1. ***Motor Dysfunction: Tongue Paralysis***

Motor innervation to the tongue is primarily by the Hypoglossal Nerve (CN XII).

Hypoglossal Nerve (CN XII) Lesion

A lesion (damage) to CN XII results in paralysis and eventual atrophy (wasting) of the muscles on the same side (ipsilateral) of the tongue.

Clinical Sign: Deviation on Protrusion

When the patient is asked to stick out their tongue, the unopposed action of the healthy genioglossus muscle pushes the tongue tip toward the damaged side.

Analogy: The healthy muscle pushes the tongue, but the paralyzed muscle's side cannot resist or counteract that push, so the tongue 'leans' toward the weaker, paralyzed side.

Consequences:

Dysarthria (difficulty articulating speech sounds, particularly those involving the tongue, like 'tuh', 'duh', 'luh').

Dysphagia (difficulty swallowing) and chewing difficulty, as the patient cannot effectively move the food bolus around the mouth and propel it toward the pharynx.

The affected side of the tongue will appear shrunken and may have fasciculations (fine, rapid muscle twitches) due to muscle denervation.

Vagus Nerve (CN X) Lesion

The Palatoglossus muscle, which elevates the posterior tongue and is part of the soft palate, is innervated by the Vagus nerve (CN X).

Damage to CN X can affect the palatoglossus, leading to difficulty elevating the posterior part of the tongue during the oral phase of swallowing. This can contribute to dysphagia and may accompany other signs of Vagus nerve palsy (e.g., uvula deviation, hoarseness).

2. ***Sensory Dysfunction: Taste and General Sensation Loss***

Sensory deficits are divided based on the area of the tongue affected and the type of sensation lost.

Specific Clinical Syndromes Involving Taste Loss:

Bell's Palsy: This involves paralysis of the Facial Nerve (CN VII) and frequently affects the chorda tympani branch. Patients often experience facial paralysis (difficulty closing the eye, smiling) along with a loss of taste on the anterior two-thirds of the tongue on the same side.

Oral Surgery Complications: The Lingual Nerve runs very close to the inner aspect of the mandible near the third molar (wisdom tooth). It is vulnerable to injury during local anesthesia or extraction surgery, resulting in numbness (loss of general sensation) to the anterior tongue, which can be temporary or permanent.

Intrinsic Muscles

These muscles are entirely within the substance of the tongue. They are arranged in longitudinal, transverse, and vertical planes and are responsible for changing the shape of the tongue (e.g., curling, flattening).

Movements of the Tongue

Tongue movements are complex, coordinated actions of both the extrinsic and intrinsic muscles, crucial for articulation (speech), manipulation of food, and initiation of swallowing.

Movement	Muscles Primarily Involved	Function
Protrusion (Sticking out)	Genioglossus (both sides contracting)	Eating, speaking.
Retraction (Pulling back)	Styloglossus and Hyoglossus	Positioning for swallowing, moving food back.
Depression (Pushing down)	Hyoglossus and Genioglossus (inferior fibers)	Opening the oral cavity during speech.
Elevation (Pushing up)	Styloglossus and Palatoglossus	Pressing food against the palate, initial stage of swallowing.
Changing Shape	All Intrinsic Muscles	Essential for the precise articulation required for speech (e.g., forming grooves, rolling).

Key Points to Remember:

General Sensation (Anterior 2/3): Lingual nerve (branch of V3/Trigeminal).
General Sensation (Posterior 1/3): Glossopharyngeal nerve (CN IX).
Special Sensation (Taste, Anterior 2/3): Chorda Tympani (branch of Facial Nerve, CN VII).
Special Sensation (Taste, Posterior 1/3): Glossopharyngeal nerve (CN IX).
Motor (All muscles except Palatoglossus): Hypoglossal nerve (CN XII).
Blood Supply: Lingual Artery (branch of the External Carotid Artery).

Clinical Implications of Tongue Innervation

Damage to the cranial nerves that supply the tongue can result in specific clinical signs related to motor function (movement/paralysis) or sensory function (general sensation/taste).

The tongue is a muscular organ located in the floor of the oral cavity. It is essential for several functions, including taste, speech, mastication (chewing), and swallowing (deglutition).

Mucous Membrane of the Tongue

The tongue is covered by a specialized mucous membrane (mucosa), which varies in appearance between the dorsal (upper) and ventral (lower) surfaces.

Dorsal Surface

The dorsal surface is rough and characterized by:

Median Sulcus: A shallow groove that runs longitudinally down the middle, representing the line of fusion of the two halves of the tongue.

Sulcus Terminalis (or V-shaped Sulcus): A V-shaped groove located on the posterior third of the tongue, dividing it into an anterior (oral) part and a posterior (pharyngeal) part.

The Foramen Cecum is a small pit at the apex of the sulcus terminalis, marking the site of embryonic descent of the thyroid gland.

Lingual Papillae: Small projections that cover the anterior two-thirds and are responsible for the rough texture. They house the taste buds (except for the filiform type).

Filiform Papillae: Smallest and most numerous; cone-shaped, giving the tongue its velvety appearance. They lack taste buds and are primarily for mechanical friction.

Fungiform Papillae: Mushroom-shaped; scattered among the filiform papillae, especially at the tip and sides. They contain taste buds.

Circumvallate (or Vallate) Papillae: Largest, 8-12 in number, arranged in a V-shape just anterior to the sulcus terminalis. They have numerous taste buds on their lateral walls.

Foliate Papillae: Leaf-like folds on the lateral borders of the tongue. They contain taste buds, particularly active in infancy.

Ventral Surface

The ventral surface is smooth, non-keratinized, and highly vascular. Key features include:

Lingual Frenulum: A fold of mucosa connecting the tongue to the floor of the mouth.

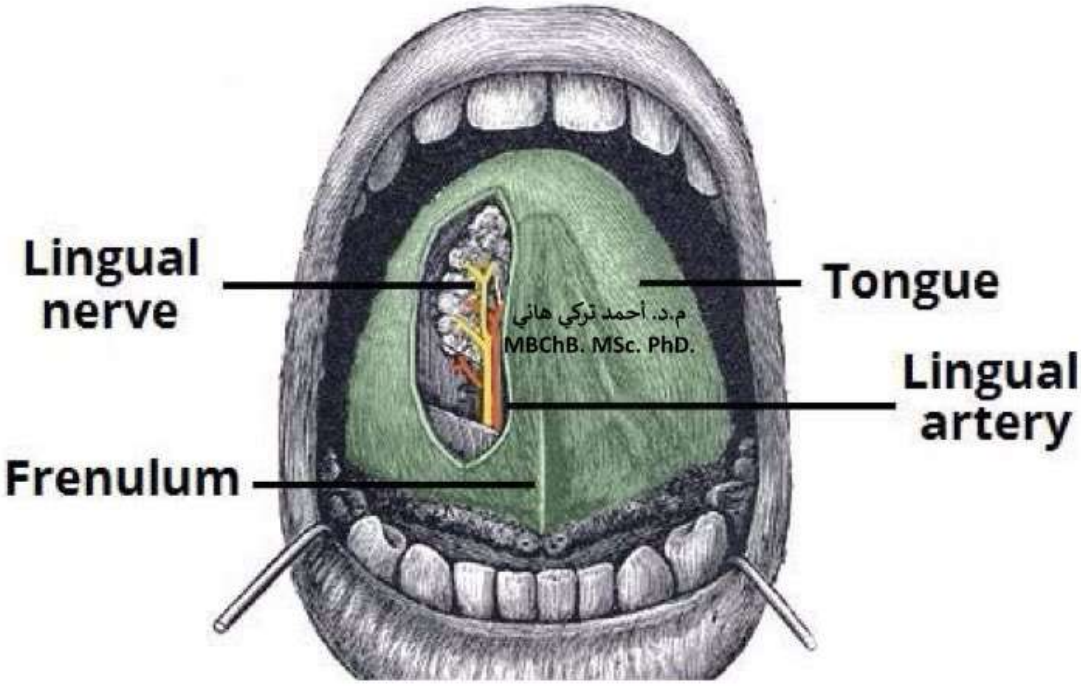
Deep Lingual Veins: Prominent veins visible beneath the mucosa.

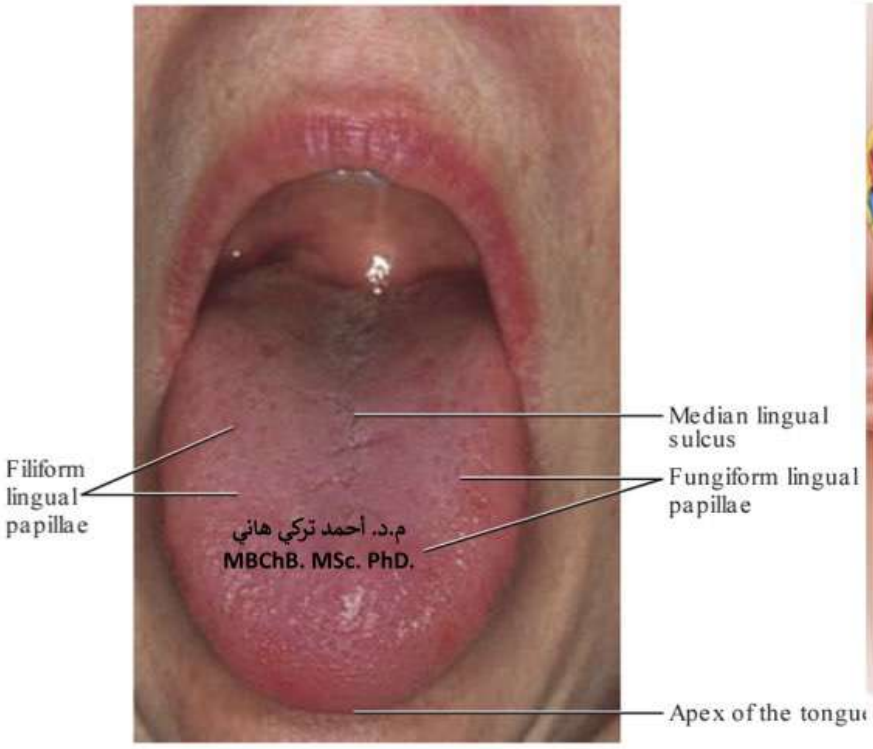
Muscles of the Tongue

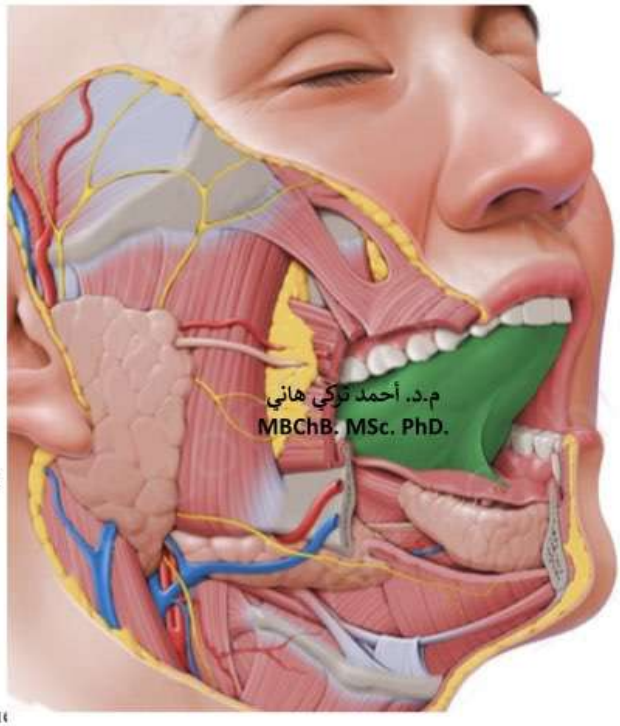
The tongue muscles are divided into two main groups: extrinsic and intrinsic. Both groups are innervated by the Hypoglossal Nerve (CN XII), except for the palatoglossus muscle.

Extrinsic Muscles

These muscles originate outside the tongue and insert into it, primarily responsible for changing the position of the tongue (e.g., protrusion, retraction).







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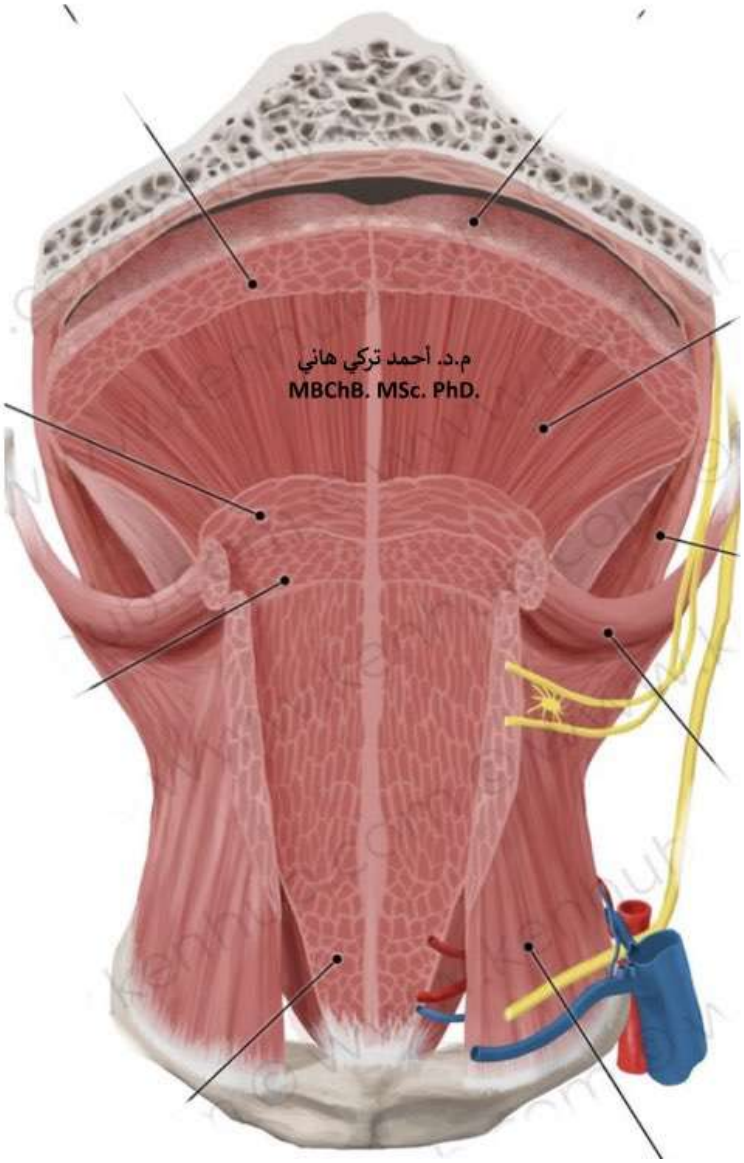

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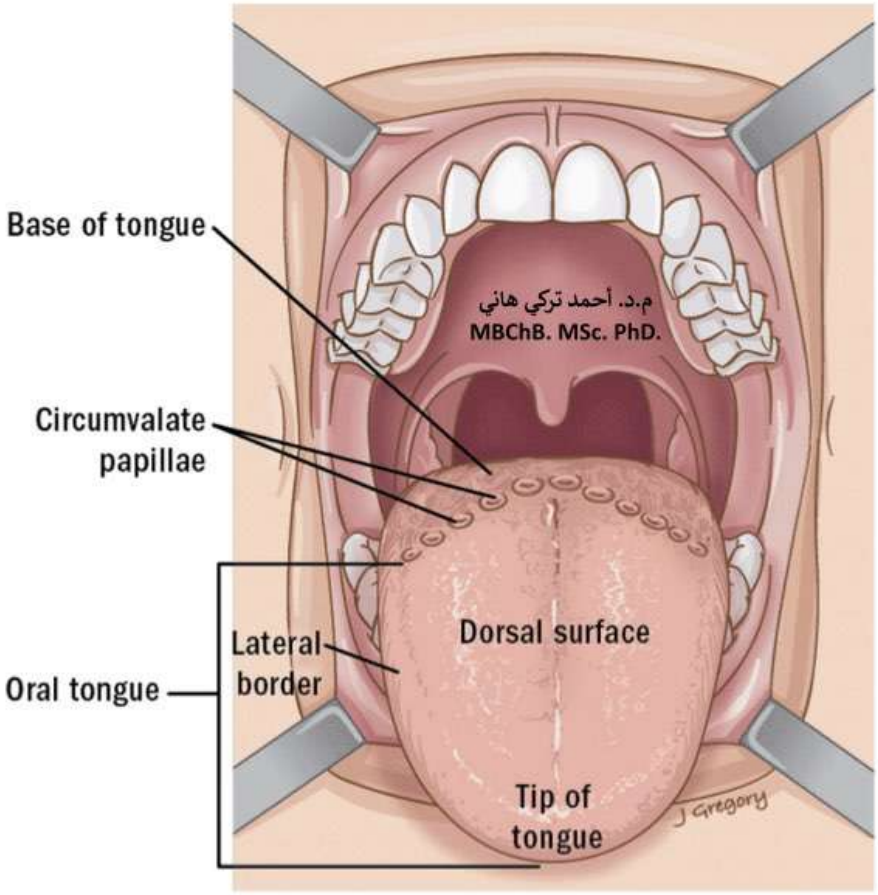

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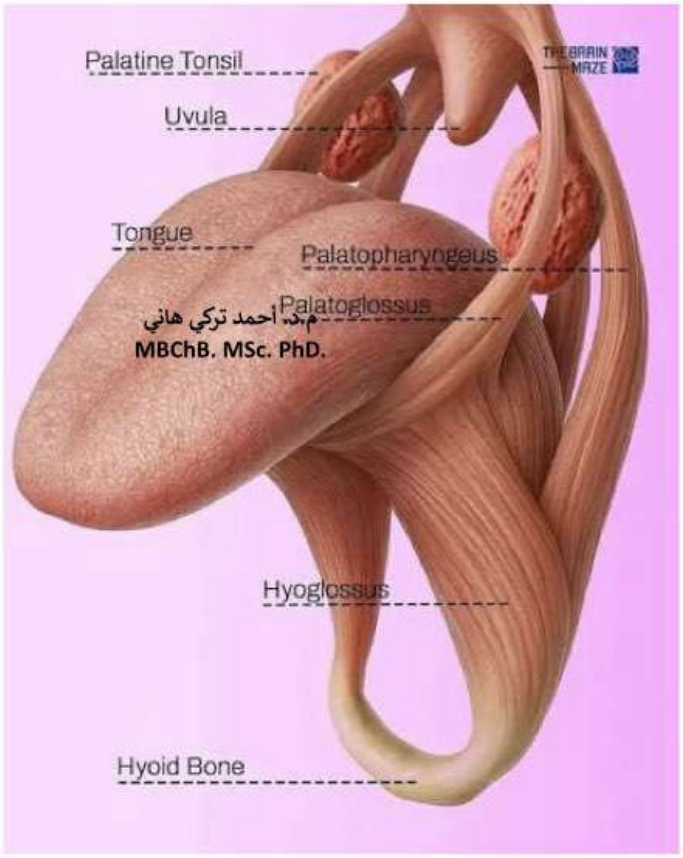

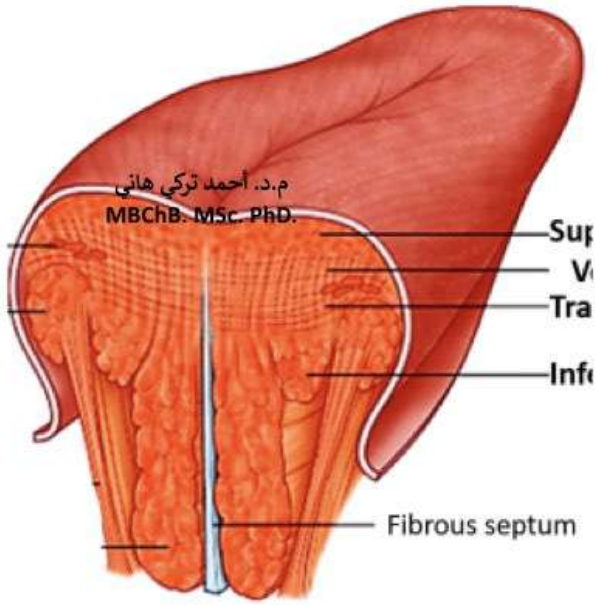

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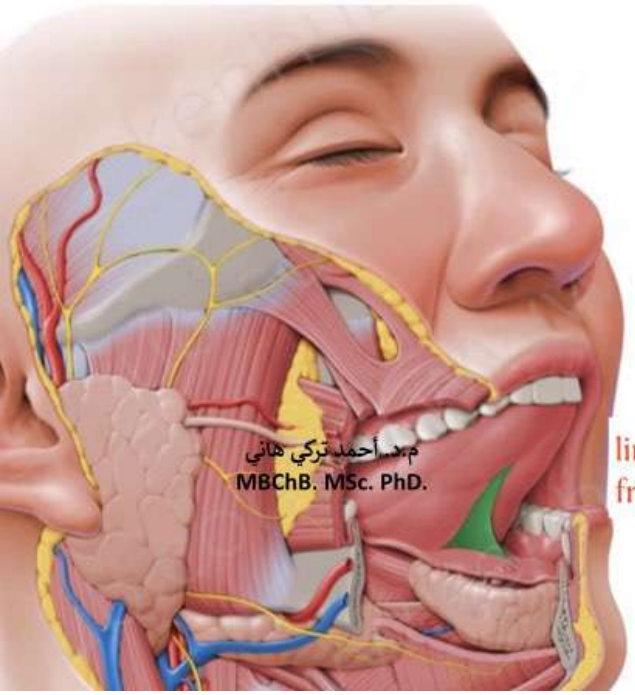

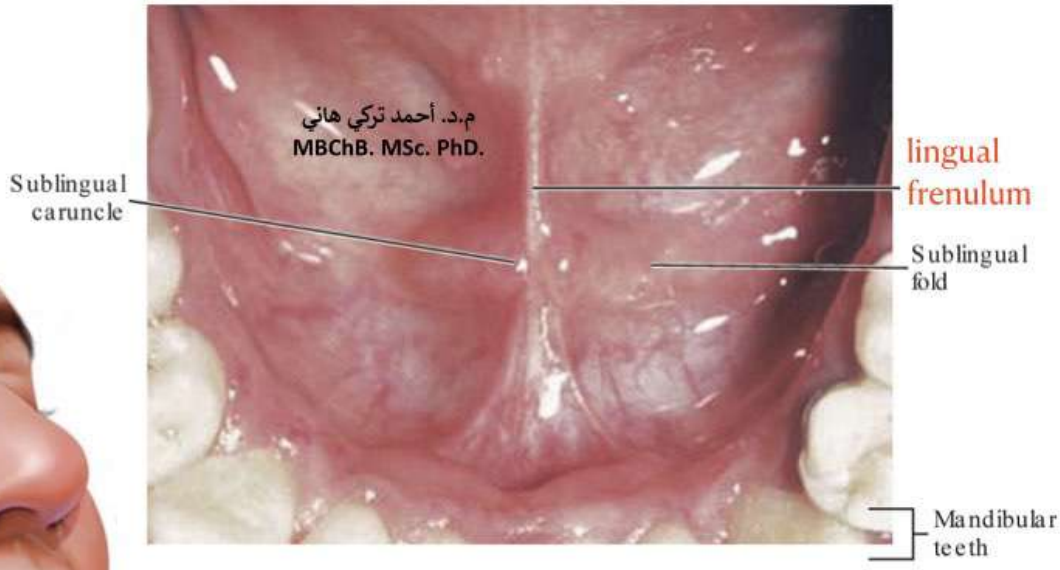

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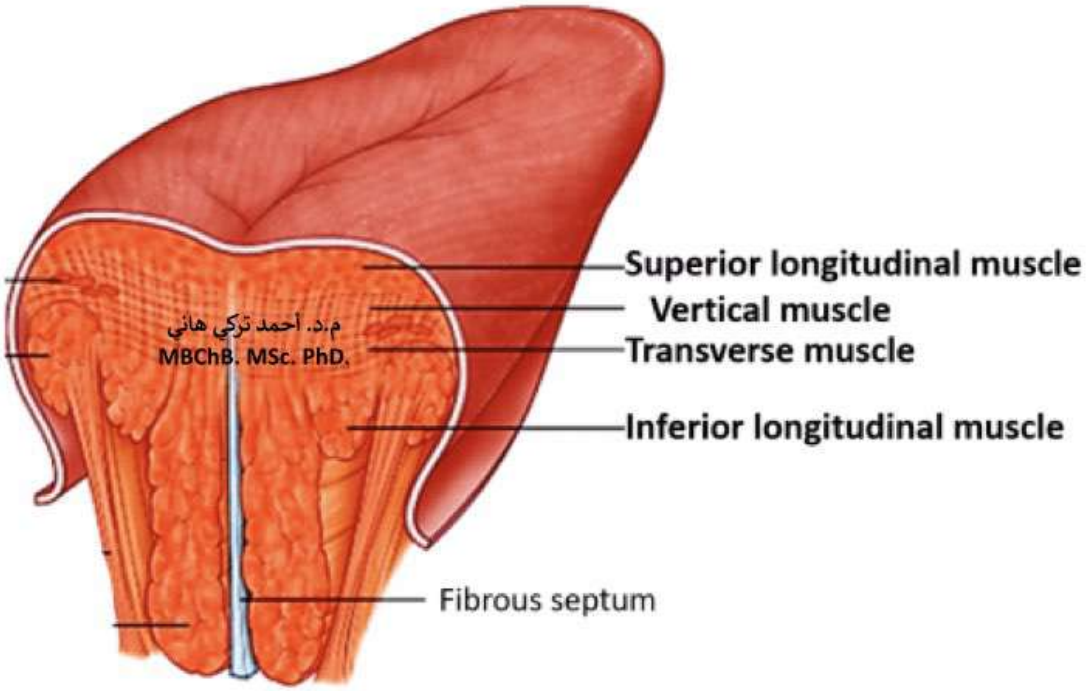

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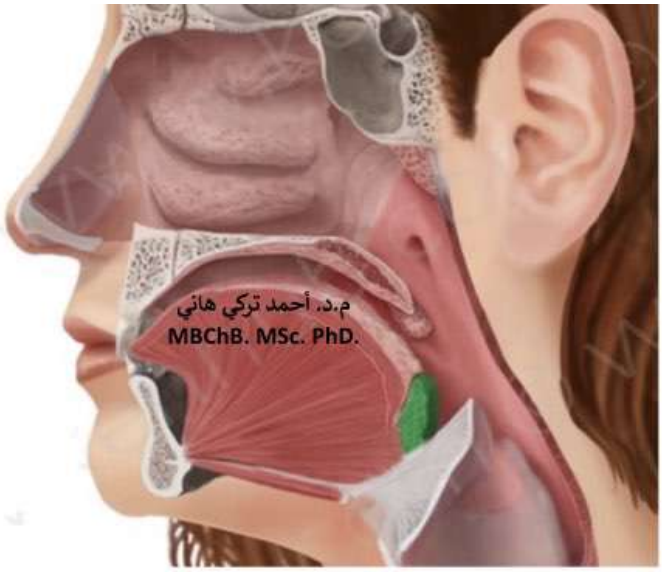

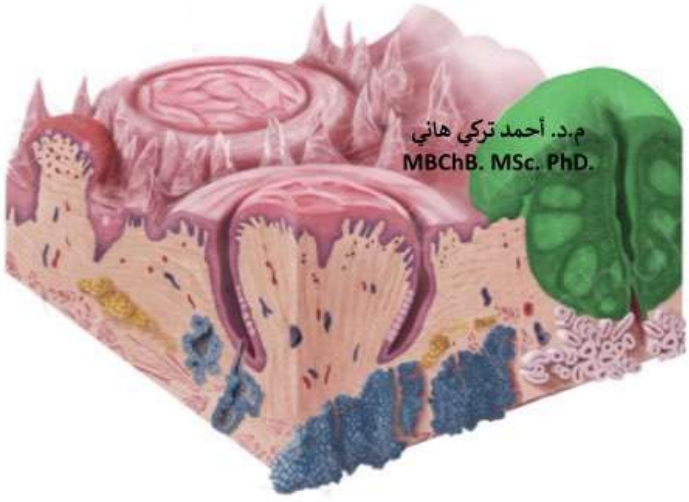

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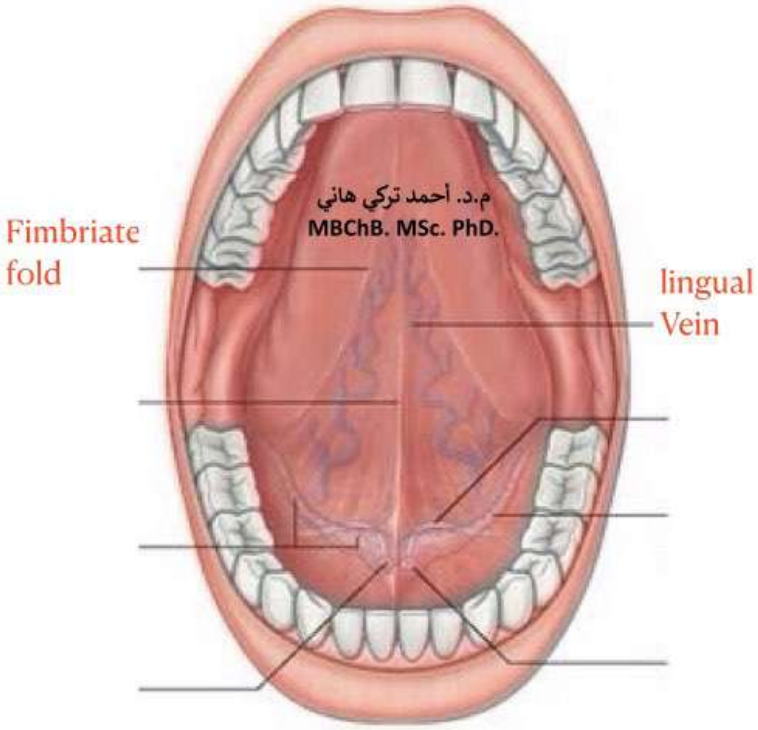

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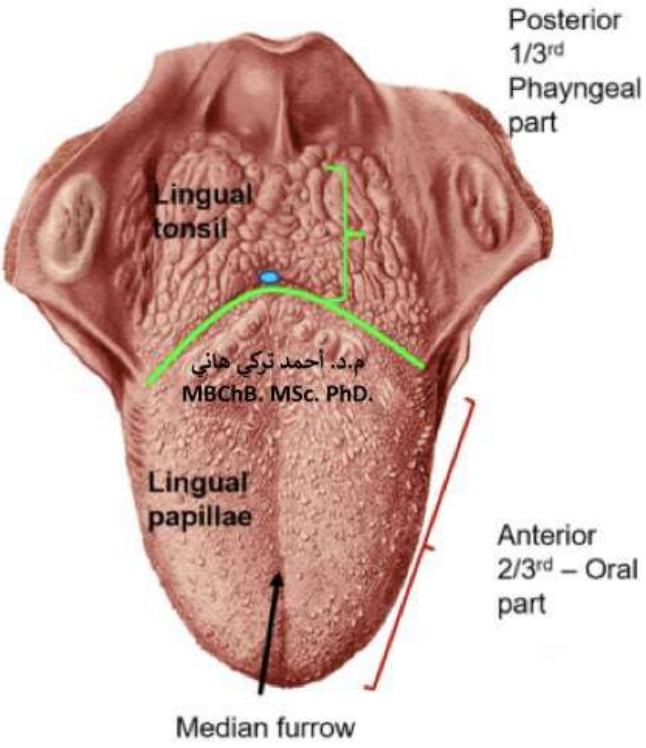

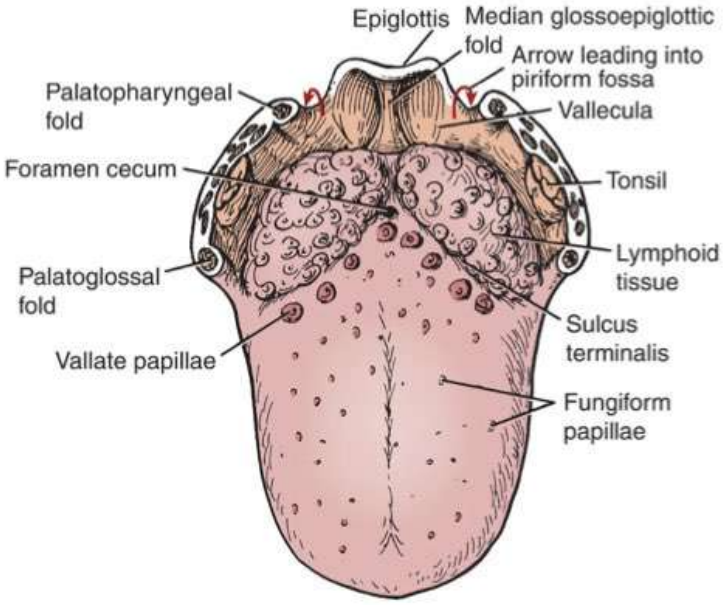

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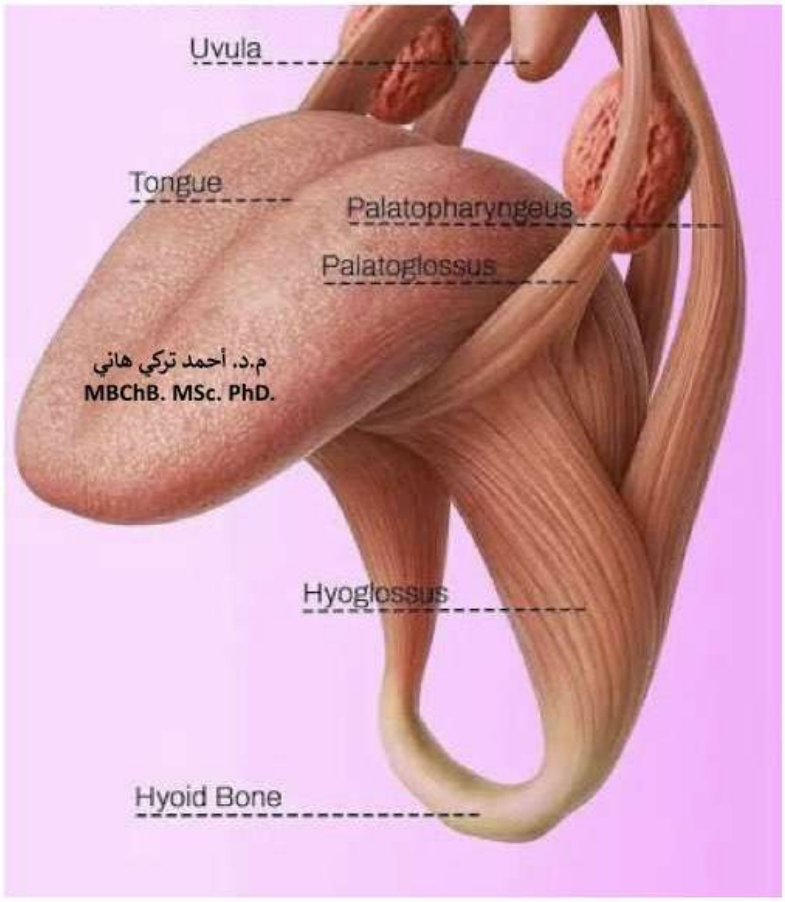

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