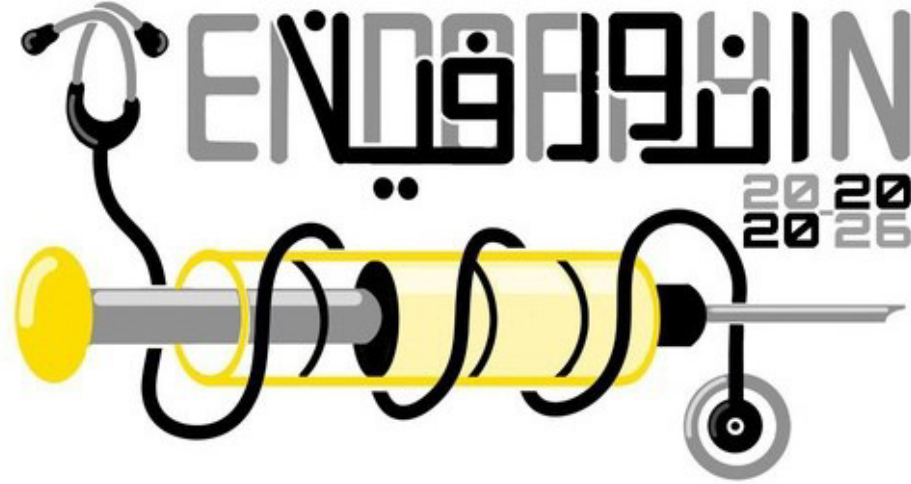


Anatomy



Sheet: 15

Lecture title: Anatomy of large intestine

Date:

Done by: Huda Shehadeh

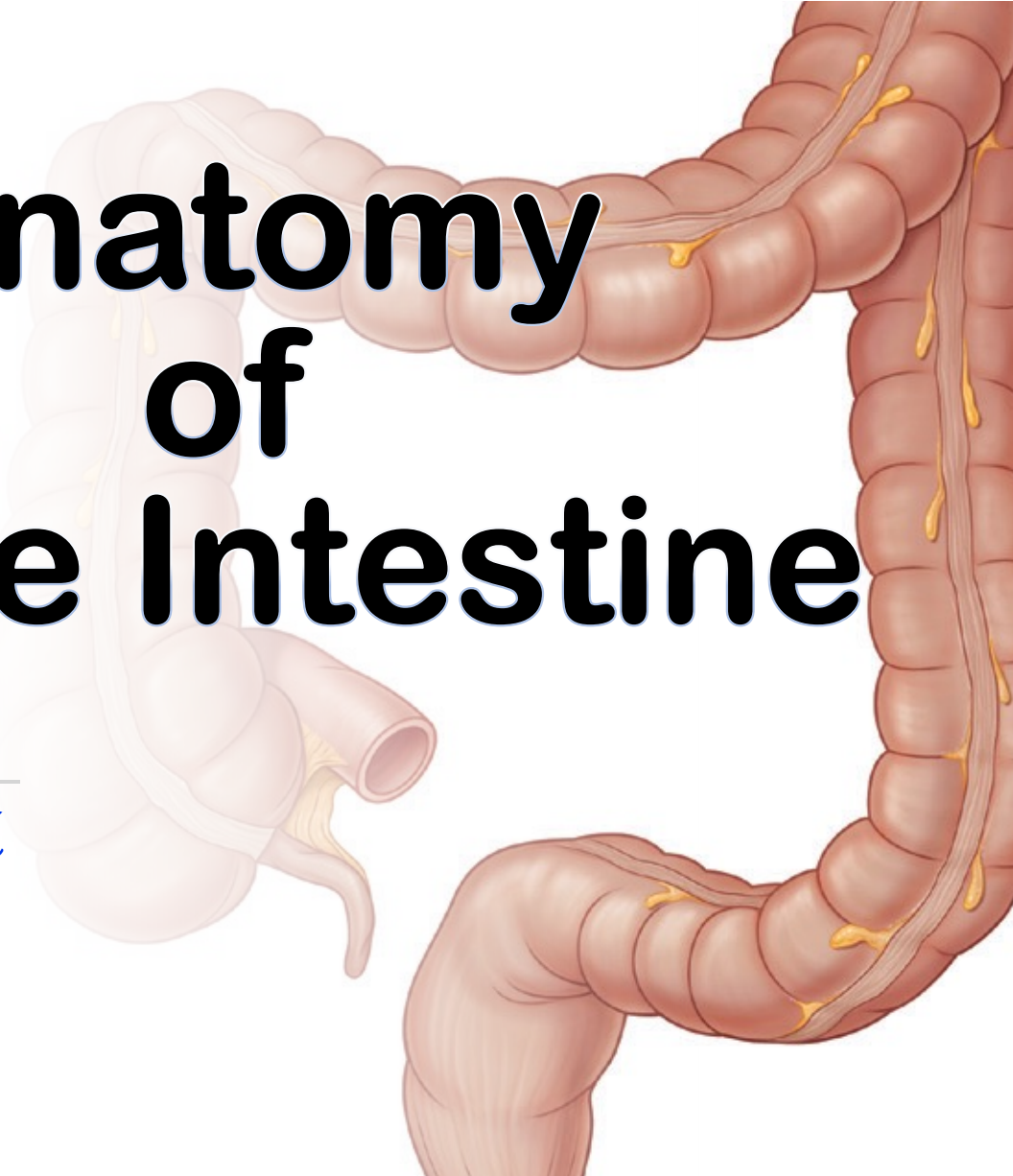
Edited by: Huda Shehadeh

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Anatomy of Large Intestine

Dr. Refat AboGhazleh



Learning Objectives

At the end of the lecture, the student should be able to:

- Discuss the gross anatomy of large intestine.
- Enlist the characteristic features of large intestine.
- Identify the positions of the appendix.
- Describe the blood supply of the large intestine.
- Understand clinical correlations related to the large intestine.

Large Intestine

- The large intestine extends from the **distal end of the ileum** to the **anus**.

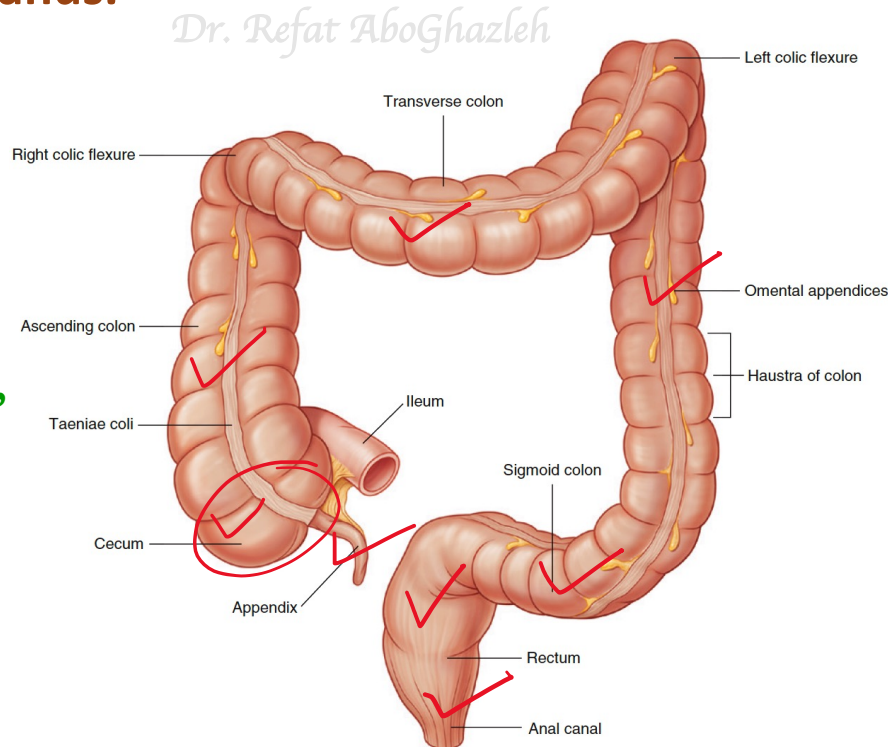
Length: ~ 1.5 m

Parts:

- Cecum with appendix
- Ascending, transverse, descending, and sigmoid colon.
- Rectum
- Anal canal

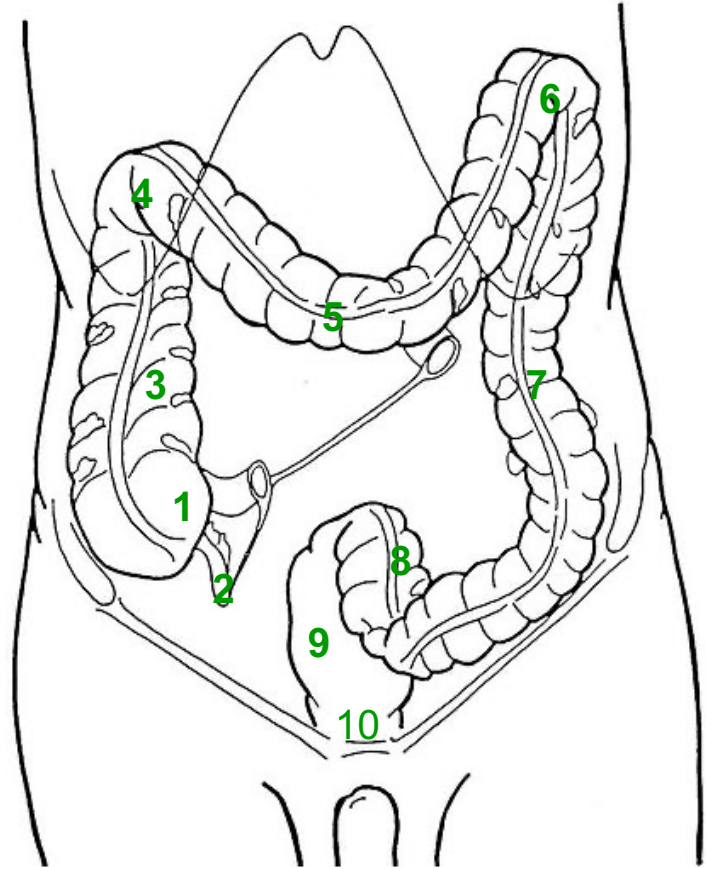
Function:

Is the absorption of water and electrolytes and the storage of undigested material to be expelled as feces.



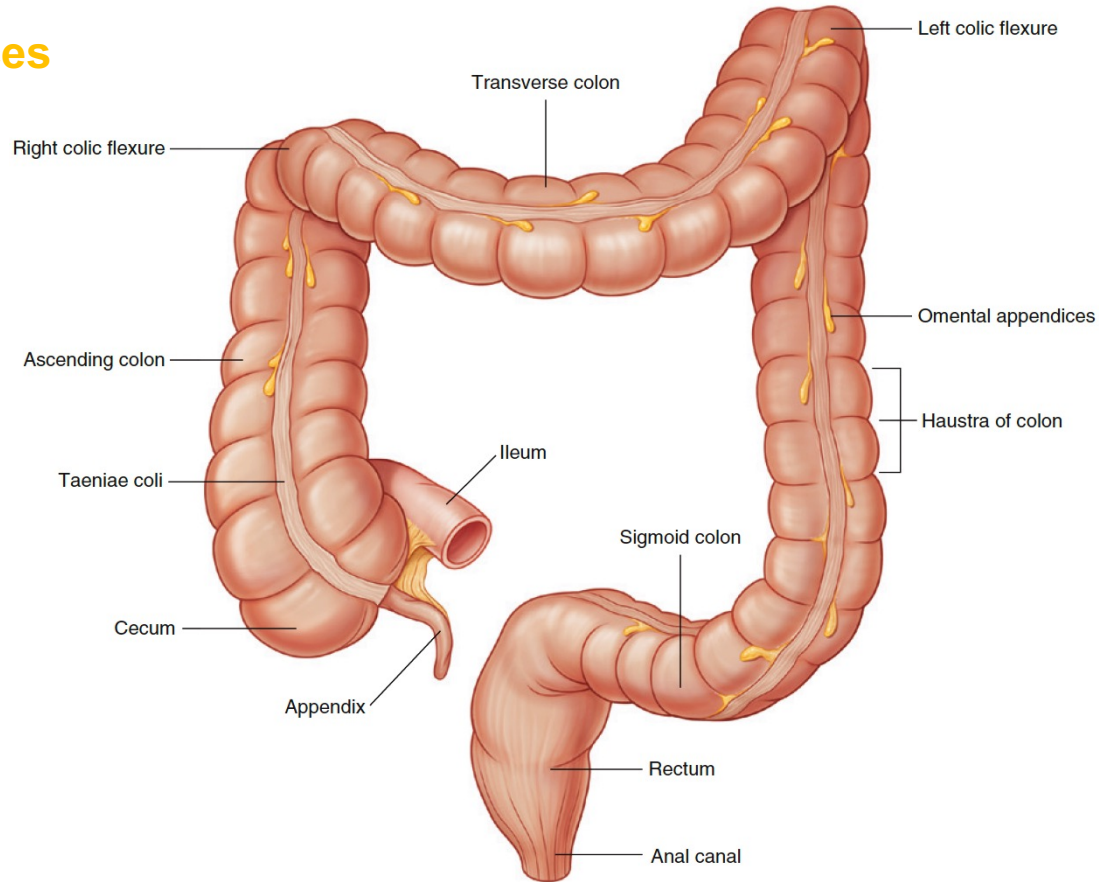
Parts of Large Intestine

1. Cecum
2. Appendix
3. Ascending colon
4. Right colic flexure / hepatic flexure
5. Transverse colon
6. Left colic flexure / splenic flexure
7. Descending colon
8. Sigmoid colon
9. Rectum
10. Anal canal



Features of Large Intestine

1. **Teniae coli**
2. **Haustra of colon**
3. **Omental appendices**

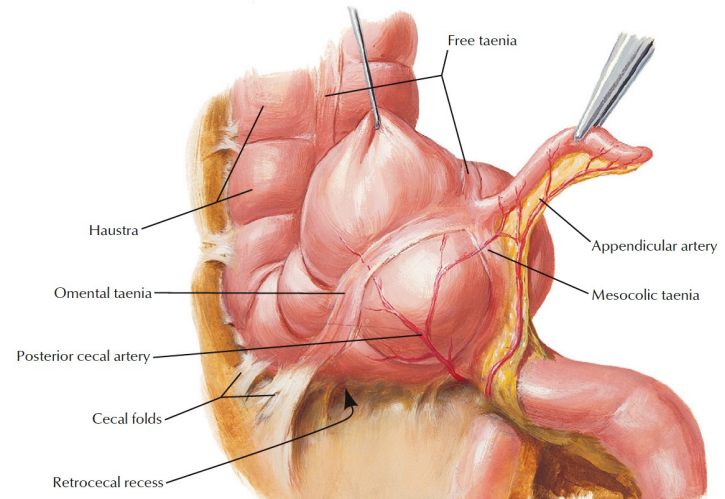
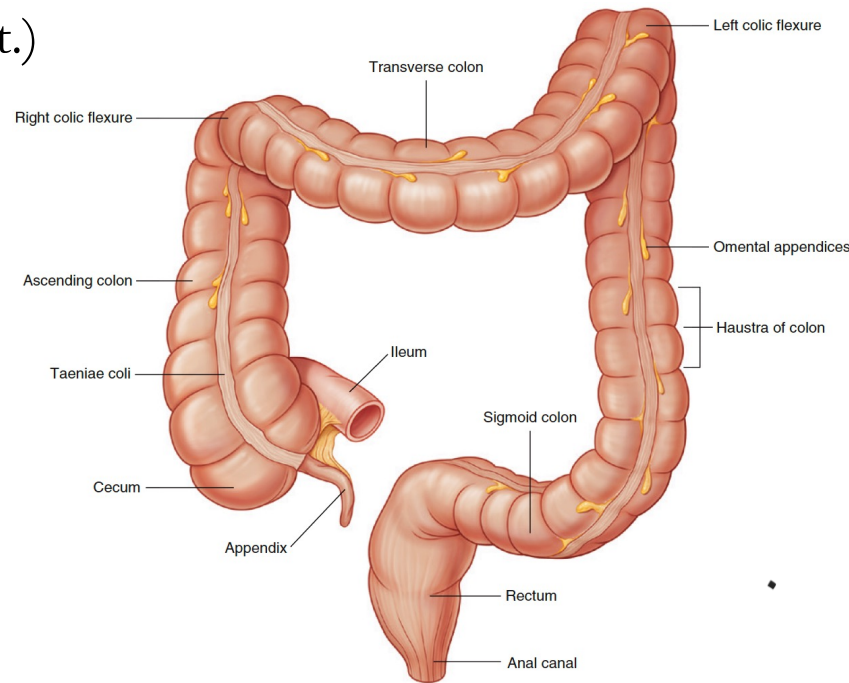


Features of Large Intestine (Cont.)

Teniae coli

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- Thickened bands of **smooth muscle** representing most of the longitudinal coat.
- Begin** at the **base of the appendix** as the thick longitudinal layer of the appendix splits to form three bands.
- The teniae run the length of the large intestine.
- Teniae coli **terminate** by merging with each other again at the **rectosigmoid junction**, forming longitudinal muscle layer around rectum.
- The teniae coli are **not present** on the **appendix or rectum**.



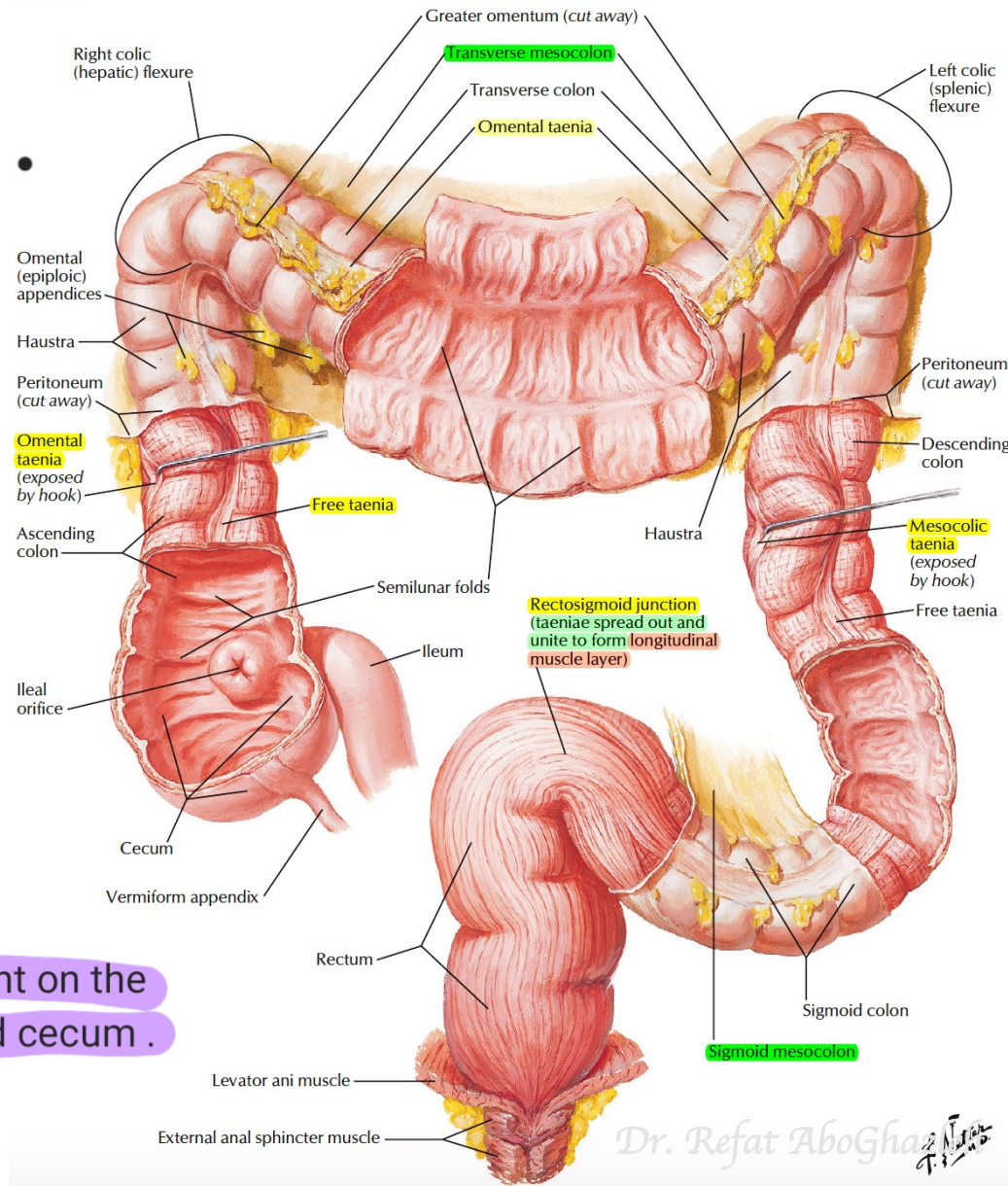
Three teniae coli:

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1. **Mesocolic tenia:**
To which the transverse and sigmoid mesocolons attach.
2. **Omental tenia:** to which the omental appendices attach.
3. **Free tenia:**
Neither mesocolons nor omental appendices are attached.

Note :

Omental tenia : not present on the appendix or rectum and cecum .



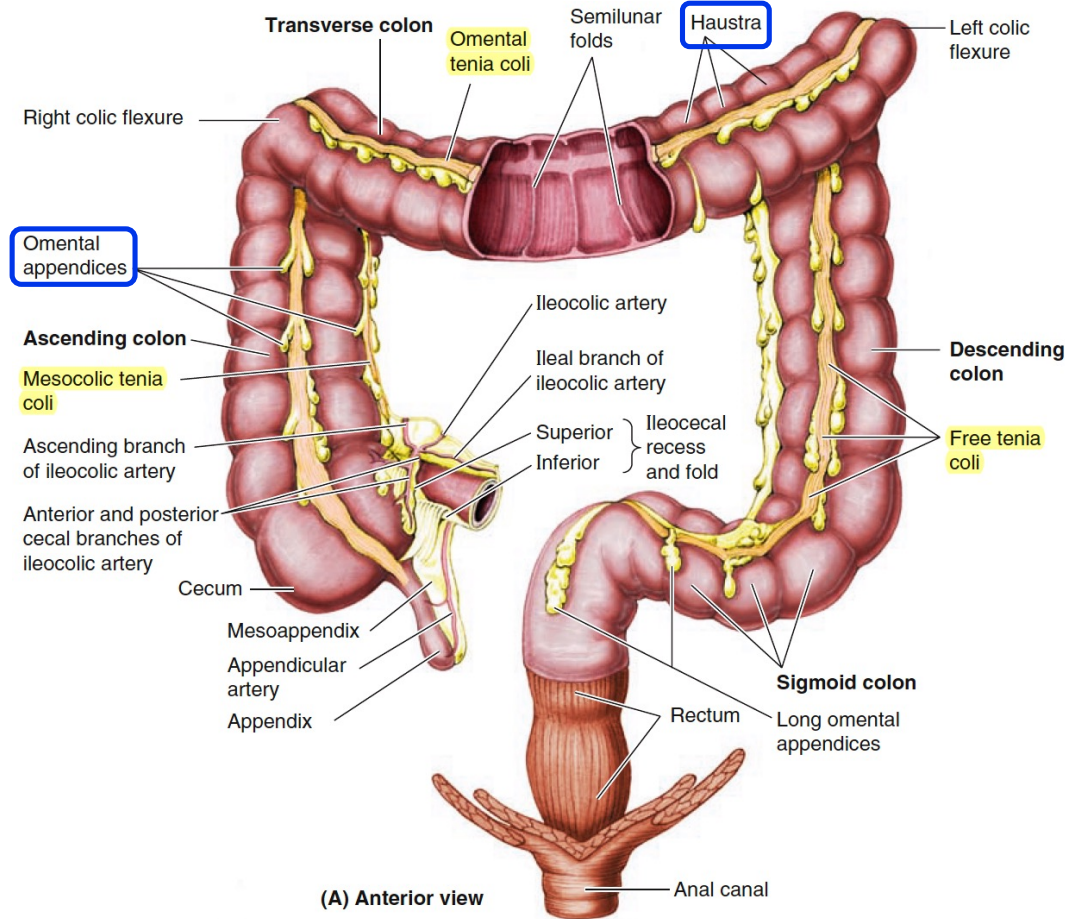
Features of Large Intestine (Cont.)

Haustra:

- Sacculations of the wall of the colon between the teniae.
- The teniae are shorter than the intestine, the colon becomes sacculated between the teniae, forming the haustra.

Omental appendices:

Small, fatty-like projections



Parts of Large Intestine

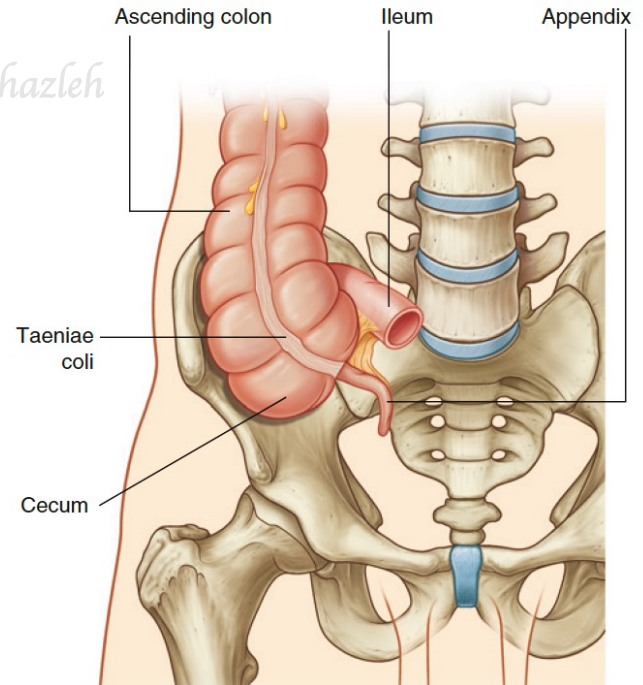
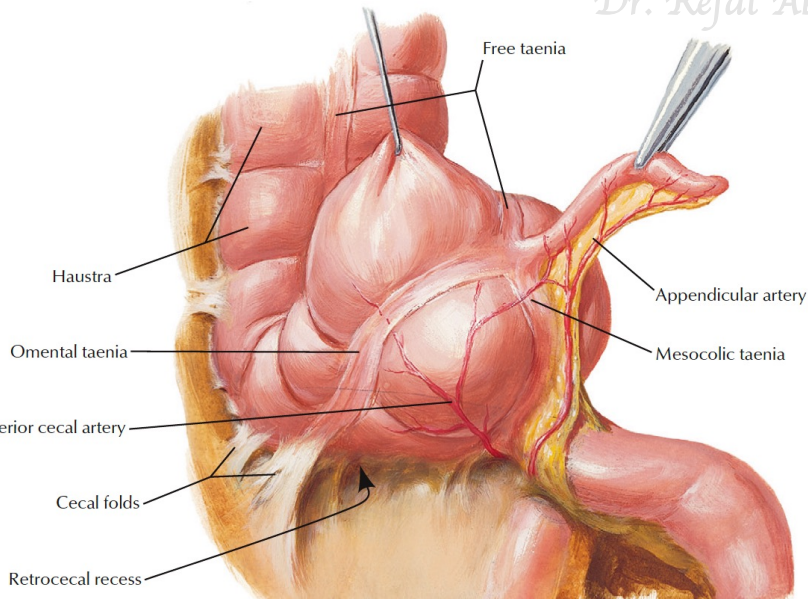
- The pouch-like **cecum**, the widest part of the large intestine, is completely **intraperitoneal** and **movable**.
- **Ascending colon** is **narrower** than the cecum and is **retroperitoneal**.
- **Transverse colon**.
- **Descending colon** occupies a **retroperitoneal** position.
- **Sigmoid colon**, characterized by its S-shaped loop, usually has a **long mesentery**, therefore, has considerable **freedom of movement**, especially its middle part.

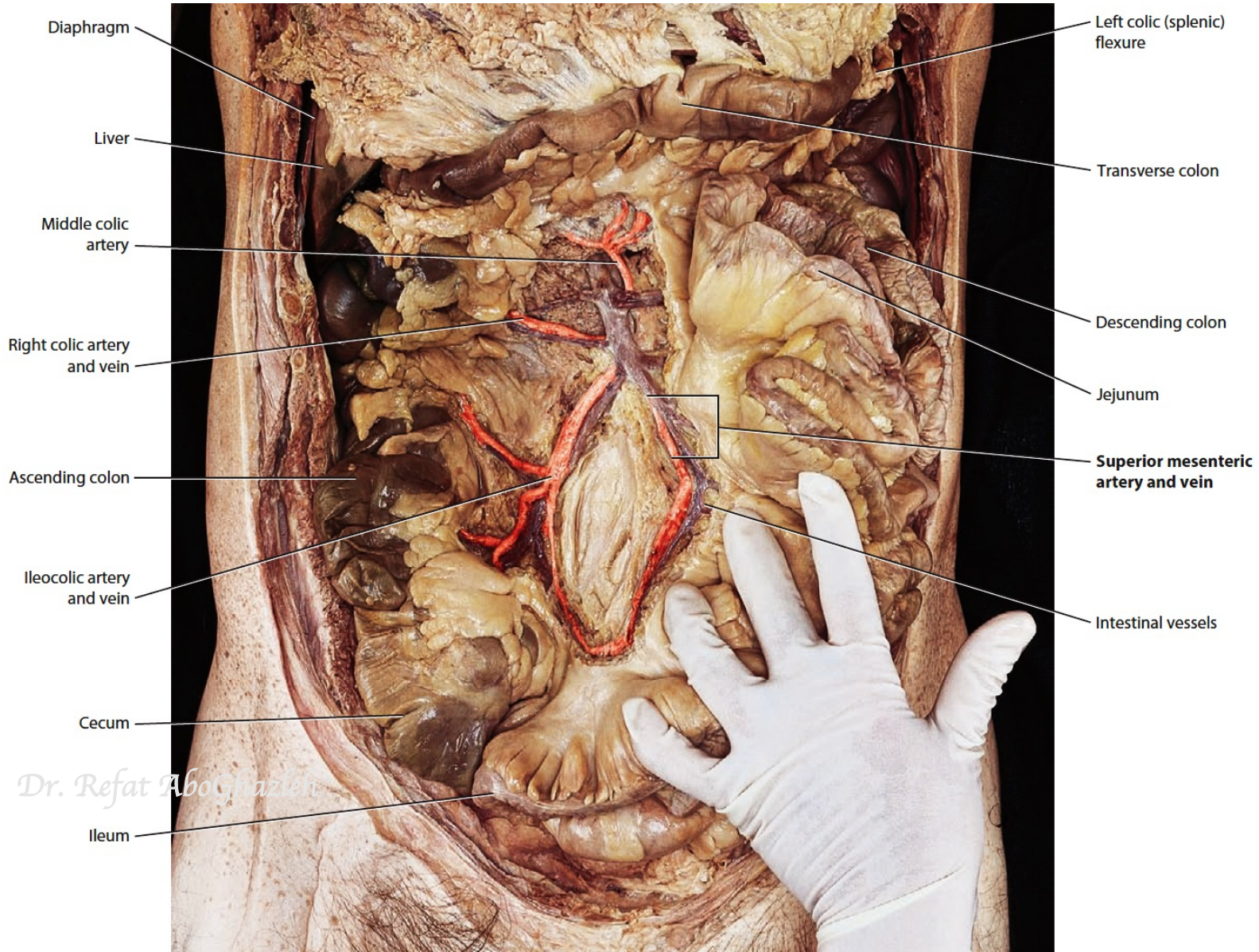
Parts of Large Intestine

Cecum

- Blind ended pouch situated in the **right iliac fossa, RLQ**.
- It **completely covered** with peritoneum.
- It has considerable amount of **mobility**, although it does **not have a mesentery**.

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Diaphragm

Liver

Middle colic artery

Right colic artery and vein

Ascending colon

Ileocolic artery and vein

Cecum

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Ileum

Left colic (splenic) flexure

Transverse colon

Descending colon

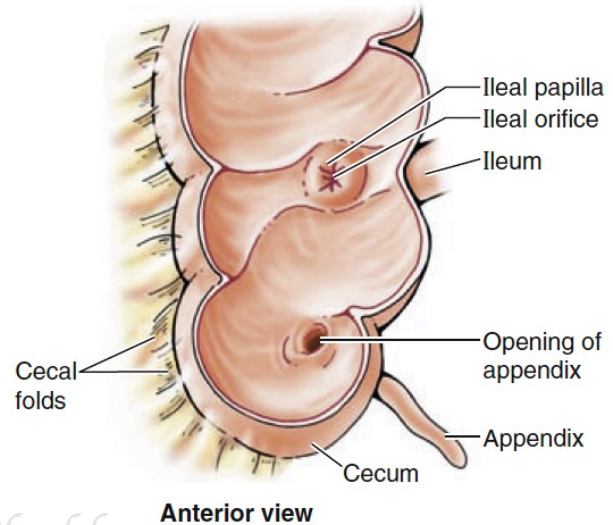
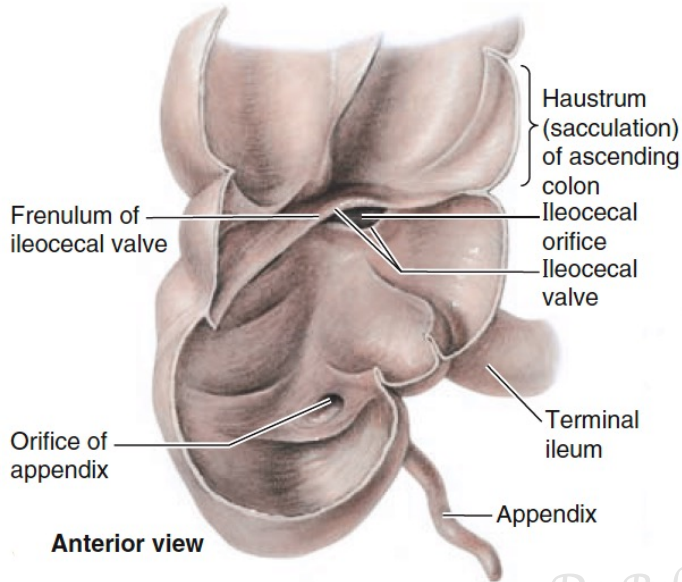
Jejunum

Superior mesenteric artery and vein

Intestinal vessels

Ileocecal valve

- Consists of **two** horizontal folds of **mucous membrane** that project around the orifice of the **ileum**.
- The valve plays **little** or **no** part in the prevention of reflux of cecal contents into the ileum.



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The orifice is usually closed by tonic contraction, by **ileal papilla** on the cecal side, preventing reflux from the cecum into the ileum.

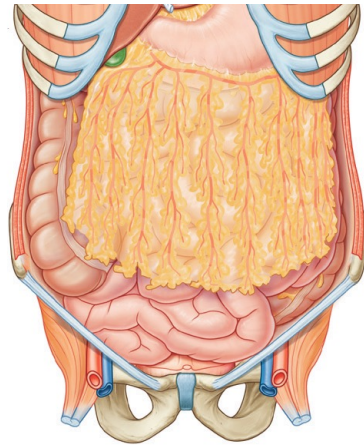
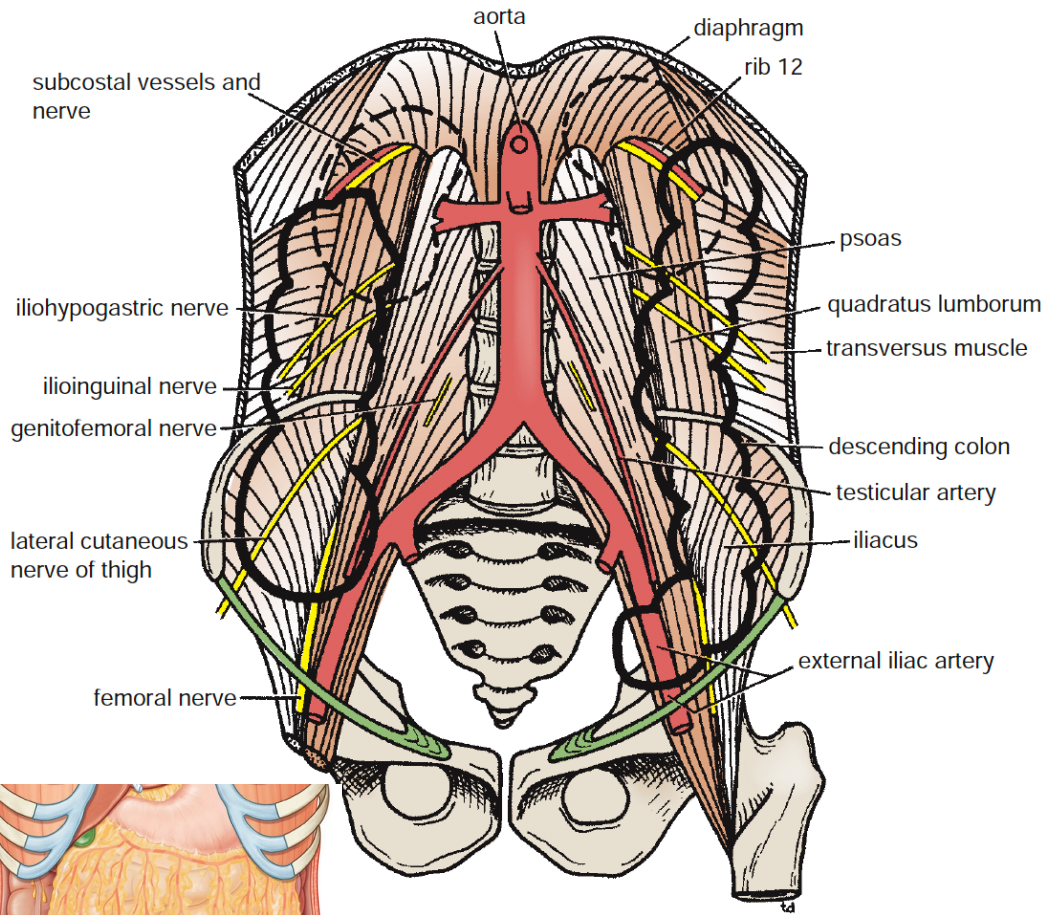
Relations of Cecum:

Anterior:

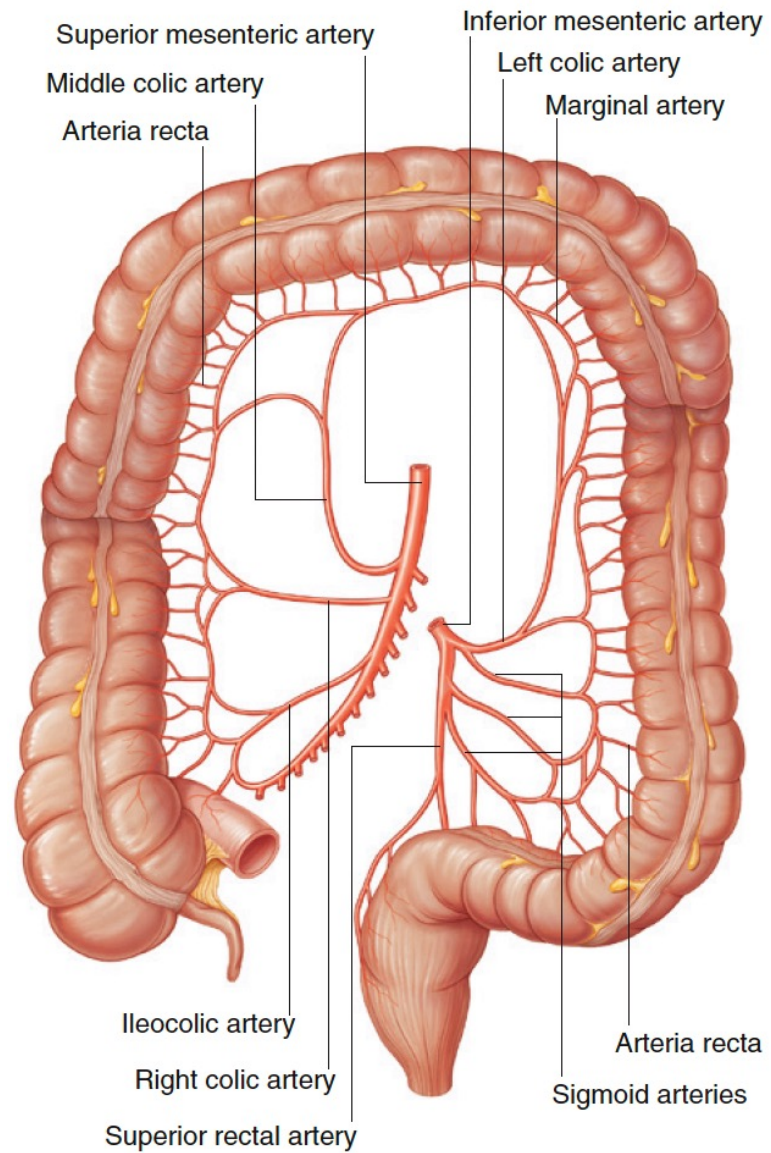
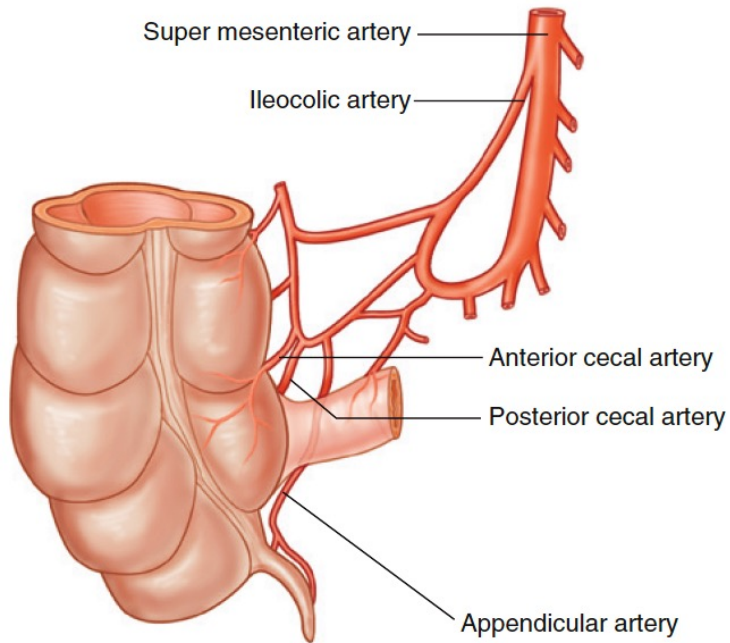
- Anterior Abdominal wall.
- Part of greater omentum.
- Coils of small intestine.

Posterior:

- Psoas and iliacus muscle.
- Lateral cutaneous nerve of thigh, femoral nerve, and genitofemoral nerves.
- Rt Ext iliac artery & Rt gonadal vessels.



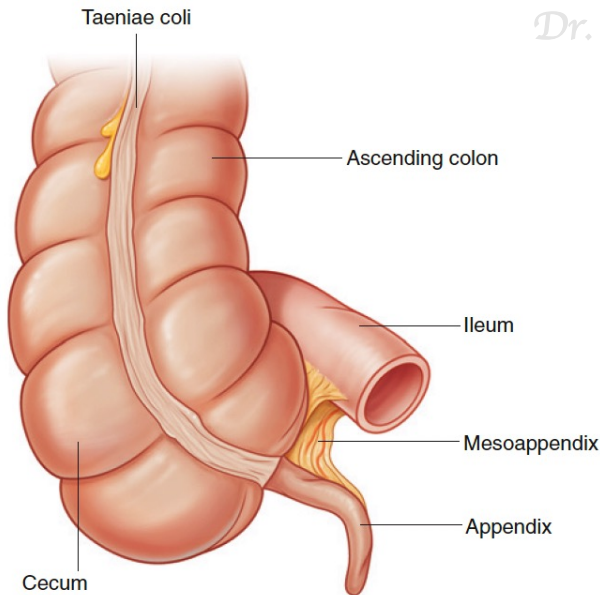
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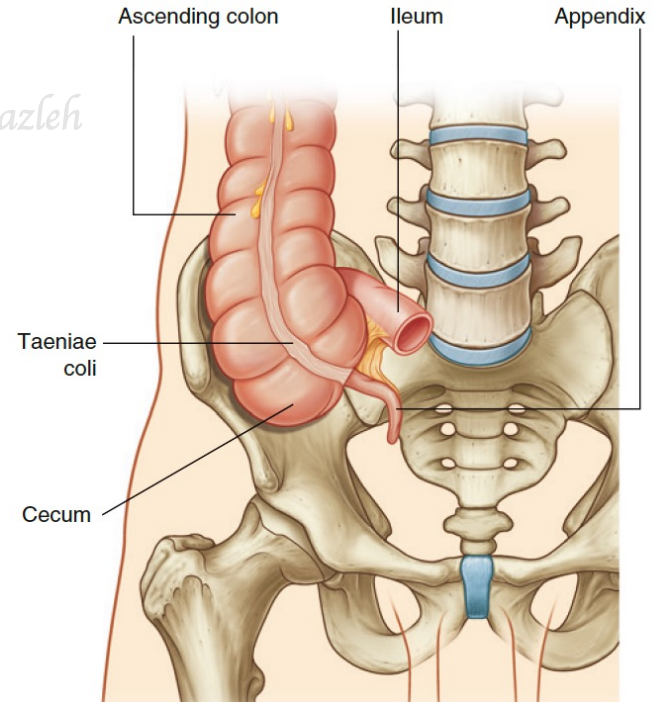
The appendix

• مهمه كثير عليها ٣ اسأله

- Is a narrow muscular tube, has a short triangular mesentery (**mesoappendix**).
- It is completely covered by peritoneum.
- Lies in the **right iliac fossa**.
- Appendix arises from the **posteromedial** aspect of the **cecum**, just **2cm below ileocecal junction**.
- **Appendix is variable in length** (usually about 7 to 10 cm).
- Contains **numerous lymphoid tissue in its walls**.

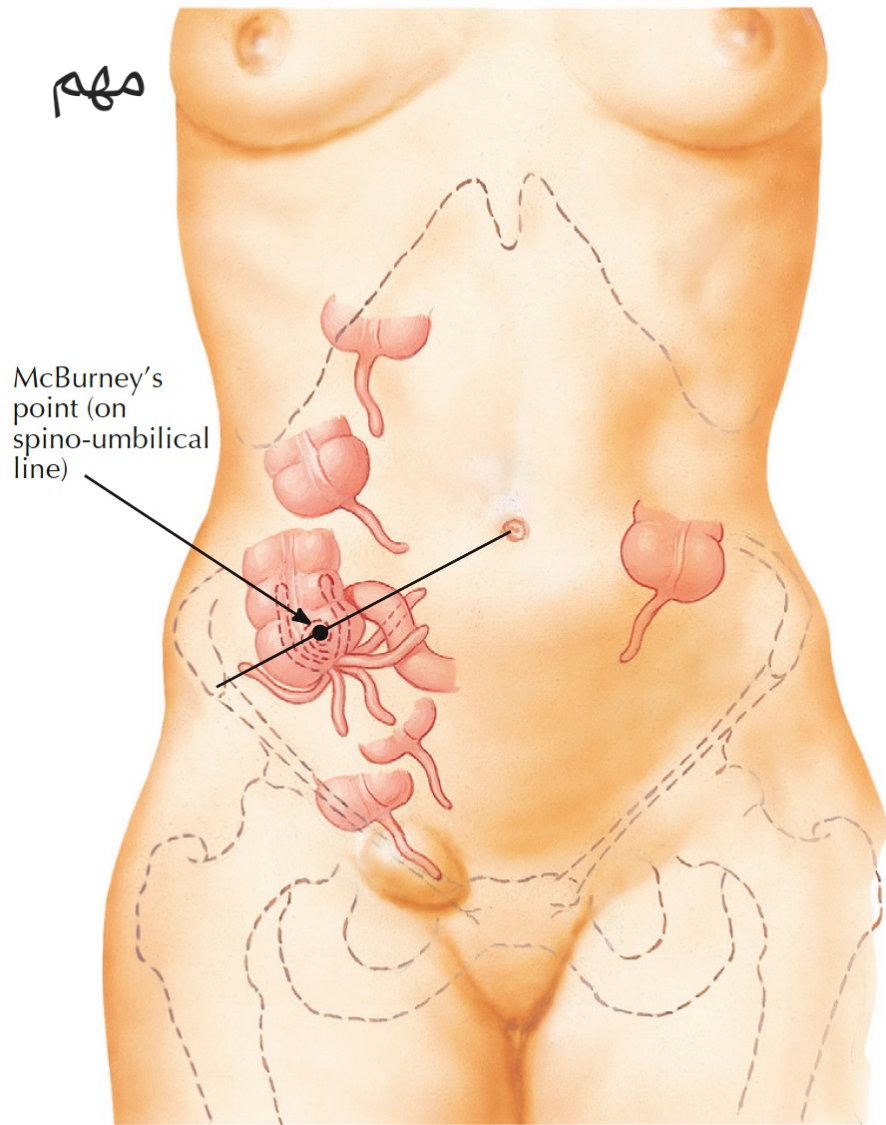


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The appendix

The **base** of the appendix lies deep to a point that is **one third** of the way along the oblique line joining the **right ASIS (anterior superior iliac spine)** to the **umbilicus (McBurney's point)**.



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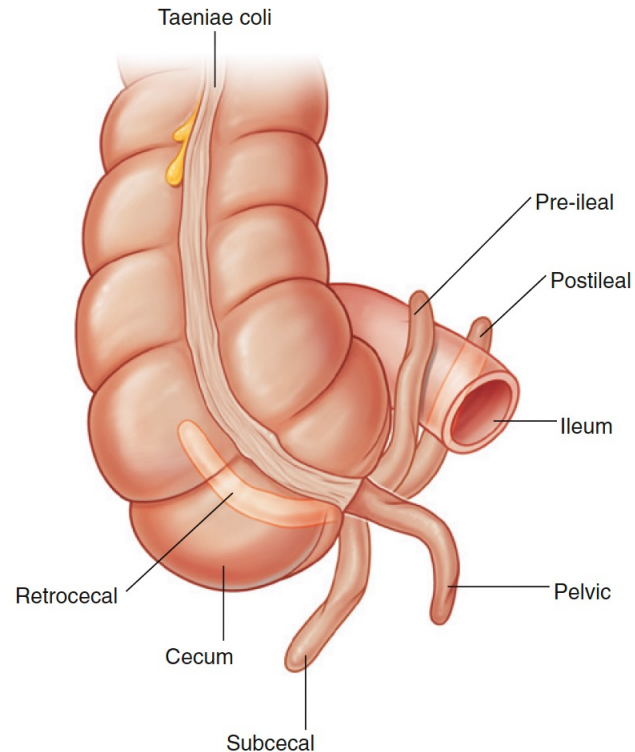
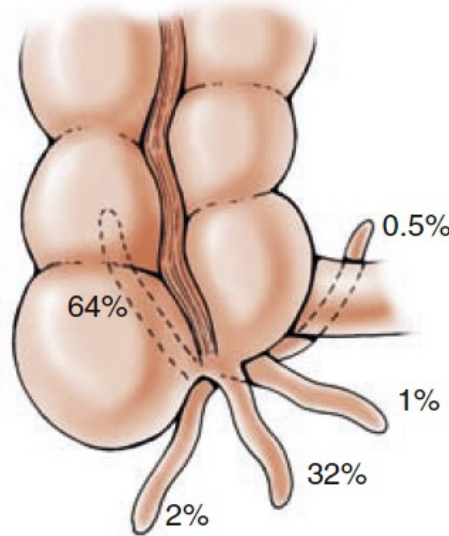
Variations in position of appendix

Following positions of the Tip of the appendix:

100 •

- **Retrocecal** or **retrocolic** position: posterior to the cecum or the lower ascending colon.
- **Suspended over the pelvic brim** in a pelvic or descending position.
- **Subcecal** location: below the cecum.
- **Pre-ileal position**: anterior to the terminal ileum, possibly contacting the body wall.
- **Postileal** position: posterior to the terminal ileum.

The first and second positions are the most common sites.

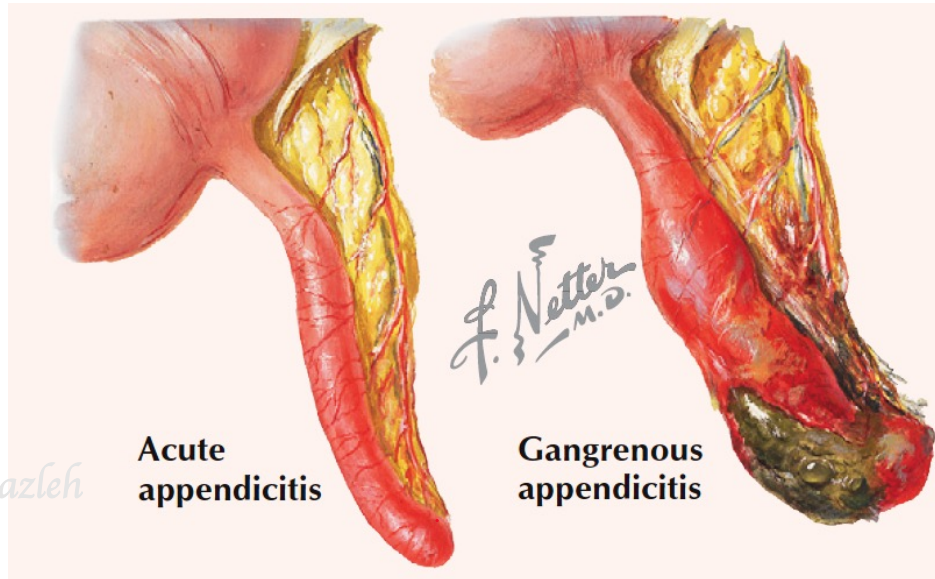


Acute Appendicitis

280 •

Is a common inflammation of the appendix, often caused by bacterial infection. **Initially**, diffuse **pain** is felt in the **periumbilical region**. However, as the appendix becomes more inflamed and irritates the parietal peritoneum, the **pain** becomes **well localized to the right lower quadrant** (tenderness to palpation).

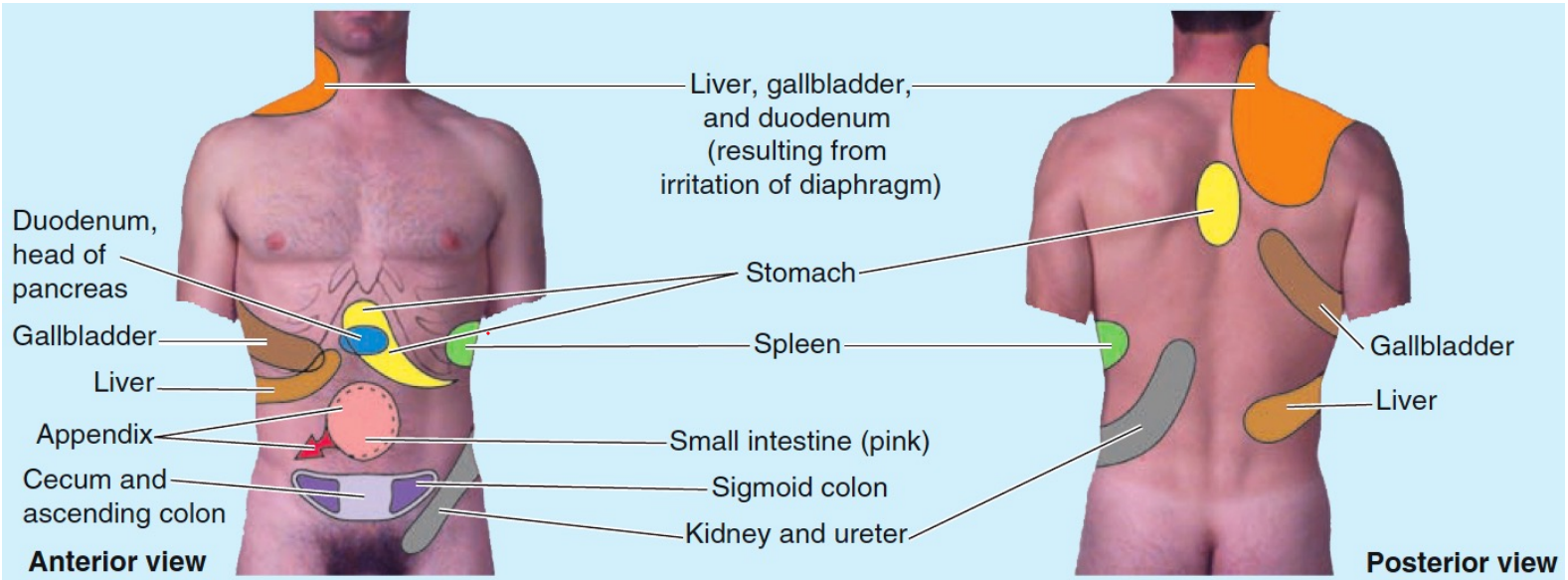
Surgical resection is the treatment of choice to prevent more serious life-threatening complications (**abscesses and peritonitis**).



Pain of Appendicitis

Visceral pain in the appendix is produced by distention of its lumen, and stretching the visceral peritoneum. The afferent pain fibers enter the spinal cord at the level of the 10th thoracic segment, and a **vague referred pain** *is felt in the region of the umbilicus*.

Later, the pain shifts to where the inflamed appendix irritates the **parietal peritoneum**. Here the pain is **precise, severe, and localized**.



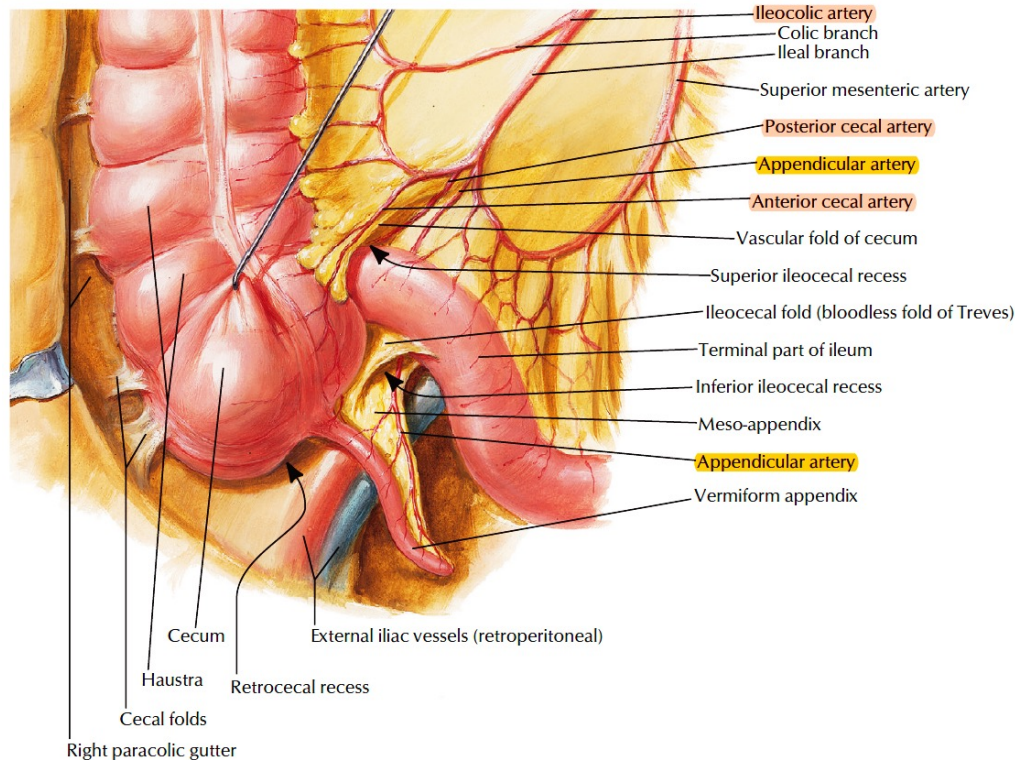
Blood supply of the appendix:

The **appendicular artery**, a branch of the **ileocolic artery**, supplies the appendix.

Venous drainage from the cecum and appendix flow through a tributary of the **SMV**, the **ileocolic vein**.

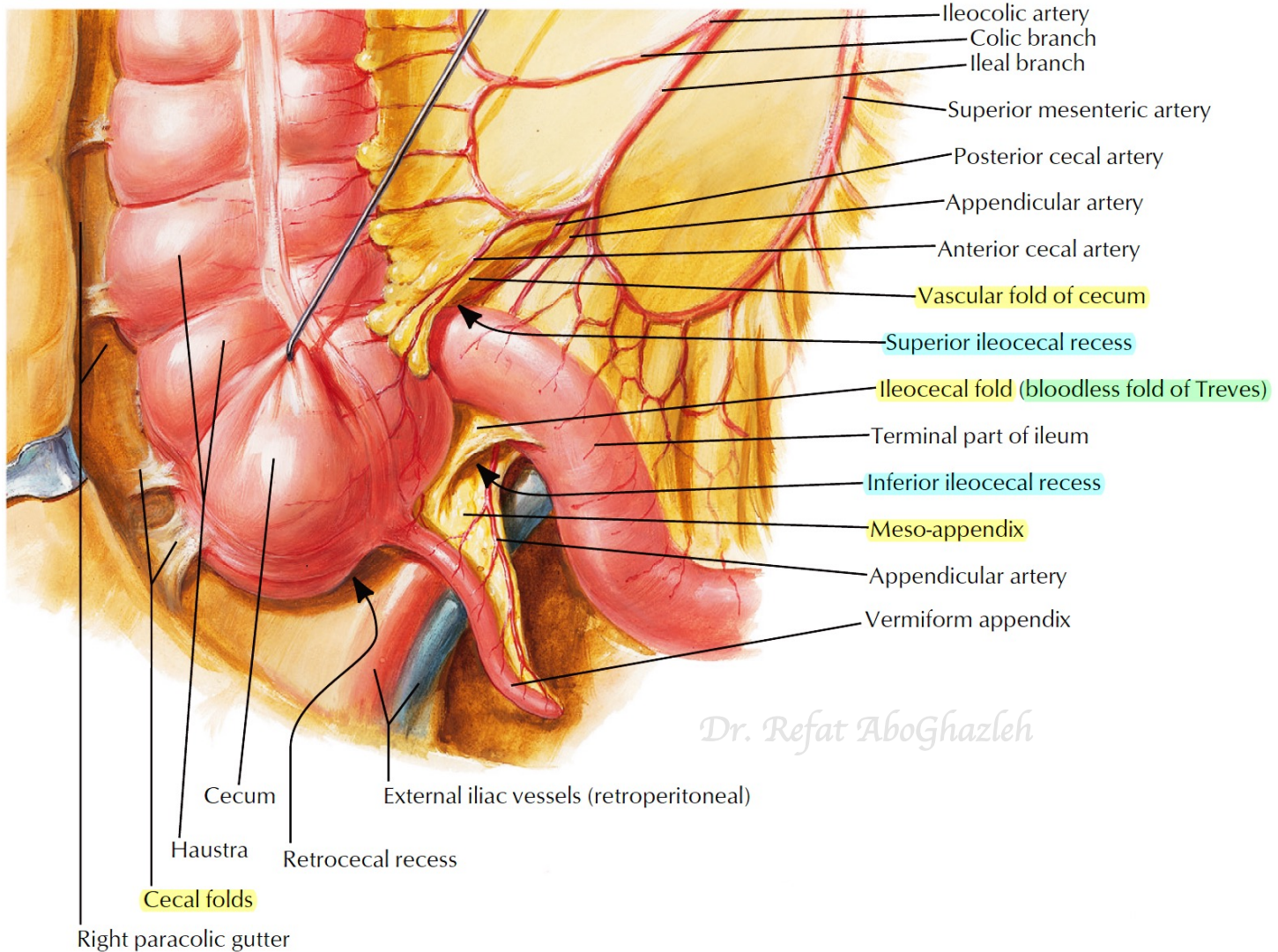
Lymph Drainage

The lymph vessels drain into lymph nodes lying along the course of the colic blood vessels and ultimately reach the **superior mesenteric nodes**.



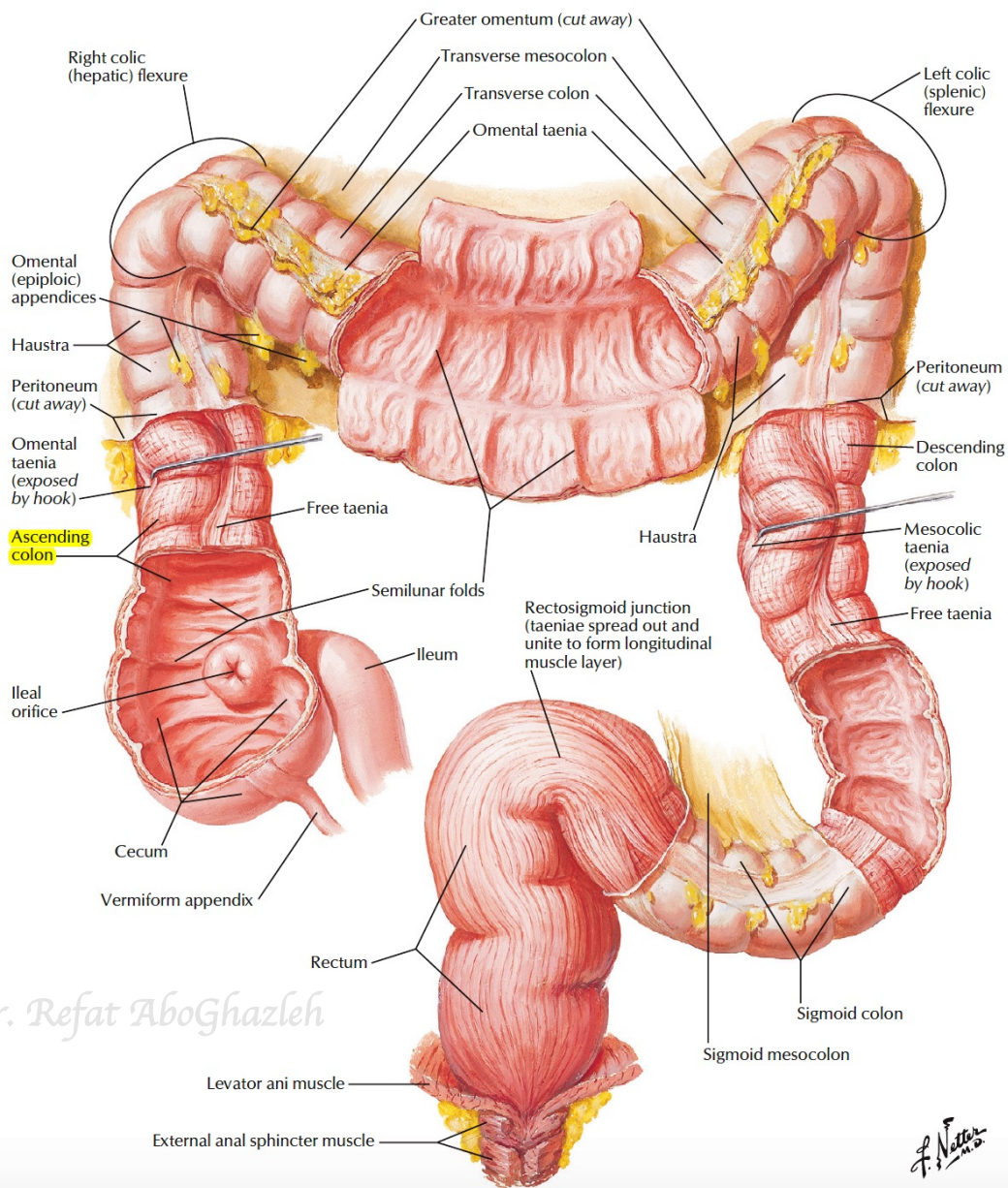
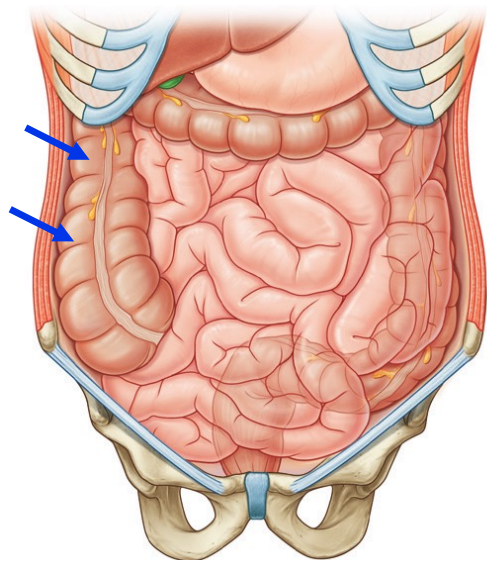
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Cecal folds of peritoneum



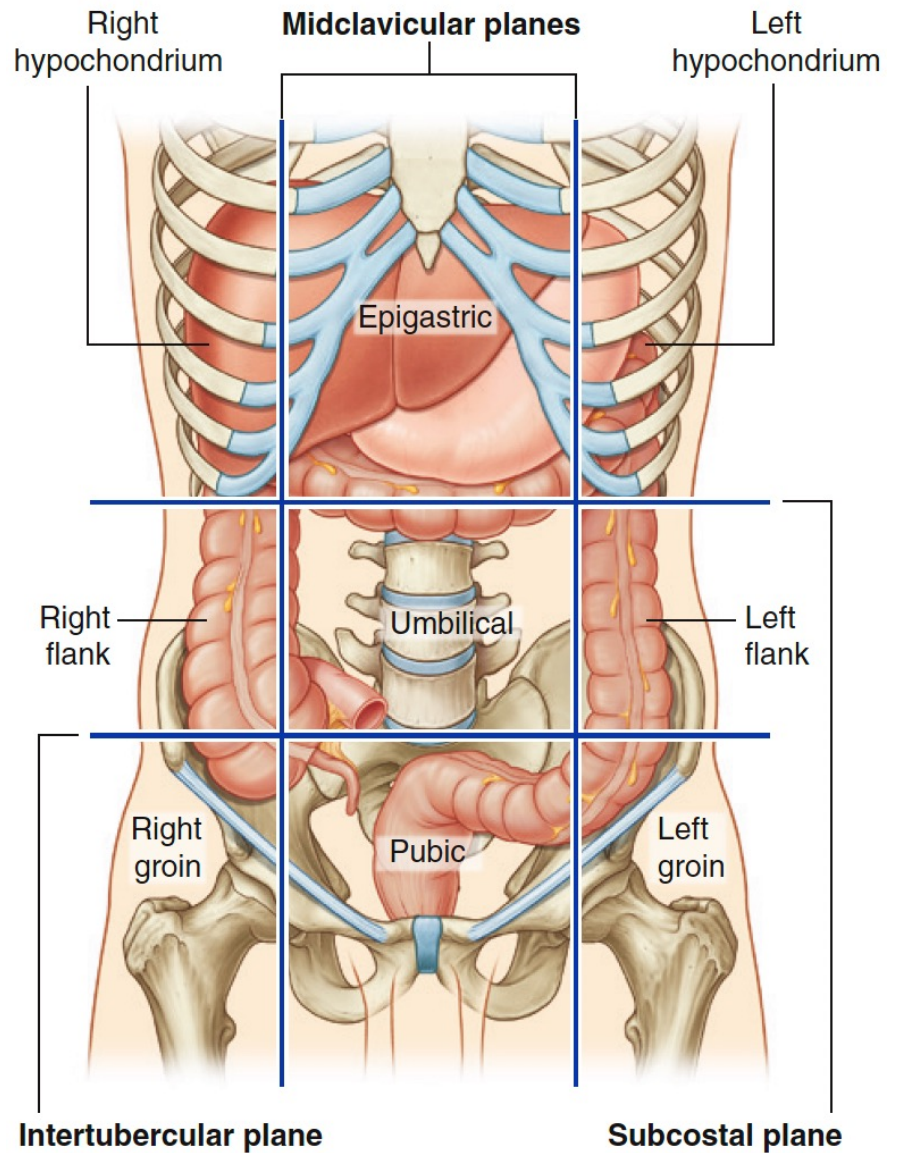
Ascending Colon

- Lies in the **right lower quadrant**.
- Peritoneum** covers the front and the sides of the ascending colon.



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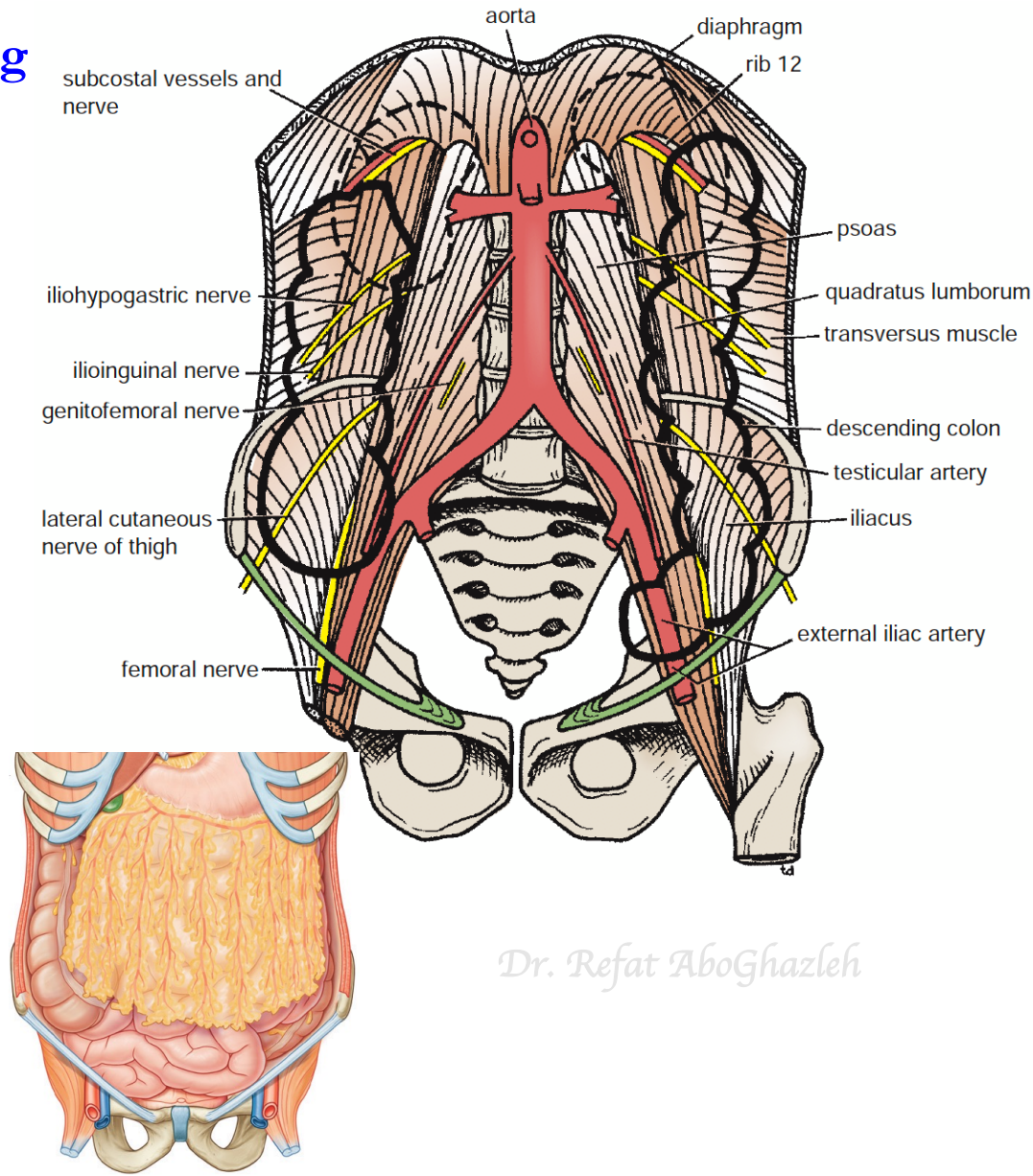
Relations of Ascending

Anterior:

- Anterior Abd. Wall
- Greater omentum
- Coils of small intestine

Posterior:

- Iliacus, iliac crest, quadratus lumborum, lower pole of Rt kidney, iliohypogastric and ilioinguinal nerve.



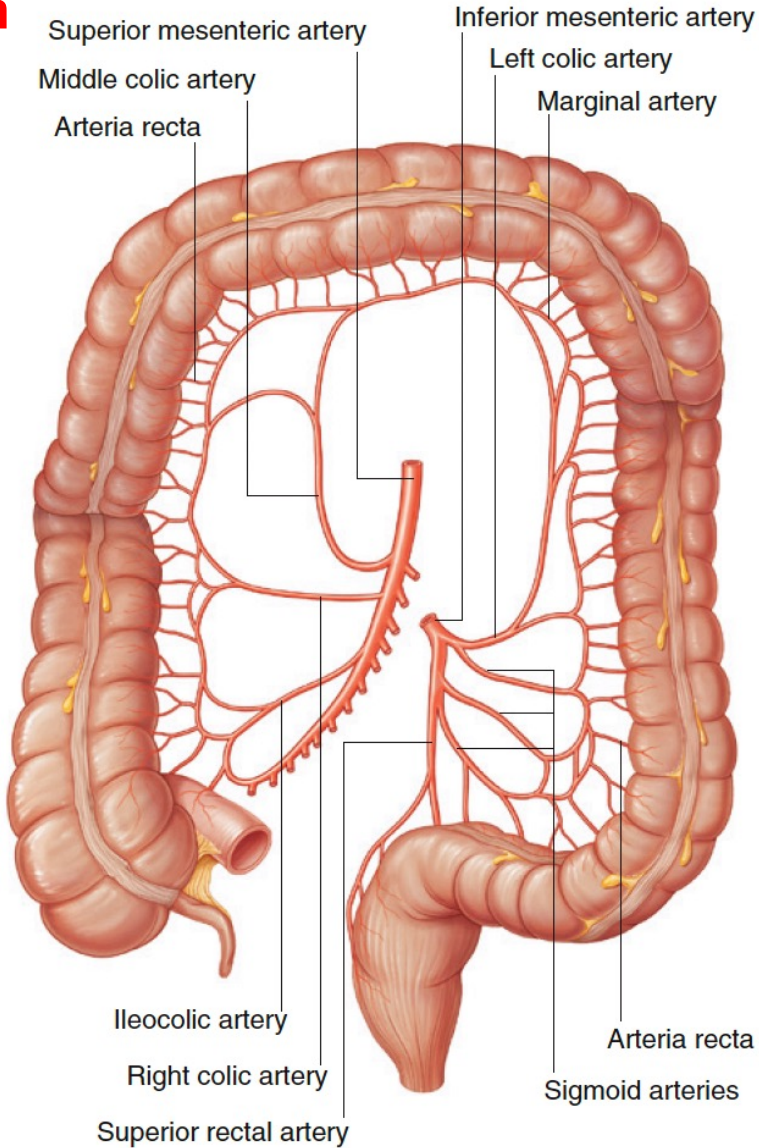
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Blood supply of ascending colon

- Ileocolic and right colic artery
(branches of superior mesenteric artery)

Veins:

The veins correspond to the arteries and drain into the superior mesenteric vein.



❖ Lymph Drainage:

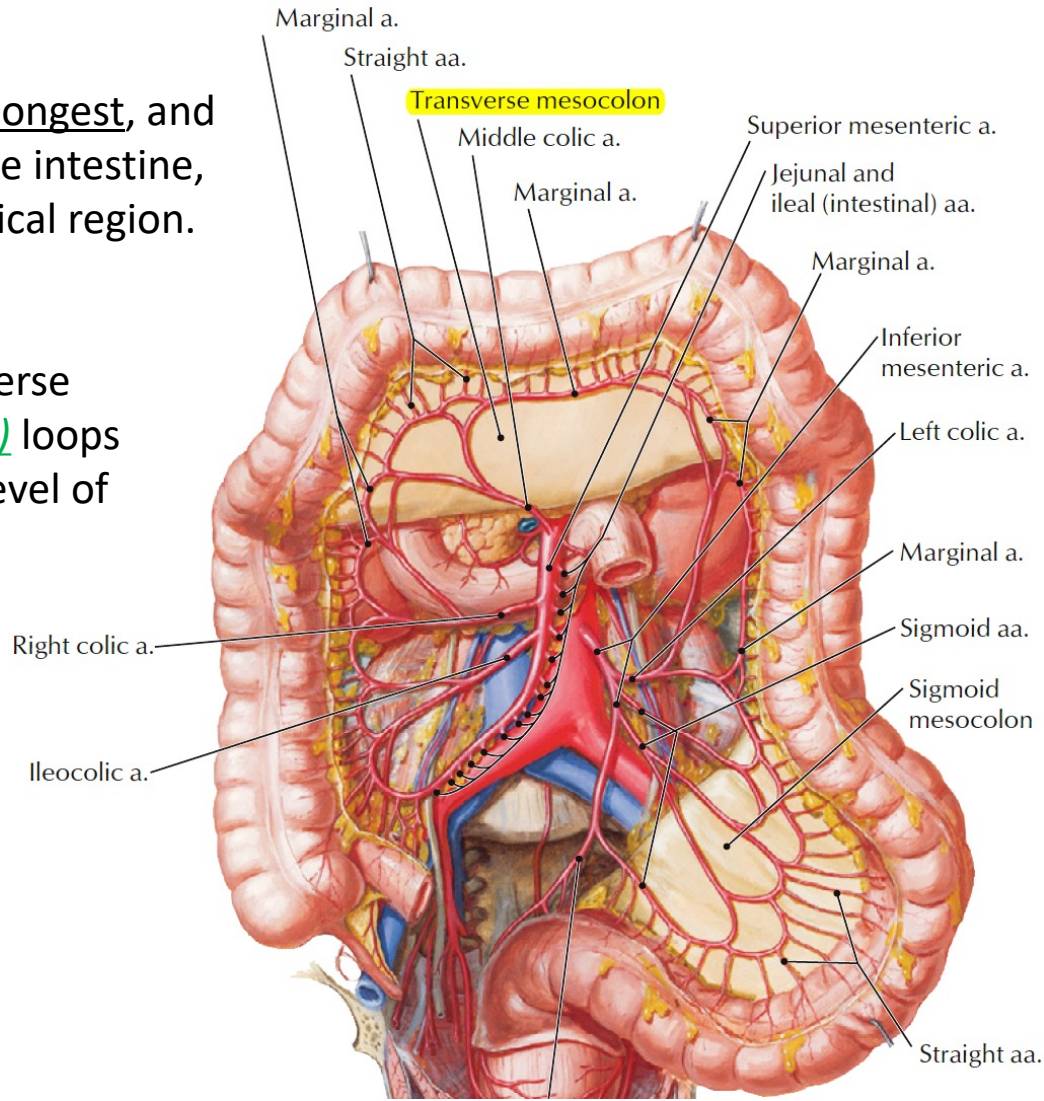
The lymph vessels drain into lymph nodes lying along the course of the colic blood vessels and ultimately reach the **superior mesenteric nodes**.

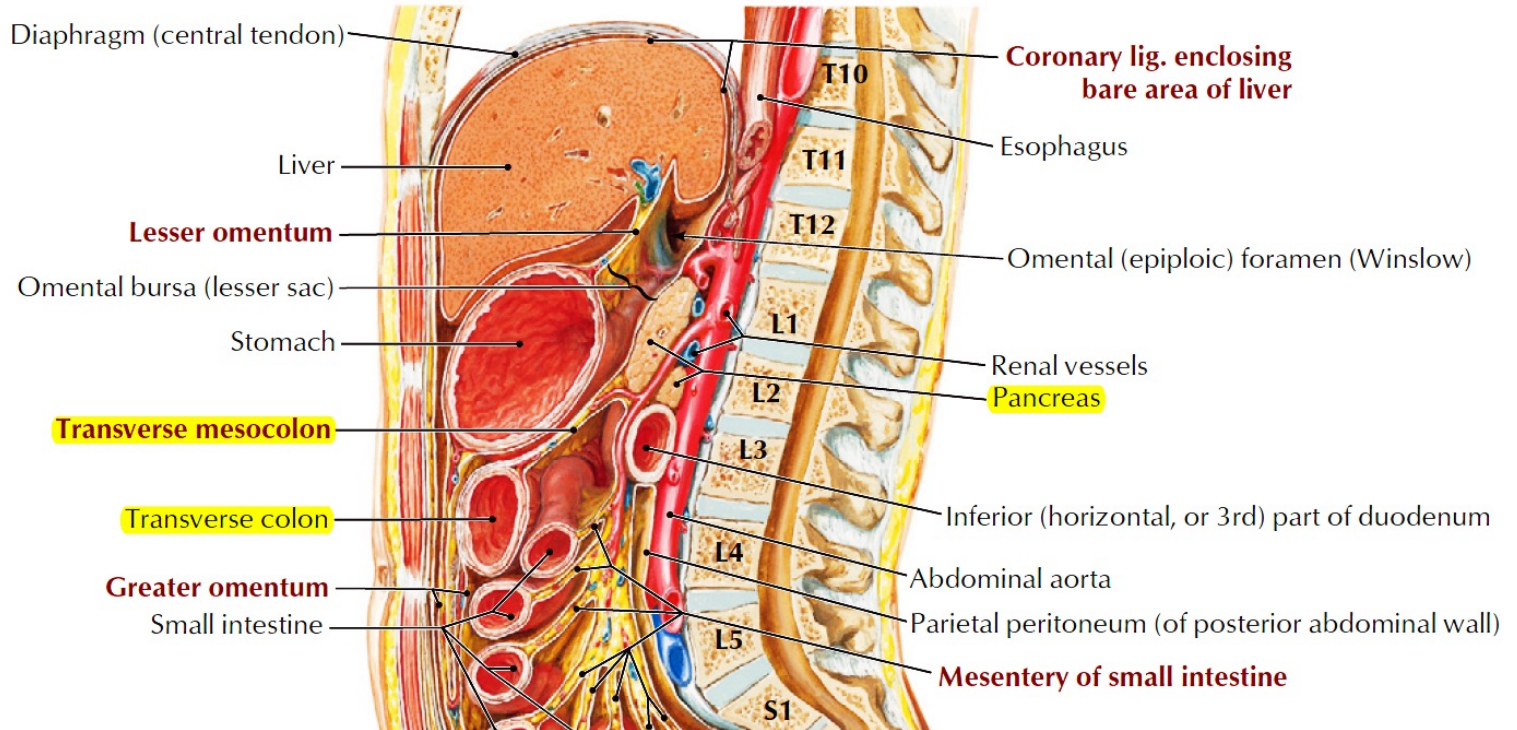
❖ Nerve Supply:

Sympathetic and parasympathetic (vagus) nerves from the **superior mesenteric plexus** supply this area of the colon.

Transverse Colon

- The **transverse colon** is the longest, and most mobile part of the large intestine, usually occupying the umbilical region.
- The mesentery of the transverse colon (**transverse mesocolon**) loops down, often inferior to the level of the iliac crests.



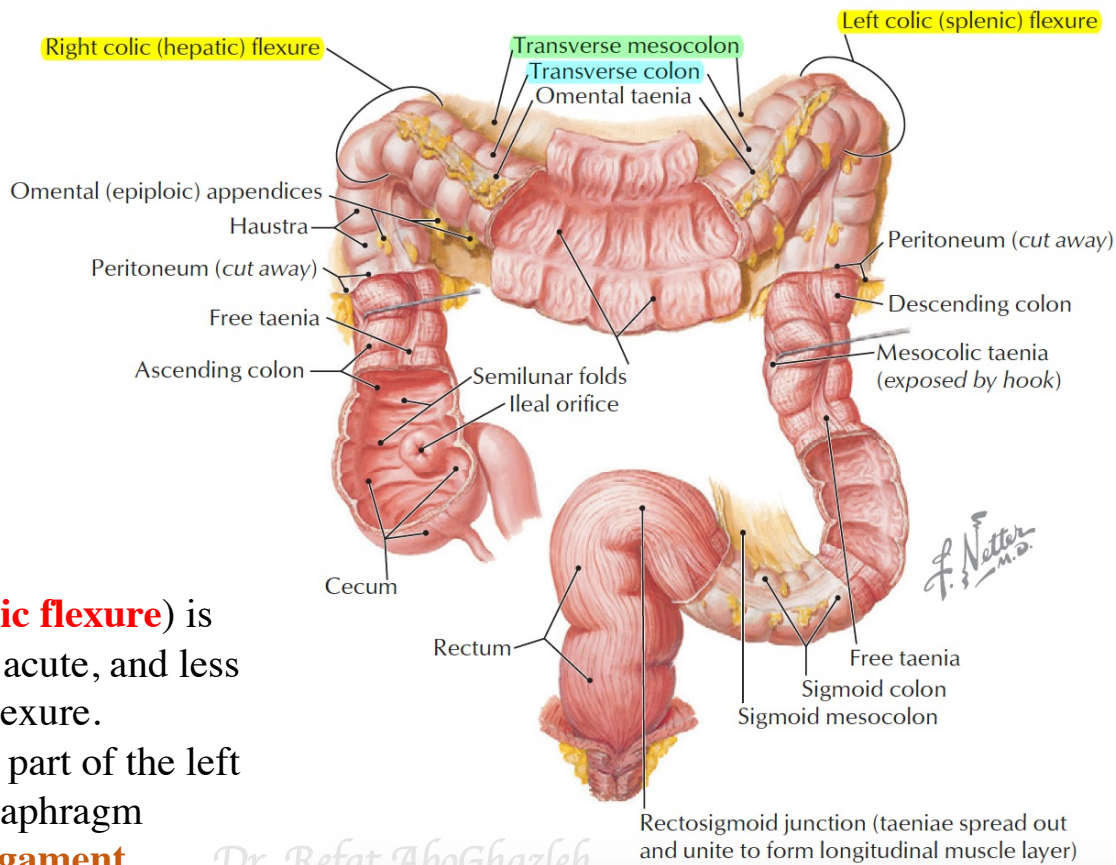


The root of the **transverse mesocolon** lies along the **inferior border of the pancreas**.

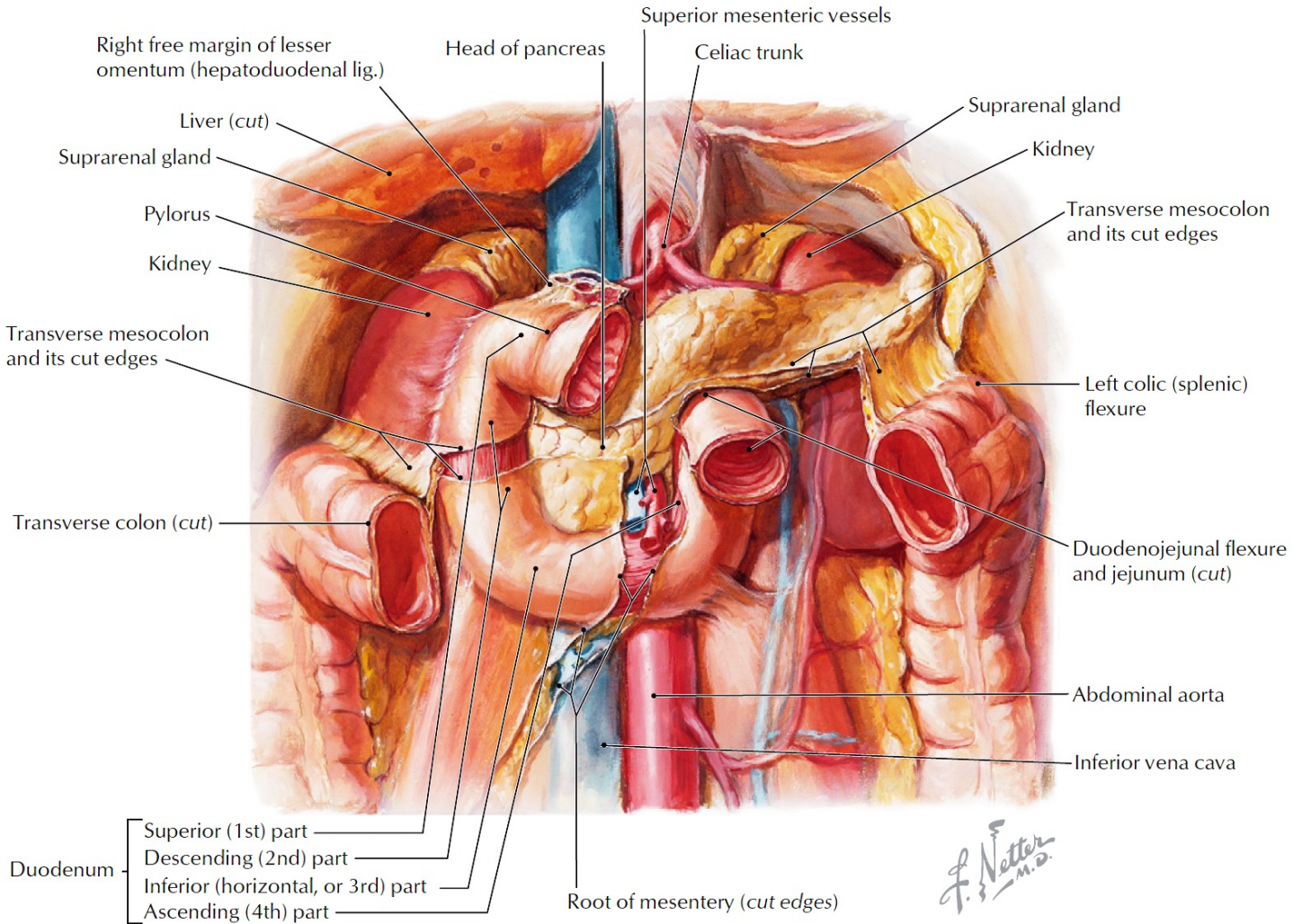
Transverse colon crosses the abdomen from the **right colic flexure** to the **left colic flexure**, where it turns inferiorly to become the **descending colon**.

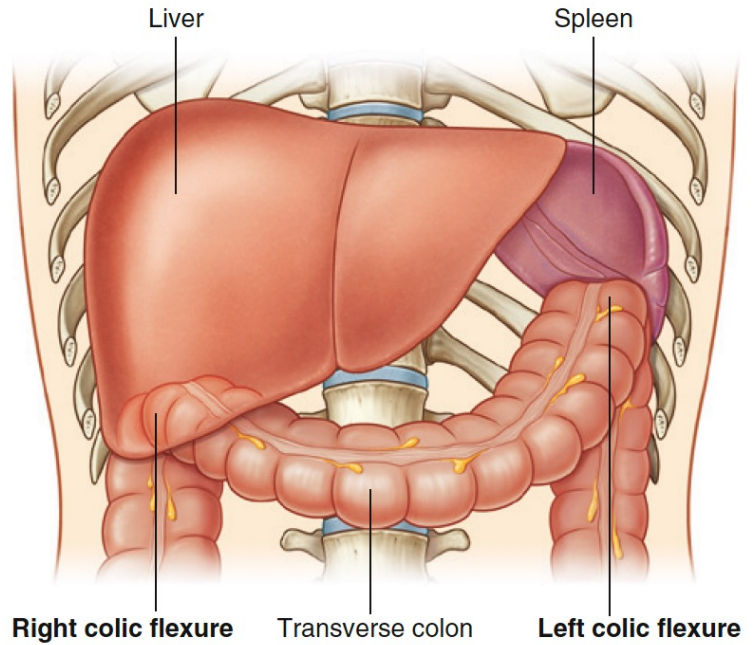
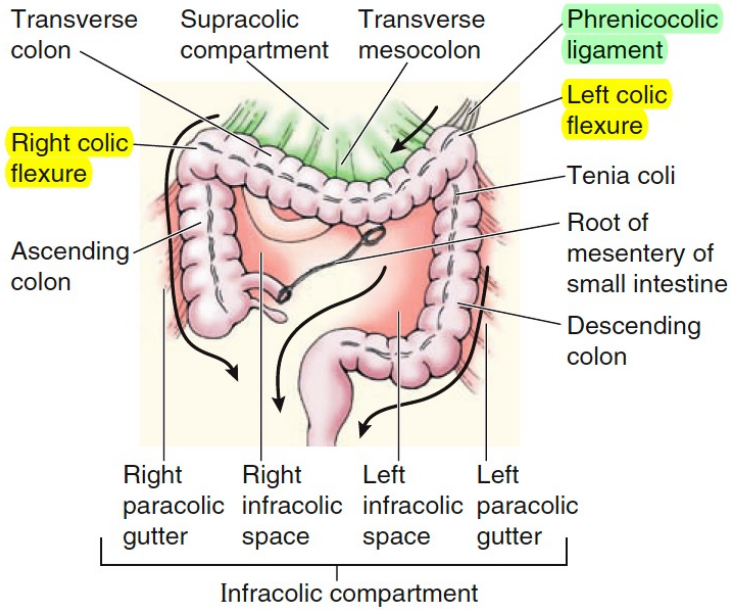
The **right colic flexure (hepatic flexure)** lies deep to the **9th and 10th ribs** and is overlapped by the **inferior part of the liver**.

The **left colic flexure (splenic flexure)** is usually more superior, more acute, and less mobile than the right colic flexure. It lies anterior to the inferior part of the left kidney and attaches to the diaphragm through the **phrenicocolic ligament**.



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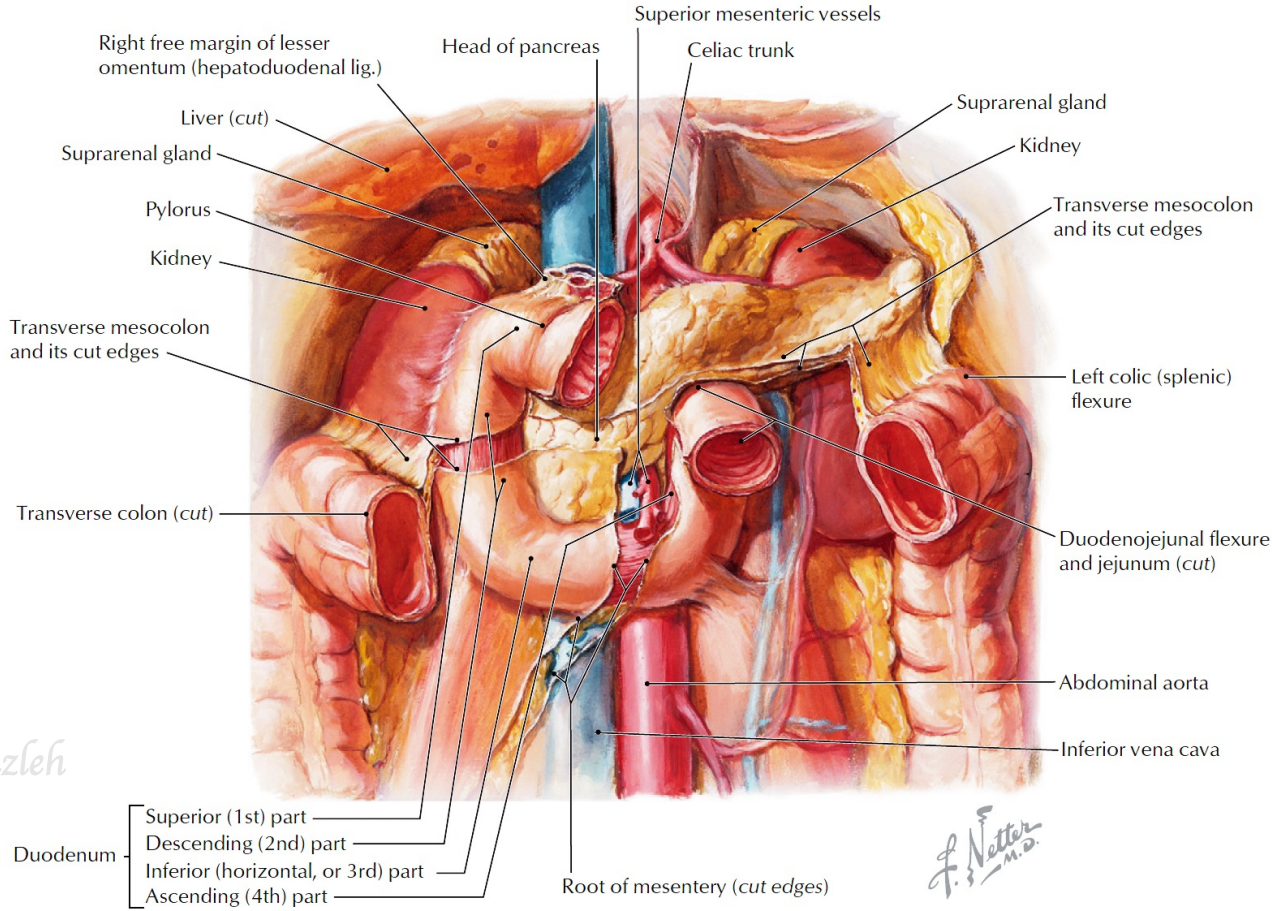


Relations of transverse colon

Anterior:

Greater Omentum and Anterior Abdominal Wall (**umbilical and hypogastric regions**).

Posterior: 2nd part of duodenum, head of pancreas, and coils of jejunum and ileum

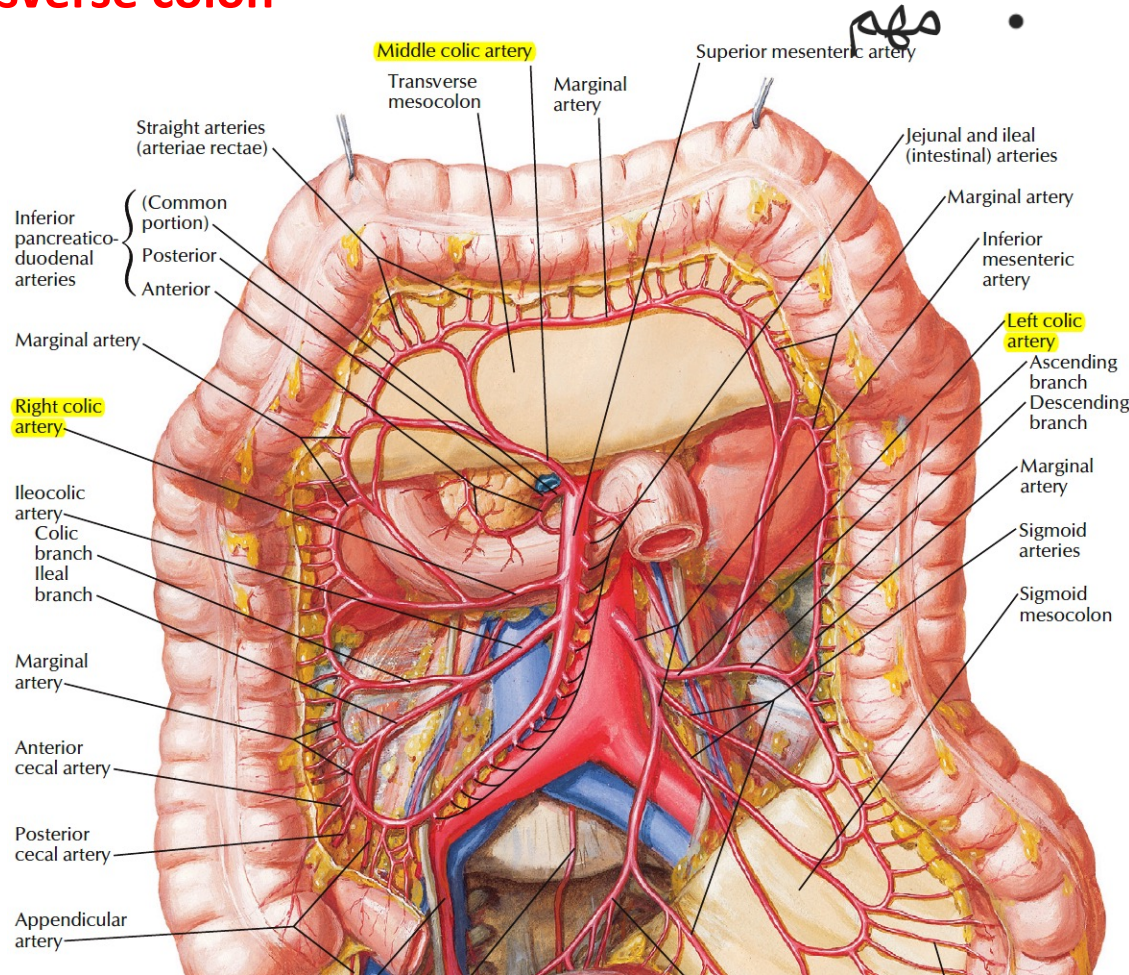


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Blood supply of transverse colon

○ Proximal two third of transverse colon are supplied by **middle colic artery**, which is a branch of **superior mesenteric artery**.

○ Distal third of transverse colon are supplied by **left colic artery**, which is a branch of **Inferior mesenteric artery**.

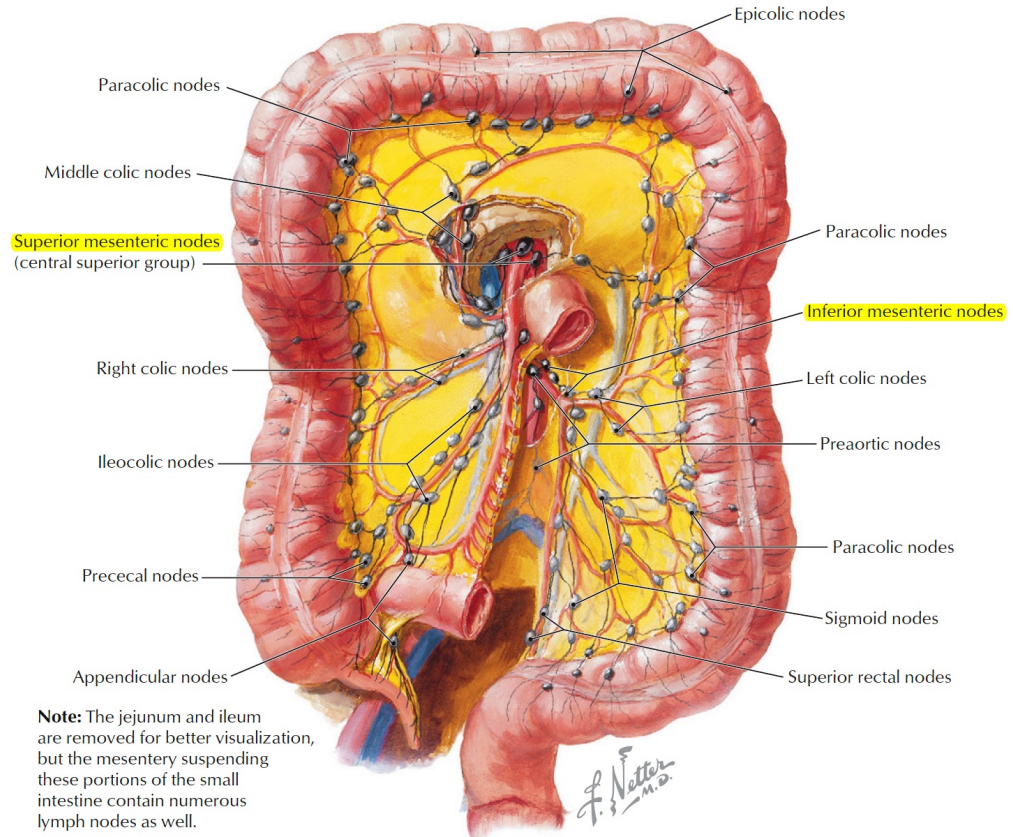


Veins :The veins correspond to the arteries and drain into the **superior and inferior mesenteric veins**.

Lymph Drainage of transverse colon:

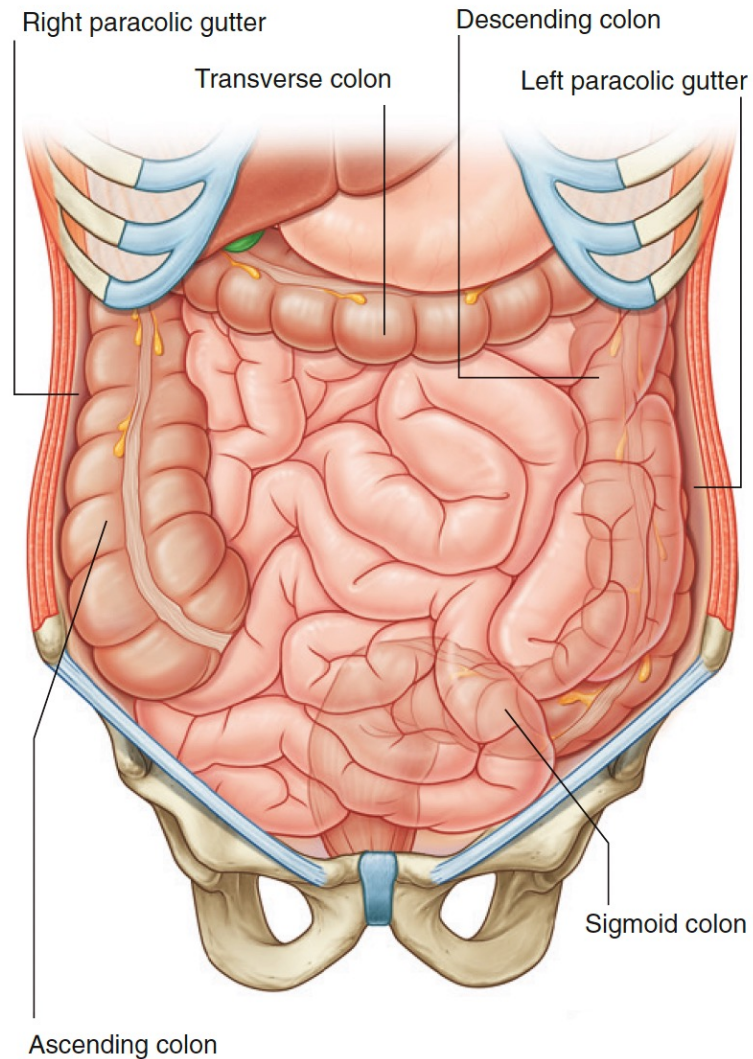
The **proximal two thirds** drain into the colic nodes and then into the **superior mesenteric nodes**. *Anterior to Right?*

The **distal third** drains into the colic nodes and then into **the inferior mesenteric nodes**.



Descending colon

- Lies in the **left upper** and **lower quadrants**.
- Extended from *left colic flexure* to the *pelvic brim*, where it becomes continuous with **sigmoid colon**.
- **Peritoneum** covers the front and the sides of the descending colon.



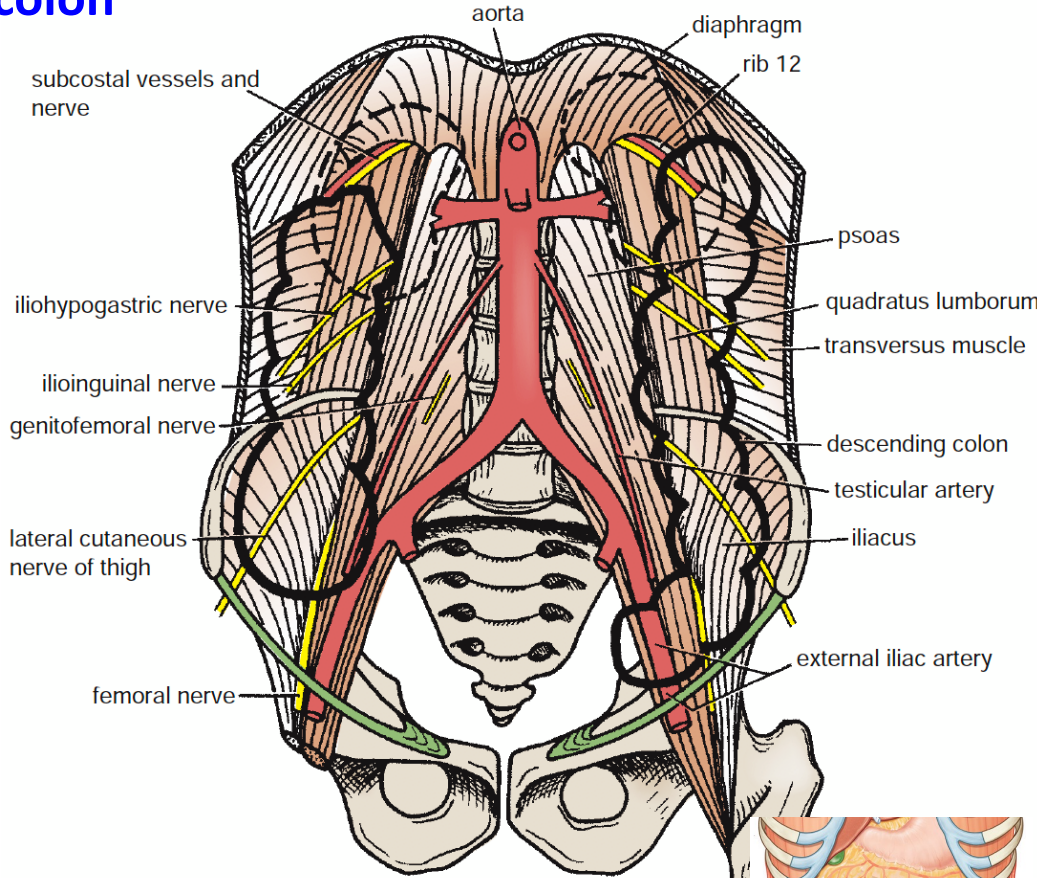
Relations of descending colon

Anterior:

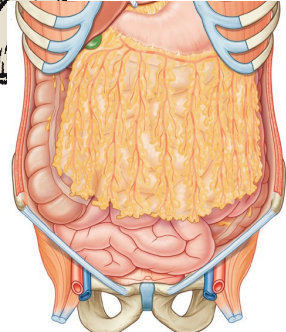
- Anterior Abd. Wall.
- Greater omentum
- Coils of small intestine

Posterior:

Iliacus, iliac crest, Lt psoas, quadratus lumborum, lateral boarder of Lt kidney, iliohypogastric and ilioinguinal nerve, femoral nerve and lateral cutaneous nerve of the thigh.

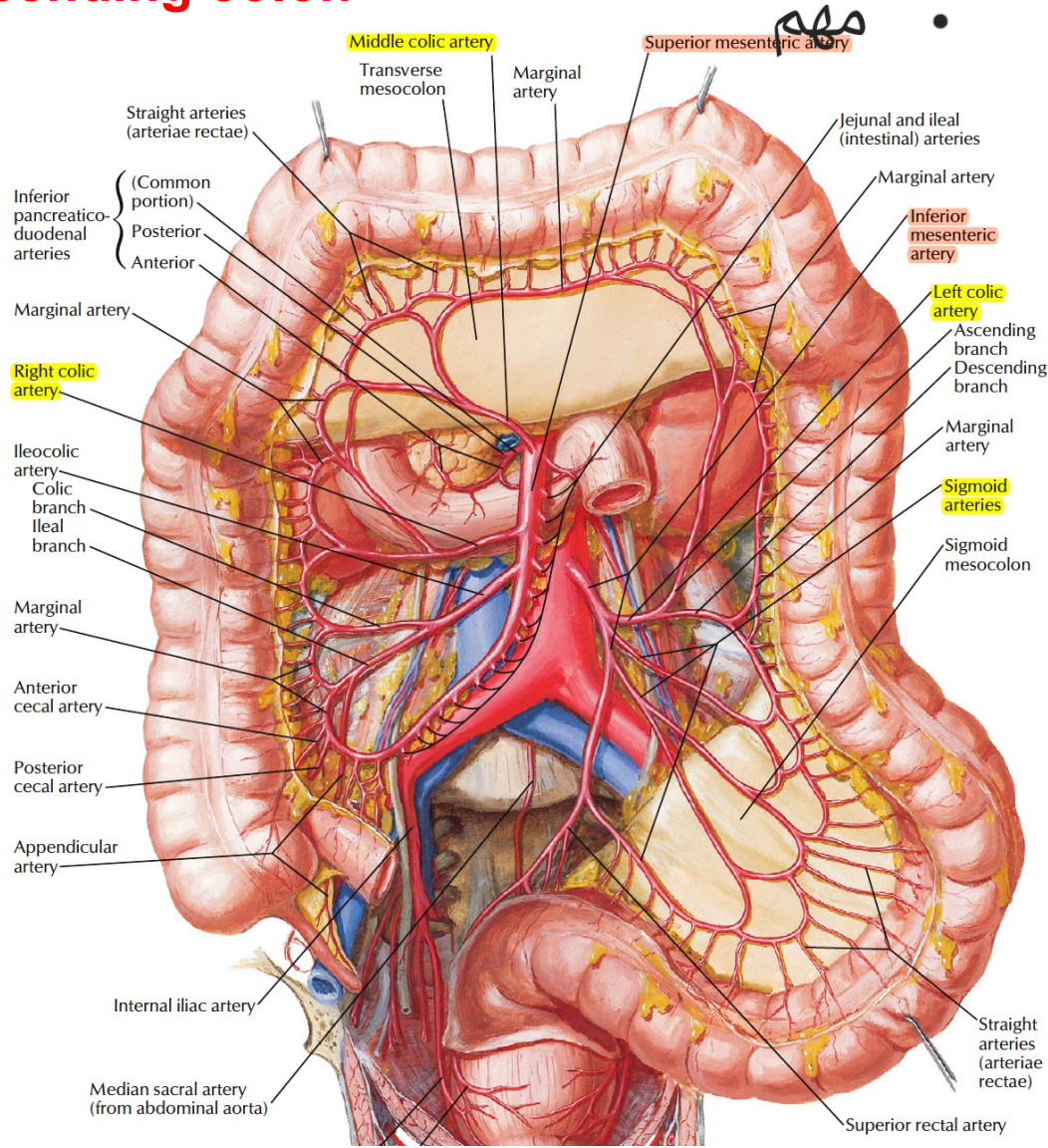


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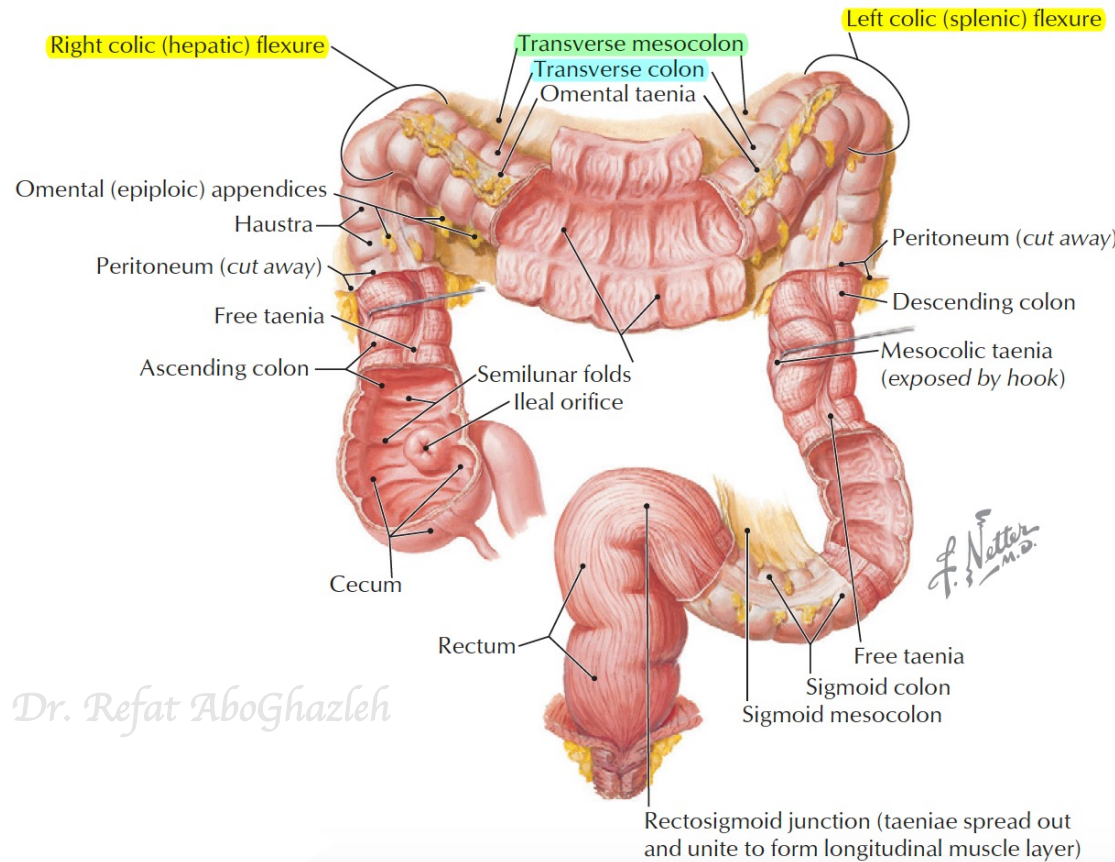


Blood supply of descending colon

Left colic and sigmoid branch of inferior mesenteric artery and vein.



Sigmoid Colon



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The final segment of the colon (the **sigmoid colon**) begins above the pelvic inlet and extends to the level of **vertebra SIII**, where it is continuous with the rectum.

This **S-shaped structure** is **quite mobile** except at its beginning, where it continues from the descending colon, and at its end, where it continues as the rectum. Between these points, it is suspended by the **sigmoid mesocolon**.

Relations of Sigmoid Colon

Laterally:

- left external iliac vessels
- obturator nerve
- ovary or vas deferens
- lateral pelvic wall

Posteriorly:

- left external and internal iliac
- gonadal vessels
- Ureter
- piriformis
- Sacral plexus

Anteroinferiorly:

- bladder in males,
or the uterus and bladder in females

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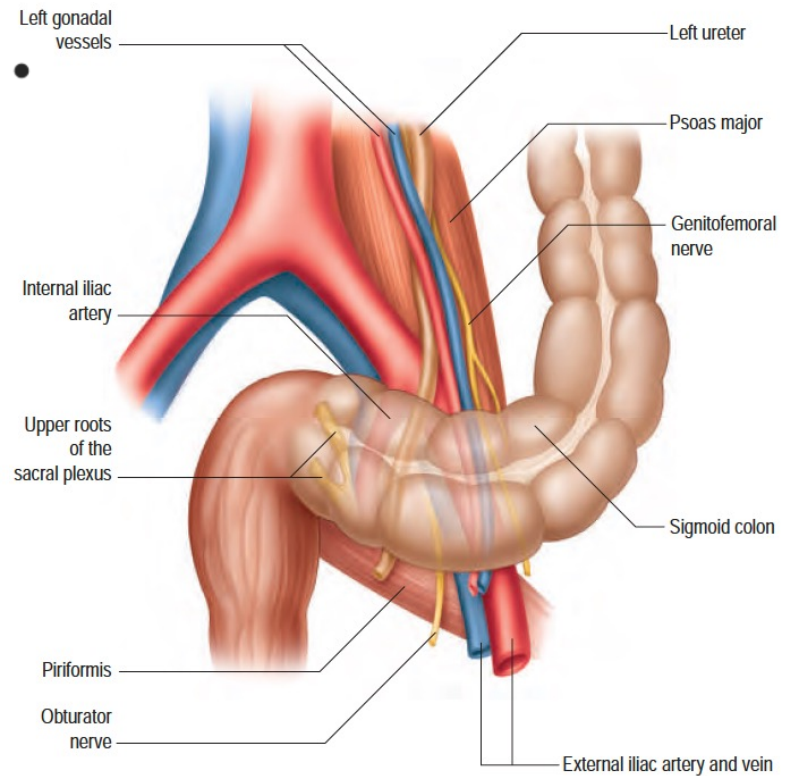


Fig. 66.28 Posterior relations of the sigmoid colon.

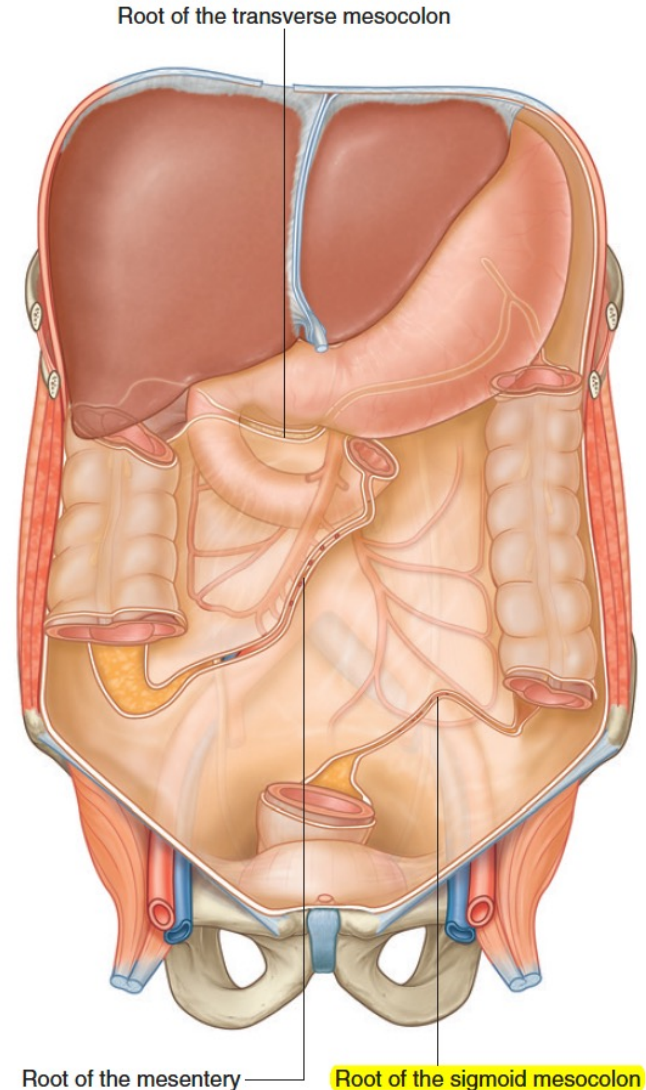
The **sigmoid mesocolon** is an inverted, V-shaped peritoneal fold that attaches the sigmoid colon to the abdominal wall.

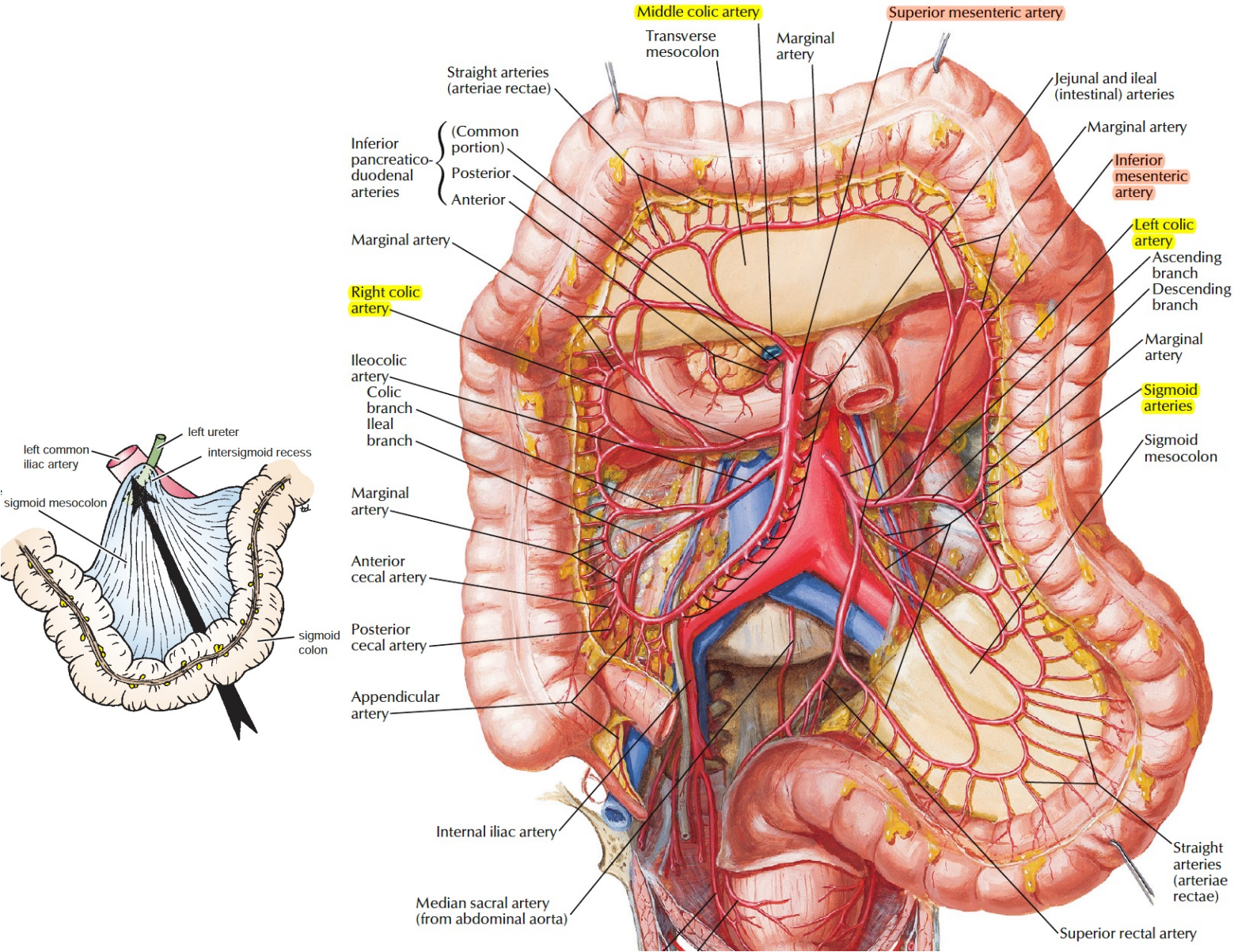
The **apex of the V** is near the division of the left common iliac artery into its internal and external branches, that crossed by ureter.

The **left limb** of the descending V along the medial border of the left psoas major muscle

right limb descending into the pelvis to end at the level of vertebra SIII.

The **sigmoid and superior rectal vessels**, along with the **nerves and lymphatics** associated with the sigmoid colon, pass through this peritoneal fold.





Middle colic artery

Superior mesenteric artery

Transverse mesocolon

Marginal artery

Straight arteries (arteriae rectae)

Jejunal and ileal (intestinal) arteries

Inferior pancreaticoduodenal arteries
 (Common portion)
 Posterior
 Anterior

Marginal artery

Inferior mesenteric artery

Marginal artery

Left colic artery

Right colic artery

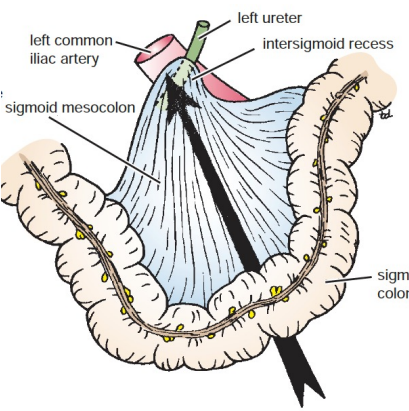
Ascending branch
 Descending branch

Ileocolic artery
 Colic branch
 Ileal branch

Marginal artery

Sigmoid arteries

Sigmoid mesocolon



Marginal artery

Anterior cecal artery

Posterior cecal artery

Appendicular artery

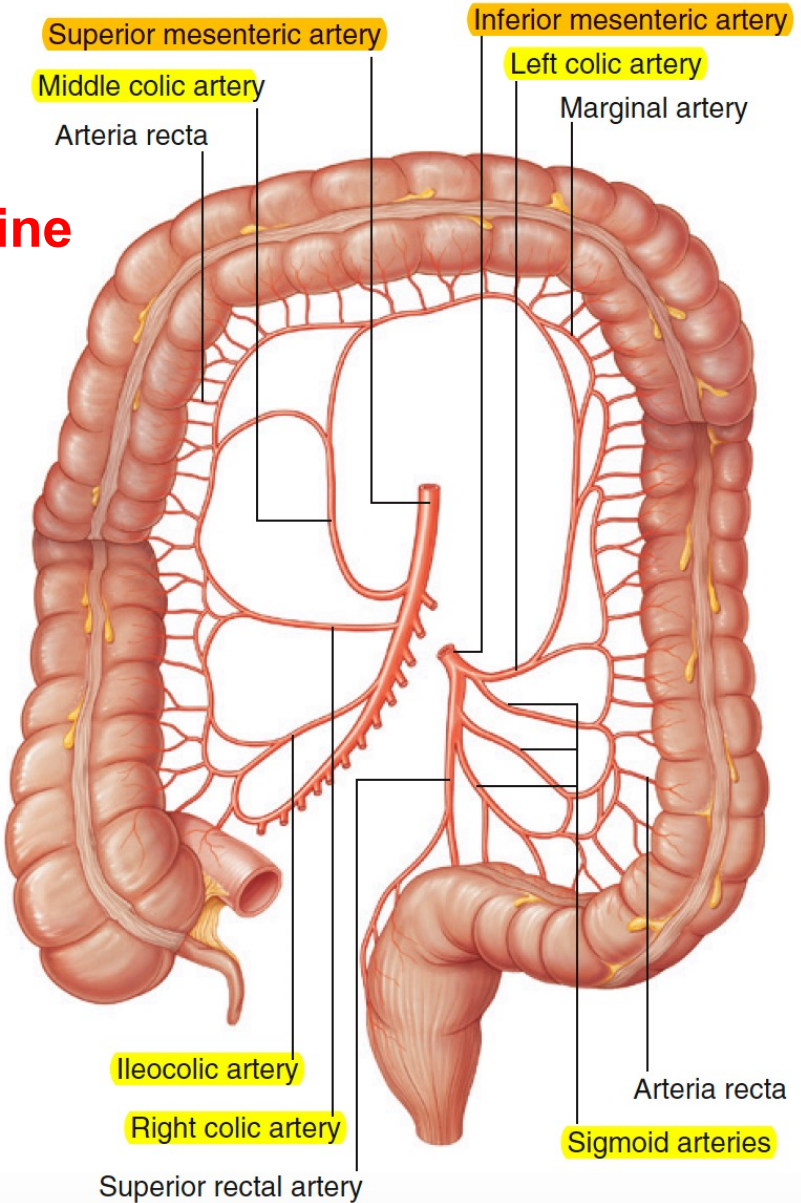
Internal iliac artery

Median sacral artery (from abdominal aorta)

Straight arteries (arteriae rectae)

Superior rectal artery

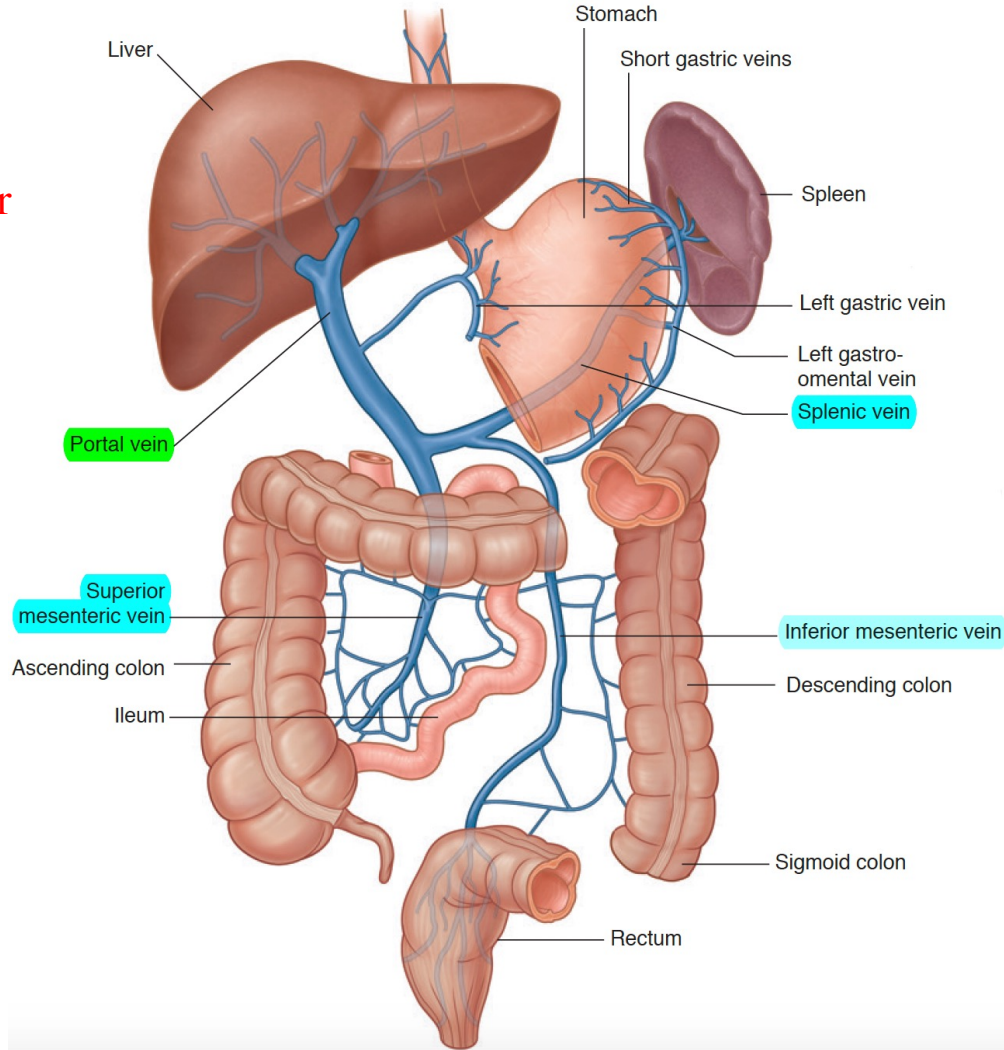
Arterial Supply of Large Intestine



Venous Drainage

Refat

Venous drainage of the **spleen, pancreas, gallbladder, and abdominal part of the gastrointestinal tract, except for the inferior part of the rectum**, is through the **portal system of veins**, which deliver blood from these structures **to the liver**.

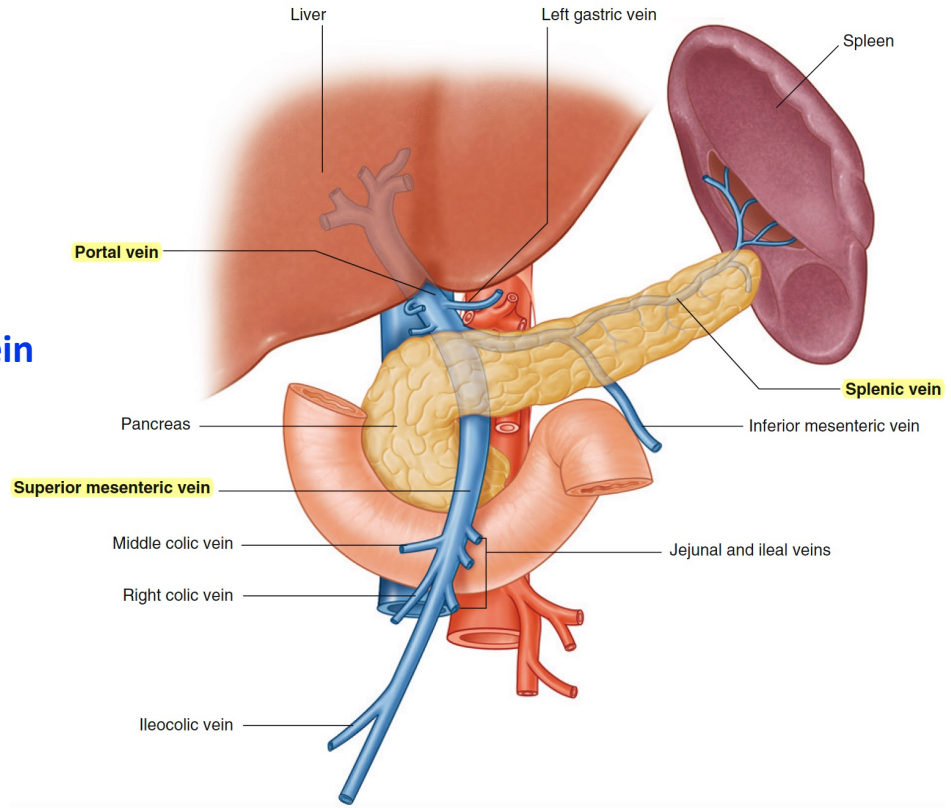


Portal vein

page •

- The **portal vein** is the final common pathway for the transport of venous blood from the **spleen, pancreas, gallbladder, and abdominal part of the gastrointestinal tract**.
- The **SMV ends** posterior to the neck of the pancreas, where it **unites with** the **splenic vein** to form the **portal vein**.

Remember that **Inferior mesenteric vein** joins the **splenic vein**.



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Tributaries to the portal vein include:

RFQ •

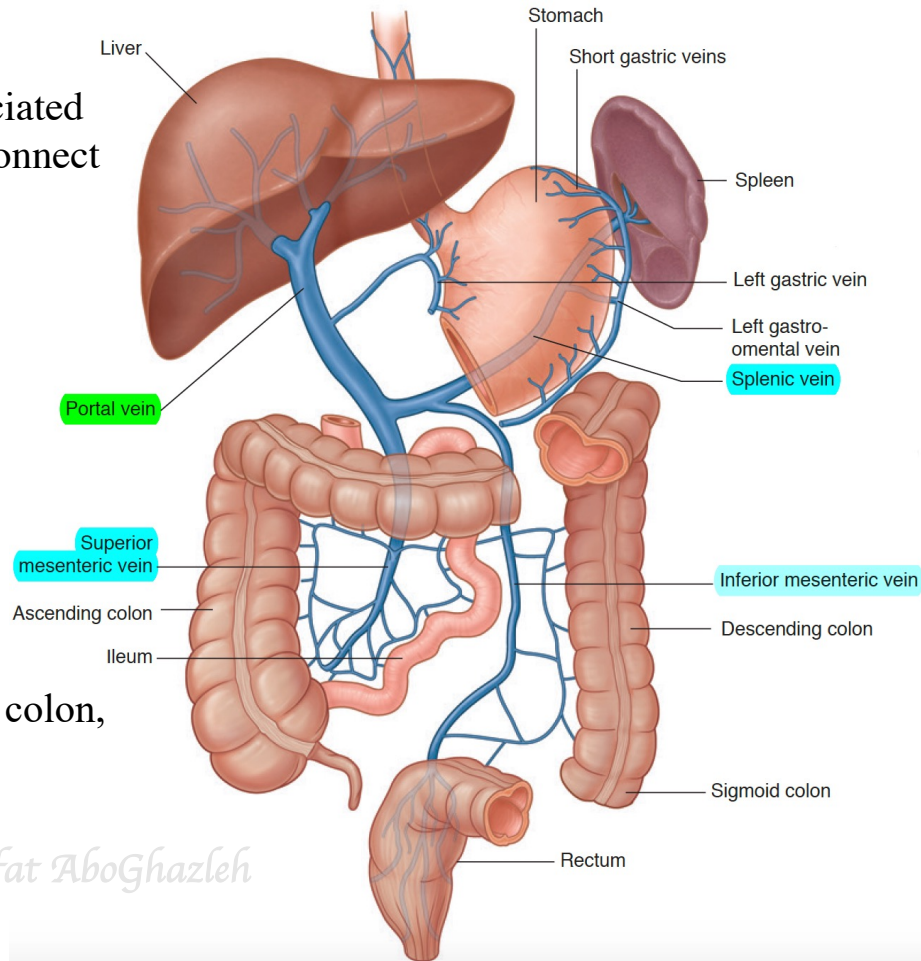
- **Right** and **left gastric veins** draining the lesser curvature of the stomach and abdominal esophagus,
- **Cystic veins** from the gallbladder, and
- **Para-umbilical veins**, which are associated with the obliterated umbilical vein and connect to veins on the anterior abdominal wall.

Superior mesenteric vein

It drains blood from the **small intestine, cecum, ascending colon, and transverse colon.**

Inferior mesenteric vein

It drains blood from the rectum, sigmoid colon, and **splenic flexure**

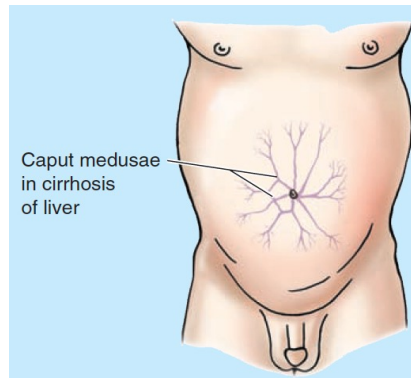


Caput medusae

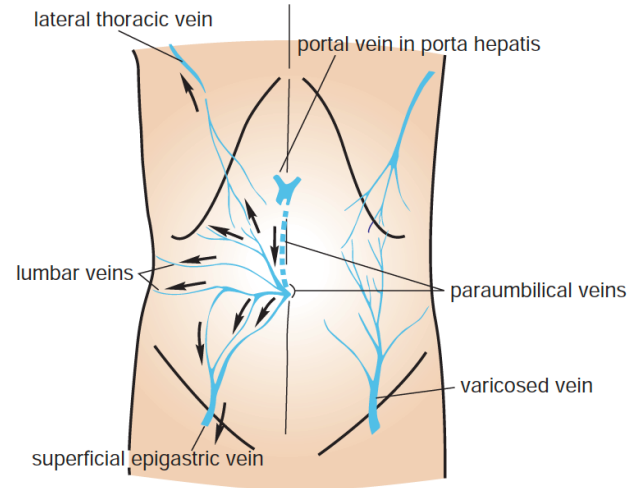
Portal Vein Obstruction

In severe cases of **portal obstruction**, the **veins of the anterior abdominal wall** (normally **caval tributaries**) that anastomose with the **paraumbilical veins** (normally **portal tributaries**) may become **varicose** and look somewhat like small snakes radiating under the skin around the umbilicus.

This condition is referred to as **caput medusae**, a character in Greek mythology.



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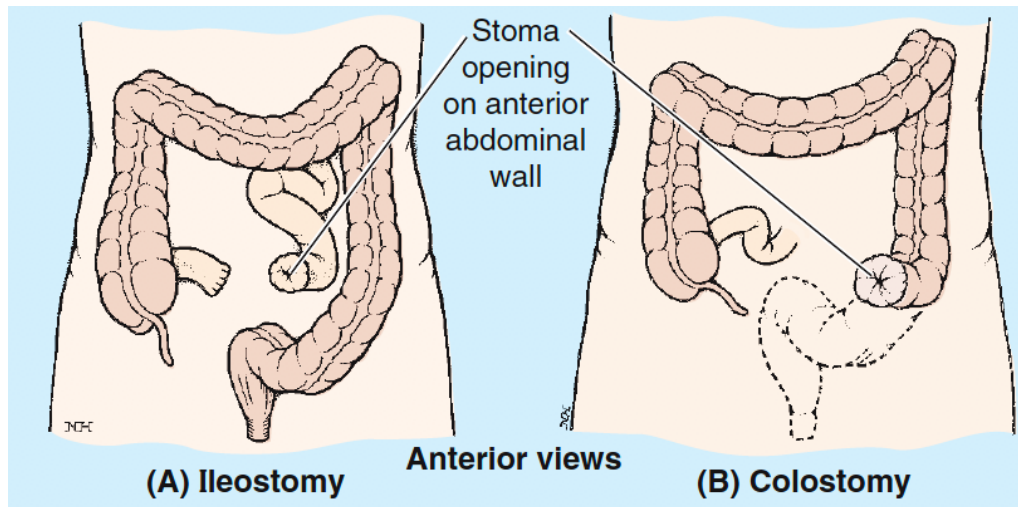


Colostomy

In many circumstances it is performed to protect the distal large bowel after surgery. A further indication would include large bowel obstruction with imminent perforation wherein a colostomy allows decompression of the bowel and its contents.

An end colostomy is necessary when the patient has undergone a surgical resection of the rectum and anus (typically for cancer).

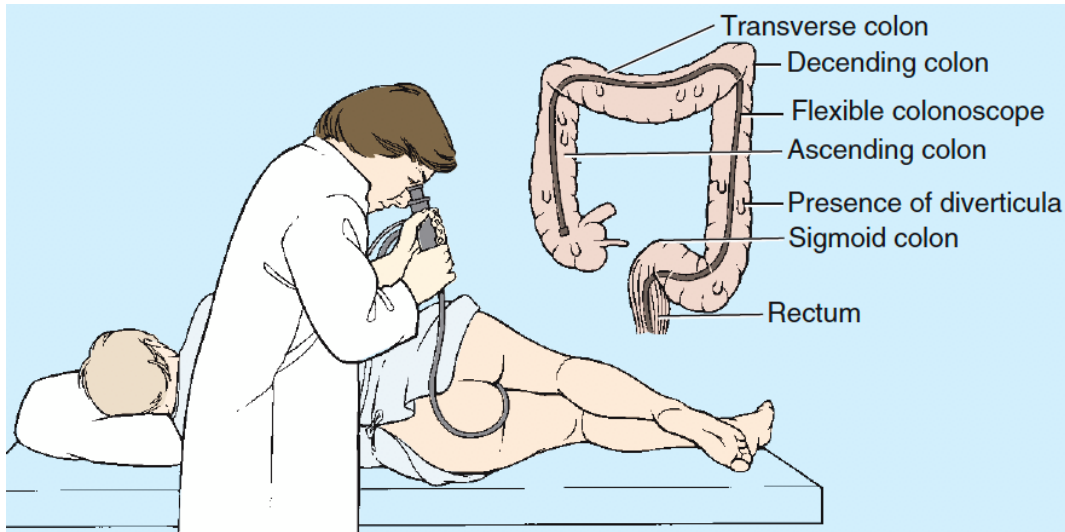
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Colonoscopy

The interior of the colon can be observed and photographed in a procedure called colonoscopy or coloscopy, using a long, flexible fiberoptic endoscope (colonoscope) inserted into the colon through the anus and rectum.

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Thank You



YouTube

References

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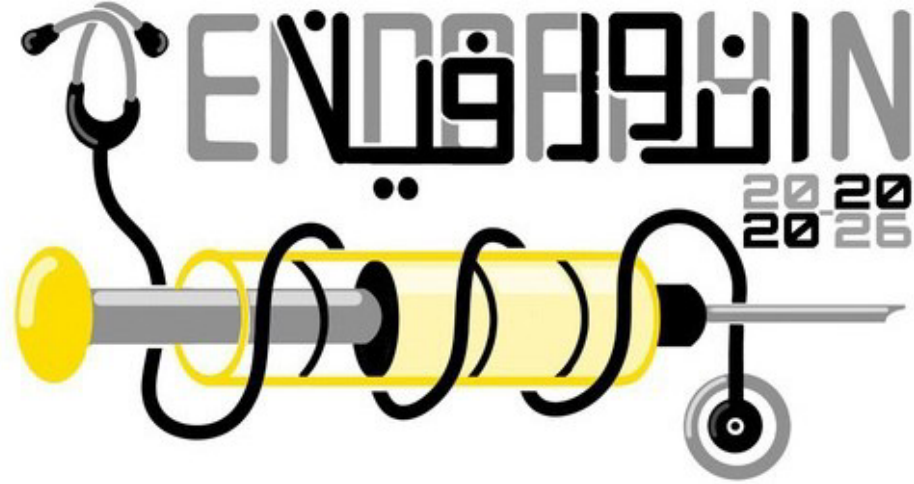
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