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QUESTIONS

1. Discuss the anatomy of the tongue and comment on its applied anatomy
2. Write an essay on the air sinuses.

ANWERS

1. STRUCTURE

 The tongue is a muscular hydrostat that forms part of the floor of the oral cavity. The left and right sides of the tongue are separated by a vertical section of fibrous tissue known as the lingual septum. This division is along the length of the tongue save for the very back of the pharyngeal part and is visible as a groove called the median sulcus. The human tongue is divide into anterior and posterior parts by the terminal sulcus which is a V-shaped groove. The apex of the terminal sulcus is marked by a blind foramen, the foramen cecum which is a remnant of the median thyroid diverticulum in early embryonic development. The anterior oral part is the visible part situated at the front and makes up roughly two-thirds of length of the tongue. The posterior pharyngeal part is the part closest the throat, roughly one-third of its length. These parts differ in terms of their embryological development and nerve supply.

The anterior tongue is at its apex, thin and narrow. It is directed forward against the lingual surfaces of the lower incisor teeth. The posterior part is at its root, directed backward and connected with the hyoid bone by the hyoglossi and genioglossi muscles and the hyoglossal membrane, with the epiglottis by three glossoepiglottic fold of mucous membrane. It also forms the anterior wall of the oropharynx.

UPPER SURFACE OF THE TONGUE

The upper surface of the tongue is called the dorsum and its divided by a groove into symmetrical halves by the median sulcus. The foramen caecum marks the end of this division and beginning of the terminal sulcus. The foramen caecum is also the point of attachment of the thyroglossal duct and is formed during the descent of the thyroid diverticulum in embryonic development. The terminal sulcus is a shallow groove that runs forward as a shallow groove in a V-shape form the foramen caecum, forward and outwards to the margins of the tongue. The terminal sulcus divides the tongue into a posterior pharyngeal part and anterior oral part.

UNDERSURFACE OF THE TONGUE

On the undersurface of the tongue is a fold of mucous membrane called the frenulum that tethers the tongue at the middle to the floor of the mouth. On the other side of the frenulum are small prominence called sublingual caruncles that the major salivary submandibular glands drain into.

MUSCLES

The eight muscles of the human tongues are classified as either extrinsic or intrinsic. The 4 intrinsic muscles act to change the shape of the tongue and are not attached to any bone. They include; the superior longitudinal muscles, inferior longitudinal muscles, vertical muscle and the transverse muscle. The extrinsic muscles are also 4 in number, they act to change the position of the tongue and are attached to bones. They include; hyoglossus, styloglossus, palatoglossus and the genioglossus.

BLOOD SUPPLY

The tongue receives its bold supply from the lingual artery, a branch of the external carotid artery. The lingual veins drain into the internal jugular vein. The floor of the mouth also receives its blood from the lingual artery. There is also a secondary blood supply to the root of the tongue from the tonsillar branch of the facial artery and the ascending pharyngeal artery.

NERVE SUPPLY

It consists of the motor fibers, special sensory fibers for taste and general sensory fibers for sensation.

* Motor supply for all extrinsic is supplied by efferent motor nerve fibers for sensation.
* Anterior two-thirds of tongue;

Taste; chorda tympani branch of the facial nerve via special visceral afferent fibers.

Sensation; lingual branch of the mandibular division of the trigeminal nerve via general visceral afferent fibers.

LYMPHATIC DRAINAGE

The tip of tongue drains to the submental nodes. The left and right halves of the anterior two thirds of the tongue drains to submandibular lymph nodes while the posterior one third drains to the jugulo-omohyoid nodes.

FUNCTION OF THE TONGUE

* Taste
* Mastication (chewing)
* Speech
* Intimacy

APPLIED ANATOMY

* Thrush; a yeast grows over the surface of the mouth and tongue. Thrush can occur on almost anyone but it occurs more often in people taking steroids.it is also called oral candidiasis.
* Ankyloglossia; also known as tongue tie is congenital disorder when the tongue is tied to the floor of the mouth by a very short and thickened frenulum and this affects speech, eating and swallowing.
* Oral cancer; a growth or ulcer appears on the tongue and grows steadily. Oral cancer is more common in people who smoke or drink alcohol heavily.
* The tongue is prone to several pathologies including glottis and other inflammation such as **burning mouth syndrome** (a relatively common problem. The tongue feels burned or scalded or strange taste or sensations develop.), **oral hairy leukoplakia** (white patches appear on the tongue that can’t be scraped off.), **geographic tongue** (ridges and colored spots migrate over the surface of the tongue, periodically changing its appearance.) and fissured tongue.
1. Air sinuses also known as paranasal sinuses are a group of four paired air-filled spaces that surround the nasal cavity.

They include the maxillary sinuses which are located under the eyes, the frontal sinuses above the eyes, the ethmoidal sinuses between the eyes and the sphenoid sinuses 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 eye, in the maxillary bones. They are innervated by the trigeminal nerve.
* 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 CN5.
* The ethmoidal sinuses; which are formed from several discrete air cells within the ethmoid bone between the nose and the eyes. Innervated by the ethmoidal nerve.
* The sphenoidal sinuses; in the sphenoid bone are innervated by the CN5.

DEVELOPMENT

Paranasal sinuses from developmentally through excavation of bone by air-filled sacs rom the nasal cavity. This process begins prenatally and it continues through the course of an organism’s lifetime. The results of experimental studies suggest that the natural ventilation rate of a sinus with a single sinus ostium is extremely slow. Such limited ventilation maybe protective for the sinus, as it would prevent drying of its mucosal surface and maintain a near sterile environment with high carbon dioxide concentration and minimal pathogen access. Thus composition of gas content in the maxillary sinus is similar to venous blood, with high carbon dioxide and lower oxygen levels compared to breathing air. At birth only the maxillary sinus and the ethmoid sinus are developed but not yet pneumatized; only by the age of seven they are fully aerated. The sphenoid sinus appears at the age of 3 and the frontal sinus at the age of 6 and fully develop during adulthood.

CLINICAL SIGNIFICANCE

Inflammation: the paranasal sinus are joined the nasal cavity via small orifices called ostia. These become blocked easily by allergic inflammation, or by swelling in the nasal lining that occurs with a cold. If this happens, normal drainage of mucus within the sinuses is disrupted and sinusitis may occur.

CANCER

Malignancies of the paranasal sinuses comprise approximately 0.2% of all malignancies. About 80% of these malignancies arise in the maxillary sinus. Men are much more affected than women. They often occur in the age group between 40-70 yrs.