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17/MHS01/001 MBBS
ANA 301 ASSIGNMENT

ANSWERS

A.) ANATOMY OF THE TONGUE

The tongue is a mass of muscle that is almost completely covered by a mucous membrane. It occupies most of the oral cavity and oropharynx. It is known for its role in taste, but it also assists with mastication (chewing), deglutition (swallowing), articulation (speech), and oral cleansing. Five cranial nerves contribute to the complex innervation of this multifunctional organ.Tiny bumps called papillae give the tongue its rough texture. Thousands of taste buds cover the surfaces of the papillae

The tongue is anchored to the mouth by webs of tough tissue and mucosa. The tether holding down the front of the tongue is called the FRENUM. In the back of the mouth, the tongue is anchored into the hyoid bone.

INTRINSIC MUSCLES

The intrinsic muscles only attach to other structures in the tongue. There are four paired intrinsic muscles of the tongue and they are named by the direction in which they travel: the **superior longitudinal, inferior longitudinal, transverse** and **vertical** muscles of the tongue. These muscles affect the shape and size of the tongue – for example, in tongue rolling – and have a role in facilitating speech, eating and swallowing.Motor innervation for the intrinsic muscles of the tongue is via the hypoglossal nerve (CNXII).

EXTRINSIC MUSCLES

The extrinsic muscles are as follows:

1.) GENIOGLOSSUS: It arises from the mandibular symphsis and inserts into the body of the hyoid bone and the entire length of the tongue. The Inferior fibres protrude the tongue, middle fibres depress the tongue, and superior fibres draw the tip back and down. Motor innervation is via the hypoglossal nerve(CNXII).

2.) HYOGLOSSUS: arises from the hyoid bone and inserts into the side of the tongue. It depresses and retracts the tongue. Motor innervation is via the hypoglossal nerve(CNXII).

3.) STYLOGLOSSUS: Originates at the styloid process of the temporal bone and inserts into the side of the tongue. It retracts and elevates the tongue. Motor innervation is via the hypoglossal nerve(CNXII).

4.) PALATOGLOSSUS: Arises from the palatine aponeurosis and inserts broadly across the tongue. It elevates the posterior aspect of the tongue. Motor innervation via the vagus nerve (CNX).

All of the intrinsic and extrinsic muscles are innervated by the hypoglossal nerve (CN XII), except palatoglossus, which has vagal innervation (CN X).

INNERVATION

In the anterior 2/3, general sensation is supplied by the **TRIGEMINAL NERVE.** Specifically the lingual nerve, a branch of the mandibular nerve.

On the other hand, taste in the anterior 2/3 is supplied by the facial nerve. In the petrous part of the temporal bone, the facial nerve gives off three branches, one of which is **chorda tympani.** This travels through the middle ear, and continues on to the tongue. The posterior 1/3 of the tongue is slightly easier. But touch and taste are supplied by the **glossopharyngeal nerve.**

VASCULATURE

The lingual artery (branch of the external carotid) does most of the supply, but there is a branch from the facial artery, called the **tonsillar artery**, which can provide some collateral circulation. Drainage is by the **lingual vein**.

LYMPHATIC DRAINAGE

The anterior 2/3 of the tongue drains initially into the submental and submandibular nodes, which empty into the deep cervical lymph nodes. While the posterior third drains directly into the deep cervical lymph nodes

EMBRYOLOGICAL DEVELOPMENT

When the tongue is developing, it starts as a two longitudinal bulbous ridges, with contribution from the first four branchial arches. These ridges join, giving rise to the longitudinal line (**median sulcus**) down the centre of your tongue. The contribution from the second branchial arch is grown over by that of the third arch, but the nerve supply remains. Using this information, we can understand why the majority of the tongue's innervation is by the trigeminal nerve (CN V) and the glossopharyngeal nerve CN IX.

There is a transverse line near the root of the tongue. This is called **sulcus terminalis**, and in the centre, where it meets the **median sulcus**, there is a pit. This is the now-closed top of a deep pit, the **foramen cecum** (blind window), at the end of which lies the thyroid gland. During development, this descends from the tongue down into the neck, If, on the way down, the pit (**thyroglossal duct**) doesn't close behind the gland, midline **thyroglossal cysts** or **fistulae** may remain.

CLINICAL ANATOMY

1.) ANKYLOGLOSSIA (tongue tie): occurs due to an abnormal length of the frenulum lingual which causes limited manipulation of the tongue during speech and results in a speech impediment. In the most common form of ankyloglossia, the frenulum extends to the tip of the tongue. Ankyloglossia can be corrected by surgically severing the lingual frenulum.

2.) FISSURED TONGUE:

occurs when several small furrows present on the dorsal surface of the tongue. It can be an oral manifestation of psoriasis. It is generally painless and benign, and is often associated with other syndromes (e.g., Down syndrome)

3.) GEOGRAPHIC TONGUE (migratory glossitis): is a benign asymptomatic condition characterized by the presence of large red patches with a greyish-white border covering the dorsum of an otherwise normal tongue. It is caused by inflammation of the mucous membrane of the tongue, which results in loss of lingual papillae. The lesions are known to migrate over time. The name arises from the map-like appearance of the tongue in this condition.

B.) 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. 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.