UTERUS

“The moment a child is born, the mother is also born. She never existed before.

- Osho

Presented by:
Dr. Archana Rani
Professor
Department of Anatomy
KGMU, UP, Lucknow

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Uterus

- Synonyms: Womb, Hystera (G).
- Child bearing organ in females situated in the pelvis b/w bladder and rectum.
- Inverted pear shaped, thick- walled hollow muscular organ.

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Uterus

- **Body** - Upper expanded part.
- **Cervix** - Lower cylindrical part.
- **Isthmus** - Circular constriction b/w the body and cervix. Corresponds to the internal os.
- **Lower uterine segment** - Upper 1/3rd of cervix.
- **Conducting part** - lower segment.
- **Propulsive part** - upper segment.

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Measurements and Communications

- Length: 3”, breadth: 2”, thickness: 1”.
- Weight: 30-40 gm.
- Superiorly on each side: communicates with uterine tube.
- Inferiorly: communicates with the vagina.
Normal Position and Angulations

- Anteverted & anteflexed. 
  **Anteversion**: forward angulation b/w the cervix and vagina (90°).
  **Anteflexion**: forward angulation b/w the body and cervix (120-125°).
- Long axis of uterus corresponds to the axis of pelvic inlet.

Disclaimer: Presentation is for educational purposes only and not for commercial activity

Human Anatomy. BD Chaurasia, 8th ed, Vol. 2, 2020
Angle of Anteversion

Angle of Anteflexion
Gross Anatomy

Division of Uterus:
(a) Body: upper 2/3\textsuperscript{rd} part.
(b) Cervix (neck): lower 1/3\textsuperscript{rd} part.

• Body of the uterus:
  (a) Fundus
  (b) 2 surfaces:
    (i) Anterior/vesical
    (ii) Posterior/intestinal
  (c) 2 lateral borders

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Fundus of the Uterus

- Lies above the entrance of the two uterine tubes.
- Convex like a dome.
- Covered with peritoneum and is directed forwards when the bladder is empty.
- Does not contain the uterine cavity.
- The fertilized ovum is implanted usually in the posterior wall of the fundus.
Surfaces of the Uterus

Anterior (vesical) surface:
• Flat & related to urinary bladder.
• Directed downwards & forwards.
• Covered with peritoneum.
• Forms the posterior wall of the utero-vesical pouch.

Posterior (intestinal) surface:
• Convex & related to terminal coils of ileum and sigmoid colon.
• Covered with peritoneum.
• Forms the anterior wall of the rectouterine pouch.
Borders of the Uterus

**Lateral border:**
- Rounded and convex.
- Provides attachment to the broad ligament of uterus.
- Uterine tube opens into the uterus at the upper end of this border.
- The round ligament of uterus is attached anteroinferior to the tube.
- The ligament of ovary is attached posteroinferior to the tube.
- Uterine artery ascends along the lateral border b/w 2 layers of broad ligament.
Cavity of the Uterus

- Vertical slit in sagittal section
- Triangular in coronal section
- Base is formed by the fundus
- Apex is formed by the internal os
- Communicates with the cervical canal through the internal os
- Endometrium: Mucous membrane of the uterine cavity
Cervix

- Lower cylindrical part of uterus lying below the level of internal os.
- Less mobile than the body.
- Length: 2.5 cm
- The lower part of cervix projects into the anterior wall of vagina which divides it into the supravaginal and vaginal parts.

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Supravaginal part of Cervix

Relations:

Anteriorly - base of bladder

Posteriorly - rectouterine pouch with intestinal coils and rectum

On each side -
• Ureter
• Uterine artery
• Attachment of Mackenrodt’s ligament
• Lower attached margin of the broad ligament
Vaginal part of Cervix

- Conical in shape.
- Projects into the anterior wall of vagina forming the vaginal fornices (anterior, posterior and 2 lateral).
- Cervical canal opens into the vagina by an opening called the external os.
- External os is small and circular in nulliparous women.
- In multiparous women, the external os is bounded by the anterior and posterior lips.

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Cervical Canal

- Fusiform in shape.
- Flattened from before backwards.
- Communicates with the uterine cavity above, through the internal os.
- Communicates with the vaginal cavity below, through the external os.
- **Arbor vitae uteri**: mucosal folds in the anterior & posterior walls of canal which resemble the branches of a tree.
- Mucosal folds interlock with each other and close the canal.

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Ligaments of Uterus

(A) Peritoneal ligaments:
1. Anterior false ligament- consists of uterovesical fold of peritoneum.
2. Posterior false ligament- consists of rectovaginal fold of peritoneum.
3. A pair of Broad ligaments

(B) Fibromuscular ligaments:
1. Round ligaments of uterus
2. Transverse cervical ligaments
3. Uterosacral ligaments
4. Pubocervical ligaments

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Peritoneal Ligaments

https://www.cambridge.org

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Supports of Uterus

Primary supports
- Muscular
  - Pelvic diaphragm
  - Perineal body
  - Urogenital diaphragm
- Fibromuscular
  - Uterine axis
  - Pubocervical ligament
  - Mackenrodt's ligament
  - Uterosacral ligament
  - Round ligament of uterus

Secondary supports
- Broad ligaments
  - Uterovesical fold
  - Rectovaginal fold

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Muscular Supports
Pelvic Diaphragm

- Levator ani
- Pubococcygeus
- Iliococcygeus
- Obtainator internus
- Coccyx
- Symphysis pubis
- Urogenital diaphragm
- Urethra
- Vagina
- Anal canal
- Piriformis
- Coccygeus
- Levator ani
- Pelvic diaphragm

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Perineal Body

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Fibromuscular Supports
Uterine axis

- Normally the uterus is antevverted and anteflexed.
- The antevverted position of uterus prevents the organ from sagging down through the vagina.
- The angle of anteversion (90°) is maintained by the uterosacral and round ligaments.
- Roughly, the long axis of uterus corresponds to the axis of the pelvic inlet.
Fibromuscular Supports

Pubocervical ligaments:
- Connect the cervix to the posterior surface of the pubis.
- Derived from the pelvic fascia.
- Pull the cervix forwards and counteract the excessive traction of the uterosacral ligaments.

Uterosacral ligaments:
- Connect the cervix to the 3rd sacral vertebra.
- Condensation of the pelvic fascia.
- Enclosed within the rectouterine folds of peritoneum.
- Pull the cervix backwards.
- Helps in maintenance of uterine axis along with the round ligament.

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Mackenrodt’s ligament

- Also known as **transverse cervical, lateral cervical, paracervical or cardinal ligament/retinacula uteri/sustentaculum of Bonny**.
- Fan-shaped condensation of pelvic fascia.
- Extends laterally from the cervico-vaginal junction to the lateral pelvic wall.
- Related above with the crossing of ureter and uterine artery, and with the lower attached margin of broad ligament.

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Round ligament of uterus

- Known as ligamentum teres uteri.
- 10-12 cm long.
- Lies b/w 2 layers of broad ligament anteroinferior to the uterine tube.
- Begins at the lateral angle of uterus → Deep inguinal ring → Inguinal canal → splits into thin filaments & merges with the areolar tissue of labium majus.
- Canal of Nuck
- Derivative of gubernaculum of ovary.
- Function: maintains the angle of anteversion.
Round ligament of Uterus
Secondary Supports

• Peritoneal folds which do not provide any support to the uterus.
• Allow mobility of the uterus for the accommodation of the distended bladder and rectum.
• Also known as false ligaments and are classified as:
  (a) Anterior false ligament (Utero-vesical fold of peritoneum)
  (b) Posterior false ligament (Recto-vaginal fold of peritoneum)
  (c) Broad ligaments
Secondary Supports

**Utero-vesical fold:**
- Formed by the reflection of peritoneum from the anterior surface of the body of uterus to the upper surface of the urinary bladder at the level of isthmus.

**Recto-vaginal fold:**
- Formed by the peritoneal reflection from the posterior fornix of the vagina to the rectum.
- This fold forms the pouch of Douglas.
**Broad ligament**

- 2 broad folds of peritoneum which suspend the uterus to the lateral pelvic wall.
- Both broad ligaments and uterus form a transverse partition which divides the pelvic cavity into an anterior compartment for the bladder, and a posterior compartment for the sigmoid colon and rectum.
- Surfaces- anterior and posterior.
- Borders- upper, lower, medial and lateral.
Broad ligament

Subdivisions:

1. **Mesosalpinx**: intervenes b/w the uterine tube and ovary with the ligament of ovary. Contains the uterine tube and the anastomosis b/w the uterine & ovarian vessels.

2. **Mesometrium**: from the ovary and its ligament to the base of the broad ligament. Contains the tortuous uterine vessels.

3. **Infundibulopelvic ligament (Suspensory ligament of ovary)**:
   Connects the ovary and the uterine tube to the pelvic brim across the external iliac vessels. Transmits the ovarian vessels and nerves.

4. **Mesovarium**: a fold derived from the posterior layer of the broad ligament where the ovary is attached. Transmits the ovarian vessels and nerves.
Contents of the Broad ligament

- **One tube:** Uterine tube in the free upper border.
- **Two ligaments:** (a) Round ligament of uterus 
  (b) Ligament of ovary
- **Two vessels:** (a) Uterine vessels 
  (b) Ovarian vessels
- **Two nerves:** (a) Uterovaginal plexus 
  (b) Ovarian plexus
- **Two embryological remnants:** 
  (a) Epoophoron and the duct of epoophoron (Gartner’s duct) 
  (b) Paroophoron
- **Two miscellaneous structures:** 
  (a) Lymphatics and lymph nodes 
  (b) Fibroareolar tissue or parametrium

Disclaimer: Presentation is for educational purposes only and not for commercial activity

https://anatomyqa.com/uterus-anatomy/
Nerve Supply of Uterus

• Both sympathetic and parasympathetic nerves through the inferior hypogastric and ovarian plexuses.
• Sympathetic nerves (T12,L1): uterine contraction and vasoconstriction.
• Parasympathetic nerves (S2,3,4): uterine inhibition and vasodilatation.
• Pain sensations from the body of uterus: sympathetic nerves.
• Pain sensations from the cervix: parasympathetic nerves.
Arterial supply of Uterus
Uterine arteries

Course:

• Runs medially towards the cervix, crossing the ureter above the lateral fornix of vagina from lateral to medial side.

• Crossing lies 2 cm lateral to cervix and above the Mackenrodt’s ligament.

• Runs upwards through the broad ligament along the lateral border of uterus with a tortuous course.
Uterine arteries (contd....)

- As the uterine artery ascends it gives arcuate (coronary) branches.
- Numerous radial arteries arise from the arcuate arteries.
- Radial arteries pierce the myometrium centripetally to form **stratum vasculare**.
- Branches from stratum vasculare:
  1. Basal branches
  2. Spiral branches
Uterine arteries (contd....)

• Finally, the uterine artery runs laterally towards the hilus of the ovary, and ends by anastomosing with the ovarian artery.
• Tortuosity permits expansion of the uterus during pregnancy.
Areas of supply

- Uterus
- Vagina
- Medial 2/3rd of uterine tube
- Ovary
- Ureter
- Contents of the broad ligament

Disclaimer: Presentation is for educational purposes only and not for commercial activity

https://www.earthslab.com/anatomy/uterus/
Ovarian arteries

Origin:
• From the front of the aorta.
• A little below the renal arteries.

Abdominal Course:
• Passes obliquely downwards and laterally in front of the psoas major, ureters and genitofemoral nerves.

Disclaimer: Presentation is for educational purposes only and not for commercial activity
https://musculoskeletalkey.com/ovarian-vessels/
Areas of supply

- Uterine tube
- Pelvic part of ureter
- Uterus
- Ovary

Disclaimer: Presentation is for educational purposes only and not for commercial activity

https://en.wikipedia.org/wiki/Ovarian_artery
Venous drainage of Uterus

- Veins form a plexus along the lateral border of the uterus.
- Through the uterine, ovarian and vaginal veins the plexus drains into the internal iliac vein.

https://slideplayer.com/slide/2792973/
Lymphatic drainage of Uterus

3 intercommunicating networks:
- Endometrial
- Myometrial
- Subperitoneal

These plexuses drain into the lymphatics on the side of the uterus:
- Upper lymphatics (from fundus & upper part of body) → Aortic nodes and superficial inguinal nodes.
- Middle lymphatics (from lower part of body) → External iliac nodes.
- Lower lymphatics (from cervix) → External iliac, internal iliac and sacral nodes.

Disclaimer: Presentation is for educational purposes only and not for commercial activity
Age and Reproductive Changes

• **In foetal life:** cervix is more elongated than the body of uterus.

• **At puberty:** uterus enlarges and arbor vitae uteri appear.

• **During menstruation:** uterus is slightly enlarged and more vascular. The lips of the external os is swollen.

• **During pregnancy:** uterus is enormously enlarged (hypertrophy and hyperplasia). Uterine walls become thinner. After parturition the uterus gradually involutes and returns to the nonpregnant size.

• **In old age:** uterus becomes smaller in size. Internal and external os are frequently obliterated.
Applied Anatomy

- Retroverted uterus
- Prolapse of uterus
- Endometritis
- Cervicitis
- Fibromyoma
- Cancer cervix
- Caesarean section
- Hysterectomy, hysterotomy, hysteropexy, hysterosalpingography

Disclaimer: Presentation is for educational purposes only and not for commercial activity

https://www.pinterest.com/pin/8514686779215780/

https://emedicine.medscape.com/article/797295-overview
Fibromyoma

Diagram showing different types of fibroids:
- Subserosal
- Intramural
- Submucosal
- Pedunculated

Related terms:
- Uterus
- Cervix
- Vagina
- Fallopian Tube
Thank You