

**The University Of Jordan  
Faculty Of Medicine**



# Female genital system

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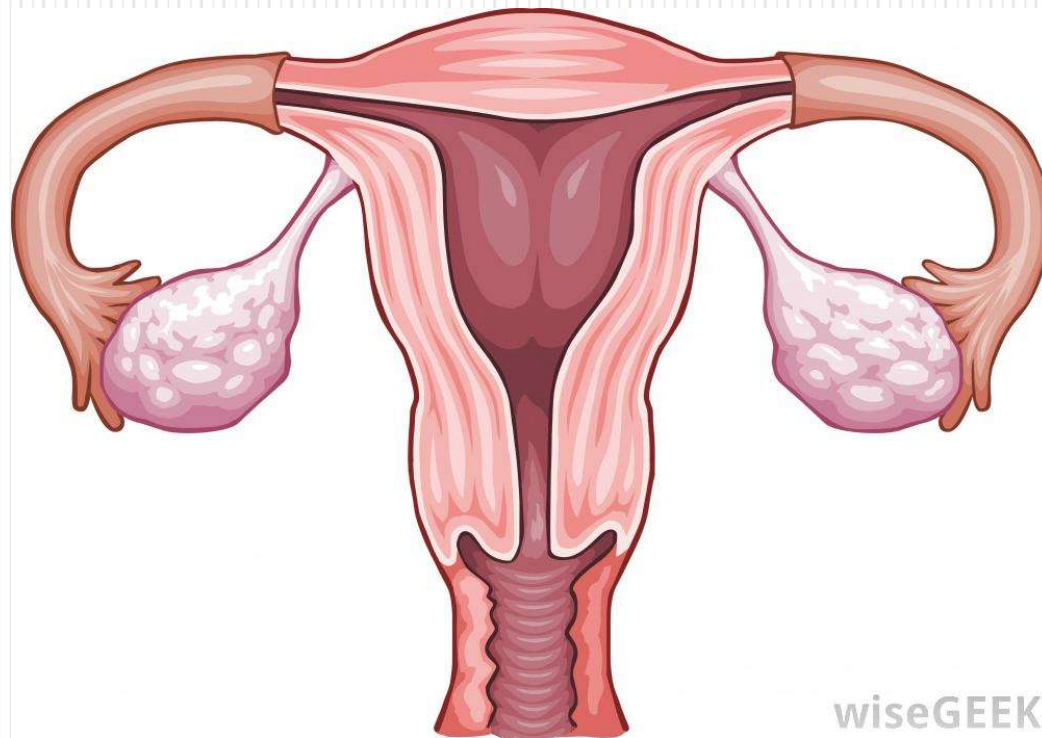
## Female Genital Organs

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This includes :

1. Ovaries
2. Fallopian tubes
3. Uterus
4. Vagina
5. External genital organs

# Ovaries



**Site of the Ovary:** In the ovarian fossa in the lateral wall of the pelvis which is bounded.

Anteriorly : External iliac vessels.

Posteriorly : internal iliac vessels and ureter

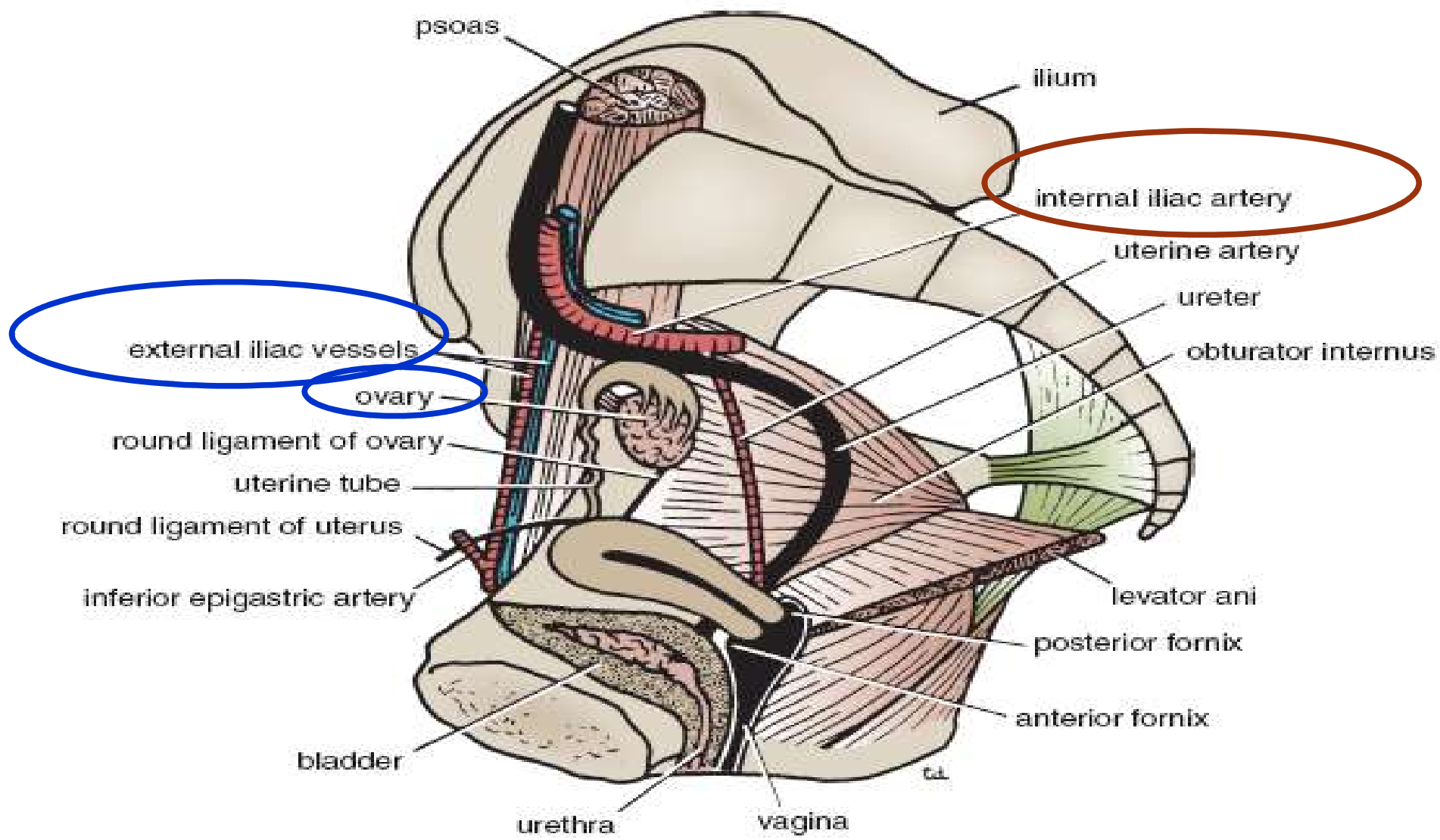
**Shape** : the ovary is almond-shaped.

**Orientation :**

- In the nullipara : long axis is vertical with superior and inferior poles.
- In multipara : long axis is horizontal, so that the superior pole is directed laterally and the inferior pole is directed medially.

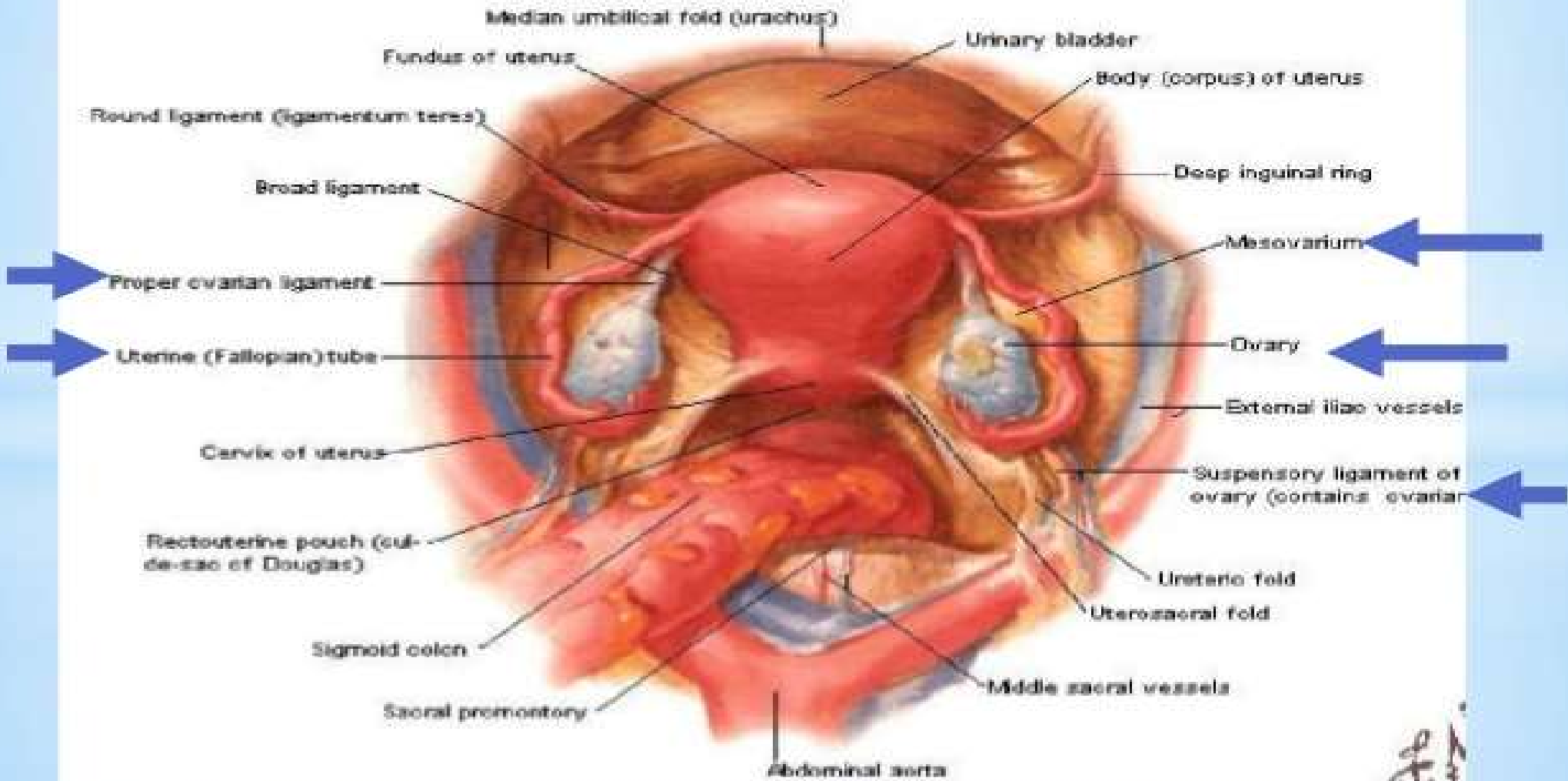
**External Features :** **REED ONLY**

- Before puberty : Greyish-pink and smooth.
- After puberty with onset of ovulation, the ovary becomes grey in colour with puckered surface.
- In old age : it becomes atrophic

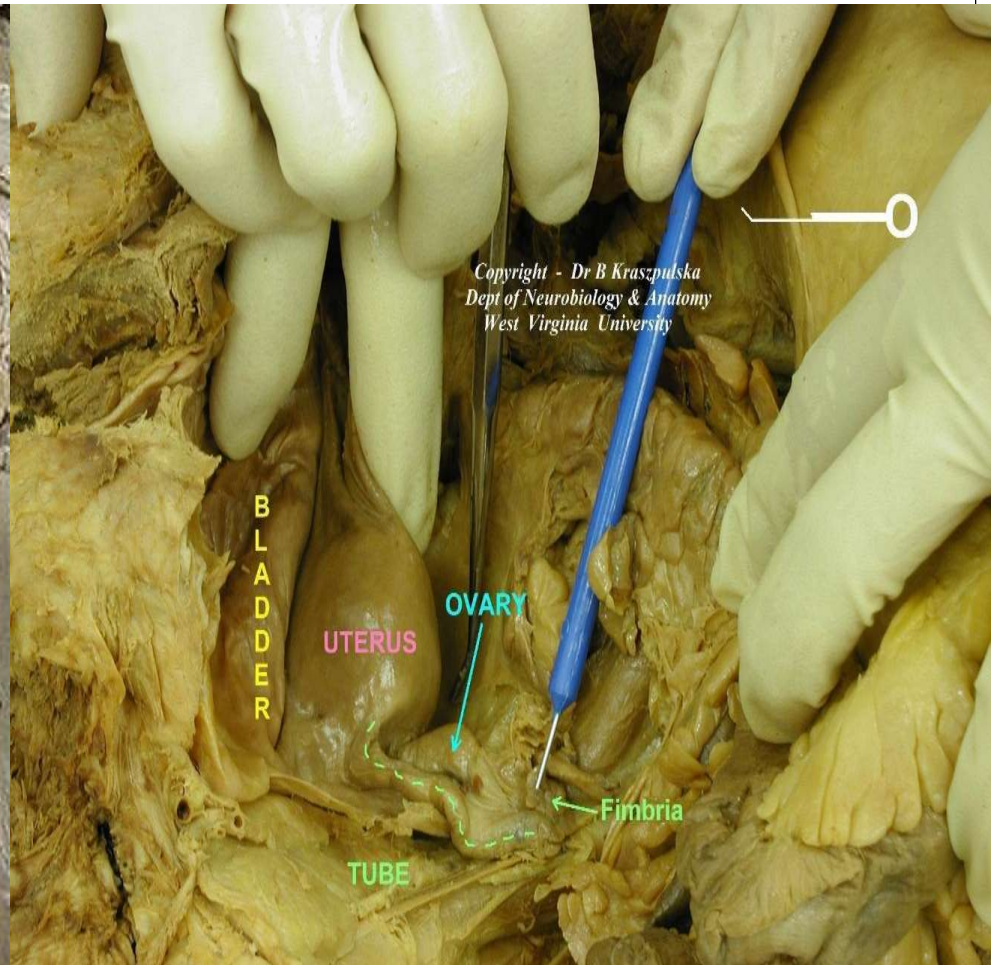
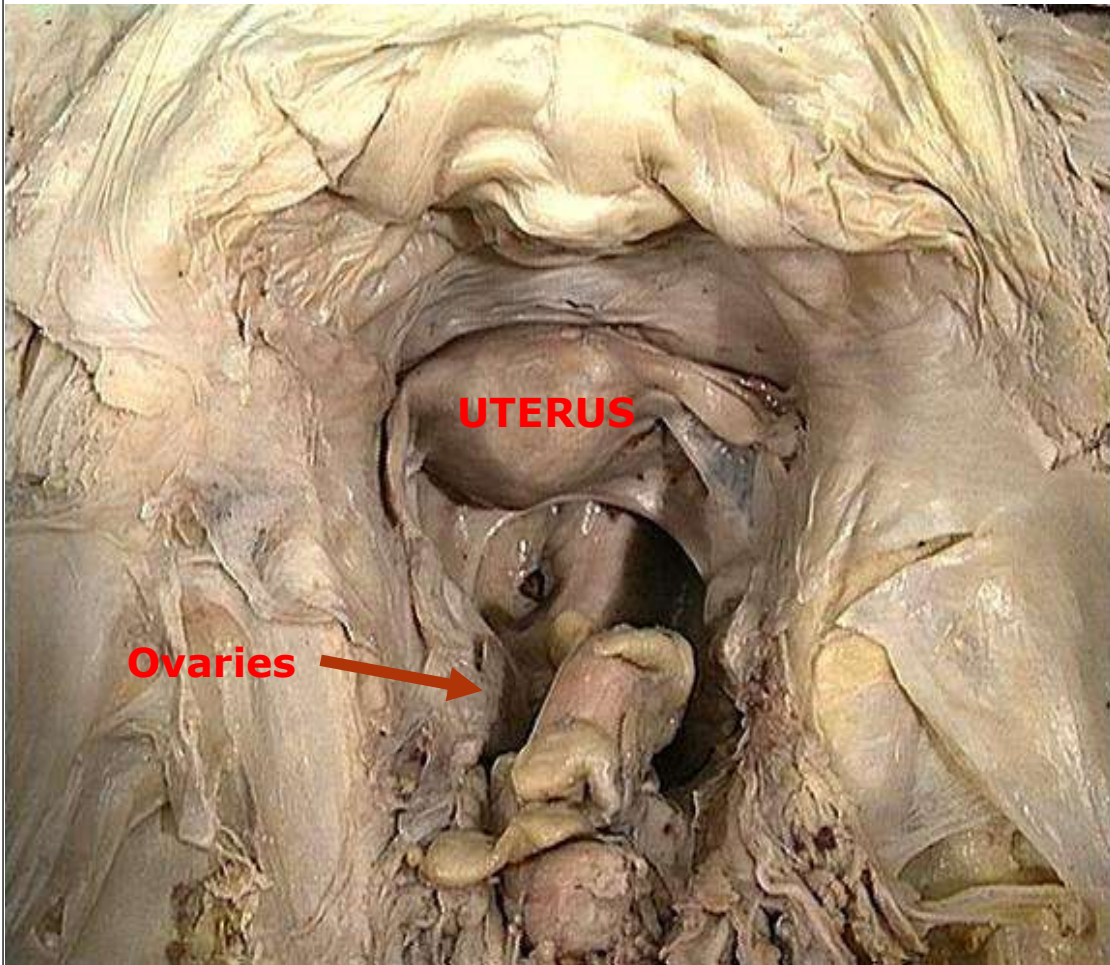


# Pelvic Viscera of Female

## Superior View - Peritoneum Intact



*Handwritten signature*



**Description :** In nullipara, the ovary has :

Two ends : superior (tubal) end and inferior (uterine) end.

Two borders : anterior (mesovarian) border and posterior (free) border.

Two surfaces : lateral and medial.

### **A. Ends of the Ovary :**

**Superior (tubal) end** : is related to the ovarian fimbria of the uterine tube and is attached to side wall of the pelvis by the ***ovarian suspensory ligament.***

**Inferior (uterine) end** : it is connected to superior aspect of the uterotubal junction by the ***round ligament of the ovary*** which runs within the broad ligament .



## **B. Borders of the Ovary :**

**Anterior (mesovarian) border :** presents the hilum of the ovary and is attached to the posterior layer of the broad ligament by a short peritoneal fold called the *mesovarium*.

**Posterior (free) border :** is related to the lateral curved end of the uterine tube.

## **C. Surfaces of the Ovary:**

**Lateral surface:** is related to the parietal peritoneum of the ovarian fossa which separates the ovary from obturator nerve and vessels.

**Medial surface:** is related to the uterine tube.

**N.B:** Uterine tube has triple relation to the ovary : the tube is related to the tubal end, the posterior border and medial surface of the ovary.

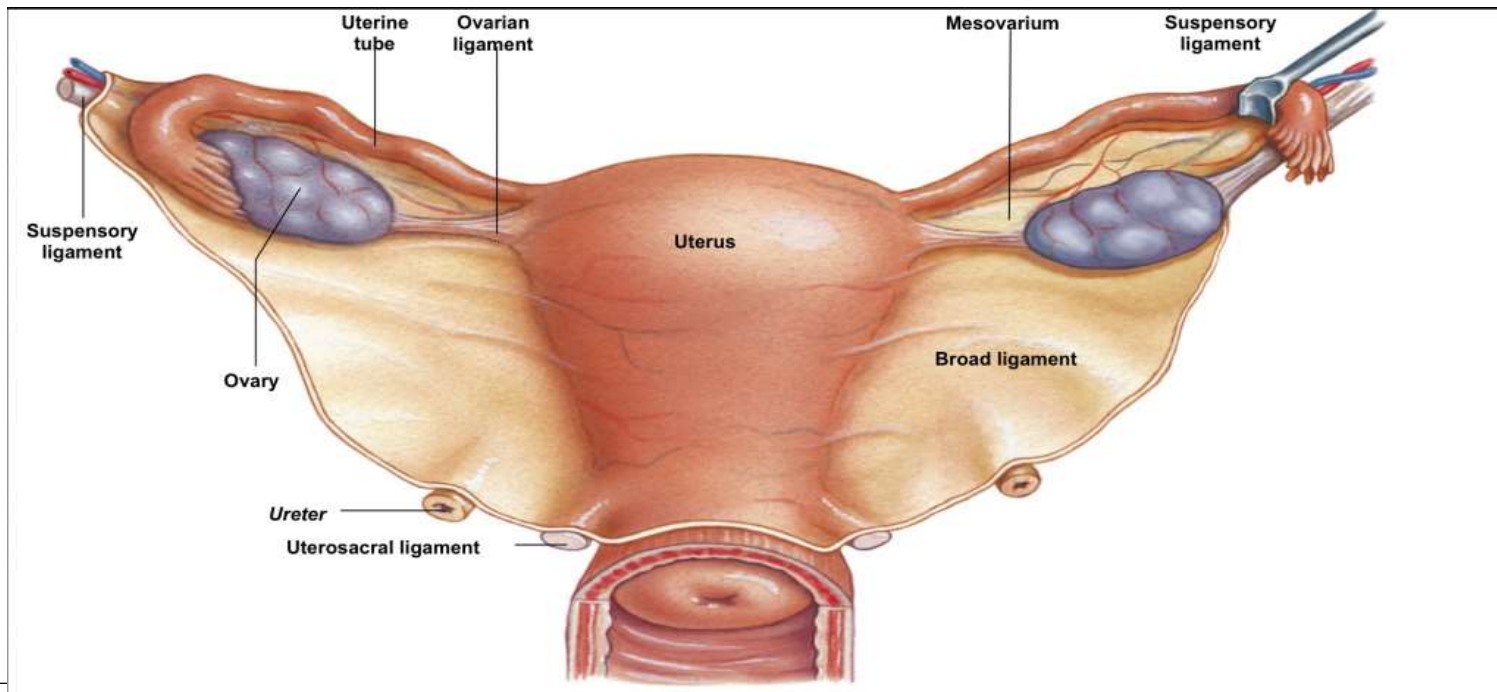
## Ligaments of the ovary

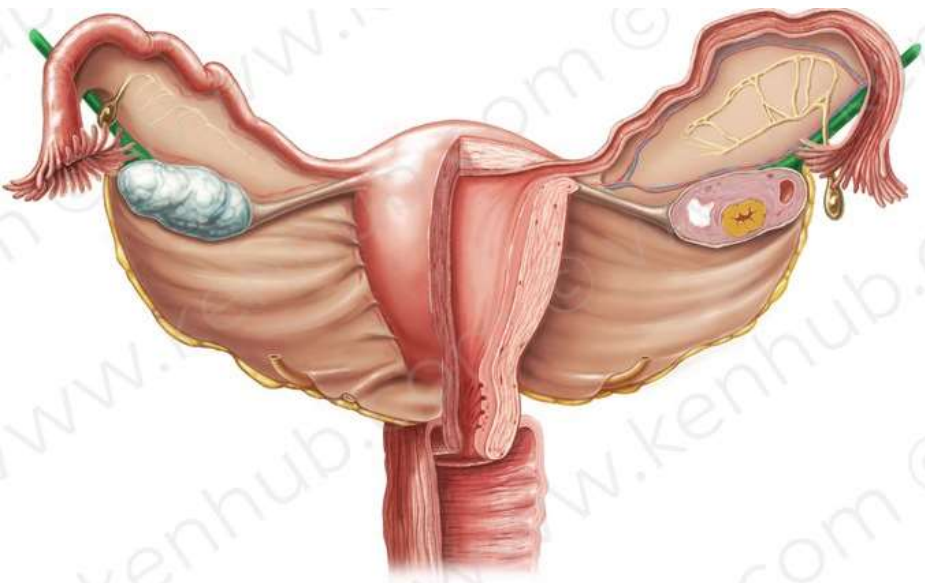
**1.Round ligament of the ovary** : extends between the uterine end of the ovary and uterotubal junction.

**2.Mesovarium** : is a short peritoneal fold between the anterior border of the ovary and posterior layer of the broad ligament.

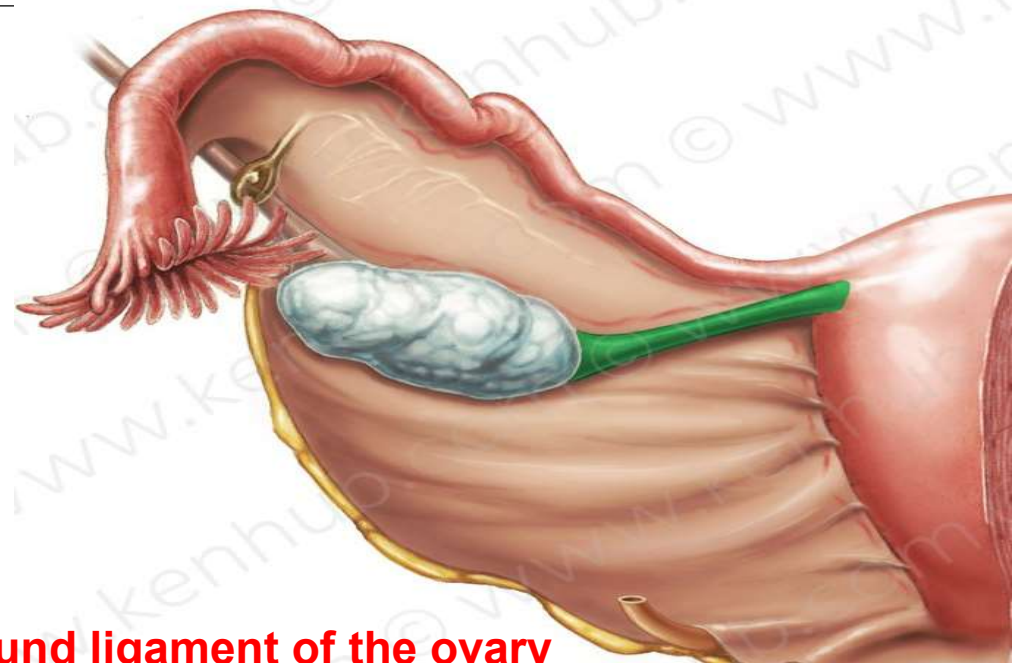
**3.Suspensory ligament of the ovary** : is a short peritoneal fold between the superior end of the ovary and side wall of the pelvis (it is a part of the broad ligament).

It conducts vessel ,nerves and lymphatics to and from the ovary

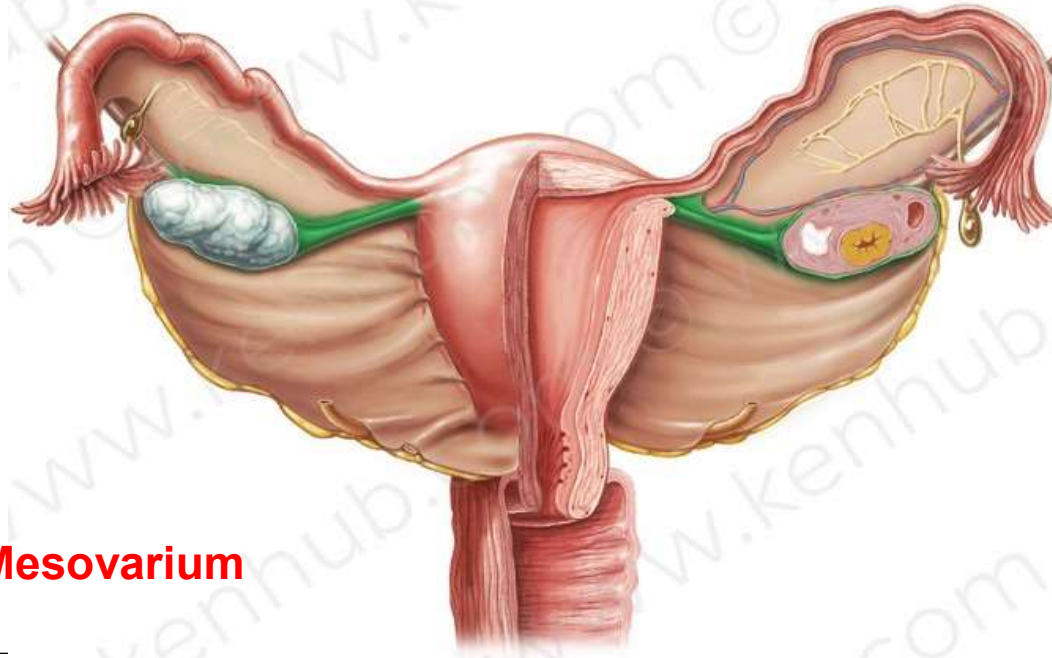




**Suspensory ligament of ovary**



**Round ligament of the ovary**



**Mesovarium**

## Arterial Blood Supply:

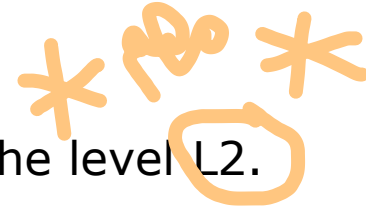
- By the ovarian artery .
  - The ovarian artery arises from the abdominal part of the aorta at the level L2.
  - The artery passes through the suspensory ligament of the ovary, then through the mesovarium to enter the hilum of the ovary at its attached border .
- \* Distribution : it supplies the ovary, lateral part of uterine tube and anastomoses with the uterine artery within the broad ligament.

## Venous Drainage:

- The veins emerge at the hilum of the ovary as a pampiniform plexus which gives rise to the ovarian vein.
- The right ovarian vein → I.V.C.
- The left → left renal vein.

**Lymphatic Drainage :** to lateral aortic lymph nodes,

**Nerve Supply :** by autonomic nerves along the ovarian artery. They are derived from coeliac and aortic nerve plexuses. They are sensory and vasomotor.



## Uterine Tubes

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It lies in the medial 4/5 of the upper free border of the broad ligament.

Length: is about 10 cm.

### **Communications:**

- Laterally, the tube pierces the upper layer of the broad ligament to open into the peritoneal cavity near the ovary (it is the abdominal ostium).
- Medially, it opens into the superior angle of the uterine cavity

## Parts of the Tube:

From lateral to medial, it has four parts;

### 1. Infundibulum :

- It is the funnel-shaped lateral part of the tube which is closely related to the ovary.
- It is about 2 cm long.
- Its bottom presents the abdominal ostium which is 3 mm in diameter.
- Its margins have 20-30 irregular processes called fimbriae which spread over the surface of the ovary.
- During ovulation, the fimbriae trap the oocyte into the uterine tube.

### 2. Ampulla :

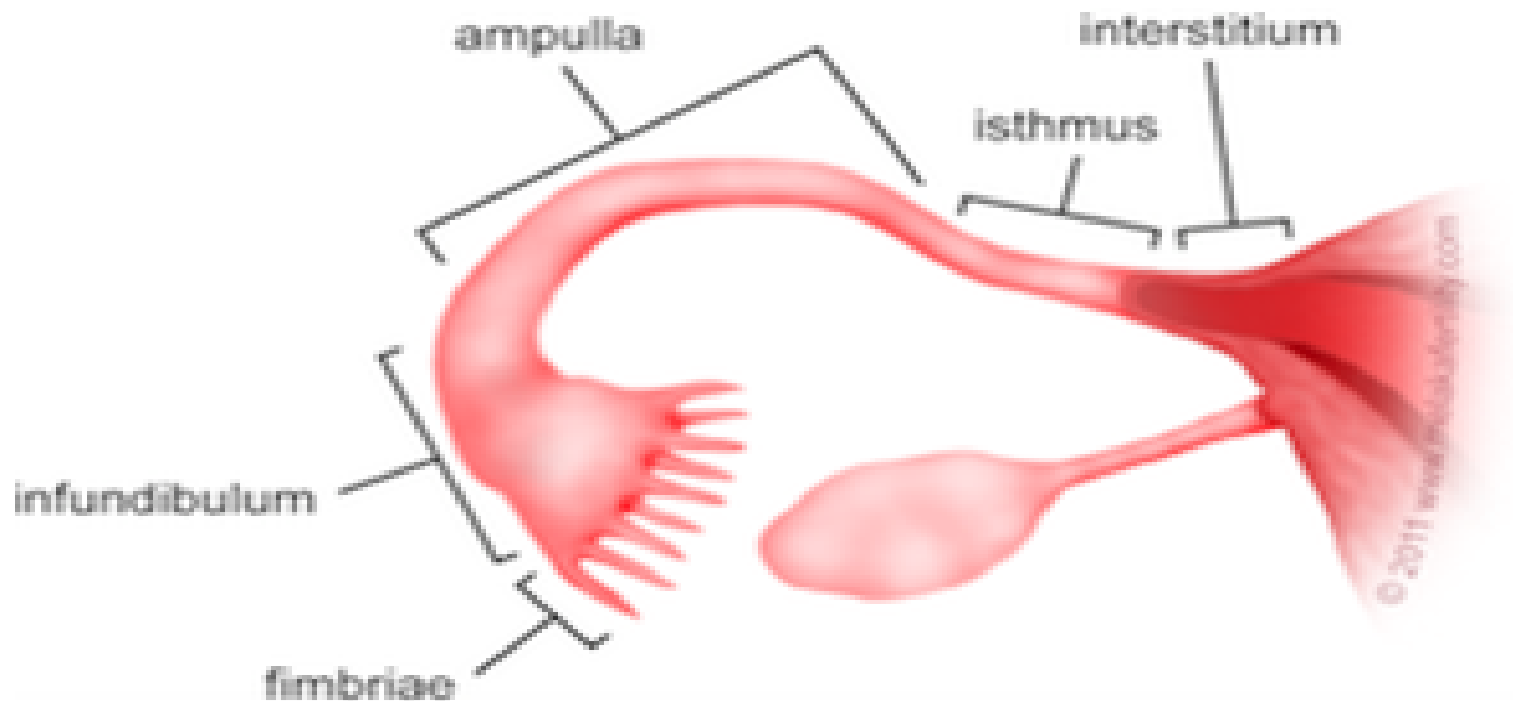
- ✓ It is the **widest** (4 mm in diameter) and longest part of the tube (about 5 cm long).
- ✓ It is thin-walled and tortuous.
- ✓ It is the site of fertilization.

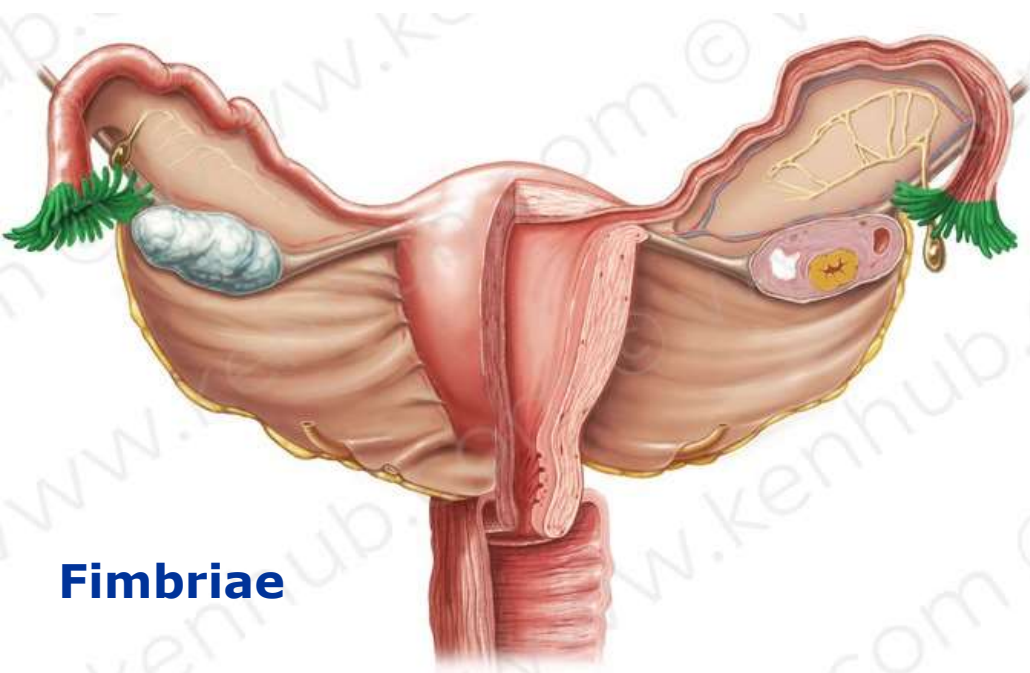
### 3. Isthmus:

It is **narrow** (2 mm) , short (2 cm) and thick-walled.

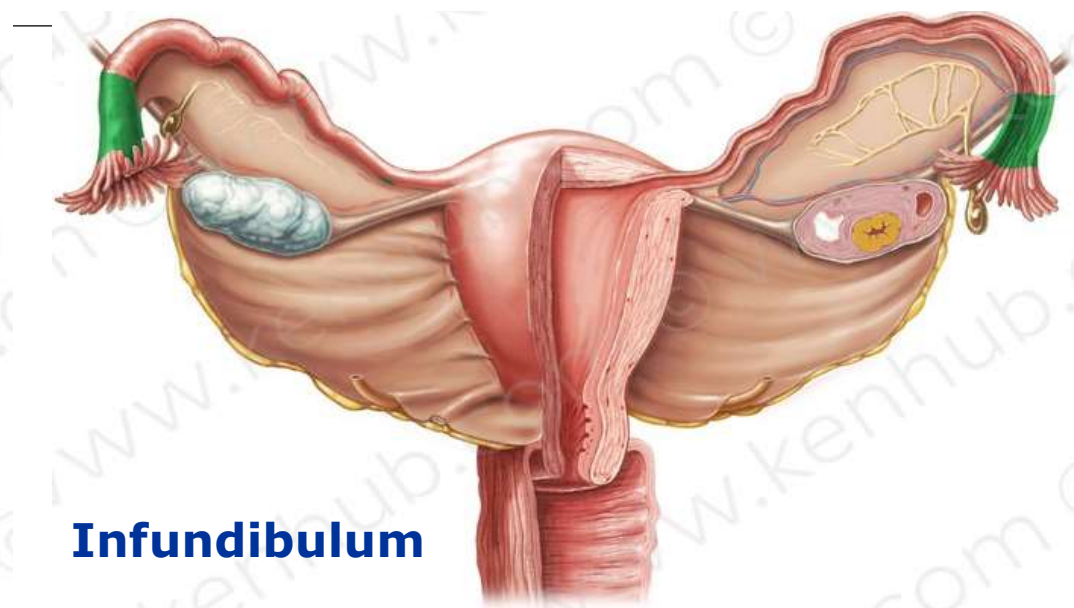
### 4. Uterine (intramural) part :

- It is the **short** segment (1 cm) that passes through the wall of the uterus.
- It is the **narrowest** part of the whole tube (1 mm in diameter).
- It opens in the uterine cavity through the uterine ostium

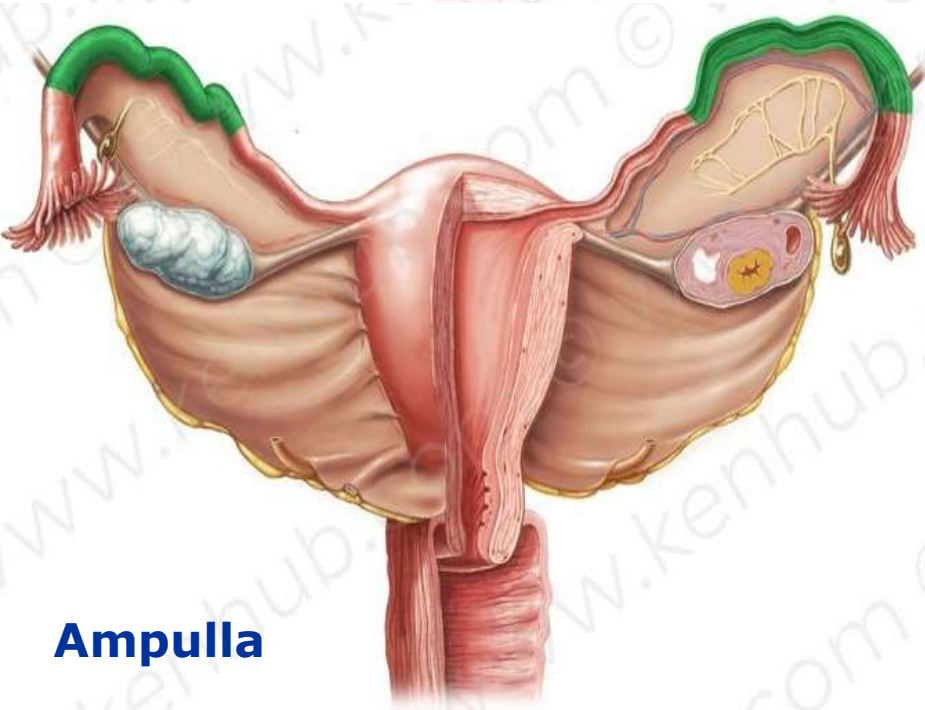




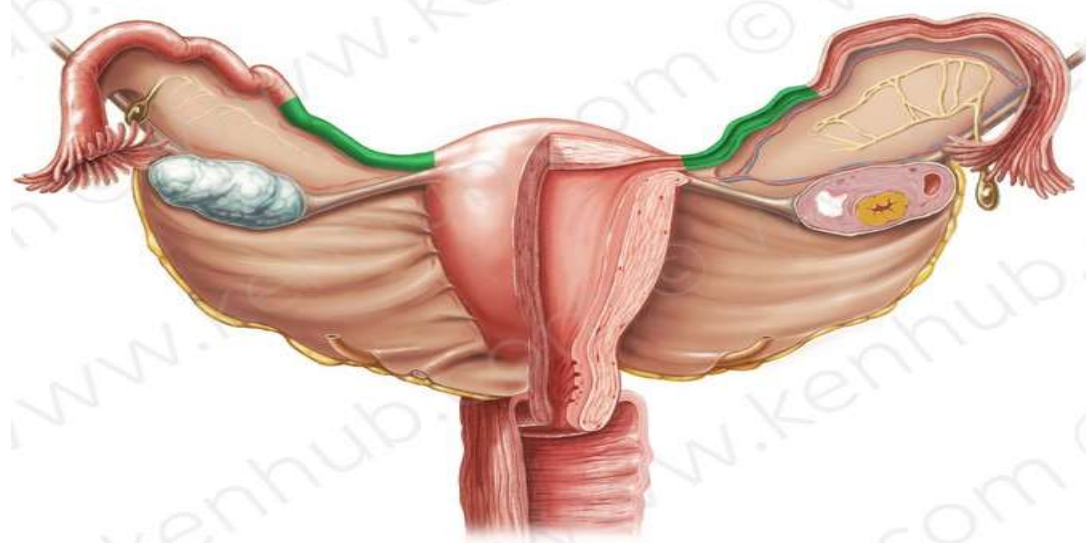
**Fimbriae**



**Infundibulum**



**Ampulla**



**Isthmus**





**Uterine (intramural)**

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**Uterine ostium of uterine tube**

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**Blood Supply :**

Medial 2/3 by uterine vessels.

Lateral 1/3 by ovarian vessels

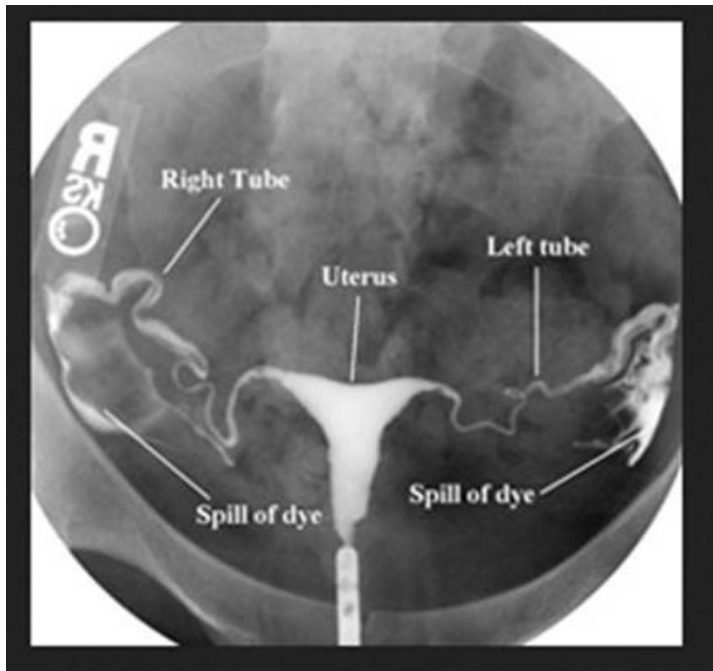
**Nerve Supply :**

Medial 2/3 by uterine nerve plexus.

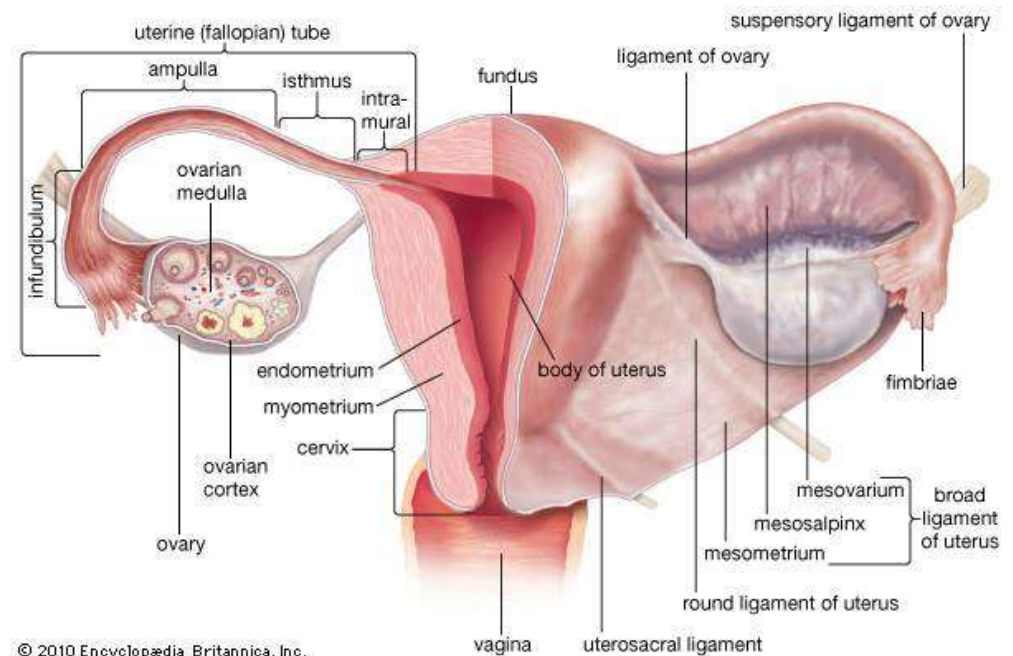
Lateral 1/3 by ovarian nerve plexus

**Nerve supply :**

Sympathetic and parasympathetic nerves from the inferior hypogastric plexuses.



Hysterosalpingography



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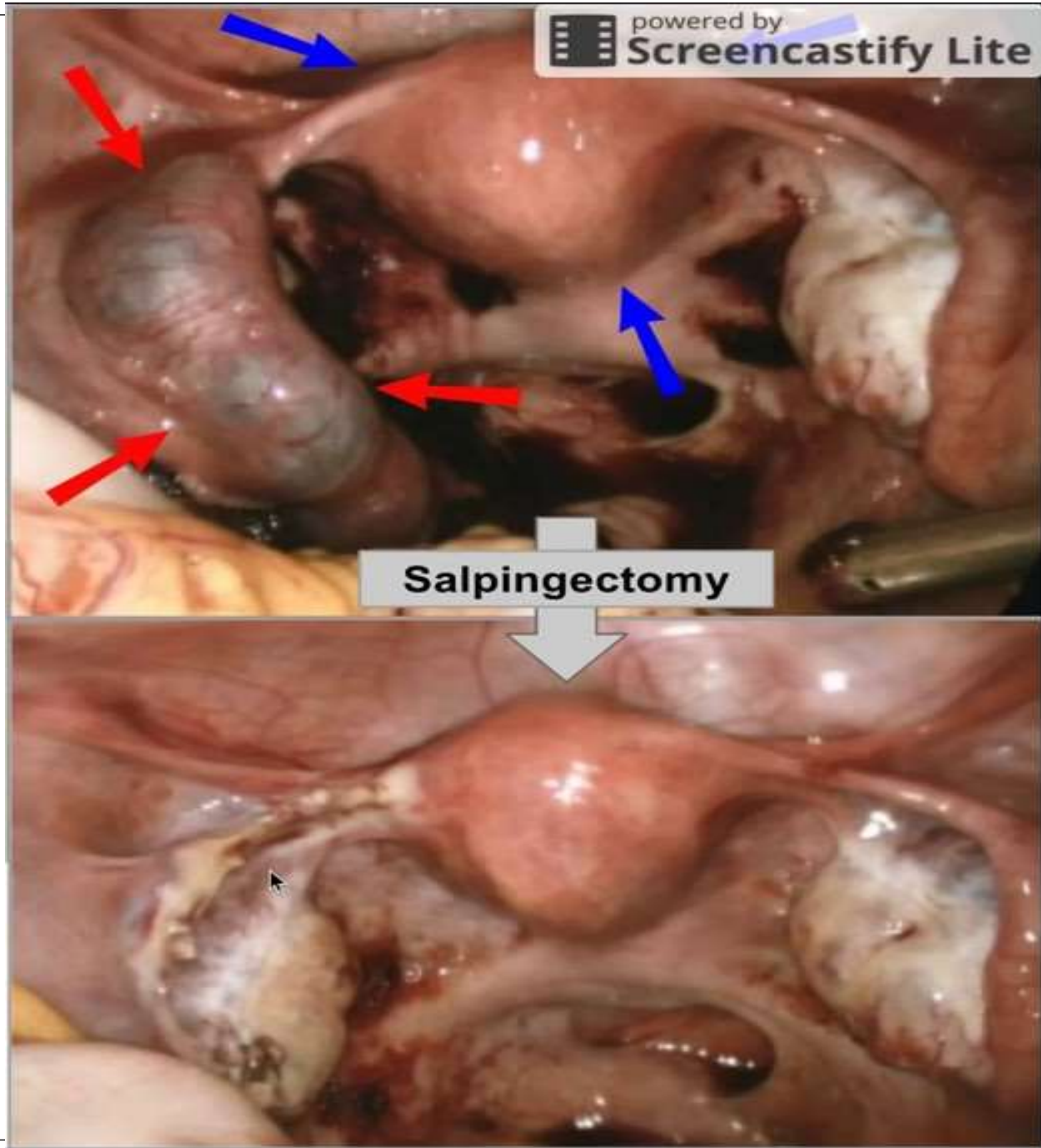
## Functions of the Tube :

1. They carry the oocyte from the ovaries and sperms from the uterus to the ampulla which is the site of fertilization.
2. The uterine tube conveys the dividing zygote to the uterine cavity.

## Applied Anatomy :

1. Blockage of the tubes (due to infection) is the main cause of sterility in women.
2. **The tube is the most common site for ectopic pregnancy.** It usually ruptures with hemorrhage into the abdominal cavity.
3. The abdominal ostium of the uterine tube communicates the female genital tract directly with the peritoneal cavity. Infections in the uterus and tubes may result in peritonitis.
4. Ligation of the uterine tubes is one method of birth control.

**Tubal Ectopic pregnancy**



# UTERUS

The uterus is a hollow thick-walled, pear-shaped muscular organ situated in the lesser pelvis between the urinary bladder and rectum.

It is piriform in shape.

محل في غير اماكنه  
الوالم \*

## Communications :

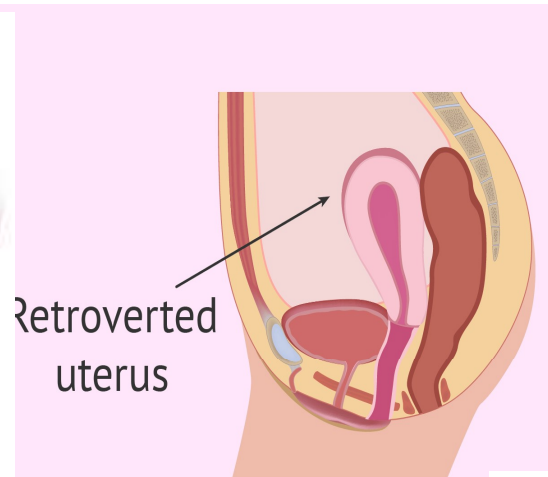
Superolateral angles : the uterus receives the uterine tubes.

Inferiorly : it opens into the vagina at external os.

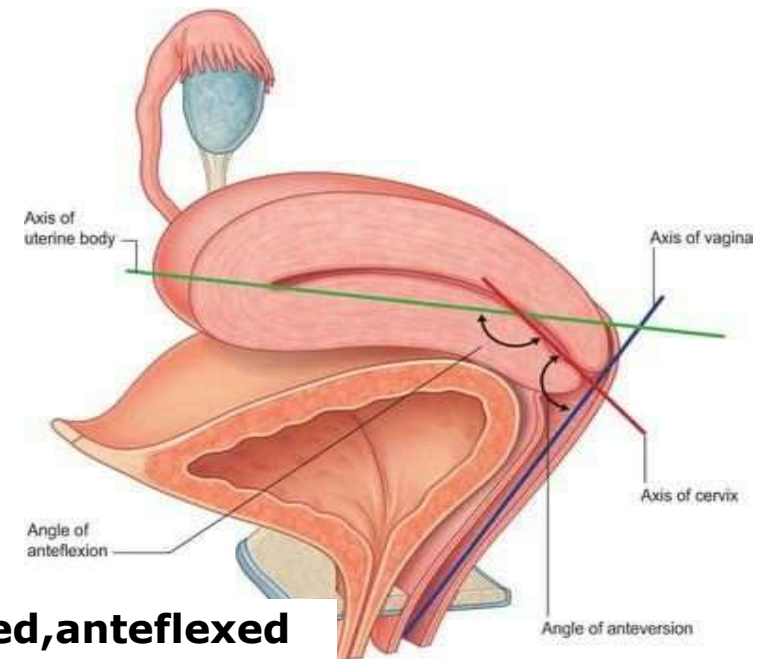
## Normal Position of the Uterus :

Normally, the uterus is anteverted, anteflexed.

- Angle of **anteversion** : it is the angle between long axis of the cervix and long axis of the **vagina**. It is about  $90^\circ$
- Angle of **anteflexion** : it is the angle between long axis of the body of the uterus and long axis of the **cervix**. It is about  $170^\circ$



**Anteverted, anteflexed**



## Description of the Uterus :

The external surface of the uterus presents a transverse constriction called the *isthmus* which divides the uterus into a large upper part called the *body* and a smaller lower part called the cervix

### A. Body of the Uterus :

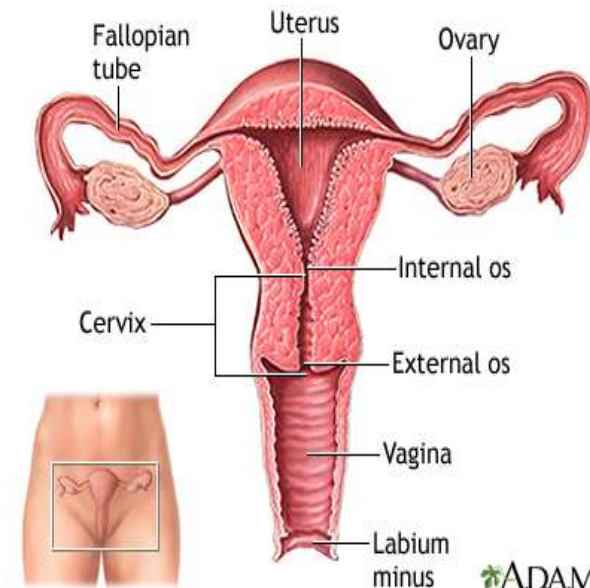
- It forms upper 2/3 of uterus. It is two inches long,
- It has a fundus, two surfaces (anterior and posterior) and two lateral borders :

#### 1- Fundus:

- \* It is that part of the body above the entry of the uterine tubes.
- \* It is completely covered by peritoneum.
- \* It is related to coils of small intestine and sigmoid colon

#### 2- Anterior (vesical) Surface :

- \* Is covered by peritoneum down to the level of internal os
- \* Is related to the urinary bladder, with uterovesical pouch in between.



### 3- Posterior (intestinal) Surface :

- \* Is covered by the peritoneum which is continued down onto the cervix and posterior vaginal fornix.
- \* Is related to sigmoid colon and coils of small intestine.

### 4- The lateral borders :

Each receives the uterine tube at its upper end.

- **Anteroinferior** to the uterotubal junction it is attached to **round ligament of uterus**
- **Posterosuperior** to the uterotubal junction, it is attached to the **round ligament of the ovary**.
- The uterine tube and the two ligaments are all running in the broad ligament which stretches from the lateral border to the lateral pelvic wall.



## B- Cervix of the Uterus :

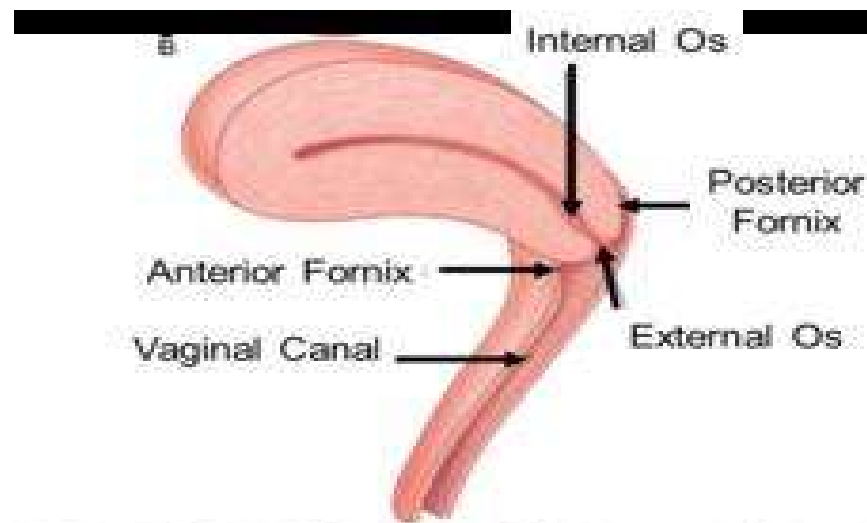
- It forms the lower 1/3 of the uterus. It is one inch long.
- Cervix protrudes into the upper part of the vagina, thus the cervix has supravaginal and vaginal parts :

### 1- The Supravaginal part of the cervix :

**Anteriorly** : it is *not* covered by peritoneum. It is related to urinary bladder with a cellular connective tissue in between called *parametrium*.

**On each side** : it is related to *parametrium*, in which the uterine artery crosses the ureter 2 cm from the supravaginal cervix.

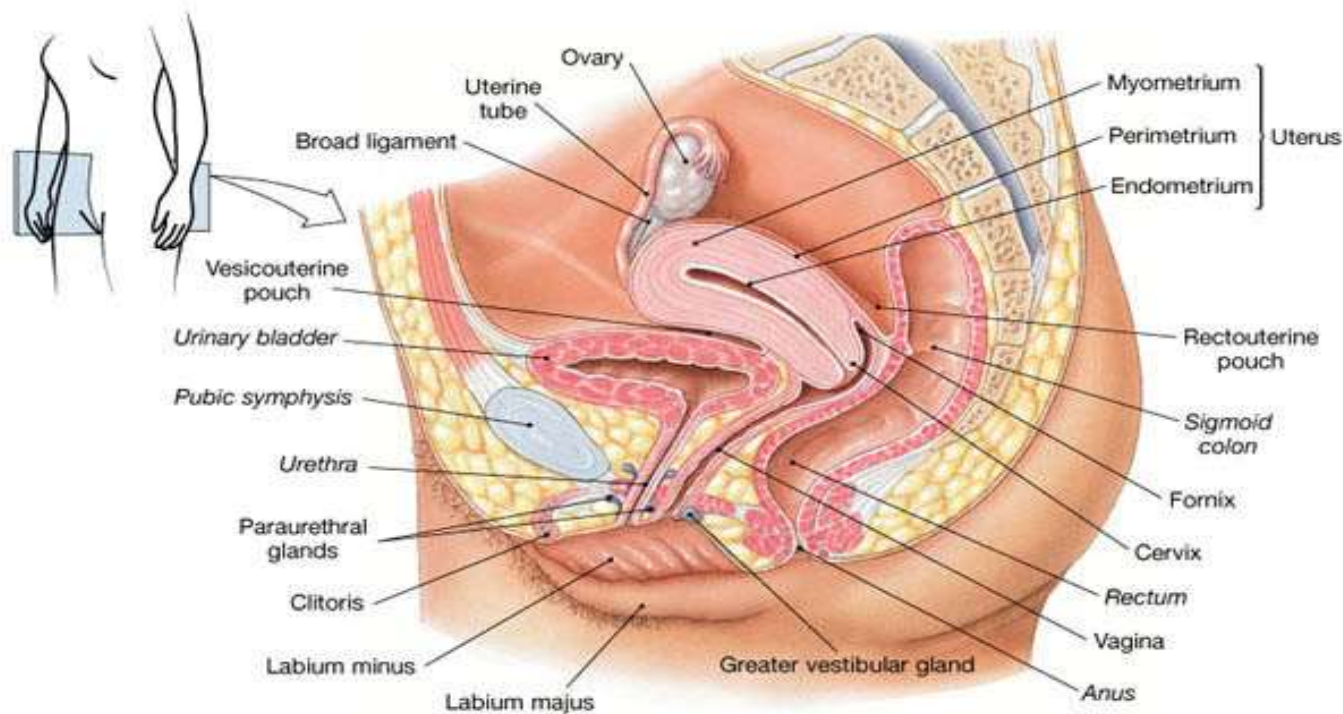
**Posteriorly** : is *covered* by peritoneum and related to the rectum with Douglas pouch in between.



## 2- Vaginal part of the cervix :

It projects into upper part of the vagina, dividing that part of vagina into four vaginal fornices

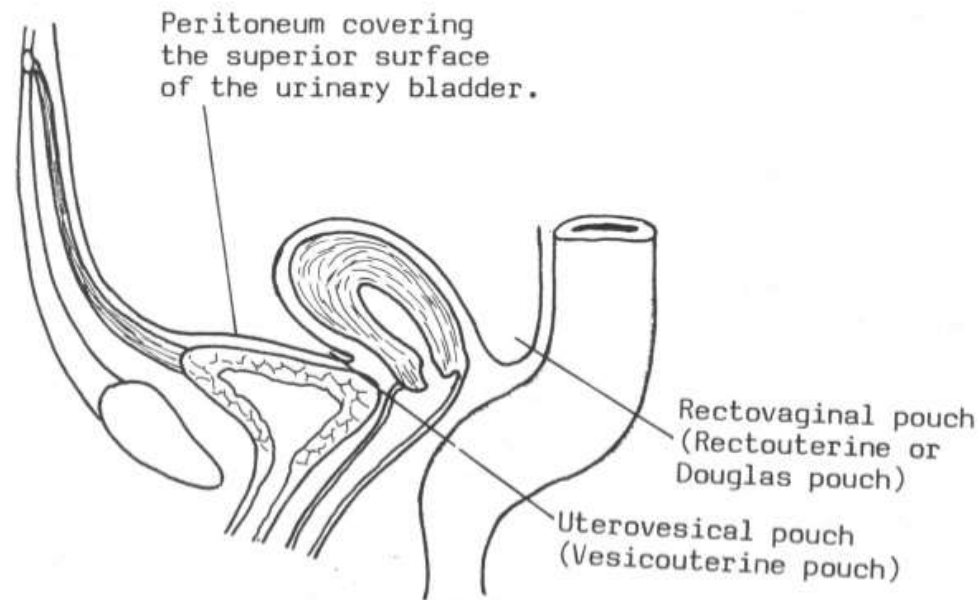
The posterior vaginal fornix is the **deepest** and the **only** one **covered by peritoneum**.

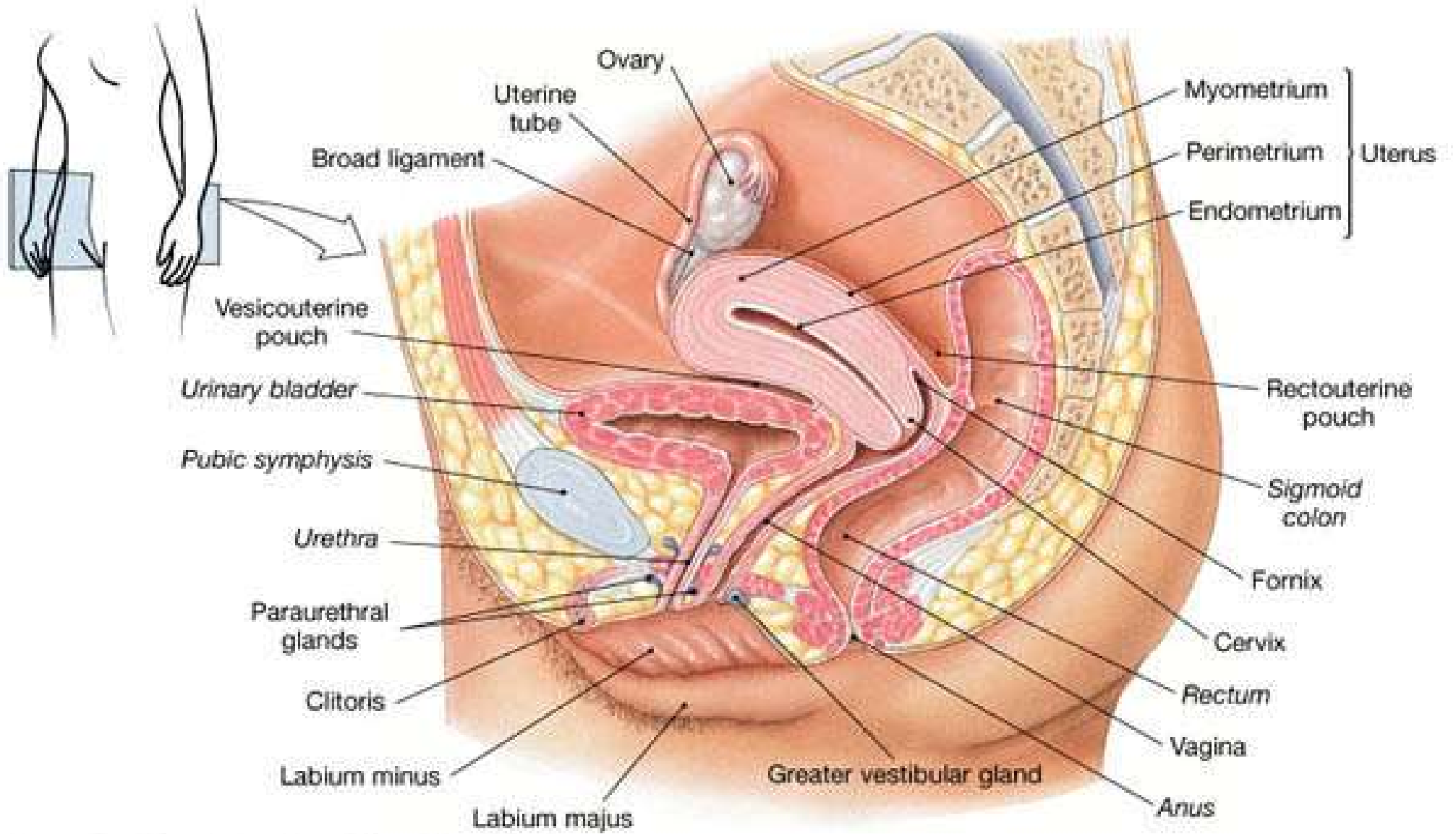


## Peritoneal Covering of the Uterus :

- The posterior surface and fundus of body of uterus are covered by peritoneum
- The peritoneum descends to cover its anterior surface down to the level of *internal os*, where it is reflected on to the bladder.
- The supravaginal cervix is covered by peritoneum *only posteriorly*.
- The front and sides of The supravaginal cervix are **bare** of peritoneum and related to cellular connective tissue, the parametrium.

### Peritoneal covering of the uterus





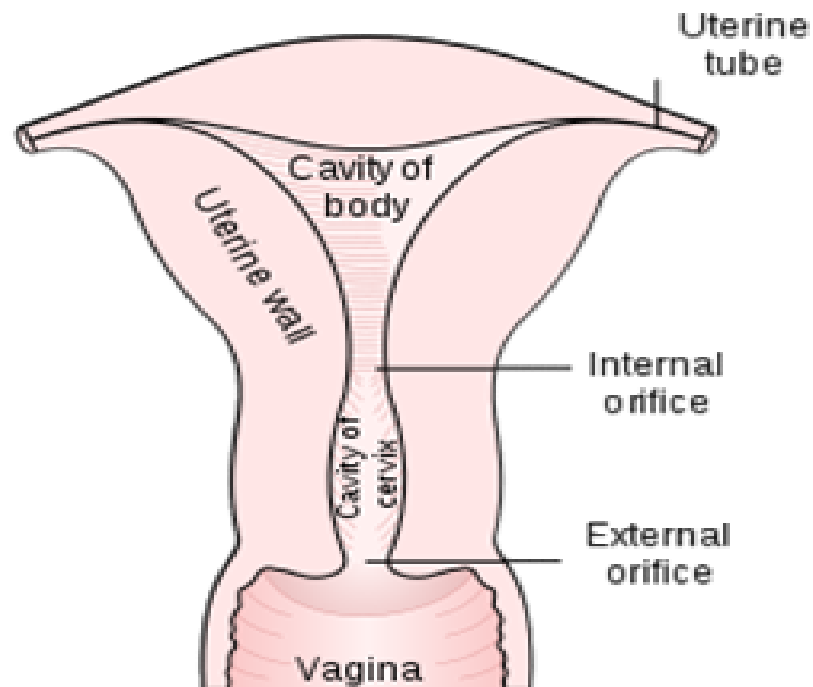
## Uterine Cavity :

### A. Cavity of the Body :

**B.** in coronal section is triangular, with its base between the openings of the uterine tubes and its apex is the internal os leading to the cervical canal .

### B. The cervical canal:

- Is fusiform, broad at its mid-level.
- It communicates with the cavity of the body at the **internal os** and with the vagina by the **external os**.



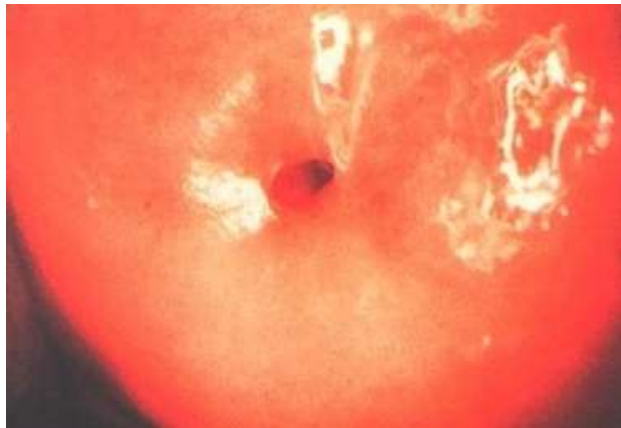
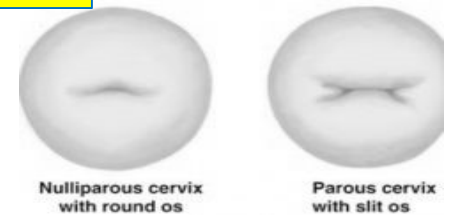
## Anatomical significance of the internal os :

- It corresponds to the isthmus of the uterus.
- It is the site of junction between uterine cavity and cervical canal.
- It is the level of the angle of anteflexion.
- It is the level at which the peritoneum is reflected anteriorly on to the bladder

## Gynaecological significance of the external os :

- In nulliparous women, it is small and *circular*.
- In multiparous women, it is a *transverse slit*.

**REED ONLY**



nulliparous women




multiparous women



menopause narrow os

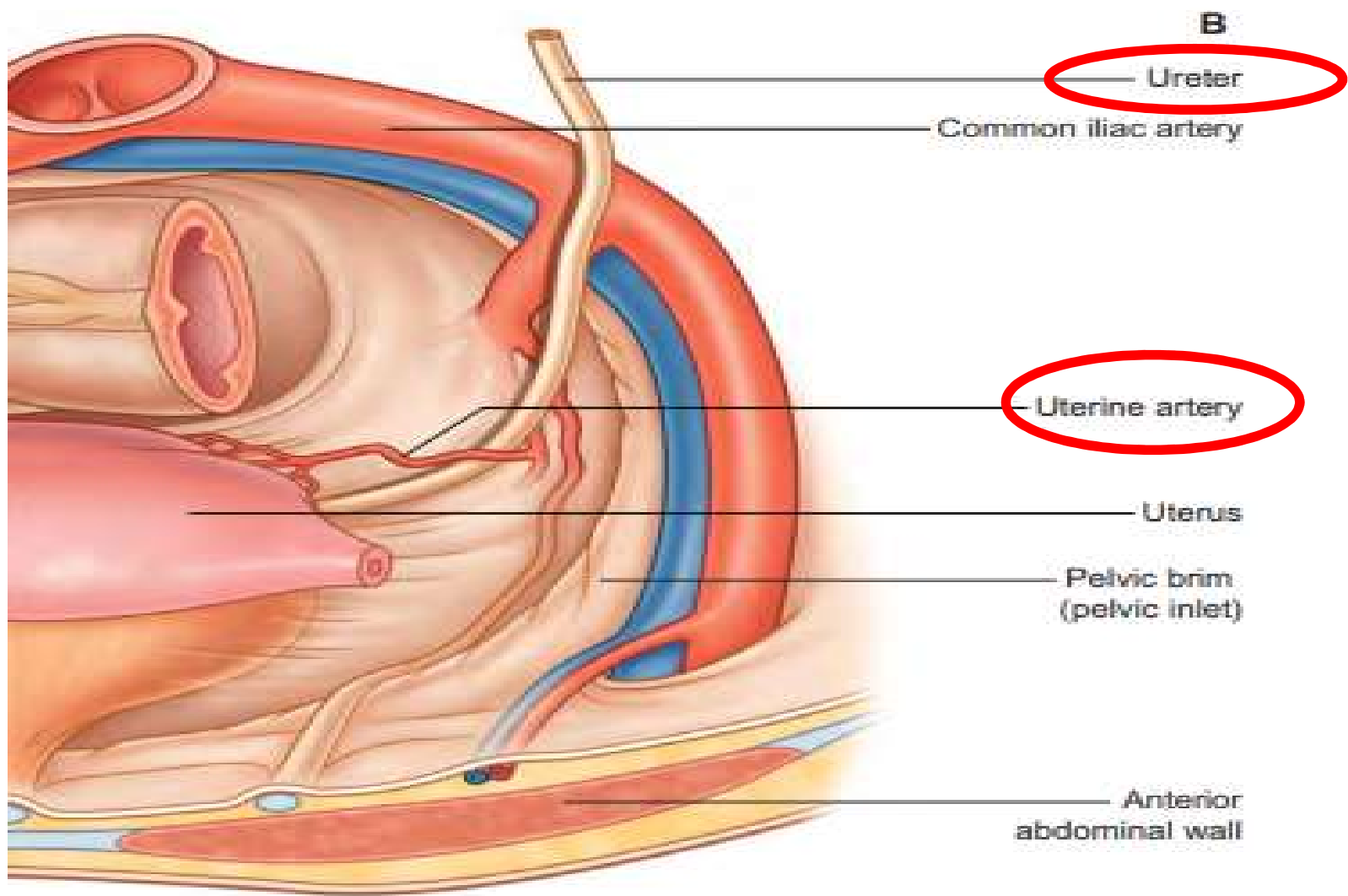
## **Arterial Blood Supply: by uterine artery**

- It runs medially on the upper surface of the pelvic diaphragm to reach the root of broad ligament close to the lateral vaginal fornix.
- It enters the broad ligament and runs a tortuous course along the lateral margin of the uterus. It ends by anastomosing with the ovarian A.
- It gives branches to pelvic part of ureter, vagina (azygos arteries), cervix and of uterus, medial part of the uterine tube .

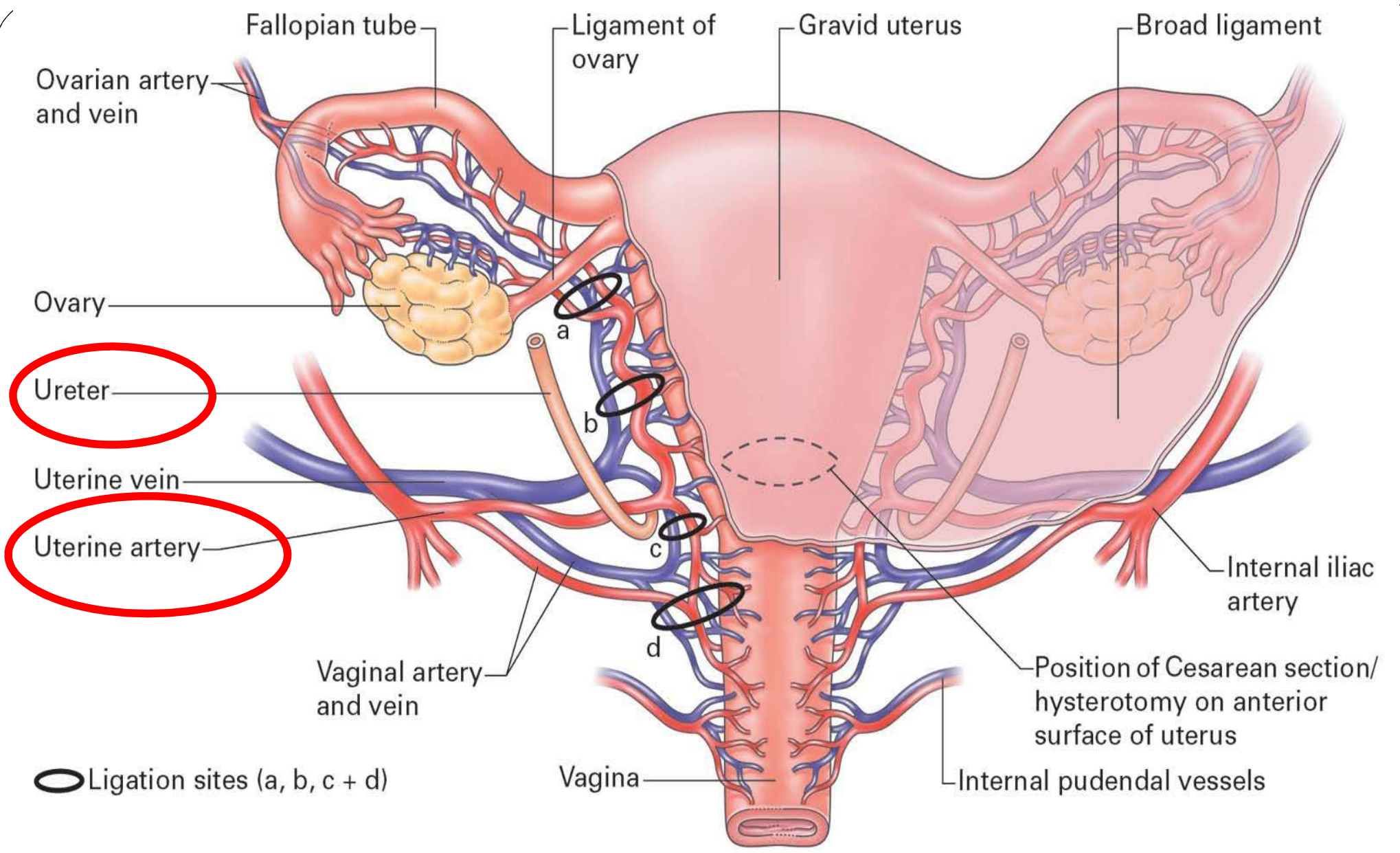
 The ureters pass at lateral fornixes of the vagina, 2 cm from the supravaginal cervix the uterine arteries cross the ureter .

***(like water underneath the bridge)***

**So The ureters are at great risk during surgical procedures on the uterus and ovaries.**







Posterior view

## Venous Drainage :

- ❖ Begins by the uterine venous plexuses.
- ❖ Each extends along the lateral side of the uterus within the broad ligament.
- ❖ The lower part of the plexus is drained by uterine veins which open into the internal iliac vein.
- ❖ The plexus communicates with the ovarian and vaginal venous plexuses.

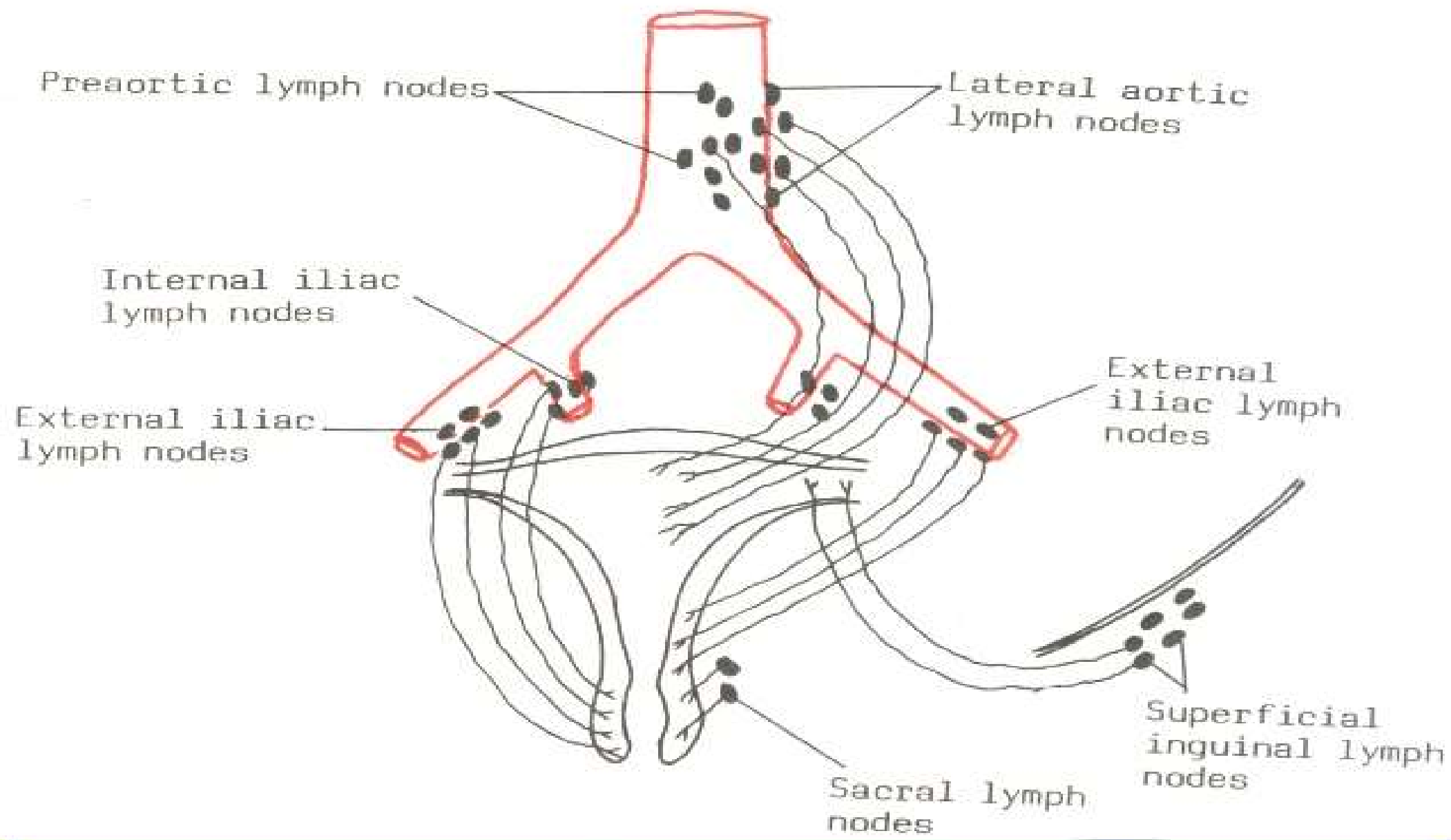
 **Varicose Vein and hemorrhoids** is common during pregnancy due to compression of gravid uterus on inferior vena cava and inferior mesenteric vein

**Nerve Supply :** by the uterovaginal nerve plexus derived from the inferior hypogastric plexus.

## Lymphatic Drainage :

\* ابدول مهم جداً \*

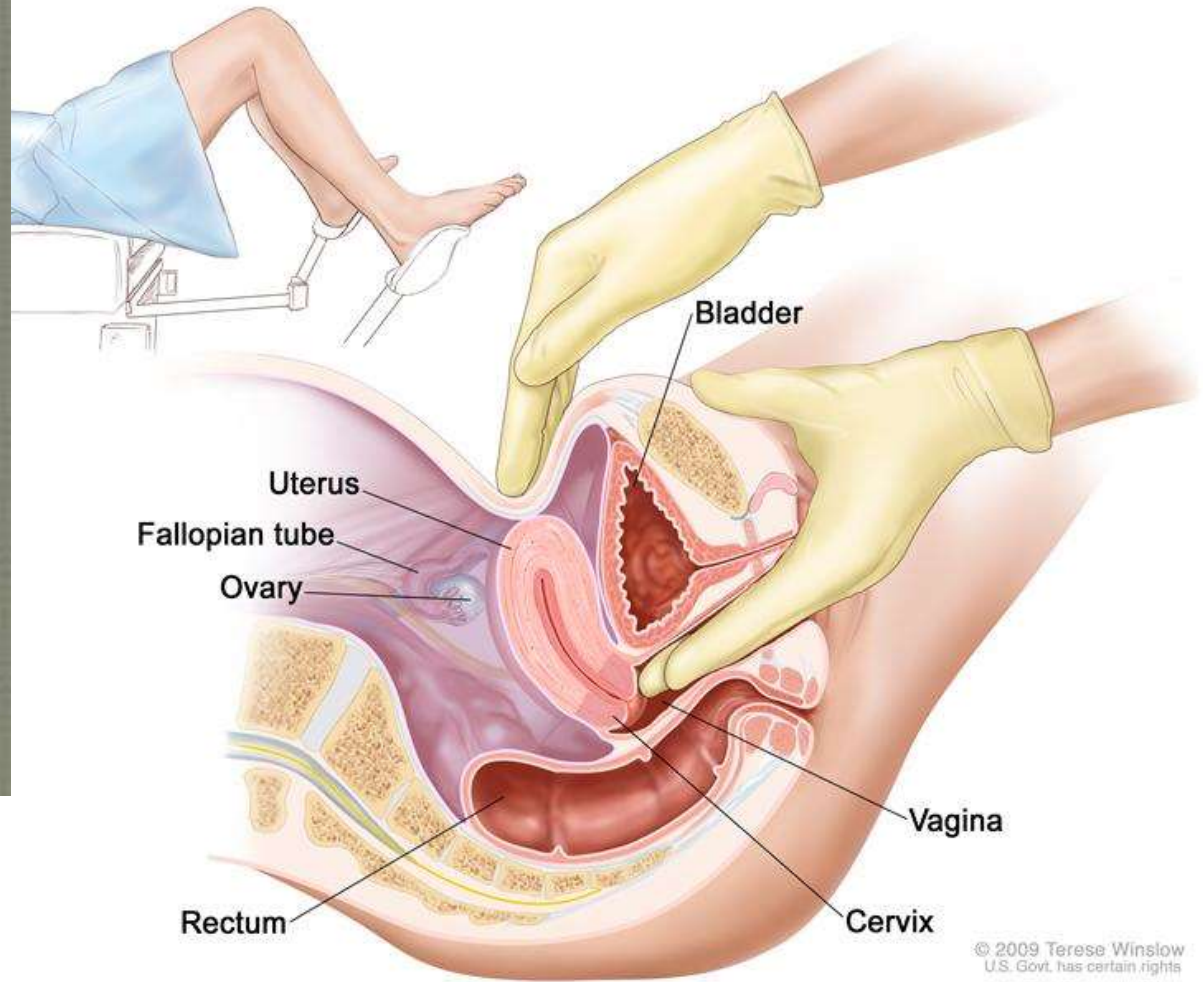
Area	Lymph group
Fundus	Lateral aortic lymph nodes
Uterotubal junction along the round ligament of the uterus	Superficial inguinal lymph nodes.
Body, lymphatics pass through the broad ligament	External iliac lymph nodes
Cervix	External, internal and sacral lymph nodes



**Lymphatic drainage of the uterus**



**Fundus examination**



**Bimanual pelvic examination of uterus**

During per rectal examination in females WE CAN NOT FEEL VAGINA

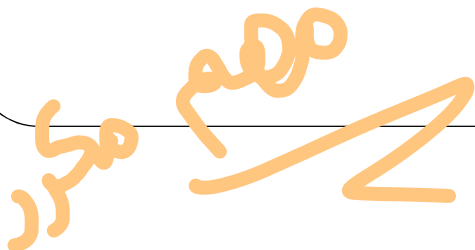
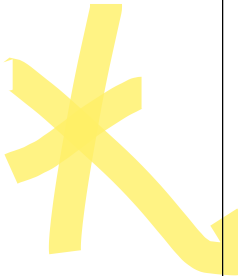
# Ligaments of the uterus

## Ligaments attached to the body of uterus

1. Round ligament of uterus
2. Broad ligament.

## Ligaments attached to cervix of uterus

1. Pubocervical ligaments
2. Transverse cervical ligaments
3. Uterosacral ligaments

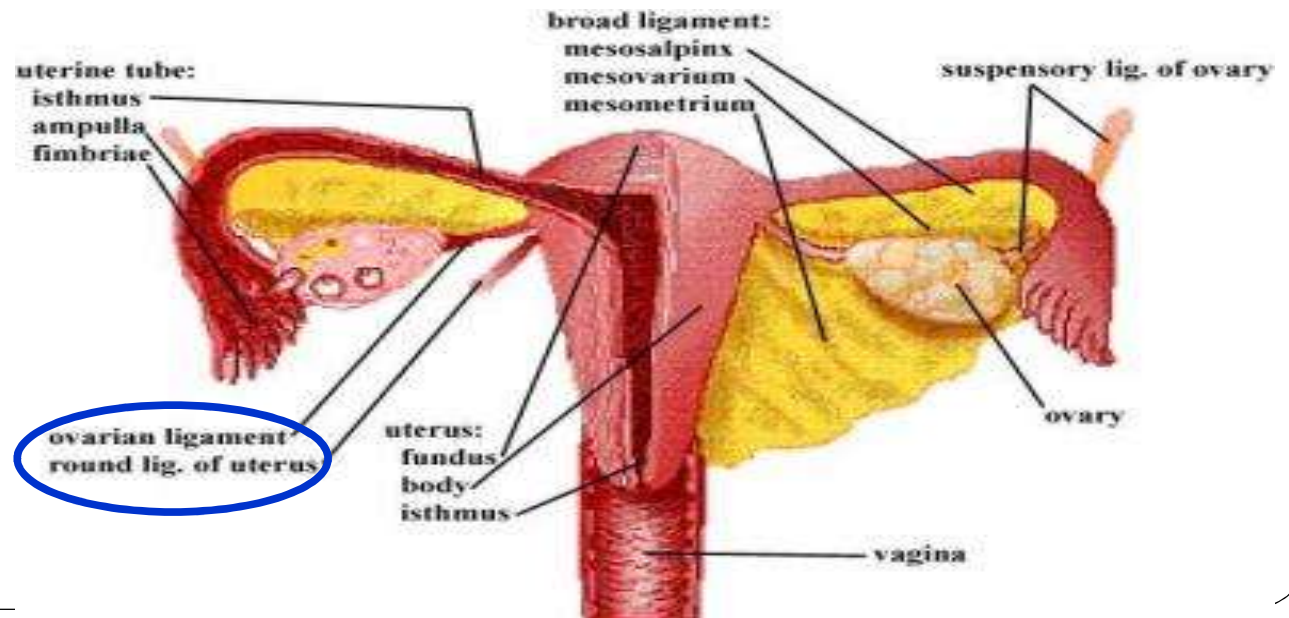


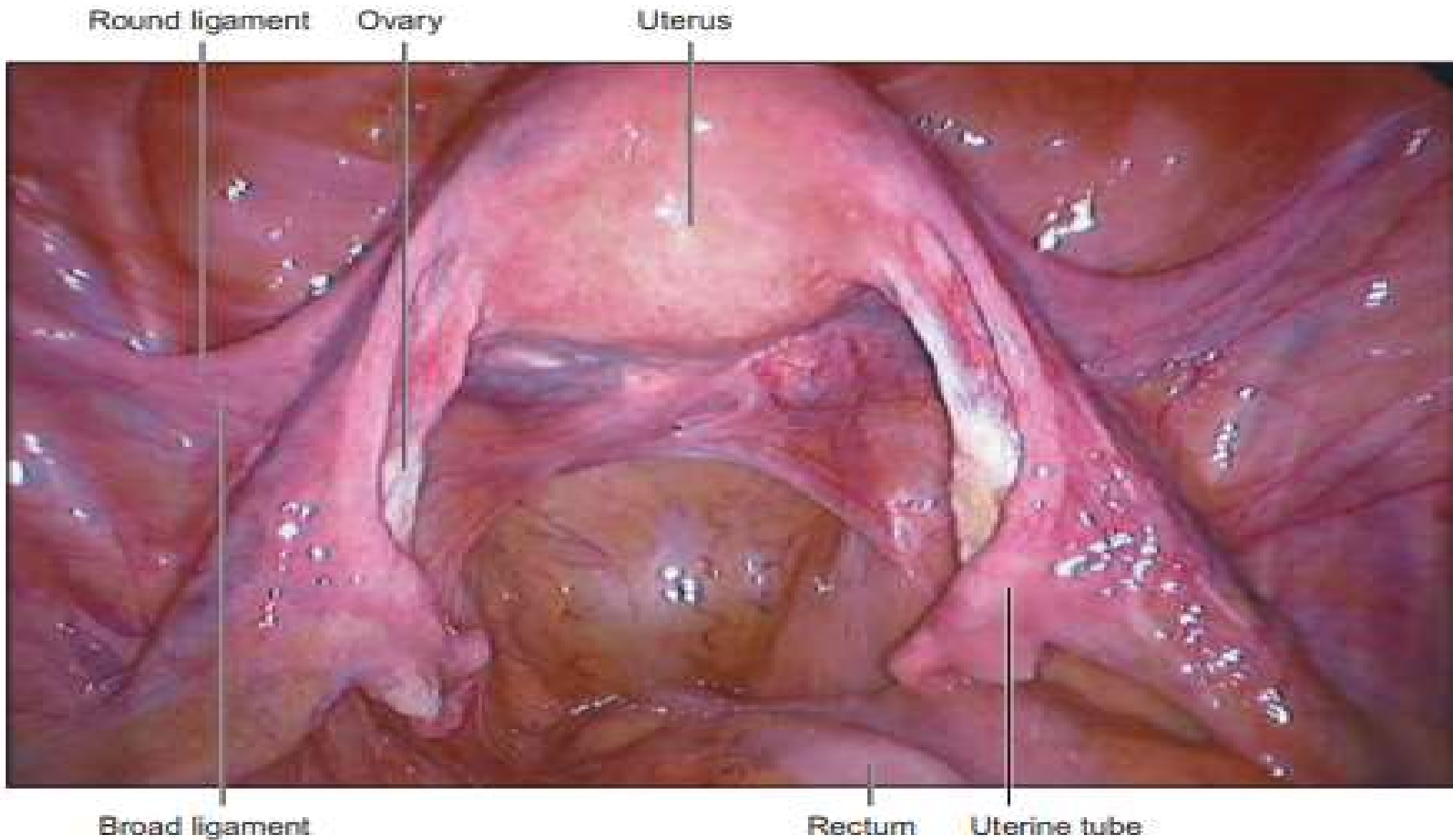
## 1- Round ligament of the uterus :

It extends from anteroinferior aspect of the uterotubal junction to the subcutaneous tissue of the labia majora.

### **Course :**

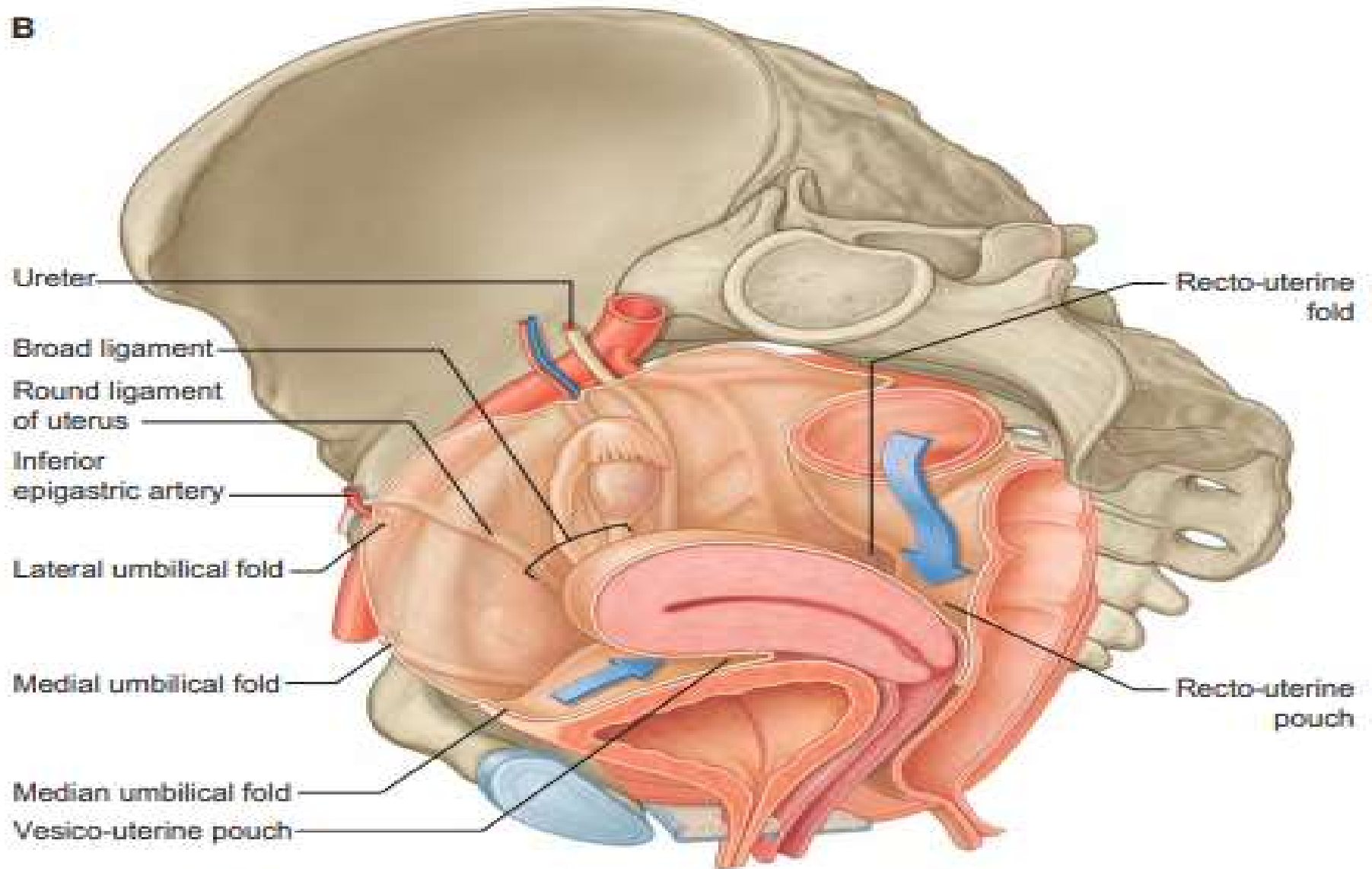
- ❑ Its proximal part runs within the broad ligament.
- ❑ Its distal part hooks around the beginning of inferior epigastric A.
- ❑ Then it enters the deep inguinal ring and traverses the inguinal canal to end in the labia majora.





**Fig. 77.11** Laparoscopic view of the uterus – the patient is tilted head down so that the small bowel is moved away from the uterus to give this view.

**B**



**Fig. 77.10 A,** Anatomical relations of the female genital tract and bladder and rectum. **B,** Pelvic peritoneal reflections showing broad ligament and its contents. (**A** from Drake, Vogl, Mitchell, Tibbitts and Richardson 2008. **B** from Drake, Vogl and Mitchell 2005.)





Ureteric pain will be referred to labia majora through genitofemoral N

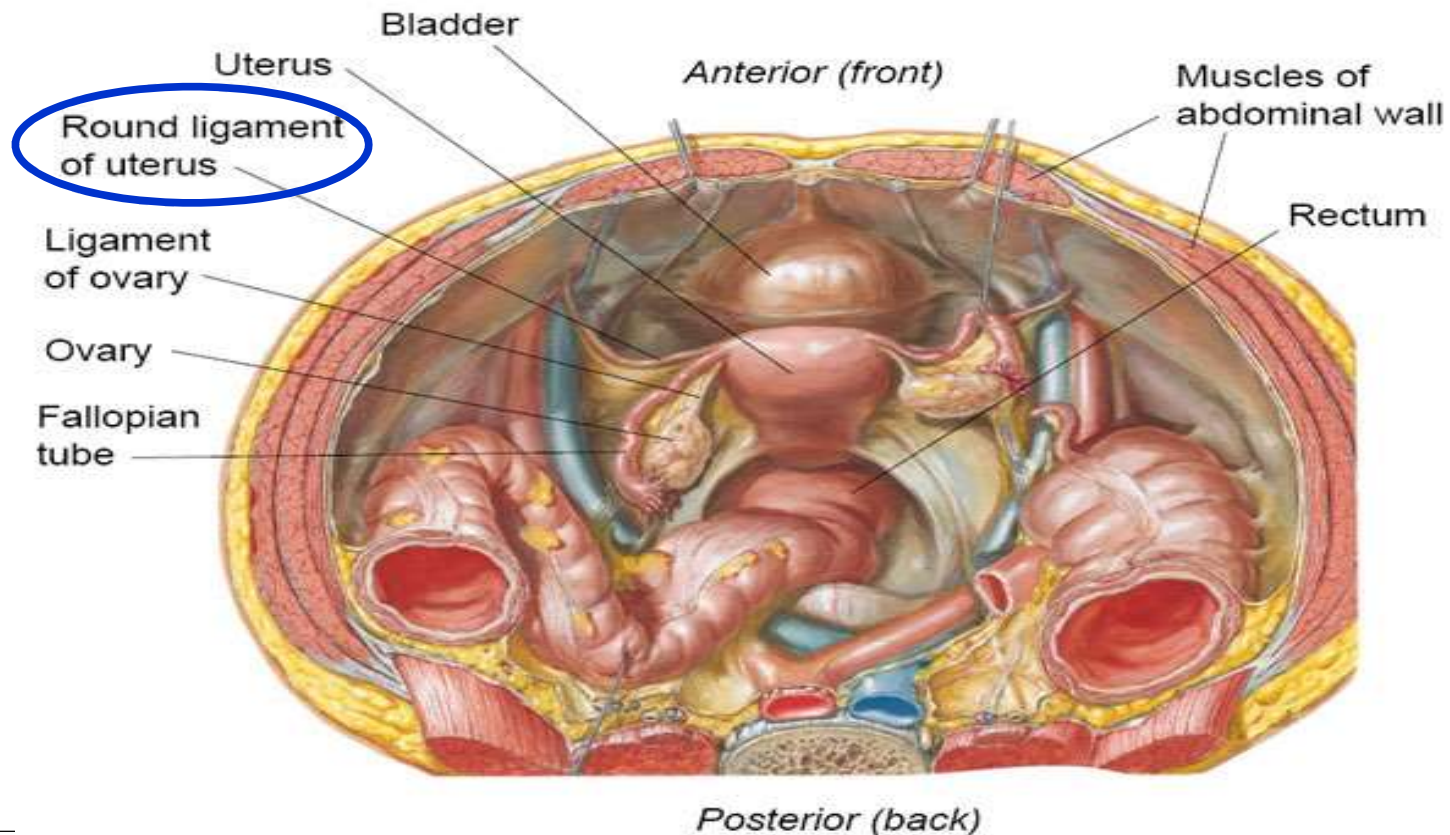


## Structures accompany the ligament in inguinal canal :

- ❖ Artery of the round ligament (corresponds to the cremasteric A. in the male).
- ❖ Genital branch of genitofemoral N. ; supplies the labia majora.
- ❖ Lymphatics from the uterotubal junction to the superficial inguinal lymph nodes.

### Function :

it keeps the angle of anteversion against the backward pull of the uterosacral ligaments.



## Round Ligament Pain

**Symptoms :** a sharp, sudden spasm in the belly

Increase by coughing , laughing, rolling over in bed, standing up too quickly

**Cause :** Stretch of round ligament during pregnancy



## 2. The broad ligament :

It is the double-layered fold of peritoneum which extends from the side of the uterus to the lateral wall and floor of the pelvis.

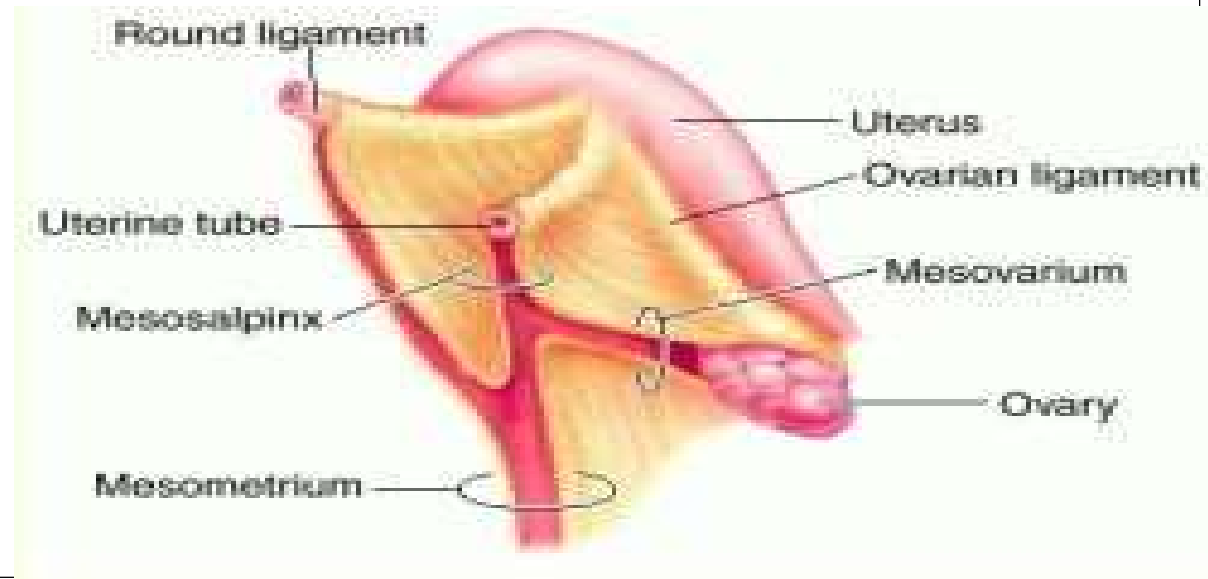
**Description** :it has 4 borders and 2 layers

### 1- Upper free border :

- Contains the uterine tube in its medial 4/5.
- The lateral 1/5 represents the suspensory ligament of the ovary.

### 2- Lower attached border :

- Rests on the pelvic floor (levator ani).
- It is related to the ureter crossed by the uterine artery about 2 cm from the supravaginal cervix.

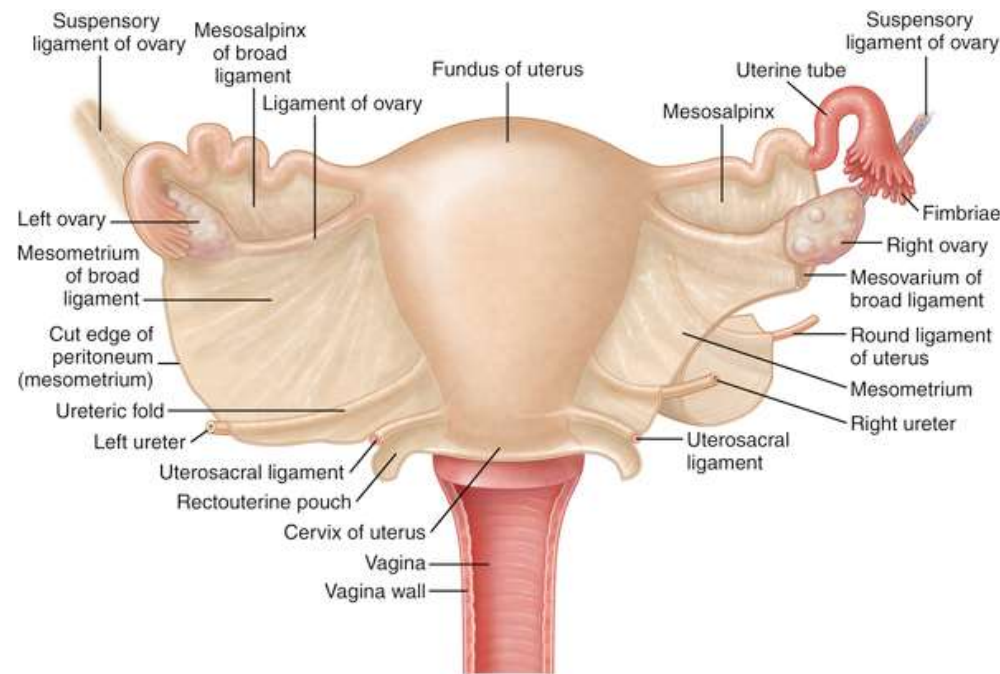


### 3-Medial border :

- Attached to the side of the uterus.
- The 2 layers of the broad ligament become continuous, with peritoneum of the body of the uterus .

### 4- Lateral border :

- Attached to the side wall of the pelvis.
- The 2 layers of the ligament become continuous with the parietal peritoneum of the lateral pelvic wall.



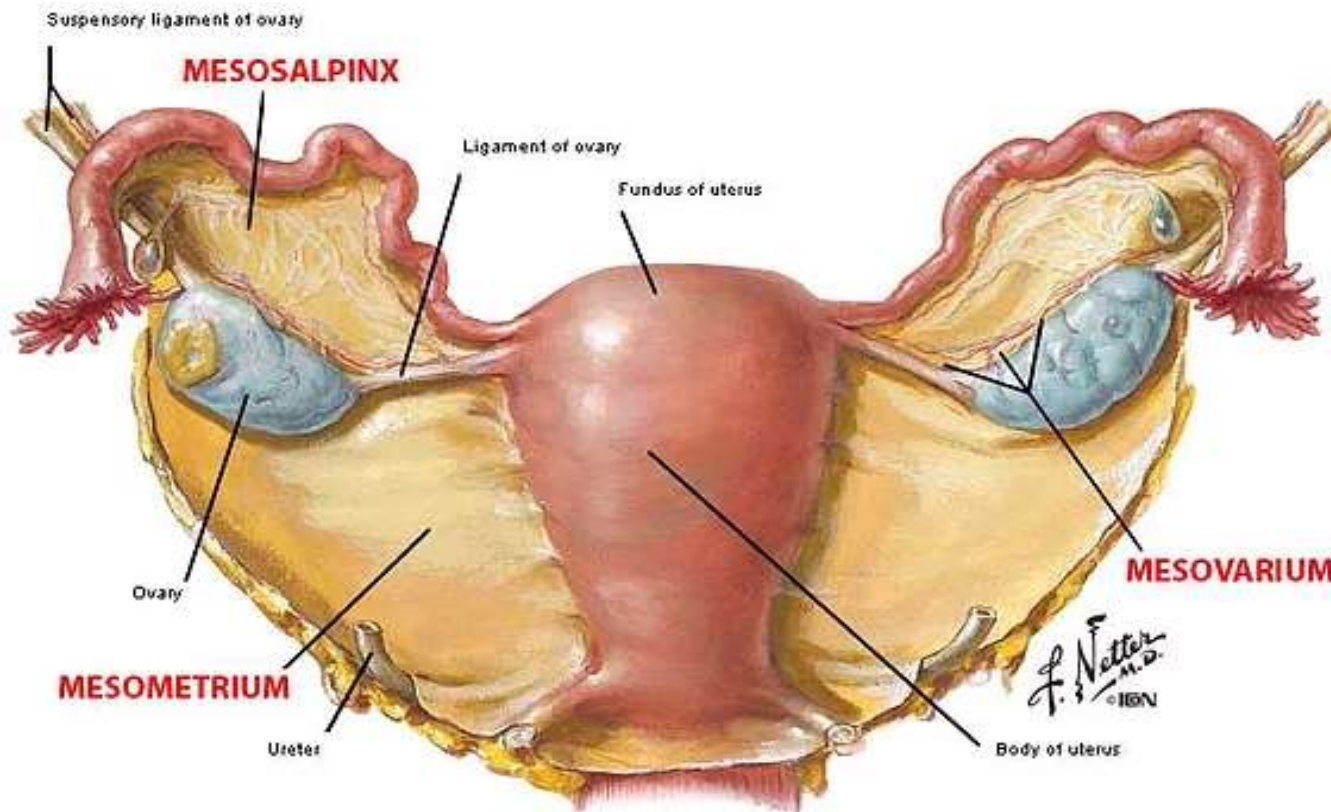
Uterus and broad ligament (posterior view)

## 5- Anterior layer :

Is bulged by the round ligament of the uterus.

## 6. Posterior layer :

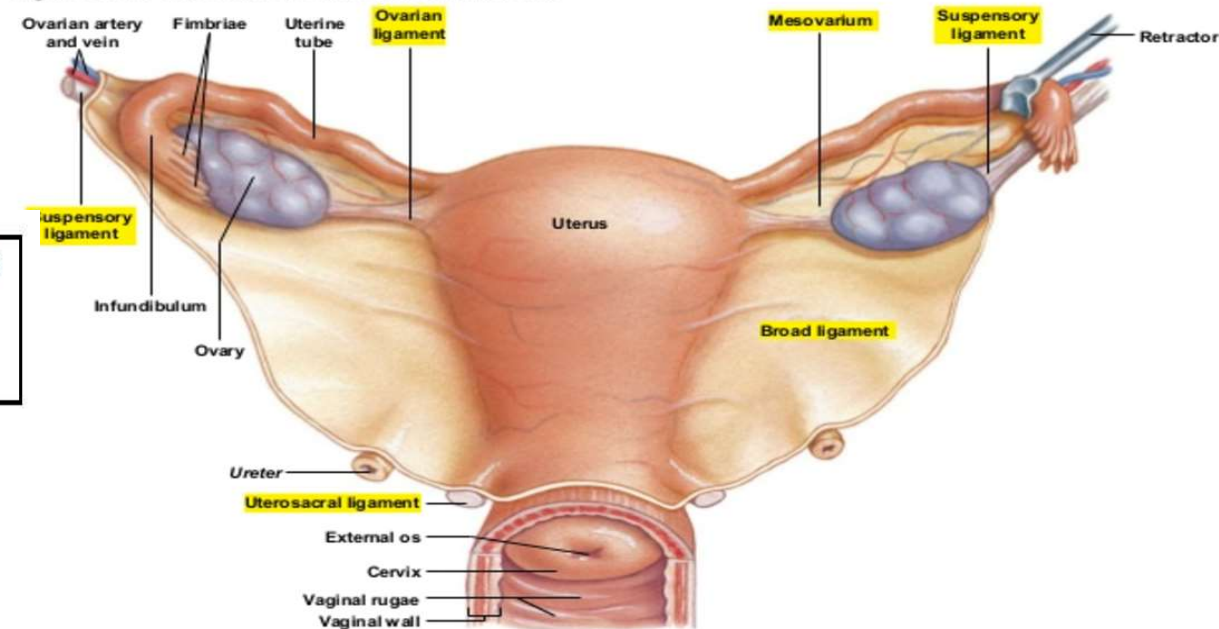
- Is connected to the ovary by the mesovarium.
- It is pierced by lateral end of the uterine tube



**Parts of the broad ligament :** is divided into four parts :

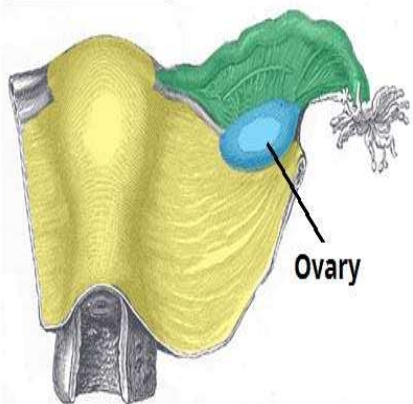
- 1. Mesovarium :** between the broad ligament and the ovary.
- 2. Suspensory ligament of the ovary :** between ovary and side wall of the pelvis, contains ovarian vessels and lymphatics.
- 3. Mesosalpinx :** between the uterine tube and the ovarian ligament.
- 4. Mesometrium :** between the ovarian ligament and uterine body.

Figure 27.11a The Ovaries, Uterine Tubes, and Uterus

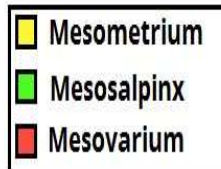
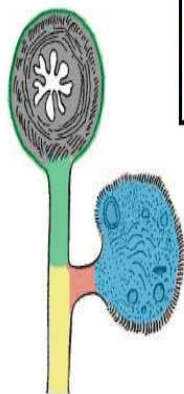


Posterior view of the ovaries, uterine tubes, and uterus along with their supporting ligaments

Coronal Plane:



Sagittal Plane:



## Contents of the broad ligament:

**1. Uterine tube** in the free border.

**2. Two ligaments :**

Round ligament of the uterus.

Round ligament of the ovary.

**3. Two vessels :**

Uterine vessels .

Ovarian vessels.

**4. Two nerve plexuses :**

Uterovaginal plexus around the uterine A.

Ovarian plexus around the ovarian A.

**5. Two embryological remnants :**

Epoophoron and the duct of epoophoron (Gartner's duct).

Paroophron.

They are embryonic remnants of mesonephric tubules and mesonephric duct.

**6. Two other structures**

Lymphatic vessels.

Parametrium (cellular connective tissue) continuous with that around the cervix of the uterus.

ligation of broad ligament from its two ends cuts uterine blood supply



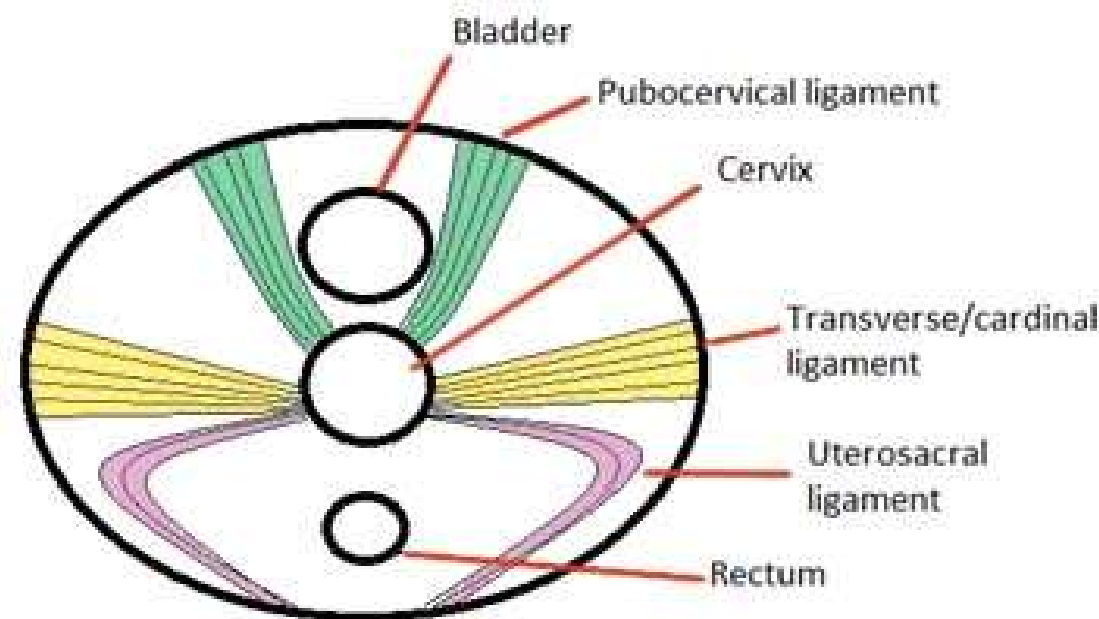
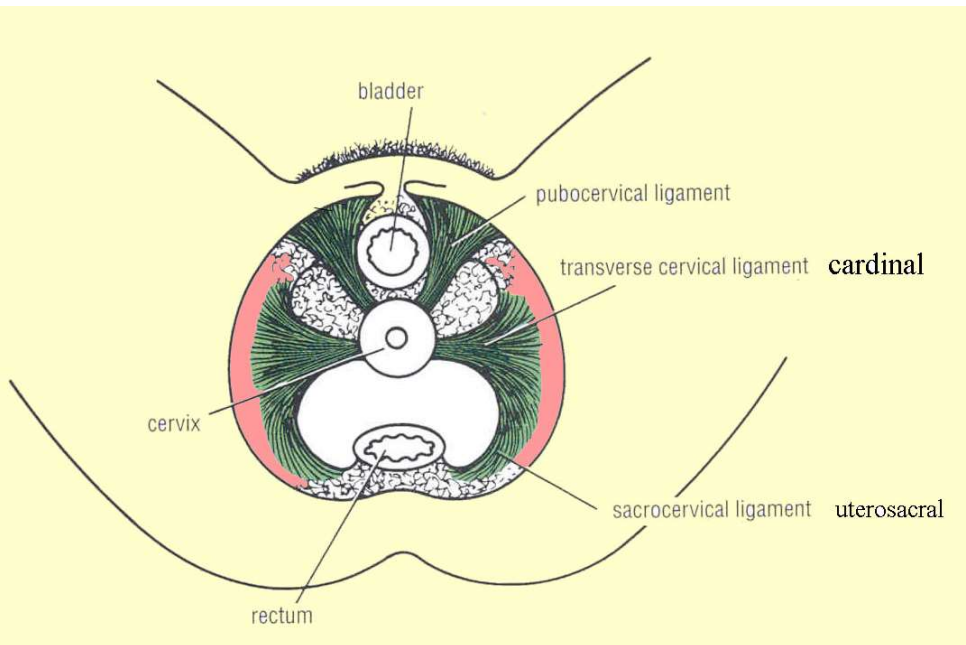
## Ligaments attached to cervix of uterus

**1. Pubocervical ligaments:** extend anteriorly from the cervix of uterus to the pubis.

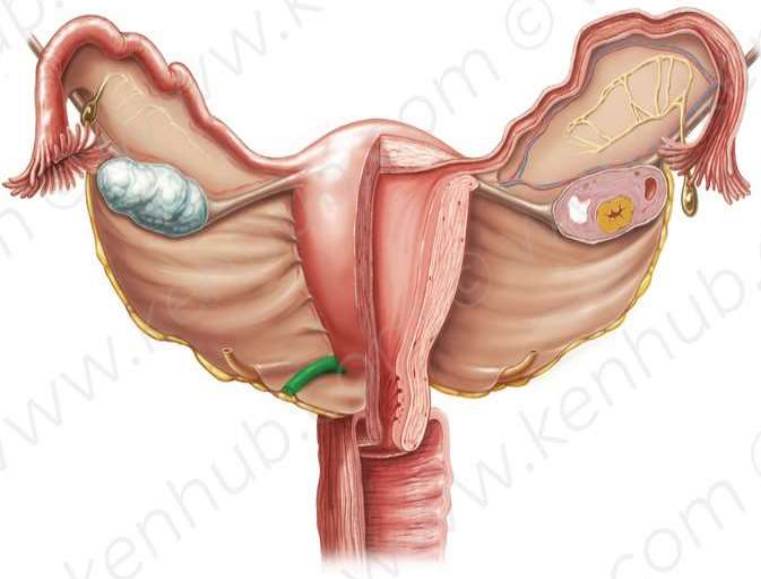
**2. Transverse cervical ligaments (Mackenrodt's ligaments):** extend laterally from the cervix and upper part of vagina to the side walls of the pelvis.

They are the main ligaments for uterine support.

**3. Uterosacral ligaments :** extend backwards from the posterolateral aspect of the cervix and the lateral vaginal fornixes to the front of S2, S3 vertebrae.



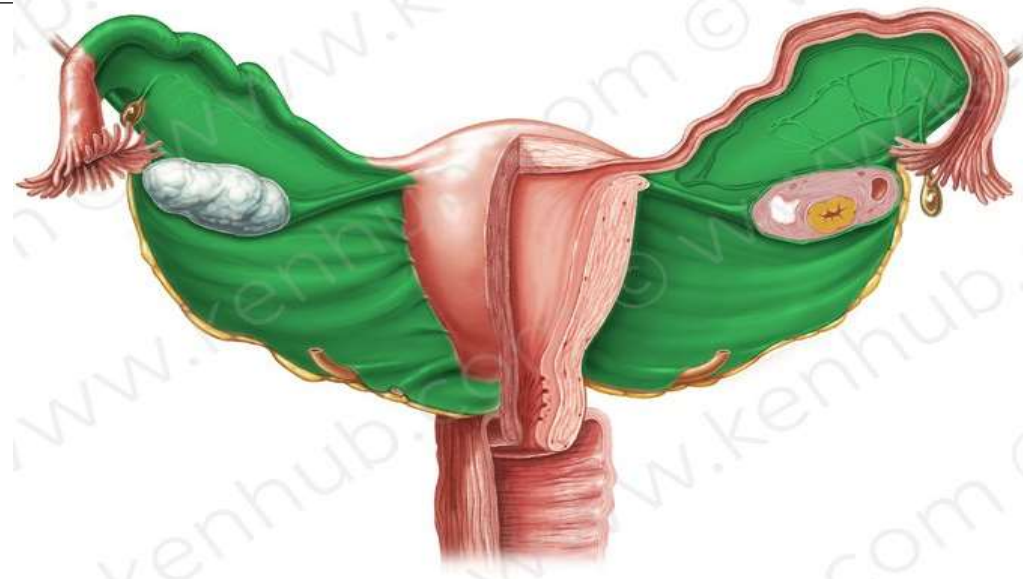




**Uterosacral ligaments**



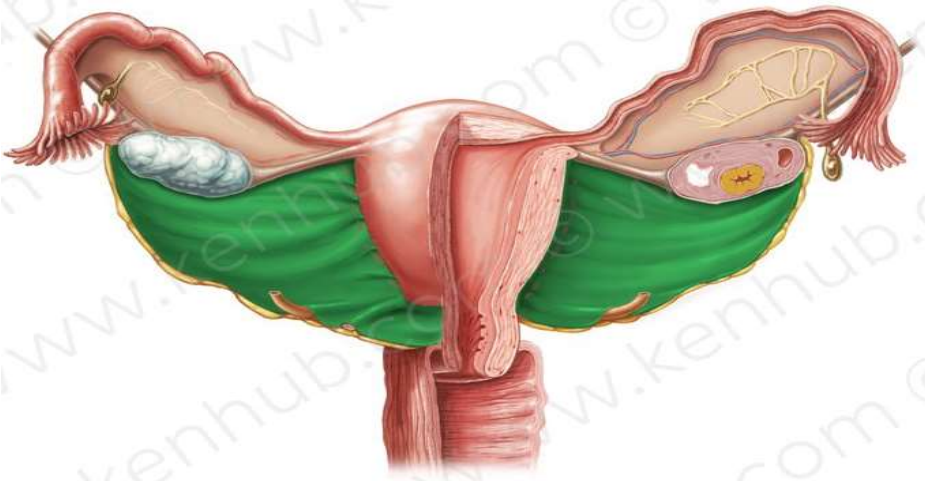
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**Broad ligament**



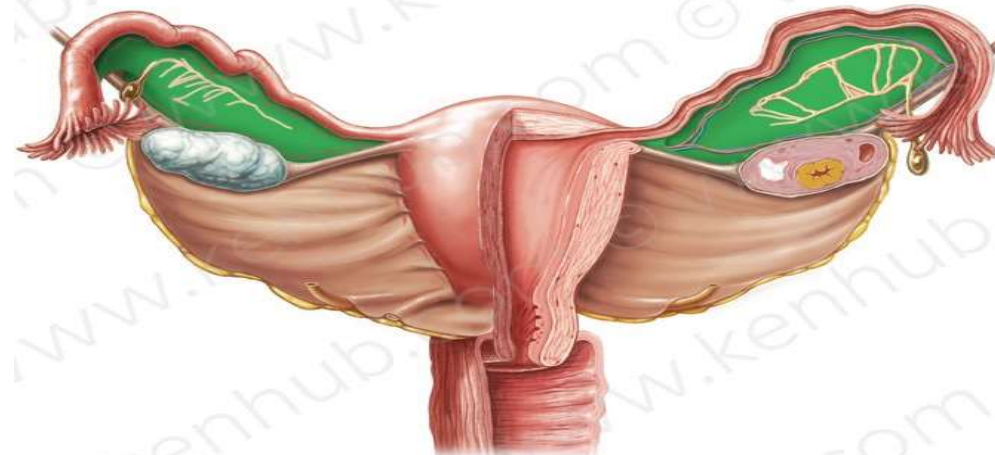
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**Mesometrium**



© www.kenhub.com



**Mesosalpinx**



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# Supporting Factors of Uterus

```
graph TD; A[Supporting Factors of Uterus] --> B[Ligaments]; A --> C[Muscles]; A --> D[Mechanical Factors]; B --> B1[1-Pubocervical ligaments]; B --> B2[2-Transverse cervical ligaments]; B --> B3[3-Uterosacral ligaments]; C --> C1[1-Muscles of the pelvic diaphragm]; C --> C2[2-Muscles of urogenital diaphragm]; C --> C3[3-Perineal body];
```

## Ligaments

- 1-Pubocervical ligaments
- 2-Transverse cervical ligaments
- 3-Uterosacral ligaments

## Muscles

- 1-Muscles of the pelvic diaphragm
- 2-Muscles of urogenital diaphragm
- 3-Perineal body

## Mechanical Factors

## Supporting Factors of Uterus :

Prolapse of the uterus into the vagina (due to increased intra-abdominal pressure) is prevented by the following factors

### **A. Ligaments :**

1. Pubocervical ligaments
2. Transverse cervical ligaments (Mackenrodt's ligaments)
3. Uterosacral ligaments

Tearing of the pelvic diaphragm during childbirth leads to paralysis of Levator ani + coccygeus

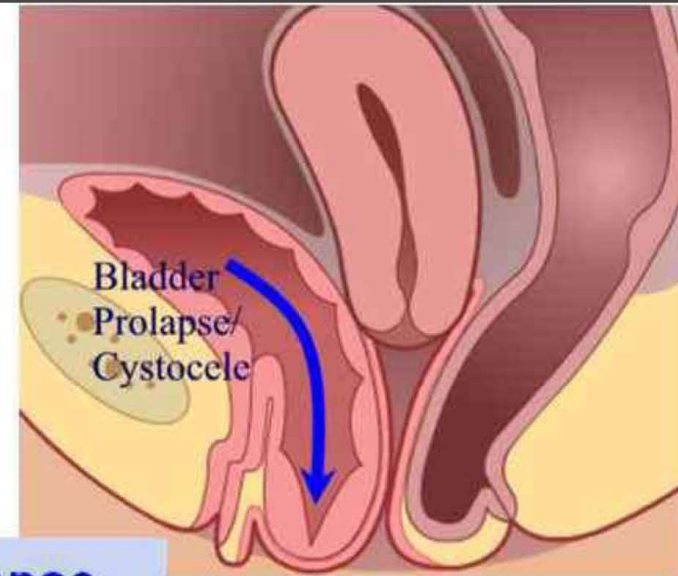
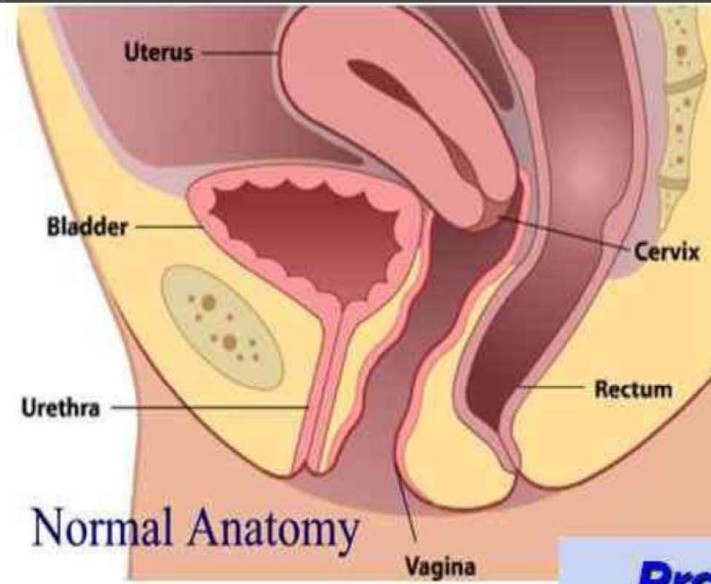
### **B. Muscles :**

1. Muscles of the pelvic diaphragm (levator ani and coccygeus) especially sphincter vaginae part of levator ani.
2. Muscles of urogenital diaphragm in the deep perineal pouch.
3. Perineal body : it is the central tendon of perineum which keeps integrity of pelvic floor.

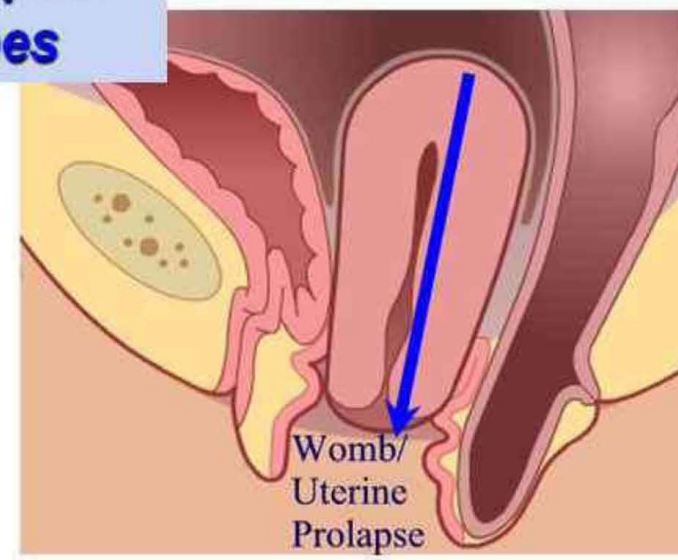
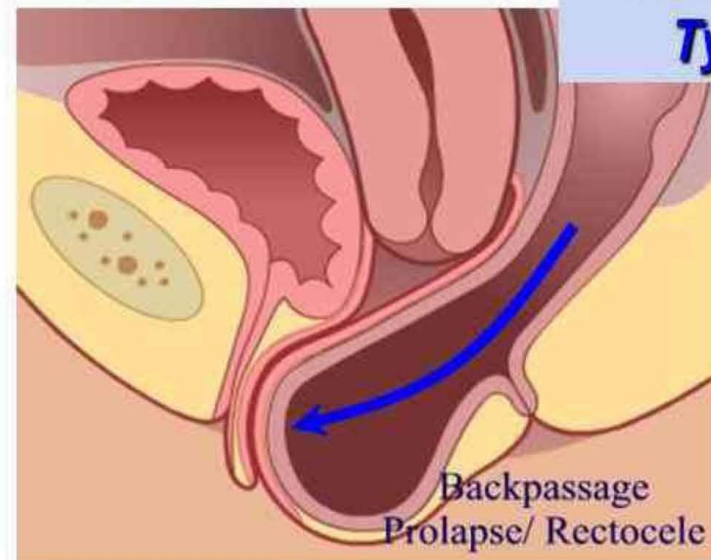
Rupture of the perineal body leads to prolapse of uterus.

### **C. Mechanical Factors :**

- The angle of anteversion prevents prolapse of uterus into the vagina.
- The angle is maintained by the forward pull by round ligaments on the uterine fundus and the backward pull by the Uterosacral ligaments on the cervix.

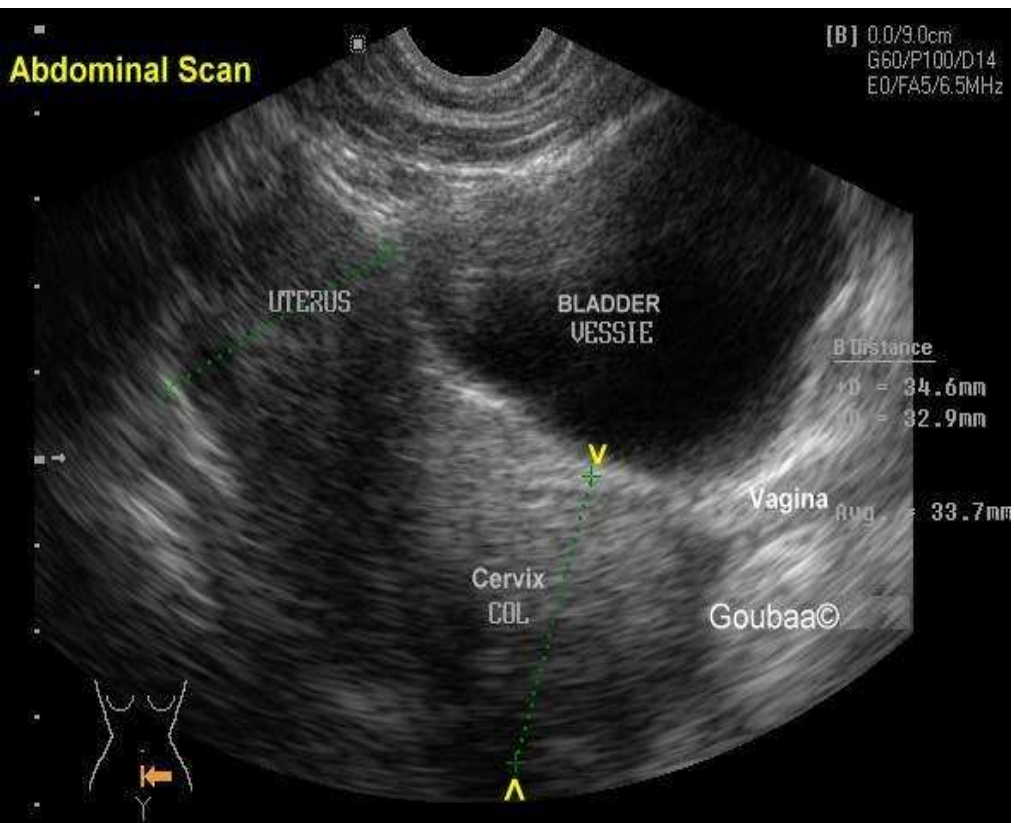
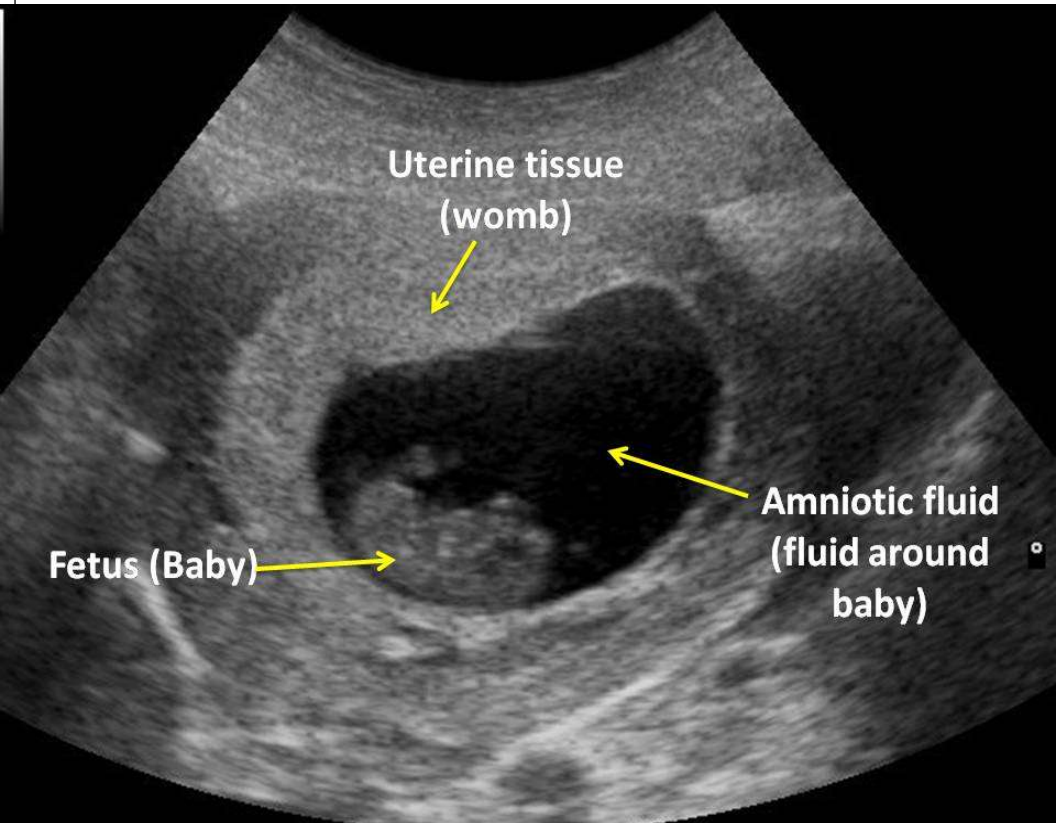


**Prolapse  
Types**





**3D and 4D ultrasound**



# Vagina

---

- ❑ It is a fibromuscular tube (8 cm long) lined with stratified squamous epithelium.
- ❑ It extends from the uterus down to the vestibule (it is a cleft between the 2 labia minora).
- ❑ Its axis makes a right angle with the cervix



# \* كس السلايد مهمة ك \*

## Dimensions :

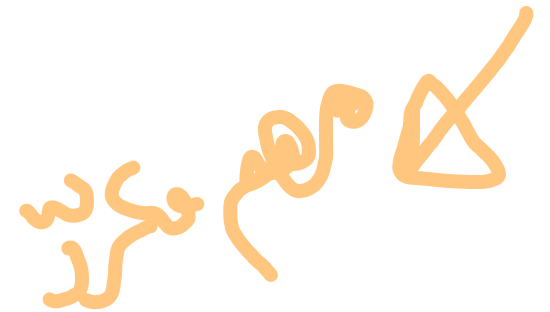
Anterior vaginal wall is about 7.5 cm.

Posterior vaginal wall is about 9 cm.

## Relations of the Vagina :

### 1- Anterior wall related to :

- Base of the bladder
- Urethra



### 2- Posterior vaginal wall :

- **Upper 1/4** (covered with peritoneum) is related to rectum with Douglas pouch in between.
- **Middle 2/4** are related directly to rectum.
- **Lower 1/4** is related to anal canal with the perineal body in between

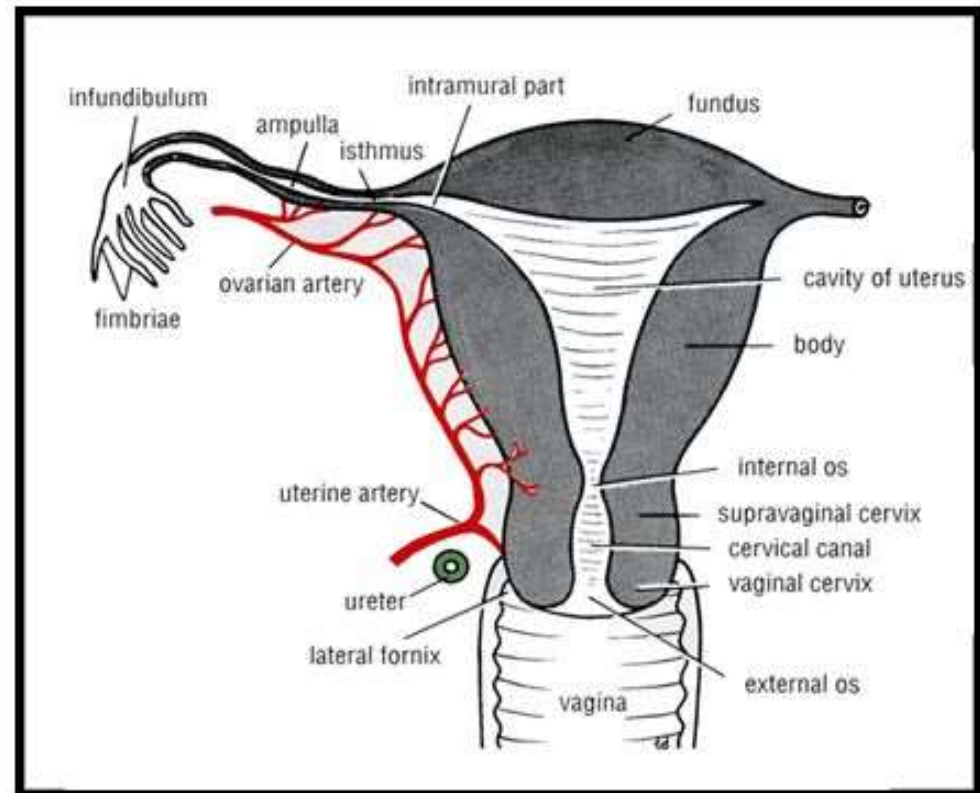
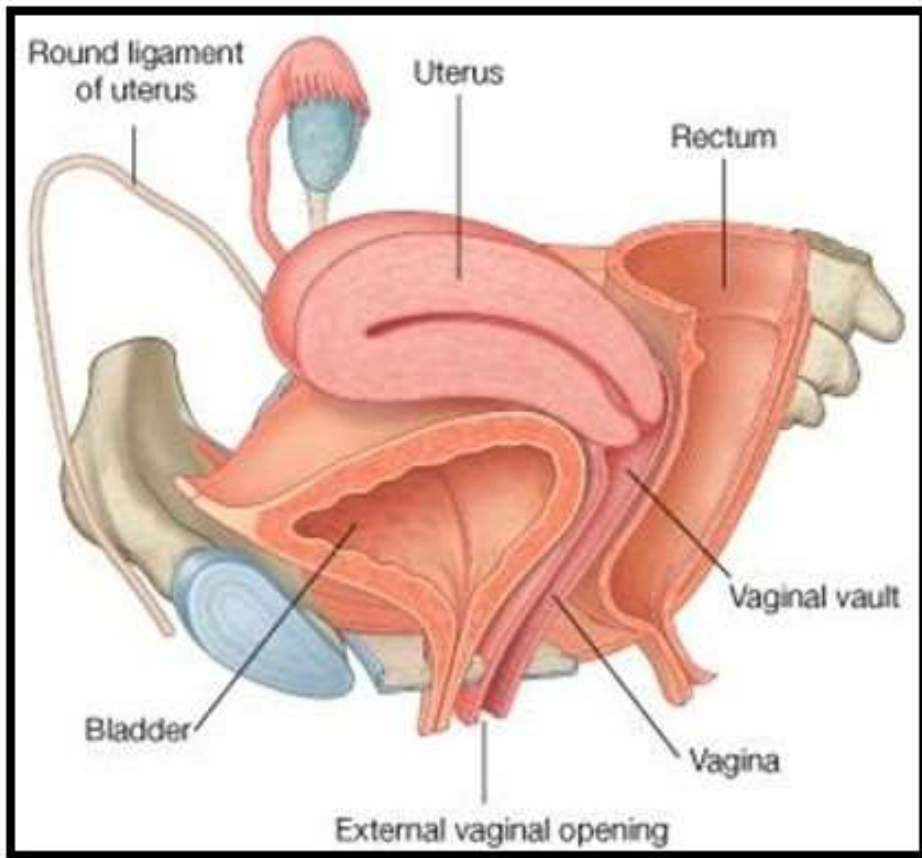
### 3- Lateral relations :

- **Upper part** : ureter
- **Middle part** : is related to sphincter vaginae part of the levator ani.
- **Lower part** is related to muscles of urogenital diaphragm (in the deep perineal pouch), bulbs of vestibule and greater vestibular glands (in the superficial perineal pouch).

ADDITIONAL INFORMATION :tear of the superior boundary of the superficial perineal space the most likely be injured is Bartholin's gland



# RELATIONS OF VAGINA



### **Cavity of Vagina :**

- Its superior part surrounds the vaginal part of the uterine cervix and is divided into four fornixes.
- The posterior vaginal fornix is the **deepest one** and the **only** fornix **covered by peritoneum.**
- In virgins ; The vaginal orifice has a thin mucosal fold called the *hymen* which is perforated at its center.

**Arterial Blood Supply :** by uterine and vaginal arteries.

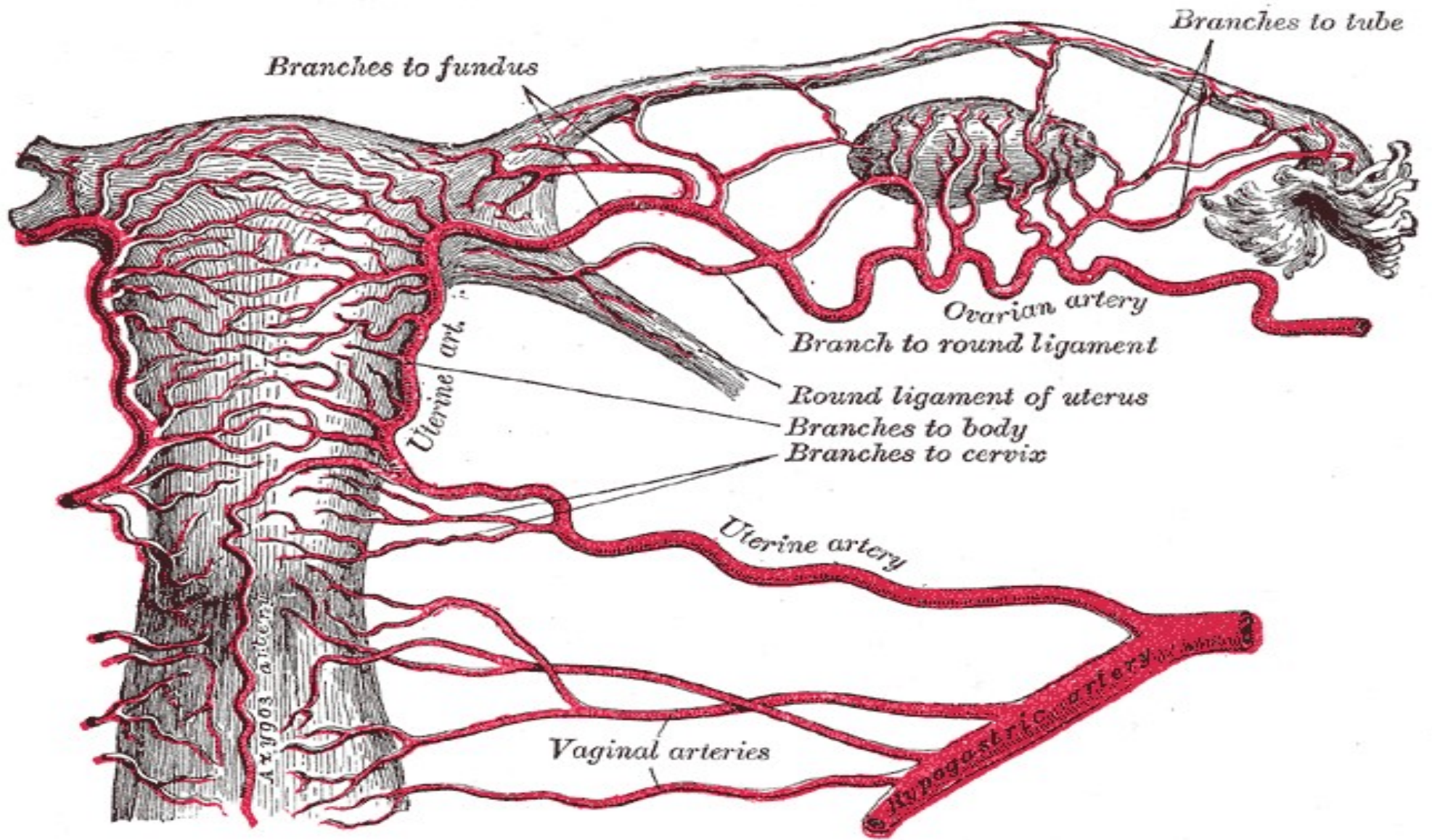
The vaginal A. supplies the base of the bladder and gives vaginal branches which anastomose with vaginal branches from uterine A.

These anastomoses form 2 median longitudinal vessels called azygos arteries which descend anterior and posterior to the vagina supplying it

**Venous Drainage :** by vaginal venous plexus on the side of vagina. It is drained by the vaginal vein into internal iliac vein.

### **Lymph Drainage :**

- **Above the hymen** → external, internal iliac lymph nodes.
- **Below the hymen** → superficial inguinal lymph nodes.



## Nerve Supply :

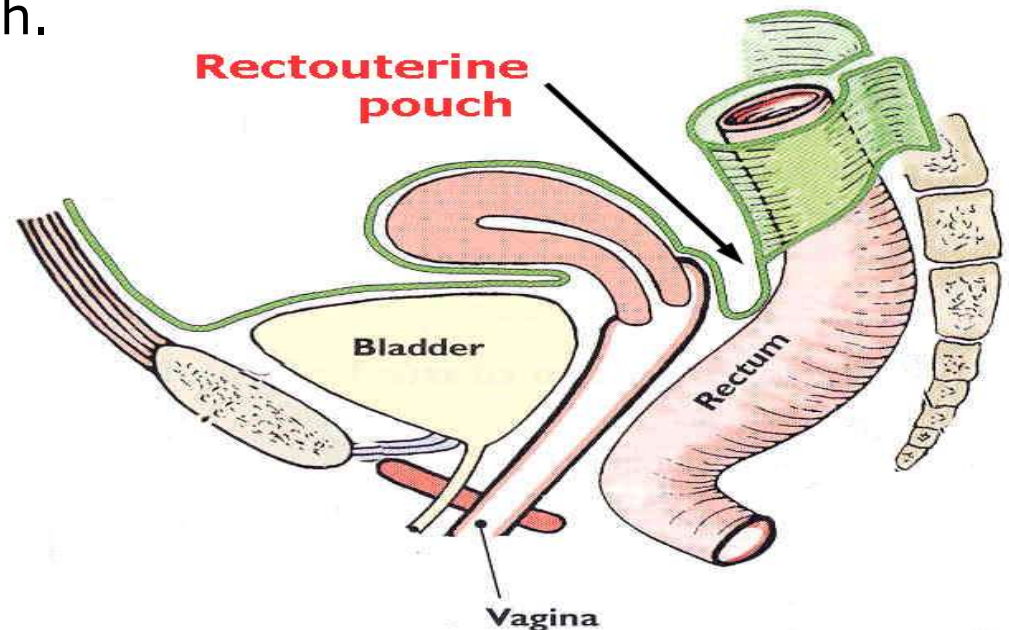
- Autonomic fibres from the uterovagina! plexus derived from the inferior hypogastric plexus.

\* The **lower inch of** vagina is supplied by the pudendal nerve



➔ The uterus is completely covered by peritoneum except the supravaginal cervix anteriorly and laterally .

- The vagina has no peritoneum except its posterior fornix, which is covered by the peritoneum of Douglas pouch.



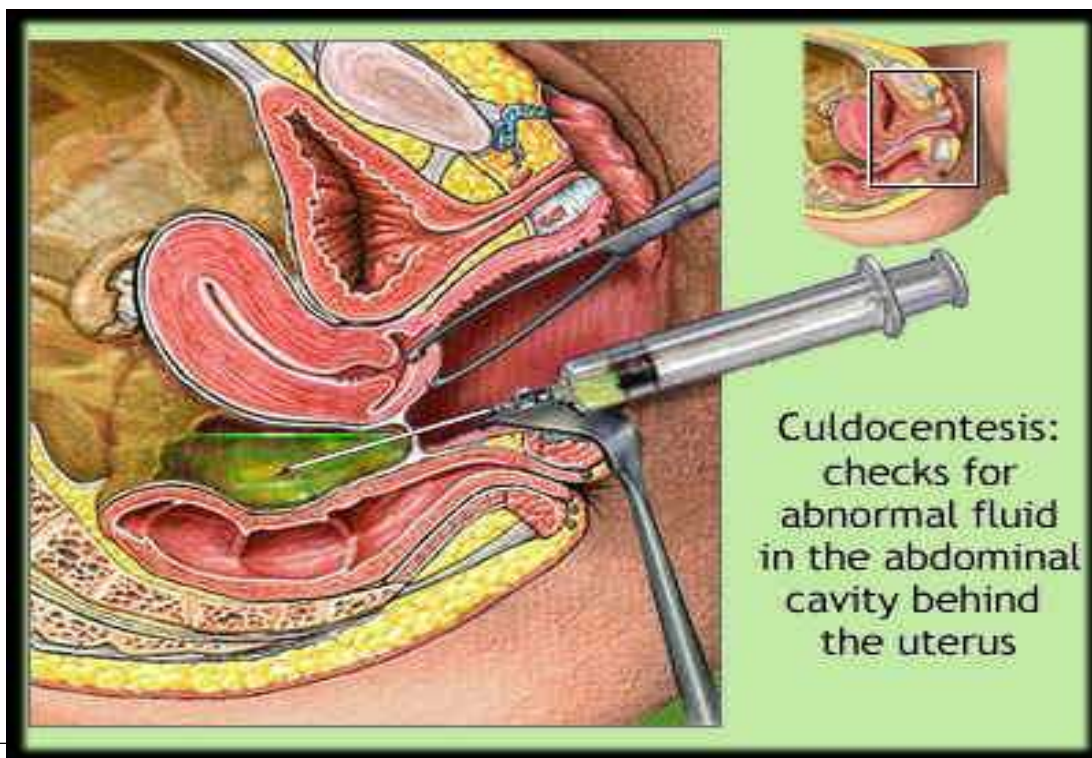
## Culdocentesis

a procedure that checks for abnormal fluid in the space just behind the vagina

Drain a pelvic abscess or blood collection through the vagina by the passage of a needle through the posterior fornix.

Misguided nonsterile instruments, which pierce the wall of the posterior fornix in a failed attempt at an illegal abortion.

This leads to Pelvic peritonitis, often with fatal consequences.



## Painless Labour

- Epidural anaesthesia provide analgesia during labour and control post partum pain
- The anaesthesia agent is administered using indwelling catheter into epidural space at L3-L4



## Epidural Analgesia (painless labour)



General area of numbness



Injection site



Anesthetic shot

ADAM

ADAM

# **FEMALE EXTERNAL GENITALIA**

---

It includes :

**1-The mons pubis :** It is the hairy skin anterior to the pubic bones.

It is rich in subcutaneous fat.

**2-The labia majora :**

They are a pair of rounded cutaneous folds (rich in subcutaneous fat), begin at mons pubis and extend posteriorly to meet each other anterior to the anus.

- Their lateral surfaces are *hairy*, their medial surfaces are *smooth*
- They surround the *pubendal cleft* which in turn encloses the remaining genital structures described below.

**3- The labia minora :**

Are a pair of smooth pink folds, covered by stratified squamous epithelium.

**Anteriorly :** near the clitoris, each splits into 2 smaller folds :

- The upper pair unite *over* the tip of clitoris, forming the *prepuce of the clitoris*.
- The lower pair unite *below* the clitoris forming the *frenulum of the clitoris*.

**Posteriorly,** the two labia minora meet to form *frenulum of labia minora (fourchette)* .



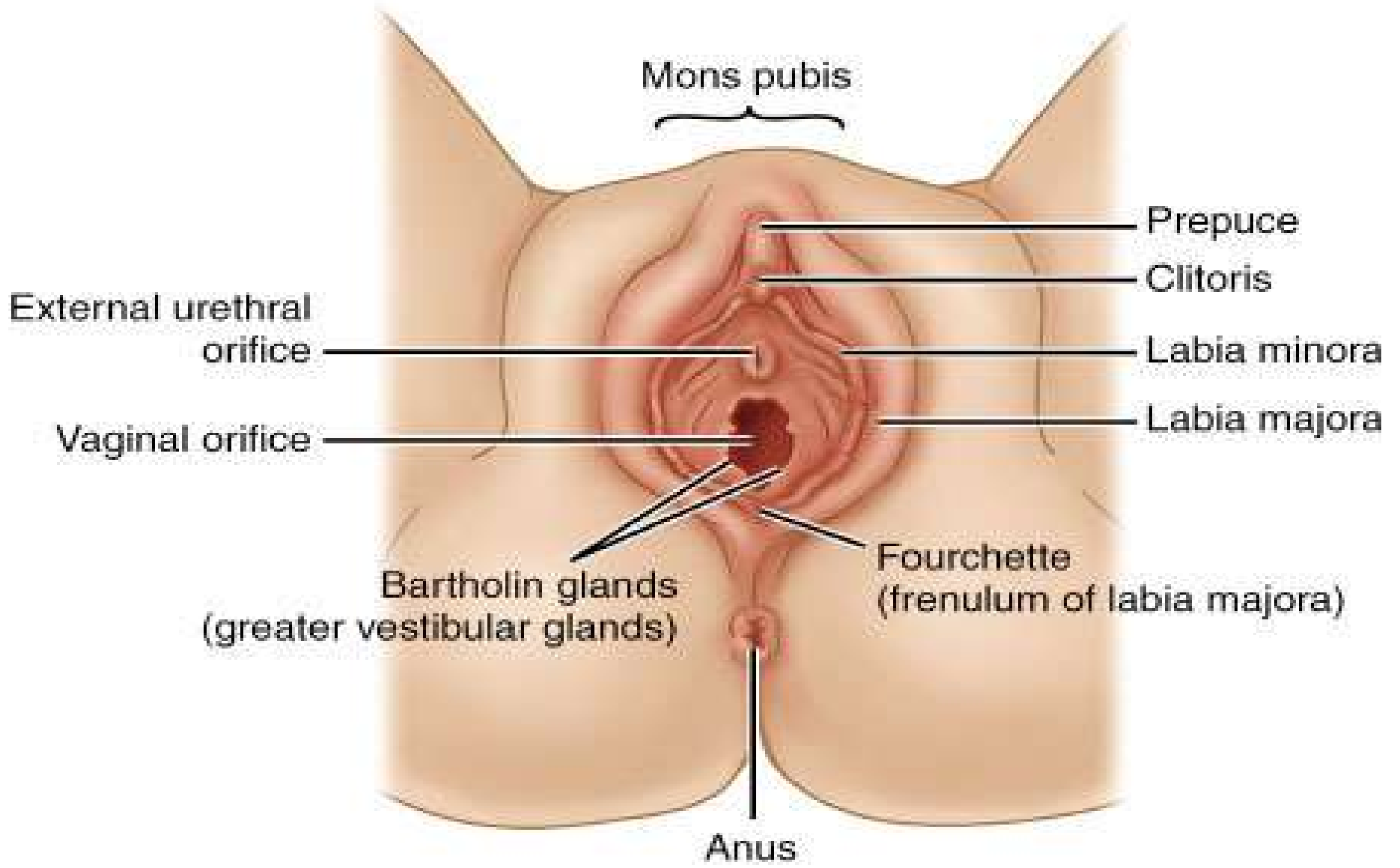
#### 4- The clitoris :

Site : it *lies in* anterior part of the pudendal cleft. It resembles the penis, but differs in the following :

- Clitoris is formed only of 2 corpora cavernosa, each arises from side of pubis arch by a crus, so it has *no corpus spongiosum*.
- it is not traversed by the urethra.
- Its free end is sensitive and is called *glans clitoridis*.

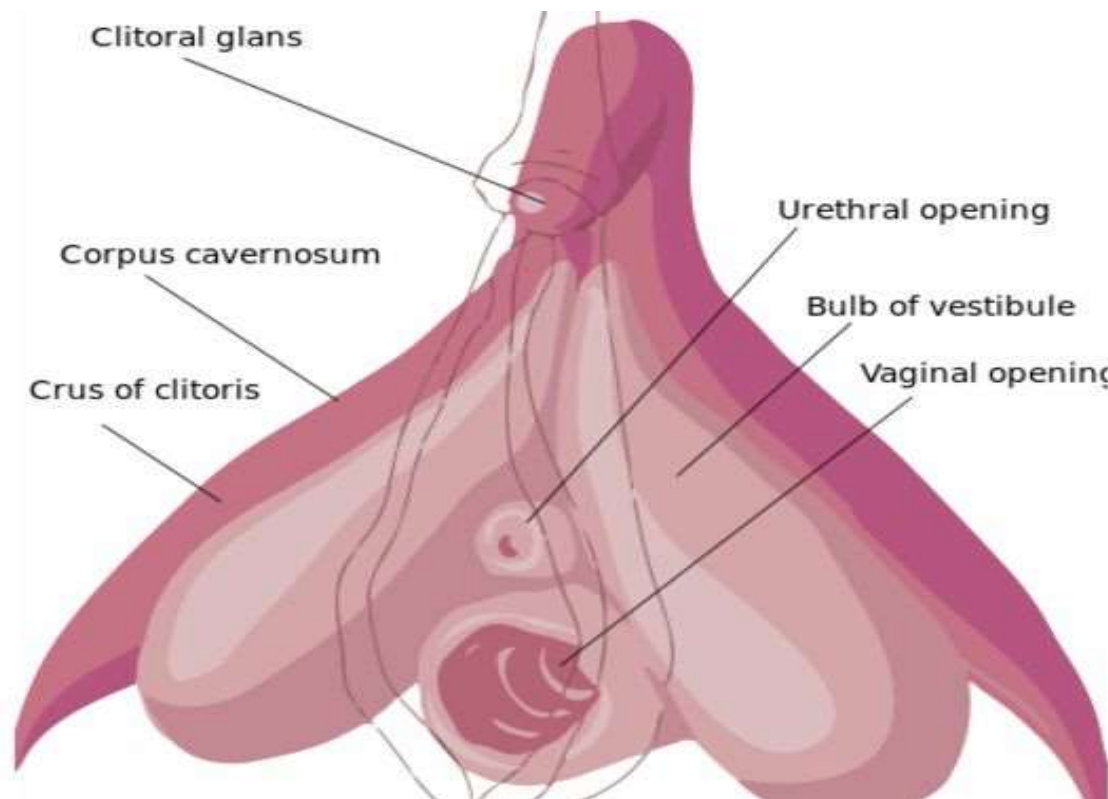
#### 5- Vestibule :

- It is the space between the two labia minora.
- It contains :
  - Urethral orifice ; lies 2 cm posterior to the clitoris but anterior to vaginal orifice.
  - Vaginal orifice : in the posterior part of the vestibule, it is closed in the virgin by the hymen.
  - Orifices of the greater vestibular glands (of Bartholin), one on each side of the vaginal orifice (these glands lie in the superficial perineal pouch).



## 6- Bulbs of the vestibule :

- These are two large, elongated masses of erectile tissue, each is about 3 cm in length.
- They lie along the sides of the vaginal orifice and are covered by bulbospongiosus muscles.
- They correspond to bulb of the root of penis, **but differ in 2 facts :**  
The bulbs are separated from the clitoris.  
The bulbs are separated by the vestibule, containing vaginal and urethral orifices.



Thank

you





# Perineum

**Dr. Ahmed Salman**

**Associate Professor of Anatomy**

It is the diamond-shaped lower end of the trunk

**Glossary** : **peri** : around, **ineo** - discharge, evacuate

**Location** : it lies below the pelvic diaphragm, between the upper parts of the thighs.

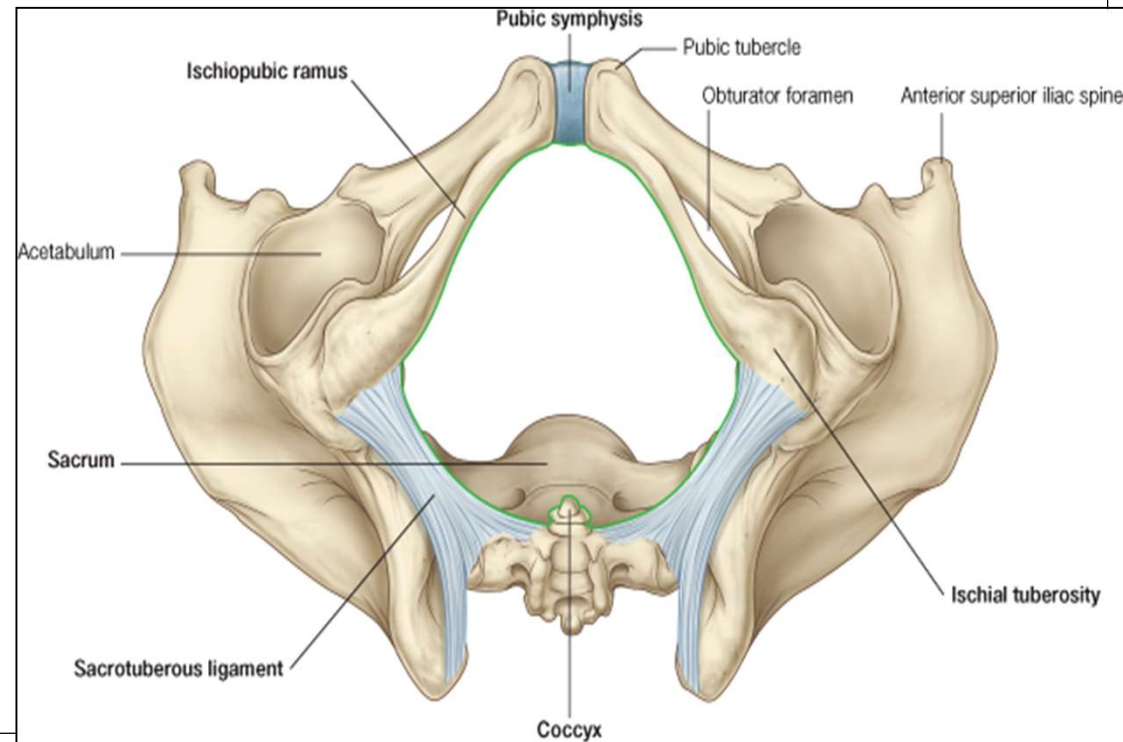
**Boundaries** :

**Anteriorly** : Inferior margin of symphysis pubis.

**Posteriorly** : Tip of coccyx.

**Anterolateral** : Fused rami of pubis and ischium and ischial tuberosity.

**Posterolateral** : Sacrotuberous ligaments.

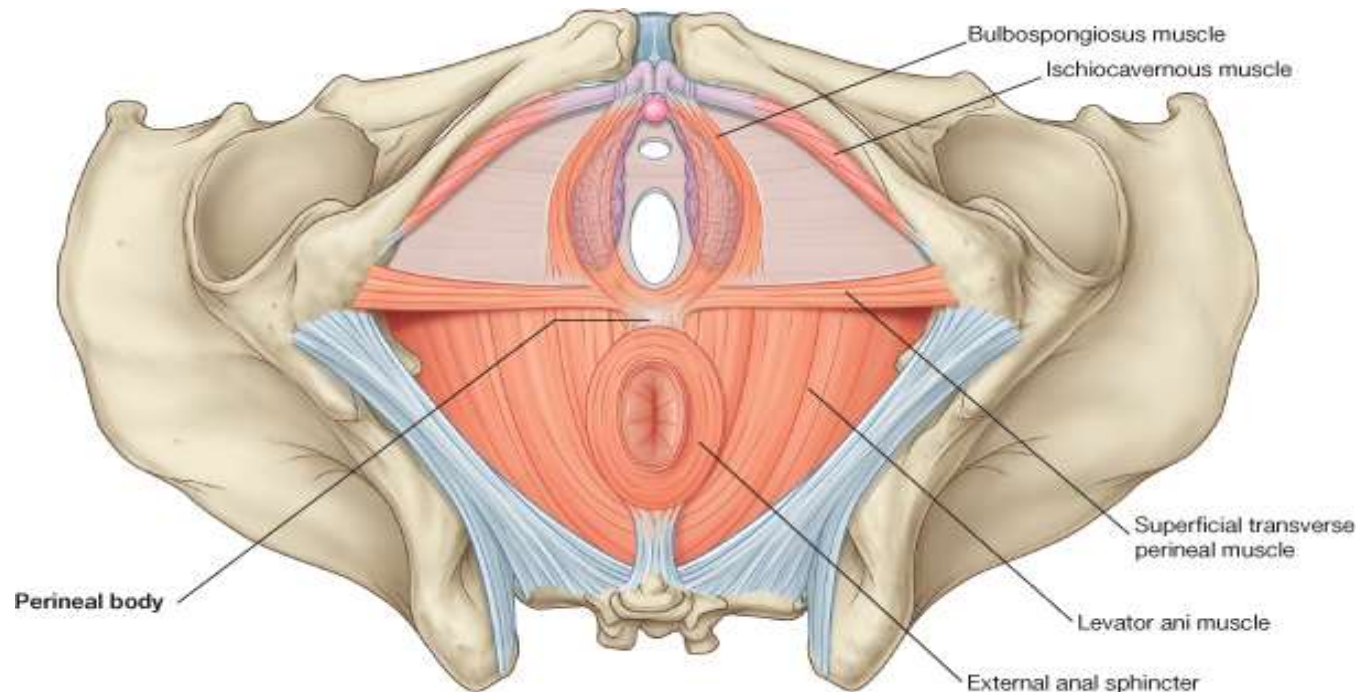


## Divisions of the Perineum :

❖ By a line joining the anterior parts of the ischial tuberosities, the perineum is divided into two triangles :

❖ **Anteriorly** : Urogenital triangle

❖ **Posteriorly** : Anal triangle



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# Perineum

```
graph TD; A[Perineum] --> B[Urogenital triangle]; A --> C[Anal triangle]; B --> B1[1-External genitalia in male or female]; B --> B2[2-Superficial perineal pouch]; B --> B3[3-Deep perineal pouch]; C --> C1[1-Anal Canal in the median plane]; C --> C2[2-Ischiorectal fossa on either side of anal canal]; C --> C3[3- Pudendal canal in side wall of ischiorectal fossa];
```

## Urogenital triangle Contains

- 1-External genitalia in male or female
- 2-Superficial perineal pouch
- 3-Deep perineal pouch

## Anal triangle Contains

- 1-Anal Canal in the median plane
- 2-Ischiorectal fossa on either side of anal canal
- 3- Pudendal canal in side wall of ischiorectal fossa



## Urogenital triangle:

Contains these fascial layers

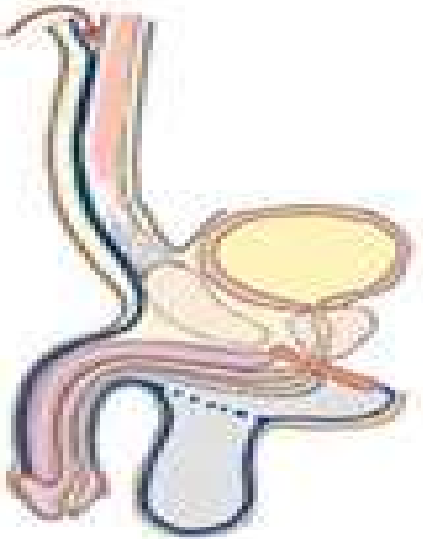
**1-The membranous layer of the superficial fascia of the perineum (Colles fascia).**

**2-The perineal membrane**

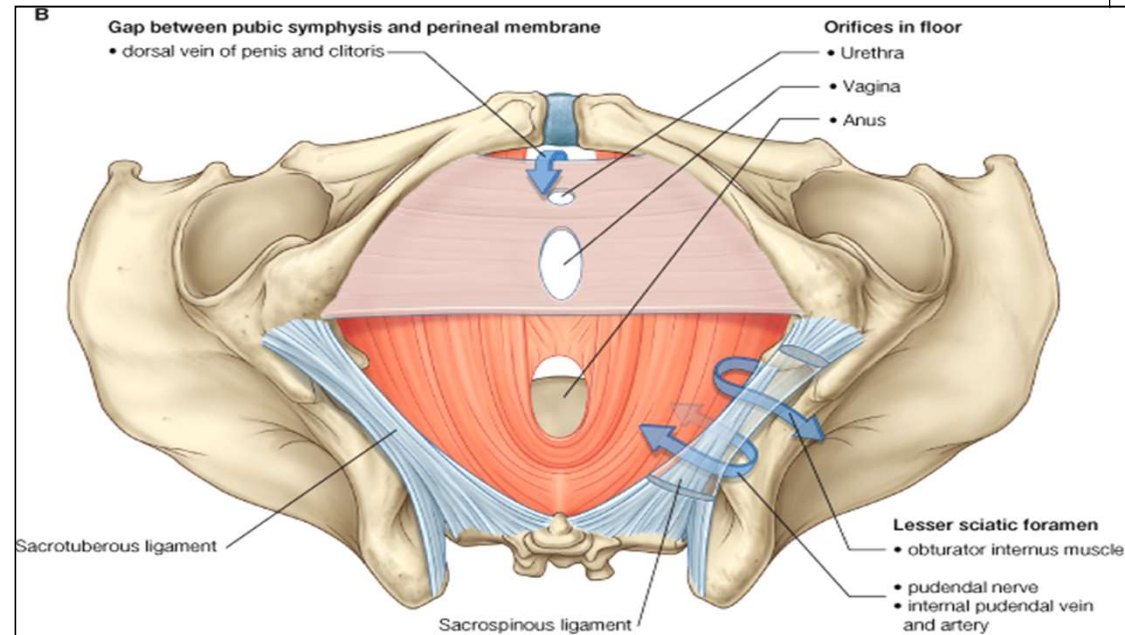
It is a triangular fibrous sheet which lies across the pubic arch.

### The perineal membrane :

- Forms the floor of the deep perineal pouch.
- Forms the roof of the superficial perineal pouch

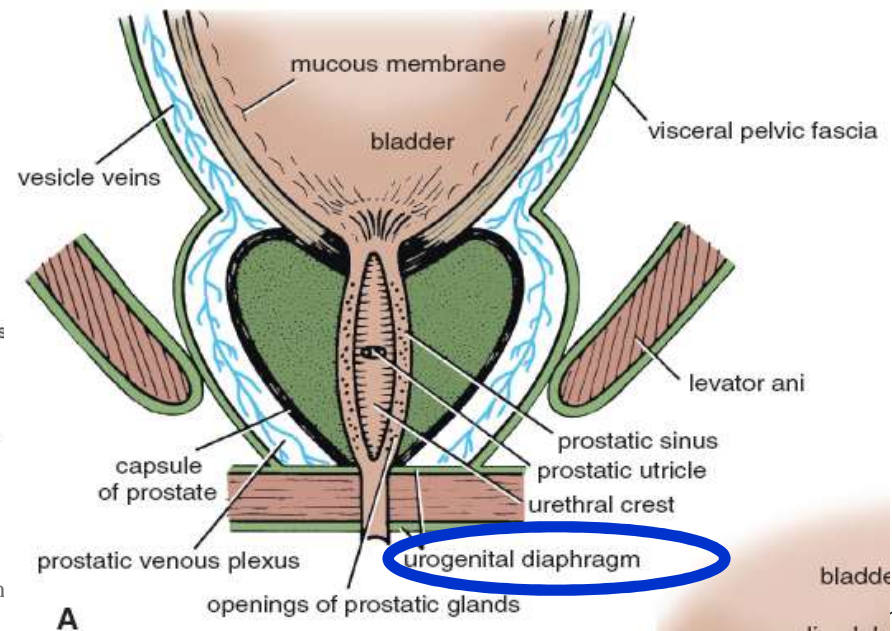
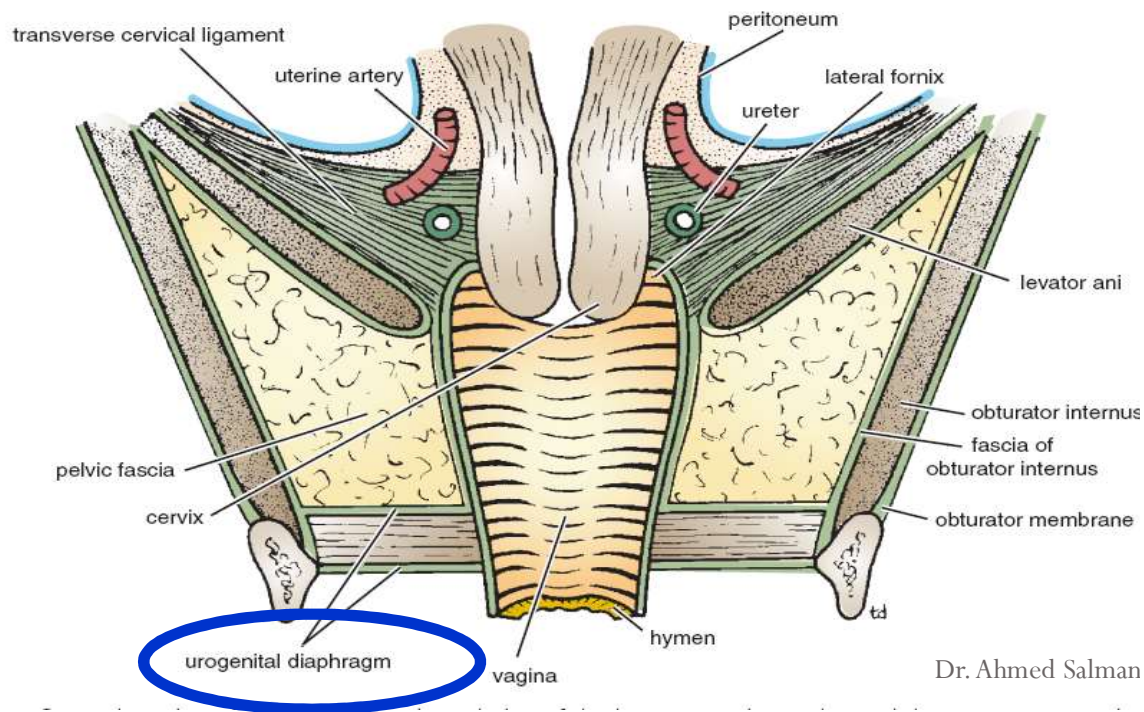


Dr. Ahmed Salman



## Urogenital Diaphragm

- It is a triangular musculofascial diaphragm situated in the anterior part of the perineum
- It fills the gap of the pubic arch
- It is formed by the **sphincter urethrae** and the **deep transverse perineal muscles**
- These two muscles are enclosed between a superior and an inferior layer of fascia of the urogenital diaphragm.
- The inferior layer of fascia is the perineal membrane.



Perineum contains two fibro muscular masses which are :

**A- Anococcygeal raphe (and body) :**

- It is a fibromuscular mass which extends from the tip of coccyx to the recto anal junction.
- It is easily stretched during defaecation and labour and recoiled by the coccygeus muscles.
- It supports the lower part of the rectum.

**B- Perineal body (central tendon of the perineum) : (remnant of urorectal septum)**

- It is a fibromuscular mass situated in the median plane, in front of anus.

**Relations :**

- In the male** : it lies between anal canal and bulb of the penis.
- **In the female** : it lies between anal canal and lower part of vagina.
- Importance : perineal body supports the uterus and vagina.
- Rupture of it during labour may result in prolapse of uterus

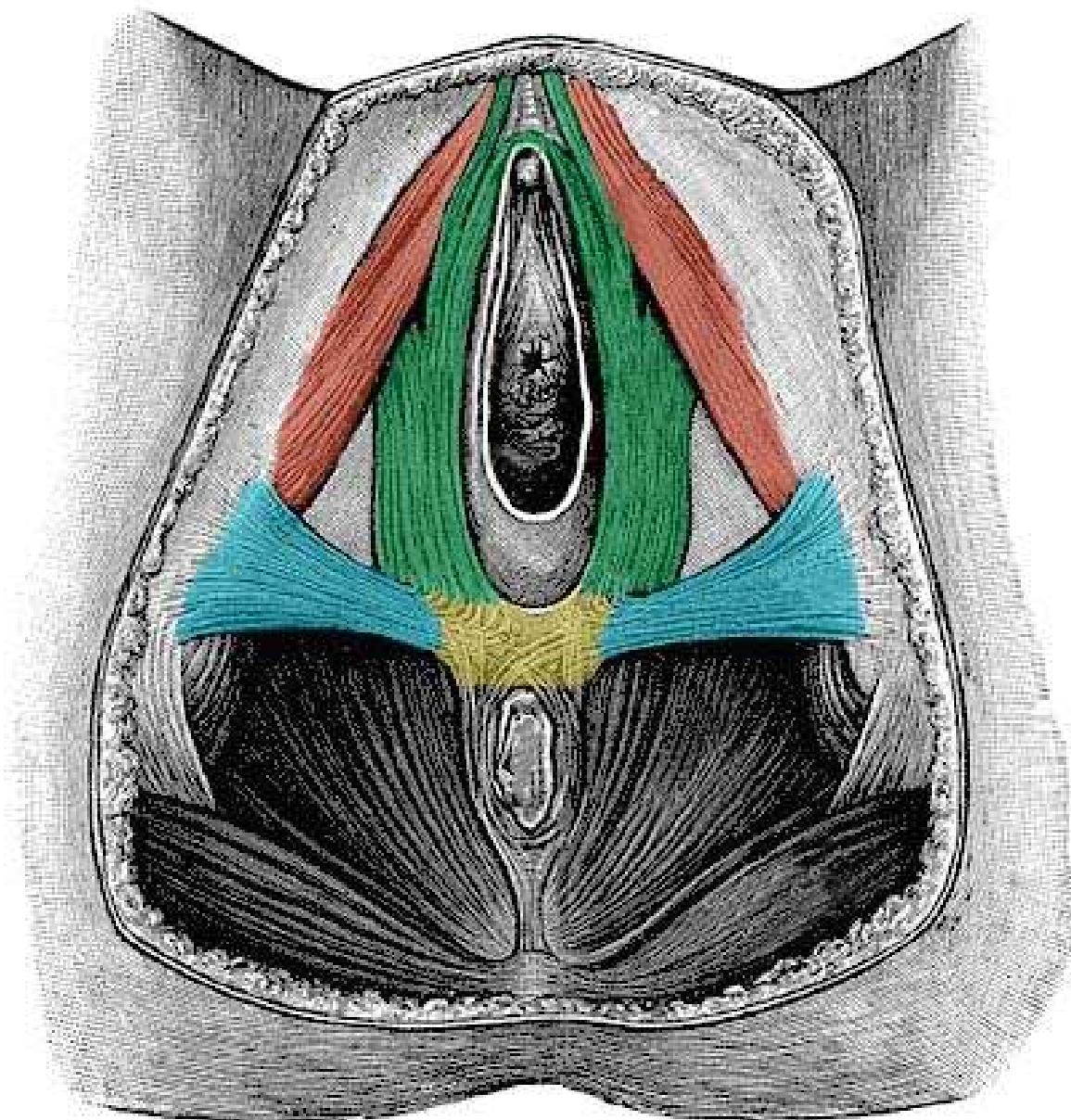
**Muscles attached to the perineal body : 3 paired and 3 single muscles :**


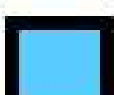
**3 paired muscles**

1. Superficial transverse perineal.
2. Deep transverse perineal.
3. Levator prostate or sphincter vaginae part of levator ani.

**3 single muscles**

1. Bulbospongiosus.
2. Superficial part of external urethral sphincter (sphincter urethrae).
3. Superficial part of external anal sphincter



-  **Perineal body**
-  **Ischiocavernosus**
-  **Bulbocavernosus**
-  **Transverse perineal**

## Muscles of perineum

**Nerve Supply** : All muscles in superficial and deep perineal pouches are supplied by perineal branch of pudendal nerve

### ❑ Muscles of Superficial Perineal Pouch :

#### 1- Ischiocavernosus :

**Site** : Each covers the crus penis.

**Action** : it compresses crus penis to maintain erection of penis.

#### 2- Bulbospongiosus :

**Site** : covers bulb of penis. In female, it is splitted into two parts to cover bulbs of vestibule.

**Action : In Male** , Assist in erection of penis and eject last drops of urine during micturition.

**In Female:** act as sphincter vagina and help in erection of clitoris

#### 3- Superficial transverse perineal:

**Site** : on posterior edge of perineal membrane in front of anus.

**Action** : fixation the perineal body.

**Muscles of the Deep perineal Pouch :** *These muscles form the urogenital diaphragm.*

### **1- Sphincter urethrae :**

**Site :** it surrounds membranous urethra.

**Attachments :** it is formed of two parts :

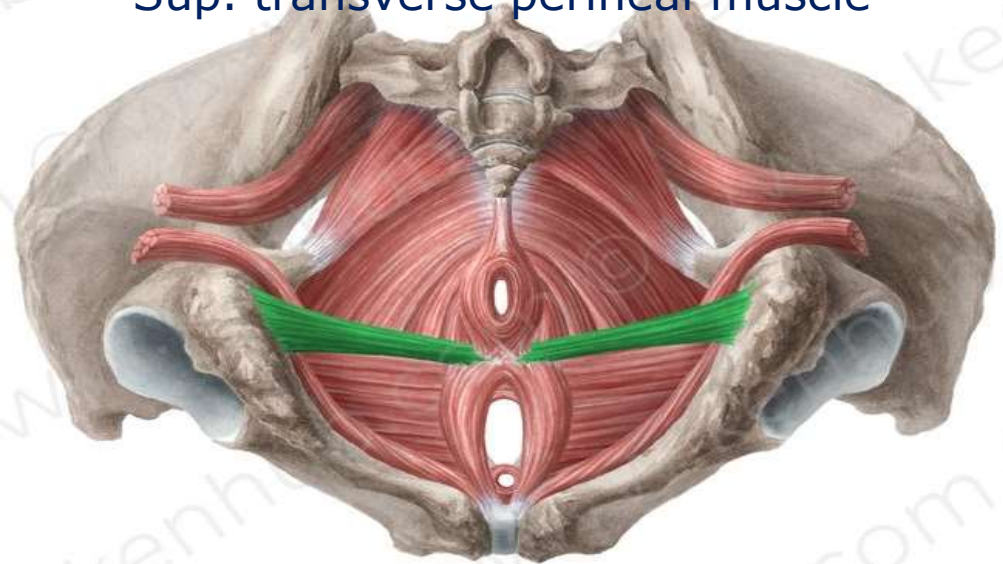
- **Inferior (or superficial) part :**
- **Superior (or deep) part :**
- **Action :** It represents the voluntary control of urethra.

### **2- Deep transverse perineal**

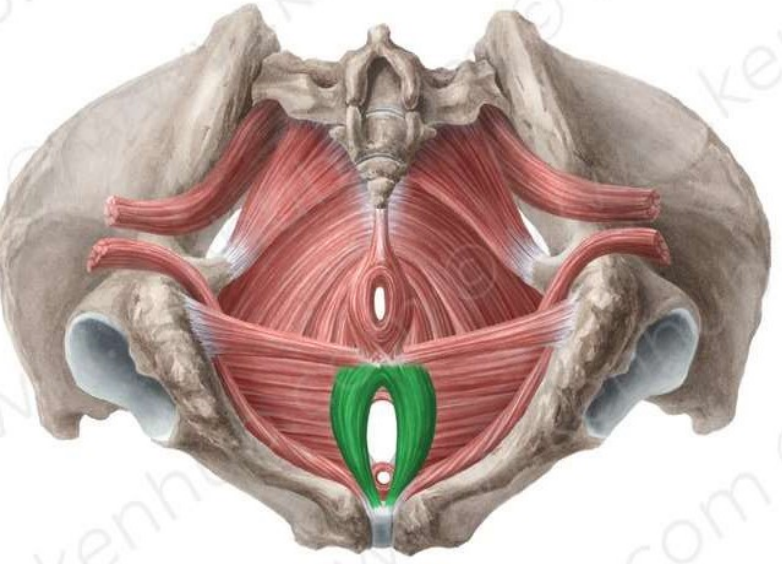
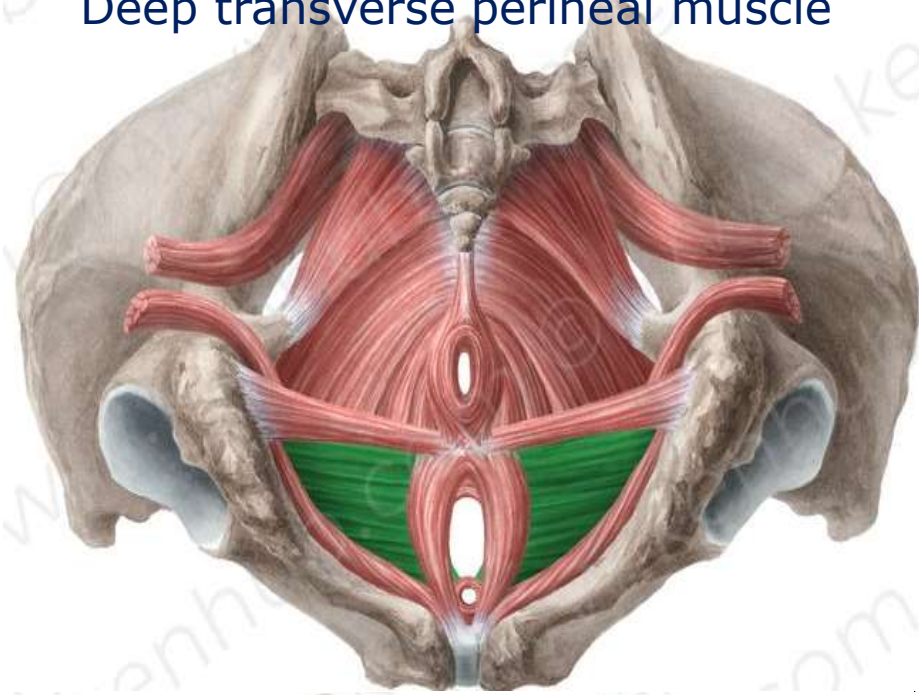
**Site :** on deep surface of posterior border of the perineal membrane.

**Action :** fixation of perineal body.

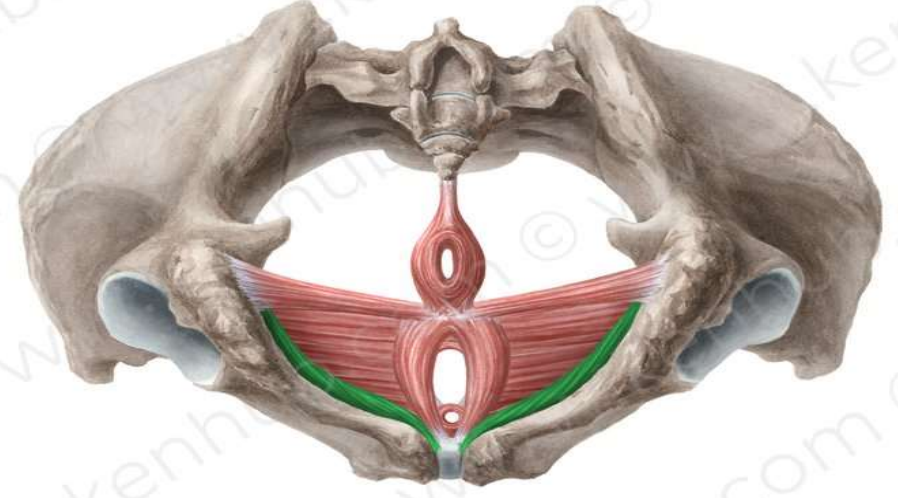
Sup. transverse perineal muscle



Deep transverse perineal muscle



Bulbospongiosus muscle



Ischiocavernosus muscle

Dr. Ahmed Salm:



## The perineal fascia

consists of superficial and deep layers

**Superficial perineal fascia**, consists of a superficial fatty layer and a deep membranous layer (***Colles fascia***).

## The superficial fatty layer

**In females,** It makes up the substance of the labia majora and mons pubis

It is continuous with the fatty layer of subcutaneous tissue of the abdomen

***(Camper fascia)***

**In males,** the fatty layer is replaced with smooth (*dartos*) muscle.

It is continuous with the fatty layer of subcutaneous tissue of the abdomen .

**In both sexes,** it is continuous posteriorly with the ischio-anal fat pad in the anal region .

## The membranous layer (*Colles fascia*).

is attached To

**Posteriorly** : The posterior margin of the perineal membrane and the perineal body

**Laterally**, the *fascia lata* (deep fascia) of the upper medial aspect of the thigh.

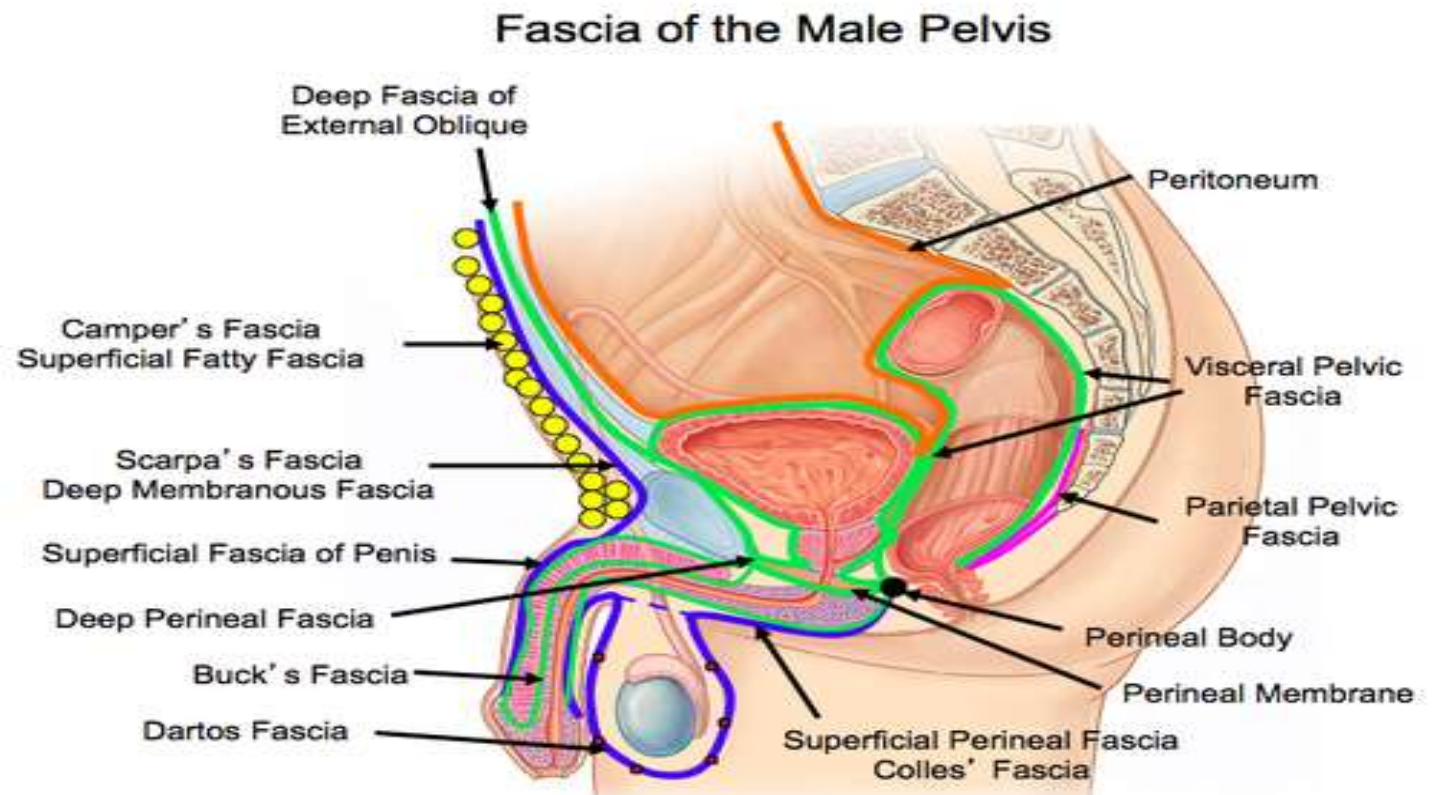
**Anteriorly**, in the male, the membranous layer of subcutaneous tissue is continuous with the fascia of the penis and scrotum

**On each side** of the scrotum, the membranous layer becomes continuous with the membranous layer of subcutaneous tissue of the abdomen (***Scarpa fascia***) .

.

## The perineal fascia (deep perineal, investing, or Gallaudet fascia)

- Invests the ischiocavernosus, bulbospongiosus, and superficial transverse perineal muscles.
- It is also attached laterally to the ischio-pubic rami.
- Anteriorly, it is fused to the suspensory ligament of the penis



# The perineal fascia

## Superficial perineal fascia

## Deep perineal (Gallaudet fascia)

### The superficial fatty layer

It is continuous with (***Camper fascia***)

### The membranous layer (***Colles fascia***)

It is attached to ***fascia lata***  
It is continuous with (***Scarpa fascia***)

## Rupture of the Urethra

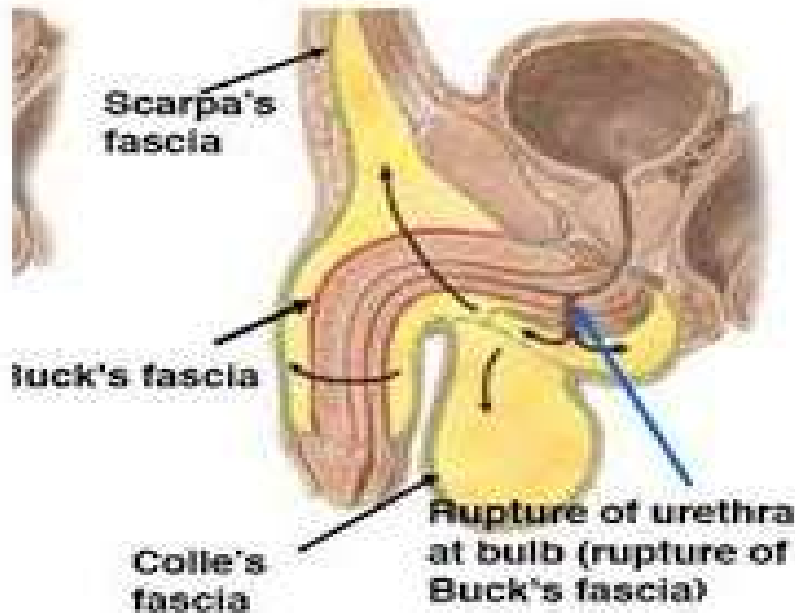
### 1- Spongy Urethra

Cause : (Straddle injury)

- a) Sever blow to perineum
- b) Falling on metal beam

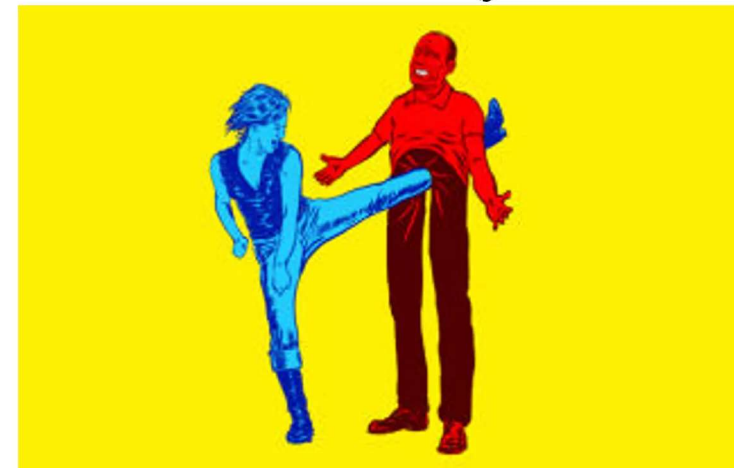
The urine extravasates into the superficial perineal pouch and then passes forward into loose connective tissue of the scrotum, around the penis beneath the membranous layer of the subcutaneous connective tissue of lower part of anterior abdominal wall.

مهم مكرر  
"Case Q"

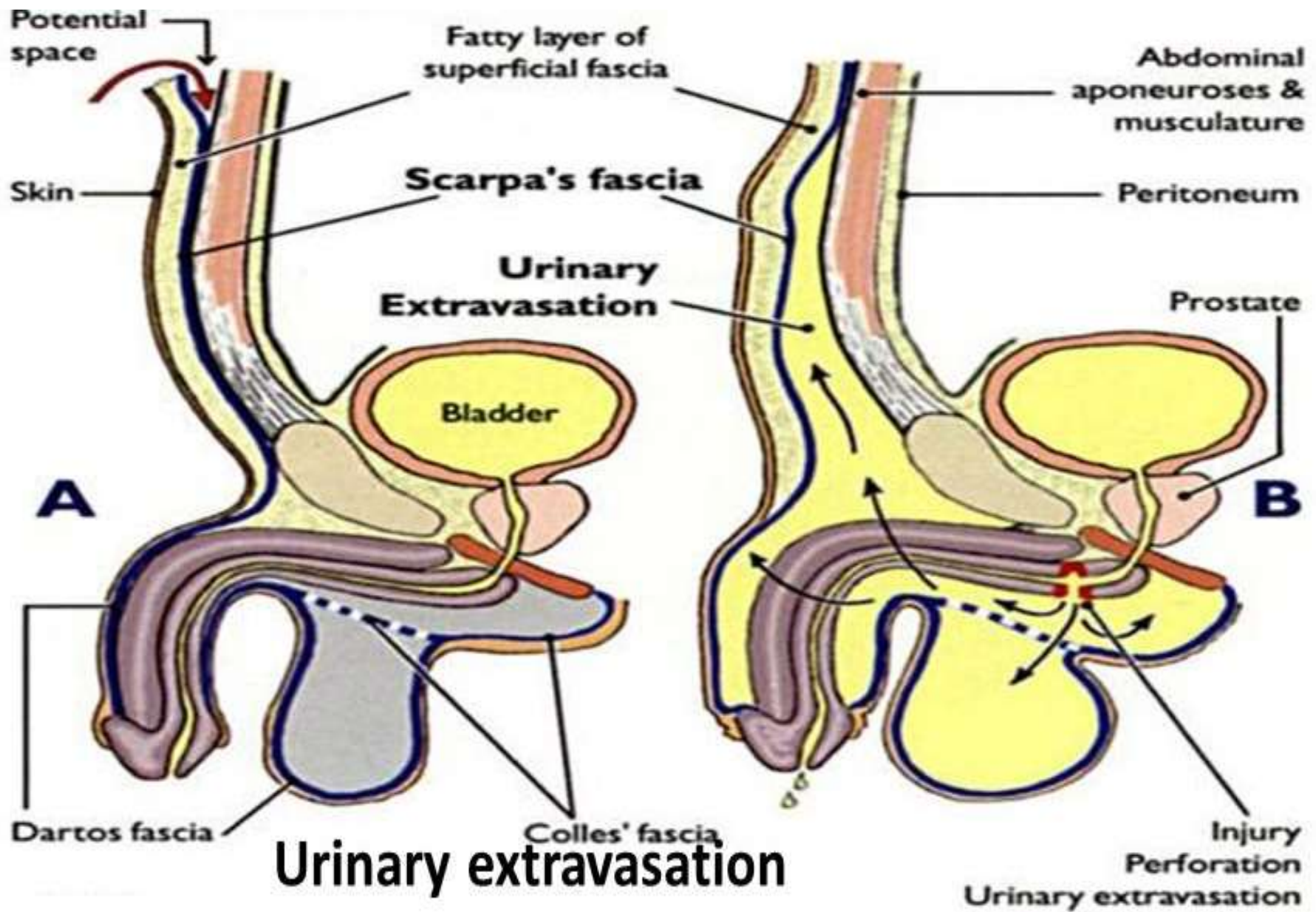


Dr. Ahmed Salman

## Straddle Injuries



## Lower GU Trauma



## Site of rupture

### 2-Membranous part

#### Cause:

- a) Fracture Pelvis
- b) Fault catheterisation



The urine escapes into the deep perineal pouch and may be pass upward around the prostate and bladder (extra peritoneal) through urogenital hiatus.

#### IN BOTH CASES

The urine cannot passes into thigh because attachment of colles fascia with fasciae lata below inguinal ligament.

Also cannot passes posteriorly to anal triangle due to fusion of superficial and deep layer of perineal fascia around posterior edge of perineal membrane

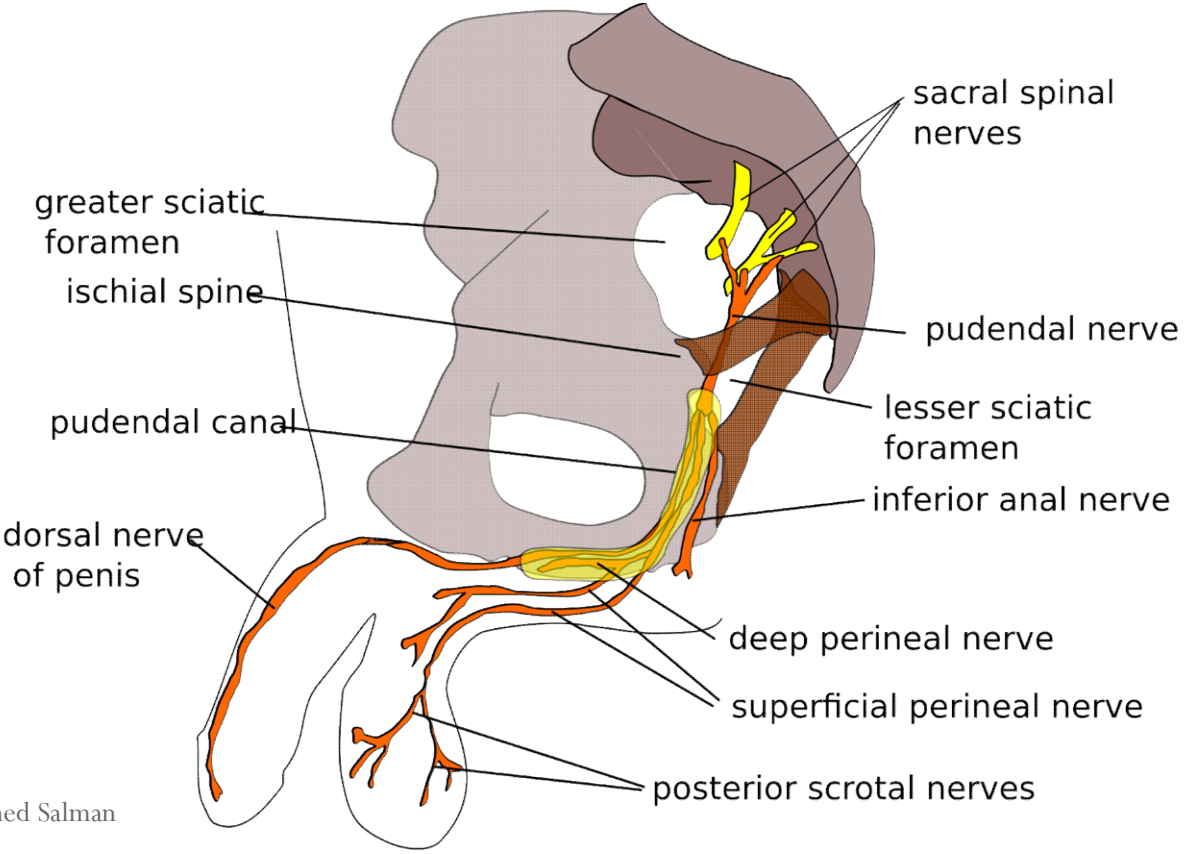
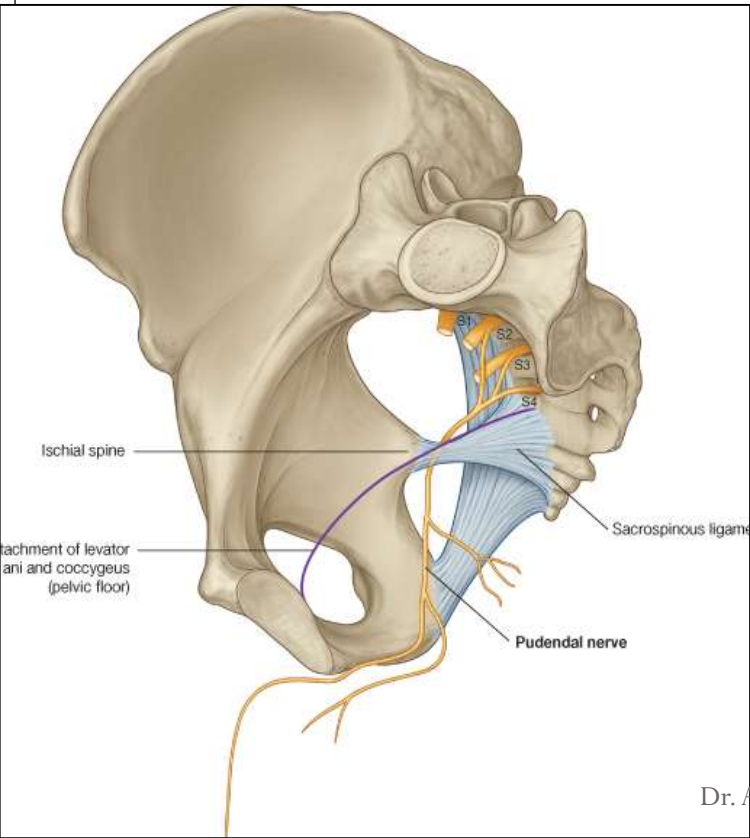
not medial

**Pudendal canal:**

**Location :** Fascial canal in lower part of the lateral wall of ischioanal fossa

**Extend:** From the lesser sciatic foramen to the posterior border of the perineal membrane.

**contents:** 1- pudendal nerve 2- internal pudendal vessels



Dr. Ahmed Salman



## Pudendal Nerve :

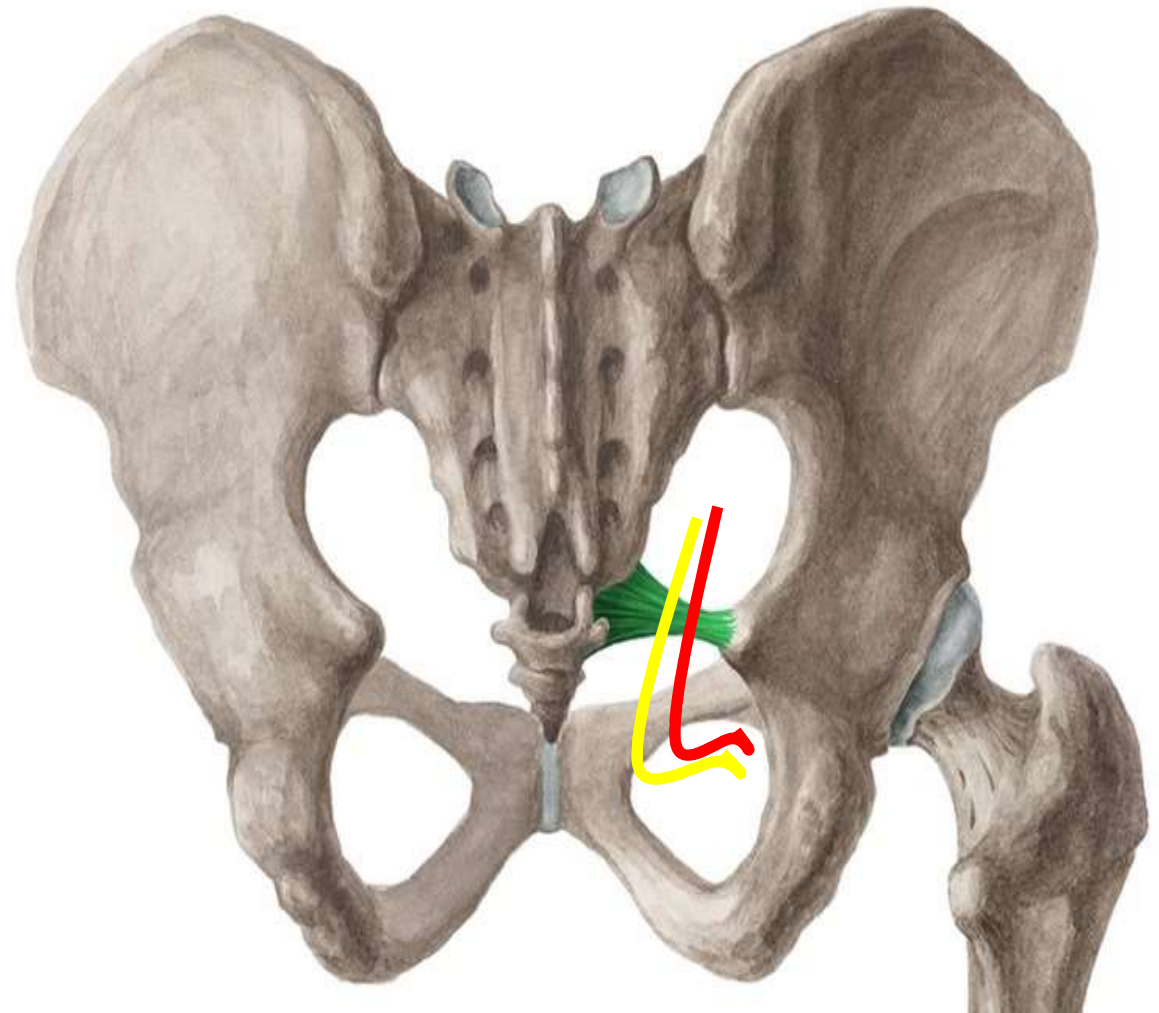
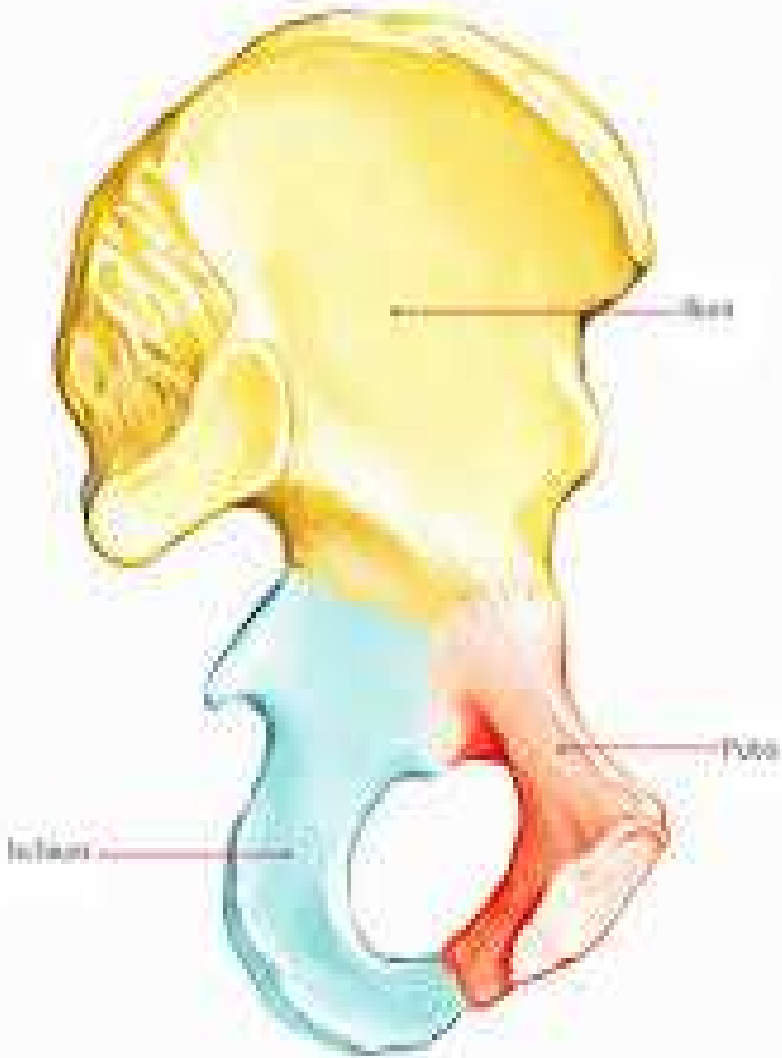
It is the *somatic* nerve of the *perineum* and external genitalia.

It arises from the sacral plexus; S2,3,4

### Course and Relations :

- The nerve leaves the pelvis through the greater sciatic foramen *below* the piriformis to enter the gluteal region.
- In the **gluteal region**, the nerve crosses the **sacrospinous ligament** *medial* to the internal pudendal vessels which cross the ischial spine.
- The nerve and the vessels pass through the **lesser sciatic** foramen to enter the **pudendal canal** in side wall of ischiorectal fossa.
- In the posterior part of pudendal canal, the nerve gives inferior rectal N. and then divides into 2 terminal branches which are the perineal N. and dorsal nerve of penis (or clitoris).

Pudendal nerve (Yellow ) crosses the **sacrospinous ligament *medial*** to the internal pudendal Artery (RED)



## Branches and Distribution :

### 1- Inferior rectal N. (mixed)

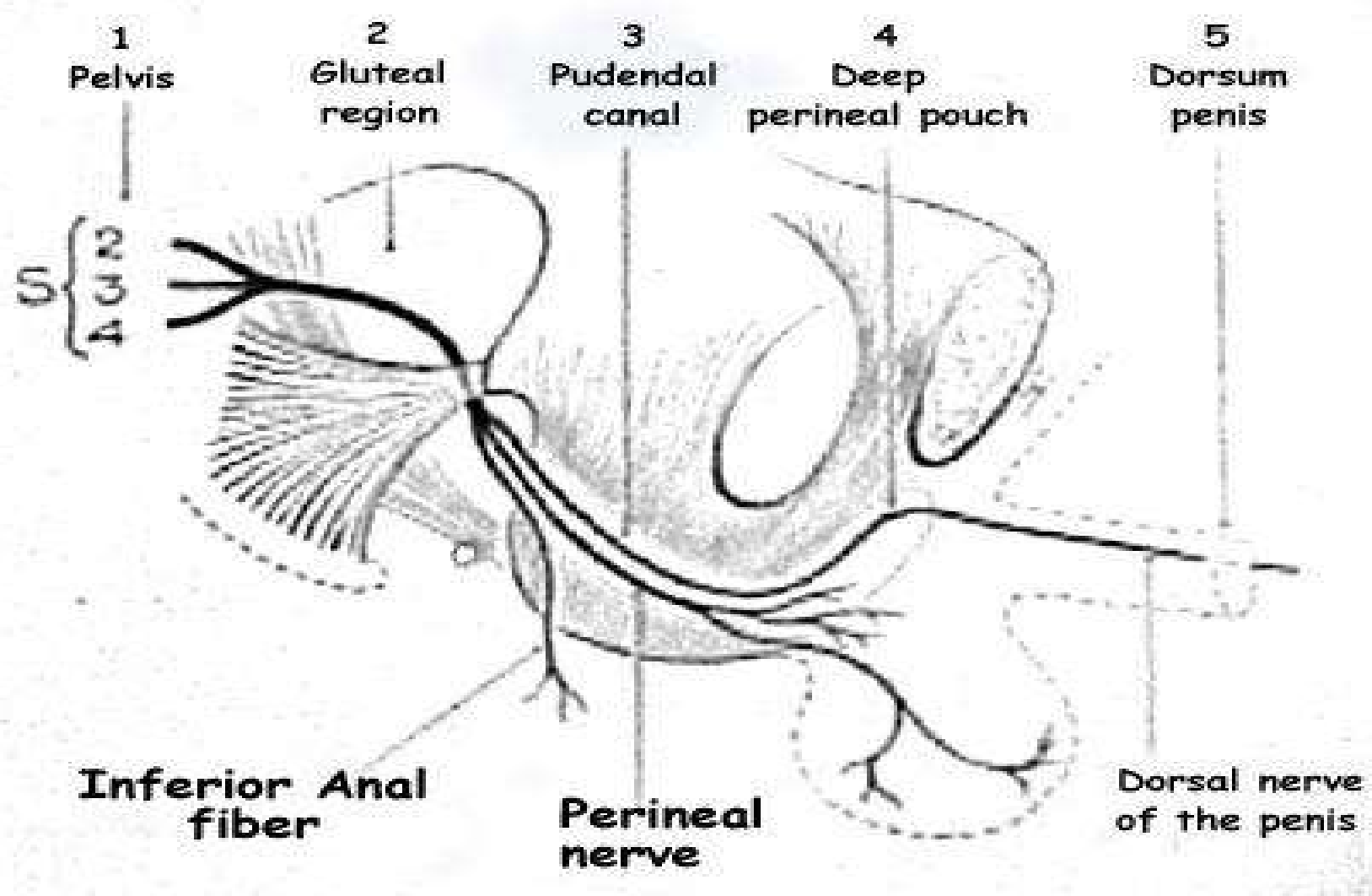
- **Motor** to external canal sphincter
- **Sensory** to anal canal *below* pectinate line, skin around the *anus* .

### 2- Perineal nerve (mixed) : it gives :

- **Motor** : to all muscles in the superficial and deep perineal pouches.
- **Sensory** : It gives 2 scrotal (labial) nerves, they pierce perineal membrane to supply posterior 2/3 of scrotum (or labium majora).

### 3- Dorsal nerve of penis or clitoris (sensory) :

- It enters the deep perineal pouch, then pierces the perineal membrane to enter the superficial perineal pouch.
- Then it runs on dorsum of penis, supplying its skin and glans.



1  
Pelvis

2  
Gluteal  
region

3  
Pudendal  
canal

4  
Deep  
perineal pouch

5  
Dorsum  
penis

A.G.N.

Inferior Anal  
fiber

Perineal  
nerve

Dorsal nerve  
of the penis

## **Internal Pudendal Artery:**

It is the artery of perineum and external genital organs.

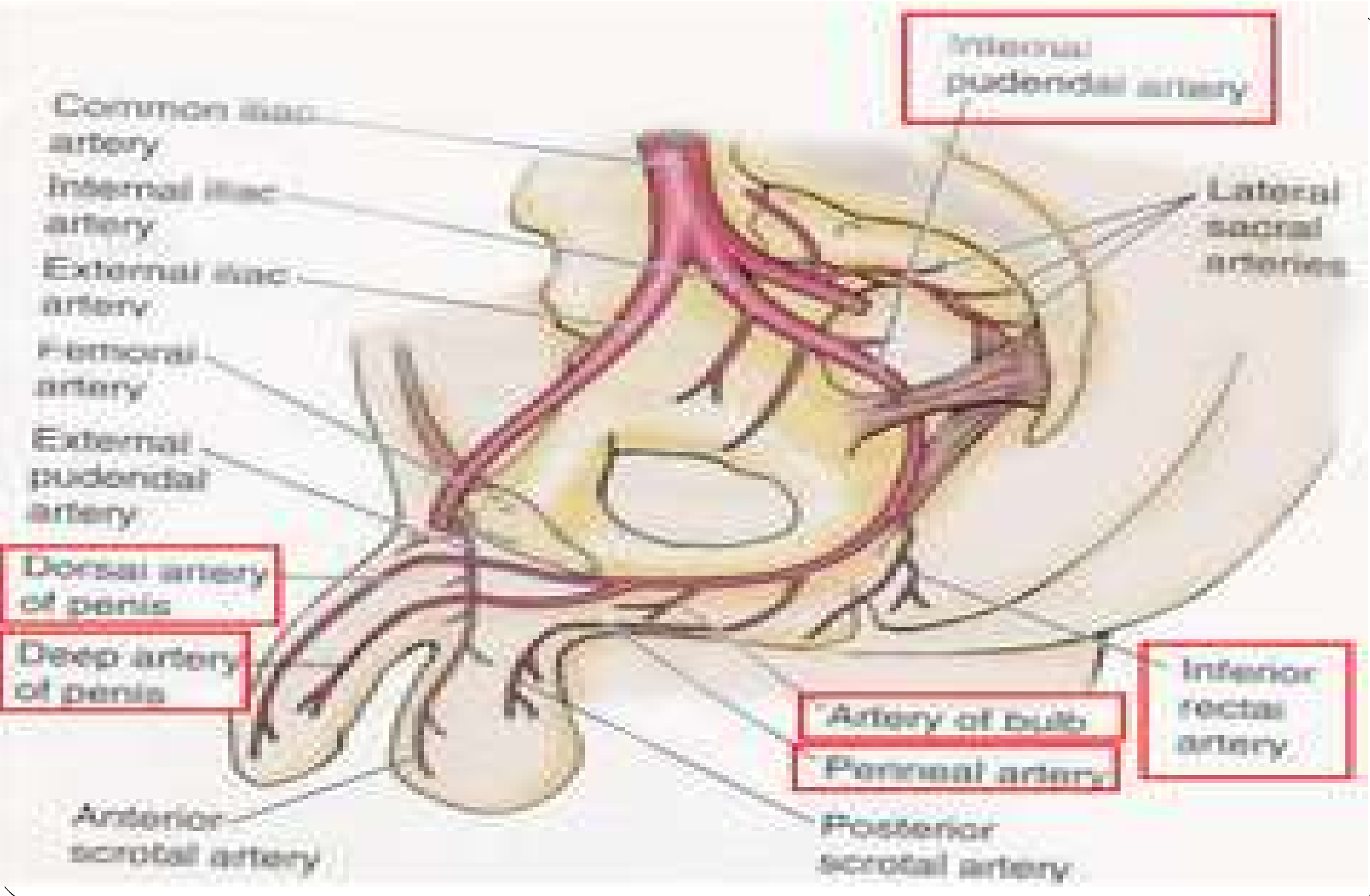
It is one of the two terminal branches of anterior division of internal iliac artery.

### **Course and Relations :**

- **In the pelvis :** it descends in front of sacral plexus and piriformis and leaves the pelvis (with pudendal N.) below the piriformis to enter the gluteal region.
- In **gluteal region:** The artery crosses the tip of the ischial spine and passes through the lesser sciatic foramen to enter the **pudendal canal** in side wall of ischiorectal fossa.
- **In the pudendal canal and perineum :**

At the end of the pudendal canal, it enters the **deep perineal pouch** then pierces the perineal membrane to enter the **superficial perineal pouch** to run close to the side of pubic arch

It ends by dividing into dorsal and deep arteries of the penis



Common iliac artery

Internal iliac artery

External iliac artery

Femoral artery

External pudendal artery

Dorsal artery of penis

Deep artery of penis

Anterior scrotal artery

Internal pudendal artery

Lateral sacral arteries

Artery of bulb

Penile artery

Posterior scrotal artery

Inferior rectal artery

## **Branches and Distribution :**

**two** in the pudendal canal, **two** in the deep perineal pouch and **two** terminal in the superficial perineal pouch.

### **A. In the pudendal canal :**

1-Inferior rectal A. : It supplies anal canal *below* the pectinate line.

2-Perineal A. : it gives

- Two scrotal (or labial) arteries to scrotum (or labia majora)
- Transverse perineal A. which anastomoses with its corresponding one .

### **B- In the deep perineal pouch :**

3-Artery of bulb : supplies bulbourethral glands and pierces perineal membrane to supply bulb of root of penis (or bulb of vestibule).

4-Urethral A. : pierces perineal membrane to enter superficial perineal pouch to supply corpus spongiosum and urethra.

### **C-Superficial perineal pouch :**

5-Dorsal A. of penis : runs on dorsum of penis, supplying its skin, fascia and glans of penis.

6-Deep A. of penis : runs in corpus cavernosum, supplying its cavernous tissue.

## Internal pudendal artery

## Internal pudendal nerve

Inferior rectal

Inferior rectal N

Perineal A

Perineal N

Two scrotal (or tibial)

Two scrotal (or tibial)

Transverse perineal A

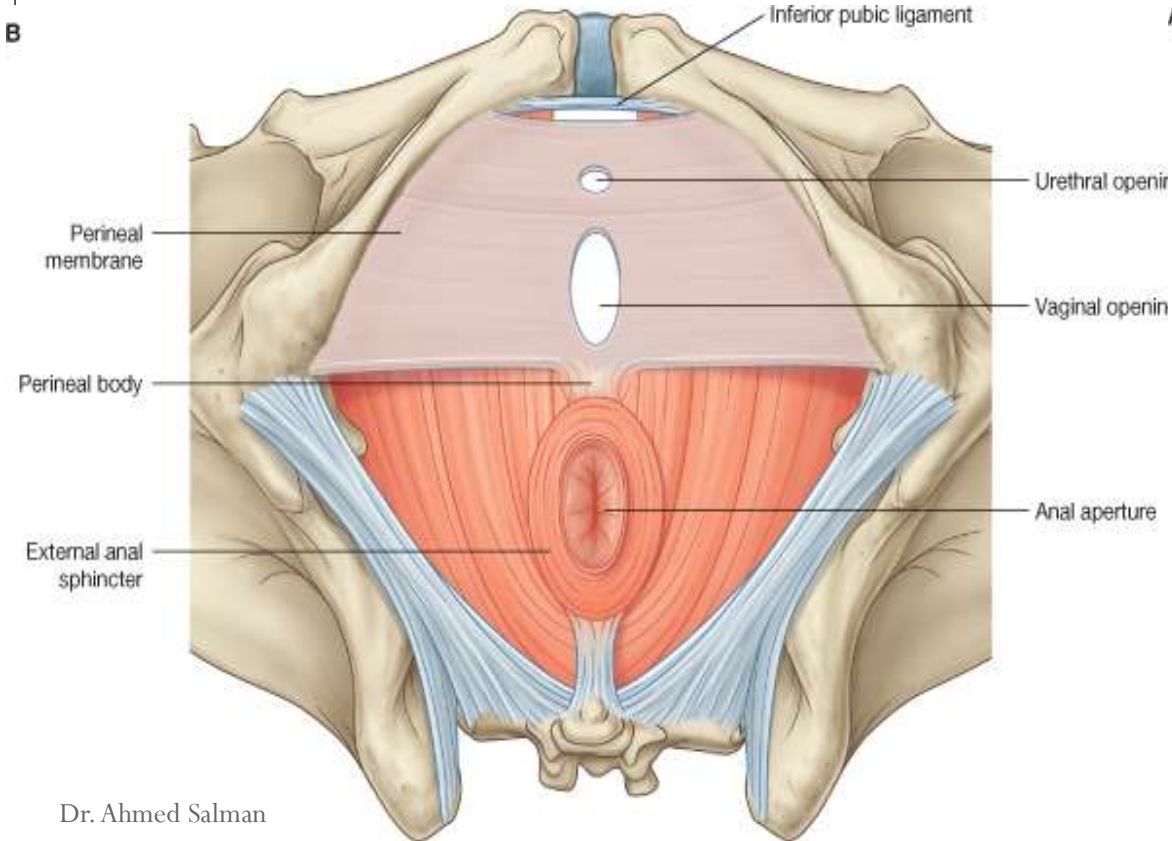
Artery of the bulb  
Urethral artery

Dorsal artery of the penis  
Deep artery of the penis

Dorsal nerve of penis or clitoris

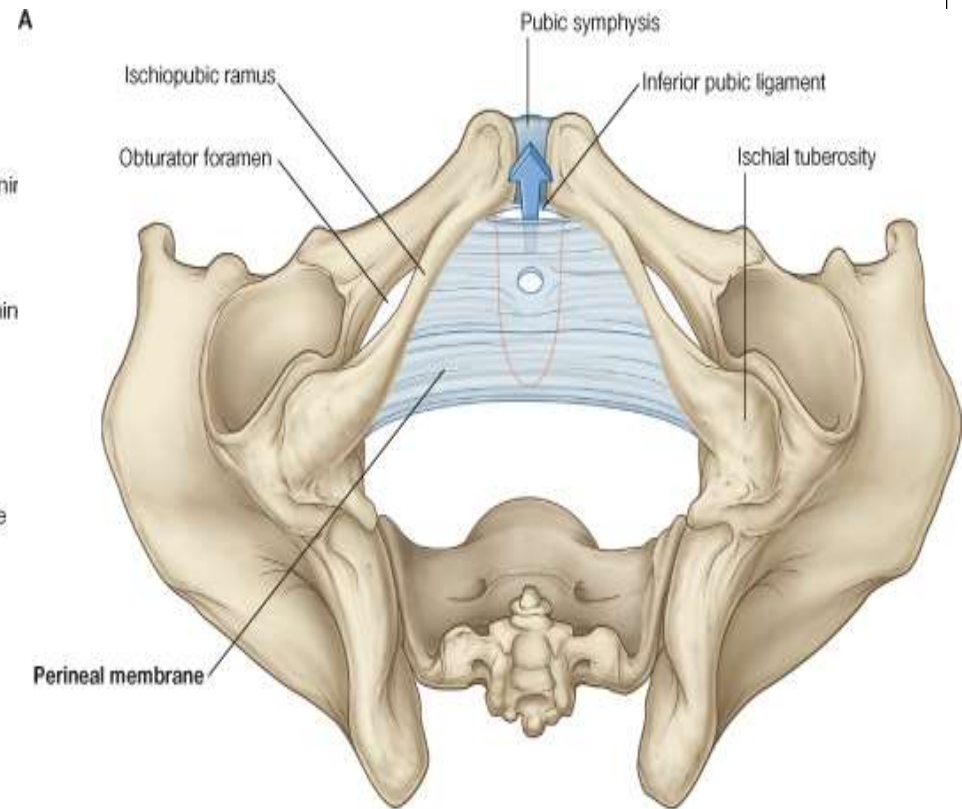


# Perineal pouches



Dr. Ahmed Salman

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## Deep Perineal pouch :

### Boundaries :

**Floor :** Perineal membrane (inferior fascia of urogenital diaphragm)

**Roof:** Inferior fascia of pelvic diaphragm (levator ani)

**On either side :** Obturator fascia.

**Posteriorly :** The pouch is closed by union of roof and floor.

**Anteriorly :** The pouch is closed by union of roof and floor below symphysis pubis to form the transverse perineal ligament.

### The transverse perineal ligament

Is separated from the symphysis pubis by an oval opening. Through this opening

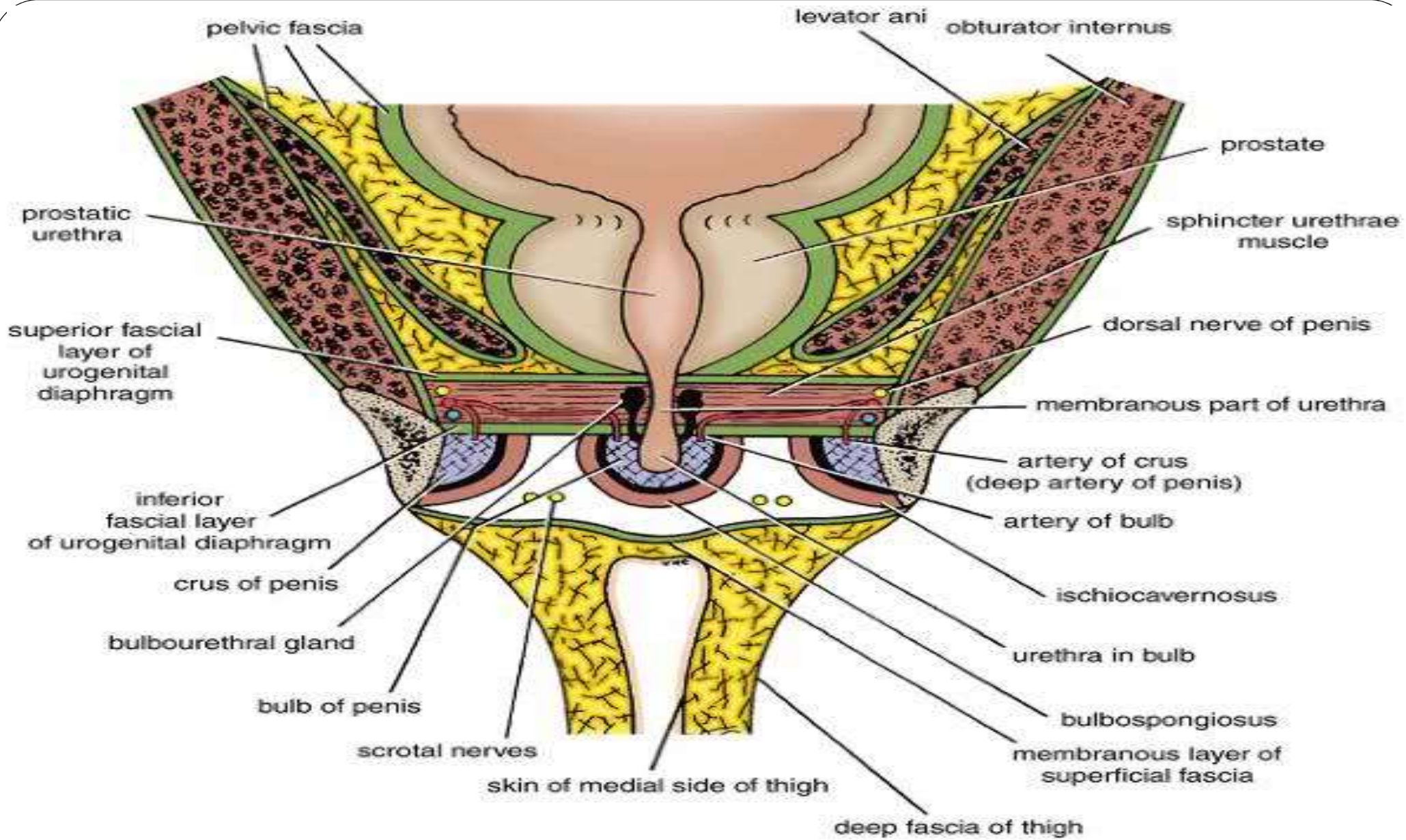
**In male** the deep dorsal vein of penis enters the pelvis to join the prostatic venous plexus.

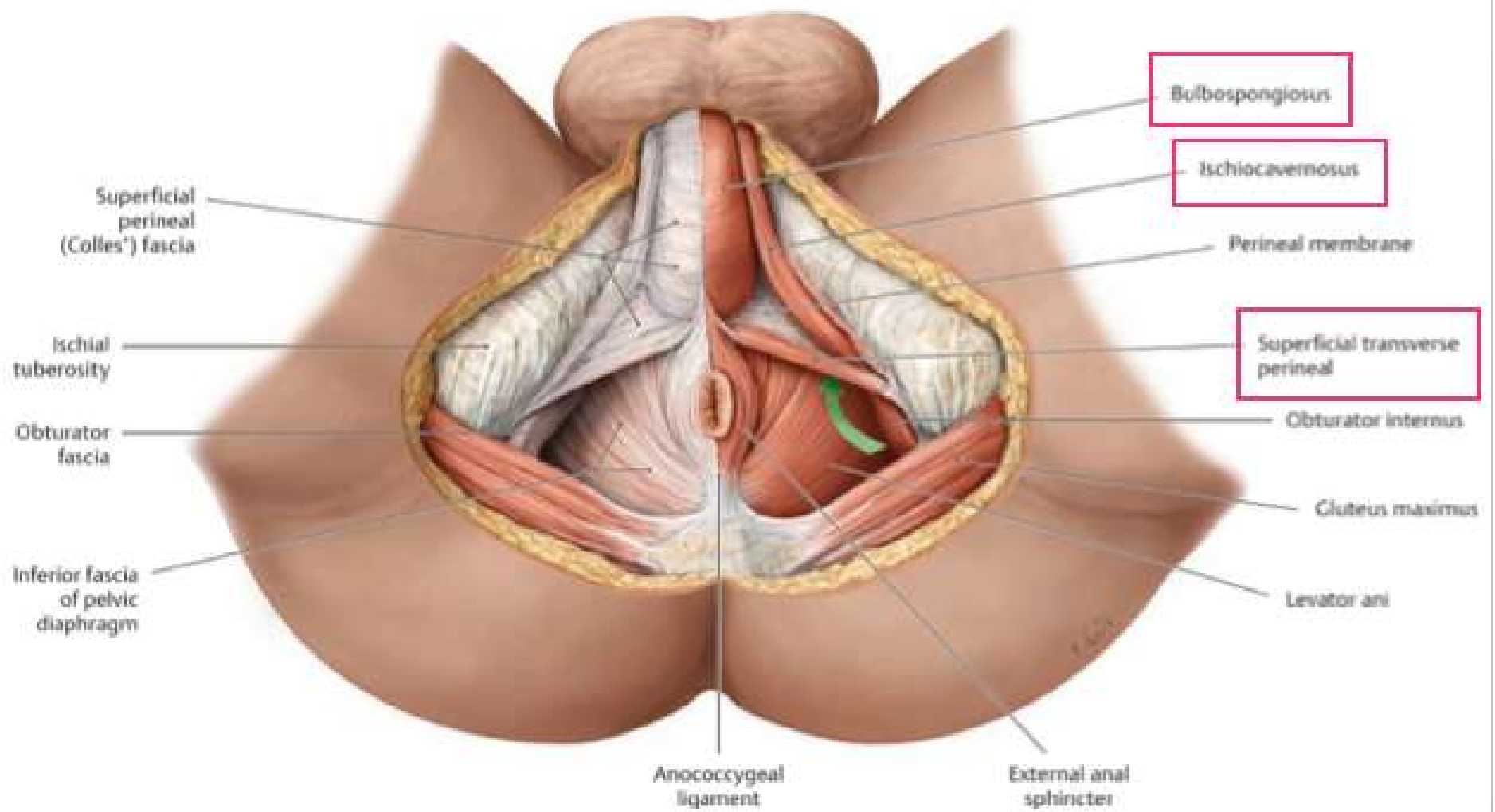
**In female,** the deep dorsal vein of clitoris joins the vesical venous plexus

## Contents of Deep Perineal pouch

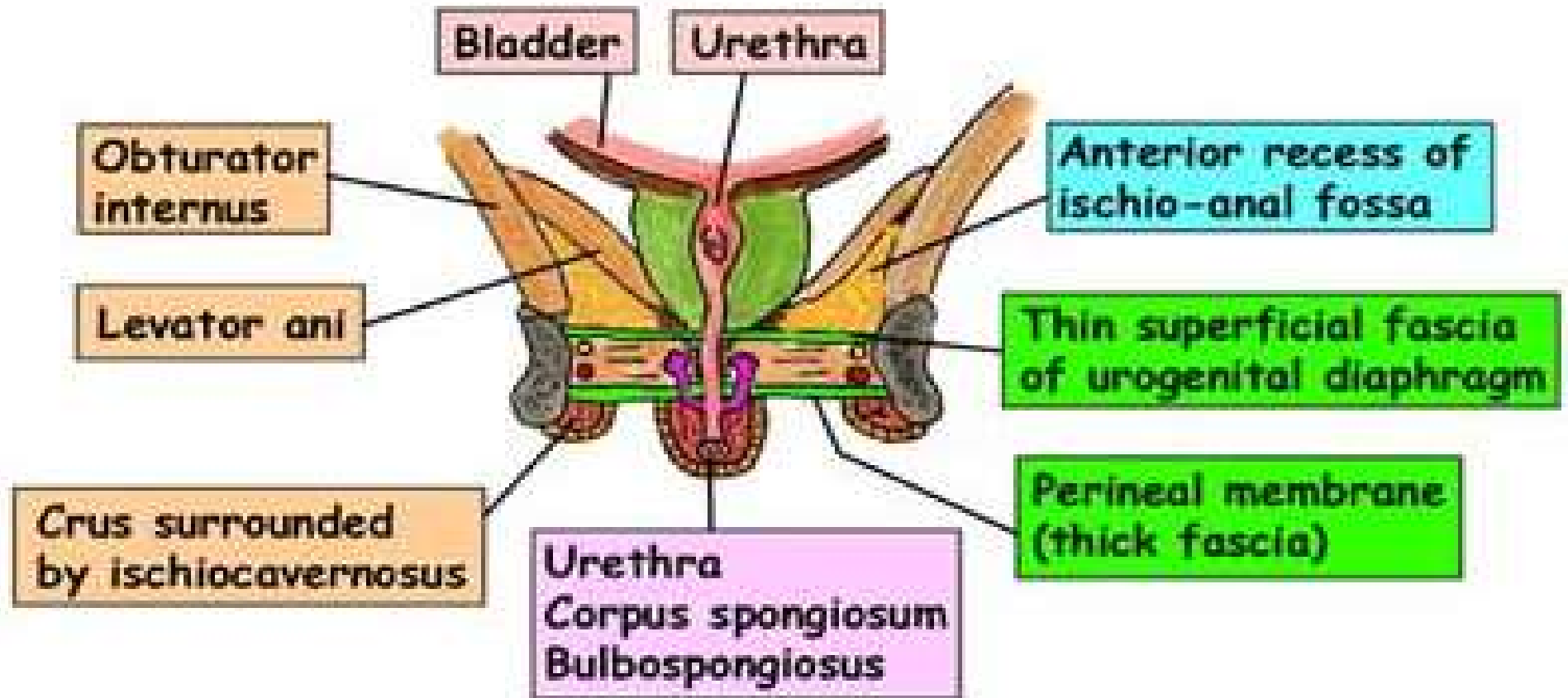
	Male	Female
<b>Urogenital Structures</b>	<ul style="list-style-type: none"> <li>• Membranous urethra</li> <li>• Bulbourethral glands</li> </ul>	<ul style="list-style-type: none"> <li>• Part of the urethra</li> <li>• Part of vagina</li> </ul>
<b>Muscles</b>	<ul style="list-style-type: none"> <li>• Sphincter urethrae</li> <li>• Deep transverse perineal muscles</li> </ul> <p>(These two muscles form the <i>urogenital diaphragm</i>.)</p>	
<b>Vessels</b>	<ul style="list-style-type: none"> <li>▪ Internal pudendal A.</li> <li>▪ Artery of bulb.</li> <li>▪ Urethral A.</li> <li>▪ Perineal A.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Internal pudendal A.</li> <li>▪ Artery of bulb of vestibule.</li> <li>▪ Perineal A.</li> </ul>
<b>Nerves</b>	<ul style="list-style-type: none"> <li>▪ Dorsal N. of penis.</li> <li>▪ Perineal N.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Dorsal N. of clitoris.</li> <li>▪ Perineal N.</li> </ul>

**N.B. : the greater vestibular glands of the female lie in the *superficial* perineal pouch, the bulbourethral glands of the male lie in the *deep* perineal pouch**

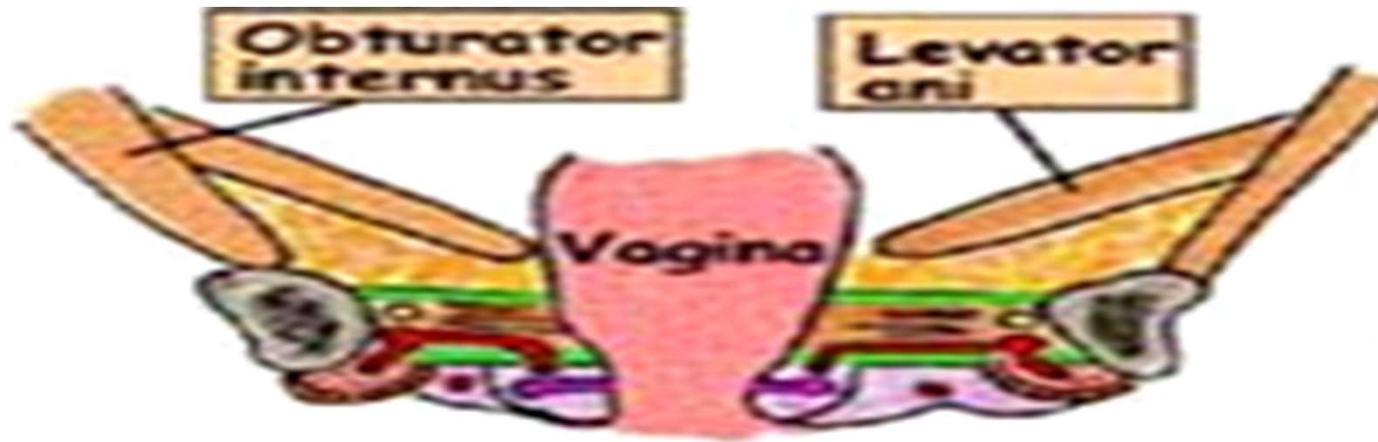




## Deep perineal pouch in male



## Deep perineal pouch in female



Coronal section  
through urogenital  
diaphragm at level  
of vagina

## Superficial Perineal Pouch:

### Boundaries :

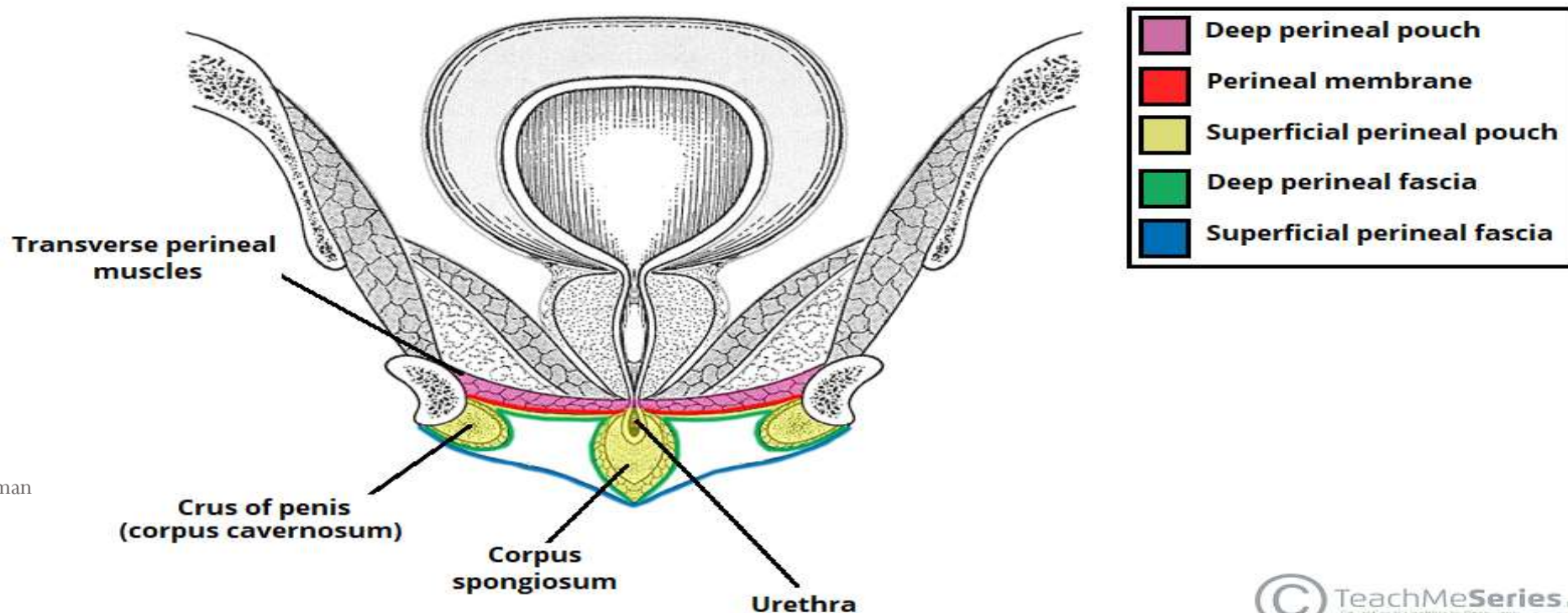
**Floor :** Membranous layer of the superficial fascia of the perineum (Colles fascia).

**Roof :** Perineal membrane.

**On either side :** both roof and floor are attached to the side of the pubic arch .

**Posteriorly :** The pouch is closed by union of the roof and floor.

**Anteriorly :** The pouch is opened and continuous with the interval between the membranous layer of anterior abdominal wall and the external oblique aponeurosis

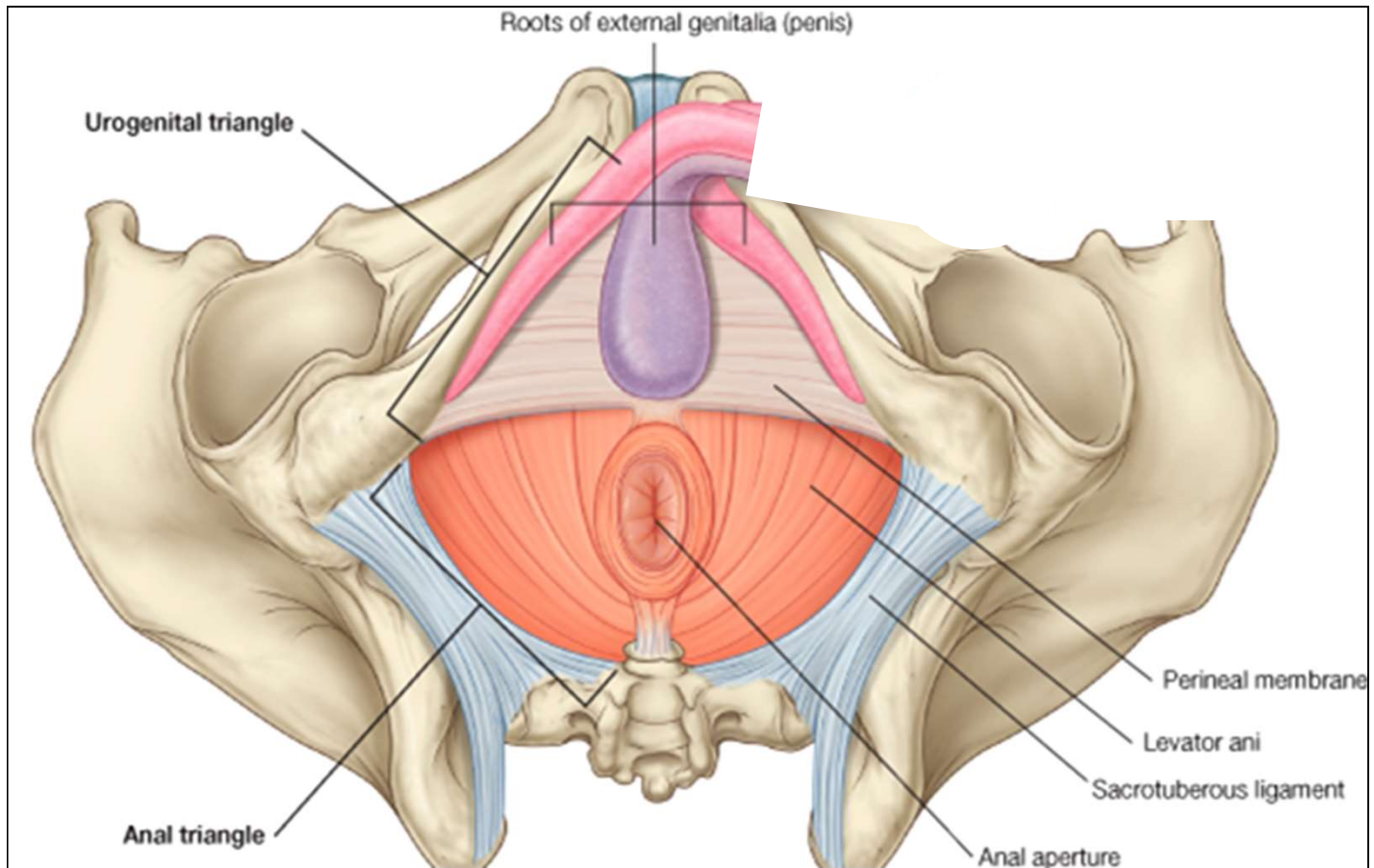




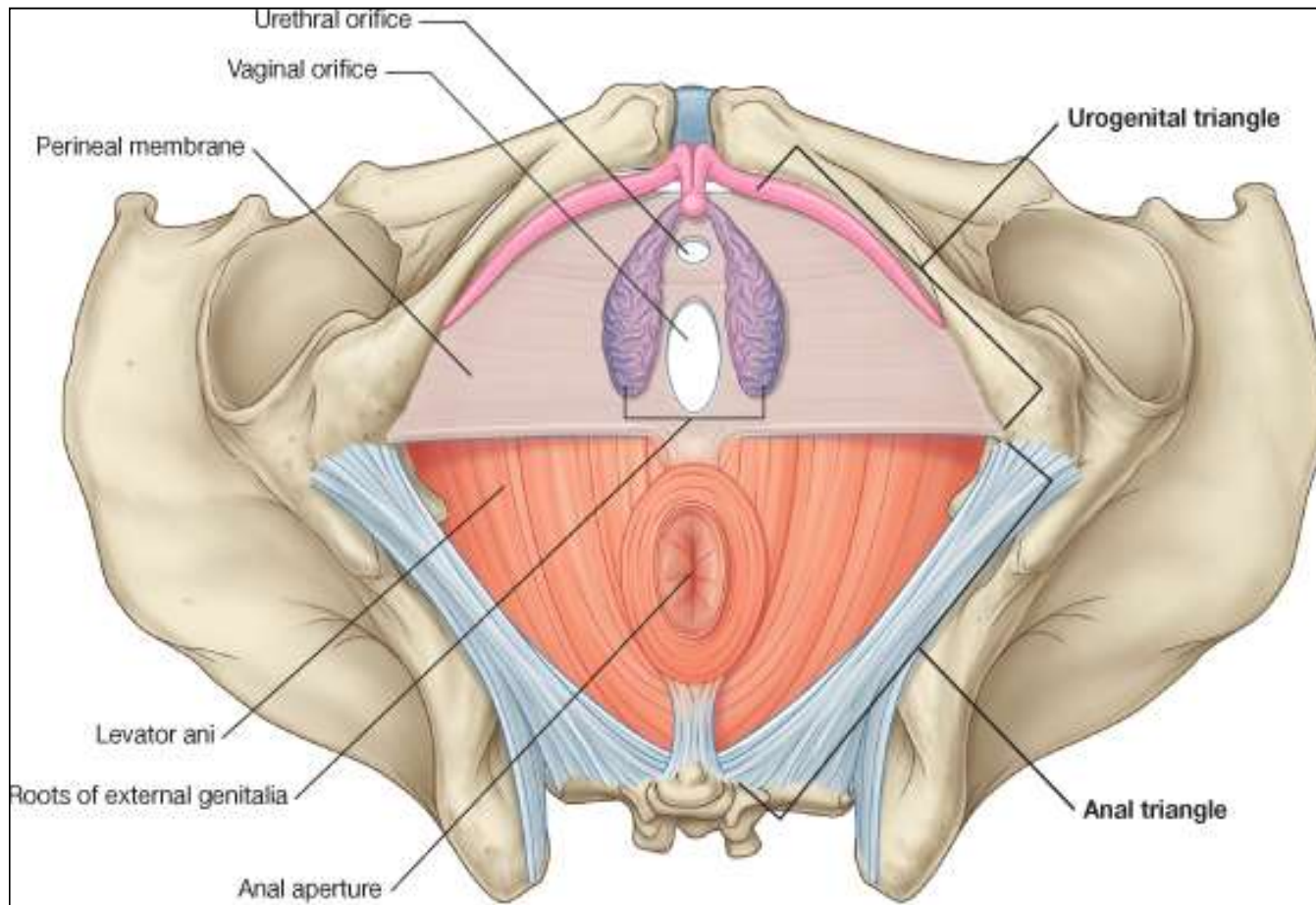
## Contents of Superficial Perineal Pouch

	Male	Female
Urogenital Structures	<ul style="list-style-type: none"> <li>• Root of penis (2 crura + Bulb)</li> <li>• Penile urethra in corpus spongiosum (bulb of penis)</li> </ul>	<ul style="list-style-type: none"> <li>• Root of clitoris (2 crura)</li> <li>• Two bulbs of vestibule</li> <li>• Greater vestibular glands.</li> </ul>
Muscles	<ul style="list-style-type: none"> <li>• Two ischiocavernosus muscles cover the 2 crura</li> <li>• Bulbospongiosus muscle covers bulb of penis.</li> <li>• Two superficial transverse perineal muscles.</li> </ul>	<ul style="list-style-type: none"> <li>• Two ischiocavernosus</li> <li>• Bulbospongiosus muscle</li> <li>• Two superficial transverse perineal muscles.</li> </ul>
Vessels	<ul style="list-style-type: none"> <li>• Dorsal A. of penis.</li> <li>• Deep A. of penis.</li> <li>• Two scrotal arteries</li> </ul>	<ul style="list-style-type: none"> <li>• Dorsal A. of clitoris.</li> <li>• Deep A. of clitoris.</li> <li>• Two labial arteries.</li> </ul>
Nerves	<ul style="list-style-type: none"> <li>• Dorsal N. of penis.</li> <li>• Two scrotal nerves</li> </ul>	<ul style="list-style-type: none"> <li>• Dorsal N. of clitoris.</li> <li>• Two labial nerves</li> </ul>

## Superficial perineal pouch in male

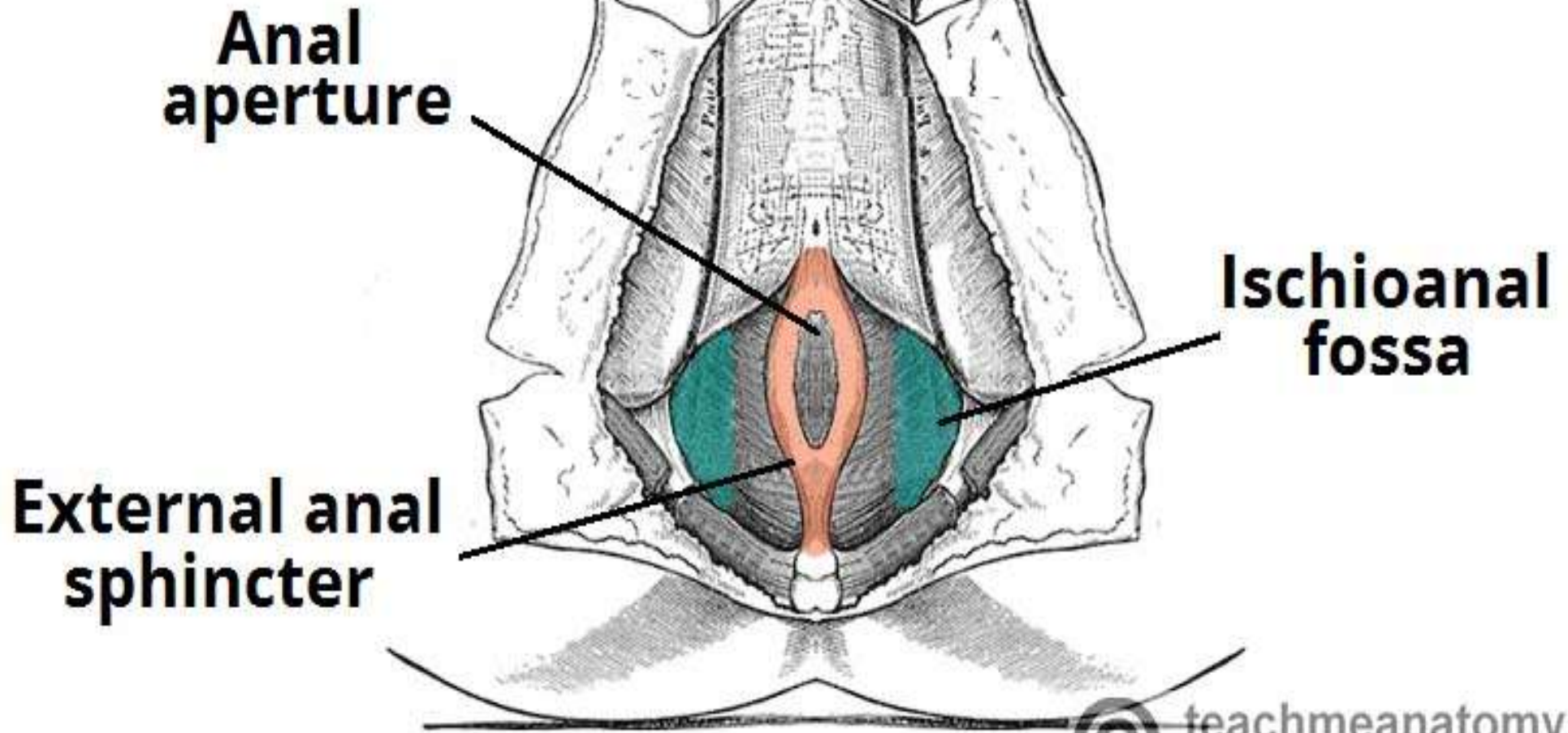


## Superficial perineal pouch in female



## Ischioanal fossa

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

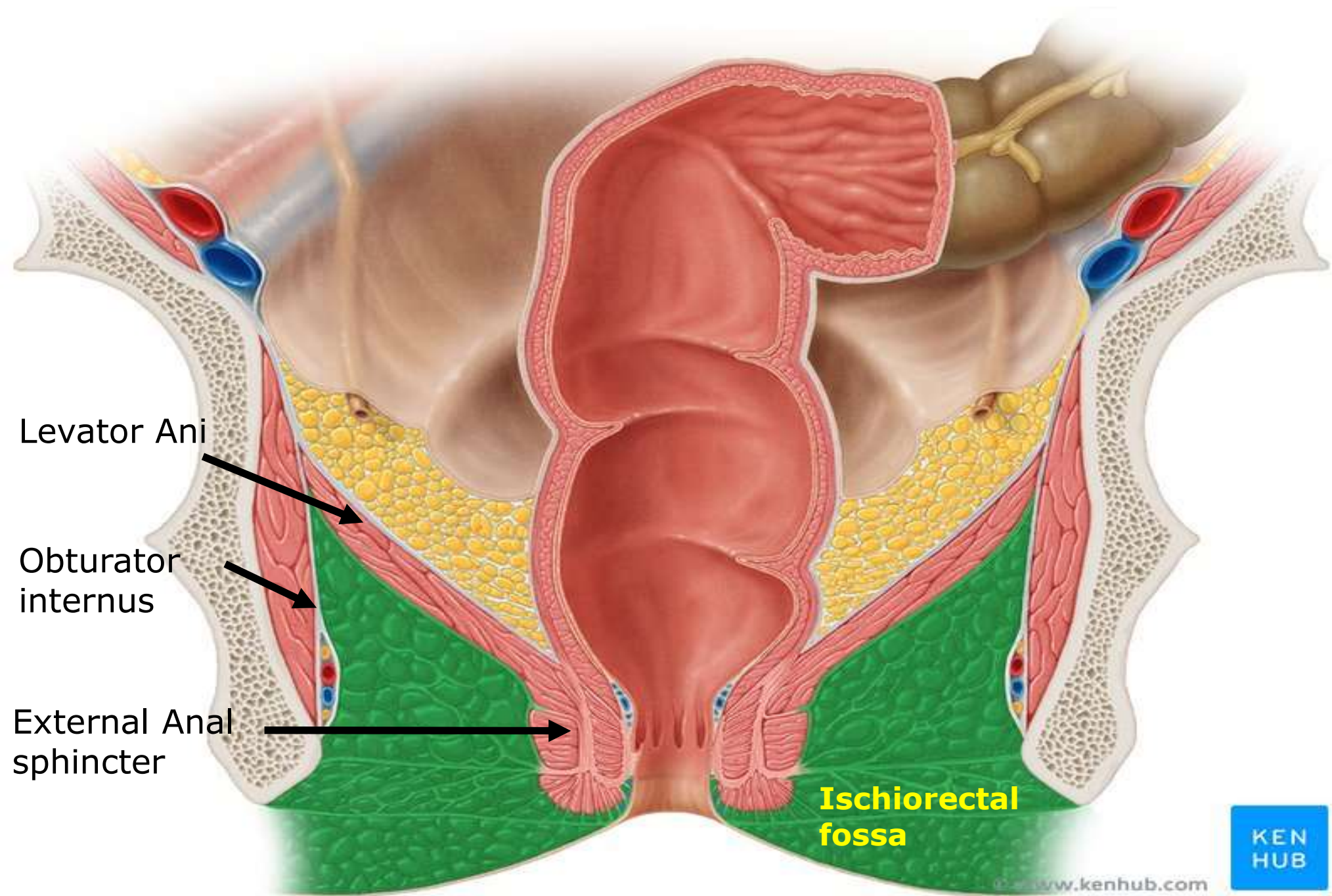


**Boundaries :** It has

1. **Apex :** it is the origin of levator ani from the lateral pelvic wall (White line)
2. **Base :** skin on either side of the anal orifice (skin of the base is supplied by inferior rectal N.).
3. **Anteriorly :** the posterior border of the perineal membrane
4. **Posteriorly :** sacrotuberous ligament covered by lower border of gluteus maximus muscle.
5. **Lateral wall :** is vertical formed by :
  - Lower part of obturator internus muscle and lower part of obturator fascia splitting to form pudendal canal.
  - Medial surface of ischial tuberosity.
6. **Medial wall :** formed by :
  - Levator ani muscle (lower surface).
  - External anal sphincter.

The pudendal nerve is related to Lower part of obturator internus muscle and obturator fascia inside the ischiorectal fossa

\* كى اسلايد مهمه !! \*



Levator Ani



Obturator internus



External Anal sphincter



**Ischioanal fossa**

## Contents of Ischiorectal fossa :

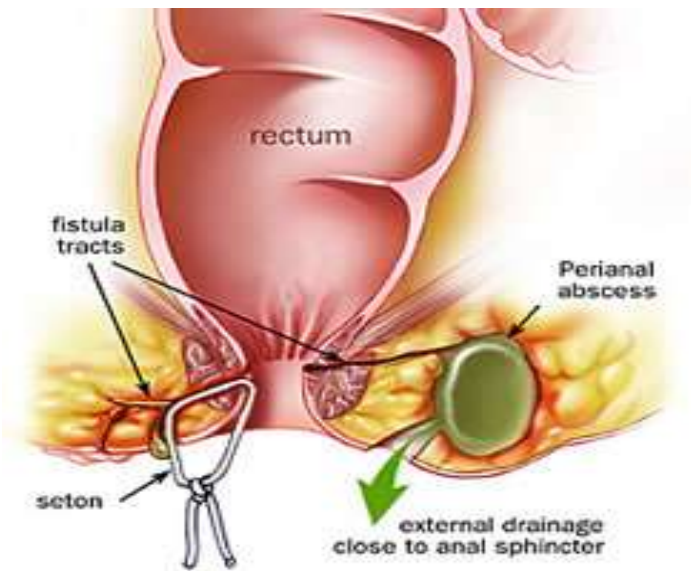
1. Pudendal nerve.
2. Internal pudendal vessels.
3. Inferior rectal nerve.
4. Inferior rectal vessels.
5. Posterior scrotal nerves.
6. Posterior scrotal vessels.
7. Perforating cutaneous N. (S2, S3) .
8. Pad of Fat : It is rich in fibroelastic fibres and has two functions :

- It acts as a cushion support for rectum and anal canal.
- It allows distention of the rectum and anal canal during defaecation,  
Then compress them after termination of the act.

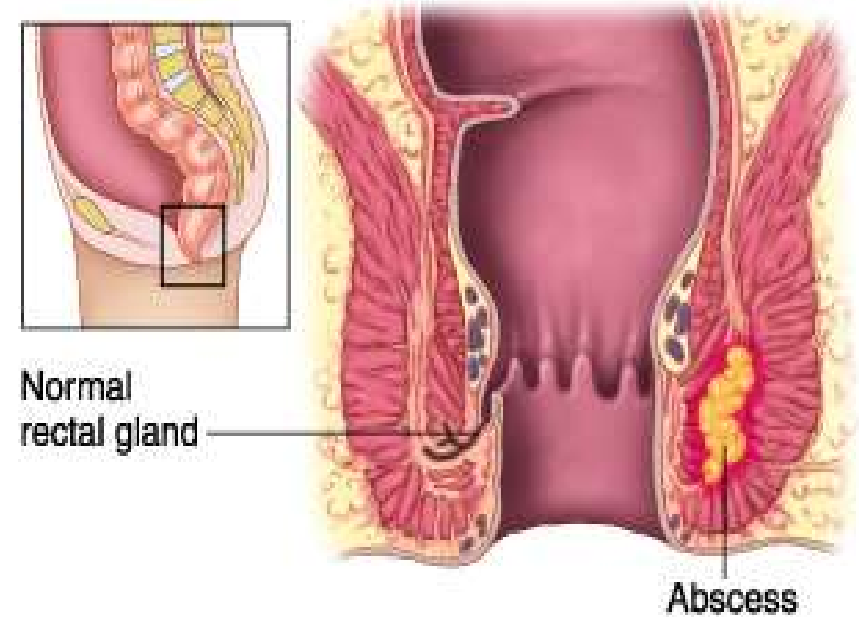
## Applied Anatomy:

Infections in the ischiorectal pad of fat is common and lead to abscess formation.

The abscess may rupture medially into the anal canal or downwards into the skin at the fossa. This may leads to anal fistula



Anal Fistula



Dr. Ahmed Salman



Thank  
you

Jordan University  
Faculty Of Medicine

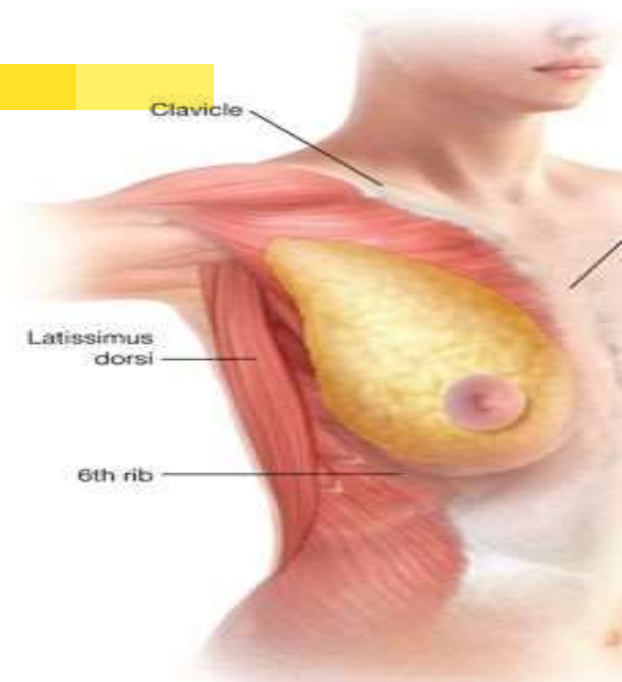


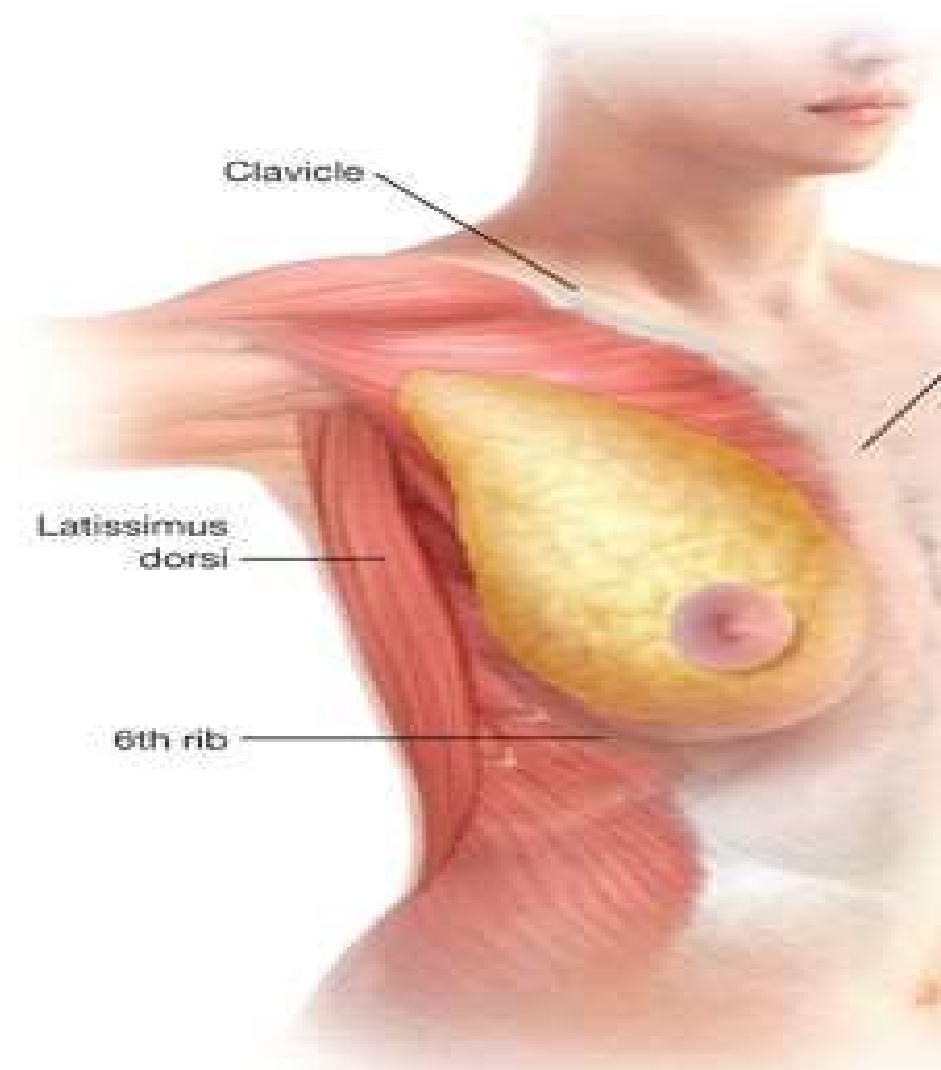
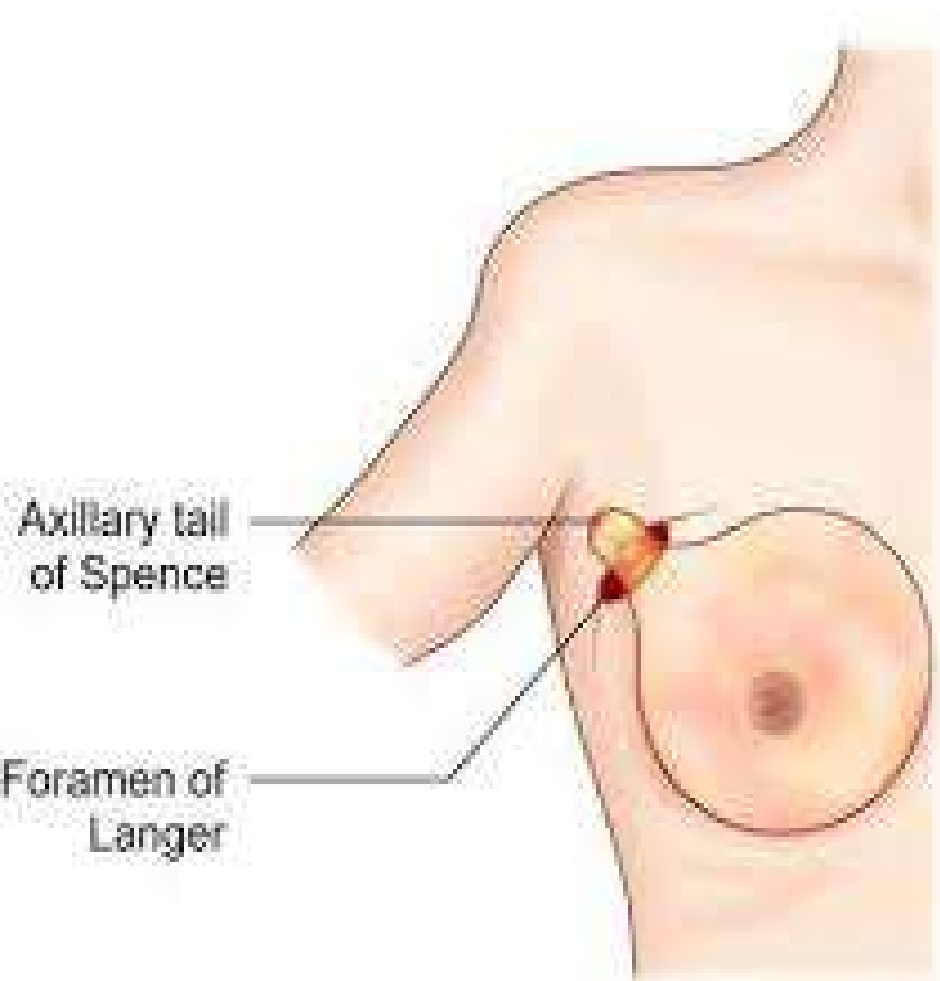
# Anatomy of the Breast

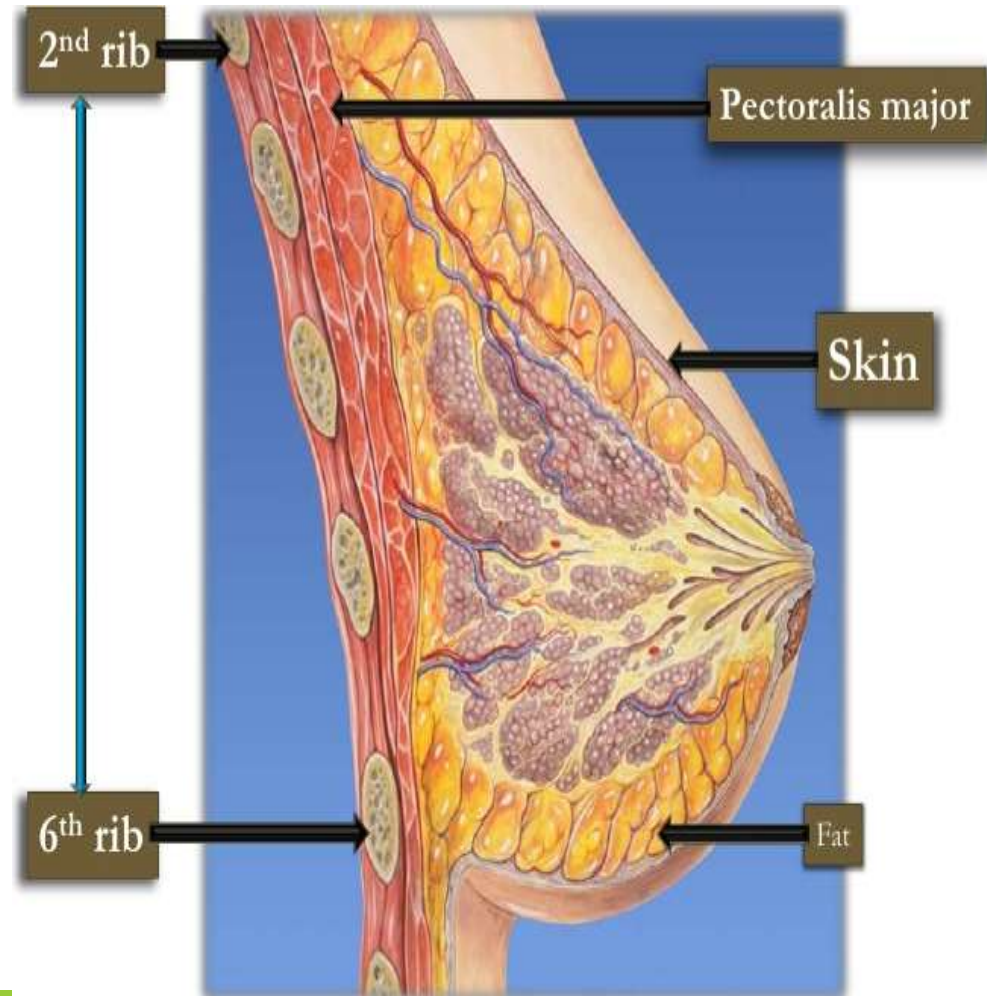
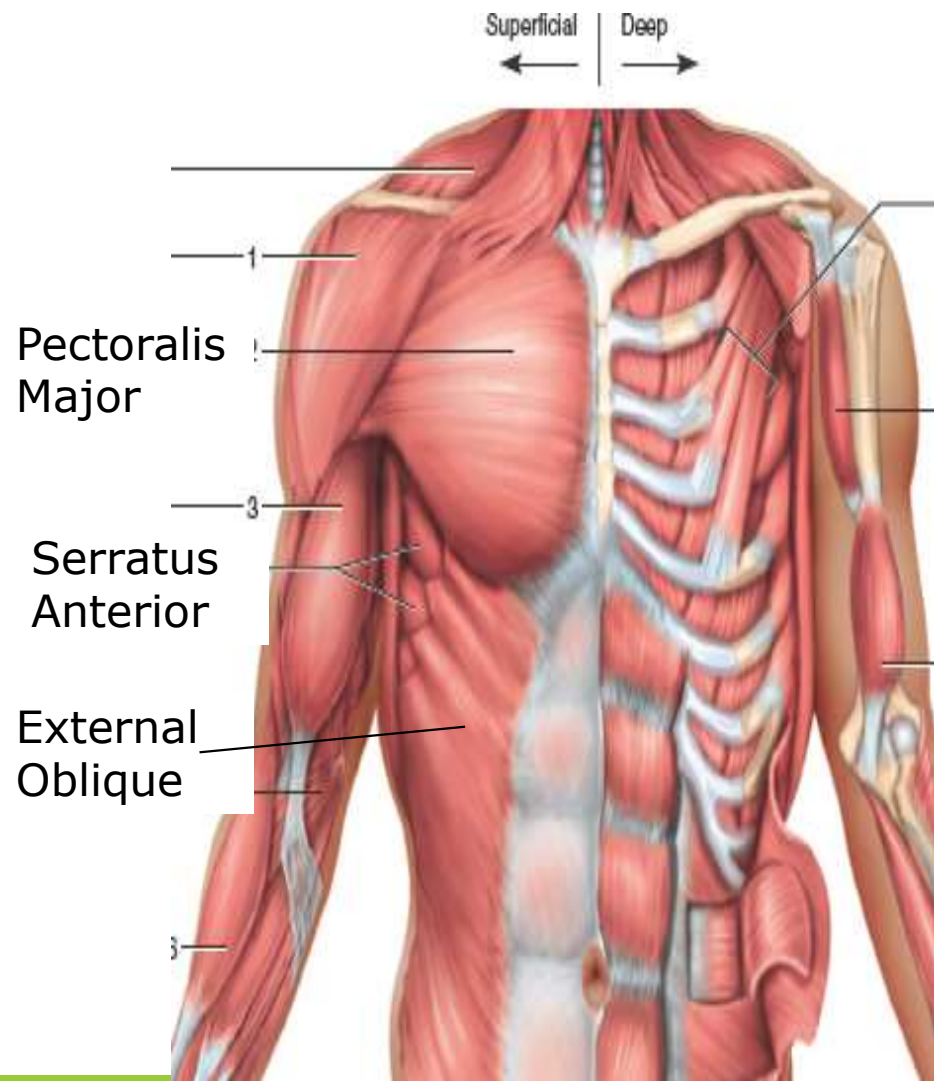
**Dr. Ahmed Salman**

Associate professor of anatomy & embryology

- ❖ The breasts are specialized accessory glands of the skin that secrete milk .
- ❖ They are present in both sexes.
- ❖ It is located in superficial fascia of pectoral region.
- ❖ It is axillary tail (**axillary tail of Spence** ) extends upward and laterally, pierces the deep fascia and enters the axilla. It passes through an opening in the deep Pectoral fascia is known as (**foramen of langer**)
- ❖ The base of the breast extends from the 2<sup>nd</sup> to 6<sup>th</sup> rib
- ❖ From the lateral margin of the sternum to the mid axillary line .







## Deep Relations:

The deep surface of the breast is related to the following structures in that order :

### 1) The retromammary space:

- It is loose areolar tissue between the gland and deep fascia (pectoral fascia)
- Allows the free mobility of the breast over the deep fascia.

**2) The deep fascia :** covering the pectoralis major muscle

**3) The flat base of the breast** lies on the pectoralis major (medial 2/3) and serratus anterior (lateral 1/3).

**4) The lower lateral part of the gland** rests on the external oblique muscle of the abdomen

## Structure of the breast

includes the skin, parenchyma and stroma.

**1) Skin:** covers the gland and fascia.

### a) Nipple

conical projection from just below the centre of the breast , Lies in the 4th intercostal space

#### Contains

- a. Circular smooth muscle erect the nipple.
  - b. Longitudinal smooth muscle flatten the nipple.
- Carries the opening of lactiferous ducts (15-20 openings).

### b) Areola:

- Pigmented area of skin that surrounds the base of the nipple.
- It is rich in modified sebaceous gland particularly at the outer margin.

sebaceous gland is a microscopic exocrine gland in the skin that opens into a hair follicle to secrete an oily or waxy matter, called sebum

These become enlarged during pregnancy and lactation to form raised tubercles "tubercles of Montgomery"

These glands secrete oily secretin, which has a great importance to lubricate the nipple and areola and prevents them from cracking during lactation

➤ Fat and hair are absent under the areola and nipple .

**2) The stroma :** The gland has no capsule. The stroma is divided into :

**1) Fibrous stroma**

- Forms fibrous septa known as suspensory ligaments of Cooper.
- The septa divide the gland into 15-20 lobules.
- The septa anchor the skin and the gland to the pectoral fascia.

**2) Fatty stroma:**

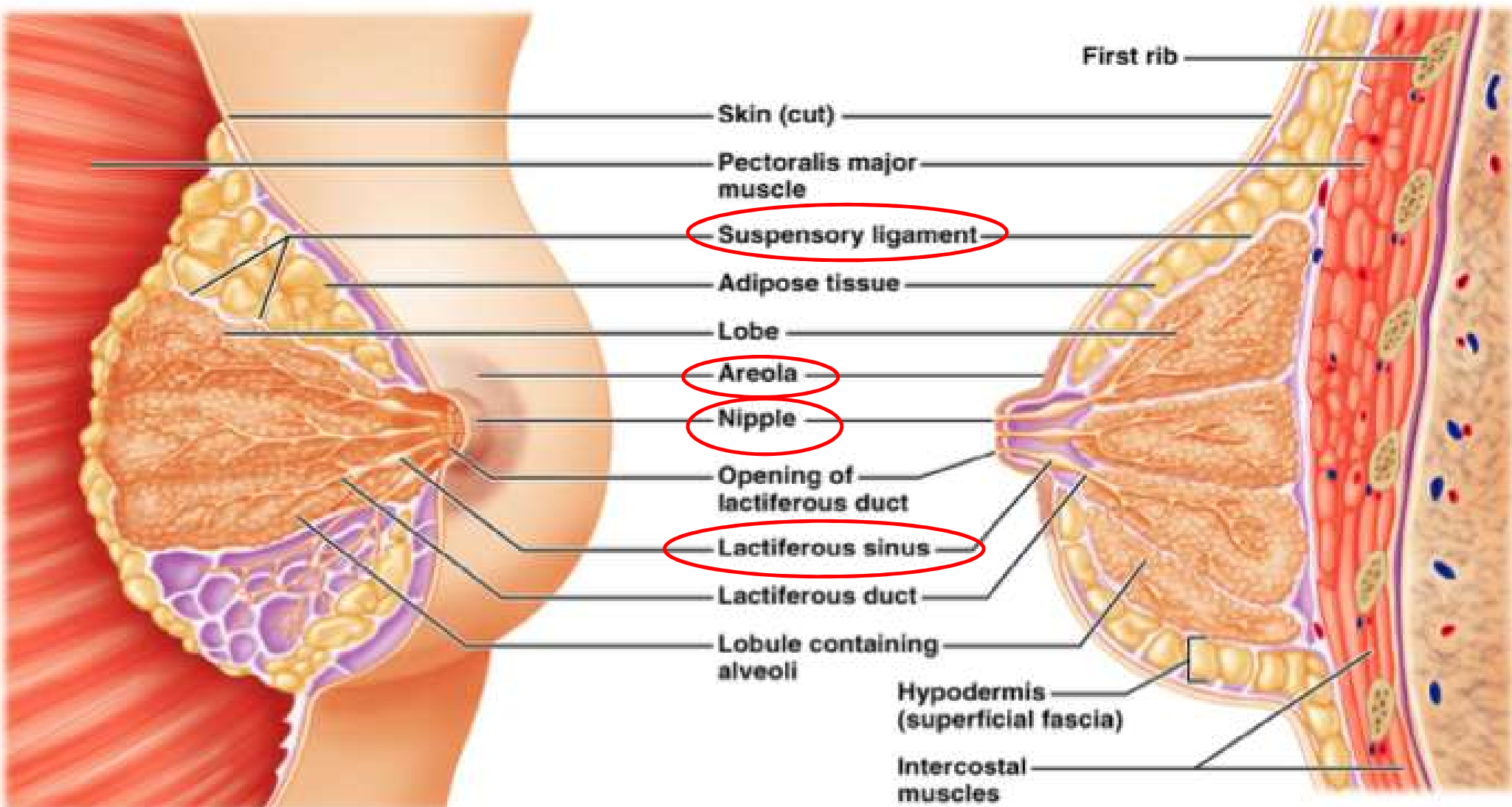
- Forms the main bulk of the gland , The gland is embedded into it
- It is responsible of the smooth contour of the breast.

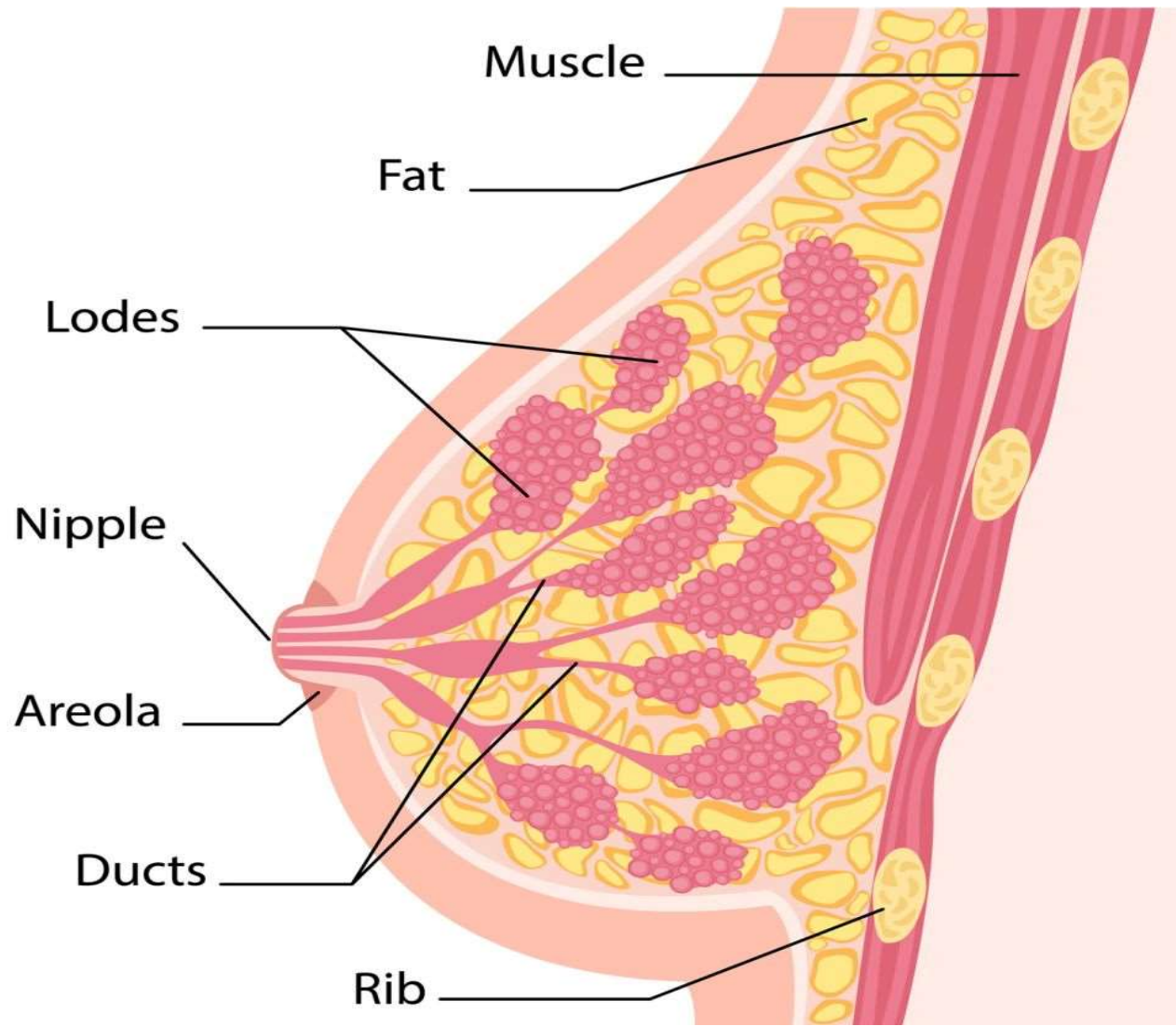
**3) Parenchyma (mammary gland):**

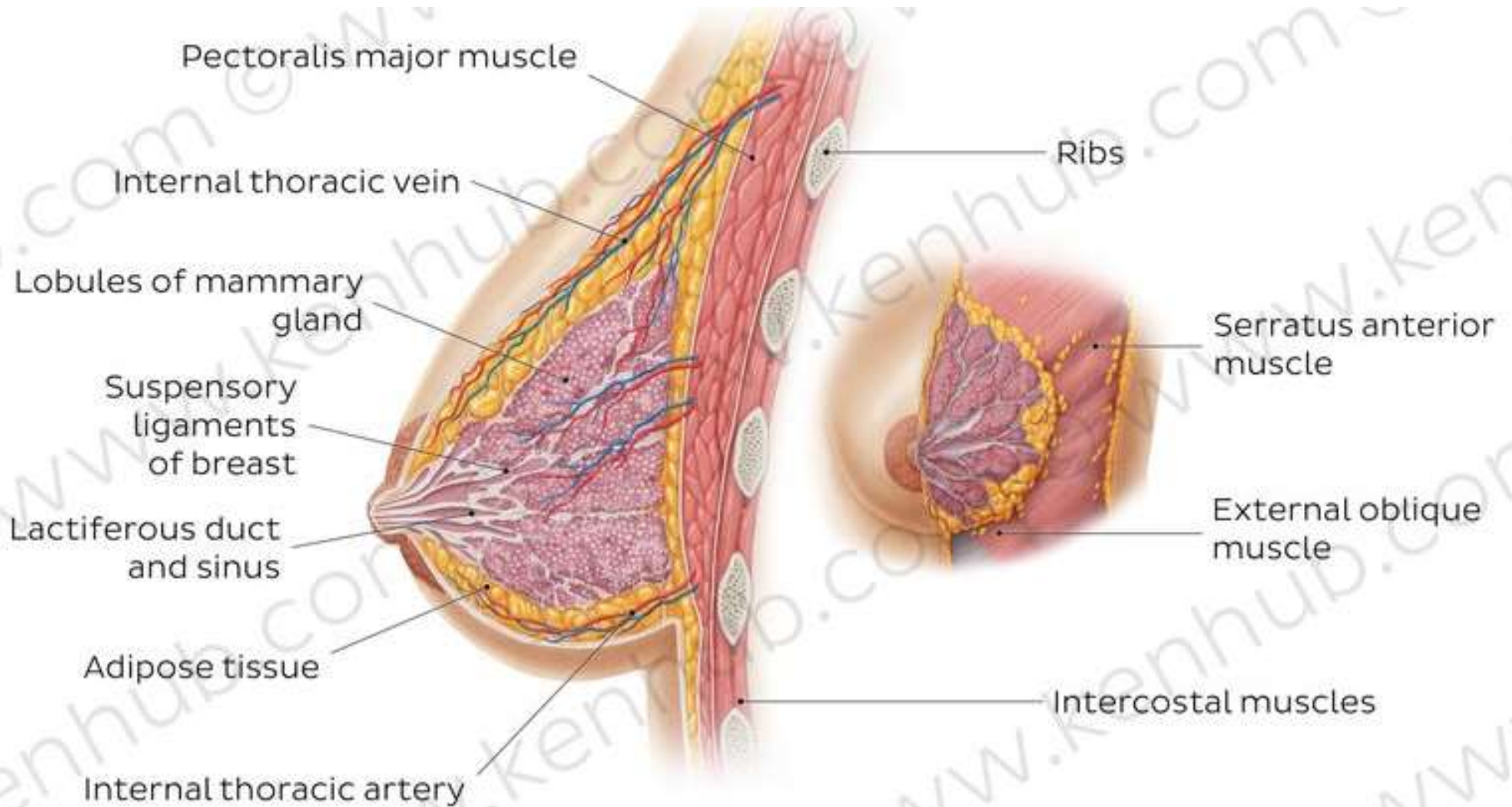
- Consists of the glandular tissue which secretes milk.
- The glandular tissue is divided into 15-20 lobules
- Each lobule has a lactiferous duct.

The lactiferous duct dilates under the areola to form to lactiferous sinus then become narrow again to open on the summit of the nipple.

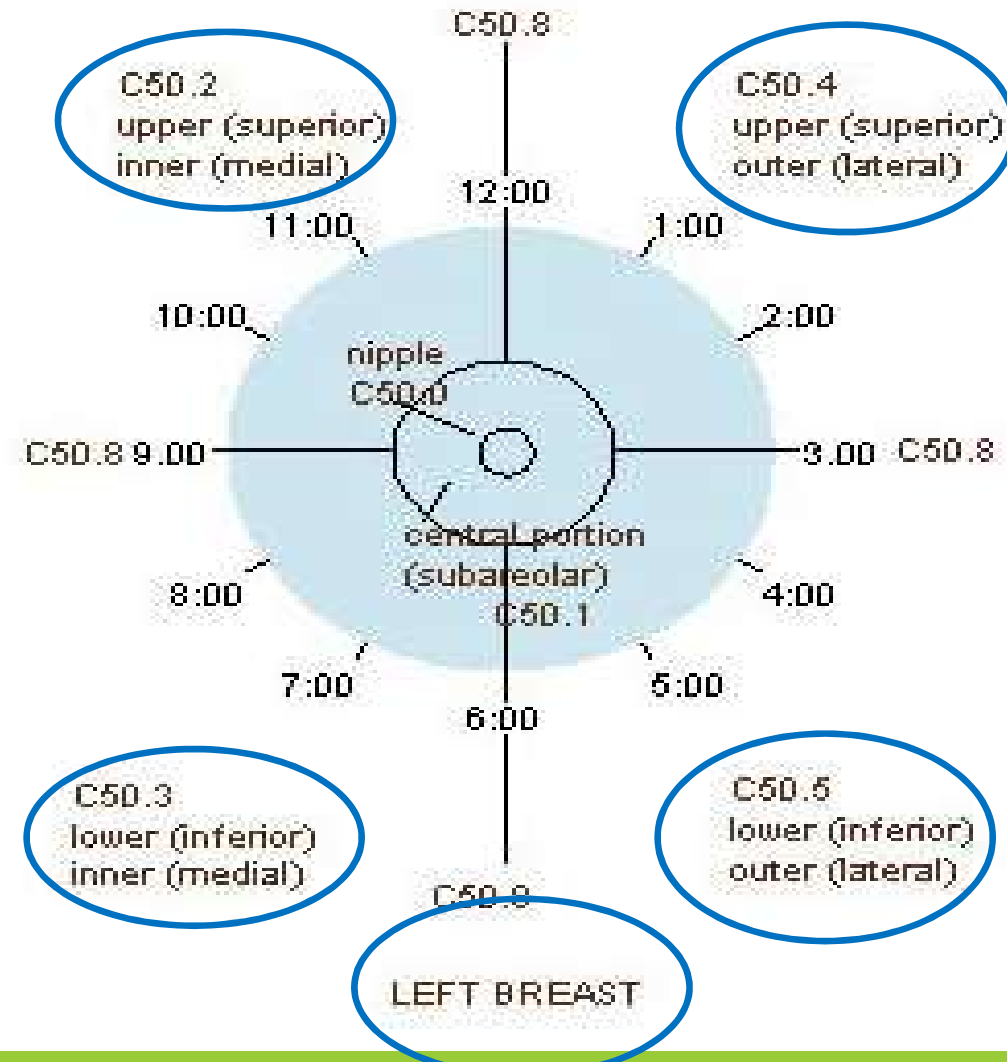
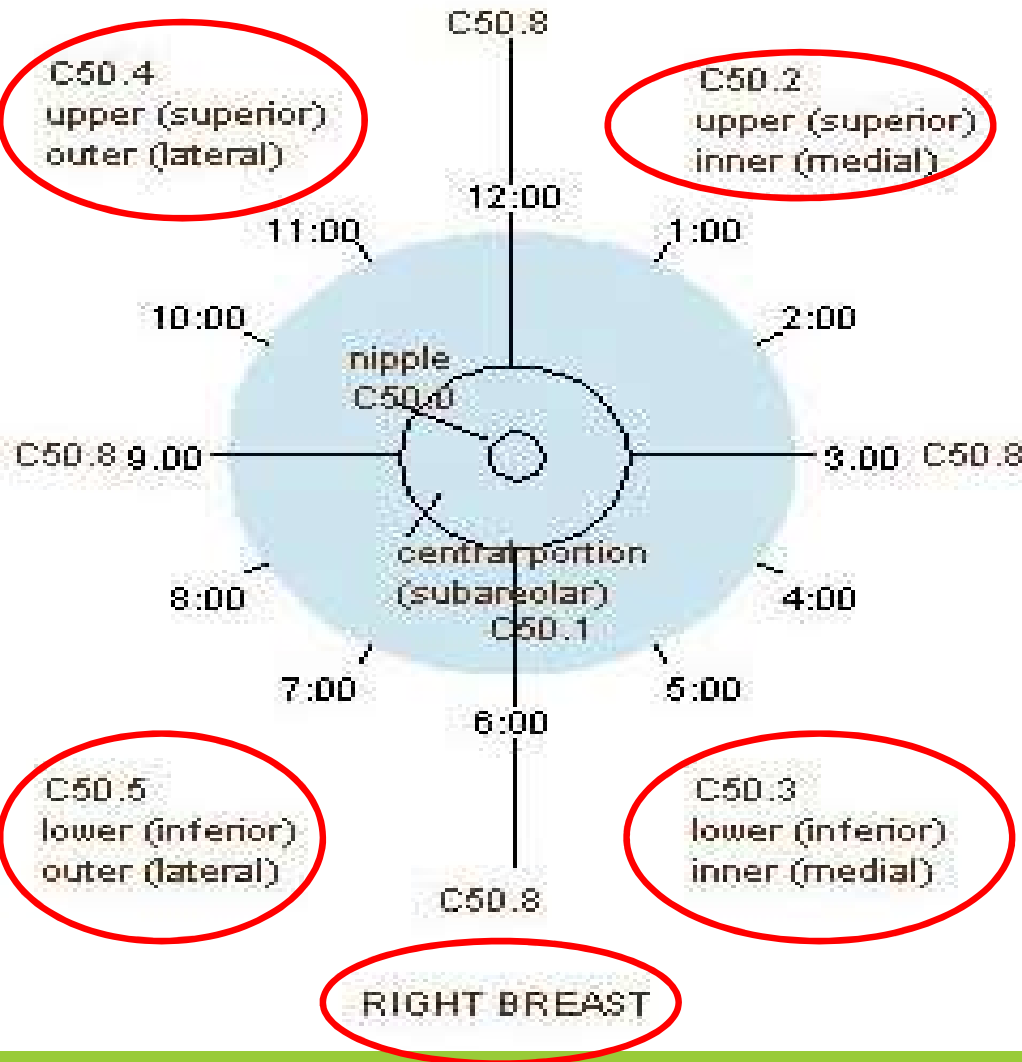








# \* الساعة مهمة كل رنة عليها سؤال \*



## Arterial supply:

### 1) The medial part.

- a) Perforating branches of the internal mammary artery
- b) Anterior intercostal arteries from 2-6

### 2) The (upper lateral part)

← for blood supply ← \* تكرار السؤال عنه  
Pectoral branch of the thoraco acromial artery. (branch of 2<sup>nd</sup> part of axillary artery).

### 3) The lower lateral part:

Lateral thoracic artery (branch of 3<sup>rd</sup> part of axillary artery).

## Venous drainage :

- 1) The subcutaneous tissues → venous circle at the base
- 2) The gland and stroma → small veins that accompany the arteries → internal mammary and axillary veins

Pectoral branch thoracoacromial artery

**Lateral**

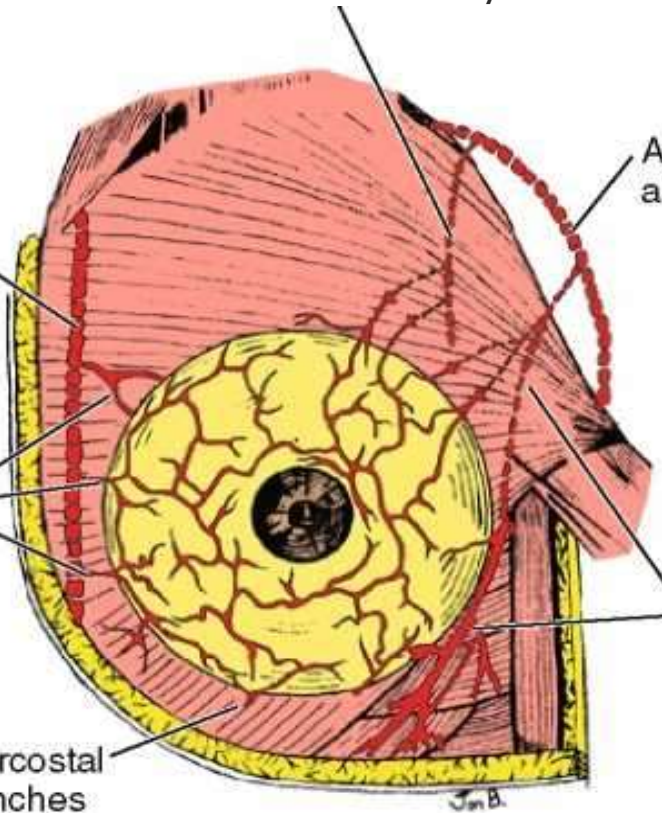
Internal  
mammary  
artery

Axillary  
artery

Anterior  
intercostal  
perforating  
arteries

Lateral  
thoracic  
artery

Intercostal  
branches  
of arteries



## Lymphatic drainage of the female breast:

**The superficial lymphatics**, form a dense plexus deep to the areola which is called the *subareolar plexus*

**The deep lymphatics** form a plexus on the deep fascia of pectoralis major which is called the *deep lymphatic plexus*

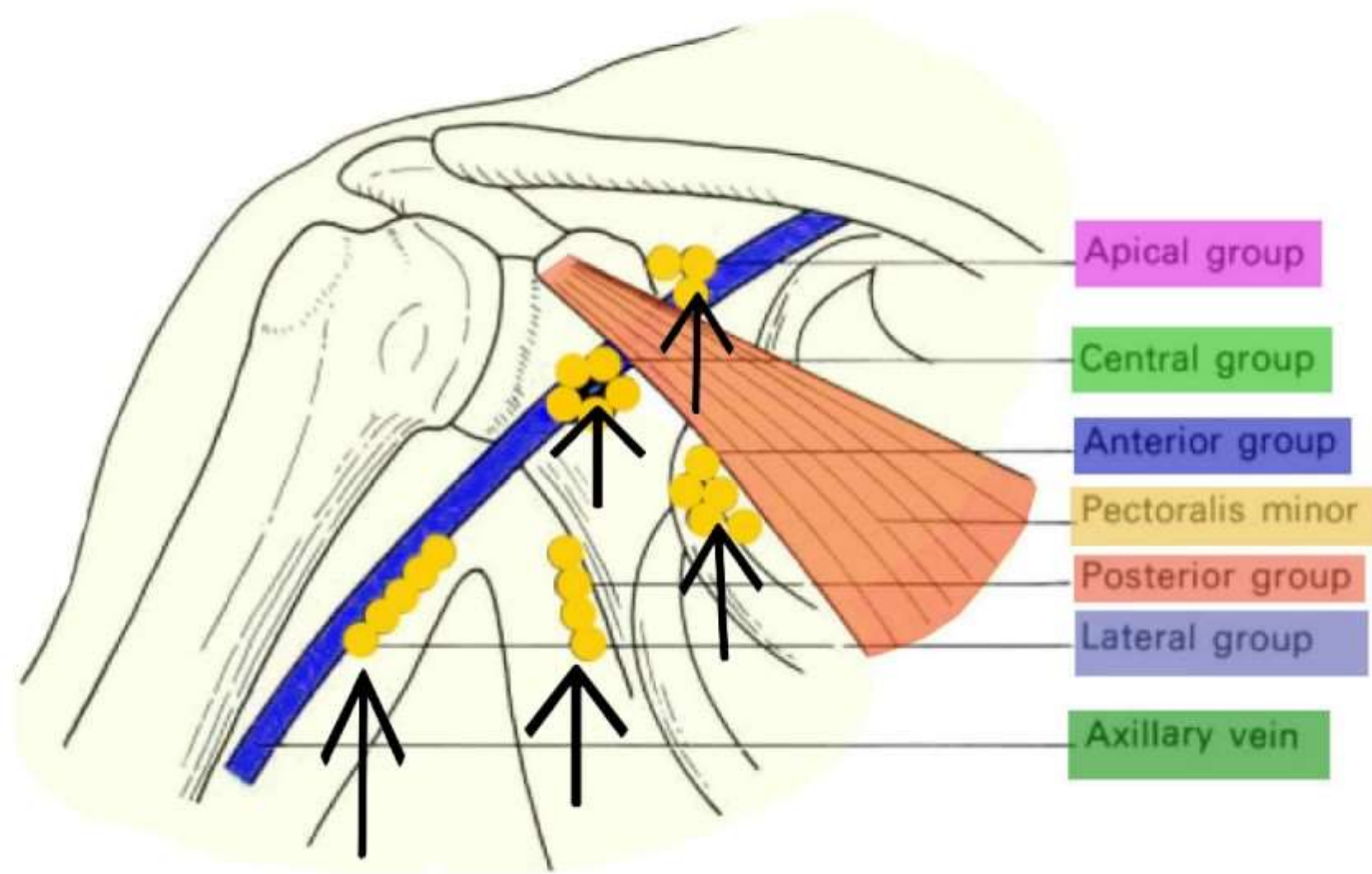
- The **central and lateral parts of the gland** drain into the **pectoral (anterior)** group of axillary lymph nodes
- One or two large lymphatics from the **upper part of the gland** pierce the clavicular head of pectoralis major and the clavipectoral fascia to end in the **apical group of axillary lymph nodes**
- Lymphatics from the **medial part** of the gland pass through the intercostal spaces with the perforating branches of the internal mammary artery to end in the **internal mammary (parasternal)** lymph nodes
- Lymphatics from the **medial part** of the gland also cross the middle line to anastomose with the lymphatics of **the opposite breast**
- Lymphatics from the **inferomedial** part of the gland anastomose the lymphatics of the **rectus sheath, linea alba and subdiaphragmatic lymphatics**

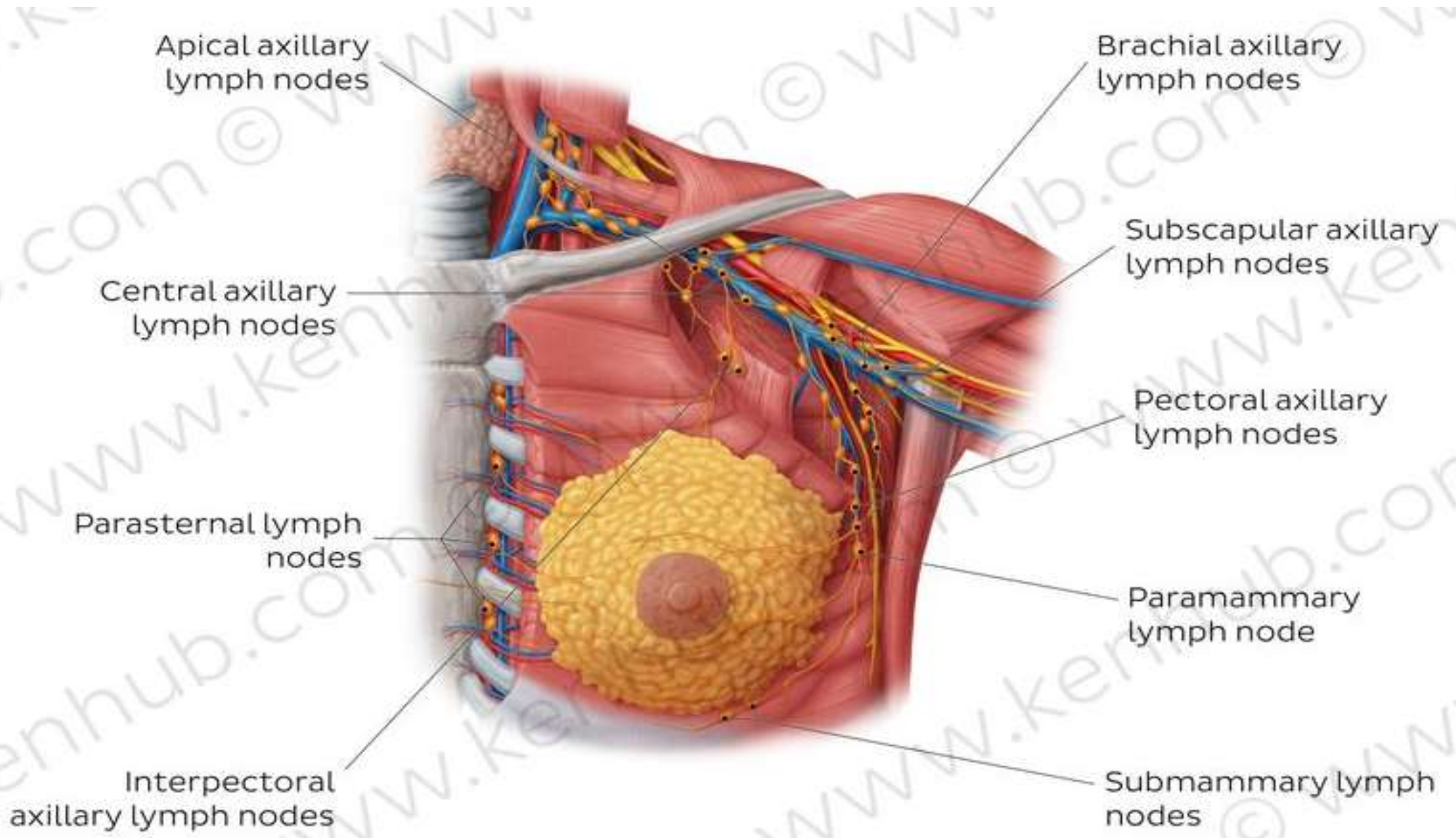
## Lymphatic drainage of the female breast:

Area	Lymph Group
Central and lateral parts	Pectoral (anterior) group of axillary lymph nodes
Upper part	Apical group of axillary lymph nodes
Medial part	Internal mammary (parasternal) lymph nodes Cross to opposite breast
Inferomedial part	Lymphatics of the rectus sheath, linea alba and subdiaphragmatic lymphatics



# Lymphatic Drainage Of Breast





## **Carcinoma of the breast may give rise to the following features :**

- 1) Retraction or puckering of the skin due to invasion of the ligament of Cooper. ←
- 2) Peau d'orange or oedema with pitting oedema is due to obstruction of cutaneous lymphatics by cancer cells and pitting due to fixation of the hair follicles to subcutaneous tissue. ←
- 3) Retraction of the nipple is due to extension of the growth along the lactiferous ducts with accompanying fibrosis. ←
- 4) Breast may become fixed with the deep fascia, pectoral muscle and chest wall due to direct spread to the subjacent structures.
- 5) Axillary lymph nodes may be involved, these are stony, hard and fixed

## **Mammography**

- ❖ Mammography is a radiographic examination of the breast.
- ❖ This technique is extensively used for screening the breasts for benign and malignant tumors and cysts.





**Inverted nipple**



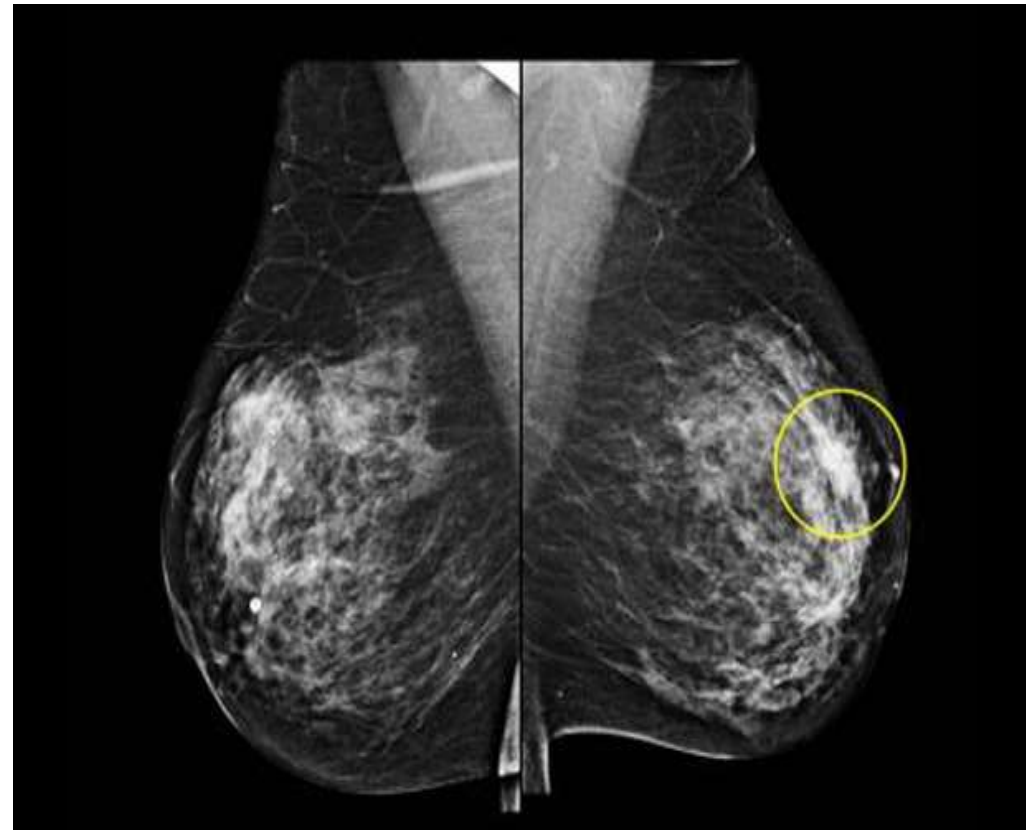
**Retracted nipple**



**puckering of the skin**



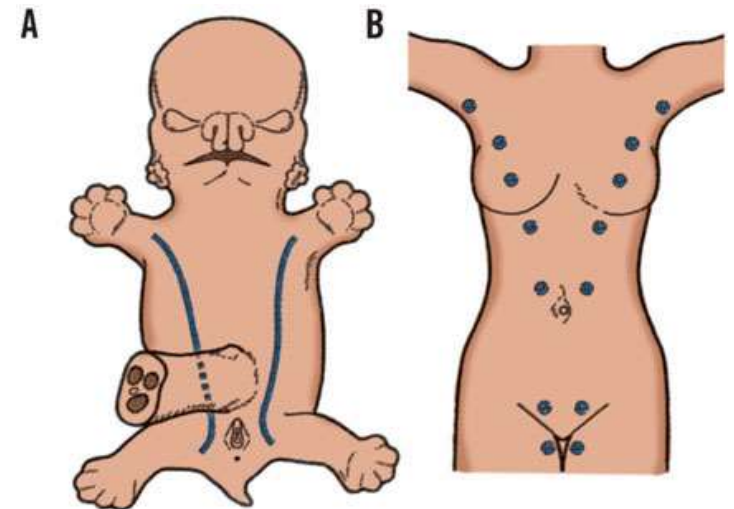
**Peau d'orange**



Normal Mammography

## Development of the Breasts

- A linear thickening of ectoderm appears called the **milk ridge**, which extends from the axilla obliquely to the inguinal region.
- the ridge disappears except for a small part in the pectoral region.
- This localized area thickens, becomes slightly depressed, and sends off 15 to 20 solid cords, which grow into the underlying mesenchyme.
- The underlying mesenchyme proliferates, and the depressed ectodermal thickening becomes raised to form the **nipple**.
- At the fifth month, the **areola** is recognized as a circular pigmented area of skin around the future nipple.



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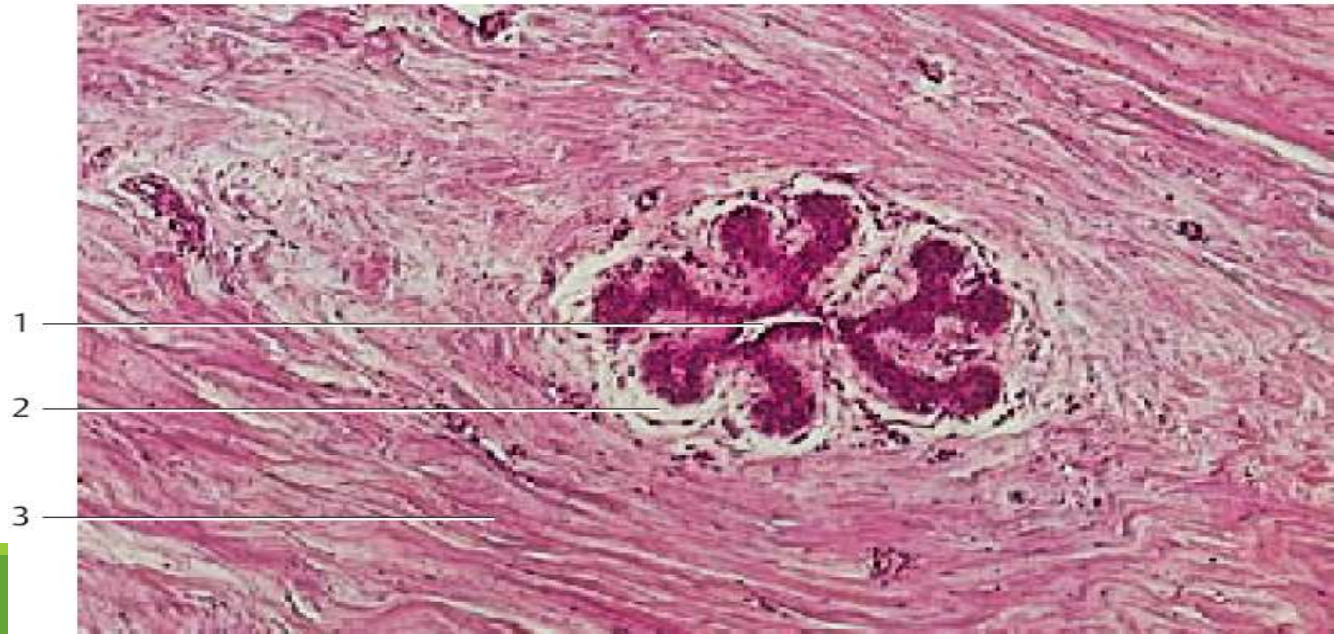
## Histology of the breast

The mammary gland is a compound tubule alveolar, formed of lobes and lobules. The lobules are separated by dense & fatty C.T.

### Resting gland:

- Ducts (lactiferous ducts) are embedded in abundance of fatty C.T. and are considered the principal glandular elements
- The ductule epithelium cells show small alterations and vacuolation during the menstrual cycle.
- Alveoli are collapsed and represented by solid cords of cells.

- 1-Sinus lactiferi
- 2- Connective tissue sheath
- 3- Coarse fibrous collagenous connective tissue



histo of pregnancy breast;

Alveoli distended

The glandular tissue is divided into 15-20 lobules

Milk in acini appears interrupted with vacuoles of dissolved fat

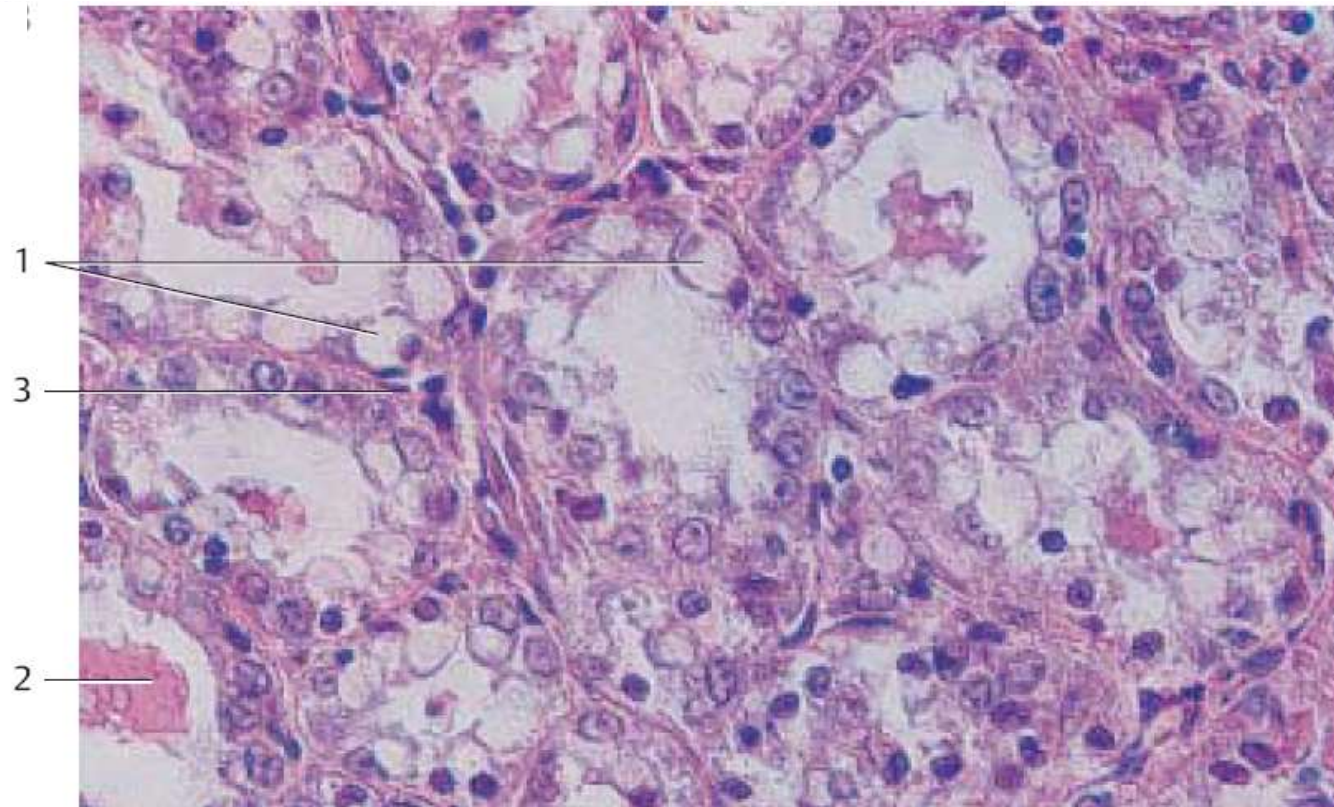
## Lactating gland:

- Little amount of C.T. and many secretory acini and ducts.
- Some acini and ducts are distended with milk others are empty.
- The acini are lined by either tall columnar or low cuboidal cells depending on the state of activity
- Milk in acini appears interrupted with vacuoles of dissolved fat.
- Myoepithelial cells are found around the acini and beneath the terminal ductule epithelium.

1-Secretory product in gland cells  
(vacuoles)

2 -Secretory product

3 -Myoepithelial cells







Thank  
You



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