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Female genital system

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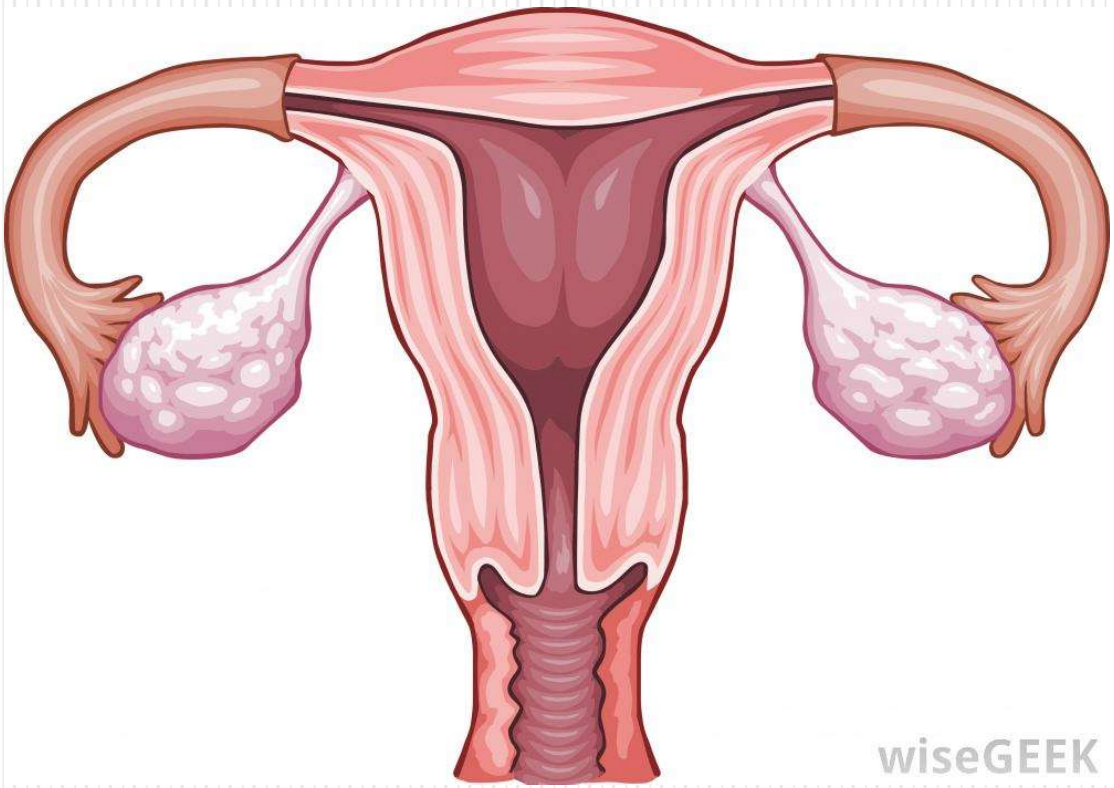
Female Genital Organs

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.

laterally: obturator nerve

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 :

- 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

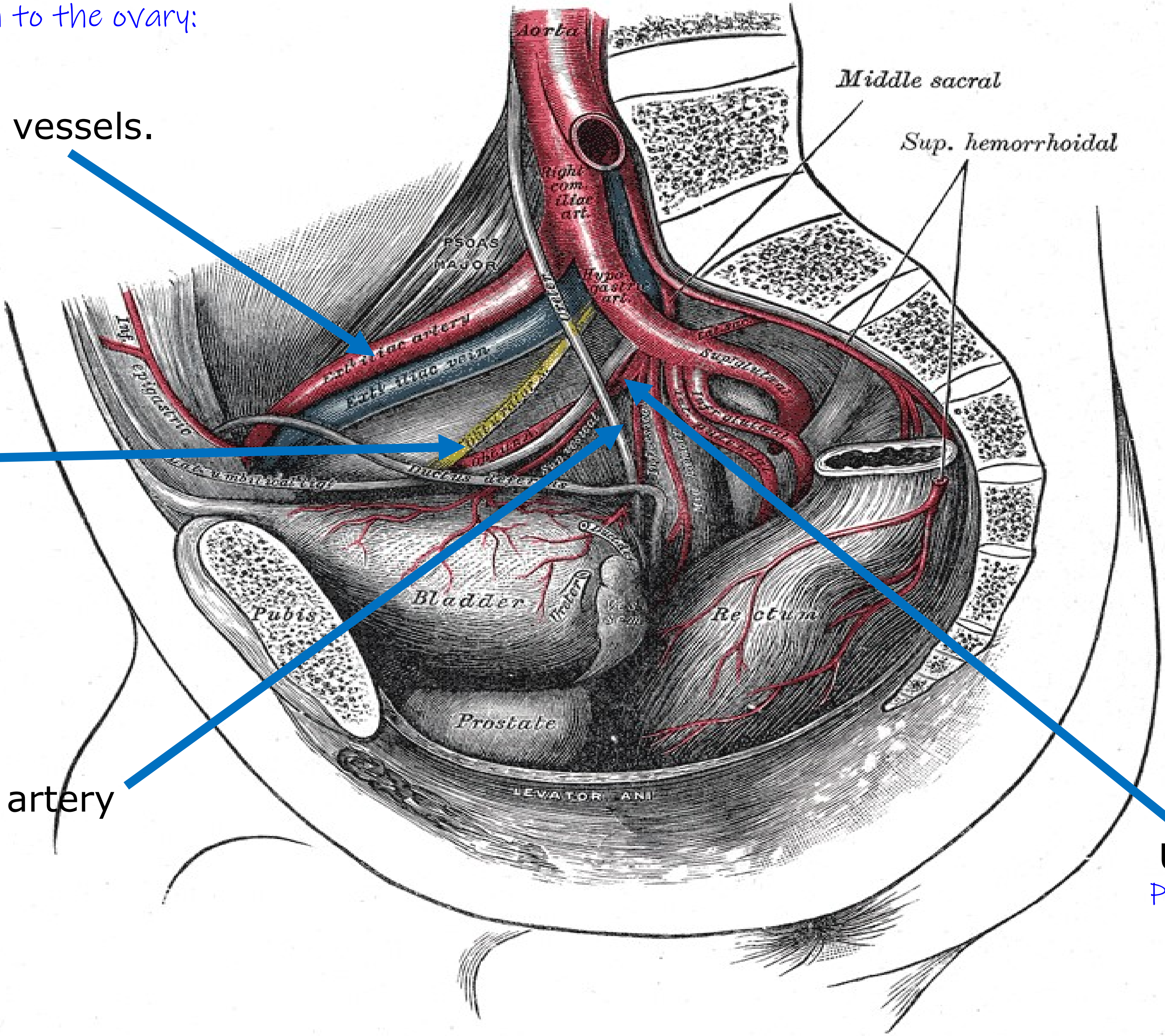
in relation to the ovary:

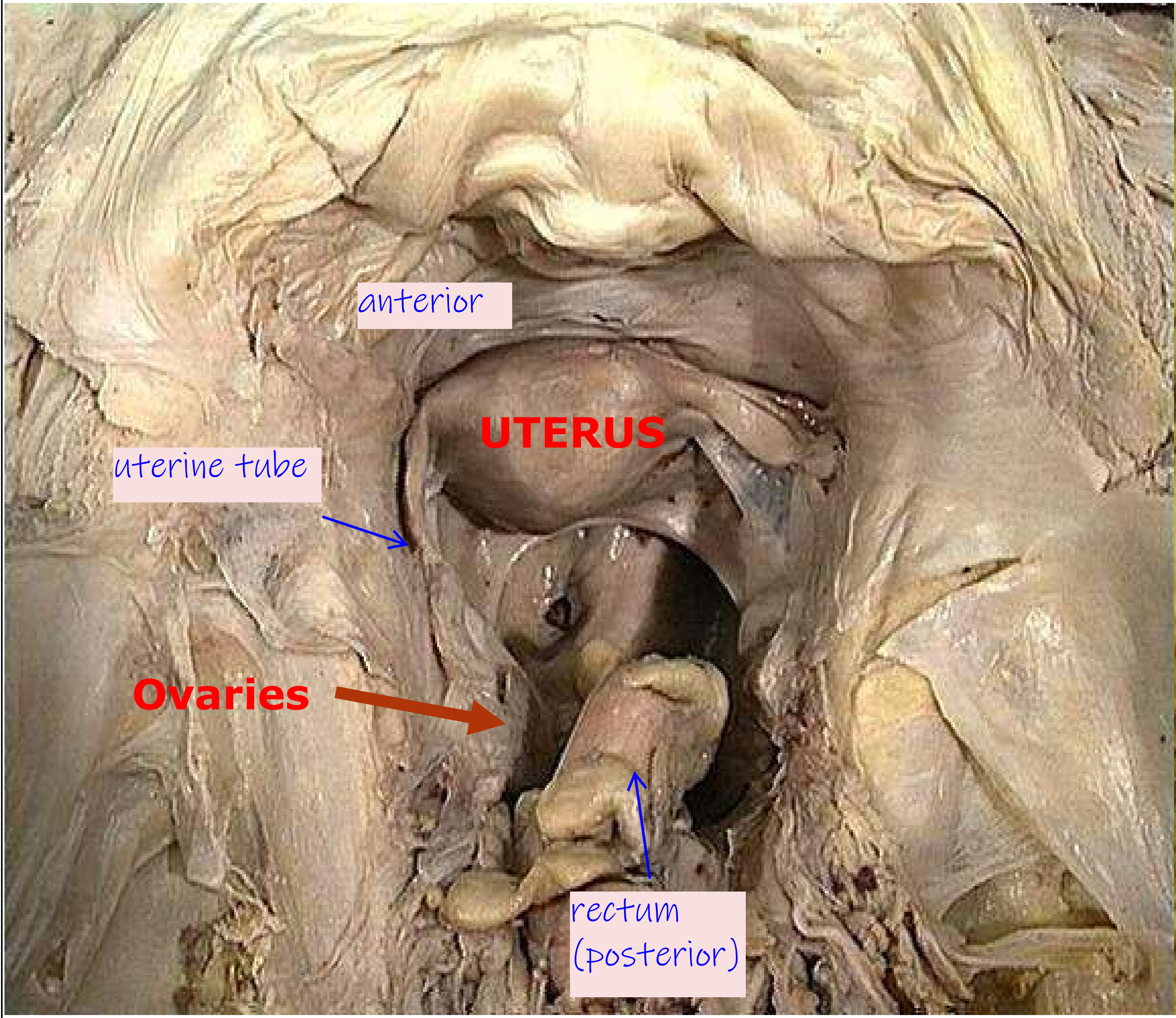
External iliac vessels.
anteriorly

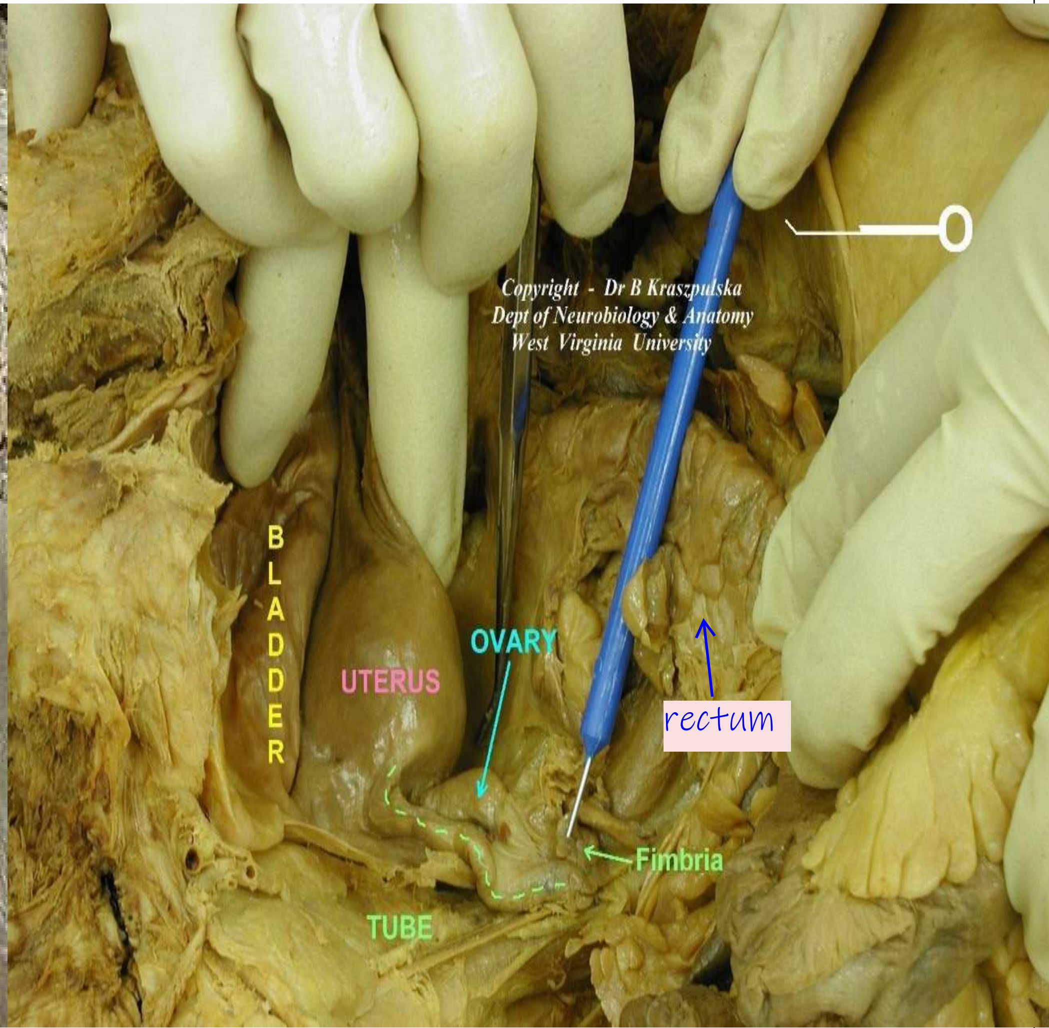
Obturator N.
laterally

Internal iliac artery
posteriorly

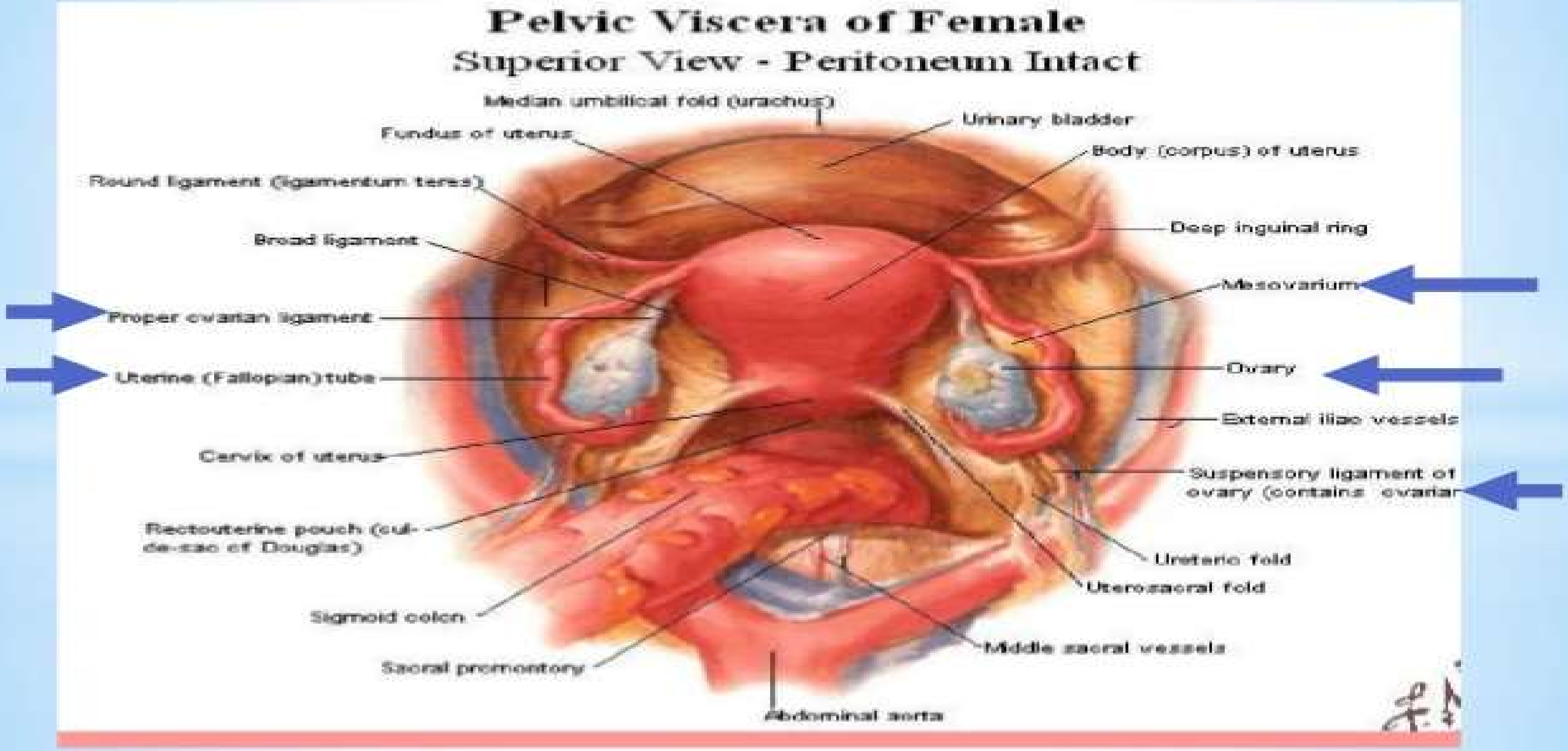
Ureter
posteriorly







in both pictures, notice the ovaries are posterior to the uterus (not on the same level)



Pelvic Viscera of Female
Superior View - Peritoneum Intact
Median umbilical fold (urachus)
Urinary bladder
Fundus of uterus
Body (corpus) of uterus
Round ligament (ligamentum teres)
Deep inguinal ring
Broad ligament
Mesovarium
Proper ovarian ligament
Ovary
Uterine (Fallopian) tube
External iliac vessels
Cervix of uterus
Suspensory ligament of ovary (contains ovarian
Rectouterine pouch (cul-de-sac of Douglas)
Ureteric fold
Uterosacral fold
Sigmoid colon
Middle sacral vessels
Sacral promontory
Abdominal aorta

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.

part of the infundibulum

A. Ends of the Ovary :

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

(indirectly)

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 .

blood vessels and nerves enter to the ovary through the hilum

B. Borders of the Ovary :

Anterior (mesovarian) border :presents the hilum of the ovary and is attached to the upper 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.

important!

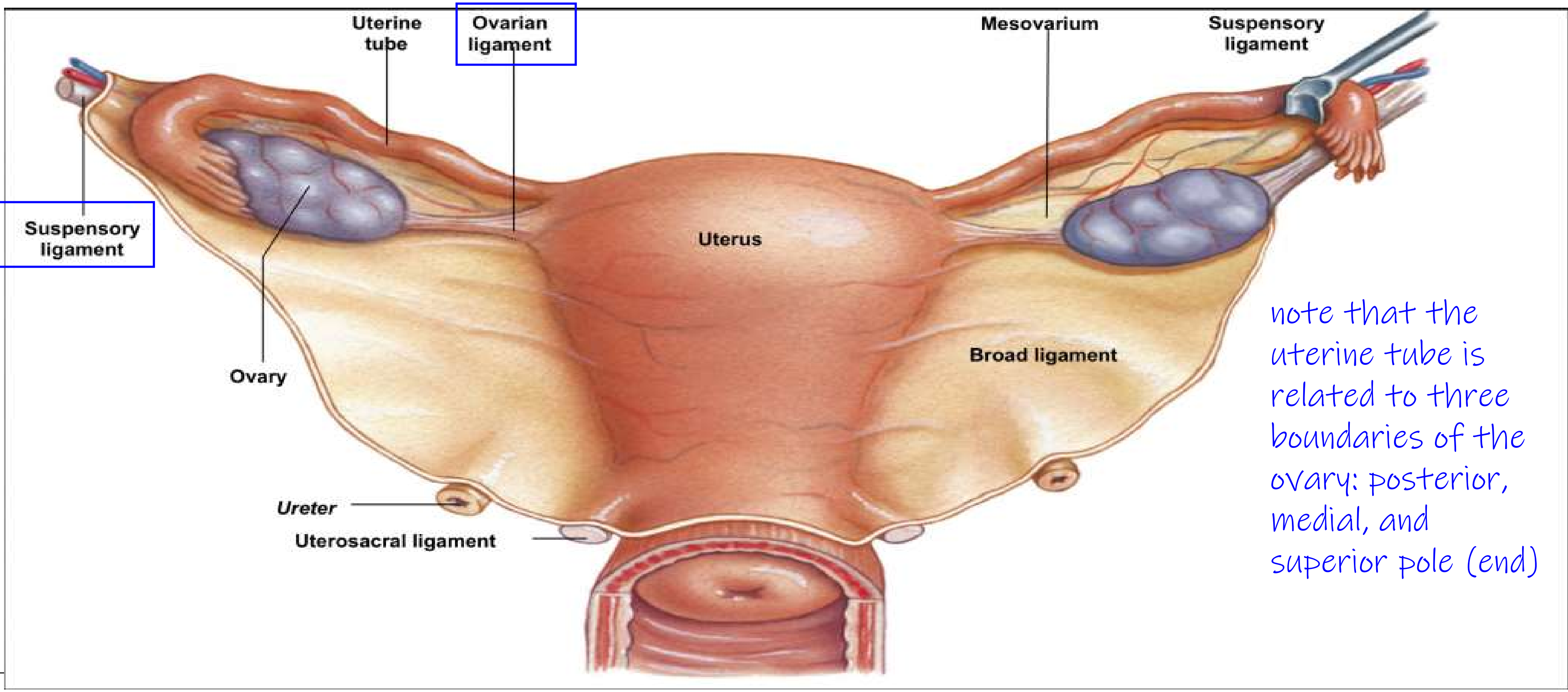
Ligaments of the ovary

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 upper surface 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



note that the uterine tube is related to three boundaries of the ovary: posterior, medial, and superior pole (end)

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

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:

infundibulum, ampulla, isthmus, and intramural part

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 :

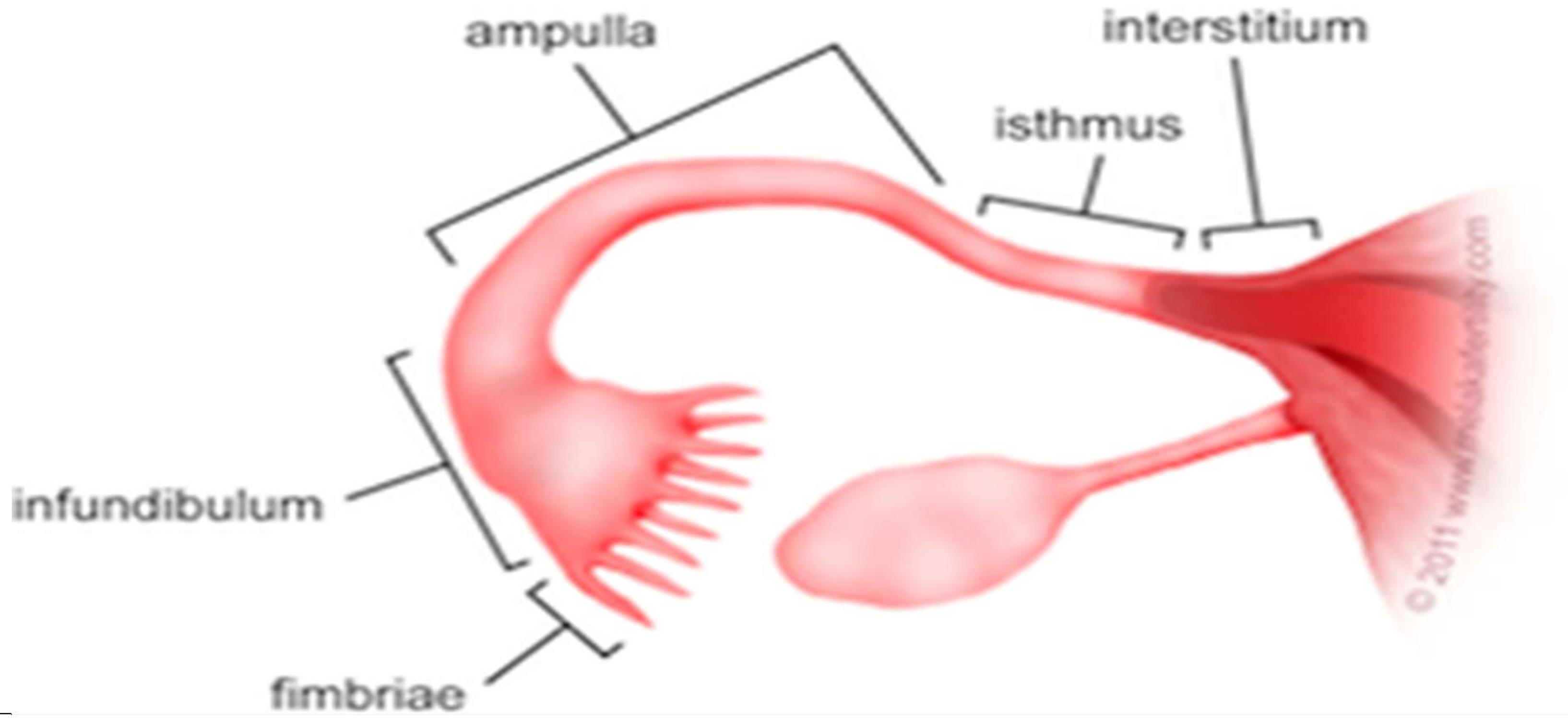
- It is the **widest** (4 mm in diameter) and longest part of the tube (about 5 cm long).
- It is thin-walled and tortuous.
- It is the site of fertilization.

3. Isthmus:

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

4. Uterine (intramural) part :

- It is the **shortest** 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



Blood Supply :

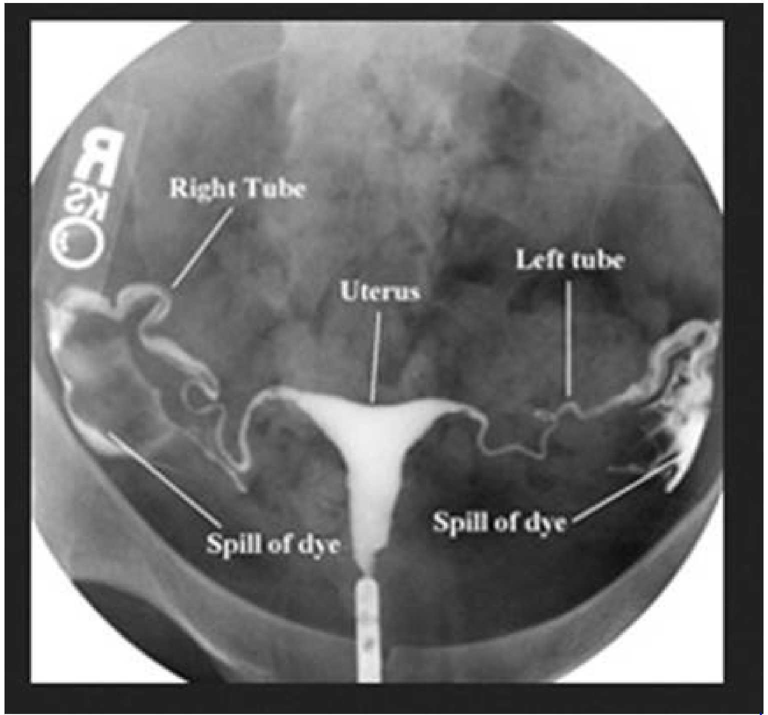
Medial 2/3 by uterine vessels. Lateral 1/3 by ovarian vessels

Nerve Supply :

Medial 2/3 by uterine nerve plexus. Lateral 1/3 by ovarian nerve plexus

Nerve supply :

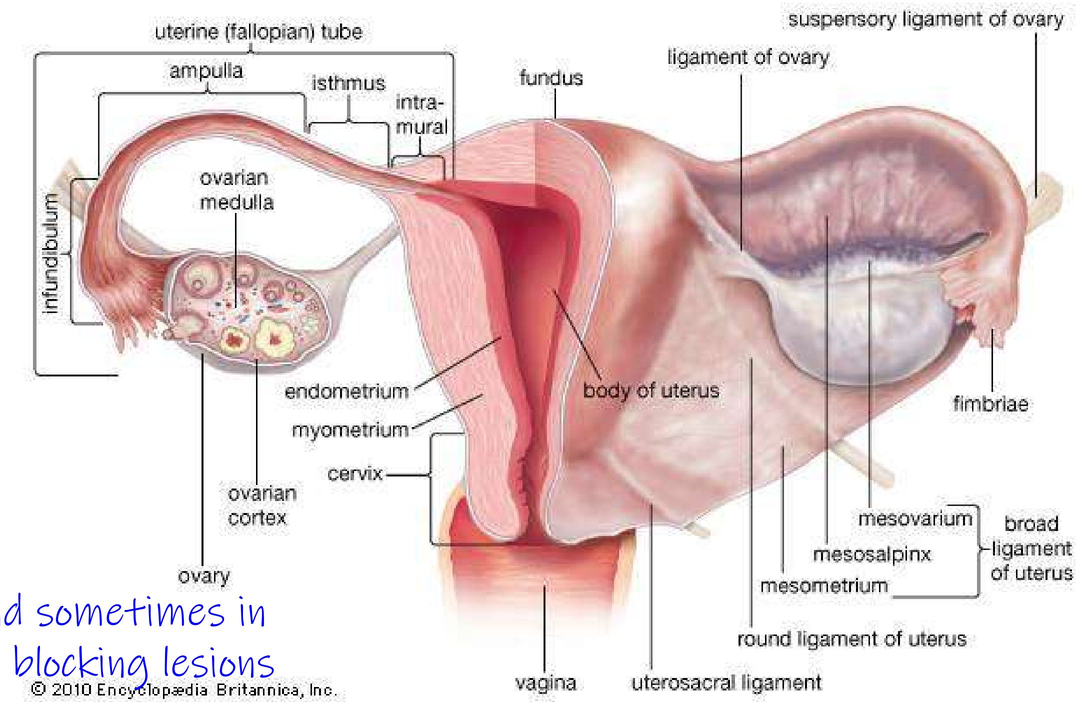
Sympathetic and parasympathetic nerves from the inferior hypogastric plexuses.



Hysterosalpingography

used in diagnosis and sometimes in treatment of small blocking lesions

since the dye is distributed in all parts of the tract -> no blockage



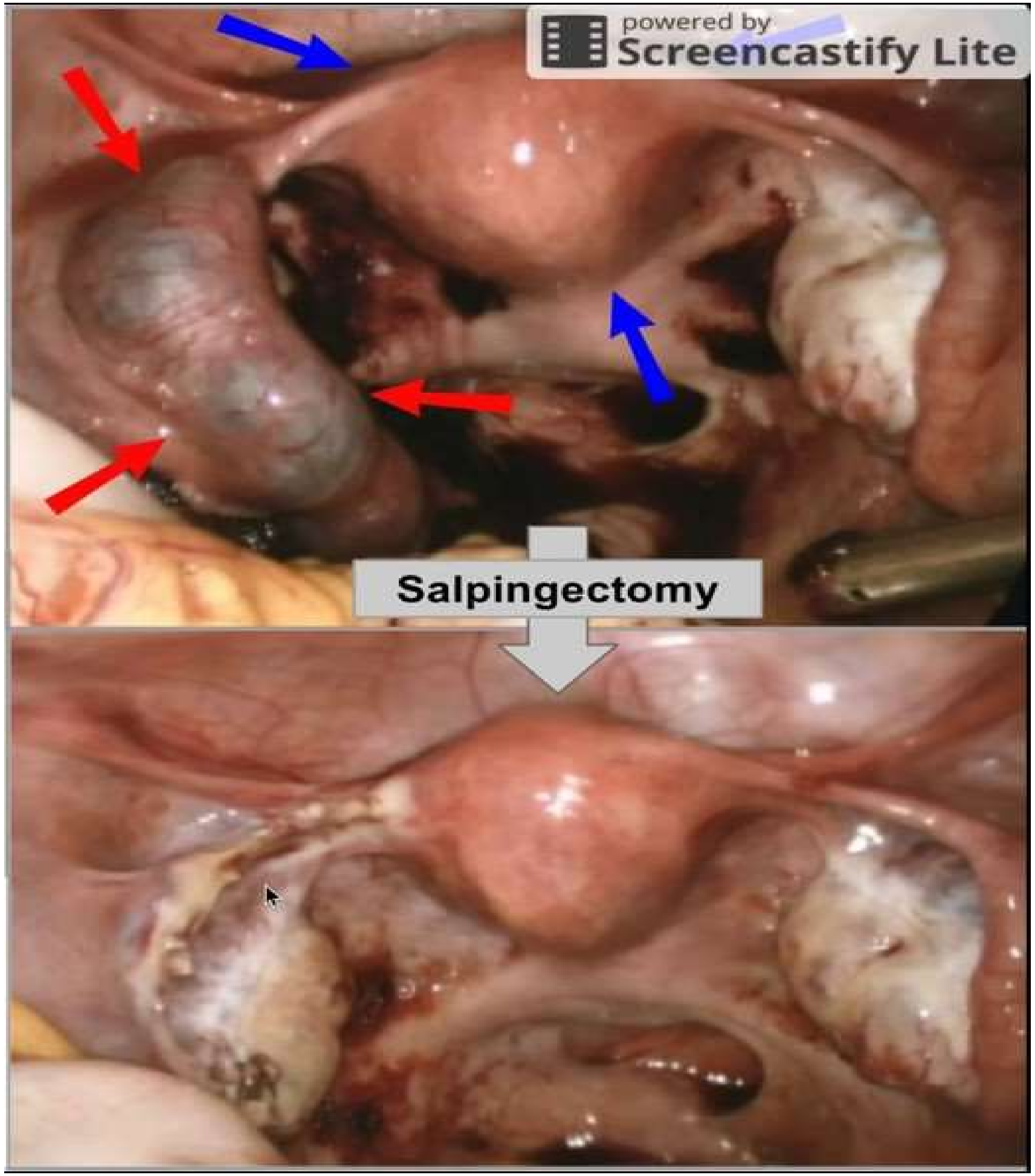
Functions of the Tube :

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



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). connects between the uterus and the external genitalia
- Its axis makes a right angle with the uterus

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

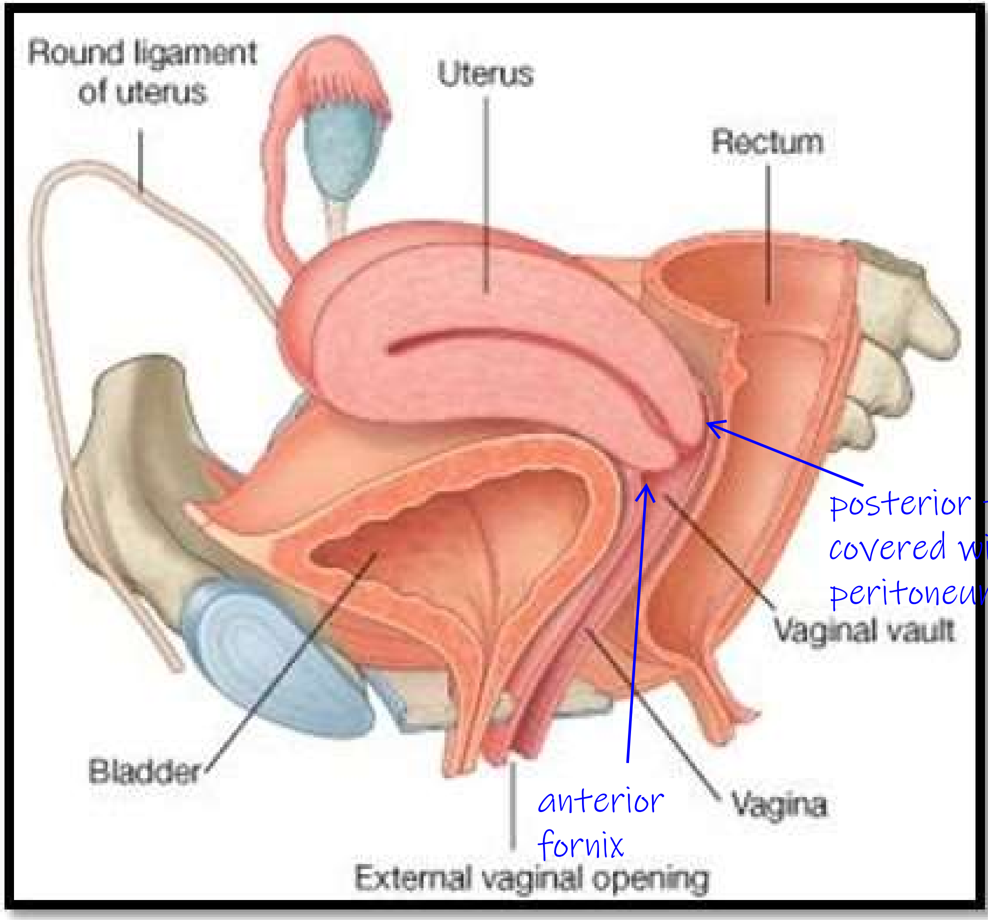
2- Posterior vaginal wall :

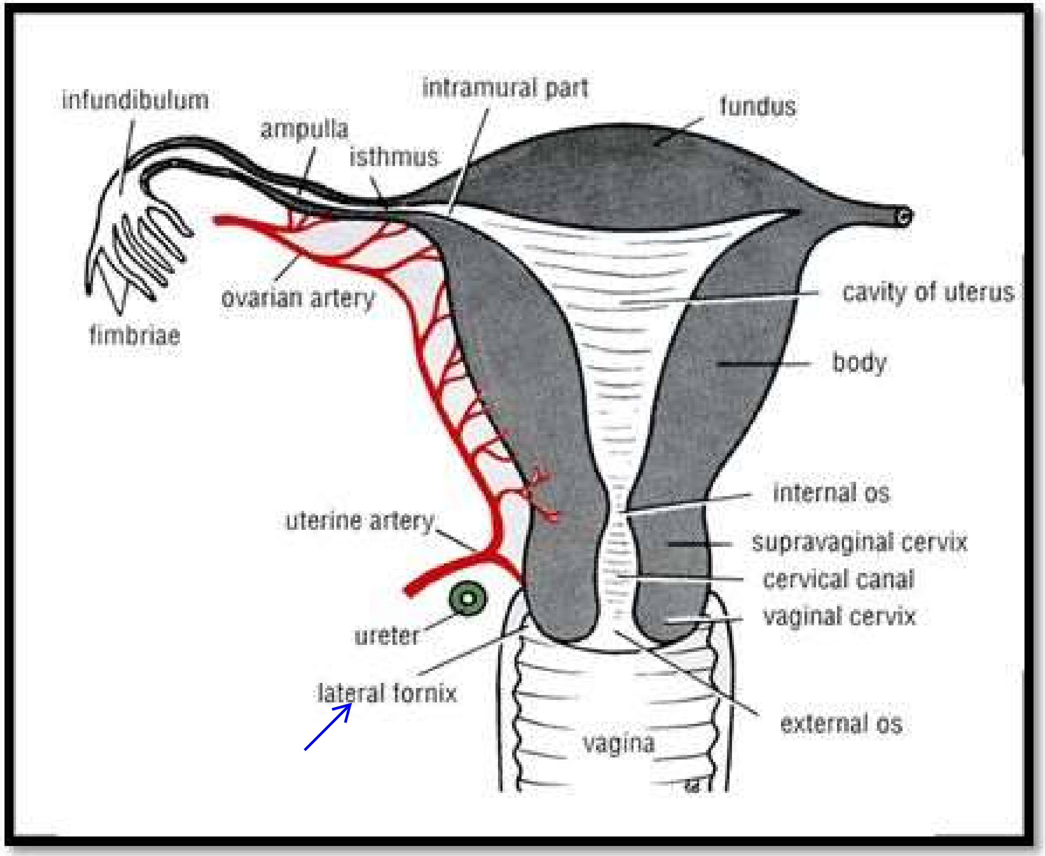
- **Upper 1/4** (covered with peritoneum) is related to rectum with Douglas pouch in between.
- **Middle 2/4** are related directly to rectum.
- **Lower 1/4** is related to anal canal with the perineal body in between

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).

RELATIONS OF VAGINA





IMPORTANT SLIDE !

the extension of the uterine cervix into the vagina divides the superior part of the vagina into four spaces (fornixes) (check the pictures above)

Cavity of Vagina :

- Its superior part surrounds the vaginal part of the uterine cervix and is divided into four fornixes. (2 lateral, 1 posterior, 1 anterior)
- 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.

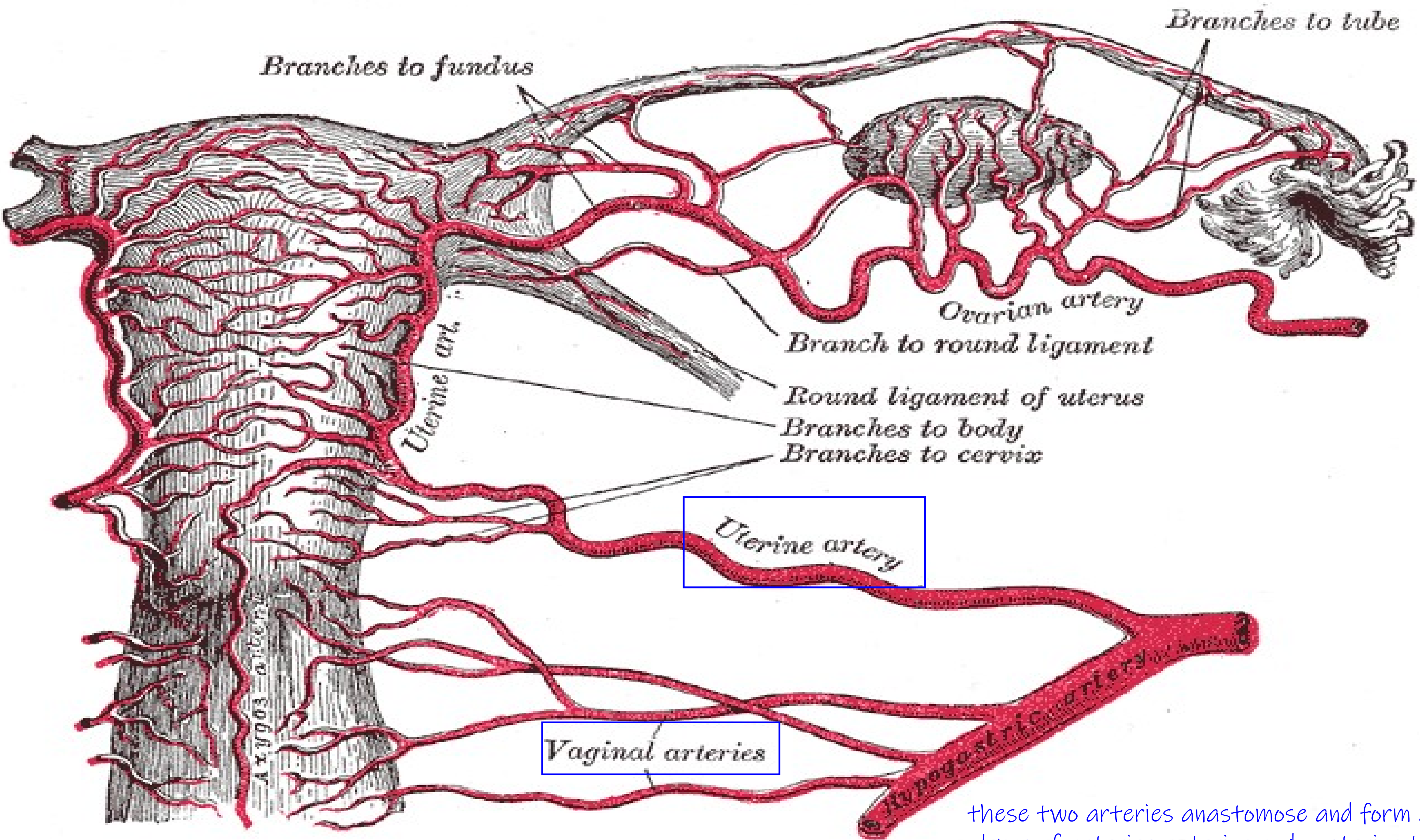
The vaginal A. supplies the base of the bladder and gives vaginal branches which anastomose with vaginal branches from uterine A.

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.



these two arteries anastomose and form a plexus of arteries anterior and posterior to the vaginal called azygous anastomoses

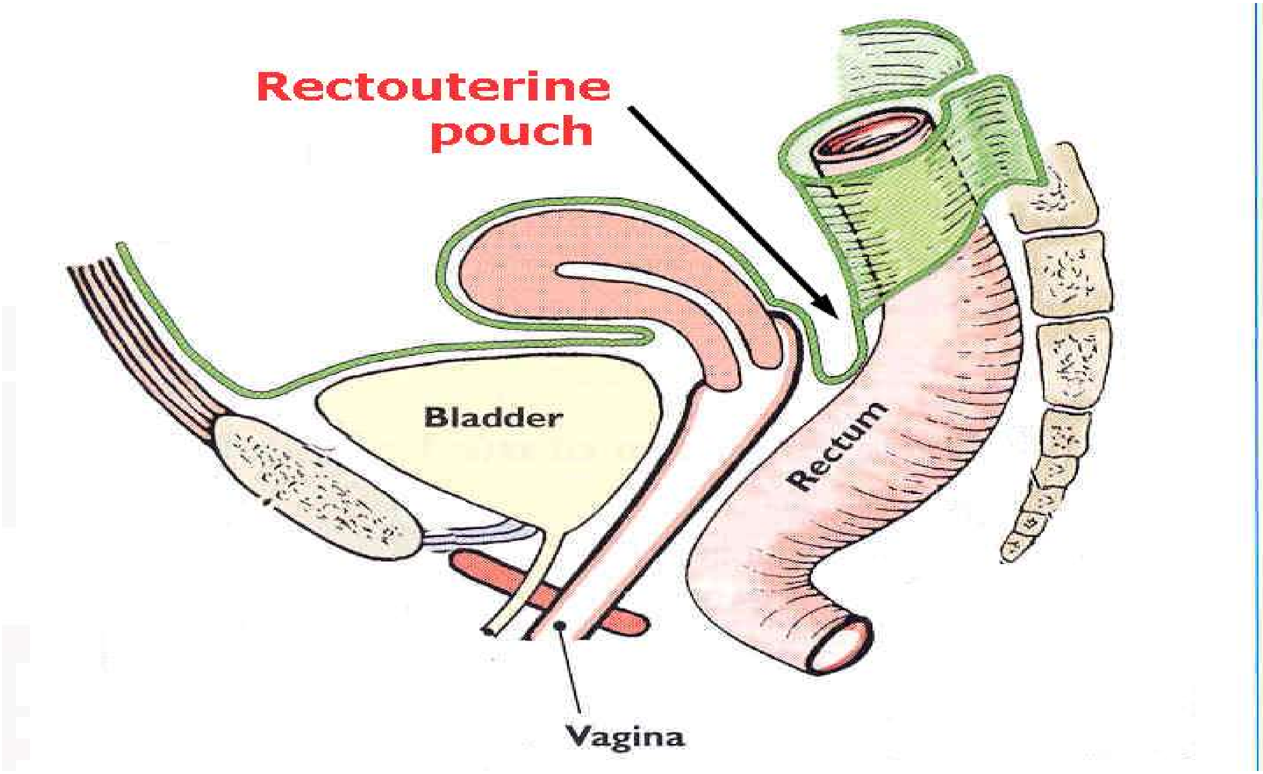
Nerve Supply : above the hymen

- Autonomic fibres from the uterovaginal plexus derived from the inferior hypogastric plexus.

The **lower inch of** vagina (below hymen) is supplied by the pudendal nerve (somatic)

The uterus is completely covered by peritoneum except the supravaginal cervix anteriorly and on the sides.

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

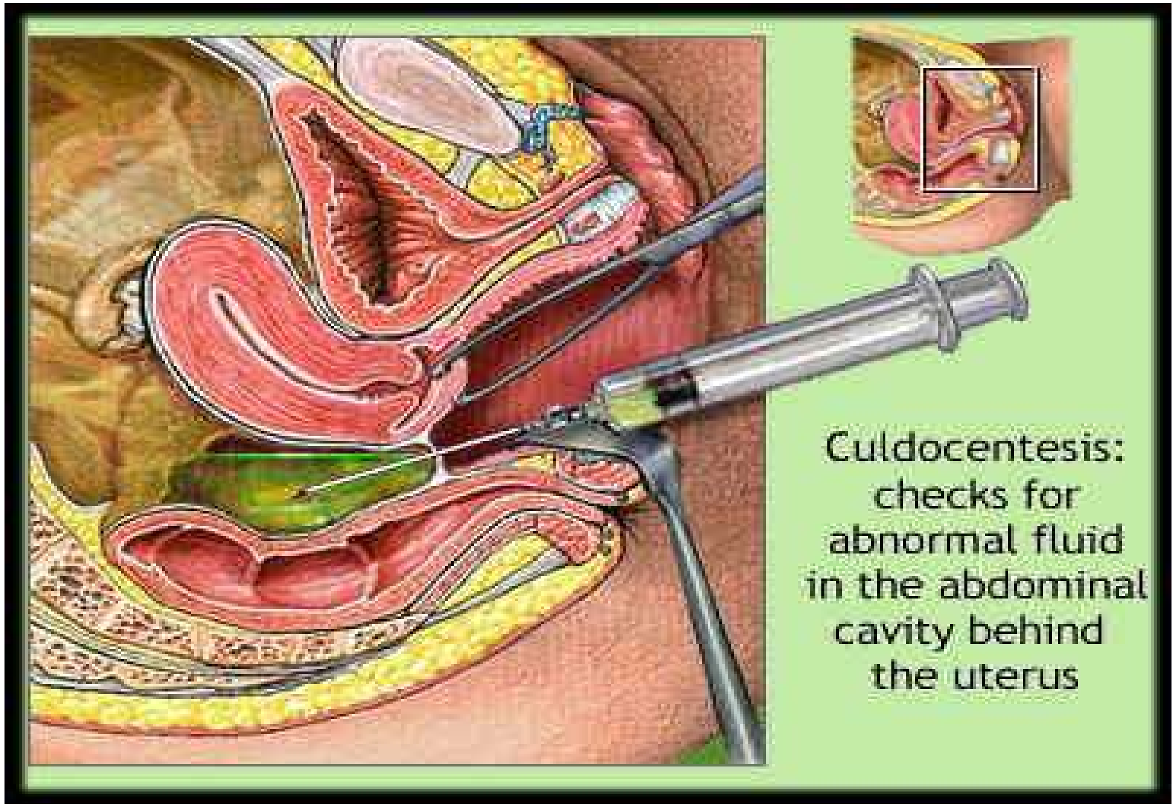


Culdocentesis

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.

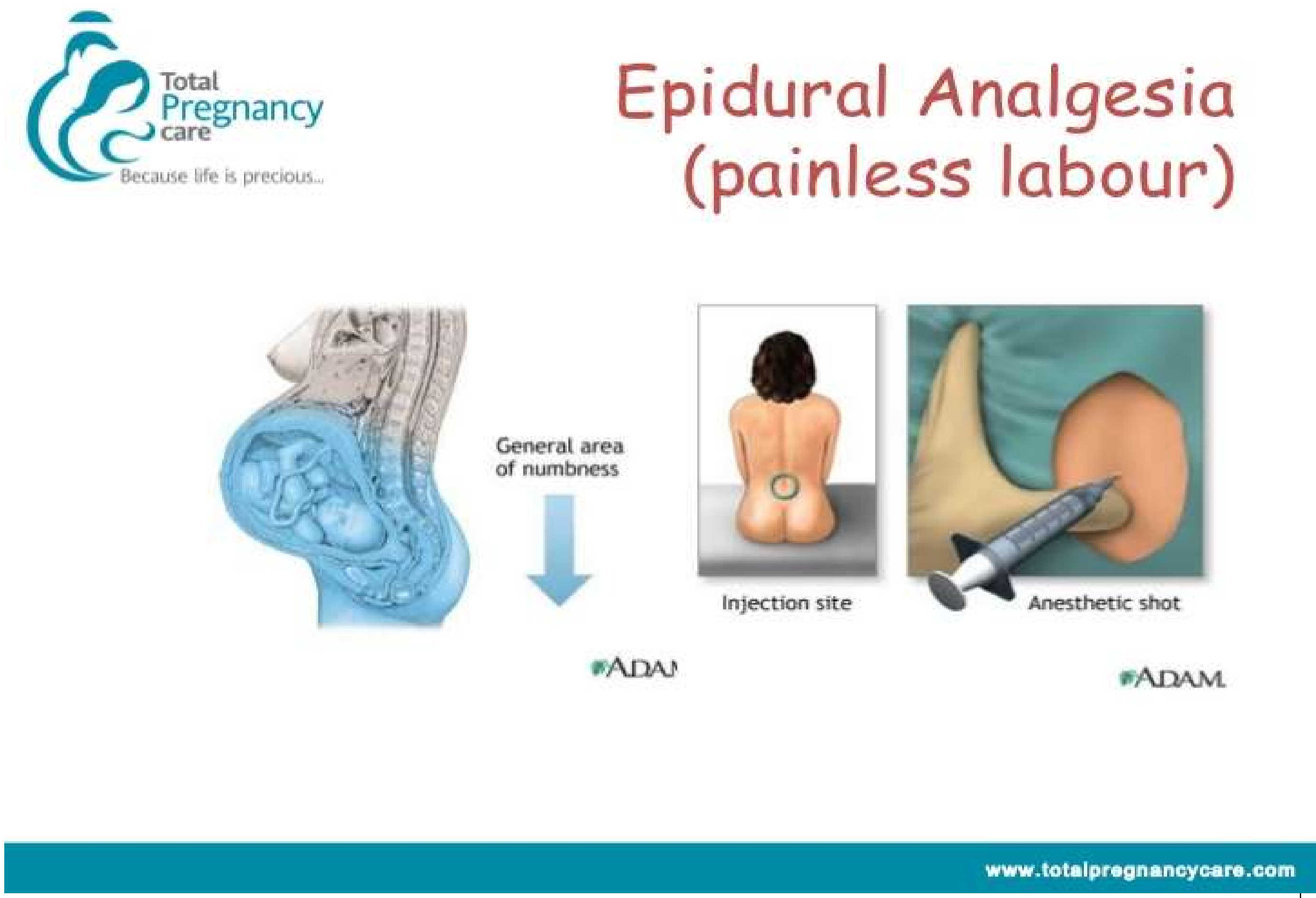


Painless Labour

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

epidural anesthesia can be dose adjusted so that only sensory input is blocked while the motor output will still be functioning, so uterine contractions are not affected

spinal anesthesia however blocks both sensation and motor function, and shot is injected in the subarachnoid space



FEMALE EXTERNAL GENITALIA

It includes :

1-The mons pubis :

It is the hairy fatty skin anterior to the pubic bones.

2-The labia majora :

(skin)

They are a pair of rounded fatty cutaneous folds , begin at mons pubis and extend posteriorly to meet each other anterior to the anus.

- They surround the ***pudendal cleft*** which in turn encloses the following structures :

A- The labia minora :

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

Anteriorly : near the clitoris, It *cover* the tip of clitoris, forming the *prepuce of the clitoris.*

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

B- The clitoris :

in between the two labia minora

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

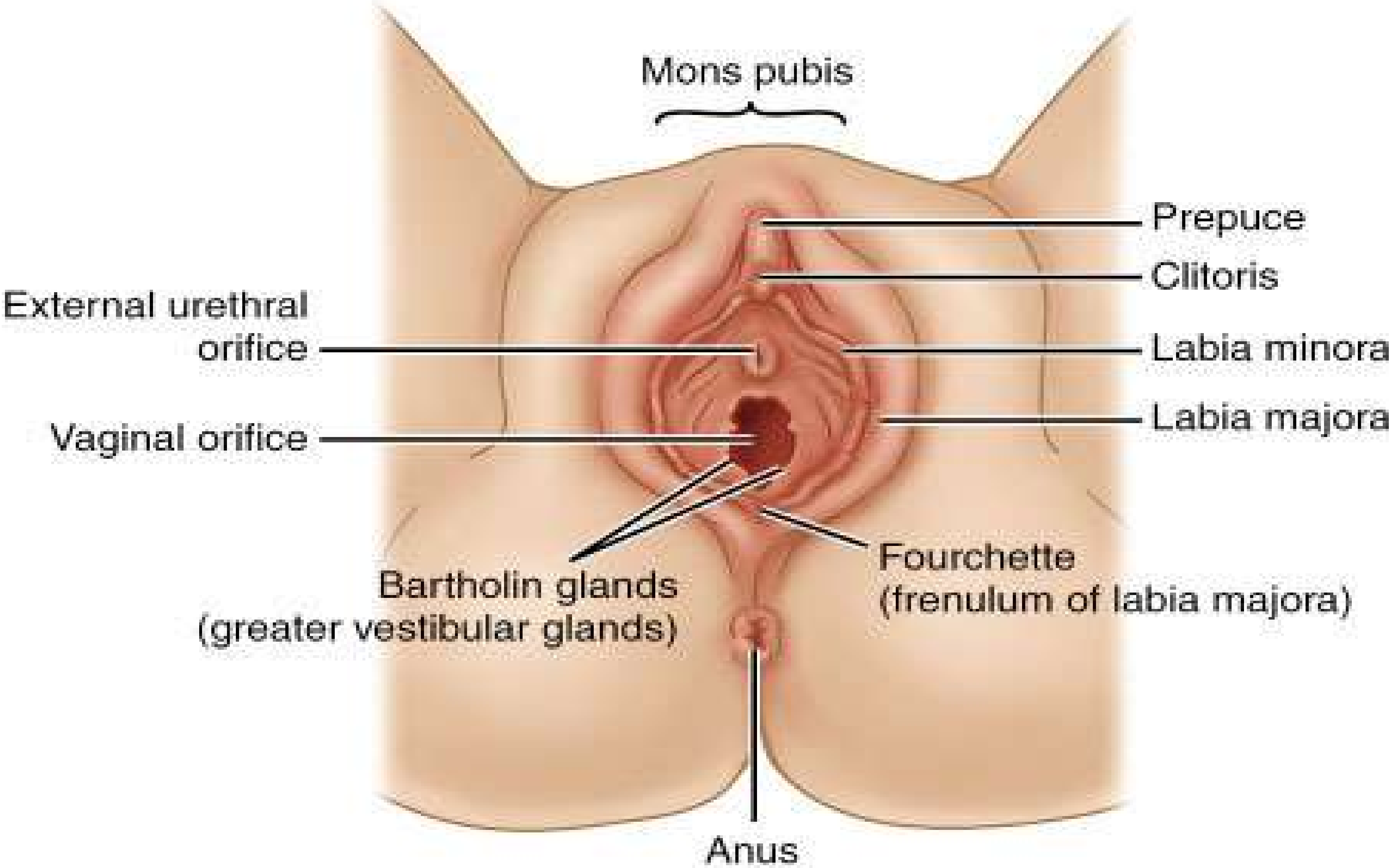
- Clitoris is formed only of 2 corpora cavernosa, each arises from side of pubis arch by a crus, so it has *no* corpus spongiosum.
  - it is not traversed by the urethra.

C- Vestibule :

- It is the space between the two labia minora.
- It contains :
  - Urethral orifice ; lies 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).

structures between the two labia minora:

1. clitoris
2. vestibule, which contains:
   a. urethral orifice
   b. vaginal orifice, into which Bartholin glands open


Mons pubis
Prepuce
Clitoris
External urethral orifice
Labia minora
Labia majora
Vaginal orifice
Fourchette (frenulum of labia majora)
Bartholin glands (greater vestibular glands)
Anus

3- 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.

also:
- females have two bulbs, males have one.
- the urethra is not passing through the bulbs in females.