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MEDICINE AND SURGERY

ANATOMY OF THE TONGUE

The tongue is the muscular organ found in the vertebrate mouth. It is attached via muscles to the hyoid bone, mandible, styloid process, palate, and pharynx. It forms part of the floor of the oral cavity and the anterior wall of the oropharynx. Its anterior part is in shape and is somewhat triangular in shape with a blunt apex. The apex is directed anteriorly and sits immediately behind the incisor teeth. The oral and pharyngeal surface are separated by the terminal sulcus of the tongue (sulcus terminalis). This terminal sulcus forms the inferior margin of the oropharyngeal isthmus between the oral and pharyngeal cavities. At the apex of the v-shaped sulcus is a small depression, the cecum of the tongue which marks the sight in the embryo where the epithelium invaginated to form the thyroid gland. In some people, the thyrogloseal duct persists and connects the thyrogloseal duct in the tongue with the thyroid gland in the neck.

THE SUPERIOR SURFACE

The superior surface of the oral part of the tongue is covered by hundreds of papillae. The papillae in general increase the area of contact between the surface of the tpongue and the content of the oral cavity. Types of papillae includes:

* Filiform papillae: they are small cone shaped projections of the mucosa that end in one or more point. They are organized in rows parallel to the sulcus terminalis.
* Fungiform papillae: they are mushroom shaped papillae with erythematous domes, and tend to be concentrated along the margin of the tongue.
* Vallate papillae: they are the largest of the papillae, there are only about 8-12 vallate papillae in a single v-shaped linejust anterior to the sulcus terminalis and are studded with taste buds.
* Follate papillae: they are linear folds of the mucosa on the side of the tongue near the sulcus terminalis.

All except the follate papillae have taste buds on their surface.

THE INFERIOR SURFACE

The inferior surface of the oral part of the tongue lacks papillae but does have a number of linear mucosa folds. A single median fold (the frenulum of the tongue) is continuous with the mucosa covering the floor of a of the oral cavity and overlies the lower margin of a midline sagittal septum which internally separates the right and left side of the tongue. On each side of the frenulum is a lingual vein, and lateral to each vein is a rough fimbriated fold.

PHARYNGEAL SURFACE

There are no papillae on the pharyngeal surface. It contains the lingual tonsil; a collection of nodular lymphatic tissue towards the posterior one third of the dorsum of the tongue.

MUSCLES OF THE TONGUE

All the muscles of the tongue are paired and there are intrinsic and extrinsic lingual muscles.

THE INTRISIC MUSCLES OF THE TONGUE

They originate and insert within the substance of the tongue. They include:

* The superior longitudinal lingual muscle, which shortens the tongue and curls it upward.
* The inferior longitudinal lingual muscle, which shortens the tongue and curls it downward.
* The transverse lingual muscle which elongates and narrows the tongue.
* The vertical lingual muscle which flattens the tongue

EXTRINSIC MUSCLES OF THE TONGUE

They originate from structures outside of the tongue and inserts into the tongue. there are four major muscles on each side, they are :

* Genioglossus muscle: it is a thick, fan shaped muscle. It originates from the superior mental spine on the posterior surface of the mandibular symphisis immediately superior to the origin of the muscle from the inferior mental spine. The geniooglossus muscle; depress the central part of the tongue and protrudes the anterior part of the tongue out of the oral fissures.
* Hyoglossus muscle: the hyoglossus muscle are quadrangular muscles lateral to the genioglossus muscle. Each hyoglossus muscle originates from the entire length of the greater horn and adjacent part of the body of the hyoid bone. It passes superiorly and anteriorly through the oropharyngeal triangle. The hyoglossus muscle depresses the tongue and it is an important landmark on the floor of the oral cavity because (i) the lingual artery enters the tongue deep to the hypoglossus between the hyoglossus and the genioglossus. (ii) the hypogloseal nerve and lingual nerve from the neck and infratemporal fossa of the head, respectively, enter the tongue on the external surface of the hypoglossus .
* Styloglossus muscle: it originates from the anterior surface of the styloid processes of the temporal bone. They pass through the oropharyngeal triangle to enter the lateral surface of the tongue. They retract the tongue and pull the back of the tongue superiorly.
* Palatoglossus muscle: they are muscles of the soft palate and the tongue. Each originate from the under surface of the palatine aponuerosis . the palatine muscles elevate the back of the tongue, move the palatoglosseal arches of mucosa towards the midline and depress the soft palate.

Except from the palatoglossus, which is innervated by the vagus nerve (x) all muscles of the tongue are innervated by the hypoglossal nerve(xii)

BLOOD VESSELS

Arteries

The major artery of the tongue is the lingual artery. On each side, the lingual artery originates from the external carotid artery in the neck adjacent to the tip of the greater horn of the hyoid bone. In addition to the tongue, the lingual artery supplies the sublingual gland, ginvia, and oral mucosa in the floor of the oral cavity.

Vein

The tongue is drained by

* Deep inguinal vein
* Dorsal inguinal vein.

INNERVATION

The tongue is innervated by

* Glossopharyngeal nerve(ix)
* Lingual nerve
* Facial nerve(vii)
* Hypoglossal nerve (xii)

LYMPHATICS

All lymphatic vessels from ultimately drain into the deep cervical chain of nodes along the internal jugular vein.

CLINICAL ANATOMY

* ORAL CANCER: a growth or ulcer appears on the tongue and grows steadily. It is most common in people who drink and smoke very heavily
* GEOGRAPHIC TONGUE: ridges and coloured spurs migrate over the surface of the tongue, periodically changing its appearance. This condition is harmless
* THRUSH : A yeast(candida albicans)grows over the surface of the mouth and tongue. It occurs mostly in people taking steroids or with suppressed immune systems.
* ATROPHIC GLOSSITIS: the tongue looses its bumpy texture becoming smooth sometimes this is due to anaemia or vitamin B deficiency.
* BURNING TONGUE SYNDRKE: the tongue feels burnt or scalded or strange taste or sensation develop. This condition is harmless and may be caused by a mild nerve problem.

2. AIR SINUSES

They develop as outgrowths from the nasal cavities and erode into the surrounding bones. They are all open into the nasal cavity, lined by respiratory mucosa and are innervated by branches of the trigerminal nerve.there are four paranasal air sinuses

* FRONTAL SINUSES: the frontal sinuses are variable in size and are the most superior of all the sinuses. Each is triangular in shape and is in the part of the frontal bone under the forehead. Each frontal sinus drains into the lateral wall of the middle meatus through the frontonassal duct, which penetrates the ethmoidal labirynth and continues as the ethmoidal infundibulum at the front end of the semilunar hiatus, the frontal sinuses are innervated by branches of the supra orbital nerve from the ophthalmic nerve . their blood supply is from branches of the anterior ethmoidal arteries.
* ETHMOIDAL CELLS: ethmoidal cells on each sides fill the ethmoidal labirynth. Each cluster of cell is separated from the orbit by the thin orbital plate of the ethmoidal labyrinth and from the nasal cavity by the medial wall of the ethmoidal labirynth. The ethmoidal cells are formed by variable number of individual air chamber. (i) the anterior ethmoidal cells open into the ethmoidal infundibulum or the frontonasal duct. (ii) the middle ethmoidal cells open into the ethmoidal bulla, or into the lateral wall just above this structure . (iii) the posterior ethmoidal cells open into the lateral wall of the superior nasal meatus. The ethmoidal cells are innervated by: The anterior and posterior ethmoidal branches of the naso cillary nerve from the ophthalmic nerve and the maxillary nerve via orbital branches from the pterigopalatin ganglion. Ethmoidal cells receive their blood supply through branches of the anterior and posterior ethmoidal arteries.
* MAXILLARY SINUSES: they are the largest of the paranasal sinus and completely fill the body of the maxillae. each is pyramidal in shape with the apex directed laterally and the base deep into the lateral wall of the adjacent nasal cavity. Relationship of the maxillary sinuses are: (i) the superolateral surface is related to the orbit. (ii) the anterolateral surface is related to the roots of the upper molar and premolar teeth.(iii) the posterior wall is related to the infra temporal fossa. The maxillary sinuses are innervated by infraorbital and alveolar branches of the maxillary nerve, and receive blood through branches from infraorbital and supra alveolar branches of maxillary arteries.
* SPHENOIDAL SINUSES : they are within the body of the sphenoid , open to the roof of the nasal cavity via apertures on the posterior wall of the spheno –ethmoidal recess. It is innervated by: posterior ethmoidal branch of the ophthalmic nerve and maxilarry nerve. The shenoidal sinuses are supplied by branches of the pharyngeal arteries from maxillary arteries.