

TONGUE

Anatomy of Tongue

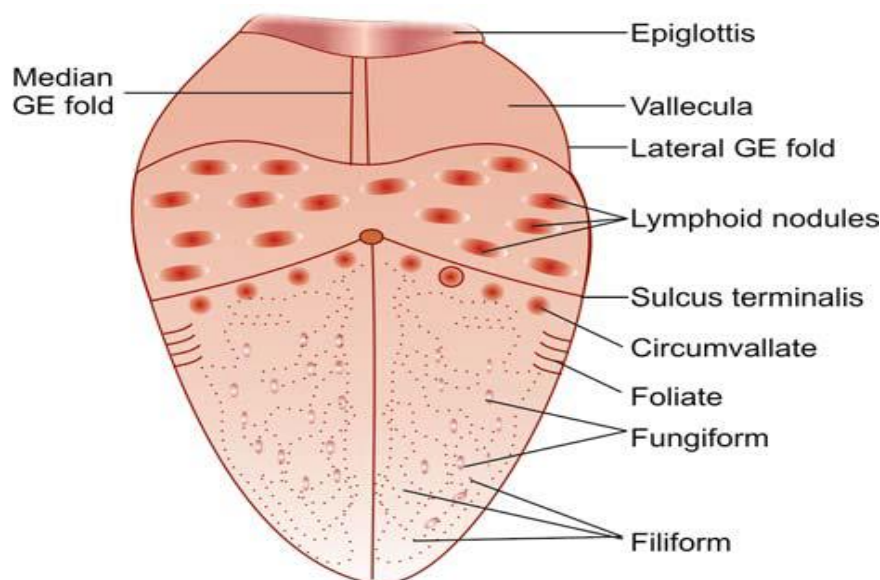
Tongue is a muscular organ located in the floor of the mouth.

Parts:

1. *Tip*: Anterior free end lies behind the upper incisor teeth.
2. *Root*: Attached to the mandible above and hyoid bone below.
3. *Body*: Dorsal surface is rough due to papillae; and is divided into anterior 2/3rd (oral part) and posterior 1/3rd (pharyngeal part) by *sulcus terminalis*. Ventral surface is smooth, has a median fold, '*frenulum linguae*' and deep lingual vein on either side.

Papillae:

1. *Vallate*—large, located in front of sulcus terminalis.
2. *Fungiform*—lies over the tip and margin of the tongue.
3. *Filiform*—lies over the dorsum of tongue, gives the velvety appearance—commonest.
4. *Foliate*—over the margin.



Muscles of Tongue:

- a. Intrinsic muscle: Superior and inferior longitudinal, transverse and vertical.
- b. Extrinsic muscle: Genioglossus, hyoglossus, styloglossus, palatoglossus. Blood supply is from lingual artery, a branch of external carotid artery. Venous drainage by deep lingual vein which drains into fascial vein or internal jugular vein.

Lymphatic Drainage of the Tongue:

- _ Tip of tongue drains into submental lymph nodes.
- _ Lateral margin drains to submandibular lymph nodes and into upper deep cervical lymph nodes. Many lymphatic vessels pass as subperiosteal lymphatics of mandible. So carcinoma can involve the bone through this route.
- _ Lymphatics in the midline of tongue freely cross communicate with each other and so spread of malignancy can occur to both side neck lymph nodes.
- _ Lymphatics from posterior third of tongue drain into pharyngeal group of lymph nodes, as well as to the upper deep cervical lymph nodes. Early spread to the pharyngeal lymph nodes from carcinoma of posterior third of tongue has a poor prognosis.

Lymphatic vessels are named as:

1. Apical vessels.
2. Central vessels.
3. Marginal vessels.
4. Basal vessels.

Development and Nerve Supply of the Tongue:

- _ *Anterior 2/3rd* develop from first branchial arch through two lingual swellings and one tuberculum impar. It is supplied by lingual nerve for general sensation and by chorda tympani for taste sensation.
- _ *Posterior 1/3rd* develops from third arch from cranial half of hypobranchial eminence. It is supplied by glossopharyngeal nerve for both general and taste sensations.
- _ *Posterior most part* develops from the fourth arch. It is supplied by vagus nerve (internal laryngeal nerve).
- _ *Muscles of the tongue* are derived from occipital myotomes and are supplied by hypoglossal nerve except palatoglossus, which is supplied by cranial part of accessory nerve.

▪ TONGUE ULCERS:

Differential diagnosis for tongue ulcers

- ❖ Dental ulcers—painful
- ❖ Aphthous ulcers—painful
- ❖ Ulcers in lichen planus—painless
- ❖ Syphilitic ulcers—painless
- ❖ Tuberculous ulcers—painful
- ❖ Malignant ulcers—painless

Dental Ulcer

It is common on sides of tongue due to sharp tooth, denture, and broken tooth. Usually it is acute painful, self-limiting ulcer. Occasionally repeated trauma form an indolent chronic ulcer which mimic carcinoma; it should be excised to rule out carcinoma and to cure the ulcer.

Aphthous Ulcer

It can be :

- (1) *Minor* aphthous ulcer, common in menstruating women as a crop with painful, round, yellow based ulcer with red margin. It regresses spontaneously in 2 weeks.
- (2) *Major* aphthous ulcer, large and deep which often becomes chronic and takes more time to subside with a scar. Chlorhexidine gluconate, local application of triamcinolone acetate, choline salicylate gel are different local applicants used to promote healing.
- (3) *Behcet's syndrome* is genital ulcer, conjunctival ulcer and multiple oral ulcers. *Reiter's syndrome* is urethritis, arthritis, periarteritis nodosa, conjunctivitis, and oral ulcers.
- (4) Herpetiform aphthous ulcer is not due to herpes simplex. They are small, 1-2 mm diameter ulcers in crops which heal by usual drugs mentioned above.

Syphilitic Ulcer

Extragenital chancre often occurs in tongue in *primary syphilis* which is painless with shotty, submental and submandibular lymph nodes. In *secondary syphilis*, multiple shallow snail track ulcers in the margins and undersurface; mucous patches on the tongue and fauces; *Hutchinson's condyloma* wart in midline of tongue can occur. In *tertiary syphilis*, gummatous ulcer occurs in anterior 2/3rd of tongue as a deep punched out painless ulcer as gumma with wash leather slough. Endarteritis is the cause for the punched out look. *Interstitial glossitis* with loss of papillae causes longitudinally fissured bald lobulated tongue in tertiary syphilis. In carcinoma arising from syphilitic ulcer, RT is *questionable* as

Blood supply is precarious due to endarteritis; RT further compromises it leading to tongue necrosis.

Tuberculous Ulcer

It is undermined shallow, often multiple, painful ulcer. Ulcer can occur in margins, tip or anterior 2/3rd of tongue. Neck nodes may be involved. Associated tuberculous larynx and lung may be present.

Herpetic Lingual Ulcer

It is involvement of lingual nerve presenting as acute neuralgia with vesicles which form multiple superficial painful ulcers.

Other Ulcers

Multiple ulcers in smokers due to glossitis (*smoker's ulcer*), ulcers due to vasculitis, eosinophilic granuloma. Post-pertussis ulcer in whooping cough occurs on upper part of frenum linguae and under the tip of tongue.

▪ **TONGUE FISSURE:**

Congenital fissures are transverse which run laterally from midline with normal papillae in between. Candida infection can occur on this. Syphilitic fissures are deep bald and longitudinal.

▪ **TONGUE TIE:**

It is short, thick, fibrous frenum linguae. During protrusion lateral margin and tip of the tongue is everted with dorsal mid part heaping. It causes speech defect, difficulty in cleaning the inner part of lower teeth.



▪ GLOSSITIS:

Median Rhomboid Glossitis

It is smooth, lobulated, triangular firm patch anterior to foramen caecum of tongue in midline with deeper colour. Candida infection can occur in it. It mimics carcinoma. Biopsy rules out malignancy. Carcinoma is uncommon in midline.

Glossitis Migrans (Geographic Tongue)

It begins as benign small red patches with white furred margin which spread and recede in an irregular way to appear as fresh patches. White margin contains keratinized epithelium and inflammatory cells over filiform papillae. It is often seen in patients with congenital heart diseases and acute gastrointestinal diseases. Etiology is unknown.

Other Glossitis

- ✓ *Hunter's glossitis* is seen in pernicious anaemia.
- ✓ *Hairy tongue* is overgrowth of filiform papillae with black/ brown stain on it due to bacteria, fungi, tobacco or drugs. There are no hairs. It is a misnomer. Cessation of causative agent, mechanical scraping, cleaning are the treatment methods.
- ✓ Agranulocytosis glossitis.
- ✓ Nonspecific glossitis.
- ✓ *Pellagra glossitis*, due to deficiency of nicotinamide (B3).
- ✓ Chronic superficial glossitis in malnutrition, iron and vitamin B deficiencies.

▪ LEUKOPLAKIA

It is a white patch in the mucosa of the oral cavity that cannot be characterized clinically or pathologically to any other disease. It is a premalignant condition.

Types

1. *Homogenous*.
2. *Nodular*—more potentially malignant.
3. *Speckled*—more potentially malignant—highest.

Clinically the lesion appears as white or greyish coloured, well-localised patch in the cheek, tongue, palate or other areas of the oral cavity.

Incidence of leukoplakia in those who smoke or chew pan is 20%, whereas incidence in non-smokers is 1%. Incidence of its turning into malignancy is 2-4%. It increases with age, duration of the pan chewing, smoking.

Common causes
❖ Smoking
❖ Spirit
❖ Sepsis
❖ Superficial glossitis
❖ Syphilis
❖ Spices
❖ Sharp tooth
❖ Susceptibility
❖ Pan chewing using areca, tobacco, slaked lime
❖ Chronic hypertrophic candidiasis (long-standing candida infection)

Diagnosis: Biopsy confirms the diagnosis as well as rules out the carcinoma.

Treatment:

- ✓ Pan chewing and smoking has to be stopped.
- ✓ Excision, if required skin grafting has to be done.
- ✓ Regular follow-up is necessary.
- ✓ Isoretinoin is helpful. Beta-carotene, tocoferol are also used.
- ✓ CO2 laser excision.

▪ **ERYTHROPLAKIA**

It is red velvety appearance of the mucosa which cannot characterize any recognized condition. It is 17-20 times more potentially malignant than leukoplakia. Histologically parakeratosis with severe epithelial dysplasia is the typical feature. Red color is due to decreased keratin causing shining and prominence of submucosal red vascularised connective tissue.

- _ It is equal in both sexes.
- _ It is common in lower alveolar mucosa, gingivobuccal sulcus and floor of the mouth.
- _ It can be homogenous/speckled/granular or erythroplakia interspersed with leukoplakia.
- _ Diagnosis is done by biopsy.
- _ *Treatment:* Biopsy and surgical excision.

▪ **CARCINOMA OF THE TONGUE**

Incidence is equal in both sexes. Presently its incidence is increasing in females due to increase in number of female smokers.

Aetiology

- ✓ Leukoplakia.
- ✓ Erythroplakia.
- ✓ All 'S's (as mentioned in leukoplakia).
- ✓ Premalignant conditions mentioned earlier.

Types

Gross

1. Papillary.
2. Ulcerative or ulceroproliferative 60%.
3. Fissure with induration.
4. Lobulated indurated mass—frozen tongue.

Histologically:

1. Squamous cell carcinoma—commonest.
2. Adenocarcinoma may arise from minor salivary glands or mucous glands.
3. *Melanomas*.
4. *Transitional cell carcinoma and lymphoepithelioma rarely* can occur in posterior 1/3rd of tongue.

Sites:

1. Lateral margin—commonest—47-50%.
2. Posterior third—20%.
3. Dorsum—6.5%.
4. Ventral surface—9%.
5. Tip—10%.

Clinical Features:

- ✓ Painless ulcer/swelling in the tongue which later may become painful. *Pain* in the tongue due to infection or ulceration or due to the involvement of lingual nerve (pain is referred to ear). Pain on swallowing, in case of carcinoma of posterior third of tongue.
- ✓ *Excessive salivation*. Saliva is often blood stained.
- ✓ *Dysphagia* either due to fixed tongue or due to the involvement of genioglossus or growth in the posterior third of the tongue.
- ✓ *Visible ulcer* in anterior two-thirds of tongue. Ulcer can bleed on touch; edge, base and surrounding areas are indurated. Often indurated area is much more extensive than the

primary tumour (it is also common in carcinoma penis). Edge is everted commonly. Ulcer may cross the midline; may extend into the floor of the mouth/alveolus/mandible. Growth or ulcer in posterior third is usually not visible.

- ✓ Ankyloglossia—involvement of muscles of the tongue. Movements of the tongue especially forward protrusion are commonly affected.
- ✓ Inability to articulate.
- ✓ Foetor (Halitosis). Due to infection and necrosis in the oral cavity. It is due to release of ammonia, butyric acid and mercaptan by tumour cells.
- ✓ Change in voice. Occurs in posterior third tumours. Tumour in posterior third area is more aggressive.
- ✓ Palpable lymph nodes in the neck which are hard, nodular and get fixed to underlying tissues in advanced stages.
- ✓ Features of bronchopneumonia—due to aspiration during lying down/sleeping mainly to lower segment of lung.

Spread of Carcinoma Tongue

✓ *Local spread:*

In case of anterior two-thirds of tongue, the spread occurs to genioglossus muscle, floor of the mouth, opposite side and mandible. In case of posterior third of tongue it spreads locally to tonsil, side of pharynx, soft palate, epiglottis, larynx and cervical spine.

✓ *Lymphatic spread:*

From tip of tongue it spreads to submental nodes. From lateral margin it spreads to submandibular lymph nodes and later to deep cervical lymph nodes. Lymphatics in the tongue are freely communicating, and so involvement of bilateral neck lymph nodes is common. From posterior third it spreads to pharyngeal nodes and upper deep cervical lymph nodes.

Investigations

1. Edge biopsy.
2. FNAC of lymph nodes.
3. Indirect and direct laryngoscopy to see posterior third growth.
4. CT scan to see the extension of posterior third growth or to see the status of advanced secondaries. *MRI* is also very useful to assess the extent of primary tumour.
5. Chest X-ray to see bronchopneumonia.
6. Orthopantomogram.

Treatment

Surgery, radiotherapy, chemotherapy.