Structured Notes According to

GYNAECOLOGY & OBSTETRICS

Revision friendly **Fully Colored Book/Structured Notes**

For Best results, watch the video lectures along with reading notes

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(Author)

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CONTENTS

Gynaecology & Obstetrics Vol-1

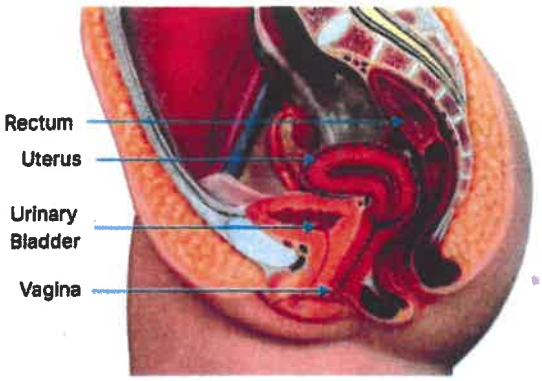
CONTRACEPTION

1. INTERNAL FEMALE GENITALIA

SAGITTAL SECTION OF THE PELVIS

00:00:50

- Anterior boundary: Urinary bladder
- Posteriorly boundary: Rectum

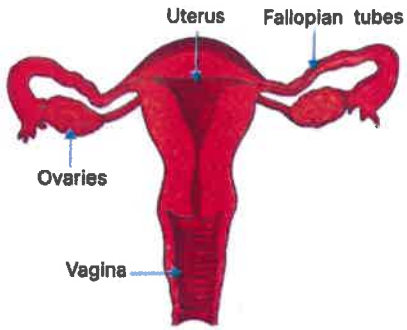


Sagittal section of pelvis

INTERNAL FEMALE GENITALIA

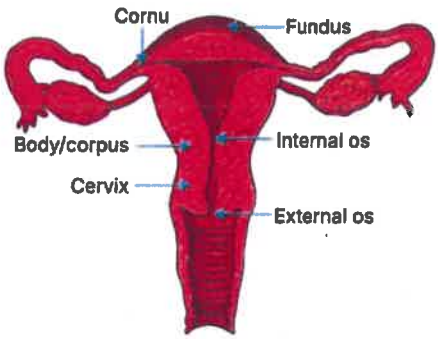
00:01:35

- Uterus → 'pear-shaped' (pyriform) fibro-muscular organ
- Nulligravid uterus
  - Weight of the uterus: 50 - 70gm
  - Dimentions of the uterus: 3 x 2 x 1 inches
  - Uterocervical length: 6-8 cm
- Multiparous uterus → slightly heavier
  - [redacted]



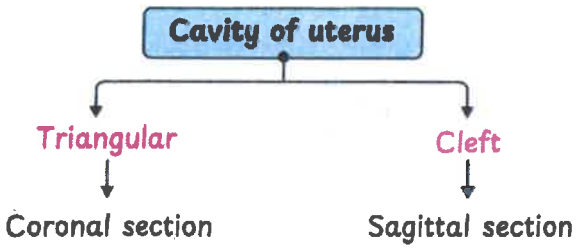
UTERUS

- Body/ corpus of the uterus - Upper part
- Cervix - below body of the uterus
- Fundus- dome-shaped part → [redacted]
- Cornu- part where the fallopian tube enters uterine cavity
- Internal os- opening of the cervix → into body of the uterus
- External os- opening of the cervix → into vagina



CORPUS/CERVIX RATIO

1:2	Before puberty
2:1	At puberty (Estrogen causes growth of the uterus)
3:1	Reproductive age group
1:1	After menopause (both uterus & cervix shrink in size)



LININGS OF UTERUS

ENDOMETRIUM	MYOMETRIUM
• Specialized lining of uterine cavity • Lined by columnar epithelium → forms glands → contains underlying specialized stroma	• Body of the uterus → made up of smooth muscle • 1.5 - 2.5 cm thickness • Crisscrossing muscle fibers → present (Vessels travel inbetween of the crisscrossing muscle fibers) • Middle layer → 'Living Ligatures' ○ Contraction of the muscle fibers → compresses blood vessels of the uterus

CERVIX

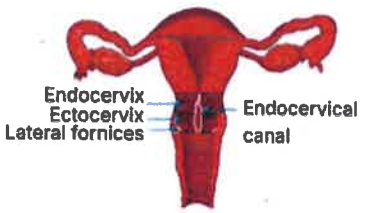
00:12:06

- Mainly connective tissue → Rich in collagen
- Only 10% muscle

MULTIPAROUS CERVIX	NULLIPAROUS CERVIX
• Cylindrical shape • External os → transverse slit	• Conical shape • External os → pin point

PARTS OF CERVIX

- Endocervix
- Ectocervix or Portio vaginalis
- Fornices Recesses around ectocervix (are the recesses around the ectocervix)
- Endocervical canal: 2-3 cm long

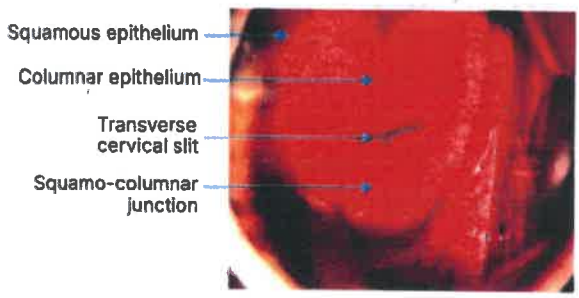


- Vaginal epithelium has folds → **'Rugae'**
- Cervix attached to → Anterior vaginal wall
- Posterior vaginal wall → longer (compared to anterior vaginal wall)
  - [redacted]

EPITHELIUM

Endocervical epithelium

- Mucus secreting, tall, reddish, columnar epithelium
- Forms cleft-like infoldings - compound clefts
- Does not undergo specialized changes in menstrual cycle like endometrium

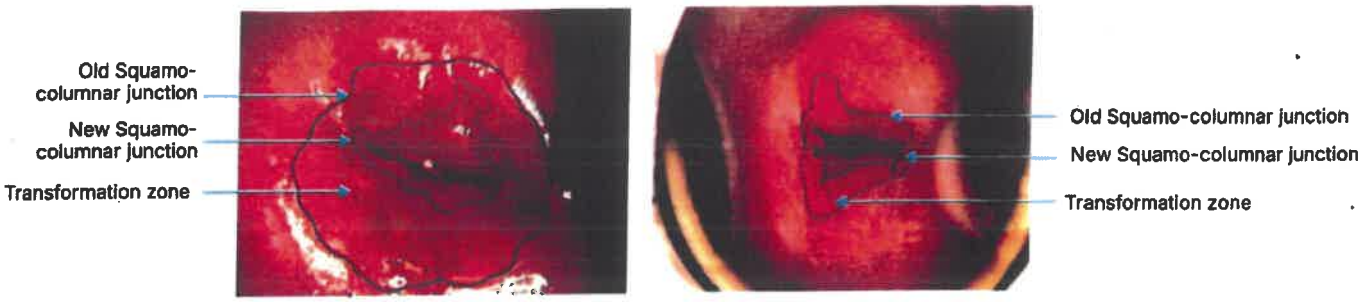


Ectocervical epithelium

- [redacted]

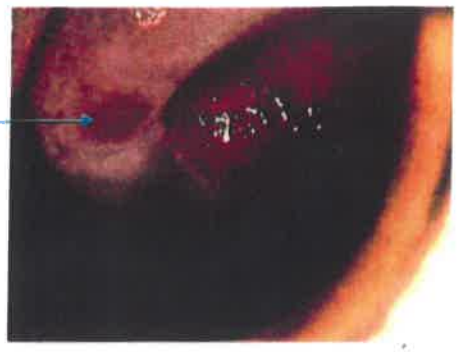
Eversion / Ectropion - physiological

- Endocervical epithelium → everted out into the ectocervix
- Between endocervix & ectocervix - squamocolumnar junction
- Stratified squamous epithelium → replaces endocervical epithelium
  - Squamous metaplasia
- Transformation zone
  - Zone (area) on ectocervix → between new & old squamocolumnar junction
  - M/c area → cervical intraepithelial neoplasia/ cervical cancer occurs



Q. Identify the cystic structure seen on the ectocervix

Ans.



- [redacted]
  - AKA: Nabothian cysts (if large)
  - Location: Along periphery of the ectocervix (along the old squamocolumnar junction)
  - Physiological

Endocervical epithelium has clefts (mucus-secreting)

↓

Squamous metaplasia → clefts get blocked.

↓

Mucus collected inside

↓

Nabothian follicle

00:31:15

ISTHMUS

Histological internal Os

- Location where endometrial lining changes → to endocervical lining

Isthmus

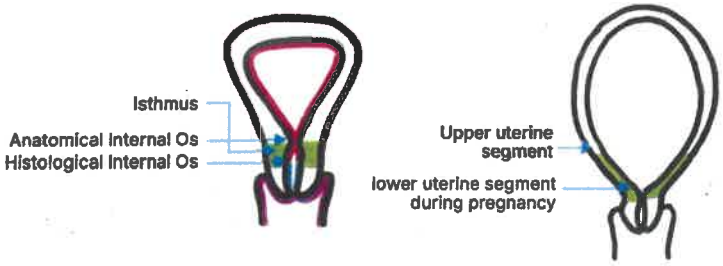
Area between anatomical internal Os & histological internal Os.

- Area where corpus joins cervix

Clinical significance

Isthmus ↑ in size (pregnancy)

- Most of the body and corpus → Upper uterine segment
- Isthmus → lower uterine segment (pregnancy)



VAGINA

- Fibromuscular hollow tube
- Lumen → like a transverse slit.
- Cervix attached to the anterior vaginal wall (7-9 cm long)
- Length of Posterior vaginal wall >> Length of Anterior vaginal wall
- Lining: Non-keratinizing stratified squamous epithelium.
- No serosal covering
  - Exception: Region of cul-de-sac

Important Information

- Normal vaginal pH in reproductive age group → Acidic: 3.5 to 4.5
  - Cause → Estrogen dependent
  - Use → one of the primary defense mechanisms against infections
- Growth of vaginal flora – Doderlein's bacilli (Lactobacilli) contributes to the acidic pH of the vagina

SECRETIONS IN THE VAGINA COME FROM

Endocervical glands	**Bartholin glands** secretion	**Transudation** of fluid across the vaginal epithelium.
Alkaline mucus	during coitus (alkaline)	

PERITONEAL REFLECTION OVER THE UTERUS

00:38:40

- Serosa → peritoneal covering over the uterus

PERITONEAL REFLECTION

Anteriorly	Posteriorly
at level of isthmus	at lower level → extends up to upper part of the vagina

• Identified by loose fold of peritoneum
  ○ Utero-vesical fold
	• Pouch of Douglas (POD)/ Cul-de-sac
	  ○ Most dependent part of the peritoneal cavity in females (upright)

CLINICAL CORRELATION

Hysterectomy

- During procedure → loose fold of peritoneum is identified At level of isthmus

Cesarean section

- During procedure → [redacted] loose fold of peritoneum

Culdocentesis

- Procedure: Needle introduced to POD through posterior vaginal fornix to drain/ aspirate contents

Culdocentesis

Posterior Colpotomy

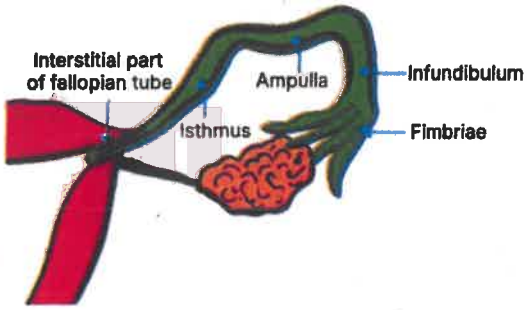
- Incision in posterior vaginal fornix
- Provides access to peritoneal cavity

FALLOPIAN TUBE

00:47:00

- **Length: 7 -12 cm**
- **Infections** ascend through the fallopian tube into the peritoneal cavity
  - PID is more common in females
- **Parts**

Infundibulum	Ampulla	Isthmus	Interstitial part
• Fimbrial end ○ Finger-like projections present	• Widest and longest part		• Intramural part • Narrowest part anatomically



- **Tubal mucosa** → lined by ciliated columnar epithelium
  - Not ciliated throughout
  - Secretory cells and peg cells present
    - Peg cells (supporting cells) → in the epithelial or mucosal lining of the fallopian tube (their exact role is unclear)
- **Role of Fallopian tube**

Ovum capture	Site of fertilization	Secretory cells	Movement of conceptus towards the uterine cavity by Tubal peristalsis & Cilia
↓	↓	↓	
Fimbrial end	Ampulla	provide nourishment to zygote	

OVARY

IN REPRODUCTIVE AGE GROUP

Size	Lining	Inner medulla	Outer cortex
3 x 2 x 1 cm	Cuboidal epithelium	Fibromuscular tissue & vessels	Contains ovarian follicles & stroma

ADNEXAL STRUCTURES AND BROAD LIGAMENT

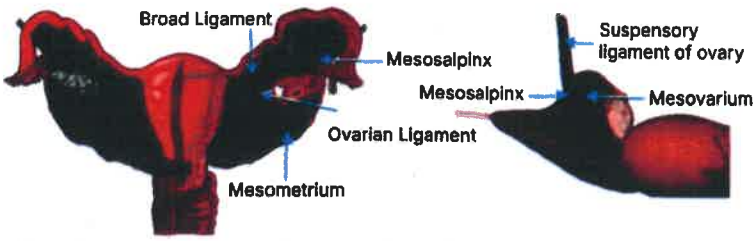
00:54:25

- **Adnexa**
  - fallopian tube and ovary
- **Ovarian ligament (also sometimes called as utero-ovarian ligament)**
  - Connects ovary to the cornu of the uterus
- **Broad ligament**
  - Thin double-layered sheet of peritoneum → extending from sides of uterus up to the lateral pelvic wall

- Portion of broad ligament attached to
  - Fallopian tube → Mesosalpinx
  - Body of the uterus → Mesometrium
  - Ovary (attached to the posterior leaf of broad ligament) → Mesovarium

Infundibulopelvic ligament/ Suspensory ligament of ovary

- Extension of broad ligament
- Infundibular end of the fallopian tube to the lateral pelvic wall
- Attaches the lateral part of the ovary to the lateral pelvic wall
  - Suspends the ovary
- Ovarian vessels → travel through infundibular ligament and reach the ovary



Coronal section of uterus and attachments viewed from behind

Round ligament

- Present anteriorly

STRUCTURES ATTACHED TO THE CORNU OF THE UTERUS

Round ligament | Fallopian tube | Ovarian ligament

Anterior → Posterior

Important Information

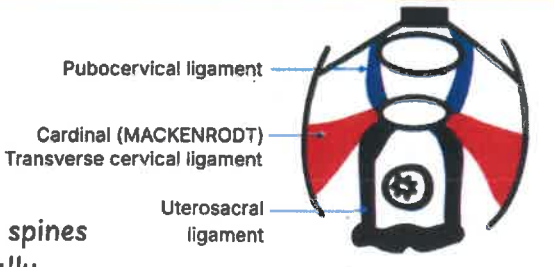
- Ureter lies on the medial leaf of the broad ligament
  - 1.5 - 2cms lateral to the cervix
  - Uterine artery crosses over the ureter (in this location) **(Mnemonic**: Water under the bridge)
- M/c site of ureter injury during gynaecology surgery
  - 1.5 - 2cms lateral to the cervix
  - At the level of isthmus
  - Danger area

LIGAMENT SUPPORTS OF THE UTERUS

Condensations Of Endopelvic Fascia

Function

- Help suspend external os of the cervix at level of ischial spines
- Help maintain the normal position of the uterus (especially uterosacral ligament)



Transverse view of pelvis from above

Ligaments

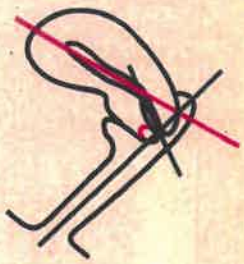
Transverse cervical ligament
- Cardinal / Mackenrodt ligament
- Lateral aspect of the cervix to lateral pelvic wall

Uterosacral ligament
- Posterior aspect of the cervix to sacrum

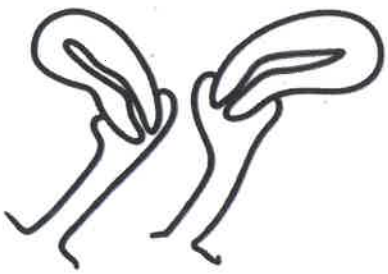
Pubocervical ligament
- Anterior aspect of the cervix to pubic symphysis
- Along sides of the bladder

Important Information
- Body of the uterus → sits on top of the urinary bladder
- Normal position of the uterus – [redacted]

Angle of anteversion	Angle of anteflexion
• Between long axis of the vagina & cervix • Around 90°	• Between long axis of the body of uterus & cervix • Around 120 °



ANTEVERSION & RETROVERSION
- Transient retroversion → [redacted]
- Fixed retroversion Causes
  - Pelvic adhesions
  - Scar tissue inside pelvis
  - Heavy tumor in the uterus



CLINICAL EXAMINATION

External os is directed posteriorly & anterior lip of cervix felt → **Anteversion**

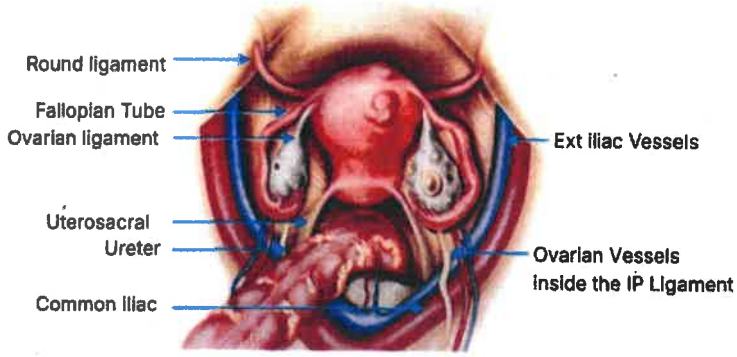
External os is directed anteriorly & posterior lip of cervix felt → **Retroversion**

OVERVIEW OF THE PELVIS

01:21:46

- Ureter crosses over the bifurcation of common iliac → enters from abdominal cavity to the pelvic cavity

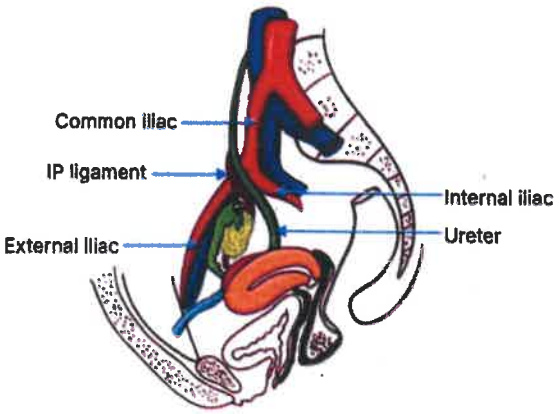
Round ligament enters deep inguinal ring (in anterior abdominal wall)
↓
Travels in inguinal canal
↓
Comes out through superficial inguinal ring
↓
Terminates in anterior part of labia majora



BOUNDARIES OF THE OVARIAN FOSSA

01:28:20

Above	External iliac vessels
Behind	Ureter & internal iliac vessels
Floor (lateral)	Obturator nerve and vessels



CLINICAL CORRELATIONS

During gynecology surgery → Risk of ureter injury
- 2nd M/c site of injury: Entry of ureter → at pelvic brim → at bifurcation of the common iliac artery
  - Ureter is behind infundibulopelvic ligament

Advanced ovarian cancer→ referred pain to the knee joint
- Cause: Infiltration of obturator nerve

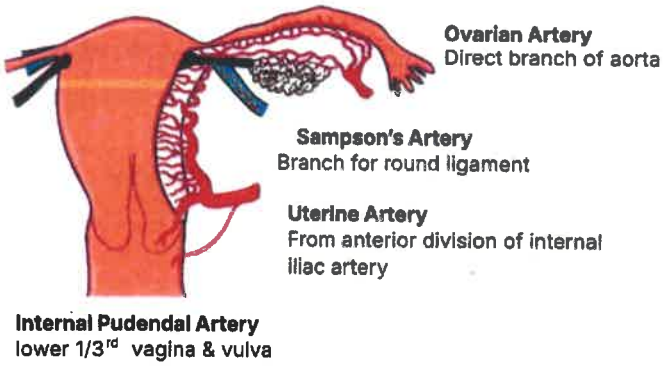
Dissection in the lateral pelvic wall → Risk of Obturator nerve injury

BLOOD SUPPLY OF THE GENITAL STRUCTURES

01:32:38

Ovarian artery →
- Traverses in the infundibulopelvic ligament

Uterine artery
- Arises from anterior division of the internal iliac artery
- Traverses in the sheet of the broad ligament



Branches

Ascending branch
Body and fundus of the uterus
- Gives tubal branch
- Anastomosis of the uterine and ovarian artery branches
  → Site: Mesosalpinx
  → Supplies the ovary also

Descending branch
Cervix

Vaginal artery
Can arise from anterior division of the internal iliac artery

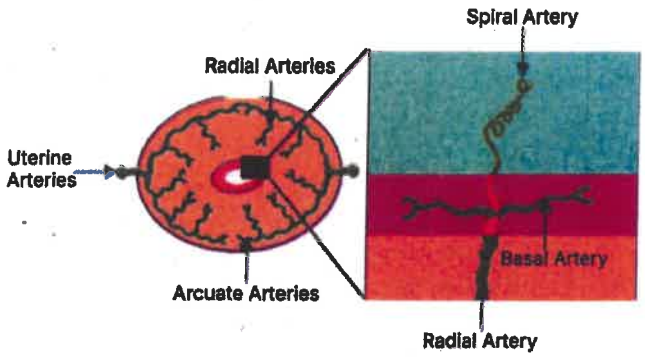
→ **Sampson's artery**- supplies round ligament
- Branch of uterine artery

→ **Internal pudendal artery**
- Supplies lower 1/3rd of vagina and vulva

BRANCHES OF UTERINE ARTERY FOR THE UTERUS

01:35:42

Uterine artery
↓
Arcuate artery
↓
Radial arteries → supply the myometrium
↓
Terminal arteries
↓
Basal artery → Supplies deep 1/3rd of the endometrium
Spiral artery → Supplies superficial 2/3rd of the endometrium



NERVE SUPPLY

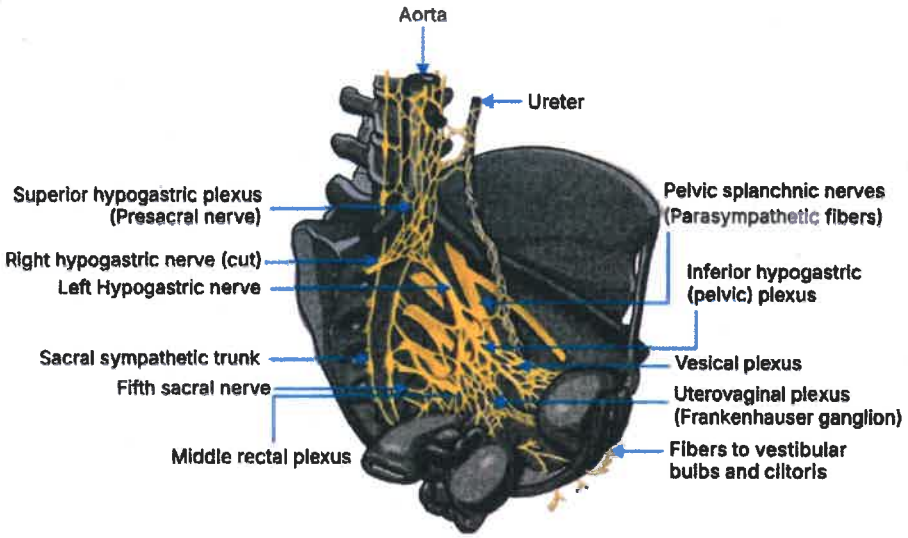
01:38:18

→ **Superior hypogastric plexus/ presacral nerve**
- Plexus of sympathetic fibers in front of the aorta
  - Divides into left & right hypogastric nerve

→ **Pelvic splanchnic nerves**
- Parasympathetic fibers originating from S2, S3, S4
  - Pain fibers from the cervix and upper vagina ascend via pelvic splanchnic nerves
    → Toward S2, S3, S4

Inferior hypogastric plexus -

- Pelvic plexus
  - Supplies autonomic innervation to the pelvic viscera
    → Parts of rectum, uterus, vagina, bladder, urethra
  - [redacted]
    → Arise from inferior hypogastric plexus
    → Pain fibers (sensory) from the body and fundus ascend via uterovaginal plexus → inferior hypogastric plexus
      - Towards T10 -L1



Important Information

- Pain fibers (sensory) from lower vagina, vulva and perineum ascend via the pudendal nerve
  - Towards S2, S3, S4

MCQ's

01:44:03

Q. Arrange the parts of the fallopian tube from the ovary to the uterus.
a. Infundibulum – isthmus-ampullary – intramural
b. Ampulla-isthmus-intramural-infundibulum
c. Infundibulum- ampulla-isthmus-intramural
d. Isthmus-ampulla-infundibulum -intramural

Ans. (c)

Q. Which of the following structures does not play a role in providing support to the uterus in terms of preventing prolapse?
a. Uterosacral ligament
b. Cardinal ligament
c. Round ligament
d. Levator ani

Ans. (c)

Q. The uterus and adnexa have relatively fixed anatomic relations that can be appreciated on physical and laparoscopic evaluation. Which of the following is a normal finding?
a. Anteflexion
b. Ovaries on anterior leaf of broad ligament
c. Round ligament attached at cornu posterior to fallopian tube
d. Cervix not palpable on per-rectal examination

Ans. (a)

Q. A 38-year-old woman presented to the physician's clinic to undergo tubal ligation. Subsequently, she underwent the procedure. The surgeon points the fallopian tube to his assistant

Ans.

- Structures at the cornu- anterior to posterior
  - Round ligament
  - Fallopian tube
  - Ovarian ligament
- Important for identification of tube.

Q. During a hysterectomy, vaginal bleeding can occur even after removal of the uterus. Such bleeding would most likely originate from which of the following arteries?

a. Internal pudendal artery
b. Uterine artery
c. Superior vesical artery
d. Ovarian artery

Ans. (a)

Q. Hysterectomy specimen is shown below. For the removal of arteries along with the specimen, which of the following structures is clamped and cut?

a. Ovarian ligament
b. Round ligament
c. Cardinal-uterosacral
d. Infundibulopelvic ligament

Ans. (d)

2. VULVA & BARTHOLIN GLAND

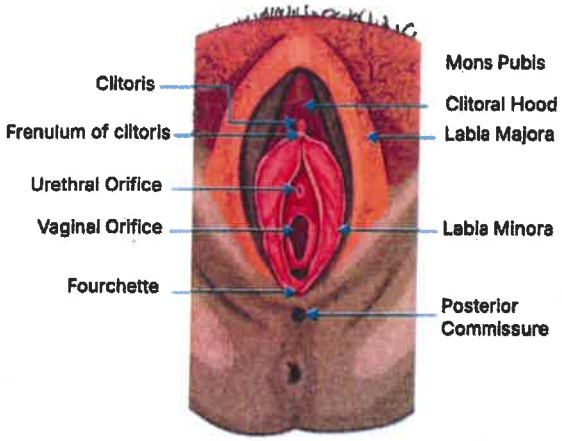
VULVA (PUDENDA)

00:00:42

STRUCTURES OF VULVA

STRUCTURES OF VULVA

- Mons pubis triangular pad of fat, which is overlying pubic symphysis.
- Labia majora
- Labia minora (hairless)
- Clitoris (erectile tissue 1.5 -2 cm): Highly vascular



Important Information

- Glans clitoris
- Labia minora → clitoral hood + frenulum of clitoris
- Posterior fourchette → Posterior joining of labia minora
- Posterior Commissure → Posterior joining of labia majora

LABIA MAJORA	LABIA MINORA
Stratified squamous epithelium	Stratified squamous epithelium
Hair bearing	Hairless
Subcutaneous fat ++	No subcutaneous fat, Rich in connective tissue
Sebaceous glands +	Sebaceous glands +
Apocrine sweat glands +	Apocrine sweat glands -
Contains: • Termination of round ligament of uterus • Obliterated vaginal process (canal of nuck)	-----

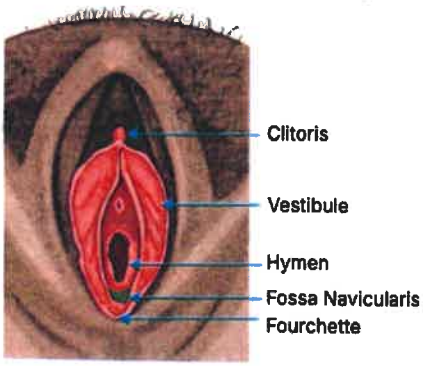
Important Information

- **Hidradenoma vulva** → benign tumor of apocrine sweat glands of vulva (very rare)
  - Arising in labia majora

VESTIBULE

00:08:26

- **'Almond-shaped'** area which is bounded by labia minora on both the sides
- **Fossa navicularis:** Space between Hymen and Fourchette
  - It is not seen in women post-vaginal delivery
- **Harts line** - Marks the change from keratinised skin of labia minora →

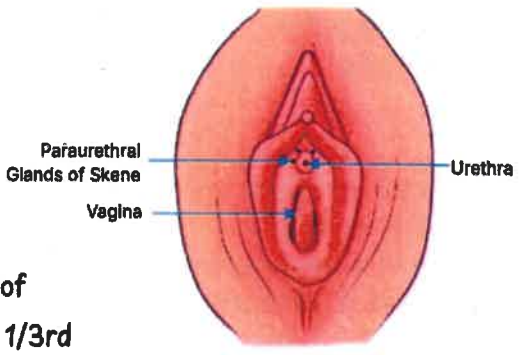


Boundaries

Laterally	Labia minora
Posteriorly	Fourchette
Anteriorly	Clitoris

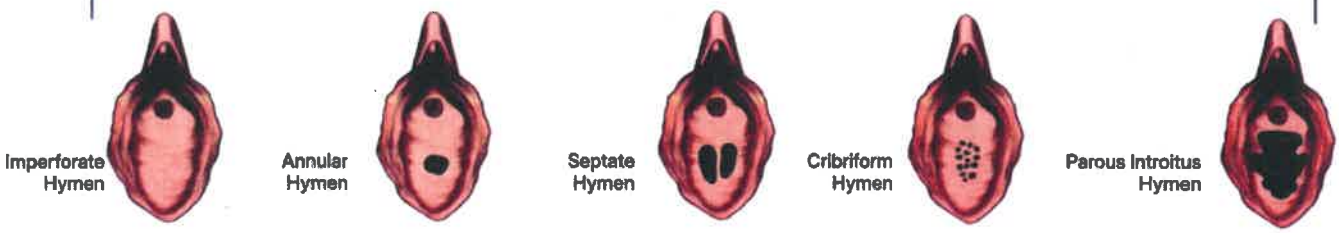
STRUCTURES OPENING IN THE VESTIBULE

- Vagina
- Urethra
- Paraurethral Glands of Skene → homologous to prostate gland
- Duct of Bartholin's Gland → opens just outside the hymen, at the junction of anterior 2/3rd & posterior 1/3rd



HYMEN

- **Definition:** Membrane that surrounds the vaginal opening
- **Types**
- **Lining:** Non-keratinized stratified squamous epithelium
- **Remnants of hymen after childbirth**



FALSE VIRGIN	TRUE VIRGIN
• Labia majora not apposed • Labia minora protruding out • Roomy vagina • Hymen intact	• Labia majora firm & apposed • Labia minora not protruding out • Narrow vagina • Hymen intact

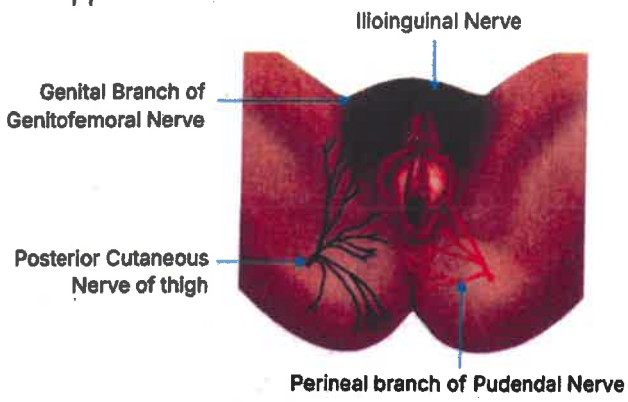
BLOOD SUPPLY OF THE VULVA

Internal Pudendal Artery (main)
Branch of anterior division of internal iliac artery

Branch of External Pudendal Artery
Branch of femoral artery
Supplies Mons Pubis

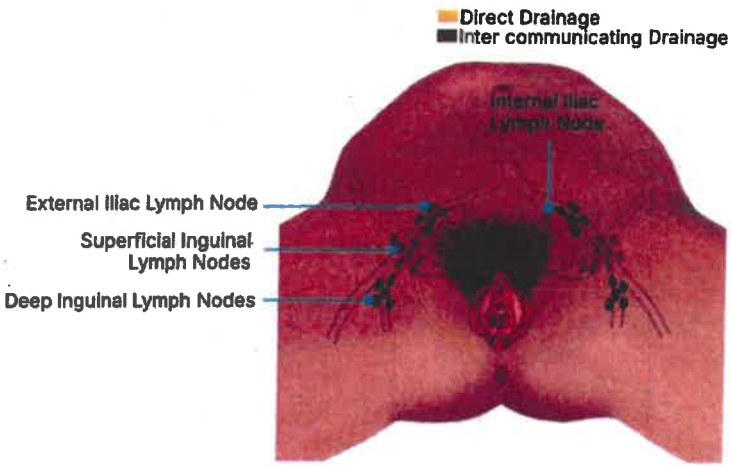
NERVE SUPPLY OF THE VULVA

- Ilioinguinal nerve & genital branch of the genitofemoral nerve → branches of lumbar plexus
- Pudendal nerve and Posterior cutaneous nerve of thigh → branches of Sacral plexus



LYMPHATIC DRAINAGE OF THE VULVA

Superficial inguinal nodes (groin)
↓
Deep inguinal lymph nodes (femoral canal)
↓
Pelvic lymph nodes



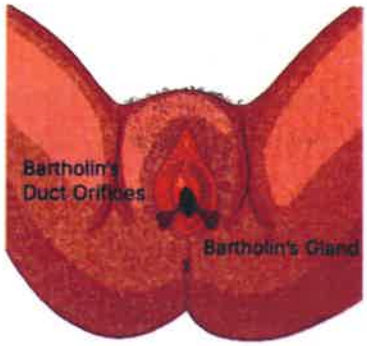
- Some clitoral lymphatics → drain directly to Deep Inguinal lymph nodes
- Lymphatics from midline structures like clitoris, fourchette, anterior labia minora) → B/L drainage
- Lymphatics from lateral structures like labia majora or bartholin's glands → I/L drainage

Q. What is Cloquets lymph nodes / Rosenmullers lymph nodes?

- Highest /superior most lymph nodes of deep inguinal group of lymph nodes

BARTHOLIN'S GLAND/ GREATER VESTIBULAR GLAND

- Homologous to [redacted]
- **Location**: Superficial perineal pouch
- Duct opens in the vestibule → outside the hymen → junction of anterior 2/3rd & post 1/3rd
- **Function** - secrete alkaline mucus during coitus
- **Bartholin gland cyst**: Accumulation of secretions → Blockage of duct opening → Swelling
  - Cause: Trauma, infection, debris, discharge



BARTHOLIN'S GLAND CYST

- M/c cyst of vulva in reproductive age women
- Infection of contents of cyst → Abscess formation
- **M/c organisms** - E. Coli >> Gonorrhoea, Chlamydia & Gram-ve aerobes

CLINICAL PRESENTATION OF BARTHOLIN'S GLAND SWELLING

Location- [redacted]

Clinical features

- Asymptomatic (Cosmetic discomfort)
- Pain and discomfort / Dyspareunia
- **Signs of infection / abscess** → Excruciating pain, redness, warmth, tenderness, +/- fever

T/t OF BARTHOLIN GLAND SWELLING

Asymptomatic (<3cm size)
- Observed
- Sitz bath

Symptomatic
- T/t needed

Bartholin's abscess
- I & D using word catheter Under antibiotic cover

Simple cyst
- I & D using word catheter
- Marsupialisation (if recurrence)

Solid lesion / female age >40years with recurrent episodes / postmenopausal female / Risk of malignancy
- Excision of cyst