ANATOMY OF MALE AND FEMALE REPRODUCTIVE SYSTEMS

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ANATOMY OF THE MALE REPRODUCTIVE SYSTEM
OBJECTIVES

• IDENTIFY THE STRUCTURES RELATED TO THE EXTERNAL GENITALIA
• IDENTIFY THE TESTIS, ITS COVERINGS, AND TUBULES
• TRACE THE ENTIRE COURSE OF THE DUCTUS DEFERENS AND IDENTIFY ITS AMPULLA;
• IDENTIFY THE SEMINAL VESICLE AND DEMONSTRATE THE FORMATION AND COURSE OF THE EJACULATORY DUCT.
• IDENTIFY THE PROSTATE GLAND AND DESCRIBE ITS SUBDIVISIONS
• DEMONSTRATE THE EPIDIDYMIS AND ITS SUBDIVISIONS.
What is the homologous structure of the scrotum in females?
EXTERNAL GENITAL ORGANS

PENIS
SCROTUM
PERINEUM IN LITHOTOMY POSITION

Lithotomy position

Urogenital triangle

Anal triangle
PENIS AND THE SUPERFICIAL PERINEAL POUCH

- Glans penis
- Corpora spongiosa
- Corpora cavernosa
- Crus of the penis
- Bullb of the penis

body
roots
**PENIS**

The **penis** is the organ by which the sperm is introduced into the female.

It contains spongy tissue that becomes turgid and erect when filled with blood.
- **ERECTILE TISSUES**

  - **CORPUS SPONGIOSUM** – IS THE MASS OF SPONGY TISSUE WHICH SURROUNDS URETHRA AND INVOLVES IN ERECTION BY ALLOWING RUSHING OF BLOOD INTO IT

  - **CORPUS CAVERNOSA** – IS ONE OF A PAIR OF SONGE-LIKE REGIONS OF ERECTILE TISSUE WHICH CONTAINS MOST OF THE BLOOD IN THE PENIS DURING PENILE ERECTION
CORONAL SECTION OF THE PENIS

- Corpora cavernosa (with tunica albuginea)
- Corpora spongiosa (with tunica albuginea)
- Urethra
- Deep dorsal vein
- Superficial (Darto’s) fascia
- Deep (Buck’s) fascia
- Dorsal artery
- Dorsal nerve
• **URETHRA** – A TUBE WITHIN THE PENIS THAT CONVEYS SEMEN OUT OF THE BODY DURING EJACULATION.

• **GLANS** – THE ROUNDED, HIGHLY SENSITIVE HEAD OF THE PENIS.

• **PREPUCE** – A FOLD OF SKIN, COVERING THE HEAD OF THE PENIS.
SCROTUM

A POUCH OF SKIN FORMED FROM THE LOWER PART OF THE ABDOMINAL WALL.

THE SCROTUM KEEPS THE TESTES AT A TEMPERATURE SLIGHTLY COOLER THAN BODY TEMPERATURE.
INTERNAL GENITAL ORGANS

TESTIS
EPIDIDYMIS
VAS DEFERENS

Seminal Vesicles
Prostate Gland
Bulbourethral Glands
THE SCROTUM AND TESTIS

- Dartos muscle
- External spermatic fascia
- Cremaster muscle
- Internal spermatic fascia
- Tunica vaginalis
- Vas deferens
- Epididymis
- Testis
THE TESTES ARE THE TWO- OVAL SHAPED MALE ORGANS THAT PRODUCE SPERM AND HORMONE TESTOSTERONE.

*TESTOSTERONE- THE PRIMARY MALE SEX HORMONE
EACH TESTIS IS MADE OF TIGHTLY COILED STRUCTURES CALLED SEMINIFEROUS TUBULES. AMONG TUBULES ARE CELLS THAT PRODUCE TESTOSTERONE.
EPIDIDYMIS

The epididymis is a tightly coiled tubes against the testicles. It acts as maturation and storage place for sperm.

Adult human testicle with epididymis:
A. Head of epididymis,
B. Body of epididymis,
C. Tail of epididymis, and
D. Vas deferens
VAS DEFERENS (DUCTUS DEFERENS)

The vas deferens is a thin tube that starts from the epididymis to the urethra in the penis.

They transport sperm from the epididymis in anticipation of ejaculation.
ACCESSORY GLANDS

a. SEMINAL VESICLES

b. PROSTATE GLAND

c. BULBOURETHRAL GLANDS

These glands produce nourishing fluids for the sperms that enter the urethra.
SEMINAL VESICLES PRODUCE A STICKY YELLOWISH FLUID THAT CONTAINS FRUCTOSE.

THE SEMINAL VESICLES ARE SAC-LIKE STRUCTURES ATTACHED TO THE VAS DEFERENS AT ONE SIDE OF THE BLADDER.
THE PROSTATE GLAND SURROUNDS THE EJACULATORY DUCTS AT THE BASE OF THE URETHRA, JUST BELOW THE BLADDER.

THE PROSTATE GLAND IS RESPONSIBLE FOR MAKING THE PRODUCTION OF SEMEN, A LIQUID MIXTURE OF SPERM CELLS, PROSTATE FLUID AND SEMINAL FLUID.
BULBOURETHRAL GLANDS
(COWPER’S GLAND)

The bulbourethral glands are two small glands located on the sides of the urethra just below the prostate gland.

These glands produce a clear, slippery fluid that empties directly into the urethra.
BLOOD SUPPLY OF THE PENIS AND SCROTUM

- Common iliac artery
- External iliac artery
- Internal iliac artery
- Internal pudendal artery
- External pudendal artery
- Dorsal artery
- Deep artery
- Posterior scrotal artery
- Anterior scrotal artery
**SPERM**

**FUNCTION:**
- TO MOVE AND CARRY GENETIC INFORMATION TO THE EGG.

**STRUCTURE:**
- HEAD: THE LARGE HEAD REGION OF THE SPERM THAT CONTAINS DNA.
- MIDPIECE: THE NARROW MIDDLE PART OF THE CELL THAT CONTAINS MITOCHONDRIA.
- TAIL: THE WAVELIKE MOTION OF THE FLAGELLUM PROPELS THE SPERM FORWARD.
THE PATHWAY OF THE SPERM IN THE MALE REPRODUCTIVE SYSTEM ARE THE FOLLOWING:

(ARRANGE IN CHRONOLOGICAL ORDER)

Testes ➔ Epididymis ➔ Vas Deferens ➔ Ejaculatory Duct ➔ Urethra
ANATOMY OF THE FEMALE REPRODUCTIVE SYSTEM
OBJECTIVES

• DESCRIBE THE NORMAL POSITION AND RELATIONSHIPS OF ALL ORGANS OF THE REPRODUCTIVE TRACTS IN BOTH SEXES AND THE ROLE OF EACH IN REPRODUCTIVE PROCESSES.

• IDENTIFY THE VAGINA, AND NOTE THE ANGLE FORMED AT ITS JUNCTION WITH THE UTERUS

• IDENTIFY THE UTERUS AND ITS SUBDIVISIONS AND DEMONSTRATE THE CONTINUITY OF ITS LUMEN WITH THAT OF THE UTERINE TUBES AND THE VAGINA

• DEMONSTRATE THE UTERINE TUBE AND ITS SUBDIVISIONS

• DESCRIBE THE BROAD LIGAMENT AND DIFFERENTIATE ITS PARTS.

• IDENTIFY THE OVARY AND DISCUSS THE FUNCTIONAL SIGNIFICANCE OF ITS LIGAMENTS
FEMALE REPRODUCTIVE SYSTEM

• PRODUCE SEX HORMONES
  • ESTROGEN, PROGESTERONE

• PRODUCE EGG (OVA)

• SUPPORT & PROTECT DEVELOPING EMBRYO

• GIVE BIRTH TO NEW BABY
EXTERNAL GENITALIA

- VULVA—WHICH RUNS FROM THE PUBIC AREA DOWNWARD TO THE RECTUM.

- Labia majora or "greater lips" are the part around the vagina containing two glands (Bartholin’s glands) which helps lubrication during intercourse.

- Labia minora or "lesser lips" are the thin hairless ridges at the entrance of the vagina, which joins behind and in front. In front they split to enclose the clitoris.

- The clitoris is a small pea-shaped structure. It plays an important part in sexual excitement in females.
THE FEMALE EXTERNAL GENITALIA

- Mons pubis
- Clitoris
- External urethral orifice
- Vaginal orifice
- Labia majora
- Labia minora
- Hymen
PELVIC FLOOR FROM BELOW

- Covered superiorly and inferiorly with fascia (epimysium)
- Nerve supply for levator ani is perineal branch of S4, S5 for coccygeus
The Pelvic Diaphragm = the deepest muscle layer

Anterior
- Symphysis pubis
- (Urogenital diaphragm)
- Urethra
- Vagina
- Anal canal

Posterior
- Iliococcygeus
- Coccygeus

Superior View of Female Pelvis

Figure 5.1. The pelvis on coronal section.
FEMALE EXTERNAL GENITALIA AND THE SUPERFICIAL PERINEAL POUCH

- Bulb of the Vestibule
- Greater vestibular gland (Bartholin’s gland)
- Anus
- Perineal body
- Puborectalis
- Pubococcygeus
THE FEMALE EXTERNAL GENITALIA AND THE SUPERFICIAL PERINEAL POUCH

- Clitoris
- External urethral orifice
- Vaginal canal
- Ischiocavernous muscle
- Bulbospongiosus muscle
- Superficial transverse perineal muscle
FEMALE EXTERNAL GENITALIA AND THE DEEP PERINEAL POUCH

- Crus of the clitoris
- Bulb of the vestibule
- Perineal membrane
- Greater vestibular gland
- Clitoris
- Urethra
- Vagina
- Deep transverse perineal muscle
SAGITAL VIEW OF THE ENTIRE FEMALE REPRODUCTIVE SYSTEM

- Labia majora
- Labia minora
- Clitortis
- Fallopian tube
- Ovary
- Body of Uterus
- Cervix
- Vaginal canal
THE VAGINA

• A MUSCULAR, RIDGED SHEATH CONNECTING THE EXTERNAL GENITALS TO THE UTERUS.

• FUNCTIONS AS A TWO-WAY STREET, ACCEPTING THE PENIS AND SPERM DURING INTERCOURSE

• SERVING AS THE AVENUE OF BIRTH THROUGH WHICH THE NEW BABY ENTERS THE WORLD

Anterior and posterior fornices
Vaginal
Rectouterine pouch
Vesicouterine pouch
Pouch of Douglas Cul de sac
THE CERVIX

• THE LOWER PORTION OR NECK OF THE UTERUS.

• THE CERVIX IS LINED WITH MUCUS, KNOWN AS CERVICAL MUCUS

  • CERVICAL MUCUS PROVIDES LUBRICATION & SPERM TRANSPORT DURING SEXUAL INTERCOURSE
  
  • DURING OVULATION SECRETION OF CERVICAL MUCUS INCREASES IN RESPONSE TO ESTROGEN
  
  • BUT WHEN AN EGG IS READY FOR FERTILIZATION, THE MUCUS THEN BECOMES THIN AND SLIPPERY, OFFERING A “FRIENDLY ENVIRONMENT” TO SPERM
At the end of pregnancy

The cervix acts as the passage through which the baby exits the uterus into the vagina.

The cervical canal expands to roughly 50 times its normal width for the passage of the baby during birth.

THE CERVIX
UTERUS

• PEAR-SHAPED MUSCULAR ORGAN IN THE FEMALE REPRODUCTIVE TRACT.

• THE FUNDUS IS THE UPPER PORTION OF THE UTERUS WHERE PREGNANCY OCCURS.

• THE CERVIX IS THE LOWER PORTION OF THE UTERUS THAT CONNECTS WITH THE VAGINA AND SERVES AS A SPHINCTER TO KEEP THE UTERUS CLOSED DURING PREGNANCY UNTIL IT IS TIME TO DELIVER A BABY.

• THE UTERUS EXPANDS CONSIDERABLY DURING THE REPRODUCTIVE PROCESS.

• THE ORGAN GROWS TO FROM 10 TO 20 TIMES ITS NORMAL SIZE DURING PREGNANCY.
• The main body consists of a firm outer coat of muscle (myometrium) and an inner lining of vascular, glandular material (endometrium).

- The endometrium thickens during the menstrual cycle to allow implantation of a fertilized egg.
UTERUS

Fundus
Body
Isthmus
Cervix
Endometrium
Myometrium
Perimetrium
• The endometrium is the innermost layer as a lining for the uterus.

• During the menstrual cycle, the endometrium grows to a thick, blood vessel-rich, glandular tissue layer.

• This represents an optimal environment for the implantation of a blastocyst upon its arrival in the uterus.
The endometrium is central, echogenic (detectable using ultrasound scanners), and has an average thickness of 6.7 mm.

During pregnancy, the blood vessels in the endometrium further increase in size and number, forming the placenta,

Placenta supplies oxygen and nutrition to the embryo & fetus.
• ALSO KNOWN AS FEMALE GONADS

• THEY PRODUCE EGGS (ALSO CALLED OVA) EVERY FEMALE IS BORN WITH A LIFETIME SUPPLY OF EGGS

• THEY ALSO PRODUCE HORMONES:

ESTROGEN & PROGESTERONE
FALLOPIAN TUBES [UTERINE TUBES]

• STRETCH FROM THE UTERUS TO THE OVARIES AND MEASURE ABOUT 8 TO 13 CM IN LENGTH.

• THE ENDS OF THE FALLOPIAN TUBES LYING NEXT TO THE OVARIES FEATHER INTO ENDS CALLED FIMBRIA

• MILLIONS OF TINY HAIR-LIKE CILIA LINE THE FIMBRIA AND INTERIOR OF THE FALLOPIAN TUBES.

• THE CILIA BEAT IN WAVES HUNDREDS OF TIMES A SECOND CATCHING THE EGG AT OVULATION AND MOVING IT THROUGH THE TUBE TO THE UTERINE CAVITY.

• FERTILIZATION TYPICALLY OCCURS IN THE FALLOPIAN TUBE
PREGNANT UTERUS
THE BROAD LIGAMENT (POSTERIOR VIEW)

- Mesosalpinx
- Mesovarium
- Mesometrium
LIGAMENTS OF THE FEMALE REPRODUCTIVE ORGANS (POSTERIOR VIEW)

- Broad ligament
- Suspensory ligament
- Ovarian ligament (Round ligament of the Ovary)
- Uterosacral ligament
LIGAMENTS OF THE FEMALE REPRODUCTIVE ORGANS (SUPERIOR VIEW)

- Round Ligament of the uterus
- Round ligament of the ovary (Ovarian ligament)
- Uterosacral ligament
- Suspensory ligament of the ovary (Infundibulopelvic ligament)
BLOOD SUPPLY OF THE PELVIC ORGANS

- Common iliac
- Internal iliac artery
- Uterine artery
- Vaginal artery
- Internal pudendal artery
- Obturator artery
- Superior vesical artery
- Inferior vesical artery
BLOOD SUPPLY OF THE FEMALE REPRODUCTIVE ORGANS

- Ovarian artery
- Uterine artery
- Vaginal artery
- Internal pudendal artery