MSS Module

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Scalp and Muscles of the Face

Muscles of Face and Scalp

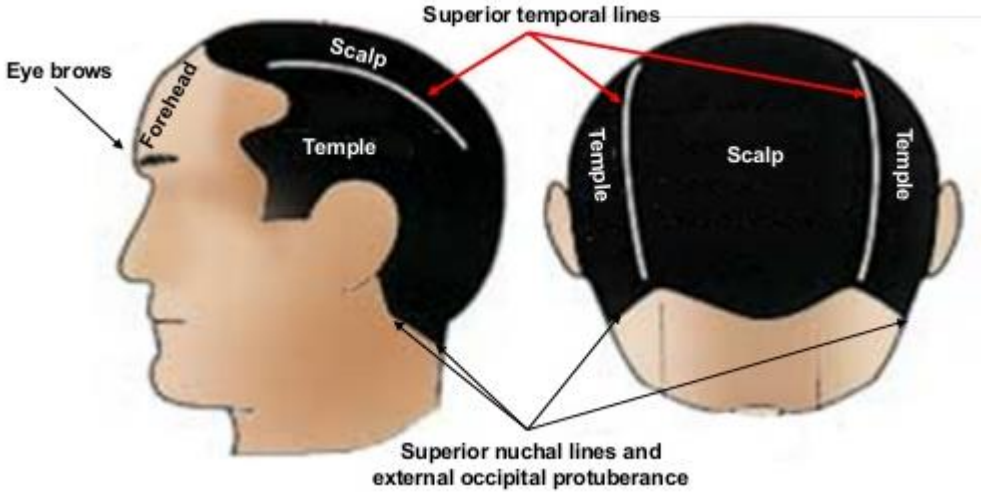
- ***By the end of this session, you should be able to:***

1. Identify and recognize the different layers of the scalp.
2. Relate them to relevant clinical scenarios
3. Know the main muscles of the face

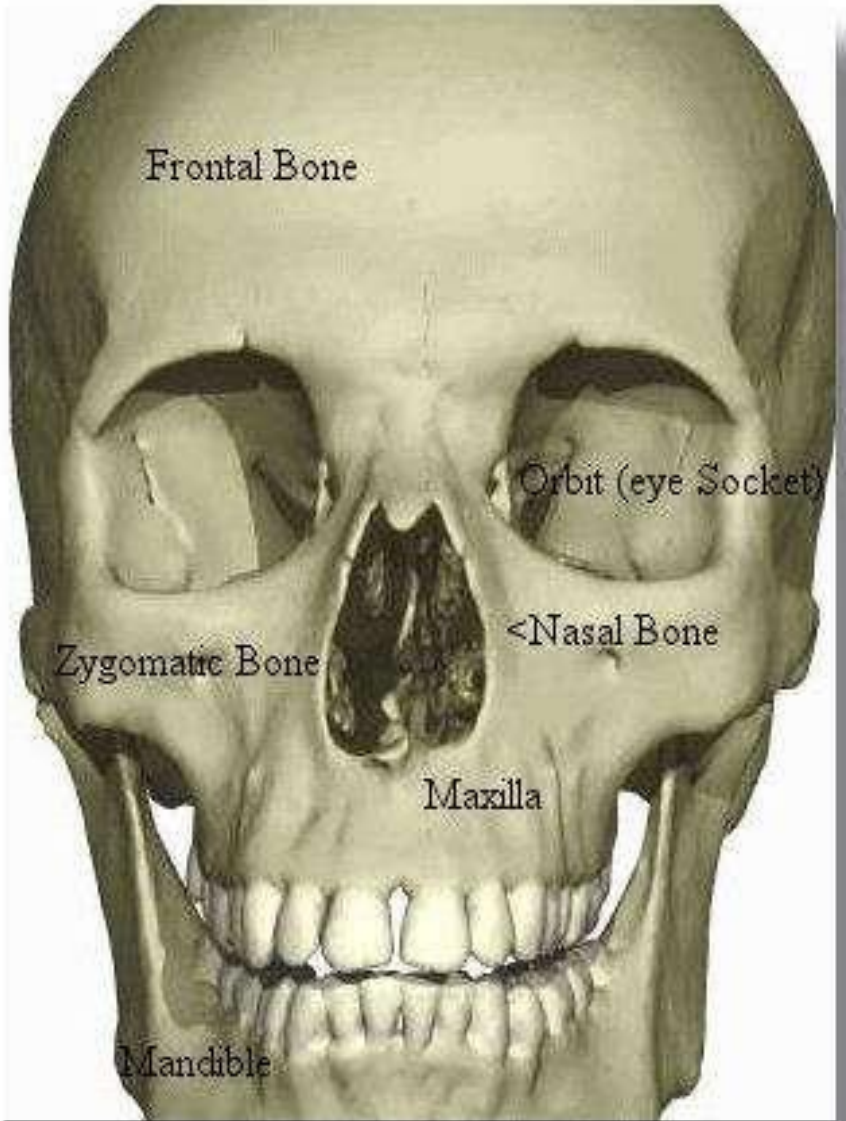
The Scalp

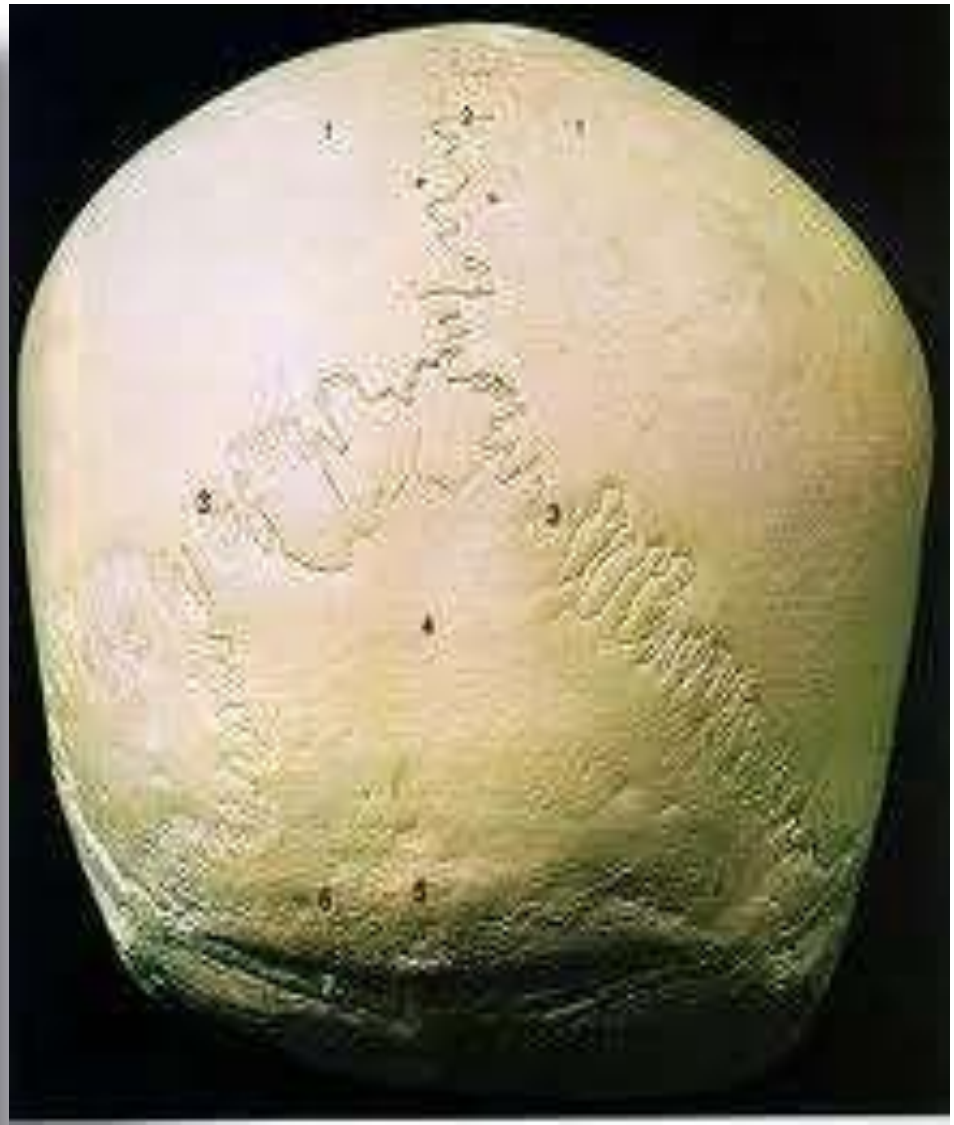
- The scalp is the part of the head that extends from the ***Supraciliary*** arches anteriorly to the ***External Occipital protuberance and Superior Nuchal Lines*** posteriorly.

- Laterally it continues inferiorly to the ***Zygomatic Arch.***



The Scalp


Frontal Bone
Orbit (eye Socket)
Nasal Bone
Zygomatic Bone
Maxilla
Mandible

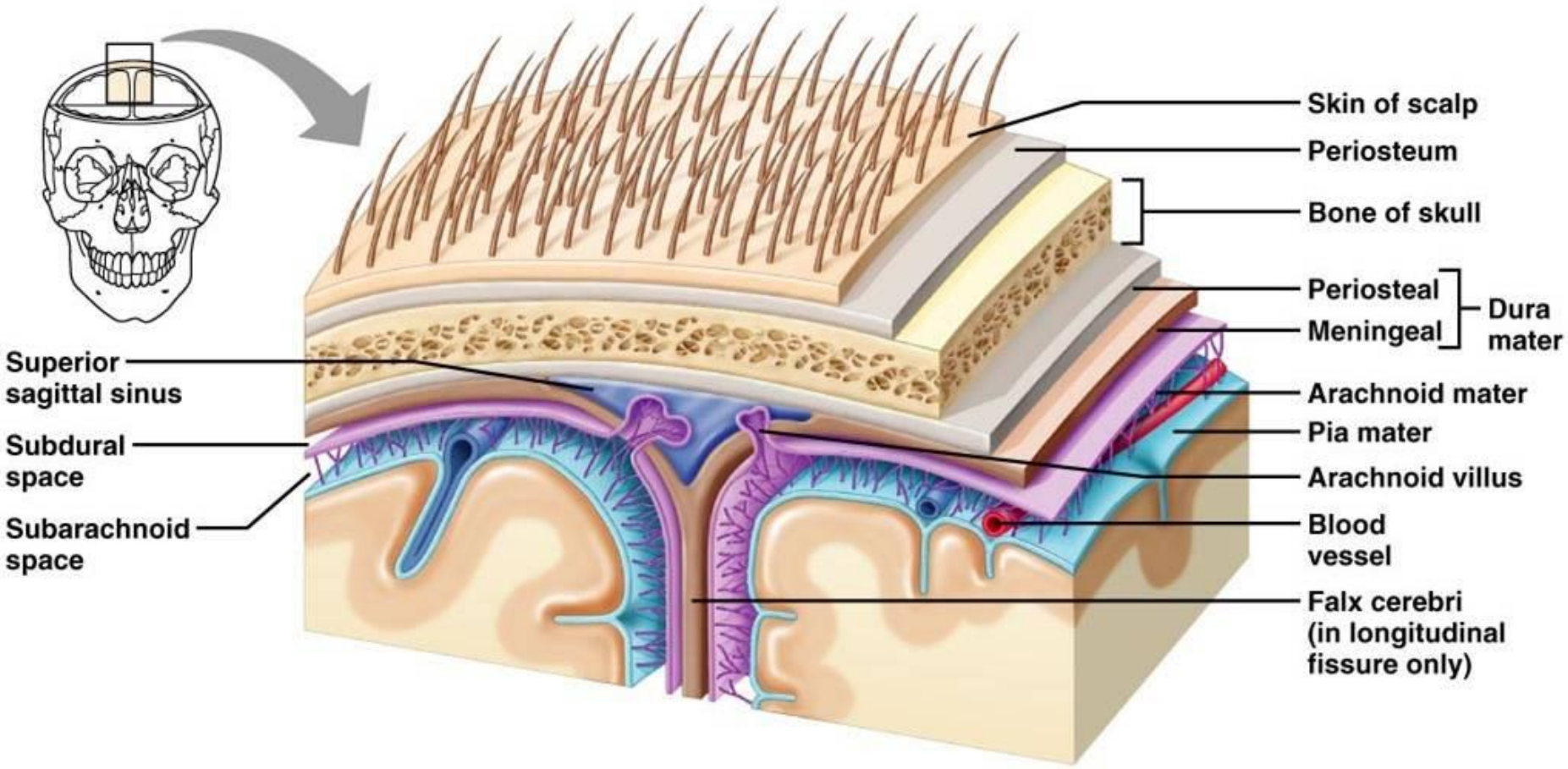


The Scalp

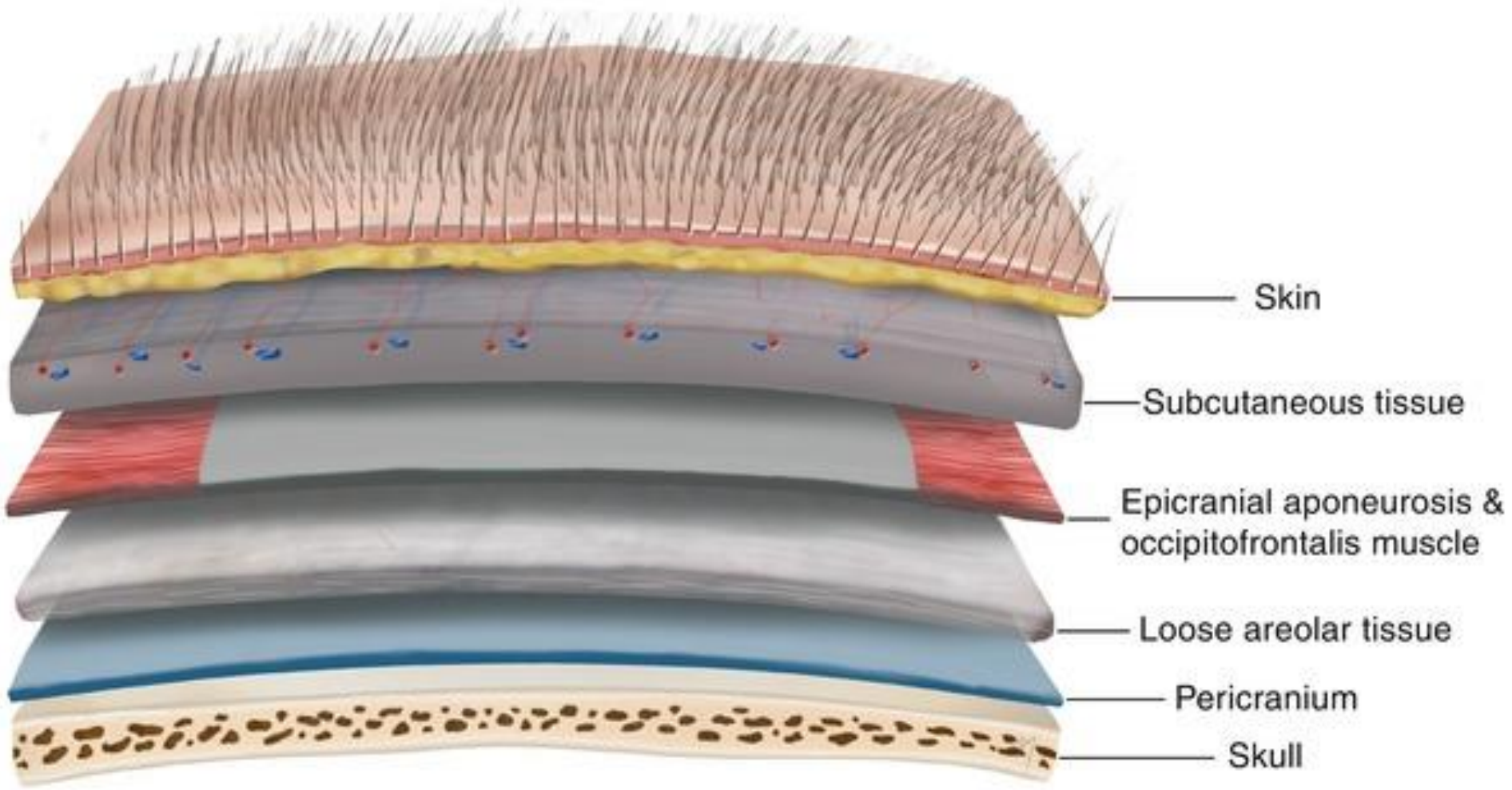
- **The scalp is a multilayered structure with layers that can be defined by the word itself:**

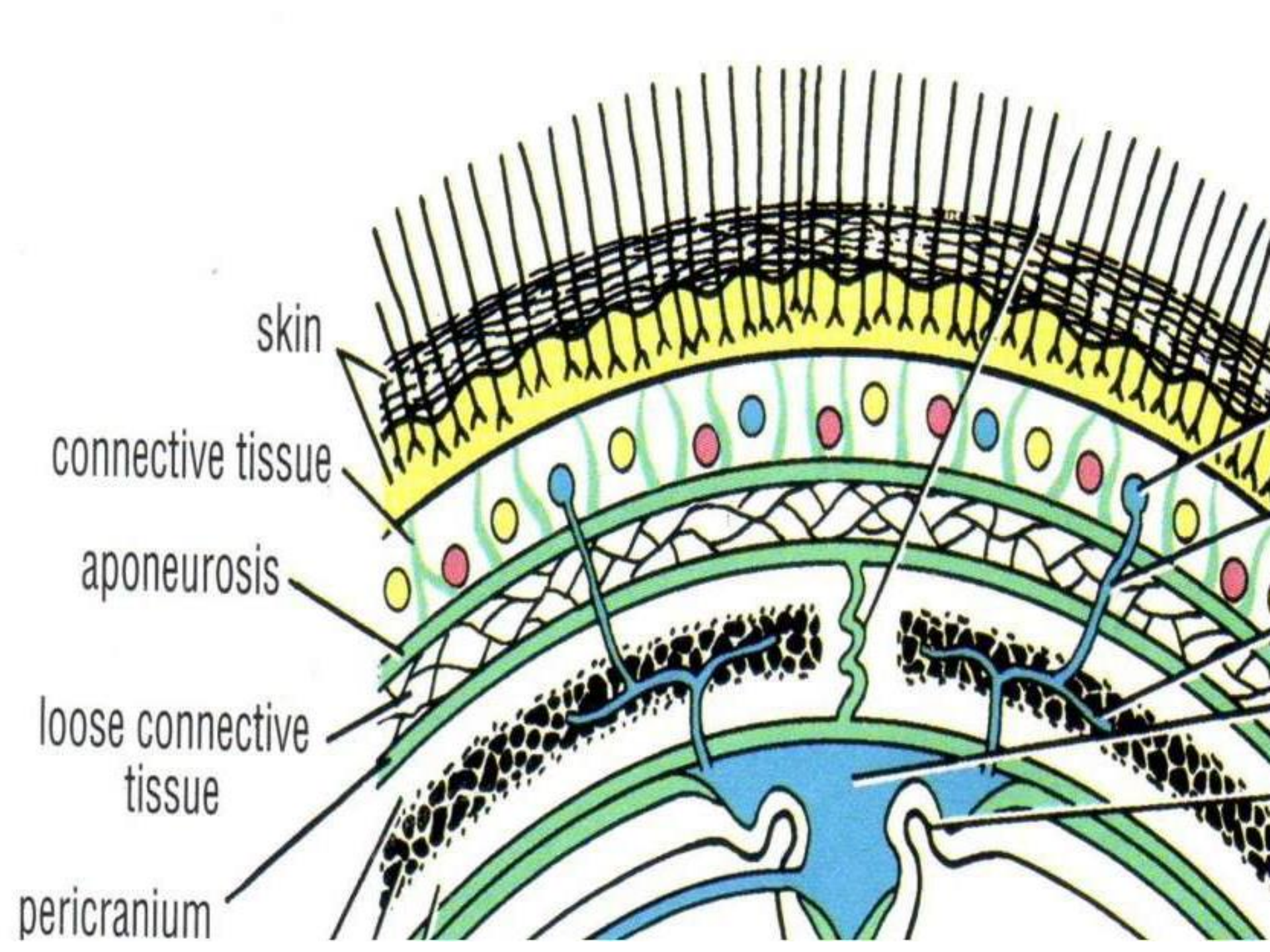
- ***S- Skin***
- ***C- Connective tissue (dense)***
- ***A- Aponeurotic layer (galea aponeurotica)***
- ***L- Loose connective tissue***
- ***P- Pericranium***

The Scalp


Skin of scalp
Periosteum
Bone of skull
Periosteal
Meningeal
Dura mater
Superior sagittal sinus
Subdural space
Subarachnoid space
Arachnoid mater
Pia mater
Arachnoid villus
Blood vessel
Falx cerebri (in longitudinal fissure only)

The Scalp


Skin
Subcutaneous tissue
Epicranial aponeurosis &
occipitofrontalis muscle
Loose areolar tissue
Pericranium
Skull


skin
connective tissue
aponeurosis
loose connective tissue
pericranium

The Scalp

- ***SKIN***

- The skin is thick and hairy, full of sebaceous glands.

- It is **adherent** to the **epicranial aponeurosis** through the **dense superficial fascia**.

The Scalp

- ***CONNECTIVE TISSUE:*** ***Dense Superficial fascia***

- It is ***more fibrous and denser*** in the center than ***at*** the ***periphery*** of the head.

- Provides the proper medium for passage of vessels and nerves of the skin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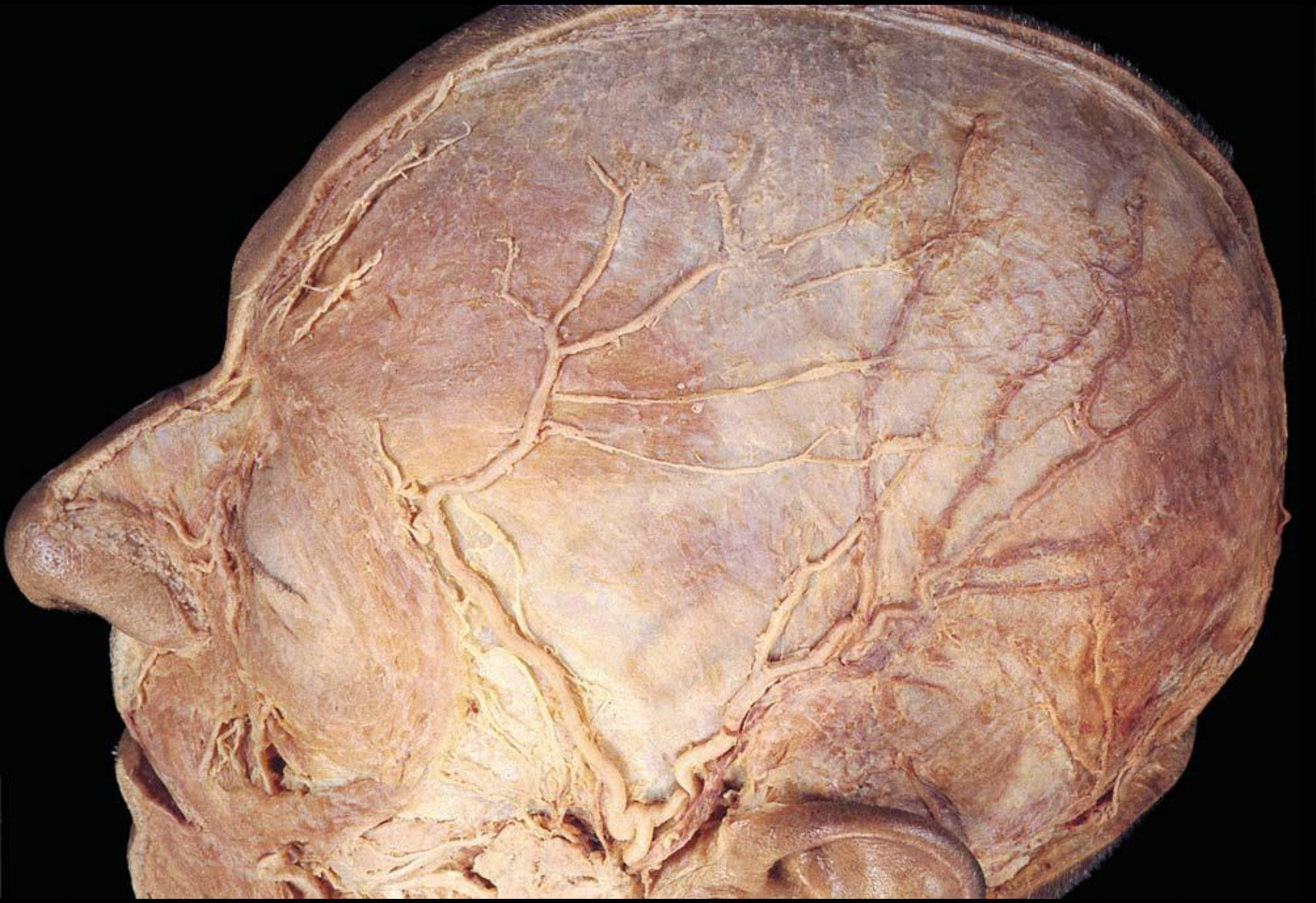

The Scalp

- ***APONUEROSIS (EPICRANIAL)***
- It is freely movable on the pericranium along with the overlying and adherent scalp and fascia, ***adherent to the previous 2 layers***
- On each side it is attached to the superior temporal lines.
- Anteriorly ,it receives the insertion of the frontalis.
- Posteriorly ,receives insertion of the occipital bellies.


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The Scalp

- ***LOOSE AEREOLAR CONNECTIVE TISSUE***

- Extends anteriorly **into the eyelids**.

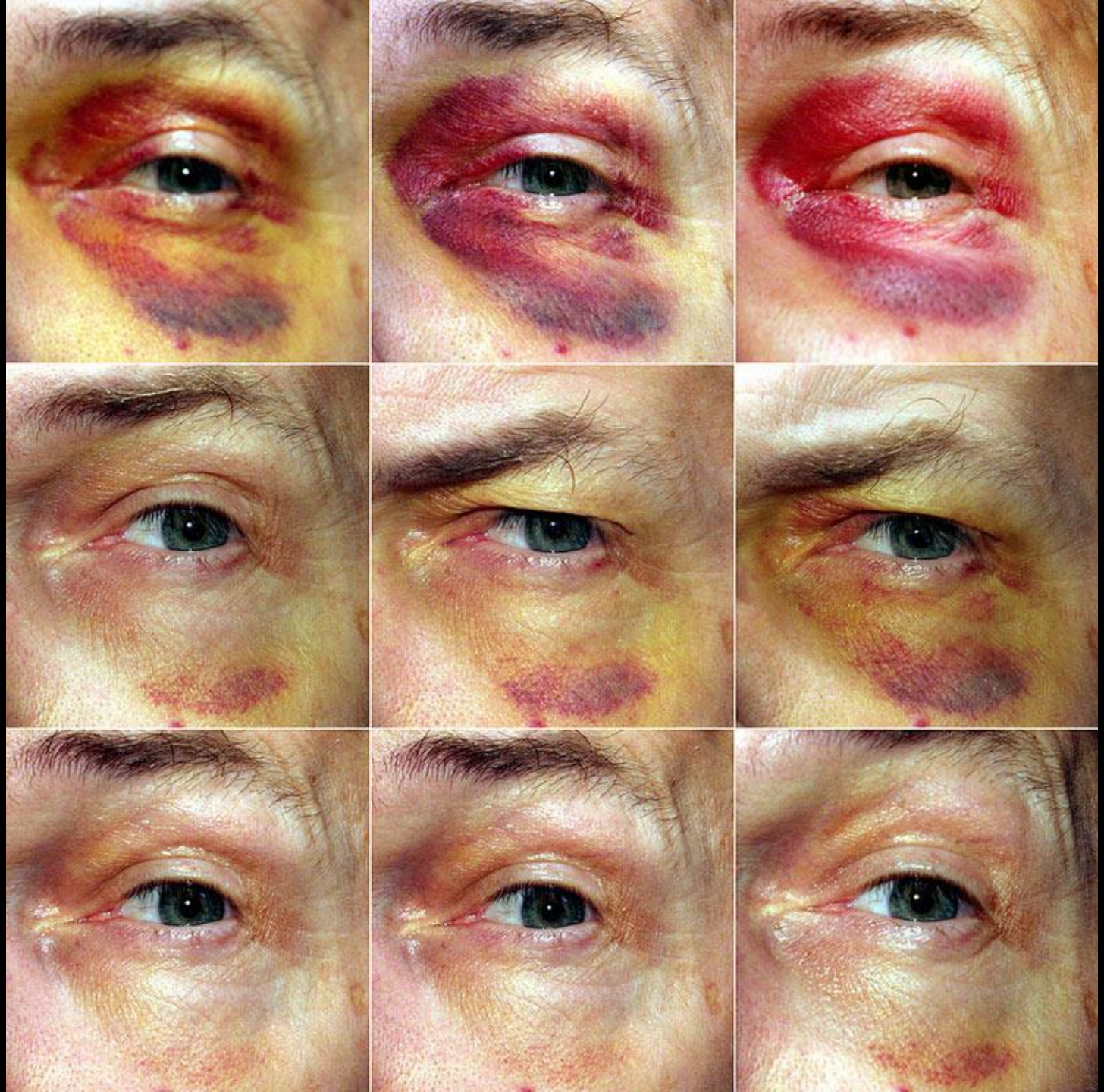
- Posteriorly to the highest and superior nuchal lines and on each side to the superior temporal lines.

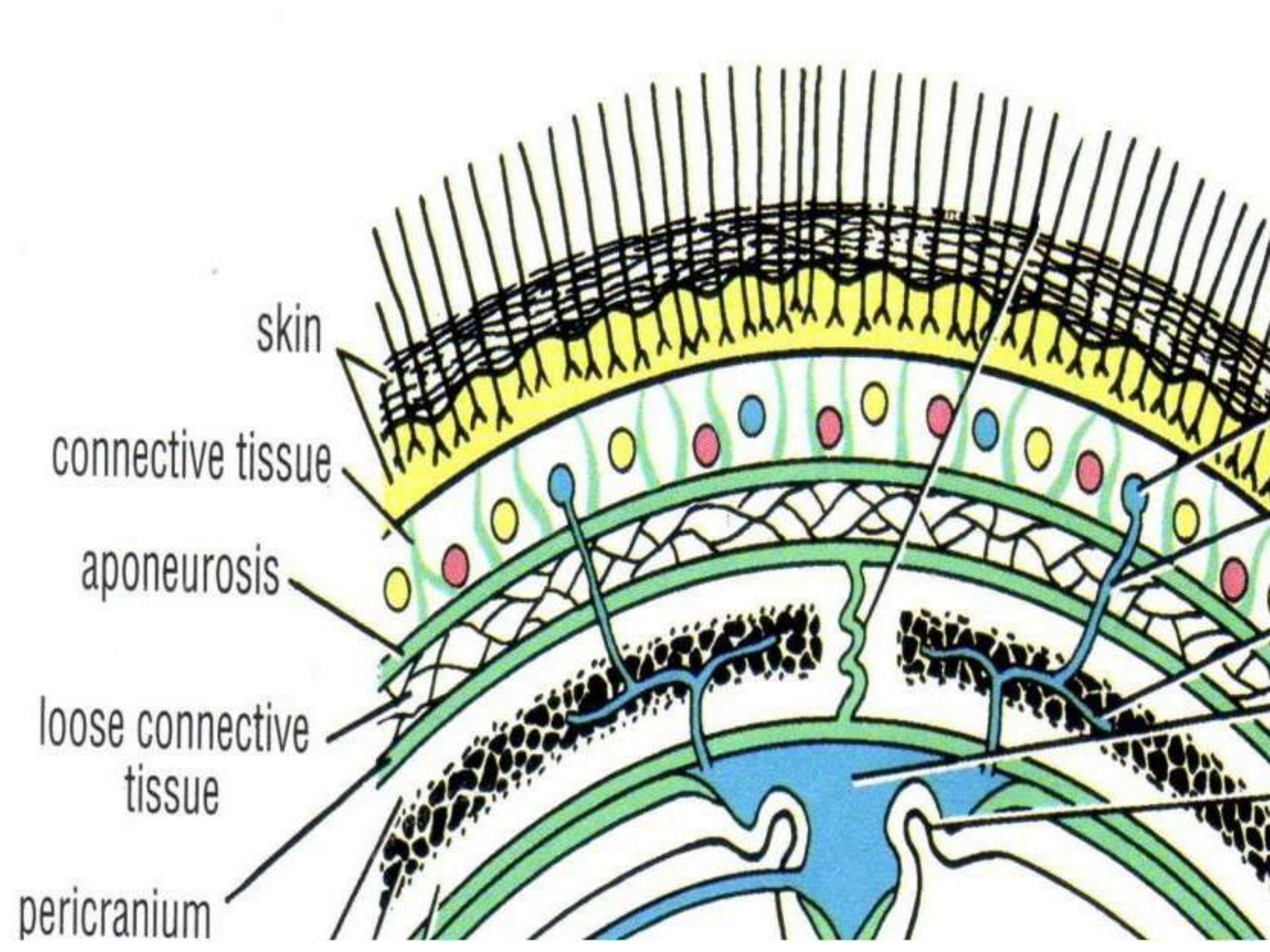
The Scalp

- The ***areolar tissue*** contains a few small arteries, but it also contains some important emissary veins. The ***emissary veins*** are ***valveless*** and connect the superficial veins of the scalp with the ***diploic veins*** of the skull bones and with the intracranial venous sinuses.

- *Called dangerous layer of scalp-emissary veins open here and carry any infections inside the brain (**venous sinus**).*

- *Bleeding leads to **BLACK EYE**.*

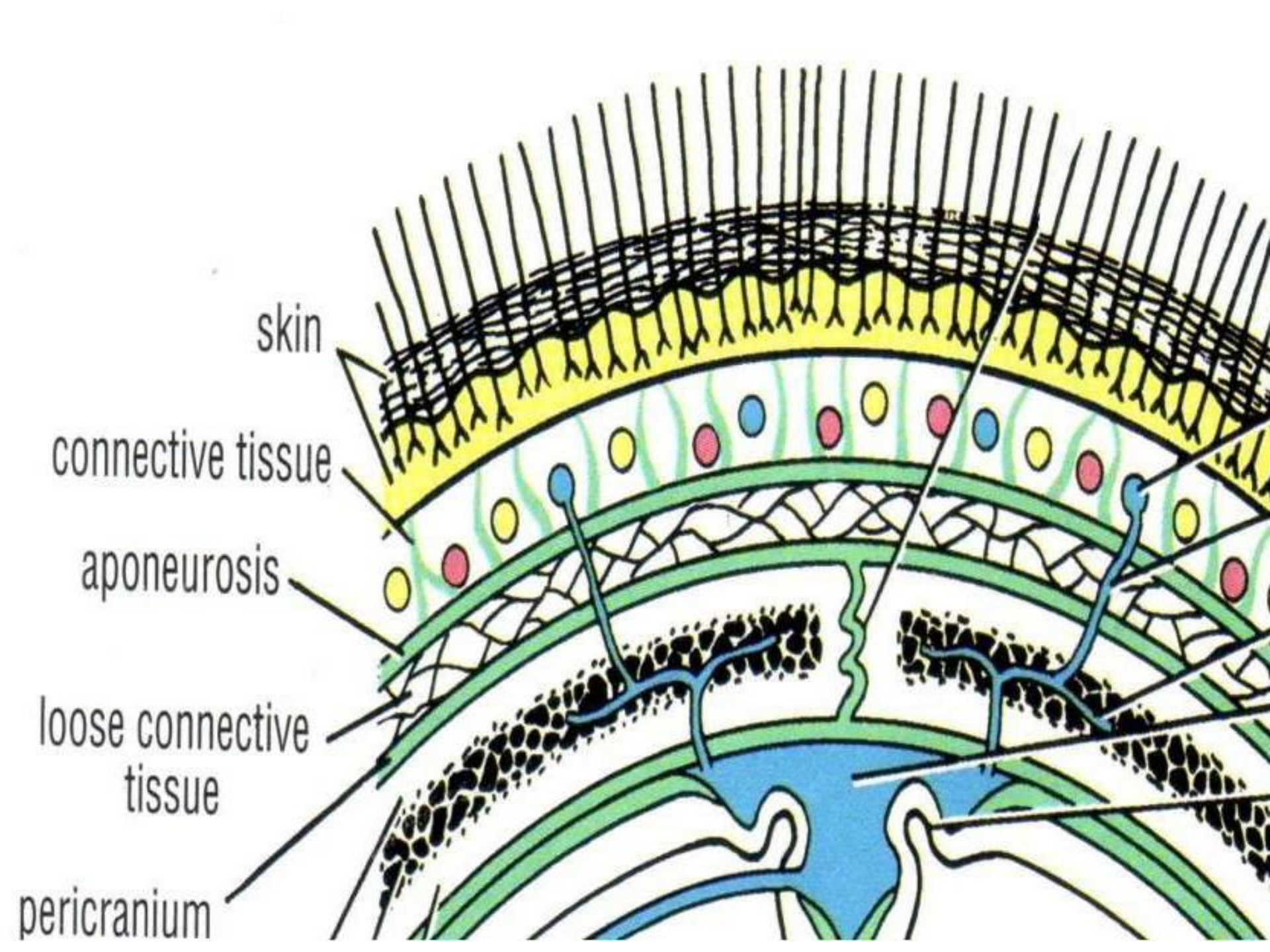



skin
connective tissue
aponeurosis
loose connective tissue
pericranium

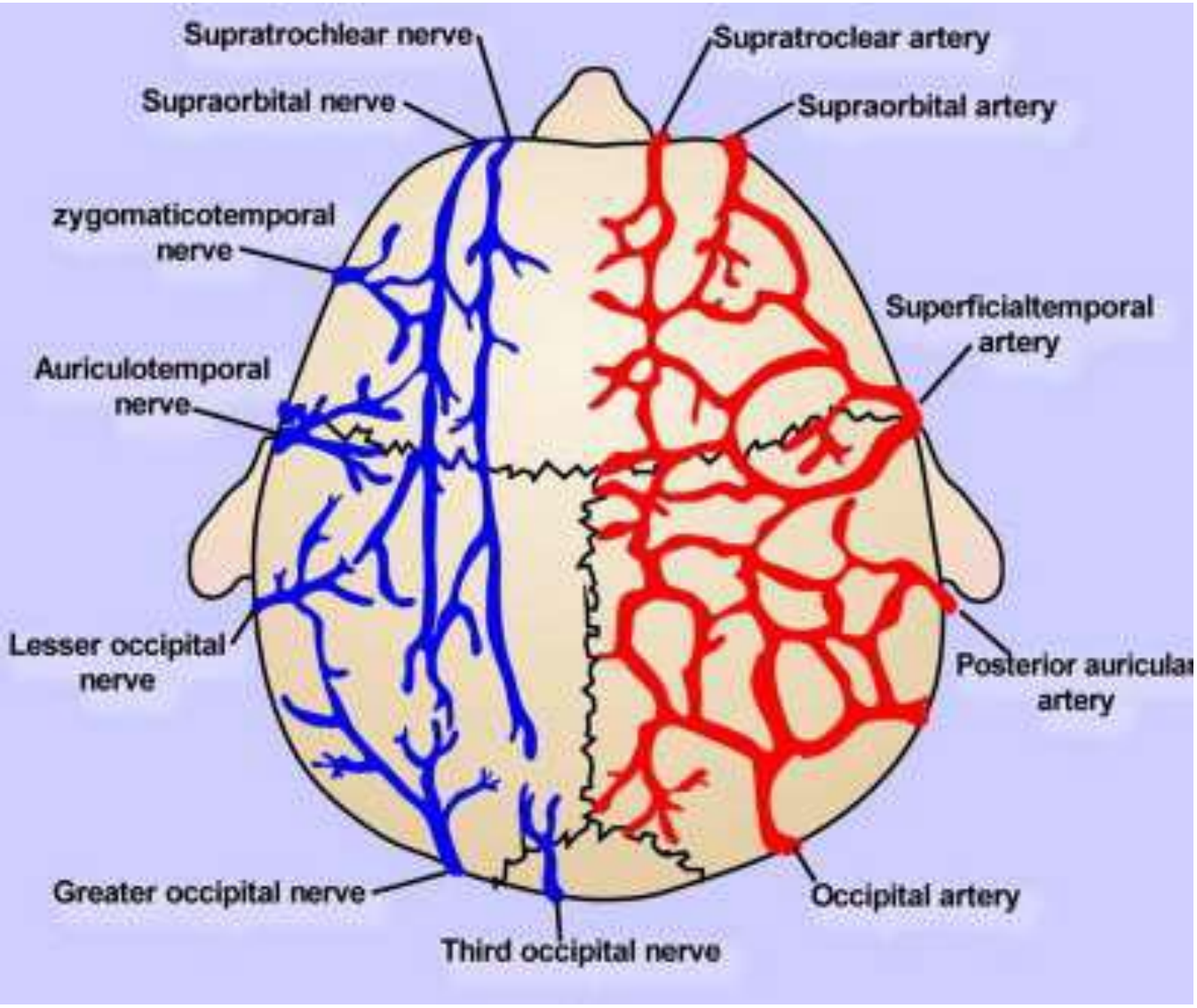
The Scalp

- ***PERICRANIUM (Periosteum)***

- Loosely attached to the surface of the bones but is firmly adherent to the sutures where the sutural ligaments bind the pericranium to the endocranium.


skin
connective tissue
aponeurosis
loose connective tissue
pericranium

Blood Supply of the Scalp



Blood Supply of the Scalp

- ***ARTERIAL SUPPLY***
- ***IN FRONT OF AURICLE***

1. Supratrochlear
2. Supraorbital
3. Superficial temporal arteries

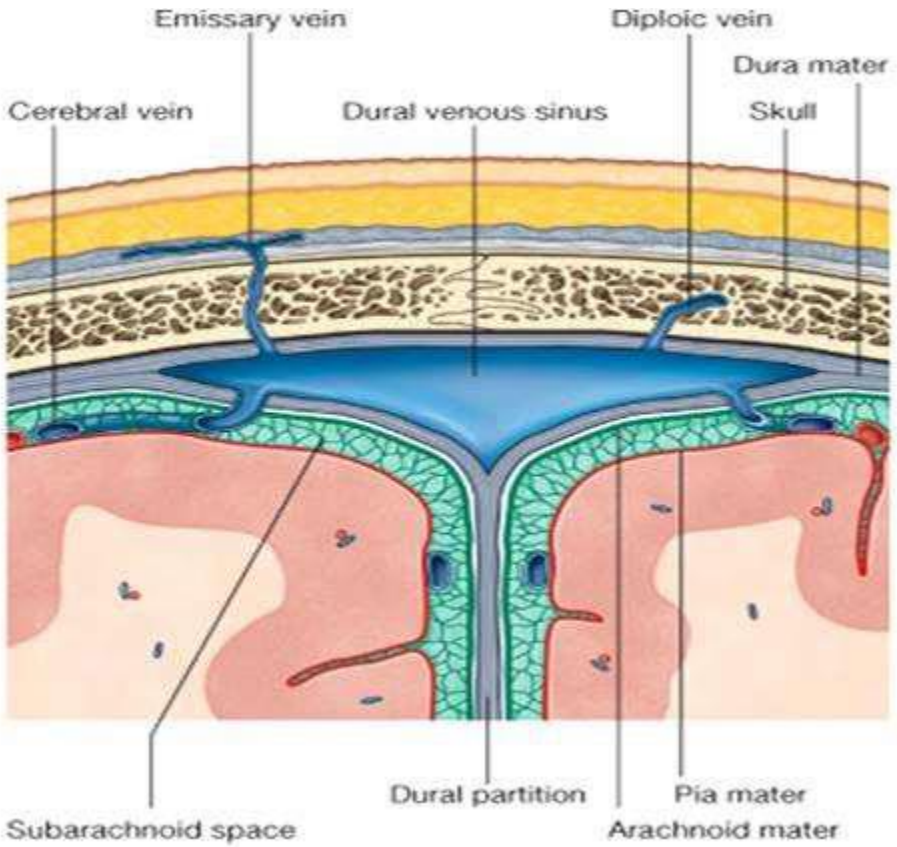
- ***BEHIND THE AURICLE***

1. Posterior auricular
2. Occipital arteries

Blood Supply of the Scalp

- ***Venous Drainage***

- Emissary veins connect the extracranial veins with the intracranial venous sinuses to equalize the pressure.



Blood Supply of the Scalp

- ***Venous Drainage***

- The ***superficial temporal*** vein joins the ***maxillary*** vein to form ***retromandibular vein***.

- The ***supratrochlear*** and the ***supraorbital*** vein unite at the medial angle of eye to form ***angular*** vein

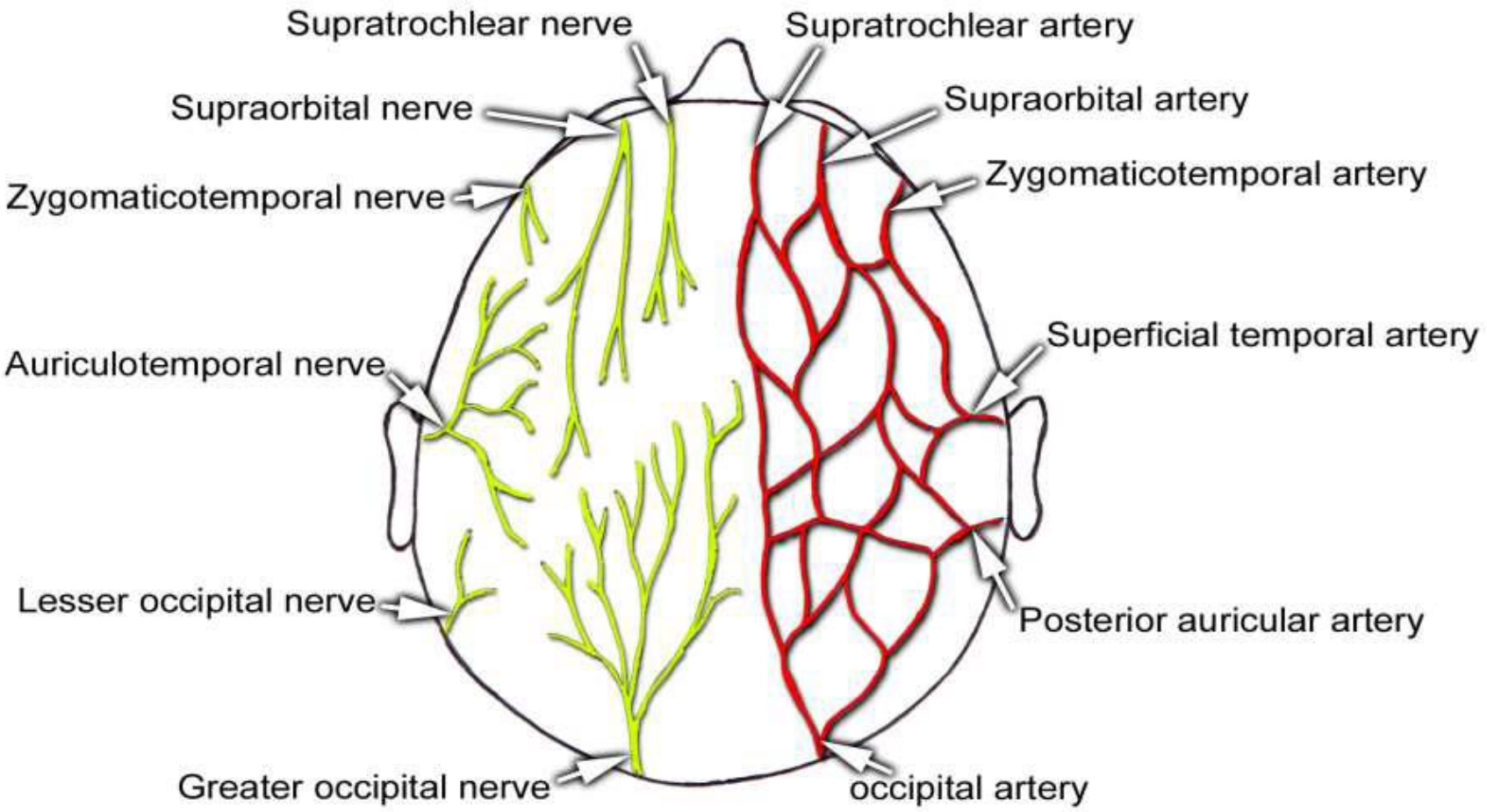
Blood Supply of the Scalp

- ***Venous Drainage***

- The ***posterior*** division of ***retromandibular*** vein unites with the ***posterior auricular*** vein to form ***external jugular*** vein

- Frontal diploic to sphenoparietal sinus and occipital diploic to transverse sinus

Nerve Supply of the Scalp



IN FRONT OF AURICLE	BEHIND THE AURICLE
SUPRATROCHLEAR	POSTERIOR DIVISION OF GREAT AURICULAR
SUPRAORBITAL	LESSER OCCIPITAL
ZYGOMATICOTEMPORAL	GREATER OCCIPITAL
AURICOTEMPORAL	THIRD OCCIPITAL
MOTOR	MOTOR
TEMPORAL BRANCH OF FACIAL	POSTERIOR AURICULAR BRANCH OF FACIAL

CLINICAL ANATOMY

- Since there are ***numerous sebaceous glands***, the ***scalp*** is the ***commonest*** site for ***sebaceous cyst***

- Scalp ***lacerations bleed profusely*** because elastic fibers of underlying galea aponuerotica prevent initial vessel retraction (***gapping***), the ***wounds*** may by ***associated with significant blood loss*** which can ***result*** in ***clinical shock***.

CLINICAL ANATOMY

- It is very ***easy to raise*** a ***flap*** within the plane between the galea and the pericranium without compromising the blood or nerve supply of the scalp.

- Similar flaps are seen in ***traumatic scalp avulsion***, when hair is trapped in moving machinery


C


D


E

Muscle Groupings

Facial Muscle Consists Of Group Of Muscles, Namely:

1. Muscles Of Scalp
2. Muscles Of Auricles
3. Muscles Of Eyelid
4. Muscles Of Nose
5. Muscles Around Mouth

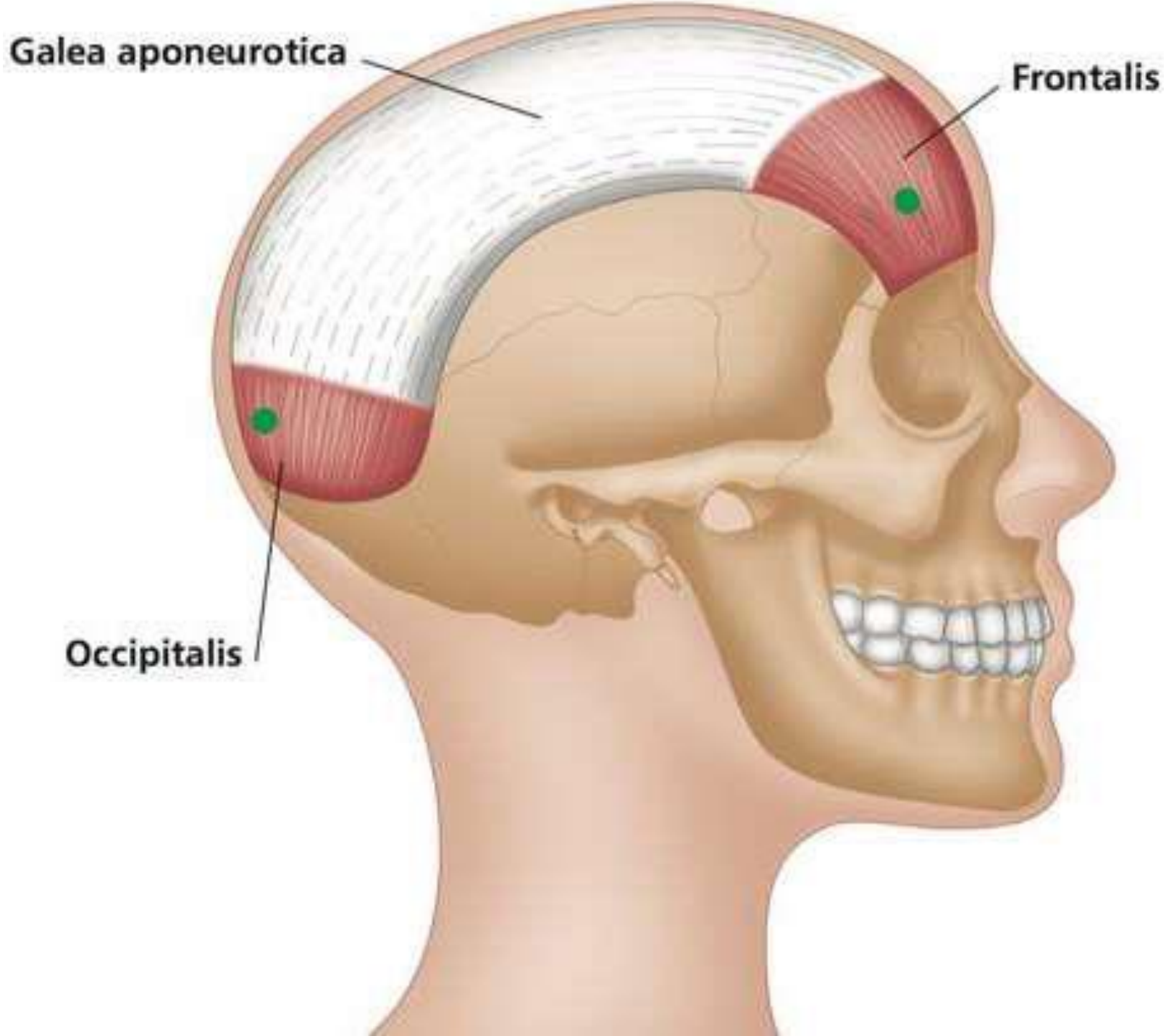
Muscles of the Scalp

Occipitofrontalis:

It covers the dome of skull.

Origin: occipital belly highest nuchal line of occipital bone, frontal belly to skin and superficial fascia of eyebrow

Insertion: Epicranial aponeurosis


Galea aponeurotica
Frontalis
Occipitalis

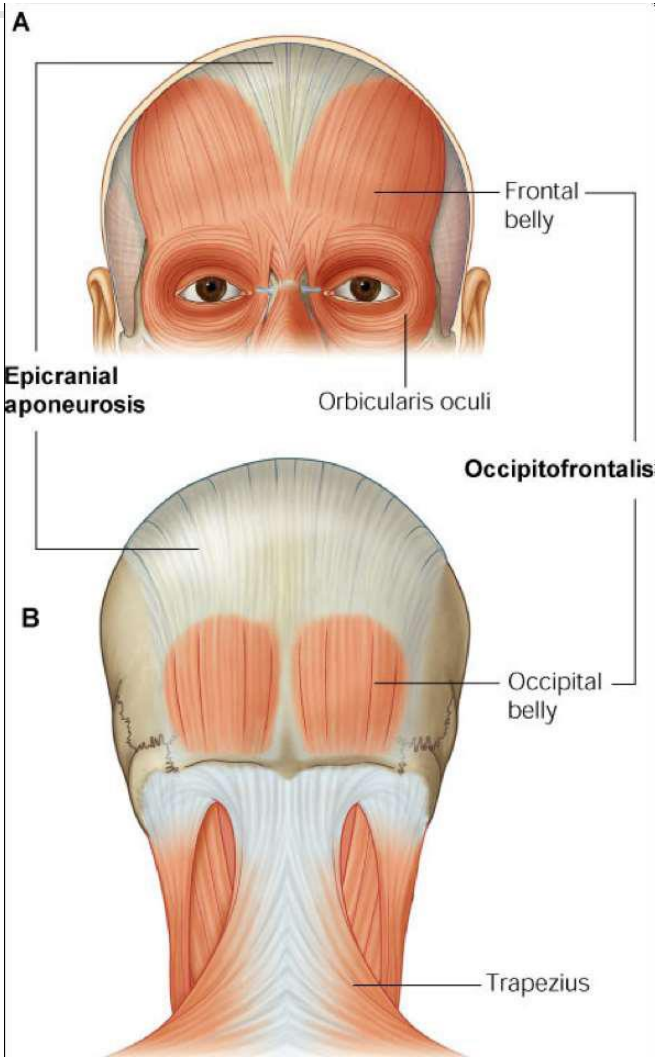
Occipitofrontalis

The frontal part is divided into 3 parts:

A. Medial fibers – which is connected to ***procerus***

B. Intermediate fibers – connected to ***corrugator supercilli***.

C. Lateral fibers – connected to ***orbicularis oculi***.



Occipitofrontalis

Nerve supply:

Post auricular branch of facial nerve to occipitalis, temporal branches of facial nerve to frontalis

Blood supply:

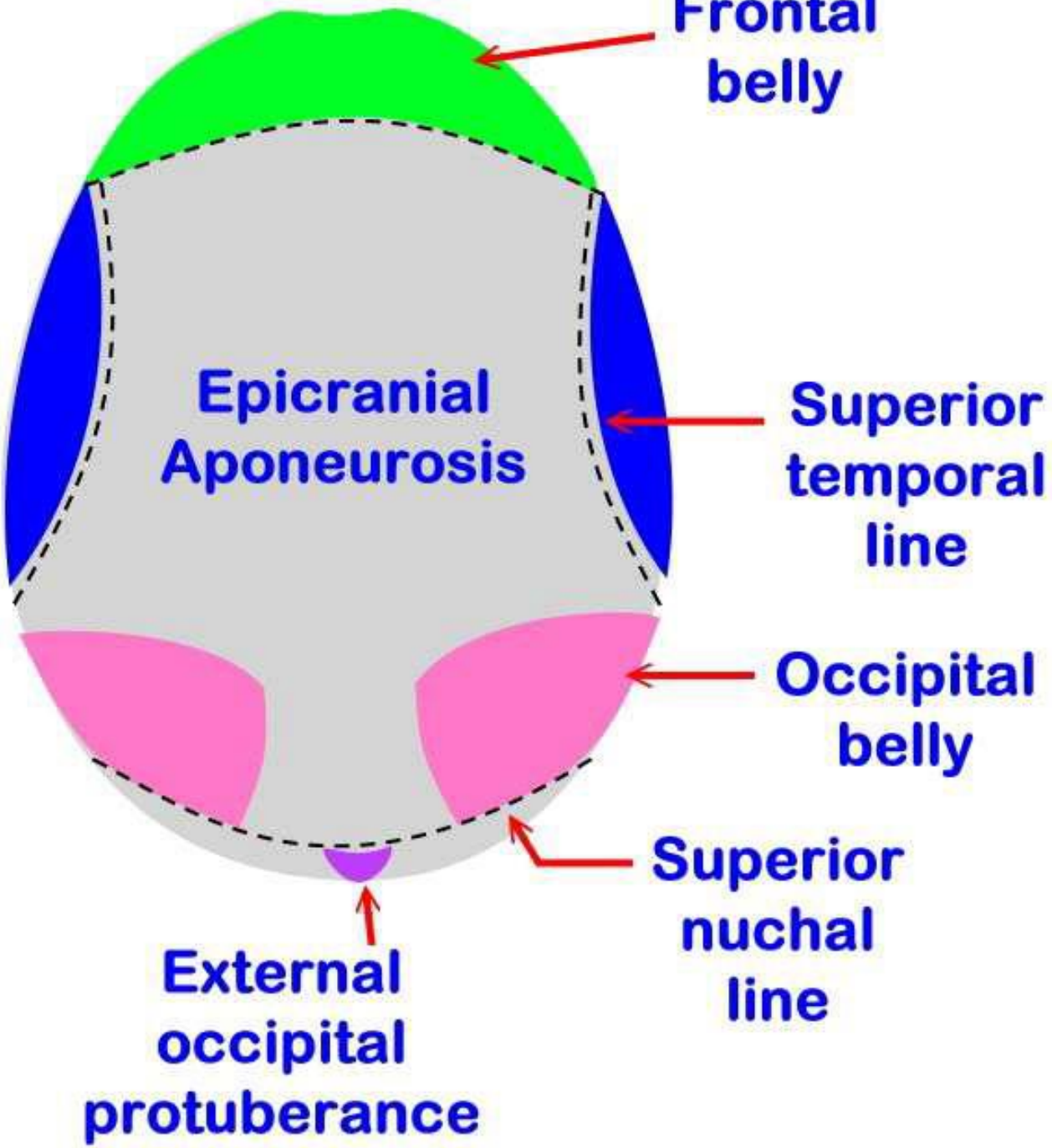
Branches of the superficial temporal, ophthalmic, posterior auricular and occipital arteries.

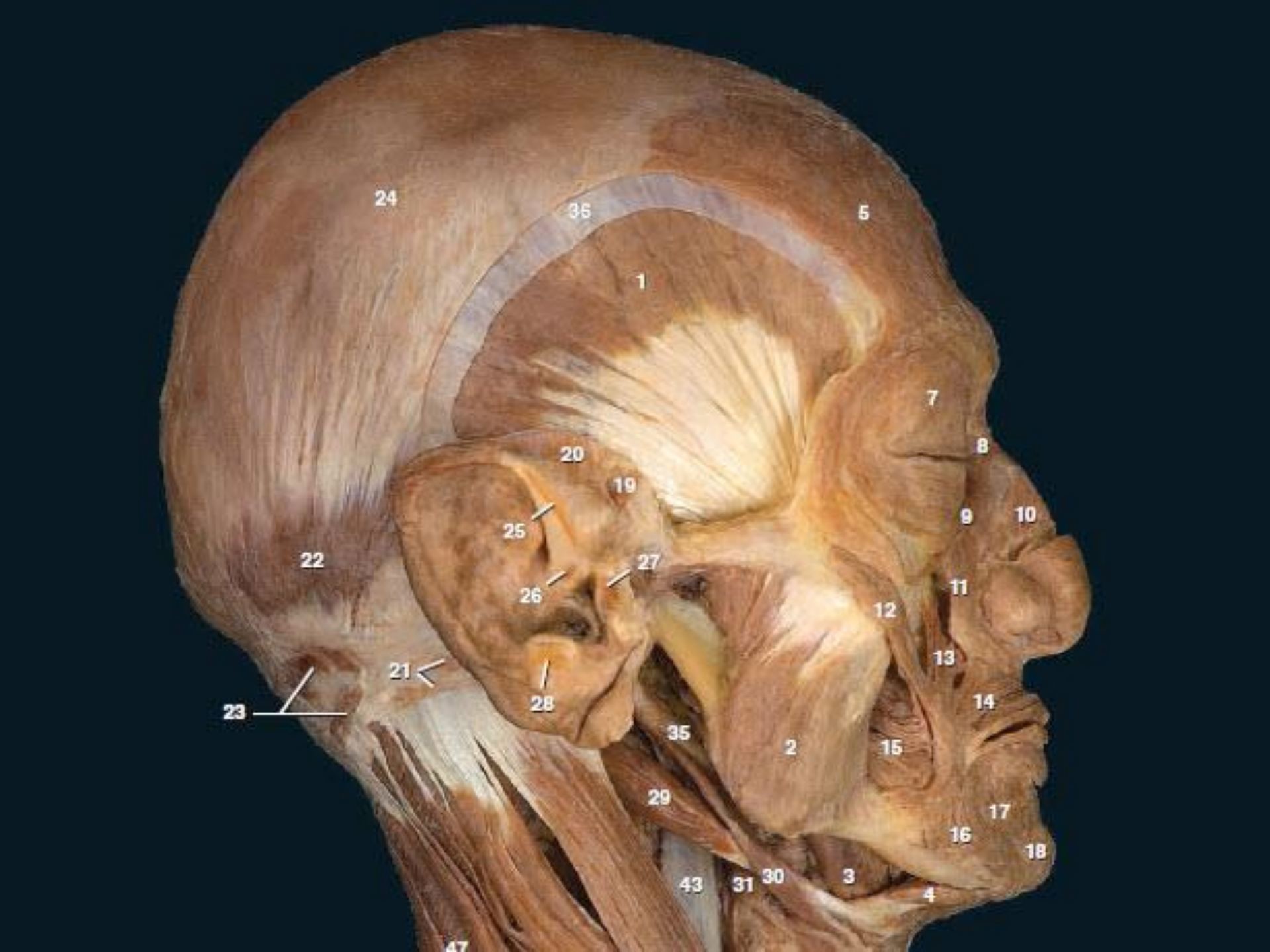
Occipitofrontalis

Action:

A. ***Frontalis:*** ***raise the eyebrows and the skin over the root of the nose***, and at the same time ***draw the scalp forward*** forming ***transverse wrinkles of the forehead***.

B. ***Occipitalis:*** in some individuals occipitalis can pull the scalp backwards, but otherwise it ***merely anchors the aponeurosis when frontalis elevates the eyebrows***.


Frontal belly
Epicranial Aponeurosis
Superior temporal line
Occipital belly
Superior nuchal line
External occipital protuberance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Occipitofrontalis

Applied anatomy:

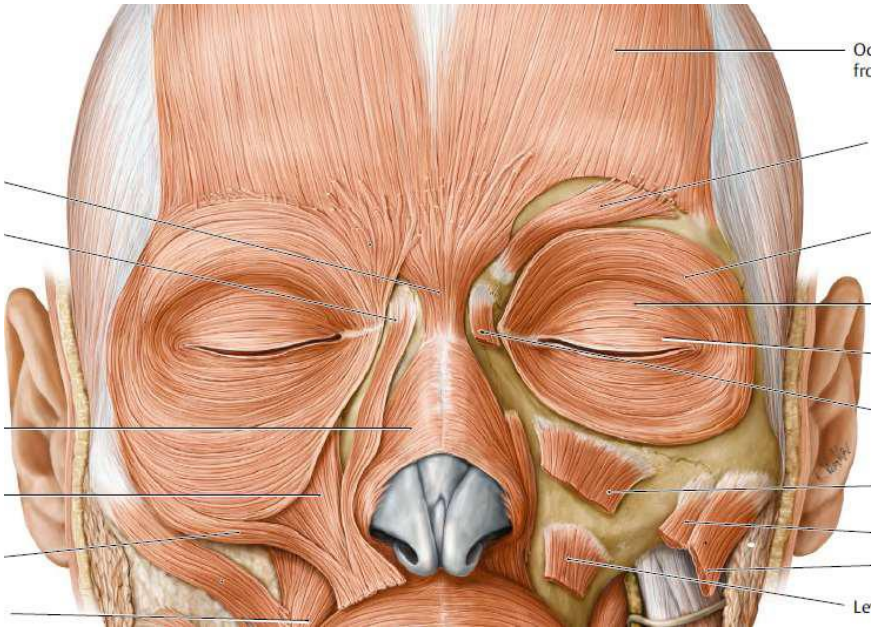
Frontalis muscle is one among the many muscles examined to check the functioning of facial nerve.

Transverse wrinkles on the forehead are absent when the patient is asked to look upwards without moving his head in cases of infranuclear ***lesions of the facial nerves***.

Muscles of Eyelids

Muscles of eyelids are:

1. Orbicularis oculli
2. Corrugaror supercilli
3. Levator palpebral superioris
4. Extraocular muscles

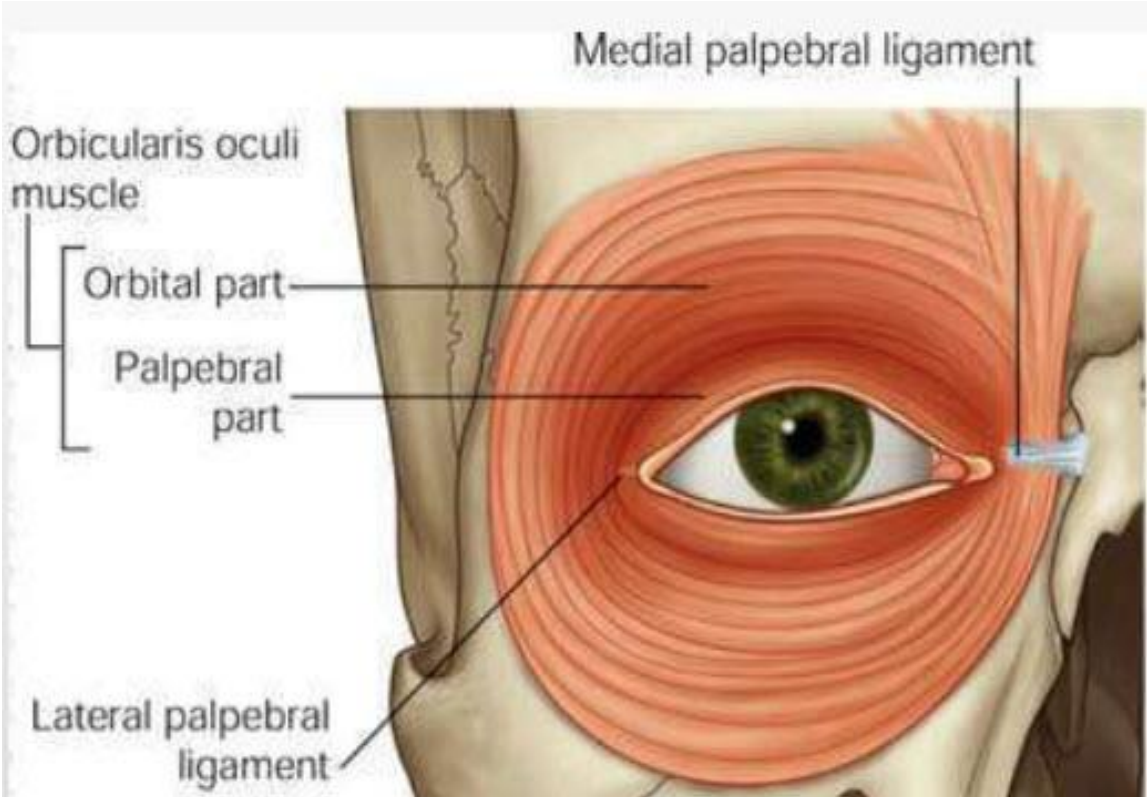


Orbicularis Oculli

It surrounds the circumference of orbit.

It has 3 parts:

1. Orbital
2. Palpebral
3. Lacrimal



Orbicularis Oculi

- ***Orbital part(outer)***
  - Originate from medial part of medial palpebral ligament and form concentric rings, return to point of origin
  - Action: ***closes the lids tightly***

- ***Palpebral part(Inner)***
  - Originate from lateral part of medial palpebral ligament
  - Insert into lateral palpebral raphe
  - Action: ***closes the lids gently***

- ***Lacrimal part(Small)***
  - Originate from lacrimal fascia& lacrimal bone
  - Insert into upper &lower tarsi
  - Action: ***dilate lacrimal sac***

Orbicularis occuli
(Orbital part)

Orbicularis occuli
(Palpebral part)

Orbicularis Oculli

Nerve supply:

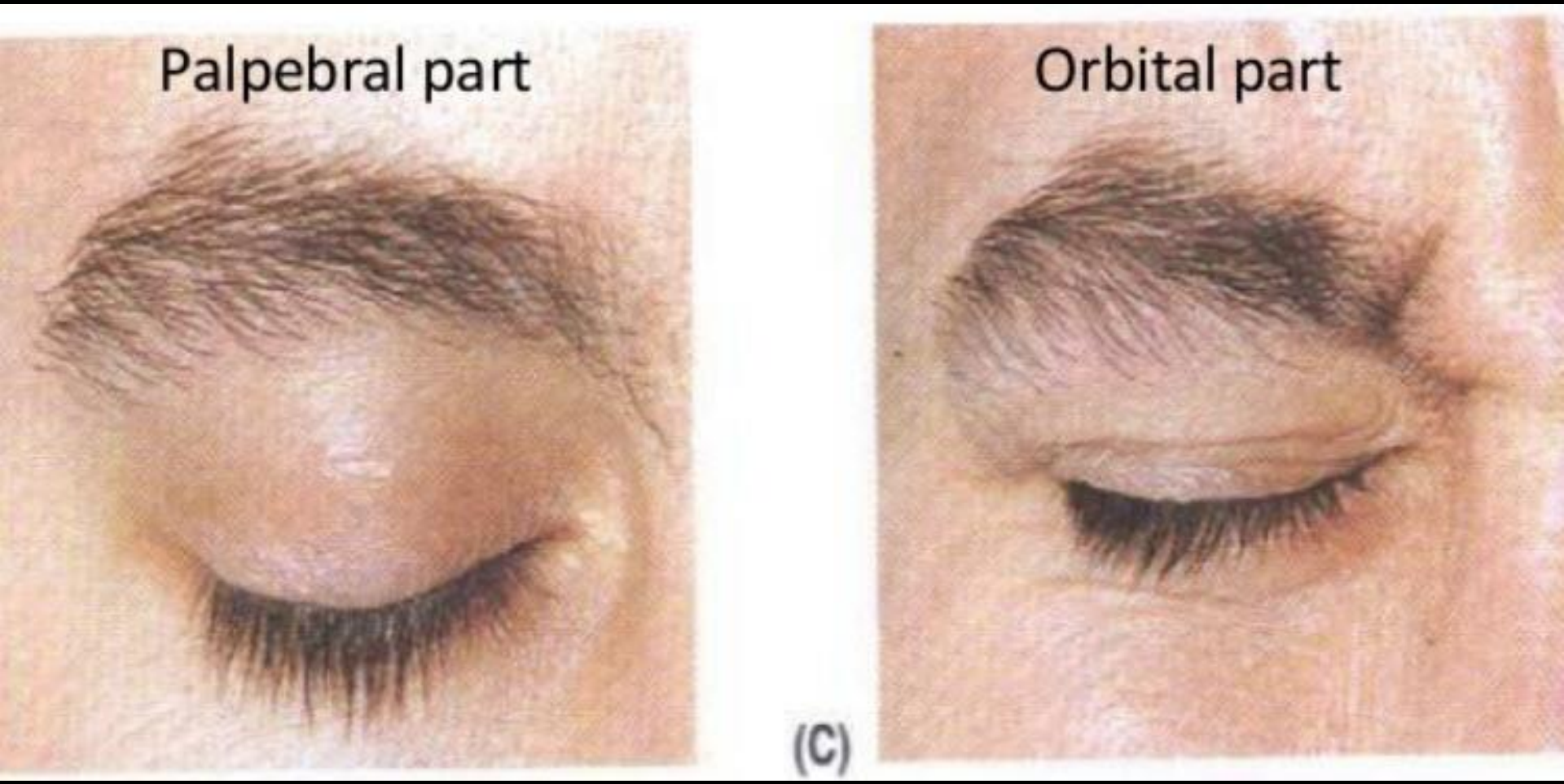
Temporal and zygomatic branch of facial nerve.

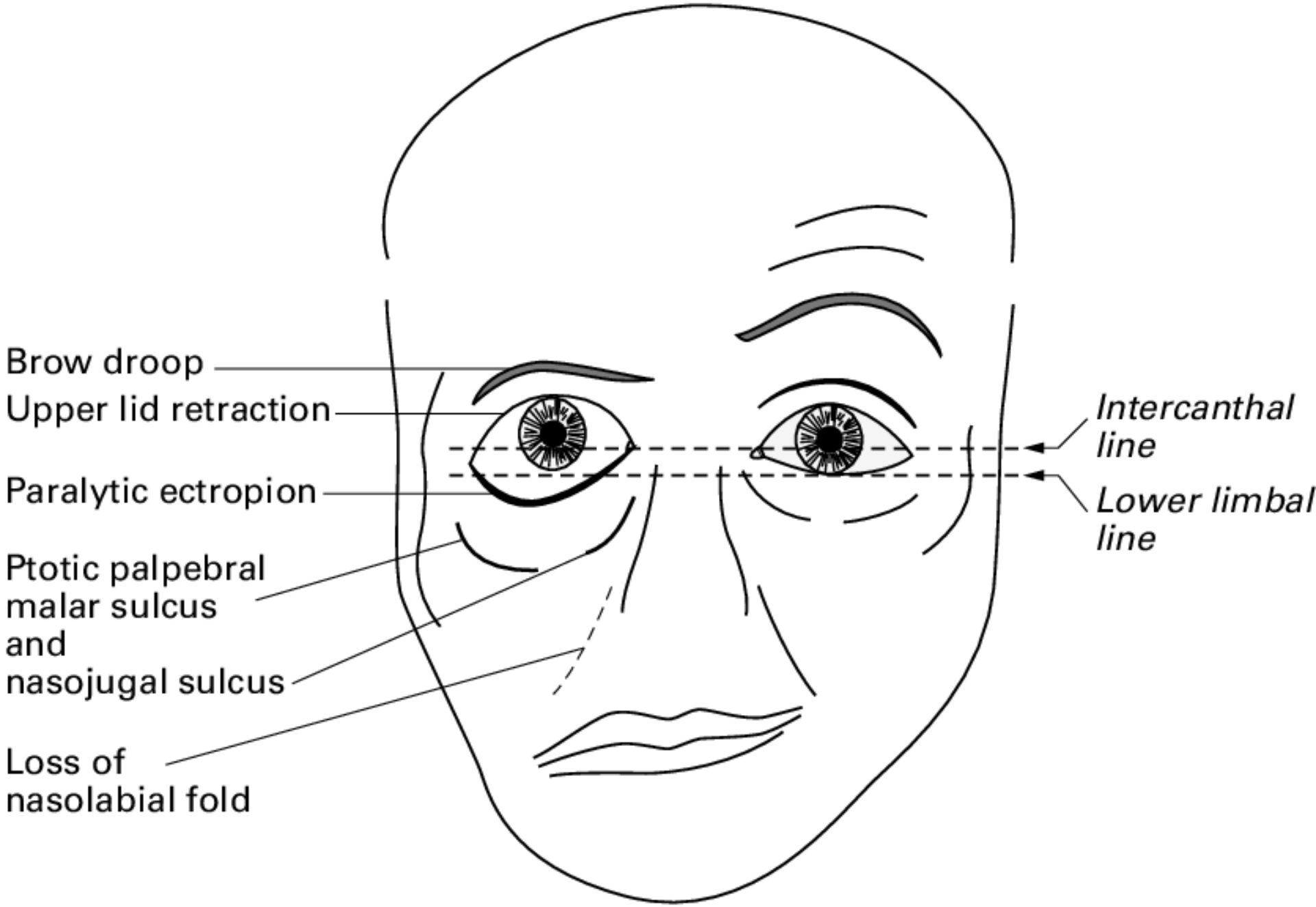
Action:

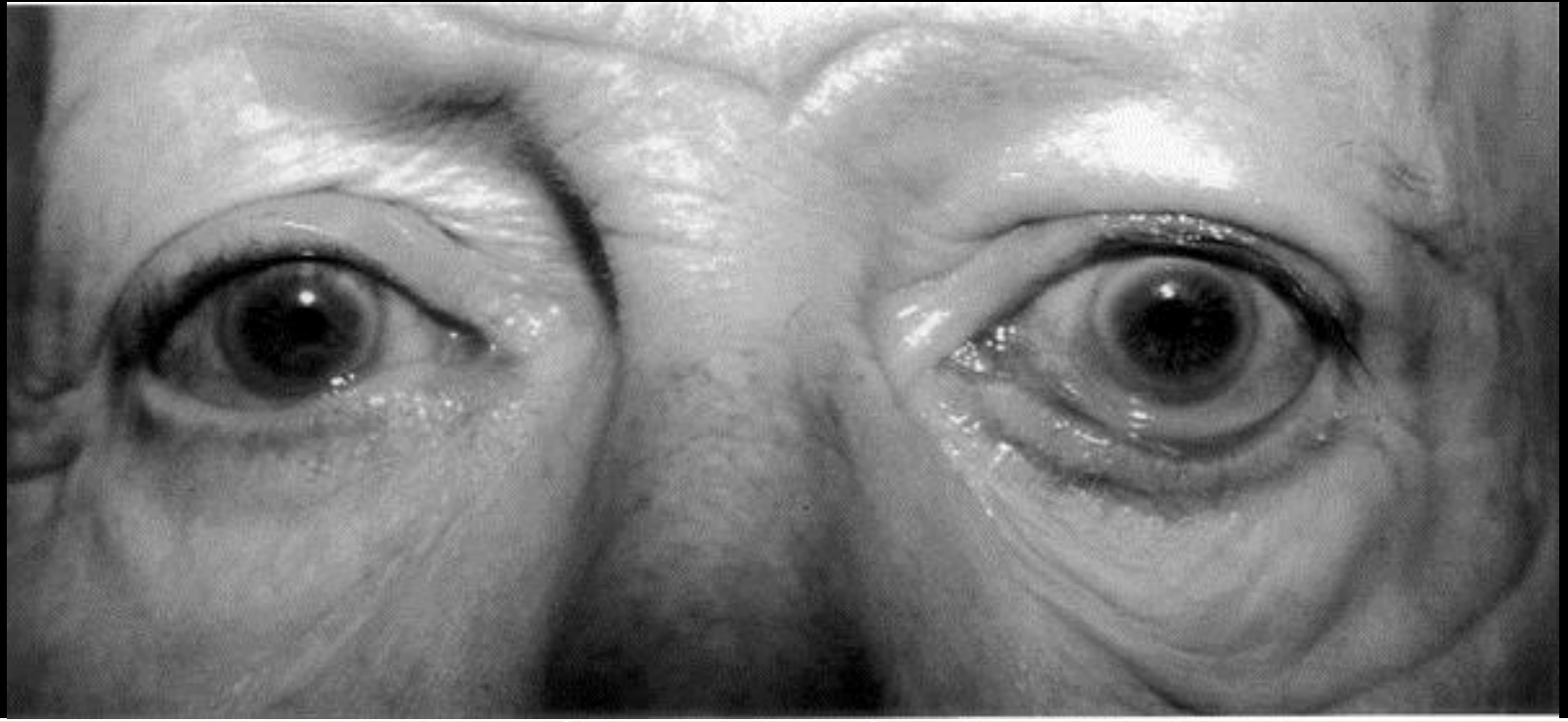
The major action of muscles help in closing of eyelids (forceful and gentle closure).

Applied anatomy:

Paralysis of orbicularis oculli leads inability to fully close the eye and ectropion of lower eye lid, hence excessive tearing will be noted


Palpebral part
Orbital part
(C)


Brow droop
Upper lid retraction
Paralytic ectropion
Ptotic palpebral
malar sulcus
and
nasojugal sulcus
Loss of
nasolabial fold
Intercanthal
line
Lower limbal
line



Corrugator Supercilli

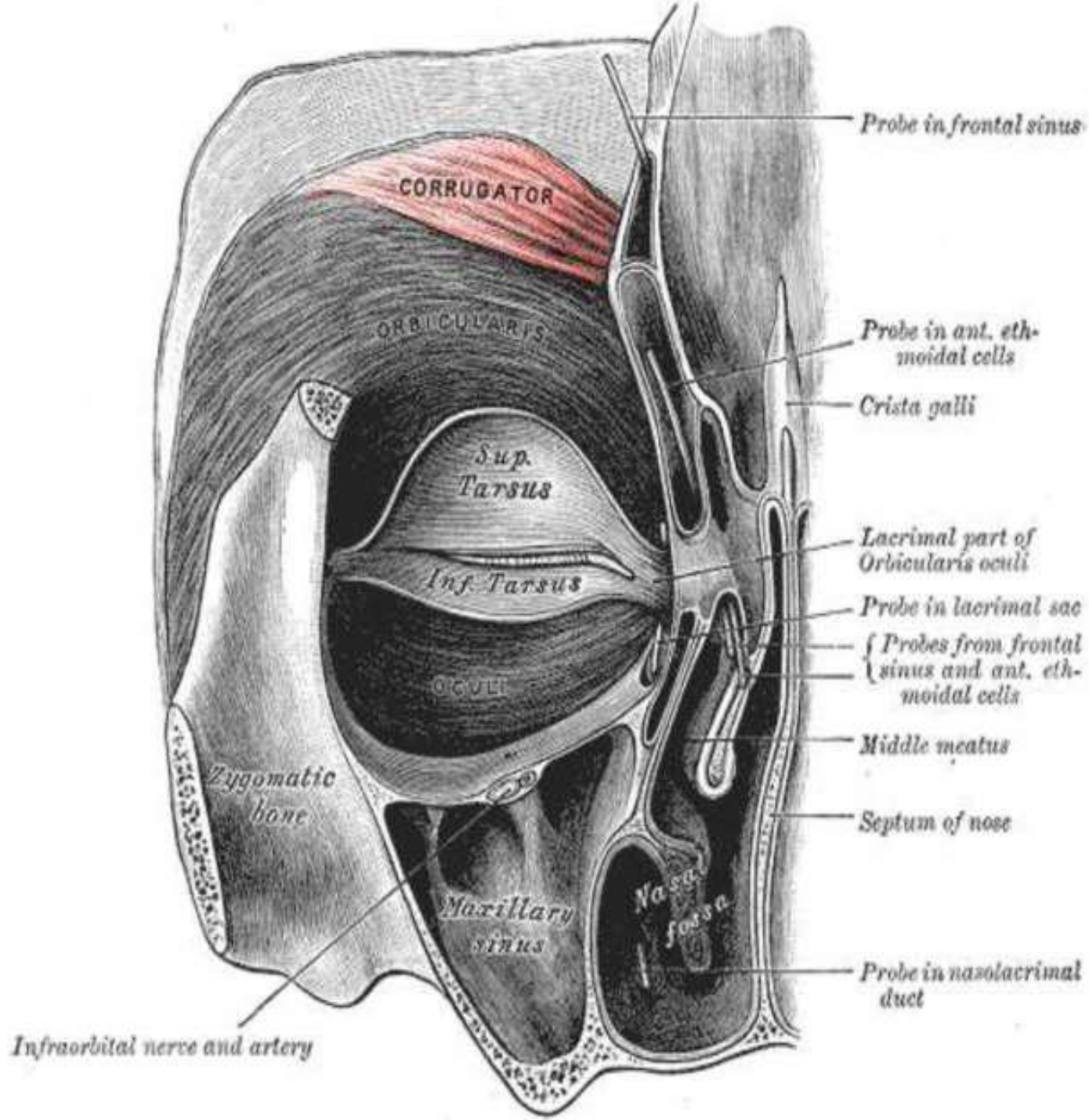
Small pyramidal muscle located at medial end of each eyebrow.

Arises from ***medial end of the supercilliary arch*** and ***inserted*** into ***deep surface*** of ***skin***, above the ***middle*** of the ***orbital arch***.

Action: produces vertical wrinkles of the forehead in frowning as an expression of annoyance

Nerve supply:

Temporal branch of facial nerve.


Probe in frontal sinus
CORRUGATOR
ORBICULARIS
Probe in ant. ethmoidal cells
Crista galli
Sup. Tarsus
Lacrimal part of Orbicularis oculi
Inf. Tarsus
Probe in lacrimal sac
Probes from frontal sinus and ant. ethmoidal cells
OCULI
Middle meatus
Zygomatic bone
Septum of nose
Maxillary sinus
Nasal fossa
Probe in nasolacrimal duct
Infraorbital nerve and artery

Corrugator supercilii

Levator Palpebral Superioris

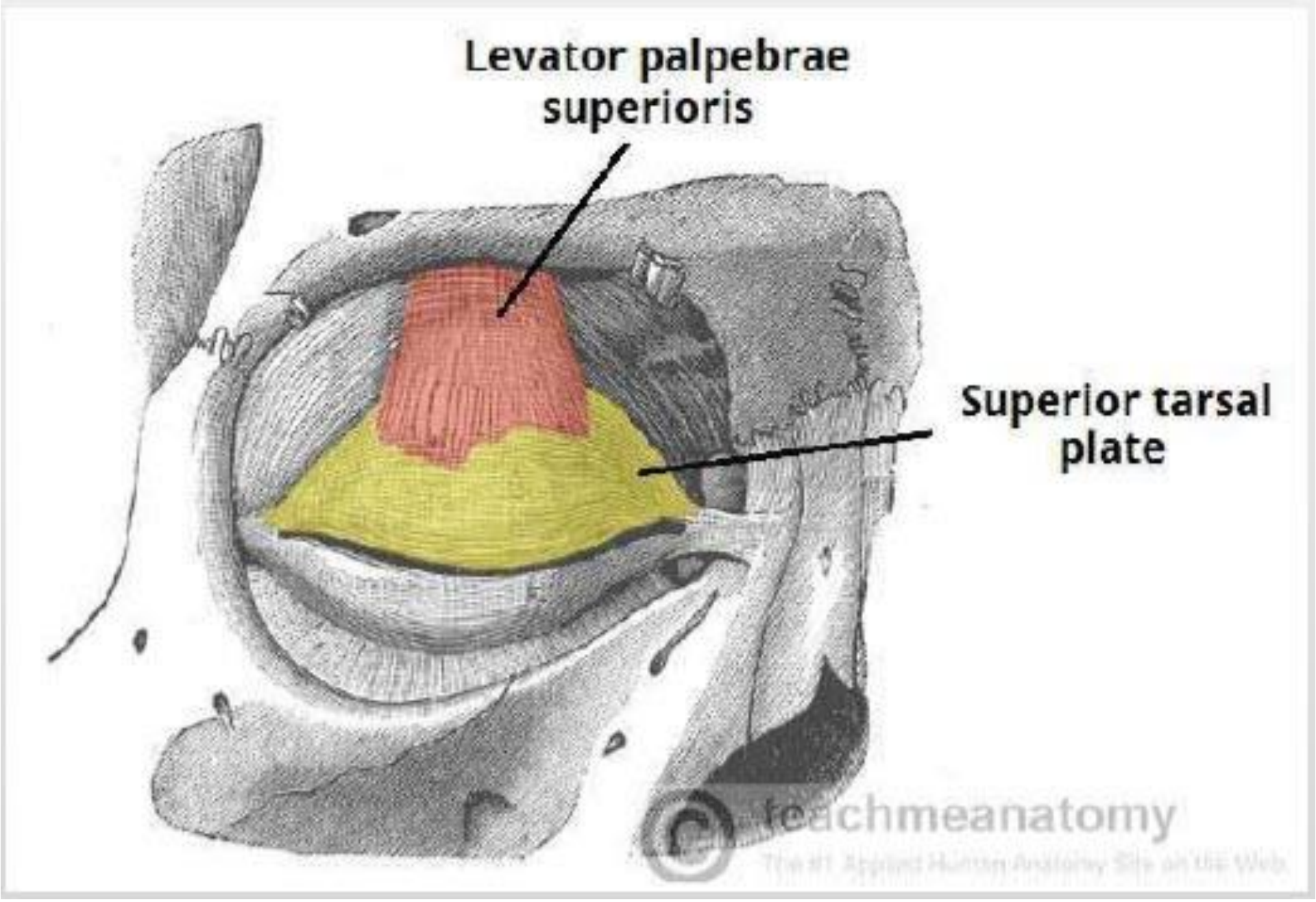
It is muscle that helps in elevating eyelid.

Origin:

Arises from the under surface of the lesser wing of the sphenoid, anterosuperior to the optic foramen.

Insertion:

Blends with the orbital septum and inserts into the anterior surface of the superior tarsus.


Levator palpebrae superioris
Superior tarsal plate
teachmeanatomy

Muscles Around The Mouth

1. ***Orbicularis Oris***
2. Levator Labii Superioris
3. Levator Labii Superioris Alaeque Nasi
4. **Zygomaticus Major**
5. **Zygomaticus Minor**
6. Levator Anguli Oris
7. Depresor Anguli Oris
8. Depresor Labii Inferioris
9. **Mentalis**
10. ***Risorius***
11. ***Buccinator***

Orbicularis Oris

The orbicularis oris muscle is a complex of muscles in the lips that encircles the mouth.

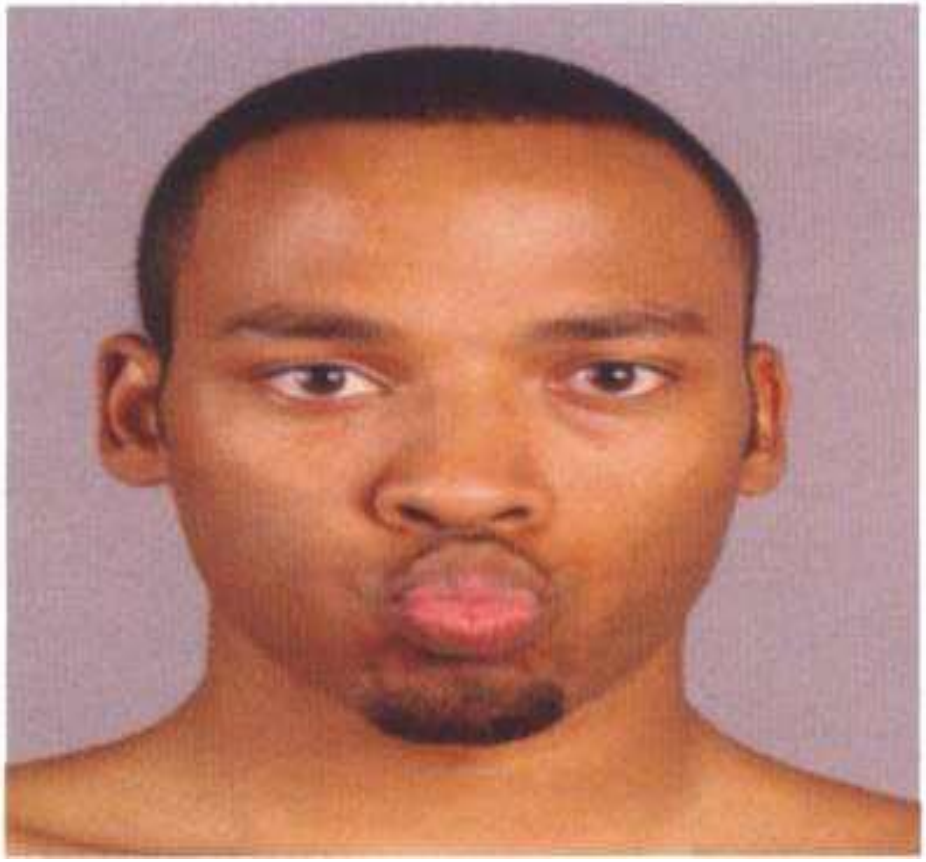
Origin:

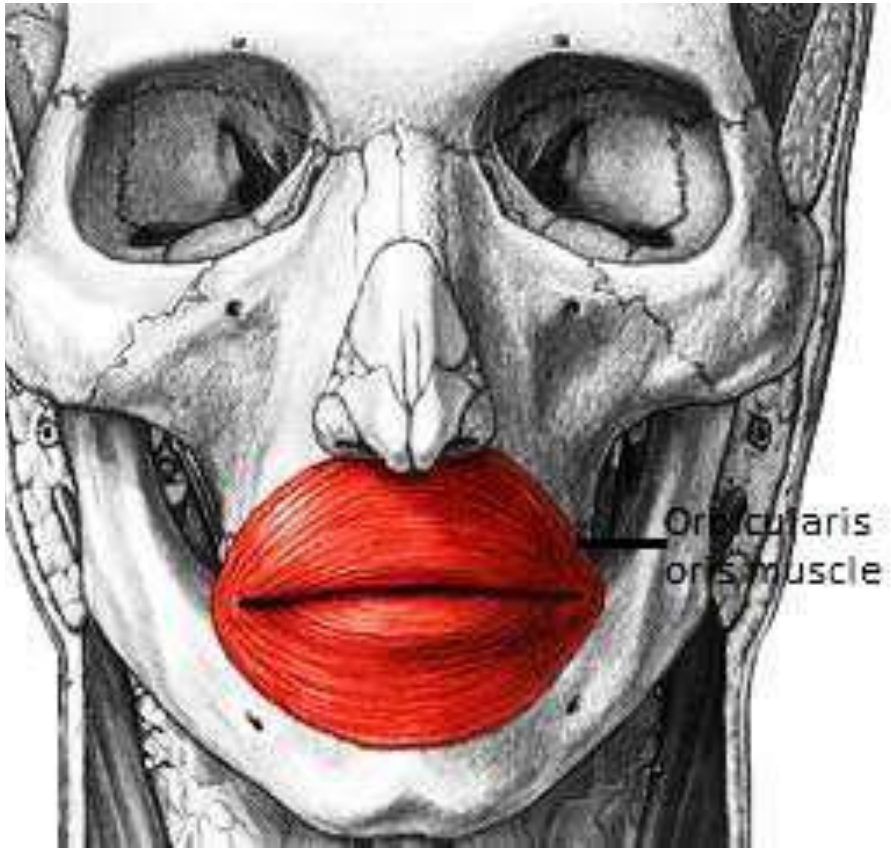
A. Anterior surface of maxilla
B. Anterior surface of mandible
C. Modiolus *(fibromuscular core formed as a chiasma of facial muscles held together by fibrous tissue, located lateral and slightly superior to each angle of the mouth)*

Insertion:

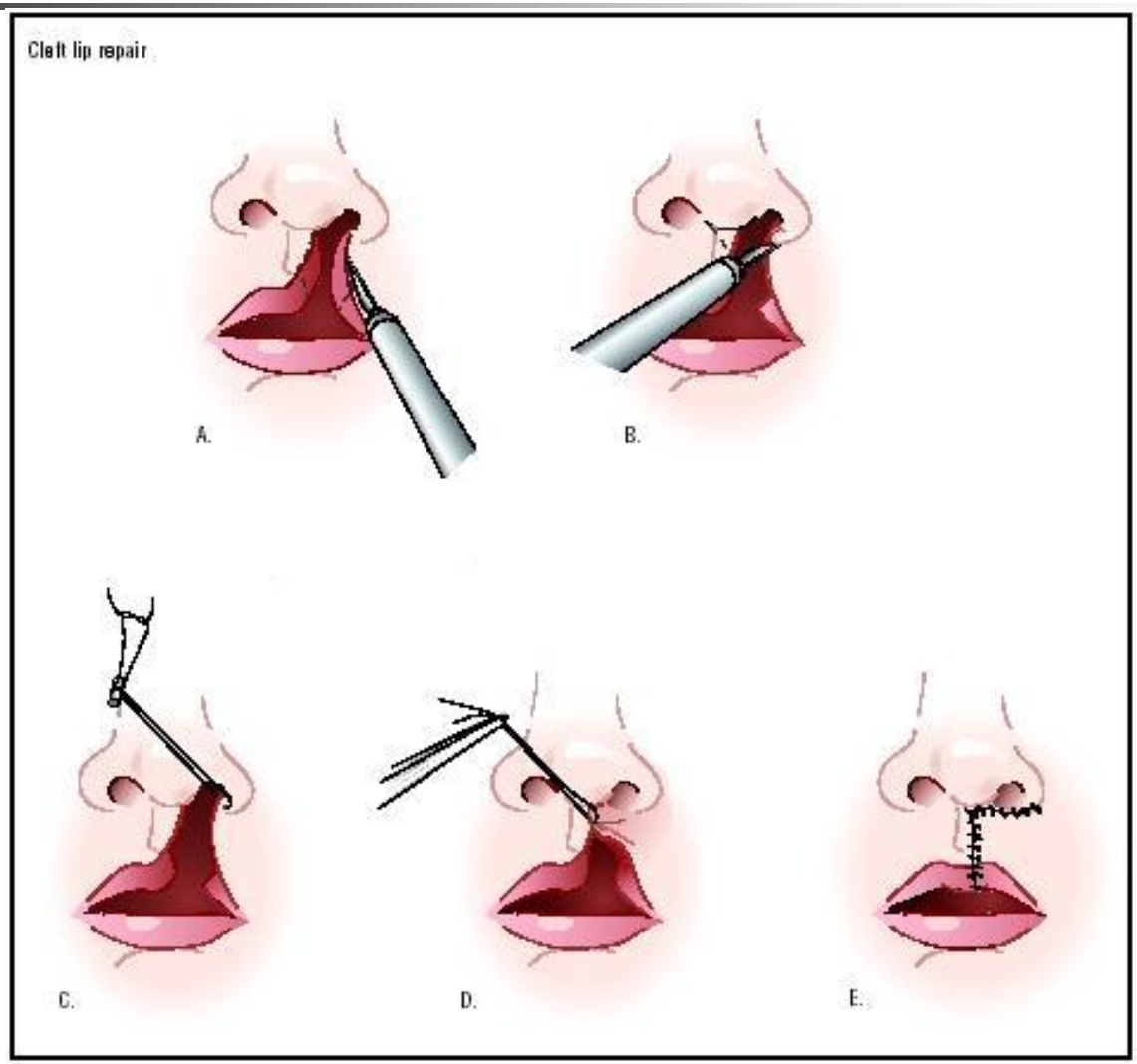
Peripheral part decussate with opposite fibers crossing the midline to insert into the skin near nasolabial sulcus.

Action: closes the mouth




Orbicularis
oris muscle

Applied Anatomy – Cleft Lip



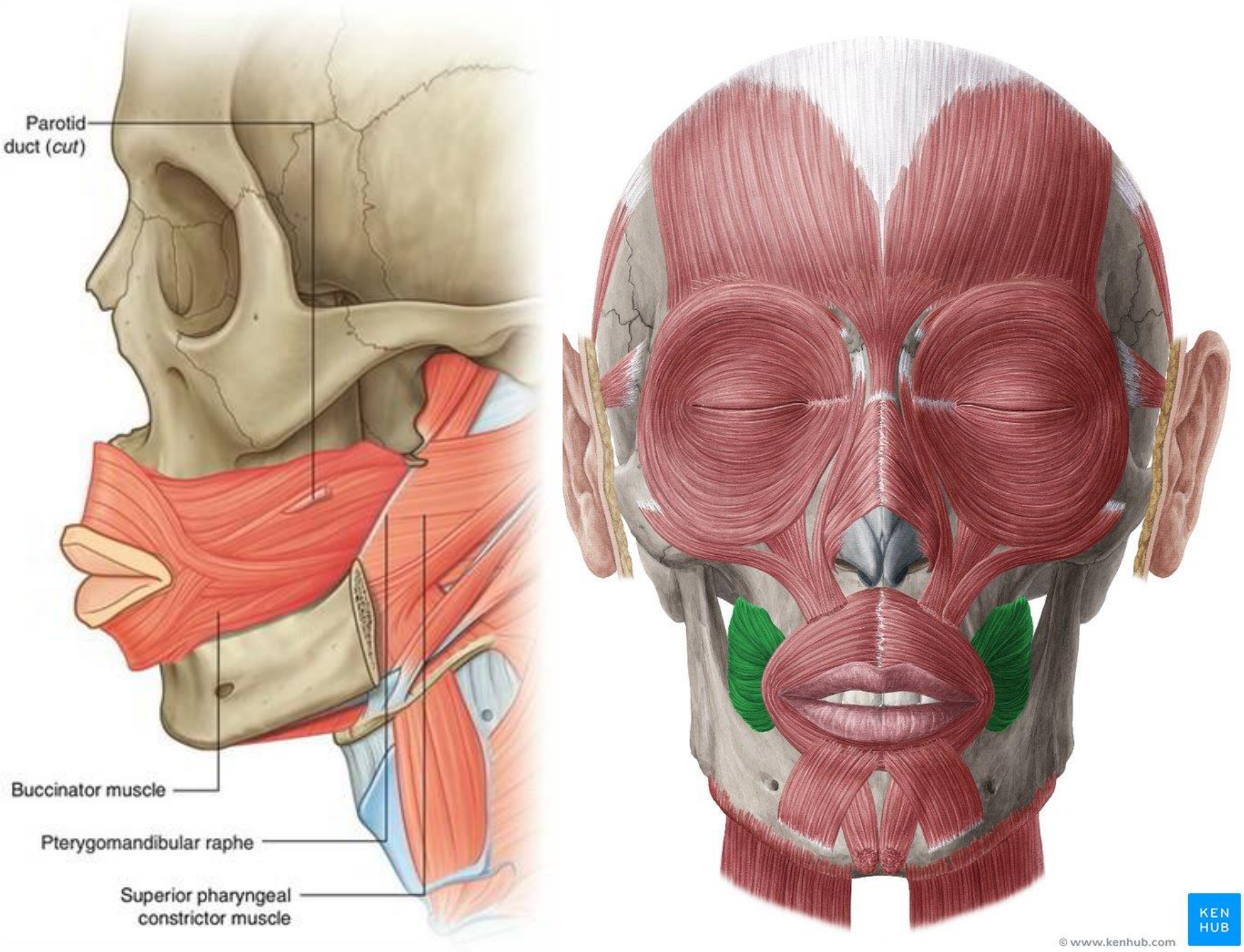
Buccinator

Origin:

Arises from the outer surface of the alveolar process of the maxilla and mandible (upper and lower fibers), corresponding to the molars anteriorly and from the anterior border of pterygomandibular raphe posteriorly (middle fibers).

Insertion:

The fibers converge towards the angle of the mouth (modulus) towards corresponding lip.



Buccinator

Blood supply:

Branches from the facial artery and the buccal branch of the maxillary artery.

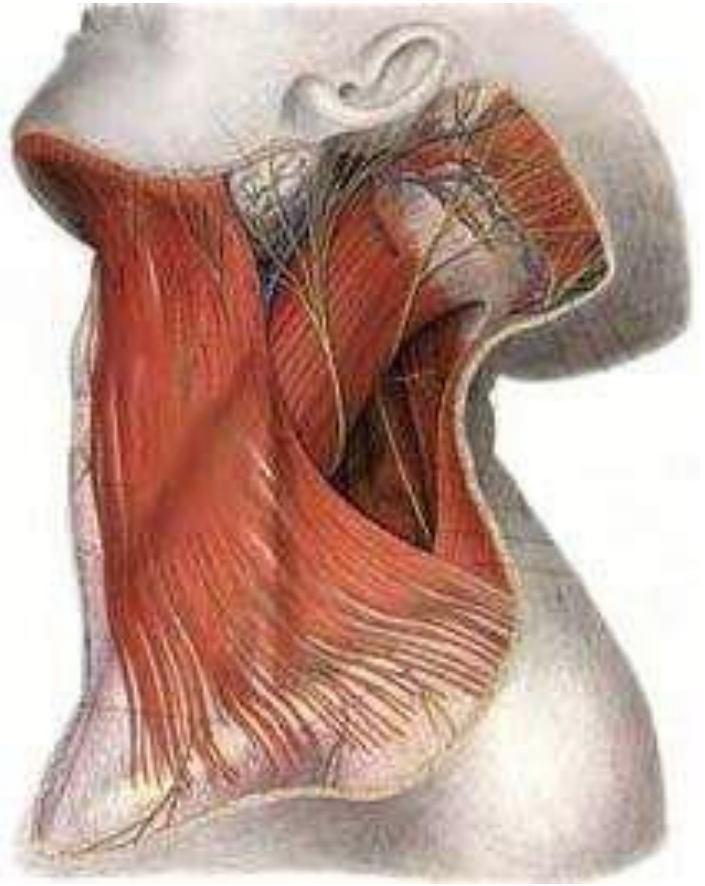
Action:

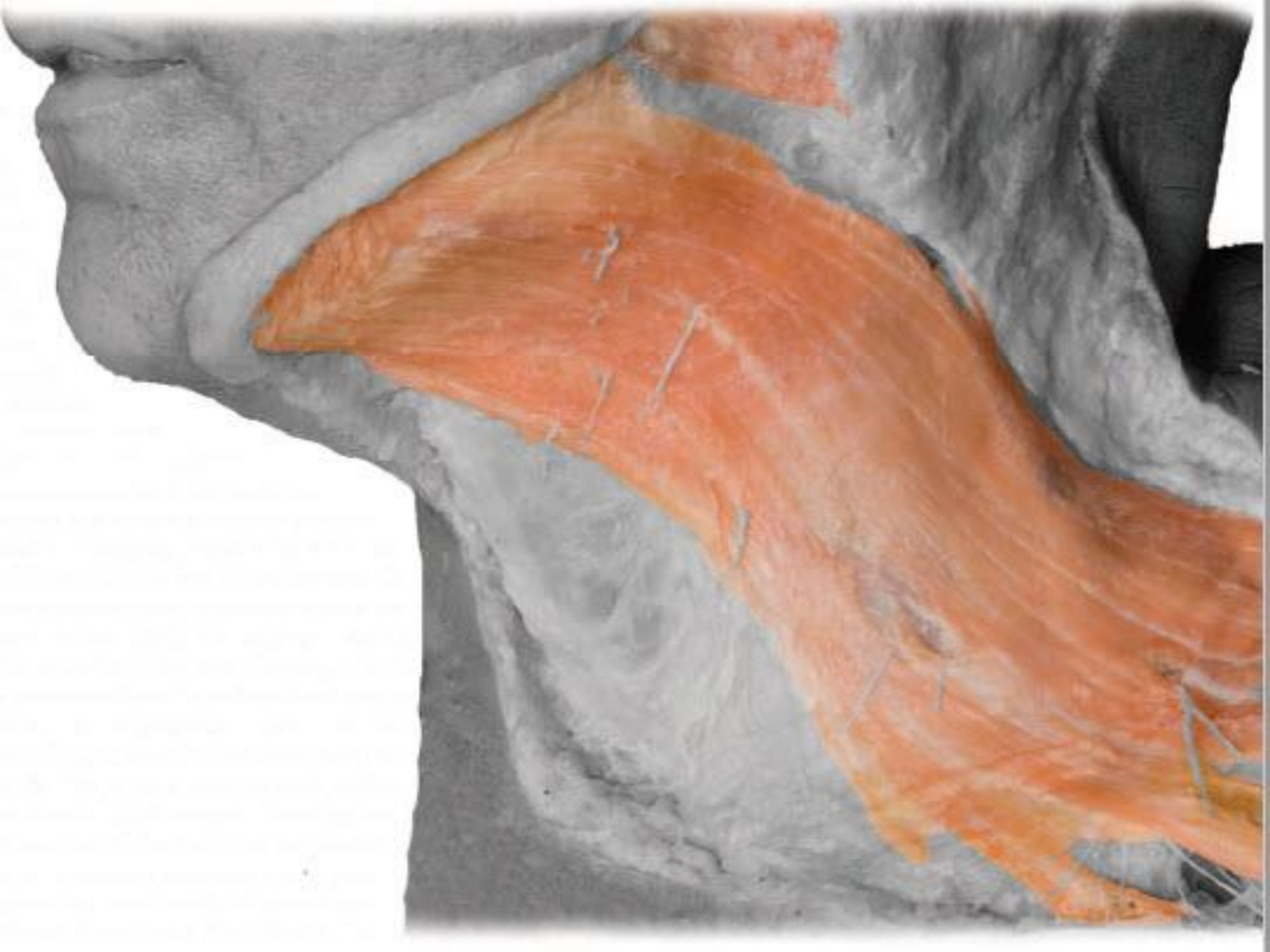
Compresses the cheeks so that during mastication the food is kept under immediate pressure of the teeth and It is **used every time air expanding the cheeks is forcefully expelled**.

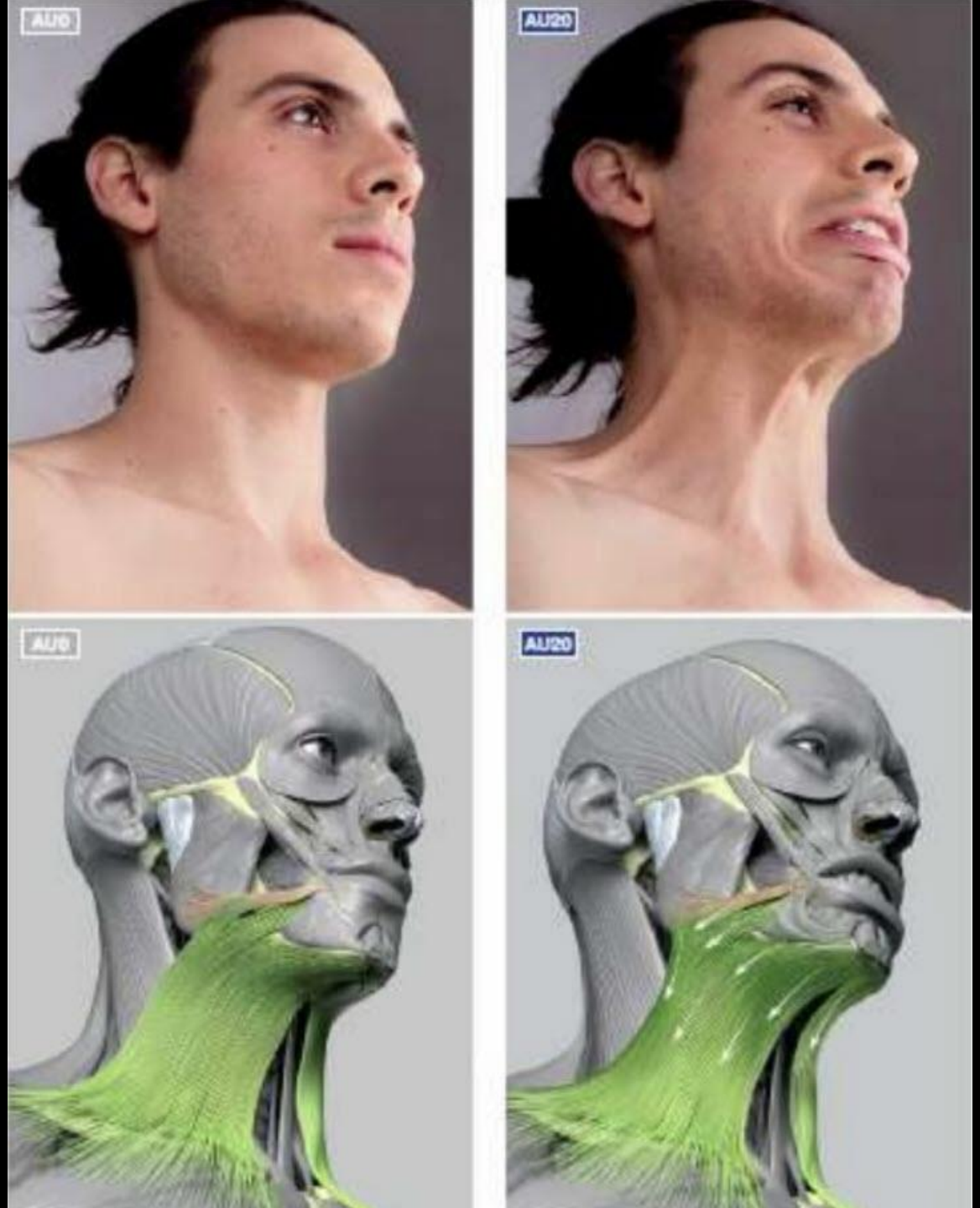
Hence it is sometimes called as ***accessory muscle of mastication***.

Platysma

- ***Origin:*** upper part of pectoral and deltoid fascia
- ***Insertion:*** base of mandible, skin of lower face and lip
- ***Action:*** pulls angle of mouth downwards and stretches skin of the neck (as in ***terror, fright and horror***)



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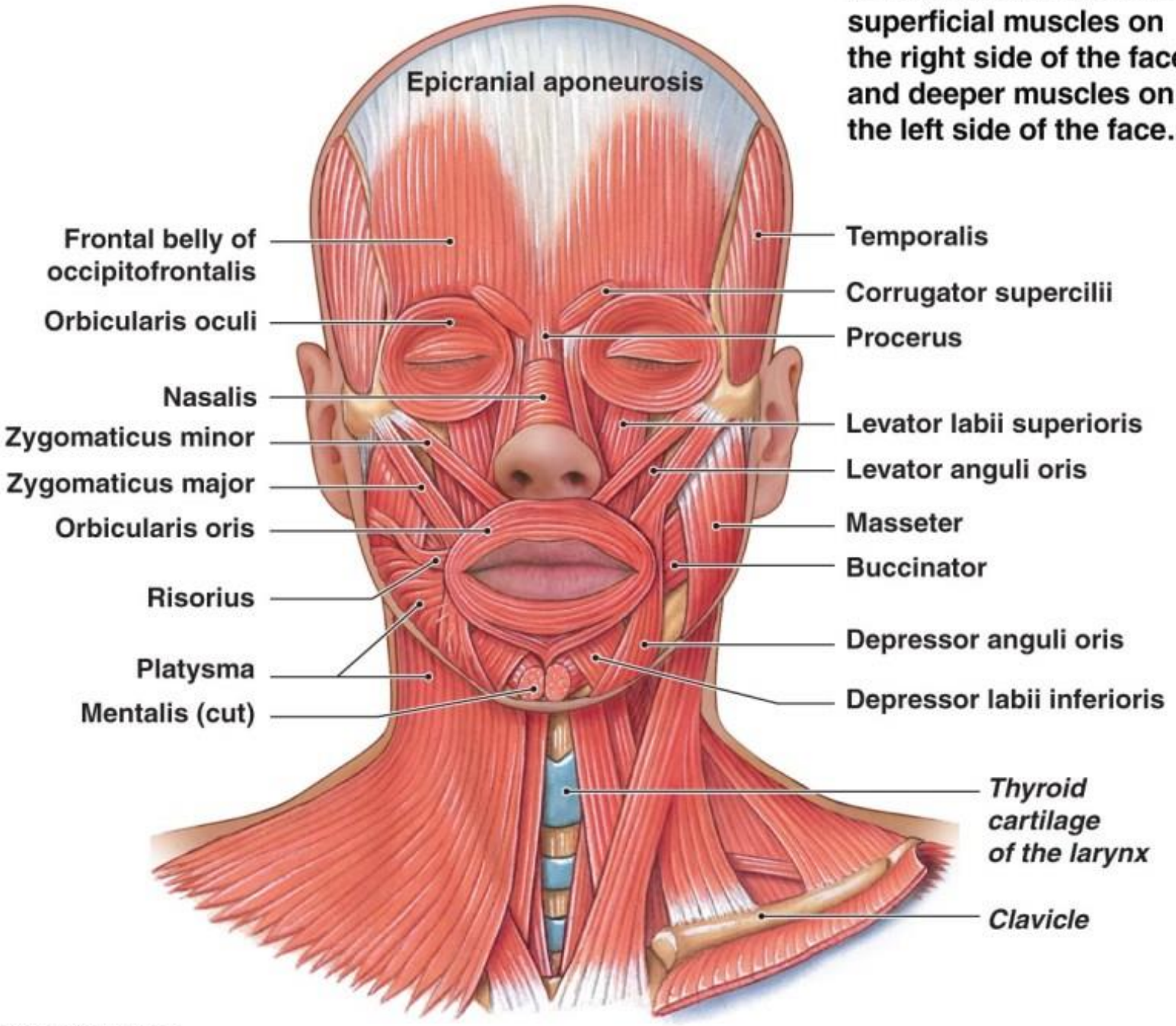
Muscles of Facial Expression

- The muscles of the face develop from the 2nd pharyngeal arch = ***facial nerve [VII].***
- They are in the superficial fascia, with origins from either bone or fascia, and **insertions into the skin**.
- These muscles control expressions of the face.
- They act as ***sphincters*** and ***dilators*** of the orifices of the face (i.e. the orbits, nose, and mouth).

An anterior view showing superficial muscles on the right side of the face, and deeper muscles on the left side of the face.

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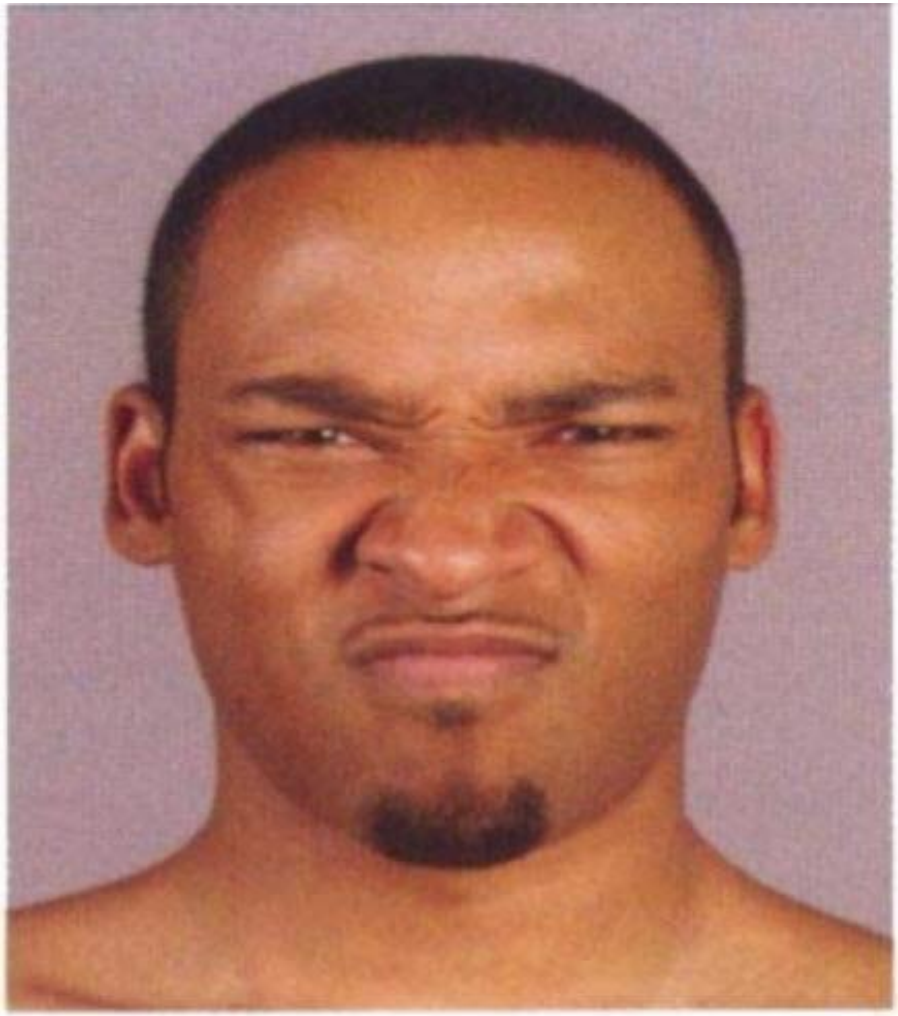
Procerus

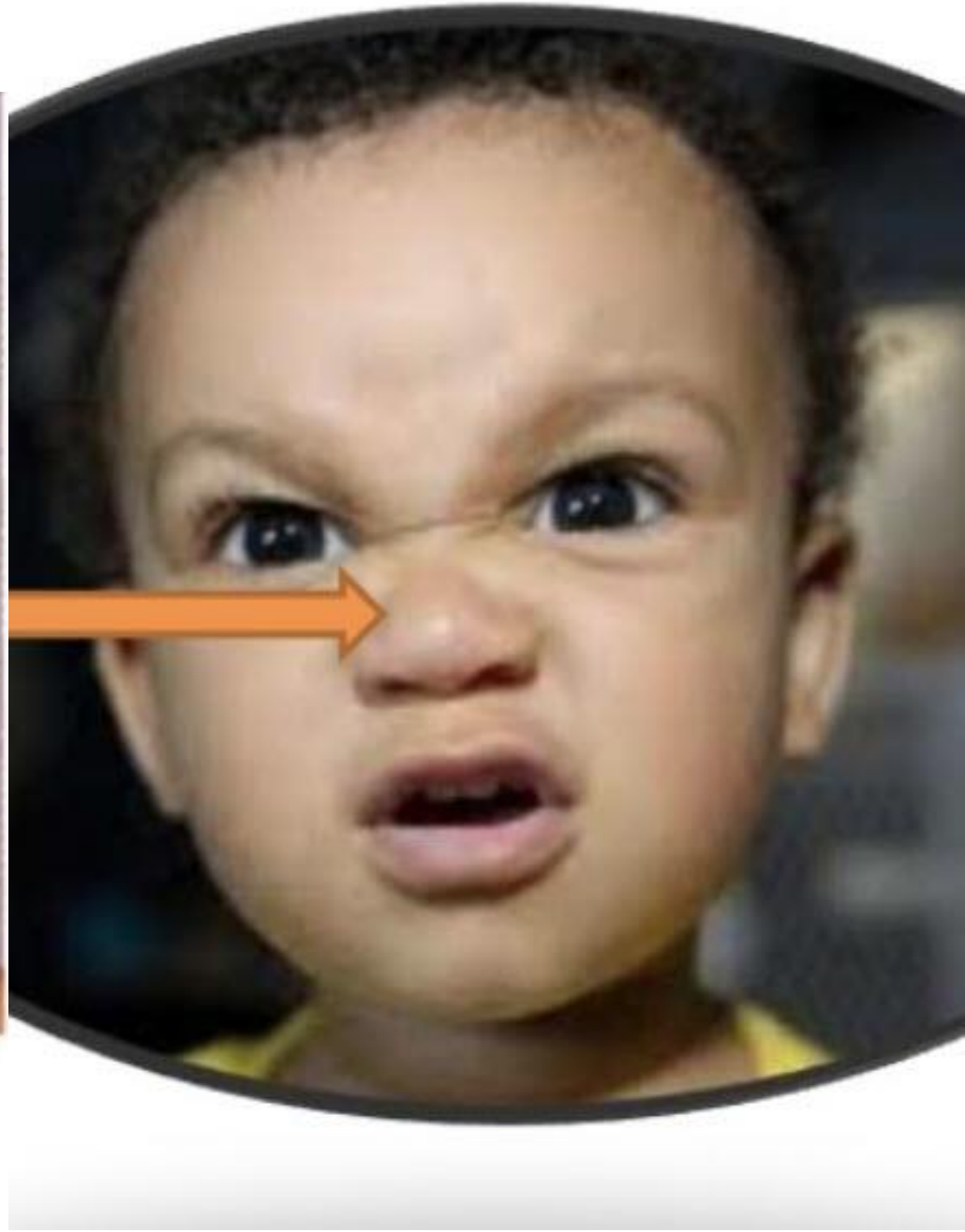
Origin: nasal bone and lateral nasal cartilage

Insertion: skin between the eyebrows

Action: pulls down the medial end of the eyebrow wrinkles the skin of the nose transversely in frowning



Procerus + transverse
part of nasalis



Zygomaticus Major

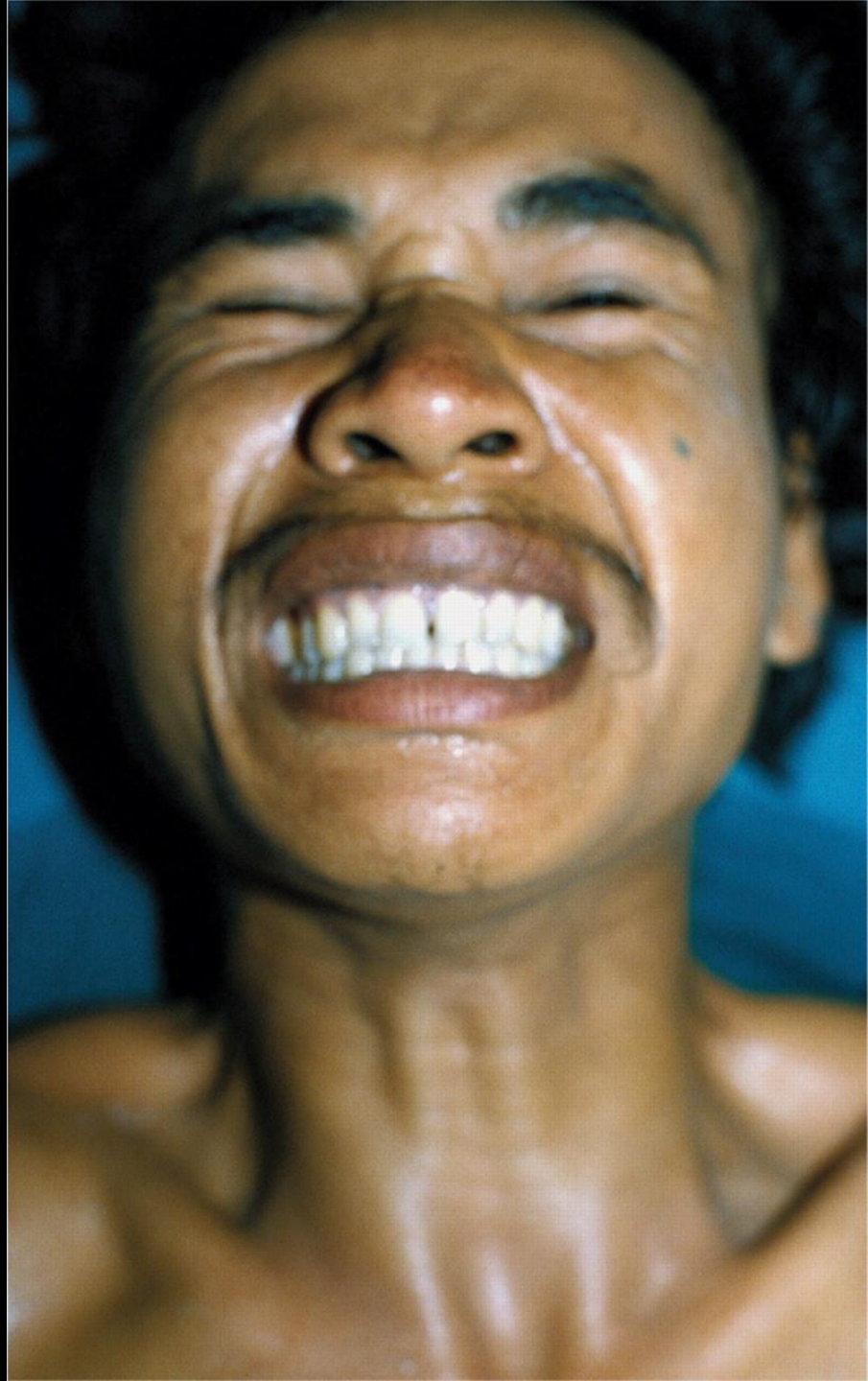
Origin: zygomatic bone

Insertion: angle of mouth

Action: draws angle of mouth upward and laterally as in laughing, smiling and Laughing Spasm "risus sardonicus" (highly characteristic, abnormal, sustained spasm of the facial muscles that appears to produce grinning "smiling broadly")

- **Risus Sardonicus**

A sign of tetanus. It can also be caused by poisoning with strychnine or Wilson's disease.



Zygomaticus Minor

Small muscle

Extending from zygomatic bone to the upper lip

Action: elevates and everts the upper lip increase the nasolabial furrow

Risorius

Origin: parotid fascia, as a continuation of posterior fibers of platysma

Insertion: angle of mouth

Action: retract the angle of mouth as in grinning

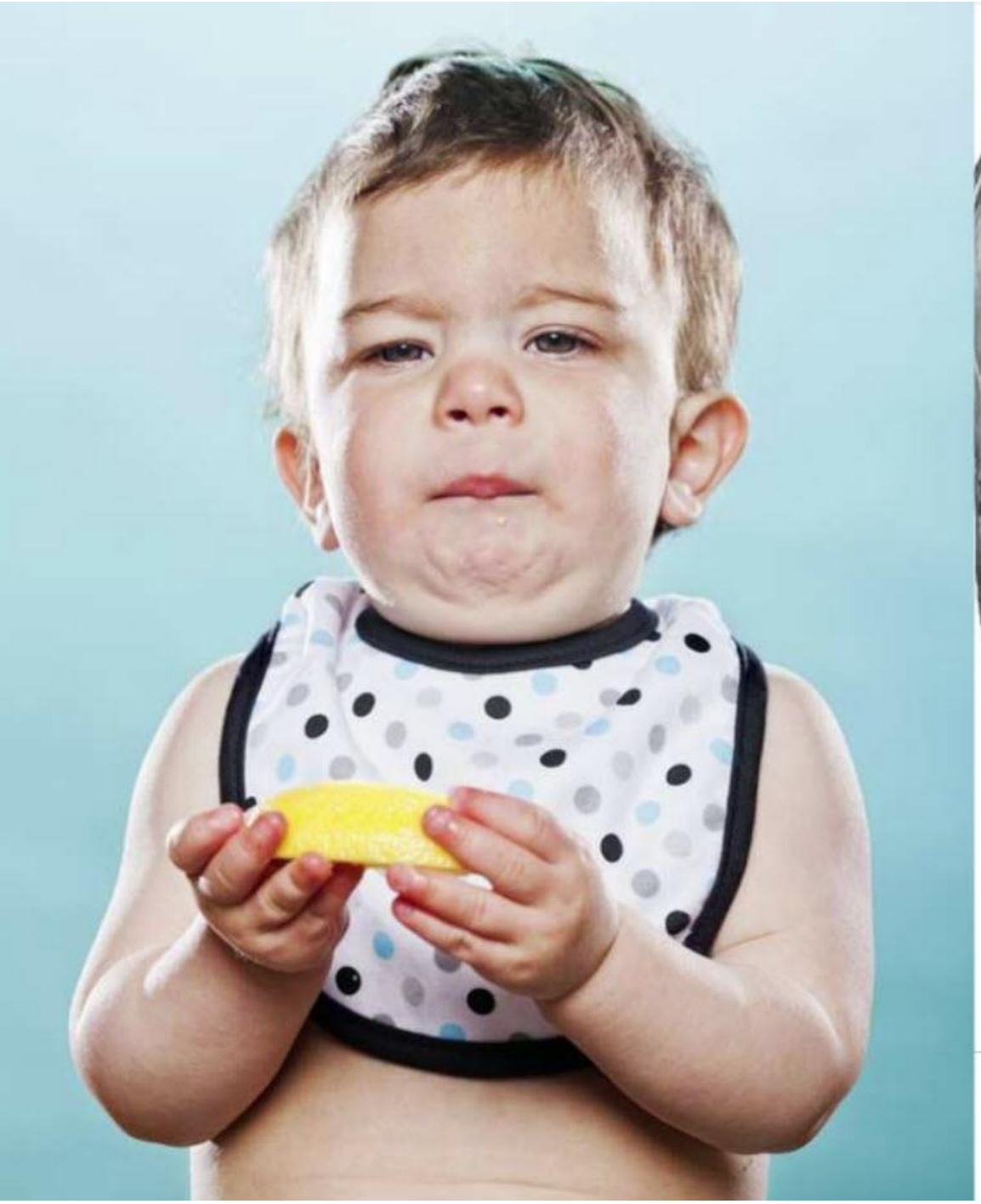
Mentalis

Muscle of chin, conical in shape

Origin: incisive fossa

Insert: skin of chin

Action: puckers the chin, protrudes the lower lip in drinking



mentalis

Common Facial Expressions

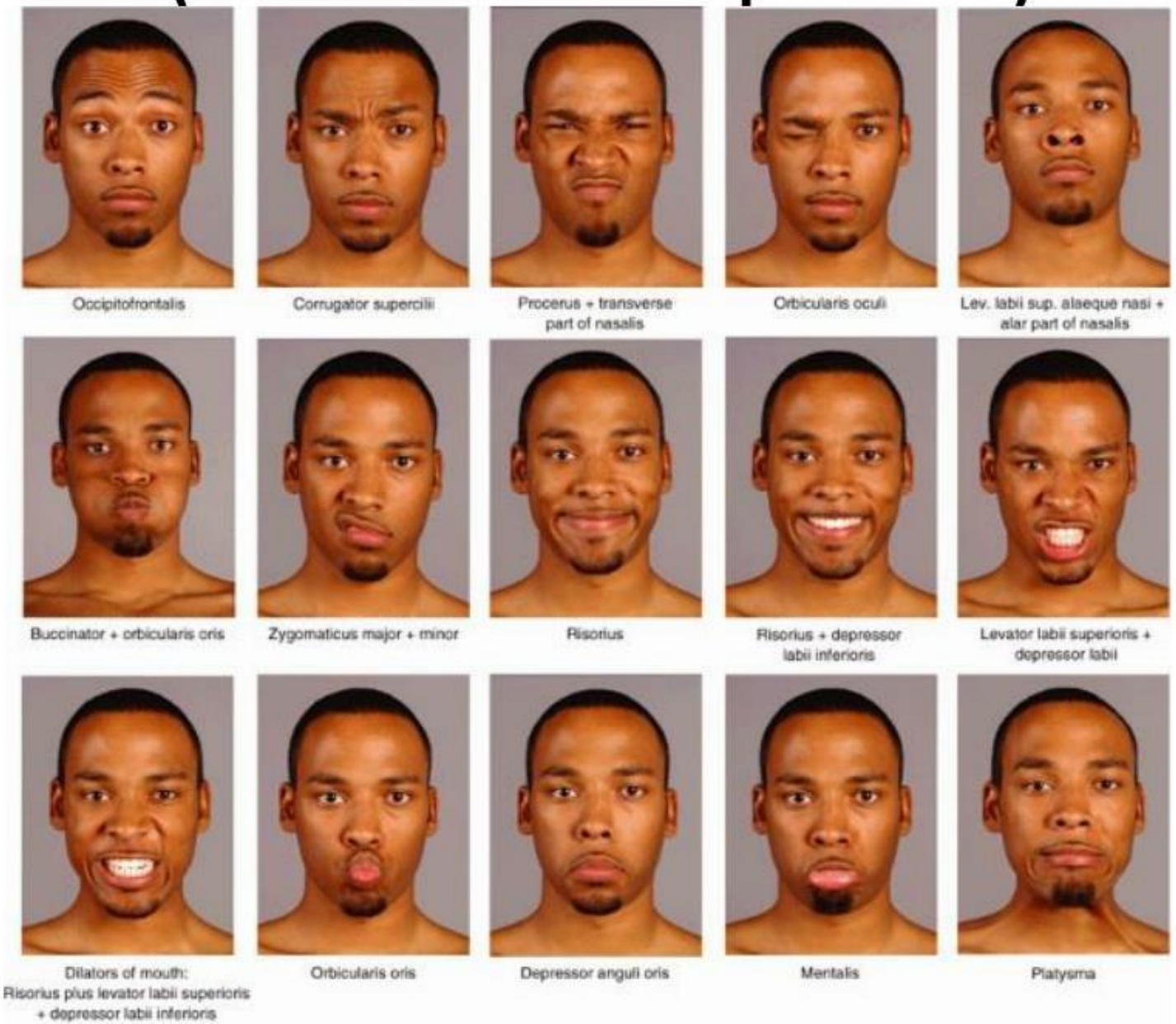
- **Smiling & Laughing: Zygomatics Major**
- **Grief: Depressor Anguli Oris**
- **Anger: Dilator Naris & Depressor Septi**
- **Frowning: Corrugator Supercilii & Procerus**

Common Facial Expressions

- **Horror, Terror & Fight: Platysma**
- **Surprise: Frontalis**
- **Doubt: Mentalis**
- **Grinning: Risorius**
- **Contempt: Zygomatic Minor**

Muscles of The Face

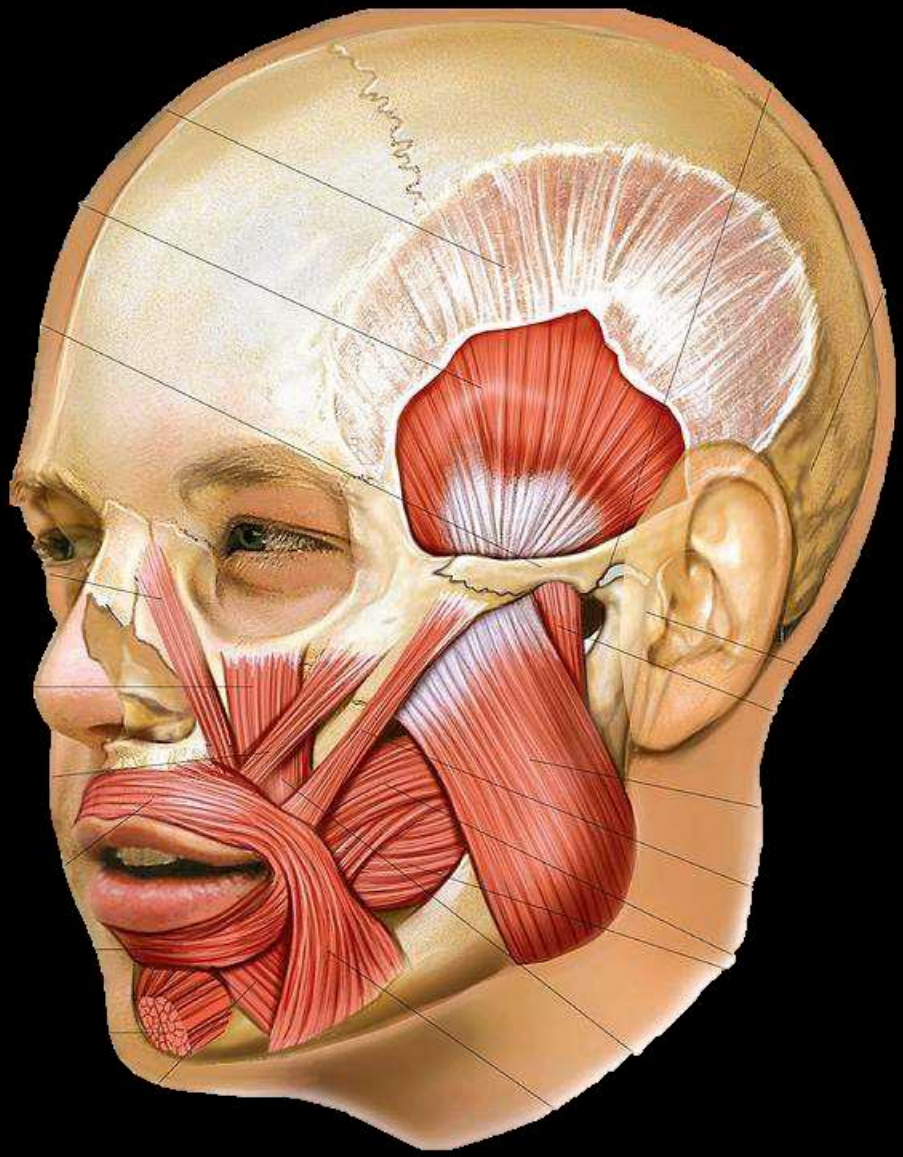
(Muscle of Facial Expressions)



Muscles of Mastication

- The muscles of mastication are mainly concerned in the movement of mandible during mastication and speech.

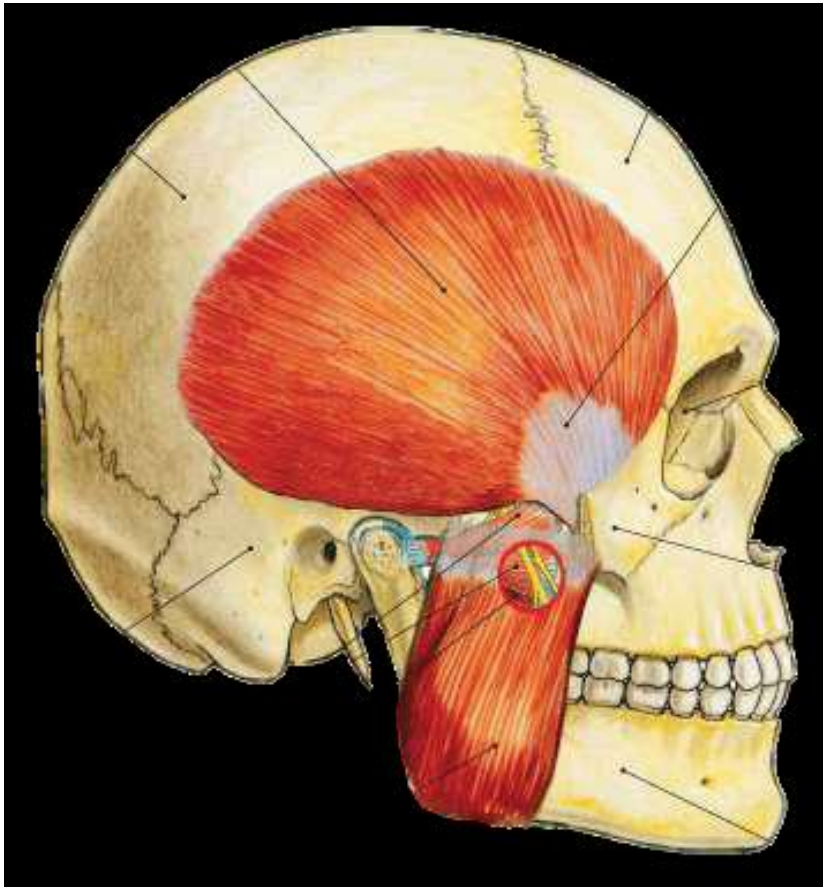
- They develop from the mesoderm of ***1st branchial arch*** and is supplied by ***mandibular nerve***, which is a nerve of that arch.



Muscles of Mastication

Include the following muscles:

1. Masseter
2. Temporalis
3. Medial pterygoid
4. Lateral pterygoid



Masseter

It is a quadrilateral muscle that covers the lateral surface of ramus of mandible.

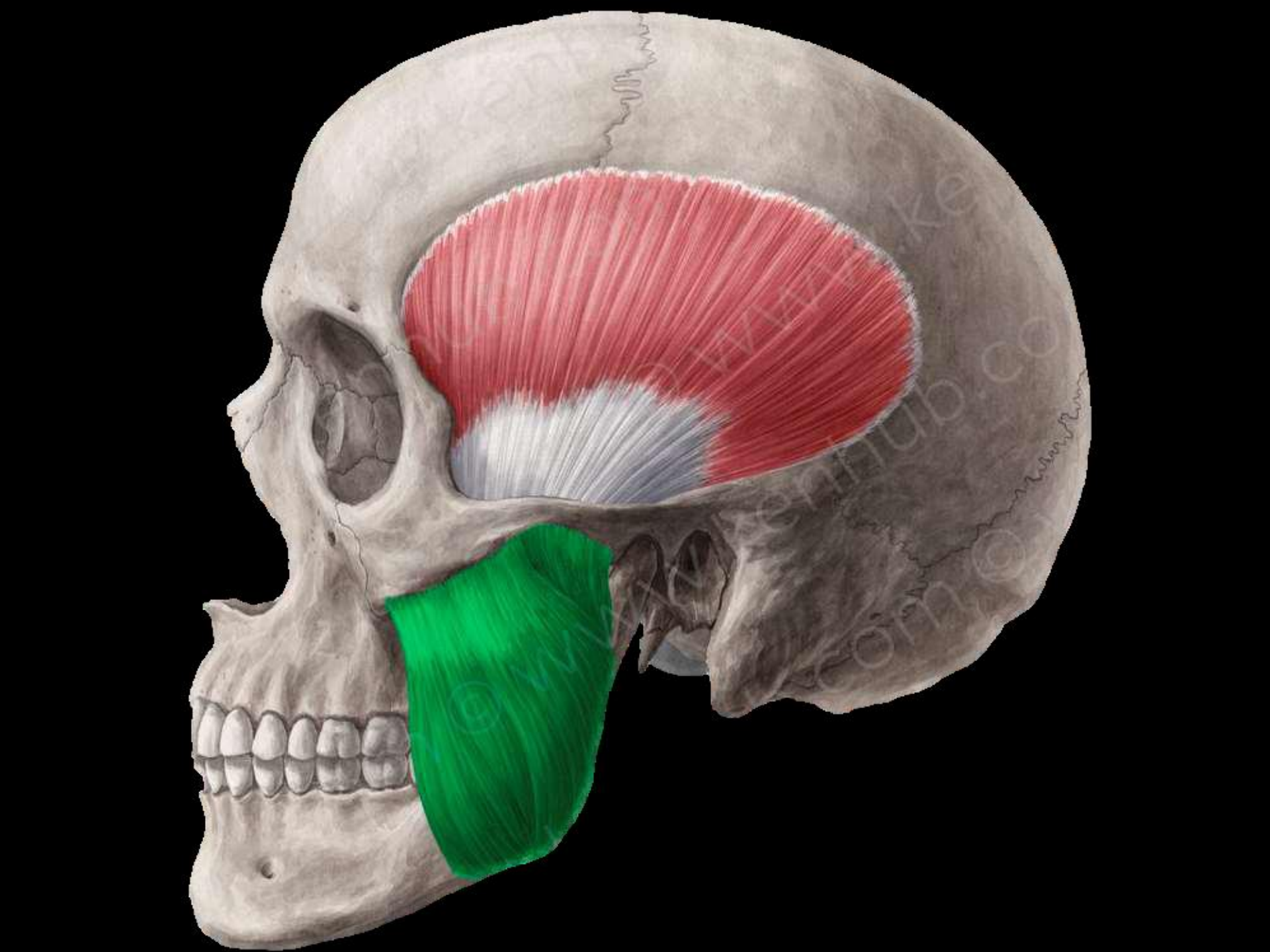
It is divided into two layers:

Superficial part:

Originates from the anterior 2/3rd of lower border of zygomatic arch and inserts into lower part of lateral surface of ramus.

Deep layer:

Originates from the deep surface of zygomatic arch and inserts into the rest of ramus of the mandible.



Masseter

Nerve supply:

Masseteric nerve which is branch ***of*** anterior division of ***mandibular nerve***.

Blood supply:

Supplied by the ***masseteric branch*** of the ***maxillary artery***, the ***facial*** artery and the ***transverse facial*** branch of the ***superficial temporal artery***.

Action:

Elevates the mandible to close the mouth.

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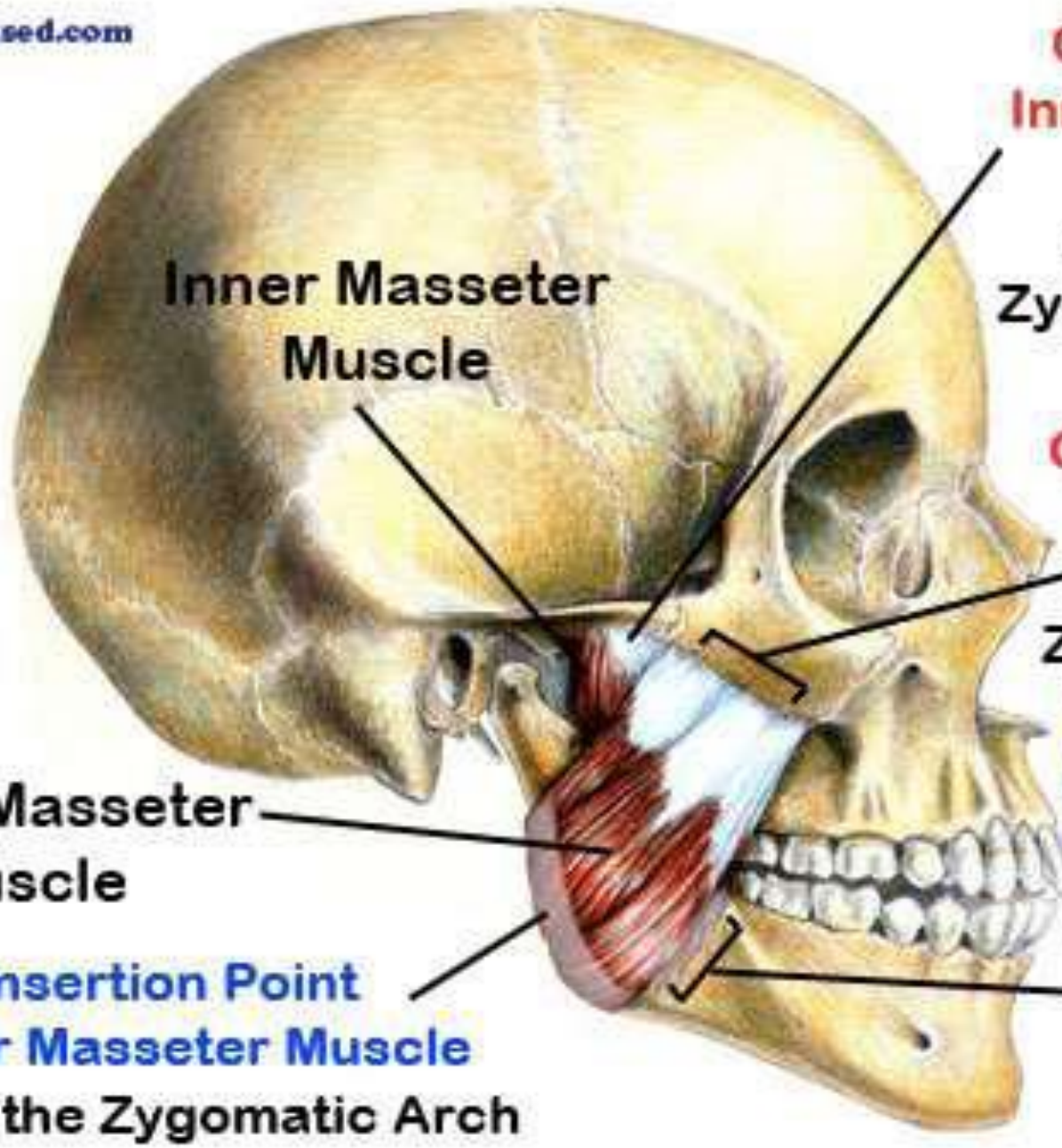


Origin Point
Inner Masseter
Muscle
rear of the
Zygomatic Arch

Inner Masseter
Muscle

Origin Point
Outer Masseter
Muscle
along the
Zygomatic Arch

Insertion Point
Inner Masseter
Muscle
upper surface
of the
Ramus of the
Mandible

Outer Masseter
Muscle

Insertion Point
Outer Masseter Muscle
rear of the Zygomatic Arch

Temporalis

Origin and insertion:

Originates from ***temporal fossa*** ***excluding the zygomatic bone***, and the ***temporal fascia***.

The fibers converge and passes deep to the zygomatic arch and ***inserts*** into the margins of the ***coronoid process*** and anterior border of the ***ramus*** of the ***mandible***.

Temporalis

Nerve supply:

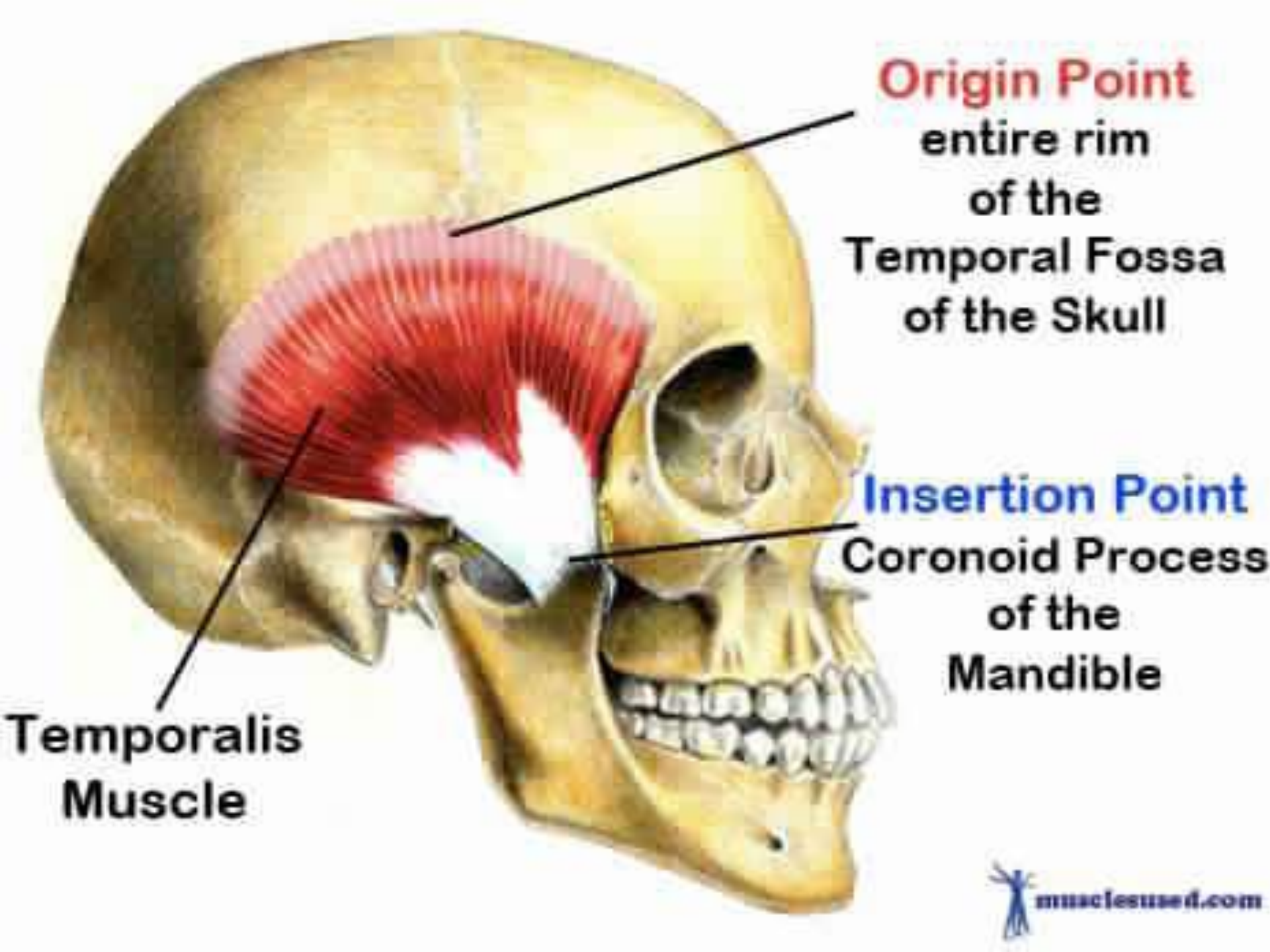
Two deep temporal branches from the anterior division of the mandibular nerve.

Blood supply:

Supplied by the deep temporal branches from the second part of the maxillary artery.

Actions:

1. Elevates the mandible to close the mouth.
2. Posterior fibers retract the protruded mandible.


Origin Point
entire rim
of the
Temporal Fossa
of the Skull
Insertion Point
Coronoid Process
of the
Mandible
Temporalis
Muscle
musclesused.com

Medial Pterygoid

Origin:

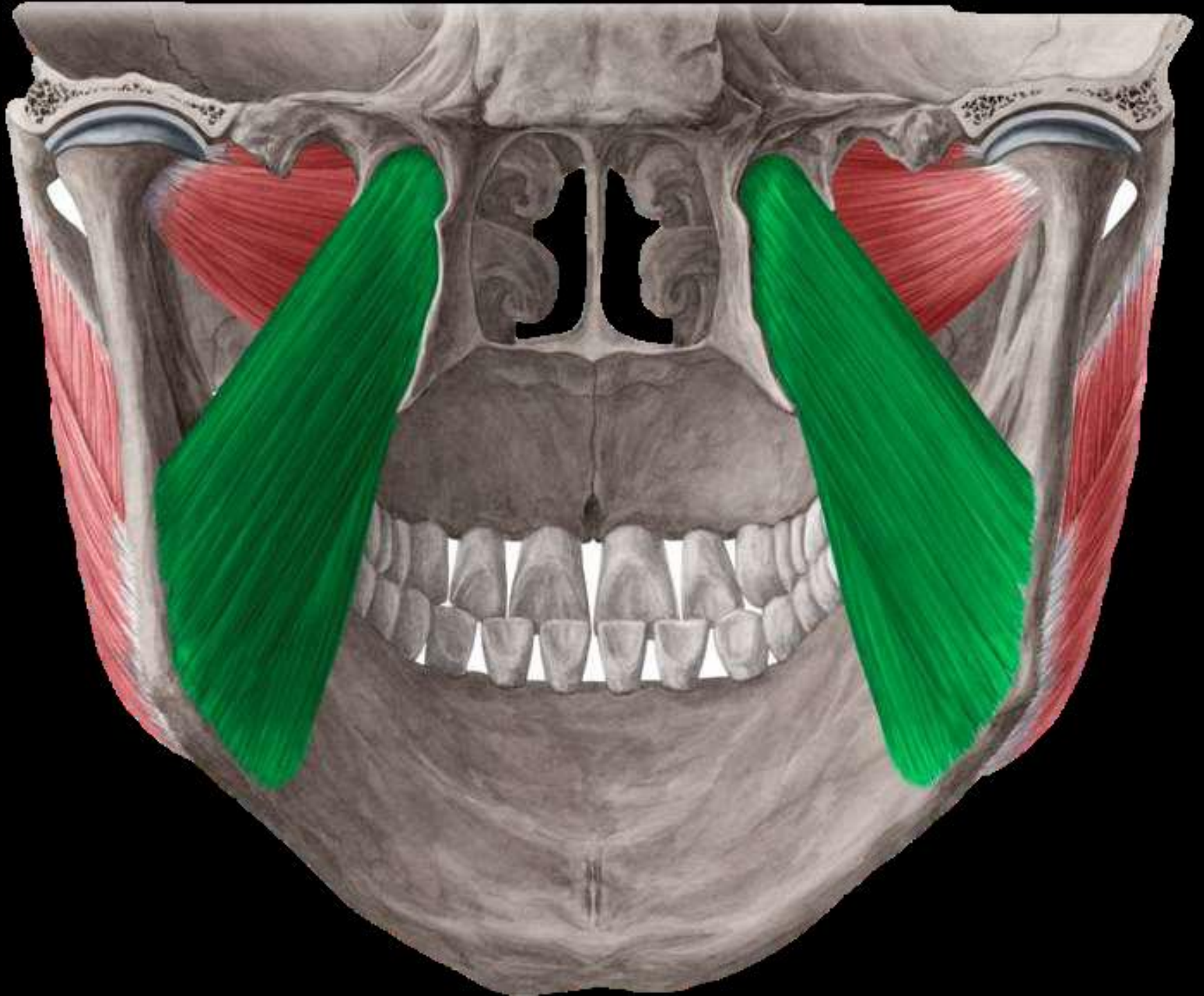
It has two heads:

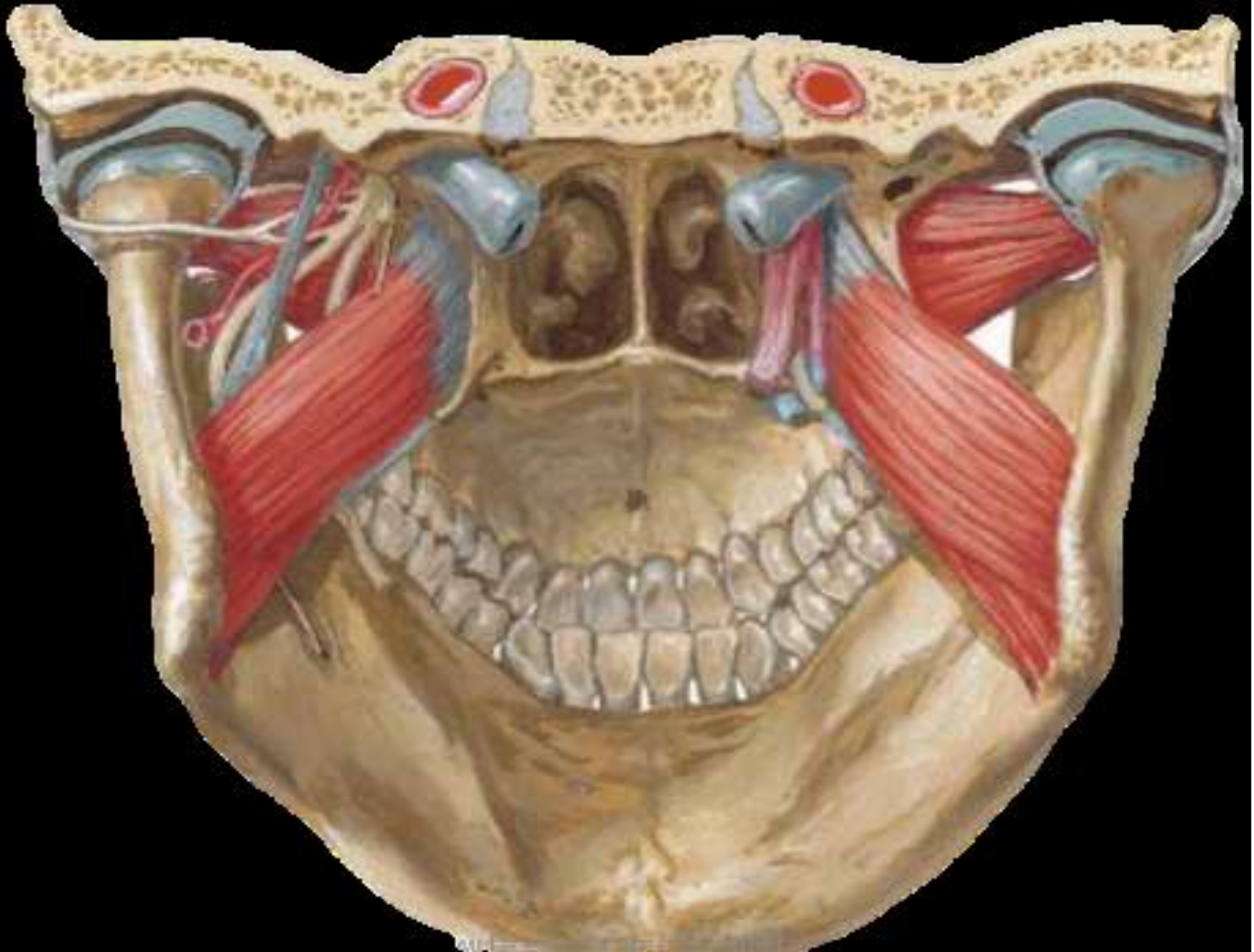
Superficial head: originates from the tuberosity of the maxilla and adjoining bone.

Deep head: originates form the medial surface of lateral pterygoid plate and adjoining process of palatine bone.

Insertion:

Into the roughened area on the ***medial surface of angle*** and adjoining ramus of ***mandible***, below and behind the mandibular foramen and mylohyoid groove.





Medial Pterygoid

Nerve supply:

Nerve to medial pterygoid, a branch of the main trunk of mandibular nerve.

Blood supply:

Medial pterygoid derives its main arterial supply from the pterygoid branches of the maxillary artery.

Actions:

1. Elevates mandible
2. Protrusion of mandible
3. Side to side grinding movements in alternate movements of the muscles

Lateral Pterygoid

Origin:

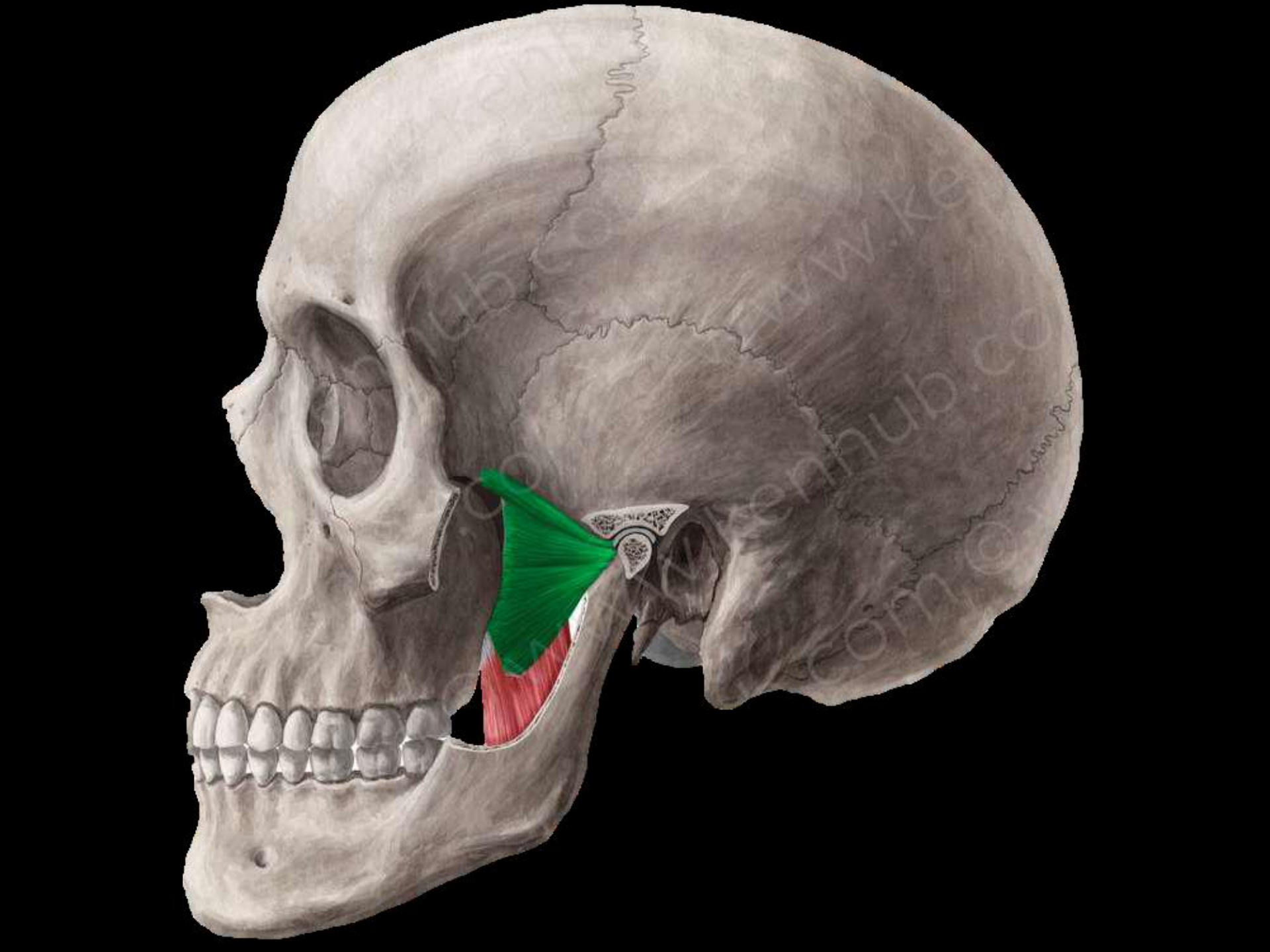
It has two heads

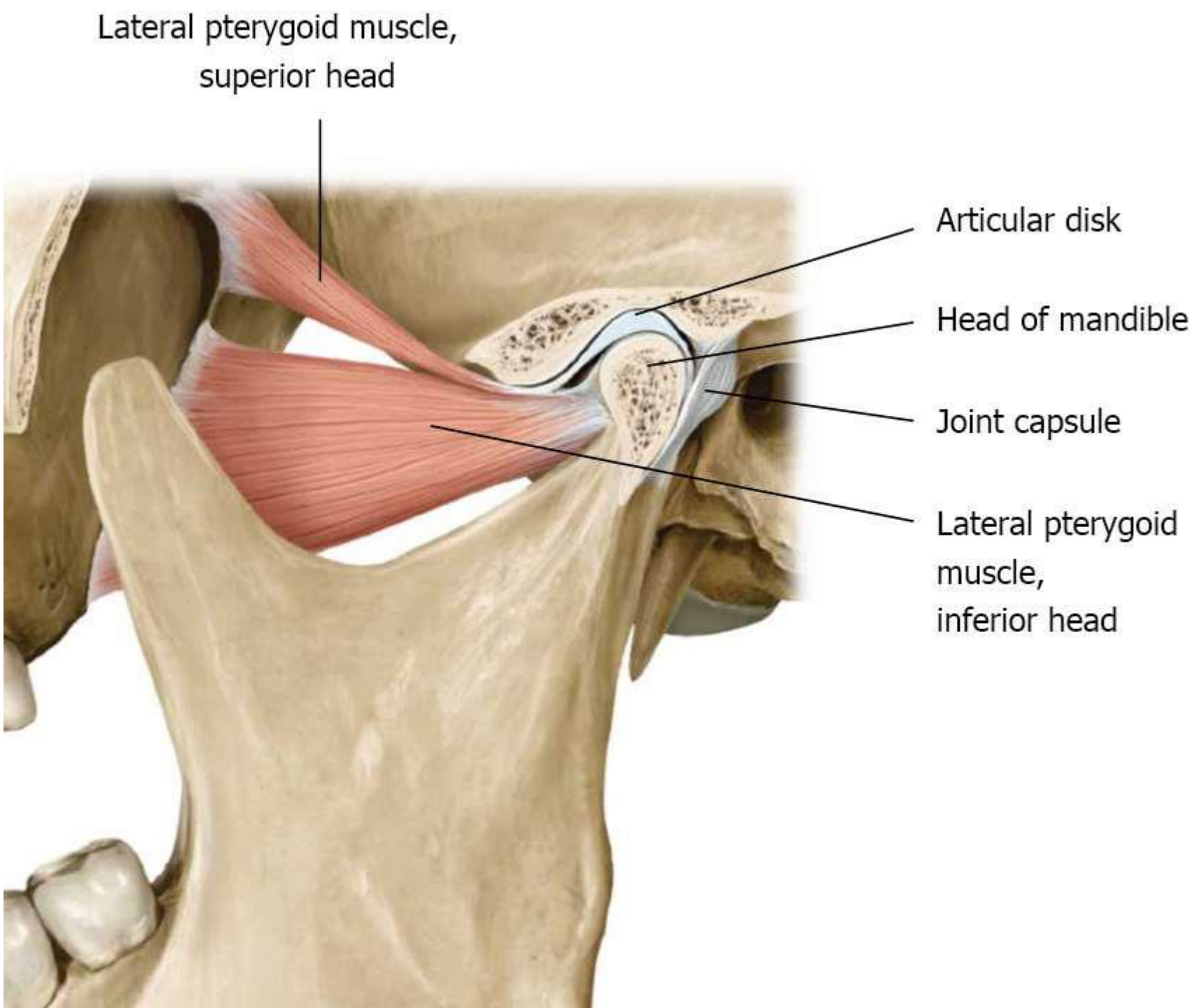
Upper head: originates from the infratemporal surface and crest of the greater wing of sphenoid.

Lower head: from the lateral surface of the lateral pterygoid plate.

Insertion:

Its fibers insert into ***pterygoid fovea*** on the anterior surface of the neck of the condyle mandible anterior margin of the articular disc and capsule of TMJ.




Lateral pterygoid muscle, superior head
Articular disk
Head of mandible
Joint capsule
Lateral pterygoid muscle, inferior head

Lateral Pterygoid

Nerve supply:

A branch of anterior division of mandibular nerve.

Blood supply:

Lateral pterygoid is supplied by pterygoid branches from the maxillary artery.

Actions:

1. Depresses mandible to open the mouth along with suprahyoid muscles (Main opener of the mouth).
2. Lateral and medial pterygoids protrude the mandible.

Applied Anatomy

Masseteric hypertrophy:

It is recognized as an enlargement of one or both masseter muscles. Most patients complain of facial asymmetry.

Submasseteric space infection:

Sometimes infection around mandibular third molar tooth tracks backwards, lateral to the mandibular ramus and pus localizes deep to the attachment of masseter in the submasseteric tissue space.

Masseteric Hypertrophy

Submasseteric Space Infection

- For further inquiries ***PLZ*** feel free to contact at any time through email

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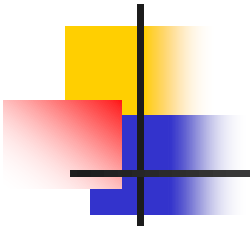

Thank You