

MBBS MANUAL

SEARCH

Scalp, Temple and Face

...

(10 marks)

Q1) Define and name layers of the scalp. Give its blood supply, nerve supply and applied anatomy.

Ans

DEFINITION- The soft tissue covering the vault of the skull is known as SCALP.

LAYERS- Scalp consists of five layers, i.e.,

- Skin
- Connective tissue
- Aponeurosis of occipitofrontalis muscle
- Loose areolar tissue
- Pericranium

BLOOD SUPPLY OF SCALP

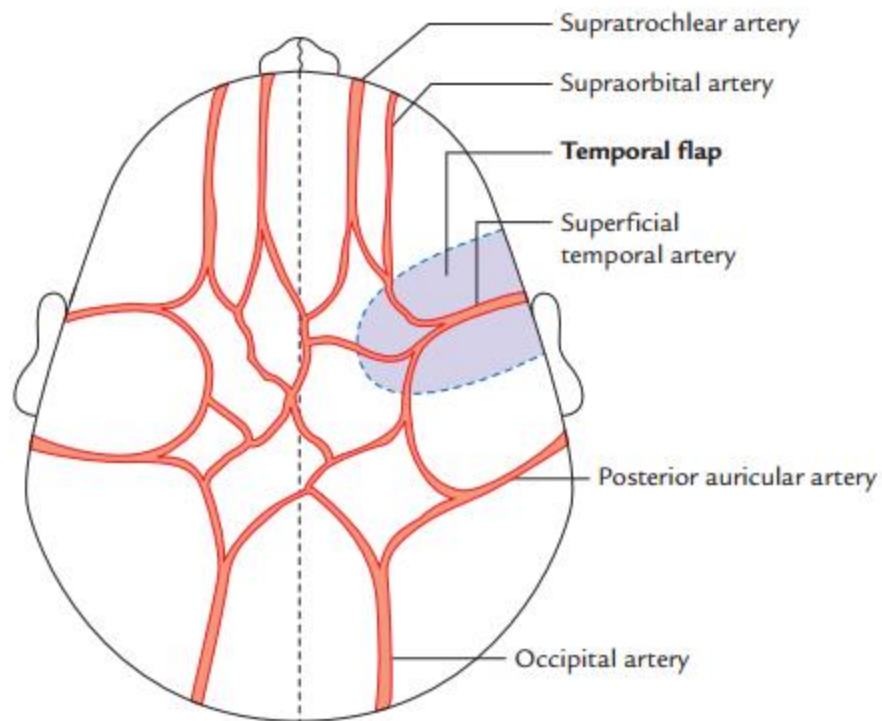


Fig. 3.6 Arterial supply of the scalp. The area enclosed by blue dotted line shows the temporal flap.

- On each side of midline, scalp is supplied by 5 arteries.
- 3 in front of the auricle and 2 are behind the auricle
- They are
 - Supratrochlear artery- It is the branch of ophthalmic artery from internal carotid artery. Site of entry to scalp is from one finger breadth lateral to midline around supraorbital margin.

- Supraorbital artery- It is the branch of ophthalmic artery from internal carotid artery. Site of entry to scalp is through supratrochlear notch, 2-3 cm lateral to supratrochlear artery.

- Superficial temporal artery- It is the terminal branch of External carotid artery. Site of entry to scalp is in front of root of zygoma.

- Posterior auricular artery- It is the branch of External carotid artery. Site of entry to scalp is behind the root of ear.

- Occipital artery- It is the branch of external carotid artery. site of entry to scalp is midway between ear and external occipital protuberance.

Venous Drainage= Veins of the scalp follows the arteries.

- Supratrochlear and Supraorbital veins- They join to form angular vein and further downwards continues as facial vein.

- Superficial temporal vein- It runs downward near tragus and joins with maxillary vein to form retromandibular vein.
- Posterior auricular vein- It joins with posterior division of retromandibular vein to form external jugular vein.
- Occipital vein- It terminates as suboccipital plexus.

NERVE SUPPLY OF SCALP.

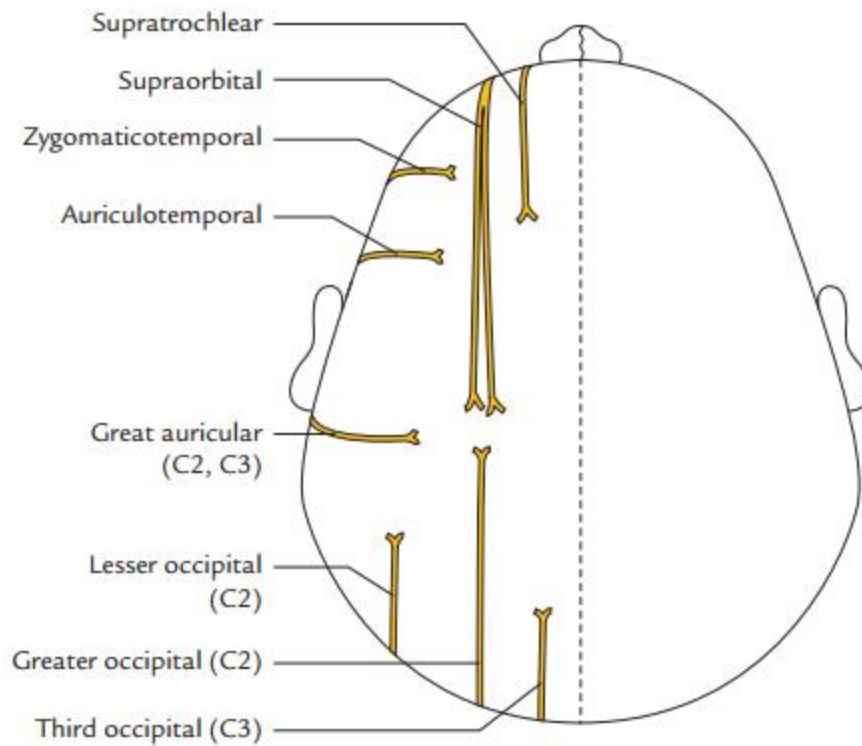


Fig. 3.5 Sensory supply of the scalp (shown in left half only).

[A]Motor supply

- Supplied by two branches of facial nerve
- Temporal branch of facial nerve- supplies frontal bellies of occipitofrontalis.
- Posterior auricular branch of facial nerve- supplies occipital bellies of occipitofrontalis.

[B]Sensory supply

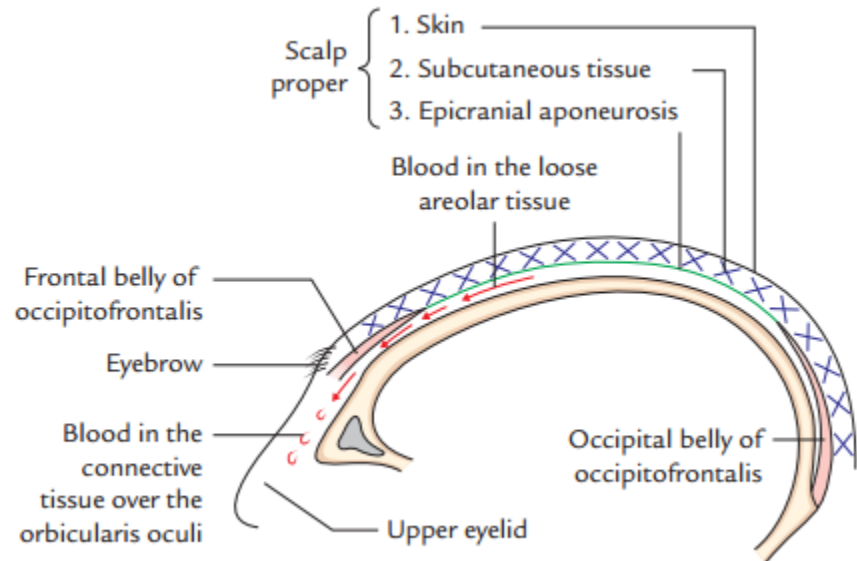
- Supplied by 8 sensory nerves they are-
- Supratrochlear
- Supraorbital
- Zygomaticotemporal
- Auriculotemporal
- Greater auricular
- Lesser occipital
- Greater occipital
- Third occipital

Applied Anatomy-

- Surgical layers of the scalp-First three layers of the scalp i.e., skin, connective tissue, aponeurosis is termed as surgical layers of the scalp. Because

these layers are strictly adhered to each other & freely movable over loose areolar tissue

- Black eye-



Blood and fluid freely track downwards and towards frontal region in loose areolar tissue layer due to a blow to head. This blood usually flows forwards rather than to temple and occipital region due to bony attachments of occipitofrontalis & seals these areas. Whereas it has no bony attachments anteriorly so fluid & blood freely

track downwards into eyelids and makes black discolouration around the eye.

- Dangerous area of Scalp- Loose areolar tissue is called dangerous layer, due to chances of accumulation of fluid and pus.
- Safety valve hematoma- Collection of blood in 4th layer due to haemorrhage or fracture to duramatter & pericranium. The blood will collect & acts like safety valve.
- Cephalhematoma- Collection of blood in pericranium or subperiosteal layer of scalp.

Q2) Describe blood supply and venous drainage of face & add a note on applied anatomy(RS2)

ANS- Blood suply of face.

Arterial supply.

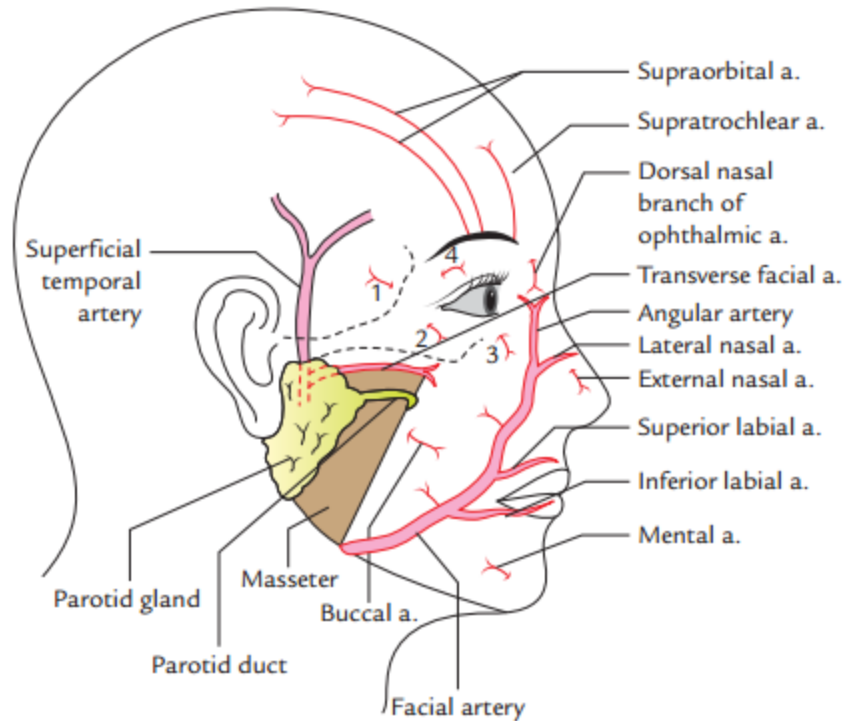


Fig. 3.17 Arterial supply of the face (1 = zygomaticotemporal, 2 = zygomaticofacial, 3 = infraorbital, 4 = palpebral branch of lacrimal artery).

The face is the highly vascular region and is supplied by the following arteries,

1. Facial artery.
2. Transverse facial artery.
3. Arteries that accompany the cutaneous nerves.

The main arterial supply to the face is by the *facial artery*, hence it is called chief artery of the face.

Facial Artery

It arises from external carotid artery in the neck at the level of greater cornu of the hyoid bone, and after a looped course in the submandibular region, it enters the face by winding around the lower border of the mandible at the anteroinferior angle of the masseter by piercing the investing layer of deep cervical fascia.

In the face, the artery passes tortuously, first upwards and forwards to a point 1.25 cm lateral to the angle of the mouth and then ascends along the side of the nose to the medial angle of the eye where it ends by anastomosing with the *dorsal nasal branch of ophthalmic artery*. The terminal part of facial artery is called angular artery.

Branches of the Facial Artery in the Face

In the face it gives three sets of named branches, *viz.*

1. **Inferior labial artery**, to supply the lower lip.
2. **Superior labial artery**, to supply the upper lip.
3. **Lateral nasal artery**, to supply the ala and dorsum of the nose. All these branches arise anteriorly.

4. **Muscular branches**, are small, unnamed and arise from the posterior aspect of the artery.

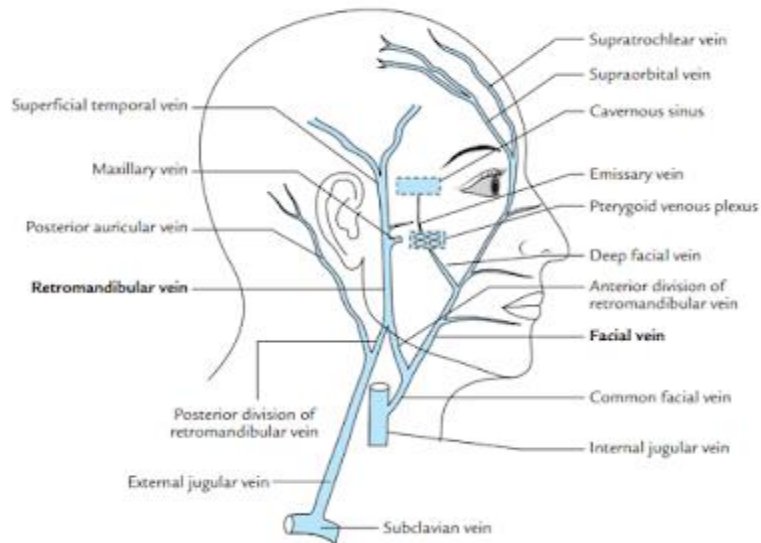
Transverse Facial Artery

It is a small artery that arises from superficial temporal artery, within the parotid gland. After emerging from parotid gland it runs forwards on the masseter between the zygomatic arch and the parotid duct accompanied by buccal branch of the facial nerve.

Arteries Accompanying the Cutaneous Nerves

They are small and usually go unnoticed but some of them can be easily seen, *viz.* infraorbital artery, buccal artery, and mental artery. Note, they all are derived from maxillary artery

Venous drainage.



The venous blood from the face is drained by two veins, *viz.*

1. Facial vein.
2. Retromandibular vein.

Facial Vein

It is the largest vein of the face. It is formed at the medial angle of the eye by the union of supratrochlear and supraorbital veins. After formation, it runs straight downwards and backwards behind the facial artery to reach the anteroinferior angle of the masseter. Here it pierces the deep fascia, crosses superficial to submandibular gland and joins the anterior division of *retromandibular vein* below the angle of the

mandible to form the *common facial vein*, which drains into the internal jugular vein. The tributaries of facial vein correspond to the branches of facial artery.

Deep Connections

The facial vein communicates with the cavernous sinus through the following two routes:

1. At the point of commencement, the facial vein communicates with the superior ophthalmic vein, which passes backwards within the orbit and drains into cavernous sinus.
2. In the cheek, the facial vein is joined to the pterygoid venous plexus by the *deep facial vein*. The deep facial vein passes backwards over the buccinator deep to the ramus of the mandible and communicates with the *pterygoid venous plexus* around the lateral pterygoid muscle, which in turn communicates with the cavernous sinus through an emissary vein

Retromandibular Vein

The retromandibular vein is formed by the union of the superficial temporal and the maxillary vein within the parotid gland. On leaving the parotid gland, it divides into

two divisions: anterior and posterior.

The anterior division joins the facial vein to form the common facial vein, whereas

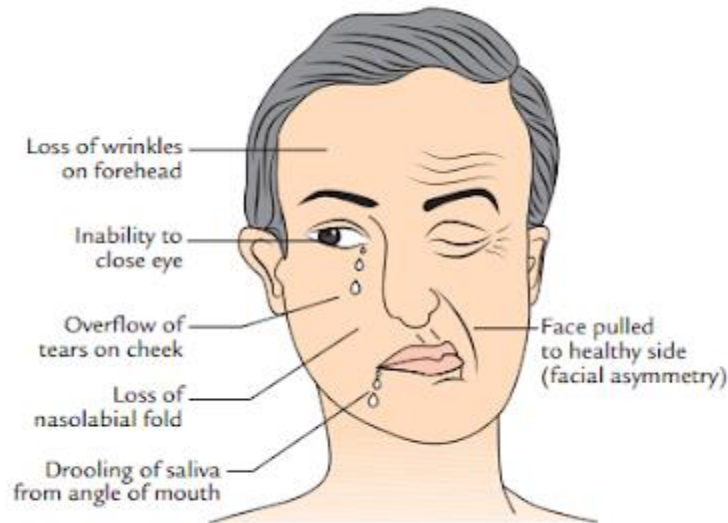
posterior division joins the posterior auricular vein to form the external jugular vein

Applied Anatomy of face.

- **Crow's feet:** The contraction of entire orbicularis oculi draws the skin of forehead, temple, and cheek towards the lateral angle of the eye, producing radiating skin folds from the lateral angle of the eye, which may be a permanent feature in some old people forming the so called crow's feet

- **Ectropion:** The paralysis of orbicularis oculi results in drooping of the lower eyelid (ectropion) causing spilling of tear on the cheek (epiphora)

Bell's palsy:



It is lower motor neuron type paralysis of facial muscles due to compression of facial nerve in the facial canal near stylomastoid foramen. The exact etiology is not known but it is probably due to viral infection.

Characteristic Features on the Side of Paralysis.

1. *Facial asymmetry* (affected side is drawn to the healthy side)—due to unopposed action of muscles of normal side.
2. *Loss of horizontal wrinkles on forehead*—due to paralysis of occipitofrontalis muscle.
3. *Widening of palpebral fissure and inability to close the eye*—due to

paralysis of orbicularis oculi.

4. *Tears flow down from the eye (epiphora)*—due to paralysis of the lower part of the orbicularis oculi.

5. *Sagging of the angle of the mouth towards the affected side* and inability of the angle of the mouth to move upwards and laterally during laughing—due to paralysis of zygomaticus major.

6. *Loss of nasolabial furrow*—due to paralysis of levator labii superioris alaeque nasi.

7. *Accumulation of food into the vestibule of the mouth*— due to paralysis of buccinator muscle.

8. *Dribbling of saliva from the angle of the mouth*—due to paralysis of orbicularis oris.

9. Loss of resistance when one presses cheek with inflated vestibule and air leaks out from between the lips—due to paralysis of buccinator muscle.**Dangerous area of the face:** The facial vein and its

communications are devoid of valves in their lumens. Since facial vein rests directly on the muscles of facial expression, the movements of these muscles may facilitate the spread of septic emboli from infected

area of the lower part of the nose, upper lip, and adjoining part of the cheek in retrograde direction through deep facial vein, pterygoid venous plexus, and emissary vein into the cavernous sinus leading to meningitis and cavernous sinus thrombosis. For this reason, this portion of the face is called *dangerous area of the face*

(5 marks)

Q1) Scalp: Layers, blood supply & Nerve supply, Applied Anatomy

(RS2,RS3)

ANS-

LAYERS- Scalp consists of five layers, i.e.,

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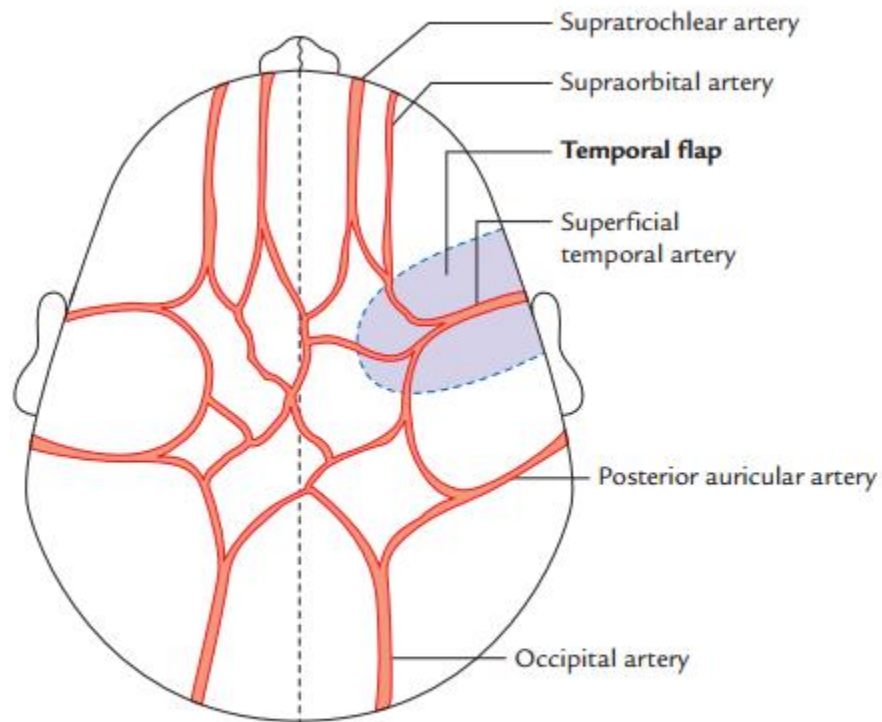


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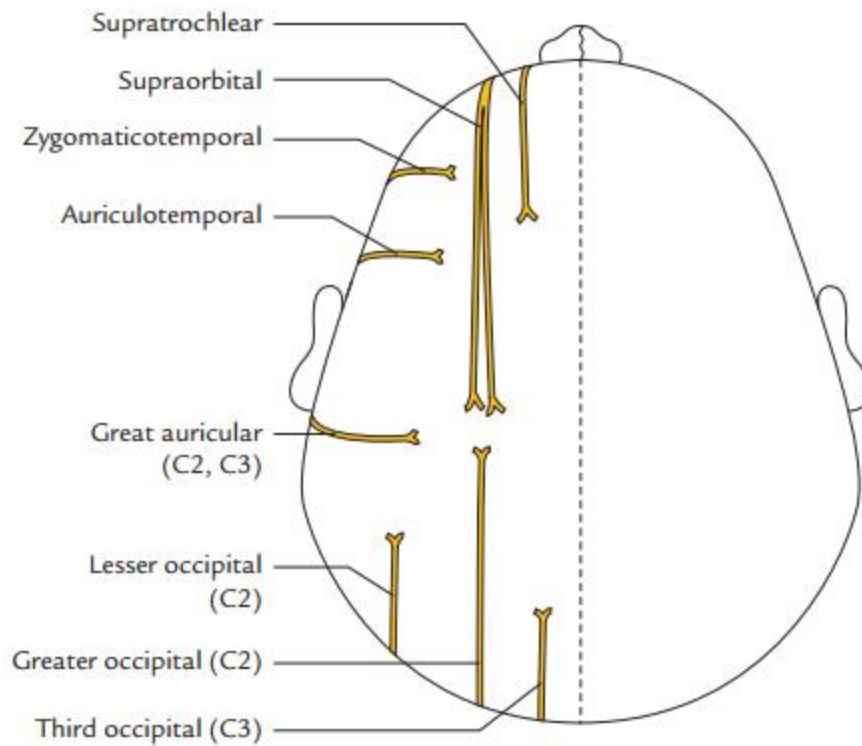


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Applied Anatomy-

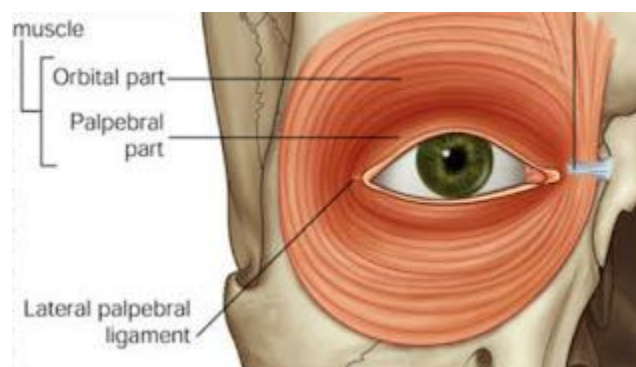
- Surgical layers of the scalp-First three layers of the scalp i.e., skin, connective tissue, apponeurosis is termed as surgical layers of the scalp. Because these layers are strictly adhered to each other & freely movable over loose areolar tissue

- Black eye- Blood and fluid freely track downwards and towards frontal region in loose areolar tissue layer due to a blow to head. This blood usually flows forwards rather than to temple and occipital region due to bony attachments of occipitofrontalis & seals these areas. Where as it has no bony attachments anteriorly so fluid & blood freely track downwards into eyelids and makes black discolouration around the eye.

Q2) Orbicularis Oculi: Parts, attachments, nerve supply & actions

(RS2, RS3)

Ans-



Orbicularis oculi It consists of three parts—orbital, palpebral, and lacrimal.

part	Orbital part	Palpebral part	Lacrimar part
Attachments	arises from medial palpebral ligament, frontal process of maxilla, and adjoining part of the frontal bone. The fibres form complete elliptical loops on and around the orbital margin, without interruption before returning to their point of origin.	arises from medial palpebral ligament and sweeps laterally over the upper and lower eyelids to be inserted into the lateral palpebral ligament. A small group of fibres called <i>ciliary bundle</i> lie along the margins of both eyelids.	lies behind the lacrimal sac. It arises from posterior lacrimal crest and lacrimal fascia forming a sheath of lacrimal sac that passes laterally in front of tarsal plates of both eyelids to be inserted into the lateral palpebral raphe.
Parts	Orbital	Palpebral	Lacrimal
Actions	It closes the eye tightly to protect the eye from intense light and dust particles. It	It closes the eyelids gently as in sleep or in blinking.	It dilates the lacrimal sac by exerting traction on the lacrimal fascia, thus helping in the

	is also used by people for winking.		drainage of lacrimal fluid.
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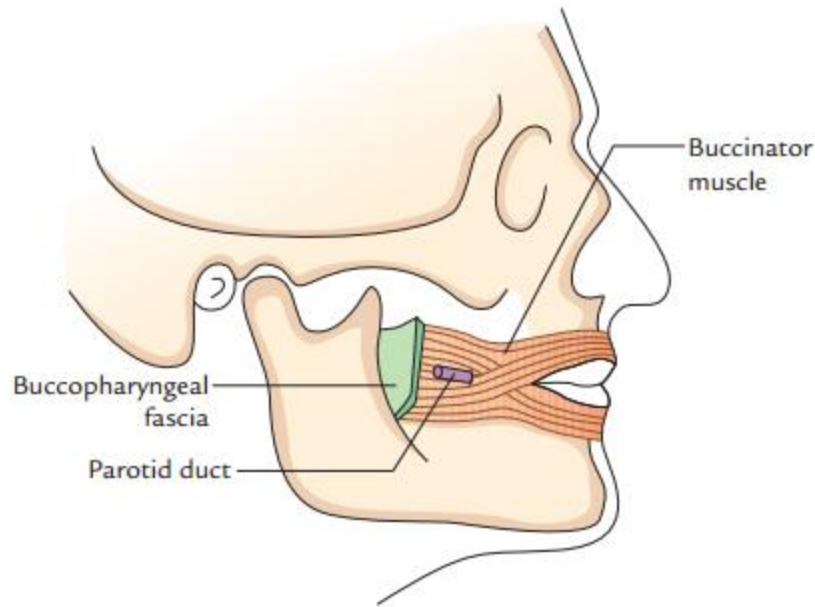
Nerve supply

The orbicularis oculi are innervated by the seventh cranial nerve, the facial nerve. The upper half of the orbicularis oculi muscle receives its innervation from the temporal branch of the seventh cranial nerve (facial nerve), while the lower half receives its innervation from the zygomatic branch of the seventh cranial nerve (facial nerve).

Q3) Buccinator muscle (RS3)

Ans-

Buccinator (Bugler's muscle/trumpeter's muscle) is muscle of the cheek and needs to be discussed in detail



Origin:

The buccinator arises from the following 4 sites:

1. Outer surface of the alveolar process of maxilla opposite three molar teeth.
2. Fibrous band that extends from pterygoid hamulus to maxillary tuberosity (pterygomaxillary raphe).
3. Pterygomandibular raphe, which extends from pterygoid hamulus to the mandible behind the third molar tooth.
4. Outer surface of the alveolar process of mandible opposite three molar

teeth.

After origin, the fibres run towards the mouth and fill the gap between the upper and lower jaws. The fibres are arranged into upper, intermediate, and lower groups.

Insertion:

The buccinator is inserted in a complicated manner into the upper and lower lips.

On reaching near the angle of the mouth:

- (a) upper fibres pass into upper lip,
- (b) lower fibres pass into the lower lip, and
- (c) intermediate fibres decussate and as a result upper fibres of this group pass into lower lip and lower fibres pass into the upper lip.

Nerve supply:

Buccal branches of facial nerve.

Actions:

1. It flattens the cheek against the gum and teeth, and thus prevents the accumulation of food in the vestibule of mouth during mastication.
2. It is responsible for blowing the cheek and expelling the air between

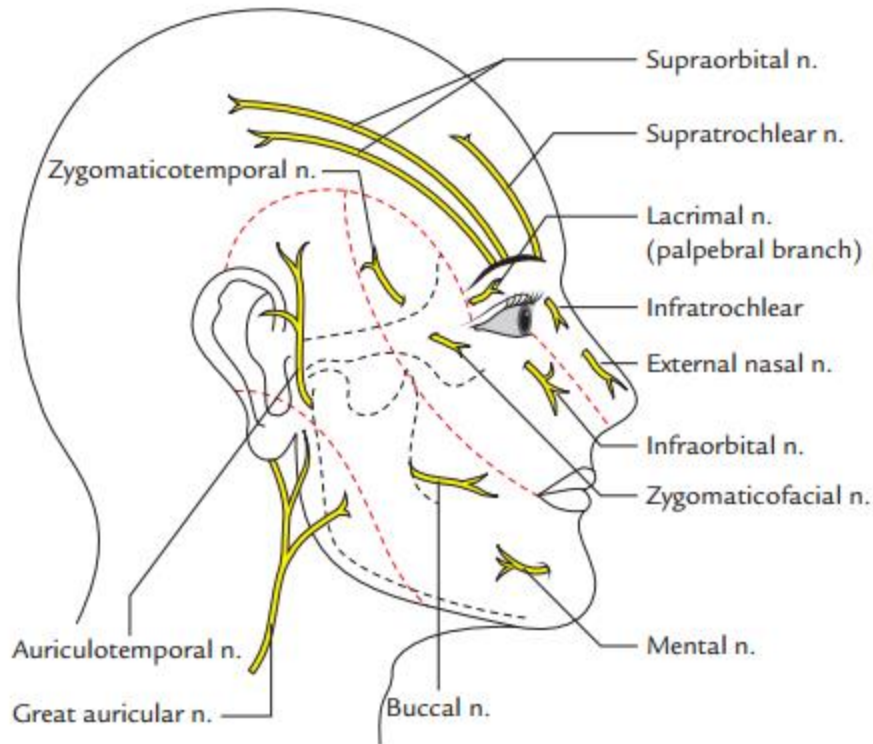
the lips from inflated vestibule as in blowing the trumpet (hence the name *trumpeter's muscle*).

Applied Anatomy:

- **Paralysis of buccinator muscle:** *If the buccinator muscle is paralyzed*, as it occurs in facial palsy, the food accumulates in the vestibule of mouth during mastication and the person cannot blow his cheek.
- **Modiolus:** It is a dense, compact, mobile, fibromuscular mass situated about 1.25 cm lateral to the angle of the mouth. It is formed due to interlacing of fibres of five muscles which converge towards the angle of the mouth. These muscles (modiolar muscles) are: levator anguli oris, zygomaticus major, buccinator, depressor anguli oris and risorius.

Q4) Cutaneous innervation of face (RS2)

Ans-



The trigeminal nerve is the sensory nerve of the face because it supplies the whole of the face, except skin over the angle of mandible, which is supplied by great auricular nerve derived from ventral rami of the 2nd and 3rd cervical nerves (C2, C3).

The upper one-third face (developing from frontonasal process) is supplied by ophthalmic division, middle third of face (developing from maxillary processes) is supplied by maxillary division and lower third of face (developing from mandibular processes) is supplied by mandibular division of

the trigeminal nerve. The territories of cutaneous innervation of ophthalmic, maxillary, and mandibular nerves are not horizontal, but curved in the posterosuperior direction, indicating the direction of growth of brain and head. Thus the original beard area has been drawn up to the temple and necessarily the neck skin is drawn up to overlap the angle of the mandible. This explains the innervation of face by the 2nd cervical nerve (C2).

The cutaneous nerves of the face derived from three divisions of the trigeminal nerve are as follows:

Branches of Ophthalmic divisions of Trigeminal nerve	Branches of Maxillary divisions of Trigeminal nerve	Branches of Mandibular divisions of Trigeminal nerve
Supraorbital Supratrochlear Infratrochlear External nasal Lacrimal	Infraorbital Zygomaticofacial Zygomaticotemporal	Mental Buccal Auriculo-temporal

Applied Anatomy

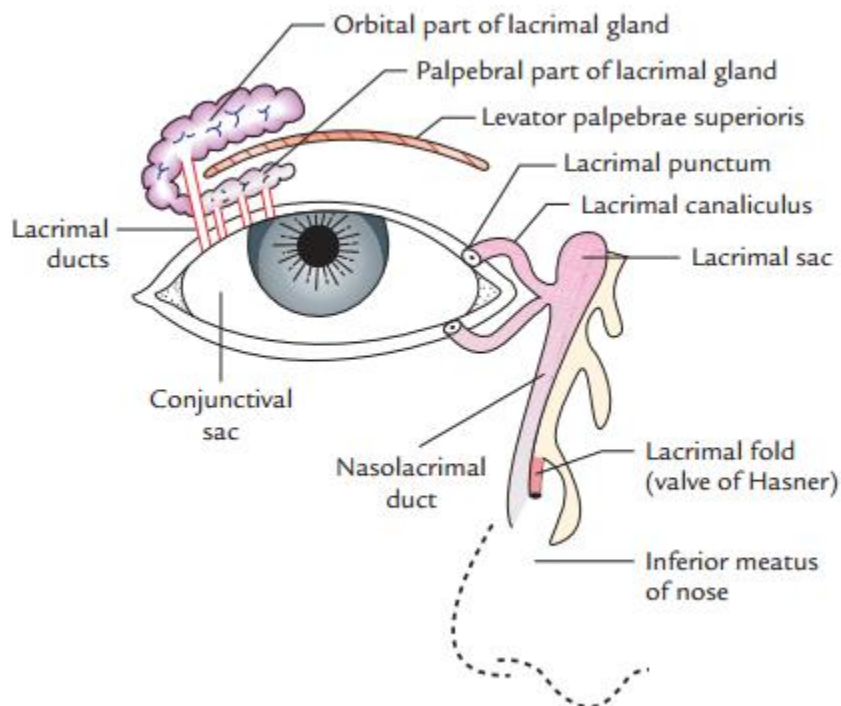
- **Trigeminal neuralgia (tic douloureux):** It is a clinical condition characterized by sudden paroxysmal attacks of lancinating pain lasting

from few hours to several days, confined to distribution of one or more divisions of trigeminal nerve. It commonly starts in the maxillary territory and more frequently on the right side.

- **Herpes zoster ophthalmicus:** It is a viral infection involving the ophthalmic nerve. It presents as severe pain and edema in the ophthalmic territory and is characterized by the appearance of vesicles along the course of cutaneous branches of the ophthalmic nerve.

Q5) Lacrimal Apparatus (RS2, RS3)

Ans-



STRUCTURE

The structures concerned with secretion and drainage of lacrimal (tear) fluid together form the *lacrimal apparatus*. The lacrimal apparatus consists of the following structures:

1. Lacrimal gland.
2. Ducts of lacrimal gland.
3. Conjunctival sac.
4. Lacrimal puncta.
5. Lacrimal canaliculi.
6. Lacrimal sac.
7. Nasolacrimal duct.

Lacrimal gland: The lacrimal gland is a (J-shaped) *serous gland*. It consists of upper large orbital part and lower small *palpebral part*. The two parts are continuous with each other around the lateral margin of the levator palpebrae superioris. The *orbital part* is almond shaped and situated in the lacrimal fossa in the anterolateral part of the roof of the bony orbit.

The *palpebral part* is one-third of the size of the orbital part and is

situated in the lateral part of the upper eyelid below the levator palpebrae superioris and extends up to the superior fornix of conjunctiva.

Ducts of the lacrimal gland: The ducts of lacrimal gland are approximately 12 in number, about 4 or 5 from orbital part and 6–8 from palpebrae part. They open into the lateral parts of the superior fornix of the conjunctival sac.

Conjunctival sac: It is a potential space between palpebral and bulbar conjunctiva

Lacrimal puncta: These are small openings on the lid margins. At the junction of these, there is a small conical projection called *lacrimal papilla* surmounted by a tiny aperture called *lacrimal punctum*. The lacrimal papilla faces inwards towards the *lacus lacrimalis*.

Lacrimal canaliculi: There are two lacrimal canaliculi, superior and inferior in upper and lower eyelids, respectively. Each canaliculus measures about 10 mm in length and begins at lacrimal punctum. The superior canaliculus at first runs upwards and then bends downwards and medially along the free margin of the eyelid to open into the lacrimal sac.

Lacrimal sac: It is the upper dilated end of the nasolacrimal duct. It is situated in the deep lacrimal groove bound by posterior lacrimal crest of lacrimal bone and anterior lacrimal crest of frontal process of the maxilla.

Nasolacrimal duct: It is a membranous canal, about 18 mm long, extending from neck of lacrimal sac to the anterior part of inferior meatus of the nose. It is lodged in the bony canal formed by maxilla, lacrimal bone, and inferior nasal concha. Its lower opening presents an incomplete mucous fold called *lacrimal fold* or *valve of Hasner*, which prevents the air from blowing the duct into the eye when one blasts his

nose to clean nasal secretions. **Factors Helping the Drainage of Tears**

Drainage of tears occurs by following means:

1. Blinking movements of eyelids.
2. Capillary action of the film of the fluid.
3. Contraction of lacrimal part of orbicularis oculi leading to distension of lacrimal sac.

DEVELOPMENT OF NASOLACRIMAL

DUCT AND LACRIMAL SAC

The nasolacrimal duct develops from a solid cellular ectodermal cord, which forms along the nasolacrimal groove, the line of fusion of maxillary and lateral nasal processes. Later, the cord become submerged beneath the surface ectoderm and becomes canalized during the third month to form the nasolacrimal duct. The upper end of the duct widens to form the lacrimal sac, which develops secondary connection with the conjunctival sac by lacrimal canaliculi.

Applied Anatomy:

Epiphora: It is an overflow of tears from conjunctival sac over the cheeks. It may occur due to:

(a) excessive secretion of tears (*hyperlacrimation*) following intake of spicy food or emotional outbreak, or

(b) obstruction in lacrimal passages, *viz.* lacrimal punctum, lacrimal canaliculi, lacrimal sac and nasolacrimal duct, or

(c) eversion of lower eyelid (*ectropion*), hence that of lacrimal papilla and lacrimal punctum due to laxity of orbiculi oculi in old age or loss of its tone due to paralysis.

(3 marks)

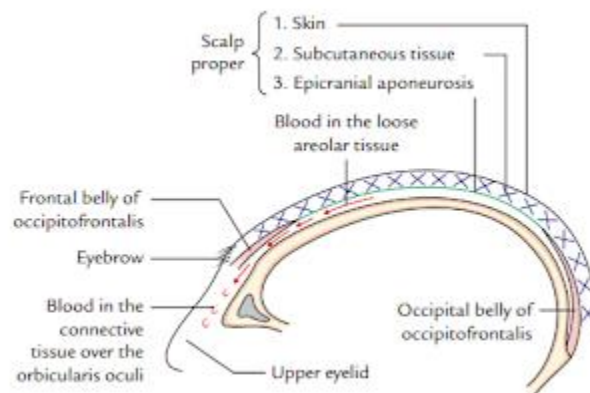
Q1) Reteomandibular vein (formation) (RS3)

Ans-

- The retromandibular vein is formed by the union of the superficial temporal and the maxillary vein within the parotid gland.
- On leaving the parotid gland, it divides into two divisions: anterior and posterior.
- The anterior division joins the facial vein to form the common facial vein, whereas posterior division joins the posterior auricular vein to form the external jugular vein

Q2) What is black eye? Give reasons (RS3)

Ans-



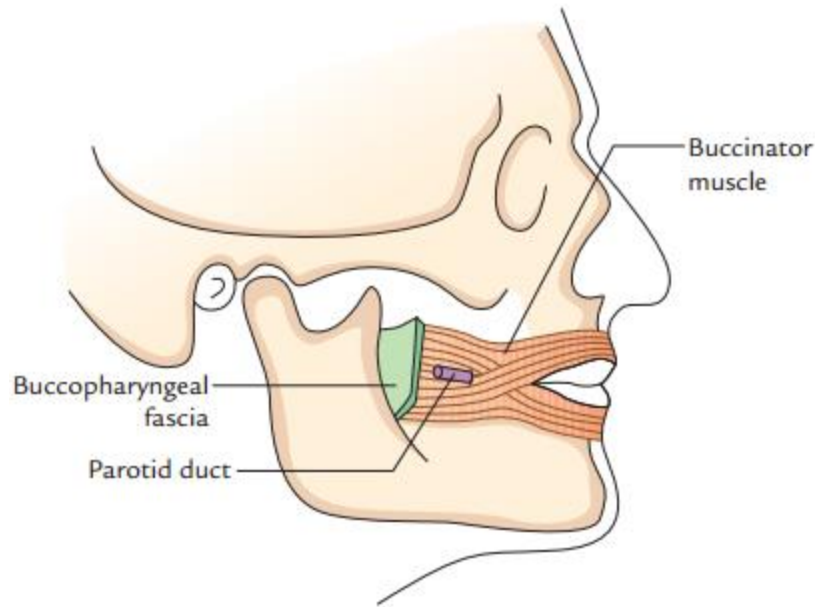
Formation of hematoma few hours after a head injury or cranial operation causing black discoloration of skin around the eyes, a condition called **black eye**.

Reasons-

The blood and fluid collecting in the layer of loose areolar tissue following a blow on head tracks freely under the scalp producing generalized swelling over the dome of the skull, but cannot pass into either occipital or temple regions because of the bony attachments of the occipitofrontalis. The blood and fluid can, however, track forward into the eyelids because occipitofrontalis has no bony attachment anteriorly. This leads to formation of hematoma few hours after a head injury or cranial operation causing black discoloration of skin around the eyes, a condition called **black eye**. It is important to note that the commonest cause of black eye is local violence, such as fist fight causing subcutaneous extravasation of blood into the eyelids

Q3) Buccinator muscle (RS2)

Ans-



Origin:

The buccinator arises from the following 4 sites:

1. Outer surface of the alveolar process of maxilla opposite three molar teeth.
2. Fibrous band that extends from pterygoid hamulus to maxillary tuberosity (pterygomaxillary raphe).
3. Pterygomandibular raphe, which extends from pterygoid hamulus to the mandible behind the third molar tooth.
4. Outer surface of the alveolar process of mandible opposite three molar teeth.

Insertion:

The buccinator is inserted in a complicated manner into the upper and lower lips.

On reaching near the angle of the mouth:

- (a) upper fibres pass into upper lip,
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Nerve supply:

Buccal branches of facial nerve.

Actions:

1. It flattens the cheek against the gum and teeth.
2. It is responsible for blowing the cheek and expelling the air between the lips from inflated (hence the name *trumpeter's muscle*).

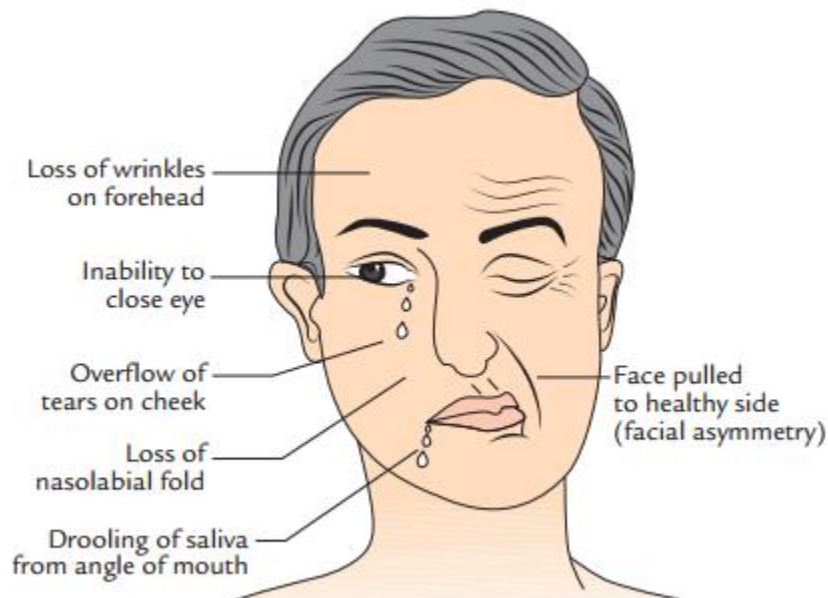
Applied Anatomy:

- **Paralysis of buccinator muscle:** *If the buccinator muscle is paralyzed*, as it occurs in facial palsy, the food accumulates in the

vestibule of mouth during mastication and the person cannot blow his cheek.

Q4) Features of Bells palsy(RS2)

Ans-

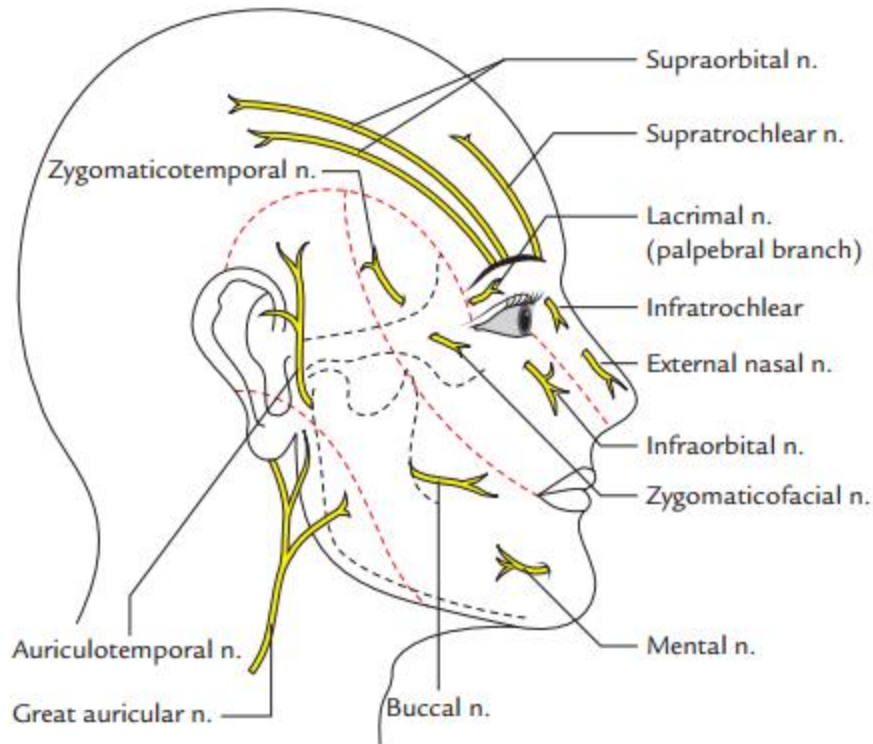


1. *Facial asymmetry* (affected side is drawn to the healthy side)—due to unopposed action of muscles of normal side.
2. *Loss of horizontal wrinkles on forehead*—due to paralysis of occipitofrontalis muscle.
3. *Widening of palpebral fissure and inability to close the eye*—due to paralysis of orbicularis oculi.

4. *Tears flow down from the eye (epiphora)*—due to paralysis of the lower part of the orbicularis oculi.
5. *Sagging of the angle of the mouth towards the affected side* and inability of the angle of the mouth to move upwards and laterally during laughing—due to paralysis of zygomaticus major.
6. *Loss of nasolabial furrow*—due to paralysis of levator labii superioris alaeque nasi.
7. *Accumulation of food into the vestibule of the mouth*— due to paralysis of buccinator muscle.
8. *Dribbling of saliva from the angle of the mouth*—due to paralysis of orbicularis oris.
9. Loss of resistance when one presses cheek with inflated vestibule and air leaks out from between the lips—due to paralysis of buccinator muscle.

Q5) Sensory nerve supply of face(RS3)

Ans-



The cutaneous nerves of the face derived from three divisions of the trigeminal nerve are as follows:

Branches of Ophthalmic divisions of Trigeminal nerve	Branches of Maxillary divisions of Trigeminal nerve	Branches of Mandibular divisions of Trigeminal nerve
Supraorbital Supratrochlear Infratrochlear External nasal Lacrimal	Infraorbital Zygomaticofacial Zygomaticotemporal	Mental Buccal Auriculo-temporal

Applied Anatomy

- **Trigeminal neuralgia (tic douloureux):** It is a clinical condition characterized by sudden paroxysmal attacks of lancinating pain lasting from few hours to several days, confined to distribution of one or more divisions of trigeminal nerve. It commonly starts in the maxillary territory and more frequently on the right side.

- **Herpes zoster ophthalmicus:** It is a viral infection involving the ophthalmic nerve. It presents as severe pain and edema in the ophthalmic territory and is characterized by the appearance of vesicles along the course of cutaneous branches of the ophthalmic nerve

Q6) Facial vein (RS3)

Ans-

Facial Vein

It is the largest vein of the face. It is formed at the medial angle of the eye by the union of supratrochlear and supraorbital veins. After formation, it runs straight downwards and backwards behind the facial artery to reach the anteroinferior angle of the masseter. Here it pierces

the deep fascia, crosses superficial to submandibular gland and joins the anterior division of *retromandibular vein* below the angle of the mandible to form the *common facial vein*, which drains into the internal jugular vein.

Deep Connections

The facial vein communicates with the cavernous sinus through the following two routes:

1. At the point of commencement, the facial vein communicates with the superior ophthalmic vein, which passes backwards within the orbit and drains into cavernous sinus.
2. In the cheek, the facial vein is joined to the pterygoid venous plexus by the *deep facial vein*.

Q7) Dangerous area of the face (RS3)

Ans-

Dangerous area of the face : The facial vein and its communications are devoid of valves in their lumens. Since facial vein rests directly on the muscles of facial expression, the movements of these muscles may facilitate the spread of septic emboli from infected area of the lower part

of the nose, upper lip, and adjoining part of the cheek in retrograde direction through deep facial vein, pterygoid venous plexus, and emissary vein into the cavernous sinus leading to meningitis and cavernous sinus thrombosis. For this reason, this portion of the face is called *dangerous area of the face*

Q8) Nasolacrimal duct (RS3)

Ans-

Nasolacrimal duct: It is a membranous canal, about 18 mm long, extending from neck of lacrimal sac to the anterior part of inferior meatus of the nose. It is lodged in the bony canal formed by maxilla, lacrimal bone, and inferior nasal concha. Its lower opening presents an incomplete mucous fold called *lacrimal fold* or *valve of Hasner*, which prevents the air from blowing the duct into the eye when one blasts his nose to clean nasal secretions.

Factors Helping the Drainage of Tears

Drainage of tears occurs by following means:

1. Blinking movements of eyelids.
2. Capillary action of the film of the fluid.

3. Contraction of lacrimal part of orbicularis oculi leading to distension of lacrimal sac.