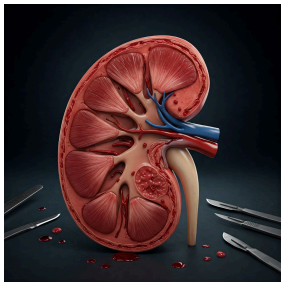


Written by: Dr. Ali Fahad Abu Jamil.
Anatomy, lecture title: LABs.

The scrotum is a skin-covered sac that holds the testes outside the body to maintain a lower temperature necessary for sperm production. It consists of several layers, starting from the outside: the skin, followed by the dartos fascia and muscle (which helps in temperature regulation by wrinkling the skin), then the external spermatic fascia, the cremasteric muscle and fascia (which raises and lowers the testes), the internal spermatic fascia, and finally the tunica vaginalis, which has parietal and visceral layers surrounding the testes. The main function of the scrotum is to protect the testes and provide the ideal environment for spermatogenesis.

The testis is a male reproductive organ responsible for producing sperm and the hormone testosterone. It is oval-shaped and located within the scrotum. Each testis is covered by the tunica vaginalis and the tunica albuginea, which forms septa dividing it into lobules. Each lobule contains seminiferous tubules where sperm is produced. Sperm then travels through the rete testis to the epididymis. The testis plays a key role in both reproductive and endocrine functions.

The epididymis is a tightly coiled tube located on the posterior surface of the testis. It has three parts: head, body, and tail. The head receives sperm from the rete testis, the body is the middle part where sperm matures, and the tail stores the mature sperm before it moves into the vas deferens. The main function of the epididymis is sperm maturation, storage, and transport.

The spermatic cord is a bundle of structures that runs from the deep inguinal ring to the testis. It contains the vas deferens, testicular artery, pampiniform venous plexus, genital branch of the genitofemoral nerve, cremasteric artery, artery to the vas deferens, lymphatic vessels, and sympathetic nerves. Its main functions are to support the testis and provide the pathway for blood, nerve supply, and sperm transport.

The vas deferens is a muscular tube that transports sperm from the epididymis to the ejaculatory ducts during ejaculation.

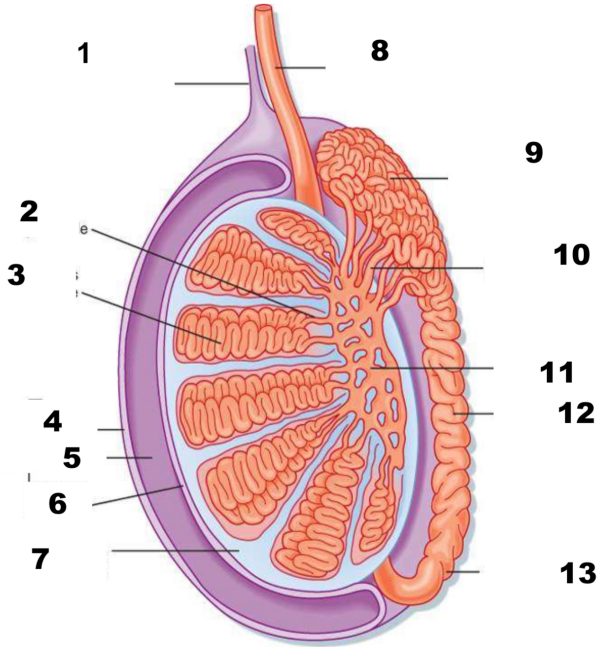
Seminal vesicles are paired glands located behind the bladder that produce a fluid rich in fructose, which forms the majority of semen and nourishes the sperm.

The ejaculatory ducts are short ducts that pass through the prostate and allow sperm and seminal fluid to enter the urethra during ejaculation.

The prostate is a walnut-sized gland located below the bladder that secretes a slightly alkaline fluid that helps protect and activate sperm.

The root anchors the penis to the pubic arch, the corpora cavernosa are two erectile tissues that fill with blood during erection, and the bulb is part of the corpus spongiosum that helps expel semen and urine.

The male urethra is divided into four parts: preprostatic, prostatic, membranous, and spongy, and it serves as a passage for both urine and semen.



1. Vestige of processus vaginalis is a small fibrous remnant of the embryonic processus vaginalis, which normally closes after the descent of the testis. If it remains open, it may lead to indirect inguinal hernia or hydrocele.

2. Straight tubule (Tubuli recti) are short ducts that connect the seminiferous tubules to the rete testis. They help transport immature sperm cells from the site of spermatogenesis toward the rete testis.

3. Seminiferous tubules are coiled structures within the testes where spermatogenesis occurs. They are lined with germ cells and Sertoli cells that support sperm development.

4. Tunica vaginalis (parietal layer) is the outer layer of the serous membrane surrounding the testis, derived from the peritoneum. It lines the inner surface of the scrotum and provides a frictionless surface for testicular movement.

5. Cavity of Tunica vaginalis is the potential space between the parietal and visceral layers of the tunica vaginalis. It contains a small amount of fluid that allows smooth movement of the testis.

6. Tunica vaginalis (visceral layer) closely adheres to the surface of the testis and epididymis. It is derived from the peritoneum and forms the inner layer of the tunica vaginalis.

7. Tunica albuginea is a thick, fibrous capsule that covers the testis and sends septa inward to divide it into lobules. It helps protect the testicular tissue and maintain the shape of the testis.

8. Ductus deferens (Vas deferens) is a muscular tube that transports mature sperm from the tail of the epididymis to the ejaculatory duct during ejaculation.

9. Head of the epididymis is the superior expanded portion that receives sperm from the efferent ductules. It begins the process of sperm maturation.

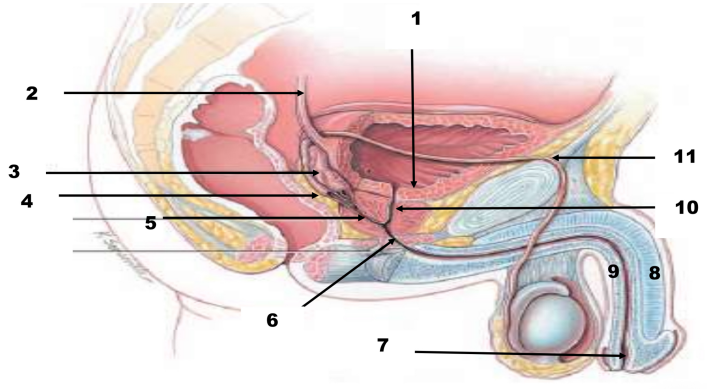
10. Efferent ductules connect the rete testis to the head of the epididymis. They transport sperm and absorb testicular fluid to concentrate the sperm.

11. Rete testis is a network of interconnecting tubules in the mediastinum testis that collects sperm from the straight tubules and channels it to the efferent ductules.

12. Body of the epididymis is the middle portion of the epididymis where sperm continue to mature and are stored temporarily.

13. Tail of the epididymis is the final segment that stores mature sperm until ejaculation. It connects directly to the vas deferens.

1.The trigone is a smooth triangular area on the posterior wall of the bladder, defined by the two ureteric orifices and the internal urethral orifice. It does not expand as the bladder fills and helps direct urine toward the urethra.



2. The ureter is a muscular tube that transports urine from the kidney to the bladder. It enters the bladder obliquely through the bladder wall, which creates a valve-like effect to prevent urine backflow (vesicoureteral reflux).

3.The seminal vesicle is a gland that produces a fructose-rich, alkaline fluid that makes up the majority of the semen volume. This fluid nourishes sperm and helps neutralize the acidity of the vaginal tract.

4. Rectovesical Fascia (Denonvilliers' Fascia) This fascia is a connective tissue layer separating the rectum from the bladder and seminal vesicles in males. It's important in pelvic surgery as a landmark and barrier between the genitourinary and gastrointestinal systems.

5. Ejaculatory Duct Formed by the union of the vas deferens and the duct of the seminal vesicle, the ejaculatory duct passes through the prostate and opens into the prostatic urethra. It delivers sperm and seminal fluid during ejaculation.

6. Membranous Urethra This is the shortest and narrowest part of the male urethra, located between the prostatic urethra and the spongy (penile) urethra. It passes through the deep perineal pouch and is surrounded by the external urethral sphincter.

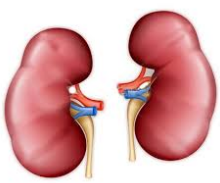
7. Navicular Fossa The navicular fossa is the terminal, widened part of the spongy urethra located in the glans penis. It is the last segment of the urethra before the external urethral meatus.

8. Corpus Cavernosum These are paired erectile tissues located dorsally in the penis. They fill with blood during erection, causing penile rigidity. They are surrounded by the tunica albuginea.

9. Corpus Spongiosum This is a single midline erectile tissue located ventrally in the penis. It contains the spongy urethra and prevents it from collapsing during erection, allowing ejaculation to occur.

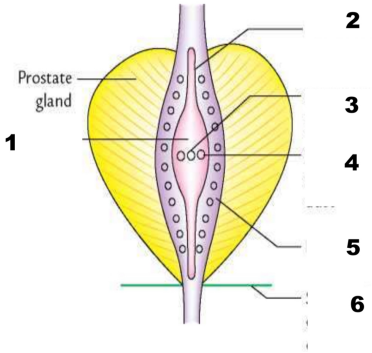
10. Prostatic Urethra This is the part of the male urethra that passes through the prostate gland. It receives the openings of the ejaculatory ducts and prostatic ducts. It's the widest part of the urethra.

11. Vas Deferens (Ductus Deferens) This is a muscular tube that transports sperm from the epididymis to the ejaculatory duct. It ascends through the spermatic cord and enters the pelvic cavity via the inguinal canal.



To be the first Doctor in the brain and nerve surgery, this is my dream.

1. Seminal Colliculus (Verumontanum) This is an elevation on the posterior wall of the prostatic urethra. It contains the openings of the ejaculatory ducts and the prostatic utricle. It's an important landmark for identifying the location of these structures during procedures.



2. Urethral Crest A longitudinal ridge on the posterior wall of the prostatic urethra. It contains the seminal colliculus and helps guide the flow of urine and semen within the urethra.

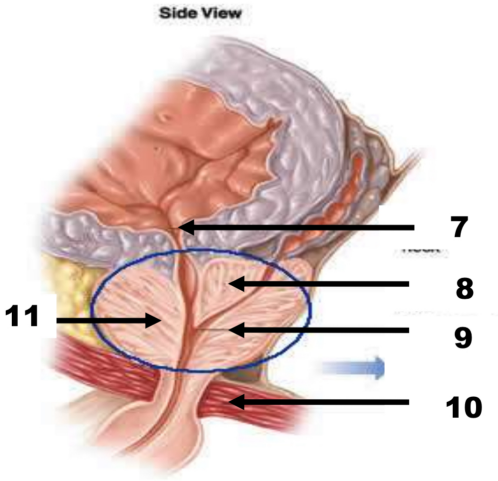
3. Prostatic Utricle A small, blind pouch in the center of the seminal colliculus. It's a vestigial remnant of the paramesonephric (Müllerian) duct in males and has no known function but may be mistaken for a pathology if enlarged.

4. Ejaculatory Duct These ducts are formed by the union of the vas deferens and seminal vesicle ducts. They pass through the prostate and open into the prostatic urethra at the seminal colliculus, delivering sperm and seminal fluid during ejaculation.

5. Prostatic Sinuses Depressions located on either side of the urethral crest in the prostatic urethra. These receive the openings of the prostatic ducts, which drain prostatic secretions into the urethra.

6. Perineal Membrane A strong fibrous sheet forming the inferior boundary of the deep perineal pouch. It provides support for the pelvic organs and serves as an attachment point for muscles of the urogenital triangle.

7. Neck of Urinary Bladder This is the most inferior and fixed part of the bladder, where it connects to the urethra. It contains the internal urethral sphincter (in males) and is anchored by the puboprostatic or pubovesical ligaments. It's important for continence.



8. Median Lobe of Prostate Also called the "middle lobe," it lies between the urethra and ejaculatory ducts. It enlarges in benign prostatic hyperplasia (BPH) and can obstruct the internal urethral orifice, leading to urinary symptoms.

9. Posterior Lobe of Prostate Located behind the urethra and below the ejaculatory ducts. It is the most common site for prostate cancer, making it clinically significant in digital rectal exams.

10. External Urethral Sphincter A voluntary (skeletal muscle) sphincter that surrounds the membranous urethra. It provides conscious control over urination and is part of the deep perineal pouch.

11. Anterior Lobe of Prostate Also known as the isthmus of the prostate, it lies anterior to the urethra. It contains little to no glandular tissue and is composed mostly of fibromuscular stroma.

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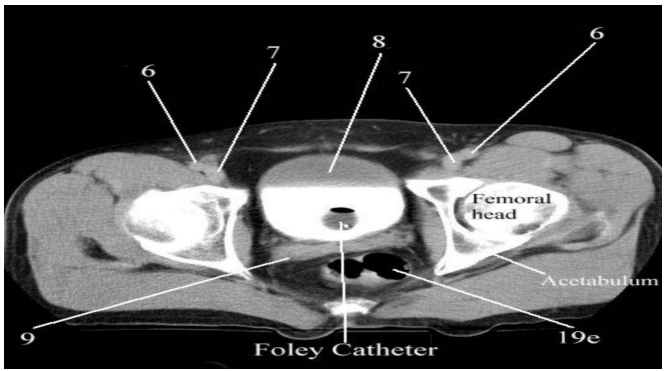
6. Femoral Artery (Lateral) lies lateral to the femoral vein in the femoral triangle major blood vessel supplying the lower limb. On imaging or cross-section, it is always the lateral vessel relative to the vein.



7. Femoral Vein (Medial) is medial to the femoral artery in the femoral triangle. It drains blood from the lower limb and continues as the external iliac vein. On anatomical sections, it's always medial compared to the artery.

8. Urinary Bladder A hollow muscular organ that stores urine. In males, it's located anterior to the rectum and superior to the prostate. On cross-sectional images, it's often identified by a Foley catheter inserted through the urethra and visible within it.

9. Seminal Vesicle (Oblique Structure Between Urinary Bladder and Rectum) are paired glands located posterior to the bladder and anterior to the rectum. They run obliquely and contribute a major portion of the seminal fluid. On imaging, they appear as oblique or curved structures between the bladder and rectum.

19.e. Rectum (Black Posterior) lies posterior to the urinary bladder and seminal vesicles in males. On axial imaging, it often appears dark ("black") due to gas or empty lumen. It is the most posterior midline pelvic structure.

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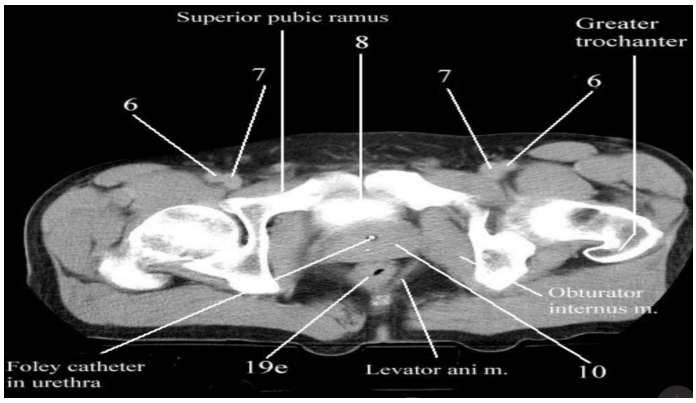
6. Femoral Artery (Lateral) lies lateral to the femoral vein and is a key artery supplying the lower limb. It is easily identified in cross-sections as the rounder, more muscular, lateral vessel in the femoral triangle.



7. Femoral Vein (Medial) Positioned medially to the femoral artery, the femoral vein drains blood from the lower limb. On axial images, it appears thinner-walled and often slightly collapsed compared to the artery.

8. Urinary Bladder A muscular reservoir for urine, located anterior to the prostate and rectum in males. A Foley catheter may be visible inside it on imaging, helping confirm its identity.

10. Prostate Gland Located inferior to the urinary bladder, the prostate surrounds the prostatic urethra and contributes prostatic fluid to semen. On axial imaging, it's seen as a solid structure just below the bladder.

19.e. Rectum (Black Posterior) is the most posterior midline structure in the male pelvis, located behind the prostate and bladder. It often appears dark on imaging due to air or fecal matter inside.

Note: The oblique muscle inferolateral to the prostate seen on axial pelvic images is the levator ani muscle. It forms part of the pelvic floor and supports the pelvic viscera.

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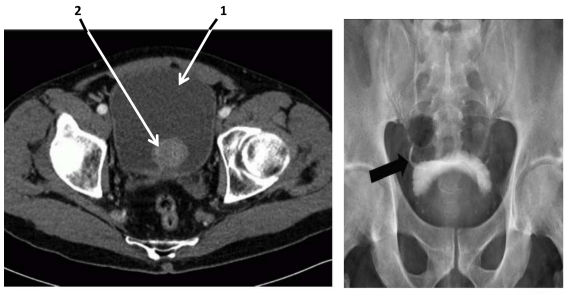
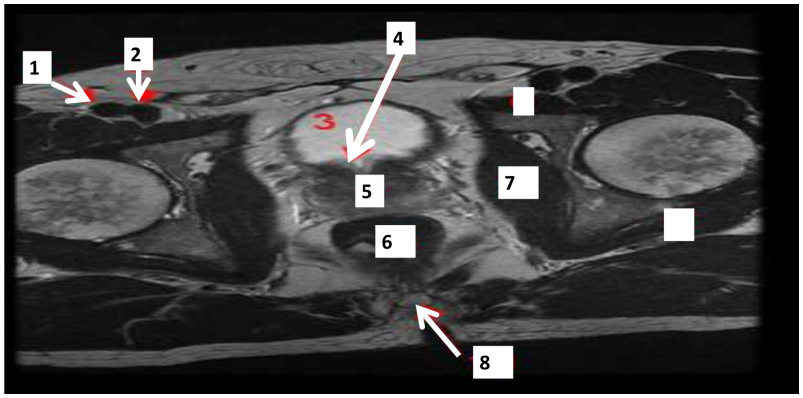
1. Urinary Bladder A muscular organ that stores urine. On imaging, it normally appears as a fluid-filled, rounded structure in the pelvis. If it appears small, it may be due to pathological conditions such as compression or obstruction.



2. Enlarged Prostate Bulging Inside the Bladder When the prostate becomes enlarged, especially the median lobe, it can

protrude into the bladder and create a bulge. This condition, often seen in benign prostatic hyperplasia (BPH), reduces the effective volume of the bladder and can obstruct urine flow. On imaging, the bladder may appear small or compressed due to the space occupied by the protruding prostate tissue.



1. Femoral Artery A major blood vessel supplying the lower limb. It runs lateral to the femoral vein in the femoral triangle and is easily identified on axial imaging by its thick muscular wall.

2. Femoral Vein This vein lies medial to the femoral artery and drains blood from the lower limb. On imaging, it may appear partially collapsed compared to the artery.

3. Urinary Bladder A muscular, hollow organ that stores urine. Located anterior to the prostate and rectum in males. On cross-sectional images, it's typically fluid-filled and centrally located in the pelvis.

4. Neck of the Bladder The narrow, inferior part of the bladder that connects to the urethra. In males, it sits directly above the prostate and plays a role in continence through the internal urethral sphincter.

5. Prostate Gland A firm gland located below the bladder, surrounding the prostatic urethra. It contributes to seminal fluid and is commonly involved in conditions like BPH and prostate cancer.

6. Rectum The most posterior midline pelvic organ. It stores feces and lies directly behind the bladder and prostate in males. On imaging, it may appear dark due to gas.

7. Obturator Internus Muscle A deep pelvic muscle forming part of the lateral wall of the pelvic cavity. On axial imaging, it appears lateral to the rectum and prostate, and medial to the pelvic bones.

8. Coccyx The terminal part of the vertebral column. It lies posterior to the rectum and appears as a small, curved bony structure at the bottom of the sacrum on axial or sagittal imaging.

The ovary is a small, almond-shaped organ with two surfaces (medial and lateral) and two poles (tubal and uterine). It is connected by several ligaments: the suspensory ligament of the ovary carries the ovarian vessels, the ovarian ligament connects it to the uterus, and the mesovarium is part of the broad ligament that attaches it to the posterior surface. Medially, it's related to the uterus, and laterally to the pelvic wall. Its blood supply comes mainly from the ovarian artery, a branch of the abdominal aorta.

The uterus has three main parts: the fundus (top), body (middle), and cervix (lower part). It is normally anteverted and anteflexed, meaning it tilts forward over the bladder. Anteriorly, it is related to the bladder, and posteriorly to the rectum. The peritoneum covers the fundus and body

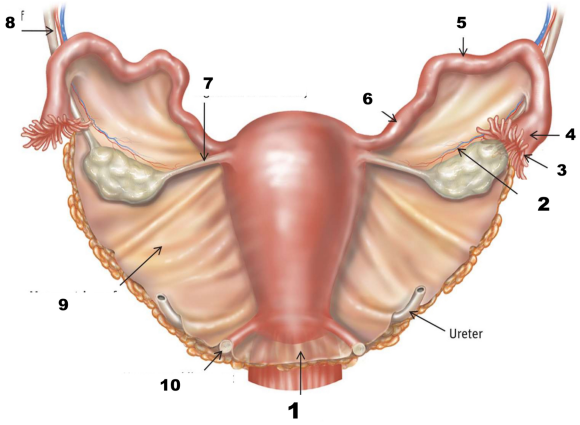
anteriorly and posteriorly, forming the vesicouterine and rectouterine pouches. Blood supply comes mainly from the uterine artery, a branch of the internal iliac artery.

The ligaments of the uterus help maintain its position and support within the pelvis. The broad ligament is a peritoneal fold that anchors the uterus laterally. The round ligament runs from the uterine horn to the labia majora, maintaining anteversion. The uterosacral ligaments extend from the cervix to the sacrum and support the uterus posteriorly. The transverse cervical (cardinal) ligaments attach the cervix to the lateral pelvic wall and carry the uterine vessels.

The cervix is the lower cylindrical part of the uterus that projects into the vagina. The vagina surrounds the cervix, creating spaces called vaginal fornices: anterior, posterior, and two lateral. The posterior fornix is the deepest and lies close to the rectouterine pouch (pouch of Douglas), which is important clinically for accessing the peritoneal cavity.

The perineum has two main pouches: the superficial perineal pouch and the deep perineal pouch. The superficial pouch lies between the perineal membrane and the skin, and contains erectile tissues and associated muscles (e.g., bulbospongiosus, ischiocavernosus). The deep perineal pouch is between the perineal membrane and pelvic diaphragm, and contains the external urethral sphincter and deep transverse perineal muscle. Each pouch has specific boundaries and contents that are key in pelvic anatomy.

The ischiorectal (ischioanal) fossa is a fat-filled space located on each side of the anal canal. Its boundaries include the ischial tuberosity laterally, the anal canal medially, the levator ani muscle superiorly, and the skin inferiorly. It allows for expansion of the anal canal during defecation and contains the inferior rectal nerves and vessels. Clinically, it's a common site for abscesses due to its fat content and proximity to the anal canal.



1. Rectouterine pouch (Douglas pouch) It is the lowest point of the peritoneal cavity in females when standing, making it a common site for fluid accumulation (e.g. pus, blood).

2. Mesovarium A short mesentery that connects the anterior border of the ovary to the posterior layer of the broad ligament and carries the ovarian vessels, lymphatics, and nerves.

3. Fimbria of the uterine tube Finger-like projections at the end of the infundibulum that help capture the ovulated oocyte from the ovary into the uterine tube.

4. Infundibulum of the uterine tube The funnel-shaped distal end of the uterine tube that opens into the peritoneal cavity and contains the fimbriae.

5. Ampulla The widest and longest part of the uterine tube where fertilization most commonly occurs.

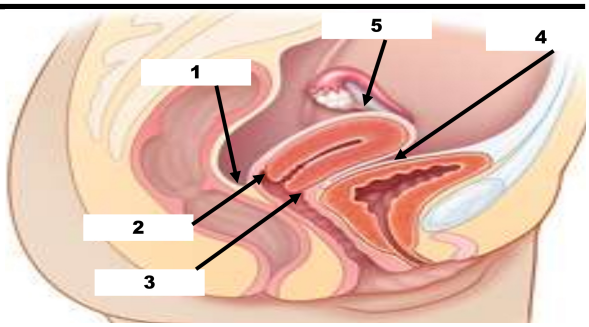
6. Isthmus The narrowest part of the uterine tube, located just before it enters the uterine wall.

7. Round ligament of ovary This term likely refers to the ovarian ligament, which connects the ovary to the uterus and helps anchor it medially.

8. Suspensory ligament of the ovary A fold of peritoneum that carries the ovarian vessels, lymphatics, and nerves from the pelvic wall to the ovary.

9. Broad ligament (Mesometrium) is the largest portion of the broad ligament and supports the uterus, carrying uterine vessels within its folds.

10. Uterosacral ligament Connects the cervix to the sacrum and helps support the uterus posteriorly; it also helps maintain uterine position.



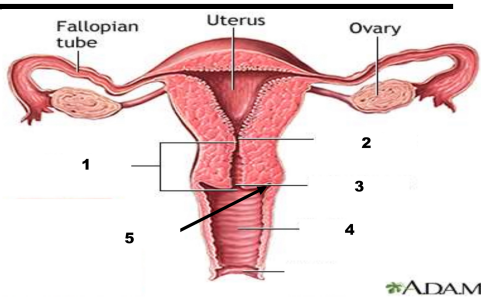
1. Rectouterine pouch (Douglas pouch) It is the most dependent part of the peritoneal cavity in females, often the first place where fluid (e.g. blood or pus) collects in pelvic pathology.

2. Posterior vaginal fornix The deepest part of the vaginal fornices; it lies close to the rectouterine pouch and is often used as an access point to the peritoneal cavity (e.g. culdocentesis).

3. Anterior vaginal fornix A shallow recess between the anterior vaginal wall and the cervix; it is related to the base of the bladder.

4. Vesicouterine pouch shallow peritoneal pouch between the bladder and the uterus; it is less clinically significant than the rectouterine pouch but can still collect fluid.

5. Round ligament of ovary This refers to the ovarian ligament, which connects the ovary to the lateral side of the uterus just below the uterine tube and helps stabilize its position.



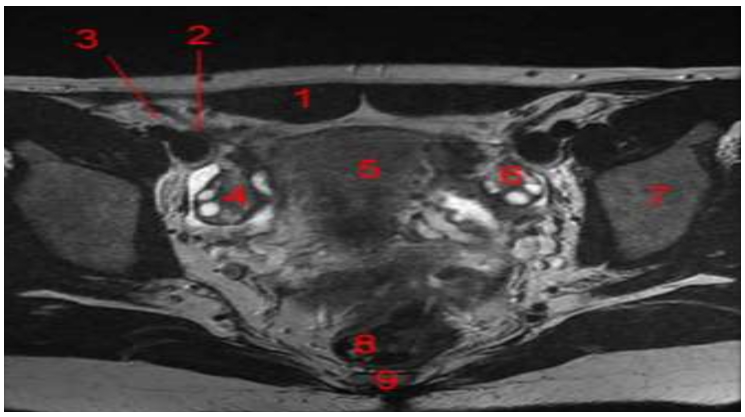
1. Cervix The lower cylindrical part of the uterus that projects into the vagina; it forms the cervical canal and plays a key role in labor and as a barrier between the uterus and vagina.

2. Internal os (opening of the cervical canal with the uterus) It is the superior opening of the cervical canal into the uterine cavity; it dilates during labor and is clinically important in assessing cervical competence.

3. External os (opening of the cervical canal with the vagina) The inferior opening of the cervical canal into the vagina; its shape can indicate parity (round in nulliparous women, slit-like in multiparous women).

4. Vagina A muscular canal extending from the cervix to the vaginal orifice; it serves as the birth canal and receives the penis during intercourse.

5. Lateral vaginal fornix One of the spaces formed around the cervix where it projects into the vagina; located on each side of the cervix and related to the uterine arteries laterally.



1. Rectus abdominis muscle A long vertical muscle in the anterior abdominal wall that helps in trunk flexion and increases intra-abdominal pressure during actions like coughing or childbirth.

2. External iliac vein (medial) Runs medial to the external iliac artery and drains blood from the lower limb; it becomes the femoral vein as it passes under the inguinal ligament.

3. Internal iliac artery (lateral) Supplies most of the pelvic organs; it lies lateral to the external iliac vein and gives rise to key branches like the uterine and vaginal arteries.

4. Right ovary A female gonad located near the lateral pelvic wall; releases oocytes and produces sex hormones. It's related to the uterine tube and receives blood from the ovarian artery.

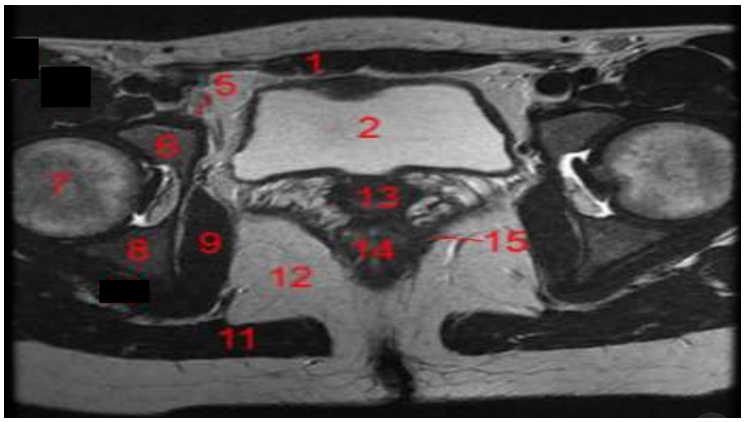
5. Uterus A pear-shaped muscular organ where fetal development occurs; normally anteverted and anteflexed, and supplied by the uterine artery.

6. Left ovary Identical in structure and function to the right ovary, located on the left side of the uterus and closely related to the sigmoid colon.

7. Loops of the ileum Part of the small intestine found in the lower abdomen and pelvis; they are involved in nutrient absorption and can be displaced by enlarged pelvic organs.

8. Rectum (posterior) The final part of the large intestine, located in the midline posterior pelvis; stores feces before defecation and lies behind the uterus and vagina in females.

9. Coccyx The terminal end of the vertebral column; provides attachment for pelvic floor muscles and ligaments, and is located posterior to the rectum.



1. Rectus abdominis muscle A key anterior abdominal wall muscle involved in flexing the trunk and increasing intra-abdominal pressure.

2. Urinary bladder A hollow muscular organ that stores urine; located anteriorly in the pelvis, just behind the pubic symphysis.

6. Superior pubic ramus A part of the pubic bone that forms the upper border of the obturator foramen and contributes to the anterior part of the pelvic brim.

7. Head of femur The rounded proximal end of the femur that articulates with the acetabulum of the pelvis to form the hip joint.

8. Inferior pubic ramus Forms the lower boundary of the obturator foramen and helps support part of the pelvic floor muscles.

9. Obturator internus A deep pelvic muscle that lines the lateral wall of the pelvis and exits through the lesser sciatic foramen to insert on the femur; helps laterally rotate the thigh.

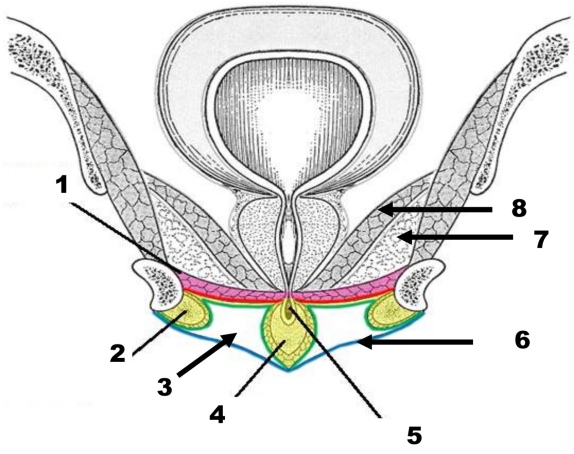
11. Gluteus maximus The largest and most superficial gluteal muscle; extends and laterally rotates the thigh and forms the bulk of the buttock.

12. Ischiorectal fossa A fat-filled space on either side of the anal canal that allows expansion during defecation; contains inferior rectal nerves and vessels.

13. Vagina A muscular tube extending from the cervix to the external genitalia; functions as the birth canal and receives the penis during intercourse.

14. Rectum The terminal part of the large intestine that stores feces and lies posterior to the vagina and uterus in females.

15. Levator ani A major component of the pelvic diaphragm that supports pelvic organs and maintains continence by elevating the pelvic floor.



1. Urogenital diaphragm (formed by sphincter urethrae and transverse perineal muscle) This muscular layer supports the pelvic organs and contains the external urethral sphincter, which is important for voluntary urinary continence.

2. Crus of the penis (covered by ischiocavernosus muscle) The crus is part of the corpus cavernosum; the ischiocavernosus muscle helps maintain erection by compressing the venous drainage.

3. Superficial perineal pouch A space between the perineal membrane and Colles fascia that contains the roots of external genitalia and associated muscles (e.g., bulbospongiosus, ischiocavernosus).

4. Bulb of penis (covered by bulbospongiosus muscle) Part of the corpus spongiosum; the bulbospongiosus muscle helps expel urine or semen and supports erection.

5. Urethra A muscular tube that conveys urine from the bladder to the outside; in males, it also carries semen and has several parts (prostatic, membranous, spongy).

6. Colles fascia The superficial perineal fascia that helps contain infections or fluids in the perineum and is continuous with Scarpa's fascia of the abdomen.

7. Deep perineal pouch Located between the perineal membrane and the pelvic diaphragm; it contains the deep transverse perineal muscles and external urethral sphincter.

8. Levator ani A key pelvic diaphragm muscle that supports pelvic viscera and aids in continence; includes pubococcygeus, puborectalis, and iliococcygeus parts.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