

(View54)

5 -Stomach :

Is an expanded part of the digestive tube that lie under the diaphragm , is divided into :

Cardiac is the superior region , *fundic* is the body form , and the *pyloric*, which is the inferior region of the stomach . (View 55-56) . The stomach wall exhibit four general layers :

- **Mucosa**

The gastric mucosa consists of a surface *epithelium* that invaginates to varying extents in to the lamina propria, forming gastric pits . Emptying in to gastric pits are branched, tubular glands (cardiac, gastric , and pyloric) characteristic of each region of the stomach .

The *lamina propria* of the stomach is composed of loose connective tissue interspersed with smooth muscle and lymphoid cells. Separating the mucosa from the underlying submucosa is a layer of smooth muscle ,the *muscularismucosa* , this layer is composed of an outer group of longitudinal fibers and circular fibers closer to the lumen .

- **Submucosa**

Consists of connective tissue with numerous lymph vessels, capillaries, and another contents.

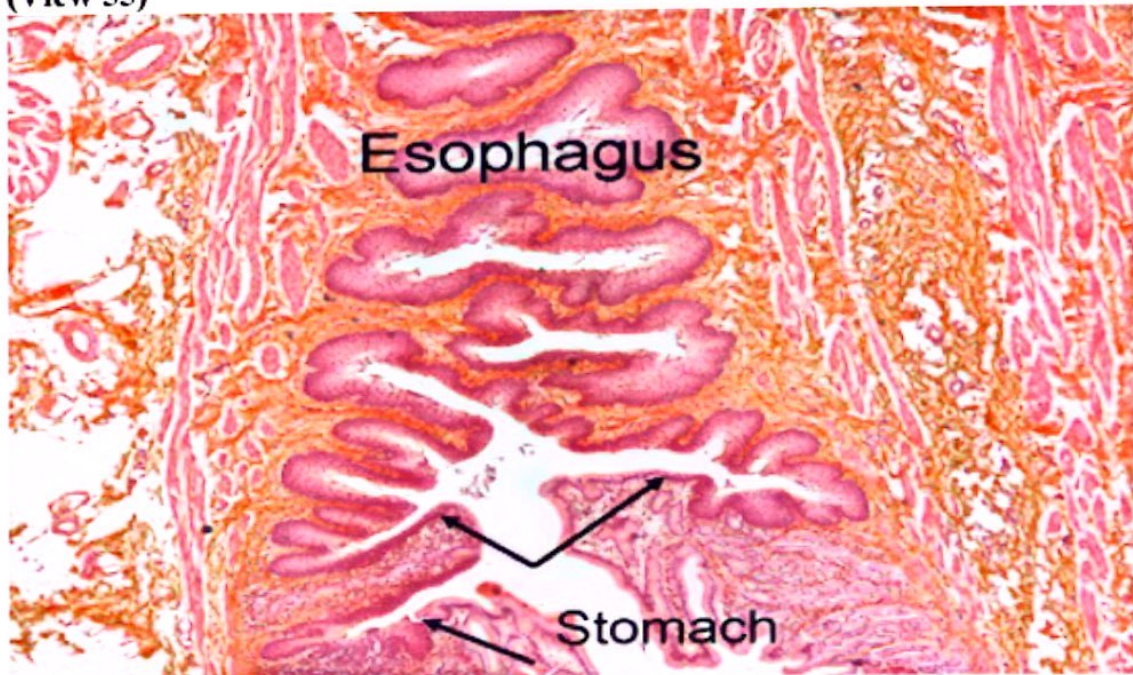
- **Muscularis externa**

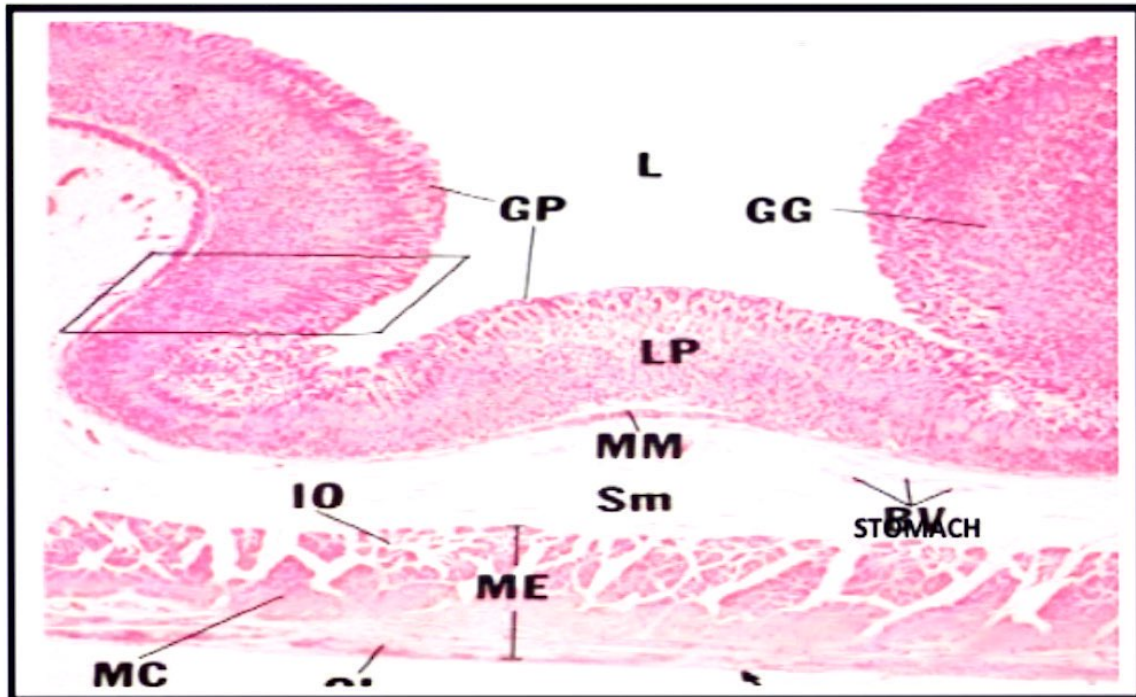
Consists of three layers of smooth muscle in different arrangements(directions) ,the internal is oblique ,the middle is circular, and the external is longitudinal layer.

- **Serosa**

Is thin and covered by *mesothelium*.

(View 55)





GP: gastric pit, GG: gastric gland, LP: lamina propria, MM: muscularis mucosa, SM: submucosa. ME: muscularis externa (View 56)

6-Small intestine

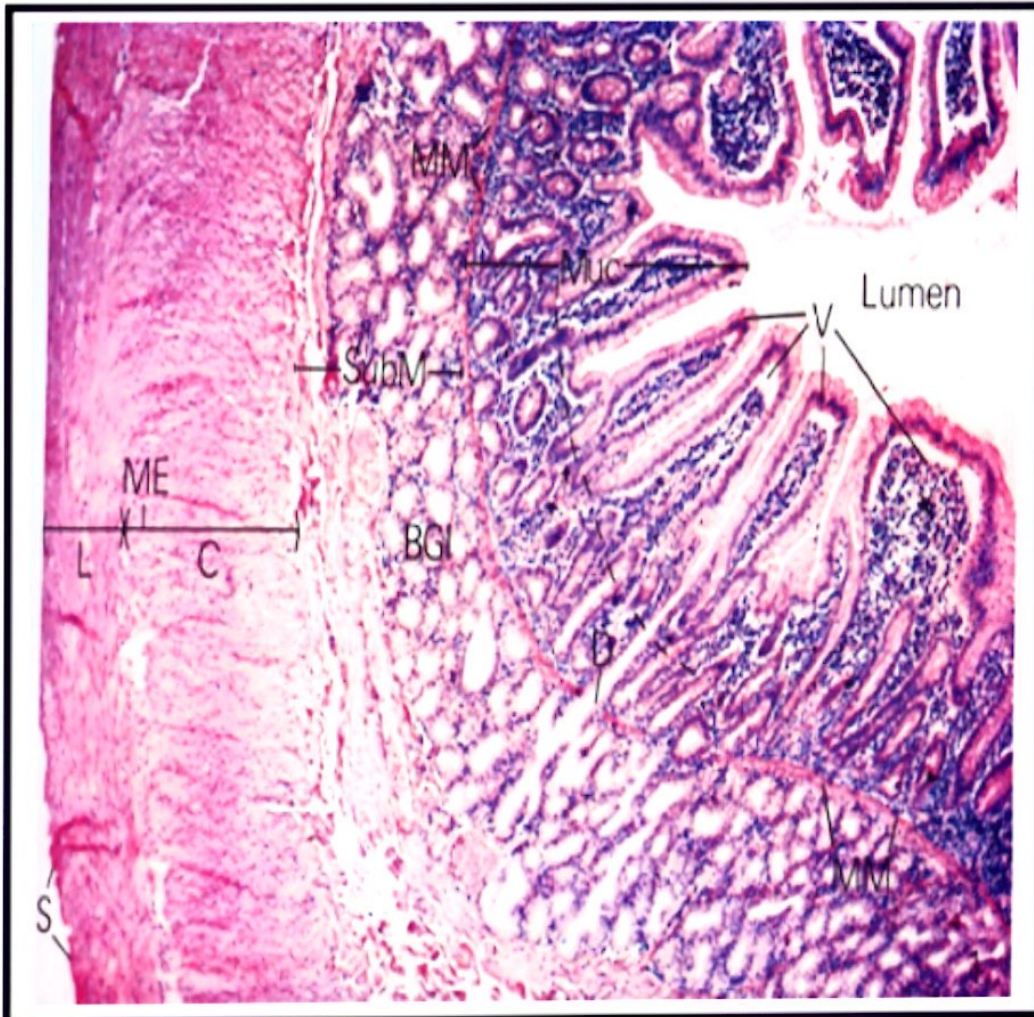
Is relatively long permitting prolonged contact between food and digestive enzymes. It consists of 3 segments: *duodenum*, *jejunum*, and *ileum*.

- **Mucosa** :- The small intestine presents folds like finger, known as villi, that change their morphology and decrease in height from the duodenum to the ileum. *Villi are elevations of epithelially covered lamina propria*.
 - 1-*Epithelium*, the simple columnar epithelium consists of goblet cells
 - 2-*Lamina propria*, composed of loose connective tissue, houses glands, known as the **crypts of Lieberkuhn**, that extend to the muscularis mucosae
 - 3-*muscularis mucosae*, consists of an inner circular and an outer longitudinal layer of smooth muscle.
- **Submucosa**:- display spiral fold, plicae circulars.
- **Muscularis externa**, is composed of the usual inner circular and outer longitudinal layers of smooth muscle, with *Auerbach's plexus*.
- **Serosa**:- composed of connective tissue covered with mesothelium.

1- Duodenum:

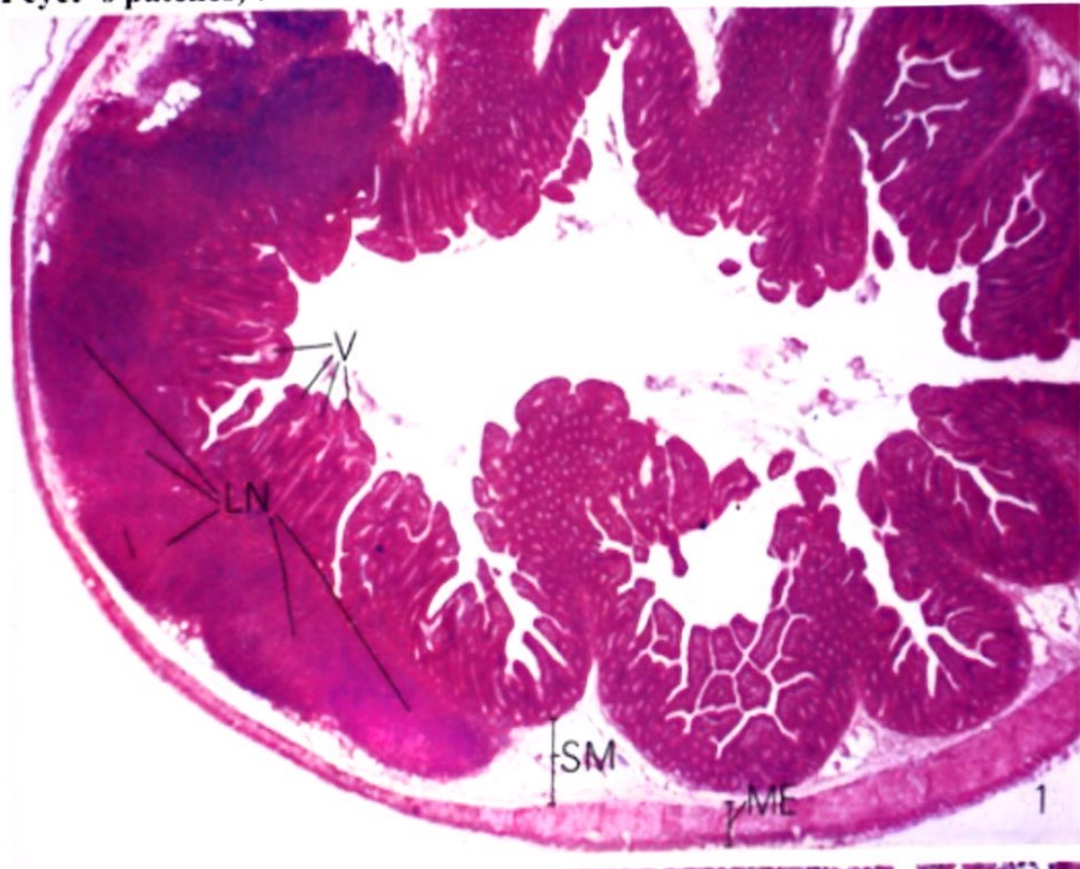
Has the same layers above ,but it has a characteristic features :-

- Submucosa* ,with the mucous duodenal (**Brunner's**) glands.
- Covered with *serosa* and adventitia.(View 57)



V: villi ,MUC: mucosa, MM: muscularis mucosa, D: duct of Bruners gland,BGI: Bruner gland, SubM: submucosa, ME: muscularis externa, S: serosa(**View 57**)

Has a lamina propria , with abundant of lymphatic nodules, are known as **(Peyer 's patches)** .



**V: villi, SM: submucosa, ME: muscularis externa, LN: lymphatic nodule
(View58)**

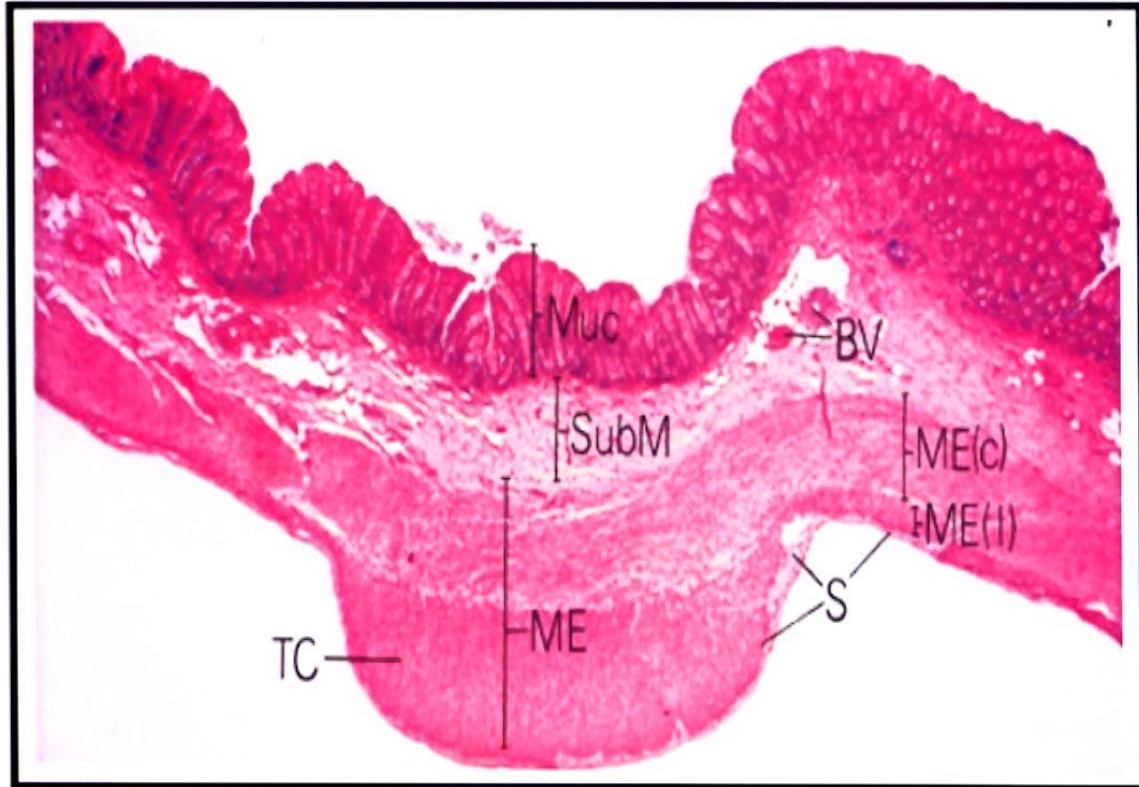
VII -Large intestine

Is composed of the, *colons (ascending , transverse , and descending) , rectum , appendix , cecum and anal canal .*

Colon

- **Mucosa** , presents no specialized folds . It is thicker than that of the small intestine . (View 59)
Epithelium , simple columnar ep. , has goblet cells and columnar cells.
Lamina propria , the crypts of Lieberkuhn are longer than that of the small intestine .
Muscularis externa , is composed of the inner circular and outer longitudinal layers of smooth muscle .
- **Submucosa** , resembles that of ileum.

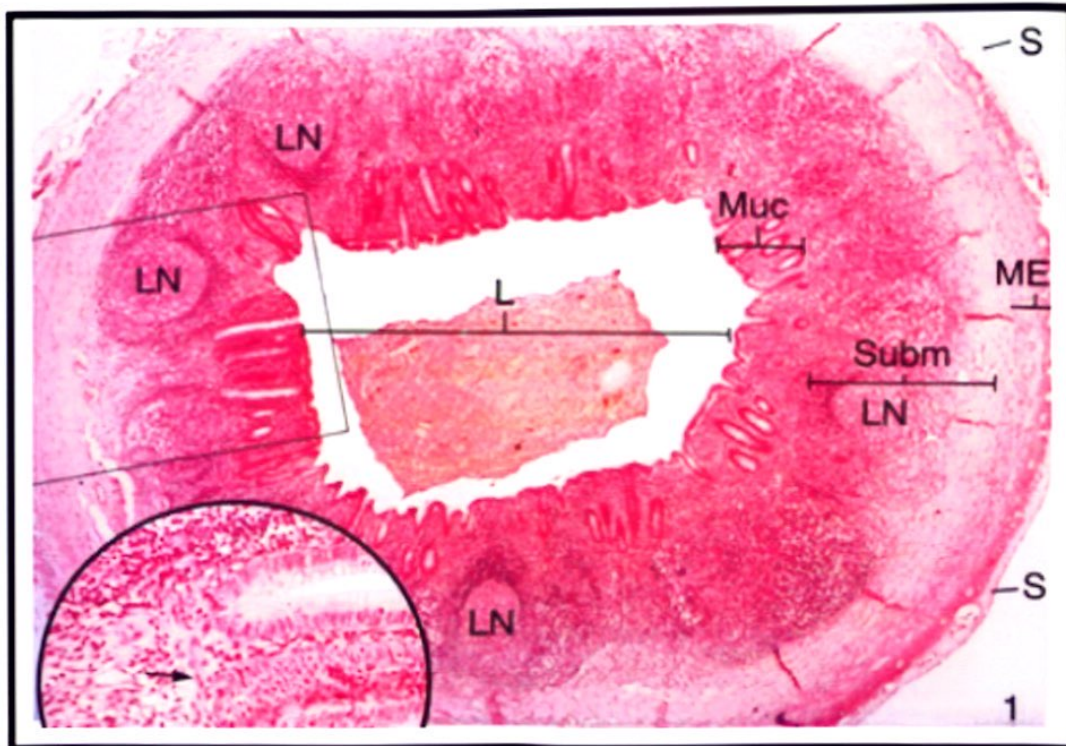
- **Muscularis externa** , is composed of the inner circular and outer longitudinal layers of smooth muscle . outer longitudinal smooth muscle is modified into *teniae coli* , *three flat ribbons of longitudinally arranged smooth muscle* , auerbach's plexus occupies its position between the two layers .
- **Serosa** , is posses both serosa and adventitia, serosa presents small , *flat-filled pouches* , the *appendices epiploicae* .



MUC: mucosa, **MM:** muscularis mucosa, **SubM:** submucosa, **ME:** muscularis externa
S: serosa **(View 59)**

Appendix(vermiform)

The lumen of the appendix is usually stellate shaped , the simple columnar epithelium covers a lamina propria rich in lymphatic nodules and some of crypts of Lieberkuhn .The muscularis mucosae , submucosa, and muscularis externa conform to the general plan of the digestive tract . It is covered by a serosa .(View 59)



SM: submucosa, ME: muscularis externa, LN: lymphatic nodule, L:lumen ,S: serosa
(View 60)

Anal canal

Presents longitudinal folds , **anal valves** , the epithelium changes from the simple columnar of the rectum , to simple cuboidal at the anal valves , to stratified squamous at the anus .

The submucosa is rich in vascular supply , while the muscularis externa forms the internal anal sphincter muscle , an adventitia connects the anus to the surrounding structures .

Digestive glands

The major glands are located outside the wall of the alimentary canal but are connected to the lumen of the digestive tract via ducts . These glands include the *major salivary glands, liver, pancreas* and *gallbladder*.

1- Major salivary glands

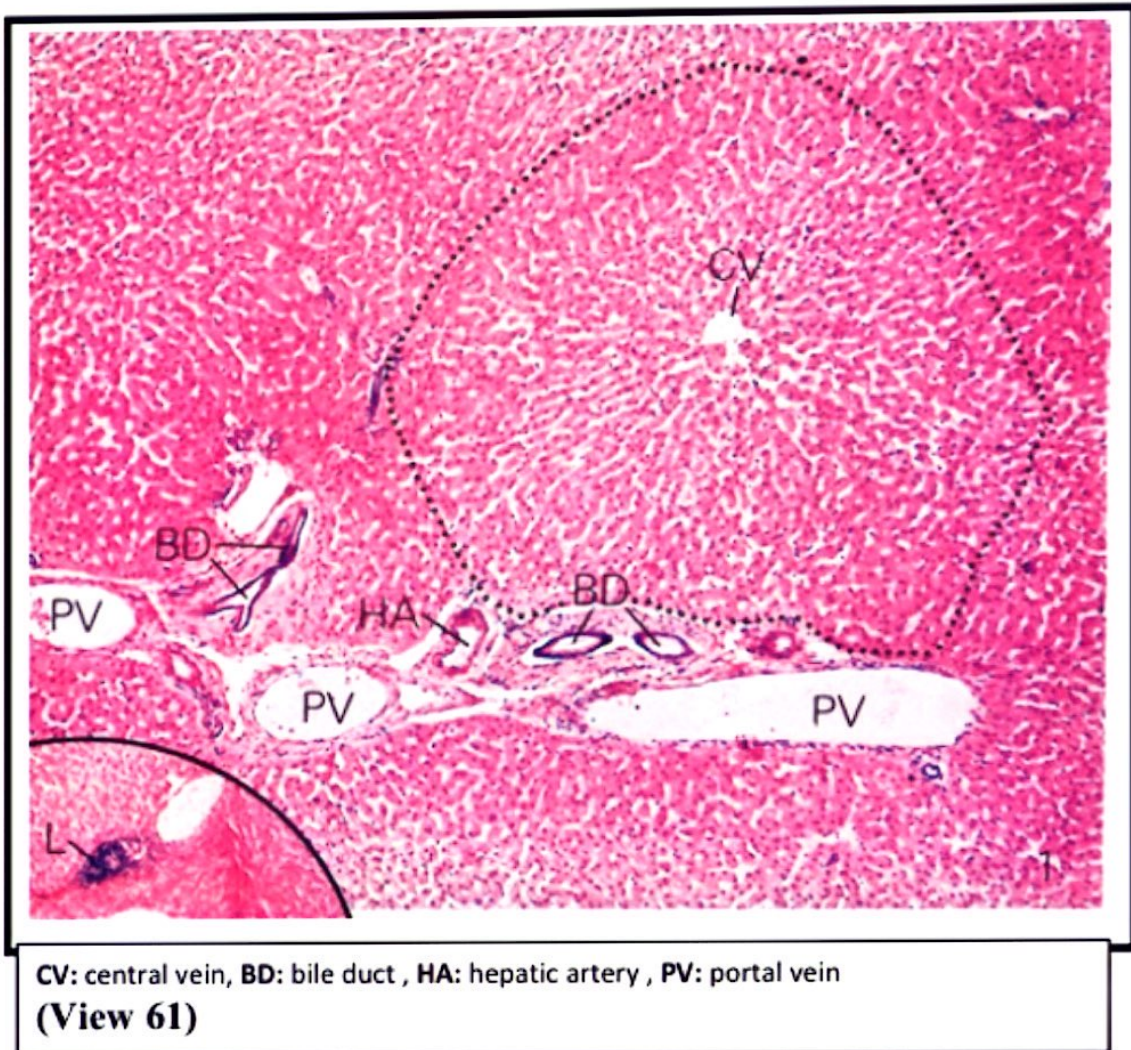
The three major salivary glands , parotid, submandibular , and sublingual, deliver their secretion ,*saliva*, into the oral cavity

2- Liver

Is the largest mass of glandular tissue in the body and also is the largest internal organ consists of lobules , the parenchymal cells of the liver , known as *hepatocytes* which organized as plates separated by *sinusoids* .A liver lobule schematically diagramed as a six sided polyhedral prism with *portal canals* containing inside interlobular branches of:- (hepatic artery , portal vein , and bile duct) at each of the corners , and in the center of each lobule a *central vein* .The hepatic sinusoids are lined with two types of cells:

1-Endothelialcells , they are small in size and only the nucleus is visible.

2-Kupffercells , that are derived from monocytes can seen just in section that stains with India ink. (View 61)

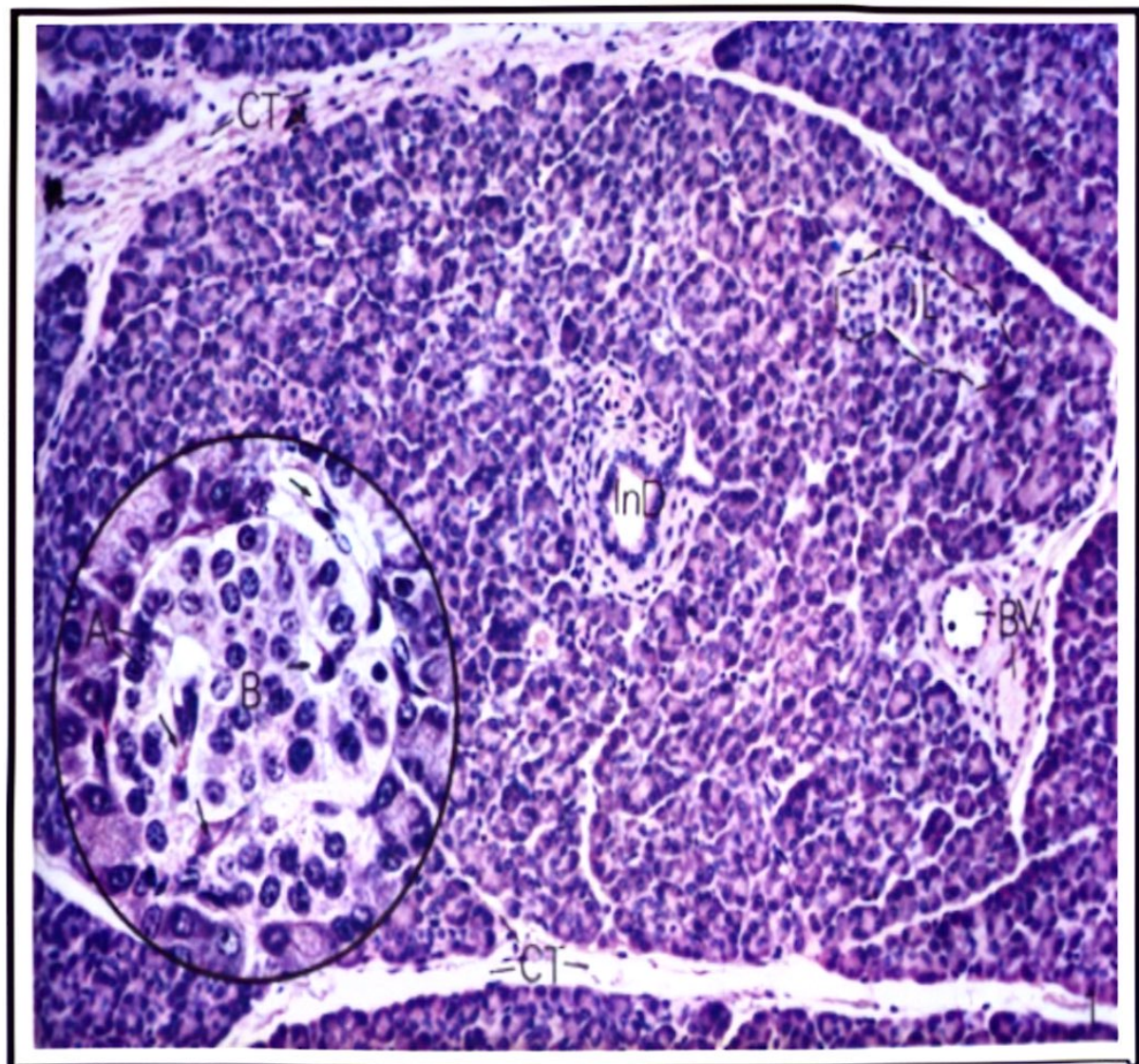


CV: central vein, BD: bile duct , HA: hepatic artery , PV: portal vein
(View 61)

3- Pancreas

Is a mixed gland , in that it has exocrine and endocrine functions .The endocrine part is composed of scattered spherical aggregates of richly vascularized cords of endocrine cells, known as *islet of Langerhans*, five cell types are present in these structures : α (**A**) *cells* , producing glycogen ; β (**B**) *cells* , manufacturing insulin ; **G** *cells* ; producing gastrin ; δ (**D**) *cells* , manufacturing somatostatin; and **PP** *cells* , secreting pancreatic polypeptide.

The exocrine pancreatic portion is a *compound acinar gland* , composed of several pyramidal serous cells surrounding a lumen , they have a spherical nucleus , and the apex of the cell stains with acidic dyes while the base stains with basic dyes.(View 62)



CT: connective tissue ,**IL:** islets of langerhans, **InD:** intralobular duct, **B:** region of most B cell, **A:** region of most A cell(**View 62**)