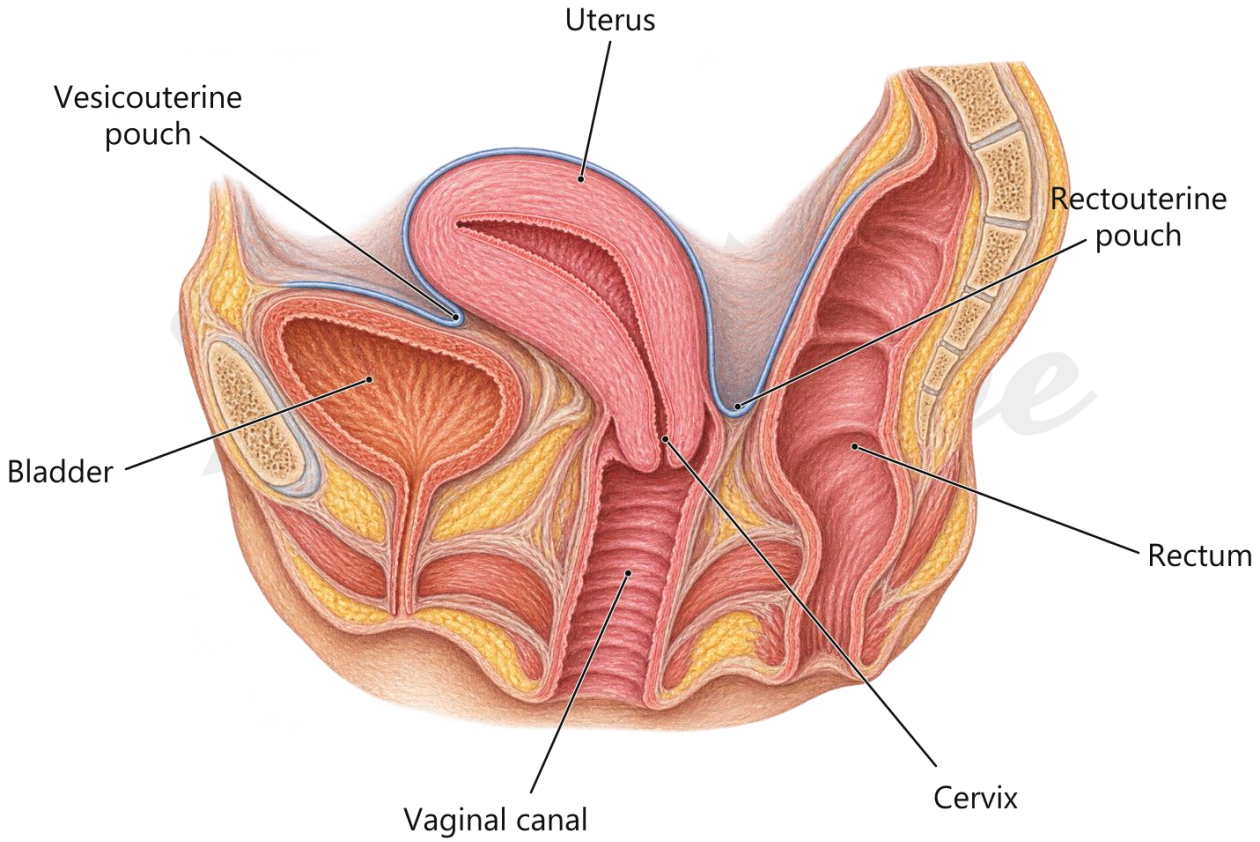
Obstetrics & Gynaecology - Topic 2 - Anatomy of the female reproductive tract (Basic anatomy and embryology)

The Female Reproductive Tract

Anatomy in Clinical Practice

- The reproductive tract includes the ovaries, uterine tubes, uterus, cervix, vagina and external genitalia.
- These structures share a small pelvic space with the bladder, ureters, rectum, blood vessels and nerves.
- Understanding their relations helps explain pain, prolapse, fistula, tumour spread and injury during surgery.



The uterus and vagina lie between the urinary bladder and rectum in the female pelvis

External Genitalia and Perineum

1. Vulva and Vestibule

- The vulva includes the mons pubis, labia majora, labia minora, clitoris and vestibule.
- The vestibule contains the external urethral opening and vaginal opening, with gland ducts opening nearby.
- The clitoris contains erectile tissue and has a rich sensory nerve supply.
- Bartholin glands lie posterolateral to the vaginal opening and drain through small ducts into the vestibule.

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- Obstruction or infection of a duct can produce a cyst or a painful abscess.

- The hymenal margin varies normally and cannot establish whether a person has had sexual intercourse.

2. The Perineal Body

- The perineal body is a central fibromuscular attachment between the lower vagina and anal canal.
- It helps support the pelvic outlet through attachments of perineal muscles and the external anal sphincter.
- Childbirth trauma can damage this support and may involve the anal sphincter or rectal mucosa.
- Examination and repair must identify the full depth of an injury rather than only closing the skin.

Vagina

Course, Relations and Fornices

- The vagina is a distensible fibromuscular canal that extends from the cervix to the vestibule.
- Its anterior wall lies close to the urethra and bladder, while its posterior wall is related to the rectum.
- The cervix projects into the upper vagina and creates anterior, posterior and lateral fornices.
- The posterior fornix lies close to the rectouterine pouch and is usually deeper than the anterior fornix.

Wall, Lubrication and Vaginal Environment

- The vaginal lining is non-keratinised stratified squamous epithelium and normally contains no glands.
- The vaginal wall consists of mucosa, smooth muscle and an outer connective-tissue layer.
- Lubrication comes mainly from fluid passing through the vaginal wall and from cervical and vestibular secretions.
- Oestrogen supports epithelial maturation and glycogen, which contribute to the usual acidic vaginal environment through lactobacilli.
    - This environment changes with age, hormonal status and infection, so one pH value is not normal in every patient.

Cervix

Structure and Epithelium

- The cervix is the lower part of the uterus and contains an endocervical canal between the internal and external os.

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- The ectocervix is mainly covered by squamous epithelium, whereas the endocervical canal has mucus-producing columnar epithelium.
- The squamocolumnar junction moves with age, hormonal changes and pregnancy.
- The transformation zone lies between the original and current junctions and is important in cervical precancer screening.

Clinical Relevance

- Cervical mucus becomes more favourable to sperm transport around ovulation and becomes thicker under progesterone influence.
- Cervical ripening and dilatation are essential for vaginal birth.
- A cervical lesion may cause contact bleeding, but appearance alone cannot reliably distinguish benign disease from cancer.
- An abnormal-looking cervix needs appropriate evaluation even when a recent screening result was reassuring.

Uterus and Adnexa

Uterus

Parts and Position

Parts, Version and Flexion

- The uterus has a fundus, body, isthmus and cervix, with a cavity that communicates with the tubes and cervix.
- Anteversion describes forward angulation of the cervix relative to the vagina.
- Anteflexion describes forward bending of the uterine body relative to the cervix.
- Position varies normally, so a retroverted uterus is not automatically a disease.

Cavity Shape and Changes in Labour

- The isthmic region contributes to the lower uterine segment as pregnancy advances.
- The uterine cavity is roughly triangular when viewed from the front, whereas the cervical canal is more cylindrical.
- The upper uterine segment retracts strongly during labour, while the lower segment stretches and becomes thinner.

Wall and Function

- The endometrium lines the cavity and responds to ovarian hormones during the menstrual cycle.
- The myometrium contains smooth muscle that enlarges in pregnancy and contracts during labour and after birth.

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- The outer surface is partly covered by peritoneum, which reflects onto neighbouring pelvic organs.
- Contraction and retraction after placental separation compress uterine vessels and help control bleeding.

Peritoneal Relations

- The vesicouterine pouch lies between the bladder and uterus.
- The rectouterine pouch lies behind the uterus and upper vagina, in front of the rectum.
- Blood, pus or fluid may collect in this dependent pelvic space.
- Previous caesarean birth or pelvic infection can create adhesions that alter the expected surgical planes.

Uterine Tubes

Parts of the Uterine Tube

A. Intramural Part

- The intramural part passes through the uterine wall and opens into the uterine cavity.

B. Isthmus

- The isthmus is a relatively narrow segment near the uterus.

C. Ampulla

- The ampulla is the wider lateral segment and is the usual site of fertilisation.

D. Infundibulum

- The infundibulum opens into the peritoneal cavity and bears fimbriae that help receive the ovulated oocyte.

Tubal Function and Clinical Relevance

- Cilia and smooth-muscle activity help move gametes and the early embryo through the tube.
- Tubal infection or damage can impair transport and increase the risk of infertility or ectopic pregnancy.

Ovaries

Position and Follicular Structure

- The ovaries lie near the lateral pelvic walls and produce oocytes and reproductive hormones.
- The cortex contains follicles at different stages, while the medulla contains vessels, nerves and connective tissue.

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Attachments and Vascular Pedicle

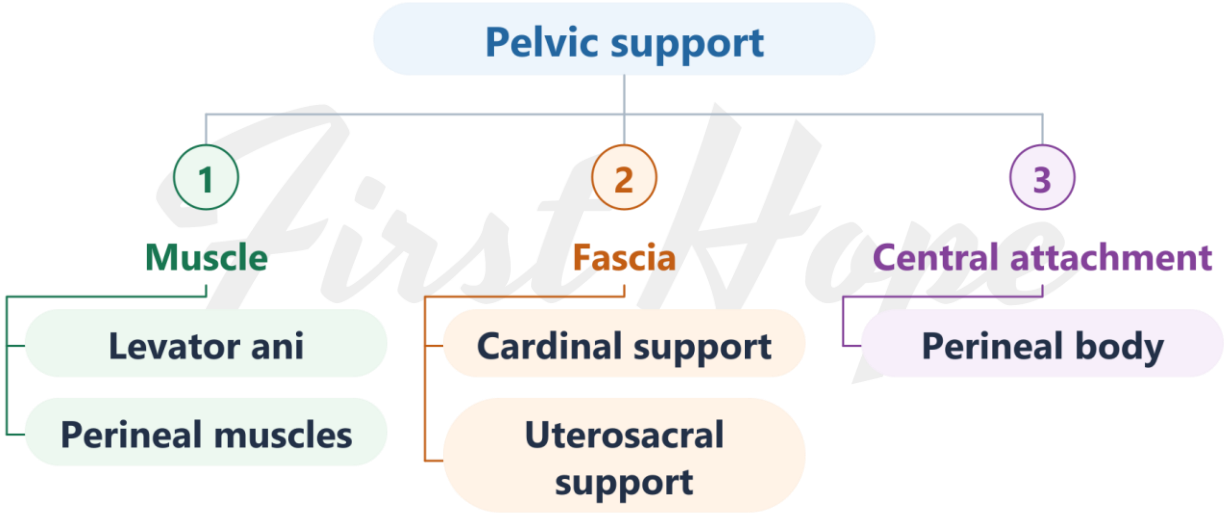
- The mesovarium attaches the ovary to the broad ligament, and the ovarian ligament links it to the uterus.
- The suspensory ligament of the ovary carries the ovarian vessels from the lateral pelvic region.

Adnexal Torsion

- An ovarian mass can twist its pedicle, causing venous obstruction and eventually reduced arterial perfusion.
- Sudden unilateral pelvic pain with nausea raises concern for torsion and requires urgent assessment.

Support, Blood Supply and Surgical Relations

Pelvic Support



Muscle Support

- Levator ani and associated pelvic-floor structures support the pelvic organs and resist raised abdominal pressure.
- The puborectalis component helps maintain the anorectal angle and contributes to continence.
- Childbirth, connective-tissue weakness and chronic straining may impair support.

Fascial and Ligamentous Support

- Cardinal and uterosacral connective-tissue supports help maintain the cervix and upper vagina in position.
- The round ligaments help maintain uterine orientation but do not provide the main resistance to prolapse.
- The broad ligament is a peritoneal fold and should not be described as the chief load-bearing support of the uterus.

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