Embryology Of urogenital system

2018-2019

DR. Hassna B. Jawad

Development of genital system :

Describe the development of the gonad
Describe development of ovaries
Describe the development of and female genital ducts
Describe the development of vagina
Describe the development external genitalia
Discuss some development l abnormalities

Chromosomal sex of an embryo is determined at fertilization by the kind of sperm (X or Y) that fertilizes the oocyte.

• Male and female morphologic characteristics do not begin to develop until the seventh week.

Development Of Gonad:

Gonads appear initially as a pair of longitudinal ridges, the genital or gonadal ridges.

• Germ cells appear in the genital ridges in the sixth week of development.

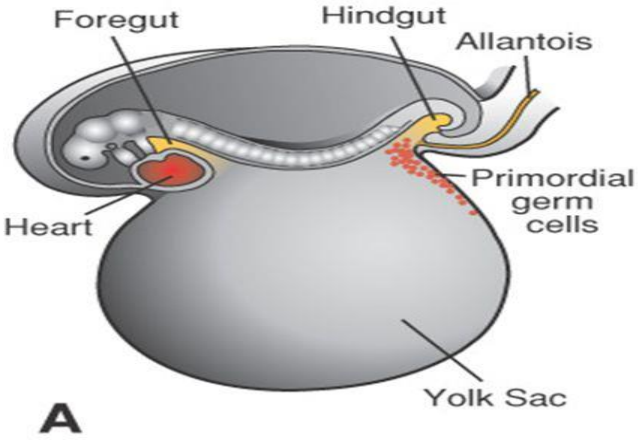
The gonades (testies or ovaries) development passes into 2 stages :

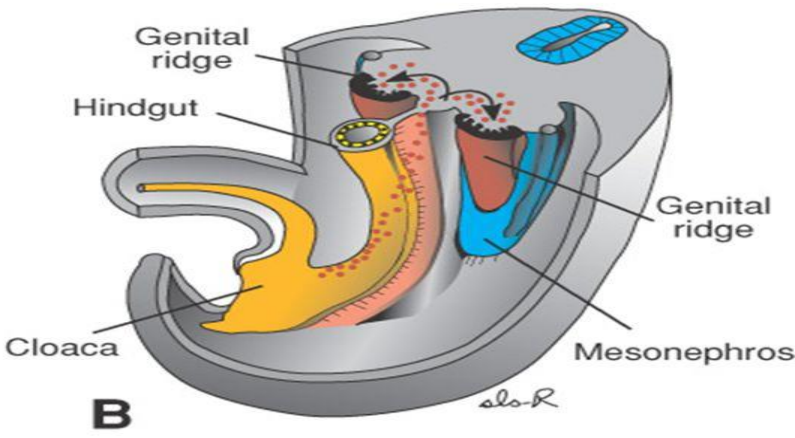
❶ Indefferent gonad (befor 7 week s)

Each testes or ovary is derived from :

1. **Genita ridge: on medial side of mesonephros ,gives stroma ,capsule and connective tissue of gonad .**
2. **Coelomic epithelium that covers genital ridage, gives the sex cords (sertoli or follicular cell).**
3. **Primordial germ cells which migrate from yplk sac and gives spermatogonia or oogonia and lies between the cells of sex cord .**

Large, spherical sex cells are first recognizable at 24 days after fertilization among the endodermal cells of the umbilical vesicle near the origin of the allantois . On each side of the embryo ,a primitive gonad arises from a genetial ridge . The primordial germ cells migrate along the wall of the hindgut and the dorsal mesentery into the genital ridge.





Shortly before and during arrival of primordial germ cells, the epithelium of the genital ridge proliferates, and epithelial cells penetrate the underlying mesenchyme to form the primitive sex cords.

The gonad develops a cortex and a medulla. Untill the 6th week of development ,these structures are identical in both sexes.

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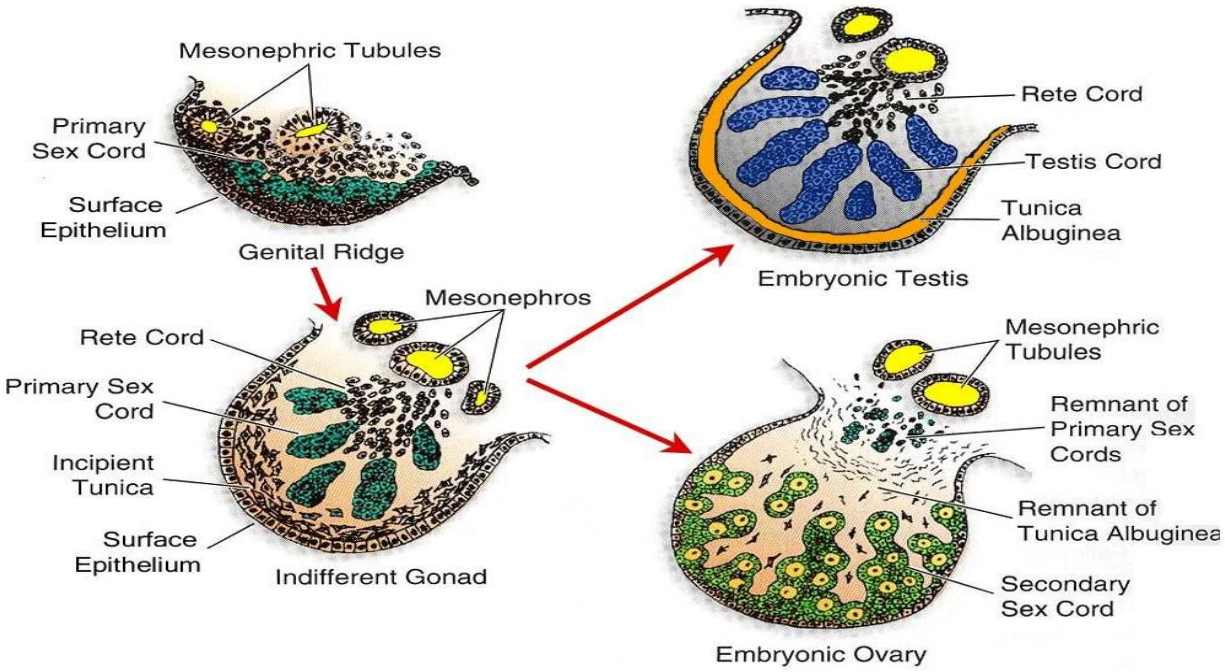
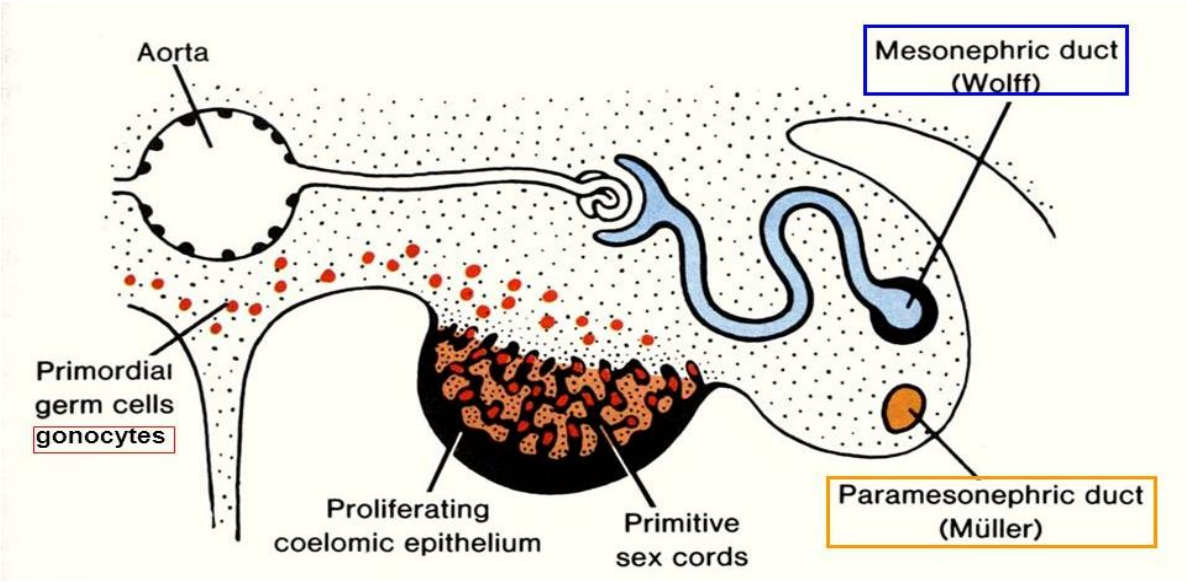




❷Stage of deffrentiation:

Development of ovary (Female) :

Gonadal development occur slowly. Primitive sex cord dissociate into irregular cell clusters in medulla of ovary .Then these cells disappear and replace by stroma that form ovarian medulla .

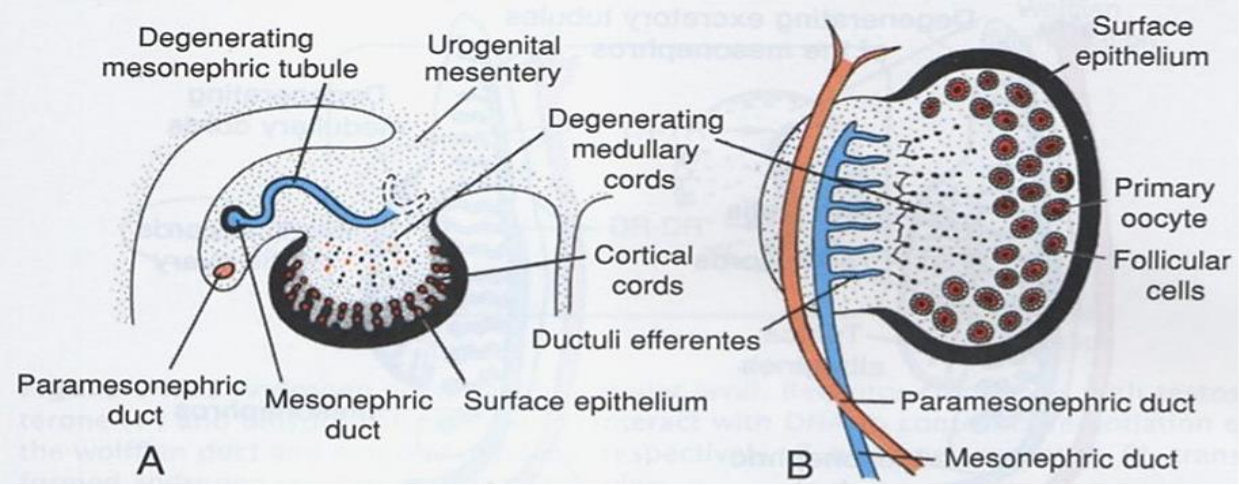
The surface epithelia continue to proliferate and in the 7th week , it gives rise to a second generation of cords, cortical cords.

• In the fourth month, these cords split into isolated cell clusters, with each surrounding one or more primitive germ cells.
• Germ cells develop into oogonia,
• The surrounding epithelial cells form follicular cells.

The cortex develops into ovary and the medulla regresses.

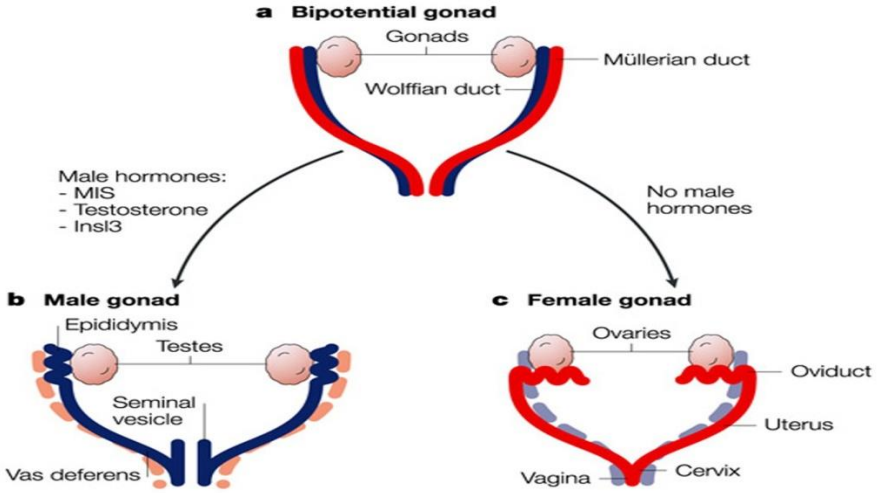
In normal female fetus

(paramesonephric duct)mullerian duct system develops into uterine tubes and uterus.



Development of Female Genital Ducts and Glands

• The mesonephric ducts of female embryos regress because of the absence of testosterone.
• The paramesonephric ducts develop because of the absence of MIS. Female sexual development during the fetal period does not depend on the presence of ovaries or hormones.
• Later, estrogens produced by the maternal ovaries and the placenta stimulate development of the uterine tube, uterus, and the superior part of the vagina.

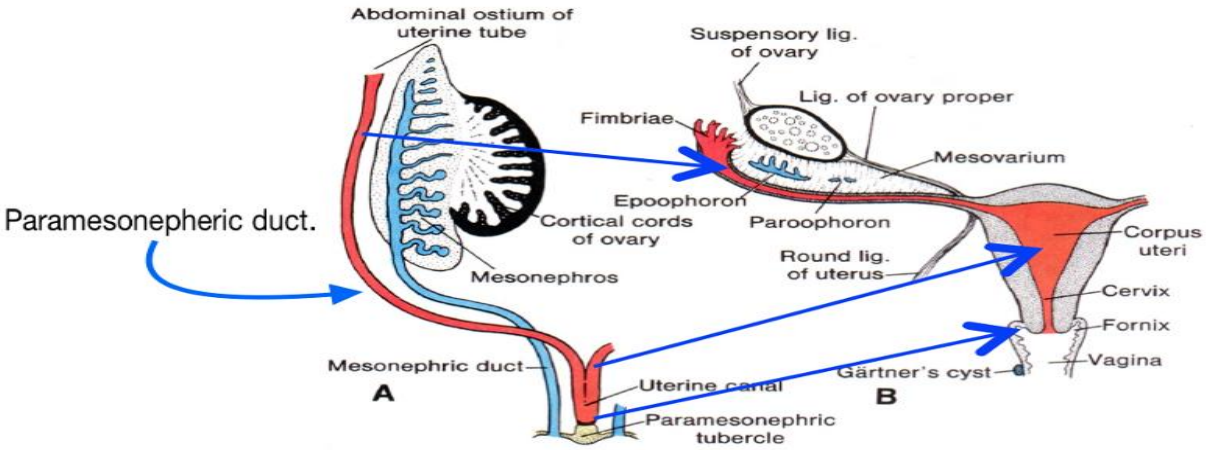


The paramesonephric ducts form most of the female genital tract.

1. **Cranial vertical portion that opens into the abdominal cavity**

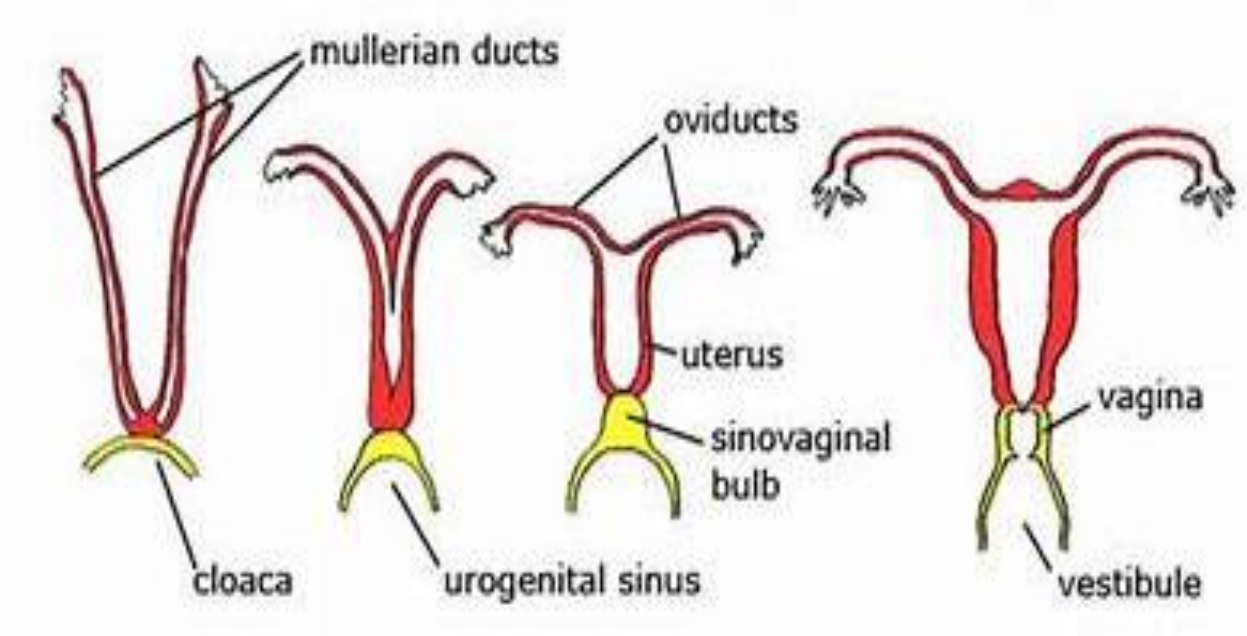
2. middle part that crosses the mesonephric duct,

3. Caudal vertical part that fuses with its partner from the opposite side.



- **The first two parts develop into the uterine tube**
- **The caudal parts fuse to form the uterine canal.**
- **After the ducts fuse in the midline, the broad ligament of the uterus is established,.**

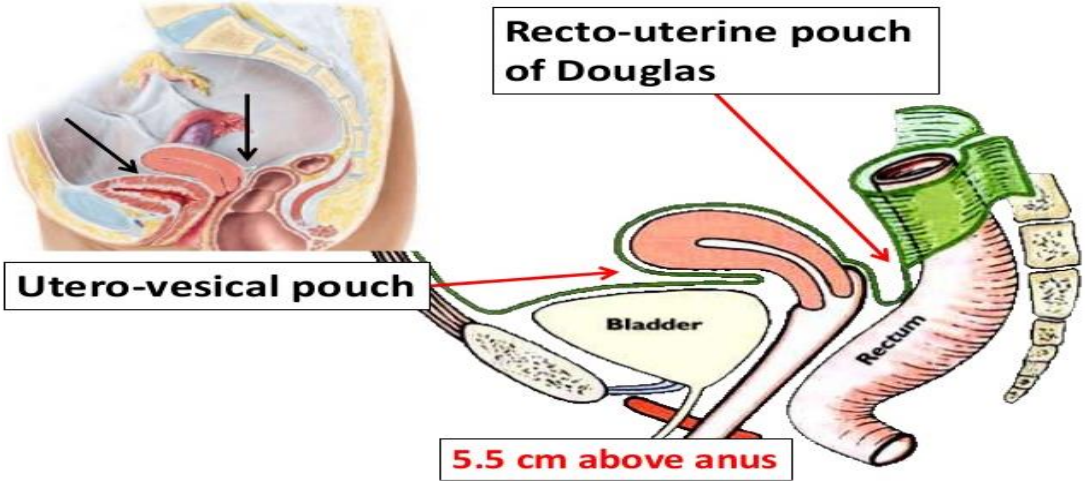
The endometrial stroma and myometrium are derived from splanchnic mesenchyme.



- The uterus and broad ligaments divide the pelvic cavity into

* Uterorectal pouch
* Uterovesical pouch.

- They are surrounded by a layer of mesenchyme that forms the muscular coat of the uterus, the myometrium, and its peritoneal covering, the perimetrium.

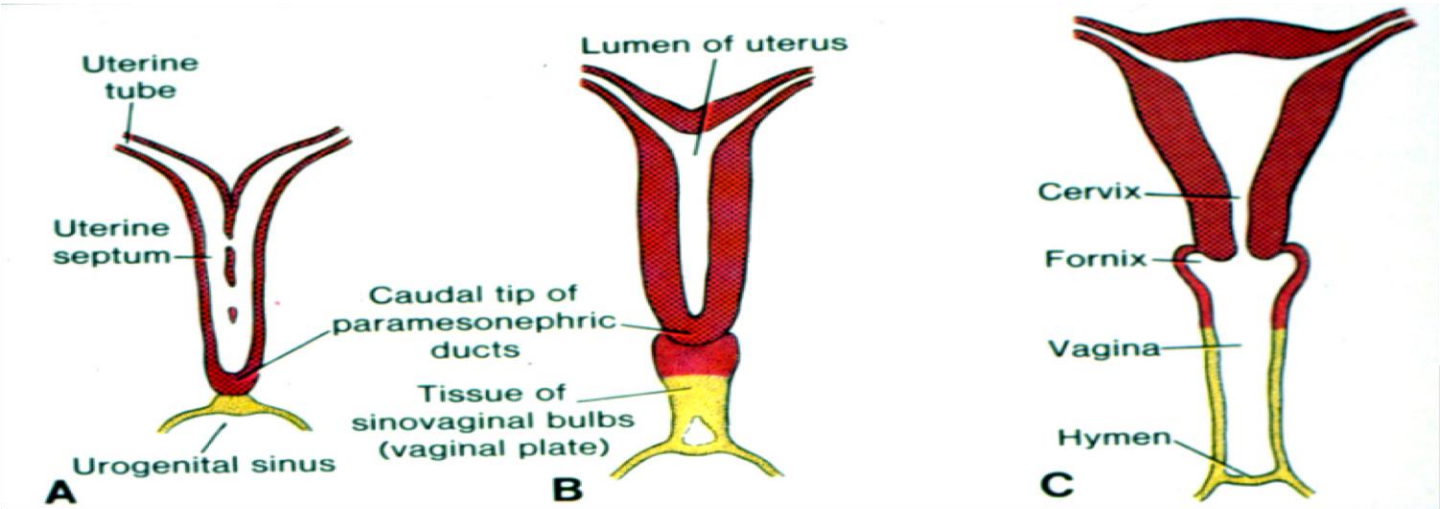


Development of Vagina :

The paramesonephric ducts reaches the urogenital sinus , gives rise to the sinovaginal bulbs, which give rise to Solid vaginal plate.

By the fifth month, the vaginal outgrowth is entirely canalized.

- Thus, the vagina has a dual origin, with the upper portion derived from the uterine canal and the lower portion derived from the urogenital sinus.
- The lumen of the vagina remains separated from that of the urogenital sinus by a thin tissue plate, the hymen.



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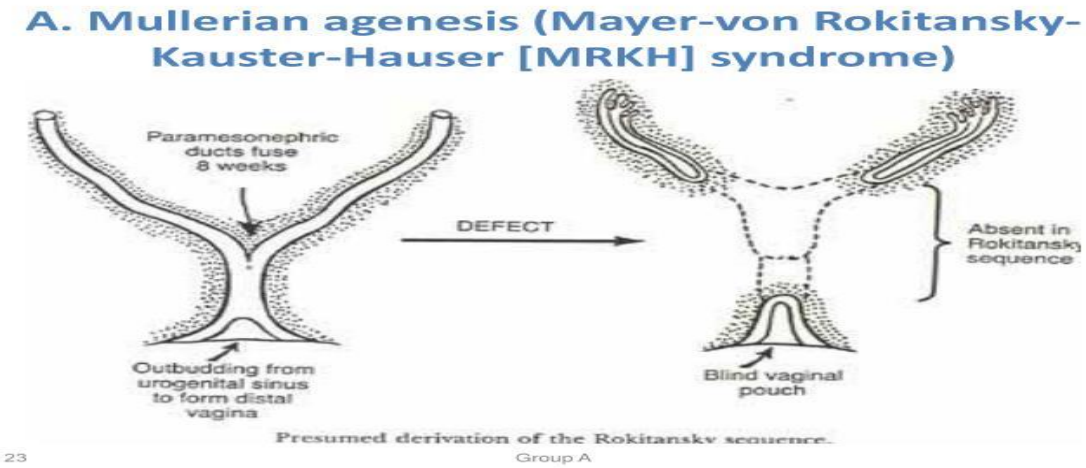
DEVELOPMENT OF EXTERNAL GENITALIA

- Estrogens stimulate development of the external genitalia of the female.
- The genital tubercle elongates only slightly and forms the clitoris.
- urethral folds do not fuse, as in the male, but develop into the labia minora.
- Genital swellings enlarge and form the labia majora.
- The urogenital groove is open and forms the vestibule.

Developmental Abnormality

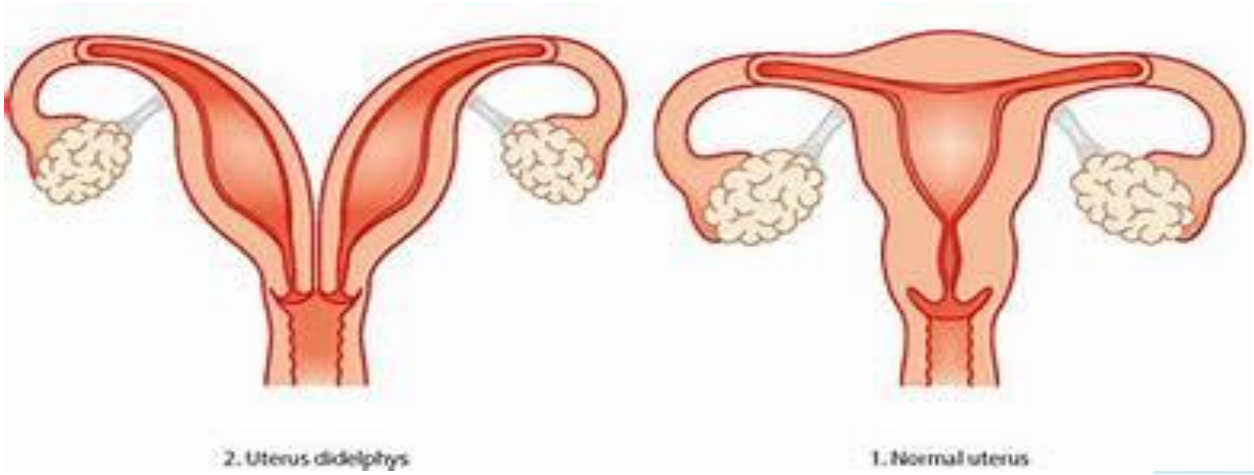
1. **Müllerian agenesis (absent uterus).**

Uterus is not present, vagina only rudimentary or absent.

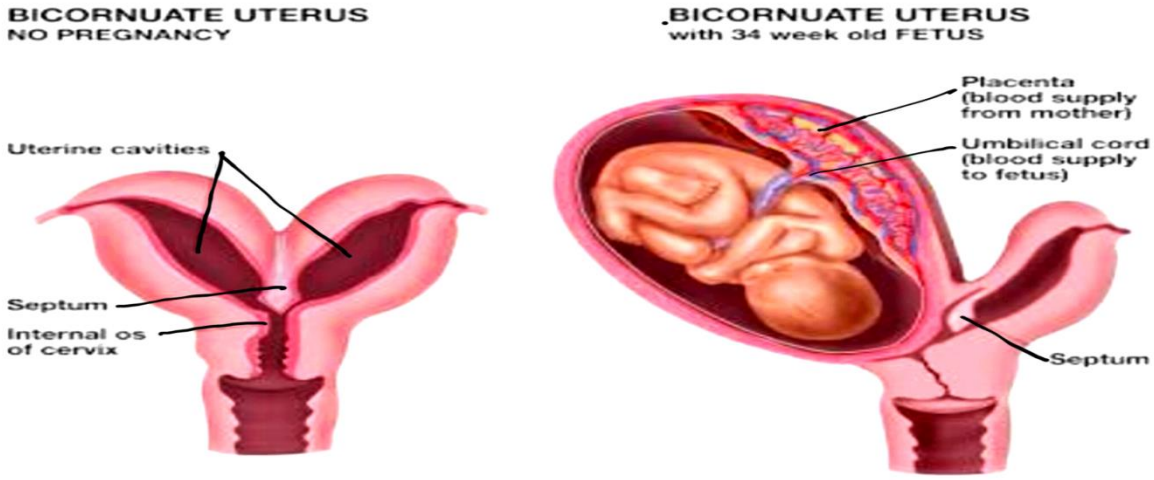


2. **Uterus didelphys, also uterus didelphis (double uterus).**

Both Müllerian ducts develop but fail to fuse, thus the patient has a "double uterus". This may be a condition with a double cervix and a vaginal partition



3. **Bicornuate uterus** (uterus with two horns).
   Only the upper part of that part of the Müllerian system that forms the uterus fails to fuse, thus the caudal part of the uterus is normal, the cranial part is bifurcated. The uterus is "heart-shaped".



4. **Septated uterus (uterine septum or partition).**
   The two Müllerian ducts have fused, but the partition between them is still present, splitting the system into two parts. With a complete septum the vagina, cervix and the uterus can be partitioned. Usually the septum affects only the cranial part of the uterus