

Embryology team 430

2nd lecture

Development of the urinary bladder and urethra

Members of the team:

- 1-Daniya Abdouh
- 2-Shatha Al-Harbi
- 3-Haifa Al-Fozan
- 4-Salwa Al-Shibani
- 5-Raseel Al-swidan
- 6-Zaid Al-saaran
- 7-Mohammed Khashougji

Important not :

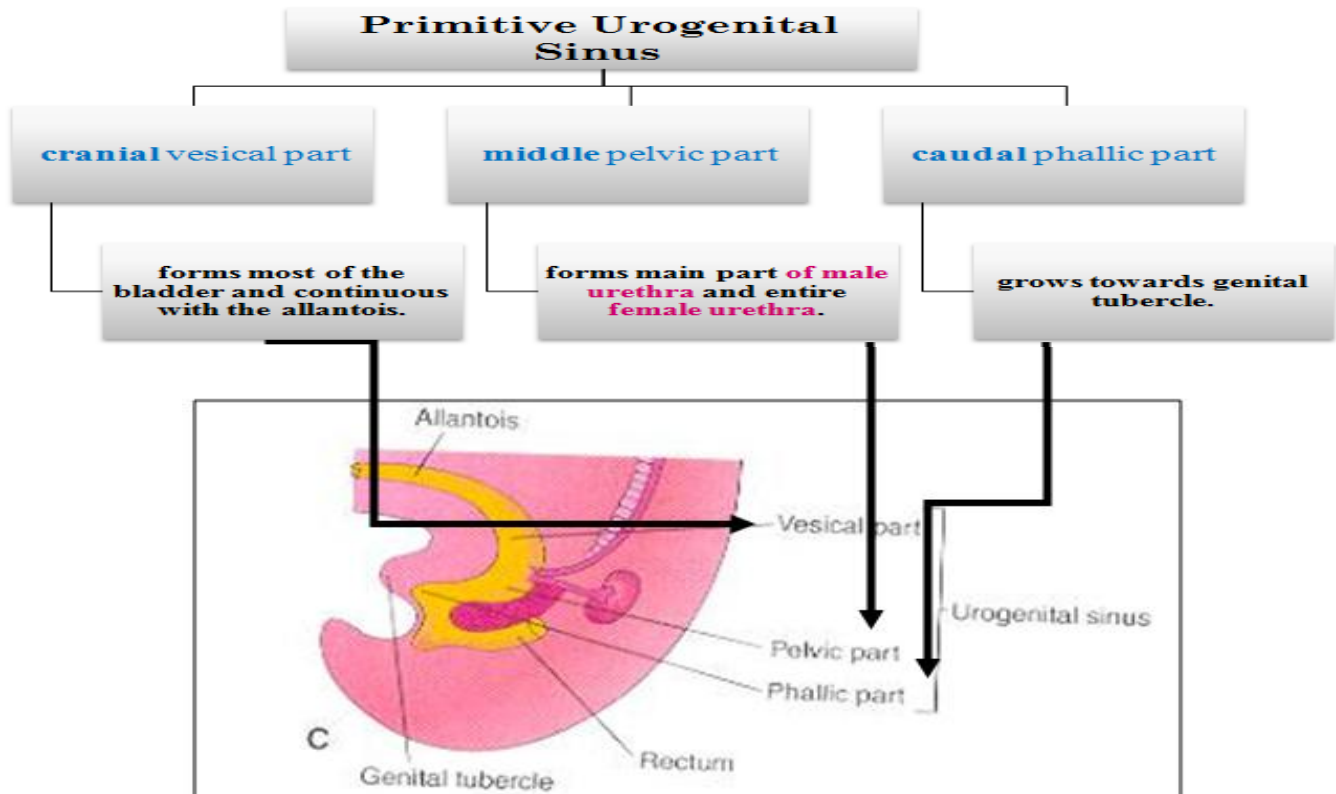
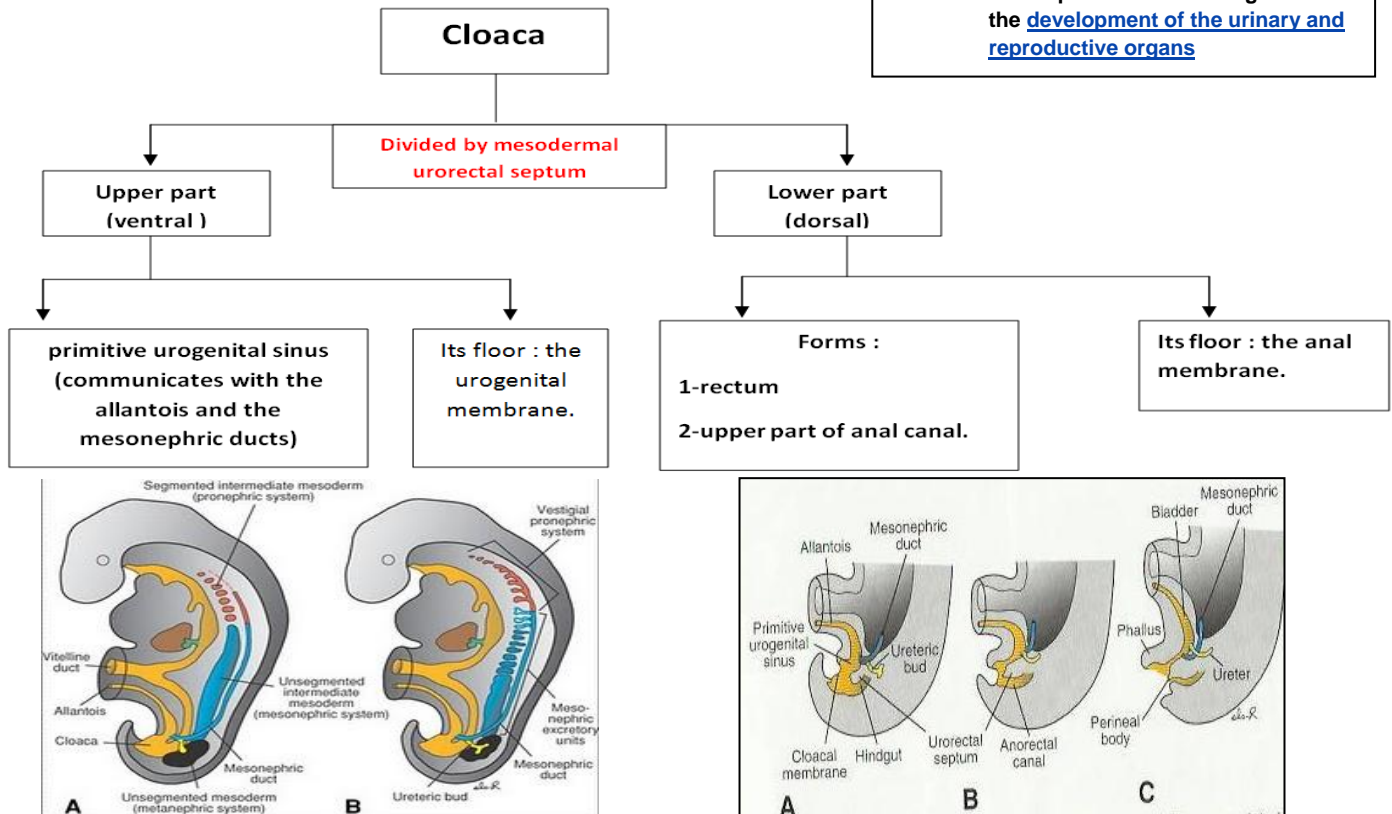
the doctor said that the development of the *bladder and *utethra is the most important thing so you have to concentrate on it .

The cloaca is : the dilated terminal part of the hind gut.

- Receives from : 1- allantois
2-the mesonephric ducts.
- The floor of the cloaca is covered by **the cloacal membrane**

For your information :

- 1- cloaca is the posterior opening that serves as the only such opening for the intestinal, reproductive, and urinary tracts
- 2- Human beings only have an embryonic cloaca, which is split up into separate tracts during the development of the urinary and reproductive organs



Urinary bladder

It develops mainly from the → **vesical** part of the urogenital sinus.

The **trigone** is derived from the → absorbed caudal ends (of the mesonephric ducts)

- The epithelium is **endodermal** in origin
- The other layers are derived from the **splanchnic mesoderm**

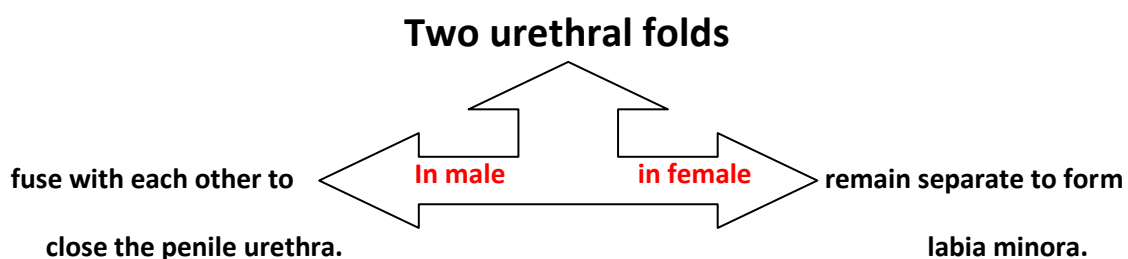
Urinary bladder

- ❑ The allantois is at first continues with the bladder → becomes a thick fibrous cord (urachus); extends from apex of the bladder to the umbilicus.
- ❑ In adult it is represented by **the median umbilical ligament**.
- ❑ After absorption of the mesonephric ducts to form the trigone, the ureters open separately in the bladder.
- ❑ In infants and children the bladder is an abdominal organ → it enters the greater pelvis at about **6 years** → becomes a pelvic organ **until after puberty**.

Urethra : Before differentiation (Indifferent stage):

- ❑ A mesenchymal elevation develops at the cranial end of the cloacal membrane, it is called "**The genital tubercle**".

→ **2 urethral folds**, develop on either side of the urogenital membrane → Laterally → **2 labioscrotal folds** develop on either side of the urethral folds.



	Female Urethra	Male Urethra
	-	The genital tubercle elongates forming the <u>phallus</u> , which is the precursor of <u>the penis</u> .
Where does it come from?	It's entirely derived from endoderm of the <u>pelvic middle part</u> of the urogenital sinus.	<u>Most of</u> the male urethra : prostatic, membranous and spongy parts is derived from endoderm of the <u>pelvic middle part</u> of urogenital sinus.
	The external urethral orifice opens <u>dorsal to</u> the glans clitoris.	The distal part of male urethra in glans penis starts as ectodermal <u>solid cord</u> that grows towards the root of penis to meet the spongy urethra , later it <u>canalizes</u> .

Male Urethra:

- ☐ The genital tubercle elongates forming the **phallus**, which is the precursor of the penis.
- ☐ It formed of two parts:
 - 1) the **pelvic part of urogenital sinus**: prostatic, membranous and spongy parts.
 - 2) **Ectodermal**: distal part of male urethra.

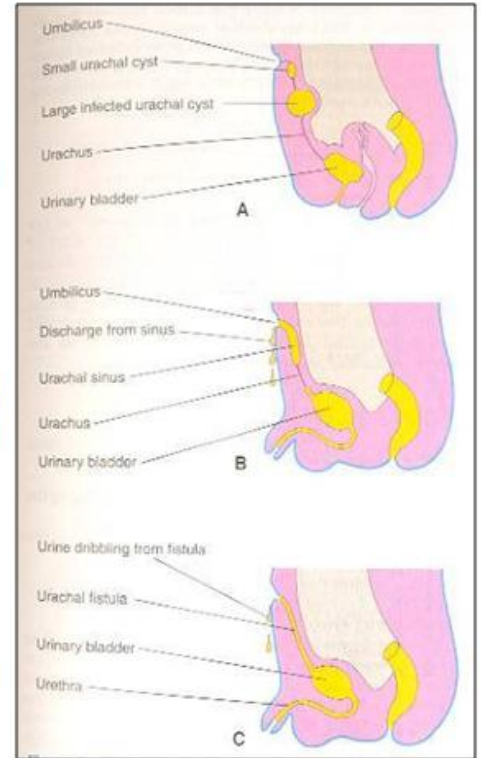
Anomalies:

- ☐ Urachal anomalies (defect in bladder).
- ☐ Exstrophy of the bladder (Ectopia vesicae); exposure of the posterior wall of the bladder due to a defect in the anterior abdominal wall and anterior wall of the bladder.

Urachal anomalies

Urachal cyst: persistence or remnant of epithelial lining of urachus.

(urachus يجب أن يحصل له fibrosis لكن هنا يكون في جزء منه لم يحدث له fibrosis فيتكون شيء مثل الكتلة)



Urachal sinus: discharge serous fluid from the umbilicus.

(جزء من urachus لم يحصل له fibrosis ويكون مفتوح على umbilicus فيتجمع فيه (serous fluid))

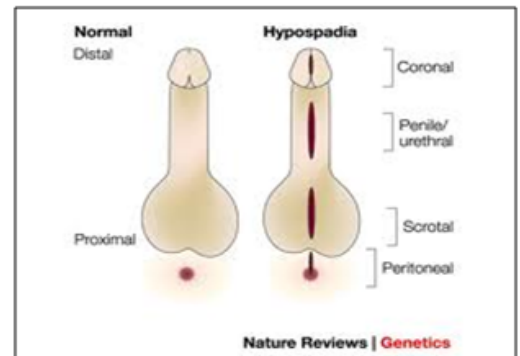
Urachal fistula: the entire urachus remains patent and allows urine to escape from the umbilicus.

(urachus كله يكون مفتوح على umbilicus فيخرج urine منها)

Urethral Anomalies

Hypospadias: is the most common anomaly, with incomplete fusion of the urethral folds, and abnormal openings of the urethra occur along the ventral (inferior) aspect of the penis.

(يحدث إذا لم يحصل ectodermal spaces. فلا تكون urethral orifice at the tip of the glans penis بل تكون في أي مكان في ventral aspect of the penis)



Epispadias: is a rare abnormality, in which the urethral meatus is found on the dorsum of penis, it is most often associated with exstrophy of the bladder.

(يحدث بسبب defect in anterior abdominal wall فتكون مفتوحة. وتكون urethral meatus في penis من الأعلى)

