"THE GENITAL - DUCT - SYSTEM"

<table>
<thead>
<tr>
<th>Mesonephros Duct (Wolffian Duct)</th>
<th>Epididymis</th>
<th>Duct epoophoron</th>
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<tbody>
<tr>
<td></td>
<td>Vas deferens - seminal Vesicles</td>
<td>Gartners's duct</td>
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<td></td>
<td>Ejaculatory Duct</td>
<td>Vesicular appendage</td>
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<td></td>
<td>Appendix epididymis</td>
<td>Ureter renal pelvis</td>
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<td>Ureter Renal Pelvis</td>
<td>Trigonal structure</td>
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<td></td>
<td>Trigonal structure</td>
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<td>Mullerian duct</td>
<td>Appendix testis</td>
<td>Fallopian tubes</td>
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<td></td>
<td>Prostatic utricle</td>
<td>Uterus, vagina</td>
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<td>Genital tubercle</td>
<td>Penis</td>
<td>Clitoris</td>
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<td>Genital glands</td>
<td>Testis</td>
<td>Ovary</td>
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<tr>
<td><strong>MALE</strong></td>
<td><strong>EMBRYONIC STRUCTURE</strong></td>
<td><strong>FEMALE</strong></td>
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<tr>
<td>Testis</td>
<td>Indifferent gonad</td>
<td>Ovary</td>
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<tr>
<td>Seminiferous tubules</td>
<td>Cortex</td>
<td>Ovarian follicles</td>
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<tr>
<td>Rete testis</td>
<td>Medulla</td>
<td>Rete ovarii</td>
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<td>Gubernaculum testis</td>
<td>Gubernaculum</td>
<td>Ovarian ligament</td>
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<tr>
<td>Efferent ductules of testis</td>
<td>Mesonephric tubules</td>
<td>Epoophoron</td>
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<td>Paradidymis</td>
<td>Paroophoron</td>
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<tr>
<td>Appendix of epididymis</td>
<td>Mesonephric duct</td>
<td>Appendix vesiculosa</td>
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<tr>
<td>Duct of epididymis</td>
<td>Duct of epoophoron</td>
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<tr>
<td>Ductus deferens</td>
<td>Longitudinal duct; Gartner duct</td>
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<tr>
<td>Ureter, pelvis, calices, and collecting tubules</td>
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<tr>
<td>Ejaculatory duct and seminal gland</td>
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<tr>
<td>Appendix of testis</td>
<td>Paramesonephric duct</td>
<td>Hydatid (of Morgagni)</td>
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<tr>
<td>Urethra (except navicular fossa)</td>
<td>Urogenital sinus</td>
<td>Urinary bladder</td>
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<tr>
<td>Prostatic utricle</td>
<td>Urethra</td>
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<td>Prostate gland</td>
<td>Vagina</td>
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<td>Bulbourethral glands</td>
<td>Urethral and paraurethral glands</td>
<td>Greater vestibular glands</td>
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<td>Seminal colliculus</td>
<td>Sinus tubercle</td>
<td>Hymen</td>
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<td>Penis</td>
<td>Phallus</td>
<td>Clitoris</td>
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<td>Glans penis</td>
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<td>Glands of clitoris</td>
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<tr>
<td>Corpora cavernosa of penis</td>
<td>Corpora cavernosa of clitoris</td>
<td></td>
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<tr>
<td>Corpus spongiosum of penis</td>
<td>Bulb of vestibule</td>
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<tr>
<td>Ventral aspect of penis</td>
<td>Urogenital folds</td>
<td>Labia minora</td>
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<tr>
<td>Scrotum</td>
<td>Labioscrotal swellings</td>
<td>Labia majora</td>
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</tbody>
</table>

*Functional derivatives are in italics.*
C. Vestigial remnants (Figure 14.3). The formation of cysts is related to vestigial remnants of the genital ducts. The diagram in Figure 14.3 shows the location of various cysts in the female reproductive tract:

1. A hydatid cyst of Morgagni (1) arises from hydatid of Morgagni, which is a remnant of the paramesonephric duct.
2. A Kobelt’s cyst (2) arises from the appendix vesiculosa, which is a remnant of the mesonephric duct.
3. A cyst of the epoophoron (3) arises from the **epoophoron**, which is a remnant of the mesonephric tubules.
4. A cyst of the paroophoron (4) arises from the paroophoron, which is a remnant of the mesonephric tubules.
5. A Gartner’s duct cyst (5) arises from the **duct of Gartner**, which is remnant of the mesonephric duct.

**FIGURE 14.3.** Location of various cysts in the female reproductive tract. See text for key.
Anomalies of the Upper Urinary Tract

| Anomalies of Number | A. Agenesis (bilateral or unilateral)  
|                     | B. Supernumerary Kidney |
| Anomalies of volume and structure | A. Hypoplasia  
|                                 | B. Multicystic kidney  
|                                 | C. Polycystic kidney |
| Anomalies of Ascent | A. Ectopic kidney  
|                     | B. Pelvic kidney  
|                     | C. Thoracic kidney |
| Anomalies of Form and Fusion | A. Crossed ectopic with or without fusion: (1) Unilateral Fussed kidney, (2) Sigmoid kidney, dan (3) Lump kidney  
|                                 | B. Horseshoe kidney |
| Anomalies of Rotation | A. Incomplete  
|                     | B. Reverse  
|                     | C. Excessive |
| Anomalies of Renal vasculature | A. Accessory, aberant,a or multiple vessels  
|                                 | B. Renal artery aneurism  
|                                 | C. Arteriovenous fistula |
Accessory Renal Arteries

Accessory (supernumerary) renal arteries usually arise from the aorta superior or inferior to the main renal artery and follow the main renal artery to the hilum of the kidney (Fig.).

Accessory renal arteries may also enter the kidneys directly, usually into the superior or inferior poles. An accessory artery to the inferior pole (polar renal artery) may cross anterior to the ureter and obstruct it, causing hydronephrosis—distention of the renal pelvis and calices with urine (see Fig.). If the artery enters the inferior pole of the right kidney, it usually crosses anterior to the inferior vena cava and ureter.

It is important to be aware that accessory renal arteries are end arteries; consequently, if an accessory artery is damaged or ligated, the part of the kidney supplied by it will become ischemic. Accessory arteries are approximately twice as common as accessory veins.

Figure 12-11 Common variations of renal vessels. A and B, Multiple renal arteries. Note the accessory vessels entering the poles of the kidney. The polar renal artery, illustrated in B, has obstructed the ureter and produced an enlarged renal pelvis. C and D, Multiple renal veins are less common than accessory arteries.
Incomplete double system

**Y-type ureter:**
- Asymptomatic
- Yo-yo phenomena

Y-type ureter where the ureter splits extravesically.

**Yo-yo phenomena = Uretero-ureteral reflux**

**VUR = vesico-ureteric reflux**

**V-type ureter:**
- Asymptomatic
- VUR

V-type ureter splits intraluminally.
Ectopic ureter

= An ectopic ureter does not enter the urinary bladder. An ectopic ureter results when the ureter is not incorporated into the trigone in the posterior part of the urinary bladder.

♀
Most commonly: ureteral orifice opens at distal part of urethral external sphincter.
♀ child complain:
continuous incontinence with an otherwise normal voiding pattern after toilet training.

♂
Most commonly: ureteral orifice opens at posterior urethral
No sign or symptom.
Pielo-ureteric duplication (variation)

**Incomplete**
- **Y type**
  - Phenomena Yo-Yo
- **V type**

**Complete**
- **Upper pole ureter**
  - Longer
  - Distal ectopic orifice
  - Obstruction more frequent
  - Ureterocele
- **Lower pole Ureter**
  - Shorter
  - Proximal orifice
  - VUR more frequent

This anomaly may develop when a single ureteral bud branches before it reaches the metanephric blastema. The duplicated ureters unite at a variable distance from the kidney, and only one ureteral orifice is present on the affected side.

**COMPLETE DUPLICATION**
The ureter of the lower renal pole arises inferiorly and is incorporated into the developing bladder first. It ascends during bladder growth and inserts superiorly and laterally to the ureter of the upper renal pole (Weigert-Meyer rule). The ureter of the upper pole remains with the wolffian duct longer. Its insertion is located in the bladder or wherever remnants or derivatives of the wolffian duct are found.
Pieloureteric Junction Obstruction

Ureteropelvic junction (UPJ) obstruction is a condition in which urine is unable to travel from the renal pelvis to the bladder because of a blockage occurring at the UPJ.
- Aganglioner of pyelo-ureteric junction
- Obstruction from aberrant vessels

Hydronephrosis

Tx: Pyeloplasty (Anderson Hynes)
   Endopyelotomy
   Transpose aberrant vessels
Percutaneous endopyelotomy is performed by making an incision on the posterolateral wall using a smaller endoscope and followed by separating the cut edges by using balloon. A ureteral stent is placed for drainage for 6 weeks and a nephrostomy tube.

Figure 87.3 Anderson-Hynes pyeloplasty. (a) Vertical en bloc resection of the pelvis, pelvi-ureteric junction with oblique division of the ureter. (b) Superior part of the pelvis is closed and start of the posterior layer anastomosis between ureter and pelvis. (c) Posterior layer anastomosis completed and anterior layer anastomosis commenced over a stent. (d) An oval-shaped anastomosis completed between ureter and renal pelvis.
I. PRIMARY REFLUX

Kelainan:  
- congenital: kondisi saat lahir/dalam janin
- Familial → terjadi pada banyak anggota keluarga dari generasi ke generasi
- Heriditer: diturunkan dari orang tuya (2 generasi)

♀ > ♂ = (4 : 1)

Penyebab:  
- ectopic ureter
  - intra vesical ureter → / short / absent
  - detrusor muscle absent / bladderwall

Normal:  
uretero vesical junction
  (intra vesical sub mucosal ureteral segment: ± 2 cm)
I. Conservatif

II. Surgical:

*Anti reflux*: - cohen's method

- politano lead better procedure

- dll
• **Cohen's methods**: (Cohen procedure, Glenn-Anderson procedure) are the main surgical options. Their aim is to mobilize the distal segment of the ureter(s) (transmural ureter) and place it under a tunnel of bladder mucosa, to restore the flap-valve mechanism which normally prevents VUR. For detail see: [http://onlinelibrary.wiley.com/doi/10.1111/j.1464-410X.2004.05083.x/pdf](http://onlinelibrary.wiley.com/doi/10.1111/j.1464-410X.2004.05083.x/pdf)


Other method: the extravesical Lich-Gregoir procedure.
KELAINAN URETHRA

1. HYPOSPADIA
   - Muara urethra yang abnormal pada sisi ventral dari penis
     macam: - glandular
     - coronal
     - penile
     - penoscrotal
     - perineal
     Hampir selalu disertai adanya chordae

2. Epispadia:
   - muara urethra pada sisi dorsal penis

3. Posterior urethral – valve:
   persistent embryonic membranes located in the posterior urethra, causing bladder outlet obstruction during voiding. How? the insertion of the mesonephric ducts into the cloaca is anomalous or too anterior, normal migration of the ducts is impeded, and the ducts fuse anteriorly resulting in the formation of abnormal ridges or folds.

4. Congenital urethral fistula

5. Urethral diverticula

6. Megalo - urethra
Fig. 6a. Diagram of the anterior urethral diverticulum.
Figure 6. Types of hypospadias.

1. **Phimosis** = occurs when the foreskin of an uncircumcised male cannot be pulled back over the head of the penis.

2. **Paraphimosis** = unretractable foreskin without adherences or a circular band of tight prepuce preventing full retraction.

3. **Micropenis** = the penis is so small that it is almost hidden by the suprapubic pad of fat. Micropenis results from fetal testicular failure and is commonly associated with hypopituitarism.

4. **Aphallia** = have no phallus → have no penis or clitoris