

# MUSCULI MASTICATORII

Muscles of mastication

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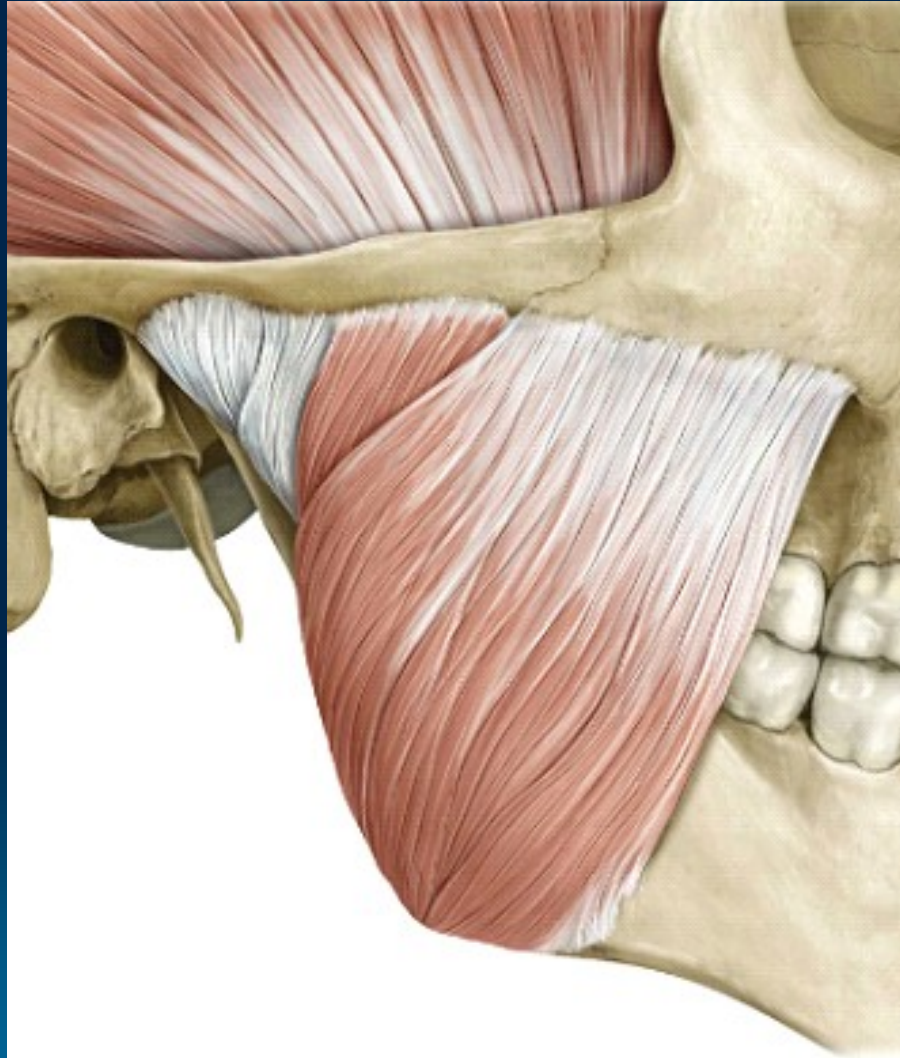


- Lat. **masticare = to chew**
- Embryologically, the muscles of mastication develop from the first (mandibular) pharyngeal arch (branchial origin)
- Movements of the mandible in the temporomandibular joint, while the rest of the skull remains stable
- origin - from the bones of the neurocranium (non-movable bones),  
insertion - on the mandible (freely movable bone)

- Pinnate structure
- Blood supply: maxillary artery (end branch of ACE)
- Nerve supply: mandibular branch of trigeminal nerve
- 4 pairs of muscles



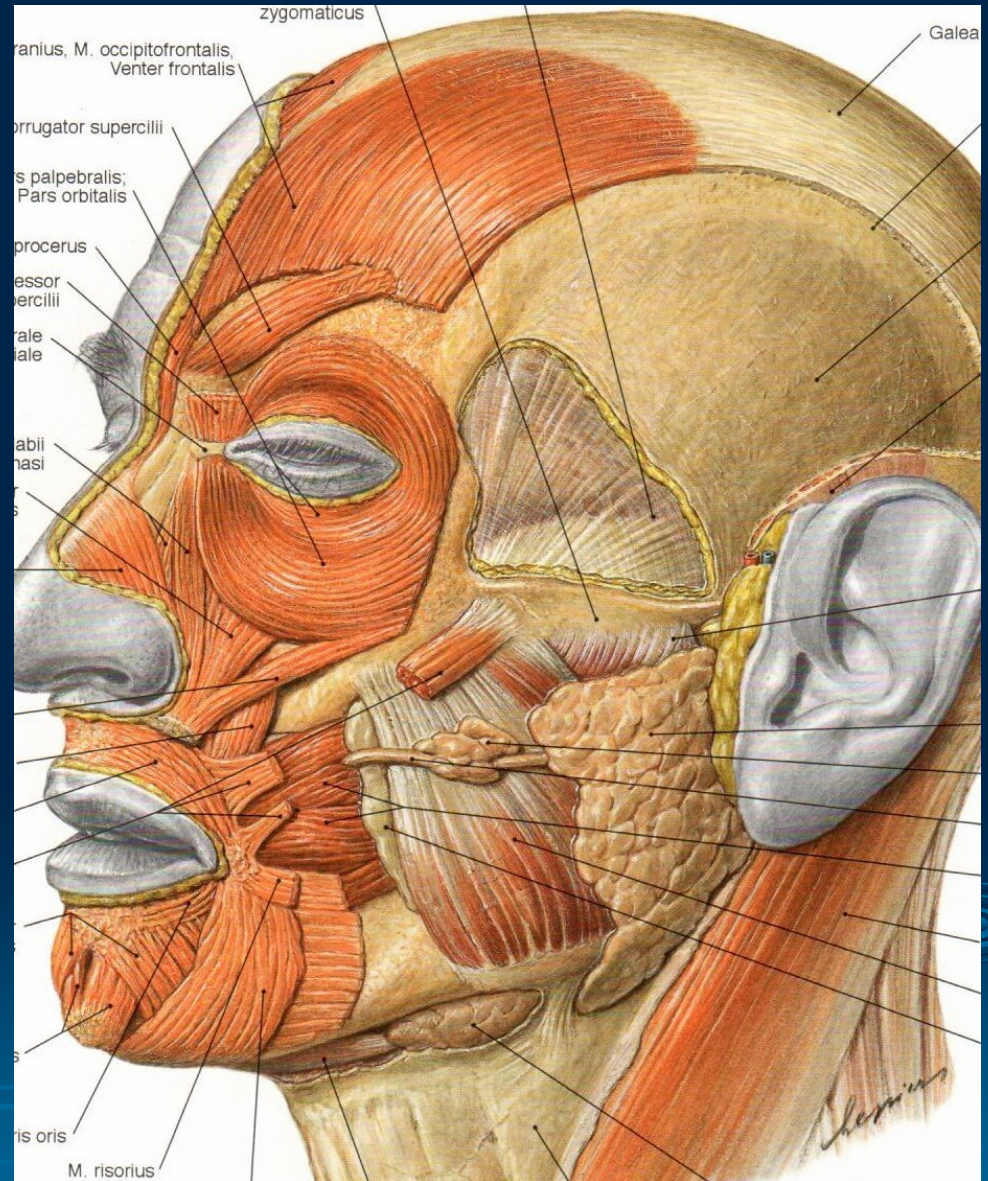
# Masseter muscle



- Thick, quadrilateral muscle, superficially located – on the side of the face, anterior to the parotid salivary gland

- Divided into Superficial, middle and deep portion

- innervation:  
n. massetericus  
(V3)



# Functional organization of the human masseter muscle.

J.F. Gaudy et al. (2000) Surg Radiol Anat 22:181-190.



## Pars superficialis

lamina spf.  
lamina prof.

## Pars intermedia

## Pars profunda

pars ventralis  
pars dorsalis:

- l. spf.
- l. intermedia
- l. prof.

## Pars spf.

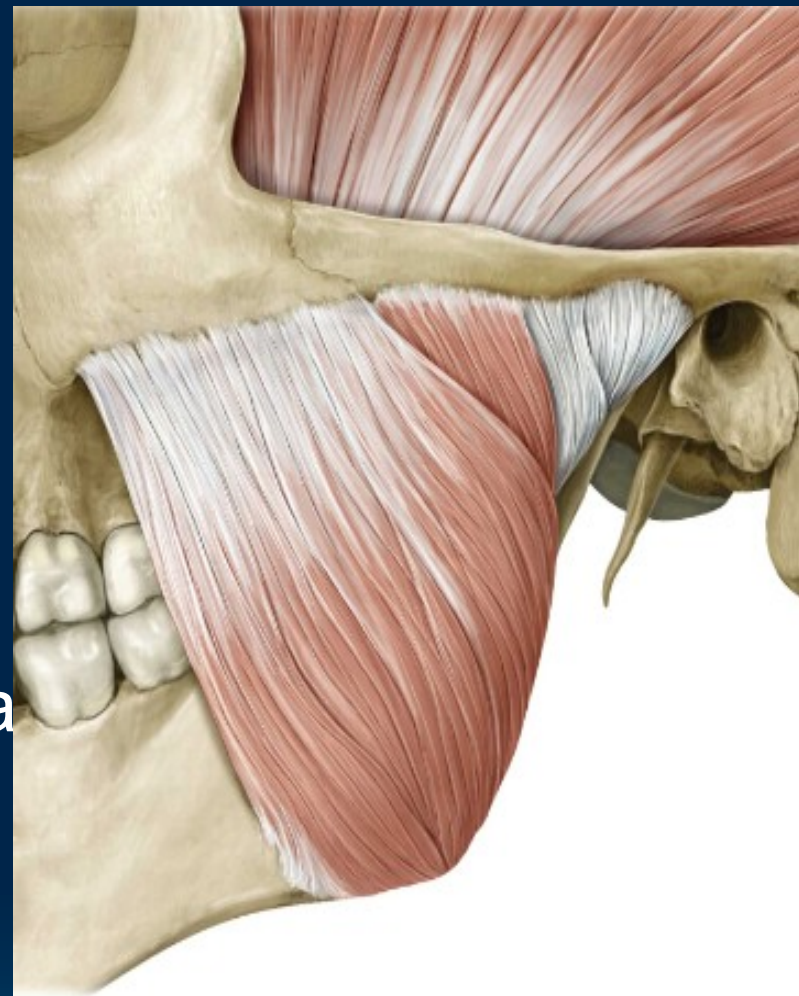
### Origo

the lower edge of the os zygomaticum up to the zygomaticotemporal suture

Fibers pass downward and backward  
– fibers with oblique course

### Insertio

lower  $\frac{1}{2}$  of outer surface of the ramus mandibulae  
up to tuberositas masseterica



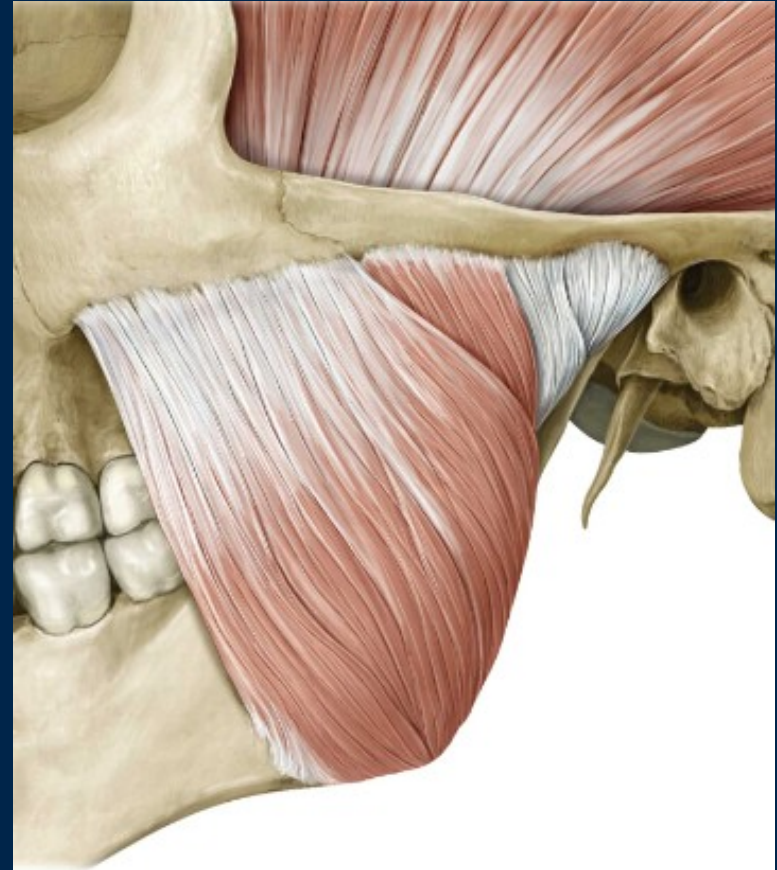
## Pars media

### Origo

lower edge of anterior 2/3 arcus zygomaticus

### Insertio

middle 1/3 of ramus mandibulae





## Pars prof.

Smaller and more muscular in texture

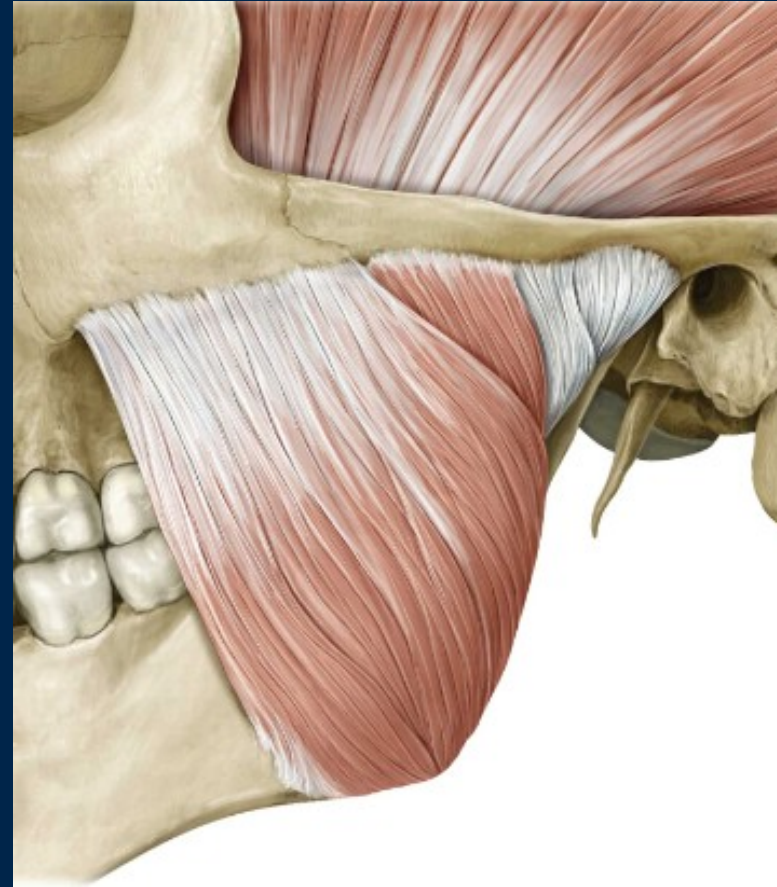
### Origo

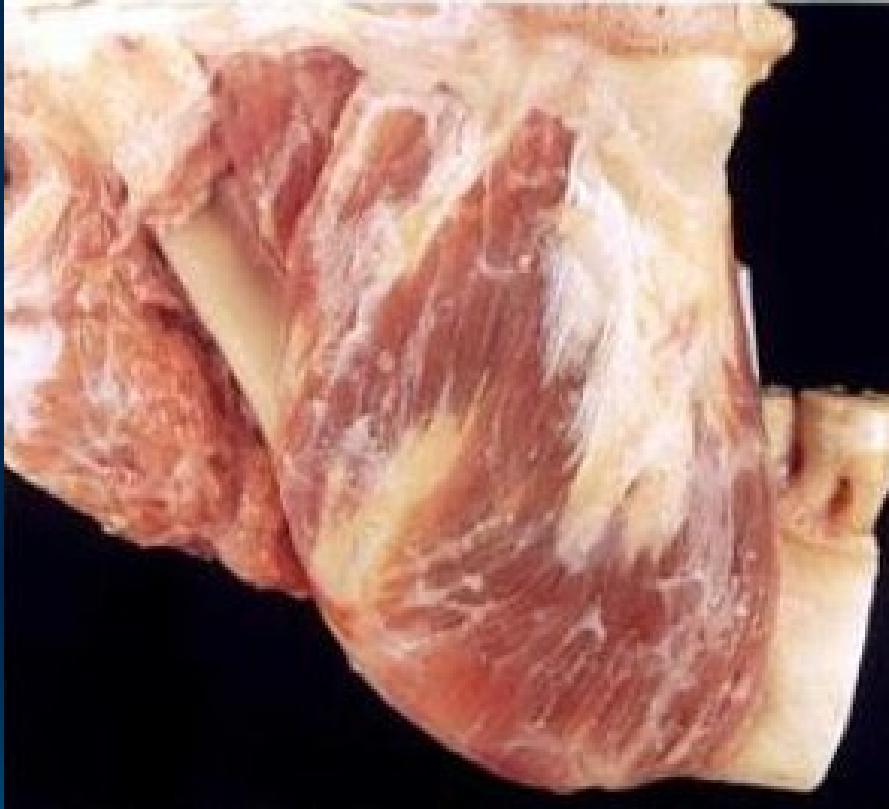
inner side of arcus zygomat.  
deep lamina of temporal fascia

Fibers pass downward – vertically running fibers

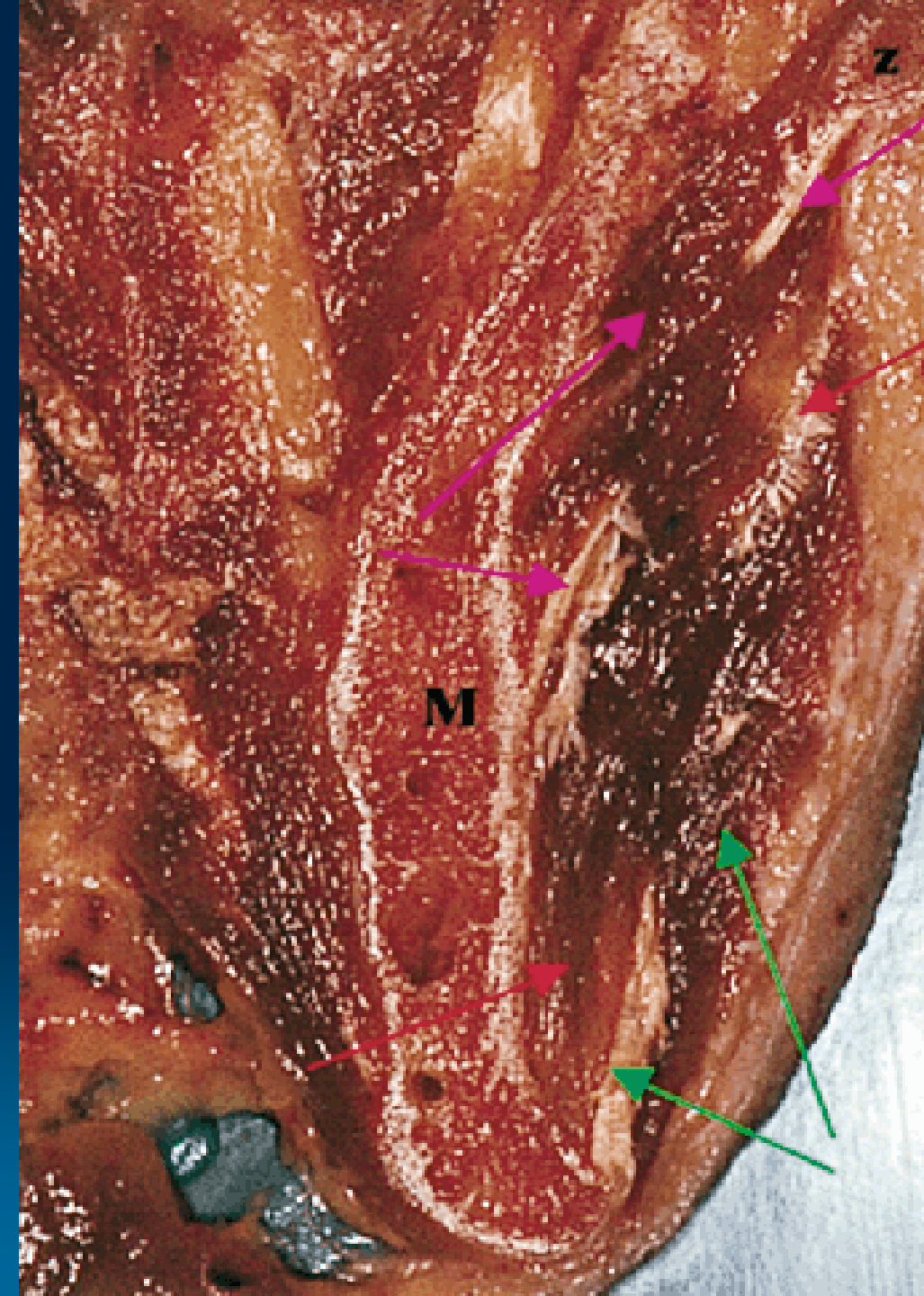
### Insertio

the upper  $\frac{1}{2}$  of the lateral (outer) surface of the ramus mandible





Functional organization of the human masseter muscle  
[www.springerlink.com/index/U007G453650W2163.pdf](http://www.springerlink.com/index/U007G453650W2163.pdf)



## Frontal section

p. superficialis

p. intermedia

p. profunda

# Function

## Bilateral contraction:

*The superficial part:*

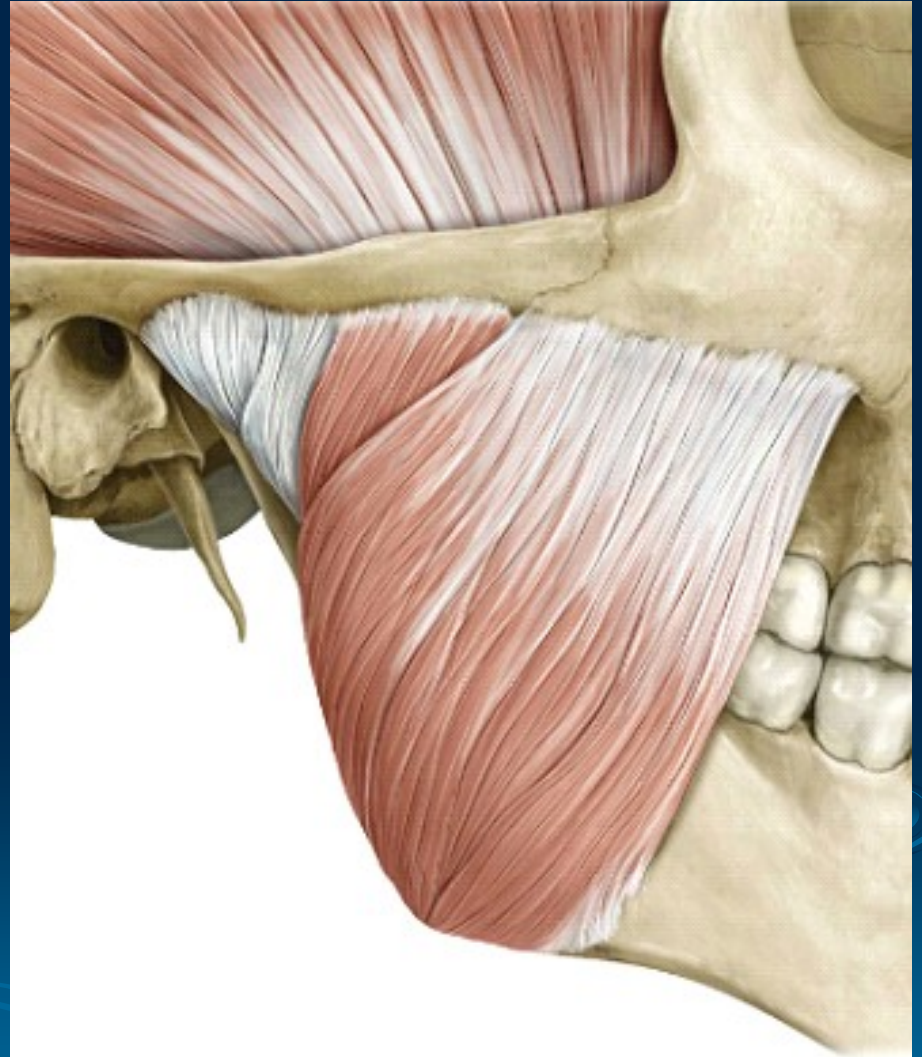
**Elevation** – closes the mouth  
**propulsion**

*The deep portion:*  
**elevation**

## Unilateral contraction:

**lateropulsion**

Pars media et profunda  
works together as one unit



# The Architecture

- The typical pinnate structure
- Zones of muscular and aponeurotic attachments
- The structure allows spreading the infection  
(**submasseteric abscess**)



# The Masseteric Fascia

- Firmly connected with the muscle
- From arcus zygomaticus to basis mandibulae
- Dorsally merge with fascia parotis (fascia parotideomasseterica)
- Caudally connected with basis mandibulae -> fascia colli spf.
- Ventrally attached to the ramus mandibulae

# Palpation

Palpation of the masseter muscle by having patient clench the teeth

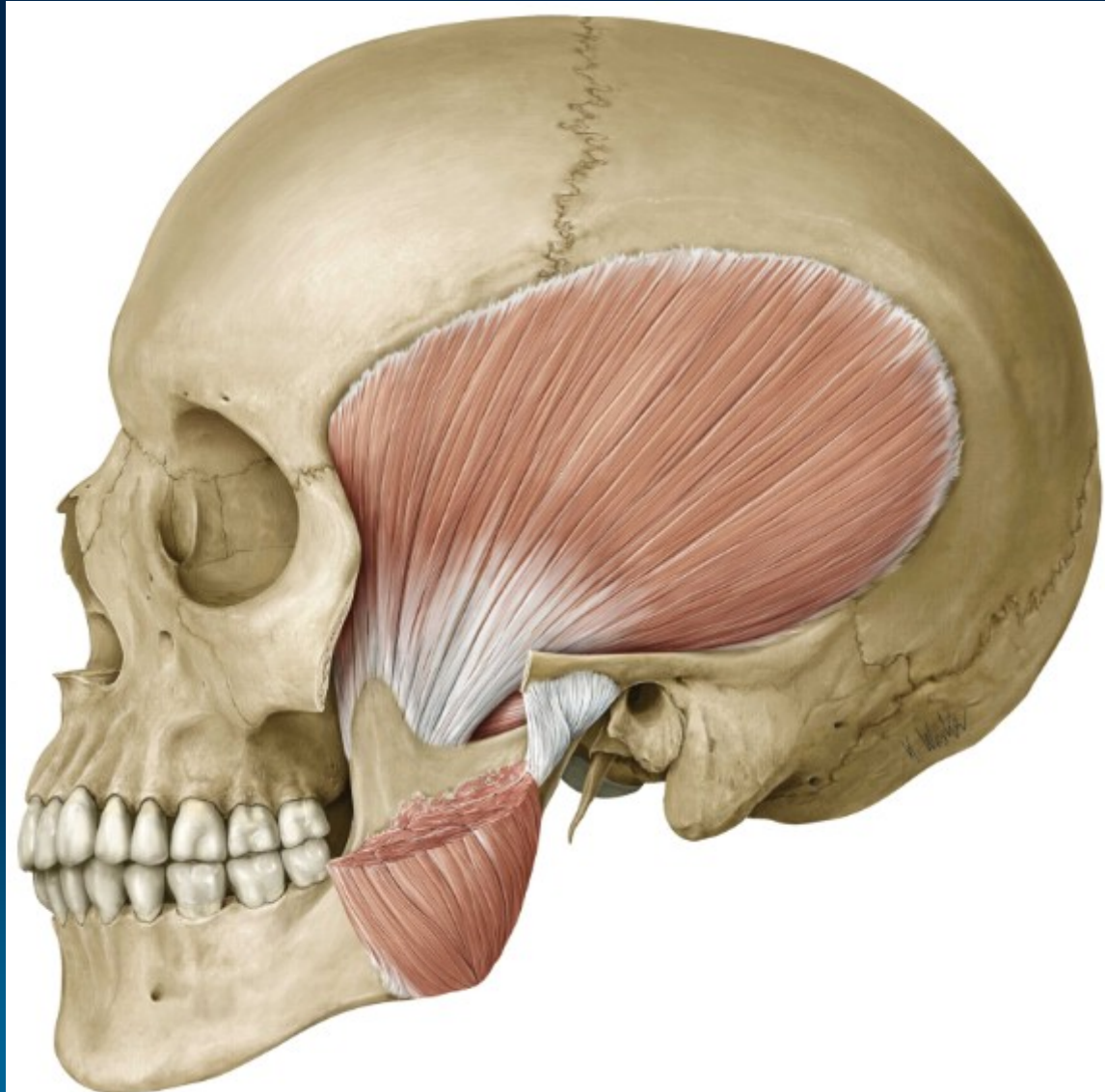


**The Superficial Portion**

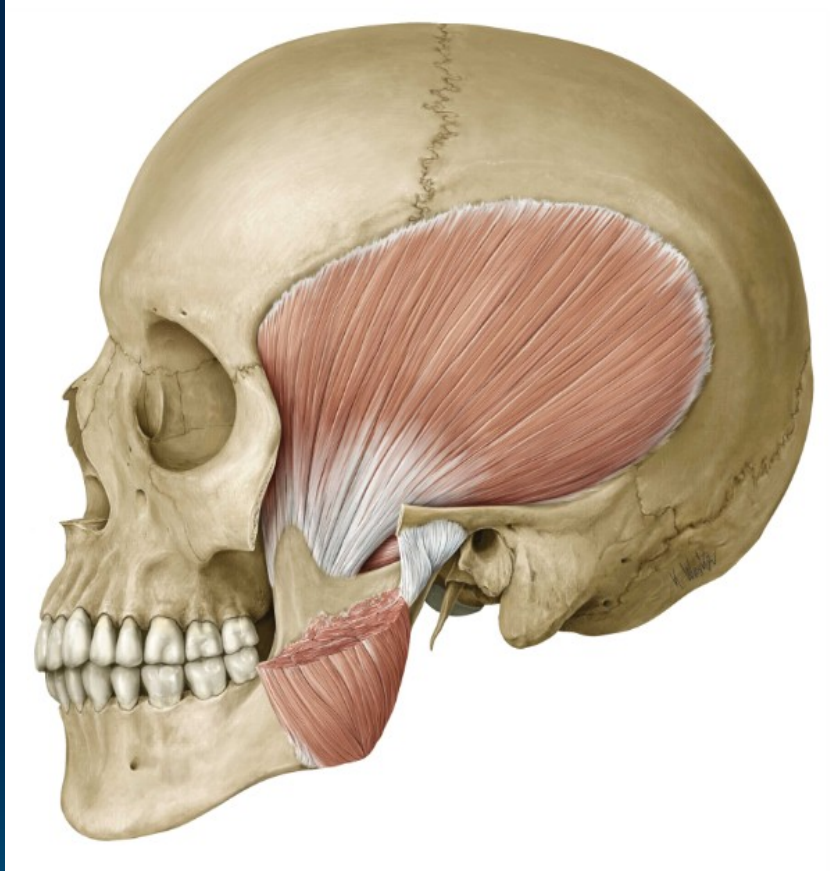


**The Deep Portion**

# Temporalis muscle







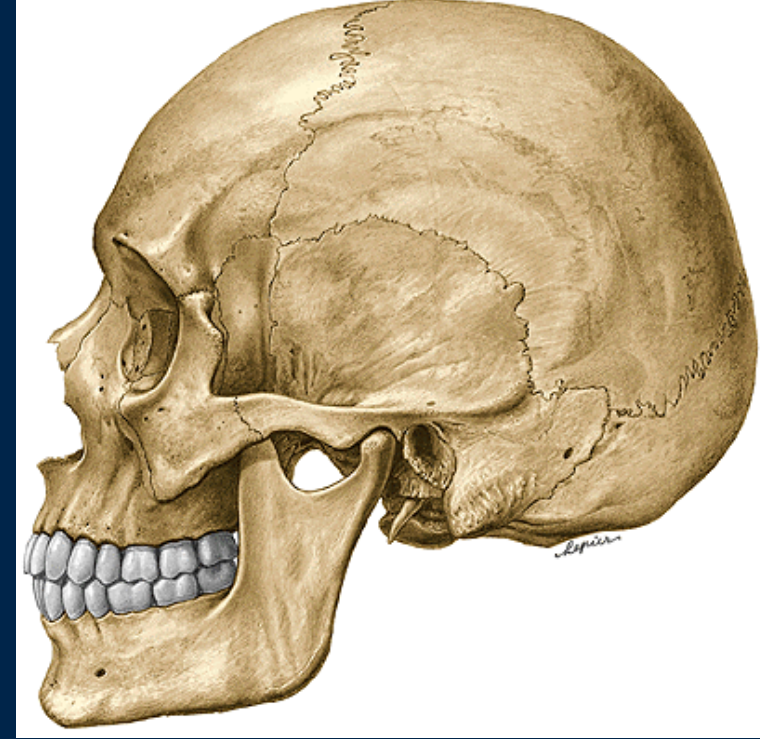
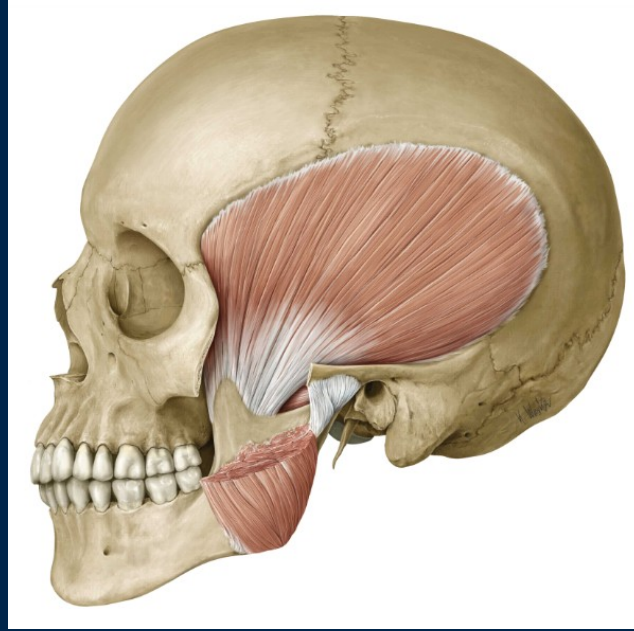
- Lies in fossa temporalis
- Flat muscle
- Broad, fan-shaped, pinnate structure
- Covered by fascia temporalis

- Blood supply.: a. tempor. media (a.tempor.superfic.)  
a. tempor. prof. (a.maxillaris)
- innervation: nn. tempor. prof. (V3)

In the long axis of the muscle, a caudally strengthening **central tendon** (double pinched muscle) is formed.

Therefore, some authors divide muscle into :

- part ventrally from the tendon – pars anterior
- part dorsally from the tendon – pars posterior

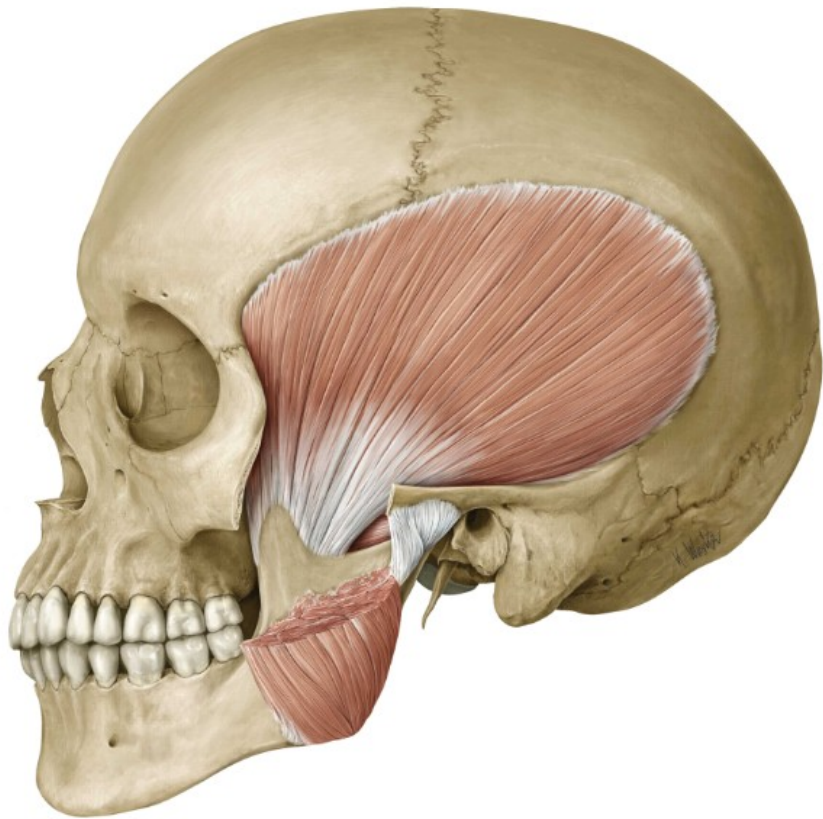


## Origo

- fossa temporalis – planum temporale

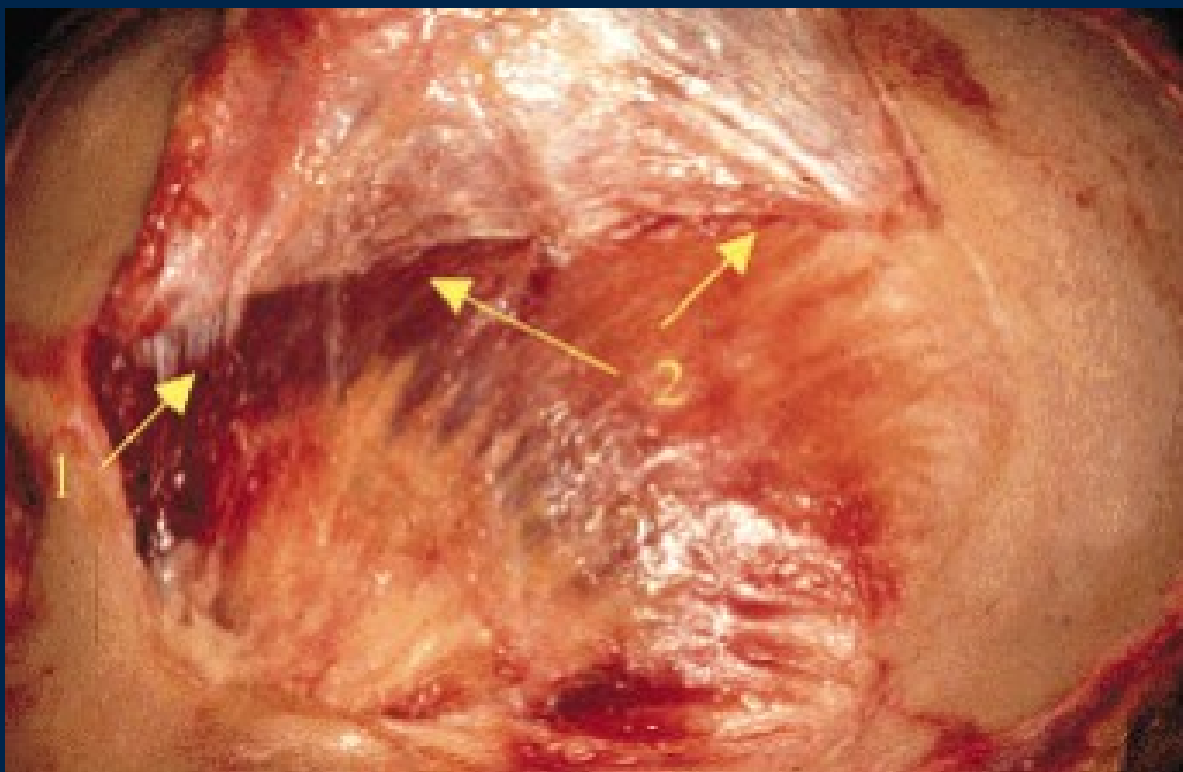
**ANTERIOR PART:** linea temporalis inf. ossis pariet.,  
facies temporalis alae majoris ossis sphen.,  
adjacent part of os frontale and os parietale  
+ inner surface of the deep lamina of the fascia  
temporalis

**POSTERIOR PART:** squama ossis temporalis



**Insertio** - muscle fibers converge caudally into a strong tendon

- tendon on the processus coronoideus
- further converges along the linea obliqua and crista temporalis (up to the trig. retromolare)
- also attached to the lig. pterygomandibulare



**1 - pars ant. (orbitalis)**

**1/3, width approx. 3 cm, dark color, adheres to fascia temporalis**

**2 - pars post. (temp.)**

**2/3, light color, connection with fascia looser**

# Detailed description

The temporalis muscle consists of three parts:

*superficial*

*zygomatic*

*deep portion*

[The human temporalis muscle: Superficial, deep, and zygomatic ...](#)  
[onlinelibrary.wiley.com](#) › ... › [Journal Home](#) › [Vol 22 Issue 6](#)

## *The Superficial Portion*

**Origo:** temporal aponeurosis, temporal line

**Insertion:** the coronoid process of the mandible



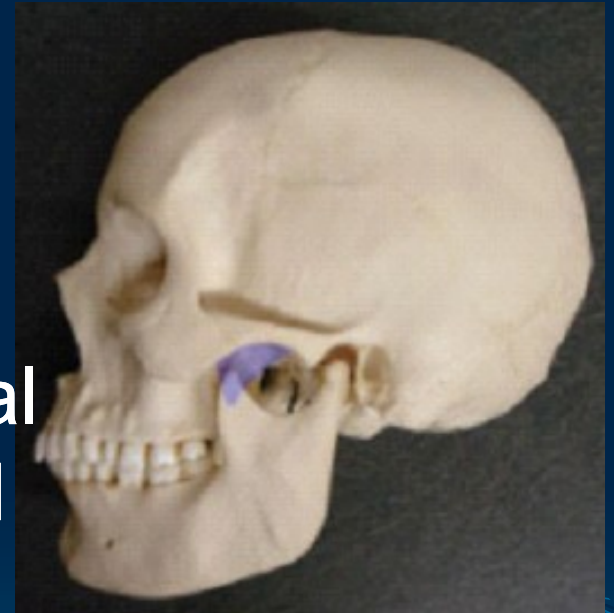
## *The Zygomatic Portion*

**Origo:** superior and medial zygoma and zygomatic arch

**Insertion:** coronoid process

Fuse with tendon of the superficial part of the temporalis muscle and with the deep masseter portion.

Rostrally interdigitated with the portion of the deep temporalis part





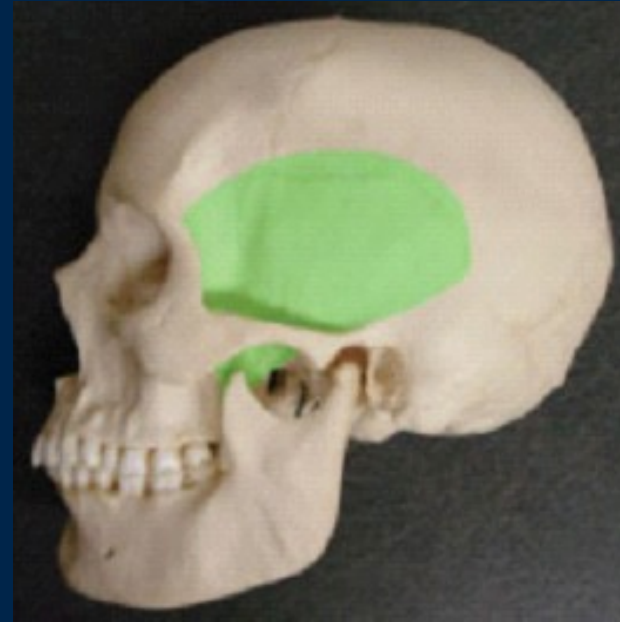
## *The Deep Portion*

**Origo:** bony surface of the frontal, sphenoid, parietal and temporal bones

**Insertion:** coronoid process and the ramus of the mandible, just caudal to the last molar (retromolar triangle)



Fibers from deep part interdigitated with the buccinator and the superior pharyngeal constrictor

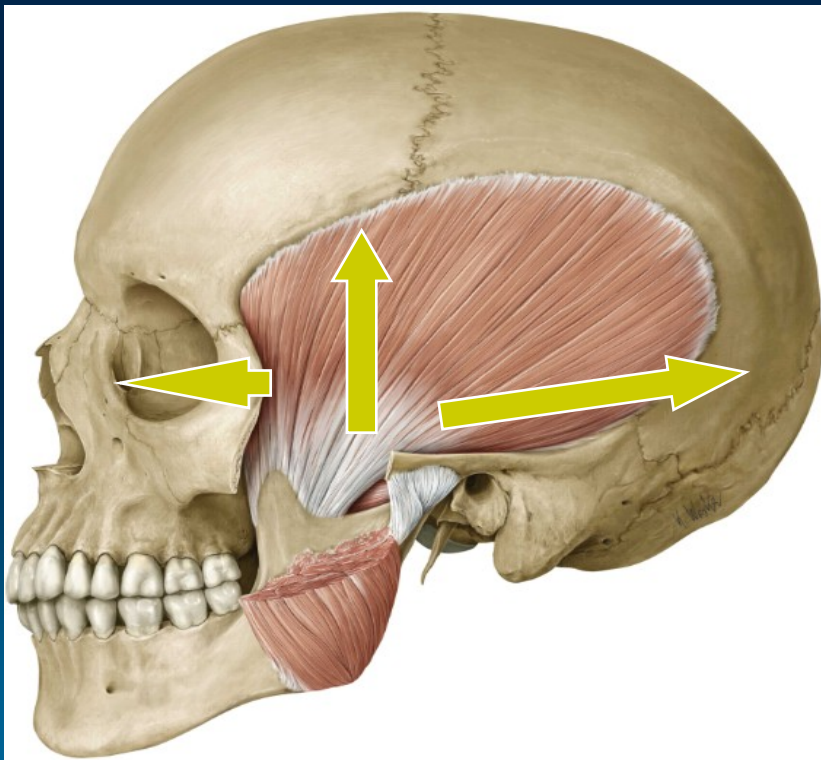


# Function

Contraction **bilateral**:

- ant. and middle fibers = **elevation (propulsion)**
- Posterior fibers = **retropulsion** (horizontally running fibres pull the mandible dorsally)

Contraction **unilateral**: **kontralateral lateropulsion**



Maintains the middle position of TMJ

# The Temporal Fascia

Covers the temporal muscle

**Origo:** superior temporal line

**Insertion:** zygomatic arch

Has two layers:

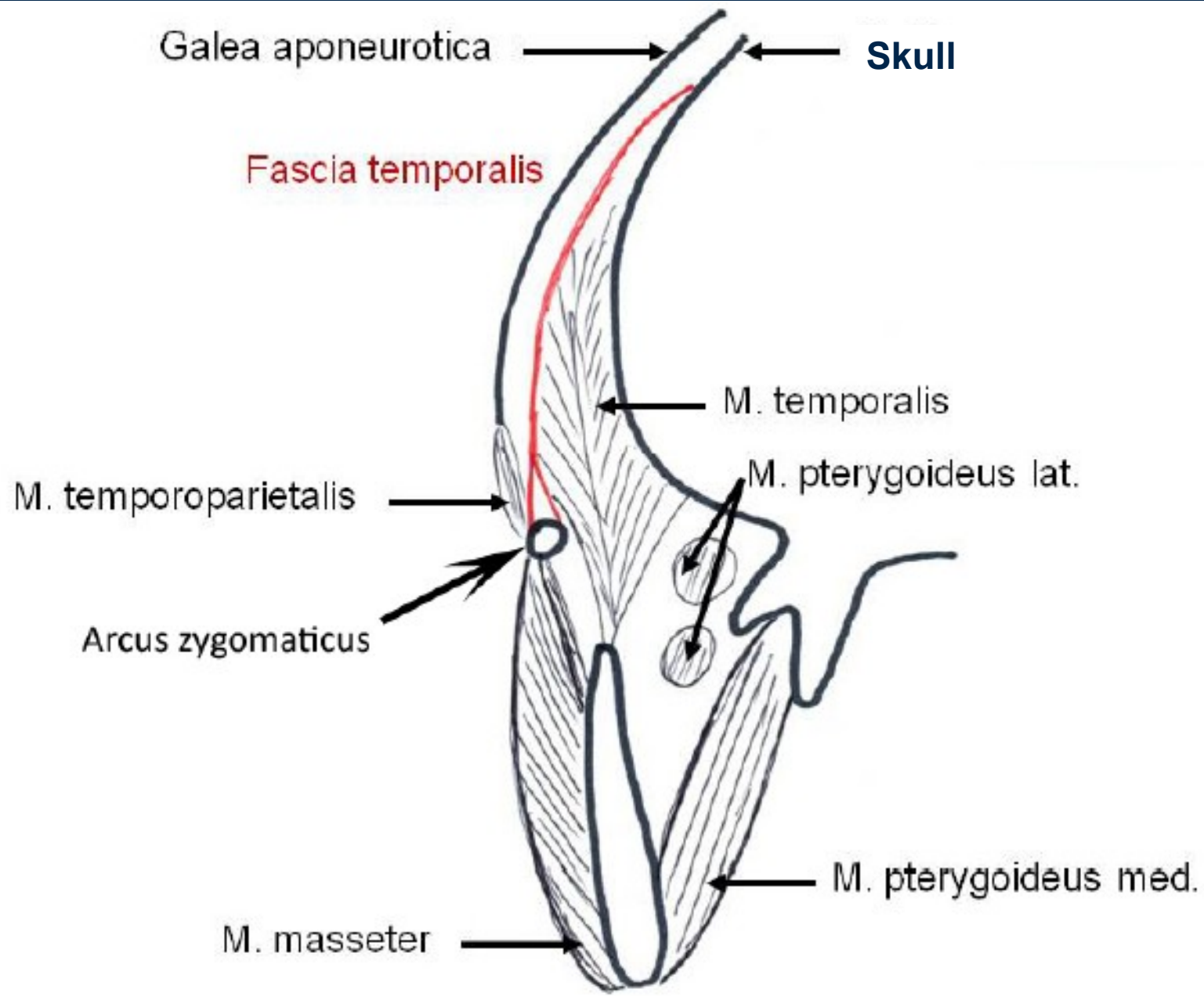
1. superficial

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



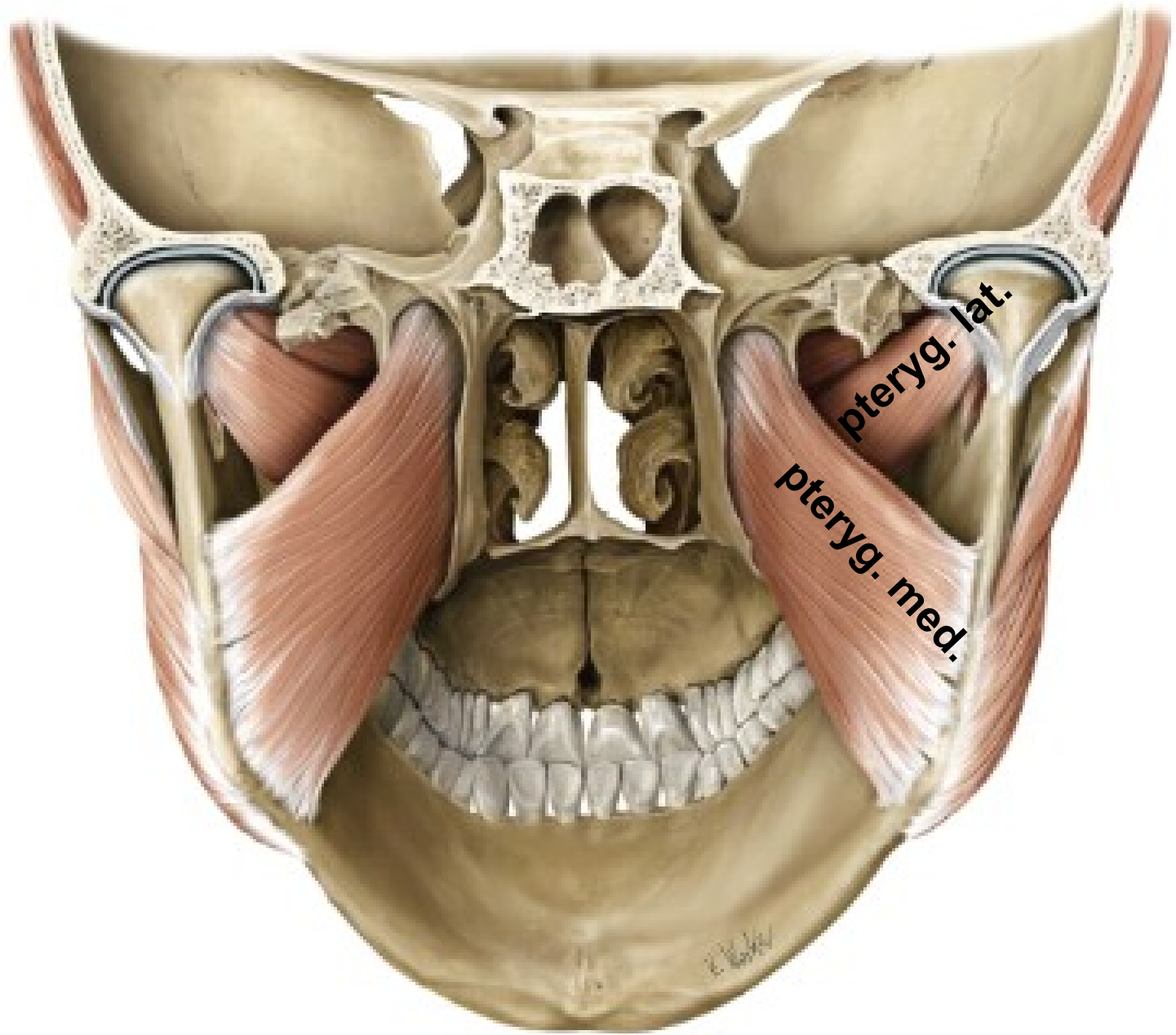
# Palpation



**The Anterior Part**



**The Posterior Part**

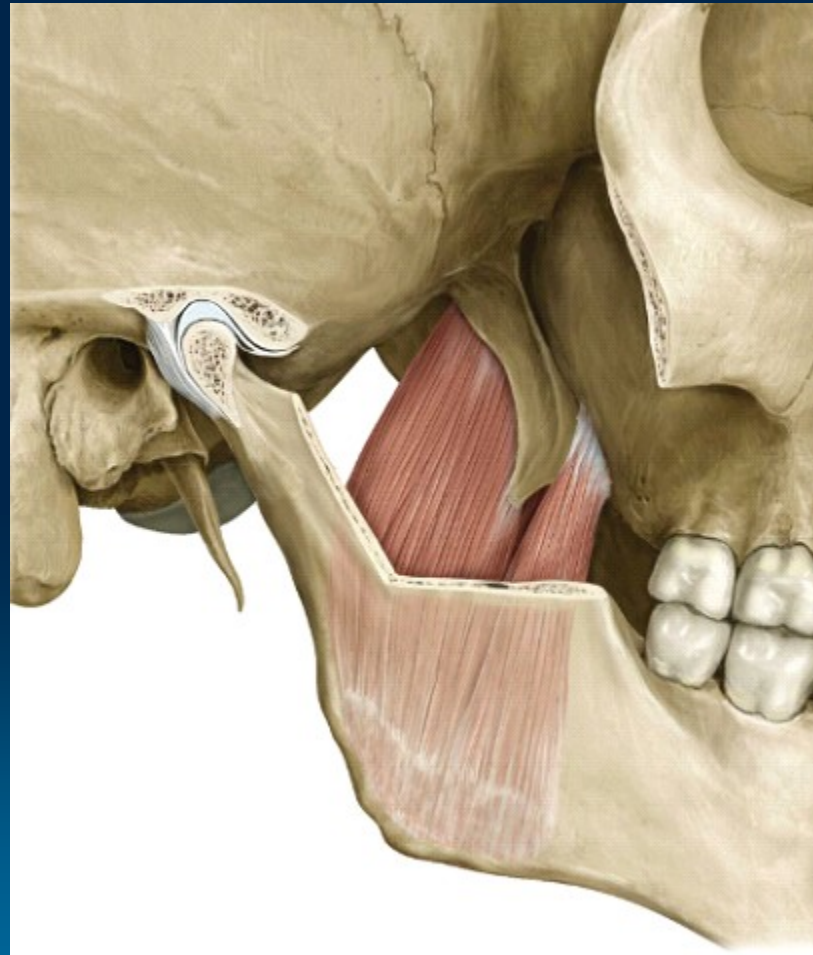


pteryg. lat.

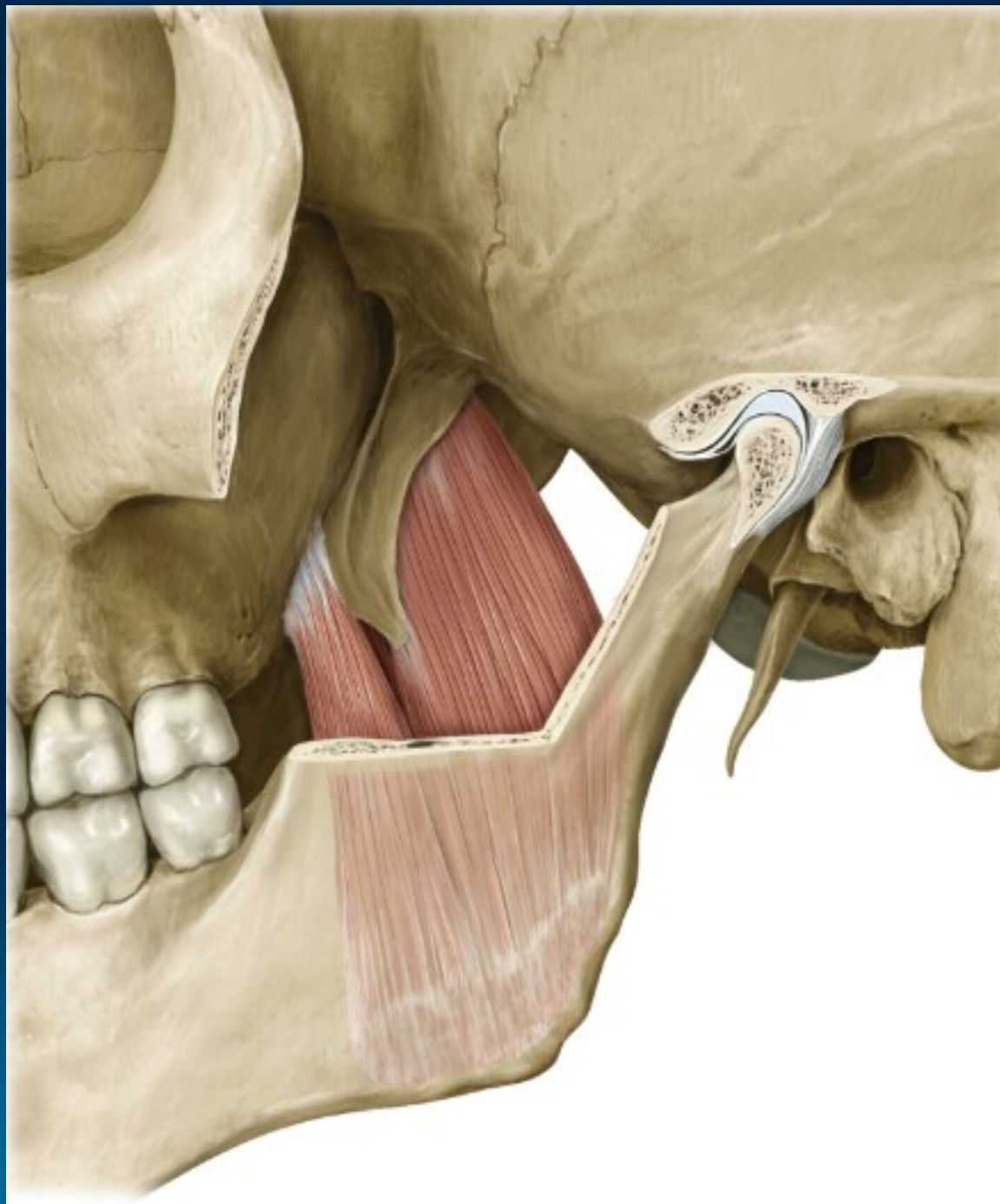
pteryg. med.



# Medial (Internal) Pterygoid Muscle

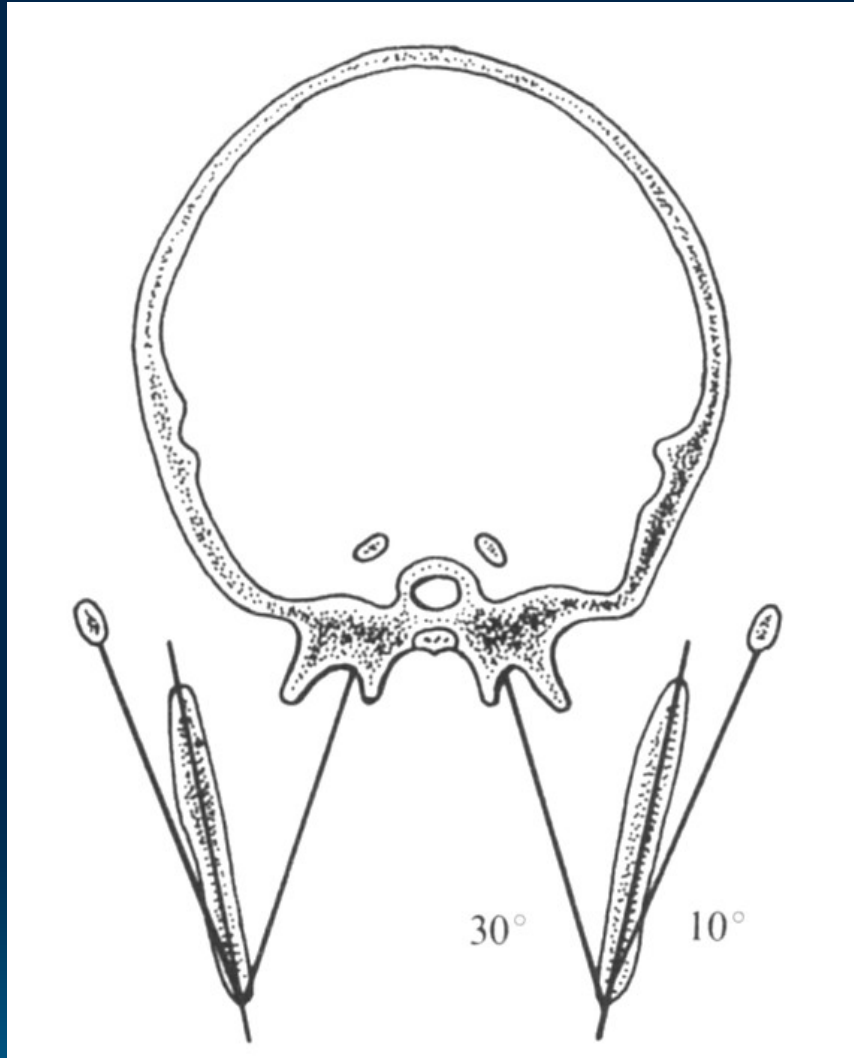






## **M. pterygoideus med.**

- Internal wing muscle
- Strong flattened muscle
- quadrilateral
- Located in the infratemporal fossa
- Two parts (medial and lateral)
- Innervation: n. pteryg. med. (V3)



It is similar to the masseter on the inside of the ramus mandibulae

Some muscle fibres in area of angulus mandibulae could be connected with m. masseter – then create a loop around angulus mandibulae

## Caput lat.

smaller

**Origo:** tuber maxillae

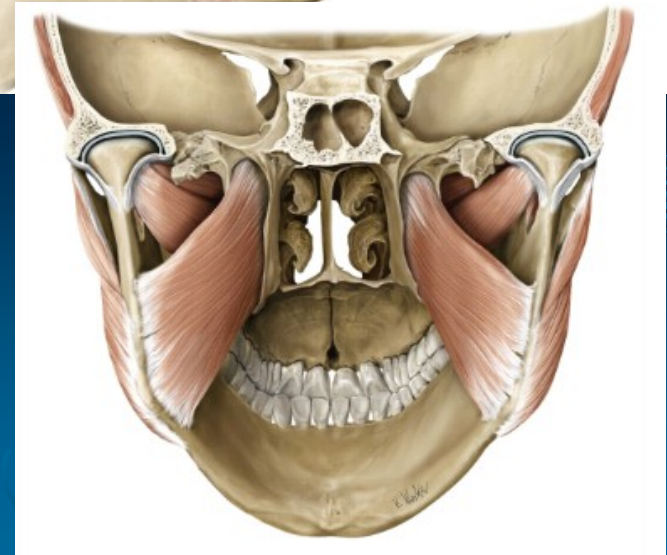
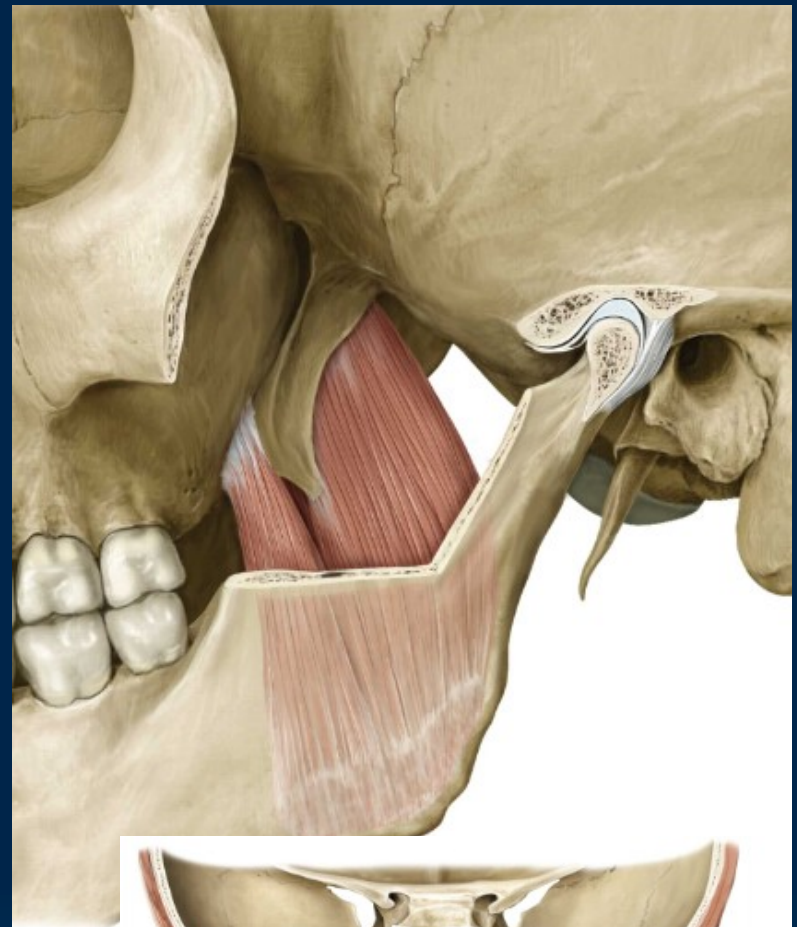
## Caput med.

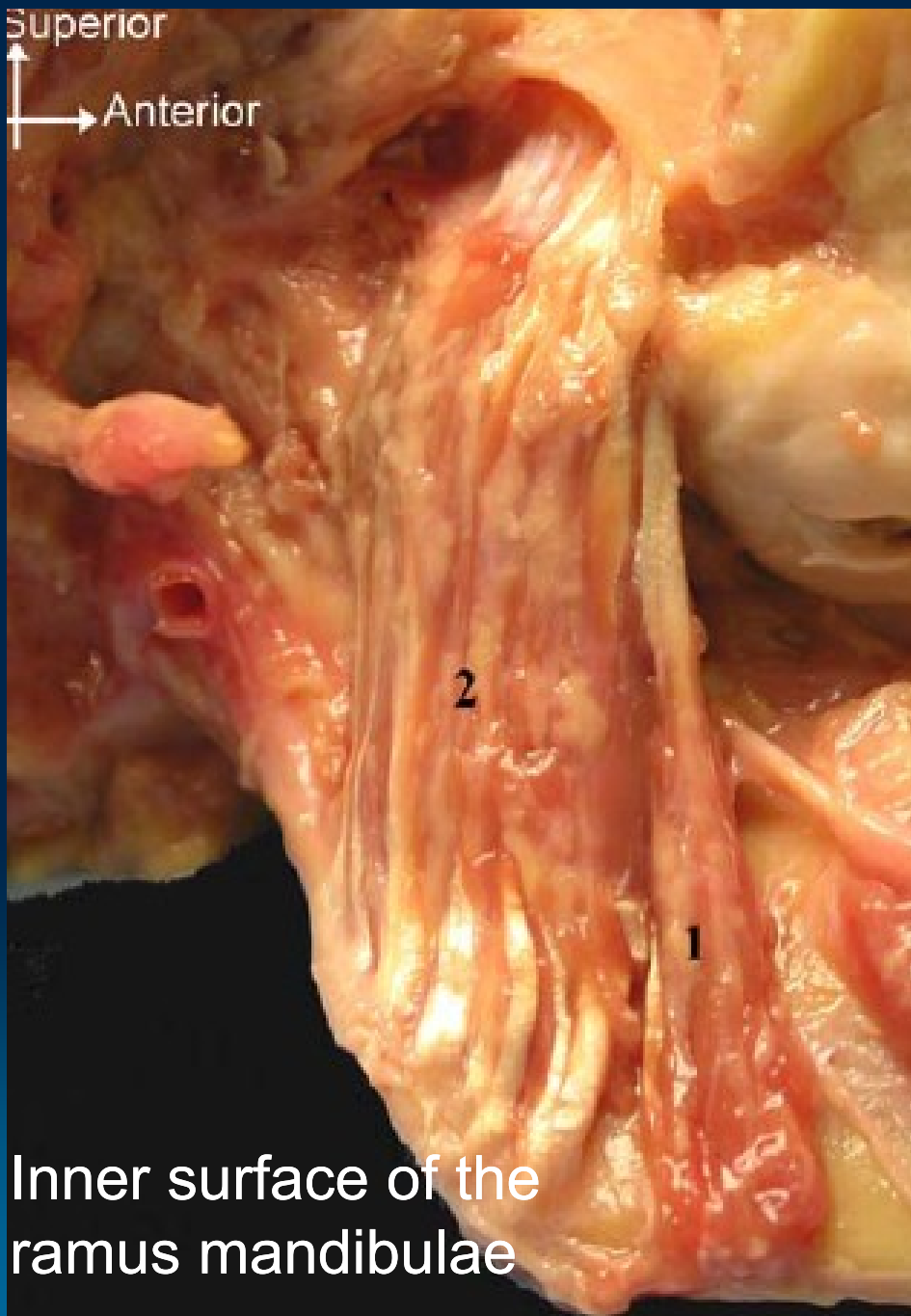
bigger

**Origo:** fossa pterygoidea, from the med. surface of lamina later. proc. pteryg., proc. pyramidalis ossis palatini

**Course of fibers:** caudally, dorsally, later.

**Insertio:** tuberositas pterygoidea on med. side of angulus mandib., part of ramus mandib. above tuberosity





Inner surface of the  
ramus mandibulae

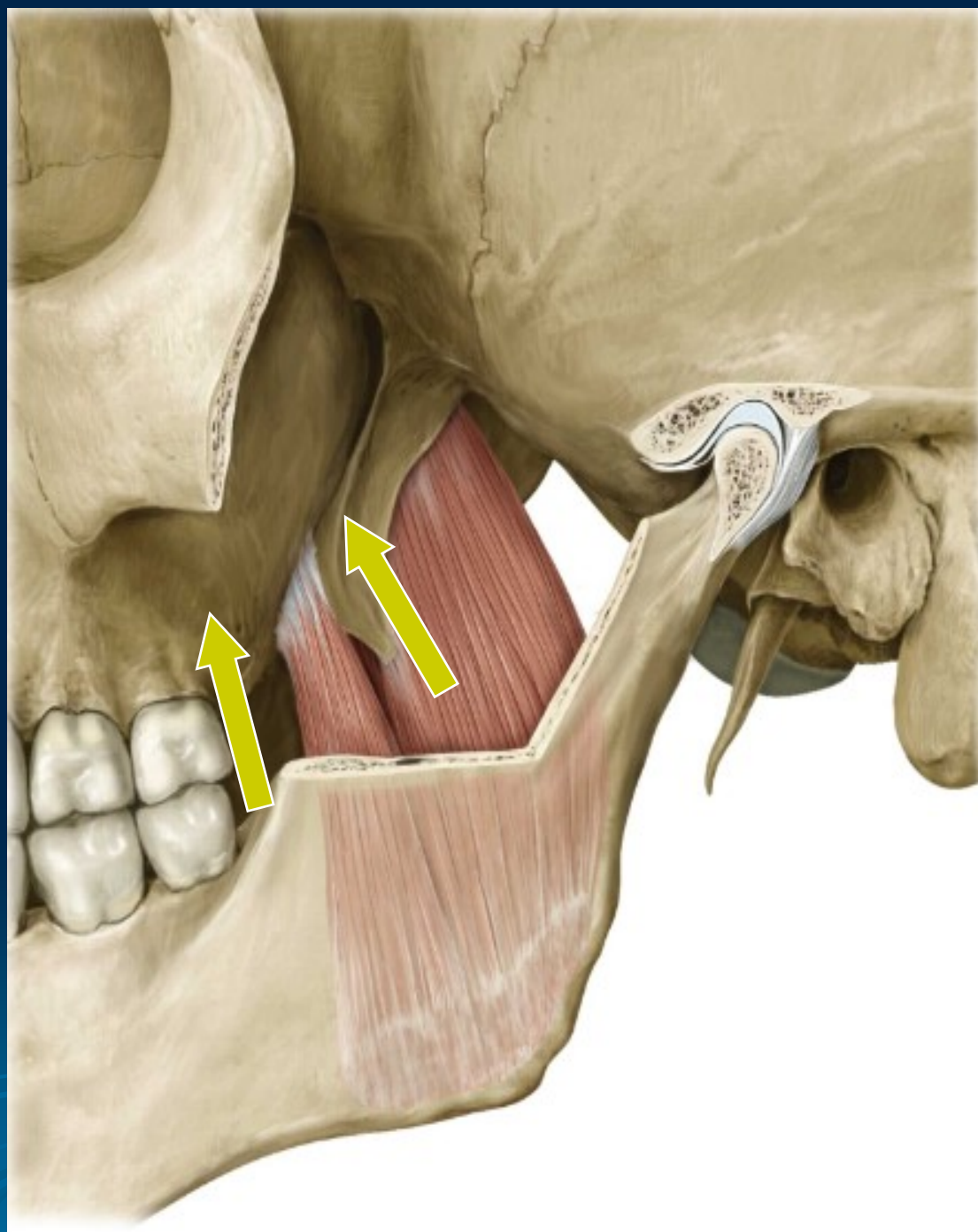
- 1 - lateral part
- 2 - medial part

# Funktion

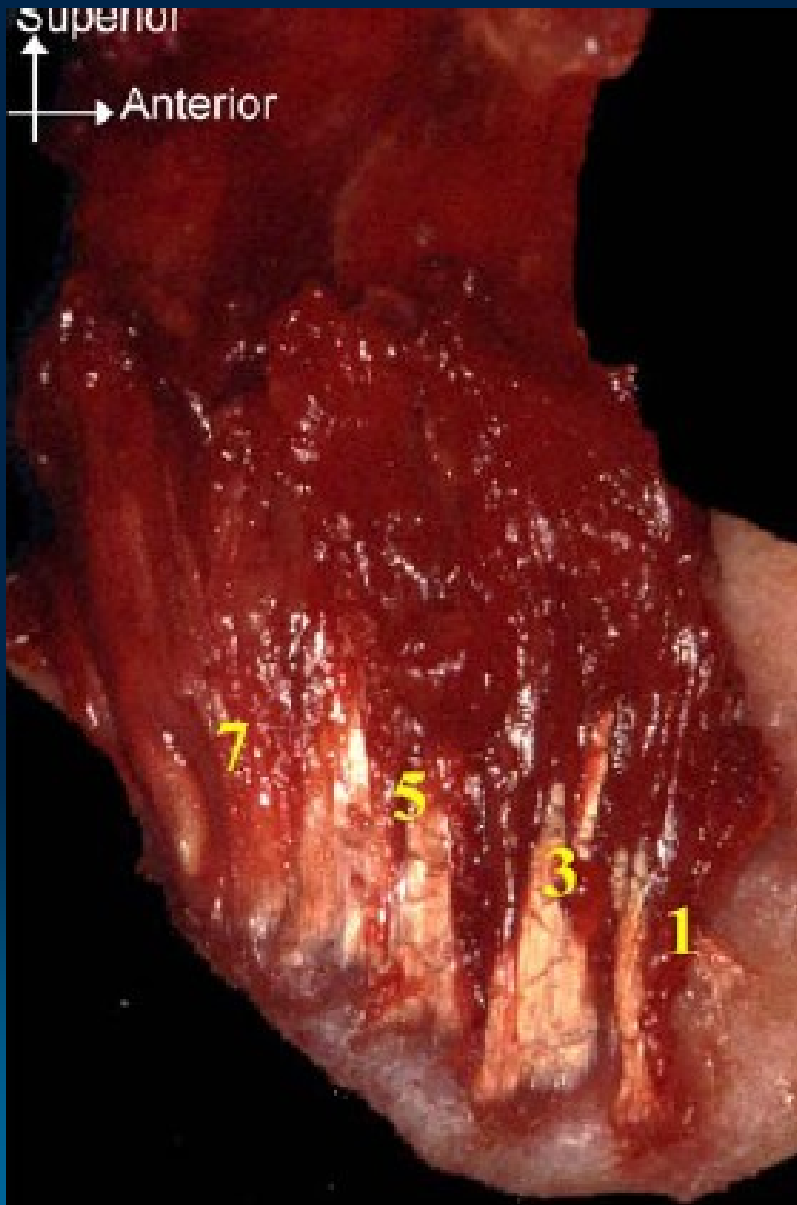
Bilateral contraction:  
**elevation**  
**propulsion**

Unilateral contraction  
**kontralateral**  
**lateropulsion**

The beginning of the muscle is closer to the midline than the attachment, so in a one-sided contraction it pulls the mandible to the opposite side; plays a major role in frictional chewing movements



# The Architecture



7 musculo-aponeurotic layers are making up a penniform structure



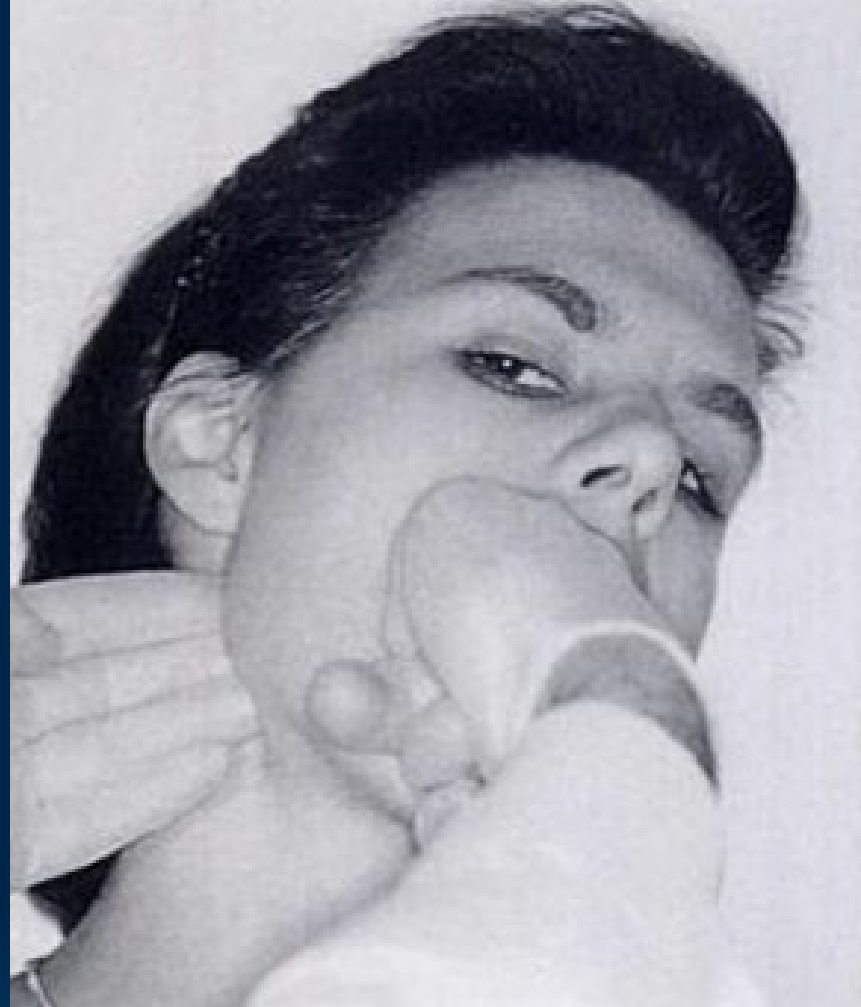
# Palpation

**Difficult**

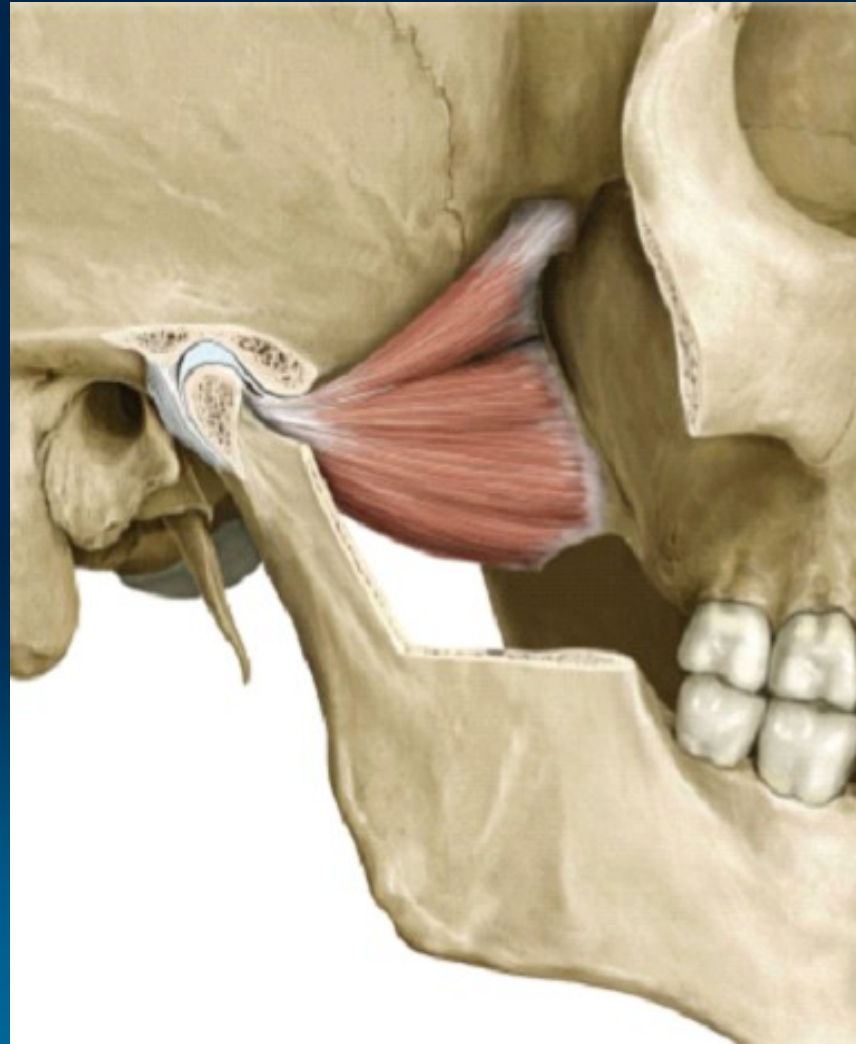
**It is performed simultaneously intra and extraorally:**

**Intraorally: at the site of application of seductive anesthesia and laterally**

**Extraorally: med. From lower edge of ramus mandibulae**

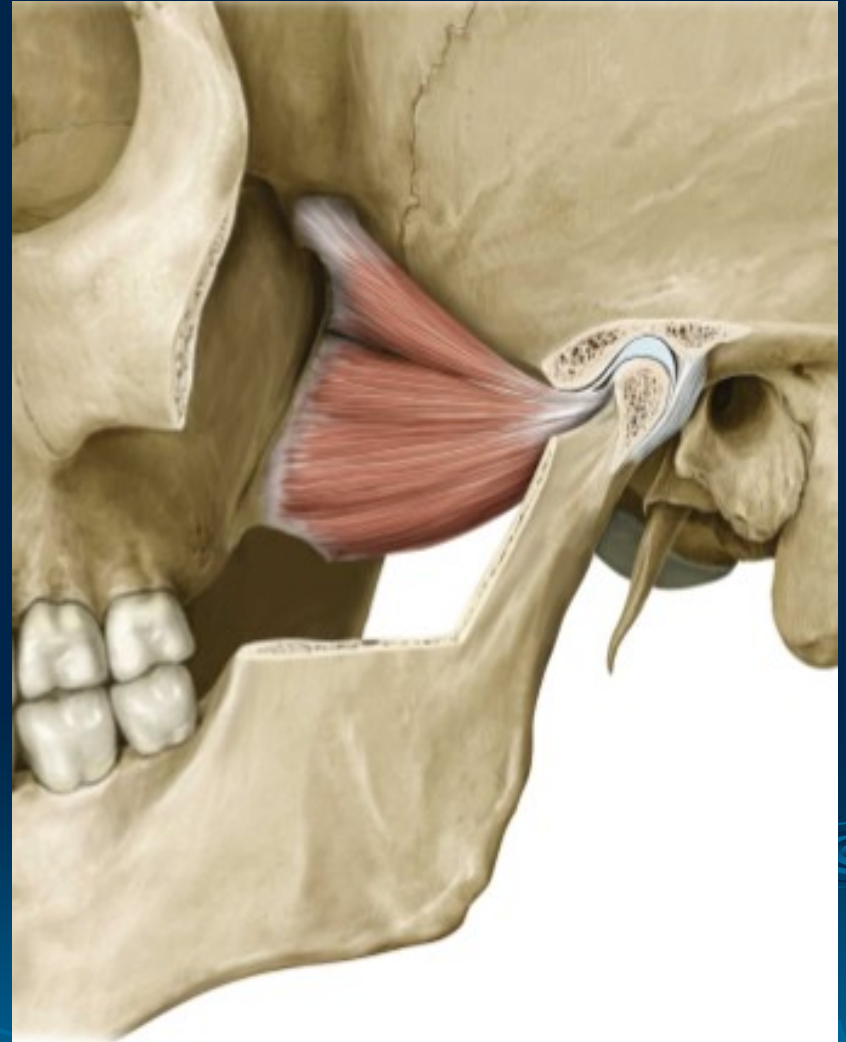


# Lateral (External) Pterygoid Muscle





- Short, thick muscle, conical in form
- Located in upper part of infratemporal fossa, deep to the temporalis muscle
- Innervation: n. pteryg. lat. (V3)
- Two separate heads of origin, they fuse posteriorly



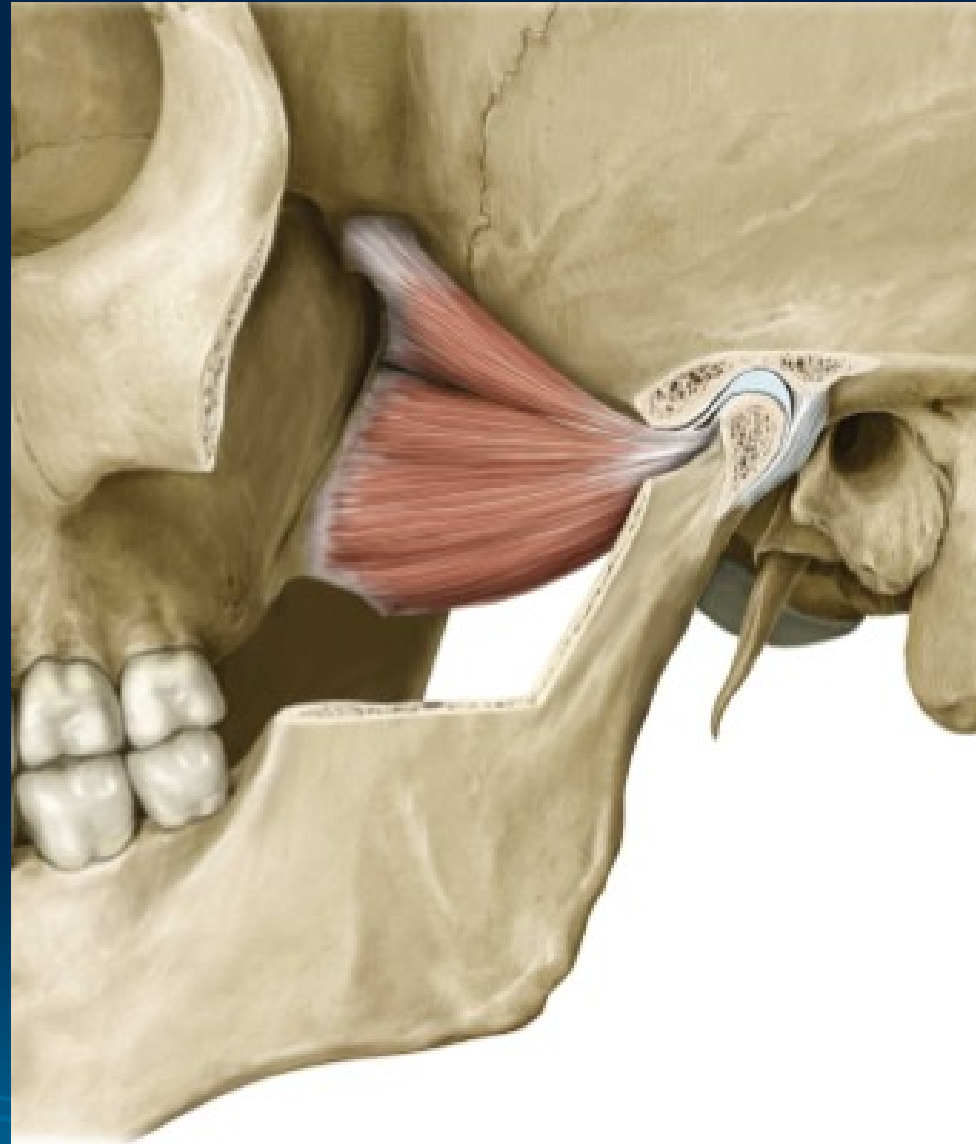
## **Origo:**

### **caput sup.**

crista infratempor. alae  
maj. ossis sphenoidalis

### **caput inf.**

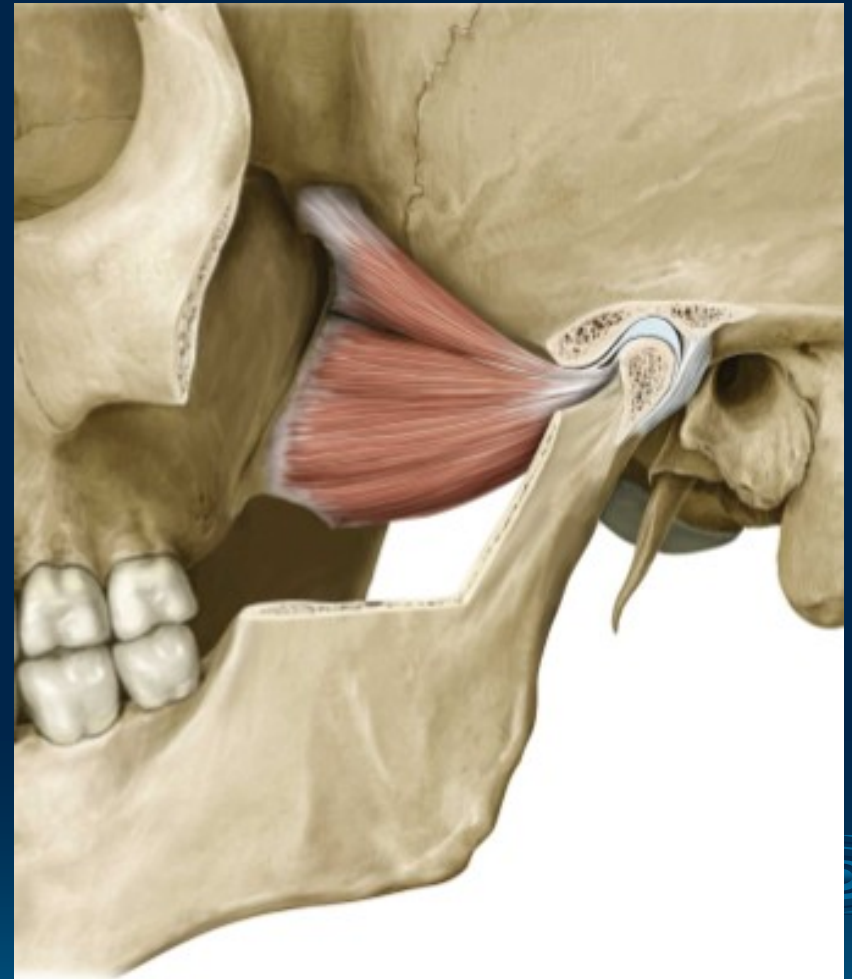
lower  $\frac{3}{4}$  of lat. surface  
lamina lat. pr. pterygoidei



Fibres pass horizontally backward and laterally

**Insertion:**

- **fovea pterygoidea**  
(depression in front of the neck of the condyle)
- **joint capsule and articular disc** of the TMJ (front margin)



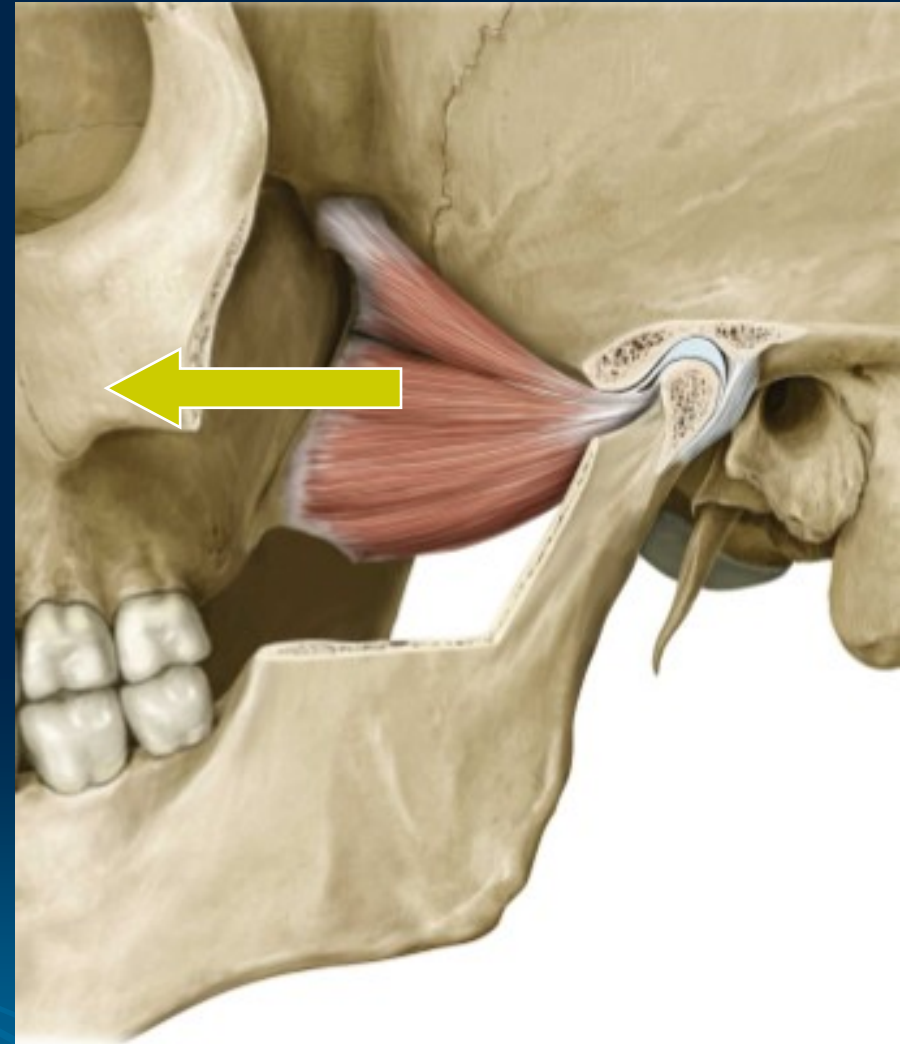
# Function

**Bilateral contraction:**  
**protraction**, *brings the lower jaw forward*

**Depression**, *opening of the jaw*

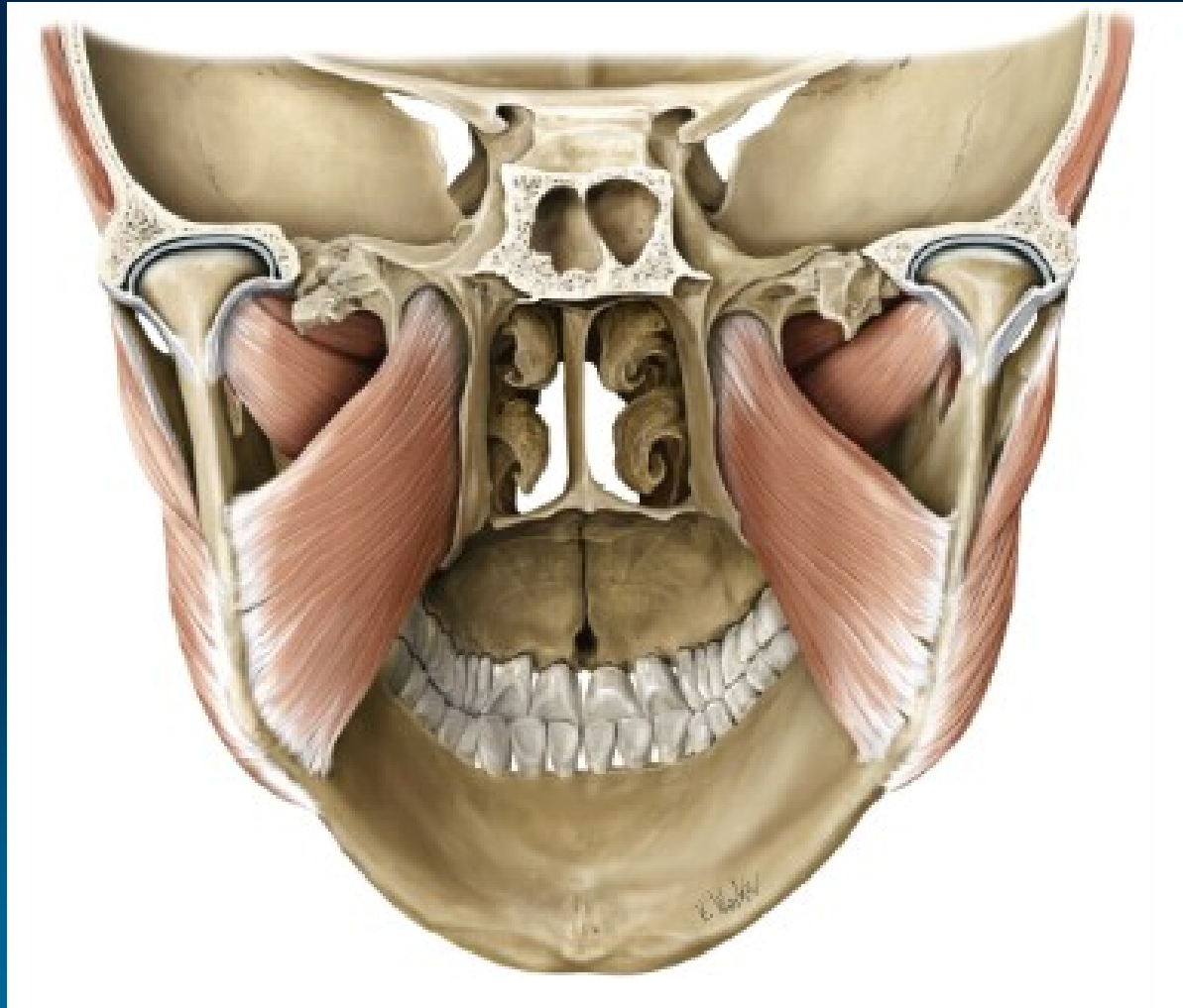
- tightens the disc and the front part of the joint capsule -  
**prevents it from closing!**

**Unilateral contraction:**  
**lateropulsion**, *it pulls the jaw to the contralateral side*



# Palpation

**This muscle is inaccessible to intraoral palpation**



# The Interpterygoid Fascia

Between the medial and lateral pterygoid muscles

Origo: the base of the skull

Insertion: inner surface of the mandible

The border is reinforced by sphenomandibular ligament

Contain nerves and vessels

Allow spread of infection

From the functional viewpoint, some of suprahyoid muscles pull the mandible caudally and cause the mandibular depression (mouth opening) – **m.mylohyoideus, venter ant. m. digastrici** – and form the masticatory muscles. They both start on corpus mandibulae and are innervated by *n.mylohyoideus (V3)*

## References:

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