

Al Rasheed College of Dentistry
Oral Histology

Dr. Omar Faridh Fawzi

Lecture 14

Masticatory mucosa

General features of masticatory mucosa

1. exposed to compressive and shear forces during mastication.
2. dorsum of the tongue has the same functional role but it is considered as specialized mucosa.
3. epithelium is relatively thick and frequently Orth-keratinized, the gingiva and hard palate also has Para-keratinized.
4. very convoluted junction between epith. and lamina propria.
5. numerous elongated papillae - good mechanical attachment.
6. thick lamina propria with dense collagen fibers in the form of large packed bundles.
7. the lamina propria is bound firmly to underlying bone (muco-periosteum) or indirectly by a fibrous (not a loose, fatty) submucosa.

1-Hard palate:

In the hard palate there are grooves and ridges, all appeared to be adaptation to resist the force of mastication. The m.m. of the hard palate is fixed tightly to the underlying periosteum, so its immovable and its color is pink. The epith. is thick, firm and stratified squamous keratinized or para-keratinized with numerous long papillae. The lamina propria is thicker in the anterior than in the posterior parts of the hard palate. Various regions in the hard palate differ because of the varying structure of the submucous layer, so the following zones can be distinguished:

- a) Gingival part: This part is adjacent to the teeth.
- b) Palatin raphe: The median area of the hard palate, extends from incisive papilla posteriorly.
- c) Anterolateral area: Between median palatine raphe and gingiva till the second premolar area (fatty sub mucosa).
- d) Posterolateral area: Between gingiva and median palatine raphe posterior to second premolar area (glandular sub mucosa).
- e) The first areas have mucoperiosteal junctions which mean that the lamina propria attached directly to the periosteum of underlying bone without submucosa, while the last two layers have distinct submucosa.

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2-Gingiva or gum:

Thick (250 μm), either Orth-keratinized or para-keratinized stratified squamous epithelium with a stippled surface. It extends from dentinogingival junction to the alveolar mucosa. It subjected to the friction and pressure of mastication. Gingiva is divided clinically into 3 parts which are free gingiva, attached gingiva and interdental papilla.

a) Free gingiva (marginal gingiva):

It's the terminal border of gingiva surrounding the tooth in a collar-like fashion, demarcated from the adjacent attached gingiva by a depression called free gingival groove.

b) Attached gingiva:

Its firm, resilient and tightly bound to underlying periosteum of alveolar bone, it extends to alveolar mucosa from which its demarcated by mucogingival junction. Attached gingiva is characterized by a surface that appears stippled (i-e depression and elevation which correspond to epith. ridges and connective tissue papillae), they're functional adaptation to mechanical impact. It's a feature of healthy gingiva and its reduction or loss is common singe of gingival disease beside it varies with age and sex.

c) Interdental papillae:

It occupies the gingival embrasure (which is the interproximal space between two adjacent teeth). Its surface is triangular in 3 dimensions. Gingiva appear slightly depressed between adjacent teeth corresponding to depression from vertical folds called interdental grooves.

The color of the gingiva is pale pink but it becomes red in inflammation, sometimes its brown because of increase melanin pigmentation.

Lamina propria of the gingiva consist of dense C.T. dose not contain large vessels, small number of lymphocytes, plasma cells, macrophages are present in C.T. Collagen fibers arranged in strong bundles arise from the cervical area of cementum and from the outer surface of alveolar process (gingival groups of PDL).

Histologically we can see three areas of epithelium which covers the gingiva. its thick stratified squamous epith. (keratinized) in 15%, (para-keratinized) in 75%, and (non-keratinized) in 10%.

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1. **Oral or outer epith.:** which covers the free and attached gingiva, its either keratinized or para-keratinized stratified squamous epith.
The epith. ridges are long, slender-like and numerous, lacks separating submucosa layer so its immovably attached to bone and teeth by coarse collagen fibers and has no glands.
2. **Sulcular epith.:** Its that epith. which lines the gingival sulcus, which is thin, non-keratinized stratified squamous epith. without epith. ridges.
3. **Junctional epith** (attachment epith): it is a non-keratinized epith. which form the dentino-gingival junction and start from the bottom of gingival junction cervically.

Lining mucosa

- a) **Alveolar mucosa:** Its red, shiny and covering the alveolar bone separated from attached gingiva by mucogingival junction. It`s movable (loosely attached to periosteum by a loose well-defined sub mucosa contain minor salivary glands). The epith.is thin, stratified squamous non-keratinized and the papillae are low and often entirely missing.
- b) **Lip:** Oral Mucosa of the lip covered by non-keratinized stratified squamous epithelium. Minor salivary glands are present in the sub mucosa and fibers of orbicularis oris muscle are noted also.

Vermillion zone of the lip is very thin keratinized epithelium that contains no adnexal skin structures (can contain sebaceous glands).

What gives the vermilion zone the red color?

- a) Epithelium is thin
 - b) Epithelium contains eleidin, which is transparent semi-fluid clear substance present in the lamina lucida of the skin epithelium
 - c) Blood vessels are present near the surface eleidin.
- c) **Soft palate**

Non-keratinized stratified squamous epith., Highly vascularized so more pink than hard palate. Submucosa contains minor salivary glands and muscles of soft palate.

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Specialized mucosa:

Dorsal surface of the tongue is rough and irregular divided into anterior ½ or body of the tongue and posterior ½ or base of the tongue by V-shaped lined called terminal sulcus. The body and the base of the tongue differ widely in the structure of the M.M. The anterior part can be termed as papillary and the posterior part the lymphatic portion. On the anterior part are found numerous papillae which are:

- a) **Filiform papillae:** Makes up majority of the papillae and covers the anterior part of the tongue. They appear as slender, threadlike keratinized projections. These papillae facilitate mastication (by compressing and breaking food when tongue is opposed to the hard palate) and movement of the food on the surface of the tongue. The papillae are directed towards the throat and assist in movement of food towards that direction. The covering epith. is keratinized, these papillae do not contain taste buds.
- b) **Fungiform papillae:** Interspersed between the filiform are the isolated mushroom-shaped or fungiform papillae, which are round reddish prominences. Their color is derived from a rich capillary network visible through the relatively thin epith. Fungiform papillae contain a few taste buds.
- c) **Circumvallate papillae:** 8-10 vallate papillae in front of the V-shape sulcus between the body and the base of the tongue connected to the substances of the tongue is at their narrow base, its free surface shows numerous secondary papillae that are covered by a thin, smooth epith. On the lateral surface of the papillae the epith. contains numerous taste buds.
- d) **Foliate Papilla:** (Leaf-like). Present on the lateral margins of the posterior tongue. Consist of 4 to 11 parallel ridges that alternate with deep grooves in the mucosa and a few taste buds are present in the epithelium. They contain serous glands underlying the taste buds which cleanse the grooves.

Taste Buds

Unique sense organs that contain the chemical sense for taste.

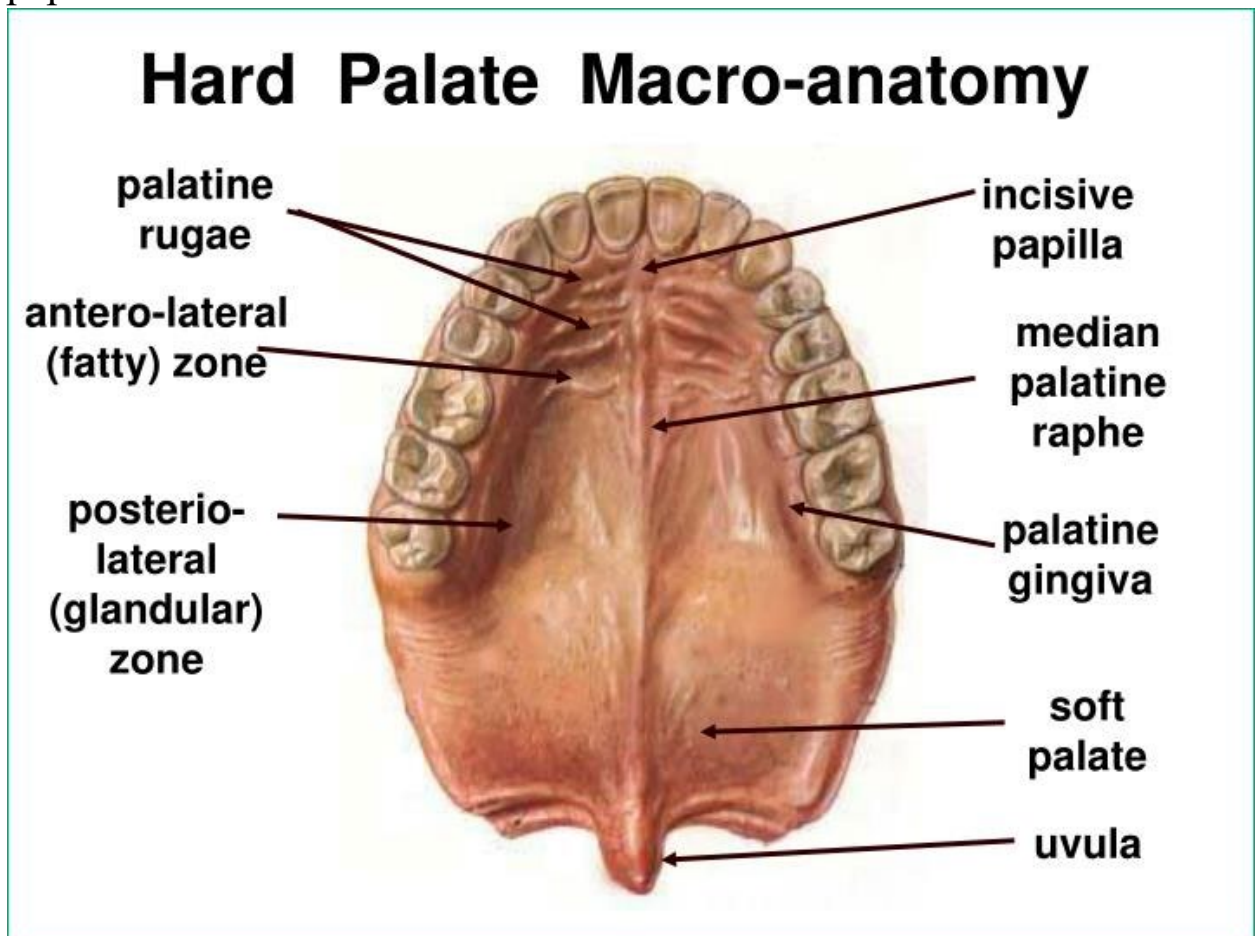
Microscopically visible barrel-shaped bodies found in the oral epithelium. Usually associated with papillae of the tongue (circumvallate, foliate and fungiform). Also seen in epiglottis,

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larynx, and pharynx referred to as neuroepithelial structures. Each taste bud has 10 -14 cells. Majority are taste cells with elongated microvilli that project into the taste pore.

4 taste sensations: Sweet, salty, sour and bitter. **Sweet and salt:** anterior tongue, **Sour:** lateral tongue, **Bitter:** region of circumvallate papillae.



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