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Matric Number: 18/MHS03/002

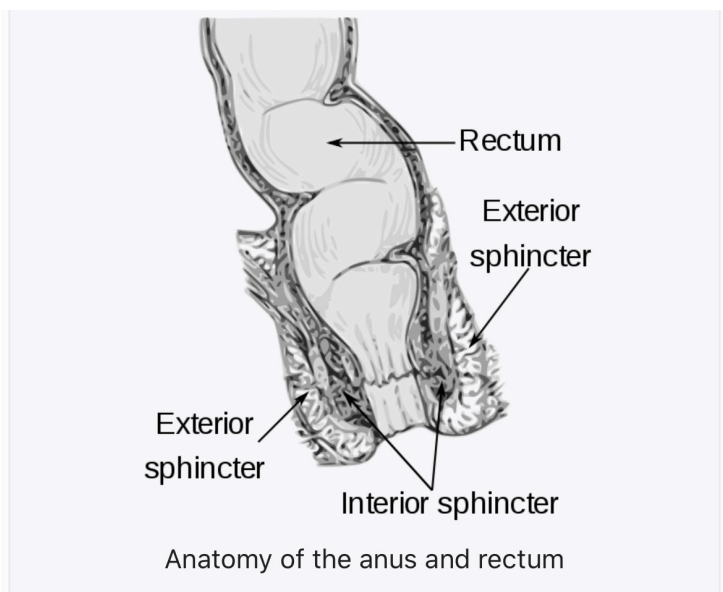
Department: Anatomy

College: Medicine And Health Sciences

Course Code: Ana 212

Question: Discuss the anal canal.

The anal canal is the terminal segment of the large intestine between the rectum and the anus. The anal canal is located within the anal triangle of the perineum between the right and left ischioanal fosse. It is the final segment of the gastrointestinal tract, around 4cm in length. The canal begins as a continuation of the rectum and passes inferoposteriorly to terminate at the anus.



Anal canal is traditionally divided into two segments, upper and lower, separated by the pectinate line also known as the dentate line. Except during defecation, the anal canal is collapsed by the internal and external sphincters to prevent the passage of faecal material.

The anal canal is surrounded by internal and external anal sphincters, which play a crucial role in the maintenance of the faecal continence.

- **Internal Anal Sphincters:** surrounds the upper 2/3 of the anal canal. It is formed from a thickening of the involuntary circular smooth muscle in the bowel wall.
- **External Anal Sphincter:** voluntary muscle that surrounds the lower 2/3 of the anal canal (and so overlaps with the internal sphincter). It blends superiorly with the puborectalis muscle of the pelvic floor.

At the junction of the rectum and the anal canal, there is a muscular ring known as the anorectal ring. It is formed by the fusion of the internal anal sphincter, external anal sphincter and puborectalis muscle, and is palpable on digital rectal examination.

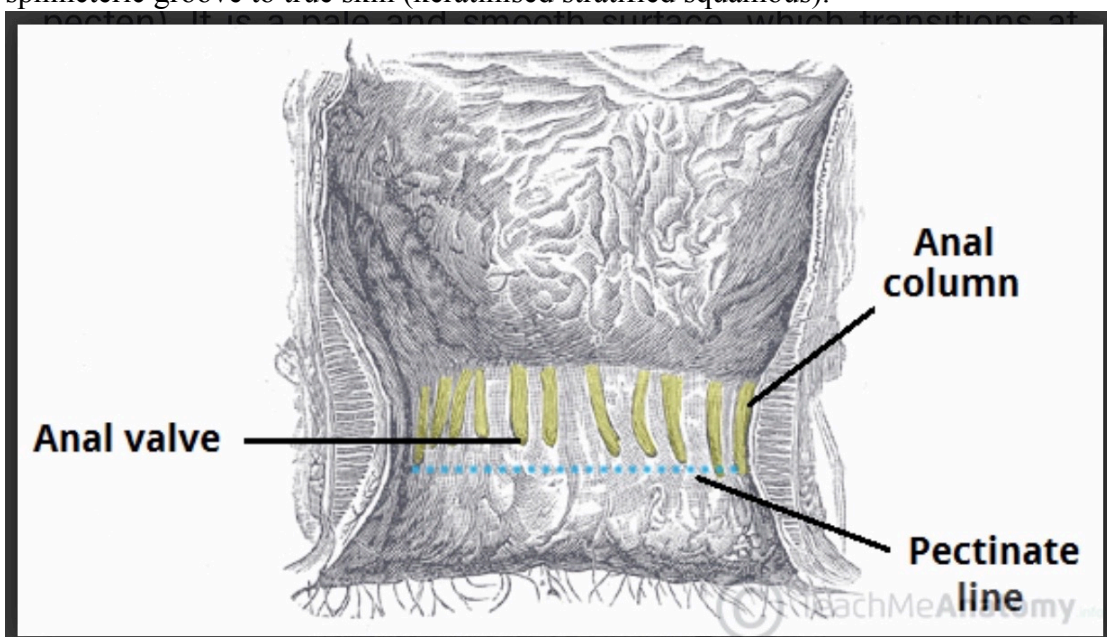
Internal Structure

The superior aspect of the anal canal has the same epithelial lining as the rectum (columnar epithelium). However, in the anal canal, the mucosa is organised into longitudinal folds, known as anal columns. These are joined together at their inferior ends by anal valves. Above the anal valves are small pouches which are referred to as anal sinuses these contain glands that secrete mucus. The anal valves collectively form an irregular circle known as the pectinate line or dentate line. This line divides the anal canal into upper and lower parts, which differ in both structure and neuromuscular supply. This is a result of their different embryological origins:

Above the pectinate - derived from embryonic hindgut.

Below the pectinate line - derived from the ectoderm of the protodeum.

Inferior to the pectinate line, the anal canal is lined by non-keratinised stratified squamous epithelium (known as the anal pecten). It is a pale and smooth surface, which transitions at the level of the intersphincteric groove to true skin (keratinised stratified squamous).

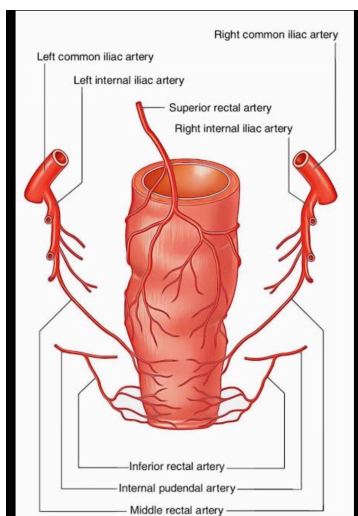


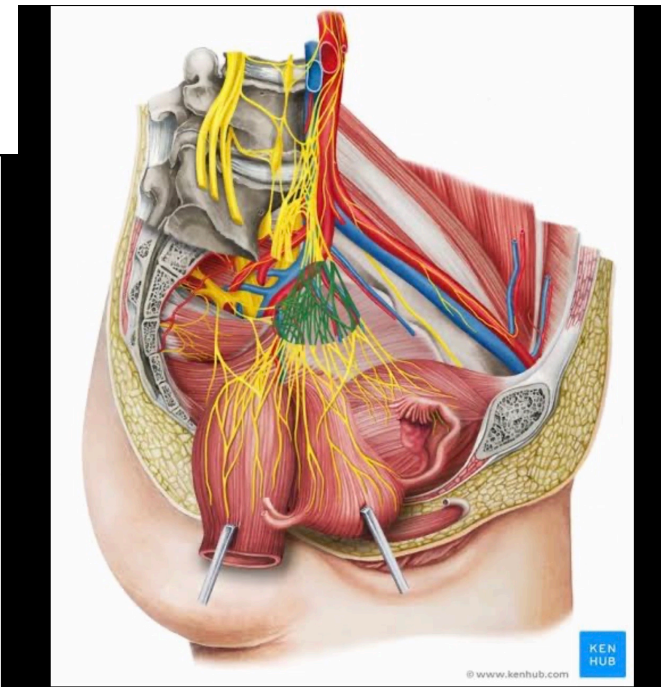
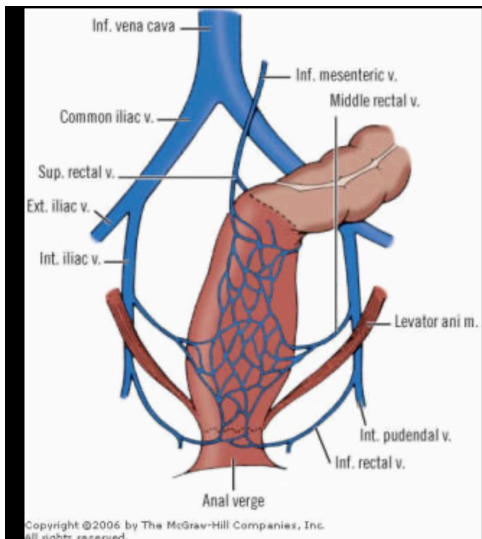
Anatomical Relations

Anteriorly		Posteriorly	Laterally
Male.	Female.	Anococcygeal ligament. Coccyx and sacrum	Ishioanal fossae.
Perineal body urinogenital diaphragm. Urethra. Bulb of the penis	Perineal body uriongenital diaphragm Vagina.		

Neurovascular Supply And Lymphatics

Modality	Above Pectinate Line	Below Pectinate Line
Arterial Supply	Superior rectal artery (branch of inferior mesenteric artery) anastomosing branches from the middle rectal artery	Inferior rectal artery (branch of the internal pudendal artery) anastomosing branches from the middle rectal artery.
Venous Drainage	Superior rectal vein which empties into the inferior mesenteric vein (portal venous system)	Inferior rectal vein which empties into the internal pudendal vein (systemic venous system).
Nerve Supply	Visceral innervation via the inferior hypogastric plexus. Sensitive to stretch.	Somatic innervation via the inferior anal nerves (branches of the pudendal nerve) sensitive to pain, temperature, touch and pressure.
Lymphatics	Internal iliac lymph nodes.	Superficial inguinal lymph nodes.





Clinical Relevance

▪ Haemorrhoids (Piles)

Haemorrhoids are vascular cushions found within the anal canal of healthy individuals, which help with the maintenance of faecal continence. If they become swollen and distended, they are referred to as pathological haemorrhoids.

Pathological haemorrhoids are observed in people who suffer from constipation, prolonged straining when defecating, or raised intra-abdominal pressure (e.g. pregnancy, ascites). Upon examination of the anal canal (with the patient in the lithotomy position), the haemorrhoids are typically located at the 3, 7 and 11 o'clock positions.

They can cause bleeding and itching, and depending on the severity, can be managed conservatively or surgically.

