

وسهلا



أهلا

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Prof. Dr. Youssef Hussein Anatomy - YouTube

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# Development of Urinary bladder

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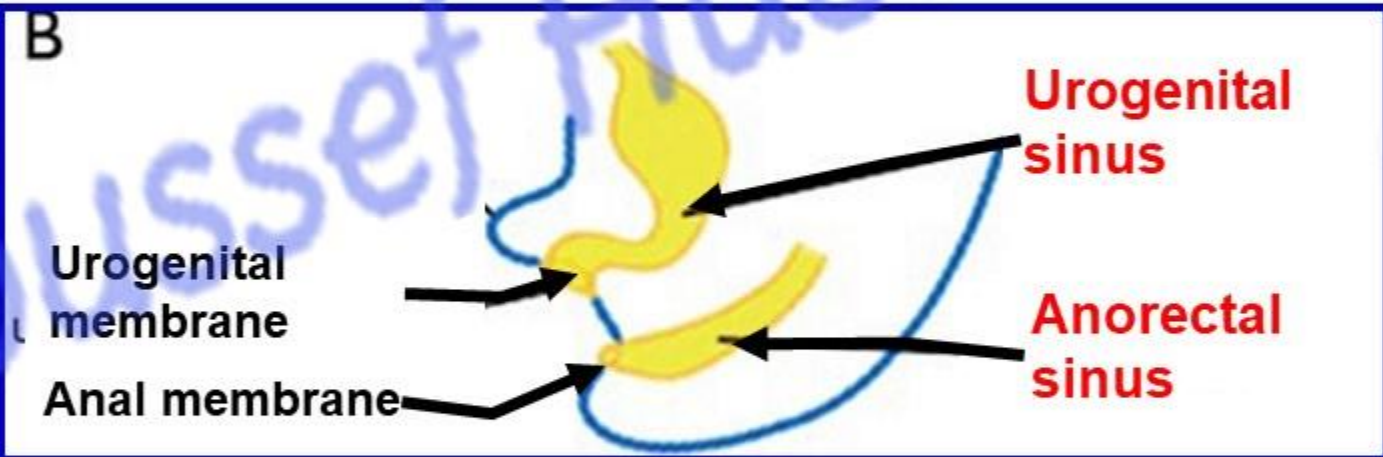
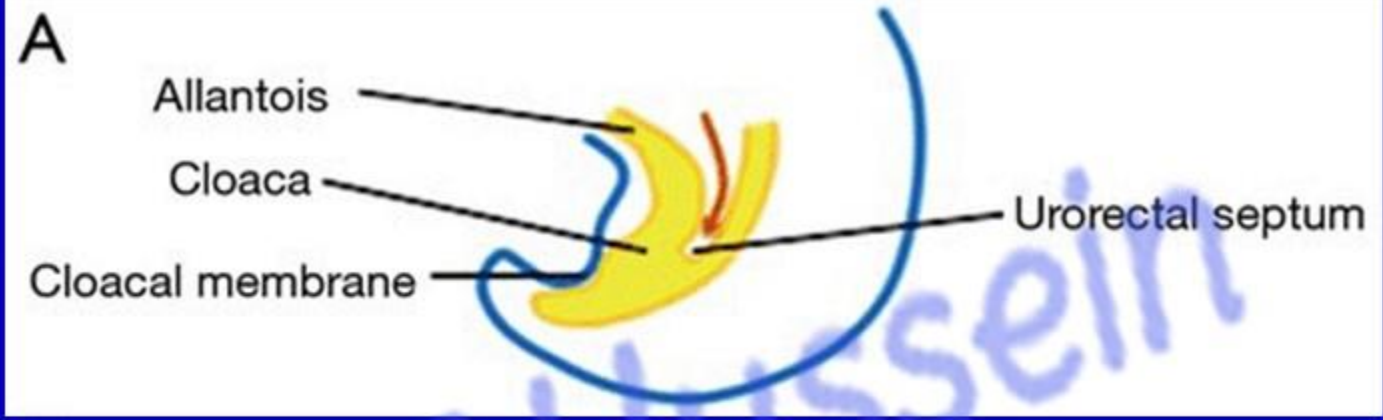
## ❖ Derivatives of cloaca

- The cloaca is the caudal dilated part of the **hindgut**, which is closed by the cloacal membrane and connected to umbilicus by **allantois (urachus)**.

- It is divided by **Urorectal septum** into:

1- **Ventral part** called **urogenital sinus**, closed by urogenital membrane that forms the mucosa of the urinary bladder and urethra (and the lower part of the vagina in females).

2- **Dorsal part** called **anorectal sinus**, closed by **anal membrane**. forms the mucosa of the rectum and upper part of the anal canal.



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- **\*\* Derivatives of the urogenital sinus:**

- It receives openings of allantois and 2 mesonephric ducts.

- The site of opening of mesonephric ducts into **urogenital sinus** dividing it into:

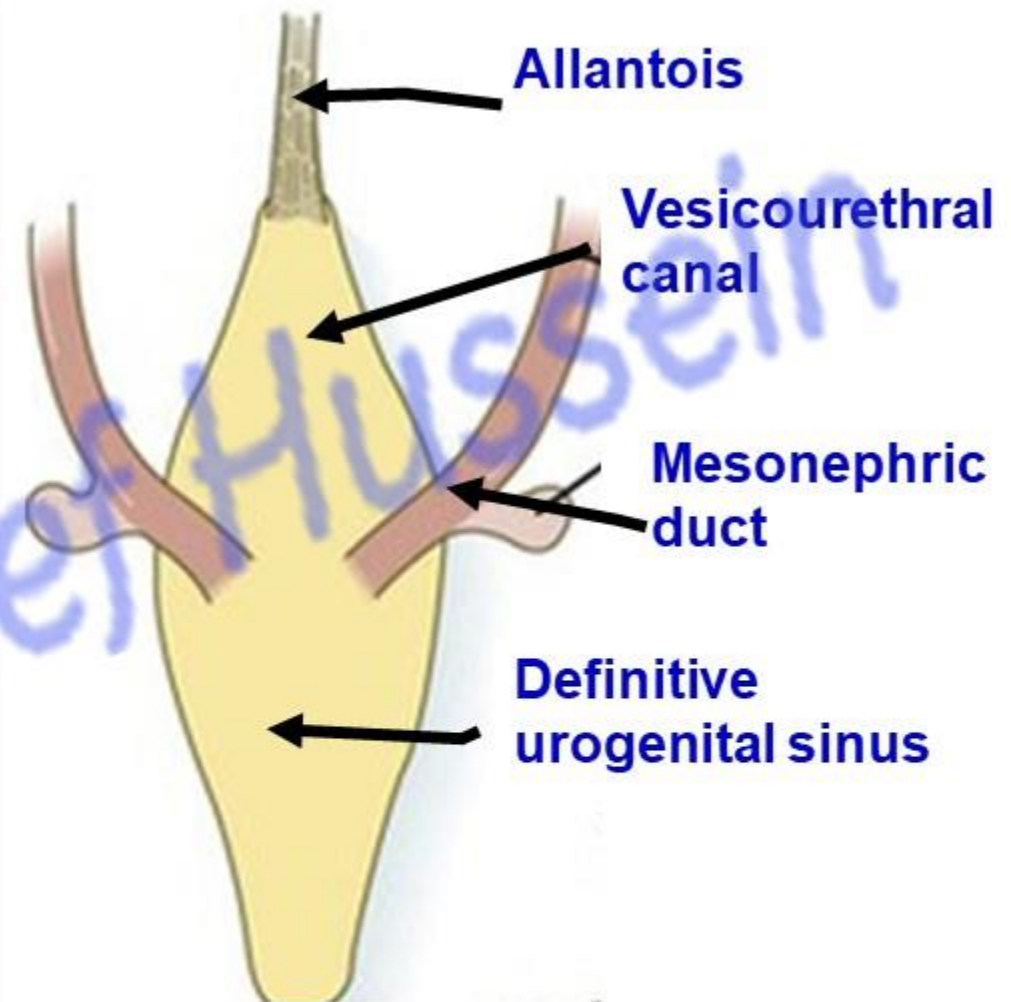
- 1- Cranial part called vesicourethral canal**

- which forms mucous membrane of:

- a) Urinary bladder.**

- b) Prostatic part of urethra** above the utricle (in male) or Upper 4/5 of the **urethra** (in female).

- 2- Caudal part called definitive urogenital sinus.**



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- **Development of the Urinary Bladder**

- \*\* Development of the mucous membrane**

**1- Proximal part of allantois** (urachus), forms the apex of the urinary bladder (endodermal in origin).

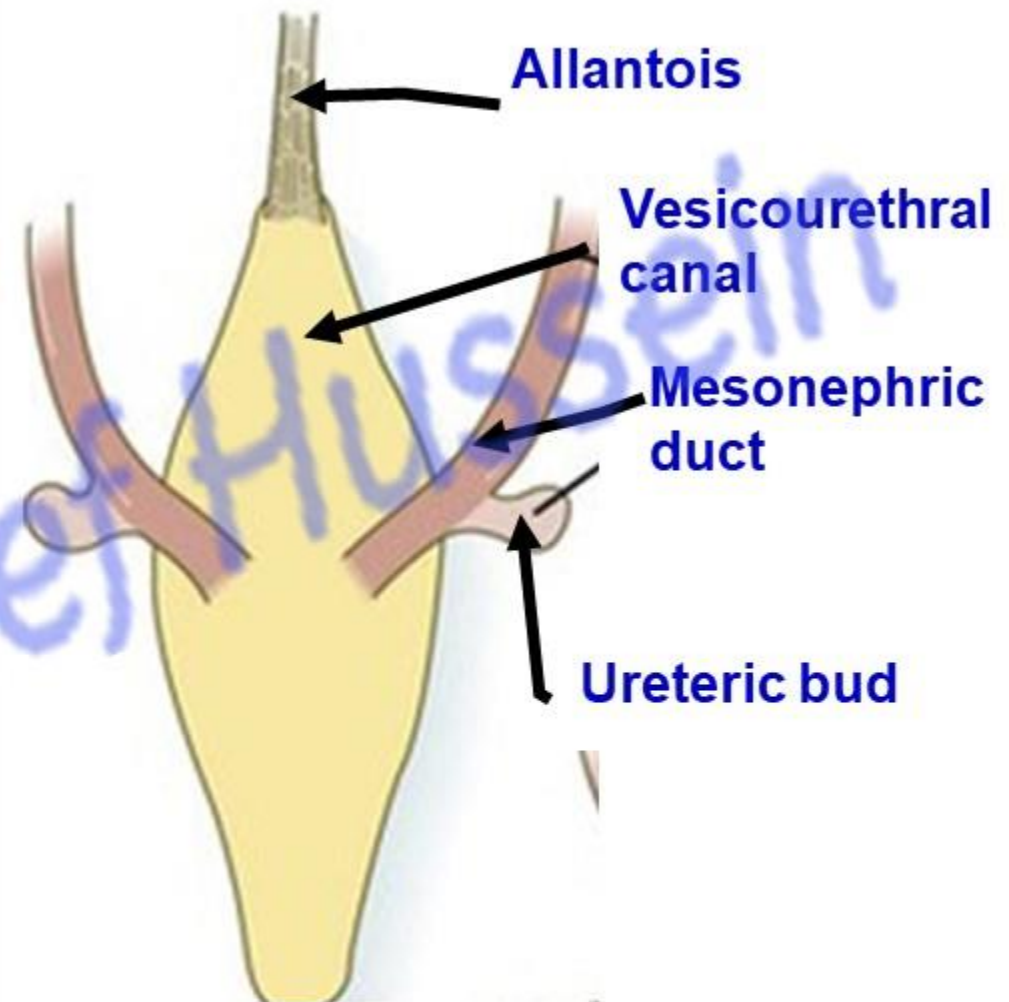
**2- Vesicourethral canal**, forms most of the urinary bladder (endodermal in origin).

**3- Proximal parts of mesonephric ducts** till the opening of ureteric buds form **trigone** (mesodermal in origin).

- \*\* Development of muscles** (from the mesoderm surrounding the vesicourethral canal).

- Distal part of allantois (urachus) obliterated, fibrosed and formed **median umbilical**

**ligament.**



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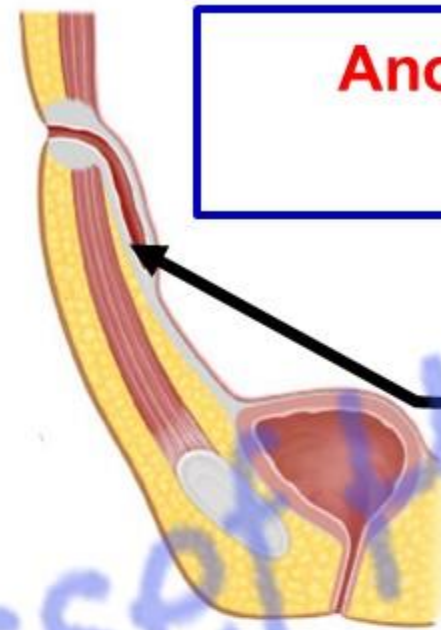


**Urachal fistula:** failure of obliteration of **urachus**. This will lead to discharge of urine from umbilicus.

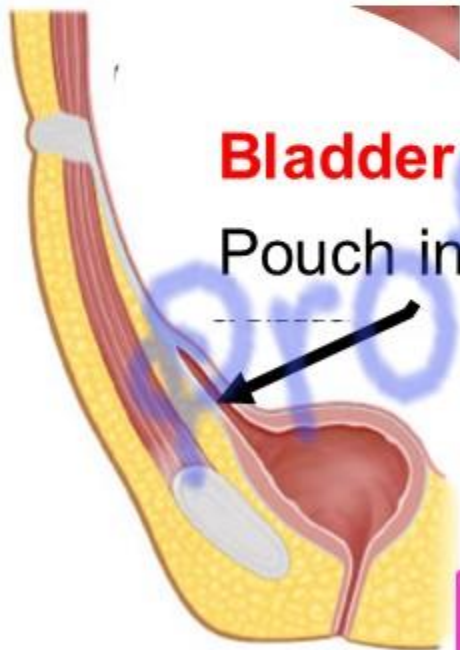


**Anomalies of urachus (allantois):**

**Urachal sinus:** failure of obliteration of **distal** part of urachus.



**Bladder diverticulum:**  
Pouch in the apex

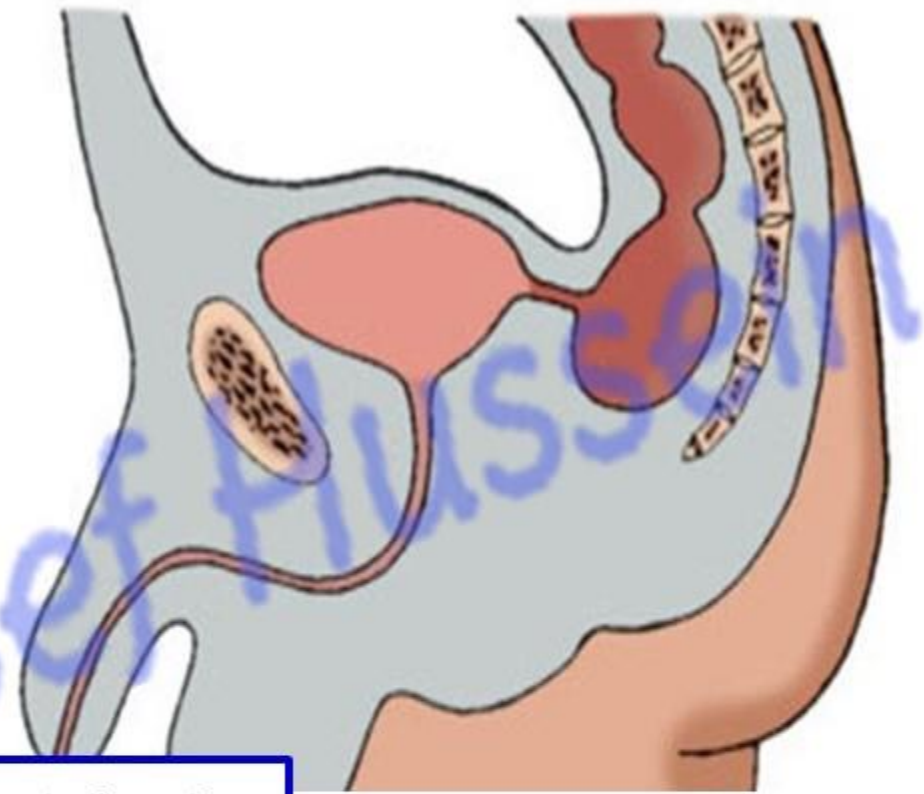
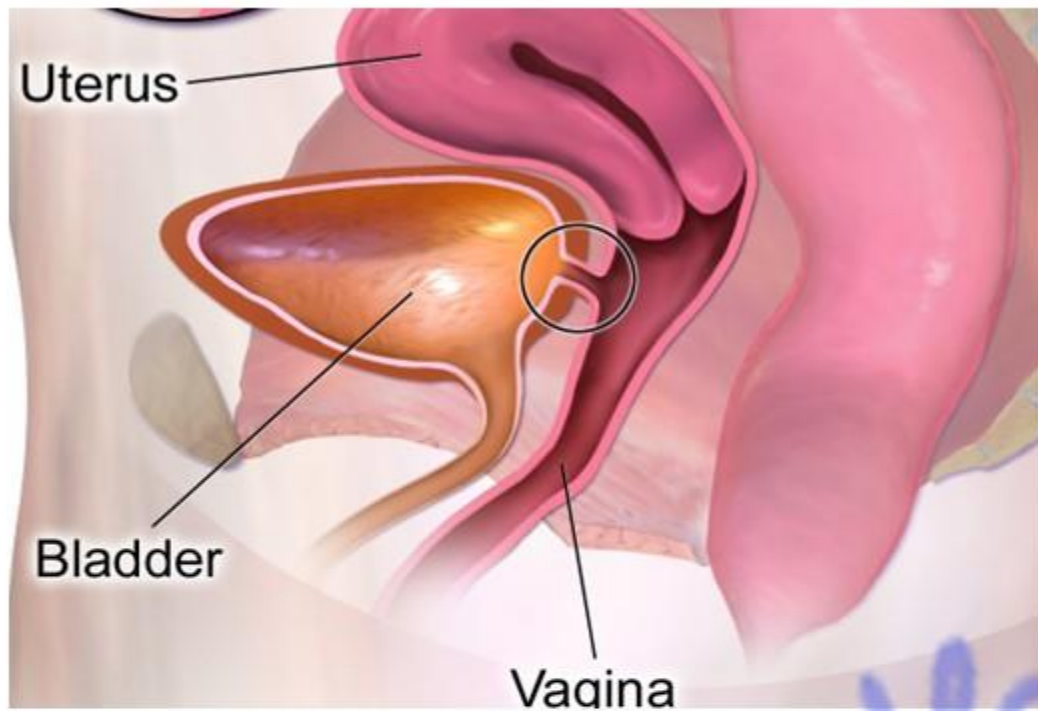


**Urachal cyst:** failure of obliteration of the **middle** part of urachus.



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**Fistulae of the urinary bladder:** due to defect in the urorectal septum.

(a) **Vesicovaginal fistula:** communication between urinary bladder and vagina (**female**).

(b) **Rectovesical fistula:** communication between urinary bladder and rectum (**male**).

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- **Ectopia vesica:**

- The inner aspect of the urinary bladder is exposed below the umbilicus.
- This occurs due to failure of the formation of the anterior abdominal wall and anterior wall of the urinary bladder.

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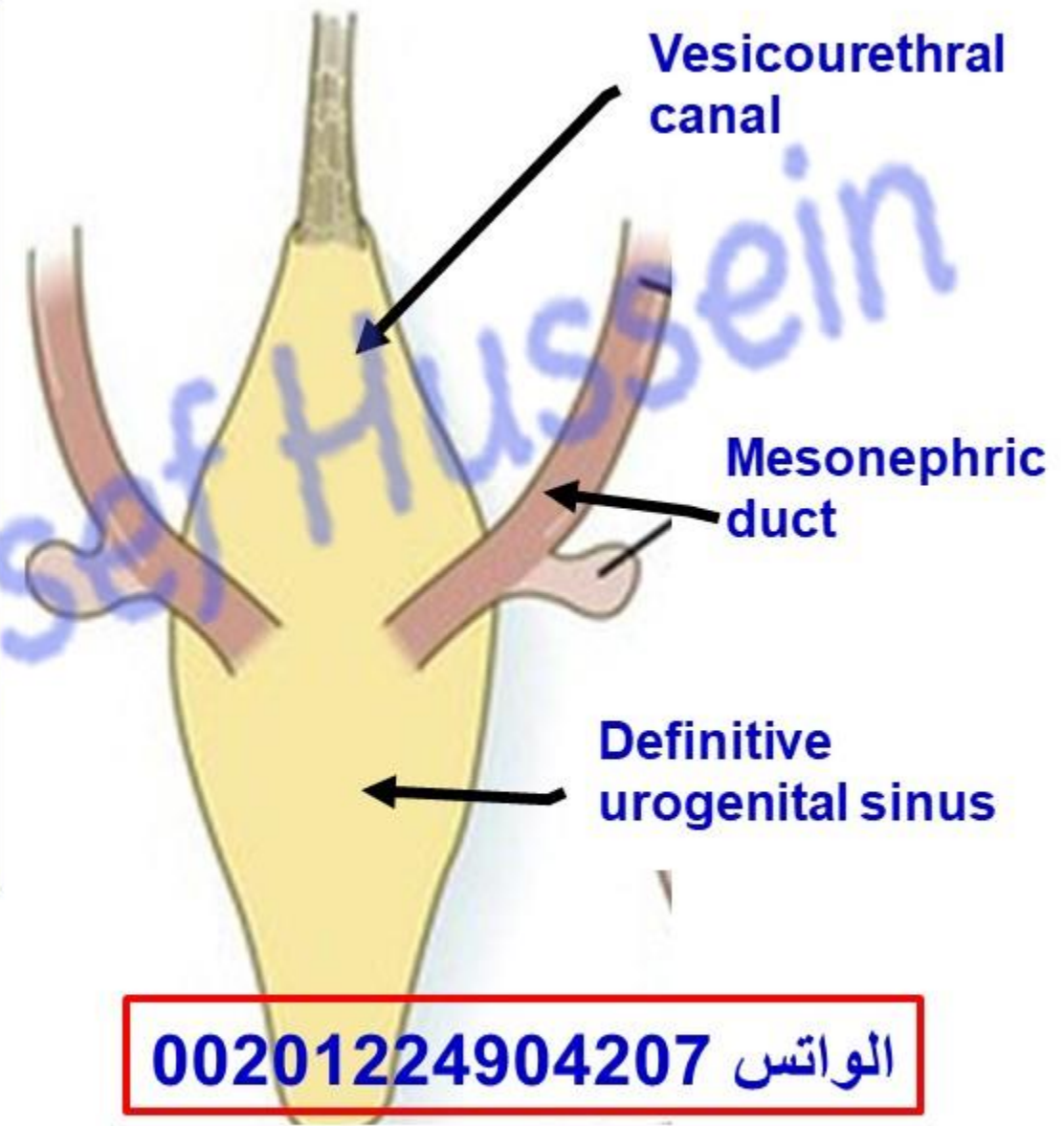
# Development of urethra

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## **\*\* Development of the female urethra**

- The site of opening of mesonephric ducts into **urogenital sinus** dividing it into:
  - 1- Cranial part called vesicourethral canal** which forms mucous membrane of Upper 4/5 of the **urethra**.
  - 2- Caudal part called definitive urogenital sinus** forms Lower 1/5 of the urethra.
- The urethral sphincters are developed from the surrounding mesoderm.



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# Male Urinary Bladder and Urethra

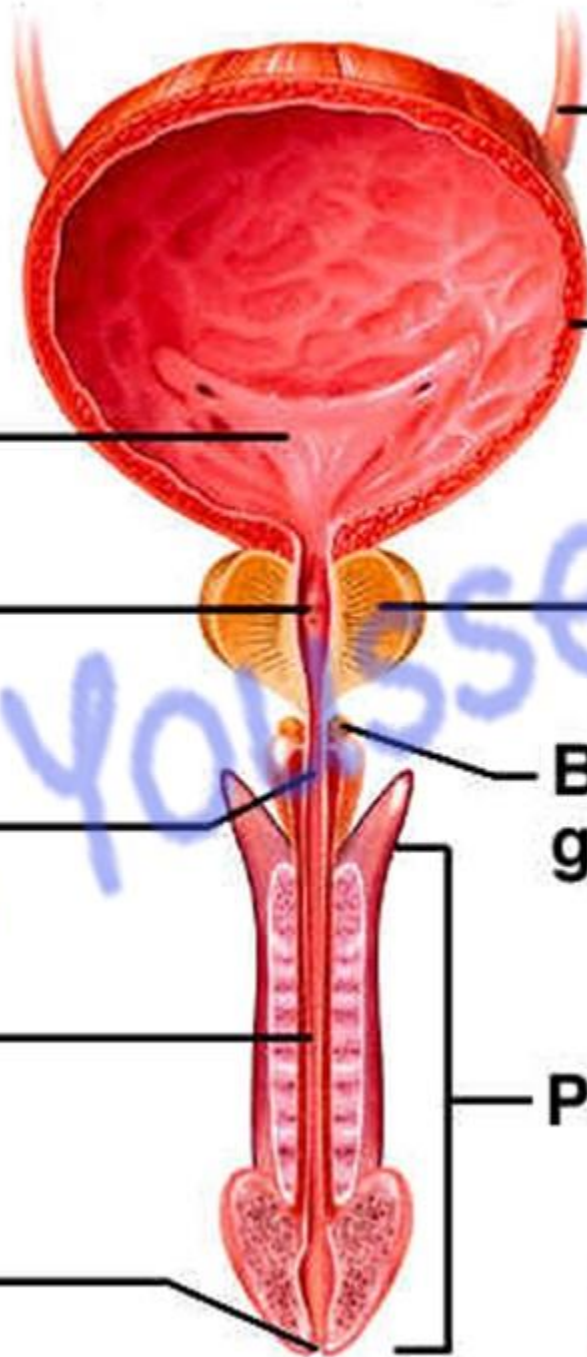
Trigone

Prostatic urethra

Membranous urethra

Penile urethra

External urethral orifice



Ureter

Urinary bladder

Prostate gland

Bulbourethral gland

Penis

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## \*\* Development of male urethra

**A- Vesicourethral canal forms Prostatic part of the urethra above the utricle .**

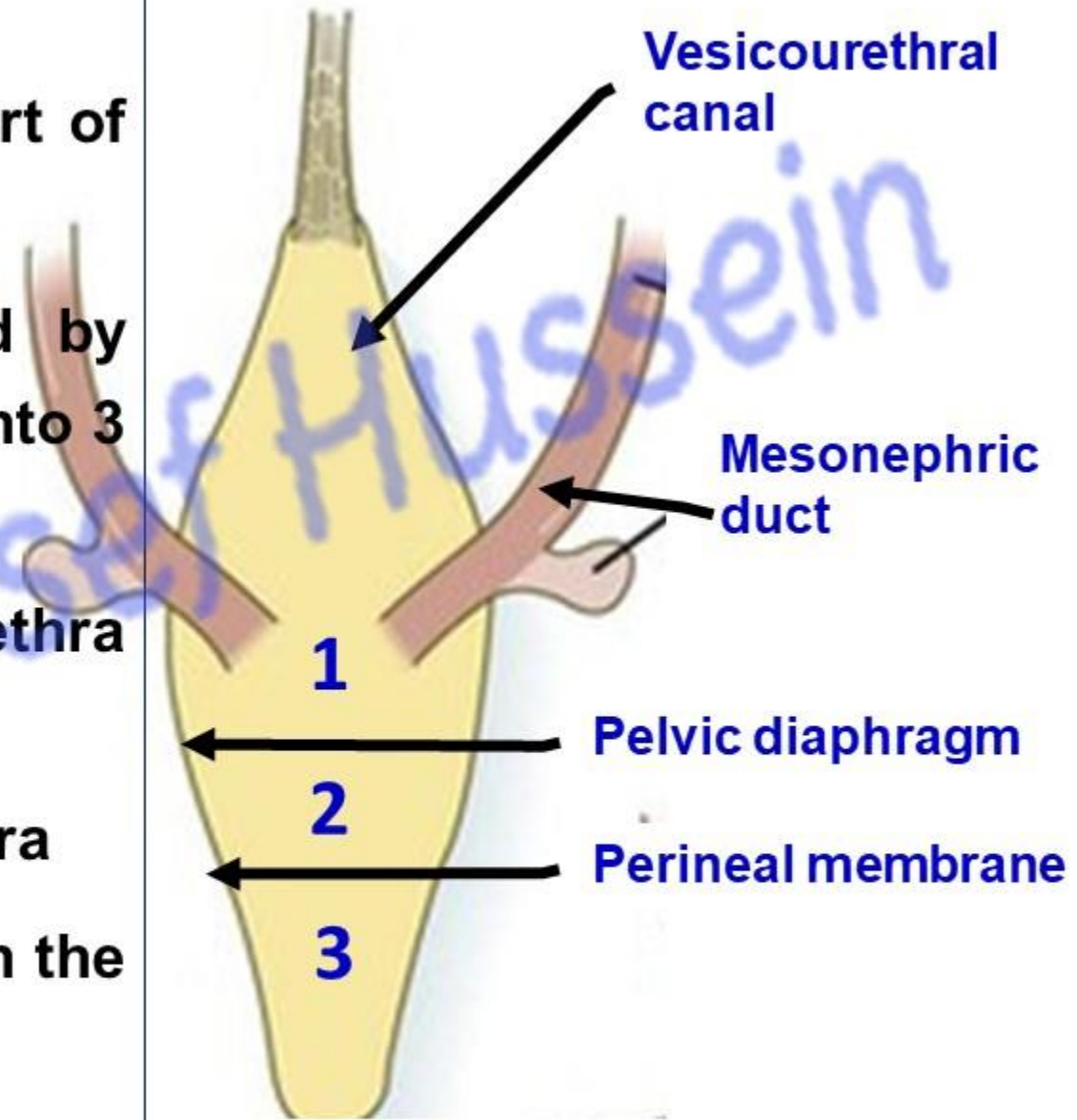
**A- Definitive urogenital sinus is divided by pelvic diaphragm and perineal membrane into 3 parts:**

**1- Cranial part form Prostatic part of the urethra below the utricle**

**2- Middle part forms the membranous urethra**

**3- Caudal part forms forms penile urethra in the root of the penis**

**- The urethral sphincters around membranous are developed from the surrounding mesoderm.**



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- **Steps of development of penile (spongy) urethra**

- 2 folds develop on each side of the urogenital membrane

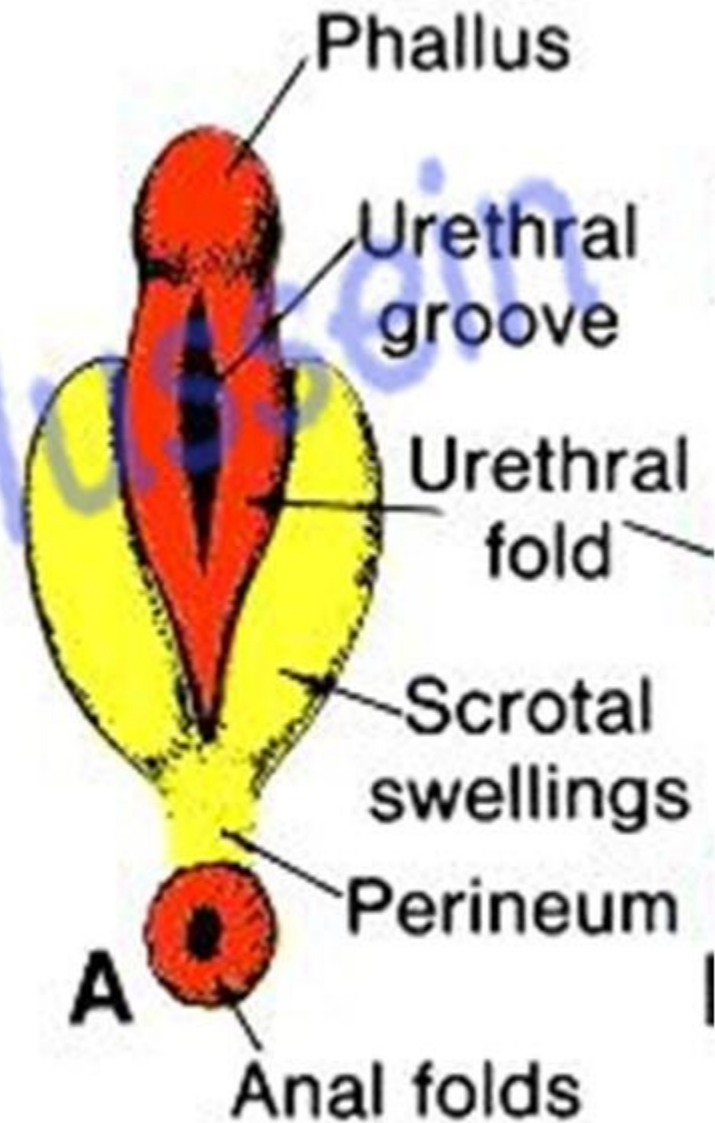
- a. Inner fold called urethral fold.**

- b. Outer fold called genital fold (scrotal).**

- The 2 genital fold meet each other **cranial** to the urogenital membrane to form **genital tubercle (phallus)** that forms **body of the penis and glans penis.**

- The 2 urethral folds fuse with each other to form **urethral tube --- solidified --- urethral plate --- canalized --- urethral groove** -- edges of the urethral groove fuse with each other --- **penile urethra in body of the penis and glans penis.**

- Mesoderm around the urethra forms erectile tissues and blood vessels of the penis.





## • Hypospadias

- External meatus is found on the lower surface of the penis.
- It is caused by failure in fusion of the urethral groove.

**A- Complete:** groove extends from the head of the penis till the scrotum (resembles labia majora).

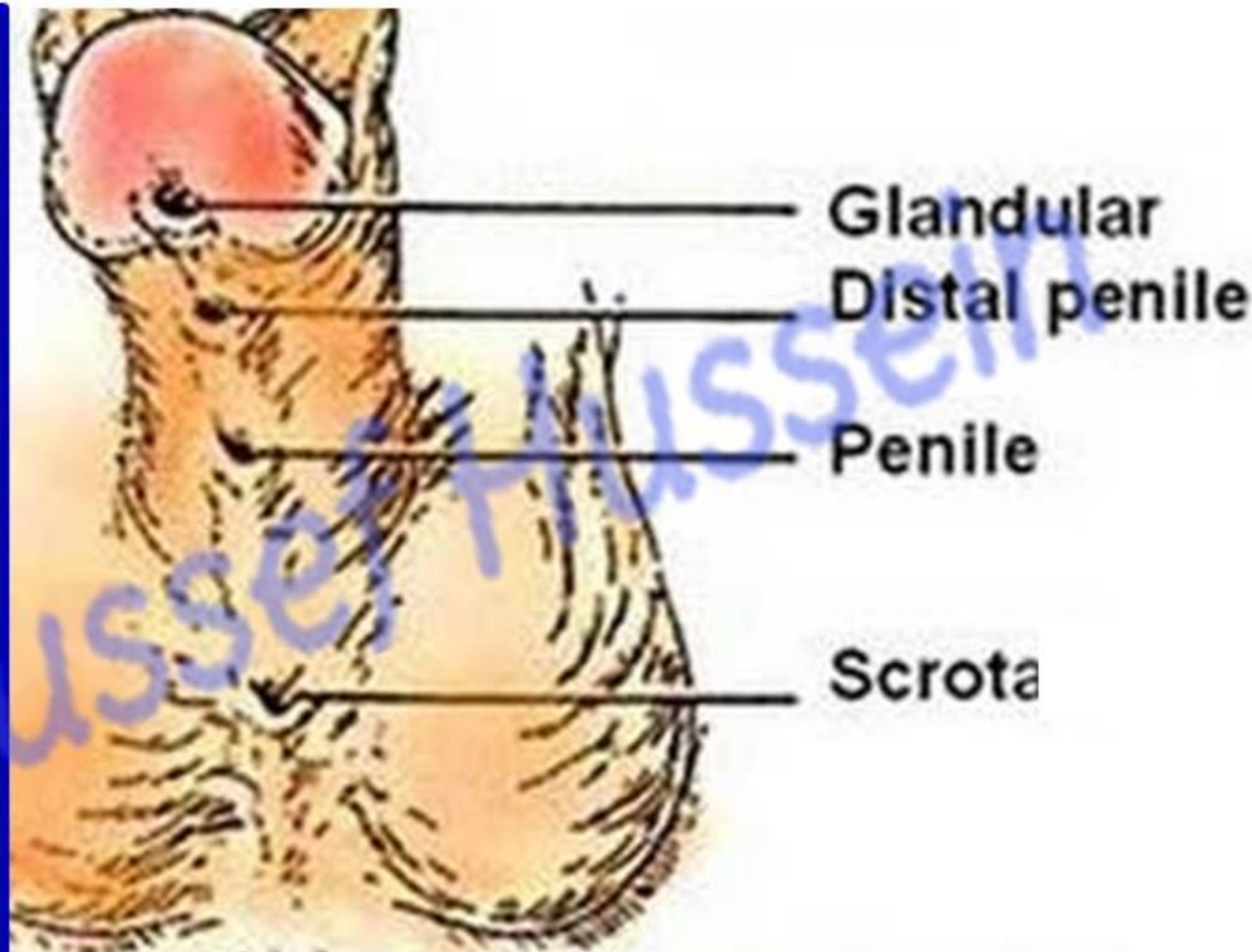
### **B- Incomplete:**

**a- Perineal (Scrotal):** at the root of the penis.

**b- Penile:** at any site along the inferior surface of the penis

**c- Distal** at the terminal of body

**d- Glanular:** at glans penis (The best one for man, can not be repair).



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- **Epispadias**

- The opening of urethra lies on the upper surface of the penis.

- It is either occurred alone or with ectopia vesica.

- **Glandular:** at glans penis.

- **Penile:** at any site along the superior surface of the penis

- **Penopubic:** at the base of the penis.

- **Urethral fistula**

- **(defect in urorectal septum)**

- **Recto-urethral fistula:** communication between rectum and urethra.

- **Urethrovaginal fistula:** communication between vagina and urethra.



**Epispadias**

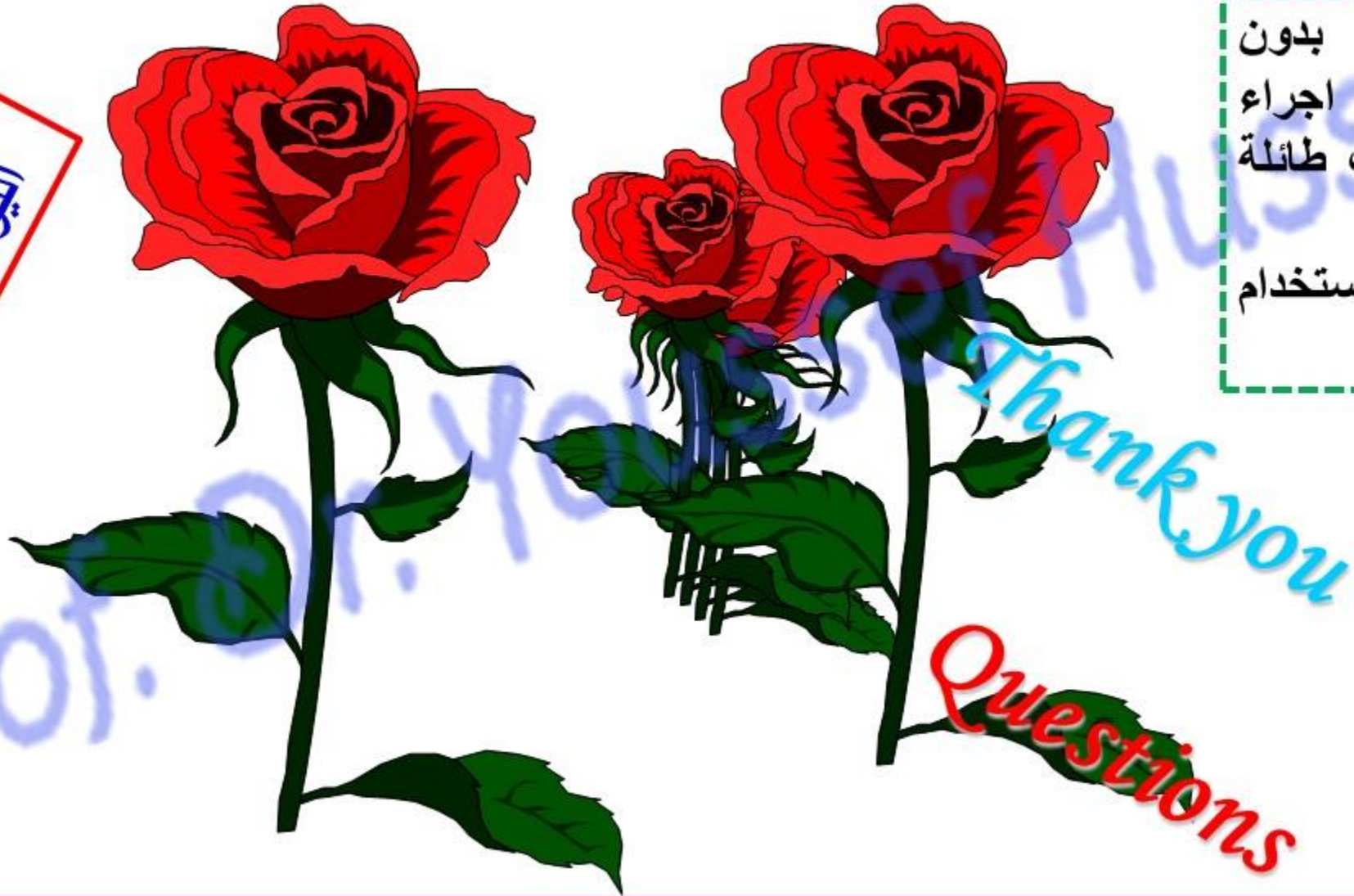
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