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MATRIC N 18/MHS/004

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COURSE = ANATOMY

QUESTION-

DESCRIBE THE MICROANATOMY OF SMALL AND LARGE INTESTINE

LARGE INTESTINE

General features

Large intestine is situated between the anus and the terminal end of the ileum. It is shorter and less convoluted than the small intestine.

Functions

The principal function of the large intestine is to absorb water and minerals (electrolytes) from the indigestible material that was transported from ileum of the small intestine and to compact them into feces for elimination from the body

It is also a site of bacteria fermentation of unabsorbed substances

Segments

It consists of an initial segment called the **cecum**; a blind-ended pouch that in humans carries a worm-like extension called vermiform appendix

- **The ascending colon**; is a continuation of the caecum located on the right side of the abdominal cavity to the liver; it bends and forms the right colic flexure. It is also the second retro peritoneal organ.
- **Transverse colon**; is the continuation of the ascending colon from the right colic flexure which later on bends and forms the left colic flexure of the spleen. It is an intraperitoneal organ and it divides the peritoneal cavity into supramesocolic and inframesocolic parts
- **Descending**; is the continuation of transverse mesocolon at the left colic flexure. It doesn't contain the peritoneal mesocolon but it is a secondary retro peritoneal organ. It reaches the left iliac fossa.
- **Sigmoid colon**; as well as the rectum and anus.

Layers

- The innermost layer, known as the **mucosa**, is made of simple columnar epithelial tissue. The mucosa of the large intestine is smooth, lacking the villi found in the small intestine. Many mucous glands secrete mucus into the hollow lumen of the large intestine to lubricate its surface and protect it from rough food particles.
- Surrounding the mucosa is a layer of blood vessels, nerves and connective tissue known as the **sub mucosa**, which supports the other layers of the large intestine.
- The muscularis layer surrounds the sub mucosa and contains many layers of visceral muscle cells that contract and move the large intestine. Continuous contraction of smooth muscle bands in the muscularis produces lumpy, pouch-like structures known as **haustra** in the large intestine.
- Finally the serosa forms the outermost layer. The serosa is a thin layer of simple squamous epithelial tissue that secretes watery serous fluid to lubricate the surface of the large intestine, protecting it from friction between abdominal organs and the surrounding muscle and bones of the lower torso.

Epithelium

Contains simple columnar epithelium which consists of goblet, regenerative, absorptive and entero endocrine cells.

SMALL INTESTINE

General features

The small intestine is a long, convoluted tube about 5 to 7m long; it is the longest section of the digestive tract. The small intestine extends from the junction with the stomach to join with the large intestine or colon.

Function:

The small intestine performs numerous digestive functions, including

1. continuation and completion of digestion (initiated in the oral cavity and stomach) of food products (chyme) by chemicals and enzymes produced in the liver and pancreas, and by cells in its own mucosa
2. Selective absorption of nutrients into the blood and lymph capillaries
3. Transportation of chyme and digestive waste material to the large intestine
4. Release of different hormones into the blood bloodstream to regulate the secretory functions and motility of digestive organs

Segments:

The small intestine is divided into 3 parts which are;

Duodenum: the shortest segment of the small intestine. The villi in this region are broad, tall, and numerous, with fewer goblet cells in the epithelium. Branched duodenal (brunner's) glands with mucus-secreting cells in the submucosa characterize this region.

Jejunum: exhibits shorter, narrower, and fewer villi than the duodenum. There are also more goblet cells in the epithelium

Ileum: contains few villi that are narrow and short. In addition, the epithelium contains more goblet cells than in the duodenum or jejunum. The lymphatic nodules are particularly large and numerous in the ileum, where they aggregate in the lamina propria and submucosa to form the prominent Peyer's patches

Layers:

There are four main layers

mucosal, submucosa, muscularis and serosa or adventitia

- Mucosa (innermost layer)- contains the epithelium, lamina propria and muscularis mucosae
- Submucosa- connective tissue layer, which contains blood vessels, lymphatics and the submucosal plexus
- Muscularis externa- consist of two smooth muscle layers; the outer longitudinal layer and inner circular layer. The myenteric plexus lies between them

- Adventitia (outermost layer) - comprised of loosely arranged fibroblast and collagen, with the vessel and nerves passing through it. The majority of the small intestine adventitia is covered by mesothelium and is commonly called the serosa

Epithelium:

Simple columnar epithelium