SCALP

DEFINE AND NAME LAYERS OF THE SCALP. GIVE ITS BLOOD SUPPLY, NERVE SUPPLY AND APPLIED ANATOMY. (LE)

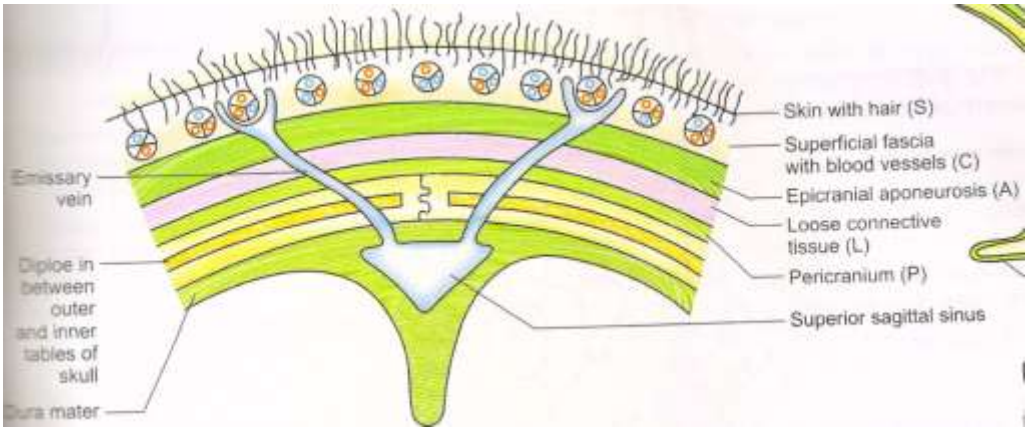
Definition: Scalp is the soft tissue over the vault

Extent:

Anteroposteriorly: Supra orbital margin to superior nuchal line and External occipital protruberance

Side to side – Between two zygomatic arches

Layers: Made up of 5 layers



From superficial to deep

Skin.

Connective tissue layer.

Aponeurosis & Occipito frontalis muscle .

Loose areolar tissue.

Pericranium .

Skin

Thin hairy skin with many sebaceous glands.

Connective tissue

It is dense and forms neurovascular plane.

Aponeurosis and Occipito frontalis muscle.

Galea aponeurotica / Epicranial aponeurosis : connects the frontal and occipital bellies of

Occipitofrontalis muscle.

Loose areolar tissue

Forms potential space.

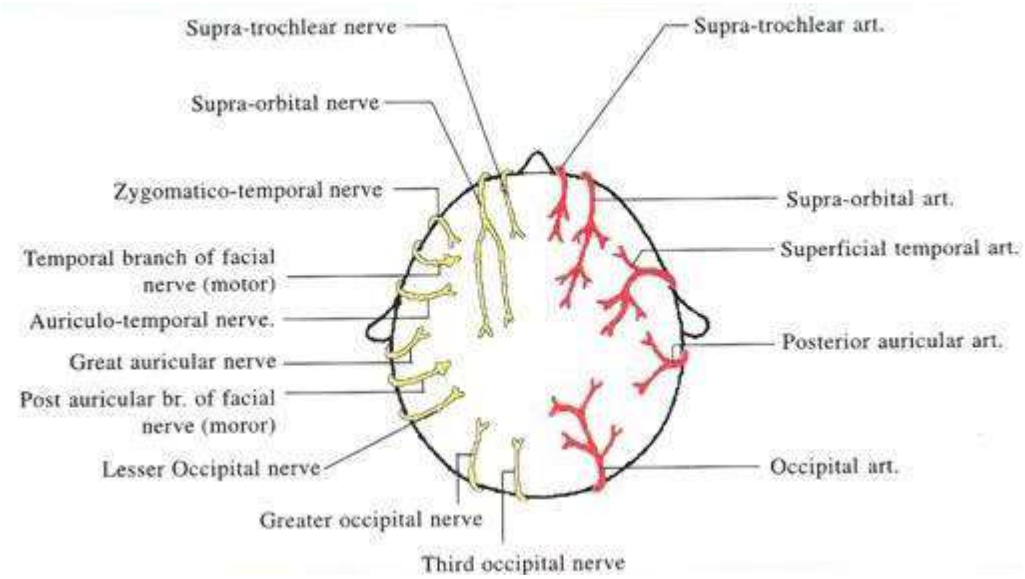
Contains **emissary veins**, (Emissary veins are devoid of valves & communicate the veins of the scalp with intracranial venous sinuses)

Pericranium

It is periosteum over the outer surface of the skull.

Loosely covers the bone except at the sutures where it is continuous with endocranium

Nerve supply:



Nerve Supply of the scalp-

Anterior to the auricle :

Supra-trochlear nerve (branch of ophthalmic nerve)

Supra-orbital nerve (branch of ophthalmic nerve)

Zygomatico-temporal nerve (branch of maxillary nerve)

Temporal branch of Facial nerve (**Motor nerve**)

Auriculotemporal nerve (branch of mandibular nerve)

Posterior to the auricle:

Great auricular nerve (C2,3)

Posterior auricular branch of Facial nerve (**Motor nerve**)

Lesser occipital nerve (C2)

Greater occipital nerve (C2)

Third occipital nerve(C3)

Blood supply of the Scalp

Arterial supply

From anterior to posterior

In front of the auricle:

Supra-trochlear artery (branch of ophthalmic artery of internal carotid artery)

Supra- orbital artery (branch of ophthalmic artery of internal carotid artery)

Superficial temporal artery (branch from external carotid artery)

Behind the auricle:

Posterior auricular artery (branch from external carotid artery)

Occipital artery (branch from external carotid artery)

Venous Drainage of scalp:

From anterior to posterior:

Supra-trochlear vein

Supra- orbital vein

Superficial temporal vein

Posterior auricular vein

Occipital vein

Applied anatomy of scalp:

Scalp Skin

Common site of **sebaceous cyst.**

Dense Connective tissue

Since walls of large blood vessels are attached to fibrous tissue,

If vessels are torn, prevents their retraction leading to profuse bleeding.

Aponeurosis

Wounds of the scalp gape widely only when the galea is severed transversely.

Loose areolar tissue:

Presence of valveless emissary vein in this layer makes it **dangerous area** of the scalp. Emissary veins can carry infection from scalp to intracranial venous sinuses.

Black eye:

Collection of blood in 4th layer of scalp due to a blow on the head produces generalized swelling of the scalp. Blood slowly gravitates into eyelids, because Frontalis has no bony attachments. This phenomenon is called black eye.

Caput succedaneum:

It is the Temporary swollen and oedematous portion of scalp which occurs during childbirth.

Pericranium- Cephalhematoma

Collection of fluid/blood beneath pericranium produces localised swelling assuming shape of the bone.

NAME THE LAYERS OF SCALP IN ORDER (SA)

Scalp is made up of five layers.

Skin

Thin hairy skin with many sebaceous glands.

Connective tissue

It is dense and forms neurovascular plane.

Aponeurosis and Occipito frontalis muscle.

Galea aponeurotica / Epicranial aponeurosis : connects the frontal and occipital bellies of
Occipitofrontalis muscle.

Loose areolar tissue

Forms potential space.
Contains **emissary veins**, (Emissary veins are devoid of valves & communicate the veins of the scalp with intracranial venous sinuses)

Pericranium

It is periosteum over the outer surface of the skull.
Loosely covers the bone except at the sutures where it is continuous with endocranium

WHAT IS BLACK EYE? GIVE REASONS (SA)

Black eye:

A black eye often results from injury to the face or the head, and is caused when blood and other fluids collect in the space around the eye. Swelling and dark discoloration result in a "black eye."
The most common cause of a black eye is a blow to the eye, nose, or forehead.
Collection of blood in 4th layer of scalp due to a blow on the head produces generalized swelling of the scalp.
Blood slowly gravitates into eyelids, because Frontalis has no bony attachments.
This phenomenon is called black eye.
The tissues around the eye may be significantly discolored and swollen without any injury to the eye itself, like a bruise (ecchymosis) around the eye.
Pain and swelling are the most common signs and symptoms of a black eye.

SENSORY NERVE SUPPLY OF SCALP (SA)

Nerve Supply of the scalp-

Anterior part of the scalp is supplied mainly by branches of Trigeminal cranial nerve
Posterior part of the scalp is supplied by branches of cervical spinal nerves

Anterior to the auricle:

Supra-trochlear nerve (branch of ophthalmic nerve)
Supra-orbital nerve (branch of ophthalmic nerve)
Zygomatico-temporal nerve (branch of maxillary nerve)
Auriculotemporal nerve (branch of mandibular nerve)

Posterior to the auricle:

Great auricular nerve (C2,3)
Lesser occipital nerve (C2)
Greater occipital nerve (C2)
Third occipital nerve(C3)

NERVE SUPPLYING ANTERIOR QUADRANT OF SCALP (SA)

There are totally 5 nerves in the anterior quadrant of scalp.

One is motor and other 4 are sensory nerves.

Nerves supplying scalp Anterior to the auricle :

Supra-trochlear nerve (branch of ophthalmic nerve)

Supra-orbital nerve (branch of ophthalmic nerve)

Zygomatico-temporal nerve (branch of maxillary nerve)

Temporal branch of Facial nerve (**Motor nerve**) supplies frontal belly of occipitofrontalis muscle.

Auriculo-temporal nerve (branch of mandibular nerve)

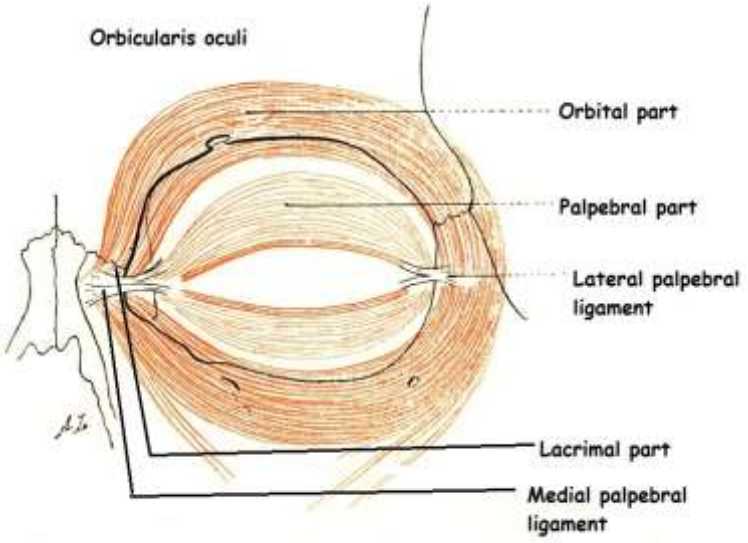
ORBICULARIS OCULI – PARTS, ATTACHMENTS, NERVE SUPPLY AND ACTION.(SE)

Orbicularis oculi has **3 parts**.

Orbital part

Palpebral part

Lacrimal part



Attachments:

Orbital part:

Medial palpebral ligament and adjoining frontal bone and maxilla.

Fibers are elliptically arranged without any interruption on the lateral side.

Palpebral part: Lies in the eyelids

Arises from medial palpebral ligament

Inserted into lateral palpebral raphe

Lacrimal part: Lies behind the lacrimal sac

Arises from the crest of lacrimal bone and lacrimal fascia

Inserted into lateral palpebral raphe.

Nerve supply: Facial nerve

Actions:

Orbicularis oculi

Acts as a sphincter of eyelids protects eyes from intense light & injury.

Palpebral part

Gentle closure of eyelids during sleep/ blinking.

Lacrimal Part

Helps in dilating lacrimal sac hence helps in drainage of lacrimal fluid.

BUCCINATOR MUSCLE (SE)

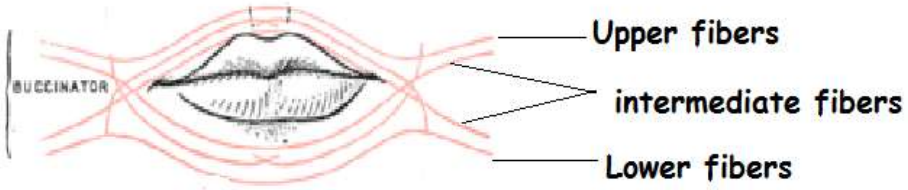
Muscle of cheek

Origin:

Outer surface of alveolar process of maxilla opposite 3 molar tooth

Outer surface of alveolar process of mandible opposite 3 molar tooth

Pterygomandibular raphe



Insertion:

Upper fibers – to the upper lip

Lower fibers – to the lower lip

Intermediate fibers – undergo chiasmatic decussation at modiolus , upper fibers go to lower lip & lower fibers go to upper lip

Nerve Supply: Facial Nerve

Action:

Flattens the cheek against gum and teeth

Thus helps in mastication by preventing accumulation of food in vestibule of mouth.

Helps in blowing a trumpet by forcibly expelling air from inflated vestibule.

Structures piercing Buccinator:

Parotid duct.

Buccal branch of mandibular nerve.

Molar mucous glands.

BUCCINATOR MUSCLE (SA)

Muscle of cheek

Origin:

Outer surface of alveolar process of maxilla opposite 3 molar teeth
Outer surface of alveolar process of mandible opposite 3 molar teeth
Pterygomandibular raphe

Insertion:

Upper fibers – to the upper lip
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Nerve Supply: Facial Nerve

Action:

Flattens the cheek against gum and teeth
Thus helps in mastication by preventing accumulation of food in vestibule of mouth.
Helps in blowing a trumpet by forcibly expelling air from inflated vestibule.

PLATYSMA (SA)

It is subcutaneous muscle of the neck (part of panniculus carnuosus)

Origin:

Fascia covering anterior part of deltoid and pectoralis major muscle up to 2nd rib.

Insertion:

Most of the fibers are inserted to inferior border of mandible

Nerve Supply: Facial Nerve (Cervical branch)

Action:

It is subcutaneous muscle in the neck
Reduces concavity of side of neck
Releases pressure from underlying veins

CUTANEOUS INNERVATION OF FACE/ SENSORY NERVE SUPPLY OF FACE (SE)

Sensory nerve supply of the face is mainly by Trigeminal Nerve EXCEPT over angle of mandible which is supplied by great auricular nerve (C2,C3).

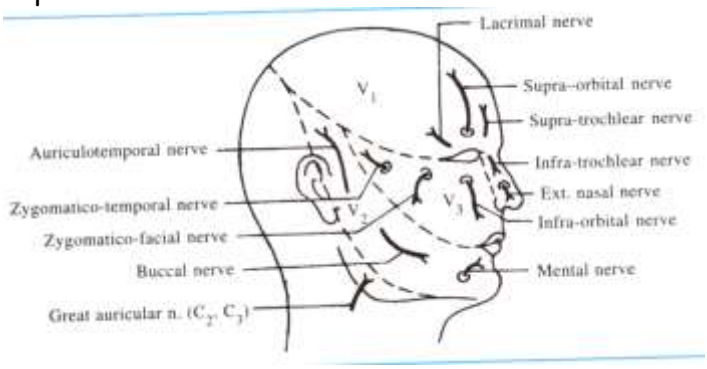
Branches of Ophthalmic division of Trigeminal nerve:

Supratrochlear nerve
Supraorbital nerve
Lacrimal Nerve
Infratrochlear Nerve
External Nasal nerve

Area supplied by Ophthalmic Nerve: Tip & side of nose, Upper lid and Forehead.

Branches of Maxillary Division of Trigeminal Nerve:

Infraorbital nerve
Zygomatico-facial nerve
Zygomatico-temporal nerve



Area supplied by Maxillary Nerve:

Upper lip, Lower lid, Partly side of nose, Malar prominence & Small portion of temple.

Branches of Mandibular Division of Trigeminal Nerve:

Auriculo-temporal nerve
Buccal nerve
Mental Nerve

Area supplied by Mandibular Nerve:

Lower lip, Chin, Skin over the mandible except over the angle,Cheek, part of pinna and external ear, most part of temple region.

CUTANEOUS INNERVATION OF FACE/ SENSORY NERVE SUPPLY OF FACE (SA)

Sensory nerve supply of the face is mainly by Trigeminal Nerve EXCEPT over angle of mandible which is supplied by great auricular nerve (C2, C3).

Trigeminal nerve has got 3 branches:

Ophthalmic nerve
Maxillary Nerve
Mandibular nerve

Area supplied by Ophthalmic Nerve:

Tip & side of nose, Upper lid and Forehead.

Area supplied by Maxillary Nerve:

Upper lip, Lower lid, Partly side of nose, Malar prominence & Small portion of temple.

Area supplied by Mandibular Nerve:

Lower lip, Chin, Skin over the mandible except over the angle,Cheek, part of pinna and external ear, most part of temple region

FEATURES OF BELL'S PALSY (SA)

Bell's palsy is weakness of the muscles on one side of face due to the extracranial course of facial nerve becomeing inflamed, swollen, or compressed.

It is lower motor neurone type of paralysis

Features:

Most features are seen on the affected side.

Inability to close eyelids.

Epiphora

Drooling of saliva from angle of mouth

Loss of nasolabial groove

While Smiling , angle of the mouth is drawn to the normal side.

BLOOD SUPPLY OF THE FACE (LE)

Arterial Supply of Face:

The face is richly vascular. It is supplied by

The facial artery

The transverse facial artery

Arteries that accompany the cutaneous nerves.

Facial Artery:

Principal artery of face

It is branch of external carotid artery

It originates in the neck

Artery enters face by winding around the lower border of mandible at the antero inferior angle of masseter muscle

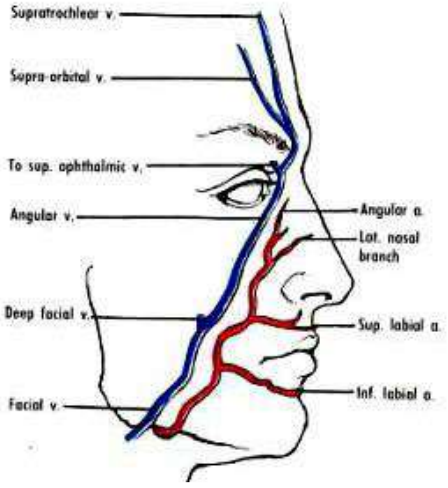
Facial Artery course in the Face:

In the face it has a tortuous course

Courses upwards & forwards to a point 1.25cm lateral to angle of mouth

Ascends along side of nose

At the medial angle of eye ends by anastomosing with dorsal nasal branch of ophthalmic a



Branches of facial artery in the face:

Inferior labial artery
Superior labial artery
Lateral nasal artery

Communications:

There is profuse communications of branches of facial artery across midline.

Facial artery communicates with dorsal nasal branch at the medial angle of eye.

Transverse facial artery.

It is a branch of superficial temporal artery.
It supplies the paritid gland, masseter, and overlying skin.
It ends by anastomosing with neighbouring arteries.

Venous Drainage of the face

The veins draining the face are

Facial vein
Retromandibular vein.

Facial Vein:

Foramtion: Begins at the medial angle of eye as angular vein by the union of supratrochlear and supraorbital vein

Course:

Runs straight downwards and backwards behind the facial artery

Termination:

Finally it drains into internal jugular vein.

Communications of facial vein:

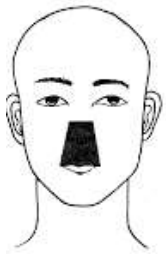
Communication with cavernous sinus
Communication with frontal diploic vein

Retromandibular vein:

Superficial temporal vein joins with the maxillary vein to form thr retromandibular vein. It divides into anterior and posterior divisions.Anterior division joins the facial vein & becomes common facial vein which drains into internal jugular vein.

Applied anatomy:

Dangerous area of the Face: Area of upper lip and adjoining lower part of nose.
Any infection in this region can spread to cavernous sinus leading to thrombosis of cavernous sinus.
This happens because of the communications of facial vein with cavernous sinus.



FACIAL VEIN (SA)

Facial Vein is the main vein draining face

Formation

At the medial angle of eye by Union of supra-trocohlear and supra orbital veins.

Course

Run downwards in the face behind the facial artery.

Termination

Drains into internal jugular vein after the formation of common facial vein.

It has no valves.

Communications

Facial vein communicates with cavernous venous sinus

Applied anatomy:

Dangerous area of the face: it is a triangular area between the angles of mouth and root of the nose. Infection in this area results into cavernous sinus thrombosis because of the connections of facial vein.

LACRIMAL APPARATUS. (SE)

Constituents of lacrimal apparatus:

Lacrimal apparatus includes:

Lacrimal gland and its ducts – secretes tear

Lacrimal puncta

Lacrimal canaliculi Conveys tears to inferior meatus of nose

Lacrimal sac.

Nasolacrimal duct

Lacrimal gland:

Situation:

Anterolateral part of roof of orbit

Has got 2 parts- orbital part and palpebral part

Structure:

It is a tubulo-alveolar gland secreting serous fluid

Ducts of lacrimal gland:

12 in number. These ducts open into superior fornix of conjunctiva.

Accessory lacrimal glands:

Numerous and present near the conjunctival fornices.

Lacrimal puncta :

Present in the medial part of upper and lower eyelids

Lacrimal canaliculi:

Present one in each eyelid

10mm in length

Convey tear fluid from palpebral fissure to lacrimal sac.

Lacrimal sac:

Situation:

Lodges in lacrimal fossa

It is the upper blind end of nasolacrimal duct.

12 mm in length

Naso lacrimal duct:

Nasolacrimal duct is a membranous canal

Length – 18 mm

Extent:

Lacrimal sac to inferior meatus of the nose

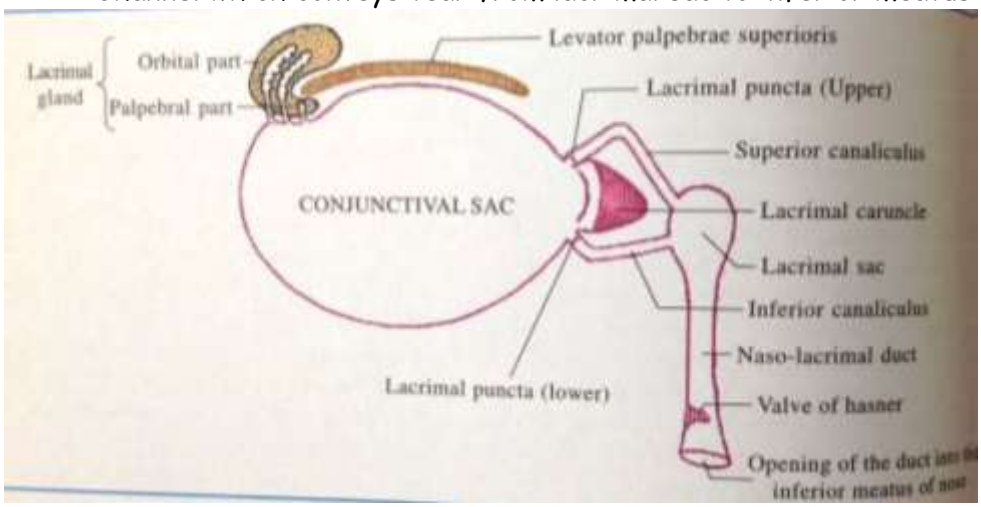
Lower opening presents an incomplete mucous fold.

Direction:

Downwards, backwards and lateral

Function:

Channel which conveys tear from lacrimal sac to inferior meatus of nose



CONSTITUENTS OF LACRIMAL APPARATUS (SA)

Lacrimal apparatus includes:

Lacrimal gland –

Situated in Anterolateral part of roof of orbit. secretes lacrimal fluid or tears

Lacrimal puncta –

Present in the medial part of upper and lower eyelids

Lacrimal canaliculi-

Convey tear fluid from palpebral fissure to lacrimal sac.

Lacrimal sac- It is the upper blind end of nasolacrimal duct. The lacrimal fluid is aspirated into the sac from the puncta.

Nasolacrimal duct - Conveys tears to inferior meatus of nose

NASOLACRIMAL DUCT (SA)

Nasolacrimal duct is a membranous canal

Length – 18 mm

Extent:

Lacrimal sac to inferior meatus of the nose

Lower opening presents an incomplete mucous fold.

Direction:

Downwards, backwards and lateral

Function:

It is a part of lacrimal apparatus

Channel which conveys tear from lacrimal sac to inferior meatus of nose