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

Most muscles serve to attach one bone, usually via tendon, to another. There are a few places where that is not entirely true: the ocular muscles, the scapulothoracic joint , the diaphragm and perineum are all good exceptions.

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 .

Most innervation for intrinsic muscles of the tongue is via the hypoglossal nerve (CNXII)

EXTRINSIC MUSCLES

The extrinsic muscles are as follows:

Genioglossus

Attachments: Arises from the mandibular symphysis . Inserts into the body of the hyoid bone and the entire length of the tongue.

Functions: Inferior fibres protrude the tongue , middle fibres depress the tongue , and superior fibres depress the tongue , and superior fibres draw the tip back and down.

Innervation: Motor innervation via the hypoglossal nerve ( CNXII)

Hyoglossus

Attachments : Arises from the hyoid bone and inserts into the side of the tongue.

Function : Depresses and retracts the tongue.

Innervation : Motor innervation via the hypoglossal nerve ( CNXII)  
 Styloglossus

Attachments : Originates at the styloid process of the temporal bone and inserts into the side of the tongue .

Functions : Retracts and elevates the tongue .

Innervation: Motor innervation via the hypoglossal nerve ( CNXII)

Palatoglossus

Attachments : Arises from the palatine aponeurosis and inserts broadly across the tongue.

Function : Elevates the posterior aspect of the tongue .

Innervation: Motor innervation via the vagus nerve (CNX)

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

INNERVATION

In the anterior 2/3 , general sensation is supplied by the trigeminal nerve ( CNV ) . Specifically the lingual nerve ,a branch of the mandibular nerve (CNV3).On the other hand, taste in the anterior 2/3 is supplied from the facial nerve ( CNVII). 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 . Both touch and taste are supplies by the glossopharyngeal nerve ( CNIX).

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 lymphatic drainage of the tongue is as follows:

Anterior two thirds – initially into the submental and submandibular nodes, which empty into the deep cervical lymph nodes.

Posterior third – directly into the deep cervical lymph nodes.

APPLIED ANATOMY

A Tongue Tied – the tongue is attached anteroinferiorly by a piece of connective tissue called the frenulum, which lies in the midline. The process by which the frenulum is formed is the same by which your fingers are made , and is known as sculpting apoptosis. Just as some people may have webbed fingers if this process fails , it can result in excess frenulum . This is called being –tongue- tied, and presents in children. There are varying degrees of severity of tongue-tie and in some cases it can restrict the movement of the tongue causing difficulties with breastfeeding. This can be managed with simple surgery.

1. Write an essay on the 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. Its is though 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 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 surfaces is lines by a respiratory mucosa.

Frontal Sinuses : These are the most superior in location, found under the forehead . The frontal sinuses are variable in sizes, but always triangular shaped . They drain into 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 sphenoethmodial 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 the 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: These are three ethmoidal sinuses; anterior, middle and posterior . They empty into 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

APPLIED ANATOMY

SINUSISTIS

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.