Digestive System

University of Jordan

Faculty of Medicine

Batch of 2013-2019

Medical Committee
The University of Jordan

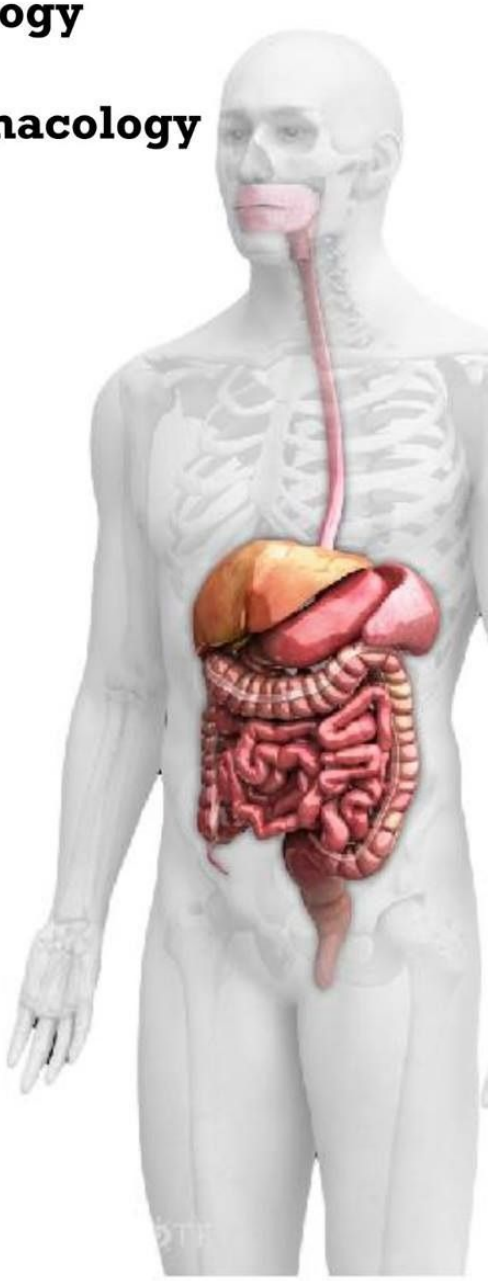
◯ Slide ✦ Sheet ◯ Handout ◯ Other

☐ Anatomy ☐ Embryology

☐ Physiology ✦ Histology

☐ Pathology ☐ Pharmacology

☐ Microbiology ☐ PBL



Sheet #: Lab 1

Done by: Bana Al-Mikhi

Date:

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DESIGNED BY: TAMER ALTAMIMI "SMILE"

- Lip :

this is a section in the lip, and as you remember the lip is made up of 3 parts:

1- The outer or Skin surface : contains hair follicles, it is normal skin covering stratified squamous keratinized epithelium, and it contains sweat and sebaceous glands.

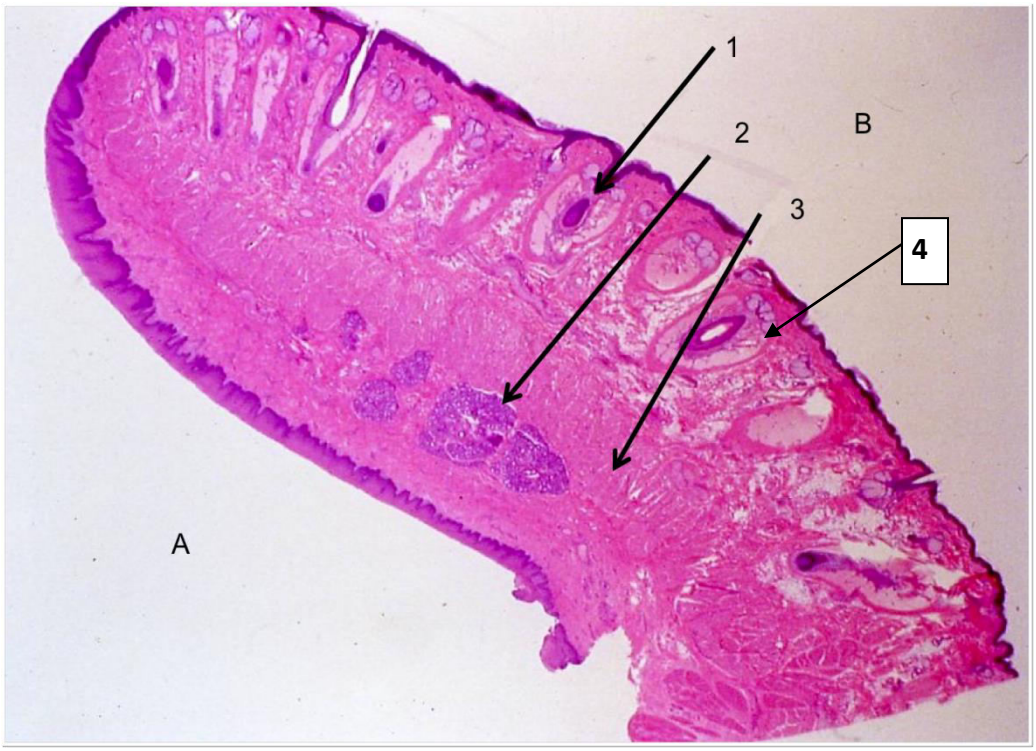
2- vermillion - transitional zone : it is modified thin skin, does not contain hair follicles nor sweat & sebaceous glands. The red colour is due to the large number of vessels and nerve terminals (sensitive).

Notice in the slides that in this zone the **lamina propria** is invaginated through the surface area, and is called : **dermal papillae.** It transports blood vessels and nerve terminals to the surface.

3- the third part(labial part) is stratified squamous non-keratinized epithelium found inside the oral cavity, it contains labial glands.

* Core of the lip : skeletal muscles and it is orbicularis oris, and as you know the skeletal muscles are voluntary with **peripheral nuclei**.

the arrows in the picture indicate :
1- hair follicles.
2- labial glands.
3- core of the lip - skeletal muscles.(orbicularis oris)
4- sebaceous glands.



- Tongue :

	Ventral surface	Dorsal surface
Epithelium	stratified squamous non-keratinized	stratified squamous para-keratinized
Papillae	--------	Filliform papillae

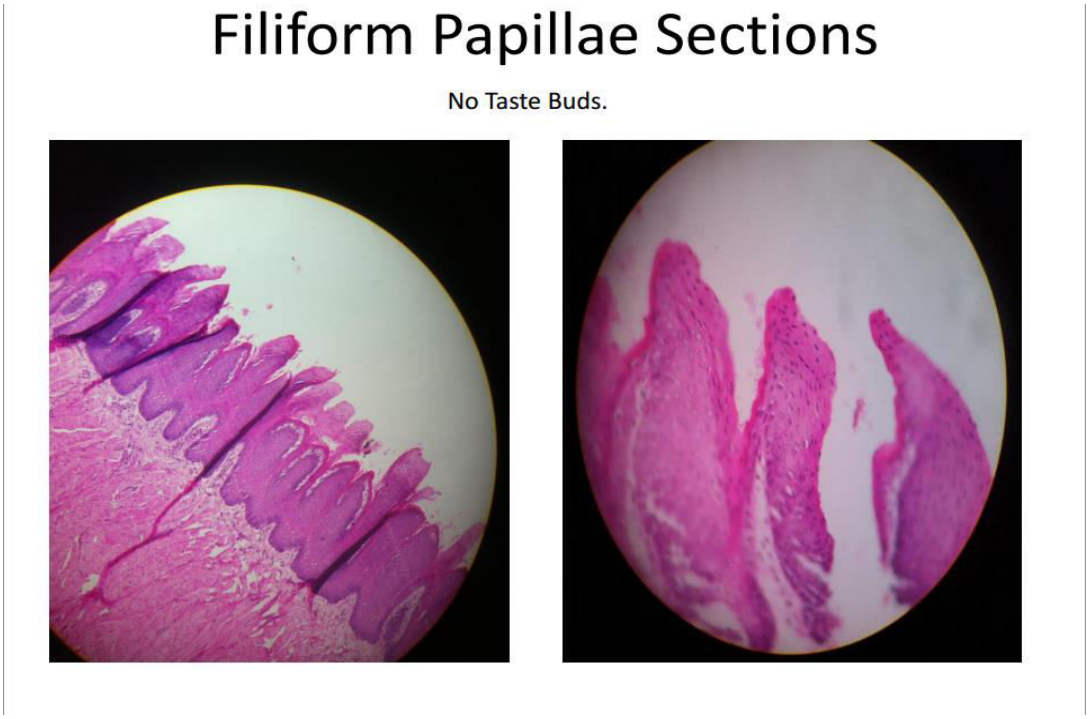
-The dorsum of the tongue is para-keratinized due to injuries; it used to be **keratinized** before injury, it cannot get back to normal (keratinized) since this is irreversible.

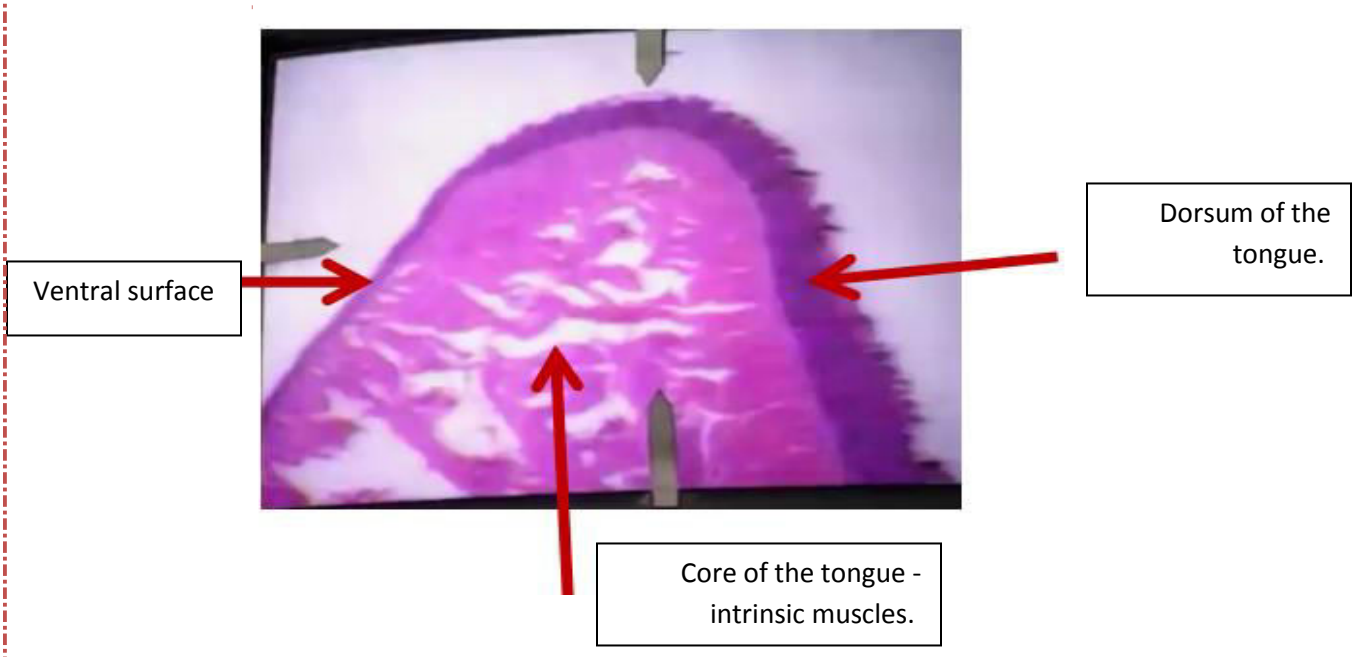
in the slides you can notice the tip of tongue, mucosa, skeletal muscles (as we said the tongue is a muscular organ), and a very thin layer of submucosa in between.

- **filliform papillae** : what is special about it, is the absence of taste buds. It is merely projections to increase surface area of the tongue.

- lamina propria: invaginations through the surface.

- skeletal muscles : voluntary intrinsic & extrinsic muscles, striated with peripheral nuclei.





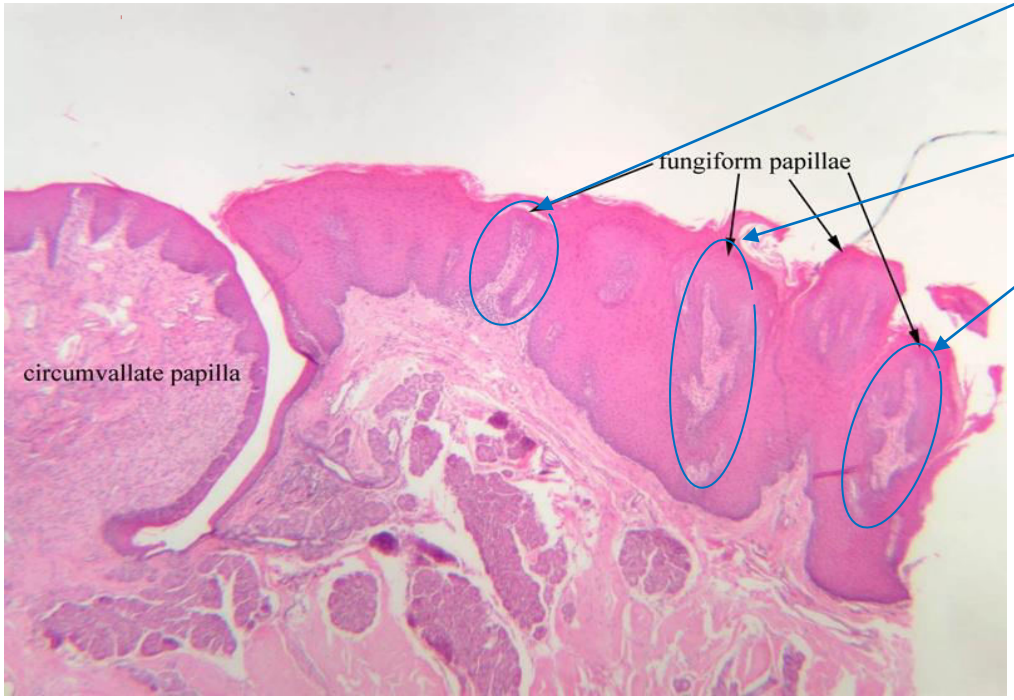
- note : the sub-mucosa is found in the tongue but it is very thin.

- Fungiform papillae : has taste buds, has different types of cells :
1- Bipolar / gustatory cell, (in the middle of the taste bud) : responsible for taste by taking the dissolved material , they have a pore on the surface.
they contain nerve fibers for transmitting the gustatory impulses .
2- Supporting cells: found on the periphery.
3- Stem cells: found on the base, they undergo mitosis and change into different cell types.

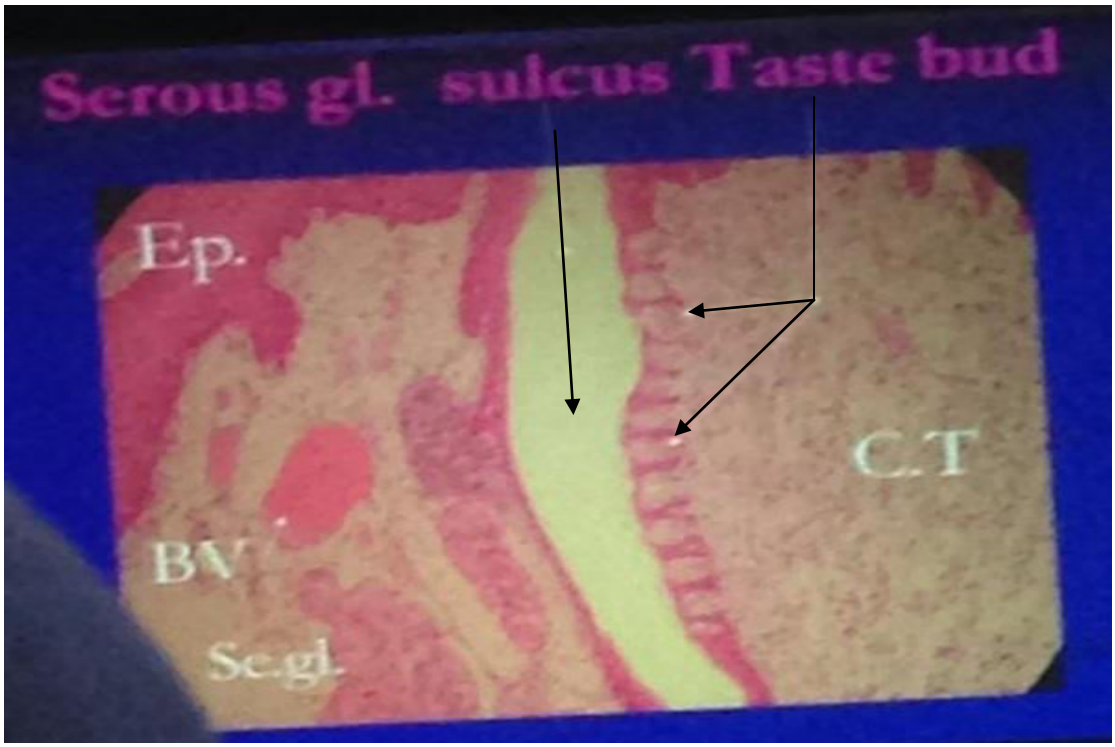
- Circumvallate papillae: has one grooves/ sulcus surrounding it, on one side of this groove we have taste buds and its other side is stratified squamous non-keratinized.

- Von Ebner's gland : **serous** gland and its secretions reach until the end/bottom of the sulcus. It contains **serous acini** with a very narrow lumen in the middle. It has

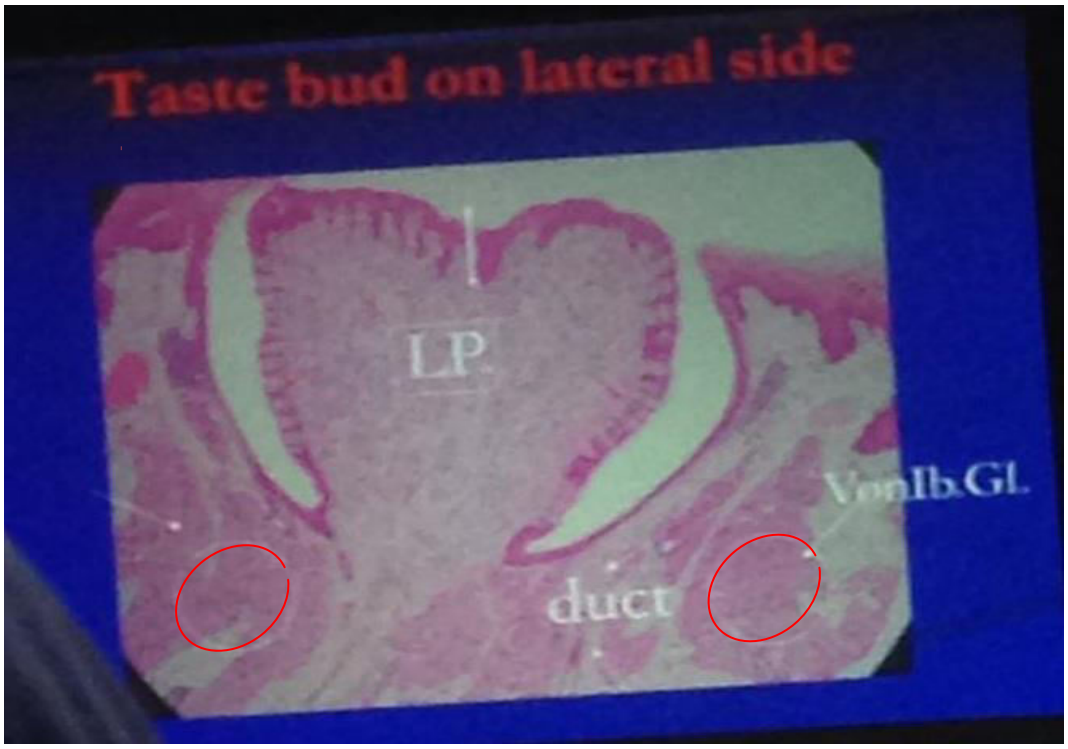
rounded and near the base nuclei. The boundaries between cells are ill-defined (not cleer).



The taste buds in this papillae ***(fungiform***) are present on their upper part/dorsum.



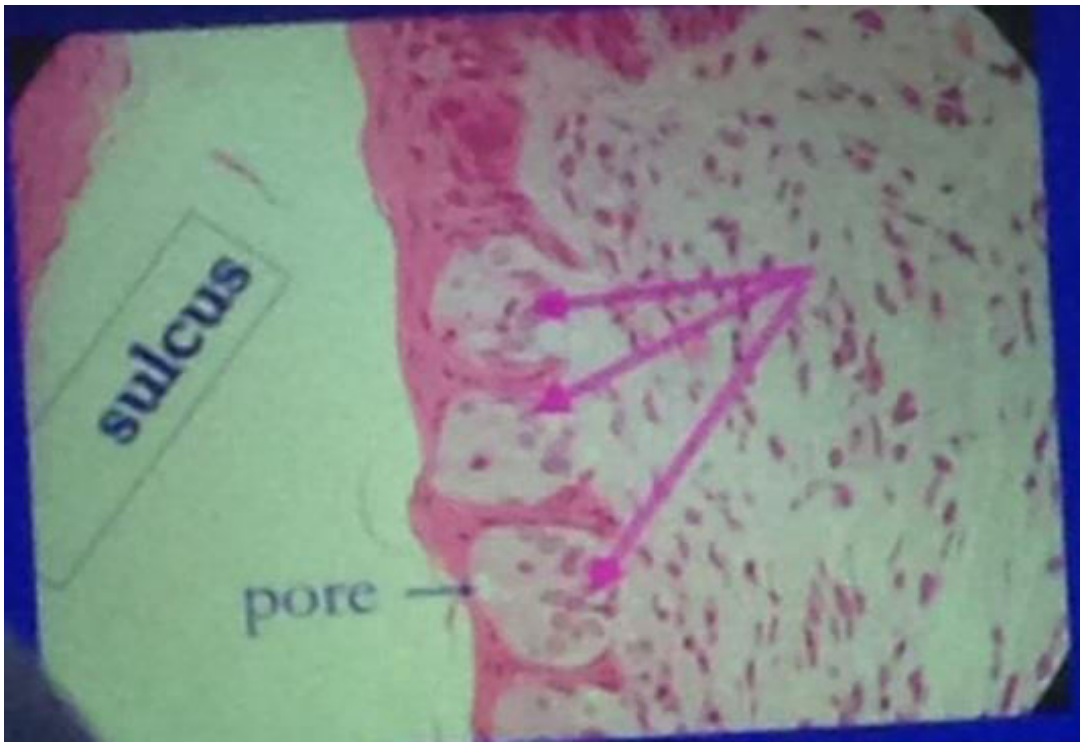
Notice the taste buds in the ***circum-vallate papillae*** are on the medial side of sulcus or the lateral side of the papillae.



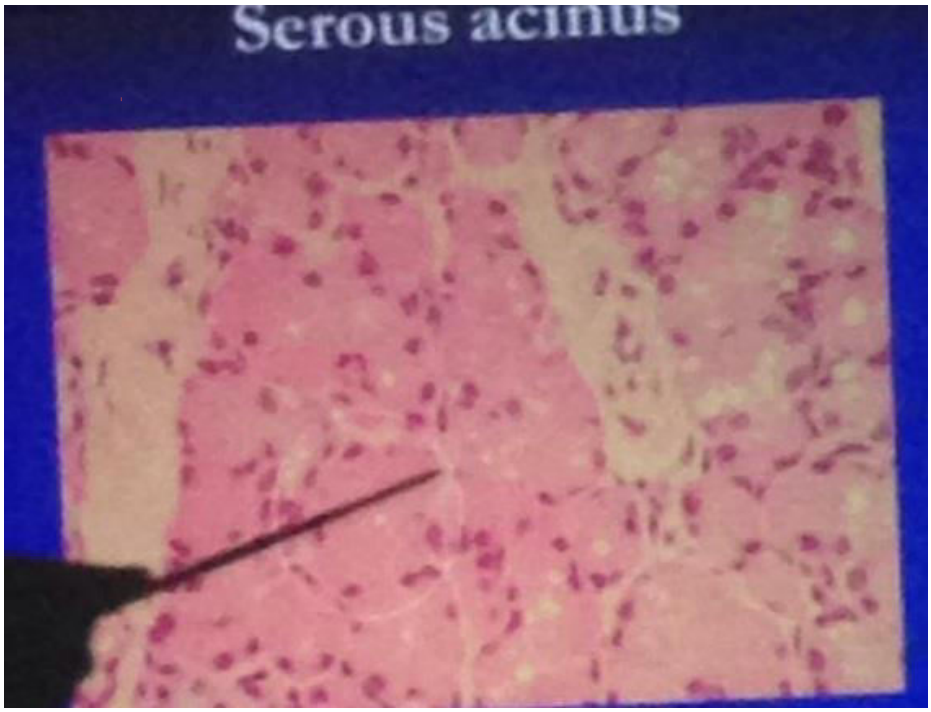
this slide indicates the ***circum vallate papillae***,

LP stands for lamina propria.

Von Ibner's gland are circulated in red, and notice their ducts reaching all the way to the sulcus .



Taste buds:
Notice the pores for the dissolving material, and the three type of cells. Bipolar cell in the middle and opposite to the pore. Supporting cells on the sides. Basal stem cells.



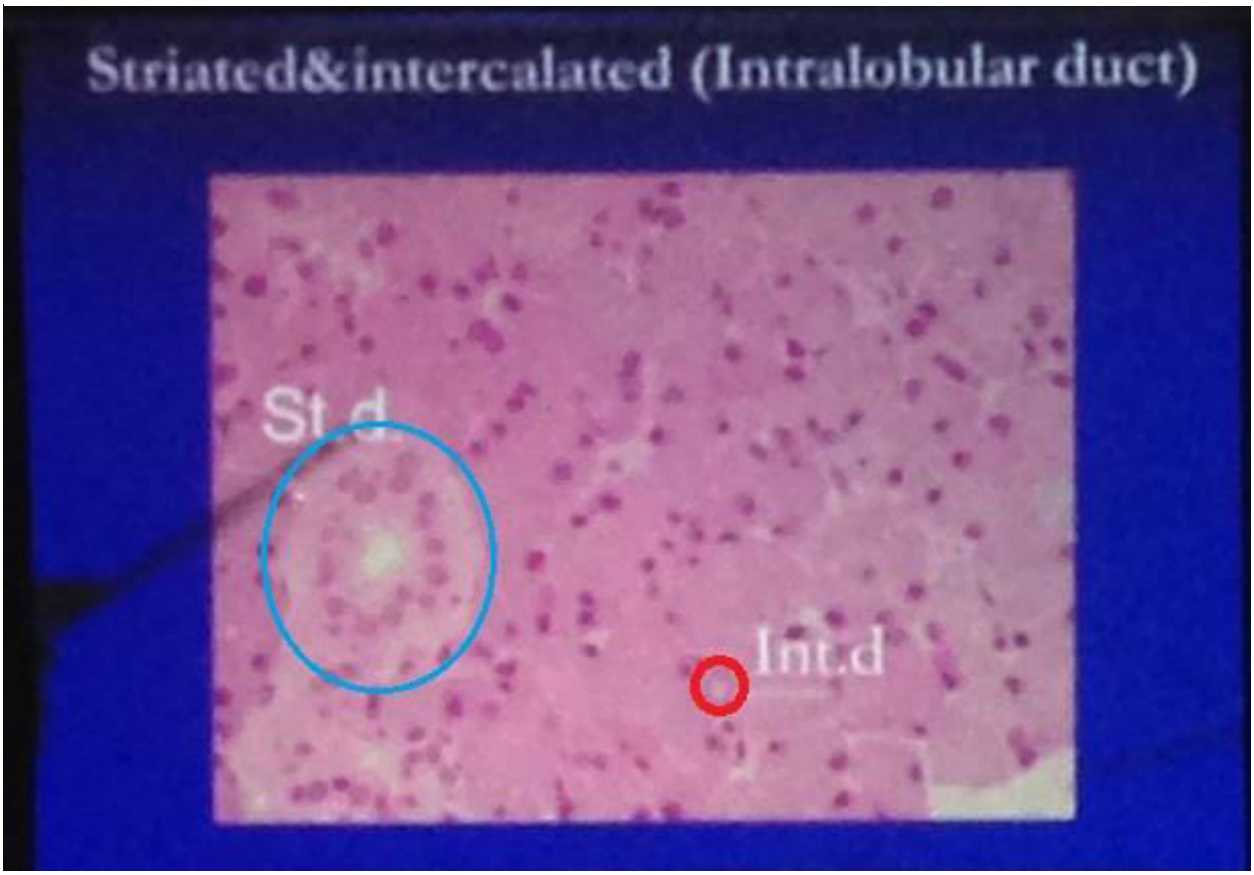
Von-Ebner's Gland: Serous cells surround the lumen, ill-defined boundaries, and rounded nuclei.

-The major salivary glands : Parotid, Submandibular, and Sublingual glands are **compound tubuloacinar gland** meaning they have tubules and acini.
the compound tubuloacinar gland is also found in : pancreas, liver, and gallbladder.

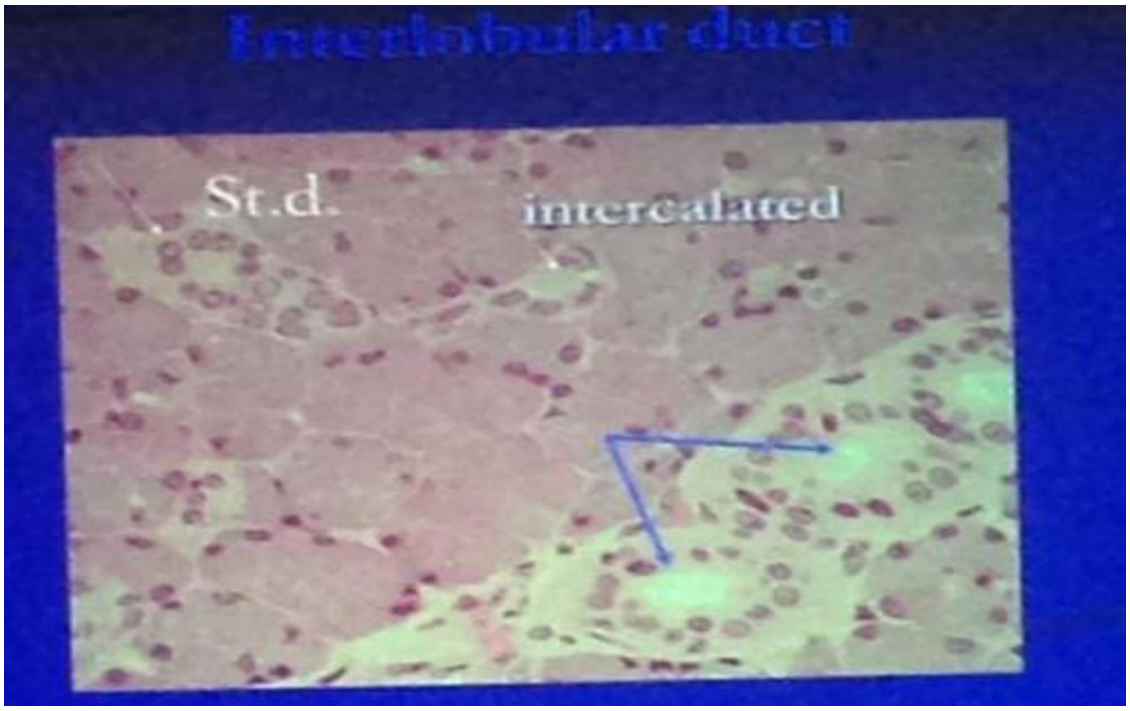
let's start with the **parotid gland :**
what specifies this gland is that it is mostly serous gland, surrounded by connective tissue (capsule).
Coming out from the capsule is connective tissue septa which divides the gland into lobules and lobes (larger than lobules)
notice that the large ducts (excretory ducts) are named **inter-lobular** but the ducts inside the lobule are called **Intra-lobular** ducts, which are either striated or intercalated ducts. notice that the striated and intercalated are both found inside the lobules but the intercalated is very small.

*** Note : the dr. said something that was not clear, so according to abu alia it goes as the following : the parotid gland has serous acini from which the ducts*

projecting are called intercalated ducts, more than one intercalated duct join to form the striated duct (this is inside the lobule). Then striated ducts (each one from a lobule) come together to form the interlobular large duct ; notice that this ducts starts as stratified cuboidal and as you go distally it becomes stratified columnar until it exits the gland in the form of a large duct heading for the mouth where it will become stratified squamous.



The slide below shows the striated duct (blue colour), intercalated duct (red colour).
Striated duct ⟶ simple cuboidal , large number of nuclei (more than 10)
Intercalated duct ⟶ simple cuboidal, very small, 5-6 nuclei.



Parotid gland, interlobular ducts:

St.d : Striated duct.

Intercalated : pointed by blue arrows

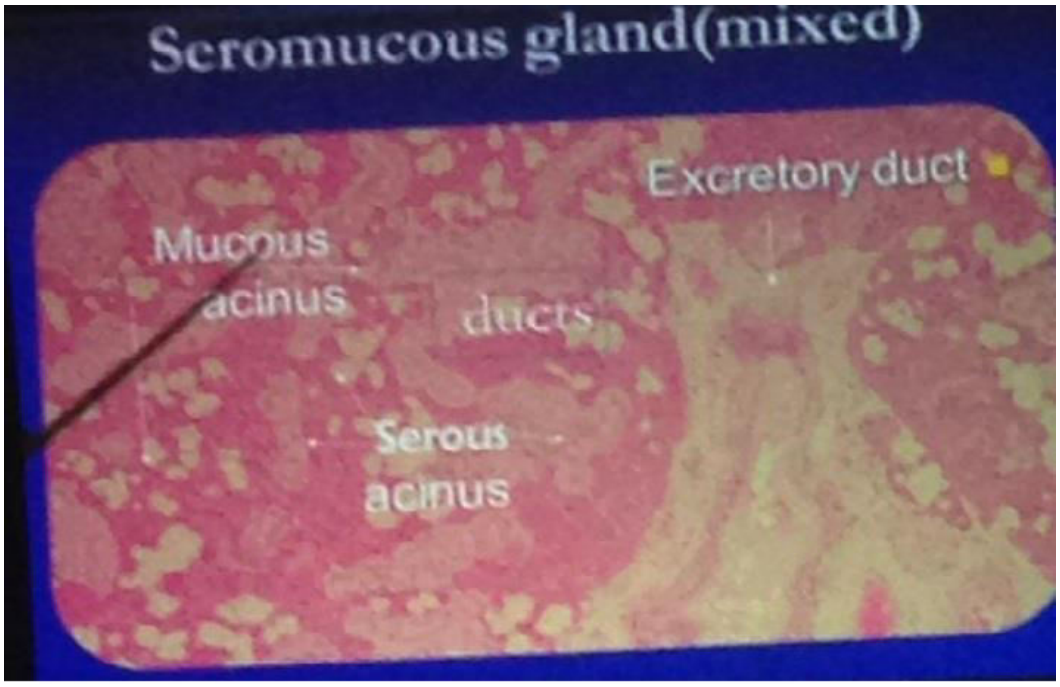
Parotid gland

Serous acinus : in the middle there is a lumen, rounded nuclei towards the base.

- Submandibular gland:

mixed between mucous and serous acini. It contains complicated duct system.
In the slides you will see three colours:
1- white = mucous acini.
2- dark pink = serous acini.
3- light pink = duct system.
between lobules you will see a large interlobular duct(stratified cuboidal and stratified columnar)→excretory duct and contains more than one nuclei.

Mucous acini are white due to dissolving of mucous so they appear as vacuoles, while the serous contains proteins in large amounts.

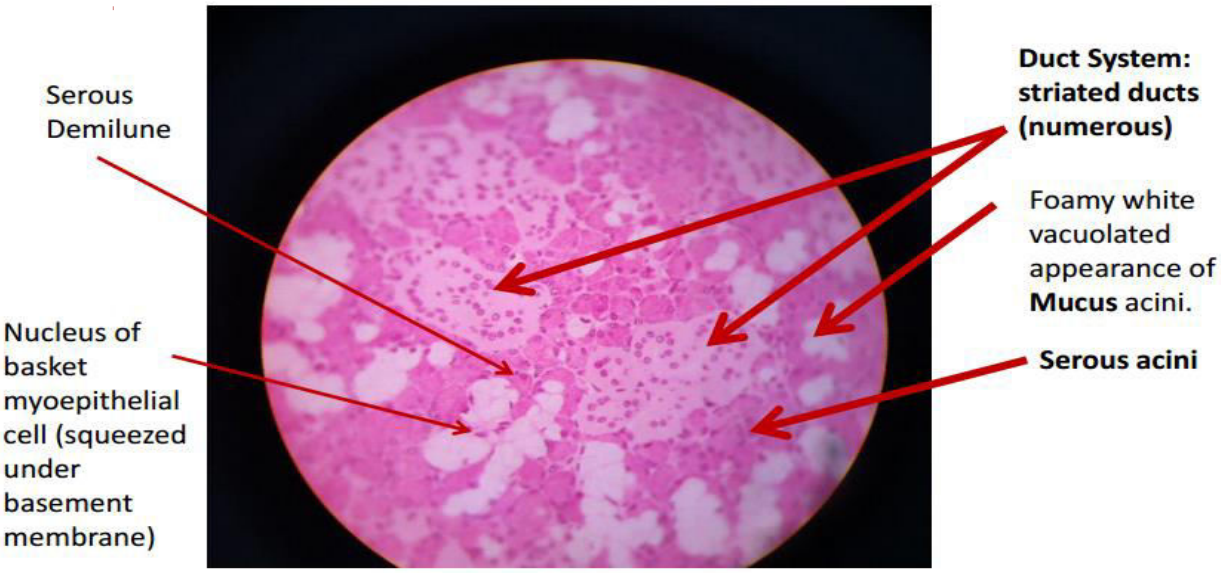


Submandibular gland:

note that the arrows of the serous acini are wrongly drawn, it is only the dark pink area.

all of the ducts in the submandibular glands are **striated** (we won't see intercalated ducts) and they are found in a large number; this is why we said it contains a complicated duct system.
* characteristics of mucous acini :
- has a foamy appearance.
- contains vacuoles.
- distinct boundaries.
-**serous demilune : capping of serous acini over mucous acini.**

Submandibular Gland section 2



- Sublingual gland:

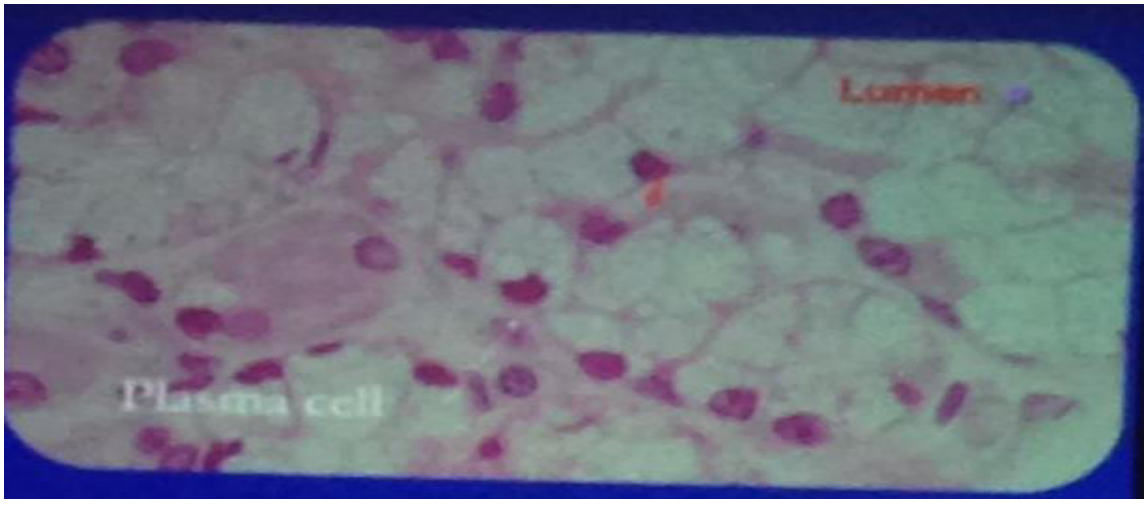
mostly mucous acini but has a small amount of serous acini and that's why we can see in it serous demilune. It's ducts are striated inside the lobule, but between them it is large and stratified cuboidal ducts.

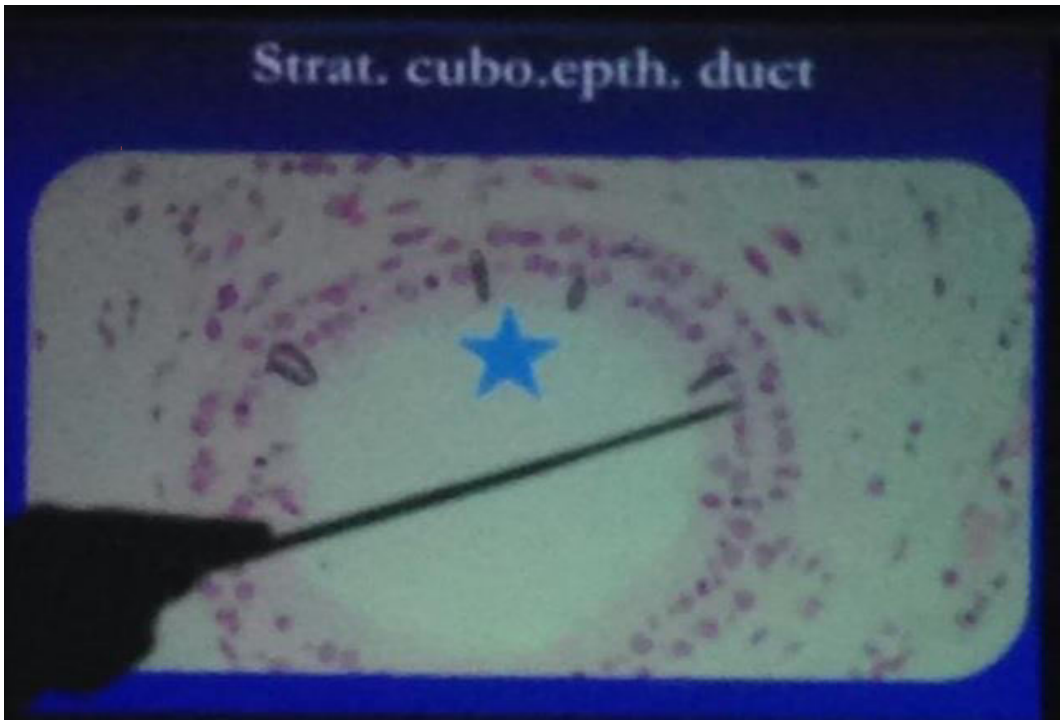
* characteristics of mucous acini :

- large lumen.
- distinct boundaries.
- basal and flattened nuclei.

-Sublingual gland:

the dr. is pointing at the mucous acini.





Sublingual gland:

the star indicates a large stratified cuboidal duct (inside the gland) .

- Esophagus :

its lumen is star shaped, and the esophagus contains 4 layers :

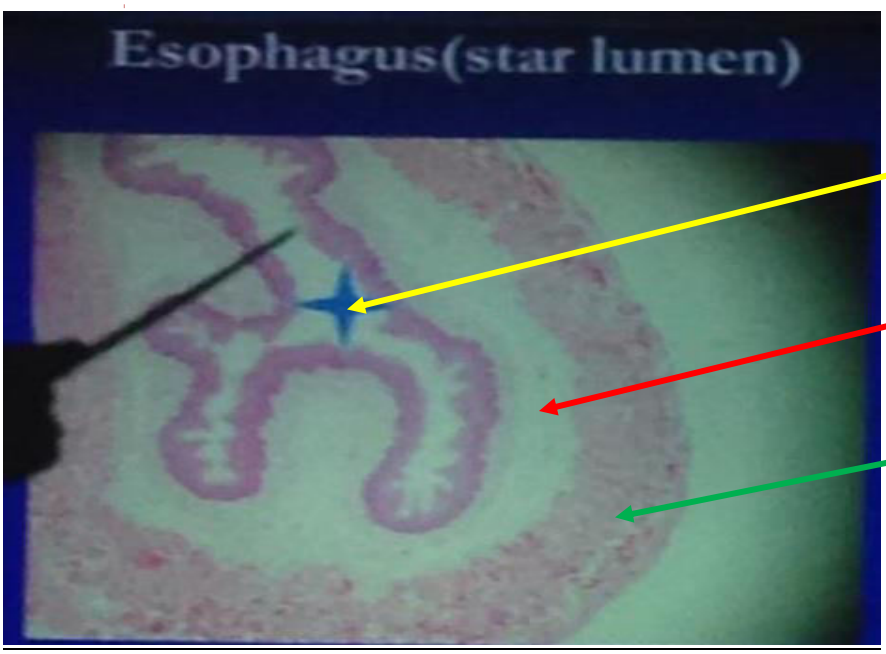
1- mucosa.
2- submucosa.
3- muscularis externa. (inner circular and outer longitudinal)
4- tunica adventitia.

In the slides you should be able to differentiate between the three sections of the esophagus (upper third, middle third, and lower third) by depending on the **muscularis externa.**

	Upper third	Middle third	Lower third
Muscularis externa	Striated muscles only.	Striated and smooth muscles.	Smooth muscles only.

- In the **lamina propria** we find a gland called **cardiac gland**, and mainly it is in the **lower third** before the stomach.

- In the **submucosa** of the esophagus, we find a gland called **esophageal gland proper**. (sero-mucos gland, compound tubuloacinar)

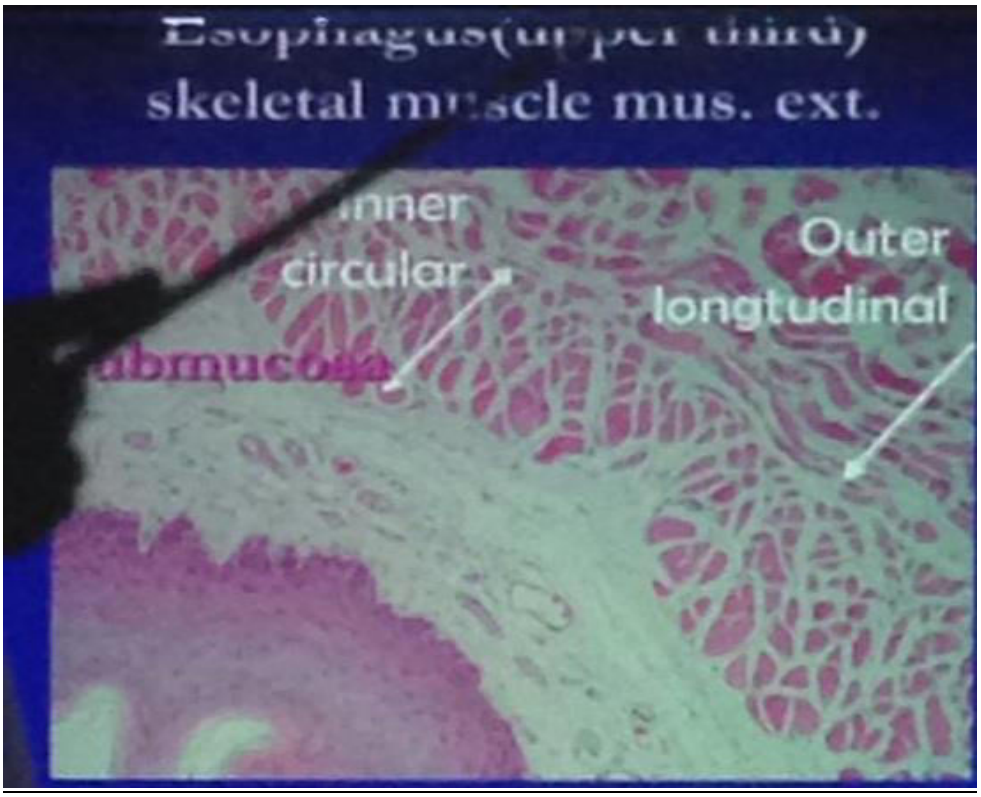


Esophagus :

1- Mucosa

2- Submucosa

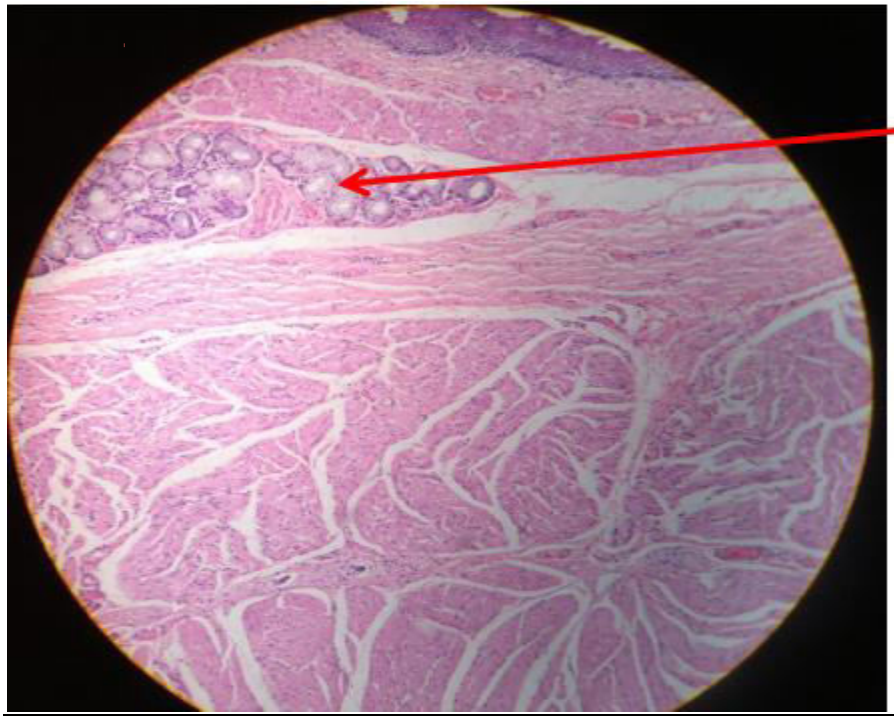
3-Musularis



Upper third of esophagus:

- in the submucosa we might find a gland.

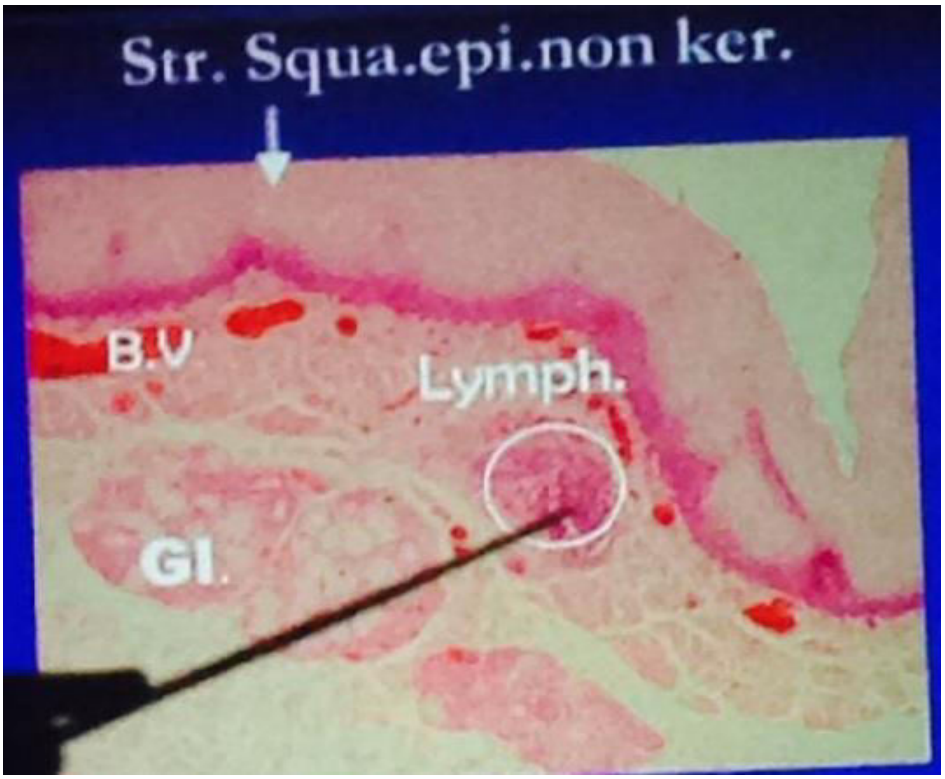
- muscularis layer with inner circular and outer longitudinal muscles, note that the nuclei is peripheral. (from the striated inner and outer you should directly tell that it is upper third)



The arrow indicates : ***esophageal gland proper***, found in the submucosa.

- compound tubuloacinar.

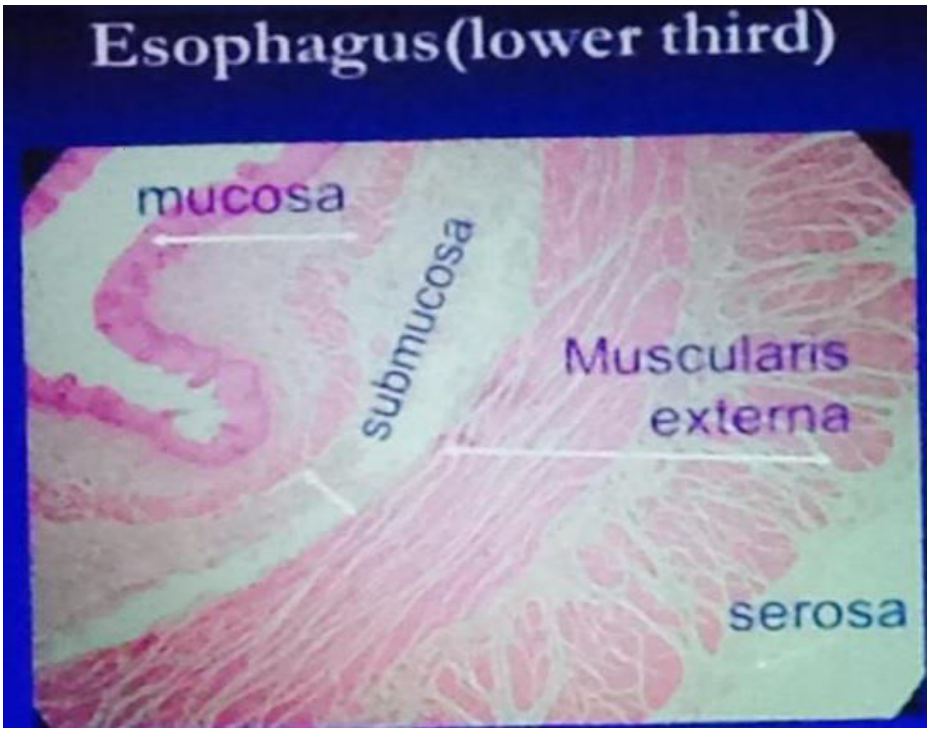
- sero-mucous gland.



Type of the lining epithelium is : Stratified Squamous non-keratinized (pointed by the white arrow above)

- the Dr. id pointing at the lymphocytes aggregation (encircled in white) in the lamina propria.

GI : esophageal gland proper.



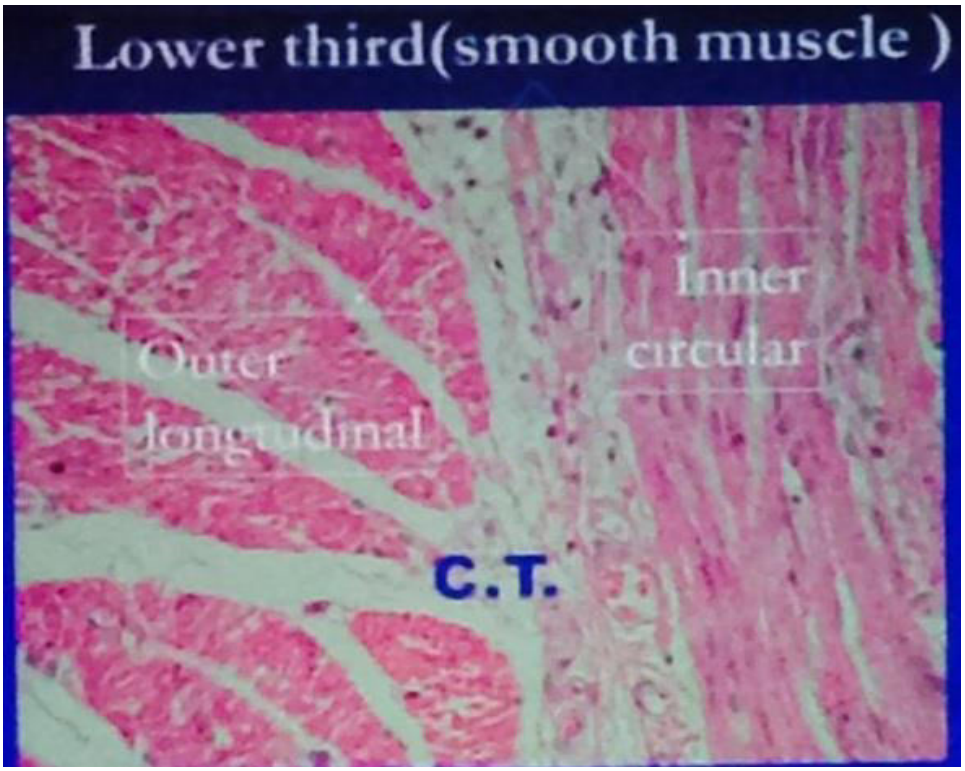
- Lower third of esophagus:

this slide shows the layers

-mucosa

-submucosa

-muscularis externa (smooth muscles only)

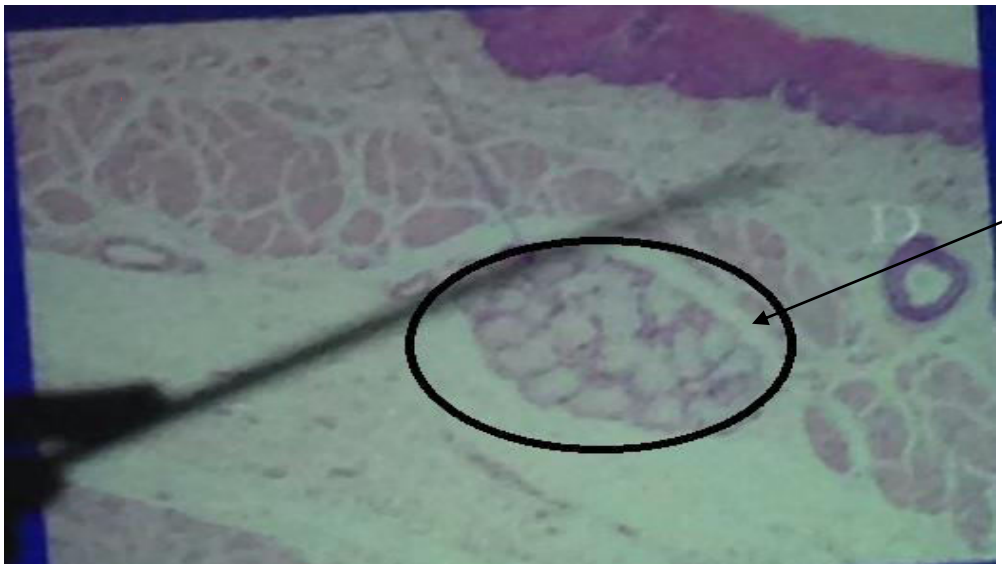


- Lower third of esophagus - muscularis externa:

smooth muscles are spindle in shape and have central nuclei.

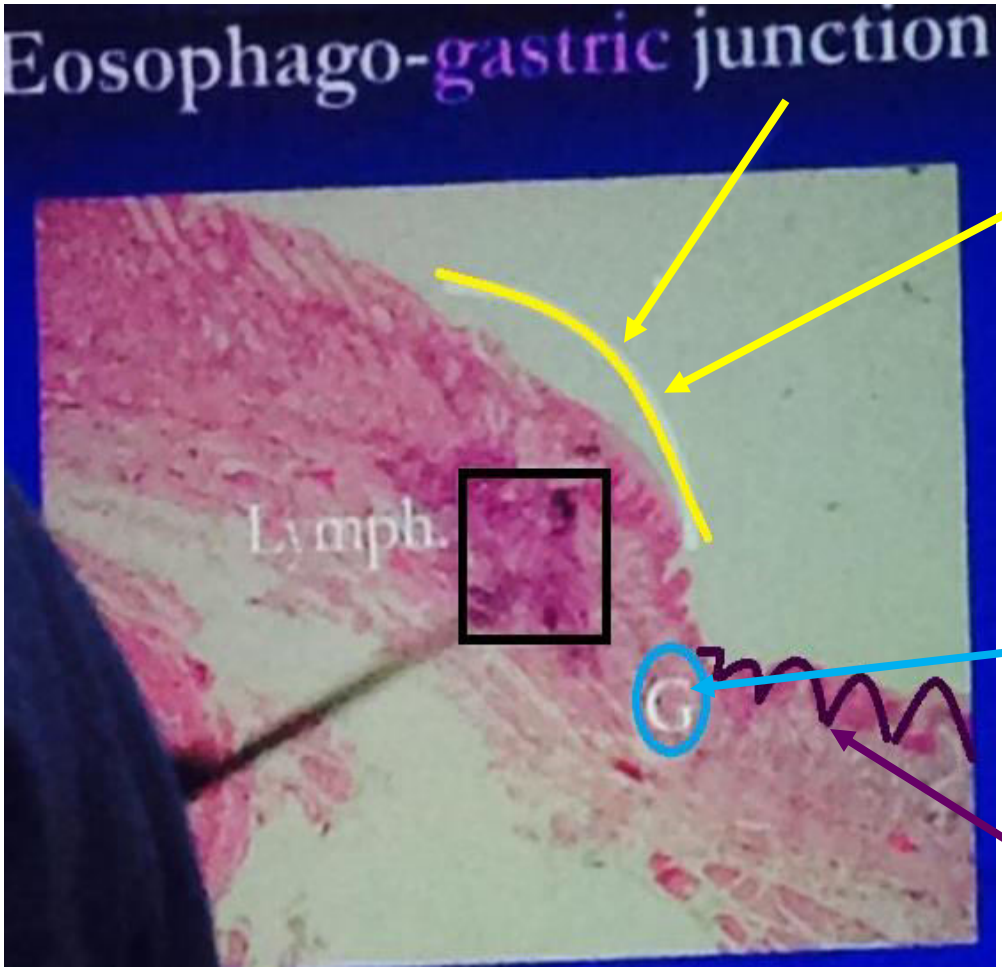
- between the inner and outer layers we find nerve fibers called myenteric plexus.

- the nerve fibers have Schwann cells around them.



- Lower third of esophagus :

Cardiac gland, found in the lamina propria of the region near the stomach.



-Esophago-gastric junction:

- the **junction**- yellow- change of the stratified squamous non-keratinized to simple columnar epithelial cells, making it a weak area (common site of cancer)

- cardiac gland

-in the black square are lymph nodules.

- gastric pits - purple-

-Middle third of esophagus:

mixed smooth and skeletal striated muscles.

- Myenteric/Aurbach's plexus is found in all the GI, parasympathetic nerve cell (containing nuclei and nucleolus). It lies between the two muscle sublayers (the inner circular and outer longitudinal.

***Note that:**

-The cardiac glands & esophageal glands are mucus-secreting gland.

- Only The most distal portion of the esophagus, in the peritoneal cavity (the last 1.3 cm), is covered by **serosa**. The rest is enclosed by a layer of loose connective tissue, the **adventitia**, which blends into the surrounding tissue.

-Lymph nodules are found in the lamina propria & in the submucosa. They are made of lymphocyte aggregates.

I'm sorry if some pictures are not clear but the dr. didn't give us the slides.

- Thanks to Mohammad Abu Alia for clearing out several points in the slides.

- Dedication to the nosiest people out there :
Yara, the AMAZING Lara, Rand, Dina, Farah, Awesome Munjed, Saba, Ala'a, Ahmad, and Yanal.