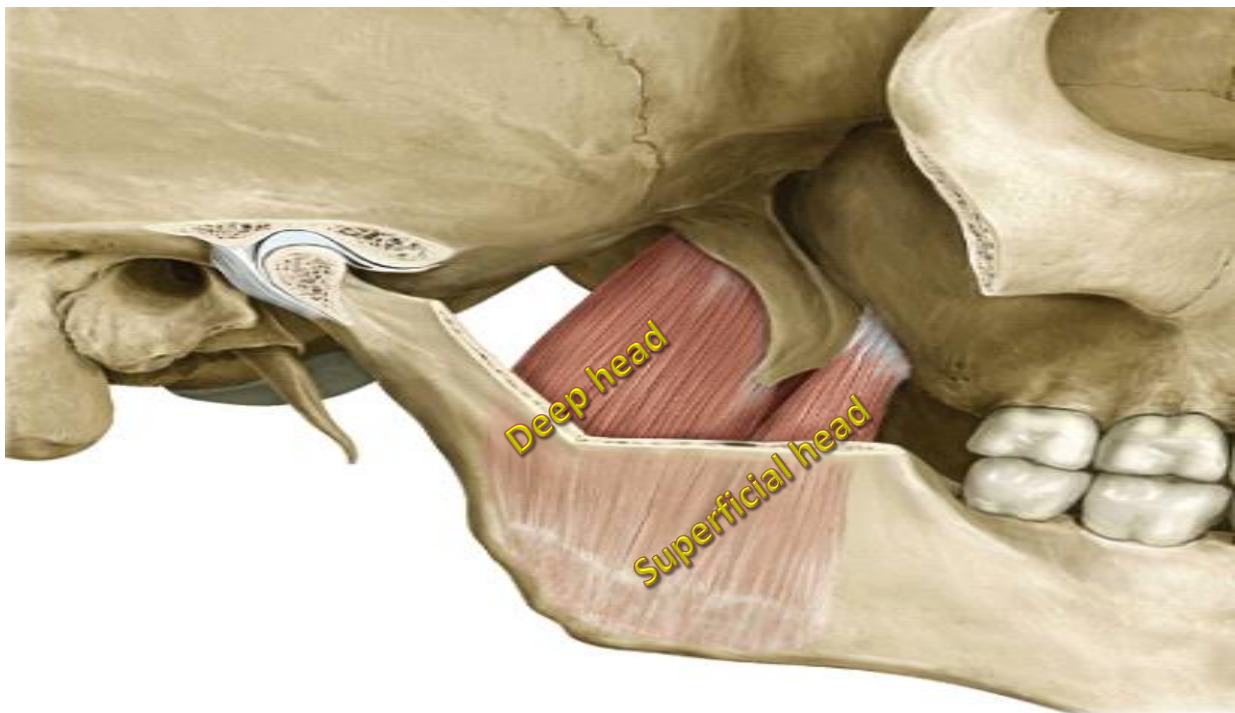
Insertion

The two heads converge into a tendon, which attaches to the neck of the mandible.

Actions: Acting bilaterally, the lateral pterygoids protract the mandible, pushing the jaw forwards. Unilateral action produces the 'side to side' movement of the jaw.

Innervation: Mandibular nerve (V₃).

Blood supply : Maxillary artery



- Superior head of the lateral pterygoid
- Inferior head of the lateral pterygoid
- Deep head of the medial pterygoid
- Superficial head of the medial pterygoid

Choose One Suitable Answer

Which of the muscles takes a small part of its origin from the maxillary tuberosity?

- a. Masseter
- b. Temporal
- c. Medial pterygoid
- d. Lateral pterygoid

which of the muscles has more than one origin?

- a. Masseter
- b. Medial pterygoid
- c. Lateral pterygoid
- d. B and c
- e. All of the above

Regarding the temporomandibular joint :

- a. articulation between mandibular fossa of temporal bone and head of mandible
- b. has two synovial joint cavity
- c. it is fibrous joint
- d. Sphenomandibular ligament supports the joint
- e. the articulating surface is covered by fibrocartilage