

وسهلا

أهلا



الأستاذ الدكتور يوسف حسين

أستاذ التشريح وعلم الأجنة - كلية الطب - جامعة الزقازيق - مصر

رئيس قسم التشريح و الأنسجة و الأجنة - كلية الطب - جامعة مؤتة - الأردن

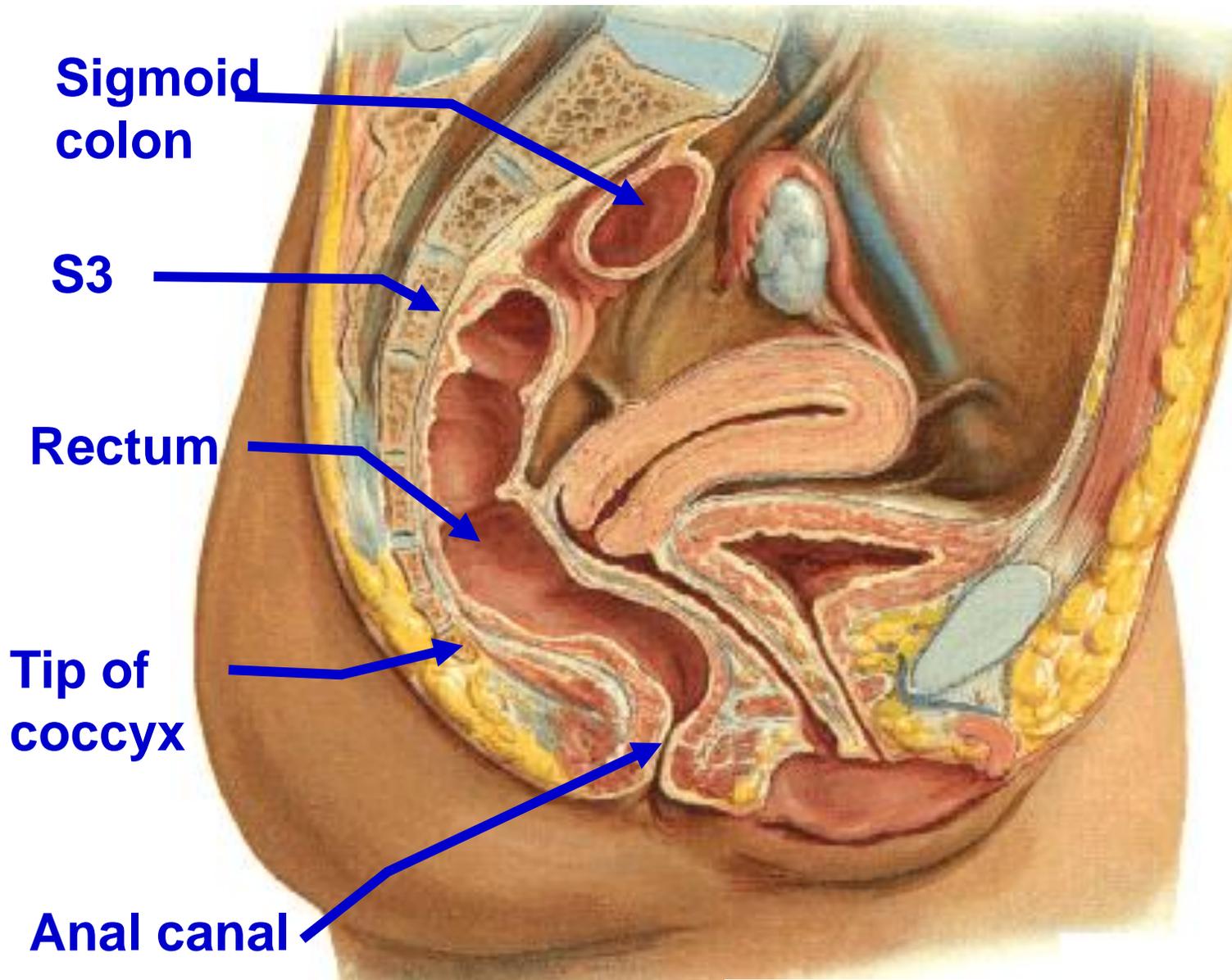
دكتورة من جامعة كولونيا المانيا

Prof. Dr. Youssef Hussein Anatomy اليوتيوب

جروب الفيس د. يوسف حسين (استاذ التشريح)



Rectum

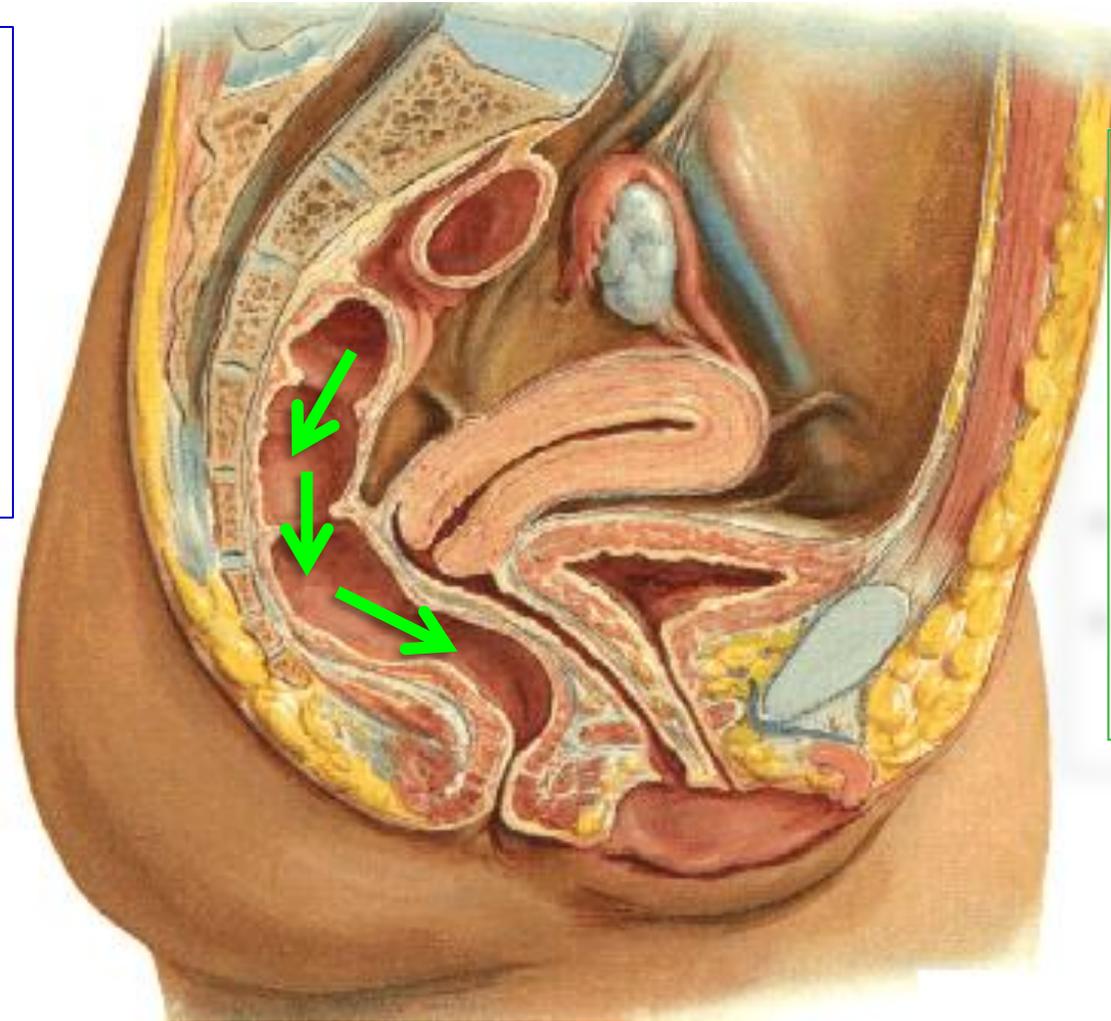


**** Beginning:** a continuation of the sigmoid colon at the **3rd sacral** vertebra.

**** End:** at anorectal junction; one inch below and in front the tip of the coccyx.

**** Length,** it is about 12 cm long.

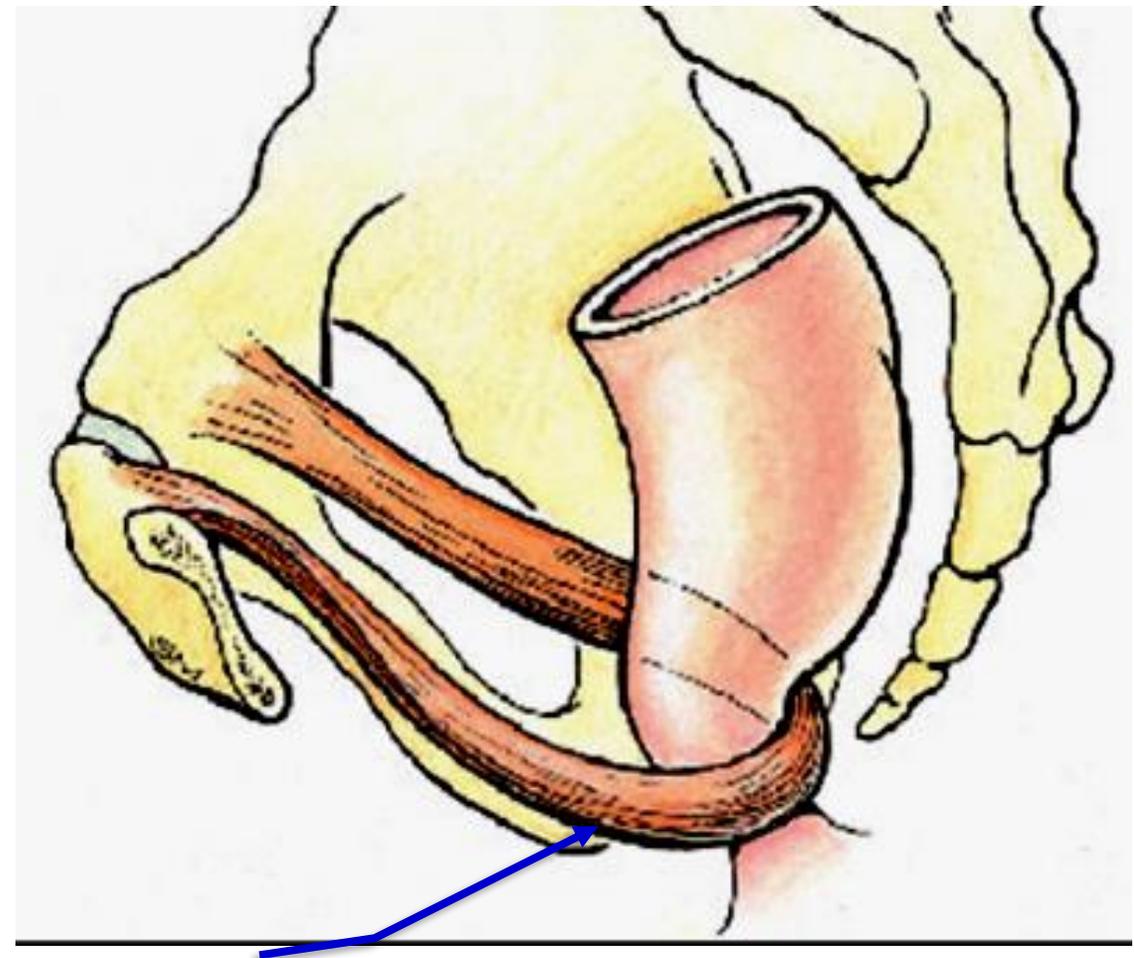
- **Anteroposterior flexure**
- Follows the curvature of the sacrum and coccyx (**Sacral flexure**, **convex backward**).



- It descends **Downwards and backwards**
- **Downwards**
- **Downwards and forwards**

- **Anteroposterior flexure**

- At anorectal junction (**convex forward**): puborectalis portion of levator ani muscles forms **a sling** at the junction of rectum with anal canal and pulls this part forward.
- It is an important mechanism for **fecal continence** during the resting state by its active contraction during peristaltic contractions if defecation is not to occur



puborectalis

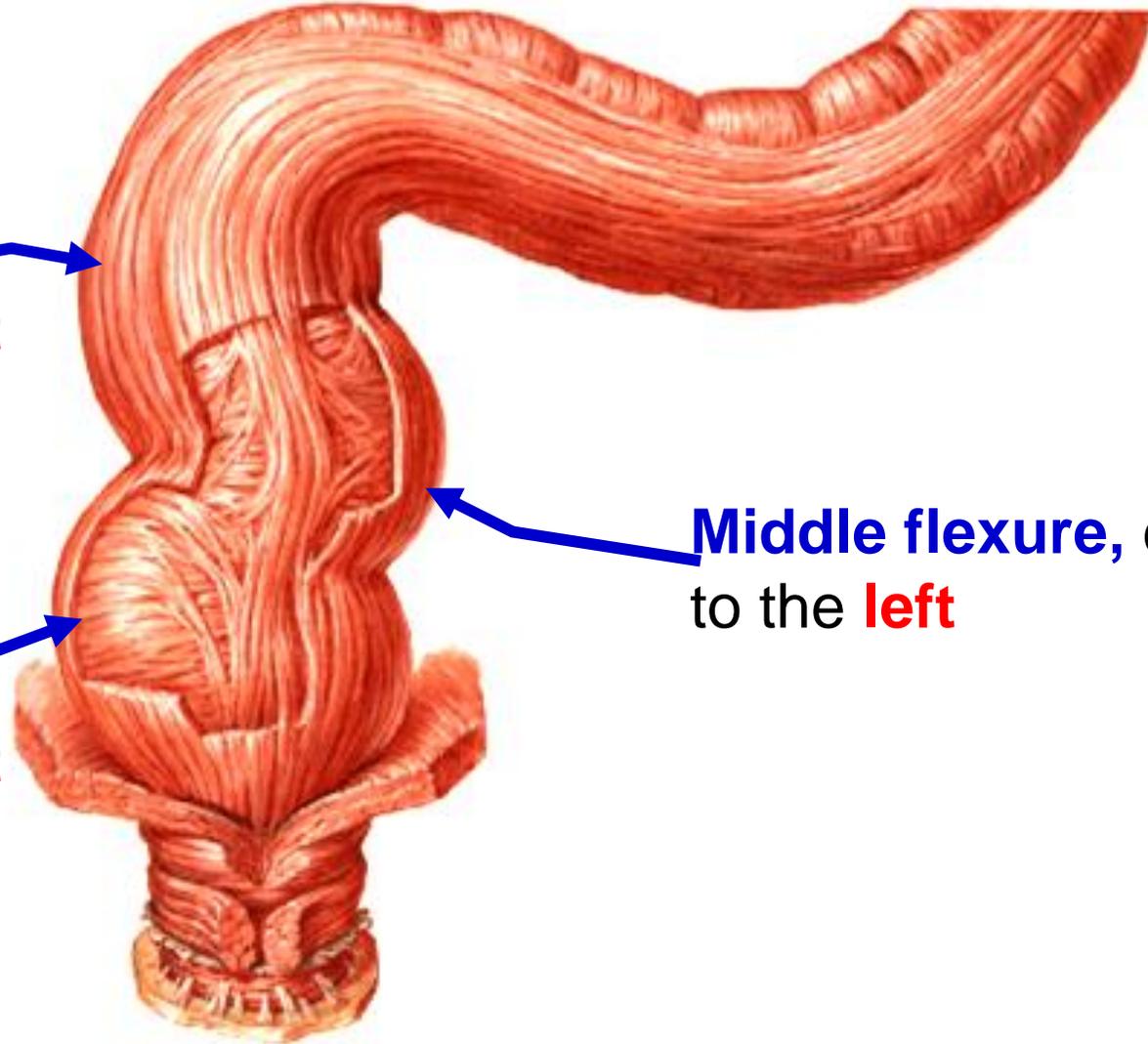
Right

- **3 Lateral rectal flexures**

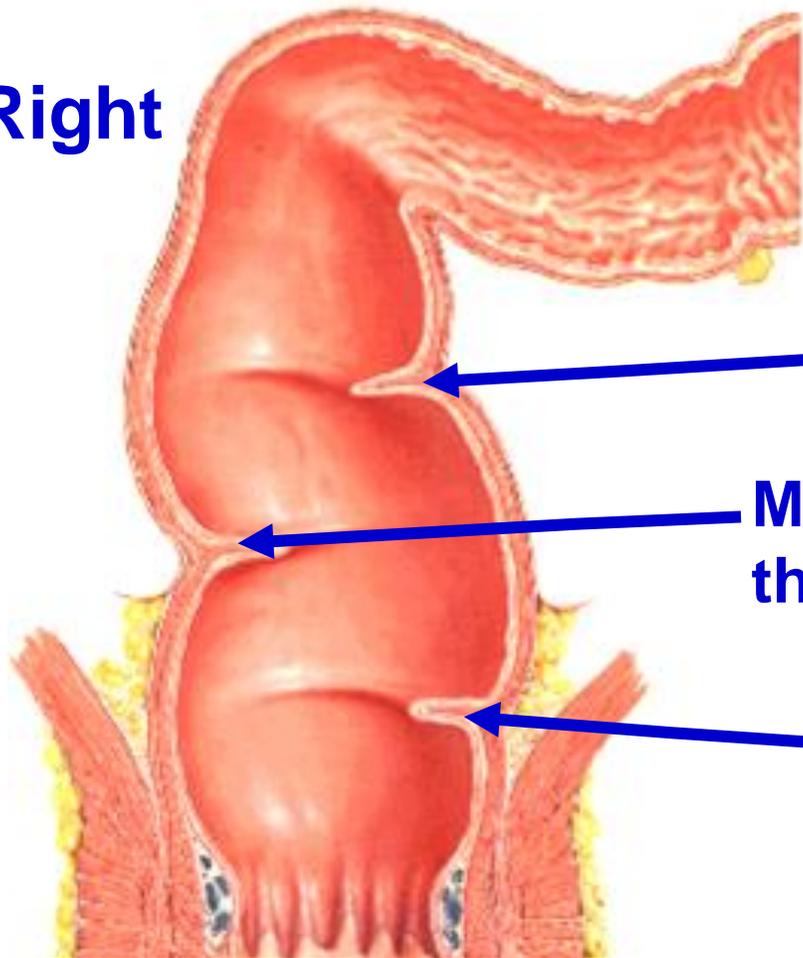
Upper flexure,
convex to the **right**

Lower flexure,
convex to the **right**

Middle flexure, convex
to the **left**



Right

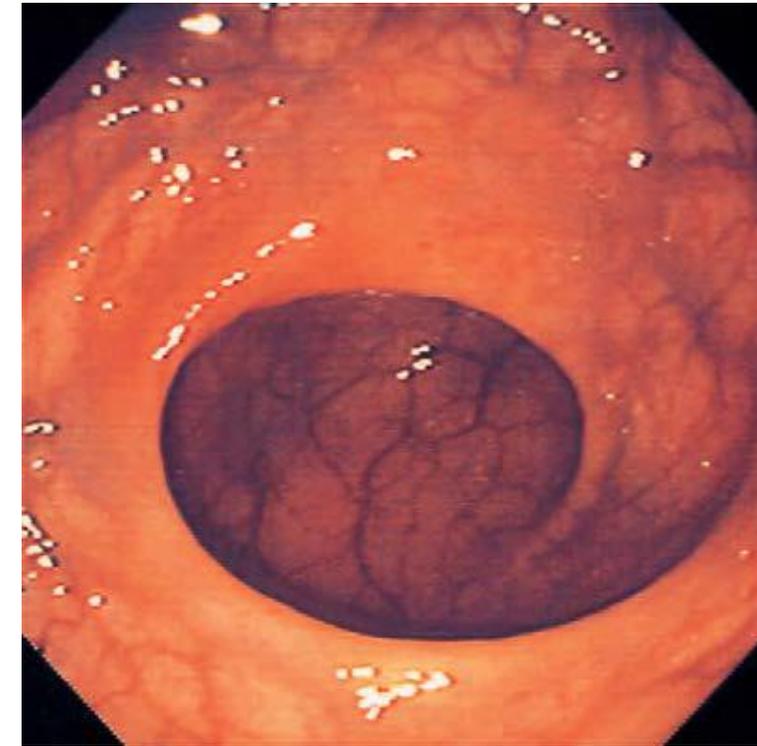


- 3 Lateral rectal folds (Houston's valves)

Superior rectal valve

Middle rectal valve, the largest

Inferior rectal valve

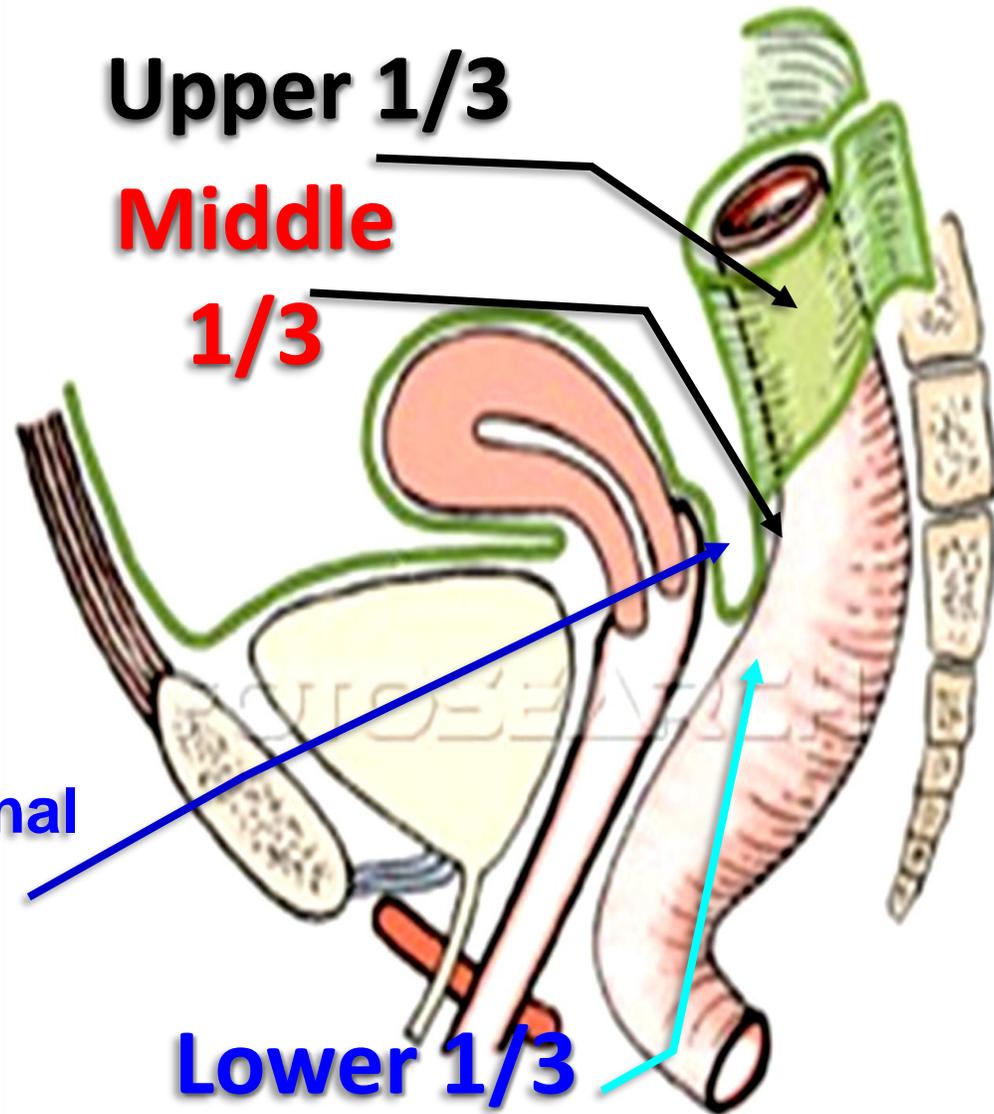


- Endoscopic appearance

- **Rectal shelves- Houston's valve:** 3 transverse folds lie close to inner aspect of **concave side** of 3 lateral flexures.

- **Functions;** support the **weight of the stool**, and prevent its urging toward the anus. dr_youssefhussein@yahoo.com

Peritoneal Relations

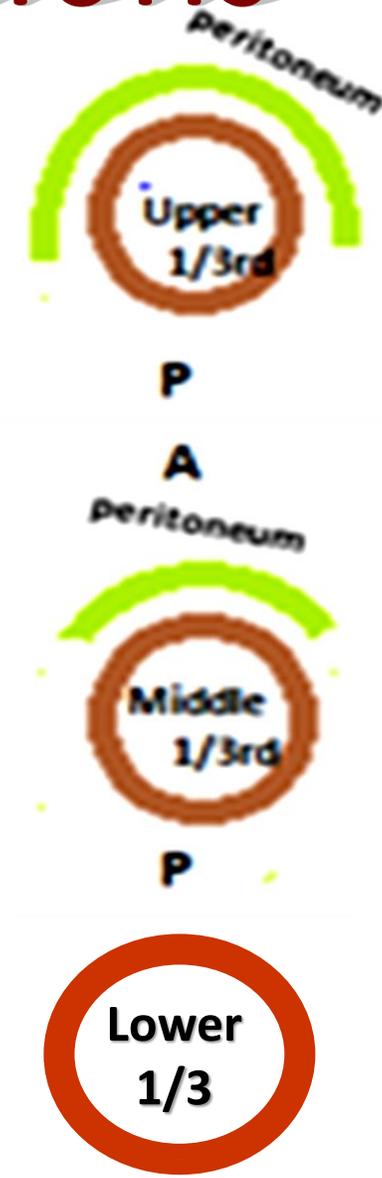


Upper 1/3

Middle 1/3

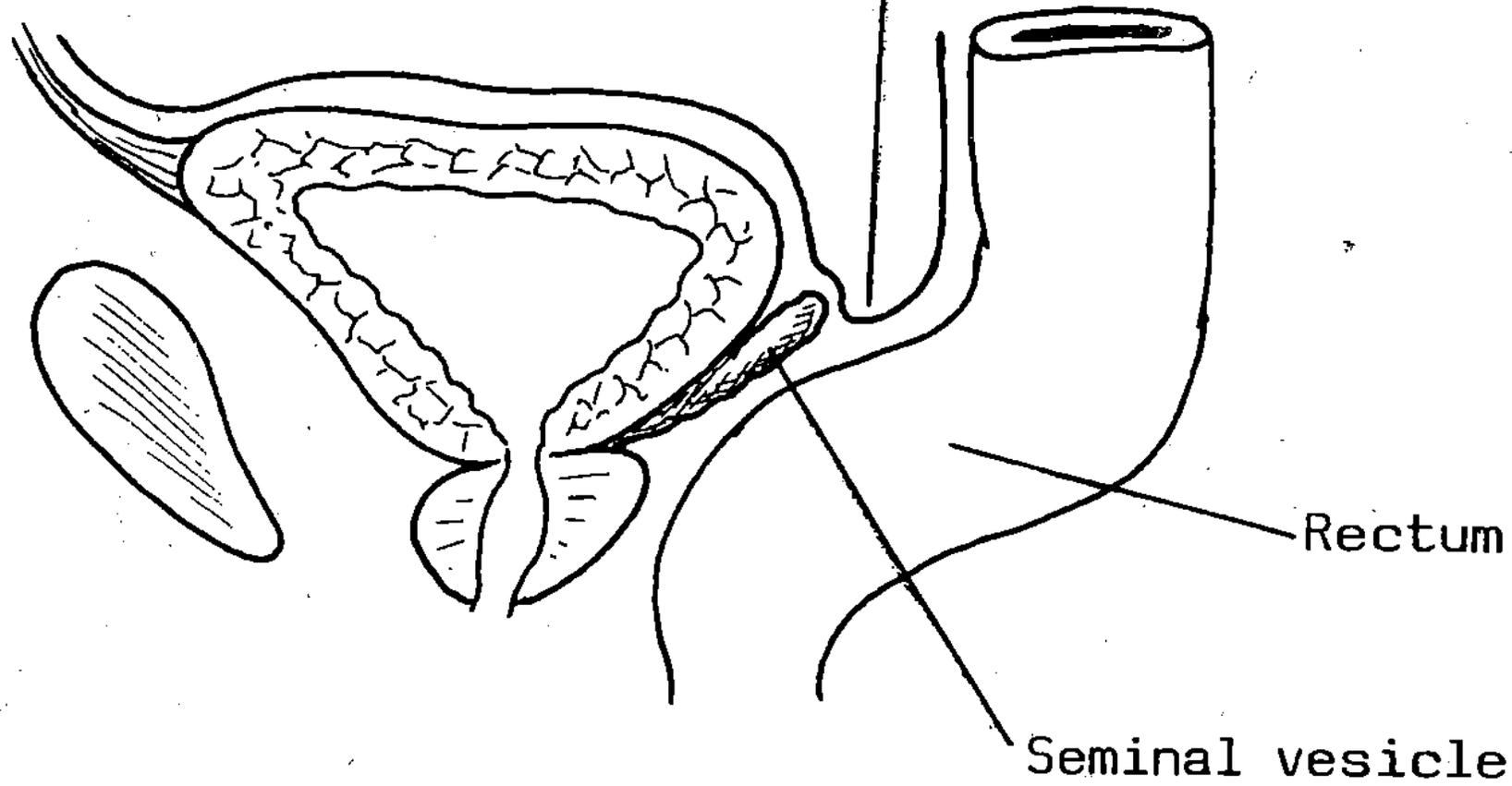
Lower 1/3

Rectovaginal pouch



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Rectovesical pouch



**** Peritoneal covering;**

1- The upper third, is covered by peritoneum on the front and sides.

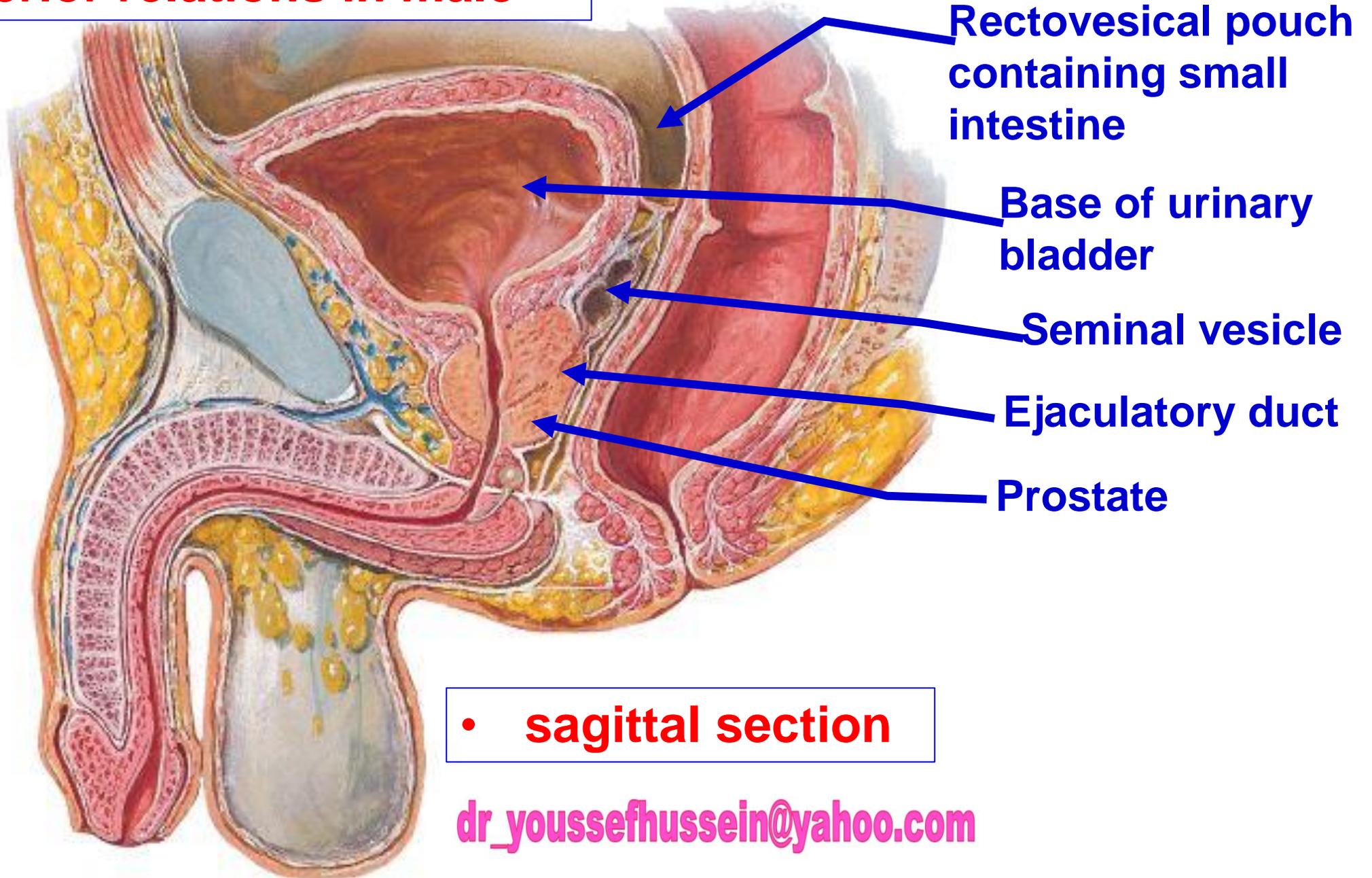
2- The middle third is only covered by peritoneum anteriorly.

3- The lower third has no peritoneal covering.

a- In female; - Reflection of peritoneum occurs from the front of the rectum at the Junction of its middle 1/3 and lower 1/3 on to the upper part of **the posterior wall of the vagina** to form the **rectovaginal, or Douglas pouch (5.5 cm from anal orifice)**.

b- In male; Reflection of peritoneum occurs from the front of the rectum at the junction of its middle 1/3 and lower 1/3 to the upper part of the **posterior surface (base) of urinary bladder**, called the **rectovesical pouch of Denonviller (7.5 cm from anal orifice)**

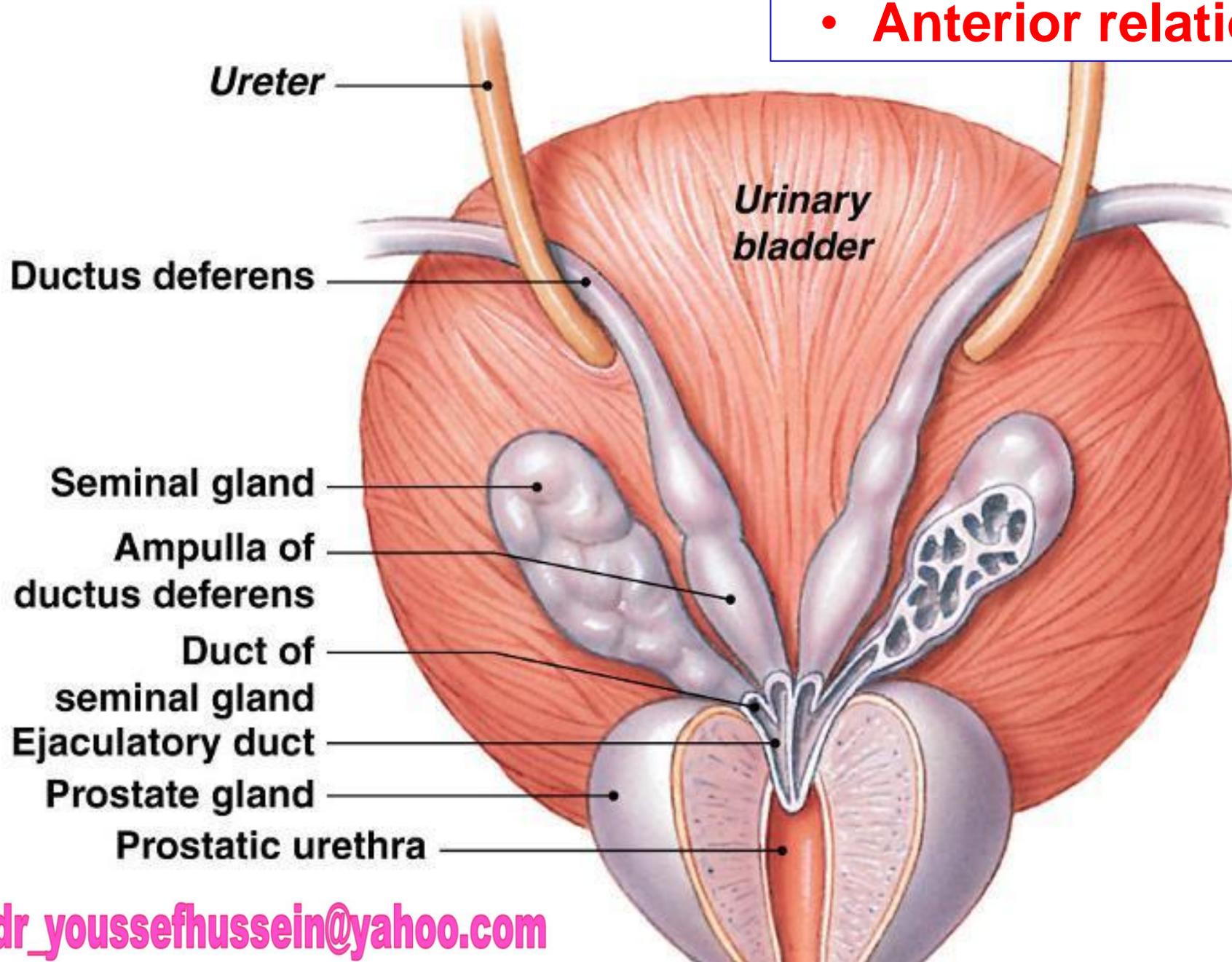
- **Anterior relations in male**



- **sagittal section**

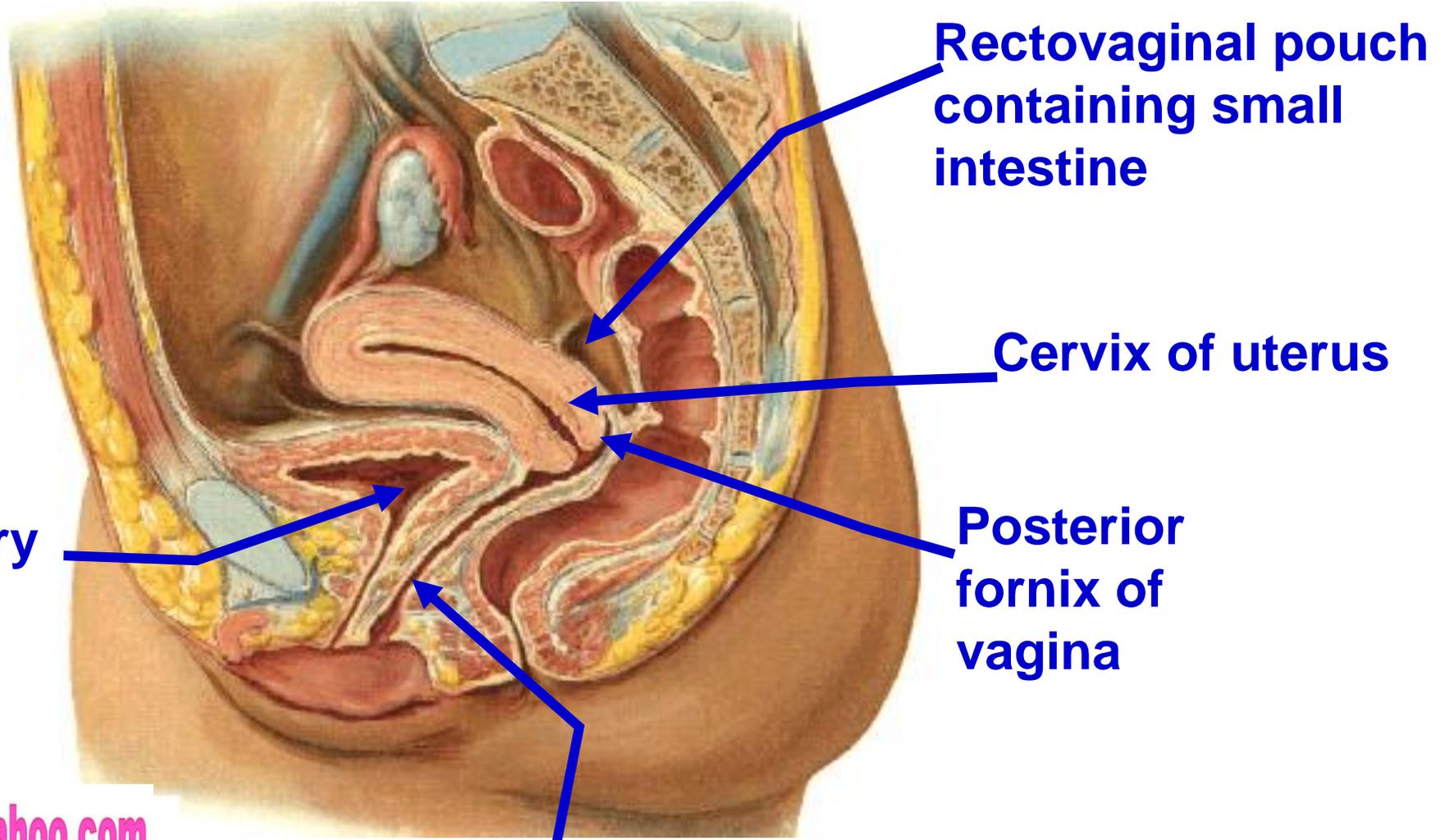
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- **Anterior relations in male**



- **Base of urinary bladder**

- Anterior relations in female**



Rectovaginal pouch containing small intestine

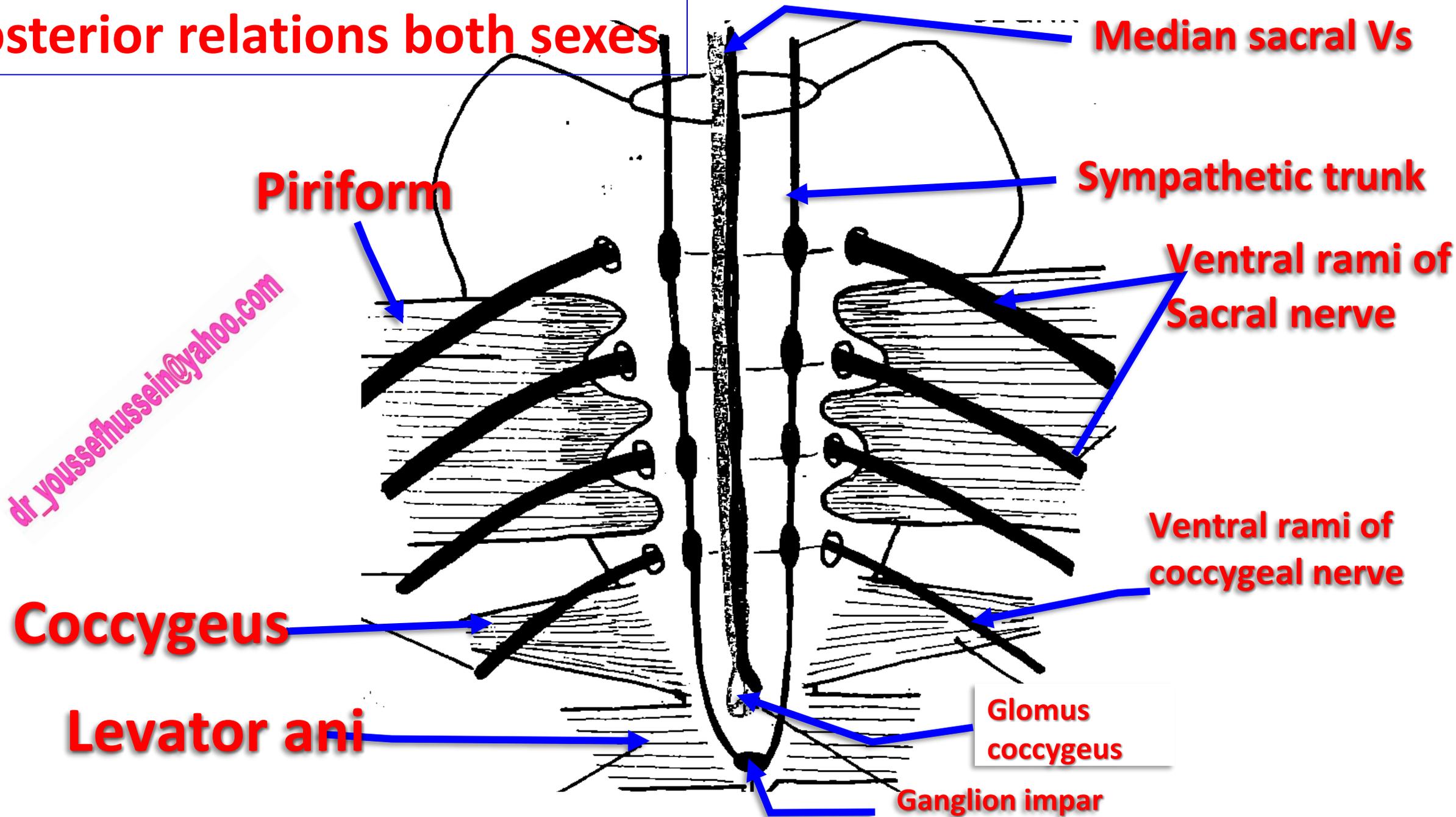
Cervix of uterus

Posterior fornix of vagina

Base of urinary bladder

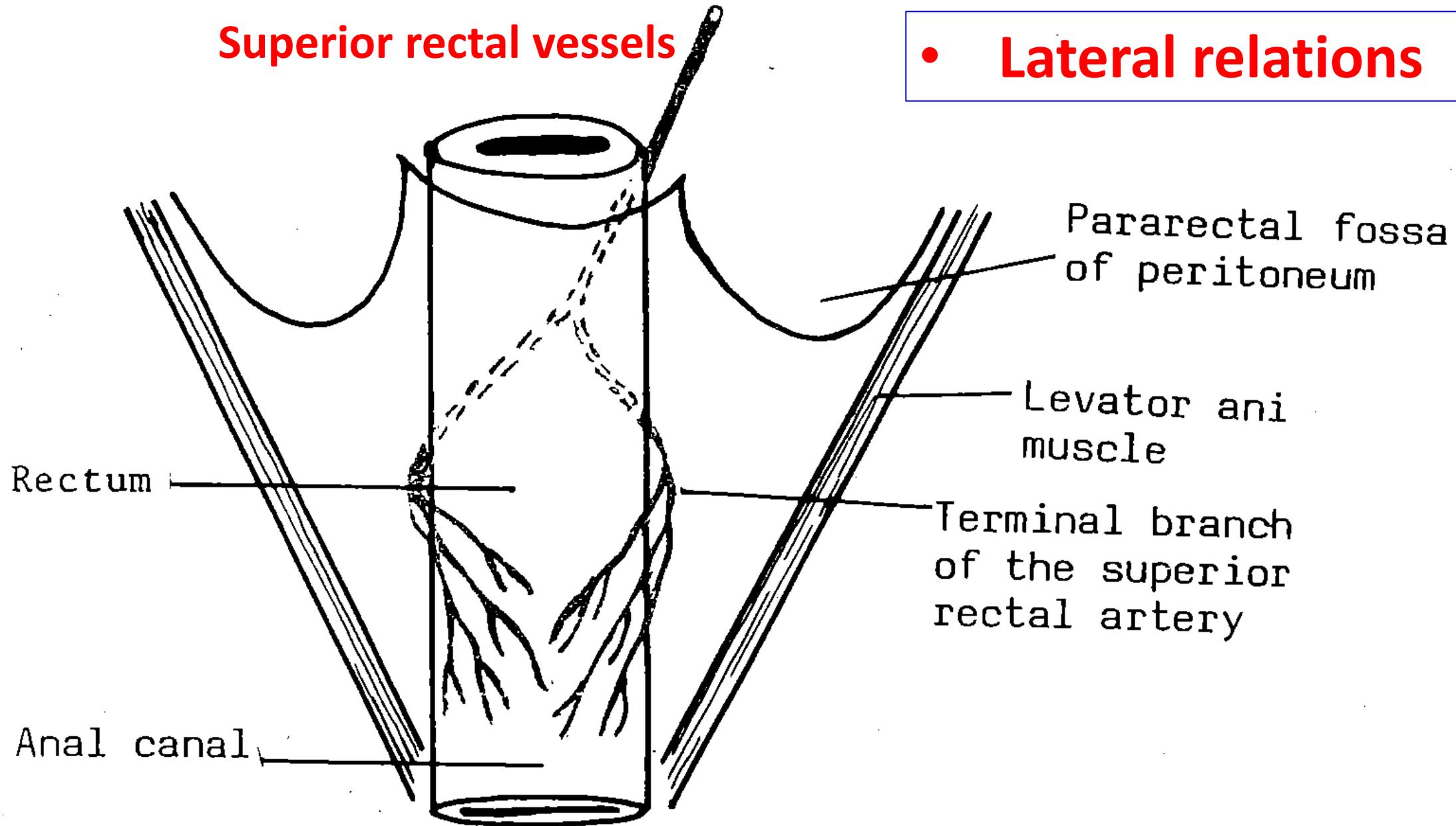
Posterior wall of Vagina

Posterior relations both sexes



Superior rectal vessels

- **Lateral relations**



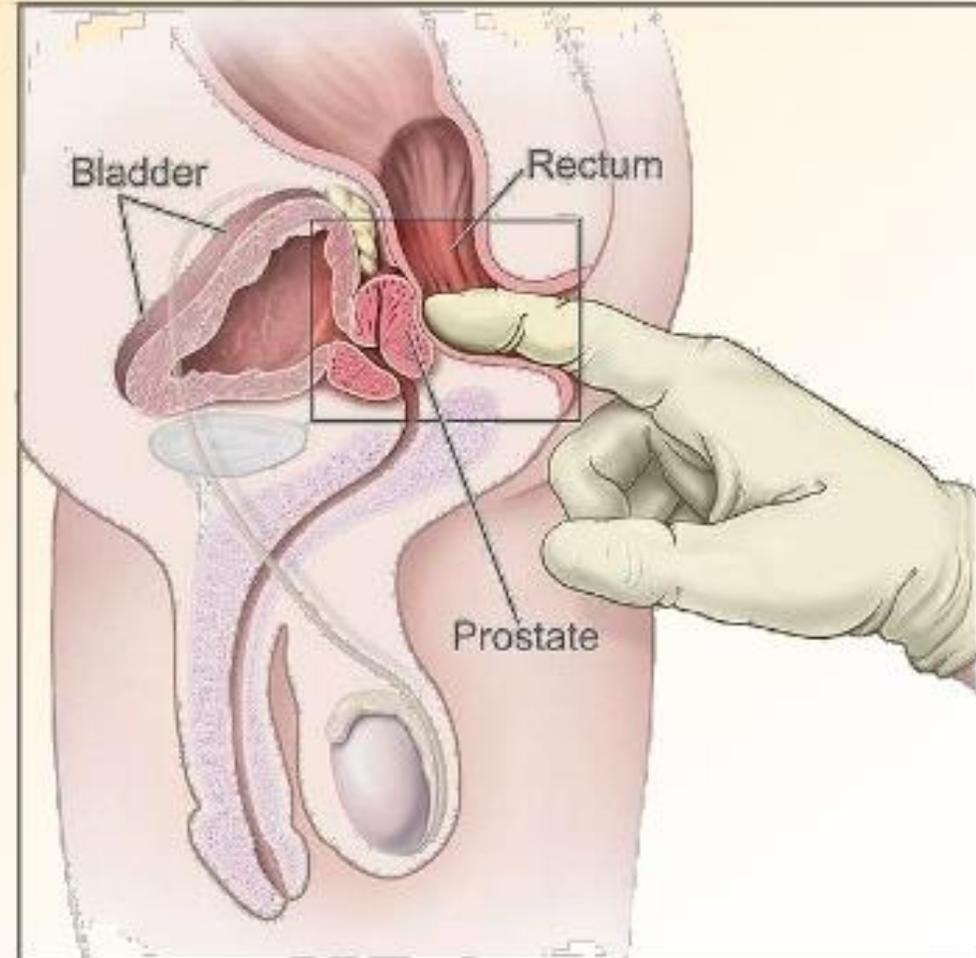
- **Factors support the rectum**
(Store of the stool)

1. **Pelvic diaphragm** (levator ani and coccygeus).
 2. **Perineal body.**
 3. **Lateral ligament of the rectum:** condensation of pelvic fascia.
 4. **Rectovesical fascia of Denonviller in male (anterior):** from the rectum to the back of the urinary bladder.
 5. **Rectovaginal fascia of Douglas in female (anterior):** from the rectum to the back of the vagina.
 6. **Fascia of Waldeyer (posterior):** condensation of pelvic fascia, connects rectum to the sacrum
- *** Rectal prolapse:** the rectum protrudes from the anal canal

Digital Rectal Examination

P/R. examination

- Examination to check for abnormalities of organs or other structures in the pelvis and lower abdomen
- To check for
 - growths in or enlargement of the prostate gland in males. A tumor in the prostate can often be felt as a hard lump
 - problems in female reproductive organs (uterus and ovaries)
 - rectal bleeding or tumors in the rectum



- **Ulcerative colitis**

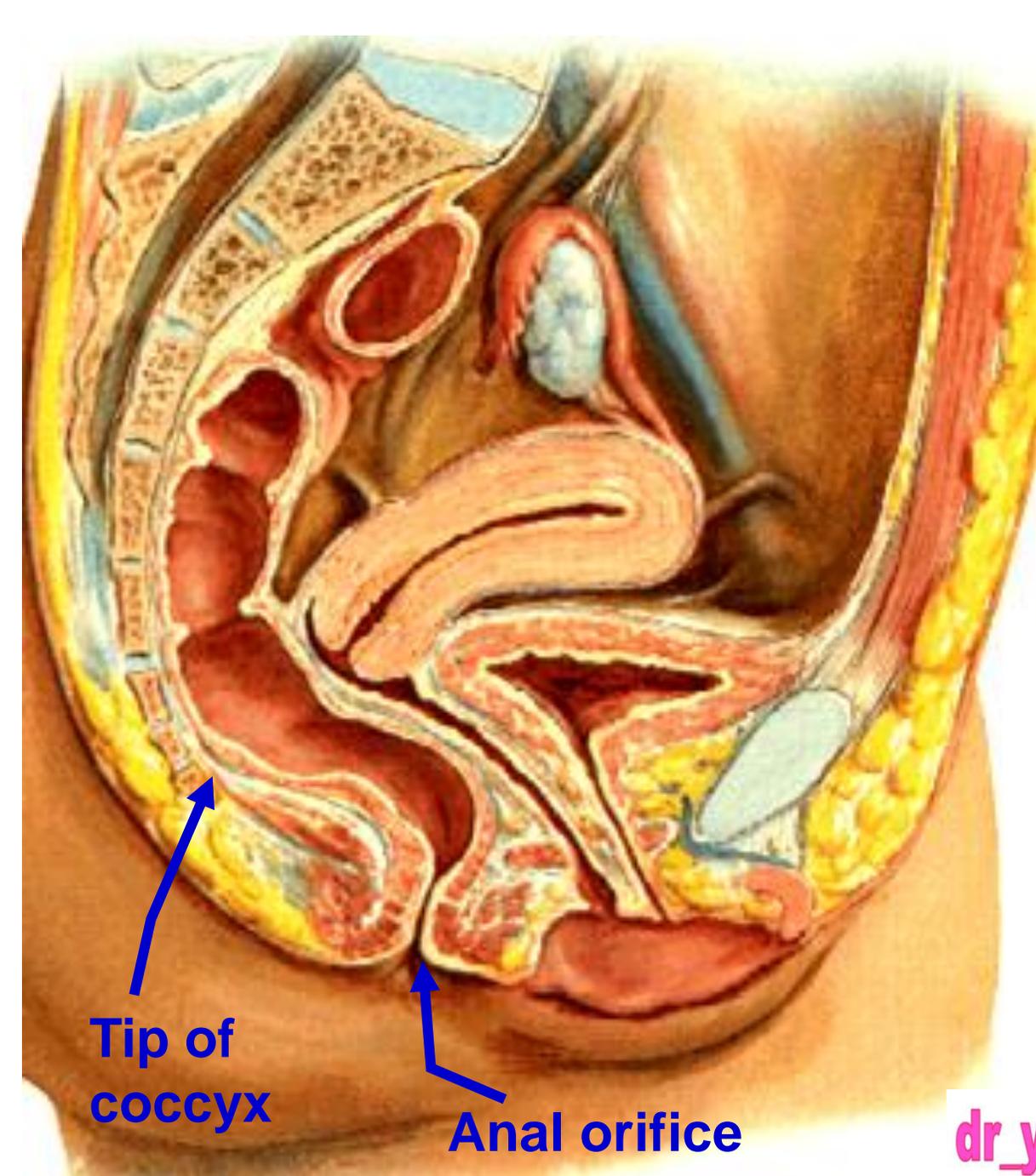
- is chronic ulceration of the colon and rectum with cramping abdominal pain, rectal bleeding, diarrhea, and loose discharge of pus and mucus with scanty fecal particles.
- Complications include hemorrhoids, abscesses, anemia, electrolyte imbalance, perforation of the colon, and carcinoma.

- **Irritable bowel syndrome (Nervous colon)**

- Causes: unknown, Genetic factors, Food sensitivity, bacterial overgrowth and neurotransmitter
- Abdominal cramps, bloating, diarrhea or constipation



Anal canal



- **Anal Canal**

**** Beginning**, one Inch below and in front of the tip of the coccyx as a continuation of the rectum.

**** Length**; It is about 4 cm long.

**** End**: It descends downwards and backwards to end at the anus (anal orifice).

Tip of
coccyx

Anal orifice

dr_youssefhusseini@yahoo.com

- **Relations in male**

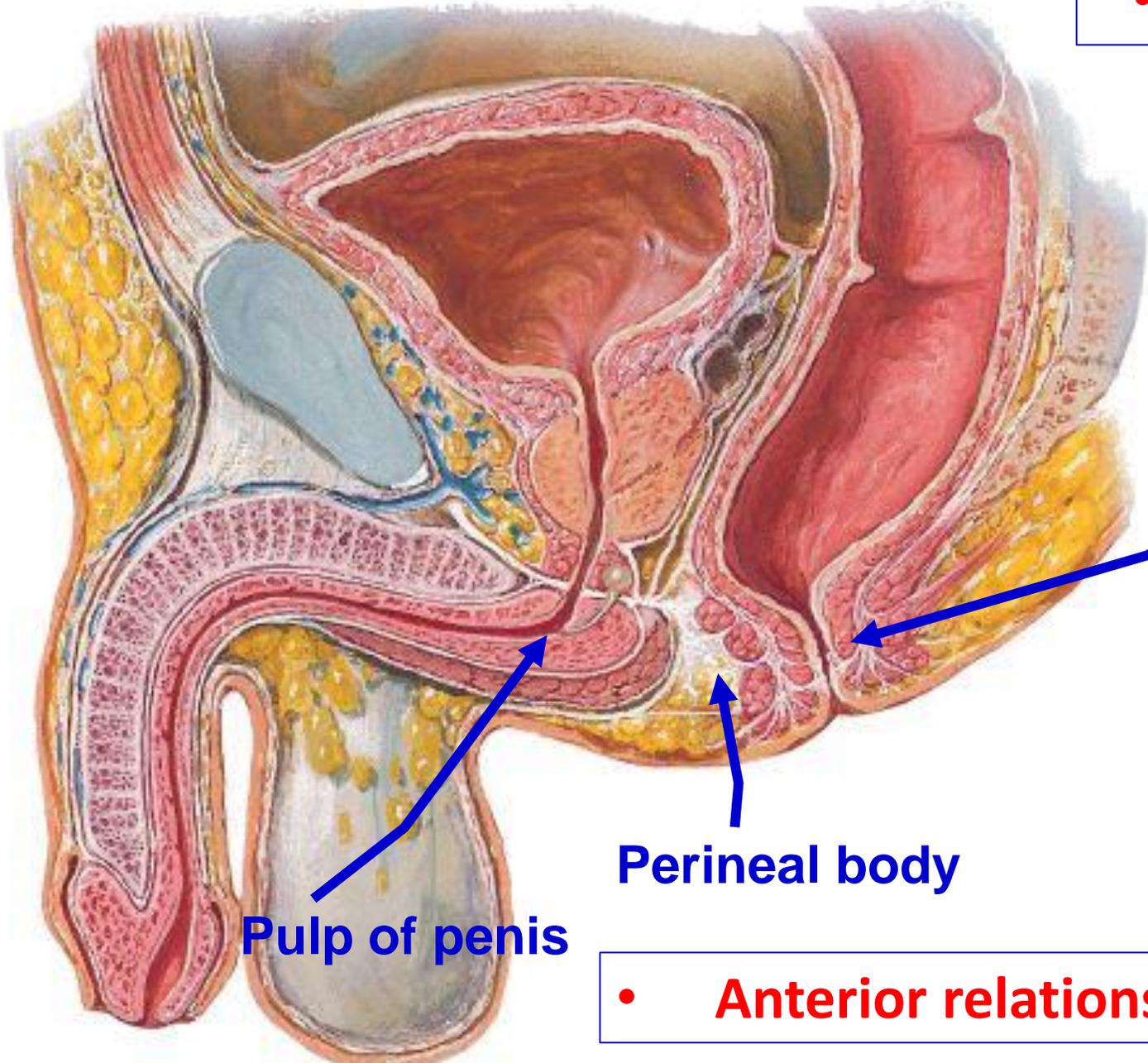
- **Posterior relations**

Anococcygeal raphe

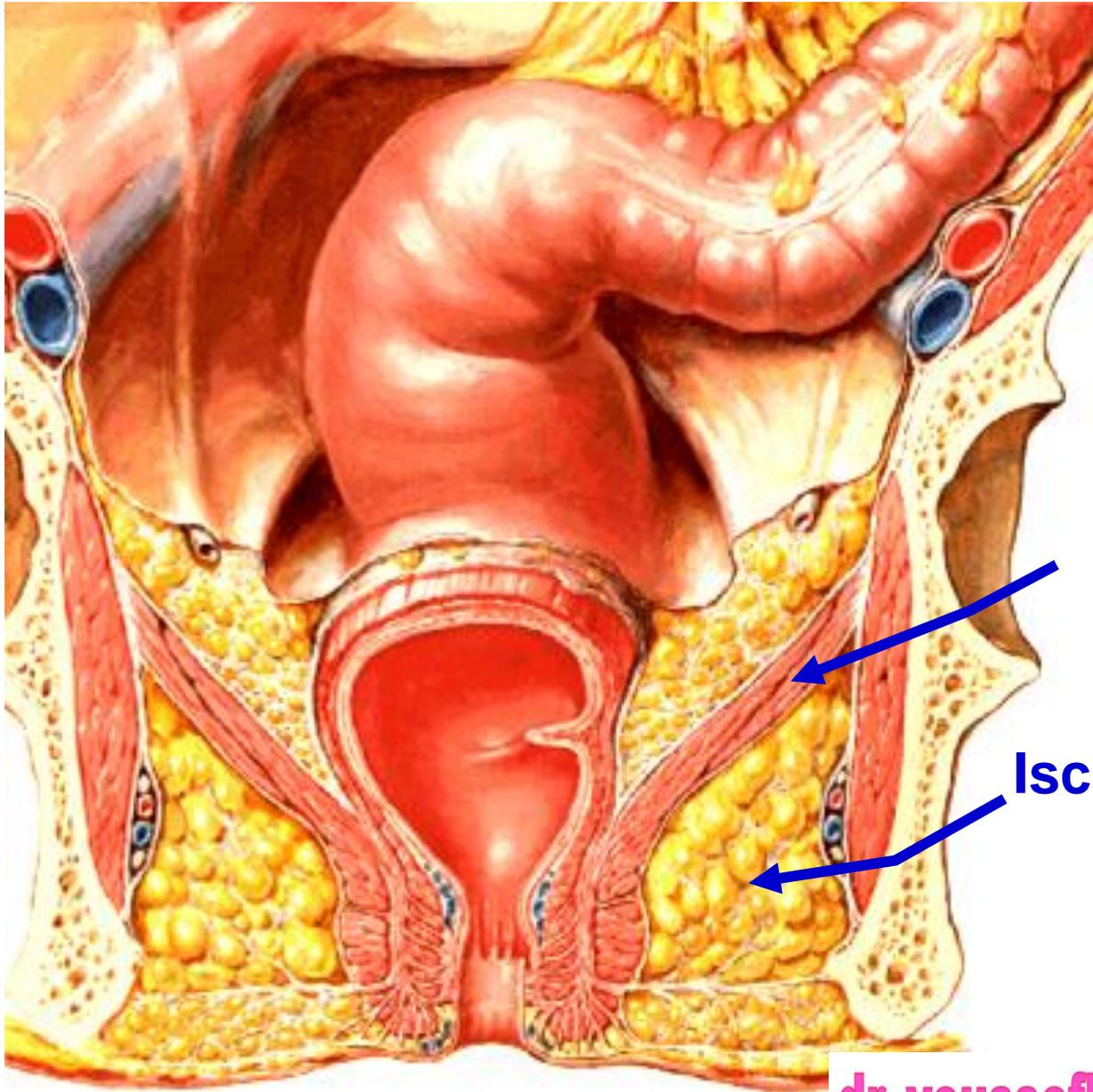
Perineal body

Pulp of penis

- **Anterior relations**



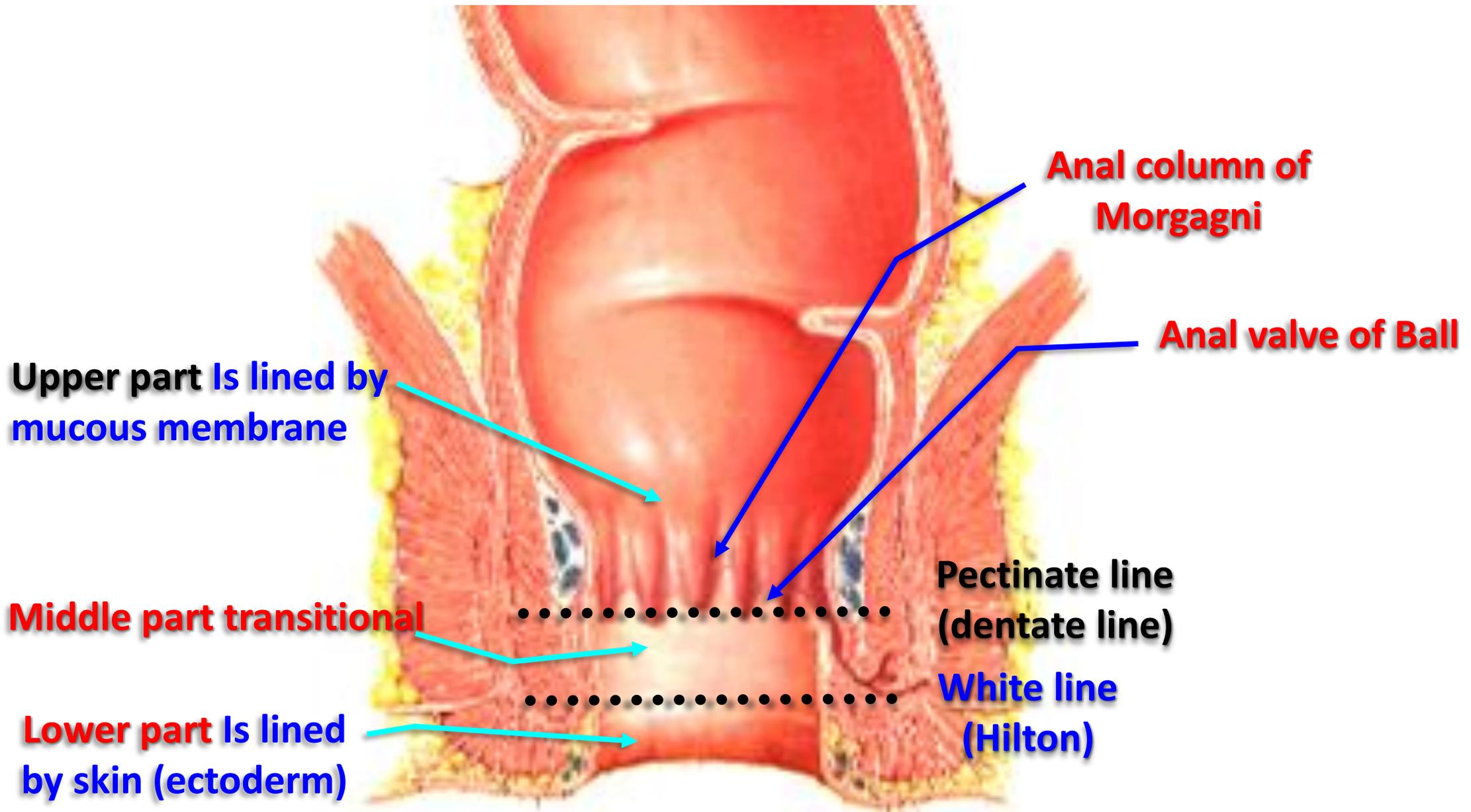
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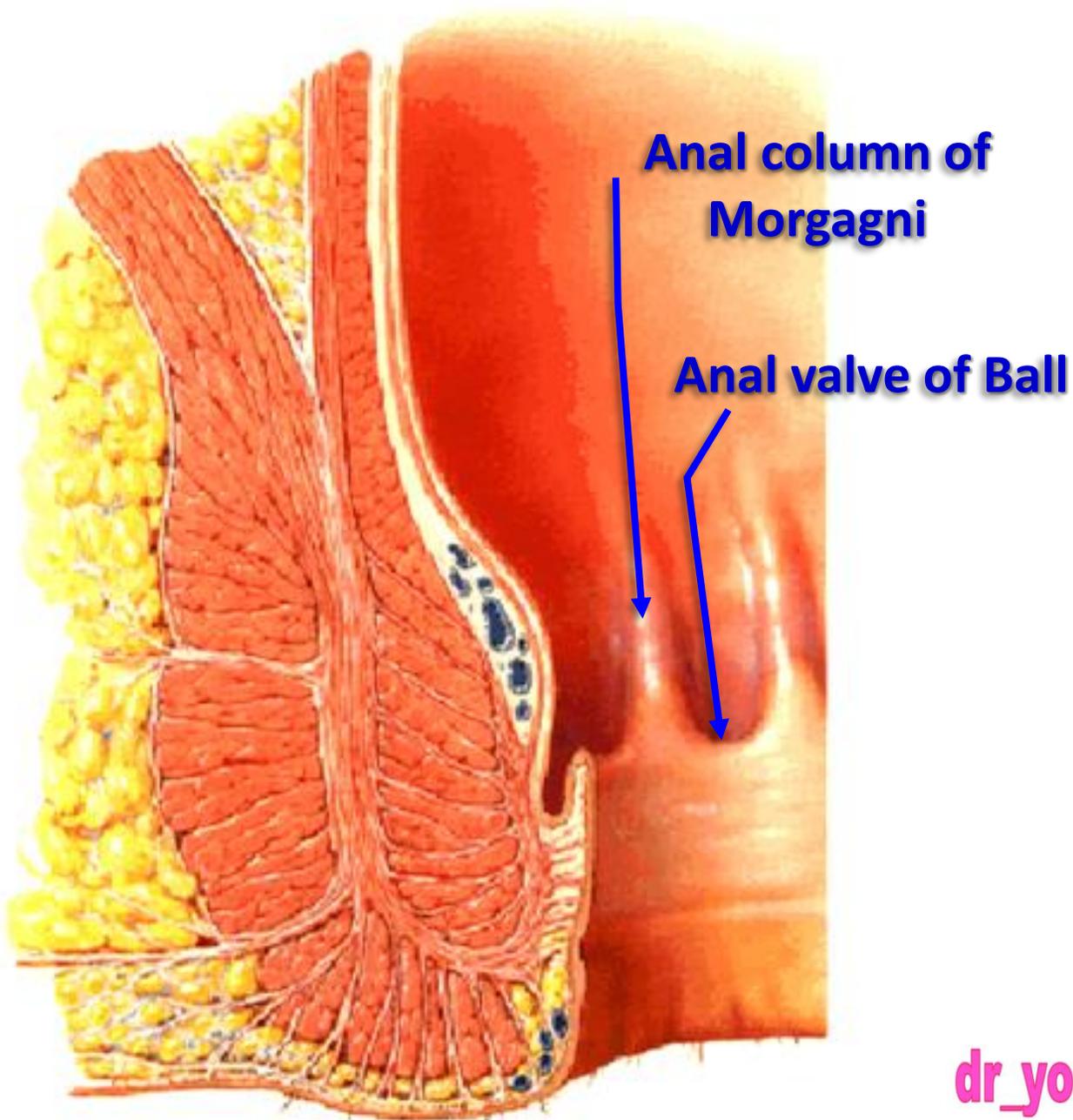
- **Lateral Relations in both sex**

**Levator ani
(above)**

**Ischiorectal fossa
(below)**



Mucocutaneous lining of the anal canal



** Internal appearance (Mucous membrane) of the anal canal

- **Upper part**, (1.5 cm) mucous part, endodermal (lined by simple columnar epithelium).
 - It shows 6-10 vertical folds called **anal columns of Morgagni**.
 - The lower end of the anal columns is connected by crescentic folds called **anal valves of Ball**.
 - Above each anal valve there is a small recess called **anal sinus** receiving the opening of the anal gland.

**** Internal appearance (Mucous membrane) of the anal canal**

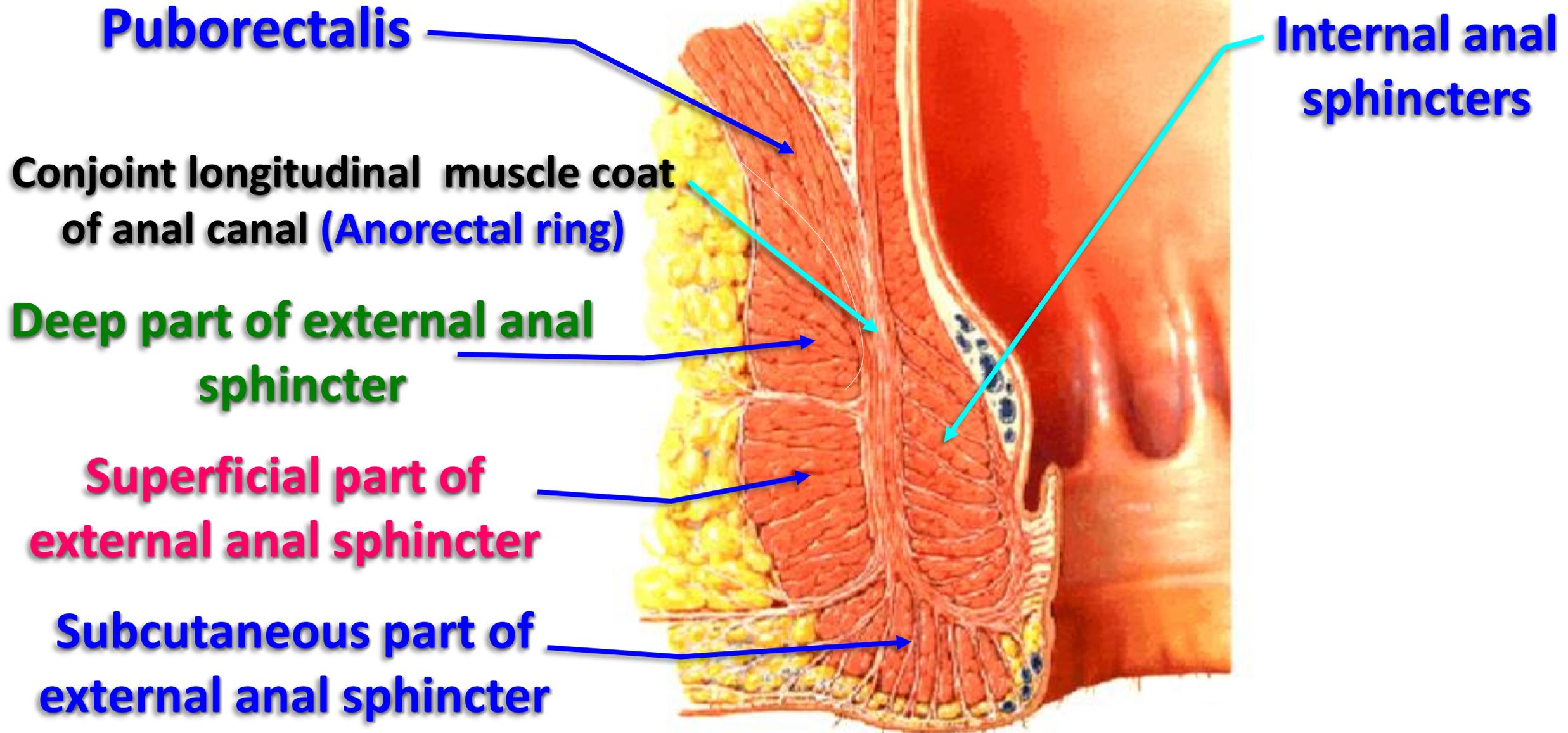
2- Middle part (1.5 cm); transitional zone;

- It is lined by stratified squamous epithelium **devoid** of sweat and sebaceous glands.
- It extends **from** the pectinate line above **to** the white line below.
- The **white line of Hilton** demarcates the lower end of the internal anal sphincter.

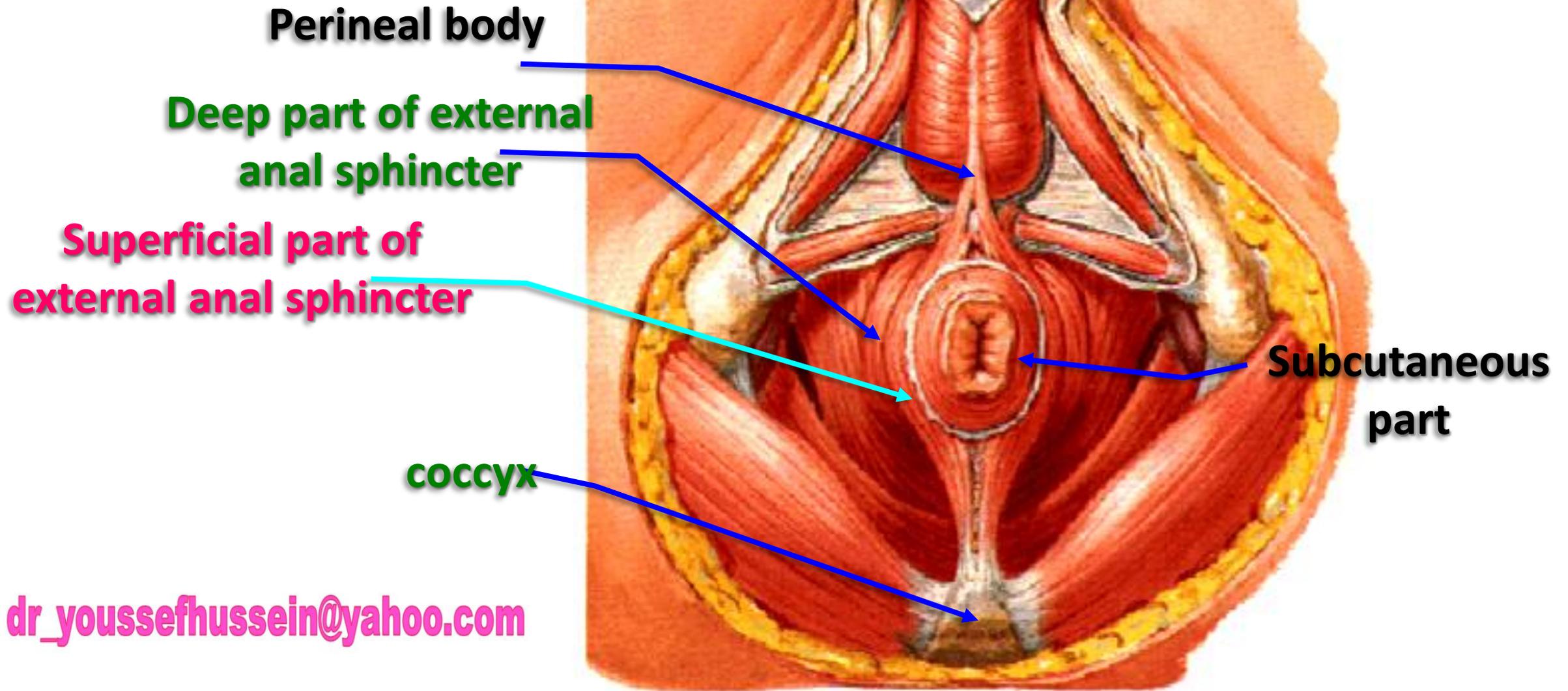
3- Lower part, (1 cm), ectodermal in origin,

- It is lined by true skin containing sweat and sebaceous glands
- **Anal fissure, tear of the lining of the anal canal leading to severe pain and bleeding.**

• L.S. Sphincters of the anal canal



T.S. External anal sphincter



**** Parts of the external anal sphincter;**

1- Subcutaneous part (under the skin),

- It is a **thick circular band** surrounding the **lower part** of the anal canal.
- has **no bony** attachment

2- Superficial part: above the subcutaneous part,

- It is formed of **two bands** surrounding **lower part** of the internal anal sphincter.
- They arise from the coccyx and inserted into the perineal body.

3- Deep part: above the superficial part.

- It is a **thick circular band** surrounding the **upper part** of the internal anal sphincter.
- has **no bony** attachment

C- Ano-rectal ring;

- It is formed by the fusion of,
 - a- Internal anal sphincter.
 - b- Deep part of the external anal sphincter.
 - c- Puborectalis part of the levator ani muscle.

Division of the ring produces fecal incontinence

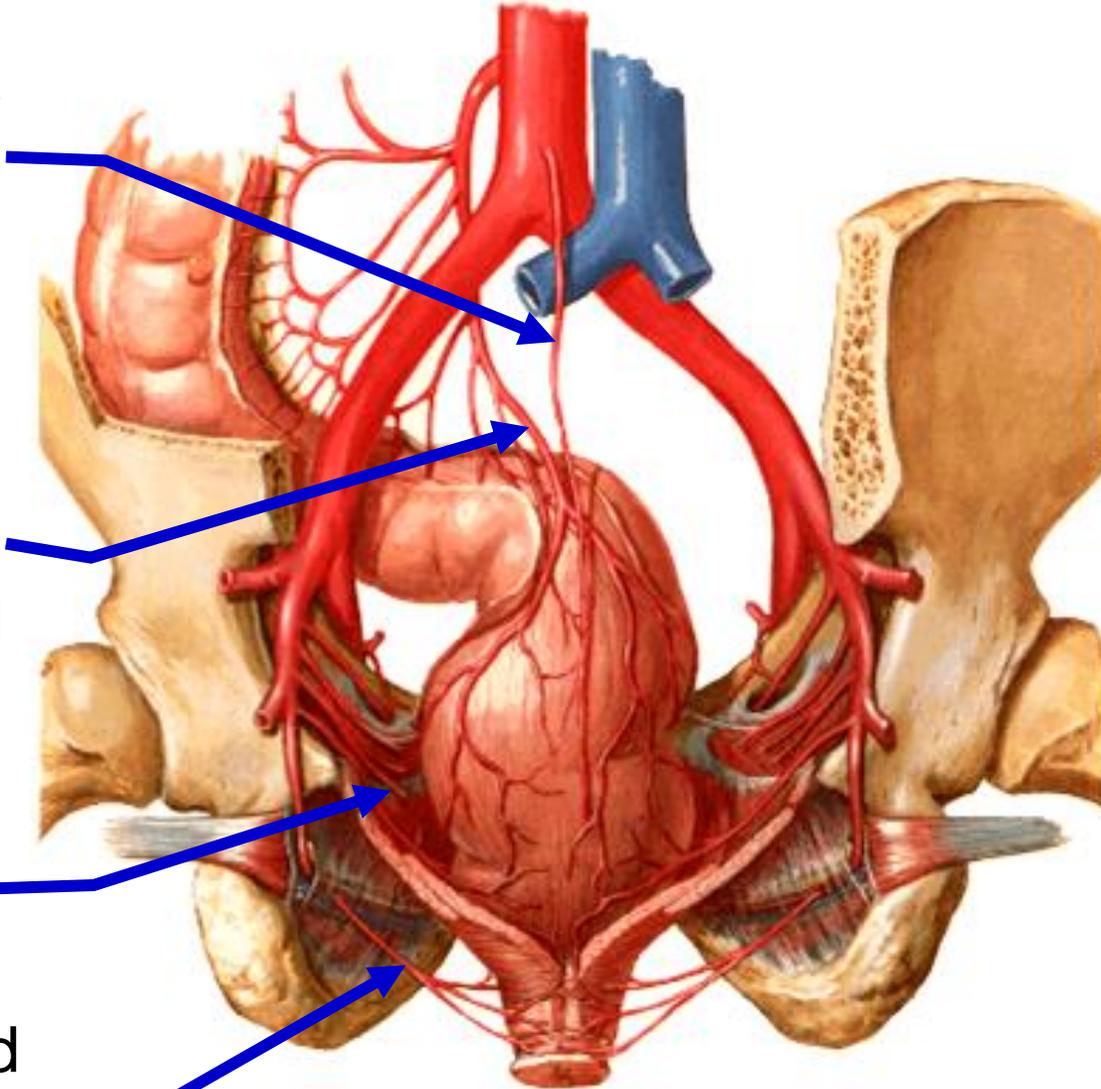
Arterial supply of the rectum and anal canal

Median sacral artery, (single branch) from **abdominal aorta**.

Superior rectal artery, (single branch) continuation of the **inferior mesenteric artery**, anastomosis with the middle and inferior rectal arteries

Middle rectal arteries (right and left) from the **internal iliac artery**

Inferior rectal arteries (right and left) from the **internal pudendal artery**.



Venous Drainage

Median sacral vein
ends in left common
iliac vein **or** IVC

IVC

Inferior Mesenteric Vein

Superior Rectal Vein

Internal iliac Vein

Middle Rectal Vein

Internal Pudendal Vein

Inferior Rectal Vein

Six Radical Veins

Internal rectal
venous plexus

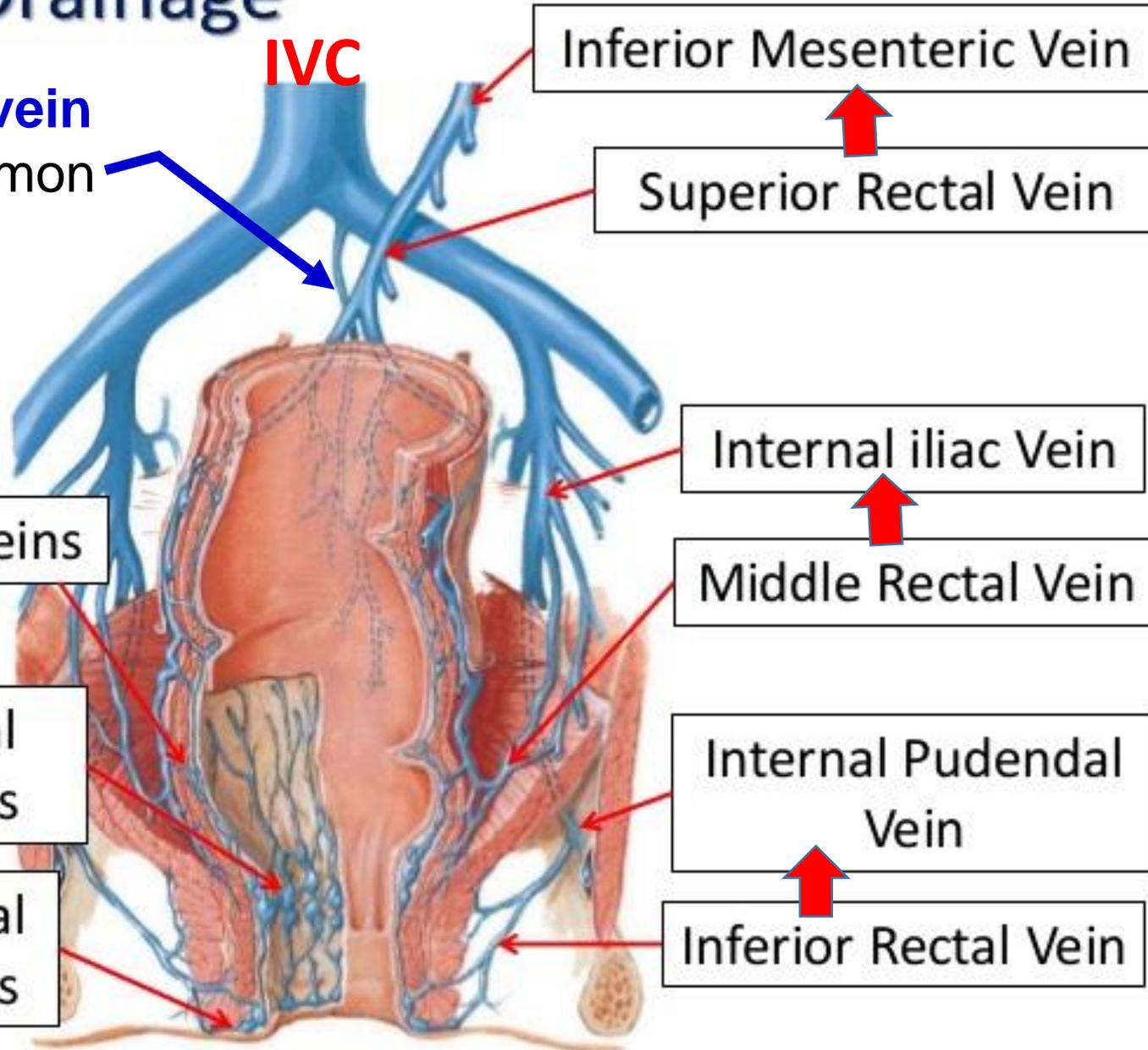
External rectal
venous plexus

P

S

S

dr_youssefhussein@yahoo.com

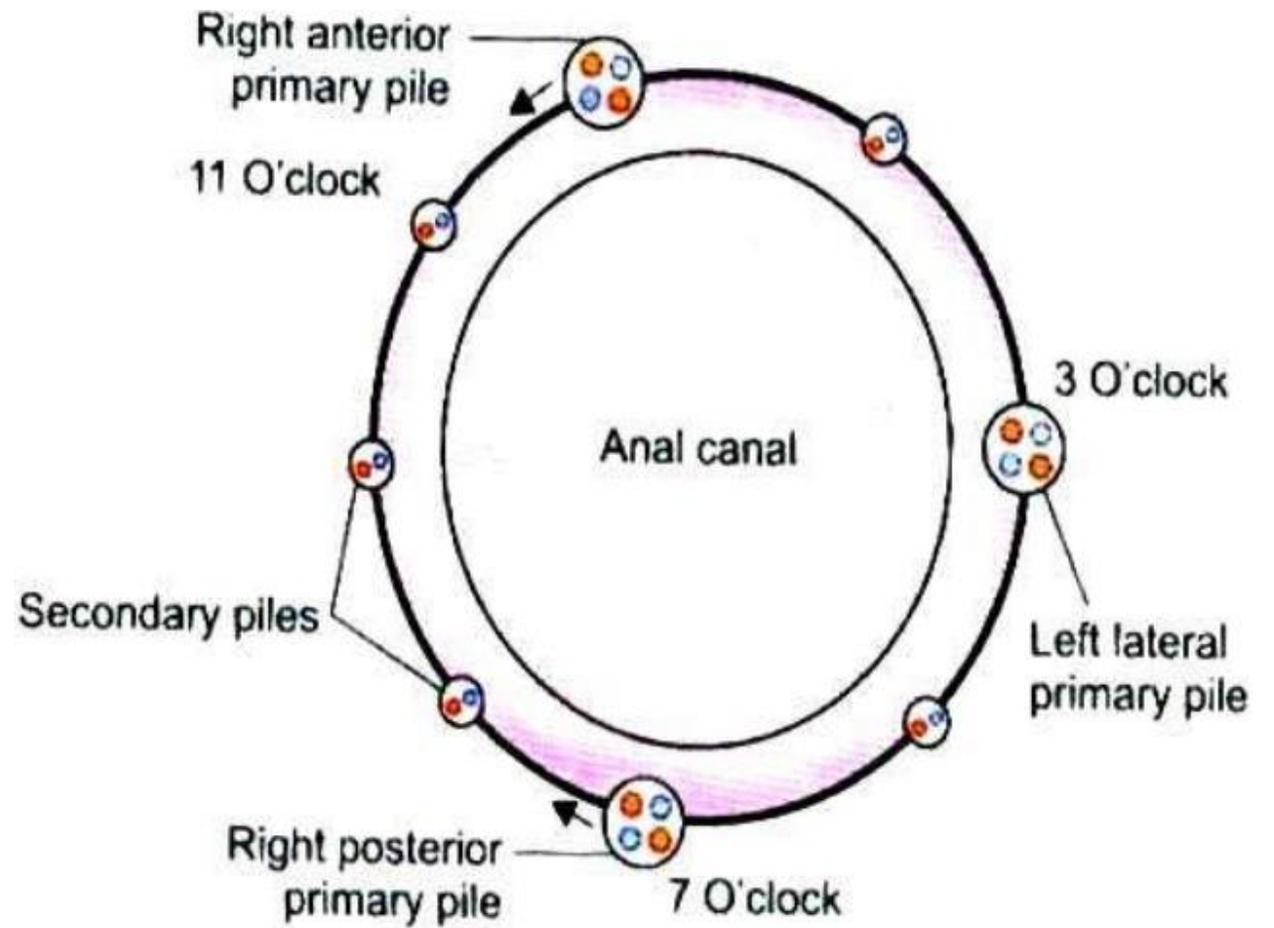
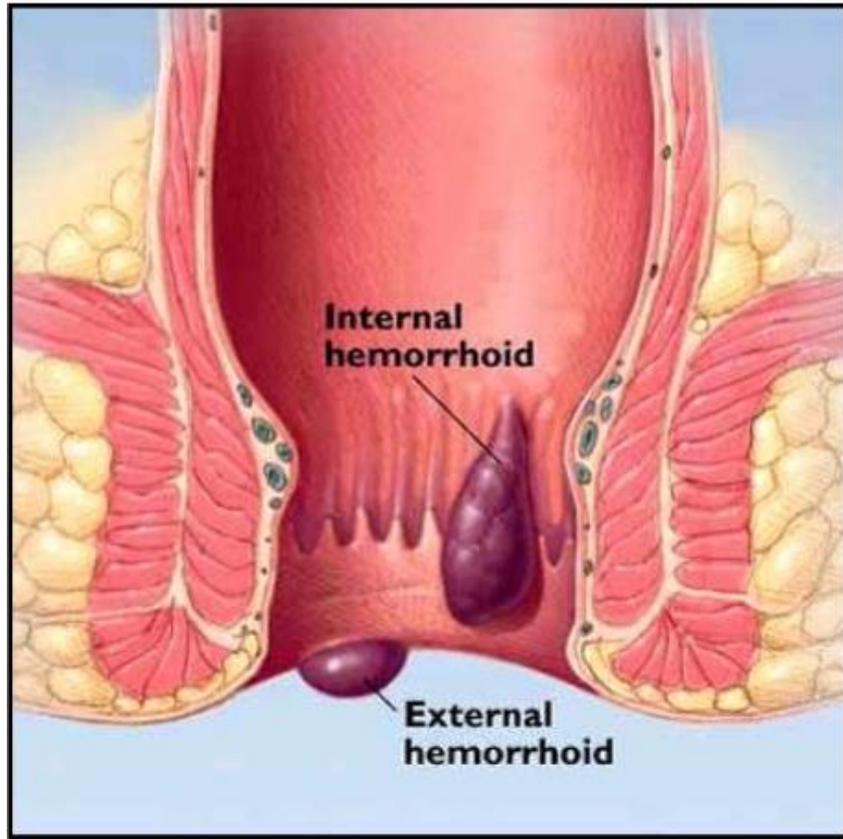


Internal rectal venous plexuses

- It lies in the **submucosa**.
- It is drained mainly by **superior** rectal vein (**portal**).
- Dilatation of this plexus leads to **internal piles**.
- It occurs mainly at the **3, 7, 11** O'clock positions.
- **Painless bleeding** and prolapse from the anal opening

External rectal venous plexuses

- It lies **outside** the muscle wall
- It is drained mainly by **middle** and **inferior** rectal veins (**systemic**).
- Dilatation of this plexus leads to **external piles**.
- It occurs under the skin around the anus (painful and bleeding).



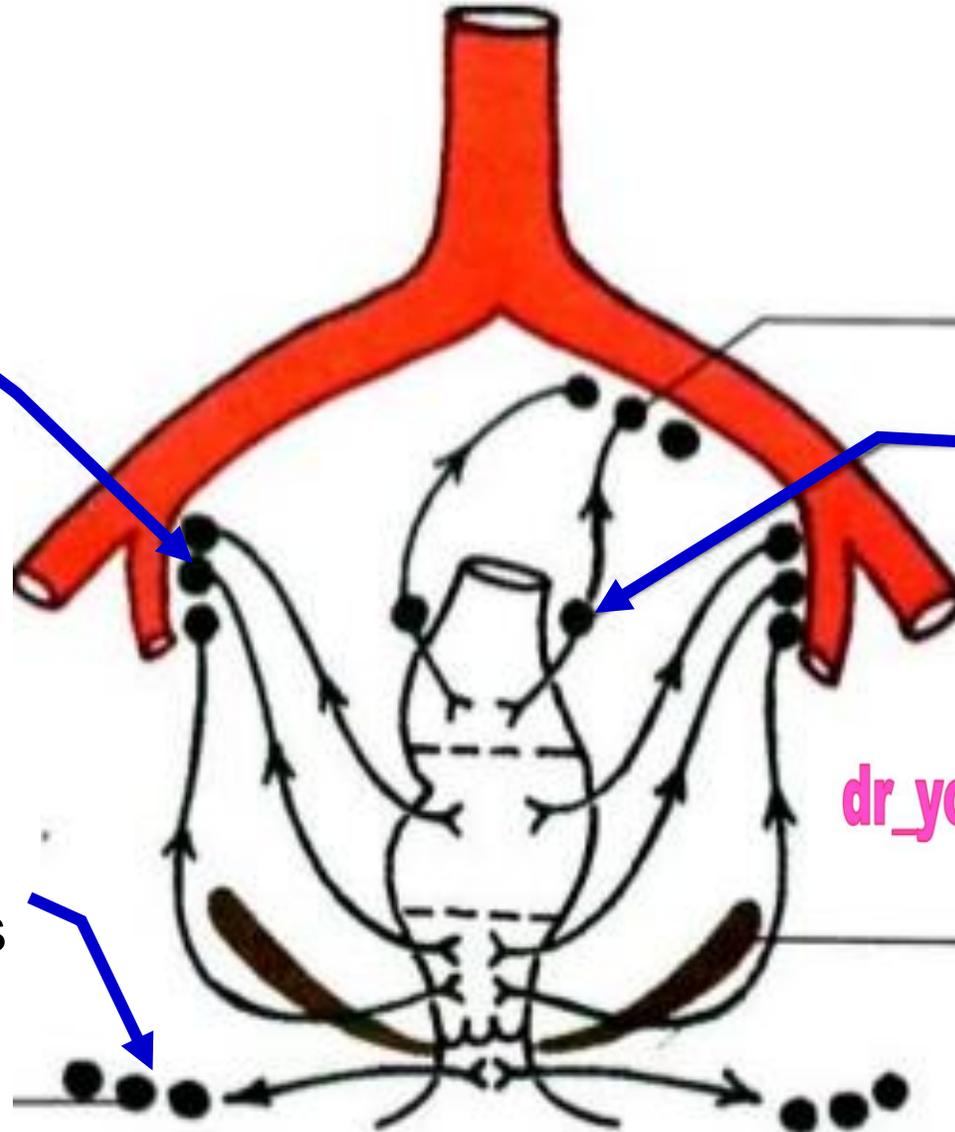
Hemorrhoids (Piles): Swollen (enlarged) and inflammation of veins in the wall of the anal canal leading to bleeding and pain

Lymphatic drainage of the rectum & anal canal

Middle part into the **internal iliac** lymph nodes

Upper part drains into **pararectal** then to inferior mesenteric lymph nodes.

Lower part drains into the **superficial inguinal** lymph nodes



dr_youssefhussein@yahoo.com

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