



01. SCALP AND SUPERFICIAL TEMPORAL REGION

Essence of the chapter

Scalp and superficial temporal region
Extent
Layers
Occipitofrontalis muscle
Arterial supply
Venous drainage
Nerve supply
Clinical anatomy

Importance for exam

University Exam

Long Essay

Describe Scalp under the following headings (RGUHS, KUHS 2013 Aug)

(1) Layer (2) Blood Supply (3) Nerve Supply (4) Applied aspect

Describe scalp under following headings (July 2019-2010 scheme)

(1) Extent (2) Layers (3) Blood supply (4) Nerve supply (5) Applied Anatomy

Short Essay

Describe scalp under the following. (Aug 2017 KUHS)

(1) Layers and Features (2) Nerve supply (3) Blood supply

Layer of Scalp (5) (KUHS 2018 Feb 2016 scheme)

Short Note

Nerve supply of scalp (KUHS 2011 Aug)

Blood Supply of Scalp (4) (KUHS 2018 July, 2010 scheme)

Epicranial Aponeurosis (RGUHS)

Competitive Exam

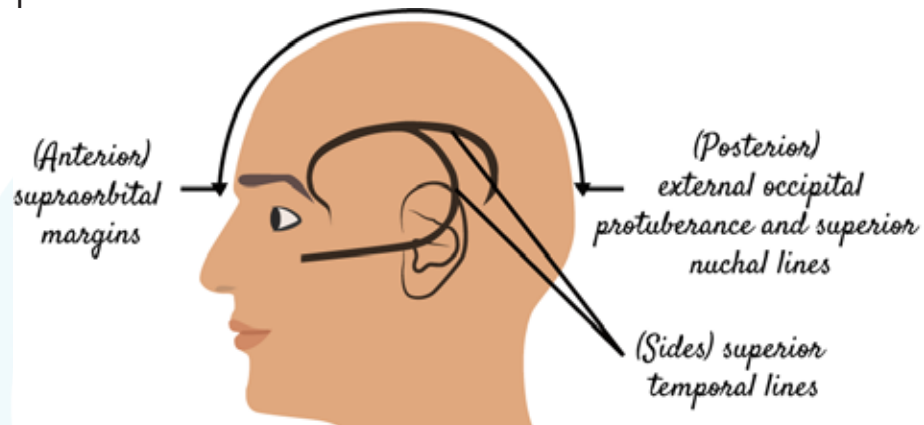
(4-6 MCQs)

Scalp

Soft tissue covering the cranial vault. The scalp serves as a physical barrier to protect the cranial vault from physical trauma and potential pathogens that can cause infection.

Extent of scalp

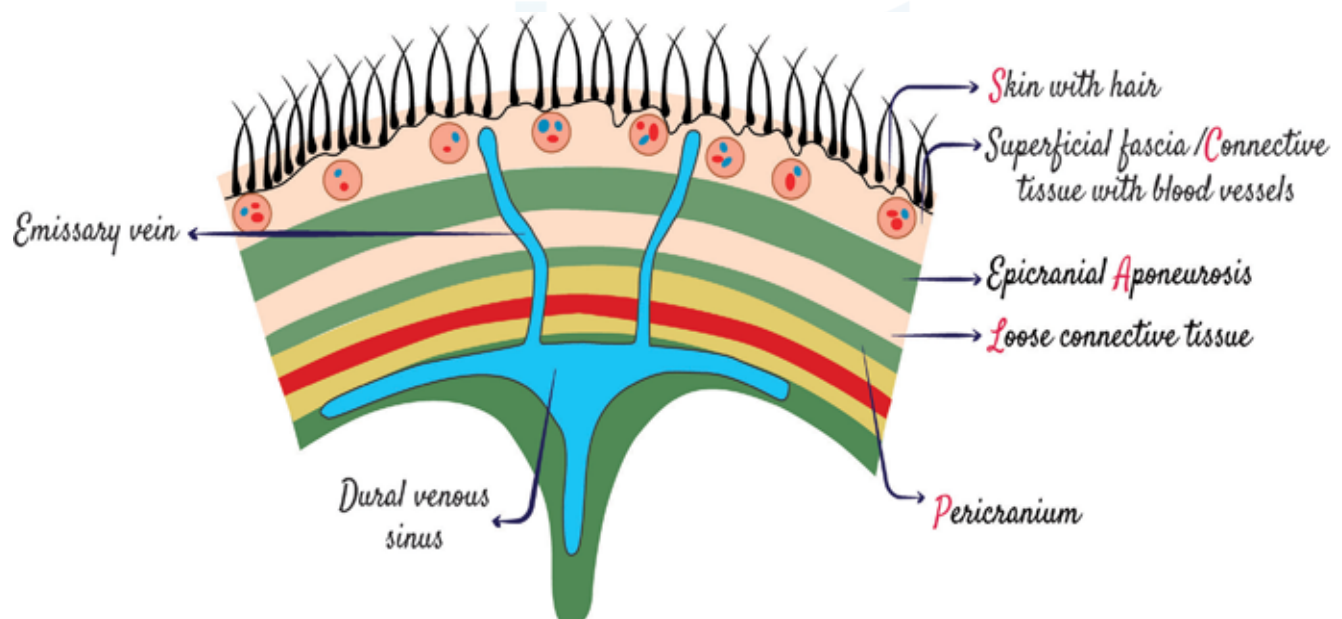
- ⇒ **Anterior** - supraorbital margins
- ⇒ **Posterior** - External occipital protuberance and superior nuchal lines
- ⇒ **Sides** - superior temporal lines



Structure of scalp

The scalp is made up of **five layers**:

- ⇒ Skin
- ⇒ Superficial fascia (Connective tissue)
- ⇒ Deep fascia in the form of the epicranial aponeurosis or galea aponeurotica with the occipitofrontalis muscle
- ⇒ Loose areolar tissue
- ⇒ Pericranium



S - Skin: (Thick and hairy)

It is adherent to the epicranial aponeurosis through the dense superficial fascia. It has more number of sweat glands and sebaceous glands.

C - Connective tissue: (superficial fascia)

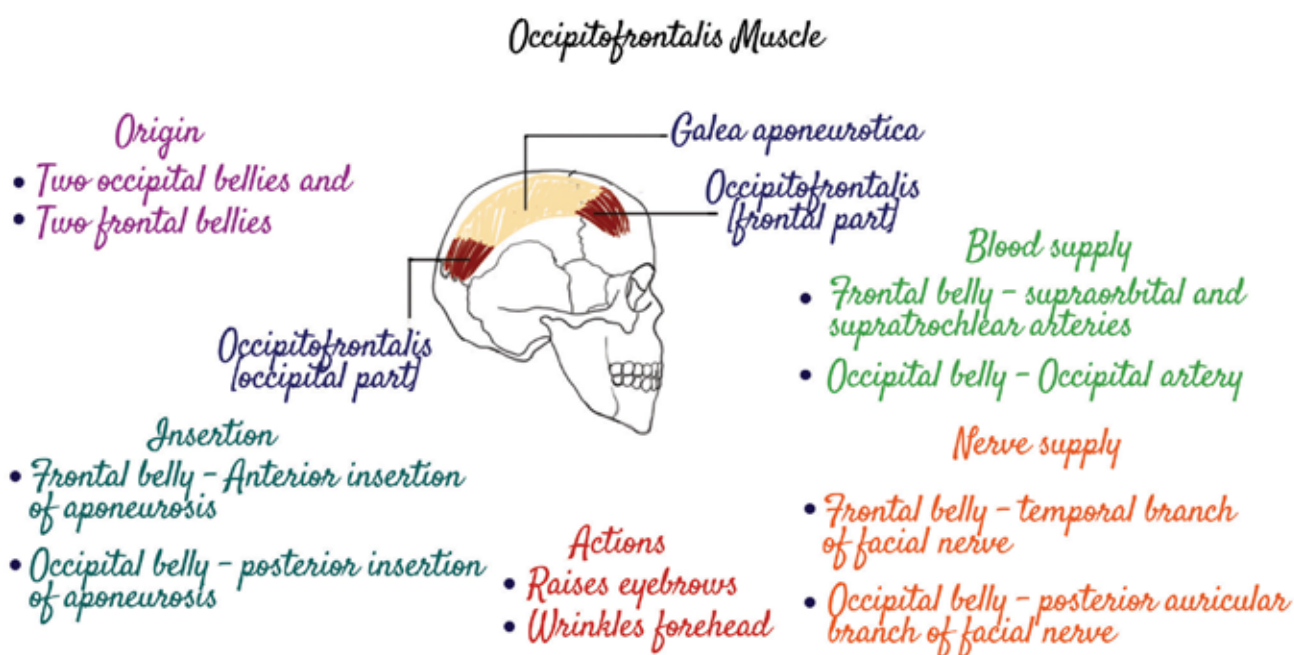
Is more fibrous and dense in the centre than at the periphery of the head. It contains many blood vessels. It binds the skin to the subjacent aponeurosis, and provides the proper medium for passage of vessels and nerves to the skin.

A - Epicranial Aponeurosis/Galea aponeurotica

Freely movable on pericranium. Along with the overlying and adherent skin and fascia. Anteriorly, it receives the insertion of the frontalis, posteriorly, it receives the insertion of the occipitalis and is attached to the external occipital protuberance, and to the highest/superior nuchal lines in between the occipital bellies. On each side, the aponeurosis is attached to the superior temporal line, but sends down a thin expansion which passes over the temporal fascia and is attached to the zygomatic arch.

Occipitofrontalis Muscle

- The occipitofrontalis muscle is an epicranial muscle which covers the skull. The muscle has got two parts. An occipital part attached to the occipital bone and a frontal part, attached to the frontal bone.
- 'SCA' - Surgical layer of scalp / Scalp proper.



L - Loose Areolar Tissue: Dangerous area of scalp

It extends anteriorly into the eyelids, because the frontalis muscle has no bony attachment; posteriorly to the highest and superior nuchal lines; and on each side to the superior temporal lines. It gives passage to the emissary veins which connect extracranial veins to intracranial venous sinuses.

The 'danger area of the scalp is the area of loose connective tissue. This is because pus and blood spread easily within it, and can pass into the cranial cavity along the emissary veins. Therefore infection can spread from the scalp to the meninges, which could lead to meningitis.

P - Pericranium

It is loosely attached to the surface of the bones, but is firmly adherent to their sutures where the sutural ligaments bind the pericranium to the endocranium.

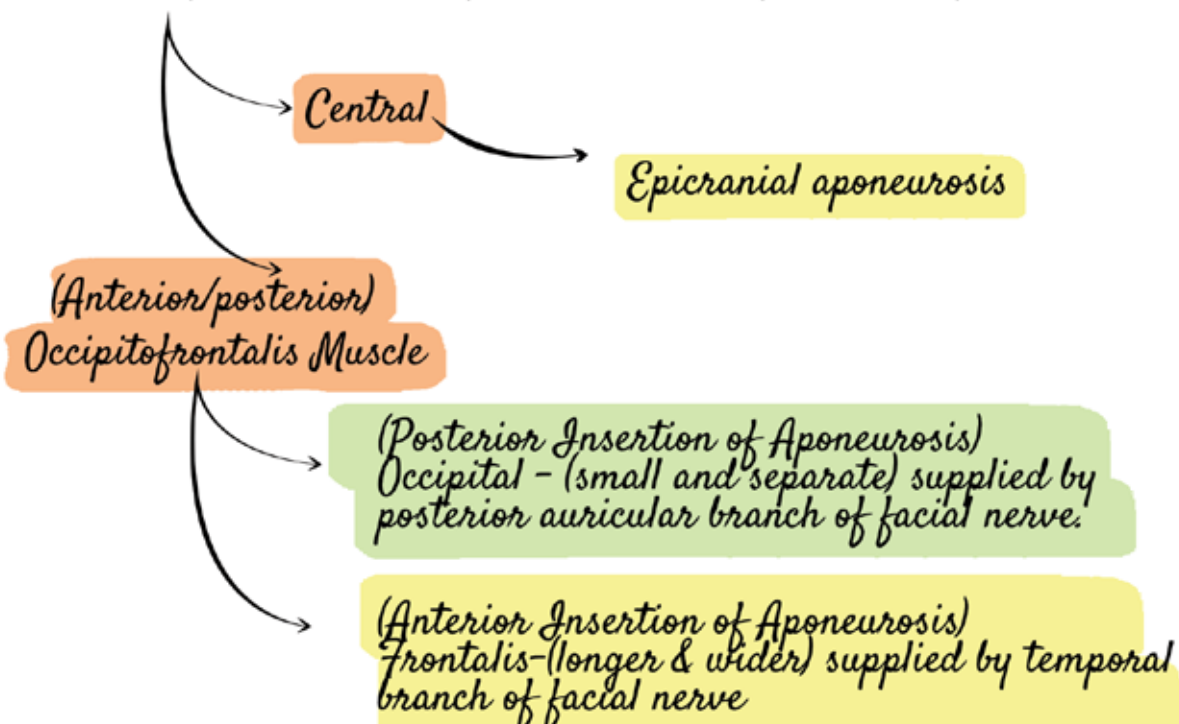
Summary of Scalp Layers

S - Skin Thick and hairy.

C - Connective tissue (superficial fascia) More fibrous and dense in center.

Proper medium for passage of vessels and nerves to skin.

A - Aponeurosis/Galea aponeurotica - Freely movable on pericranium.



'SCA' - Surgical layer of scalp / Scalp proper.

Being dense these layers prevent the stretching of the scalp during surgeries, which will prevent complications.

L - Loose Areolar Tissue (Dangerous area of scalp)

- Anteriorly to eyelids
- Posteriorly to highest and superior nuchal lines
- Sides - superior temporal lines
- Presence of Emissary veins (connects extracranial and intracranial veins).

P - Pericranium - loosely attached to bone and firmly adherent to sutures.

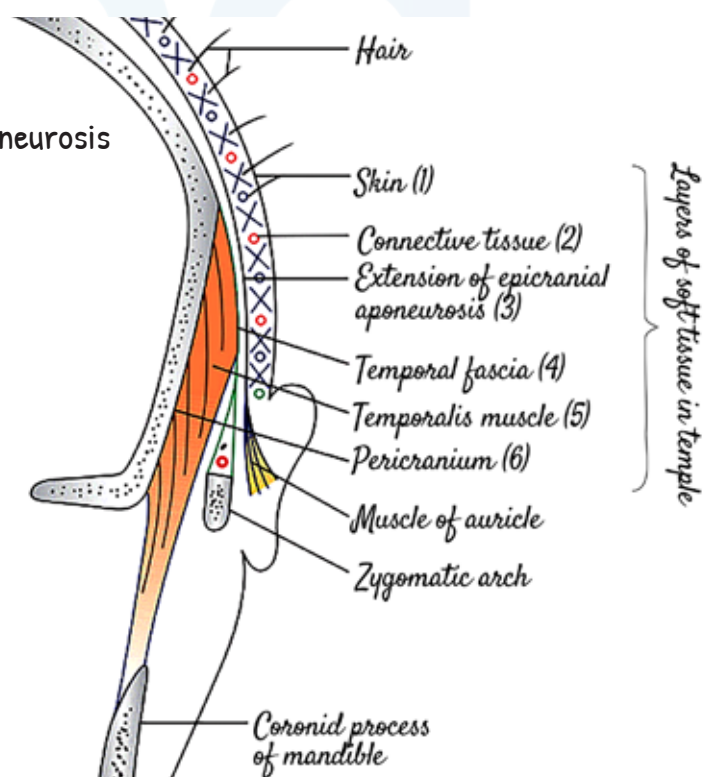
Superficial temporal region

Area between superior temporal line and zygomatic arch

Structure

⇒ 6 layers

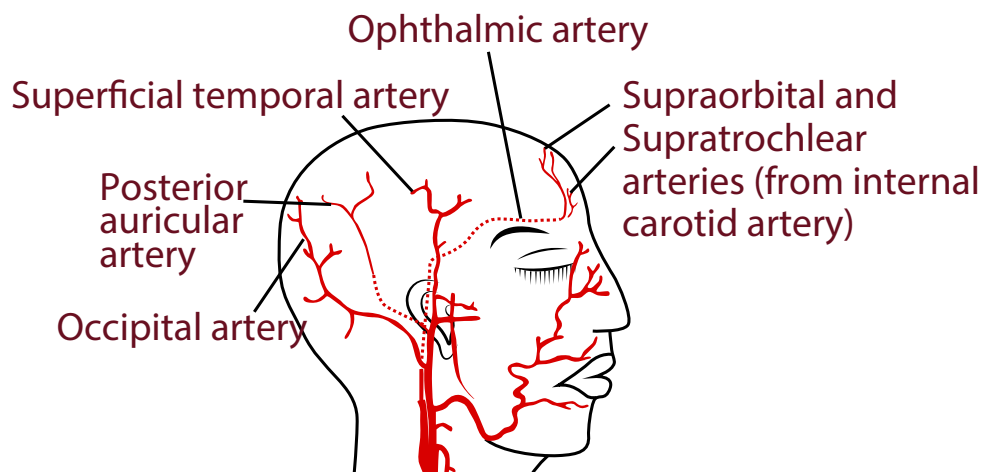
- Skin
- Superficial fascia
- Thin extension of epicranial aponeurosis
- Temporal fascia
- Temporalis muscle
- Pericranium



Arterial supply of scalp and superficial temporal region

The scalp has a rich blood supply derived from both the **internal and the external carotid arteries**, the two systems anastomosing over the temple.



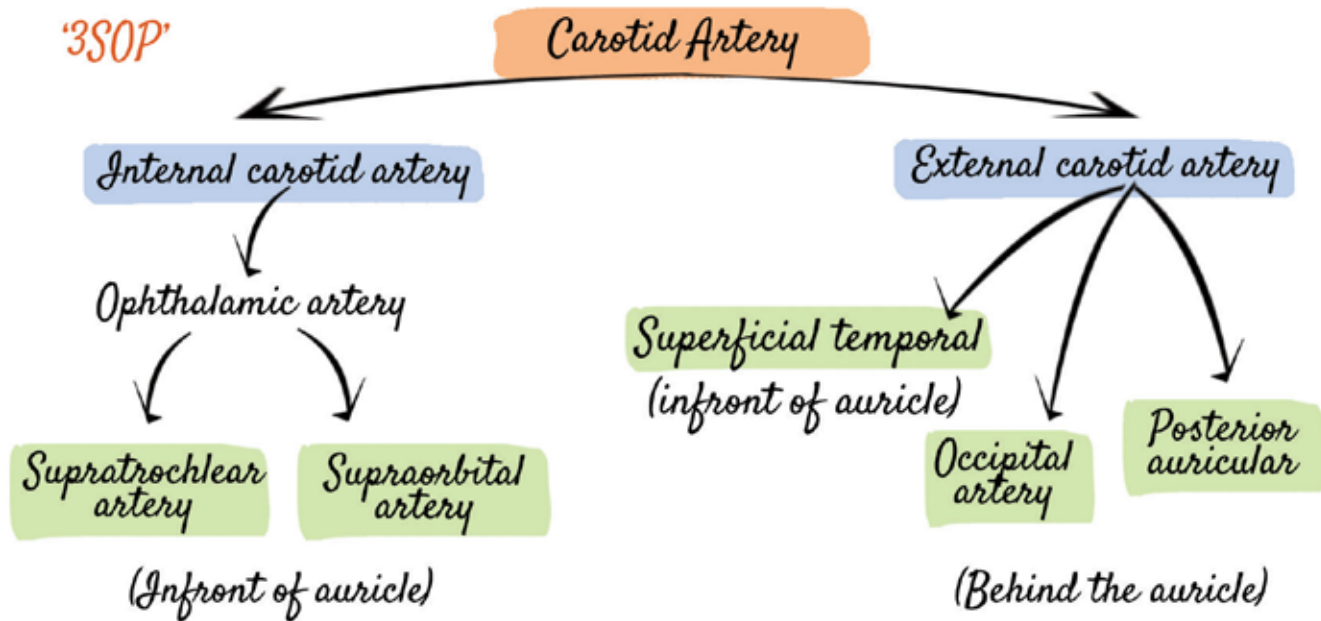


In front of the auricle, the scalp is supplied from before backwards by the:

- Supratrochlear
- Supraorbital
- Superficial temporal arteries

Behind the auricle, the scalp is supplied from before backwards by the:

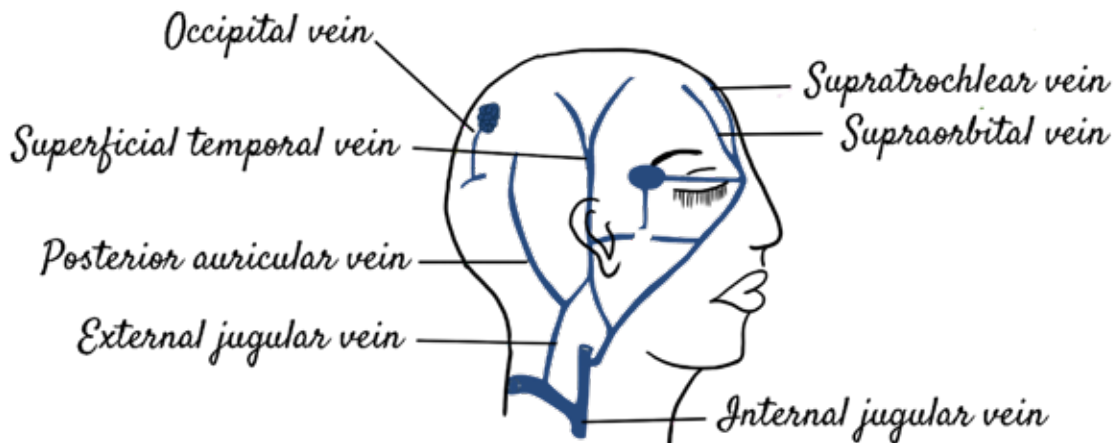
- Posterior auricular
- Occipital (tortuous) arteries, both of which are branches of the external carotid artery



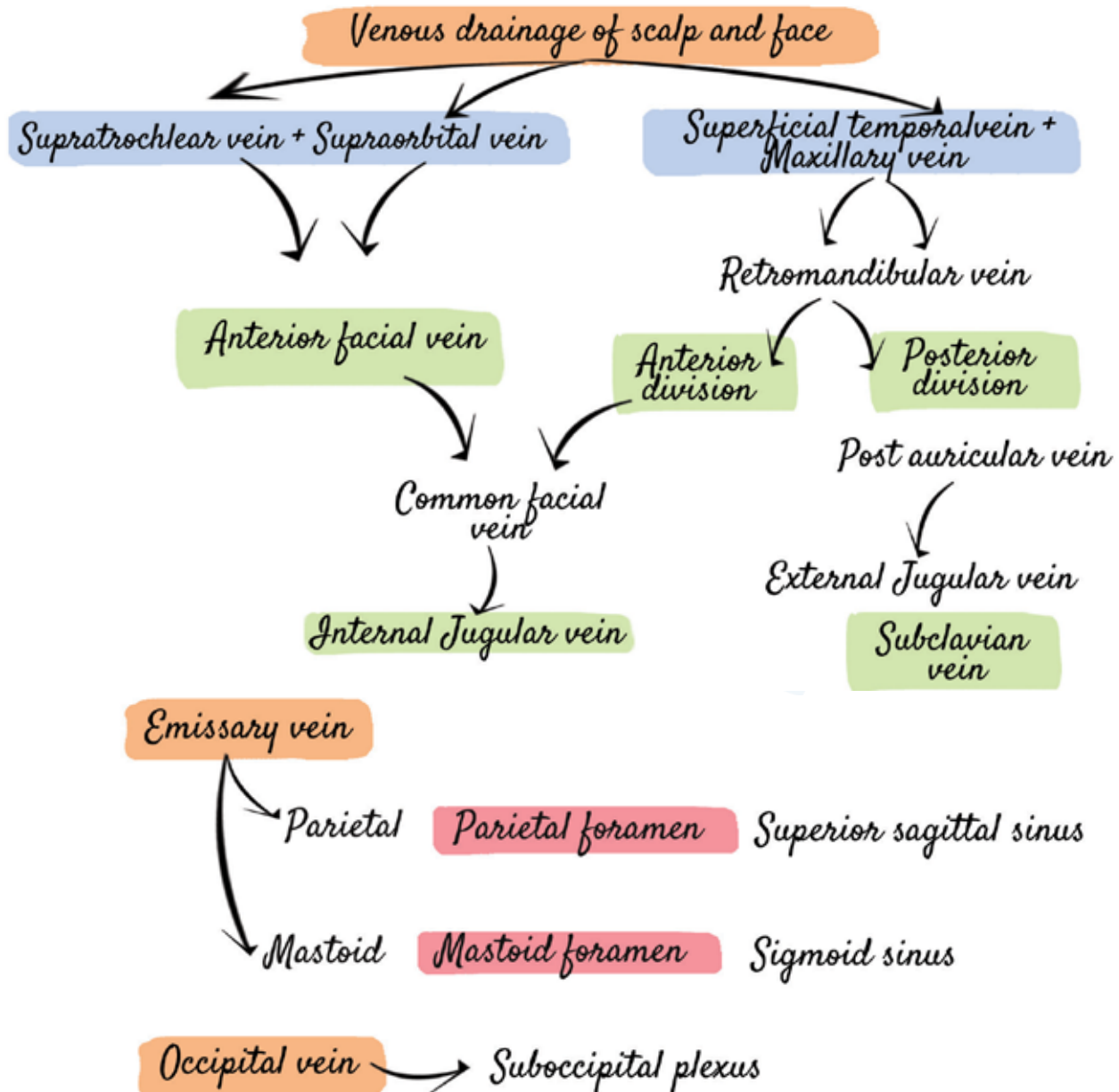
Venous drainage

The scalp drains into superficial and deep venous systems. The **superficial veins follow their respective arteries**. The supraorbital and supratrochlear veins drain the superficial scalp anteriorly. While the superficial temporal, occipital, posterior auricular drain the superficial scalp posteriorly. the superficial temporal vein has parietal and frontal branches. The frontal vein communicates with the dural sinuses via a connection with the parietal emissary vein. This vein, found in the loose areolar connective tissue layer communicates with the superior sagittal sinus.





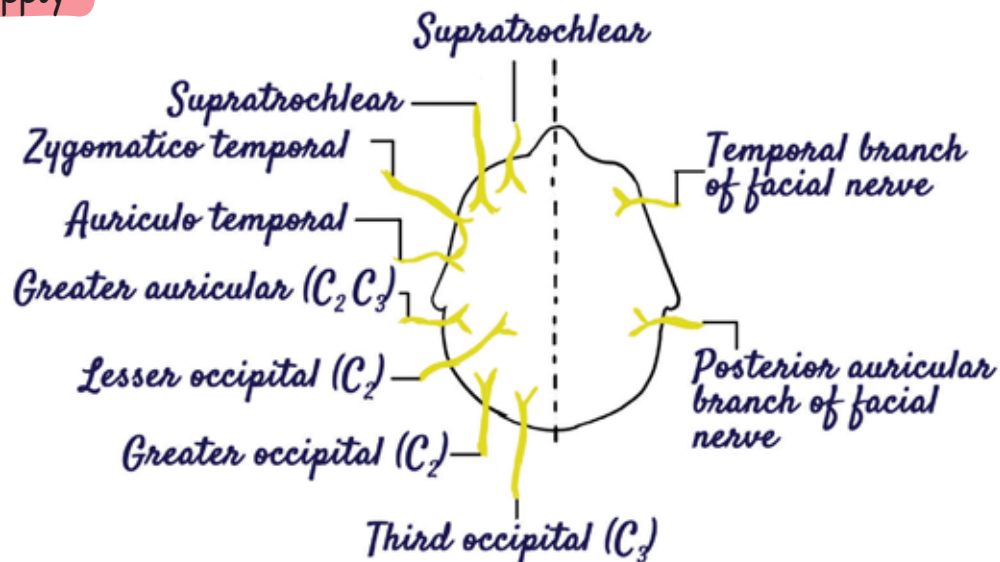
The **pterygoid venous plexus** is responsible for draining the deep scalp. It is between the temporalis and lateral pterygoid muscles. These veins include the **middle meningeal, sphenopalatine, buccinator, pterygoid, deep temporal, masseteric, infraorbital, and alveolar veins**. The pterygoid plexus also has a communicating vein that travels through the inferior orbital fissure to connect the cavernous sinus to the ophthalmic vein. The plexus eventually drains in the **maxillary vein**.



Lymphatic drainage

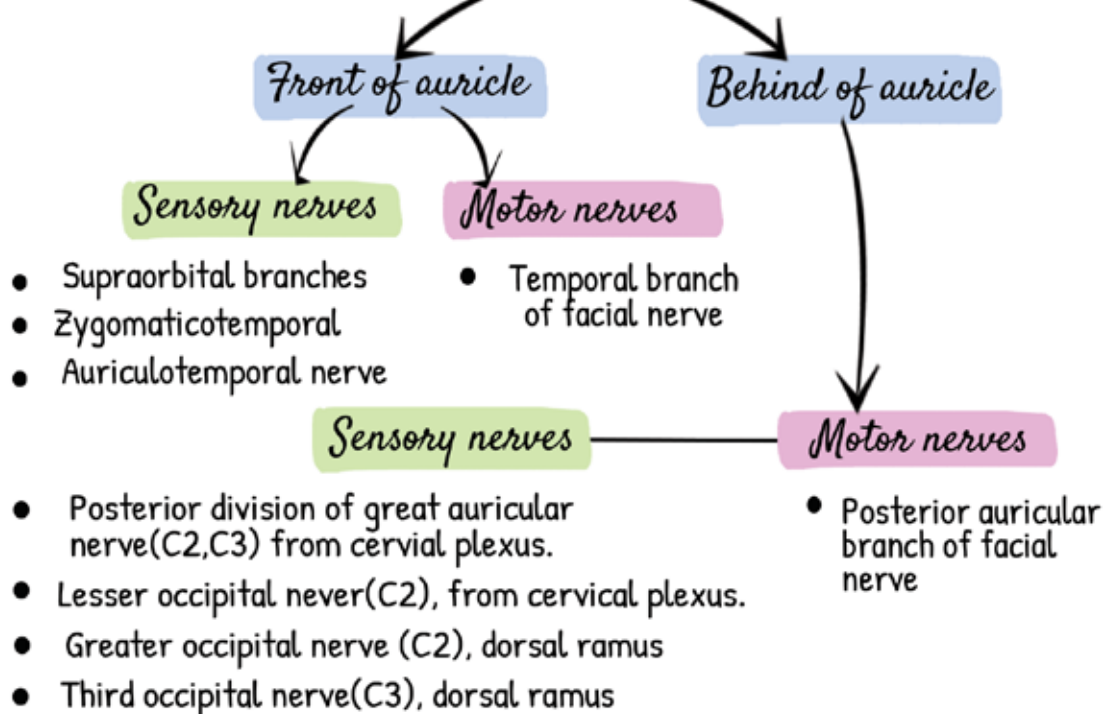
The anterior portions of the scalp drain through the parotid lymph nodes, which continue to drain through the deep cervical and submandibular lymph nodes. The posterior portions of the scalp drains to the occipital and posterior auricular (mastoid) lymph nodes. The mastoid lymph nodes is specific to the area of the scalp located directly posterior to the ear and drain into the occipital lymph nodes. The occipital lymph node drains the rest of the posterior scalp.

Nerve supply



The scalp and temple are supplied by 10 nerves on each side. Out of these, five nerves (four sensory and one motor) enter the scalp in front of the auricle. The remaining five nerves (again four sensory and one motor) enter the scalp behind the auricle.

Nerves of the scalp and superficial temporal region



Clinical anatomy



The layer of loose areolar tissue is known as the dangerous area of the scalp because the emissary veins, which course here, may transmit infection from the scalp to the cranial venous sinuses.



Because of the abundance of sebaceous glands, **the scalp is a common site for sebaceous cysts.** **Wounds of the scalp bleed profusely because** the vessels are prevented from retracting by the fibrous fascia. Bleeding can be arrested by applying pressure at the site of injury by a tight cotton bandage against the bone.

Because of the density of fascia, subcutaneous haemorrhages are never extensive, and the inflammations in this layer cause little swelling but much pain.

Because the pericranium is adherent to sutures, collections of fluid deep to the pericranium known as **cephalhaematoma** take the shape of the bone concerned when there is fracture of particular bone.

Collection of blood in the layer of loose connective tissue causes generalised swelling of the scalp. The blood may extend anteriorly into the root of the nose and into the eyelids resulting in black eye.

Because of the spread of blood, compression of brain is not seen and so this layer is also called **safety layer**.

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