

Peripheral Nervous System

THE SCALP

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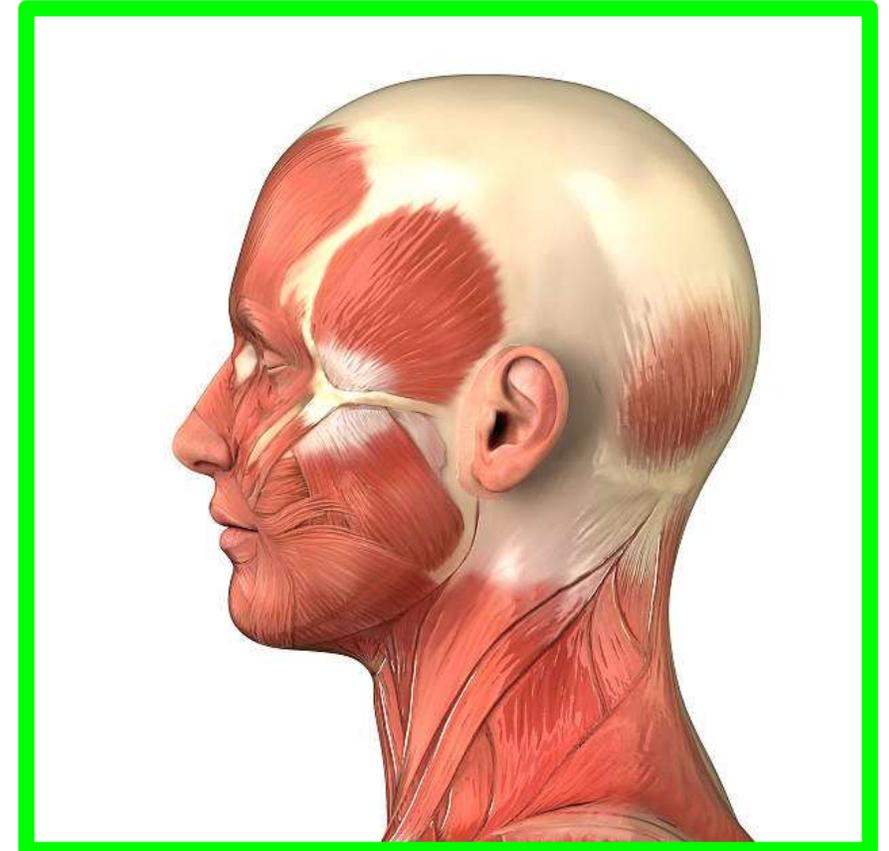
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Sunday 26 February 2023

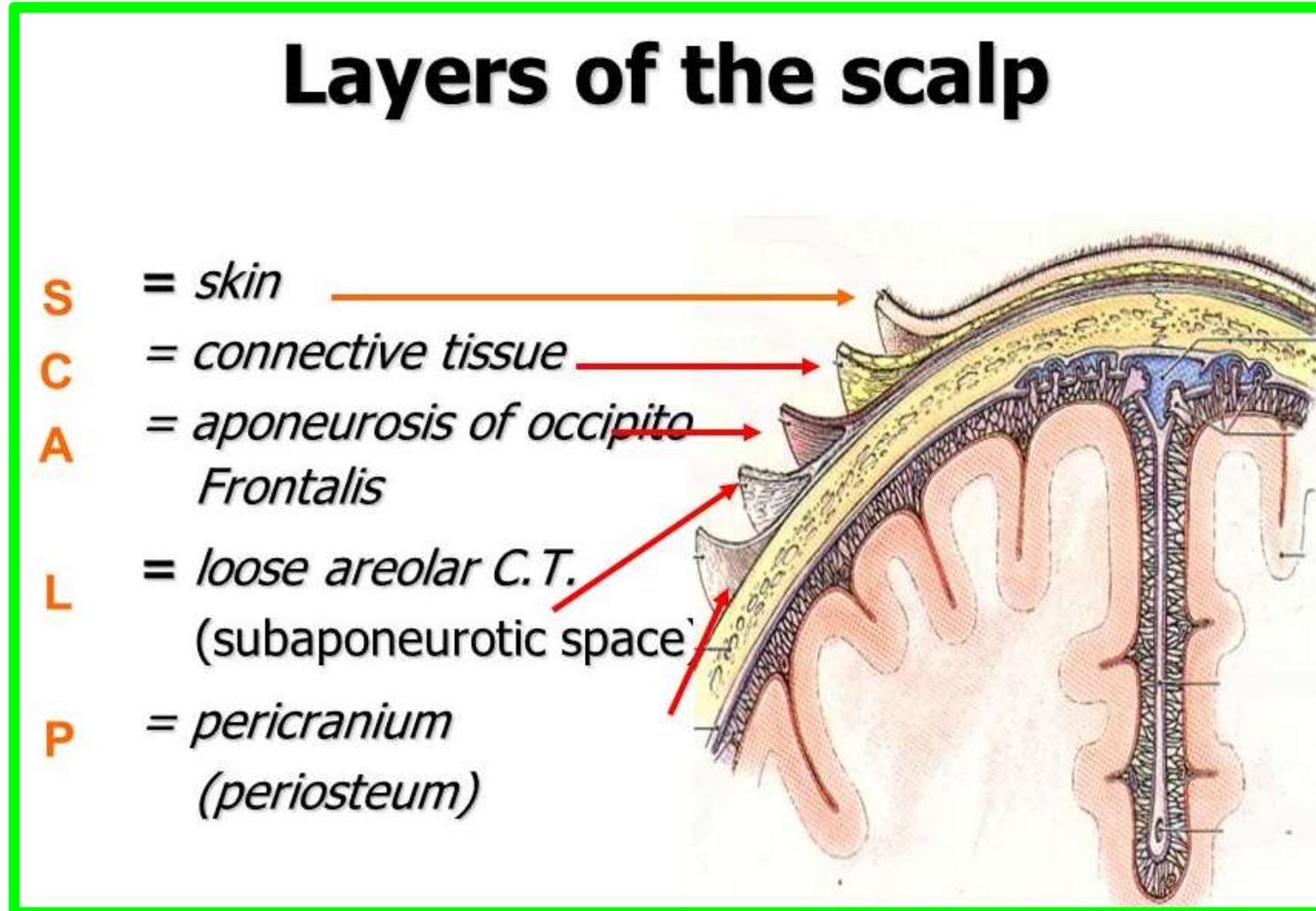
The Scalp

- The scalp includes the soft tissues covering the skull cap.
- Extent;
 - Anteriorly; Skin of the eye brows.
 - Posteriorly; External occipital protuberance and highest nuchal lines.
 - Laterally; superior temporal lines.



The Scalp

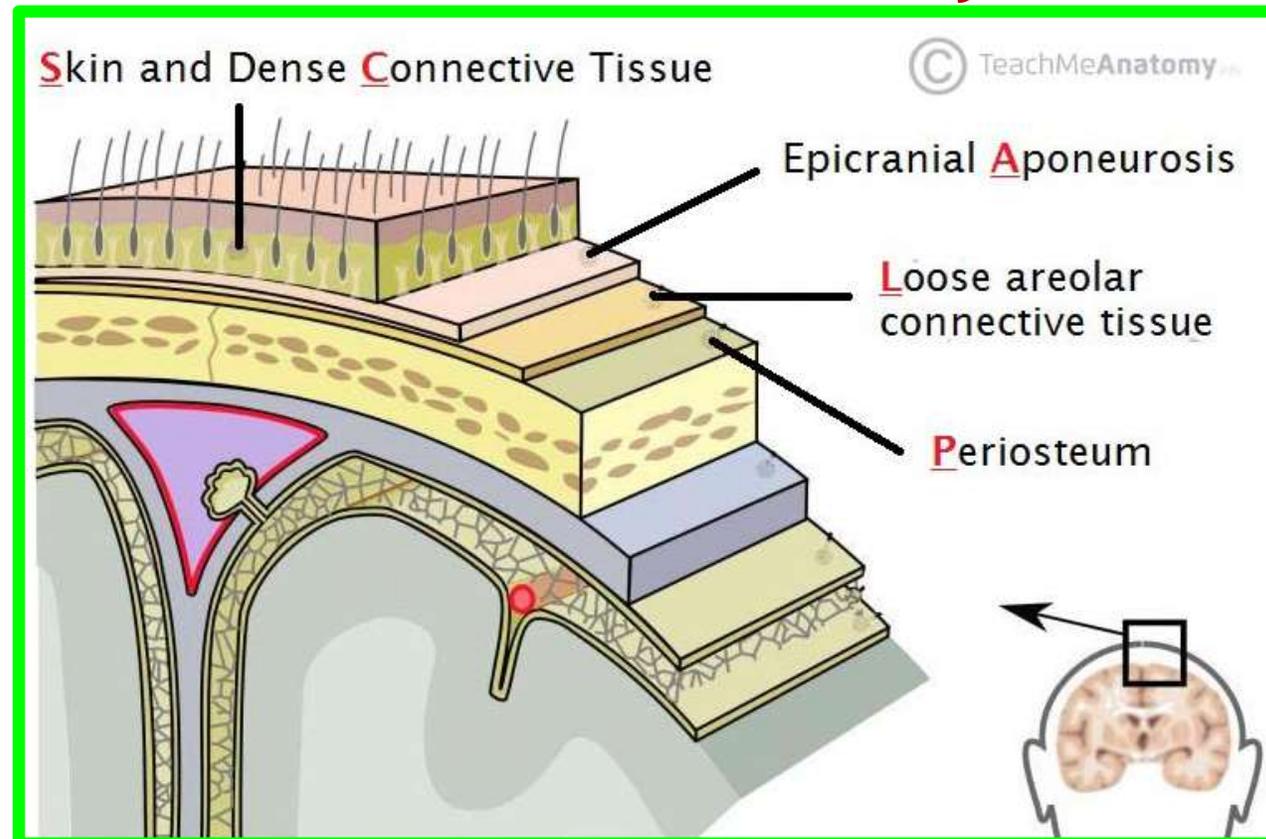
The scalp consists of **five layers**, the first three of which are intimately bound together and move as a unit. (use each letter of the word SCALP to denote the layer of the scalp)



The Scalp

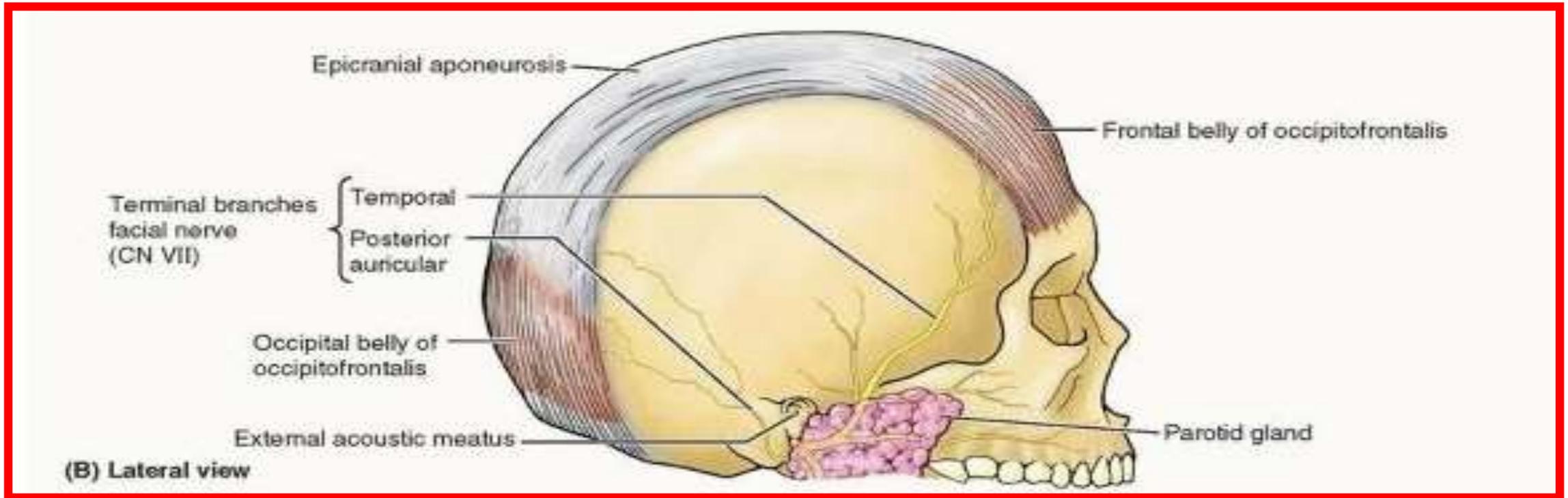
❖ **Skin**, which is thick and hair bearing and contains numerous sebaceous glands

❖ **Connective tissue** beneath the skin, which is fibrofatty
Numerous arteries and veins are found in this layer.



The Scalp

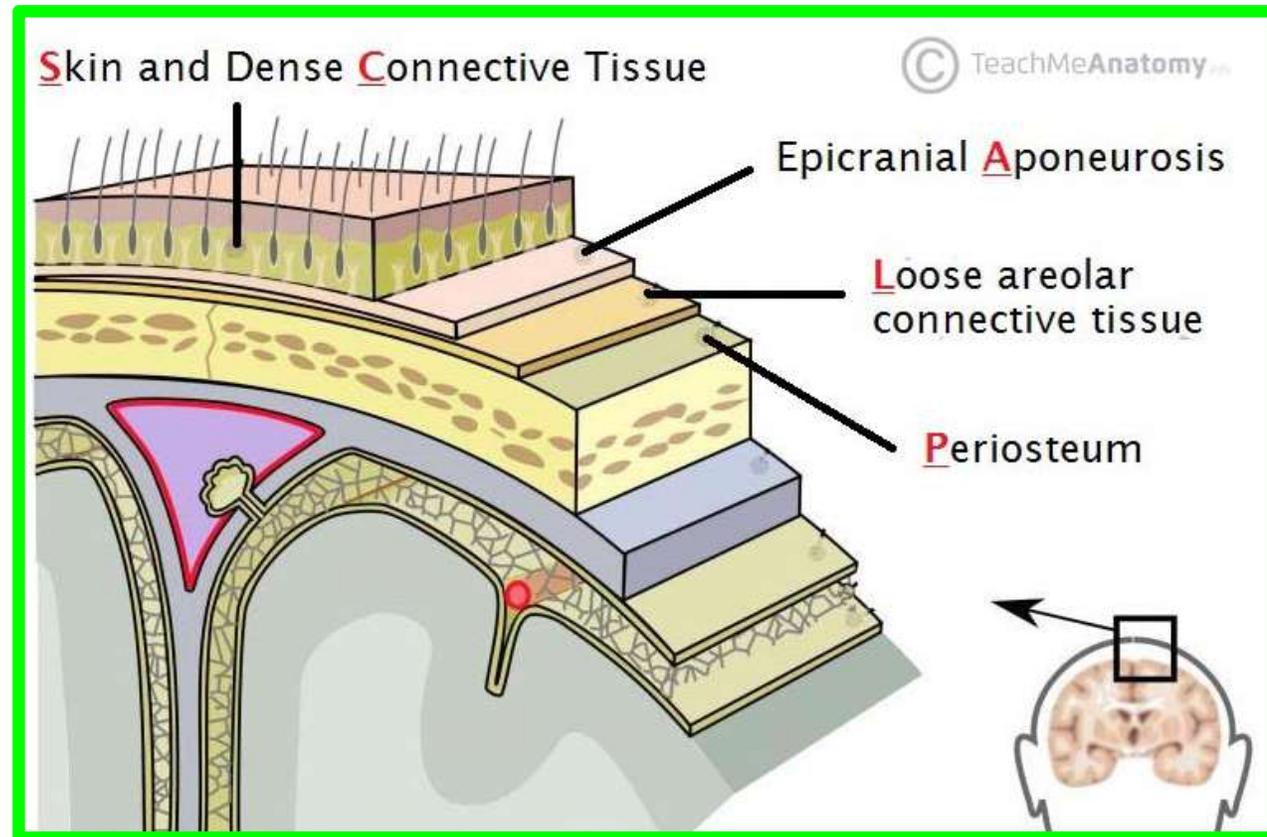
❖ **Aponeurosis (epicranial)**, which is a thin, tendinous sheet that unites the **occipital and frontal bellies** of the **occipitofrontalis muscle**



The Scalp

❖ **Loose areolar tissue**, which occupies the subaponeurotic space and loosely connects the epicranial aponeurosis to the periosteum of the skull (the pericranium).

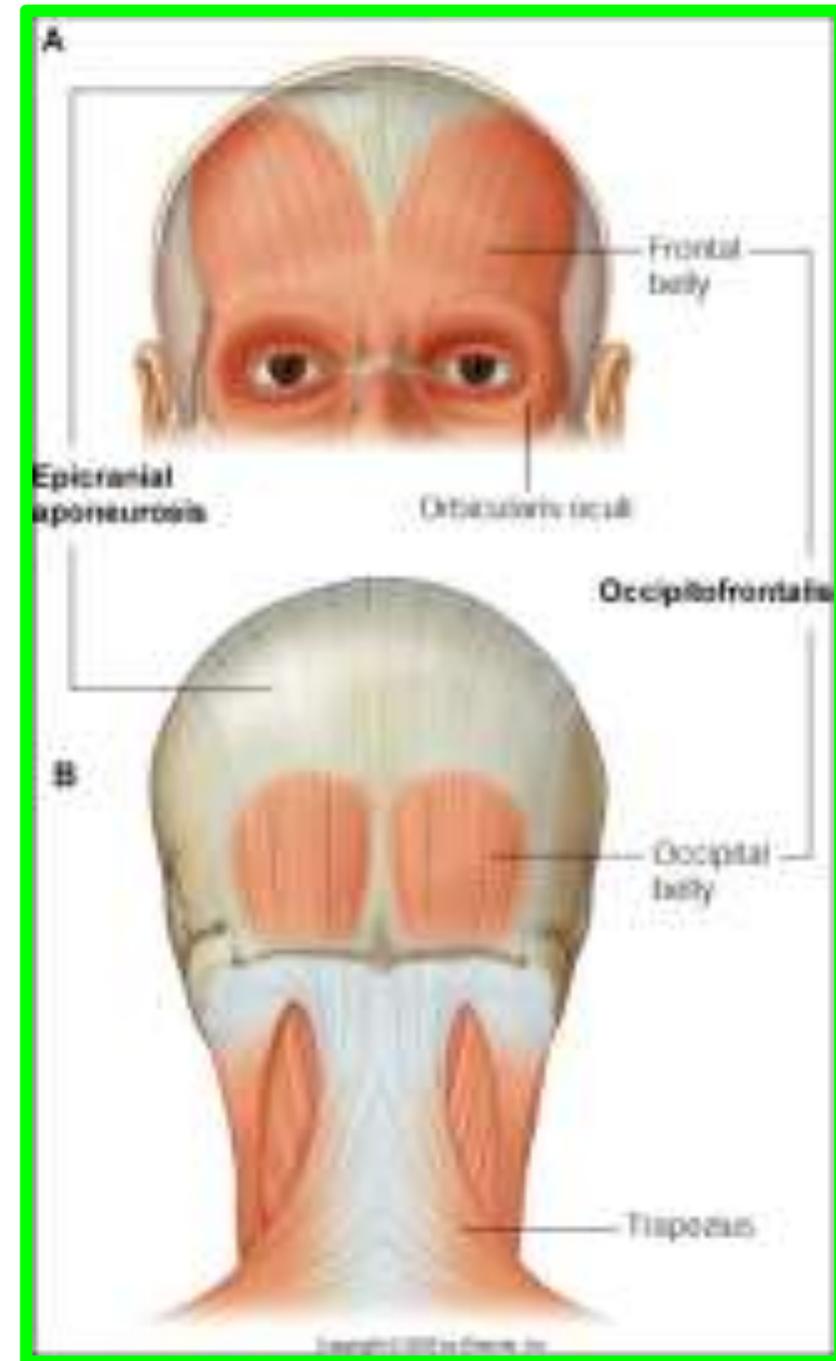
❖ **Pericranium**, which is the periosteum covering the outer surface of the skull bones.



The Scalp

* Occipitofrontalis Muscle

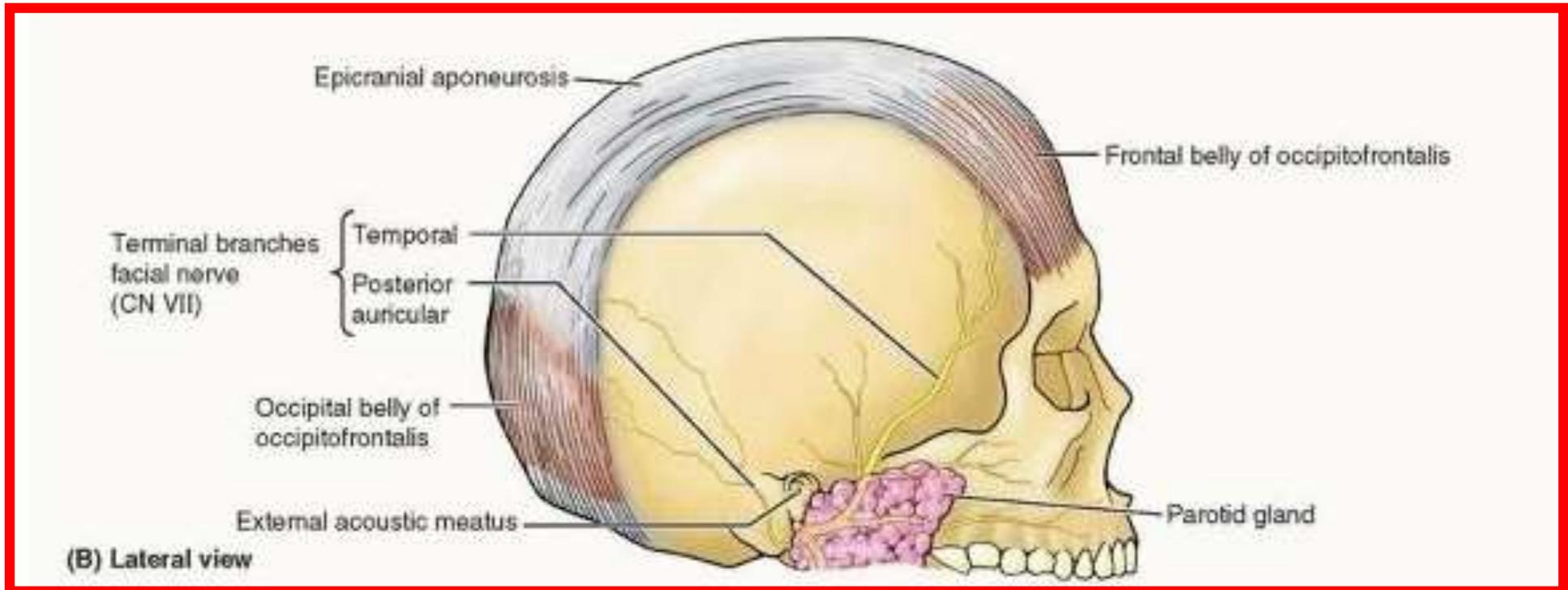
- This muscle is formed of **2 frontal bellies** and **2 occipital bellies** connected together by **the epicranial aponeurosis**.
- The two frontal bellies are **much larger** than the occipital bellies.
- The two frontal bellies** come close together in the median plane, while the **two occipital bellies** are separated by a gap of epicranial aponeurosis (***galea aponeurotica***).



❖ *Occipitofrontalis Muscle*

The frontal belly of the occipitofrontalis pulls the scalp anteriorly, wrinkles the forehead, and elevates the eyebrows;

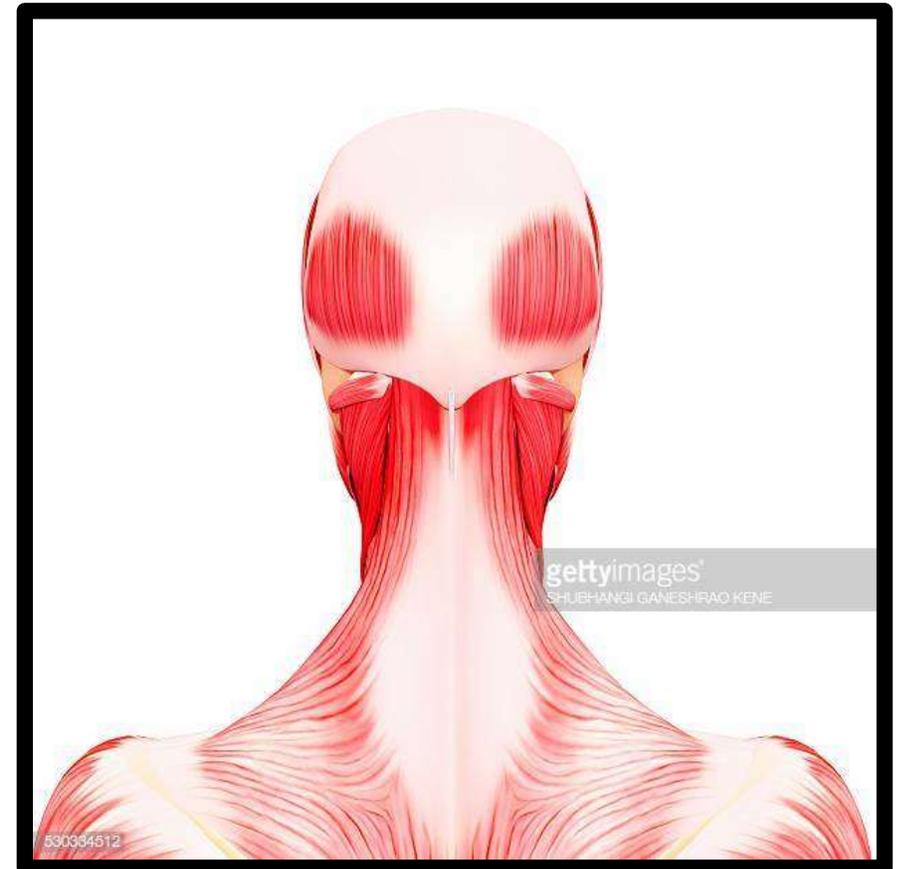
The occipital belly of the occipitofrontalis pulls the scalp posteriorly, smoothing the skin of the forehead



The Scalp

A- The occipital bellies

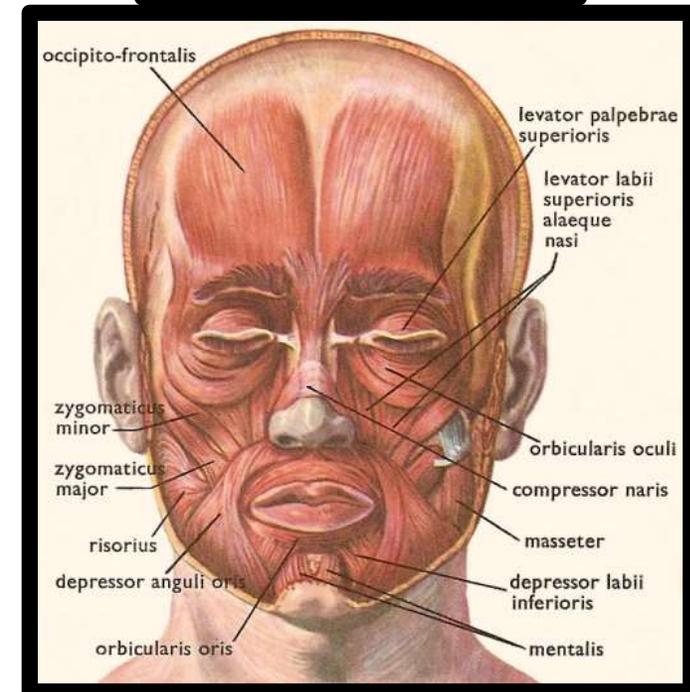
- * **Origin;** from the **highest nuchal lines.**
- * **Insertion;** **epicranial aponeurosis.**
- * **Nerve supply,** **posterior auricular branch of facial nerve.**
- * **Action,** **pull the scalp backward.**



The Scalp

B- The frontal bellies

- * Origin; from the **epicranial aponeurosis**.
- * Insertion; to the skin of the forehead and eye brows (no bony attachment).
- * Nerve supply; **temporal branches of the facial nerve**.
- * Action, **elevate the eye brows**.
 - It wrinkles the skin of the forehead (**expression of surprise**).

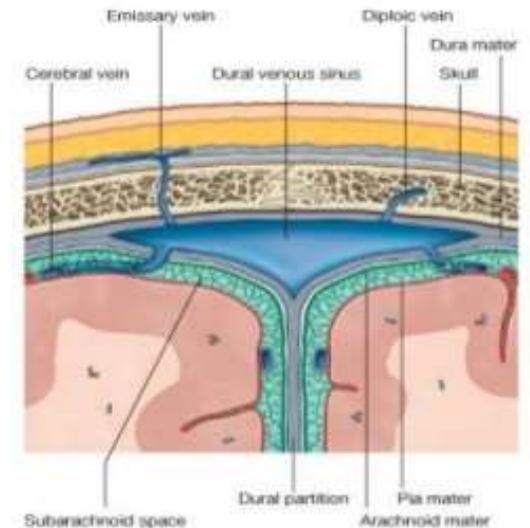


The Scalp

- The first 3 layers of the scalp are adherent together so they form a single layer.
- The layer of **loose areolar tissue** (*dangerous area*) may be the **site of collection of inflammatory exudates**.

DANGEROUS AREA OF SCALP

- The 4th layer of scalp (loose areolar tissue)
- Infection in the subaponeurotic space with pus collection readily spread to intracranial sinuses through emissary veins (valveless)



The Scalp

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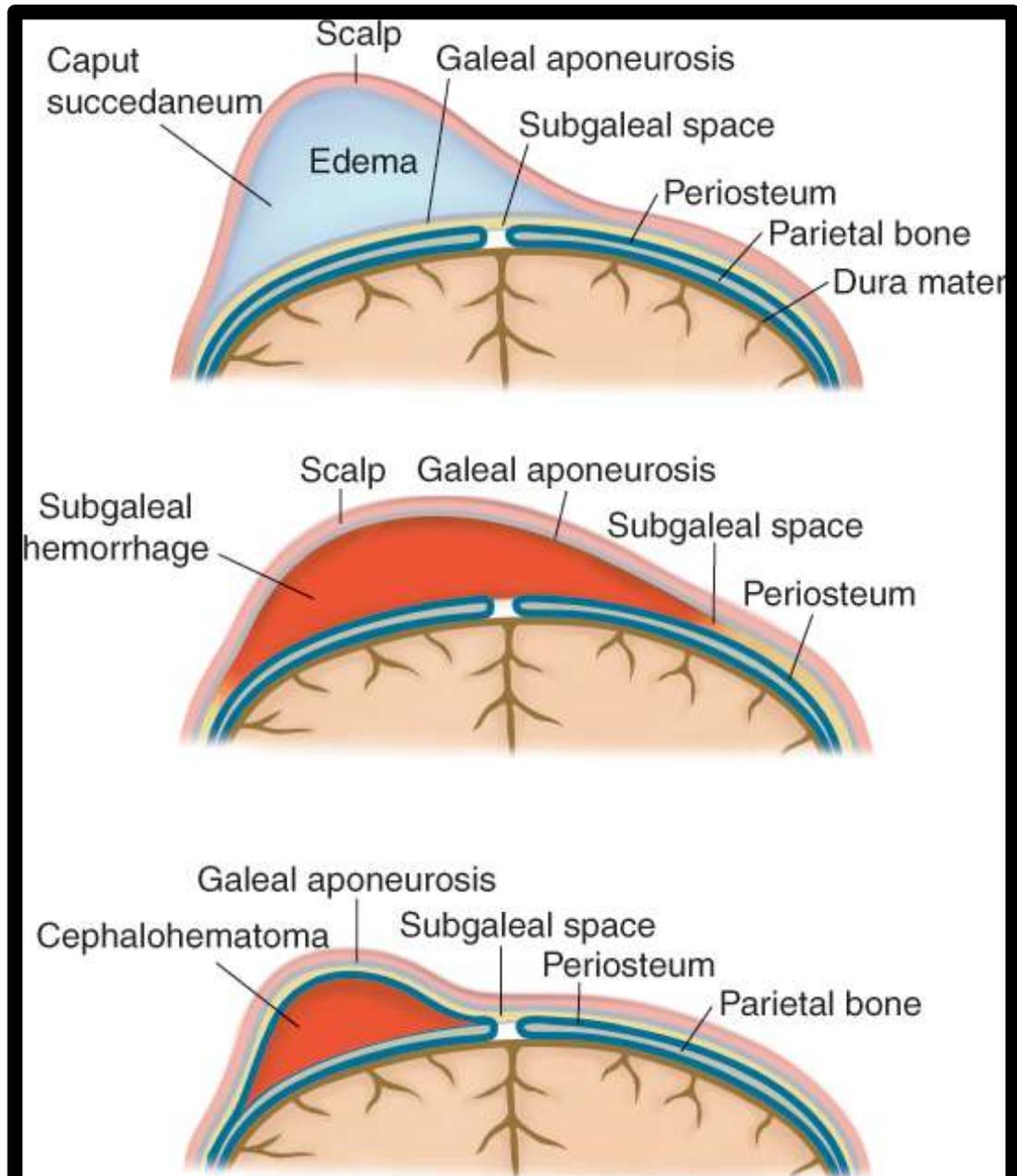
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❑ **Caput succedaneum** refers to swelling, or edema, of an infant's scalp that appears as a lump or bump on their head shortly after delivery

❑ **Subgaleal hemorrhage or hematoma** is bleeding in the potential space between the skull **periosteum** and the scalp **galea aponeurosis** is a rare but **potentially lethal** condition found in newborns. It is caused by rupture of the emissary veins

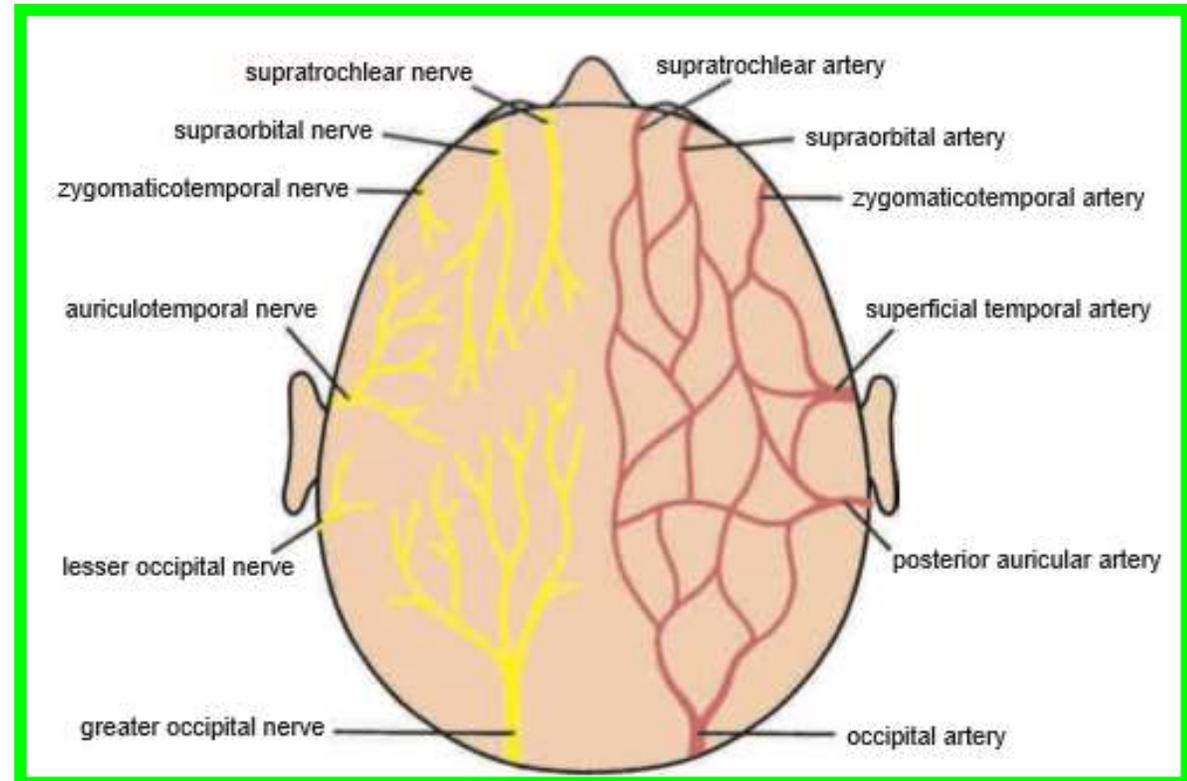
Fissure or fracture of the skull bone produces a localized haematoma because the periosteum is firmly attached to the sutural lines (Cephalhematoma)



Source: F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom, Catherine Y. Spong, Jodi S. Dashe, Barbara L. Hoffman, Brian M. Casey, Jeanne S. Sheffield: *Williams Obstetrics*, 25th Edition
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Sensory Nerve Supply of the Scalp

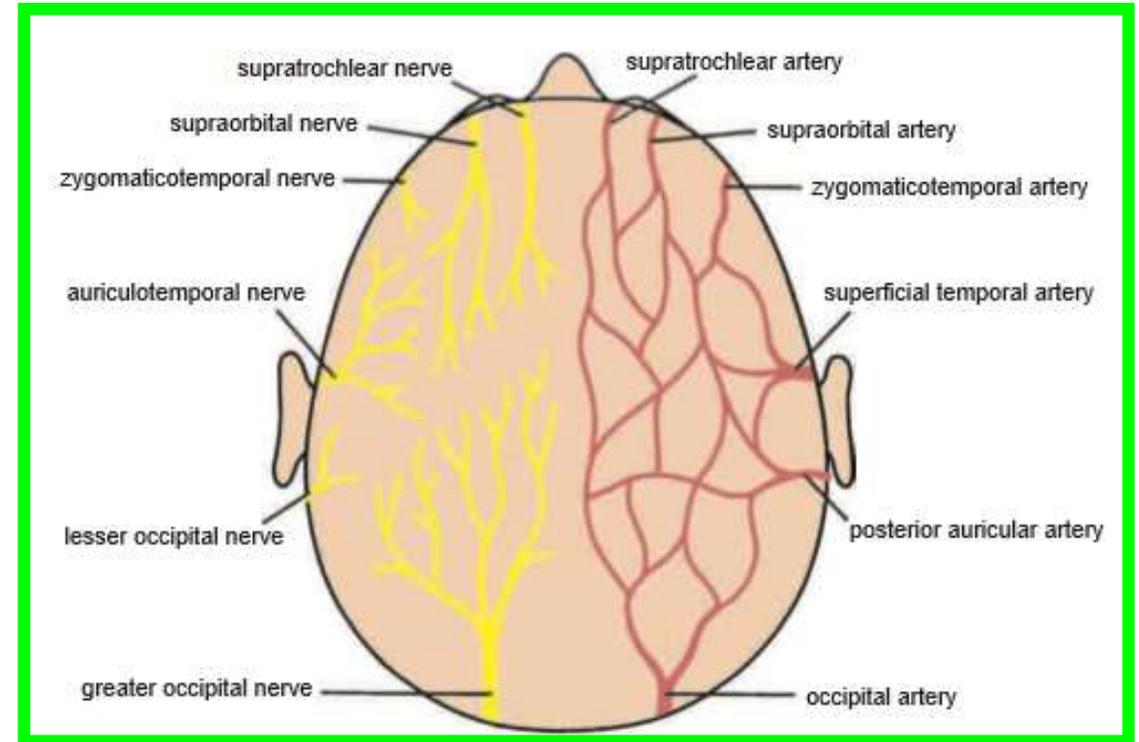
- ✓ The **zygomaticotemporal nerve**, a branch of **the maxillary division of the trigeminal N** supplies the scalp over the temple.
- ✓ The **auriculotemporal nerve**, a branch of **the mandibular division of the trigeminal N**. ascends over the side of the head from in front of the auricle. Its terminal branches supply the skin over the temporal region.



Sensory Nerve Supply of the Scalp

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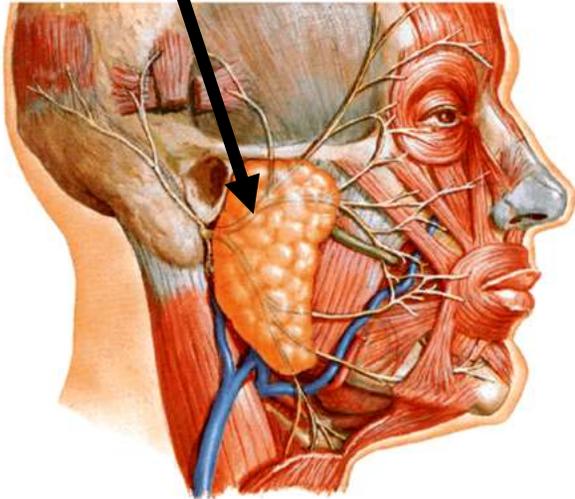
✓ **The lesser occipital nerve**, a branch of the cervical plexus (C2), supplies the scalp over the lateral part of the occipital region and the skin over the medial surface of the auricle.



✓ **The greater occipital nerve**, a branch of the posterior ramus of the 2nd cervical nerve, ascends over the back of the scalp and supplies the skin as far forward as the vertex of the skull.

Nerves in front auricle

Temporal nerve **M**

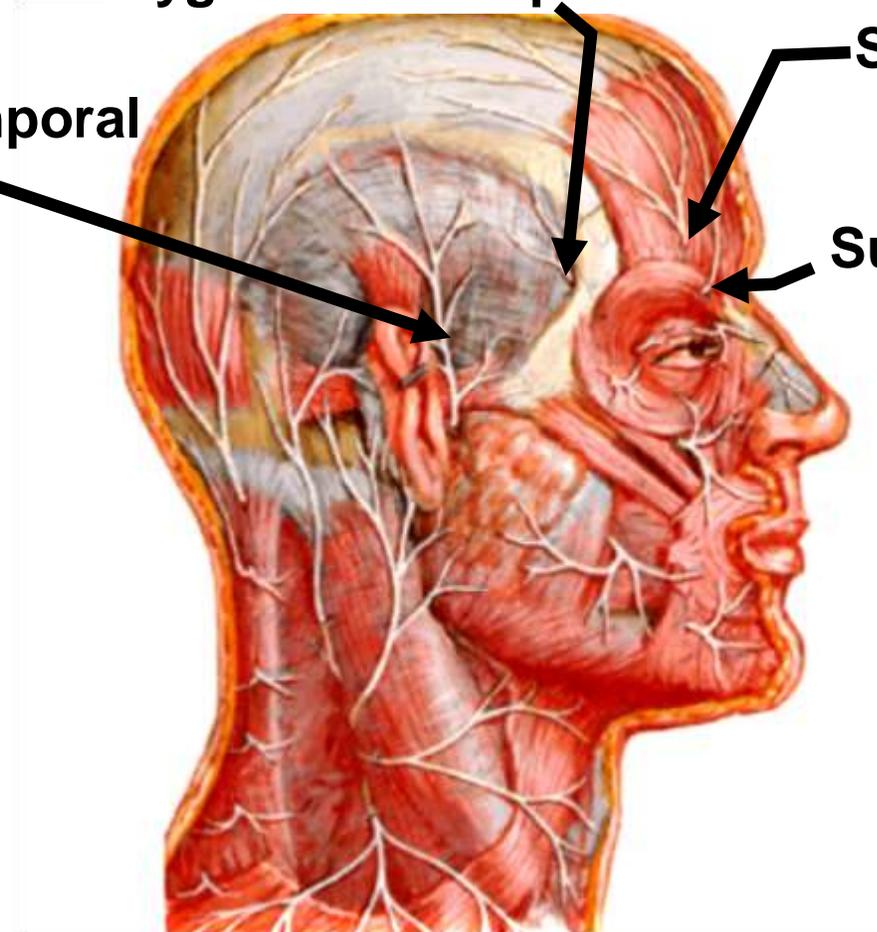


Auriculotemporal nerve **S**

Zygomaticotemporal nerve **S**

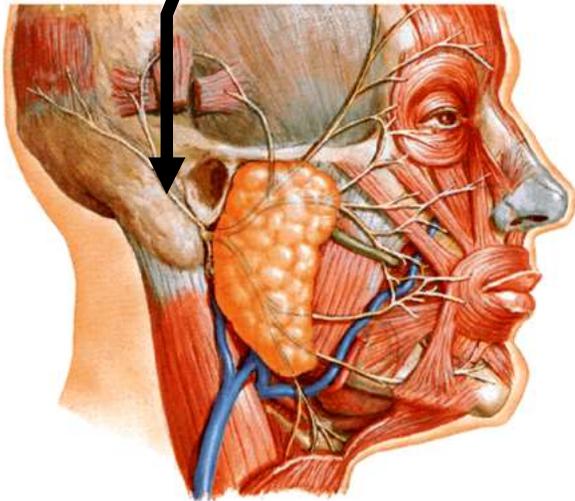
Supraorbital nerve **S**

Supratrochlear nerve **S**



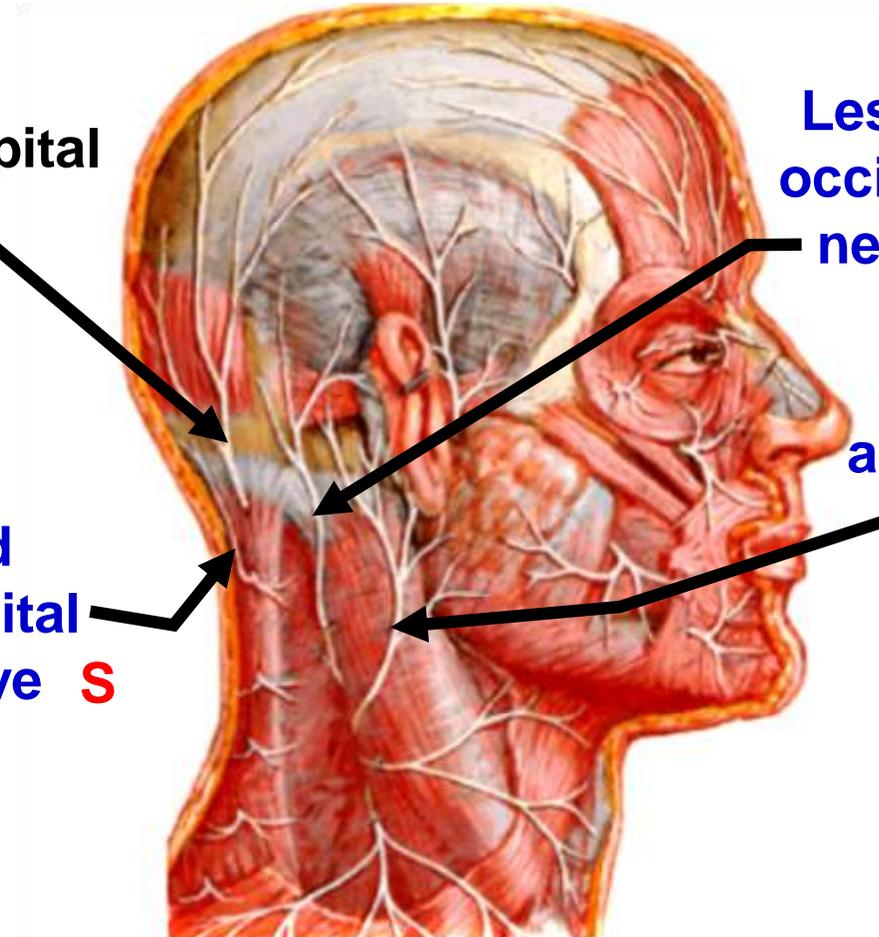
Nerves behind auricle

Posterior
auricular nerve
M



Greater occipital
nerve S

3rd
occipital
nerve S

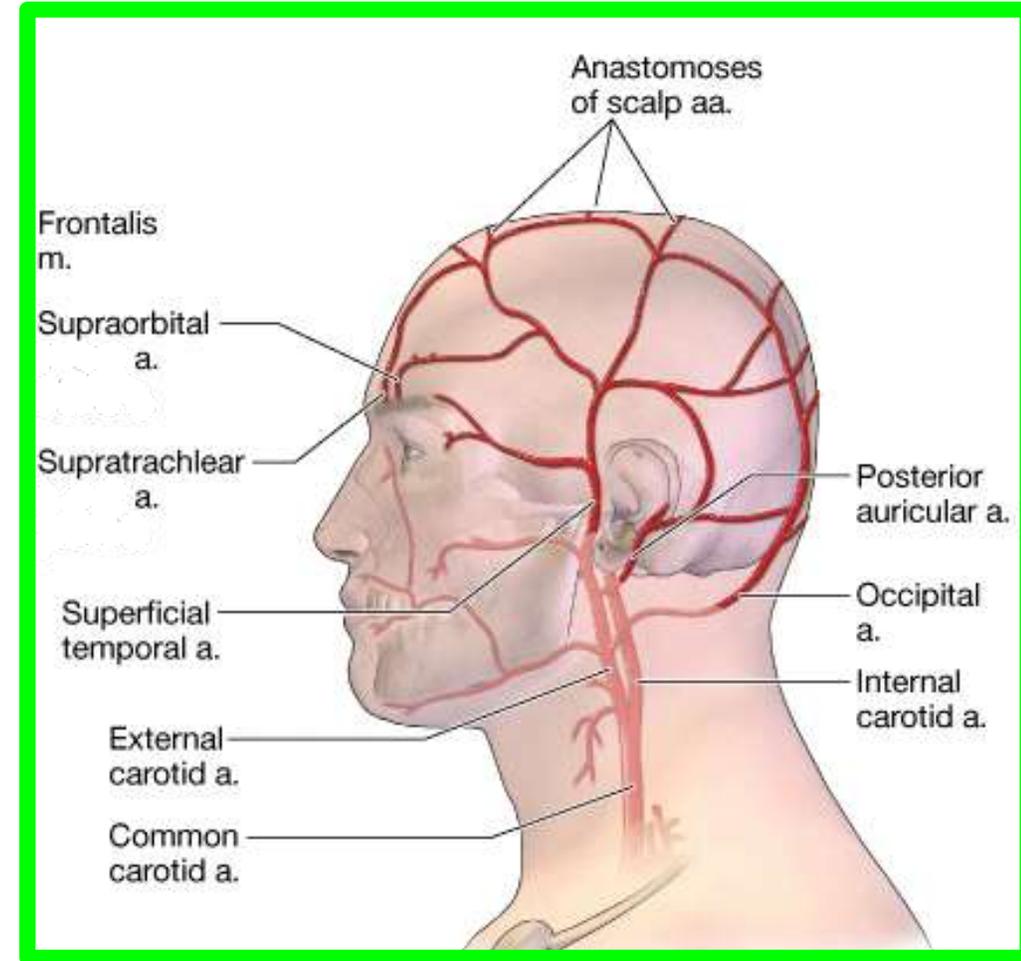


Lesser
occipital
nerve S

Great
auricular
nerve S

Arterial Supply of the Scalp

- ❖ The arteries course within layer two of the scalp, **the subcutaneous connective tissue layer** between the **skin** and **the epicranial aponeurosis**.
- ❖ The arteries anastomose freely with adjacent arteries and across the midline with the contralateral artery.
- ❖ The arterial walls are firmly attached to **the dense connective tissue** in which they are embedded, limiting their ability to constrict when cut.
- ❖ *The scalp has a rich supply of blood to nourish the hair follicles, and, for this reason, the smallest cut bleeds profusely*

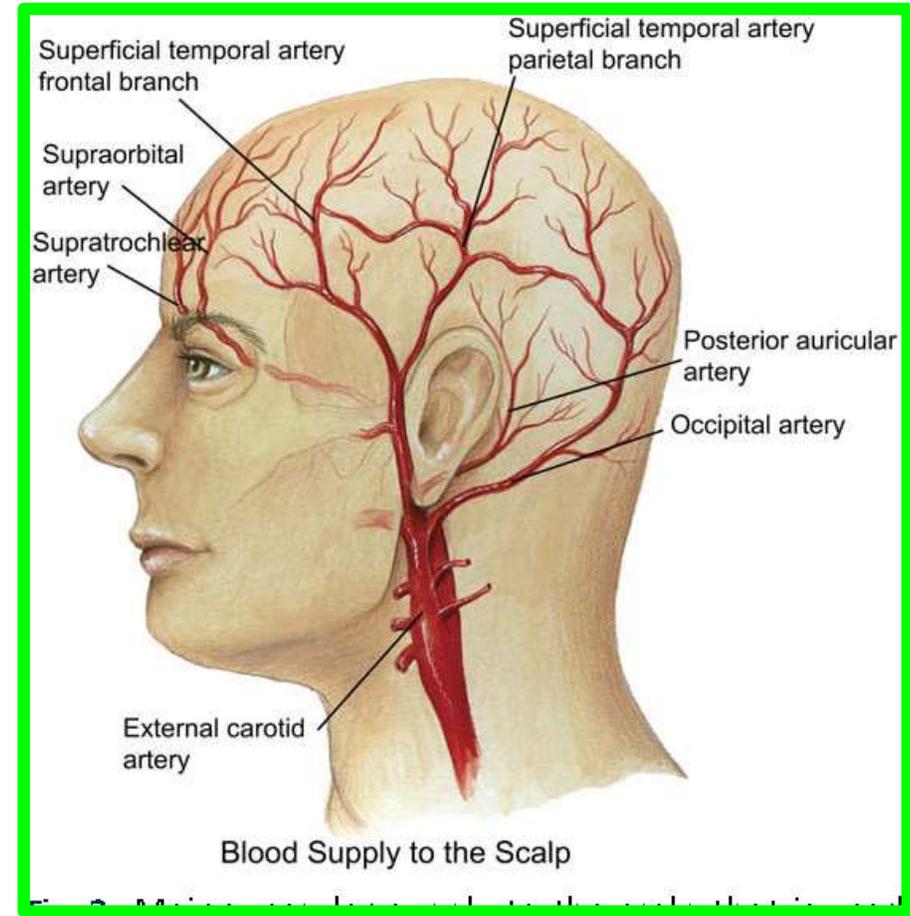
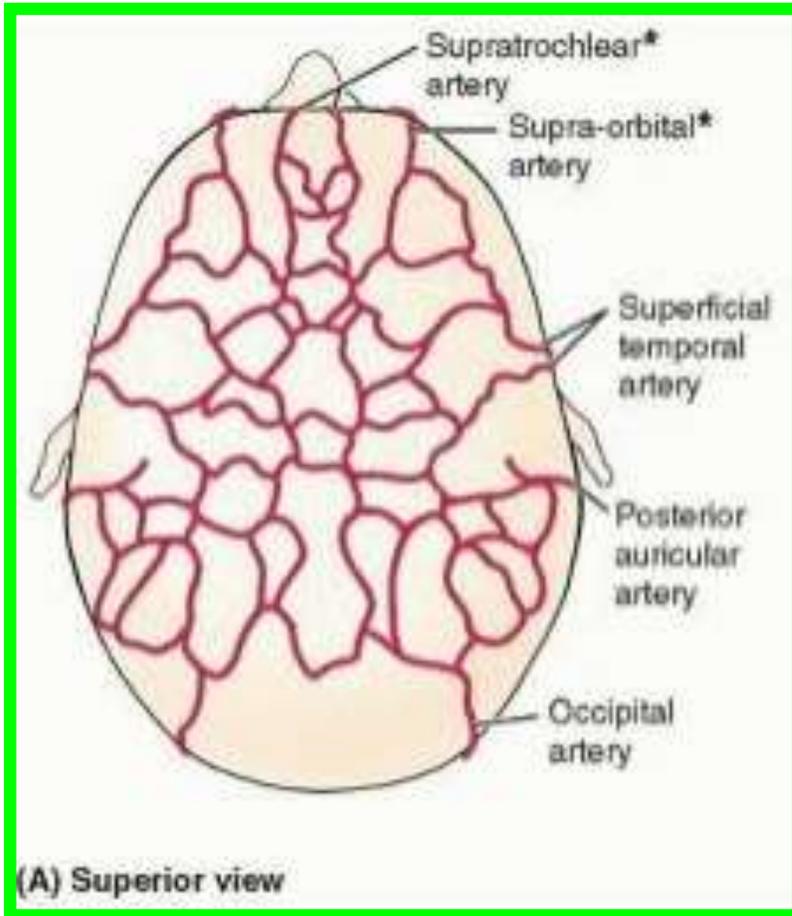


Arterial Supply of the Scalp

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from the **internal carotid arteries** through

- ✓ The **supratrochlear**,
- ✓ The **supraorbital arteries**, branches of the **ophthalmic artery**

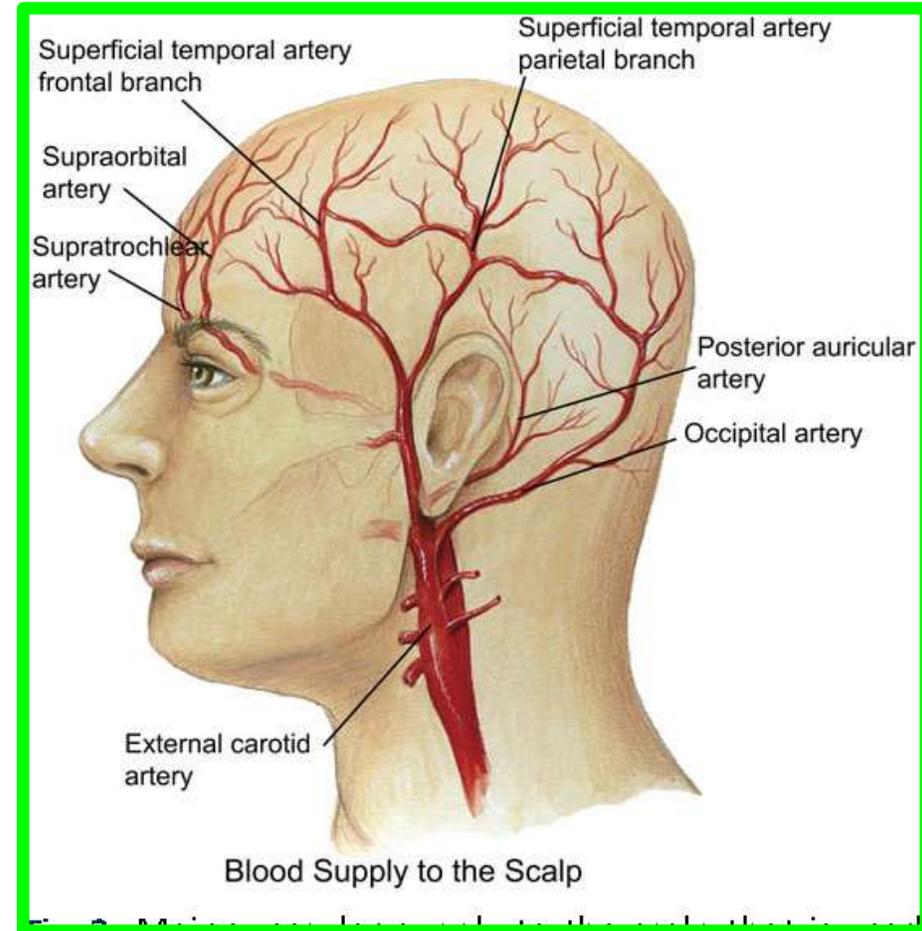


The arterial supply is from the external carotid arteries:

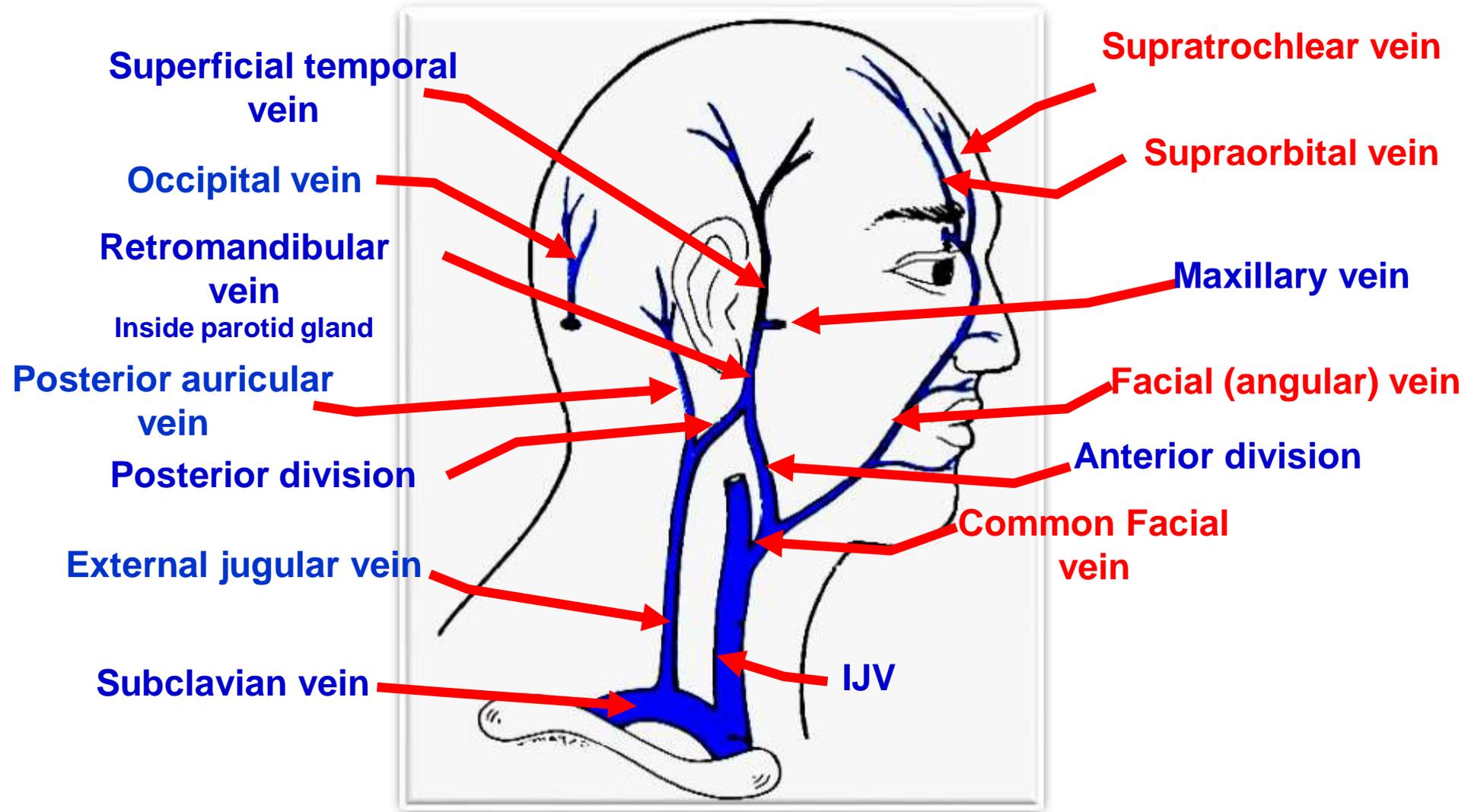
✓ **The superficial temporal artery**, the smaller terminal branch of the external carotid artery.

✓ **The posterior auricular artery**,

✓ **The occipital artery**, ascends in company with the greater occipital nerve

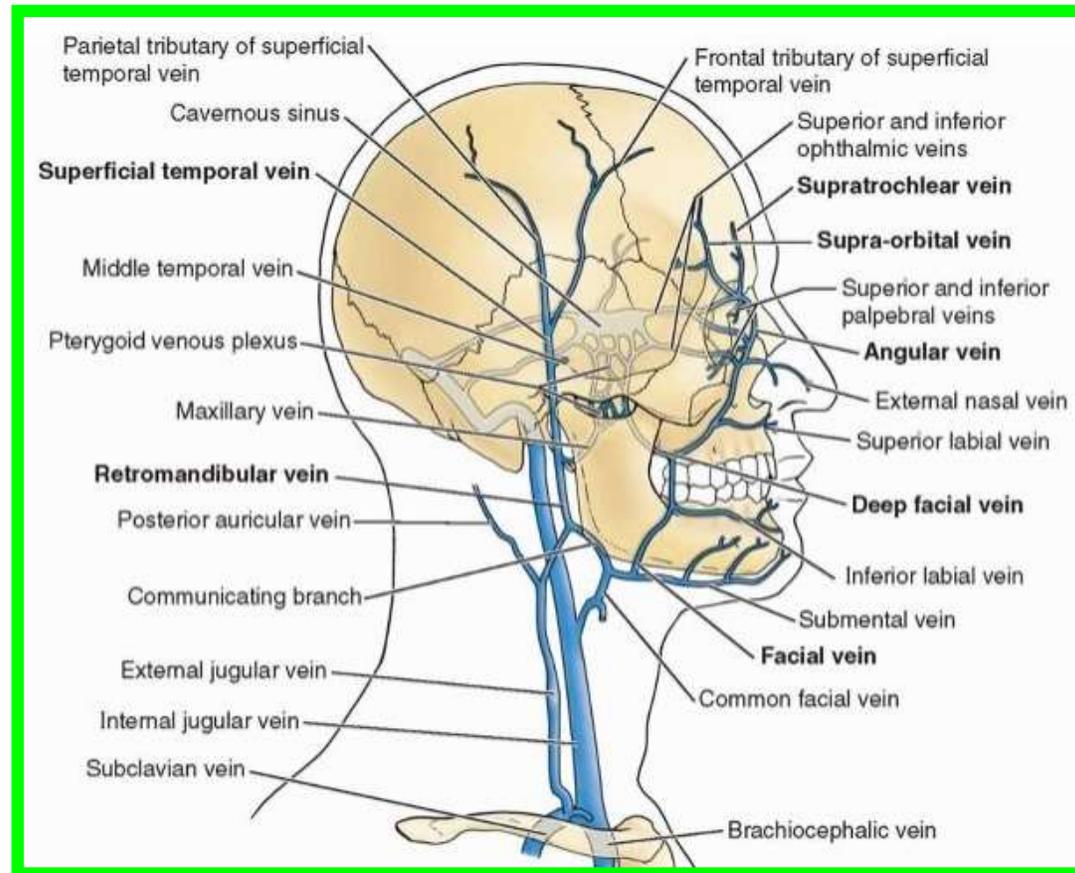


❖ **The arteries of the scalp supply little blood to the neurocranium, which is supplied primarily by the middle meningeal artery.**



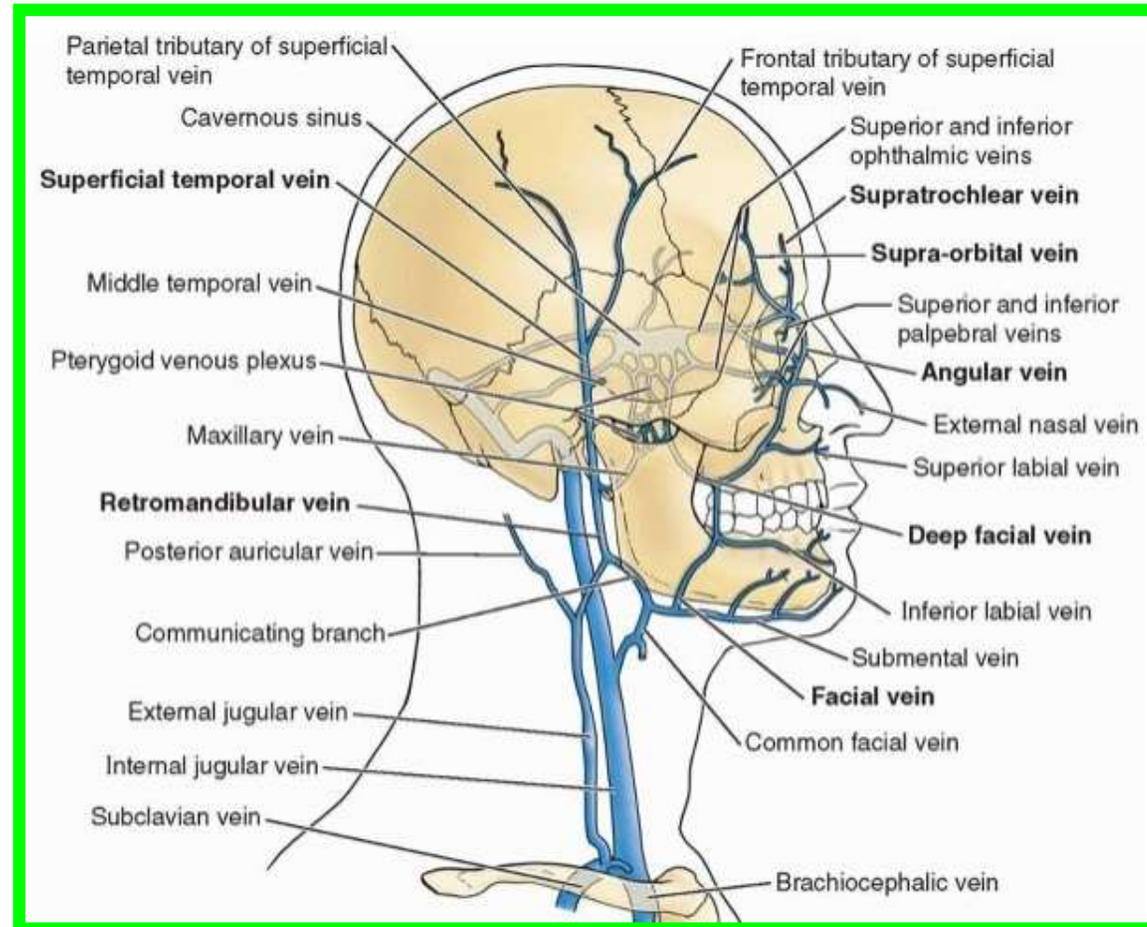
Venous Drainage of the Scalp

- ❖ The supratrochlear and supraorbital veins unite to form the **facial vein**.
- ❖ The superficial temporal vein unites with the maxillary vein in the substance of **the parotid gland** to form the **retromandibular vein**



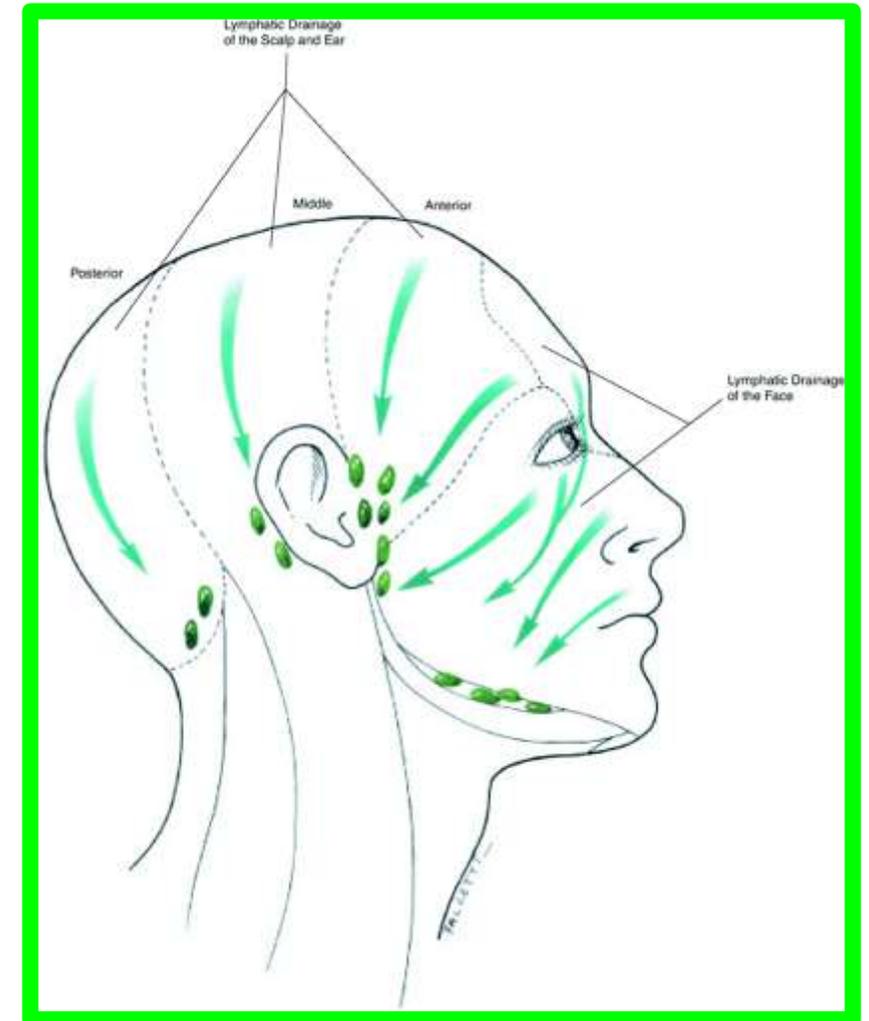
Venous Drainage of the Scalp

- ❖ The posterior auricular vein unites with the posterior division of the retromandibular vein, to form the external jugular vein
- ❖ The occipital vein drains into the suboccipital venous plexus



Lymph drainage

- ❖ There are no lymph nodes within the scalp;
- ❖ lymphatic channels from the posterior half of the scalp drain to **occipital and mastoid nodes**,
- ❖ and from the anterior half to **preauricular (parotid) nodes**.
- ❖ The lymph eventually reaches the nodes of the **deep cervical chain**.



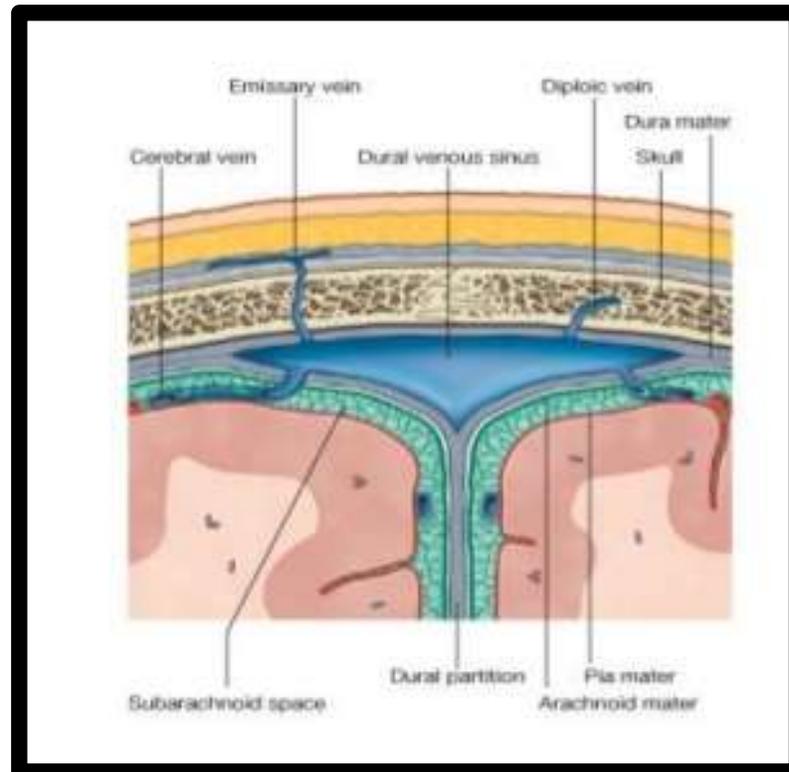
Sebaceous Cysts

The ducts of sebaceous glands associated with hair follicles in the scalp may become obstructed, resulting in the retention of secretions and the formation of **sebaceous cysts (wens)**. **Because they are in the skin, sebaceous cysts move with the scalp.**



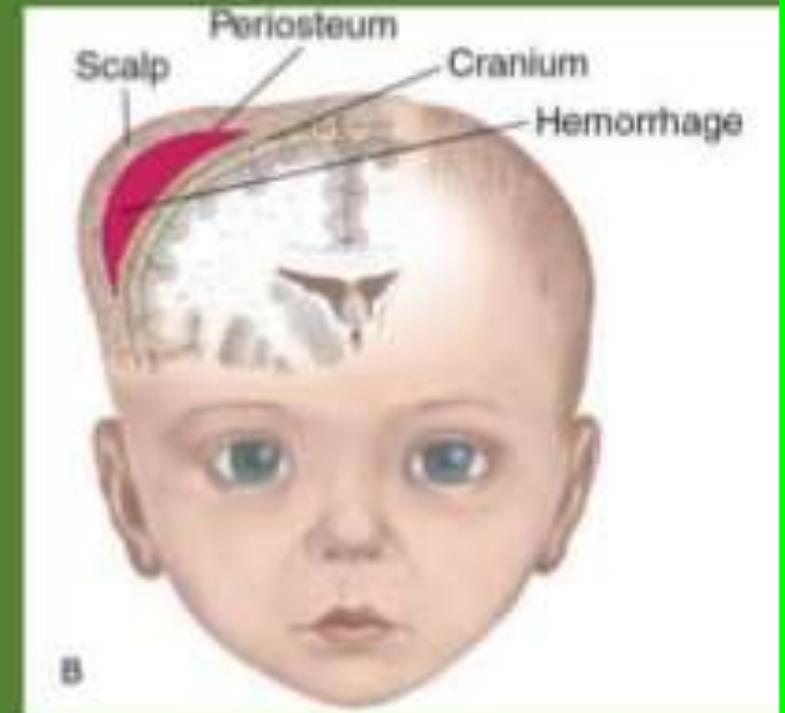
Scalp Infections

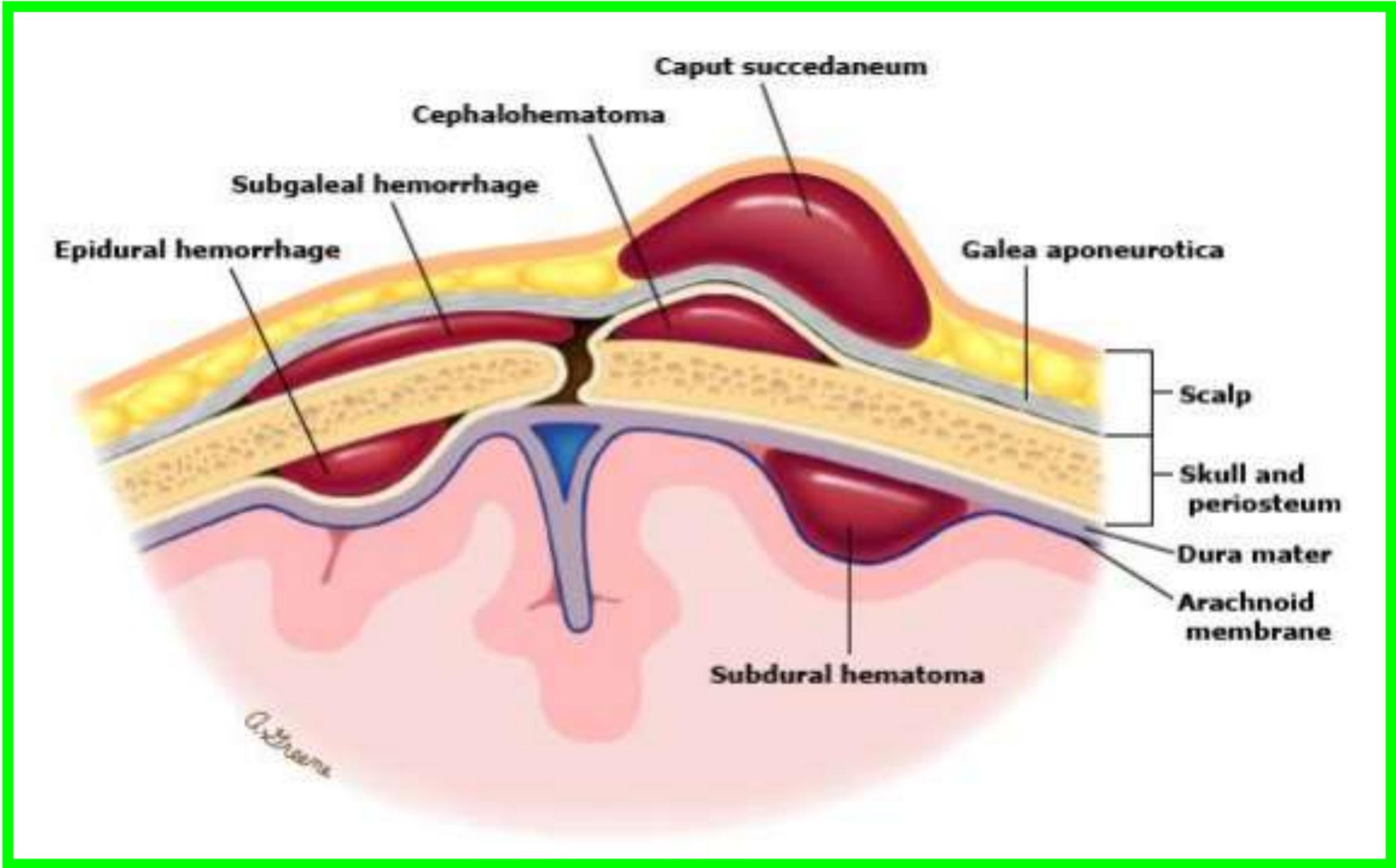
- The loose connective tissue layer (layer four) of the scalp is **the danger area of the scalp** because pus or blood spreads easily in it.
- Infection in this layer can also pass into the cranial cavity through **emissary veins**, which pass through parietal foramina in the calvaria, and reach intracranial structures such as **the meninges**



Cephalohematoma

- Occurs between the **skull** and the **periosteum** of a newborn secondary to rupture of blood vessels crossing the periosteum.
- Due to prolonged second stage of labor or instrumental delivery.
- Jaundice, anemia, hypotension
- Risk of infection: osteomyelitis, meningitis
- Differential diagnosis: subgaleal hematoma





A scenic landscape photograph showing a dense forest of pine trees on a hillside. The trees are dark green and have a characteristic gnarled appearance. In the background, a body of water is visible, with a small island or peninsula in the distance. The sky is overcast with soft, grey clouds. The overall atmosphere is calm and natural.

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