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15357

DISCIPLINE

RADIOLOGY
4th
SEMESTER

SUBJECT

VIVA
ASSIGNMENT
REGIONAL AND
RADIOLOGICAL
ANATOMY

SUBMITTED

TO

SIR
WAQAS IHSAN



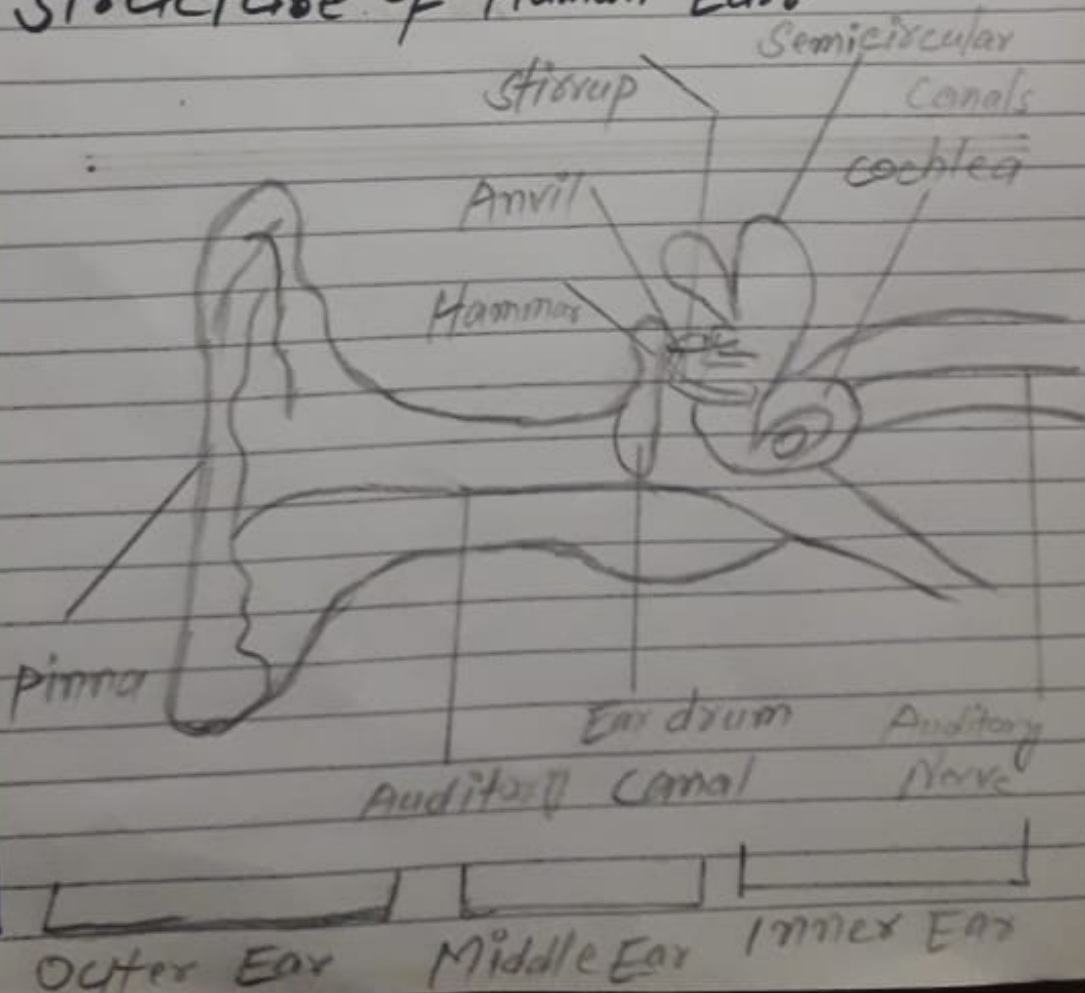
Q No: 1:

Ans:

Human Ear:-

The human ear is an organ of hearing and equilibrium that detects and analyzes sound by transduction (or the conversion of sound waves into electrochemical impulses) and maintains the sense of balance (equilibrium).

Structure of Human Ear:



Structure of Ear:-

The human ear consists three parts:

- * External ear
- * Middle ear
- * Internal ear

External ear:-

The external ear is further divided into the following parts:

Auricle (Pinna):-

The auricle comprises a thin plate of elastic cartilage covered by a layer of skin. It consists of funnel-like curves that collect sound waves and transmits them to the middle ear. The lobule consists of a dipose and fibrous tissues supplied with blood capillaries.

External Auditory Meatus:-

It is a slightly curved canal supported by bone in its interior part and cartilage in the exterior part. The meatus or the canal is lined with stratified epithelium and wax glands.

Tympanic Membrane:-

This membrane separates the middle ear and external

ear. This part receives and amplifies the sound waves. Central part is known as the crumhorn.

* changes acoustic energy into mechanical energy.

* perforated eardrum = tear.

Middle Ear:-

The middle ear comprises the following parts:

Tympanic Cavity:-

It is a narrow air-filled space separated from external ear by tympanic membrane and from inner ear by the bone wall.

The tympanic cavity has an auditory tube known as the eustachian tube in its anterior wall.

Eustachian Tube:-

The Eustachian tube is a 4cm long tube that equalizes air pressure on either side of the tympanic membrane. It connects the tympanic cavity with the nasopharynx.

Ear ossicles:-

These are responsible for transmitting sound waves from the eardrum to the middle ear.

There are three ear ossicles in the human ear:

* **Malleus:-**

A hammer shaped part that is attached to the tympanic membrane through the handle and Incus through the head. It is the largest ear ossicles

* **Incus:-**

An Anvil-shaped ear ossicle connected with the Stapes (stirrup).

* **Stapes:- (stirrup)**

It is the smallest ossicle and also the smallest bone in the human body.

* Footplate of Stapes fits into oval window.

protection by two Tiny Muscles:-

* Tensor Tympani.

* Stapedius.

Inner Ear:-

The Inner Ear comprises two parts:

bony labyrinth:-

The bony labyrinth comprises a vestibule three semi-circular canals, and spirally coiled cochlea. It is filled with perilymph.

* contain perilymph

* SMI-circular canals

- * Anterior, posterior and lateral
- * Lie right angles to each other

Vestibule:

- * oval portion

Cochlea:

- * looks like a snail
- * converts mechanical energy into electrical energy.

Membranous labyrinth:-

The bony labyrinth surrounds the membranous labyrinth. It comprises sensory receptors responsible for balance and hearing. The membranous labyrinth is filled with endolymph and comprises three semi-circular ducts, cochlear duct, saccule and utricle.

The sensory receptors include cristae, organ of Corti, and ampullaris maculae.

Function of Ear:-

Following are the important functions of the ear

Hearing:-

The mechanism of hearing involves the following steps:

- * The sound waves pass through the auditory canal and reach the eardrum.
- * The vibrations produced pass through

the tympanic membrane to the tympanic cavity.

* The ear ossicles in the tympanic cavity receive the vibrations and the stapes pushes the oval window in out.

* This action is passed onto the organ of Corti, the receptors of hearing, that contains tiny hair cells that translate the vibrations into electrical impulse that are transmitted to the brain by sensory nerve.

Balance:-

The eustachian tube and the vestibular complex are the important parts of the ear responsible for balance.

* The eustachian tube equalizes the the air pressure in the middle ear and maintains the balance.

* The vestibular complex contains receptors that maintain body balance.

Q No: 2:

Ans:

Sub-Mandibular gland:-

The sub-mandibular gland are bilateral salivary glands located in the face. These mixed serous and mucous secretion are important for the lubrication of food during mastication to enable effective swallowing and aid digestion.

Anatomical position:-

The sub-mandibular gland is located within the anterior part of the sub-mandibular triangle.

The boundaries of this triangle are:

- * Superiorly:-
Inferior body of the mandible
- * Anteriorly:-
Anterior belly of the digastric muscle.
- * Posteriorly:-
Posterior belly of the digastric muscle.

Sub-mandibular:-

The paired sub-mandibular glands (historically known as submaxillary glands) are major salivary glands located beneath the floor of the mouth. They each weigh about 15 grams and contribute some 60-70% of unstimulated saliva secretion. On stimulation their contribution decreases in proportion as the parotid secretion rises to 50%.

Anatomical structure:-

Structurally the submandibular glands are a pair of elongate, flattened hooks which have two sets of arm:

- * Superficial arm
- * Deep arm.

Blood Supply:-

The gland receives its blood supply from the facial and lingual arteries.

The gland is supplied by sub-lingual and submental arteries and drained by common facial and lingual veins.

Relationship with Nerves:-

- * Lingual Nerve
- * Hypoglossal Nerve.
- * Facial Nerve (Marginal mandibular branch)

Sub-lingual gland:-

The sub-lingual are the smallest of these paired salivary glands and the most deeply situated.

The paired sub-lingual glands are major salivary glands in the mouth.

They are the smallest, most diffuse, and the only unencapsulated major salivary glands.

They provide only 3-5% of the total salivary volume, producing mixed secretion which are predominately mucosa in nature.

These secretion are important in lubricating food, keeping the oral mucosa moist and initial digestion.

The sub-lingual glands are almond-shaped and lie on the floor of the oral cavity. They are situated underneath

P.T.O

the tongue. bordered laterally by the mandible and medially by genioglossus muscle of the tongue.

The glands form a shallow groove on the medial surface of mandible known as the Sublingual fossa.

There are also two other types of salivary glands:
They are submandibular and parotid glands.

Relation:

⇒ Above:

* Mucosa of oral floor, raised as sub-lingual fold.

⇒ Behind:-

* Deep part of submandibular gland

⇒ Below:-

* Mylohyoid in front

* Anterior end of its below.

⇒ Lateral:-

* Mandible above the anterior part of mylohyoid line.

⇒ Medial:-

Genioglossus and separated from it by lingual nerve and
P.T.O

Submandibular duct.

Duct:-

- * Duct of Rivinus
- * 8-20 ducts
- * Most of them open directly into the floor of mouth
- * Few of them join the submandibular duct.

Blood Supply:-

The gland receives its blood supply from the sublingual and submental arteries. Lymph from the sublingual salivary gland drains into the submandibular lymph nodes.

Nerve Supply:-

- * The smallest to that of submandibular glands.
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Q No: 3:

Ans:

Stone formation is more common in the sub-mandibular gland:-

The stone formation occurs most commonly in the sub-mandibular gland for several reasons.

1: The concentration of calcium in saliva produced by the sub-mandibular gland is twice that of the saliva produced by the parotid gland.

2: The sub-mandibular gland saliva is also relatively alkaline and mucous. So that's why stone formation is more common in sub-mandibular gland than other salivary glands.

Sialolithiasis:-

Sialolithiasis is the presence of calculi in the salivary glands ducts. Stones will form in the salivary gland or ducts following the stagnation of saliva:

They are typically composed of calcium phosphate and hydroxyapatite, as the Saliva is rich in Calcium.

They have an incidence of approximately 27 - 59 cases per million population per year. Whilst most cases are symptomatic, some can present with facial swelling and/or facial pain.

Sialolithiasis most commonly occurs in the submandibular gland, due to the anatomy of this duct being long and its flow of Saliva against gravity.

The type of Salivary Secretions from the submandibular gland are also more mucoid in nature as opposed to the more Serous Secretions from the parotid gland.

Q No: 4:

Ans:

Vertebrae of the human skeleton:-

The vertebral column, also called the spine, spinal column or backbone.

Vertebrae:-

composed of a series of bones called vertebrae.

(A singular vertebra)

The total number of vertebrae during early development is 33.

* As a child grows several vertebrae in the sacral and coccygeal regions.

* Adults have 26 vertebrae sacrum and coccyx bones become fused.

* About 71 cm (28 in): adult male.

* About 61 cm (24 in): adult female

Region of the Vertebral Column:-

7 Cervical Vertebrae (C₁ - C₇)

12 Thoracic Vertebrae (T₁ - T₁₂)

5 Lumbar Vertebrae (L₁ - L₅)

1 Sacrum (5 fused)

1 Coccyx (4 fused)

- * The Sacrum and coccyx do not have numbers
- * The Cervical, thoracic and lumbar vertebrae are movable.

* Sacrum and coccyx are immovable

* Between adjacent vertebra from the second Cervical vertebra to the Sacrum are intervertebral disc (inter between)

General structure of vertebrae:-

1. Cervical vertebrae (C₁ - C₇):-

- * Formed frame work of the Neck region.
- * support skull
- * Small in size
- * presence of foramen in each transverse process.

2: Thoracic Vertebrae (T₁ - T₁₂):-

- * Formed posterior part of thoracic cage.
- * Articulates with associated ribs.

3: Lumbar Vertebrae (L₁ - L₅):-

- * Formed skeletal support for posterior abdominal wall.
- * Characterized by large in size

4: Sacrum Vertebrae:-

- * Fusion of 5 sacral bones
- * Immovable
- * Articulates with L₅ at lumbosacral joint.
- * Articulates laterally with pelvic bone at sacroiliac joint.
- * Formed posterior wall of lower abdominal and pelvic cavity.

5: Coccyx:-

- * Fusion of 4 coccyx bones
- * Immovable
- * Formed part of pelvic cavity.

Parts of A Typical Vertebrae:-

The Typical vertebra consist of

- * A body of vertebrae
- * A vertebral arch
- * Seven process.

A body of vertebrae:

- * Largest part of vertebrae & thick
- * Disk-shaped anterior portion
- * weight bearing portion size increase inferiorly.
- * Its inferior and superior surface are roughened and give attachment the intervertebral disk.
- * Anterior and lateral surface contain nutrient foramen pathway for blood vessels.

Vertebral Arch:-

- * Extend backwards from the body of the vertebrae.
- * Consists of a pair of pedicles and a pair of laminae.
- * The pedicles project backward from the body to unite with laminae.

Process of the Vertebrae:-

Seven process arise from the vertebral arch:

- * Two transverse process
- * One spinous process
- * Four Articular (zygopophyses).

Function of the vertebral column:-

- 1: Supports the head.
 - 2: Help maintain balance in the upright position.
 - 3: Enclose and protect the spinal cord.
 - 4: permits movement (move forward, backward, sideways, and rotate)
 - 5: Absorbs shocks during walking
 - 6: Serve as a point of attachment for the ribs, pelvic girdle and muscles of the back and upper limbs.
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Q No: 5:

Ans:

Radiology:-

The Radiology represents a branch of medicine that deals with radiant energy in the diagnosis and treatment of diseases by using imaging technologies, this field can be divided into two broad areas.

- ⇒ Diagnostic radiology
- ⇒ Intervention radiology

Importance of radiology in

Medical Field:-

Radiology is now the key diagnostic tool for many diseases and has an important role in monitoring treatment and can even help with predicting specific outcomes with several imaging modalities. The field has become crucial to medical care.

It has a number of imaging modalities in its armamentarium which have differing physical principles of varying complexity.

⇒ **Central to Disease Management:** with so many diseases plaguing the world, it's important to have a good disease management plan.

Radiology plays a huge role in disease management by giving physicians more options, tools, and techniques for detection and treatment.

⇒ Diagnostic imaging allows for detailed information about structural or diseases related changes.

⇒ with the ability to diagnose during the early stages, patients may be saved without radiology, this may not be possible.

⇒ when it all comes down to it, radiology saves lives.

⇒ It's vital to medical case because it's one of the most powerful diagnostic and treatment tools available.

pag(22)

- ⇒ Radiology is not only vital to medical care, but its also one of the fastest growing careers.
 - ⇒ Without radiology, many would die sooner due to disease and it would be much harder to even fix something as simple as broken bone.
 - ⇒ Diagnostic imaging allows for better treatment and a better look at what's really going on within the body.
 - ⇒ With more and more physicians relying on radiology, it's expected that this field will grow by 21% from 2012 to 2022.
Due to all above reasons that's why radiology is more important in medical field.
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