King Khalid University Hospital
Department of Obstetrics & Gynecology
Course 482

EMBRYOLOGY OF THE ♀ GENITAL TRACT

SEXUAL DIFFERENTIATION

- The first step in sexual differentiation is the determination of genetic sex (XX or XY)
- ♀ sexual development does not depend on the presence of ovaries
- ♂ sexual development depend on the presence of functioning testes & responsive end organs
- ♀ exposed to androgens in- utero will be musculanized

EXTERNAL GENITALIA

1-UNDEFERENTIATED STAGE (4-8 WK)

The neutral genitalia includes:

genital tubercle (phalus)
labioscrotal swellings
urogenital folds
urogenital sinus

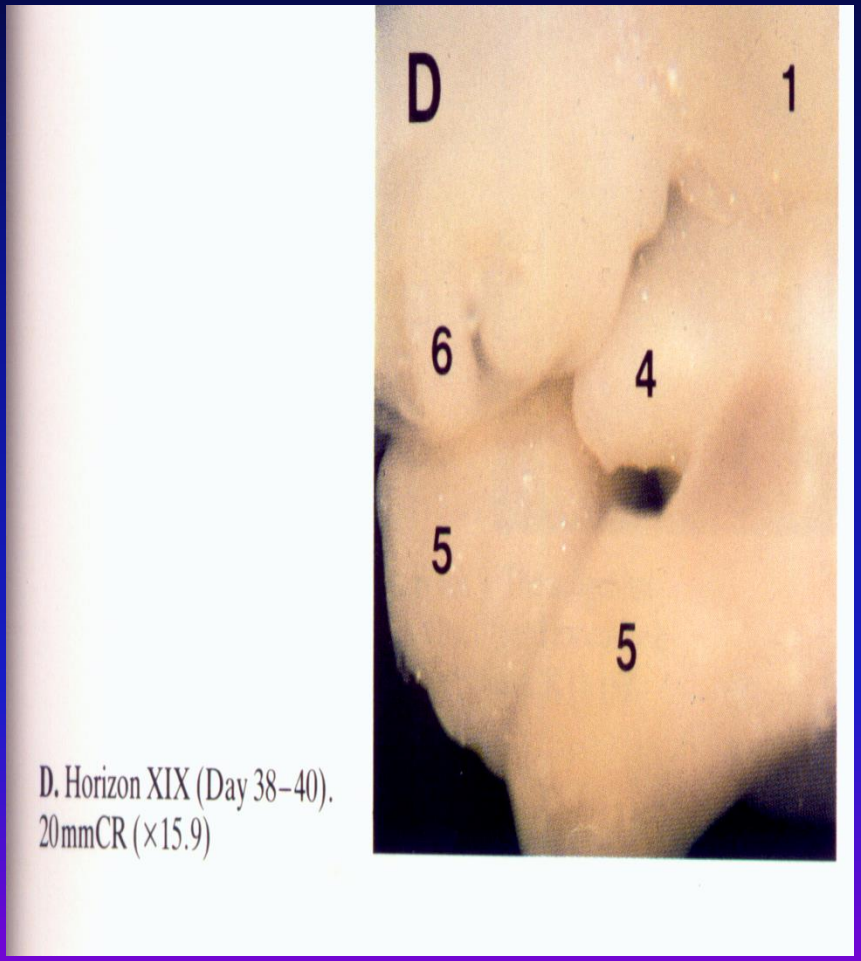
2-♂ & ♀ EXTERNAL GENITAL DEVELOPMENT (9-12 WK)

- By 12 weeks gestation ♂ & ♀ genitalia can be differentiated
- In the absence of androgens ⇨♀ external genitalia develop
- The development of ♂ genitalia requires the action of androgens, specifically DHT

5 alpha reductase

testosterone ⇨ ⇨ ⇨ ⇨ ⇨ DHT

EXTERNAL GENITALIA
INDIFFERENT STAGE



D. Horizon XIX (Day 38–40).
20mmCR (×15.9)

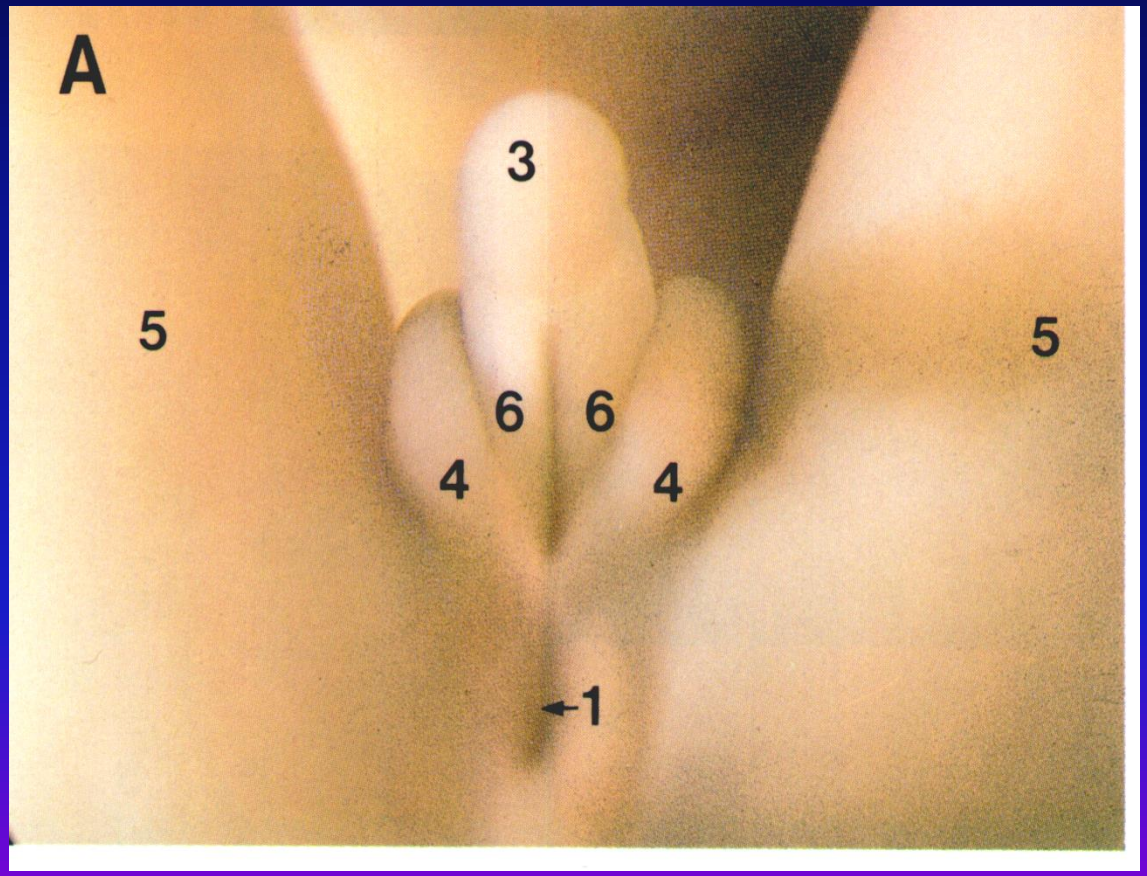
1-abdomen

4-genital tubercle

5-leg bud

6-midgut herniation to the umbilical cord

FEMALE EXTERNAL GENITALIA



Week 9

1-anus

2-buttocks

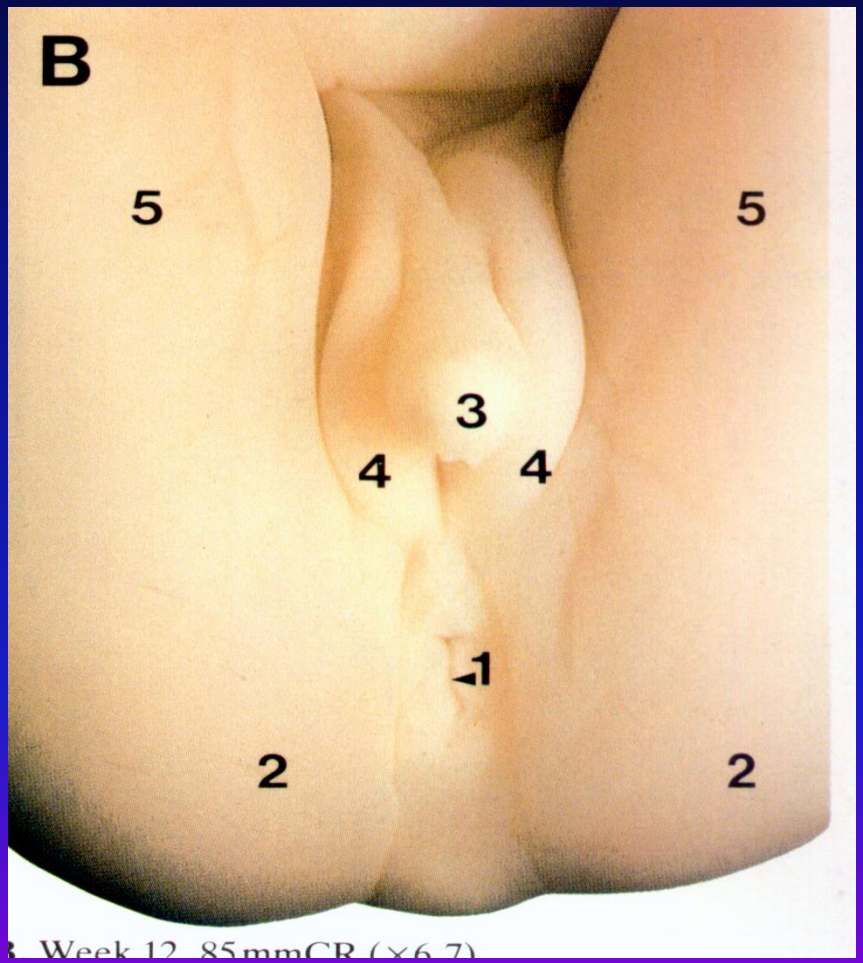
3-clitoris

4-labioscrotal swelling(labia majora)

5-leg

6-urogenital fold(labia minora)

FEMALE EXTERNAL GENITALIA



Week 12

1-anus

2-buttocks

3-clitoris

4-labioscrotal swelling(labia majora)

5-leg

6-urogenital fold(labia minora

FEMALE EXTERNAL GENITALIA

Week 13

1-anus

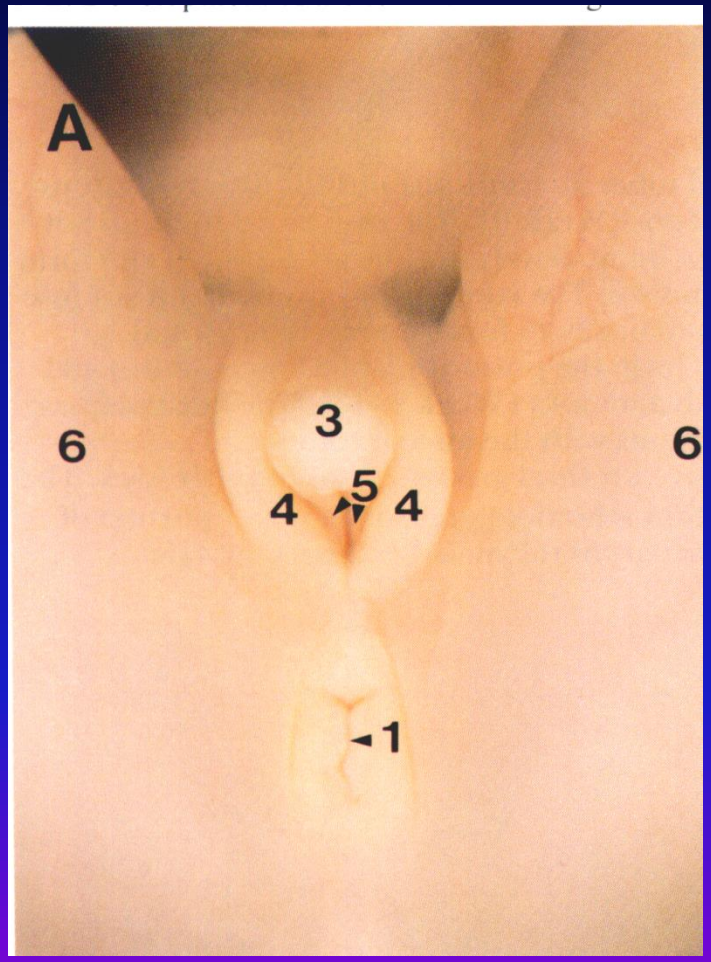
2-buttocks

3-clitoris

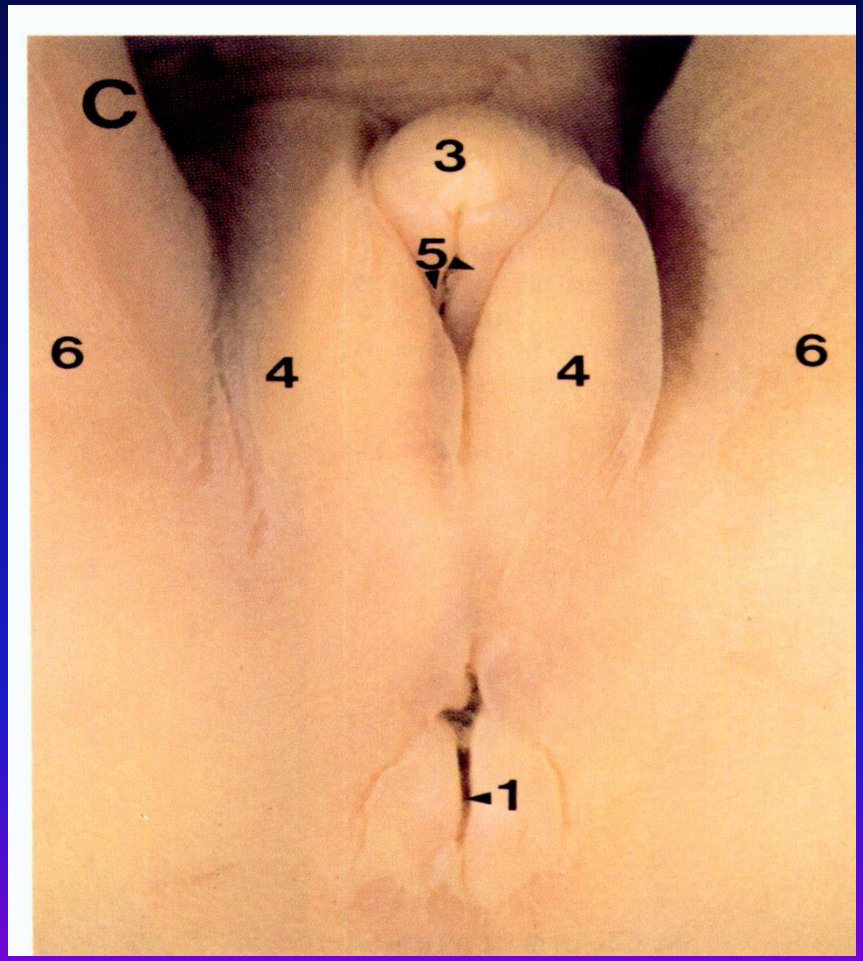
4-labia majora

5-labia minora

6-leg



FEMALE EXTERNAL GENITALIA



Week 17

1-anus

2-buttocks

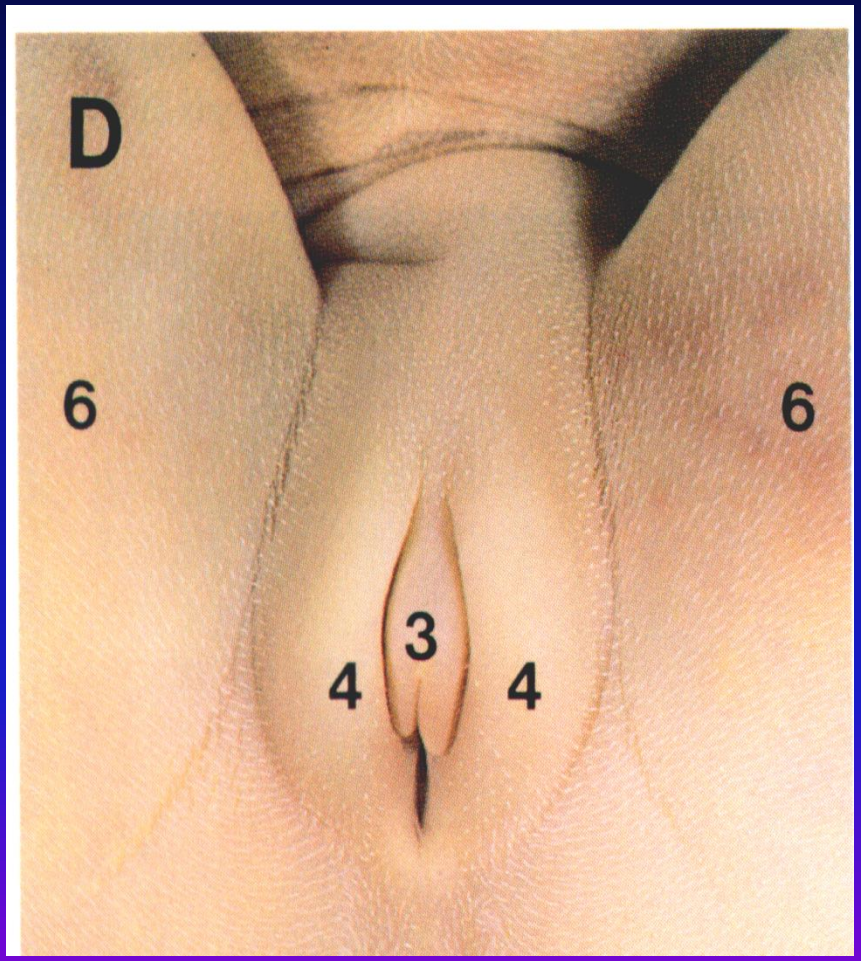
3-clitoris

4-labia majora

5-labia minora

6-leg

FEMALE EXTERNAL GENITALIA



Week 20

1-anus

2-buttocks

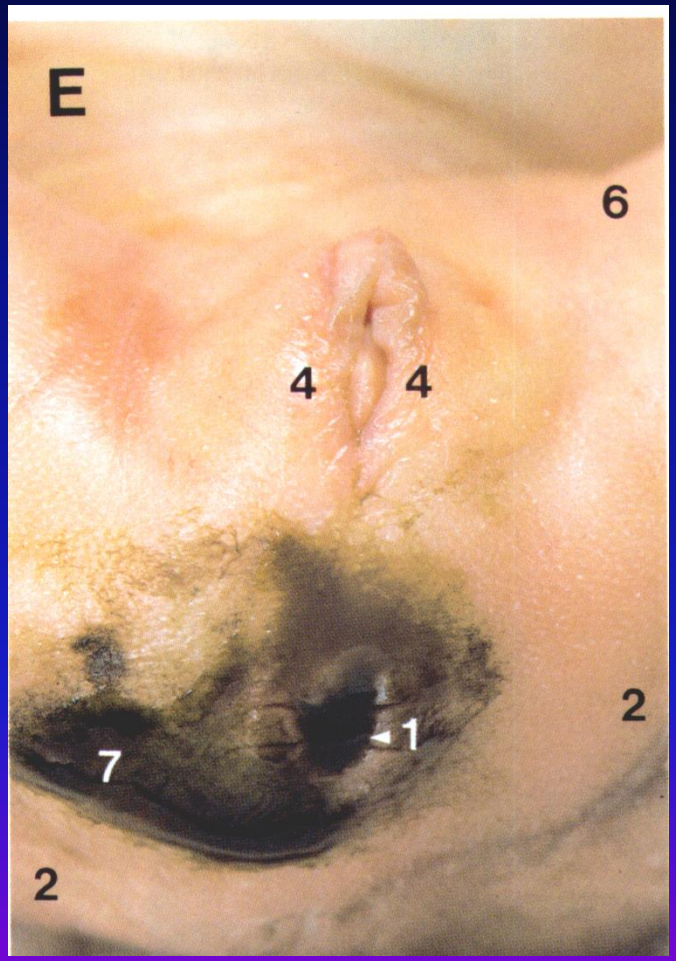
3-clitoris

4-labia majora

5-labia minora

6-leg

FEMALE EXTERNAL GENITALIA



Week 35

1-anus

2-buttocks

3-clitoris

4-labia majora

5-labia minora

6-leg

7-meconium

INTERNAL GENITAL ORGANS

1-GONADS

- Undifferentiated gonads begin to develop on the 5th wk
- Germ cells originate in the yolk sac & migrate to the genital ridge
- In the absence of Y chromosome the undiff gonad develop into an ovary
- 45XO embryo the ovaries develop but undergo atresia ⇨ streak ovaries
- The gonads develop from the mesothelium on the genital ridge ⇨ 1ry sex cords grow into the mesenchyme ⇨ outer cortex & inner medulla

INTERNAL GENITAL ORGANS
(GONADS)

- The ovary develop from the cortex & the medulla regress
- The testes develop from the medulla & the cortex regress
- The development of the testes requires the presence of SRY gene
  (sex determining region Y) found on Y chromosome
- The ovary contains 2 million 1ry oocytes at birth

INTERNAL GENITAL ORGANS

2-UTERUS & FALLOPIAN TUBES

- Invagination of the coelomic epithelium on the cranio-lateral end of the mesonephric ridge ⇨ Paramesonephric ducts
- Fusion of the two PMN ducts (mullerian ducts) ⇨ uterus, cx & F tubes (at 8-11 wk)
- 12-16 wks ⇨ proliferation of the mesoderm around the fused lower part ⇨ muscular wall
- In the male fetus the testes secrete the mullerian inhibiting factor ⇨ regression of the mullerian ducts

INTERNAL GENITAL ORGANS

3-VAGINA

- The caudal ends of the mullerian ducts form the mullerian tubercle at the dorsal wall of the urogenital sinus
- Mullarian tubercle is obliterated ⇨ vaginal plate ⇨ 16-18 wk the central core breaks down ⇨ vaginal lumen
- The upper 2/3 of the vagina ⇨ formed by mullerian tubercle
- The lower 1/3 ⇨ urogenital sinus

FEMALE INTERNAL GENITAL ORGANS

Week 8

1-bladder

2-kidney

3-ovary

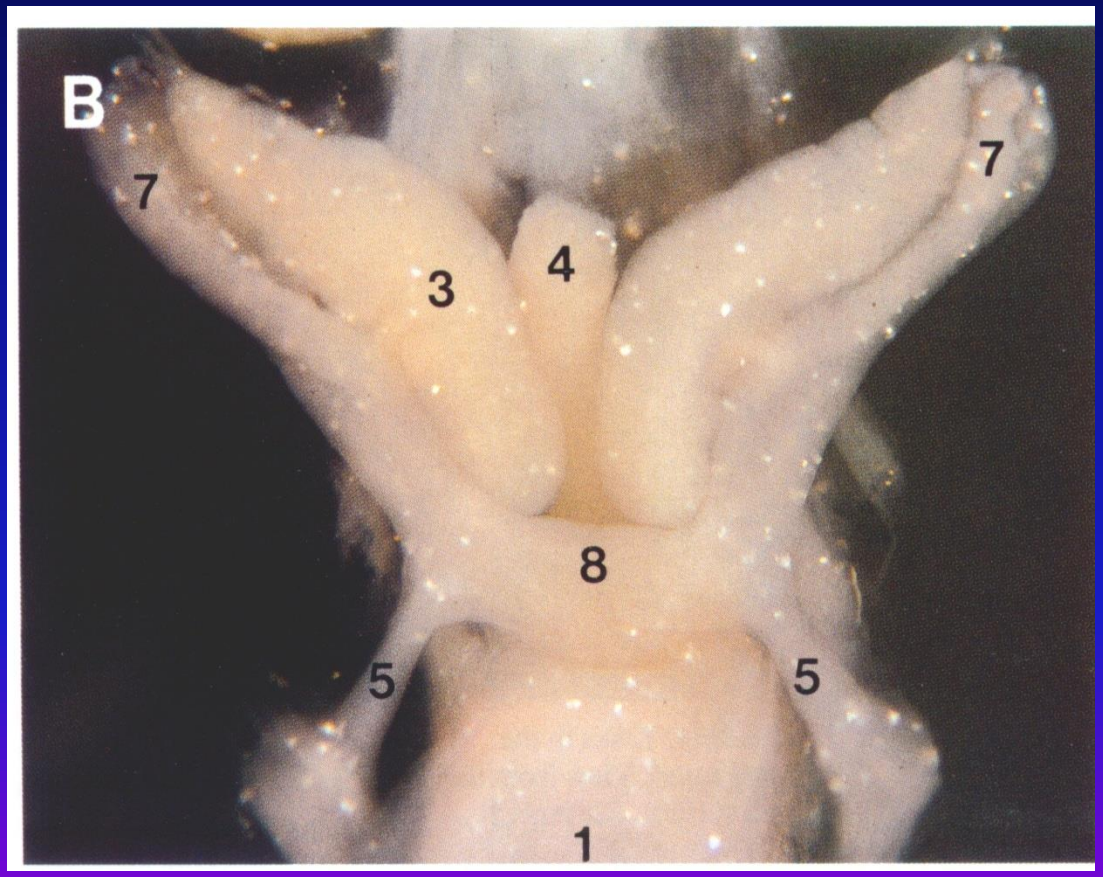
4-rectum

5-round ligament of the uterus

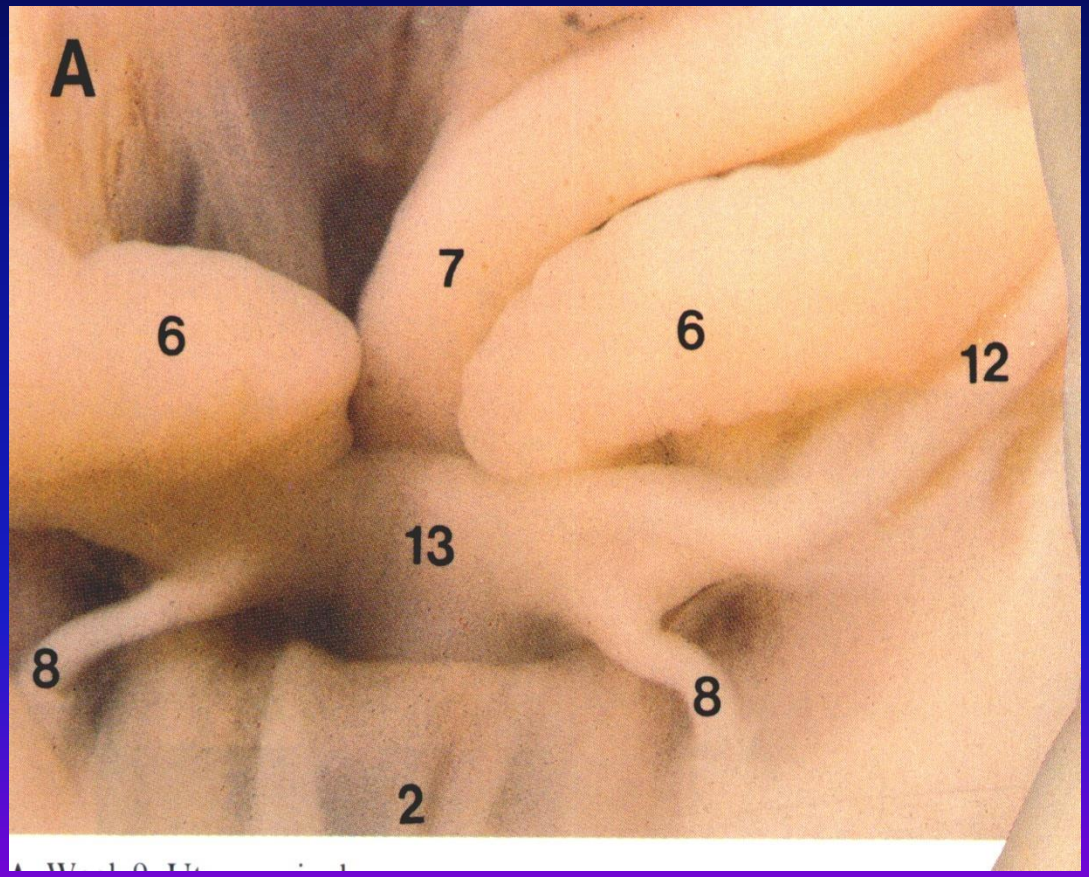
6-adrenal gland

7-Fallopian tube

8-utero vaginal primordium



FEMALE INTERNAL GENITAL ORGANS



Week 9

2-bladder

6-ovary

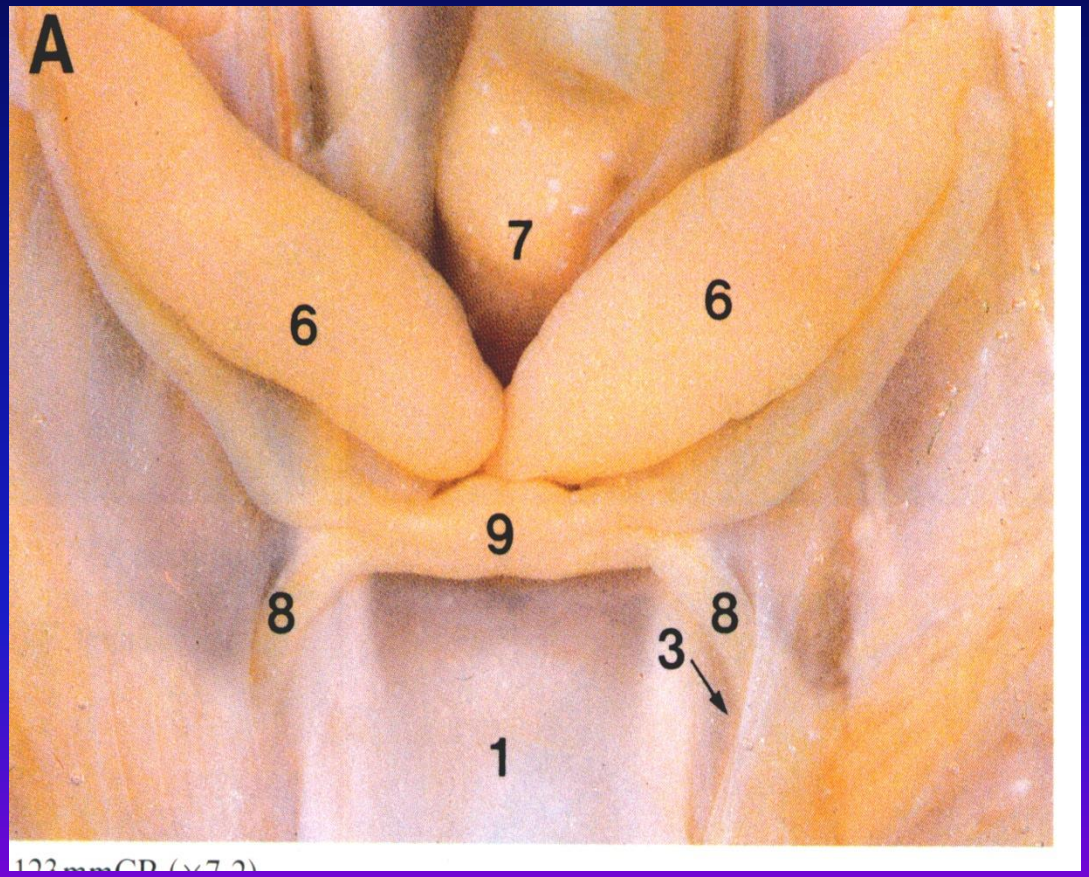
7-rectum

8-round ligaments

12-uterine tube

13-uterovaginal primordium

FEMALE INTERNAL GENITAL ORGANS



Week 15

1-bladder

2-clitoris

3-vaginal process

4-labia majora

5-leg

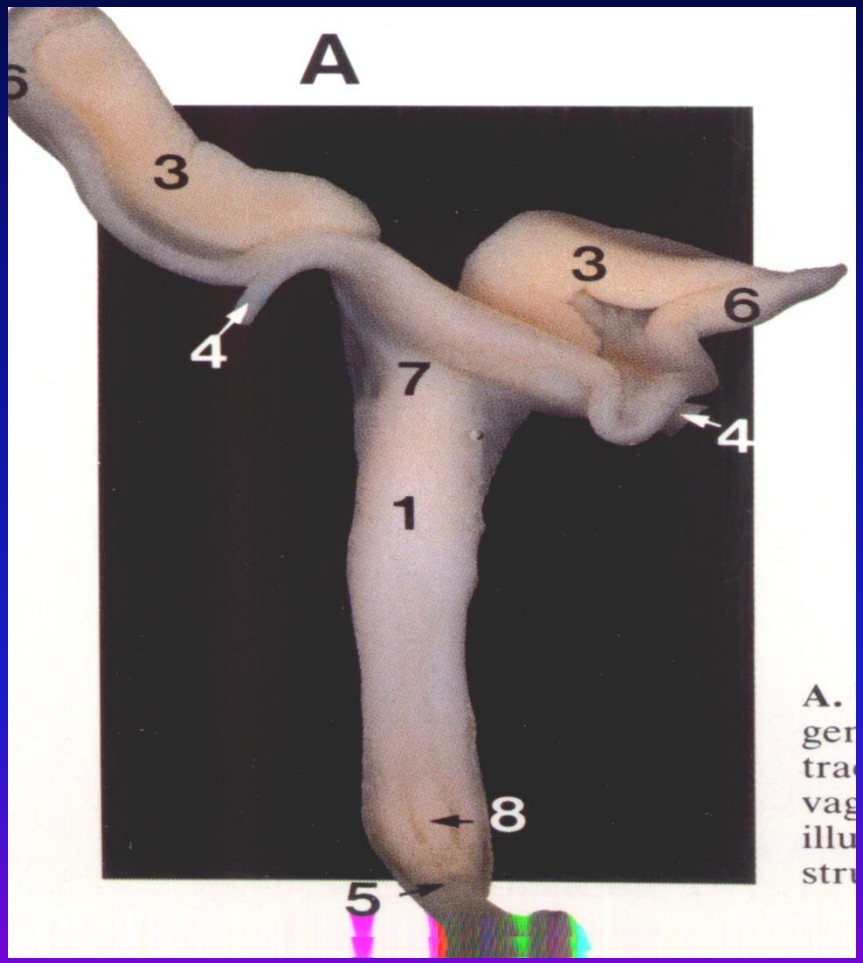
6-ovary

7-rectum

8-uterine round ligament

9-uterovaginal primordium

FEMALE INTERNAL GENITAL ORGANS



Week 13 (dissected genital tract)

1-body of uterus

2-clitoris

3-ovary

4-round ligament

5-solid epithelium (vagina meets urogenital sinus)

6-fallopian tube

7-uterus

8-vagina

FEMALE INTERNAL GENITAL ORGANS (Newborn)

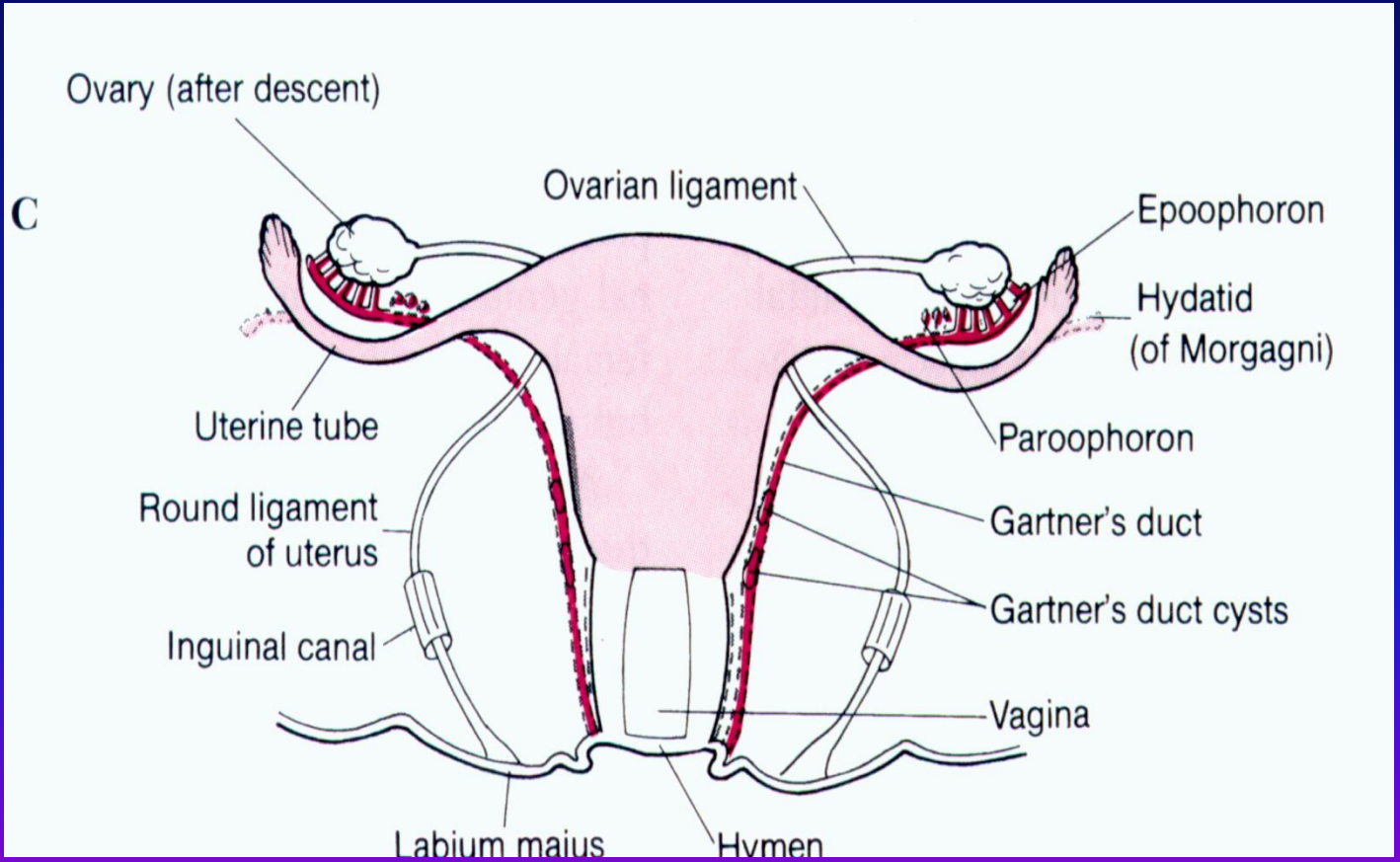


TABLE 1-2
Male and Female Derivatives of Embryonic Urogenital Structures

Embryonic Structure	Derivatives	
	Male	**Female**
Labioscrotal swellings	Scrotum	Labia majora
Urogenital folds	Ventral portion of penis	Labia minora
Phallus	Penis	Clitoris
	Glans, corpora cavernosa penis, and corpus spongiosum	Glans, corpora cavernosa, bulb of the vestibule
Urogenital sinus	Urinary bladder Prostate gland Prostatic utricle Bulbourethral glands Seminal colliculus	Urinary bladder Urethral and paraurethral glands Vagina Greater vestibular glands Hymen
Paramesonephric duct	Appendix of testes	Hydatid of Morgagni Uterus and cervix Fallopian tubes
Mesonephric duct	Appendix of epididymis Ductus of epididymis Ductus deferens Ejaculatory duct and seminal vesicle	Appendix vesiculosis Duct of epoophoron Gartner's duct —
Metanephric duct	Ureter, renal pelvis, calyces, and collecting system	Ureter, renal pelvis, calyces, and collecting system
Mesonephric tubules	Ductuli efferentes Paradidymis	Epoophoron Paroophoron
Undifferentiated gonad	Testis	Ovary
Cortex	Seminiferous tubules	Ovarian follicles
Medulla	—	Medulla
	Rete testis	Rete ovarii
Gubernaculum	Gubernaculum testis	Round ligament of uterus