

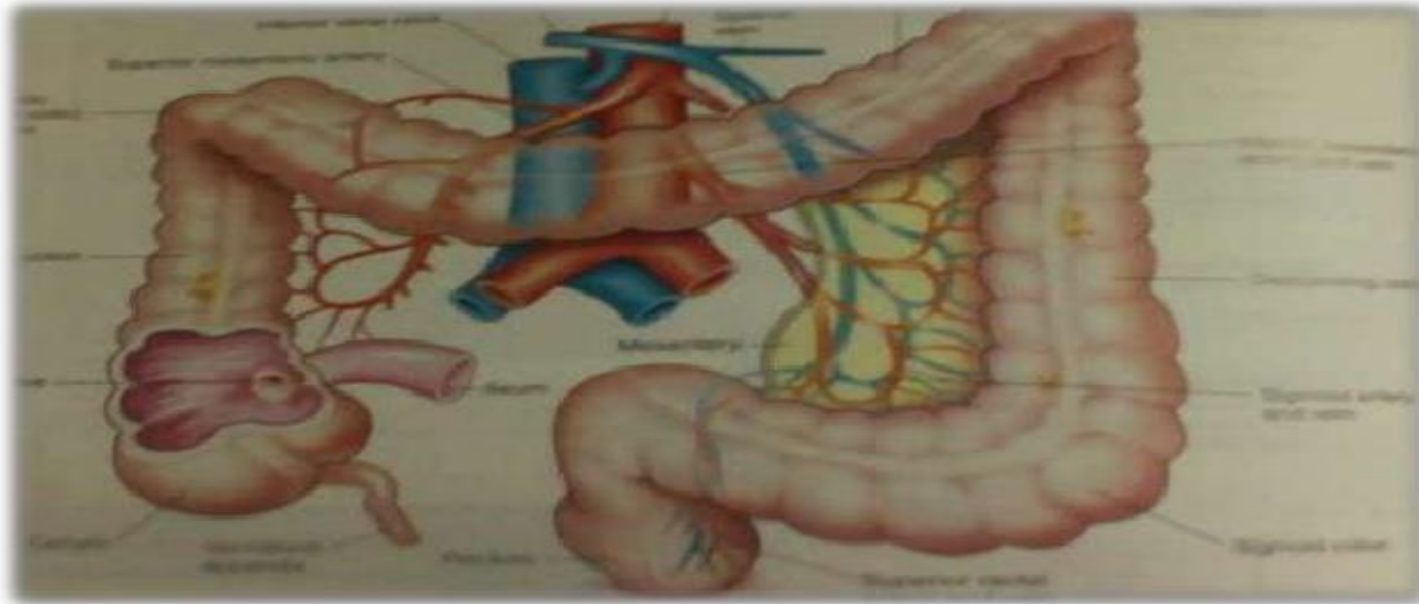
ANATOMY OF APPENDIX

By Dr. Mahvish Javed

INTRODUCTION

The term “vermiform” comes from latin word and means “worm shaped”.

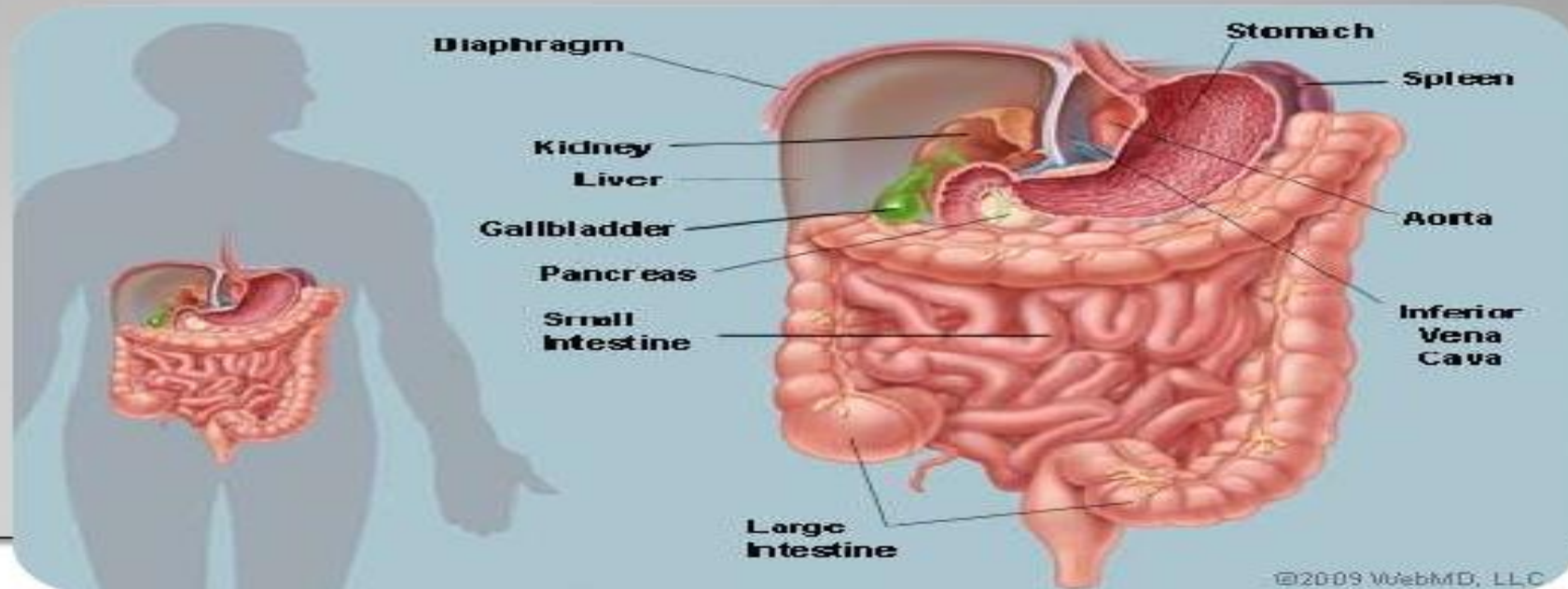
The vermiform appendix is a blind ended tube connected to the cecum from which is develops embryologically.



- It is a blind-ended muscular tube attached to the posteromedial wall of caecum, about 2cm below ileocaecal jxn.
- Suspended by peritoneal fold, MESOAPPENDIX.
- Devoid of taenia coli, sacculations, appendices epiploicae.

DEFINITION

Vermiform appendix is a vestigial organ. A tubular structure of about 8cm with a lumen attached the cecum.



VESTIGIALITY

A vestigial structure is a structure that has lost all or most of its original function through the process of evolution. The main function of appendix is to digest cellulose with the help of mutualistic bacteria. As the human appendix no longer houses a significant amount of these bacteria and humans are no longer capable of digesting more than a minimal amount of cellulose per day. Thus human appendix is considered as a vestigial organ.

SIZE AND LOCATION

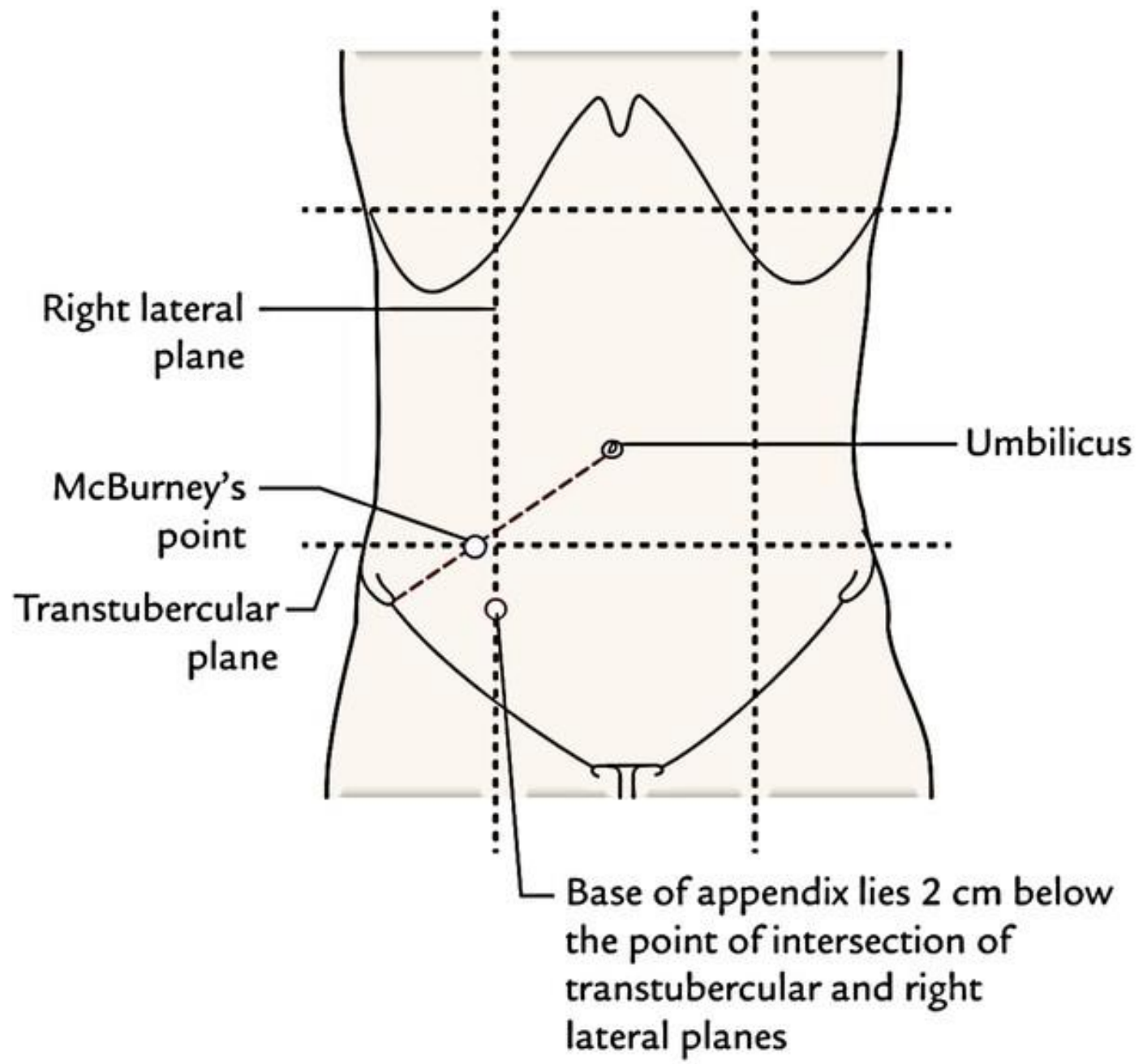
- The appendix averages 11 cm in length but can range from 2 -20 cm.*
- The diameter of appendix is usually between 7 and 8 mm.*

Fig. 1a. The Appendix.

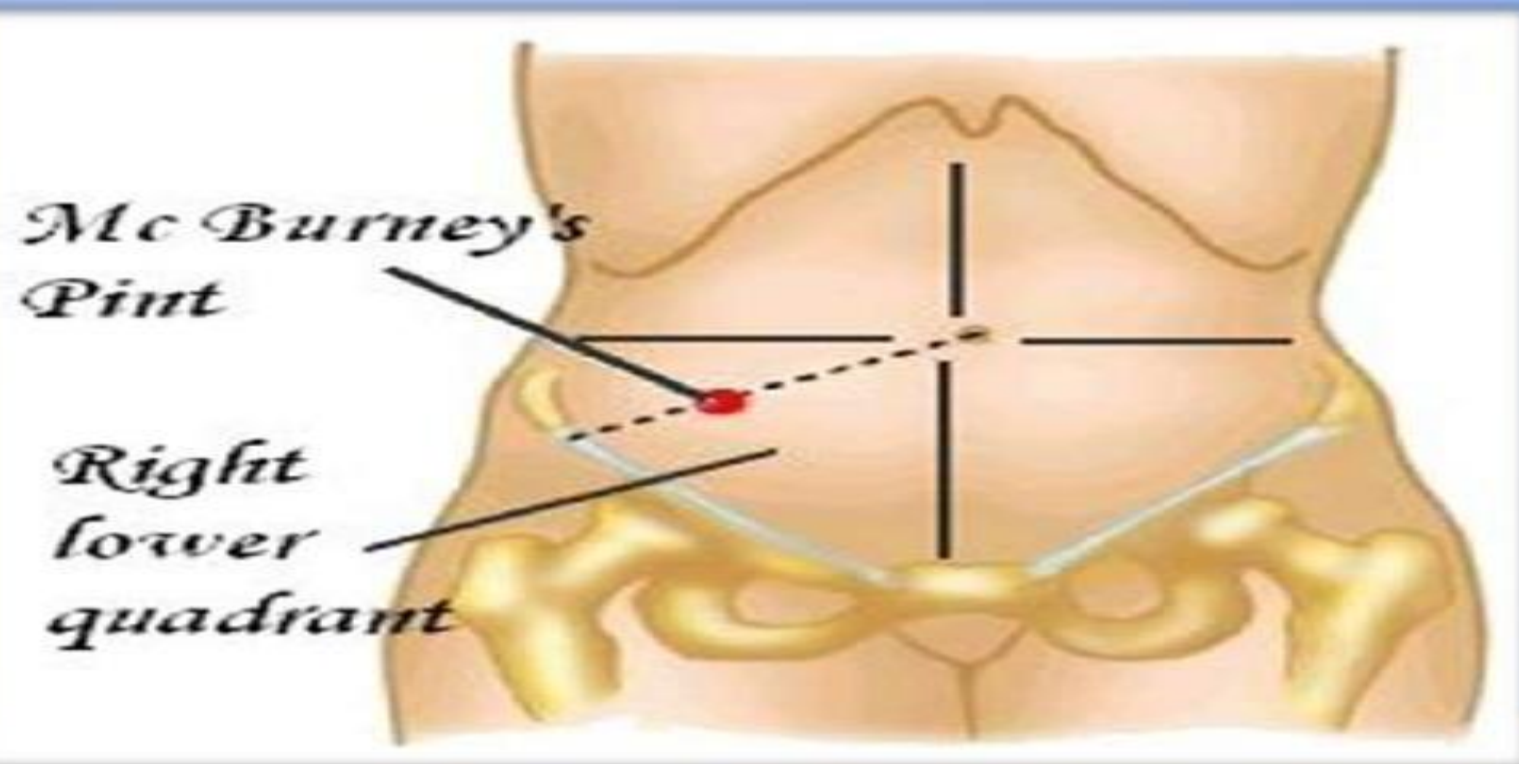


McBurney's point

- Represented by a point at the junction of medial two third and lateral one third of a line which extends from the umbilicus to rt ant. Sup.iliac spine.
- This point indicate maximum tenderness in a patient suffering from inflammation of the appendix.

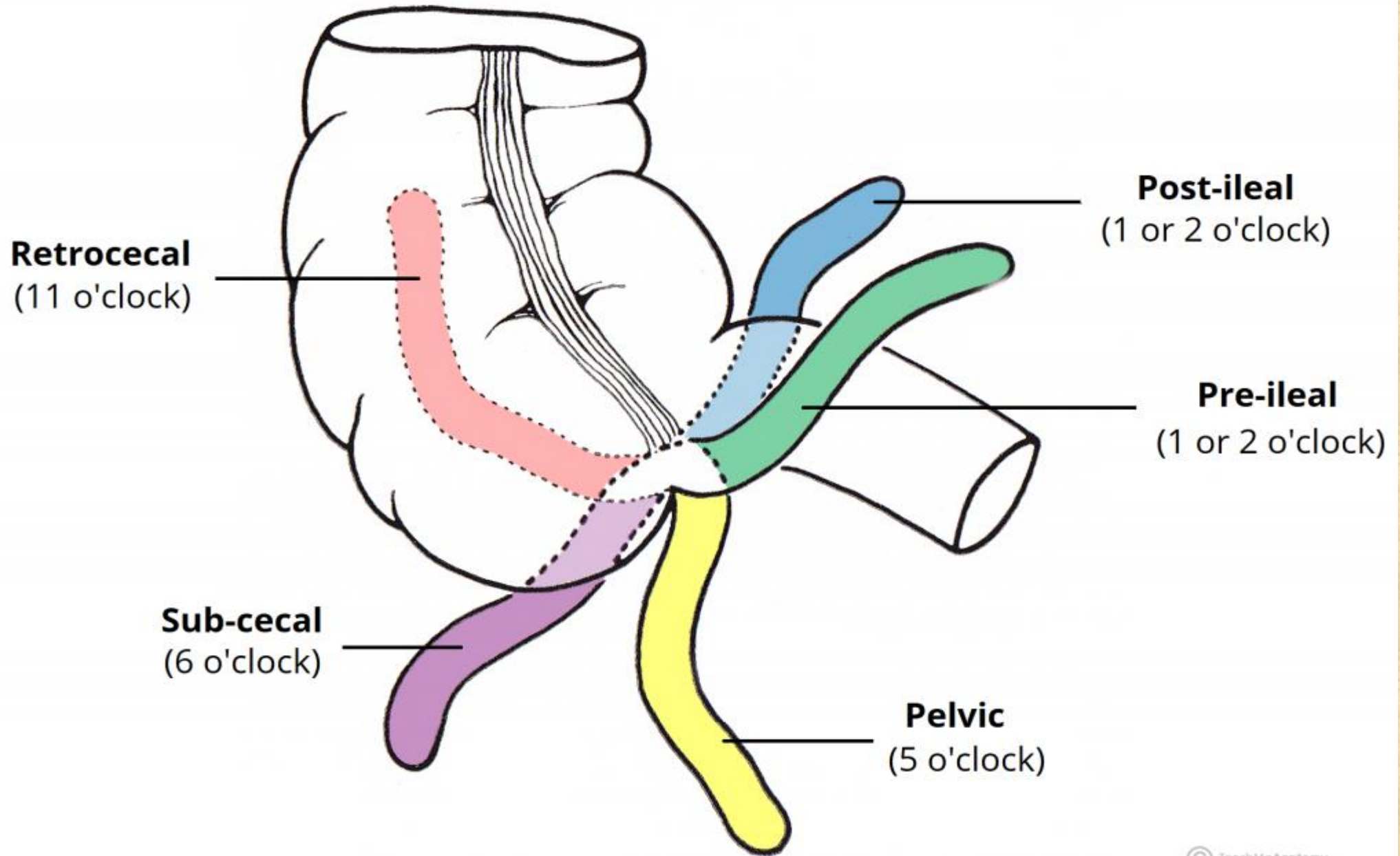


*Appendix position within the abdomen corresponds to a point on the surface known as **Mc Burney's point**.*



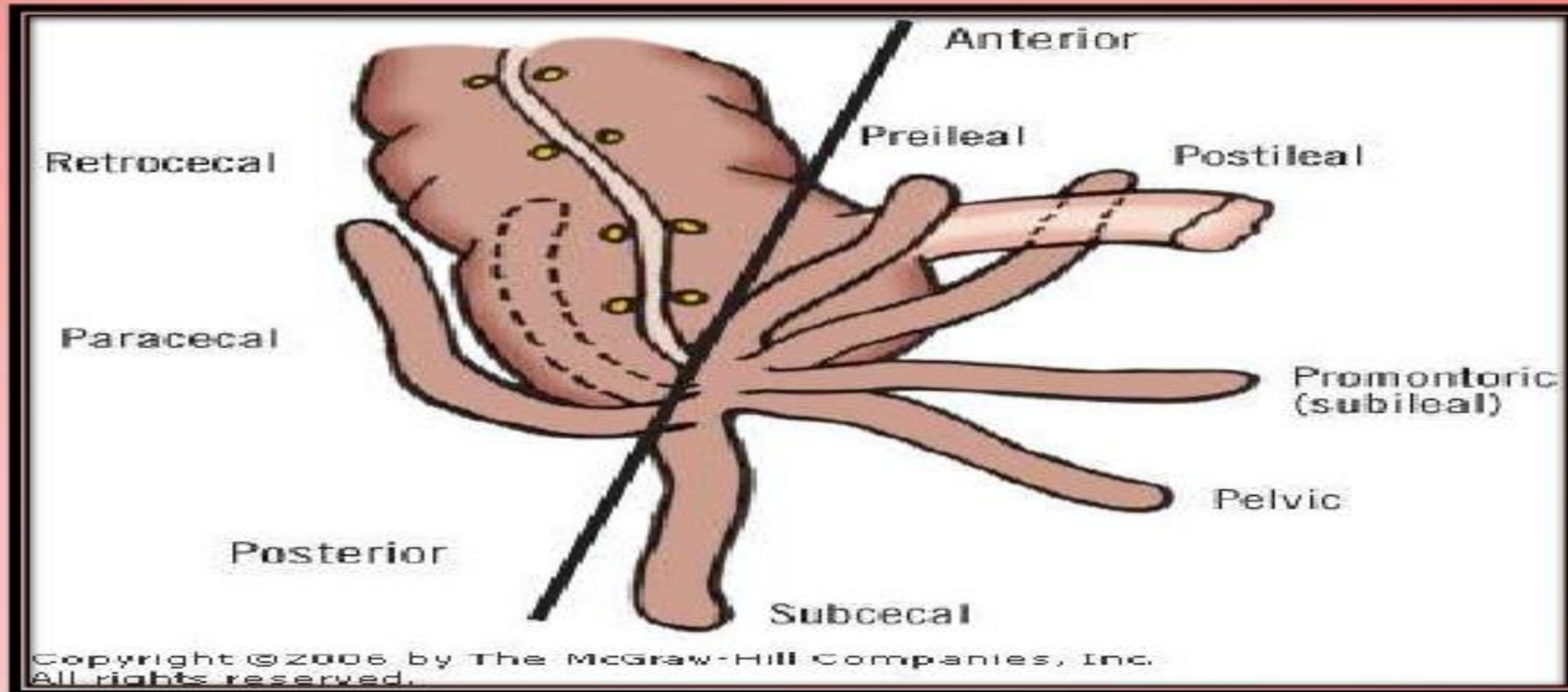
ANATOMICAL STRUCTURE AND RELATIONS

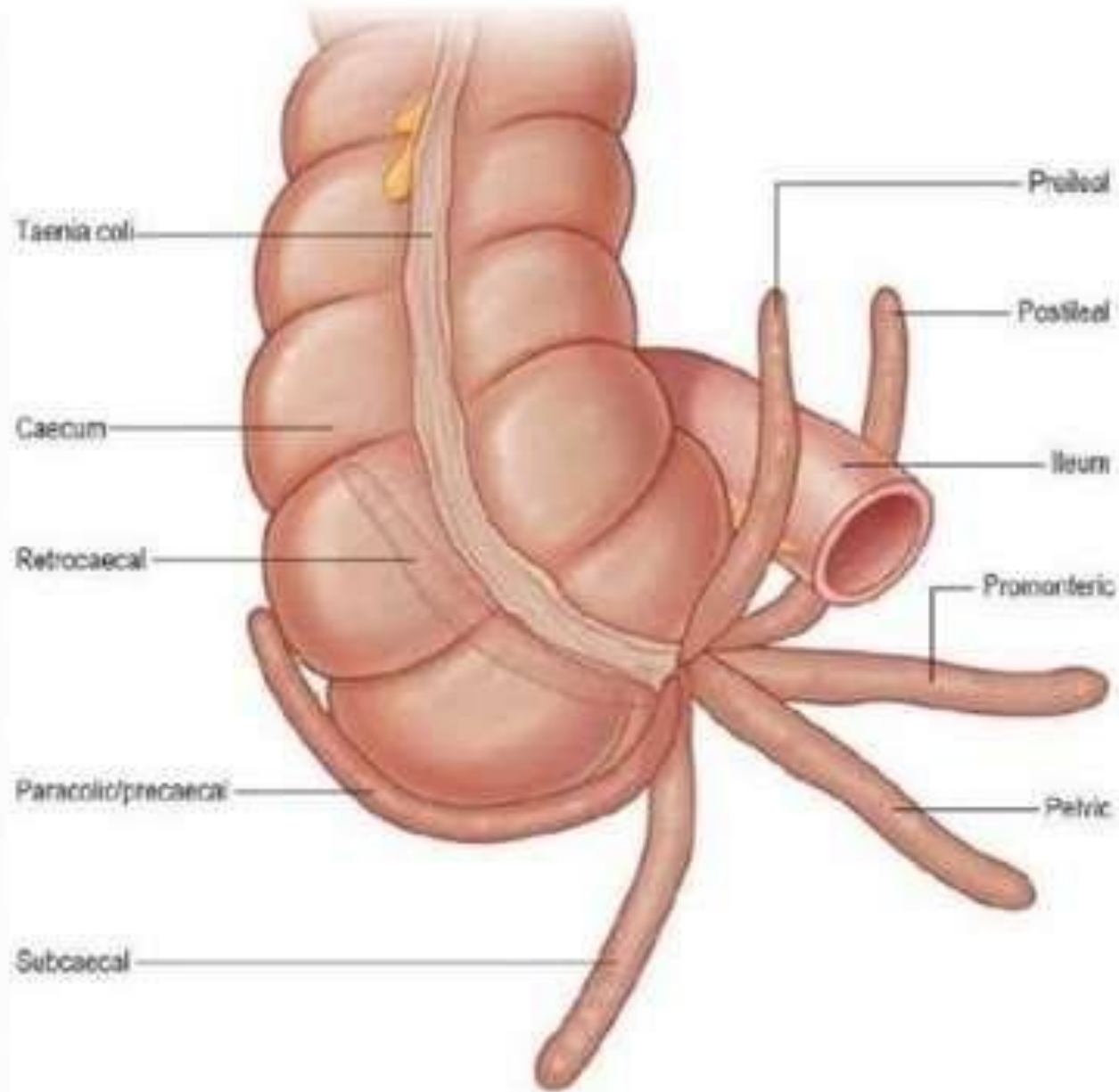
- The **appendix** originates from the posteromedial aspect of the [cecum](#). It is supported by the mesoappendix, a fold of mesentery which suspends the appendix from the terminal ileum.
- The position of the free-end of the appendix is highly variable and can be categorised into seven main locations depending on its relationship to the ileum, caecum or pelvis. The most common position is **retrocecal**. They may also be remembered by their relationship to a clock face:
 - **Pre-ileal** – anterior to the terminal ileum – 1 or 2 o'clock.
 - **Post-ileal** – posterior to the terminal ileum – 1 or 2 o'clock.
 - **Sub-ileal** – parallel with the terminal ileum – 3 o'clock.
 - **Pelvic** – descending over the pelvic brim – 5 o'clock.
 - **Subcecal** – below the cecum – 6 o'clock.
 - **Paracecal** – alongside the lateral border of the cecum – 10 o'clock.
 - **Retrocecal** – behind the cecum – 11 o'clock.



THE COMMON POSITIONS OF THE APPENDIX. THE MOST COMMON POSITION IS RETROCECAL

- *The location of the tip of the appendix can vary.*





**Variasi anatomi
posisi appendix:**

- (1) Preileal
- (2) Postileal
- (3) Promontoric
- (4) Pelvic
- (5) Subcecal
- (6) Paracolic or Prececal
- (7) Retrocaecal or Retrocolic (paling sering)

*Gray's anatomy ed
40th*

PARTS OF APPENDIX

- A) Base
- B) Body
- c) Tip

BASE

- Base – it is attached to posteromedial wall of caecum about 2 m below the ileocaecal junction.
- All taenia of caecum converge to the base and serve as a guide for the identification of the appendix.


BODY

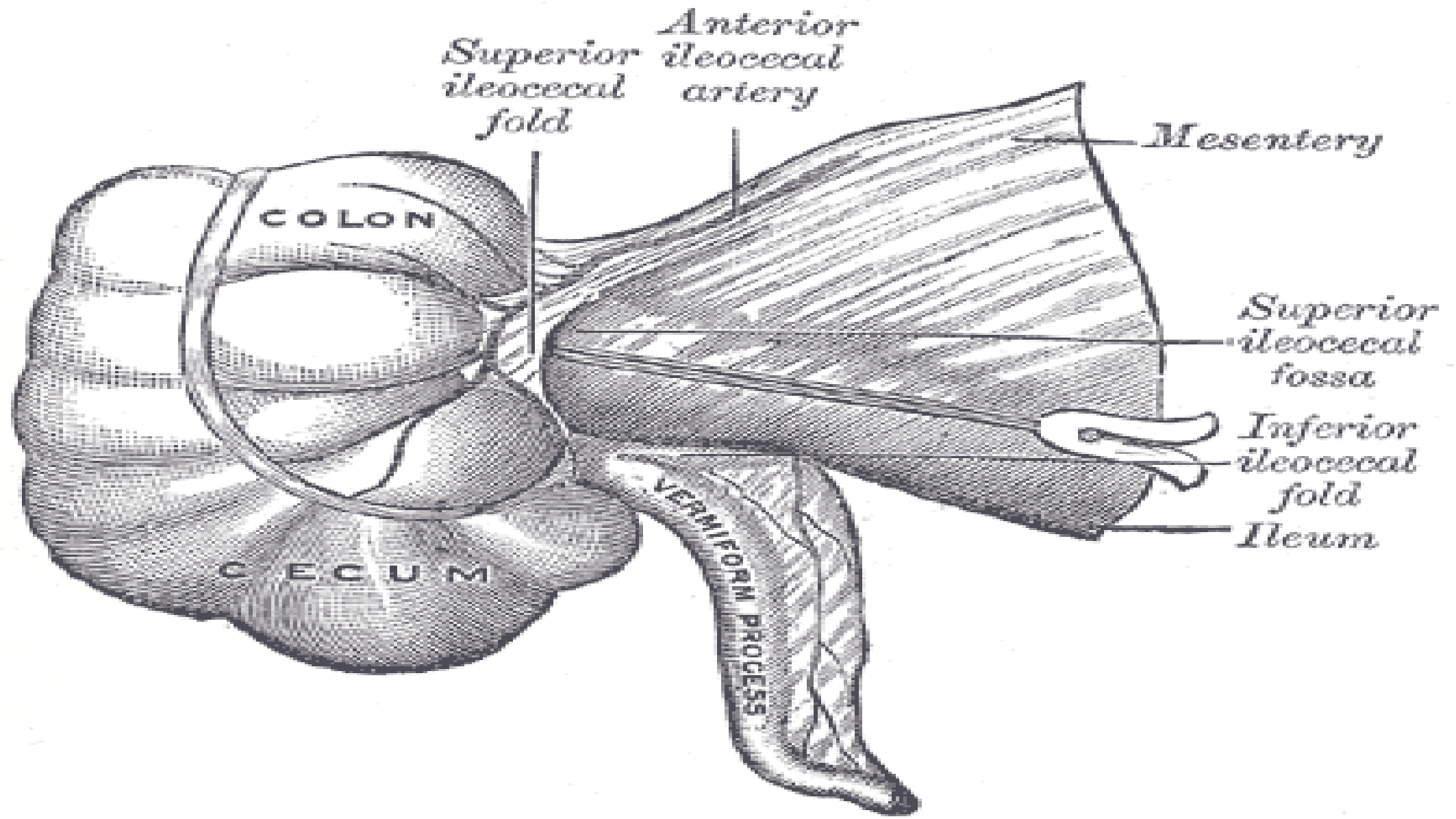
- Body is narrow,tubular and contains a canal which opens into the caecum.
- The caecal opening is guarded by an incomplete mucous fold called as,"THE VALVE OF GERLACH"

TIP

- It is least vascular and is directed in various direction.

FEATURES

- Found at the point where the taniae coli converge on the postero medial wall of caecum.
 - It opens into the caecum at one end and the other end is blind.
 - Mesoappendix :-a peritoneal fold enclosing the appendicular vessels.
 - It is the prolongation of the mesentry of the terminal ileum.
 - The tip of the appendix lies at the level of the brim of the pelvis.
- 

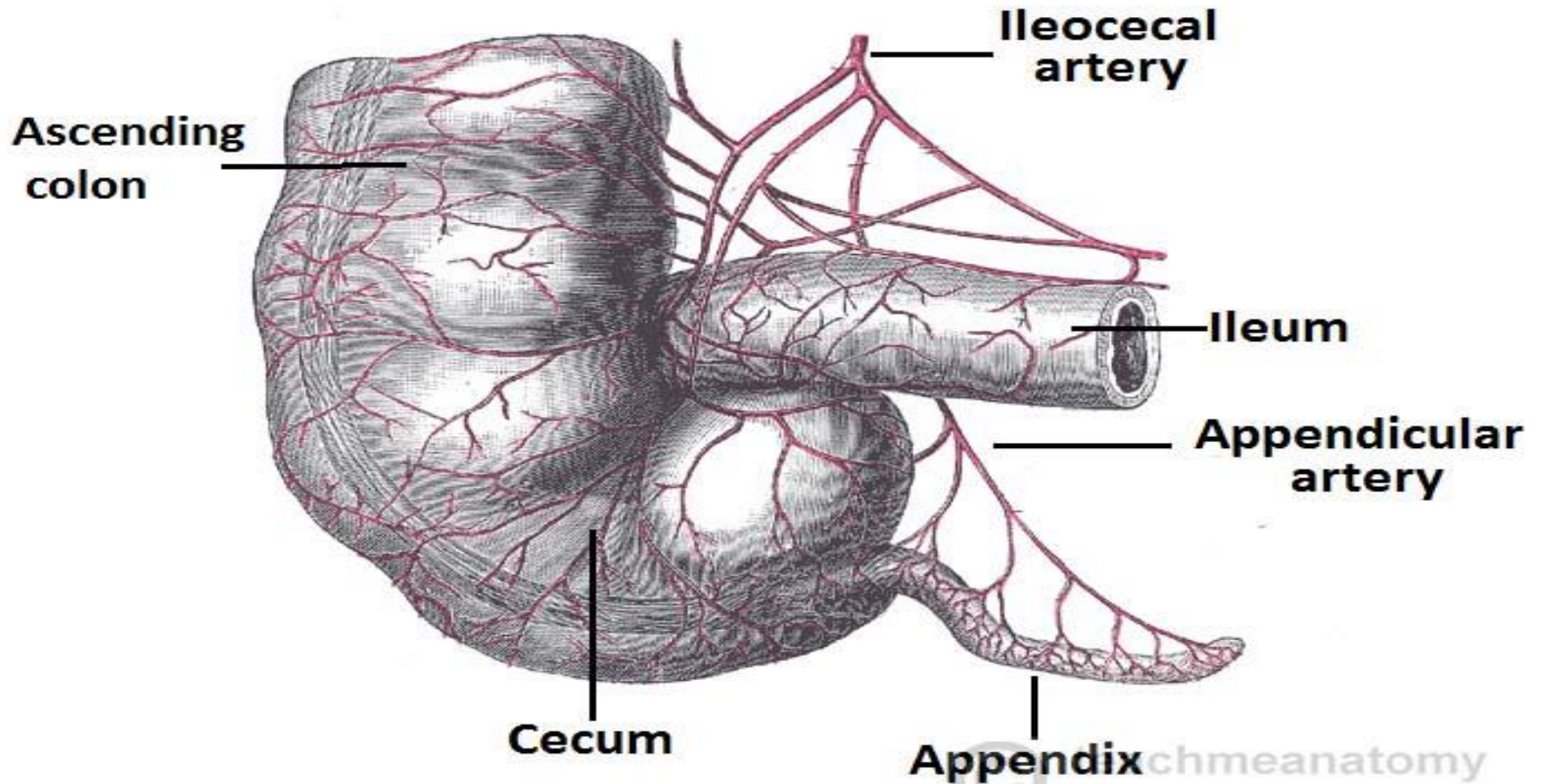


BLOOD SUPPLY

- Appendicular A br. Of inferior div of ileocolic art
- Recurrent br supplies base of appendix and anastomose with posterior caecal artery.
- End artery


NEUROVASCULAR SUPPLY

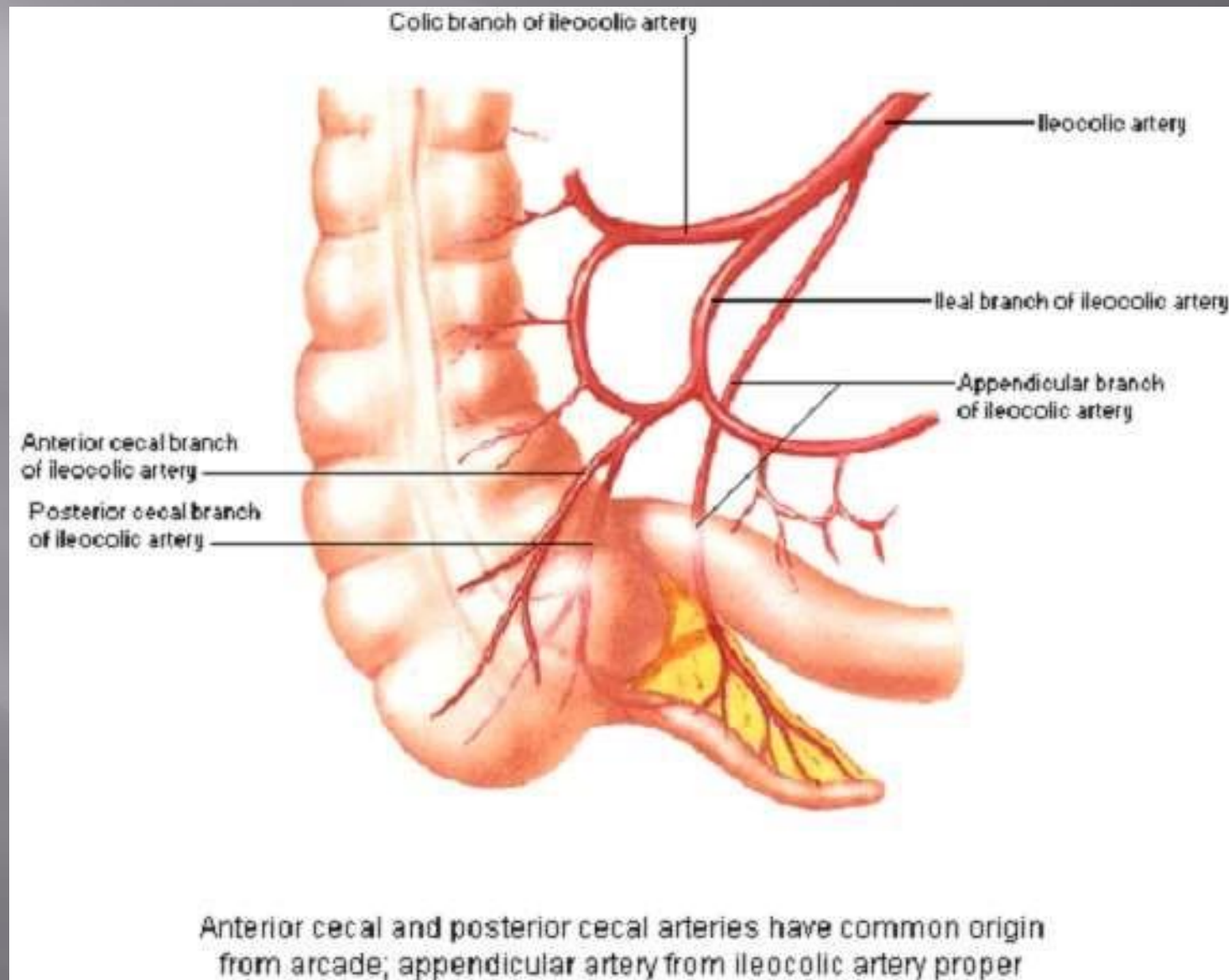
- The appendix is derived from the embryologic **midgut**. Therefore, the vascular supply is via branches of the superior mesenteric vessels.
- Arterial supply is from the **appendicular artery** (derived from the ileocolic artery, a branch of the [superior mesenteric artery](#)) and venous drainage is via the corresponding appendicular vein. Both are contained within the mesoappendix.
- Sympathetic and parasympathetic branches of the autonomic nervous system innervate the appendix. This is achieved by the ileocolic branch of the **superior mesenteric plexus**. It accompanies the ileocolic artery to reach the appendix.
- *Note: Of clinical relevance, the sympathetic afferent fibres of the appendix arise from T10 of the spinal cord – thus explaining why the visceral pain of early appendicitis is felt centrally within the abdomen.*

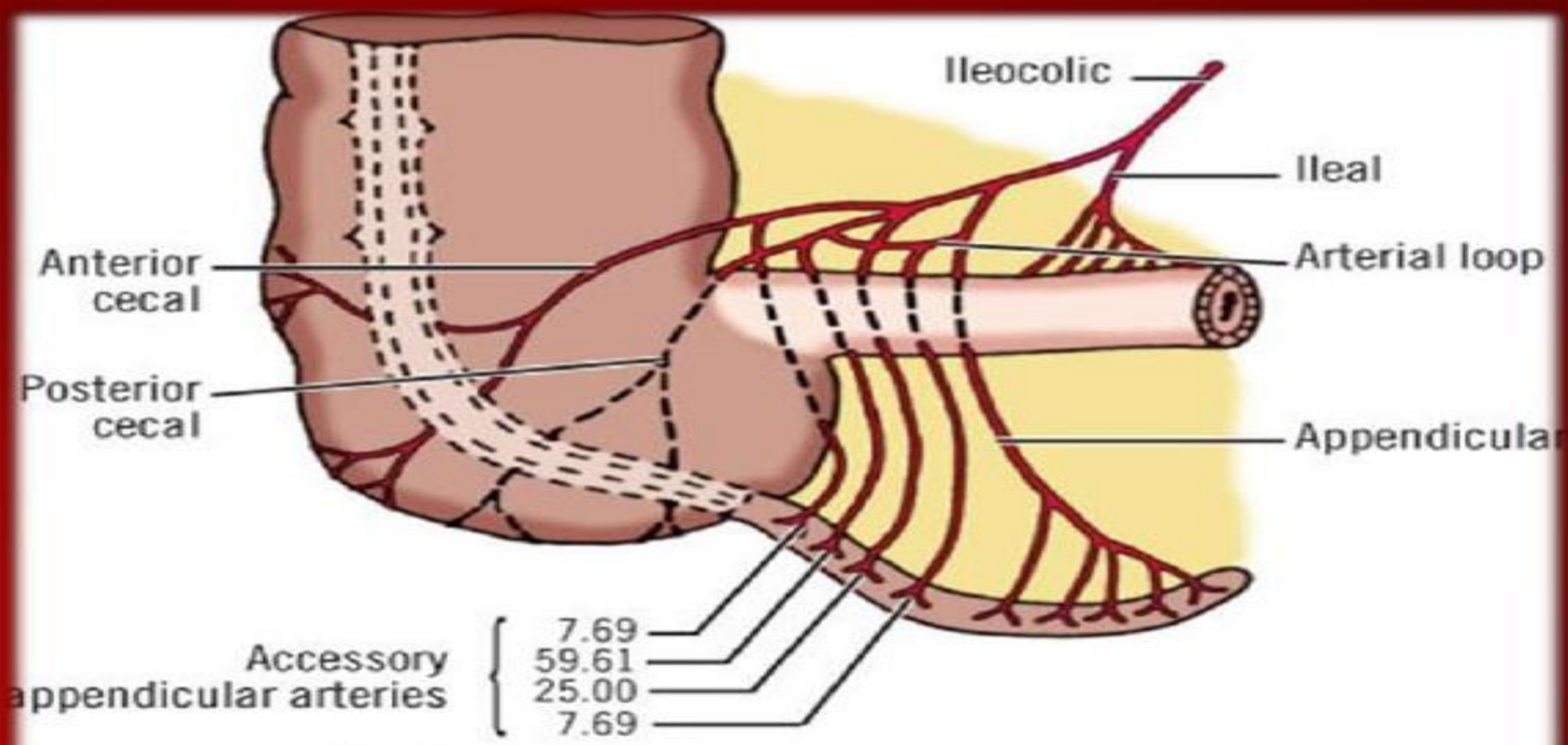


**ARTERIAL SUPPLY TO THE CECUM AND APPENDIX
VIA THE ILEOCECAL ARTERY.**

BLOOD SUPPLY TO THE APPENDIX

- The arterial supply of the appendix is by means of the appendicular artery, inferior branch of the ileocecal artery of the superior mesenteric trunk.
 - The appendicular vein, branch of ileocecal vein, drains appendiceal venous network into the superior mesenteric vein and eventually into the portal circulation.
- 



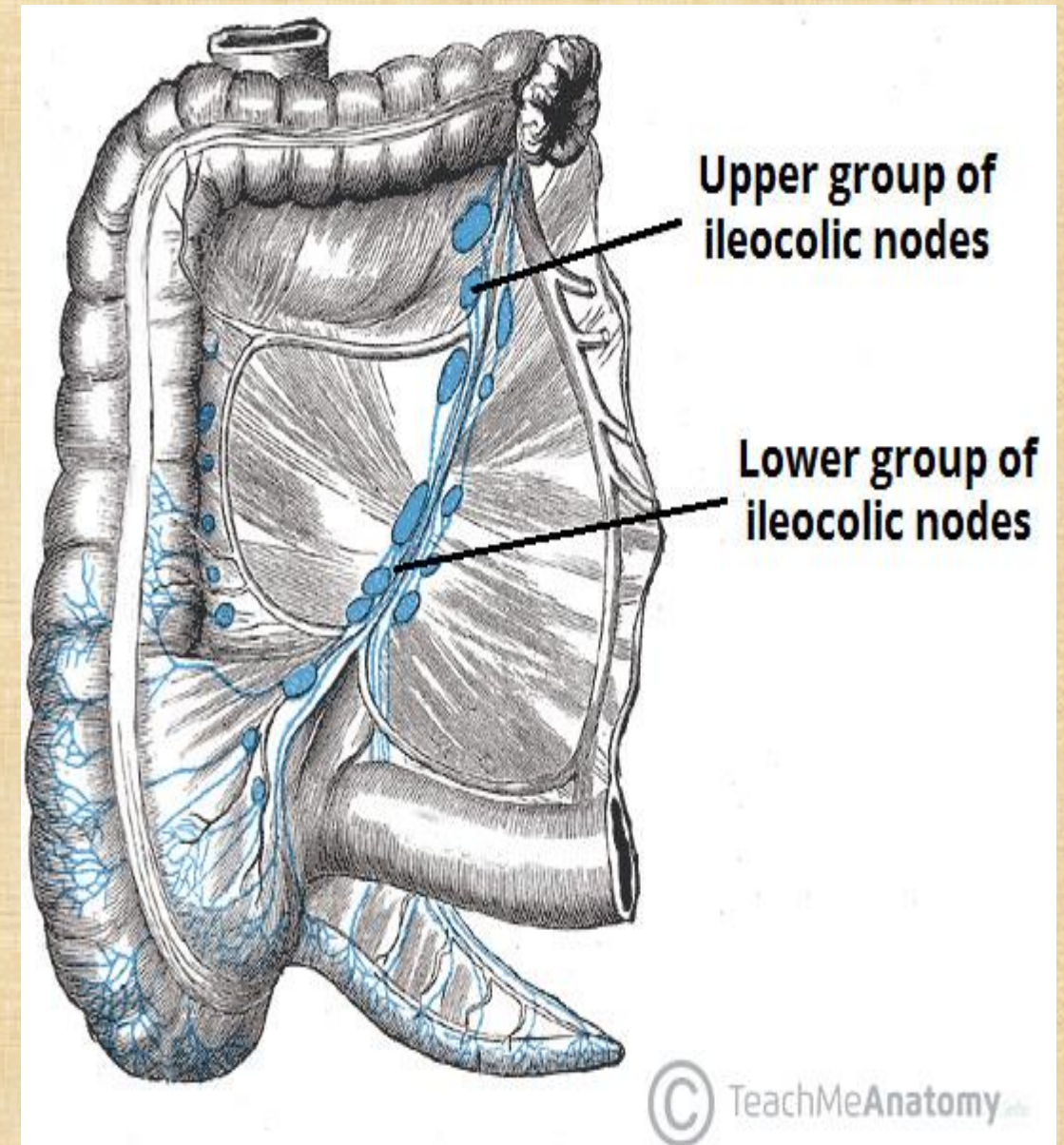


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LYMPHATIC DRAINAGE

- Lymphatic fluid from the appendix drains into lymph nodes within the mesoappendix and into the **ileocolic lymph nodes** (which surround the ileocolic artery).



Lymphatic drainage of the cecum and appendix.

KEY FACTS ABOUT THE CECUM AND APPENDIX

CECUM

Clinical variations: mobile, free, fixed cecum

Histology: mucosa (columnar epithelium), submucosa, muscularis, serosa

Blood supply: cecal arteries and veins

Innervation: superior mesenteric plexus and vagus nerve

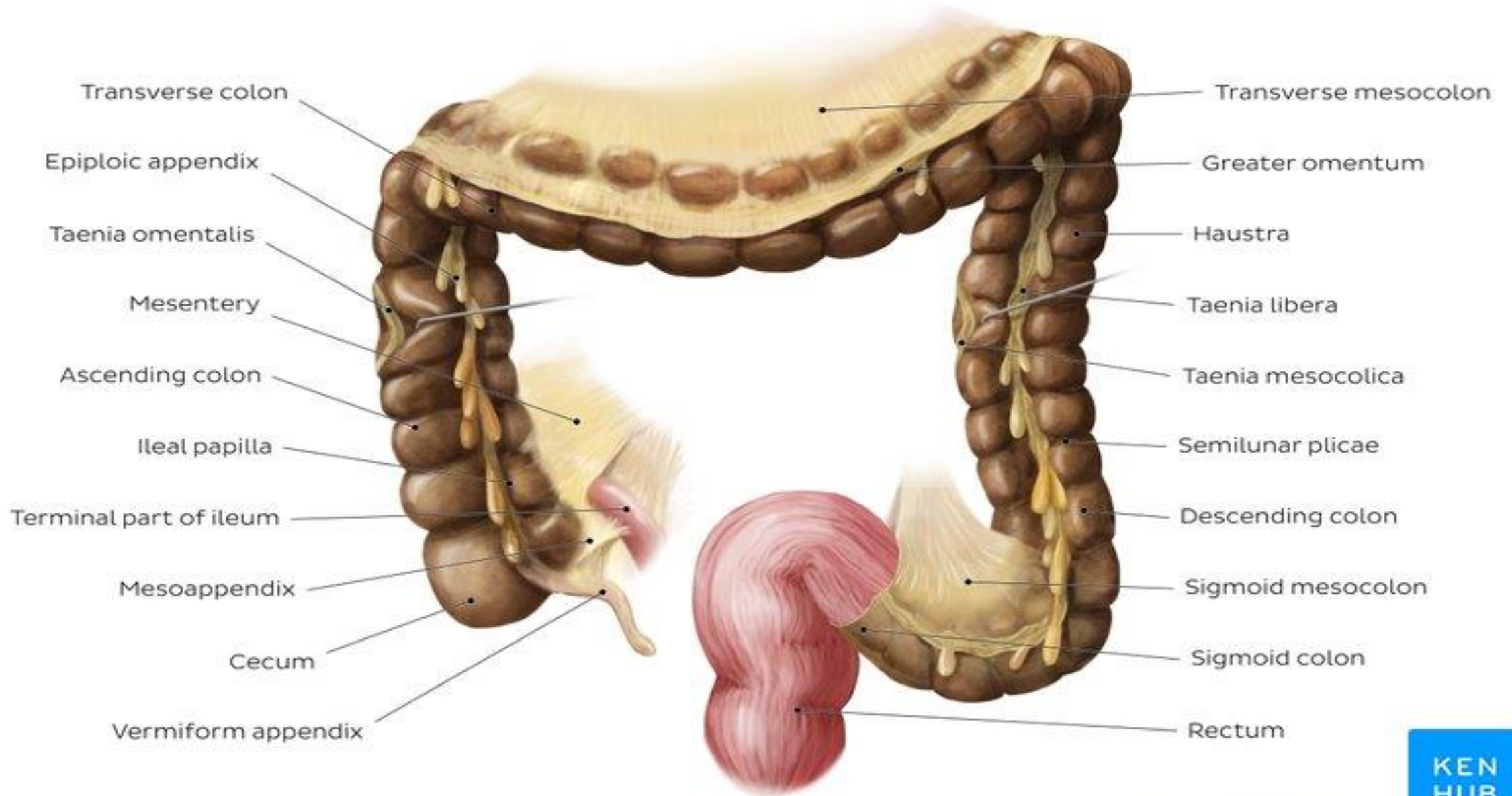
APPENDIX

Common locations: retrocecal or lesser pelvis

Histology: mucosa, submucosa (lymph follicles and parafollicular tissue), muscularis, serosa

Blood supply: appendicular arteries and veins

Innervation: superior mesenteric plexus and vagus nerve



Large intestine (diagram)

Appendices epiploicae
Ascending colon
Terminal ileum
Cecum
Appendix



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Cecum and appendix in a cadaver: When dissecting the large intestine, slice the anterior wall of the cecum to identify some of its internal features. For example, the ileocecal valve, ileocecal orifice and the opening of the appendix. They are located on the medial aspect of the cecum.

APPLIED ANATOMY

- Inflammation of appendix is known as appendicitis, seen in adolescent age. In this condition it is usually necessary to remove the appendix.
- The operation for removal of appendix is called as appendectomy.

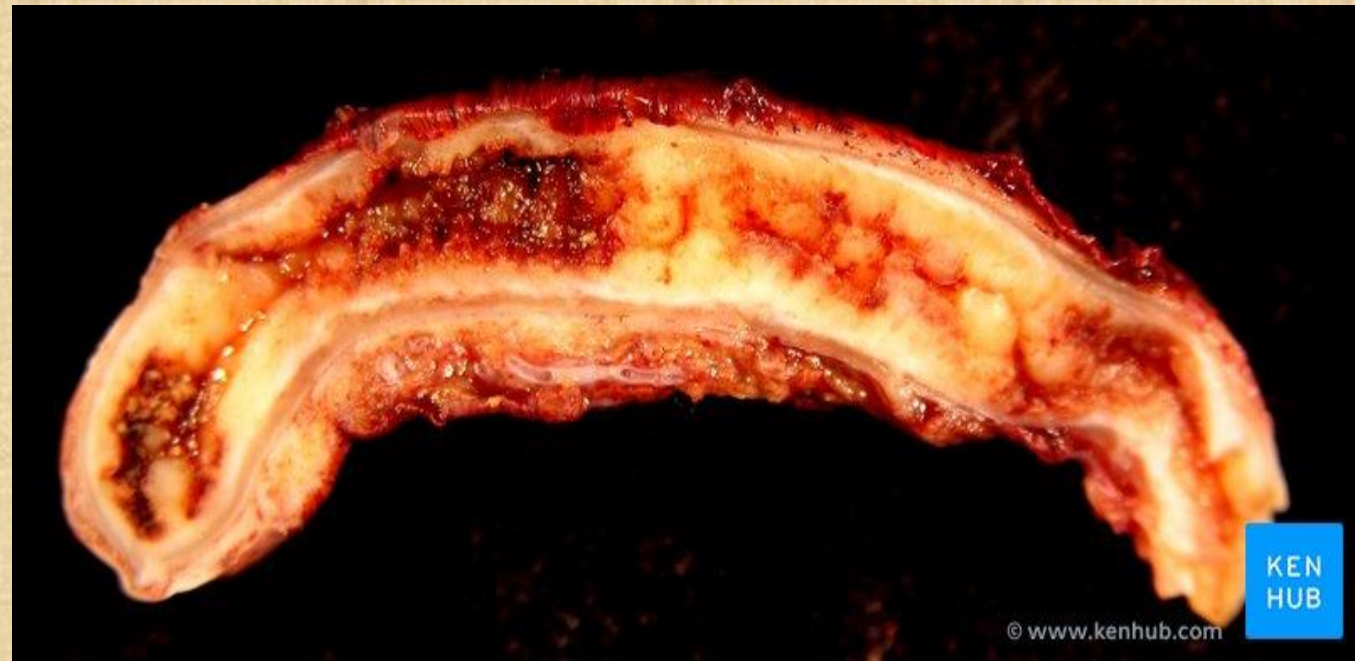
CLINICAL RELEVANCE

INFLAMMATION OF THE APPENDIX

- Inflammation of the appendix is known as [appendicitis](#), and is a common cause for acute severe abdominal pain. In established appendicitis, the abdomen is most tender at McBurney's point – situated one third of the distance from the right anterior superior iliac spine to the umbilicus. This corresponds to the location of the base of the appendix when it lies in a retrocecal position.
- The aetiology of appendicitis depends on age. In the young, it is mostly due to an increase in **lymphoid tissue size**, which occludes the lumen. From 30 years old onwards, it is more likely to be blocked due a faecolith.
- Initially, pain from the appendix and its visceral peritoneum is referred to the **umbilical region**. As the appendix becomes increasingly inflamed, it irritates the parietal peritoneum, causing the pain to localise to the **right lower quadrant**.
- If the appendix is not removed, it can become necrotic and rupture, resulting in **peritonitis** (inflammation of the peritoneum).

APPENDICITIS

- As the name implies, this condition involves the inflammation of the appendix. The main cause of appendicitis is a blockage of the appendix itself, often due to faecal matter, an infection, foreign body or a tumour. As a result, the appendix can burst or perforate if left untreated. It is a very dangerous condition that is considered a medical emergency due to potential severe complications, like peritonitis, if it is not managed.

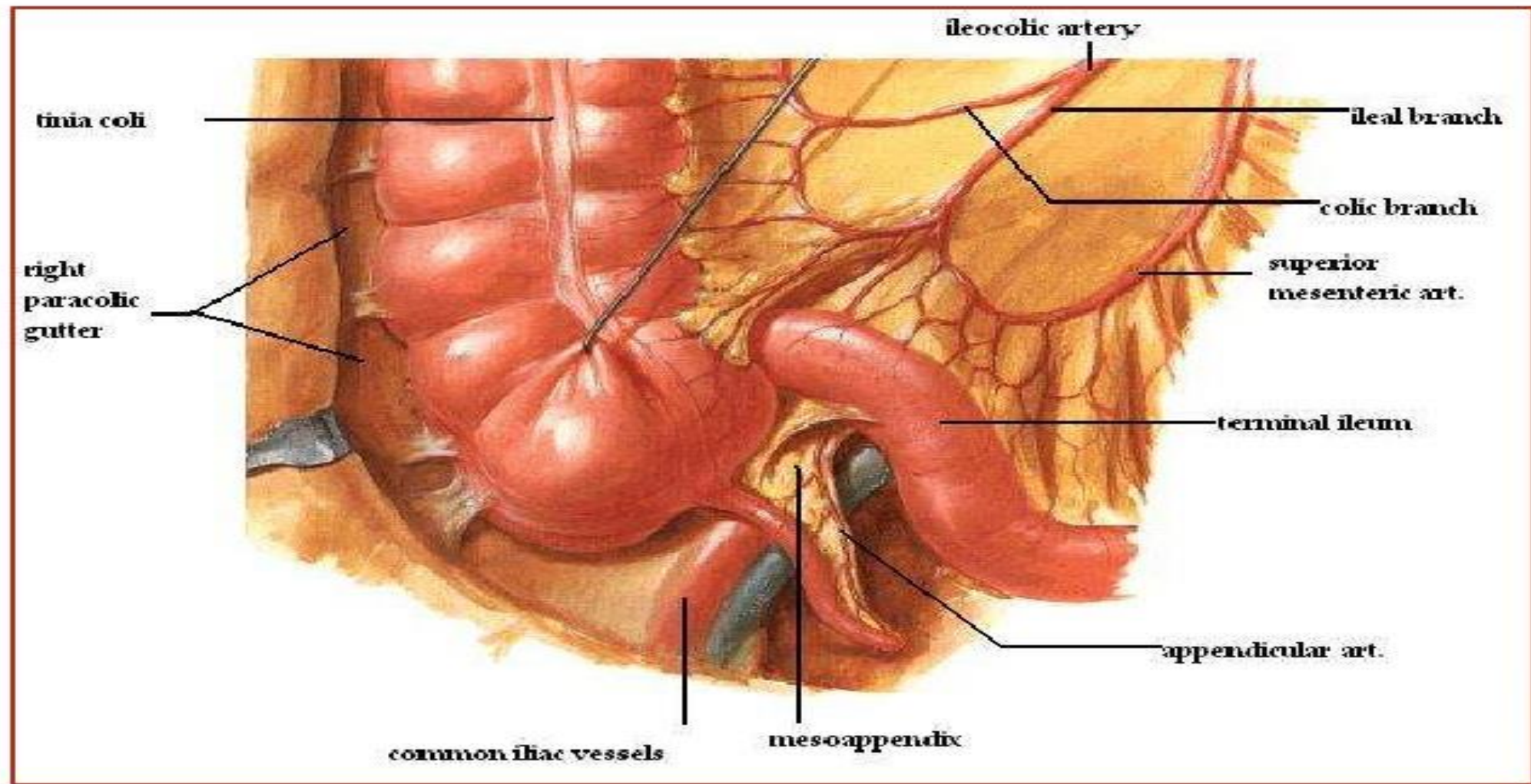


ACUTE APPENDICITIS

The signs and symptoms of appendicitis include:

- pain that extends from the navel (dull) towards the lower-right portion of the abdomen (sharp)
- loss of appetite
- nausea and vomiting
- abdominal swelling
- fever

The majority of time, treatment of appendicitis involves an appendectomy (removal of the appendix).



MESOAPPENDI

X

- The mesoappendix (mesentery of appendix) is short, triangular and variable.
- It extends the whole length of appendix. The breadth of mesoappendix usually falls short of length of appendix.
- The body of appendix is kinked on itself where the free border of mesoappendix ends, hence it is coiled like worm and is named the vermiform.
- Appendicular vessels pass through free margin of mesoappendix.

