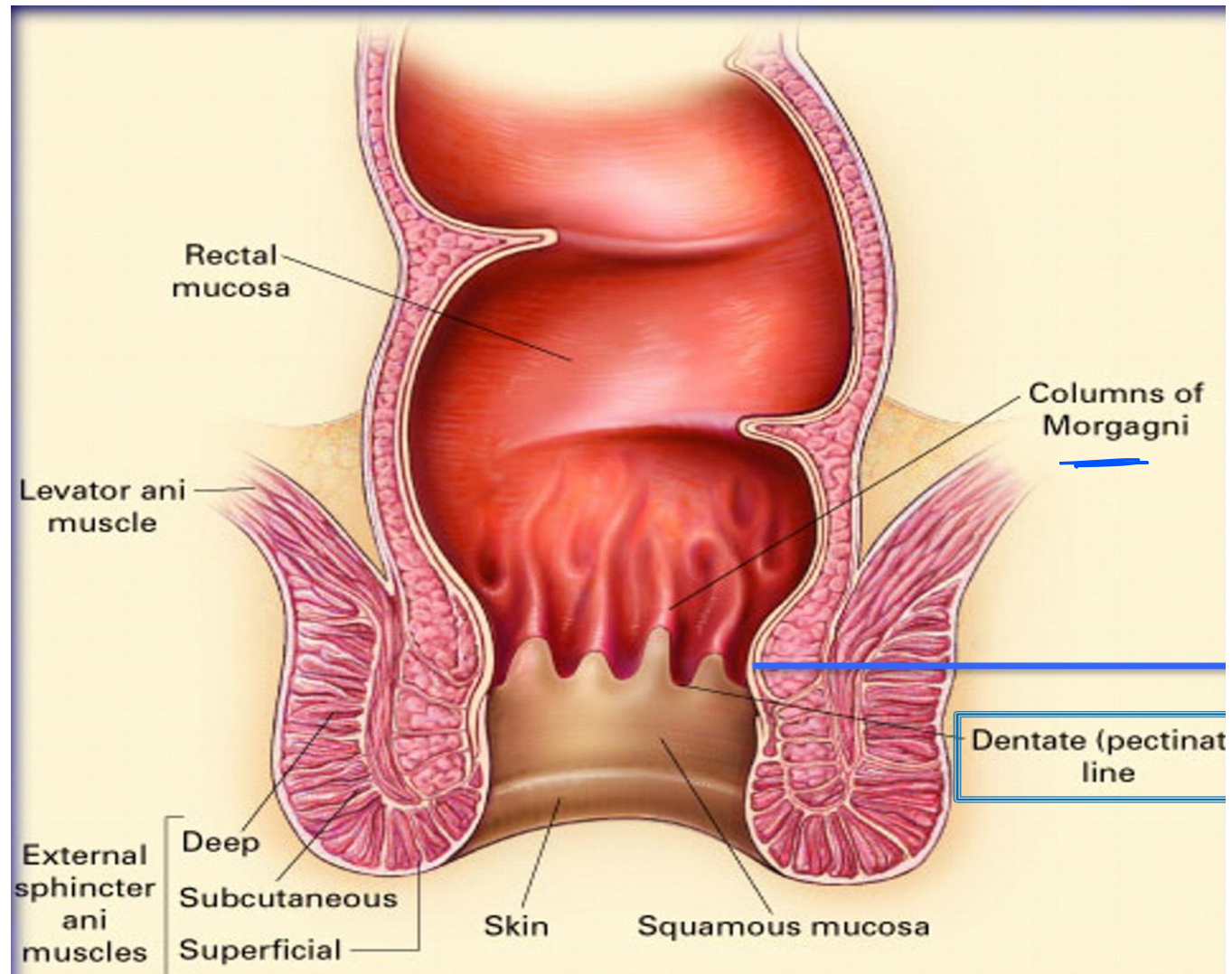
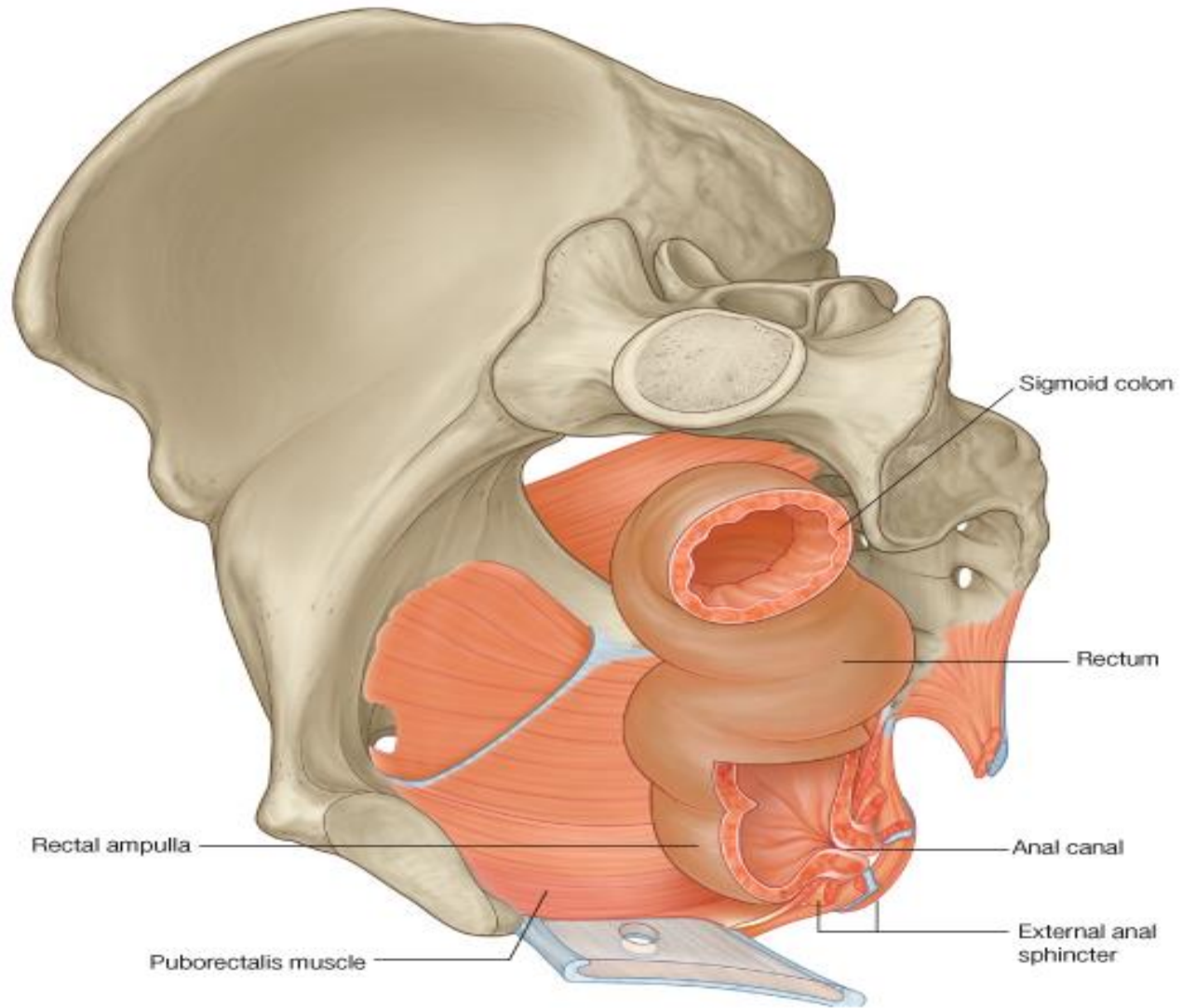


Anal Canal



A



Anatomy

1cm → dentate
anatomical
anal
canal

Surgical Anal canal : Is about 4 cm long. (shorter in females)

→ extends from 1 cm above Dentate line to anus.

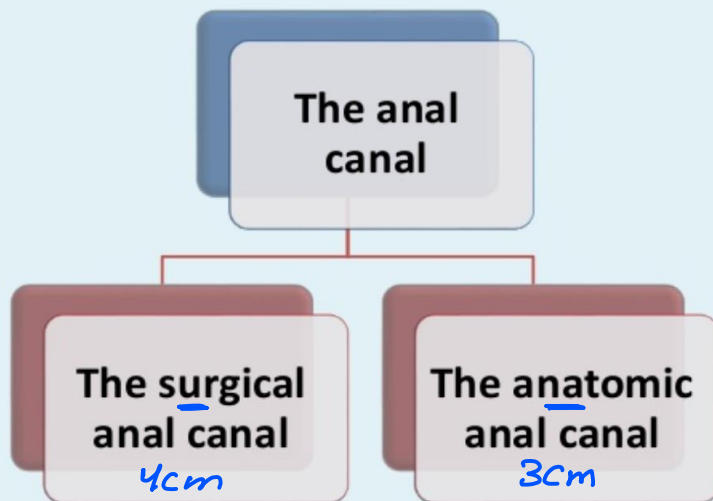
→ 3cm ♀

■ It extends from the anal verge to the anorectal junction.

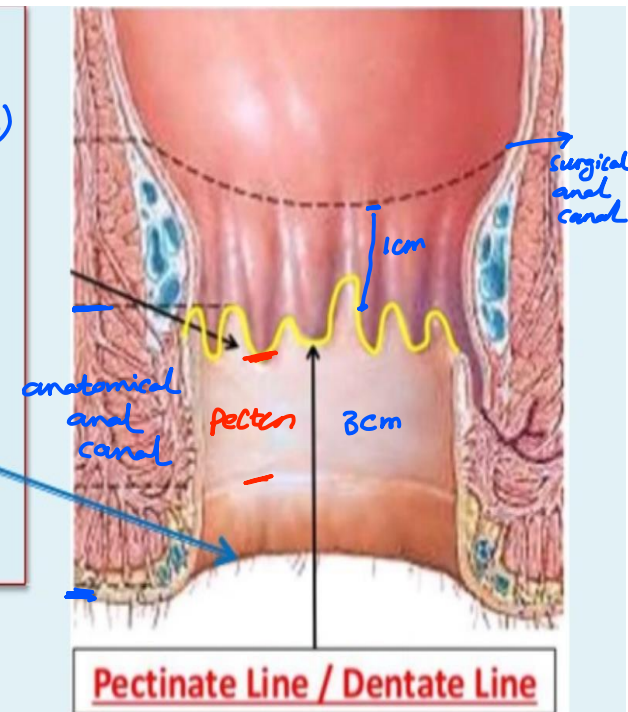
anal office

→ 1cm above
Dentate line.

which is upper border of sphincter muscles at puborectalis .



- The anatomic anal canal (3cm) extends from the dentate or pectinate line to the anal verge.



Anal canal

L+ Clip slide

Anal Canal – Extent & Course

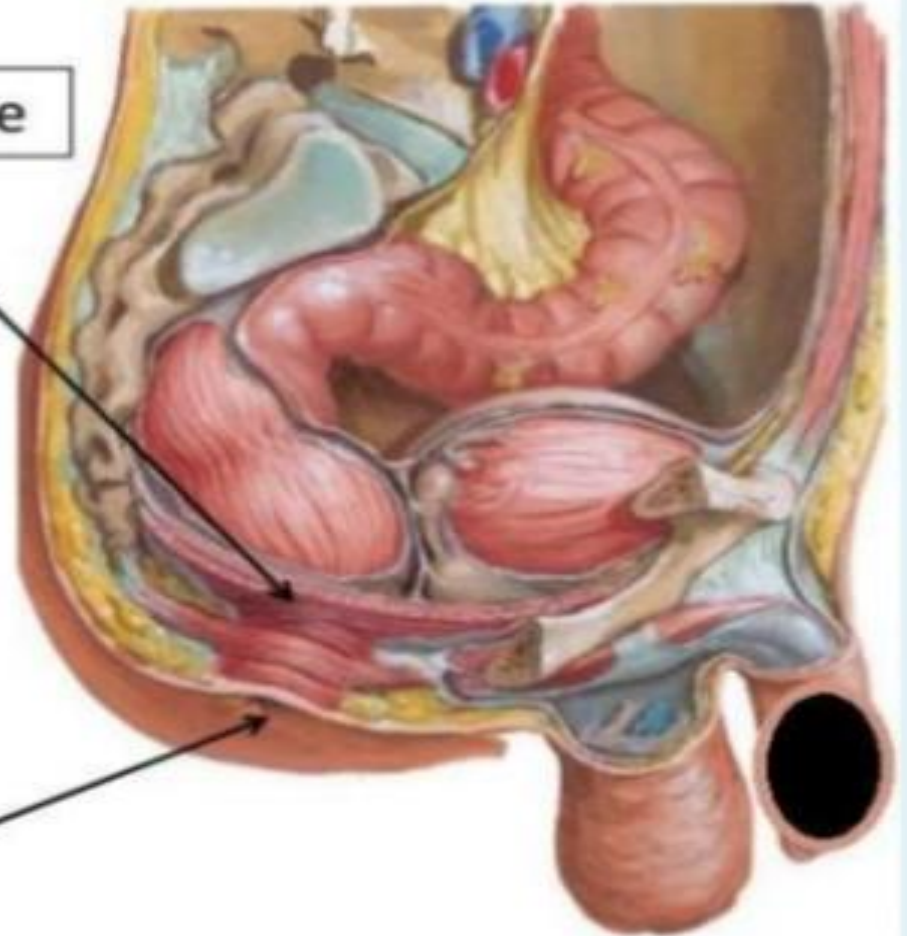
Terminal part of Large Intestine

Begins at ano-rectal jn

At a point 2-3cm in front & little below tip of coccyx

Downwards & Backwards

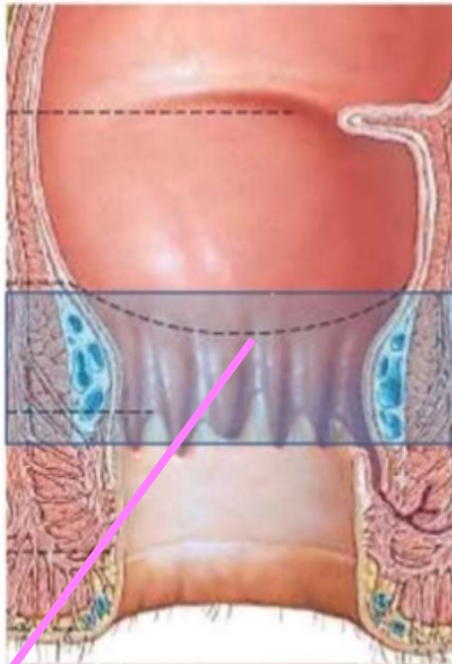
Opens at anal orifice –
4cm below & in front of tip
of coccyx



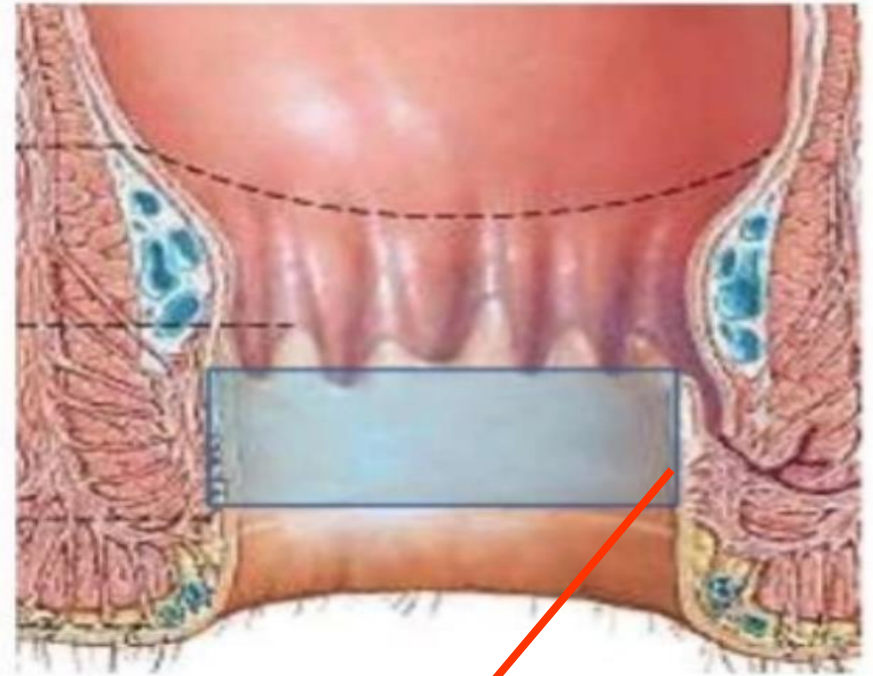
Interior of anal canal

Upper part

- 15 mm
- Endodermal origin
- Lined by semitransparent mucous membrane
 - Simple columnar / Stratified columnar or squamous
- **Plum red** due to?



Upper part of anal canal.



Pecten

طولها حوالي 1.5 cm

- **Pecten (Anoderm)** : Is the thin hairless part of the external anal canal that is

Clip side

exposed by traction, has no sweat glands . or sebaceous glands.

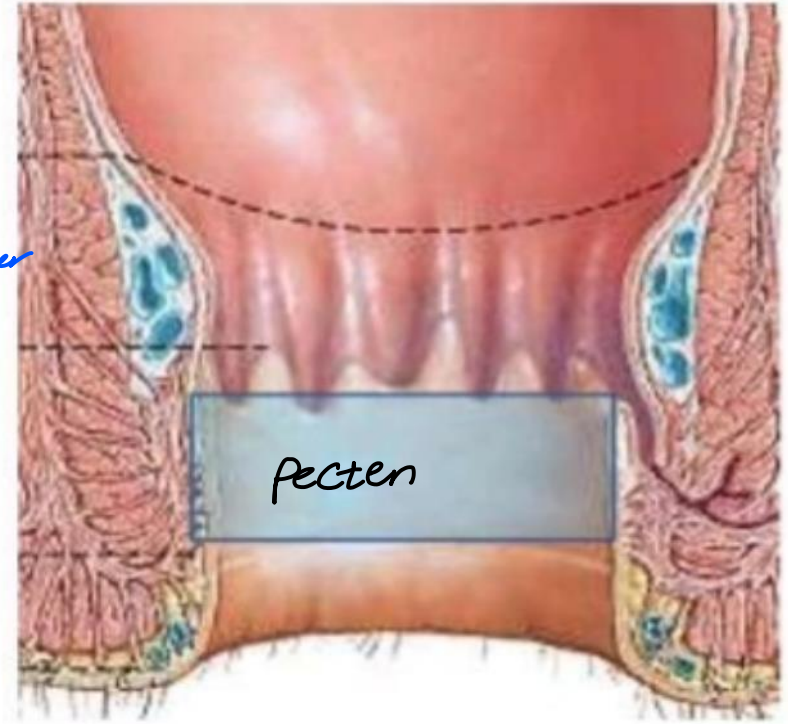
* Rectum is covered by simple columnar epithelium.

(Non-keratinized Stratified Squamous Epithelium)

The junction between the Pecten and large bowel mucosa is known as

← التي فيه تعرج .

Dentate line : which bisect the anal canal.



35 m

بعضه سه القزج الي اسف
anal valves of ball
بفتح نيزا
anal glands

external
anal
sphincter.

superior rectal artery ① as branches
vein ②

columns of morgagni (6-10)

Denate line
anal
Internal sphincter
muscle

anal glands

Anal verge

Levator ani m.

Puborectalis m.

Deep

Superficial

Subcutaneous

External
sphincter
muscle

Levator Ani Muscle

Peritoneum

Supralevator
Space

Ischiorectal space

Intersphincteric
Space

line of ball

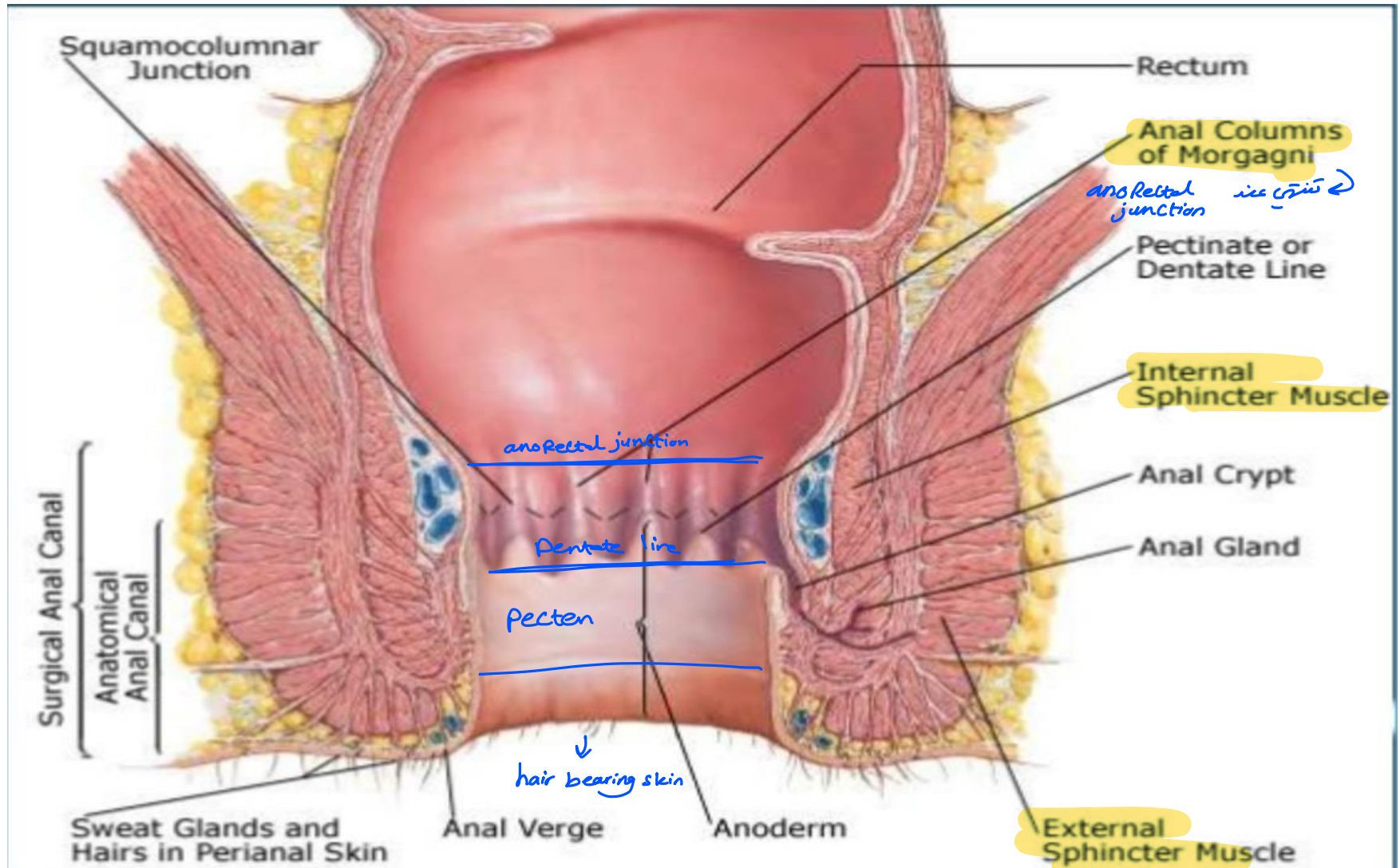
Transverse Septum of
Ischiorectal Fossa

ش رية

آفرينسته آتت

Anal Verge : is the junction between anoderm meet the hair bearing peri anal skin, at lower border of sphincter

Anatomy Of Anal Canal



Hip bone

Pubic
symphysis

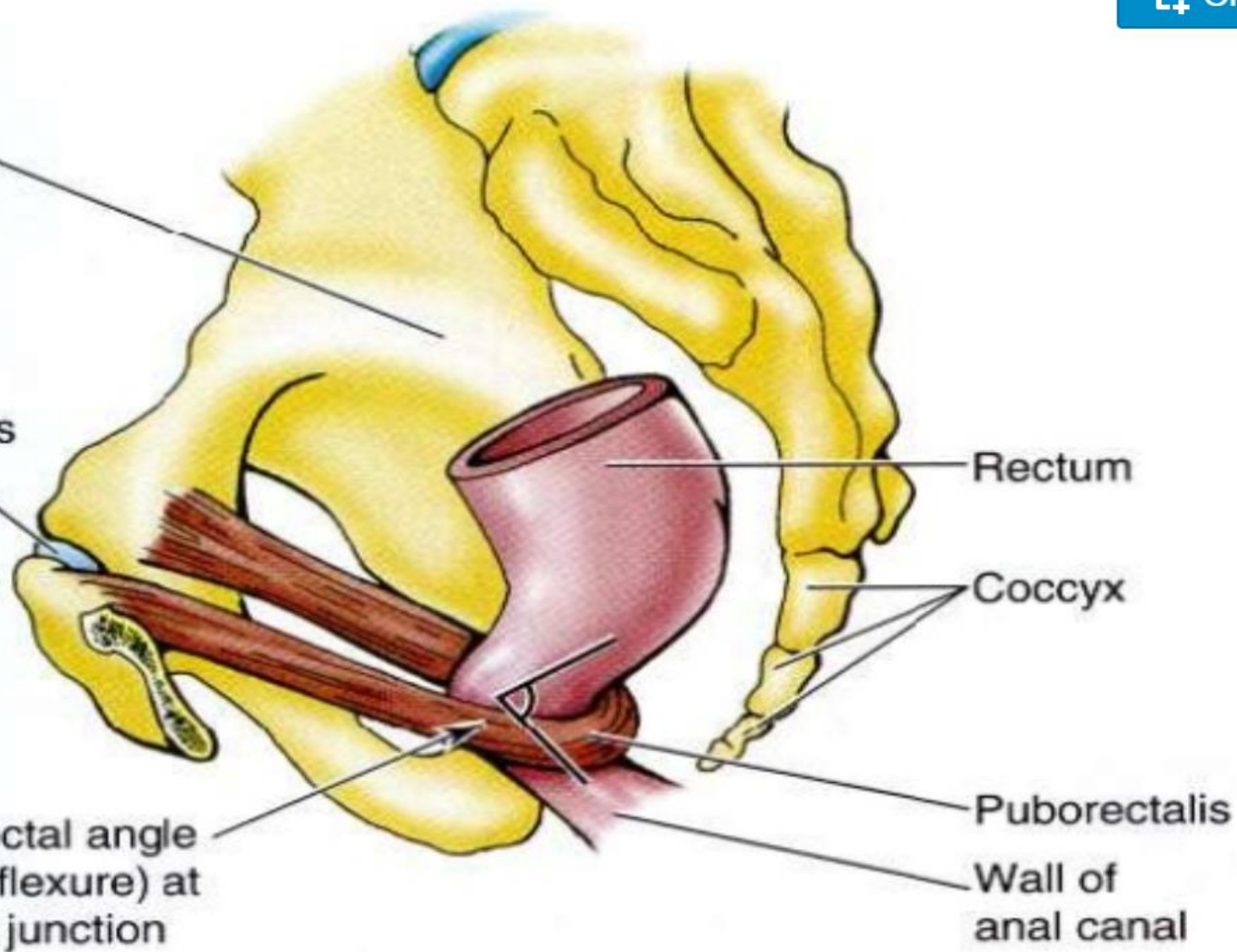
80° anorectal angle
(perineal flexure) at
anorectal junction

Rectum

Coccyx

Puborectalis

Wall of
anal canal



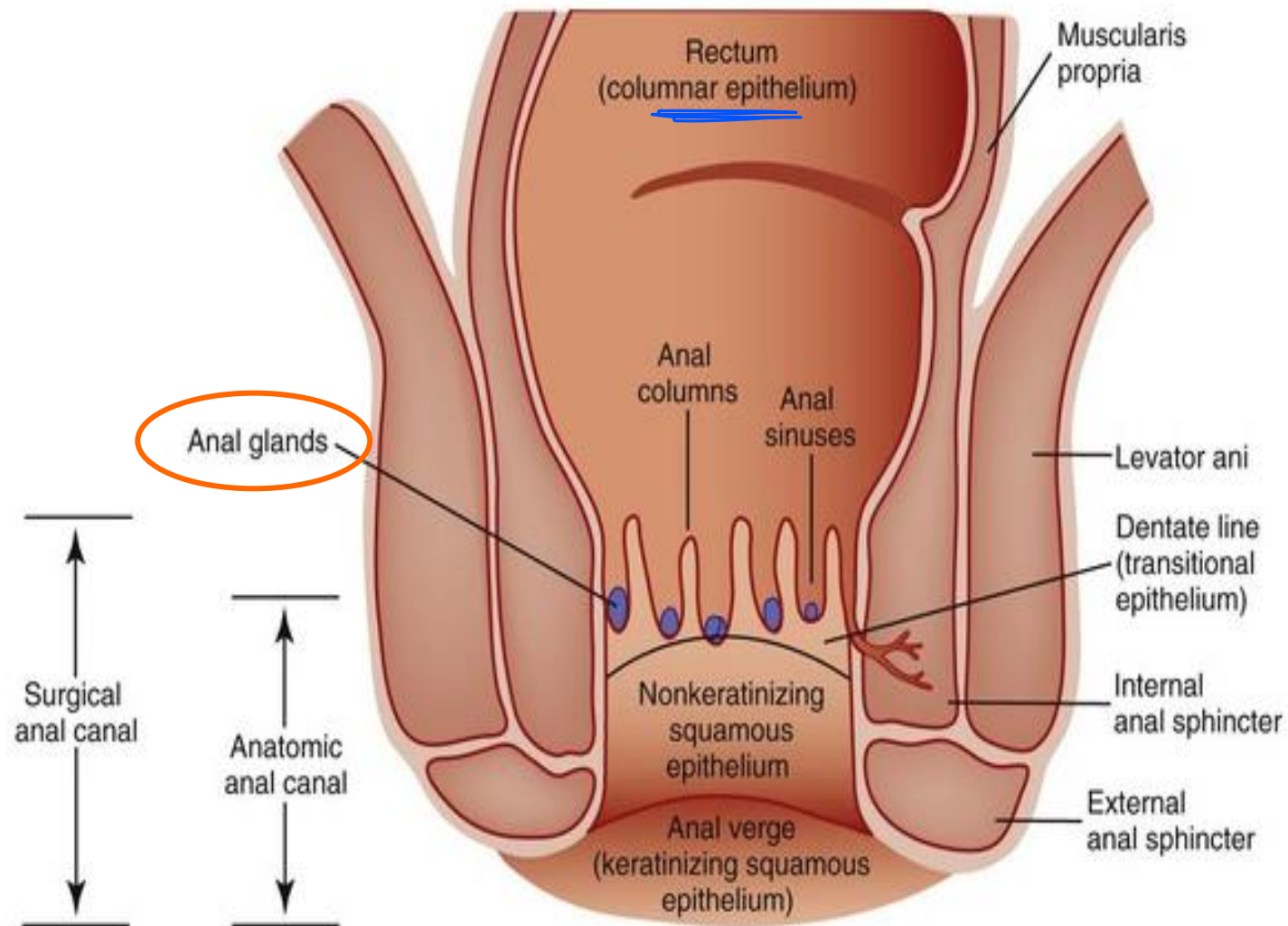
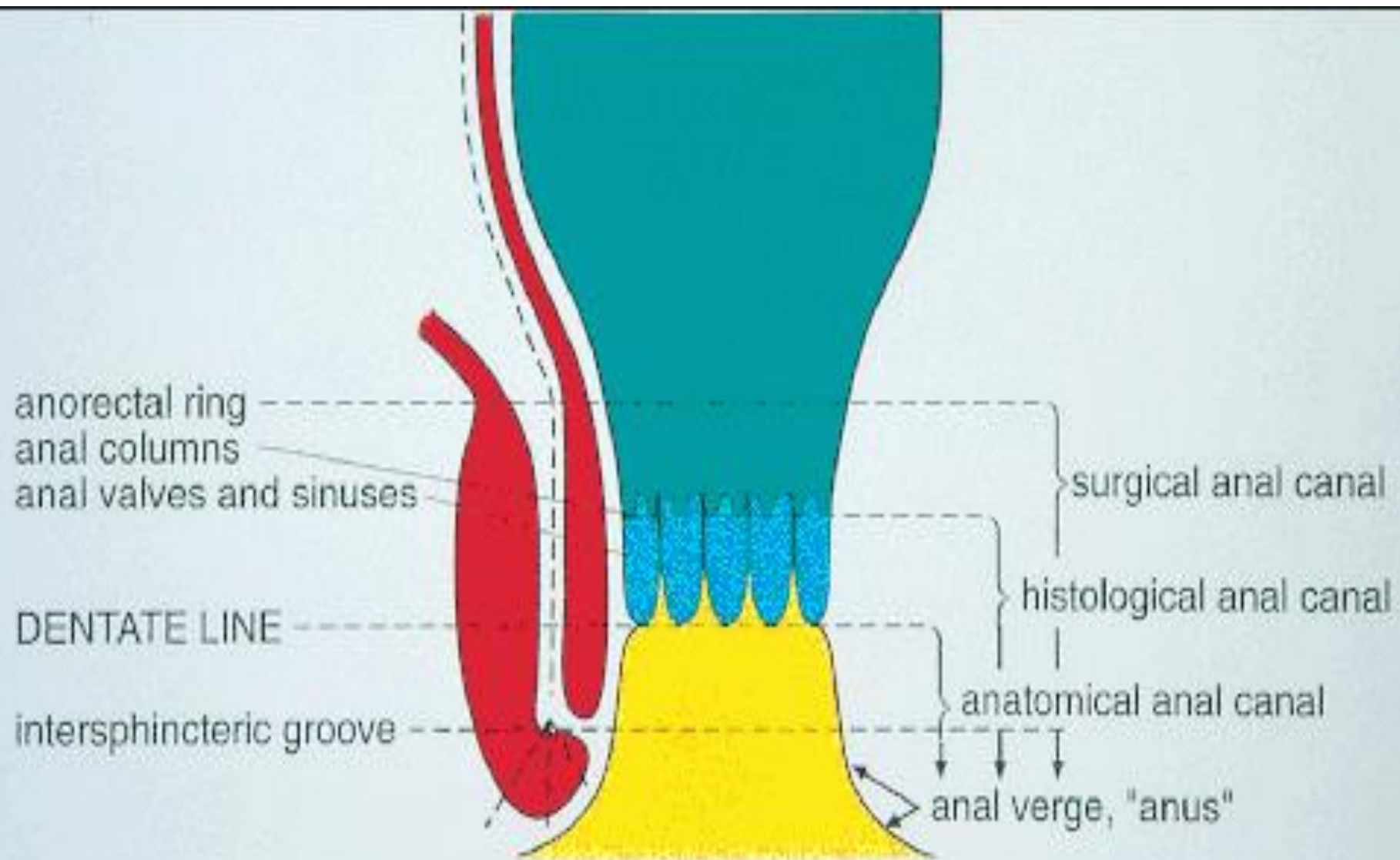
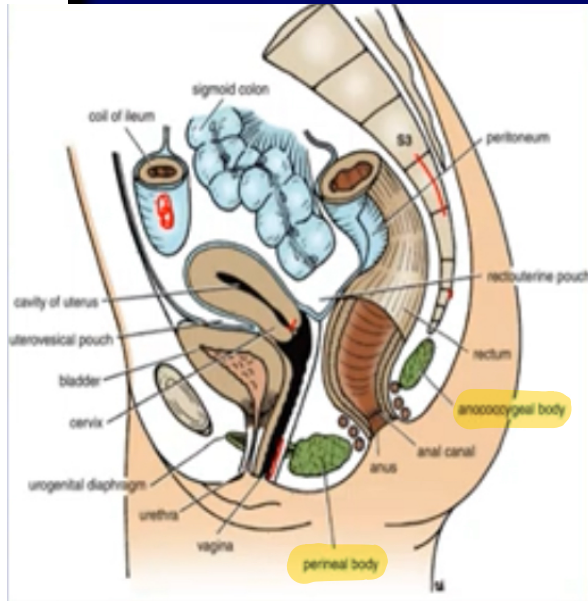


FIGURE 32.1 Anatomic features of the anal canal.

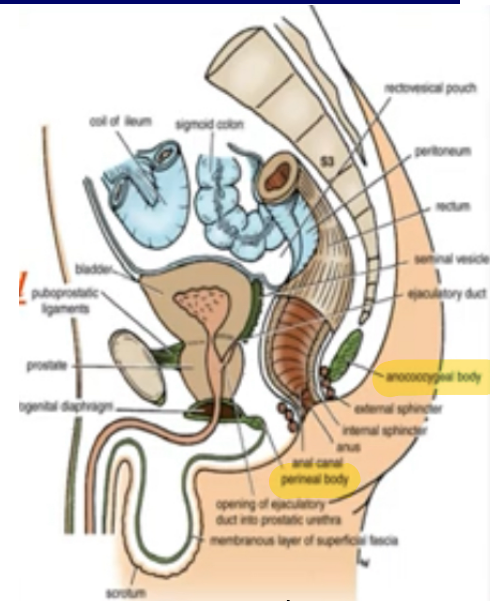


Relation of anal canal

- **Anterior: Perineal body** which separate it from bulb of penis an MU
- **Posteriorly: Anococcygeal body,**
- separate it from coccyx
- **Ischiorectal fossa on each side**



Female



Male

* انحصار سے female, male جسم اور Perineal body آپس میں
 female میں سے نکلنے والا مجلیہ support to the posterior wall of vagina, پیسی نازک.

- Above Dentate line there is transitional zone extends (from 1cm to 2 cm) having sensitive modified non-keratinized squamous epithelium.
- Above transitional zone there is insensitive large bowel mucosa (columnar epithelium).
- Anatomical anal canal: is about 3 cm long .
- It extends from anal verge to slightly above the dentate line.

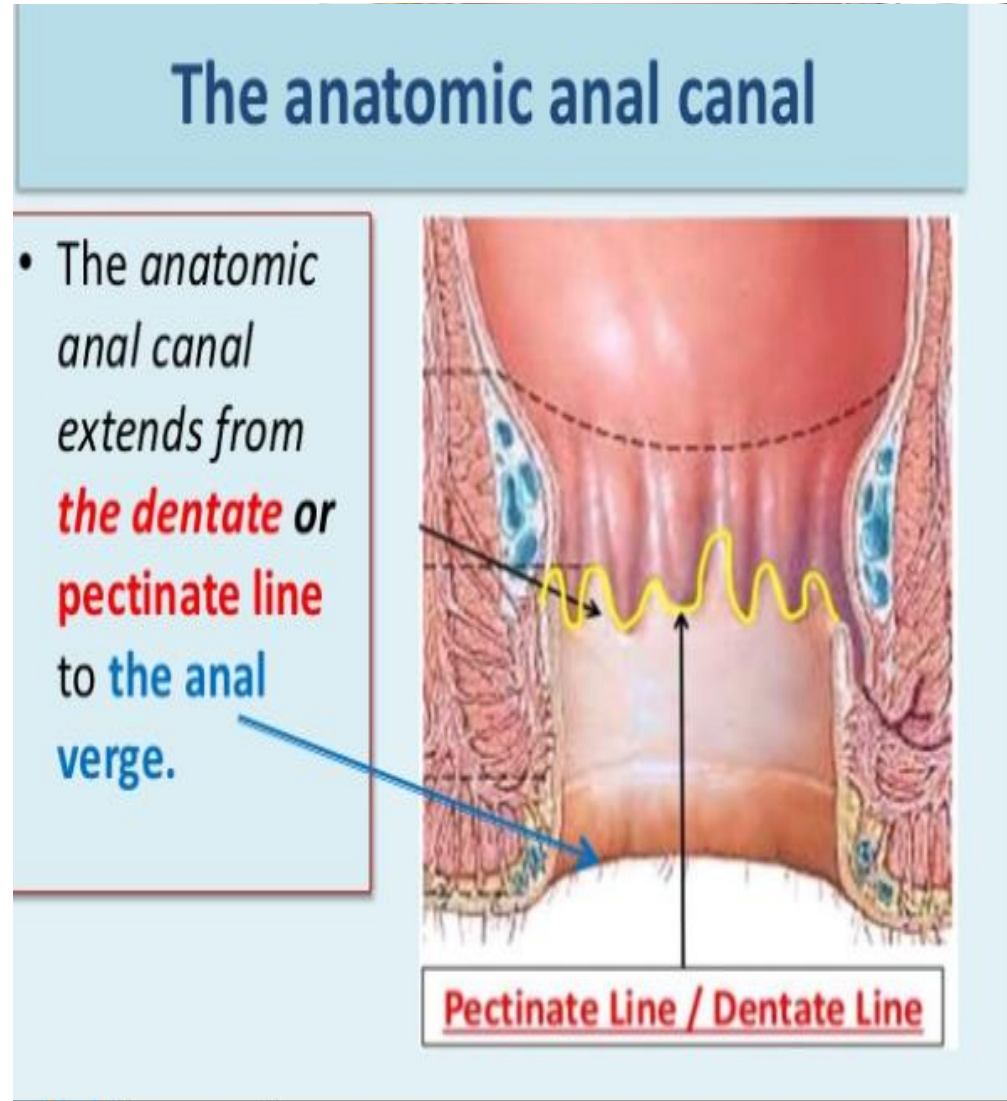
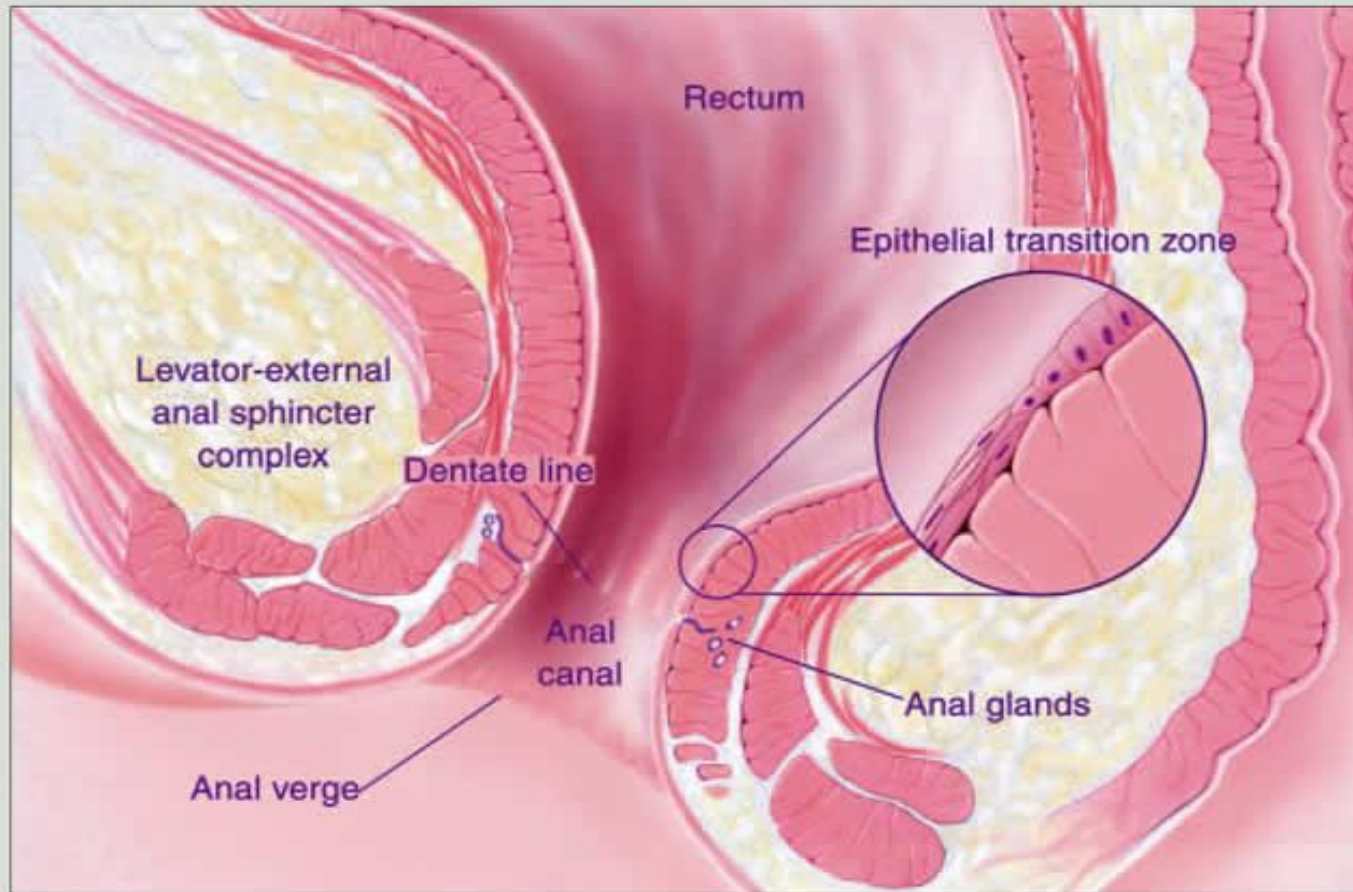


FIGURE 1

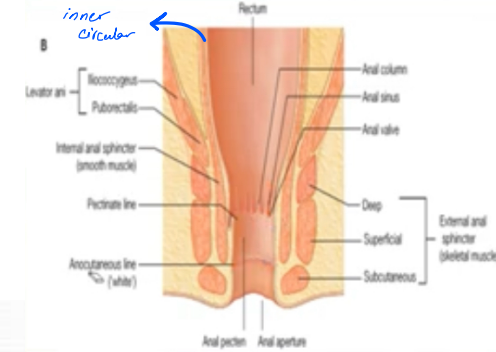
Anorectal anatomy



The anorectal area—the terminal portion of the GI tract—includes the rectum and the anal canal. The rectum is the last 12 cm above the anal verge. The anal canal extends from the anal verge to the proximal level of the levator-external anal sphincter complex. The dentate line is approximately 2 cm from the anal verge and is a place of transition from columnar epithelium to squamous epithelium. Between these layers is transitional epithelium. The anal glands—branched, straight tubular glands with ducts lined with stratified columnar epithelium—empty into the anal canal at the base of the anal columns. A clear sense of anorectal anatomy is fundamental to the evaluation of patients with anorectal disease.

inner circular ← bowel *
 outer longitudinal ←
 Teniae coli uniform في colon لا تتواجد في Rectum
 appendix ←

Cont ..



Muscle layers :

Internal Sphincter :

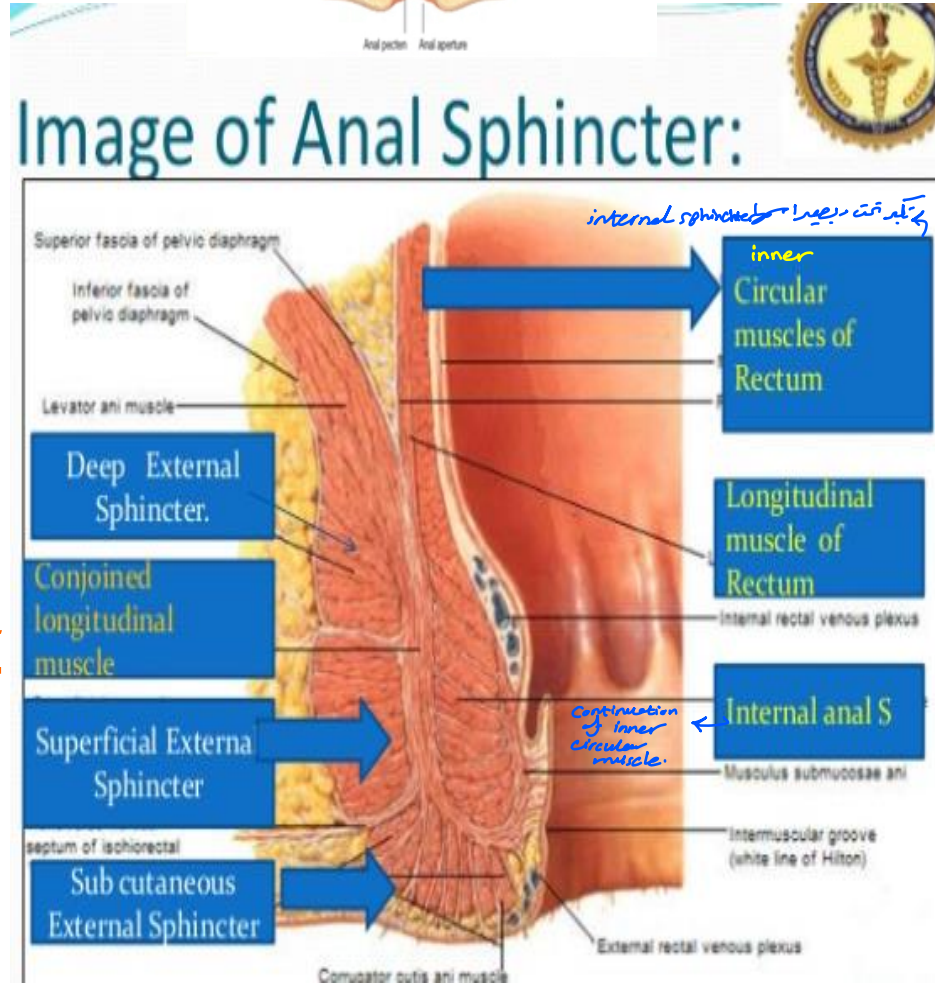
Is a condensation of Circular Smooth Muscle of the rectum and is continuous with circular muscle of the whole GIT. (autonomic nervous system)

- It maintains Tone and Resting Pressure within anal canal (anal continence).

* يغذي internal anal sphincter ← Autonomic nerves (sympathetic, parasympathetic)

إل يبقى involuntary
 ← smooth muscle
 ← لا تحت إيد الإنسان

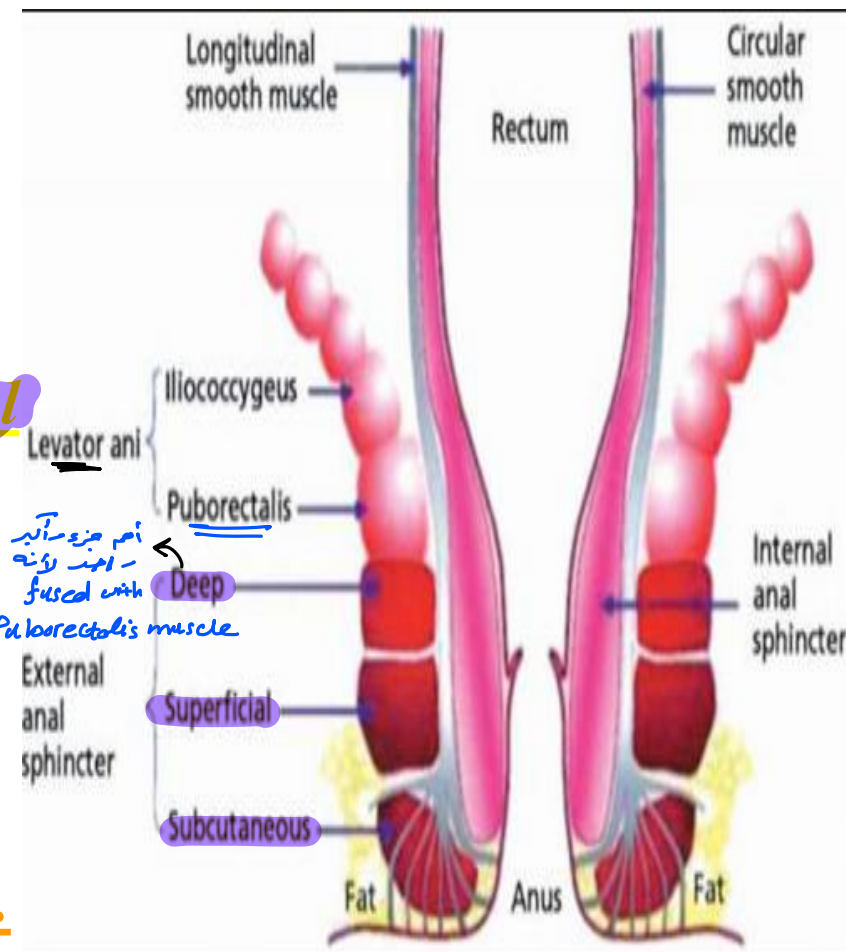
* 80% من Tone للanal canal يبقى من داخله internal sphincter
 * 20% من Tone للanal canal يبقى من خارجة لا مسكوق



* internal anal sphincter 3/4 من internal S
 * 1/4 من internal S من داخله

Cont ..

- **External Sphincter:** Consist of ending of longitudinal muscle of the rectum at the anus as series of fibrous bands which radiate to the perianal skin (somatic nerves).
- **Three parts** ^① **Sub mucous**, ^② **Superficial** and ^③ **Deep part**.
- The circular muscle of the external sphincter consists of lower part of levator ani, known as the puborectalis sling.
- Responsible for **Squeeze Pressure**.

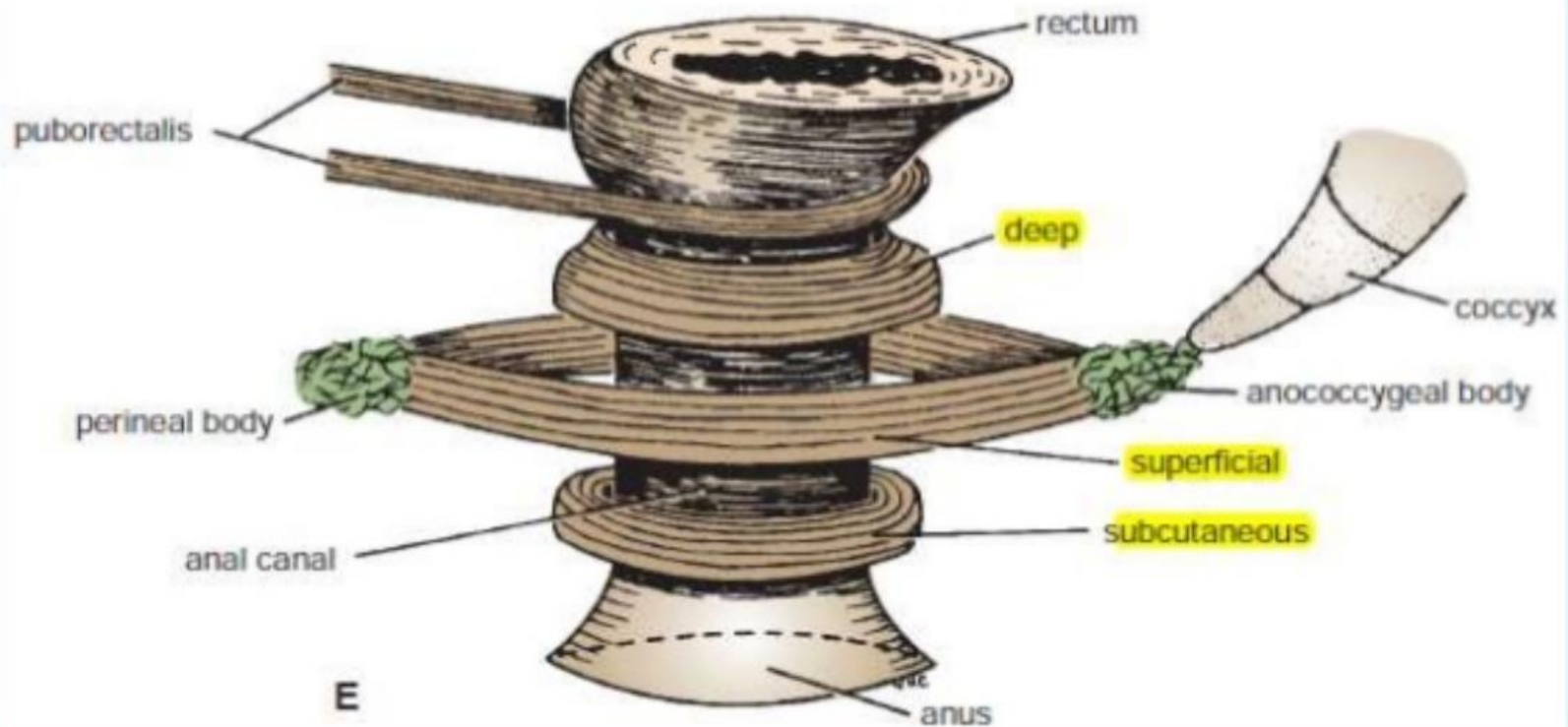


Striated muscle ← external sphincter *
 contraction → relaxation → sphincter
 red in color :: voluntary control ::
 (spinal nerves) somatic nerves

anal canal ← external anal sphincter *

The external sphincter

Clip slide



The *deep external anal sphincter* : ring, together with the *puborectalis* muscle.
Superficial : elliptical, and attached to coccyx
Subcutaneous : ring

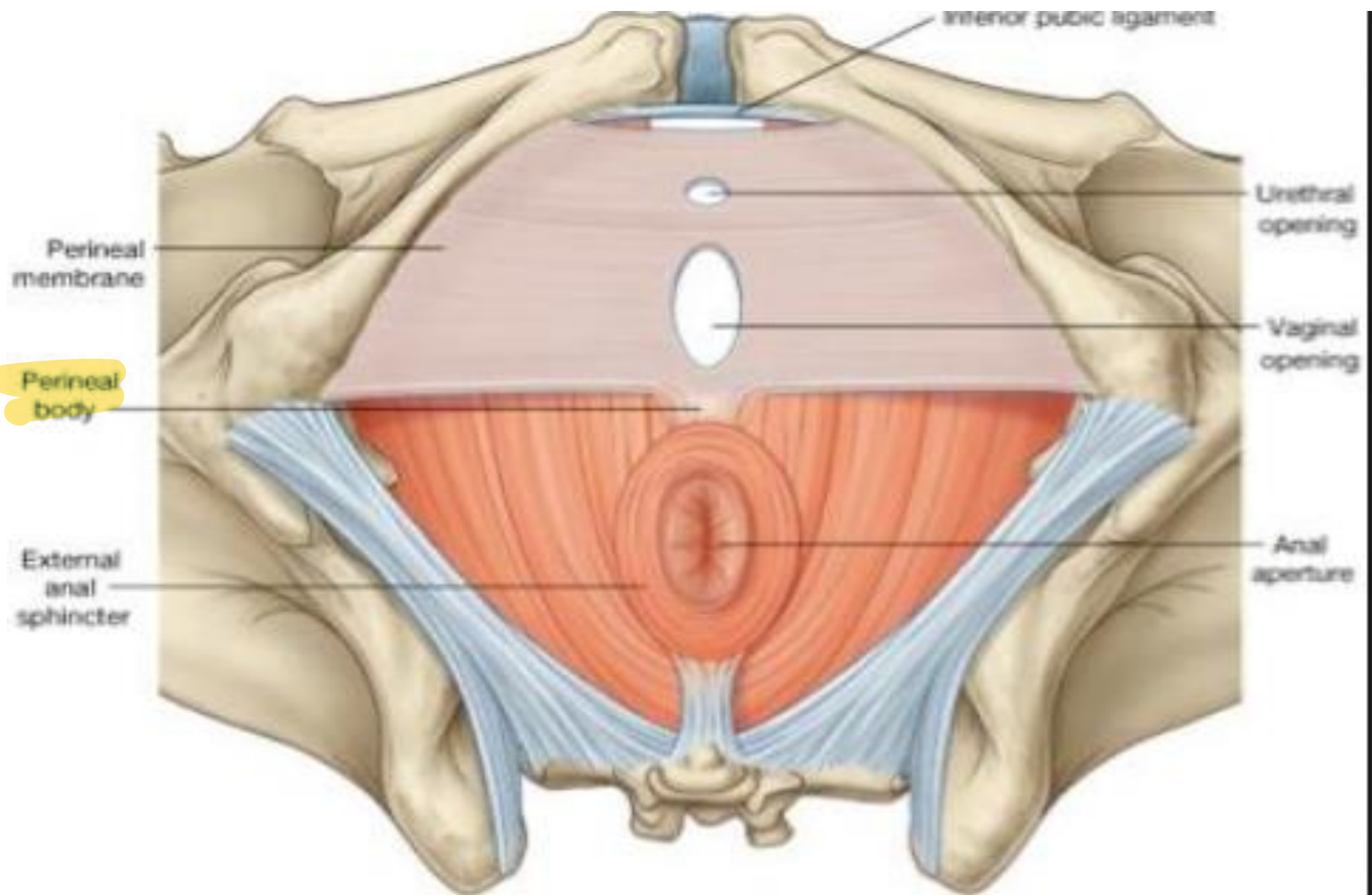
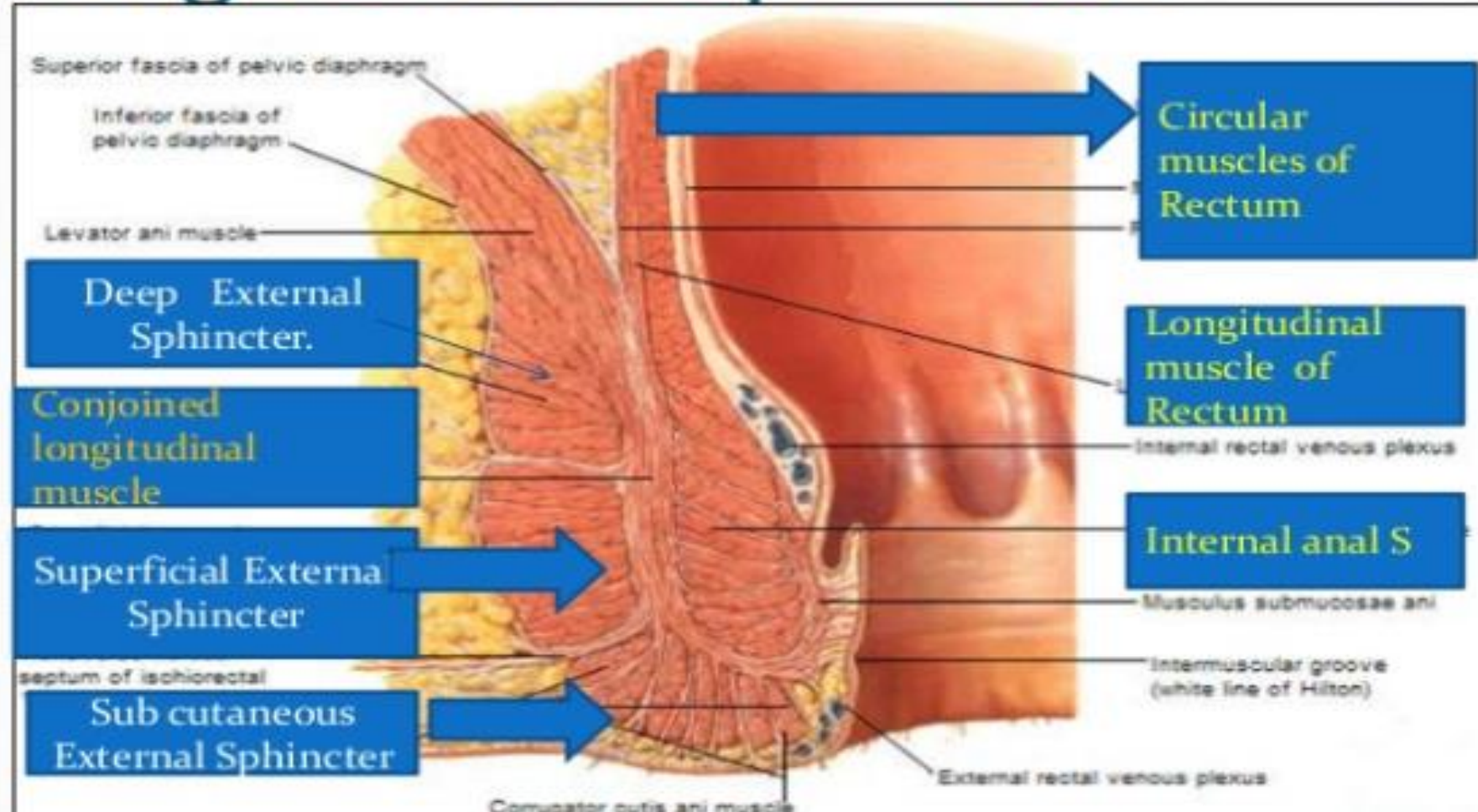




Image of Anal Sphincter:



Cont ..

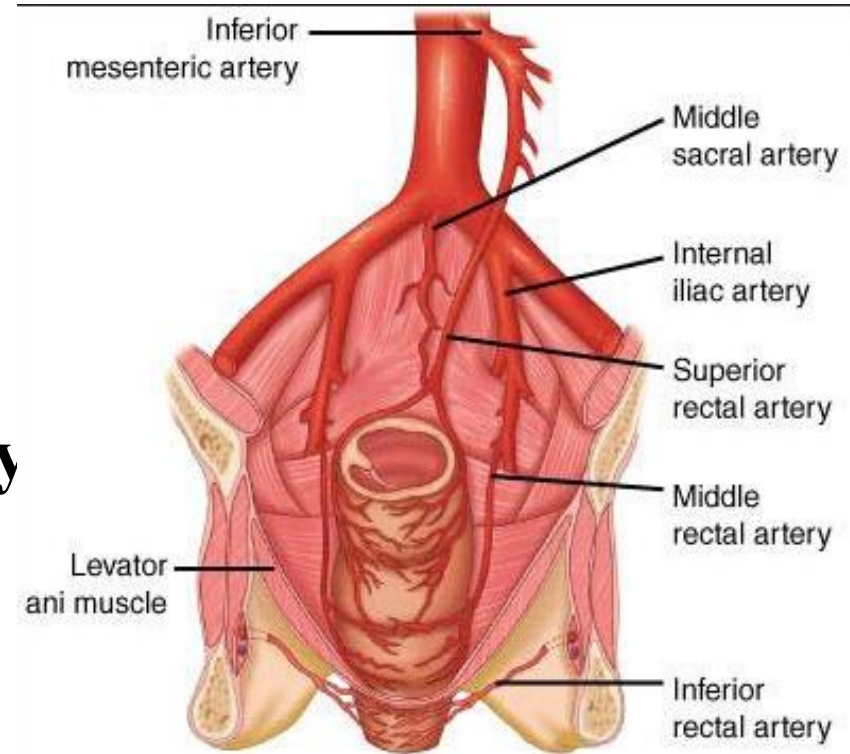
Blood supply

■ The anal area receives an intercommunicating blood supply from **superior, middle, inferior rectal arteries** .

upper 1/2 of anal canal ←

lower 1/2 of anal canal ←

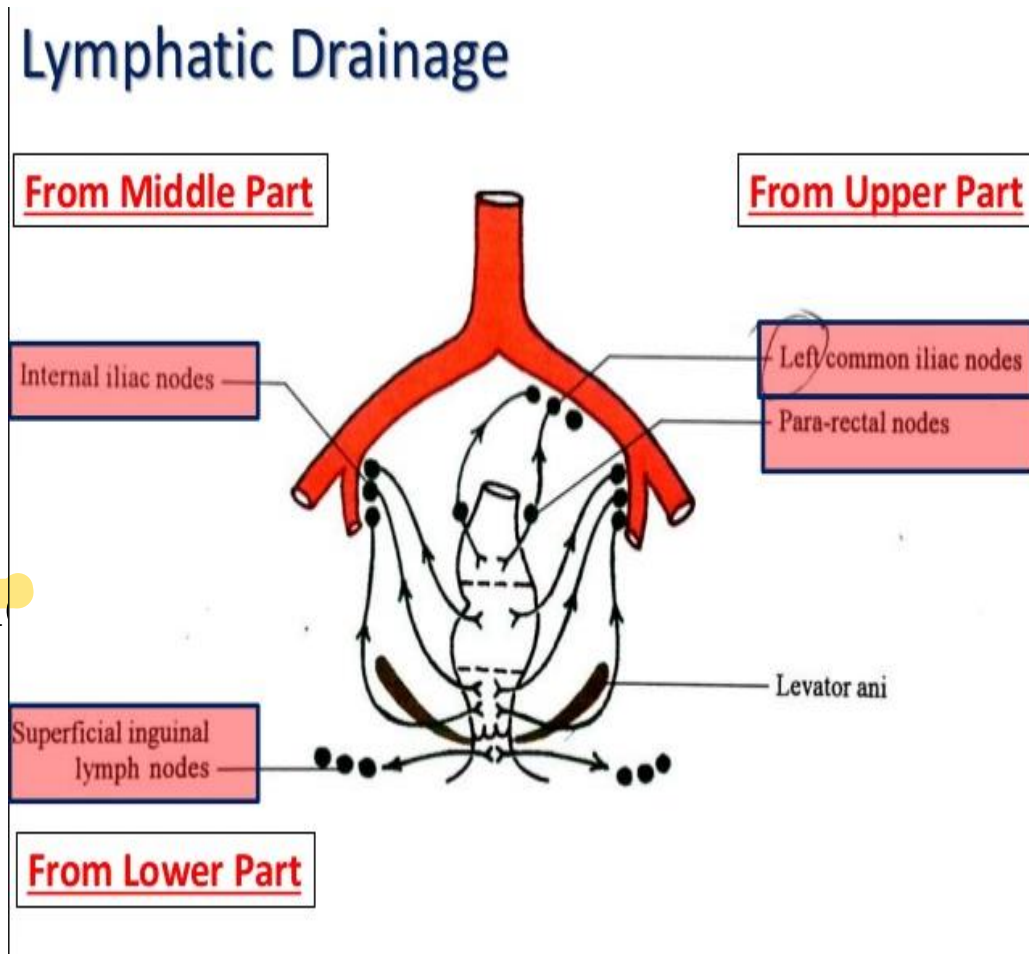
■ Venous drainage goes mainly to superior rectal vein then portal system, but from anal sphincter and below the drainage goes towards systemic circulation .

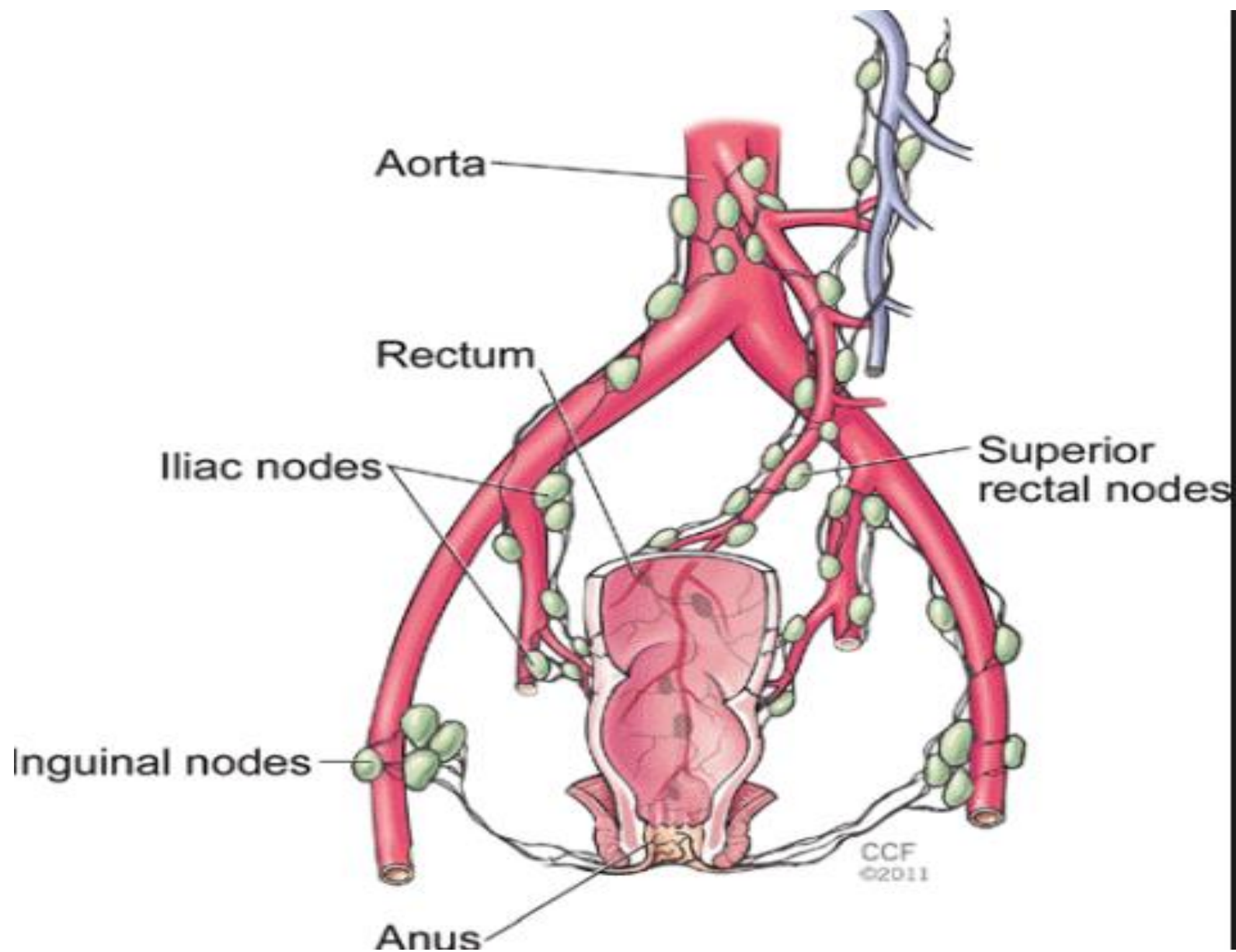


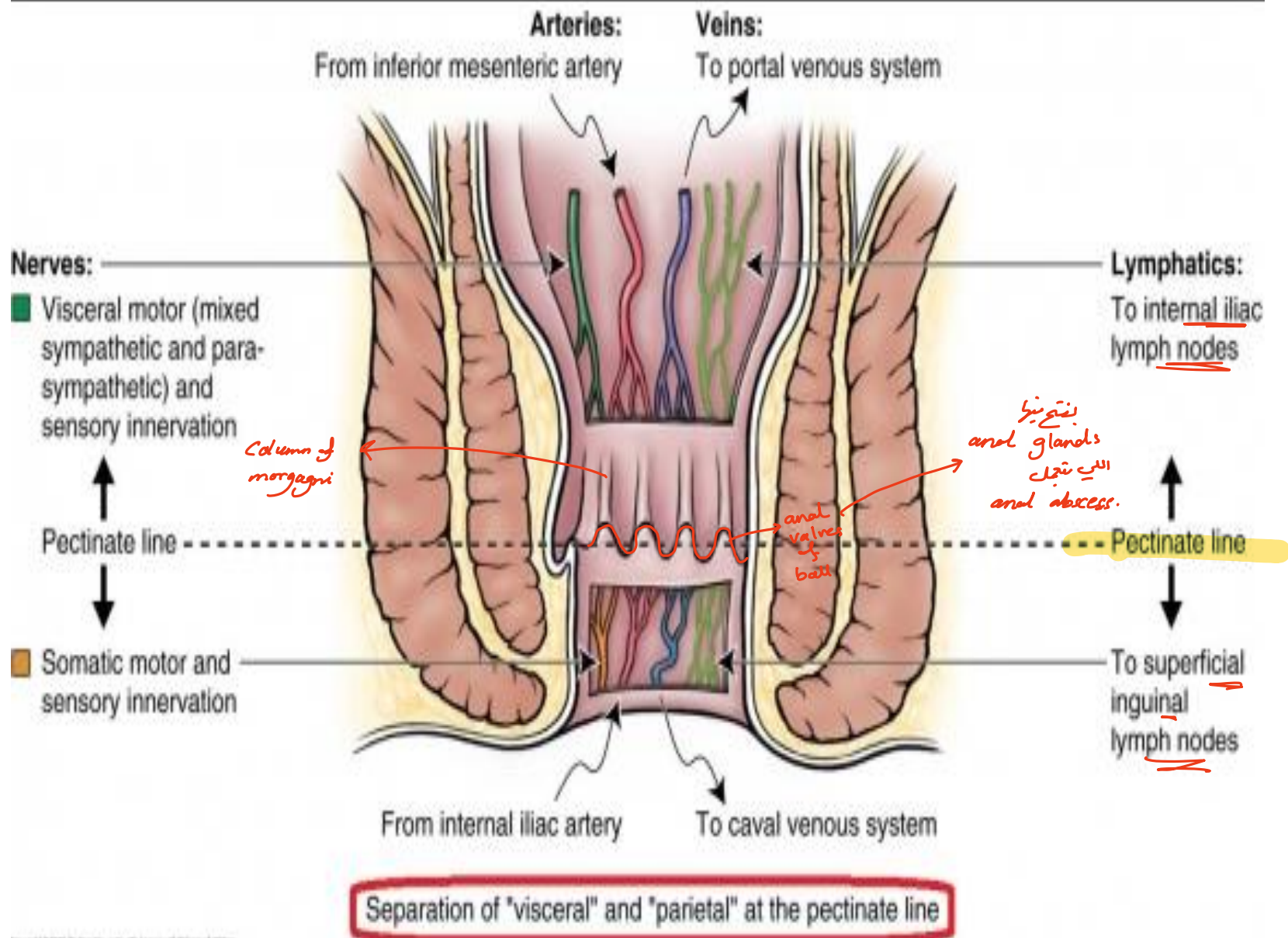
Arterial supply to the rectum and anal canal.

Cont ..

- Lymphatic drainage
- Above dentate line:
To inferior mesenteric and internal iliac nodes
- Below dentate line :
To superficial inguinal nod







Cont ..

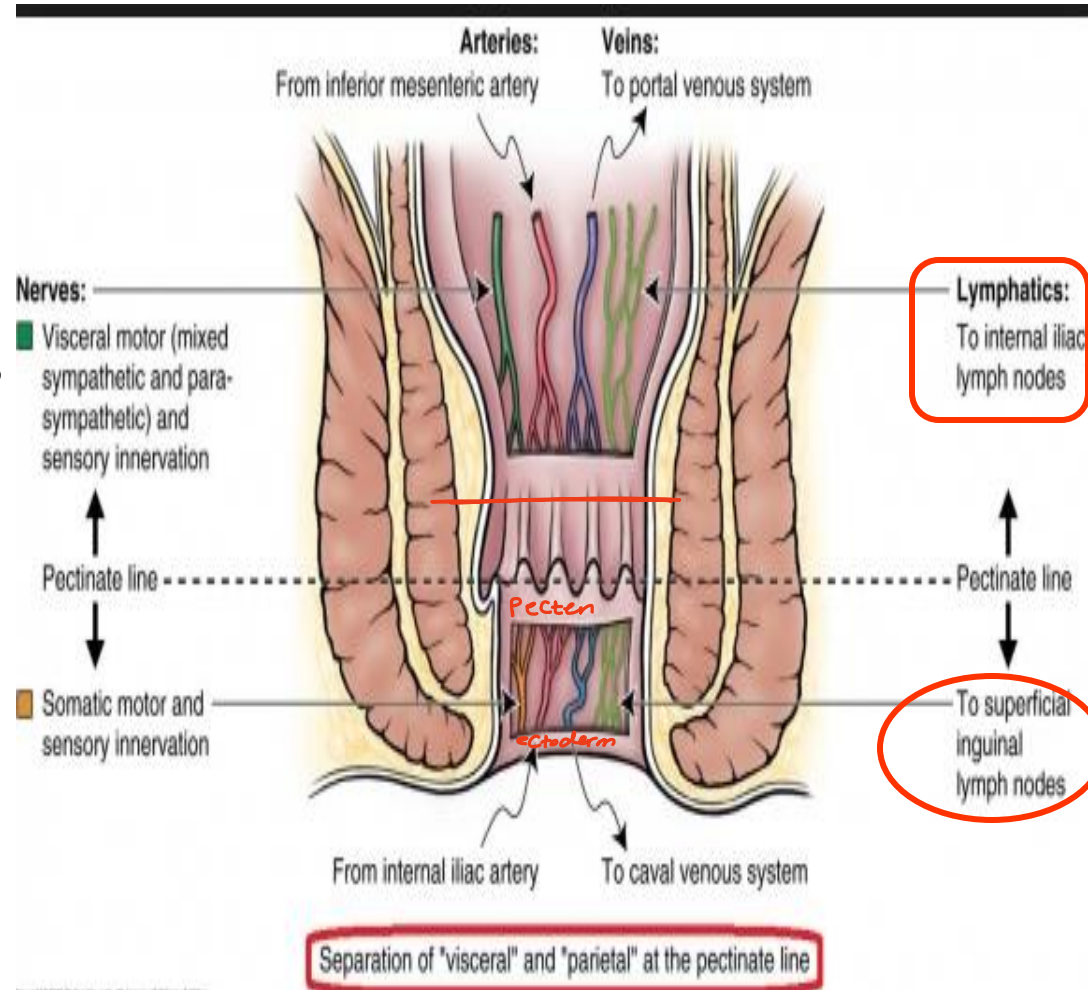
- **Lymphatic drainage**

- Above dentate line

**To inferior mesenteric
and internal iliac nodes**

- Below dentate line

**To superficial inguinal
nodes**



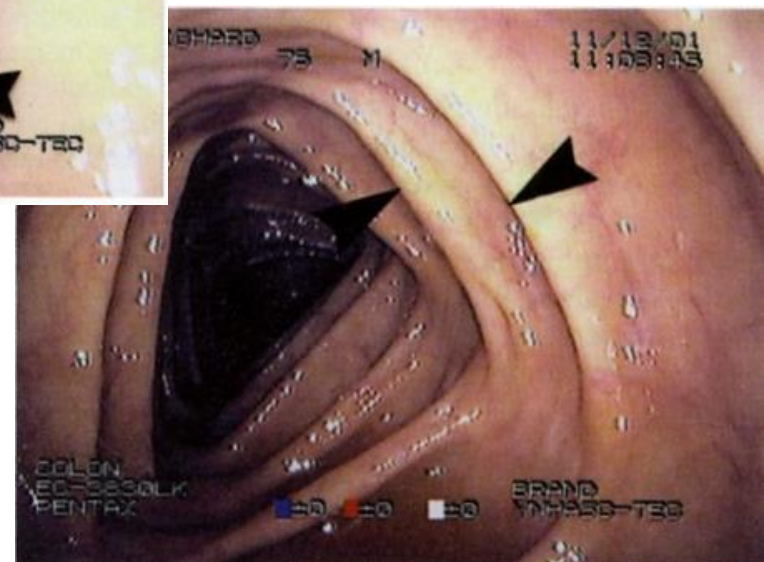
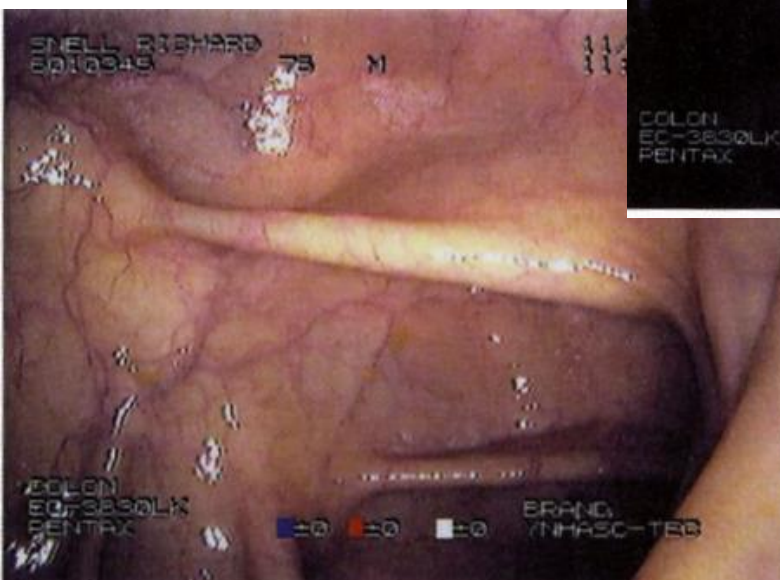
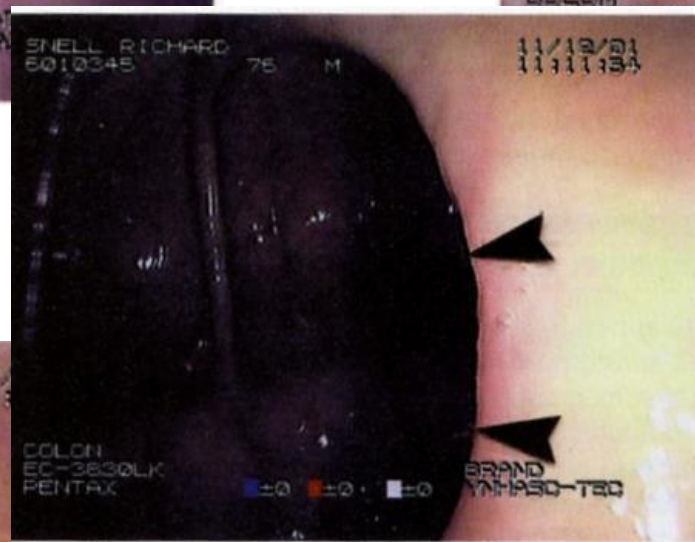
COLONOSCOPY منظار القولون

لے بنجملہ نتائج سہولت دہندہ اڈام فی
لے مہم تشخیص کل اسراعہ القولون

- Since colorectal cancer is a leading cause of death in the Western world, colonoscopy is now being extensively used for early detection of malignant tumors.
- In this procedure, the mucous membrane of the colon can be directly visualized through an elongated flexible tube, or endoscope.
- Following a thorough washing out of the large bowel, the patient is sedated, and the tube is gently inserted into the anal canal.
- The interior of the large bowel can be observed from the anus to the cecum.

COLONOSCOPY

- **Photographs of suspicious areas, such as polyps, can be taken and biopsy specimens can be removed for pathologic examination.**
- **Although a relatively expensive procedure, it provides a more complete screening examination for colorectal cancer than combined fecal occult blood testing and the examination of the distal colon with sigmoidoscopy.**



CANCER OF THE LARGE BOWEL

9/8 13% Population $\hat{=}$ Common Cancer $\hat{=}$ $\hat{=}$ Cancer Colon *
 20% Lung cancer $\hat{=}$ male/female cancer $\hat{=}$ 1% *
 20% Prostatic cancer $\hat{=}$ male $\hat{=}$ Cancer $\hat{=}$ 1% *
 breast cancer $\hat{=}$ Female $\hat{=}$ ✓

- Cancer of the large bowel is relatively common in persons older than 50 years.
- The growth is restricted to the bowel wall for a considerable time before it spreads via the lymphatics.
- Bloodstream spread via the portal circulation to the liver occurs late.
- If a diagnosis is made early and a partial colectomy is performed, accompanied by removal of the lymph vessels and lymph nodes draining the area, then a cure can be anticipated.