



GENITOURINARY SYSTEM

SUBJECT : Anatomy

LEC NO. : Lec 5

DONE BY : Shefaa almaaitah

وَقُلْ رَبِّ زِدْنِي عِلْمًا

GUS..



Lecture (5)

Anatomy of Perineum

Dr. Amany Allam

Assistant professor of Anatomy & Embryology

ILOs

- 1. Understand the gross anatomy of perineum.**
- 2. Describe the urogenital and anal triangle.**
- 3. Understand the urogenital diaphragm, superficial & deep perineal pouches and their contents in both sexes.**

Perineum

- **It is** the diamond-shaped lower end of the trunk.
- **It lies** below the pelvic diaphragm, between the upper parts of the thighs. *levator ani muscle* **تمثل بـ**
- **Boundaries:** As boundaries of the pelvic outlet.
- **Division of perineum:**
By a line joining the ischial tuberosities, the perineum is divided into two triangles:
 - **Anteriorly: Urogenital triangle.**
 - **Posteriorly: Anal triangle.**

في كتب بتحكي انه هاد ال Line

وهمي وفي كتب بتحكي انه في عضلة اسمها superficial transverse perineal muscle

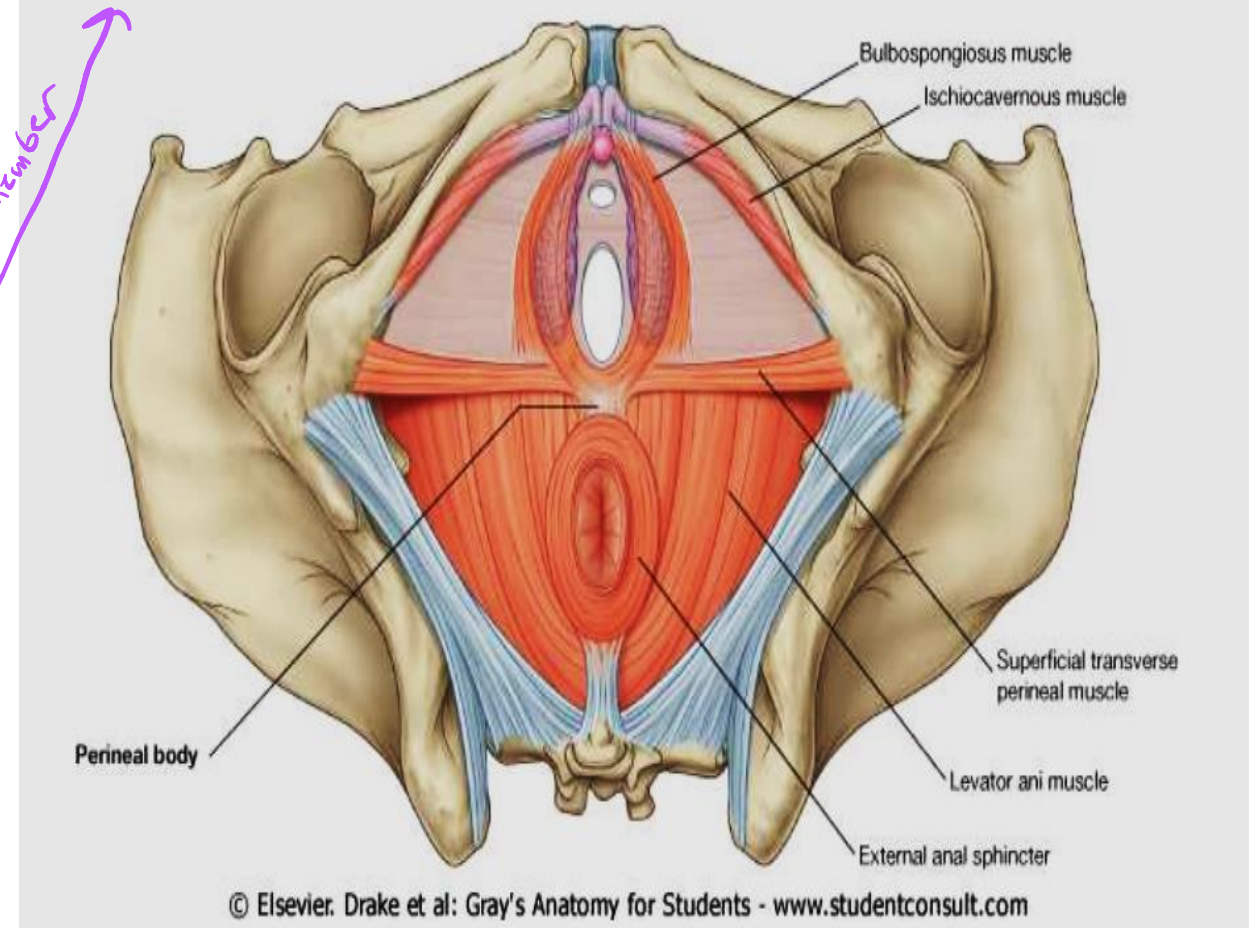
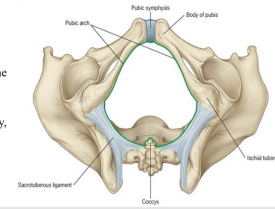
وتحتها deep transverse perineal muscle

ال posterior border تاع هدول العضلات connect to ischial tuberosity

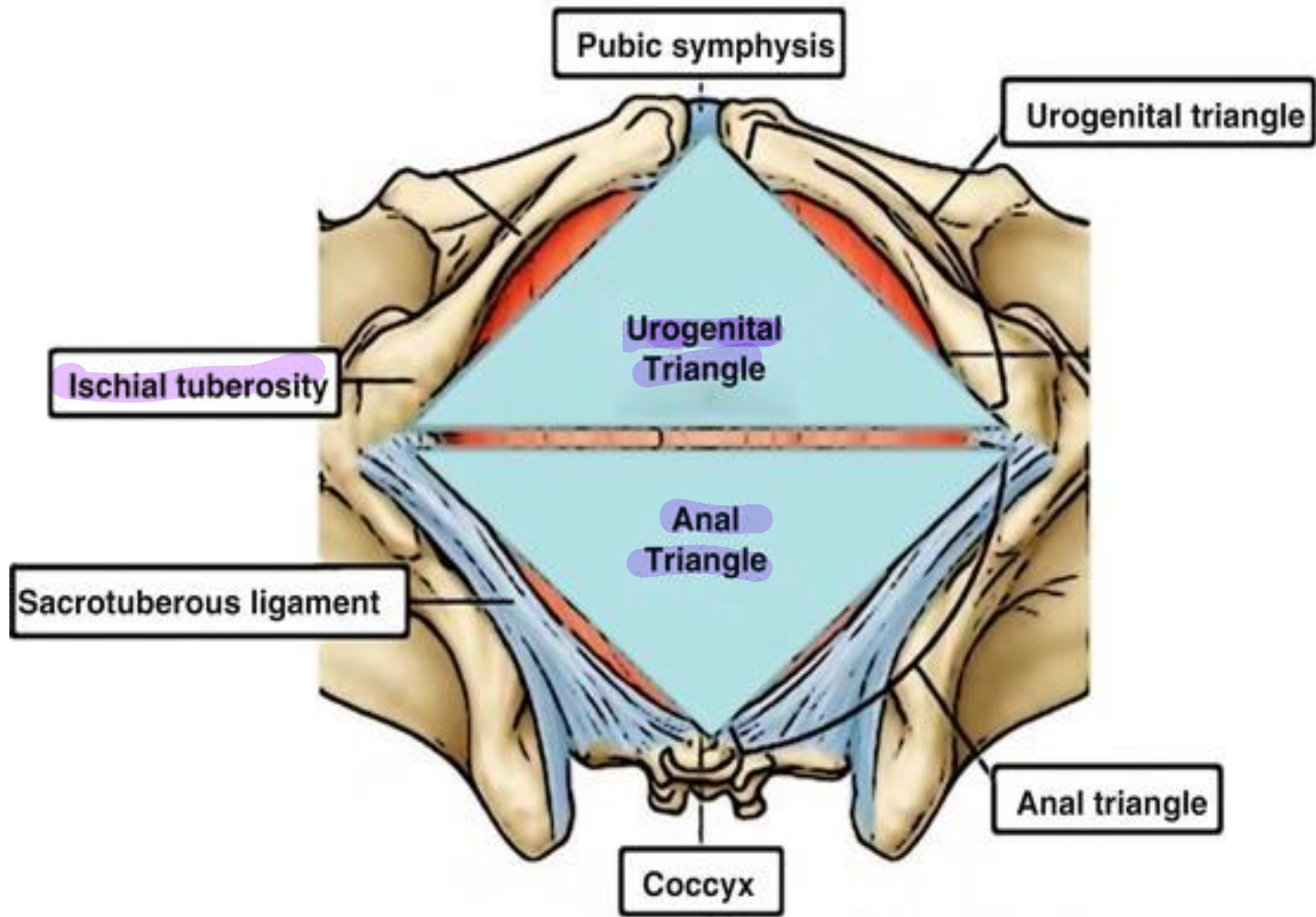
Pelvic outlet

□ Boundaries of the outlet:

- **Posteriorly:** Apex of the coccyx.
- **Anterior & anterolateral:** Lower border of the symphysis pubis & pubic arch.
- **On each side & posterolateral:** Ischial tuberosity, sacrotuberous ligament.



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Anal Triangle

The anal triangle contains:

in center

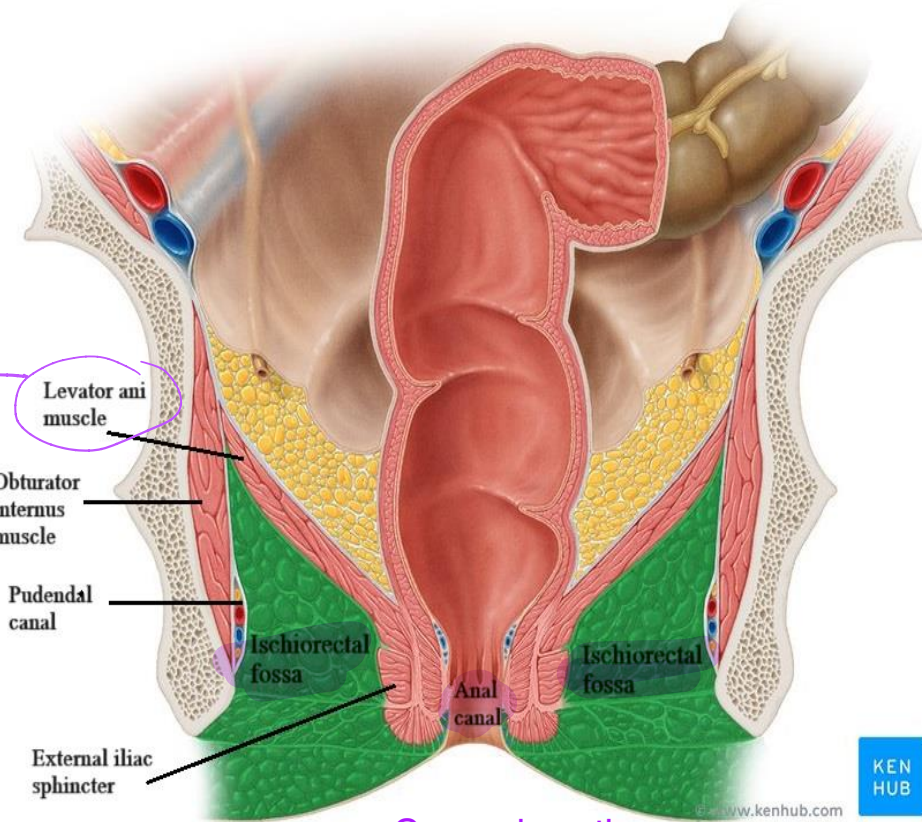
• The anal canal and its sphincters.

in each side

• The two ischio-anal (ischio-rectal) fossae.
 الاسم الأصح
 الاسم الأكثر شيوعاً

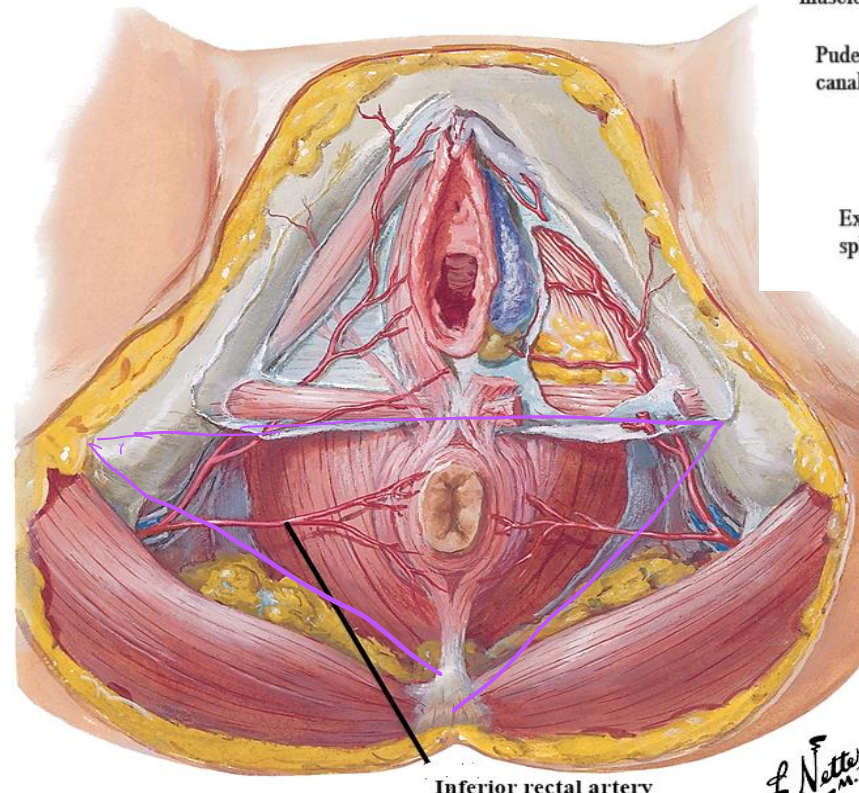
■ The structure of the anal triangle is similar in males and females.

عينك عليها لانه اذا كنت تحتها ب تكون ب منطقة ال perineum



Coronal section

كيف حعرف ب ال coronal section انه اي triangle حسب احنا ماخدين ال section وين anterior or posterior ب الصورة هون كونه ال anal canal معنا احنا ماخدين ال section posterior ويتكون posterior triangle



Inferior view

F. Netter M.D.

Ischioanal fossa:

It is wedge shaped space on either side of the anal canal.

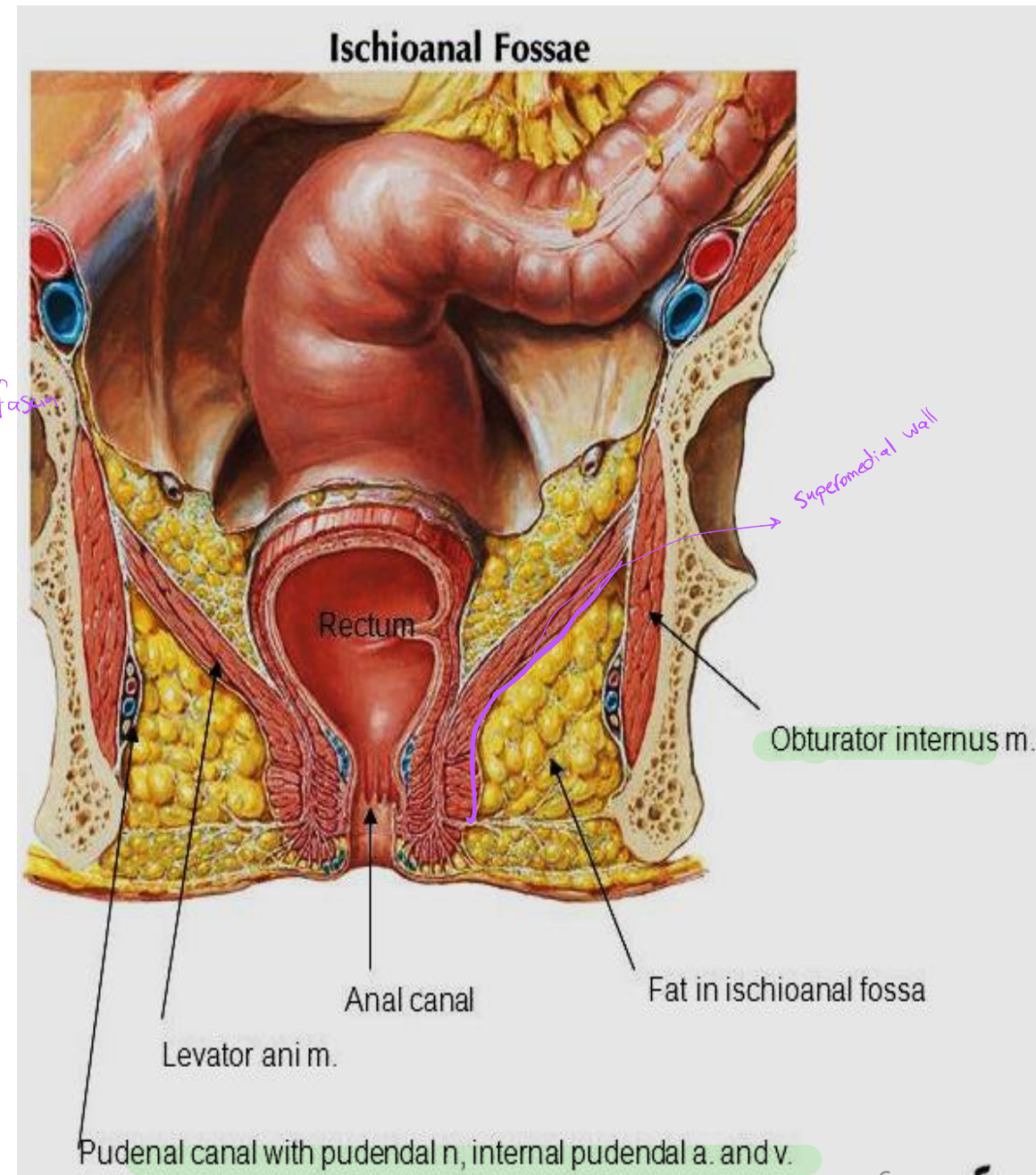
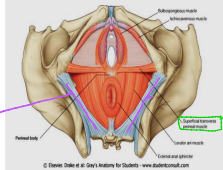
Its boundaries are formed by as follow:

- **Apex:** Origin of levator ani from tendinous arch of *of obturator fascia*
- **Base:** Skin on either side of the anal orifice. *Perianal skin*
- **Anteriorly:** Posterior borders of the superficial and deep transverse perineal muscles. *العضلات التي كانت ماشية ب العرض*
- **Posteriorly:** Sacrotuberous ligament.
- **Lateral wall:** **Obturator internus muscle & fascia and pudendal canal.** *التي مغطية ب splitting of obturator fascia*
- **Superomedial wall:** *lower border* Levator ani muscle & external anal sphincter.

Apex represent as bite
Because the coronal section
line في فاعلا

downward

انما انه ال ischia anal fossa هي جزء من
posterior borde of urogenital triangle هي ال anterior



Contents of Ischio-anal fossa:

المكون الاساسي

1. **Ischioanal fat** (allows distention of the anal canal during defecation)

2. **Pudendal canal** on its lateral wall that transmits the **pudendal nerve and internal pudendal vessels.**

3. **Inferior rectal nerve & vessels.**

← وهما من pudendal nerve and internal pudendal vessels .pudendal vessels
التي بل pudendal canal

← ماشية ب شكل transverse
لانه ال target تايعهم هو anal canal and sphincter

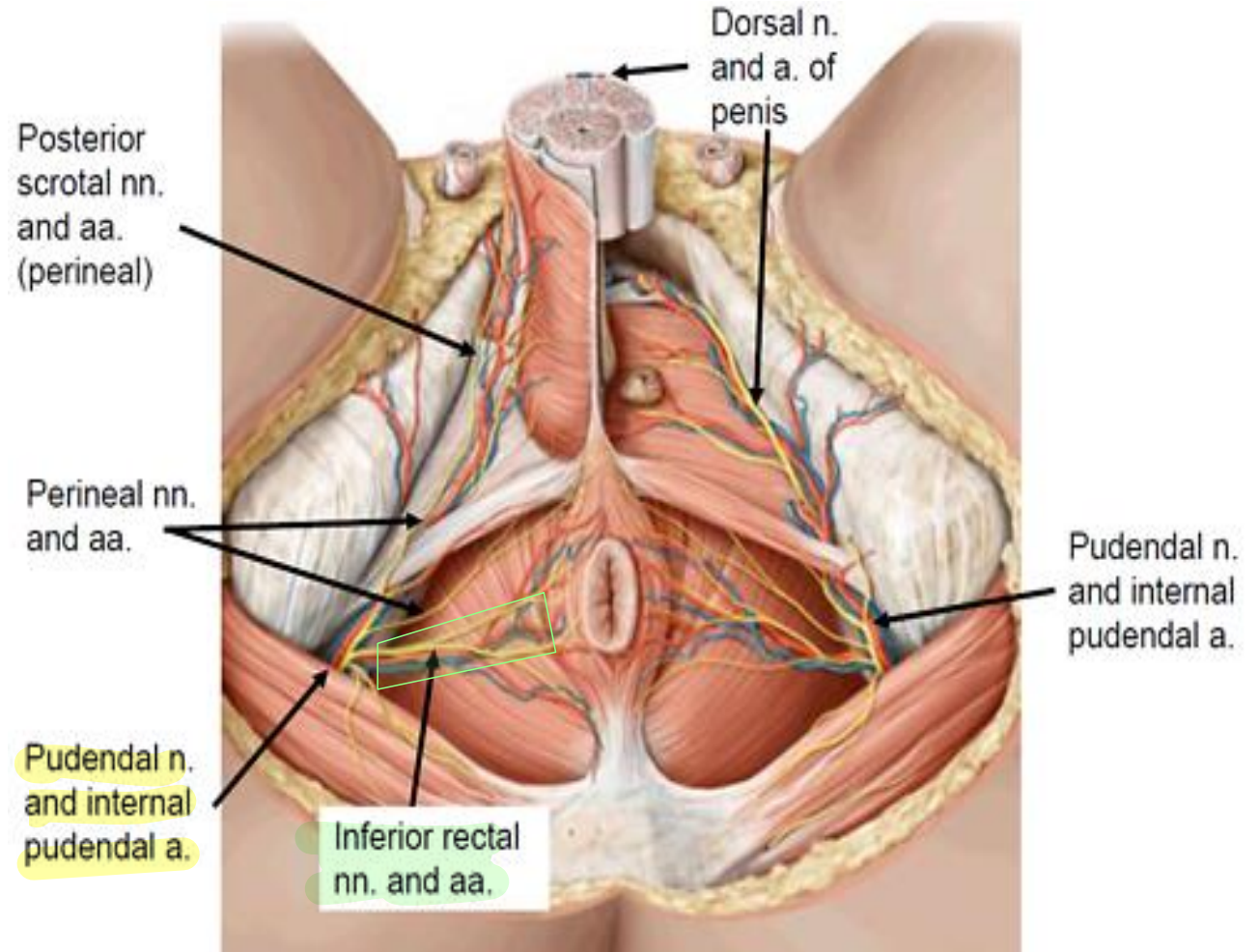
Applied Anatomy:

Infections in the ischioanal fat is common and lead to abscess formation.

← ف حيعمل anal fistula وعلاجها جراحيا

← لو سكت عليه وما تعالج
The abscess may rupture medially into the anal canal or downwards into the skin at the fossa.

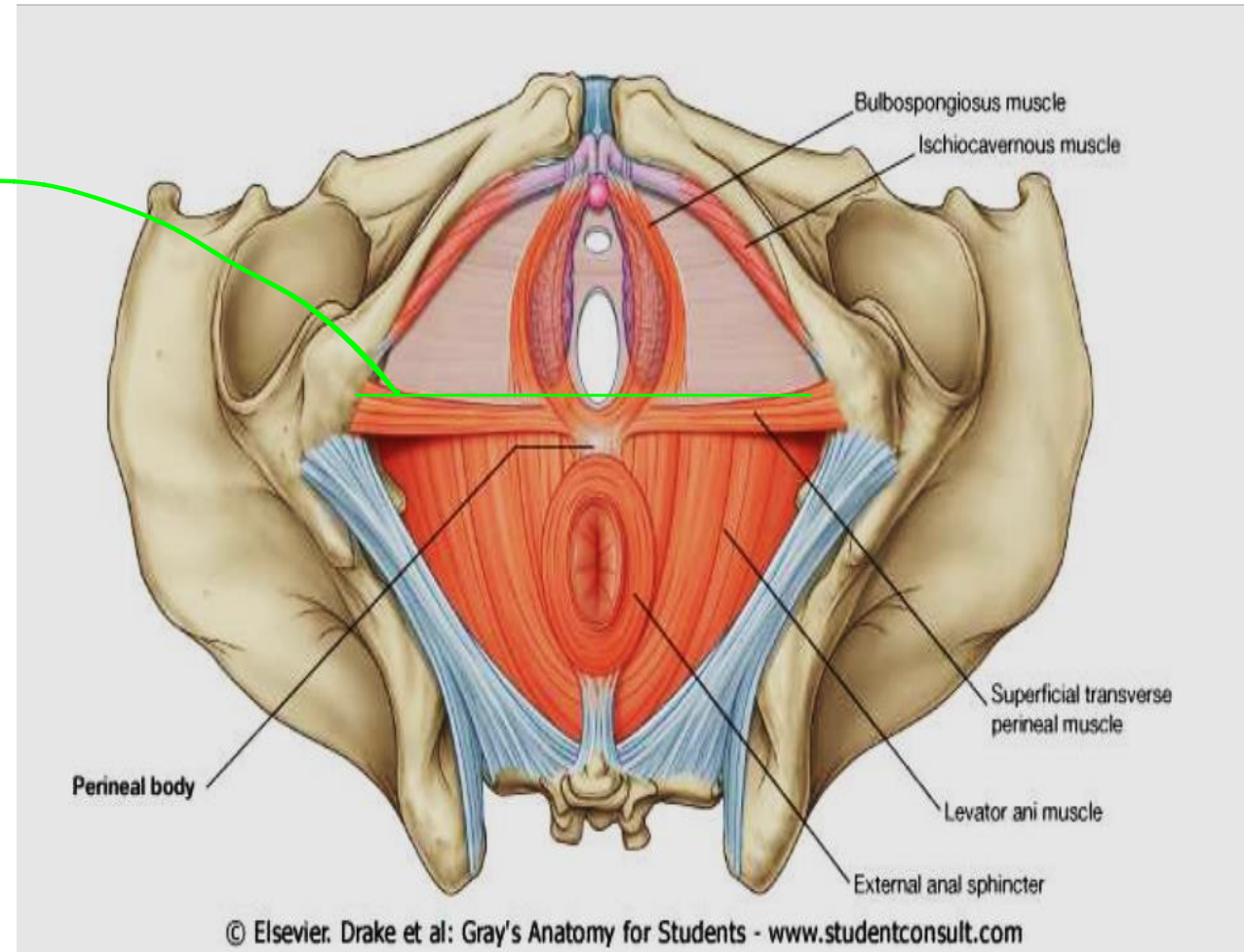
← العلاج جراحيا عن طريق فتح perianal skin



Urogenital Triangle

Boundaries:

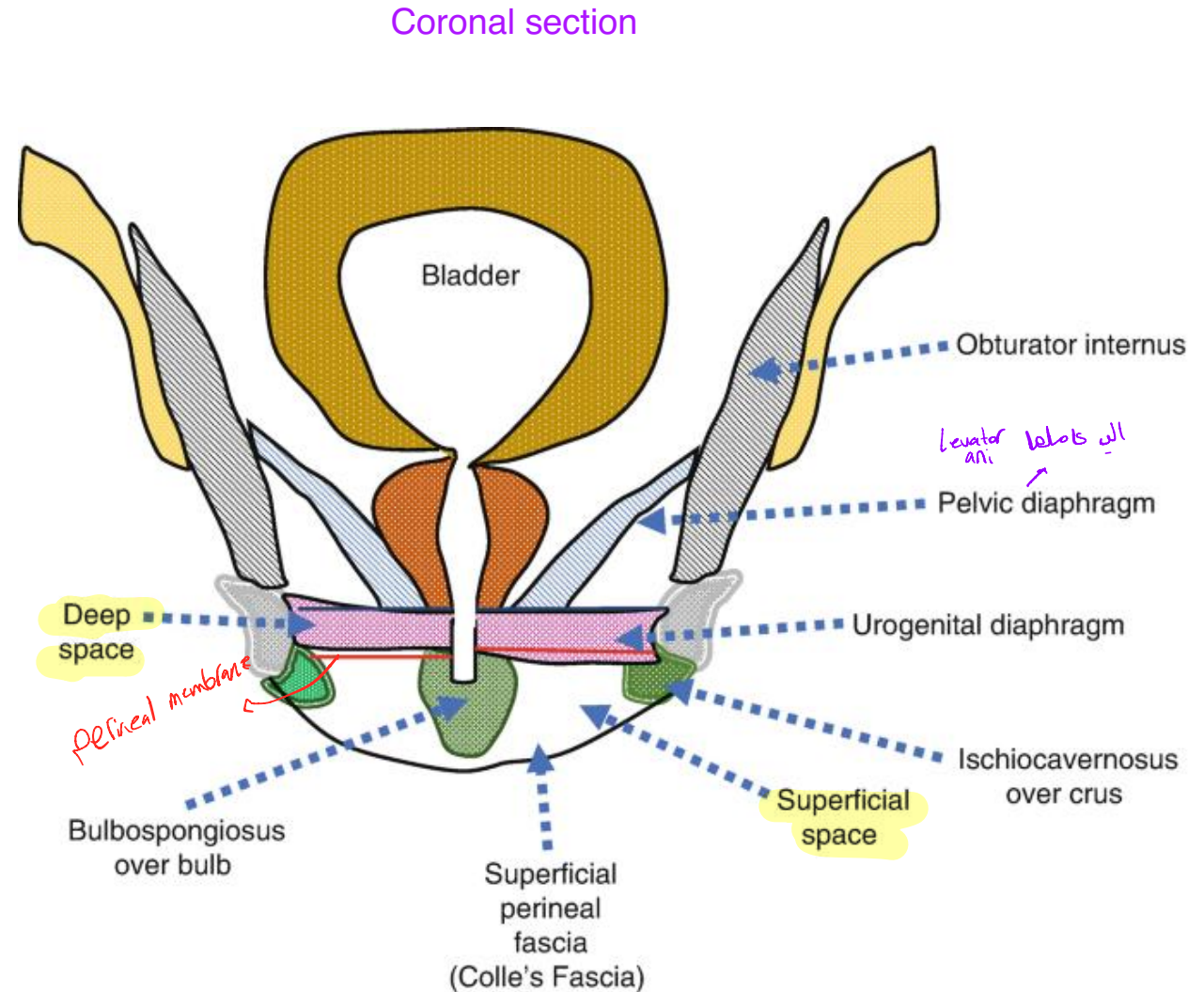
- **Posteriorly:** Inter-ischial line.
- **Anteriorly and laterally:** Symphysis pubis and ischiopubic rami.



The urogenital triangle is divided into two spaces by a strong perineal membrane:

1- Deep perineal space (pouch): lies above the perineal membrane.

2- Superficial perineal space (pouch): lies below the perineal membrane.



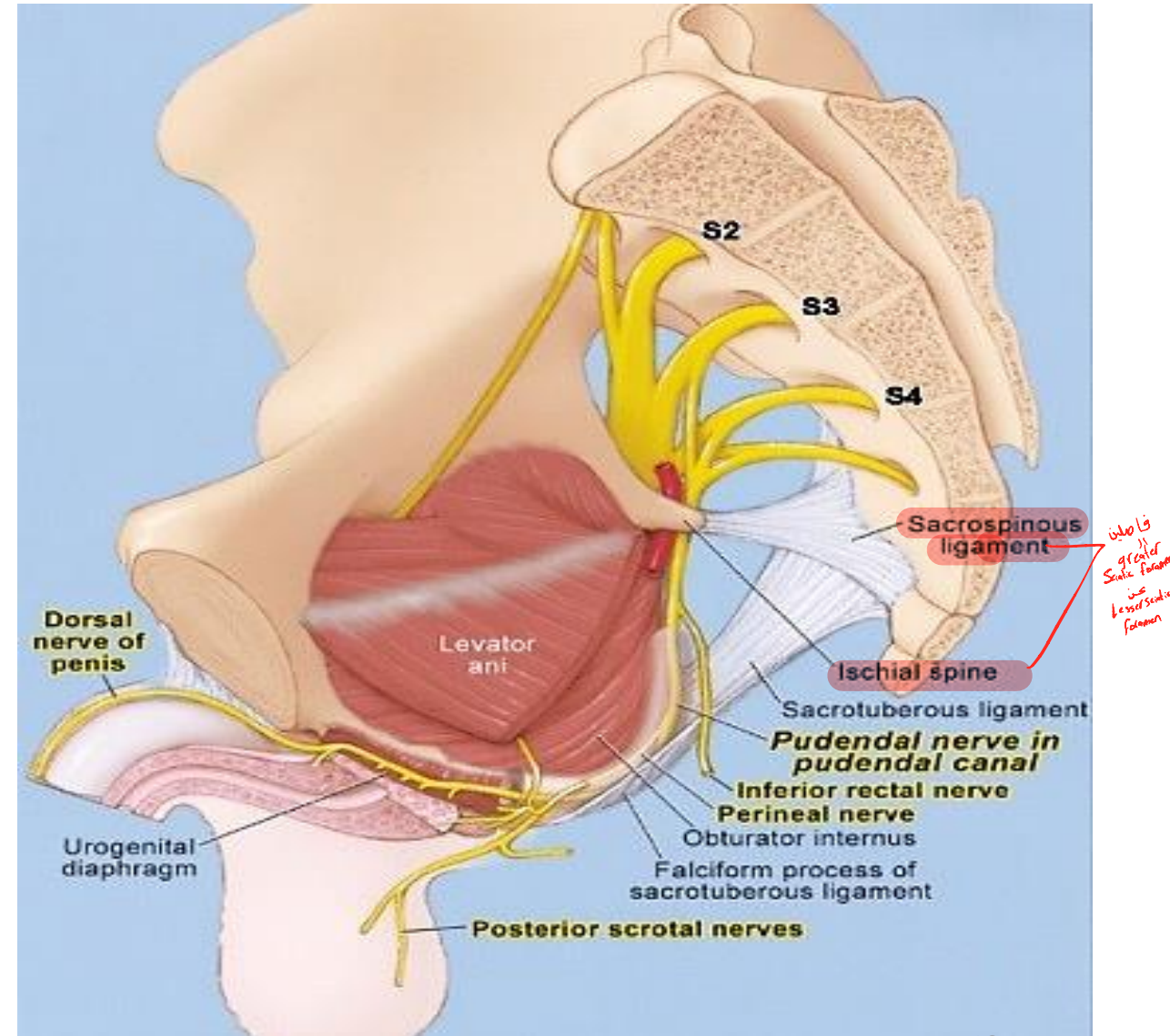
Pudendal Nerve

It arises from the sacral plexus.

Course and Relations:

- It leaves the pelvis through the greater sciatic foramen.
- Then it crosses the sacrospinous ligament.
- It pass through the lesser sciatic foramen to enter the pudendal canal. → الشرح في السلايد القادم

النقطة الي بتهم الدكتور من كل السلايد

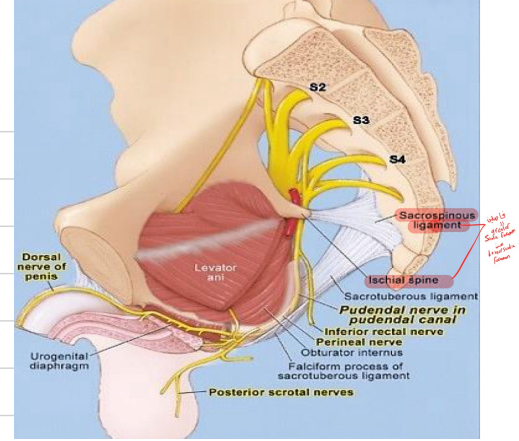


anal triangle موجودة بل pudendal canal
 تحديدا بل lateral wall of ischio-anal fossa

هاي ال canal لها Two end

Posterior end and anterior end

الفكرة انه ال pudendal nerve يدخل بل canal من ال posterior end وما يطلع لانه
 يعطي terminal branches within the canal



الذي يطلع من ال anterior end هما ال terminal branches of pudendal nerve
 اول branch هو ال dorsal nerve لو كان male اسمه dorsal nerve of penis

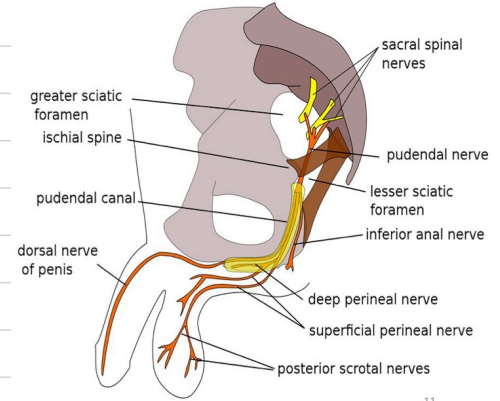
لو كانت female اسمه dorsal nerve of clitoris

وتاني terminal branch هو ال perineal nerve طلع من ال pudendal nerve داخل ال

canal بعدين يطلع من ال canal

المهم ال pudendal canal بل ال ischioanal fossa ف anterior لها هو ال urogenital
 triangle

المهم ال terminal branches of pudendal nerve مجرد ما طلعو من ال canal حيدخلو بل
 ال deep pouch of urogenital triangle



Branches of pudendal nerve:

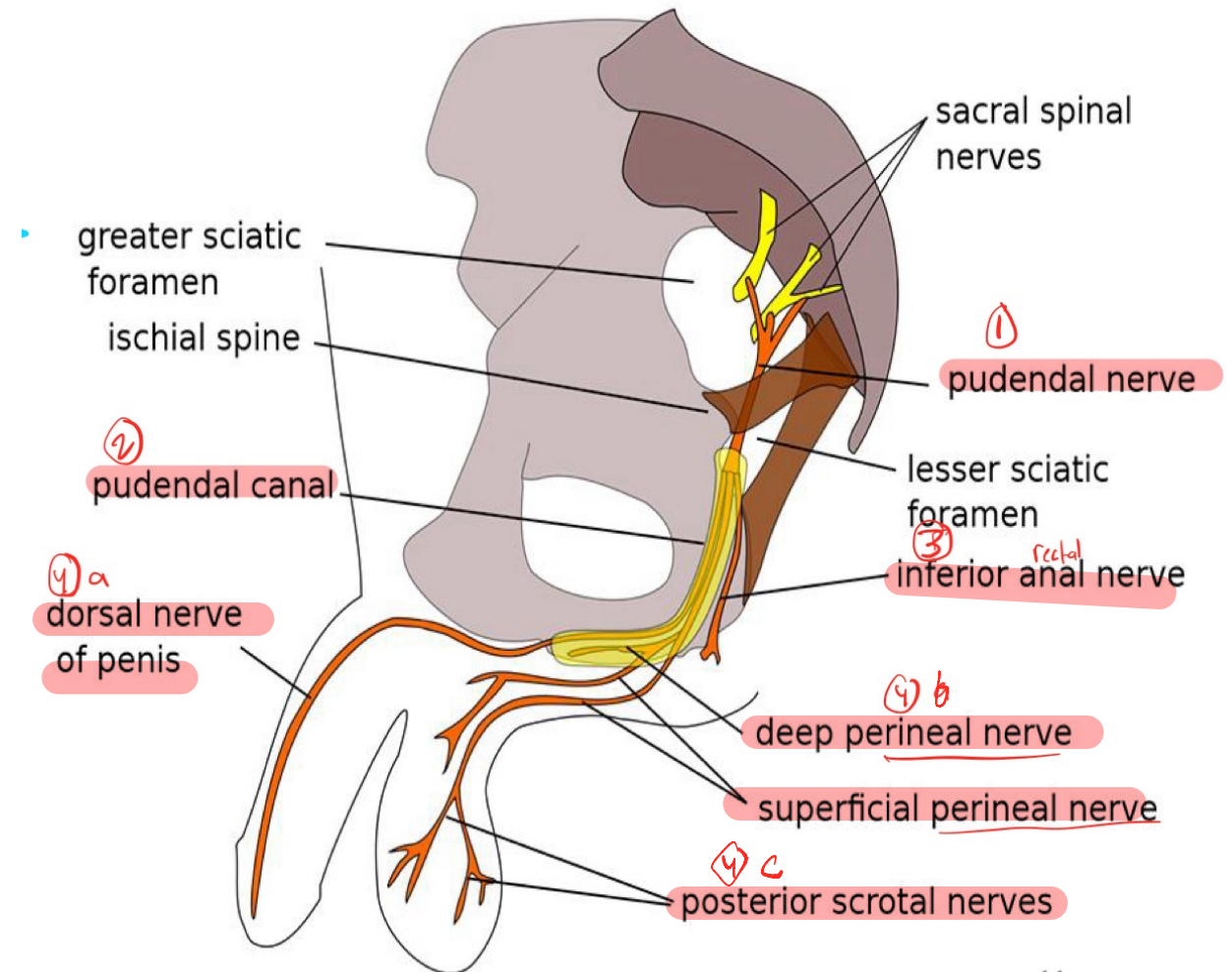
- Inferior rectal nerve. urogenital triangle ما اله علاقة ب
ischioanal fossa بل transverse حكينا انه حيمشي
anal canal and its sphincter لانه رايج لل
- **Terminal branches;** → هدفهم perineal pouch deep

a) Perineal nerve.

- **Motor:** To muscles of the superficial and deep perineal pouches.

- **Sensory:** Posterior scrotal ^{in female} (labial) nerves.
Supply posterior aspect of scrotum in male
Supply posterior part of labial in female

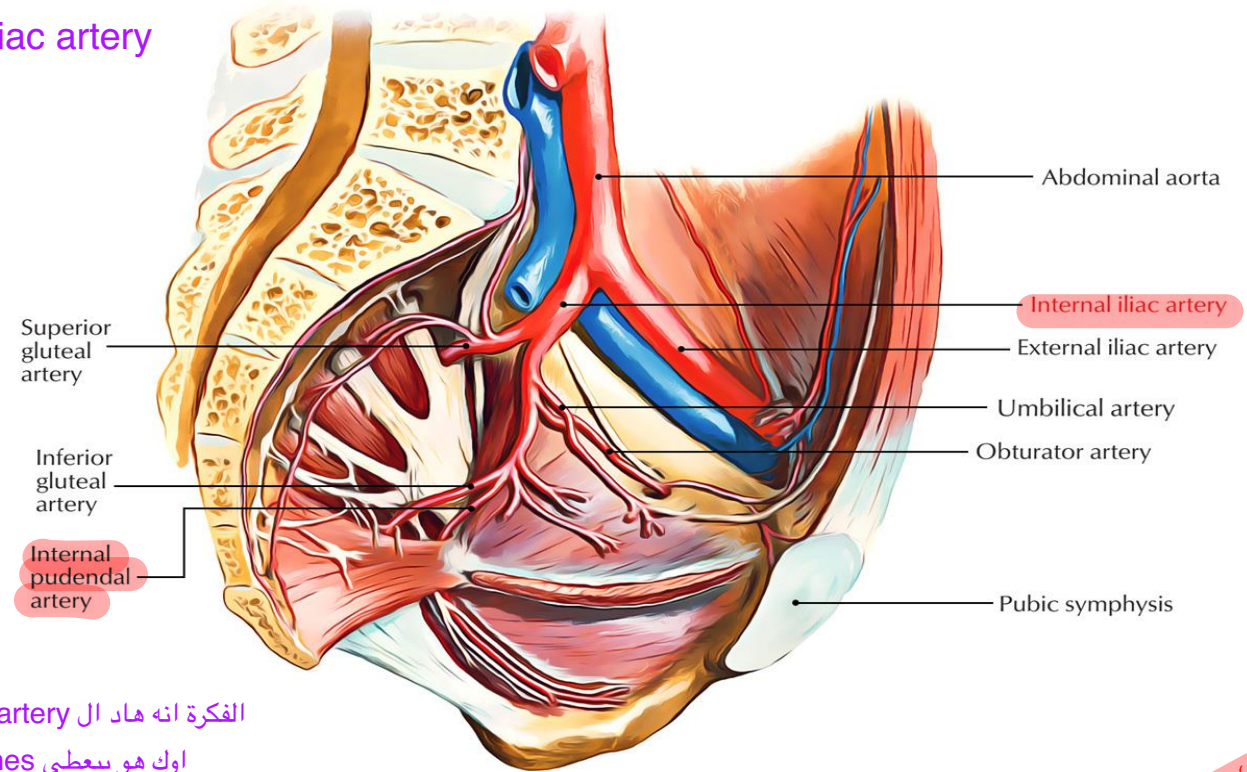
b) Dorsal nerve of penis (or clitoris). ^{infemale}



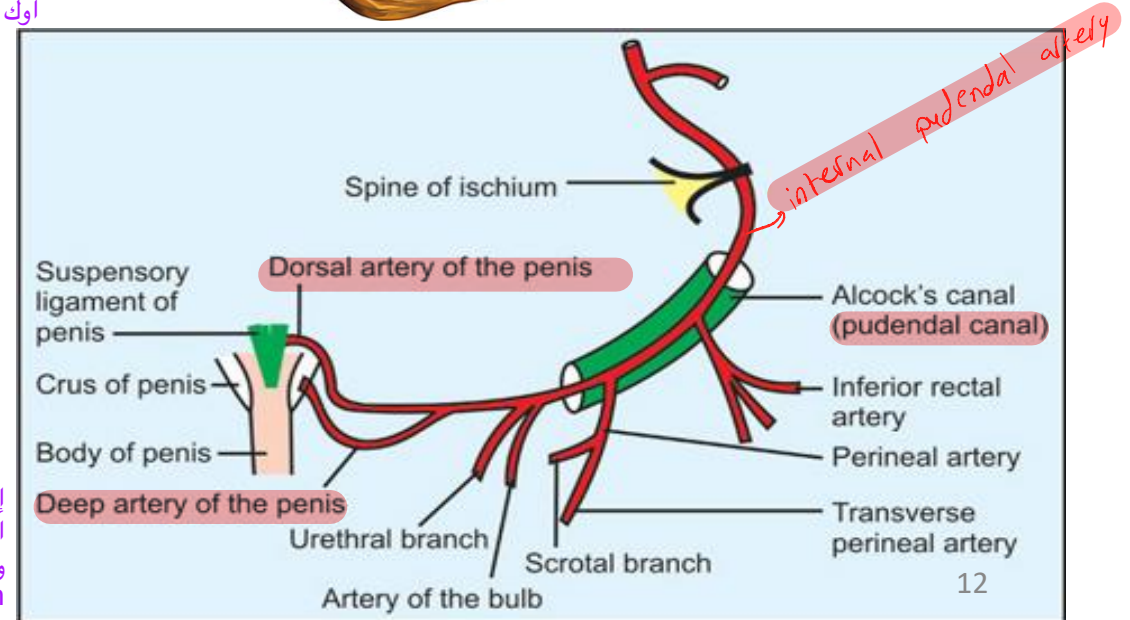
Internal Pudendal Artery Branch of internal iliac artery

Course and Relations:

- It leaves the pelvis through the greater sciatic foramen.
- Then it **crosses** ischial spine and passes through the lesser sciatic foramen to **passes through the pudendal canal.**
- Then it **enters** the **deep perineal pouch** then **pierces** the perineal membrane & enters **superficial perineal pouch**.
- It ends by dividing into **dorsal and deep arteries of the penis.**



الفكرة انه هاد ال artery حيدخل ويطلع من ال pudendal canal اوك هو بيعطي branches بل canal لكنهم مش terminal هو بنتهي بس يعطي ال terminal branches



إذا مخلص ال internal pudendal artery موجود بل pudendal canal و deep perineal و superficial perineal pouch ويعطي branches بهاي ال ٣ أماكن

Branches of Internal Pudendal Artery:

In Pudendal canal:

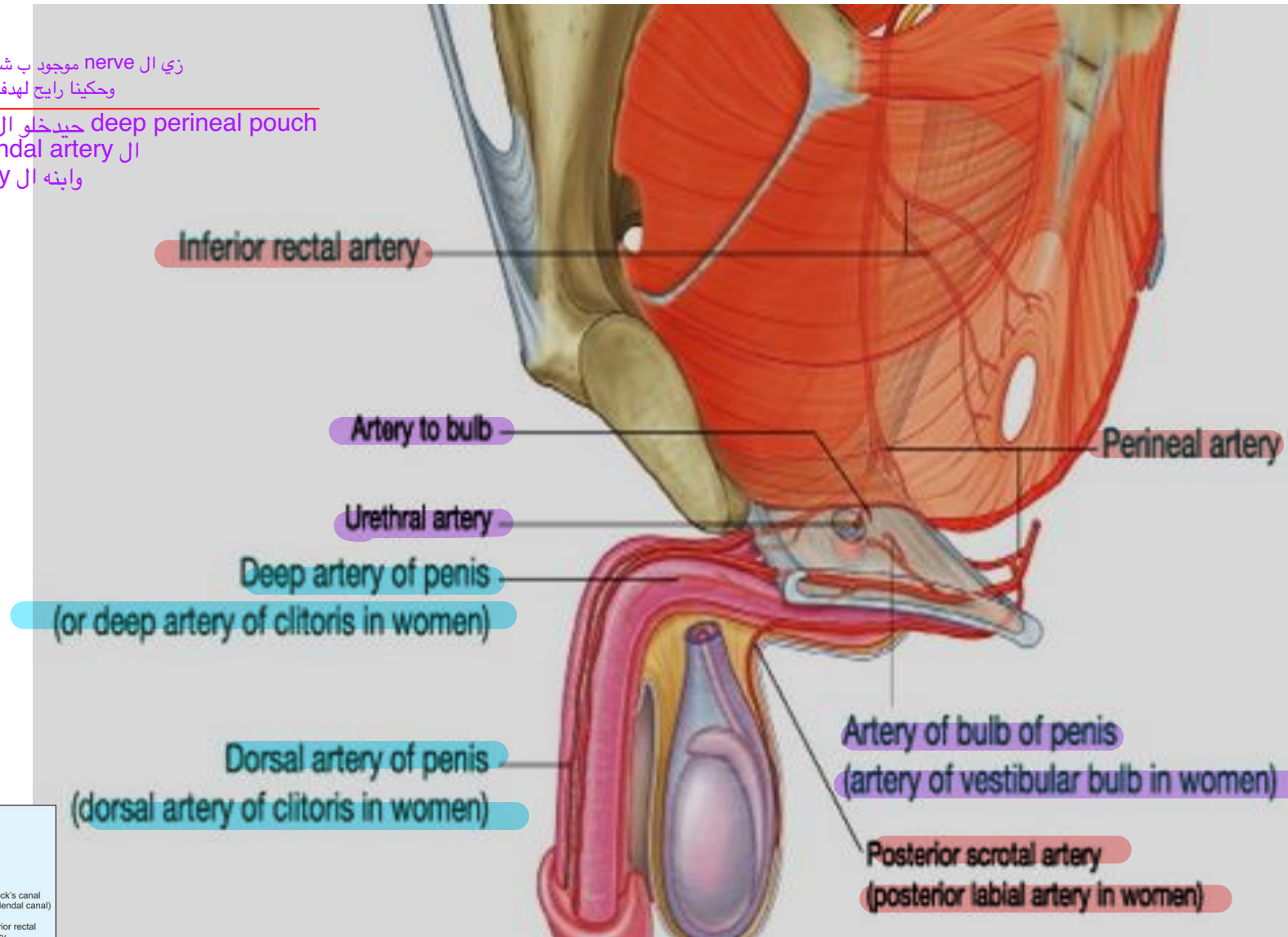
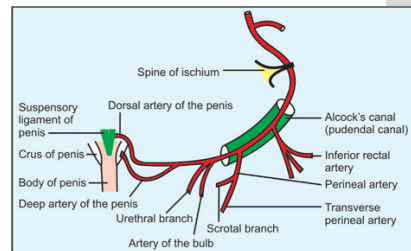
- 1- **Inferior rectal artery.** ischio-anal fossa ب شكل transverse nerve ال موجود ب وحكيئا رايح لهدفه وما دخله بل urogenital triangle ايدا
- 2- **Perineal artery!** Two arteries ال حيدخلو ال deep perineal pouch ال internal pudendal artery ال وابه ال perineal artery it gives
 - **Two scrotal (or labial) arteries.**

internal pudendal artery give branches in
In Deep perineal pouch:

- 3- **Artery of bulb.**
- 4- **Urethral artery.**

In Superficial perineal pouch:

- 5- **Dorsal A. of penis.**
- 6- **Deep A. of penis.**



Deep Perineal Space-Urogenital Diaphragm

فجوة
pouch

Lies between;

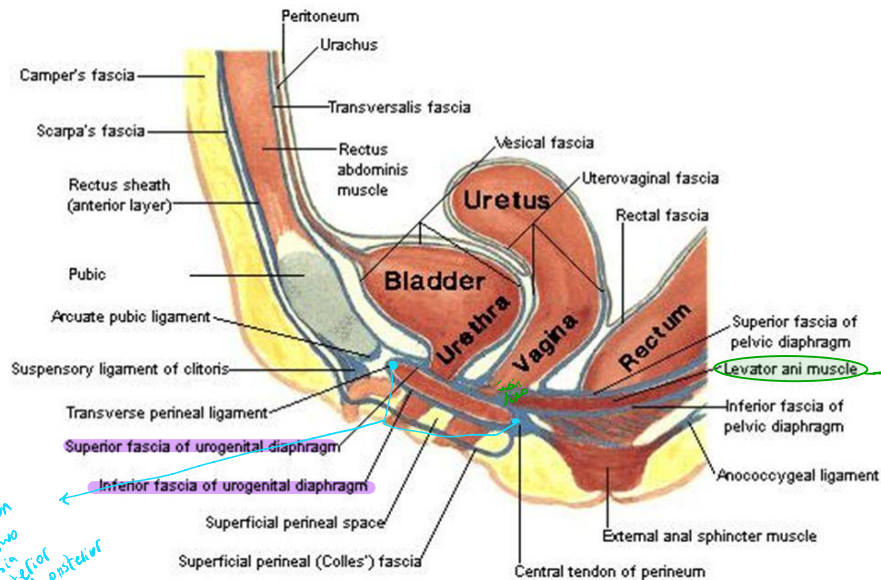
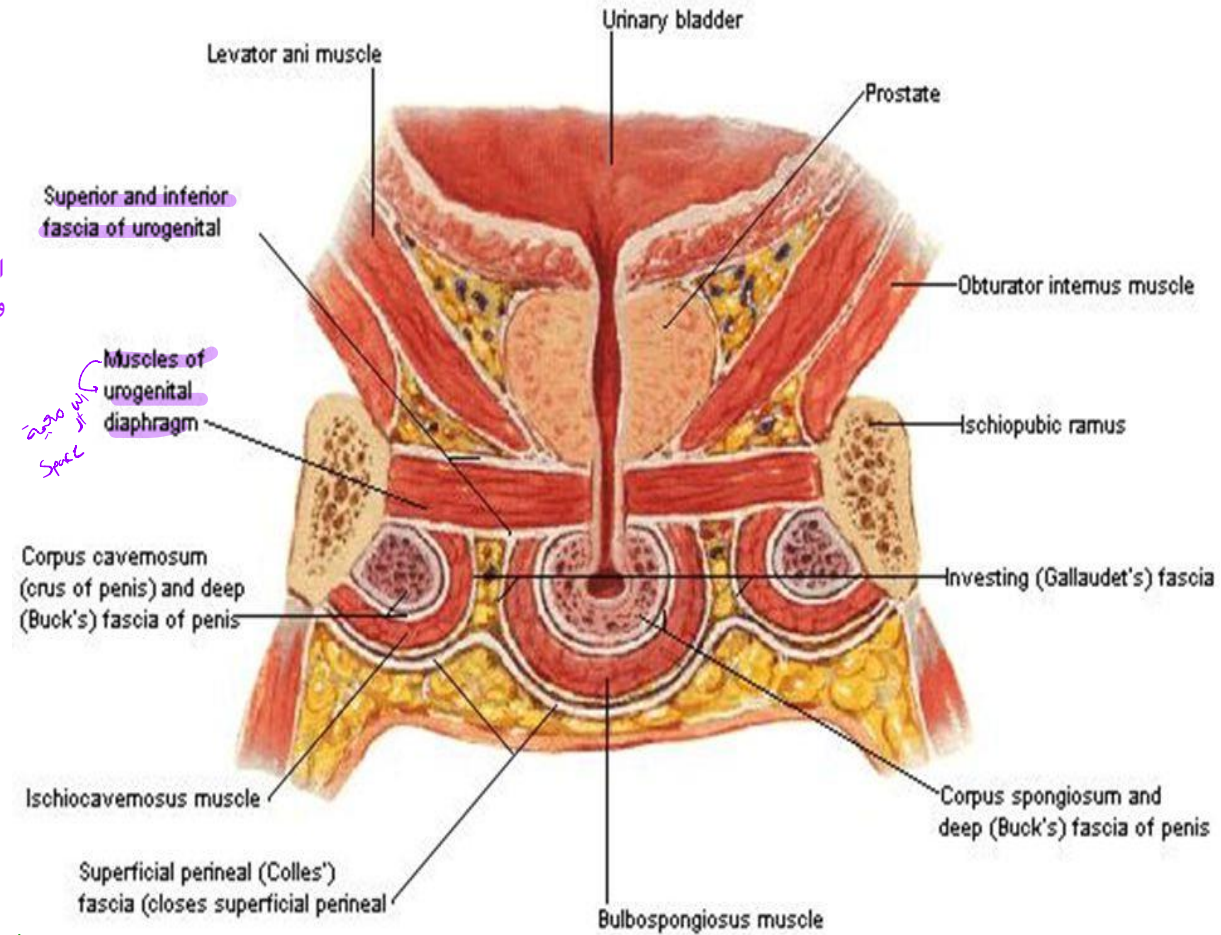
Roof: Superior fascia of the urogenital diaphragm.

Floor: Inferior fascia of the urogenital diaphragm

(Perineal membrane) *التي يفصل بين ال deep perineal space و ال superficial perineal space التي تحتون تحت هاد ال membrane*

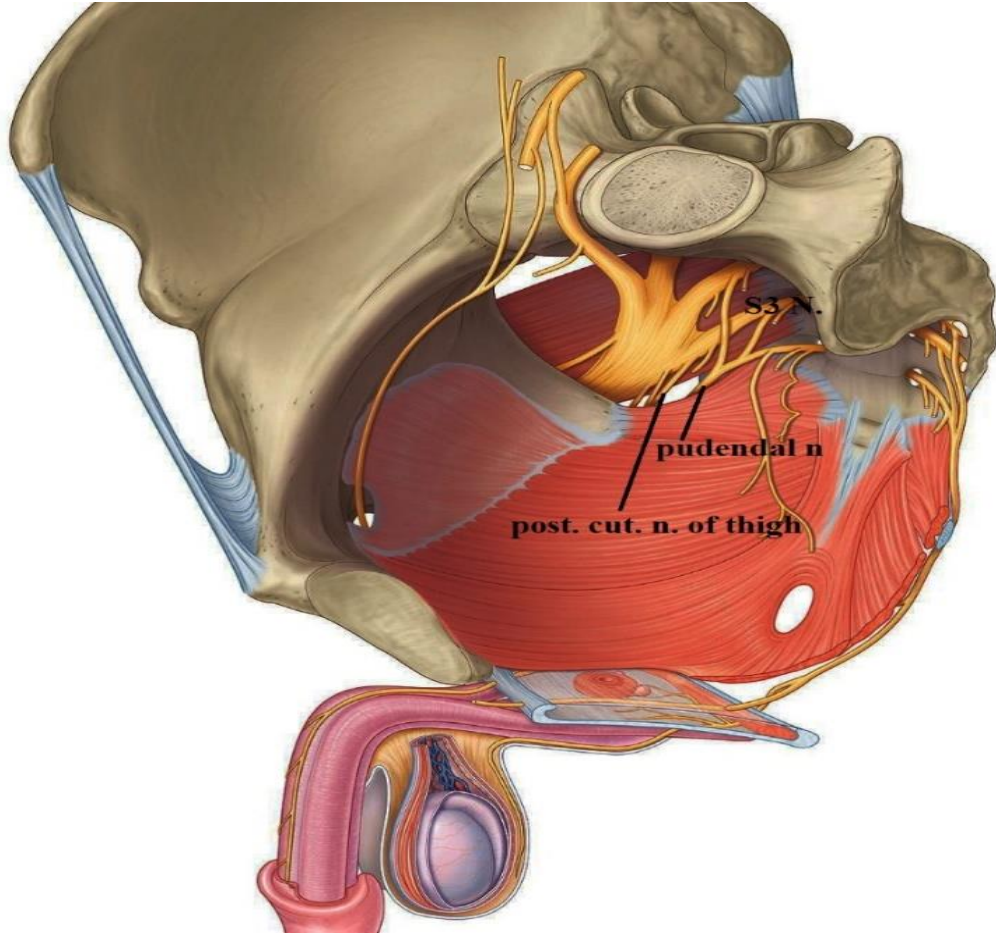
Anteriorly & Posteriorly: it is closed by union of roof and floor. *لذلك ال space is closed space*

Coronal section in male

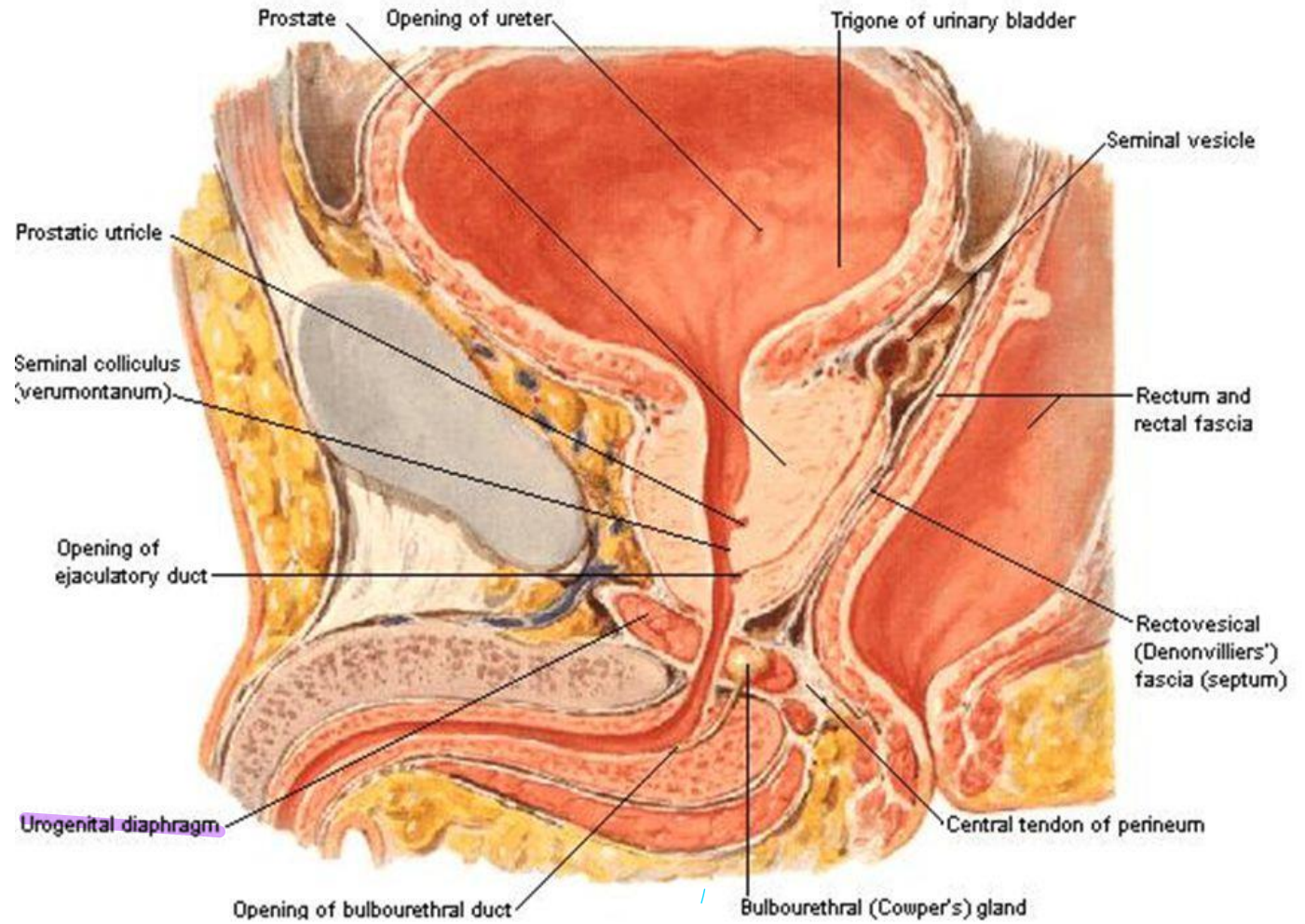


Sagittal section in female

urogenital hiatus *هنا تتزكر ال anterior two border of levator ani كان بينهم* *الي هي المكان الي بيعدى منه urethra and vagina in female* *يعملو hiatus بعد ماي عدو من* *عشان هيك حيحيترو من ال contents لهاد ال pouch*



Sagittal Section of male



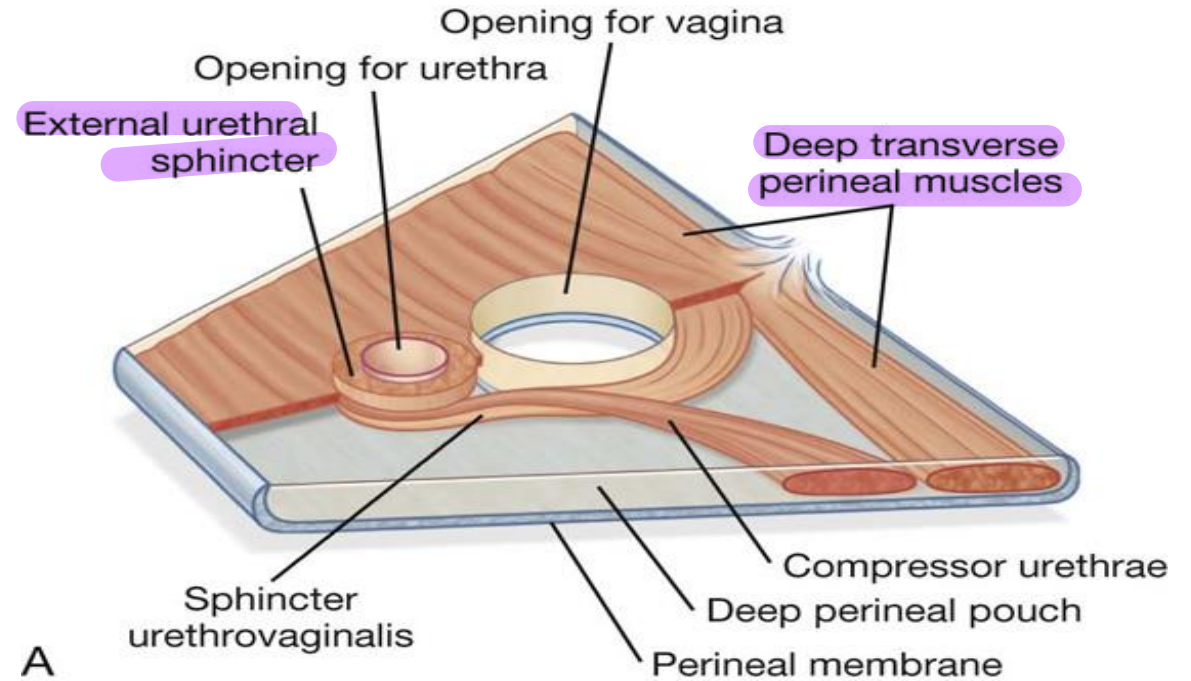
Contents of Deep Perineal Pouch:

- 1- Muscles.
- 2- Urogenital Structures according to sex.
- 3- Branches of the internal pudendal vessels and pudendal nerve.

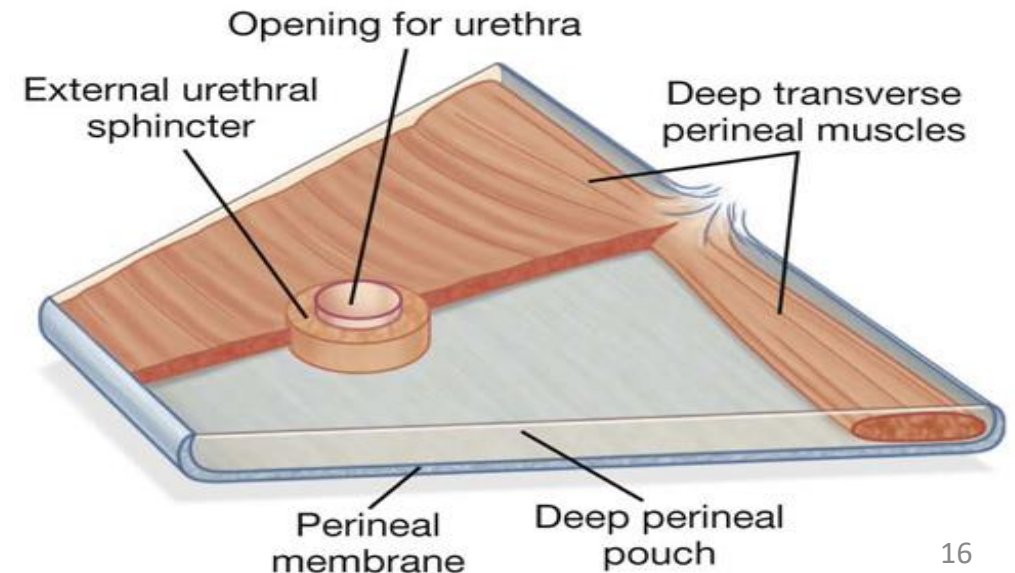
Muscles of the deep perineal pouch: → Same in both sex

- 1- **Sphincter urethrae.** External urethral sphincter (Striated muscle fibers)
- 2- **Deep transverse perineal muscles (Inserts into perineal body)**

- These muscles form the urogenital diaphragm
- They are innervated by the perineal branches of the pudendal nerve. Motor fibers of perineal nerve

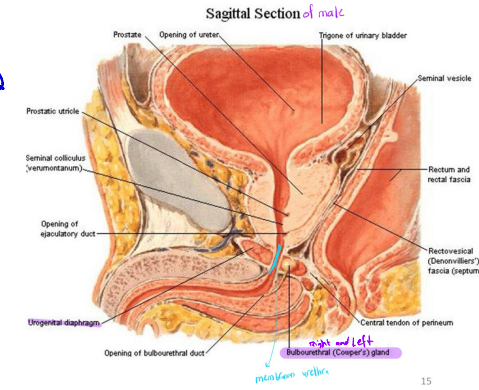


A

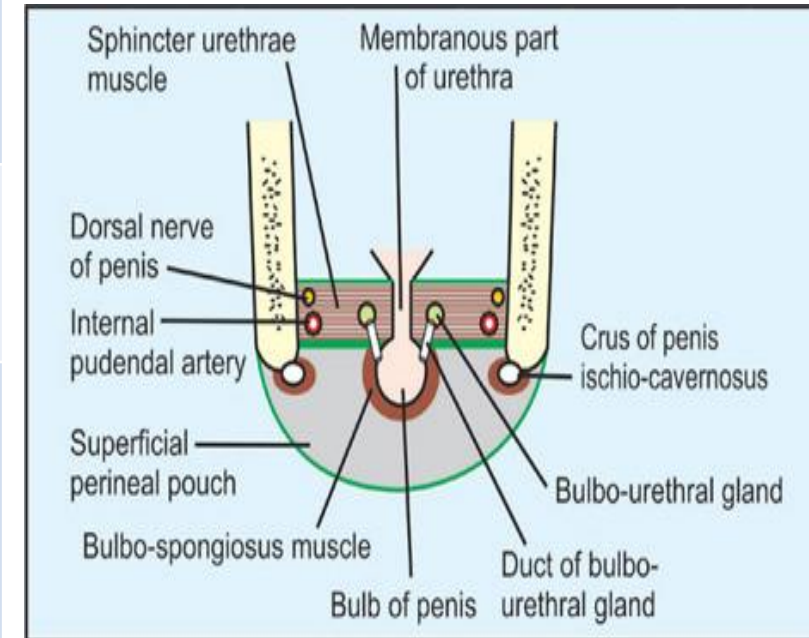


B

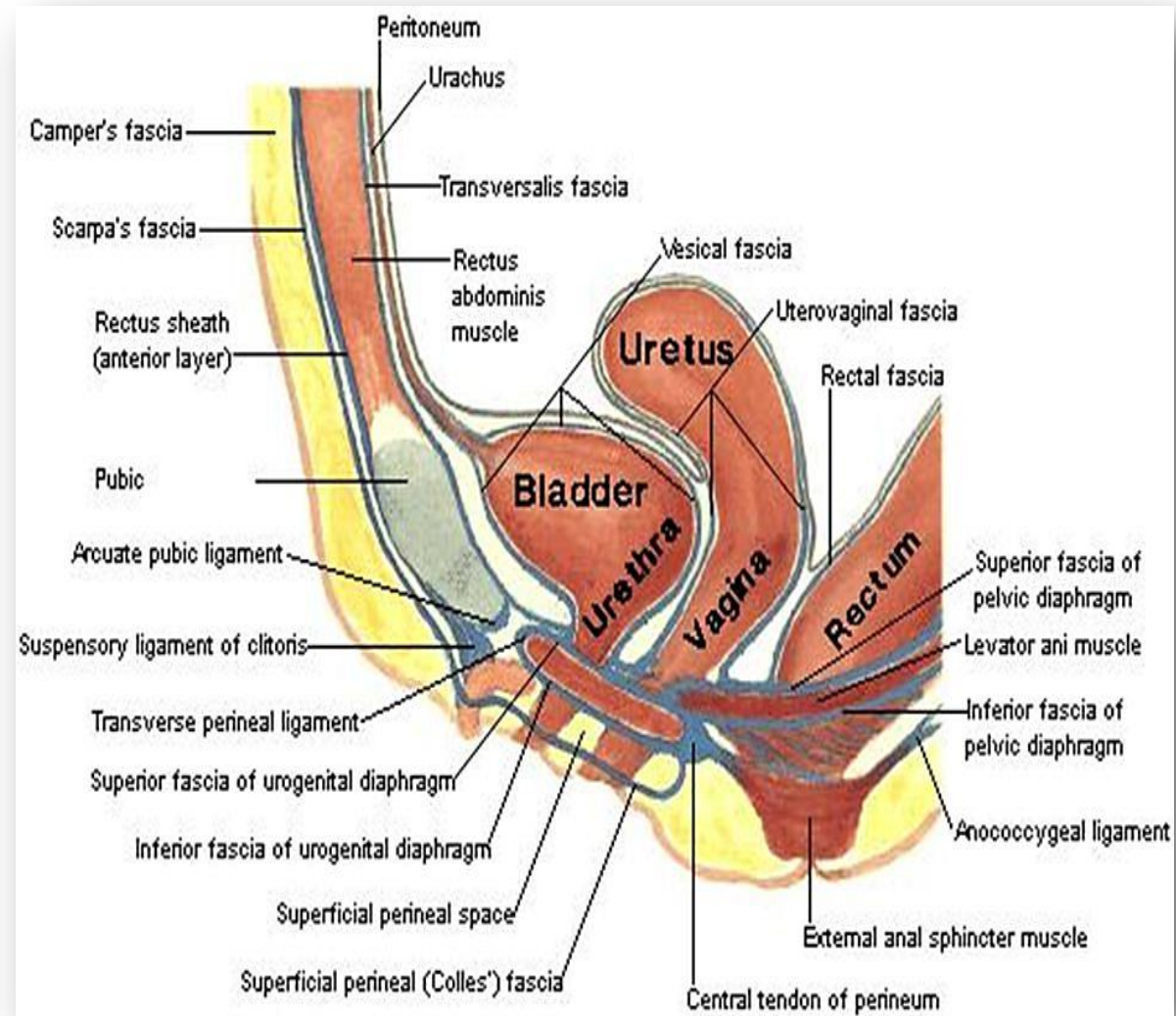
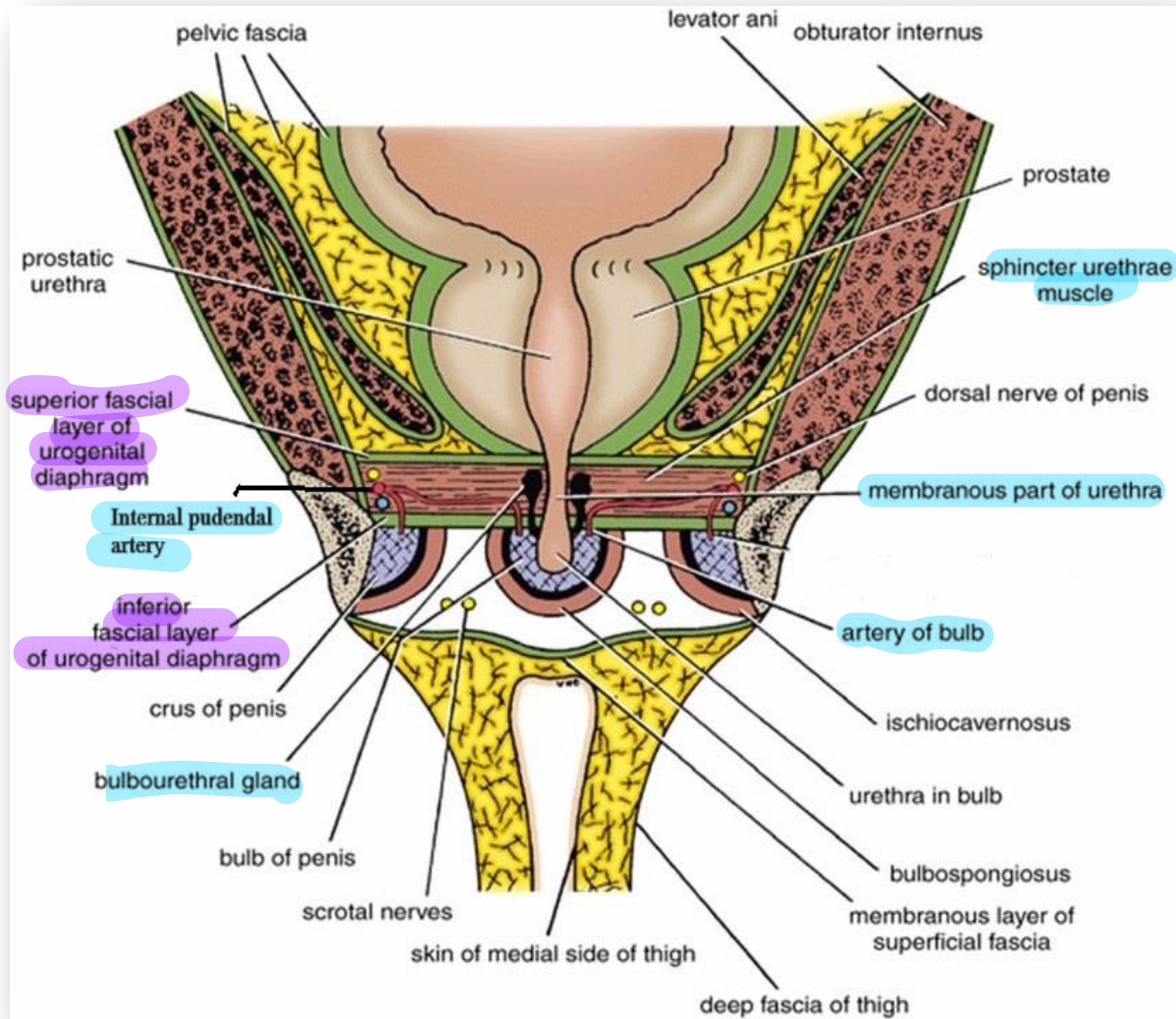
Contents of Deep Perineal Pouch



	In Male	In Female
Urogenital Structures	<ul style="list-style-type: none"> • <u>Membranous urethra.</u> • <u>Bulbourethral (Cowper's) glands</u> At each side 	<ul style="list-style-type: none"> • Part of the urethra. • Part of vagina
Muscles	<ul style="list-style-type: none"> • Sphincter urethrae • Deep transverse perineal muscles 	
Vessels	<ul style="list-style-type: none"> • Internal pudendal A. • Artery of bulb of penis • Urethral A. • Perineal A. <p>Urethral artery branch male فقط موجود بل</p>	<ul style="list-style-type: none"> • Internal pudendal A. • Artery of bulb of vestibule. • Perineal A
Nerves	<ul style="list-style-type: none"> • Dorsal N. of penis. • Perineal N. 	<ul style="list-style-type: none"> • Dorsal N. of clitoris. • Perineal N.



Contents

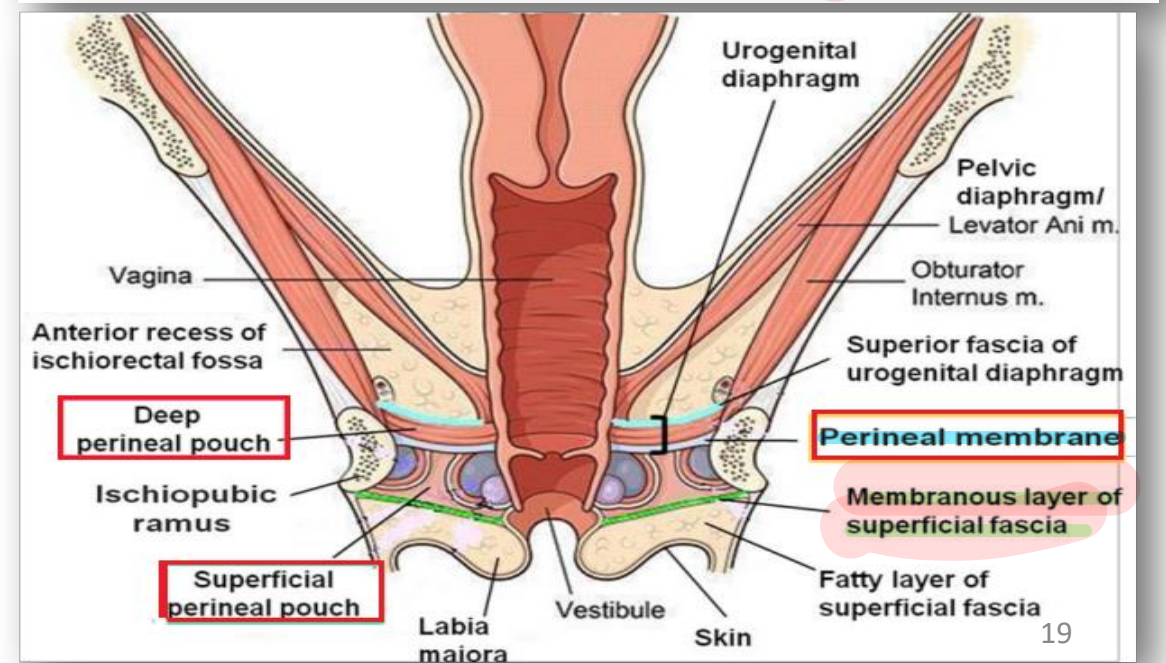
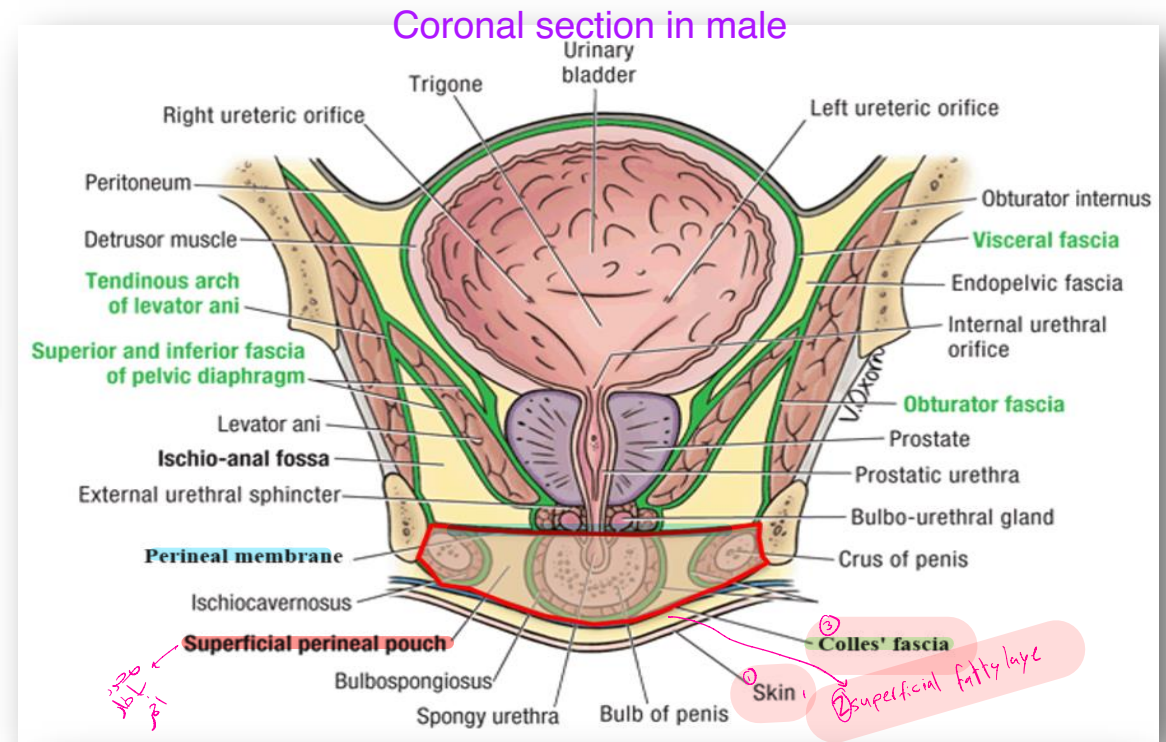


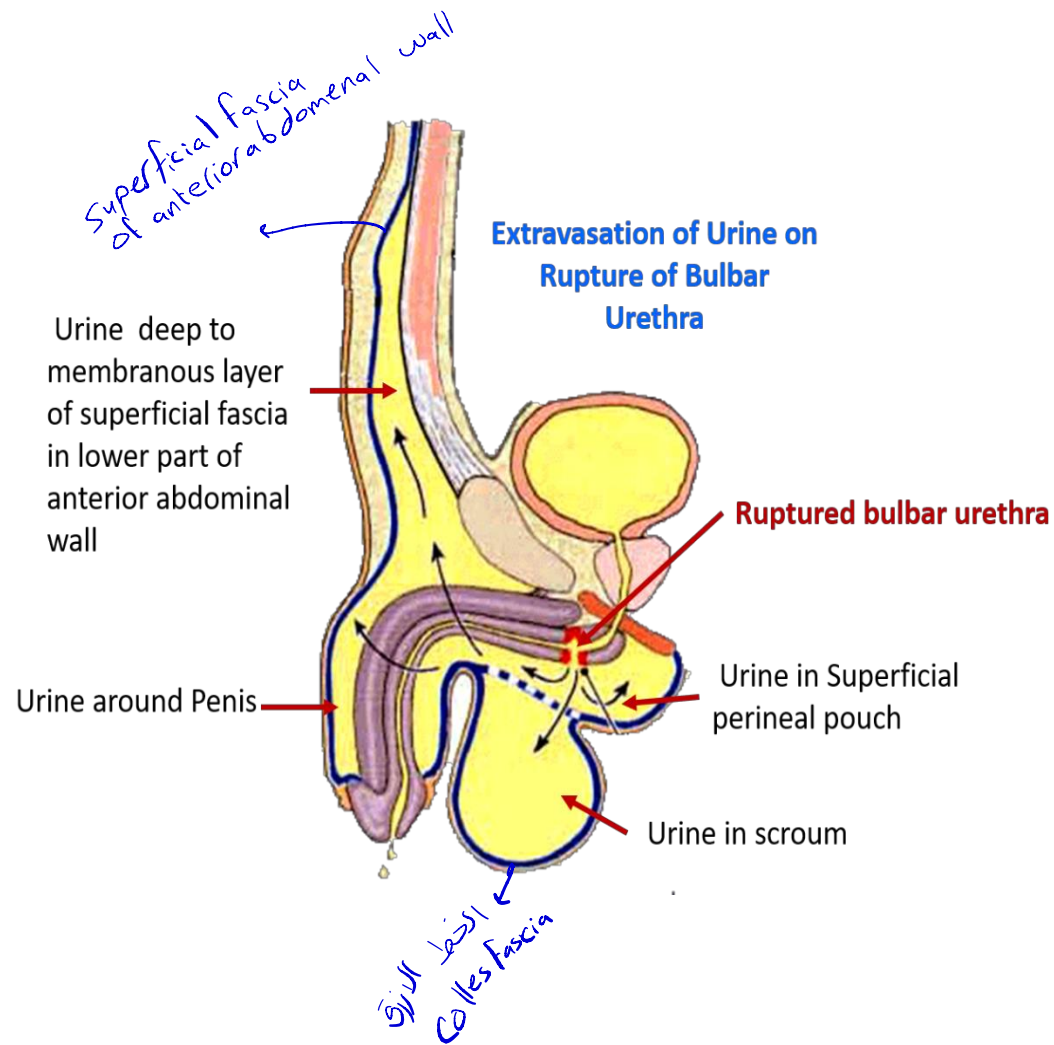
Superficial Perineal Pouch

It lies between;

- **Roof:** Perineal membrane.
- **Floor:** Membranous layer of the superficial perineal fascia (Colles' fascia).
- **Posteriorly:** It is closed by union of the roof and floor.
- **Anteriorly:** It communicates freely with the interval between the membranous layer of superficial fascia of anterior abdominal wall and external oblique aponeurosis.

deep fascia عن عبارة fat
 Superficial fascia ال
 موجودة ب كل الجسم تحت ال skin
 وهي عبارة عن fibers and fat
 في بعض الاماكن ب الجسم زي ال anterior abdominal wall
 وزي perineal fascia
 بصير عنا زي طبقات Skin
 Superficial fatty layer of superficial fascia
 Deep membranous layer of superficial fascia
 اسمها colles fascia





Rupture of Spongy Urethra:

- The urine extravasates into the superficial perineal pouch and then passes forward into loose connective tissue of the scrotum, around the penis and beneath the membranous layer of the superficial fascia of lower part of anterior abdominal wall.
- Cannot pass posteriorly to anal triangle.

superficial pouch closed posterior لا

Contents of Superficial Perineal Pouch

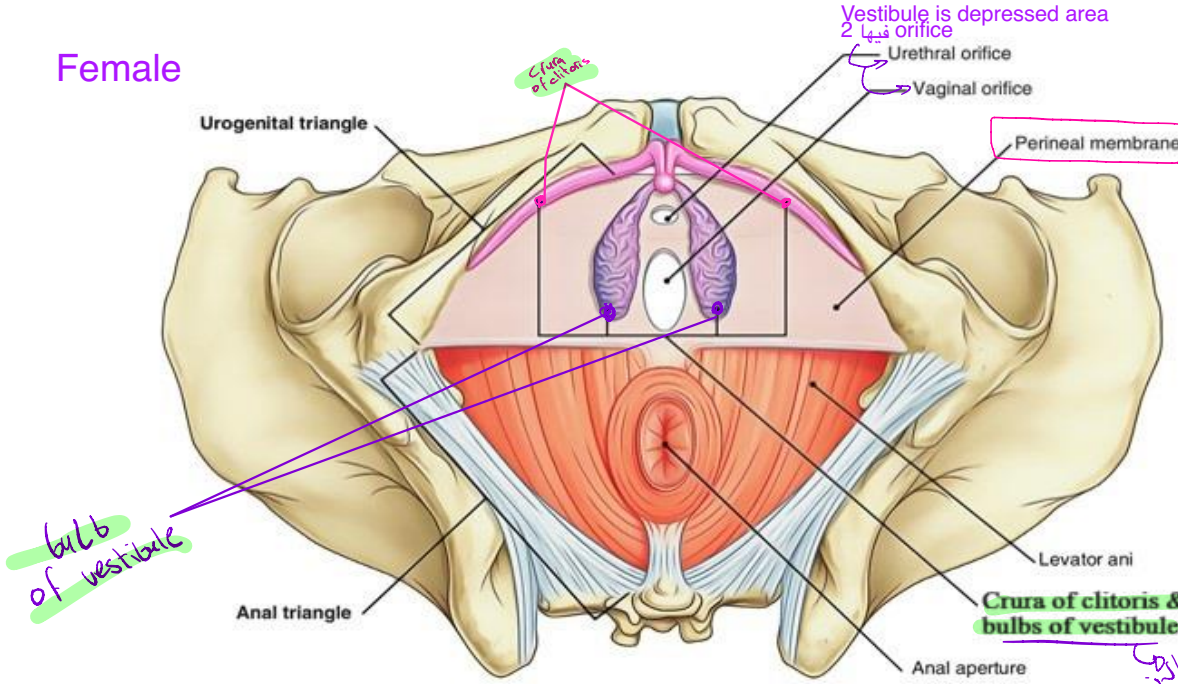
	In Male	In Female
<p>Urogenital Structures</p> <p>Covers by striated muscle fiber</p>	<p><i>erectile tissue عبارة عن</i></p> <p><i>capillary spaces بينهم وفي</i></p> <p><i>smooth muscle fiber وهي عبارة عن</i></p> <ul style="list-style-type: none"> • <u>Root of penis (2 crura + Bulb)</u> • <u>Penile urethra in bulb of penis.</u> 	<ul style="list-style-type: none"> • <u>Root of clitoris (2 crura).</u> • <u>Two bulbs of vestibule.</u> • <u>Greater vestibular glands.</u>
<p>Muscles</p>	<ul style="list-style-type: none"> • <u>Ischiocavernosus muscles</u> cover the 2 crura. • <u>Bulbospongiosus muscle</u> cover bulb of penis. • <u>Superficial transverse perineal muscles.</u> 	<ul style="list-style-type: none"> • <u>Ischiocavernosus muscles</u> cover the 2 crura. • <u>Bulbospongiosu muscle</u> covers bulb of vestibule. • <u>Superficial transverse perineal muscles.</u>
<p>Vessels</p>	<ul style="list-style-type: none"> • <u>Internal pudendal A.</u> • <u>Dorsal A. of penis.</u> • <u>Deep A. of penis.</u> • <u>Posterior scrotal arteries.</u> 	<ul style="list-style-type: none"> • <u>Internal pudendal A.</u> • <u>Dorsal A. of clitoris.</u> • <u>Deep A. of clitoris.</u> • <u>Posterior labial arteries.</u>
<p>Nerves</p>	<ul style="list-style-type: none"> • <u>Dorsal N. of penis.</u> • <u>Posterior scrotal nerves.</u> 	<ul style="list-style-type: none"> • <u>Dorsal N. of clitoris.</u> • <u>Posterior labial nerves.</u>

branch of perineal artery

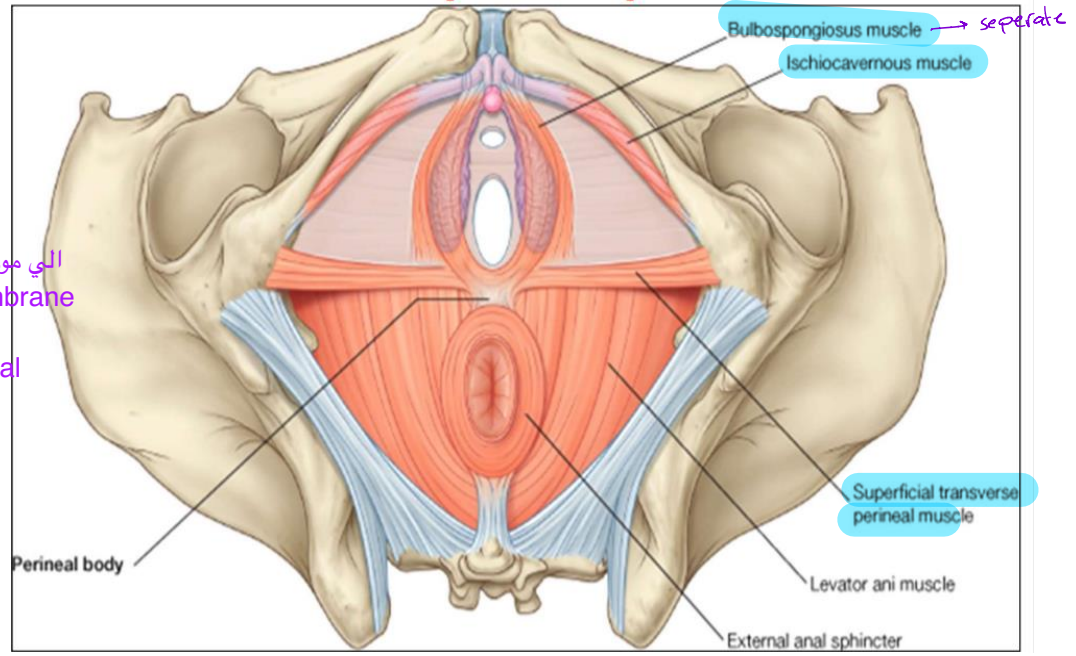
sensory fibers of perineal nerve

كشافة
في
2
part

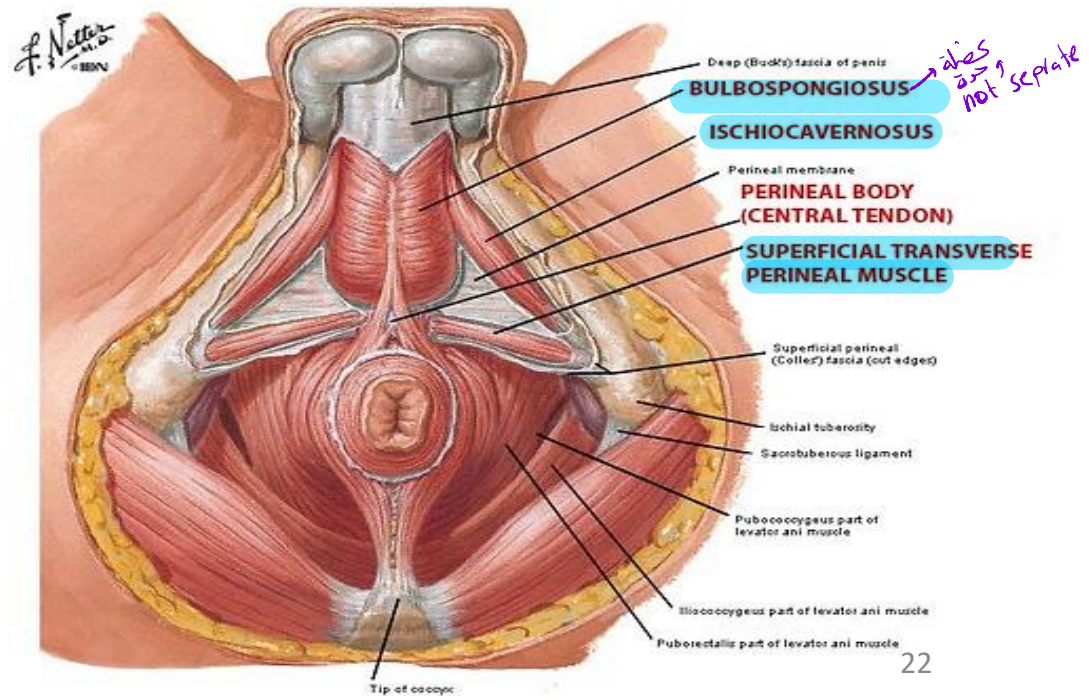
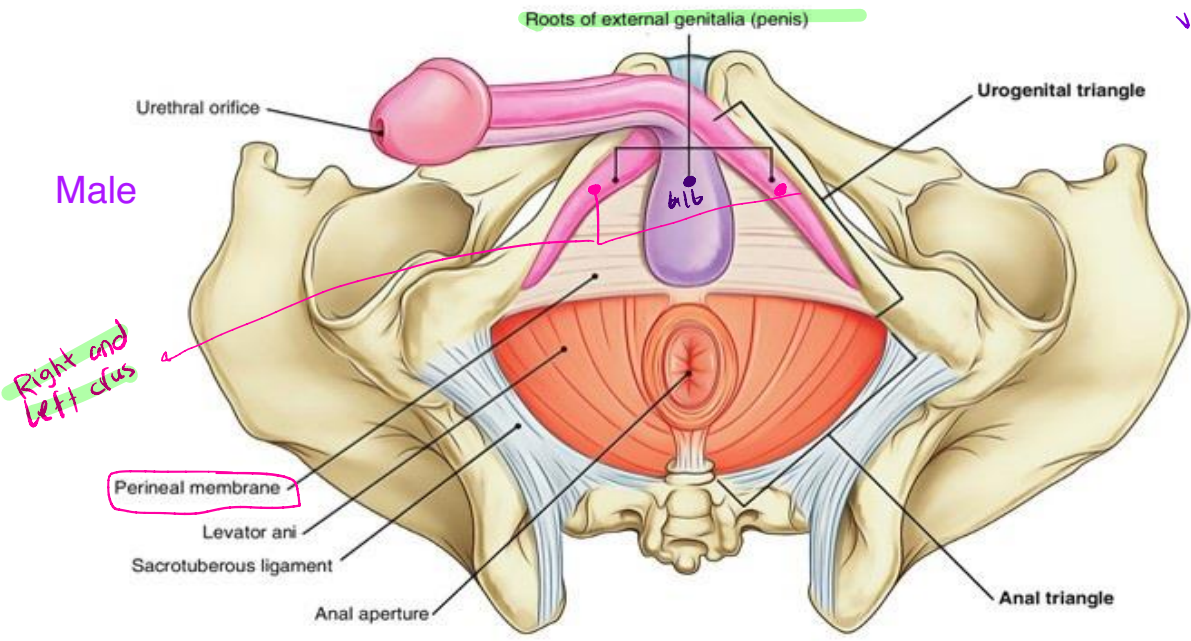
Female

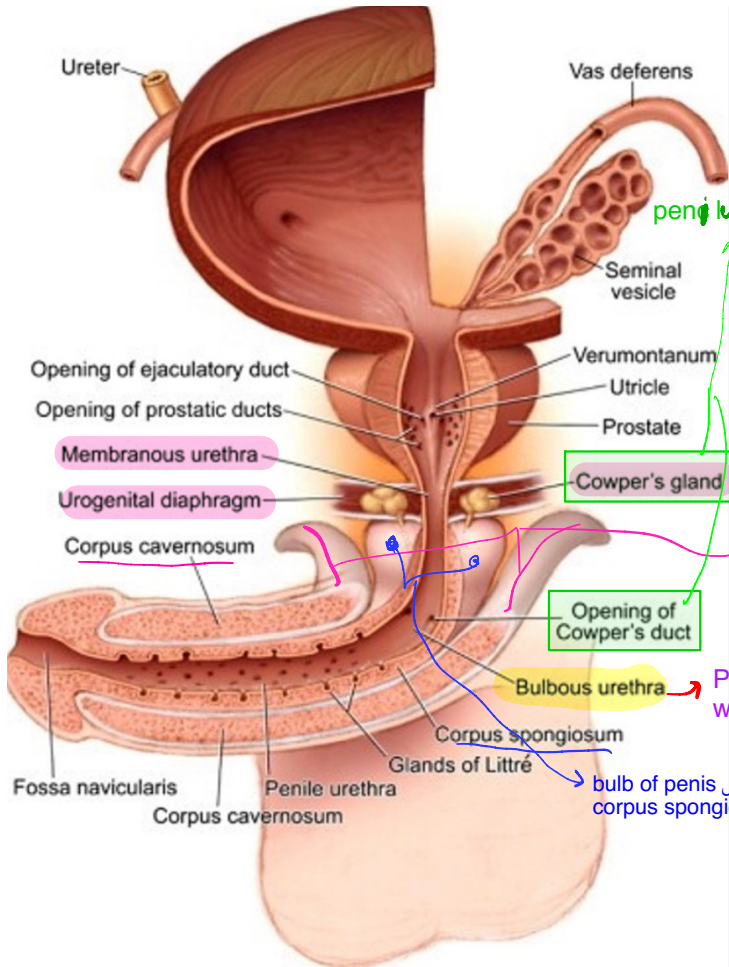


Structure superficial to the perineal membrane هي هي superficial perineal pouch



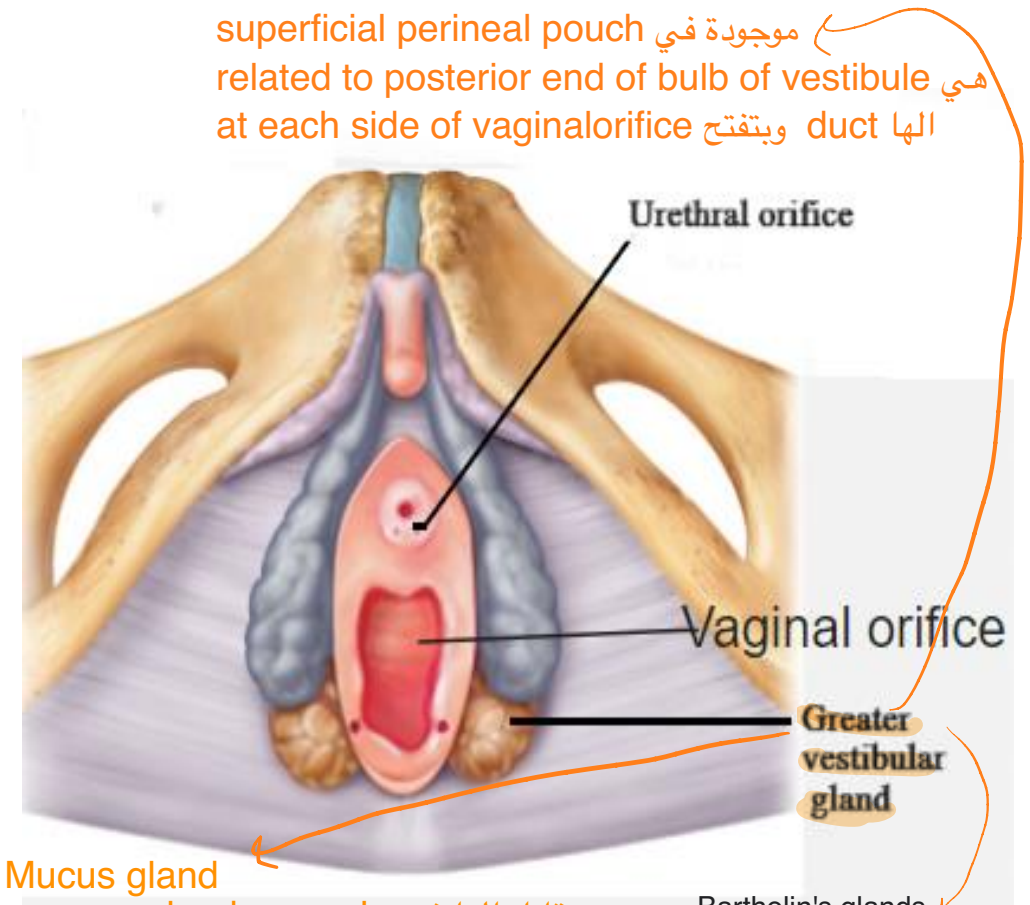
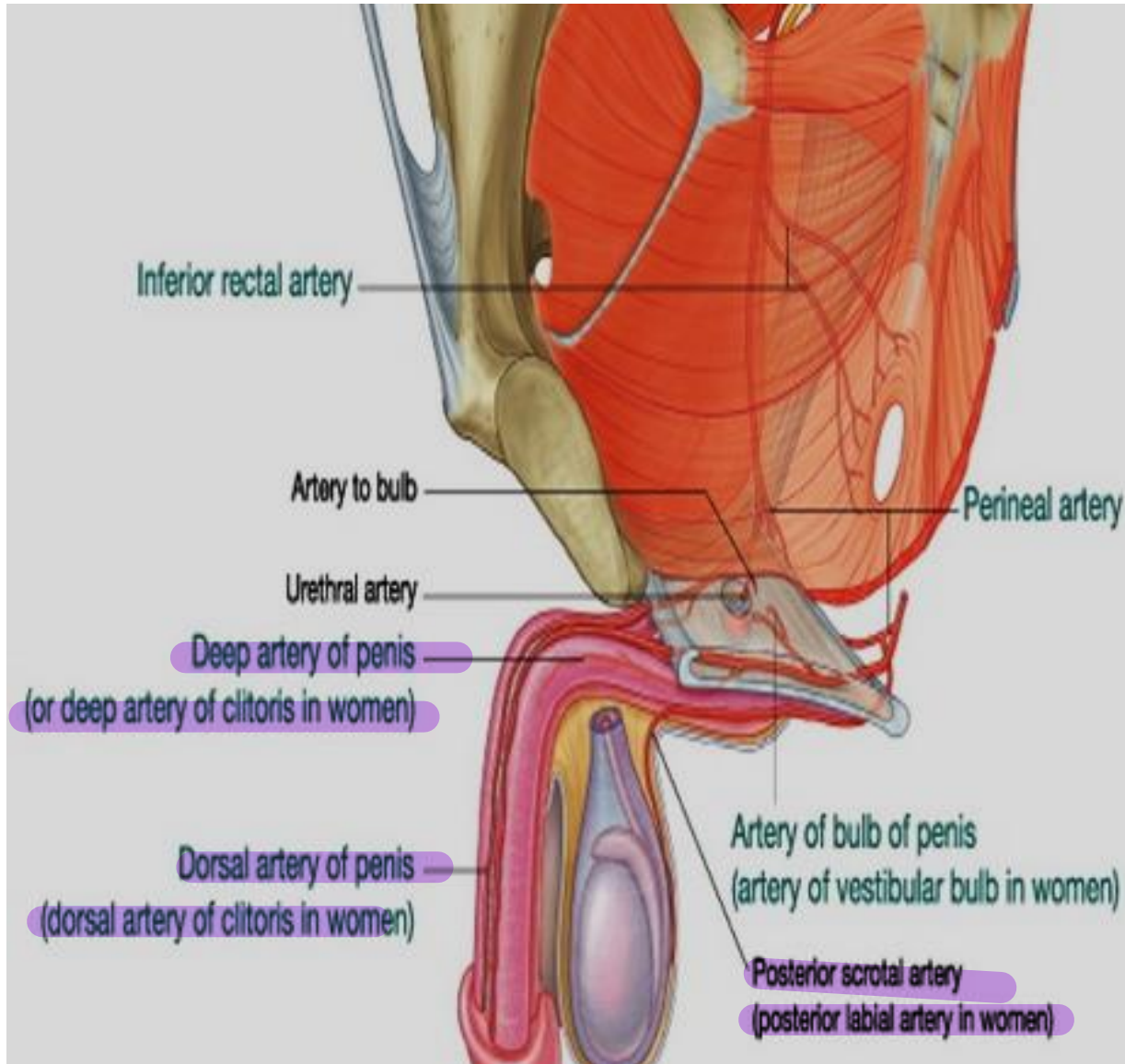
Male





Cowpers gland
 deep perineal pouch بل موجودة
 duct if this gland لكن
 Peirce perineal membrane
 وتخترق ال bulb وتفتح بل part of male urethra
 Artery of bulb مجرد مايطلع من
 Internal puendal artery
 pierce of perineal membrane ويعمل
 bulb ال ويدخل ال
 content of deep perineal pouch ال
 content of superficial perineal pouch ال لكن مش من ضمن ال
 لانه مش
 bulb ال هو دخل ال عمل مجرد ما
 حقدر امسكها ايدي خلص

Right and left crus
 erectile tissue بتكمل ب
 ercstile tissue root of penis ل
 free part of penis بل
 موجودة بل
 corpus cavernosum بتكمل ب اسم تاني ل
 Part of urethra
 within bulb of penis موجود
 bulb of penis ال
 corpus spongiosum ل free part of penis بل
 برضو حيكمل بل



superficial perineal pouch ← موجودة في هي related to posterior end of bulb of vestibule at each side of vaginal orifice duct وبتفتح الها

Mucus gland ← مقابله لها في male هي cowpers gland deep perineal pouch ← الموجودة بل

Bartholin's glands ← اسمها الشائع في ال clinical

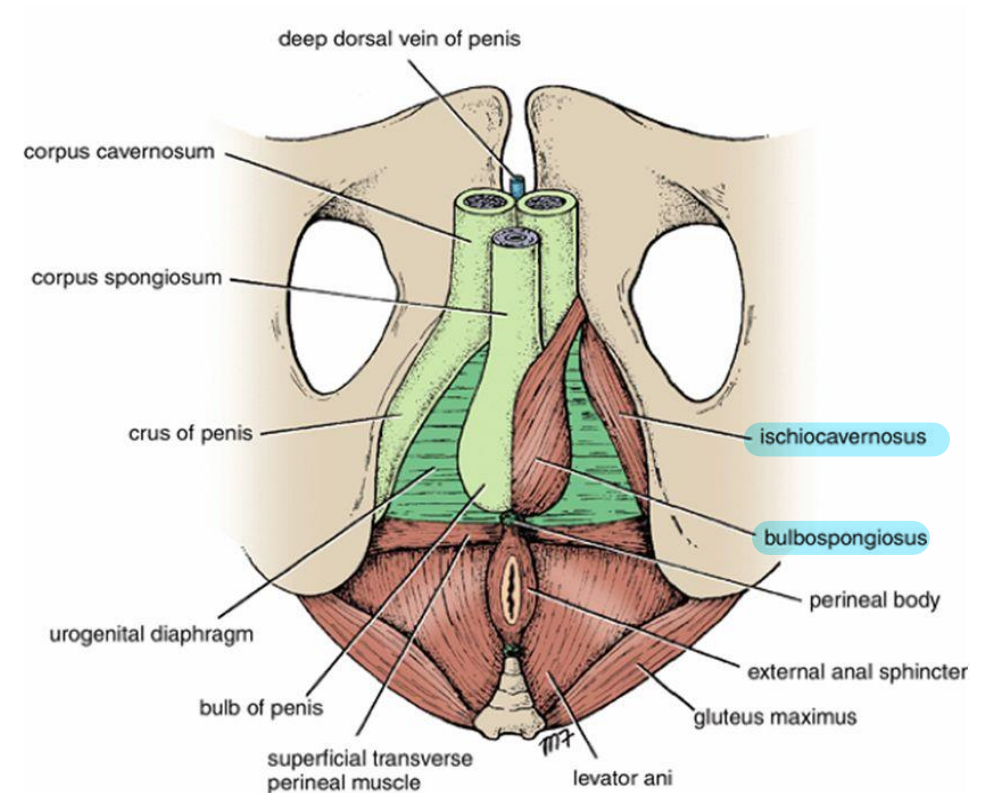
Action of muscles of superficial perineal pouch:

Ischiocavernosus muscles:

- Maintain erection of the penis by compressing the crus and the deep dorsal vein of the penis, thereby retarding venous return.
delay

Bulbospongiosus muscle:

- **In Male:** Assist in erection of penis. And expelling last drops of urine during micturition or the final semen in ejaculation.
↳ the action of urination
- **In Female:** Act as sphincter vagina and help in erection of clitoris.
- All muscles in superficial perineal pouches are supplied by perineal branch of pudendal nerve.



Perineal Body

Central tendon of perineum

- Is a fibromuscular mass **located in** the center of the perineum **between** the anal canal and the ^{anterior} vagina (or bulb of the penis) ^{posterior}.

↳ in male

نقطة تجمع
للعضلة

- Serves as a site of attachment for the superficial and deep transverse perineal, bulbospongiosus, levator ani, and external sphincter muscles

Perineal body

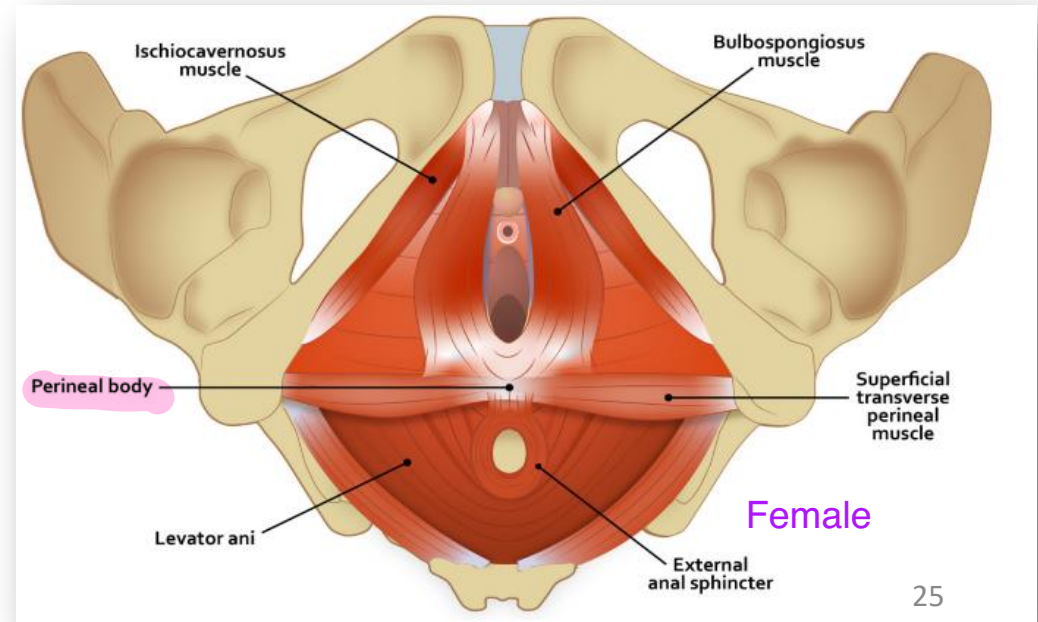
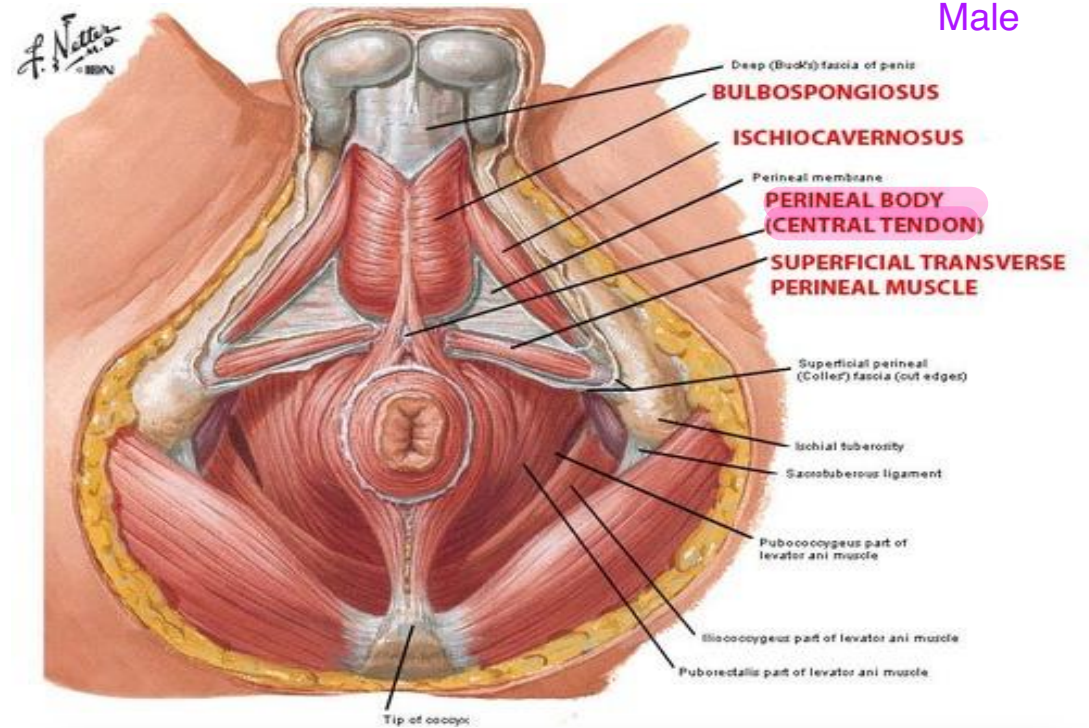
In female support the vagina and uterus

في مكانهم

To prevent prolapse

سقوط الرحم

Male



Female

Perineal Membrane

- It is a fibrous membrane in the perineum. "inferior fascia of urogenital diaphragm".
- **It forms** the floor of the deep perineal pouch.
- **It forms** the roof of the superficial perineal pouch.

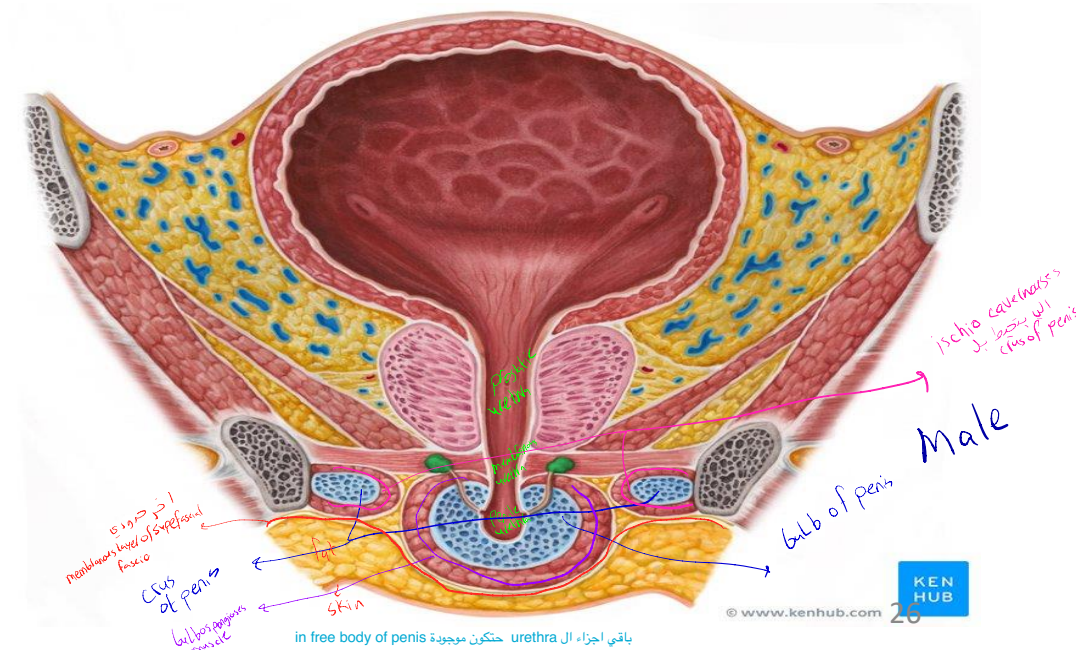
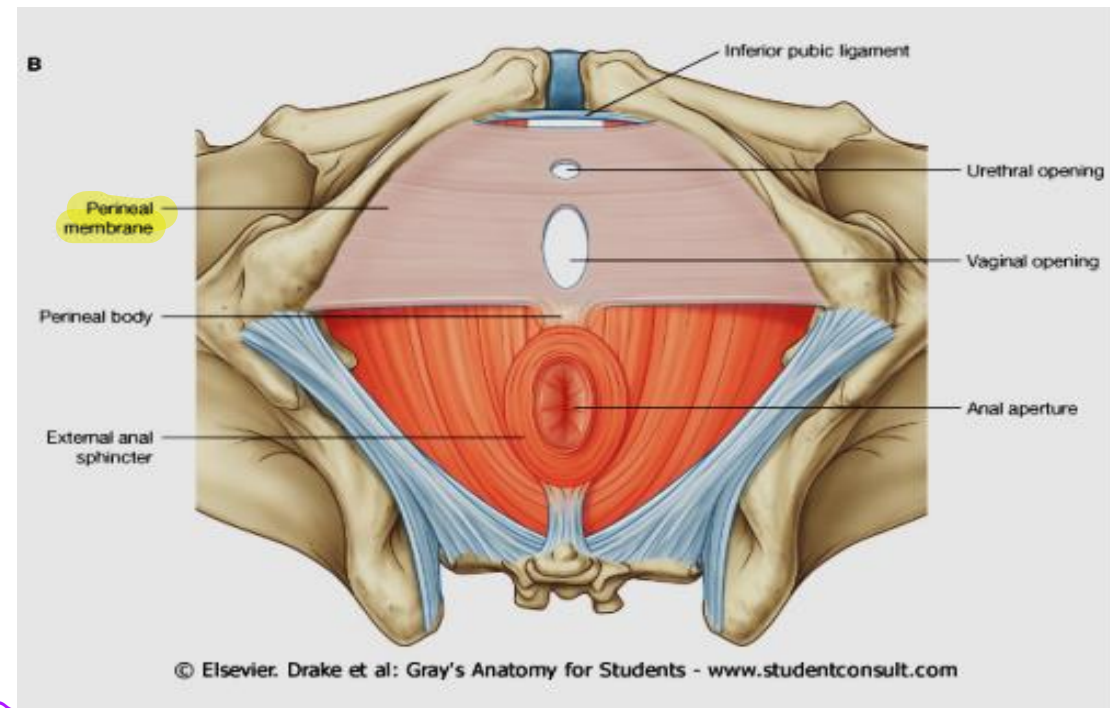
It is perforated by:

- Urethra.
- Vagina.
- Ducts of two bulbourethral gland (male).
- Internal pudendal A.
- Artery of bulb.
- Dorsal nerves of penis or clitoris.
- Posterior scrotal or labial nerves and vessels.

Structure

Pierce the perineal membrane

حتى تنتقل من deep pouch الى superficial pouch



- Perineal membrane thickened anteriorly to form the **transverse perineal ligament**.
- The **transverse perineal ligament** is separated from the symphysis pubis **by a gap**.
- Through this gap the **deep dorsal vein of penis** enters the pelvis to join the **prostatic venous plexus**.

