

Date 26-6-20

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B.S Radiology

Semester 4<sup>th</sup>

Radiological Anatomy

Sir - Waqas



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## QNo+1:

write about the structure of eye. Also name the foraminas found in the base of skull.

## Eye :-

Each of a pair of globular organs of sight in the head of humans and vertebrate animals.

## Structure of Eye :-

### Layers :-

The eye ball consist of three coats or layers from external to internal, these are :

- 1) The external "Fibrous Coat".
- 2) The middle "Vascular Coat".
- 3) The inner "nervous Coat".

### Supportive media :-

The eyeball contains three major supportive / refractive media :

- 1) Aqueous humor
- 2) Vitreous body
- 3) Lens.

### 1) Fibrous Coat :-

The external, Protective fibrous coat is made up of a posterior opaque part, the "Sclera", and an anterior transparent part, the "Cornea".

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## Sclera :-

- ⇒ The opaque sclera is composed of dense fibrous tissue and is white.
- ⇒ The optic nerve pierces the sclera posteriorly and the nerves dural sheath fuses with the sclera.
- ⇒ The sclera is directly continuous in front with the cornea at the corneoscleral junction, or limbus.

## Cornea :-

- It is responsible for refraction of light, and is more important refractive medium of the eye.
- This refractive power occurs on the anterior surface of the cornea.
- The cornea is in contact with the aqueous humor posteriorly.

## Blood supply :-

The cornea is avascular and devoid of lymphatic drainage. It is nourished by diffusion from the aqueous humor and from the capillaries at its edge.

## 2) Vascular Pigmented Coat :-

- Consist from behind forward, of the "choroid", the "ciliary body" and the "iris".

### Choroid :-

The choroid is composed of an "outer pigmented layer" and an "inner, highly vascular layer".

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Ciliary body :-

- It continuous Posteriorly with the choroid.
- Anteriorly, lies behind the peripheral margin of the iris.

Iris & Pupil :-

- Iris is a thin, contractile, pigmented diaphragm with a central aperture; the Pupil.
- It suspended in the aqueous humor between the cornea and the lens.
- It divides the space between the lense & the cornea into an anterior and a posterior chamber.

3) Nervous Coat :-

- It consist of the retina.
- Retina consist of outer pigmented layer & inner nervous layer.
- Outer surface contact with choroid, inner is in contact with vitreous body.

1) Aqueous humor :-

- It is a clear fluid that fills the anterior & posterior chamber of the eye ball.
- Its function is to support the wall of the eye ball by inserting internal pressure & thus maintaining its optical shape.
- Nourishe cornea and lens.



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## 2) Vitreous Body :-

→ It is a transparent gel that fills the eye ball behind the lens.

→ Its function is to contribute slightly to the magnifying power of the eye.

## 3) Lens :-

→ Transparent, biconvex structure enclosed in a transparent capsule.

→ Situated behind the iris & in front of the vitreous body, encircled by the ciliary process.

## Foramina of the Skull :-

→ Cribriform Foramina in Cribriform plate.

→ Optic Canal

→ Superior orbital fissure.

→ Foramen rotundum.

→ Foramen ovale

→ Foramen Spinosum

→ Internal acoustic meatus

→ Jugular Foramen

→ Hypoglossal canal

→ Foramen magnum.



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QNO#2:

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Write the names of the muscles of the medial facial compartment of thigh with their origin and insertion?

**Thigh:-**

The thigh is the proximal segment of the lower limb proper, from the hip to the knee. The femur is the bony core of the thigh.

**Muscles of the medial thigh or**

The muscles in the medial compartment of the thigh are collectively known as the hip adductor.

There are five muscles:

- 1) Adductor Magnus
- 2) Adductor Longus
- 3) Adductor Brevis
- 4) Obturator Externus
- 5) Gracilis.

**1- Adductor Magnus:**

- It is the largest muscle in the medial compartment.
- It lies posteriorly to the other muscles.

**Origin:-**

→ Originates from the inferior rami of the

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Pubis and the rami of ischium, attaching to the linea aspera of the femur.

**Insertion :-**

→ Adductor part is innervated by the obturator nerve (L2-L4).

## 2- Adductor Longus :-

The adductor longus is a large, flat muscle. It partially covers the adductor brevis and magnus. The muscle forms the medial border of the femoral triangle.

**Origin :-**

→ Originate from the pubis, and expands into a fan shape, attaching broadly to the linea aspera of the femur.

**Insertion :-**

→ Obturator nerve (L2-L4).

## 3- Adductor Brevis :-

The adductor brevis is a short muscle, lying underneath the adductor longus.

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### Originates :-

→ originate from the body of Pubis and inferior pubic rami. It attaches to the linea aspera on the posterior surface of the femur, proximal to the adductor longus.

### Insertion :-

Obturator nerve (L2-L4).

## 4- Obturator Externus :-

This is one of the smaller muscles of the medial thigh, and it is located most superiorly.

### Origin :-

→ It originate from the membrane of the obturator foramen, and adjacent bone.

→ It passes under the neck of femur, attaching to the posterior aspect of the greater trochanter.

### Insertion :-

Obturator nerve (L2-L4).

## 5- Gracilis :-

The gracilis is the most superficial and medial of the muscles in this compartment.



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Origin &

→ It originates from the inferior rami of the Pubis, and the body of the pubis.

Insertion &

Obturator nerve (L2-L4).



Obturator  
externus  
Adductor  
brevis  
Adductor  
Longus  
Adductor  
magnus



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QNO#4:

write about the structures of the skull also write a note on Trigeminal nerve and its branches.

## Structures Of the Skull :-

- Structures 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 of potential weakness in both childhood and adulthood.
- The main sutures in adulthood are:

Coronal Suture :- which fuses the frontal bones with the two parietal bones.

Sagittal Suture :- which fuses both parietal bones to each other.

Lambdoid Suture :- Occipital bone to the two parietal bones.



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

→ The two major fontanelles are the frontal fontanelle and the occipital fontanelle.

### Occipital bone :-

→ Forms the posterior portion of the cranium and cranial base.

→ Articulates with the temporal bones and parietal bones.

→ Forms the posterior cranial fossa.

→ The most striking features of the occipital bone is this large opening, the foramen magnum, located at its base, through which the spinal cord and its accompanying structures pass.

### Trigeminal nerve :-

The trigeminal nerve (the fifth cranial nerve, or simply CNV) is a nerve responsible for sensation in the face and motor functions such as biting and chewing. It is the most complex of the cranial nerves.

#### Branches &

V1. Ophthalmic Nerve

V2. Maxillary Nerve

V3. Mandibular Nerve.

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### 1- Ophthalmic Nerve &

The ophthalmic nerve (CNV1) is a terminal branch of the trigeminal nerve (along with the maxillary and mandibular nerves). It provides sensory innervation to the skin, mucous membranes and sinuses of the upper face and scalp.

### 2. Maxillary Nerve &

The maxillary nerve is the second branch of the trigeminal nerve, which originates embryologically from the first pharyngeal arch. Its primary function is sensory supply to the mid-third of the face.

### 3- Mandibular Nerve &

It has a sensory role in the head, and is associated with parasympathetic fibres of other cranial nerves.



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Q No # 3:

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

**Injury to the Superior Laryngeal nerve:**

- 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 vocal folds.
- It tends to be, however, the external laryngeal branch that is affected.
- Therefore, it would affect only the cricothyroid muscle.
- Some Patients may not have any significant consequences of this, while other may have difficulty in changing the Pitch of their voice or reduced stamina in their voice.
- This can have disastrous consequences for those who use their voice in their careers, for example, singers and public speakers.



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## Integrity of facial nerve &

- 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.

## QNO#5:

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 bundle of nervous tissue and supporting cells that extends from the brainstem to the lumbar vertebrae.
- Together the spinal cord, and the brain form the central nervous system.

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## Anatomical Position :-

- The spinal cord is a part of the "central nervous system (CNS)".
- It is situated inside the vertebral canal of the "vertebral column".
- During development, there's a disproportion between spinal cord growth and vertebral column growth.
- The spinal cord finishes growing at the age of 4, while the vertebral column finishes growing at age 14-18.
- This is the reason why in adults, the spinal cord occupies only the upper two thirds of the vertebral canal.
- The spinal cord is a continuation of the brain stem.
- It extends from the foramen magnum at the base of the skull to the L1/L2 vertebra.

## Structure of Spinal Cord :-

- The spinal cord is a long, thin, tubular structure.
- Made up of nervous tissue, which extends from the medulla oblongata in the brainstem to the lumbar region of the vertebral column.
- It encloses the central canal of the spinal cord, which contain cerebrospinal fluid.

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Artery & Spinal artery.

Vein & Spinal vein.

## Pharynx

→ The Pharynx is a muscular column that runs between the oral cavity, and the esophagus.

→ It is divided up into three main sections known as :-

- 1) The Oropharynx
- 2) The nasopharynx
- 3) The Laryngopharynx.

All three of these cavities open posteriorly into the Pharyngeal tube.

### Pharynx Constrictors Enumerations &

- Inferior Constrictor muscle.
- middle Constrictor
- Superior Constrictor.

The inner longitudinal layer includes,

- Stylopharyngeus muscle
- Salpingopharyngeus muscle
- Palatopharyngeus muscle.

**THE END**