

Assignment Title: Nose and Oral Cavity

Course Title: Cross Anatomy of Head and Neck

Course Code: ANA 301

i) Discuss the Anatomy of the tongue and comment on its applied anatomy

Tongue

The tongue is a mobile muscular organ covered with mucous membrane. It can assume a variety of shapes and positions. It is partly in the oral cavity and partly in the oropharynx. The tongue's main functions are articulation and squeezing food into the oropharynx as part of deglutition. The tongue is also involved with mastication, taste and oral cleansing.

Parts and surfaces of tongue

The tongue has a root, body and apex. The root of the tongue is the attached posterior portion, extending between the mandible, hyoid, and the nearly vertical posterior surface of the tongue. The body of the tongue is the anterior, approximately two thirds of the tongue between root and apex. The apex of the tongue is the anterior end of the body, which rests against the incisor teeth. The body and apex of the tongue are extremely mobile.

The tongue features two surfaces. The more extensive, superior and posterior surface is the dorsum of the tongue. The inferior surface of the tongue usually rests against the floor of the mouth. The margin of the tongue separating the two surfaces is related on each side to the lingual

gingivae and lateral teeth. The dorsum of the tongue is characterized by a V-shaped groove, the terminal sulcus of the tongue, the angle of which points posteriorly to the foramen caecum. This small pit, frequently absent, is the nonfunctional remnant of the proximal part of the embryonic thyroglossal duct from which the thyroid gland developed. The terminal sulcus divides the dorsum of the tongue transversely into a post-sulcal posterior part in the oropharynx.

A midline groove divides the anterior part of the tongue into right and left parts. The mucosa of the anterior part of the tongue is relatively thin and closely attached to the underlying muscle. It has a rough texture because of numerous small lingual papillae.

- Vallate papillae: large and flat topped, lie directly anterior to the terminal sulcus and are arranged in a V-shaped row.

- Foliate papillae: small lateral folds of the lingual mucosa. They are poorly developed in humans.

- Filiform papillae: long and numerous, contain afferent nerve endings that are sensitive to touch. These scaly, conical projections are pinkish gray and are arranged in V-shaped rows that are parallel to the terminal sulcus, except at the apex, where they tend to be arranged transversely.

- Fungiform papillae: mushroom shaped pink or red spots scattered among the filiform papillae, but most numerous at the apex and margins of the tongue.

The vallate, foliate and most of the fungiform papillae contain taste receptors in the taste buds.

The mucosa of the posterior part of the tongue is thick and fairly movable. It has no lingual papillae, but the underlying lymphoid nodules give this part of the tongue an irregular, cobblestone appearance. The lymphoid nodules are known collectively as the lingual tonsil. The pharyngeal part of the tongue constitutes the anterior wall of the oropharynx. It can be inspected only with a mirror or downward pressure on the tongue with a tongue depressor.

The inferior surface of the tongue is covered with a thin, transparent mucous membrane. This surface is connected to the floor of the mouth by a midline fold called the frenulum of the tongue. The frenulum allows the anterior part of the tongue to move freely. On each side of the frenulum, a deep lingual vein is visible through the thin mucous membrane. A sublingual caruncle is present on each side of the base of the frenulum of the tongue that includes the opening of the submandibular duct from the submandibular salivary gland.

### Muscles of Tongue

Extrinsic muscles of the tongue: alter the position of the tongue. They are genioglossus, hypoglossus, styloglossus and palatoglossus; they originate outside the tongue and attach to it. They mainly move the tongue but they can alter its shape as well.

Intrinsic muscles of tongue: the superior and inferior longitudinal, transverse

and vertical muscles) are confined to the tongue. They have their attachments entirely within the tongue and are not attached to the bone.

The inferior and superior longitudinal muscles act together to make the tongue short and thick and to retract the protruded tongue.

The transverse and vertical muscles act simultaneously to make the tongue long and narrow, which may push the tongue against the incisor teeth or protrude the tongue from the open mouth.

### Innervation of tongue

All muscles of the tongue, except the palatoglossus, receive motor innervation from Cranial Nerve XII, the hypoglossal nerve. The palatoglossus is a palatine muscle supplied by the pharyngeal plexus. For general

sensation, the mucosa of the anterior two thirds of the tongue is supplied by the lingual nerve, a branch of CN V<sub>3</sub>. For special

sensation (taste), this part of the tongue, except for the vallate papillae, is supplied by the chorda tympani nerve, a branch of CN VII.

The mucosa of the posterior third of the tongue and the vallate papillae are supplied by the lingual branch of the glossopharyngeal nerve CN IX for both general and special sensation.

Twigs of the internal laryngeal nerve, a branch of the vagus nerve CN X, supply mostly general but some special sensation to a small area of the tongue just anterior to the epiglottis. These

mostly sensory nerves also carry parasympathetic secretory motor fibres to serous glands in the tongue.

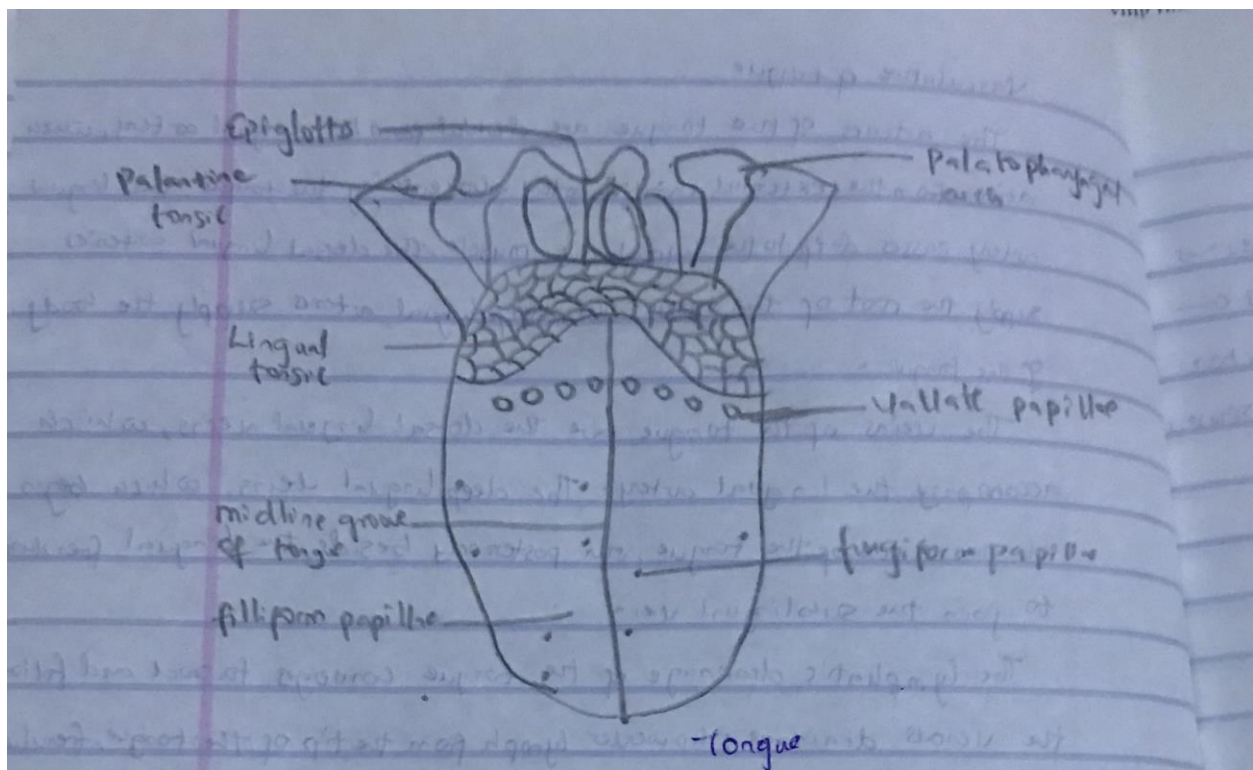
## Vasculature of tongue

The arteries of the tongue are derived from the lingual artery, which arises from the external carotid artery. On entering the tongue, the lingual artery passes deep to the hypoglossus muscle. The dorsal lingual arteries supply the root of the tongue. The deep lingual artery supply the body of the tongue.

The veins of the tongue are the dorsal lingual veins, which accompany the lingual artery. The deep lingual veins, which begin at the apex of the tongue, run posteriorly beside the lingual frenulum to join the sublingual vein.

The lymphatic drainage of the tongue converges forward and follows the venous drainage; however lymph from the tip of the tongue, frenulum and central lower lip runs an independent course. Lymph from different areas of the tongue drains through four routes

1. Lymph from the roof of the tongue, drains bilaterally into the superior deep cervical lymph nodes
2. Lymph from the medial part of the body drains bilaterally and directly to the inferior deep cervical lymph nodes
3. Lymph from the right and left lateral parts of body drains to submandibular lymph nodes on the ipsilateral side
4. The apex and frenulum drain to the submental lymph nodes, the medial portion draining bilaterally



### Clinical Anatomy

- Oral cancer: A growth or ulcer appears on the tongue & grows steadily
- macroglossia (big tongue)
- Atrophic glossitis: the tongue loses its bumpy texture, becoming smooth.
- Oral leukoplakia
- Hairy tongue: papillae can overgrow the surface of the tongue, giving it white or black appearance
- Herpes stomatitis

② Write an essay on the air sinuses

Paranasal sinuses are a group of four paired air-filled spaces that surround the nasal cavity. The maxillary sinuses are located under the eyes, the frontal sinuses are above the eyes, the ethmoidal sinuses are between the eyes and the sphenoidal sinuses are behind the eyes. The sinuses are named for the facial bones in which they are located.

- The maxillary sinuses, the largest of the paranasal sinuses, are under the eyes, in the maxillary bone (open in the back of the semilunar hiatus of the nose). They are innervated by the trigeminal nerve (CN V<sub>2</sub>)
- The frontal sinuses superior to the eyes, in the frontal bone, which forms the hard part of the forehead. They are also innervated by the trigeminal nerve (CN V<sub>1</sub>)
- The ethmoidal sinuses, which are formed from several discrete air cells within the ethmoid bone between the nose and the eyes. They are innervated by the ethmoidal nerves, which branch from the nasociliary nerve of the trigeminal nerve (CN V<sub>1</sub>)
- The sphenoidal sinuses, in the sphenoid bone. They are innervated by the trigeminal nerve (CN V<sub>2</sub> & V<sub>3</sub>)

The paranasal air sinuses are lined with respiratory epithelium (ciliated pseudostratified columnar epithelium)

## Clinical Anatomy

### Sinusitis

This is an extremely common outpatient case which presents as an inflammation of the epithelium of the sinuses. The causes can be either a viral or bacterial infection, or an allergic reaction. The inflammation can be acute or chronic and the maxillary sinuses are the most frequently affected.