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**MATRIC NO: 17/MHS01/059**

**COURSE TITLE: GROSS ANATOMY OF THE HEAD AND NECK**

**COURSE CODE: ANA** **301**

1. **Discuss the Anatomy of the tongue and comment on its applied anatomy**

DEVELOPMENT OF THE TONGUE

At the end of the 4th week

1. **Epithelium**:
* Anterior 2/3:
* 2 lingual swellings and tuberculum impar( first brachial arch)
* Supplied by the lingual nerve( post-trematic) and chorda tympani( pre-trematic)
* **Posterior 1/3:**
* Upper half of the hypobrachial eminence ( third arch)
* Supplied by the glossopharyngeal nerve
1. **Muscles**
* From the occipital myotomes
* Supplied by the hypoglossal nerve
1. **Connective tissue**
* from the local mesenchyme

PARTS & SURFACES

1. Oral part ( anterior 2/3) v shaped sulcus terminalis
2. Pharyngeal part ( posterior 1/3)
* Apex (tip)
* Body
* Root
* 2 lateral borders
* 2 surfaces( ventral and dorsal)
* 

RELATIONS

* Apex- related to the lower incisors
* Body – floor of oral cavity
* Root- attached to the mandible and hyoid bone
* Lateral borders- related to the gum and the tooth of inferior alveolar process

**Ventral surface**

* Lingual frenulum: runs vertically from the floor of the mouth to the undersurface of the tongue. ( limits the movement of the tongue)
* Deep lingual veins: on either side of the frenulum
* Plica fimbriata: mucosal folds on either sides of the deep lingual veins

**Dorsal surface**

* Sulcus terminalis: Oral and pharyngeal surfaces are separated by the v- shaped sulcus
* Foramen cecum: Apex of the v- shaped sulcus. A small depression.
* Thyroglossal duct: It persists to connect the foramen cecum to the thyroid gland in the neck.
* Papillae: tiny fingerlike projections ( anterior 2/3) & lymphatic aggregations ( posterior 1/3)

There are 4 varities of papillae

* Filiform
* Fungiform
* Foliate
* Circumvallate



**Filiform Papillae**

* Small cone shaped with one or more multi ends
* Present over anterior 2/3 of tongue
* Acts as an abrasive coating ( cleaning and grasping actions)
* Doesn’t contain taste buds

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**Fungiform Papillae**

* Round shaped( mushroom) and larger than filiform
* Present on the tip and margins of the tongue
* Taste buds embedded in their surfaces
* They respond to both sweet and sour tastes****

**Foliate Papillae**

* Red leaf-like mucosal ridges
* Present at the sides, near sulcus terminalis
* Has numerous taste buds

**Circumvalatte Pappilae**

* Large cylindrical structures
* 8 to12 in number
* Formed a V shaped row in the front of the sulcus terminalis****

MUSCLES OF THE TONGUE

The tongue is divided into left and right halfs by the median saggital septum. All tongue muscles are paired. It has 2 types: intrinsic& extrinsic muscles

Extrinsic muscles ( alter the position of the tongue)

* Genioglossus
* Hyoglossus
* Chondroglossus
* Palatoglossus
* Styloglossus

Intrinsic muscles( alter the shape of the tongue)

* Superior longitudinal
* Inferior longitudinal
* Transverse vertical

Genioglossus (safety muscle of the tongue)

Origin: superior genial tubercule( mandible) above the origin of the geniohyoid

Insertion: fan shaped radiated fibers that insert into the mucous membrane of the tongue

ii. lowest fibers passing down to the hyoid body

Action: protrusion

Bilaterally- central part depression

Unilaterally- diverges to the opposite side

Hyoglossus

Origin : greater cornu & body of hyoid bone

Insertion: Side of the tongue btw styloglossus & inferior longitudinal

Action: depresses the tongue

Chondroglossus : a part of the hyoglossus separated from it by the genioglossus

Origin: medial side &base of lesser cornua of hyoid

Insertion: intrinsic musculature btw hyoglossus & genioglossus

Styloglossus

Origin: styloid process near its apex

Insertion: longitudinal part into the inferior longitudinal muscle & oblique part into hyoglossus

Action: draws tongue upwards and backwards

 Palatoglossus ( mostly part of the soft palate than the tongue)

Origin : palatine aponeurosis of the soft palate

Insertion: side of the tongue

Action: Elevates the posterior part off the tongue

INTRINSIC MUSCLES

Functions:

1. Altering the shape of the tongue
2. Lengthening and curling of the tongue
3. Curling and uncurling its apex and edges
4. Flattening and rounding its surfaces

ARTERIAL SUPPLY OF THE TONGUE

Lingual artery ( a branch of the external carotid artery)

* Dorsal lingual arteries supply the posterior part
* Deep lingual artery supplies the anterior part
* Sublingual artery supplies the sublingual gland and the floor of the mouth

VENOUS DRAINAGE

* Dorsal lingual vein drains the dorsum and sides of the tongue
* Deep lingual vein drains the tip of the tongue and joins the sublingual vein
* All these veins terminate directly and indirectly into the internal jugular vein

LYMPHATIC DRAINAGE

* Tip drains into the submental nodes
* Sides into submandibular nodes
* Central lymphatics drain into the deep cervical nodes on either side
* Posterior part drains directly and bilaterally into the deep cervical nodes
* The deep cervical nodes usually involved are jugulodigastric and jugulo-omohyoid nodes

NERVE SUPPLY

* Except palatoglossus which is supplied by the cranial part of the accessory nerve.
* Sensory supply
1. General sensation
2. Taste sensation

Anterior 2/3 0f the tongue

1. General sensation: lingua nerve
2. Taste sensation: chorda tympani

Posterior 1/3 of the tongue: both supplied by the glossopharyngeal nerve

Posterior part of the tongue: Vagus nerve

TASTE DISCRIMINATION

1. sweet: tip
2. sour: middle
3. salty: anterolateral
4. bitter: base 

APPLIED ANATOMY

1. Aglossia: Absence of the tongue to to failure of formation of the lingual swellings
2. Hemiglossia: Absence of one side of the tongue due to failure of one side of the lingual swellings
3. Bifid tongue: Failure of fusion of the two lingual swellings
4. Double tongue



1. Ankyglossia( tongue tie): Failure of deepening of the alveoli-lingual sulcus.
2. Leukoplakia, carcinoma of the tongue, tongue and sleep apnea
3. Lingual thyroid: Failure of migration of median thyroid rudiment
4. Macroglossi: enlarged tongue



Question 2

AIR SINUSES

The paranasal sinuses are air-filled **extensions** of the respiratory part of the nasal cavity. There are **four** paired sinuses, named according to the bone in which they are located; maxillary, frontal, sphenoid and ethmoid.

The function of the sinuses is not clear. It is thought that they may contribute to the **humidifying**of the inspired air. They also reduce the weight of the skull.

Sinuses are formed in childhood by the nasal cavity **eroding** into surrounding bone. As they are outgrowths of the nasal cavity, they all drain back into it – **openings** to the paranasal sinuses are found on the **roof** and **lateral** walls of the nasal cavity. The inner surface is lined by a respiratory mucosa.

**Frontal Sinuses**: These are the most **superior** in location, found under the forehead. The frontal sinuses are variable in size, but always triangular-shaped. They drain into the nasal cavity via the **frontonasal duct**, which opens out at the hiatus semilunaris on the lateral wall.

**Sphenoid Sinuses**:  The sphenoid sinuses also lie relatively superiorly, at the level of the spheno-ethmodial recess.  They are found more **posteriorly**, and are related superiorly and laterally to the **cranial cavity**. The sphenoid sinuses drain out onto the roof of the nasal cavity.  The relationships of this sinus are of clinical importance – the **pituitary gland** can be surgically accessed via passing through the nasal roof, into the sphenoid sinus and through the sphenoid bone.

**Ethmoidal Sinuses**: There are three ethmoidal sinuses; anterior, middle and posterior. They empty into the nasal cavity at different places:

* Anterior – Hiatus semilunaris
* Middle – Ethmoid bulla
* Posterior – Superior meatus

**Maxillary Sinuses:**The largest of the sinuses. It is located laterally and slightly **inferiorly** to the nasal cavities. It drains into the nasal cavity at the **hiatus semilunaris,** underneath the **frontal sinus** opening. This is a potential pathway for spread of infection – fluid draining from the frontal sinus can enter the maxillary sinus.

**Clinical Relevance: Sinusitis**

As the paranasal sinuses are continuous with the nasal cavity, an upper respiratory tract **infection** can **spread** to the sinuses. Infection of the sinuses causes inflammation (particularly pain and swelling) of the mucosa, and is known as sinusitis. If more than one sinus is affected, it is called **pansinusitis**.

The **maxillary nerve** supplies both the maxillary sinus and maxillary teeth, and so inflammation of that sinus can present with **toothache**.