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Paper :- Regional &  
Radiological Anatomy

Q: Write about the structure of Eye. Also name the foramina found in the base of the skull.

## The Structure of Eye:-

### • Anterior chamber:-

The region of the eye between the cornea and the lens that contain aqueous humor.

### • Aqueous humor:-

The fluid produced in the eye.

### • Bruch's membrane:-

Located in the retina between the choroid and the retinal pigmented epithelium

(RPE) layer; provides support to the retina and functions as a basement membrane of the RPE layer.

- **Ciliary body:-** Parts of the eye, above the lens, that produces the aqueous humor.

- **Choroid:-** Layers of the eye, behind the retina contains blood vessels that nourish the retina.

- **Cones:-** The photoreceptor nerve cells present in the macula and concentrated in the fovea (the very center of the macula) enable people to see fine detail and colour.

- **Cornea:-** The outer, transparent structure at the front of the eye that covers the iris, pupil and anterior chamber; It is the eye's primary light-

Focusing Structure.

**Drusen:-**

Deposits of yellowish extra cellular waste products that accumulate with the beneath the retinal pigmented epithelium (RPE) layer.

**Fovea:-**

The pit or depression at the centre of the macula that provides the greatest visual acuity.

**Iris:-**

The colored ring of tissue behind the cornea that regulates the amount of light entering the eye by adjusting the size of the pupil.

**Lens:-**

The transparent structure suspended behind the iris that helps to focus light on retina; It primarily provides a fine-tuning adjustment to the primary focusing structure of the eye which is cornea.

## ● Macula:-

The portion of the eye at the center of the retina that processes sharp, clear straight-ahead vision.

## ● Optic nerve:-

The bundles of nerve fibers at the back of the eye that carry visual messages from the retina to the brain.

## ● Photoreceptors:-

The light sensing nerve cells (rods and cones) located in the retina.

## ● Pupil:-

The adjustable opening at the center of the iris through which light enters the eye.

## ● Retina:-

The light sensitive layer of tissue that lines the back of the eye.

## ● Rods:-

Photoreceptors nerve cells in the eyes that are sensitive to low light levels and are present in the retina, but outside the macula.

## ● Sclera:-

The tough outer coat that protects the entire eyeball.

## ● Trabecular meshwork:-

Spongy tissue located near the cornea through which aqueous humor flows out of the eye.

## ● Vitreous:-

Clear jelly like substance that fills the eye from the lens to the back of the eye.

# Foramina of Skull :-

Various holes, or foramina are found in the base of the skull.

1. Foramen Caecum
2. Optic Canal
3. Superior orbital fissure
4. Foramen rotundum
5. Foramen spinosum
6. Foramen ovale
7. Foramen Lacerum
8. Carotid Canal
9. Foramen magnum
10. Hypoglossal Canal
11. Jugular Foramen
12. Internal acoustic meatus

Q.2. Write the names of the muscles of the medial fascial compartment of thigh with their origin and insertion?

Ans:- The muscles in the medial compartment of the thigh are collectively known as the hip adductors.

There are five muscles in this group; Gracilis, obturator externus, adductor brevis, adductor longus, and adductor magnus.

## ● Muscles of medial fascial compartment of thigh:-

### ● Muscle:-

#### 1. Gracilis

● Origin:- Inferior ramus of pubis, ramus of ischium

● Insertion:- Upper part of shaft of tibia on medial surface.

## 2. Adductor longus

- **Origin:-** Body of pubis, medial to pubis tubercle

- **Insertion:-** Posterior surface of shaft of femur (linea Aspera)

## 3. Adductor brevis:-

- **Origin:-** Inferior ramus of pubis

- **Insertion:-** Posterior surface of shaft of femur (linea aspera)

## 4. Adductor magnus.

- **Origin:-** Inferior ramus of pubis, ramus of ischium, ischial tuberosity.

- **Insertion:-** Posterior surface of shaft of femur, adductor tubercle of femur.



## 5. Obturator externus

Origin:-

Outer surface of obturator foramen and pubic and ischial rami.

Insertion:-

Medial surface of greater trochanter.

Q3 What is the effect of injury of external laryngeal nerve and also write about the how to test the integrity of facial nerve.

Ans:- Injury to the superior laryngeal nerve can occur as a complication of a thyroidectomy.

It will result in paralysis of the cricothyroid muscle and anesthesia of the region above the level of the vocal folds. It tends to be, however the external laryngeal branch that is affected.

The facial nerve supplies motor branches to the muscles of facial expression. This nerve is therefore tested by asking the patient to crease up their forehead (raise their eyebrows) close their eyes and keep them closed against resistance puff out their cheeks and reveal their teeth.

Q4. Write about the sutures of skull also write a note on Trigeminal nerve and its branches.

## Sutures of Skull:-

Sutures are a type of fibrous joint that are unique to the skull. They are immovable, and fuse completely around the age of 20. Sutures are of clinical importance as they can be points.

Sutures are of clinical importance, as they can be points of potential weakness

in both childhood and adulthood. The main suture in adulthood are:-

- **Coronal suture:-**

the frontal bone <sup>which fuses</sup> with the two parietal bones.

- **Sagittal suture:-**

<sup>which fuses both</sup> parietal bones to each other.

- **Lambdoid suture:-**

<sup>connects</sup> the occipital bone to the two parietal bones.

- **Squamosal suture:-**

It unites the squamous portion of the temporal bone with the parietal bones.

- **Metopic suture:-**

(If present) unites the 2 frontal bones.

In neonates, the incompletely fused suture joints give rise to the membranous gaps between the bones, known as fontanelles.

The two major fontanelles are the frontal fontanelle (located at the junction of the coronal and sagittal sutures) and the occipital fontanelle (located at the junction of the sagittal and lambdoid sutures).

## Trigeminal Nerve:-

The principal regulator of the sensory modalities of the head is the trigeminal nerve. This is the fifth of twelve pairs of cranial nerve that are responsible for transmitting numerous motor, sensory and autonomic stimuli to structures of head and neck.

Trigeminal nerve (CNV) is largely a sensory nerve, it also mingles in realm of motor supply. Unlike the other cranial nerves, the trigeminal nerve is quite large. It has four nuclei that send fibers to form its tracts and is associated with three separate branches.

### • Type:-

It is mixed both (motor and sensory)-

### • Nuclei:-

• Motor nucleus of trigeminal nerve

• Principal nucleus of trigeminal nerve

• Spinal nucleus of trigeminal nerve-

• Mesencephalic nucleus of trigeminal nerve-

## Divisions :-

There are three divisions of trigeminal nerve that are belows -

- 1 Ophthalmic nerve (CN V1)
- 2 Maxillary nerve (CN V2)
- 3 Mandibular nerve (CN V3)

## Ophthalmic Nerve:-

Ophthalmic nerve give rise to 3 terminal branches frontal, lacrimal and nasociliary, which innervate the skin and mucous membrane of derivatives of the frontonasal prominence derivatives:-

- Forehead and scalp
- Frontal and ethmoidal sinus
- Upper eyelid and its conjunctiva
- Cornea (in clinical relevance)
- Dorsum of the nose.

## Parasympathetic Supply -

- Lacrimal Gland:- Post ganglionic fibres from the pterygopalatine ganglion which travels with the

zygomatic branch of V<sub>2</sub> then join the lacrimal branch of V<sub>1</sub>.

## Maxillary Nerve:-

Maxillary nerve give rise to 14 terminal branches, which innervate the skin, mucous membranes and sinuses of derivatives of the maxillary prominence of the pharyngeal arch:-

- Lower eyelid and its conjunctiva
- Cheeks and maxillary sinus
- Nasal cavity and lateral nose
- Upper lip
- Upper molar, incisor and canine teeth and the associated gingiva -
- Superior palate

# Mandibular Nerve:-

Mandibular nerve gives rise to four terminal branches in the infra-temporal fossa:-

buccal nerve,  
inferior alveolar nerve,  
auriculotemporal nerve  
and lingual nerve.

## Sensory Supply:-

- Mucous membrane and floor of the oral cavity
- External ear
- Lower lip
- Chin

## Motor Supply:-

- Muscles of mastication; medial pterygoid, masseter, temporalis.
- Tensor veli palatini
- Tensor tympani

## Parasympathetic Supply:-

- Parotid gland
- Submandibular and sublingual



sal glands.

Qs- Write a note on Spinal cord with reference to its anatomical position and structure also write a short note on Pharynx with enumeration to its constrictors.

## Spinal cord:-

The Spinal cord is a tubular structure composed of nervous tissue that extends from the brain stem and continuing distally before tapering at the lower thoracic/upper lumbar region as the conus medullaris.

The Spinal cord is anchored distally by the filum terminale. Protecting the spinal cord is the surrounding cerebrospinal fluid (CSF) supportive soft tissue membranes and meninges -

A basic knowledge of the structure and function of the spinal cord and spinal column is essential for health care providers as the recognition of signs and symptoms for the treatment of patients.

## Structure of Spinal cord:-

The spinal cord is shorter than the vertebral canal that houses it. Extends only to L1/L2.

- It has two enlargements cervical and lumbar. due to cells and fibers of limbs.

- Ends inferiorly in a tapering conus medullaris
- Anchored to the coccyx by a meningeal (non neuronal) extension. (Filum terminale) -

- Held dura by denticulate ligament -

## • Pharynx: -

It is more commonly known as a throat. It is five cm long tube extending behind the nasal and oral cavities until the voice box (larynx) and esophagus.

## • Function: -

The function of the pharynx are accomplished by the two sets of muscles with help, push the food bolus and further down the digestive tract. It also helps in swallowing and speaking -

The pharynx is a muscular column that begins in the head posterior of the nasal cavity, travels

inferiorly behind the oral cavity before emerging with the larynx and esophagus.

## • Three regions:-

Based on its anterior relations the pharynx consists of three regions:-

- (1) Nasopharynx:-  
Posterior to the nasal cavity
- (2) Oropharynx:-  
Posterior to the oral cavity.
- (3) Laryngopharynx:-  
Posterior to the larynx.

# ● Pharyngeal constrictors and longitudinal muscles:-

There are six pharynx muscles in total that can be divided into two groups:-

## ● Pharyngeal constrictors:-

- (1) Superior
- (2) Middle
- (3) Inferior

## ● Longitudinal muscles:-

- (1) Palato pharyngeus
- (2) Salpingopharyngeus
- (3) Stylopharyngeus

## (1) Superior pharyngeal constrictor:

**Origin:-** Pterygoid hamulus  
posterior end of mylohyoid  
line of mandible.

**Insertion:-** Pharyngeal tubercle on basilar part-

of occipital bone -

- Middle pharyngeal constrictor :-

- Origin :- Stylohyoid and lesser <sup>superior</sup> horn of hyoid bone -

- Insertion :- Median pharyngeal raphe, blends with superior & inferior pharyngeal constrictors -

- Inferior pharyngeal constrictor :-

- Origin :- Oblique line of thyroid cartilage and cricoid cartilage -

- Insertion :- Median pharyngeal raphe and blends inferiorly with circular esophageal fibres.