Lec 2

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Congenital Abnormalities of the Urinary System

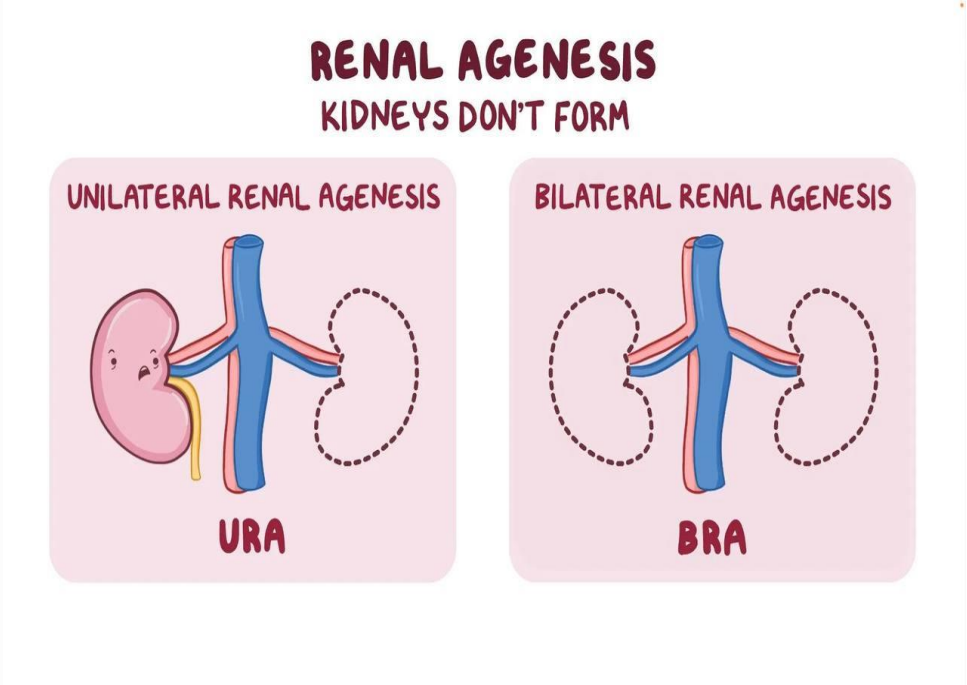
- Congenital anomalies = structural defects present at birth
- Affect kidneys, ureters, bladder, or urethra
- May be asymptomatic or cause severe renal impairment
- Early detection is crucial for management

Epidemiology & Clinical Relevance

- Occur in 3–6 per 1000 live births
- Common cause of chronic kidney disease in children
- Often detected antenatally by ultrasound
- Can be isolated or part of syndromes

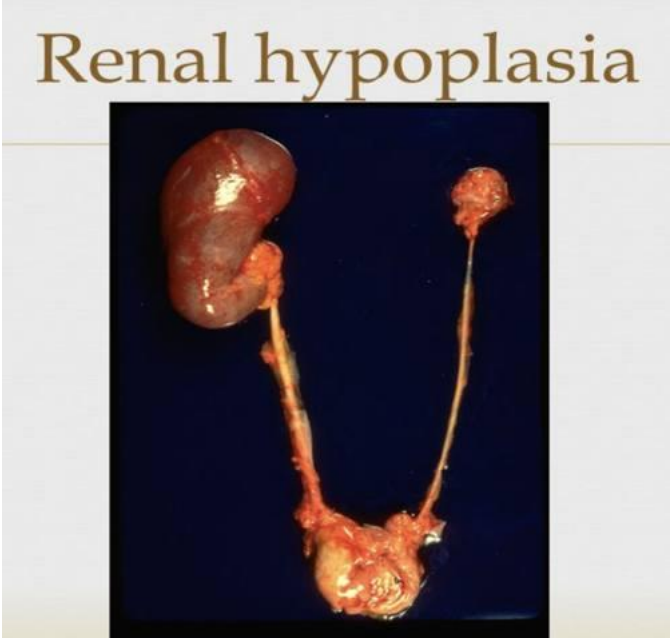
Renal Agenesis

- Unilateral more common than bilateral
- Bilateral: incompatible with life
- Unilateral: often asymptomatic, compensatory hypertrophy
- Associated anomalies are common



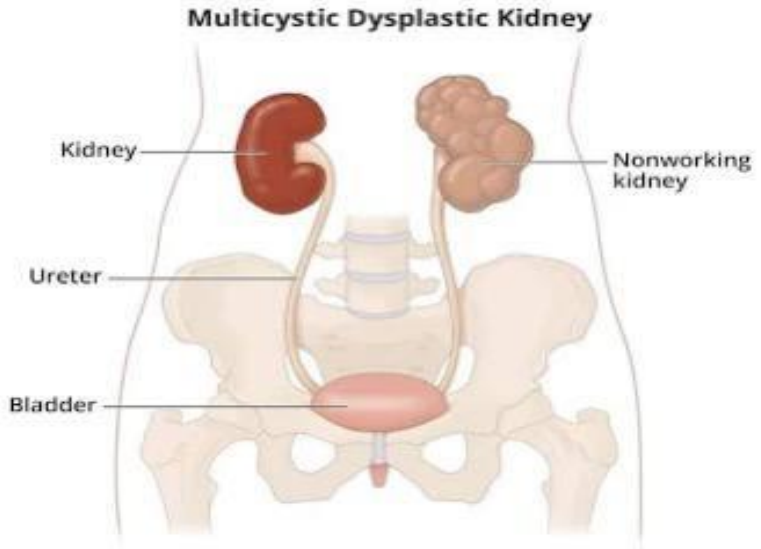
Renal Hypoplasia

- Small kidney with reduced nephron number
- Can be unilateral or bilateral
- Bilateral form may lead to chronic renal failure
- Normal structure but reduced size



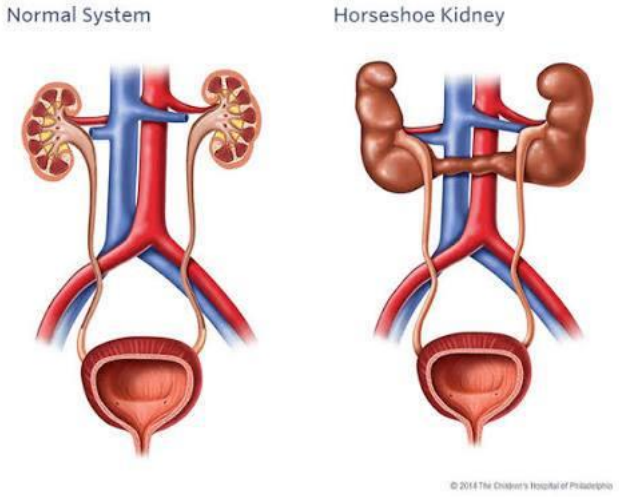
Renal Dysplasia

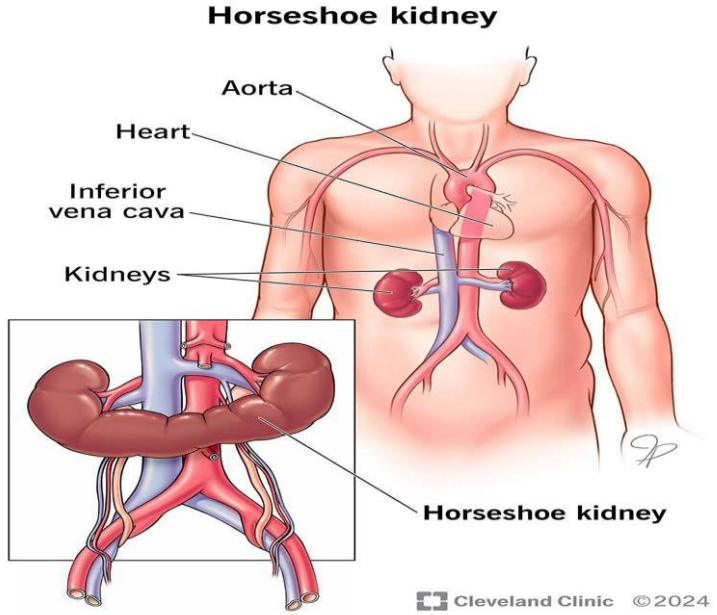
- Abnormal tissue organization; presence of cysts
- Most common cystic renal disease in children
- Usually unilateral; bilateral may cause renal failure
- Often detected by antenatal ultrasound



Horseshoe Kidney

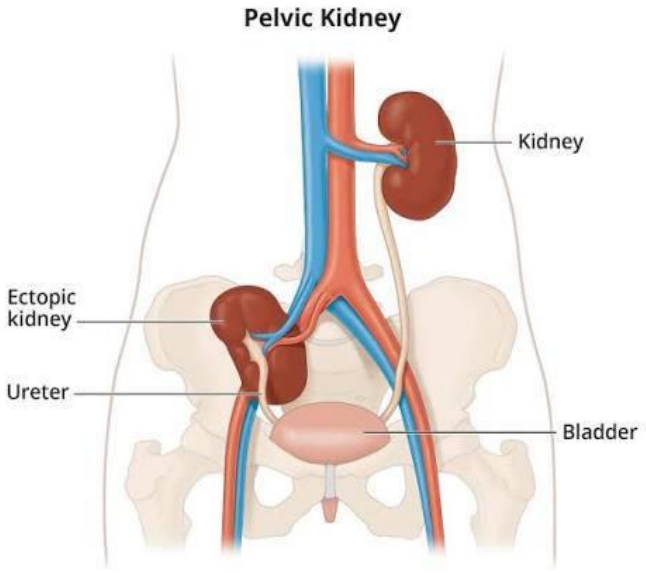
- Fusion of lower poles across midline
- Kidney located lower than normal (trapped by Inferior Mesentric A.)
- Usually asymptomatic; increased risk of obstruction, stones, infection
- Seen in Turner syndrome and trisomy 18





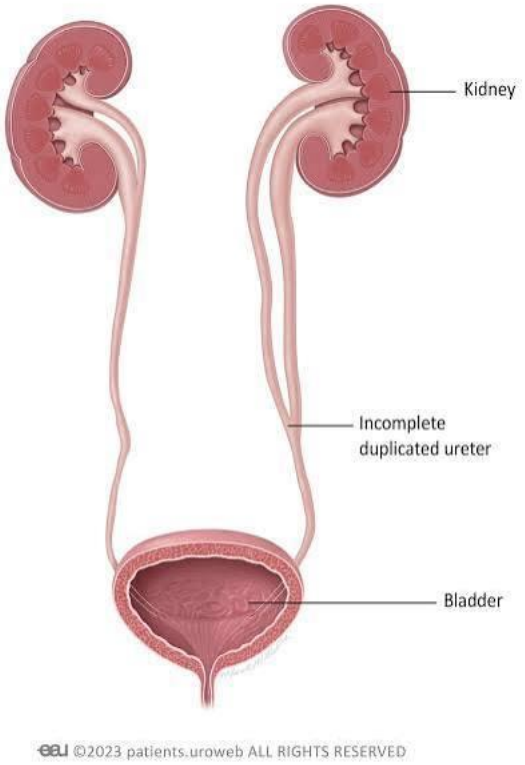
Ectopic Kidney

- Kidney fails to ascend; located in pelvis or thorax
- May have abnormal rotation and vascular supply
- Can cause obstruction or be asymptomatic
- Detected incidentally or on imaging for complications



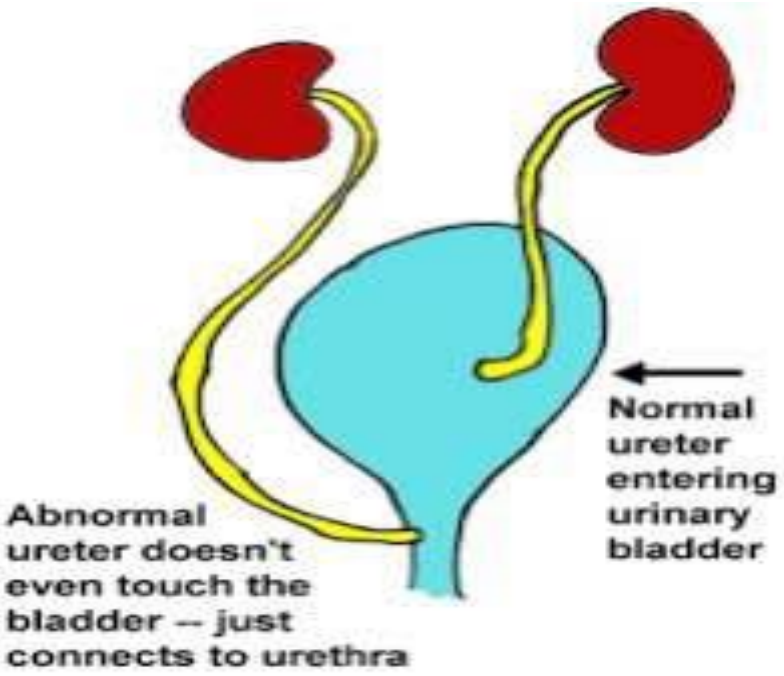
Duplicated Collecting System

- Two pelvicalyceal systems; may have two ureters
- Can lead to reflux, obstruction, recurrent infection
- Detected by ultrasound or contrast studies



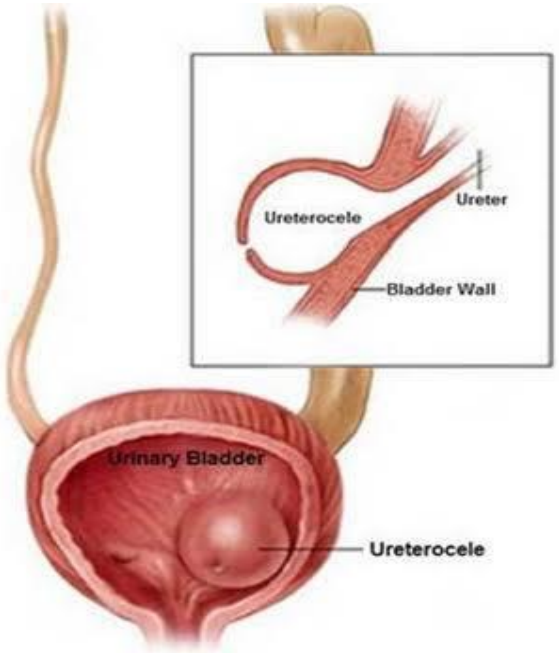
Ureteral Duplication & Ectopic Insertion

- May be complete or partial duplication
- Ectopic ureter may insert into bladder neck, urethra, vagina
- More common in females
- Can cause continuous incontinence in girls



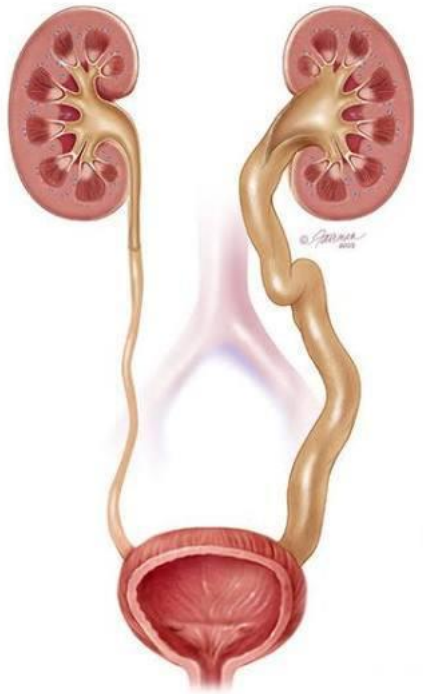
Ureterocele

- Cystic dilatation of distal ureter within bladder wall
- Can obstruct ipsilateral ureter and contralateral flow
- Treated endoscopically or surgically



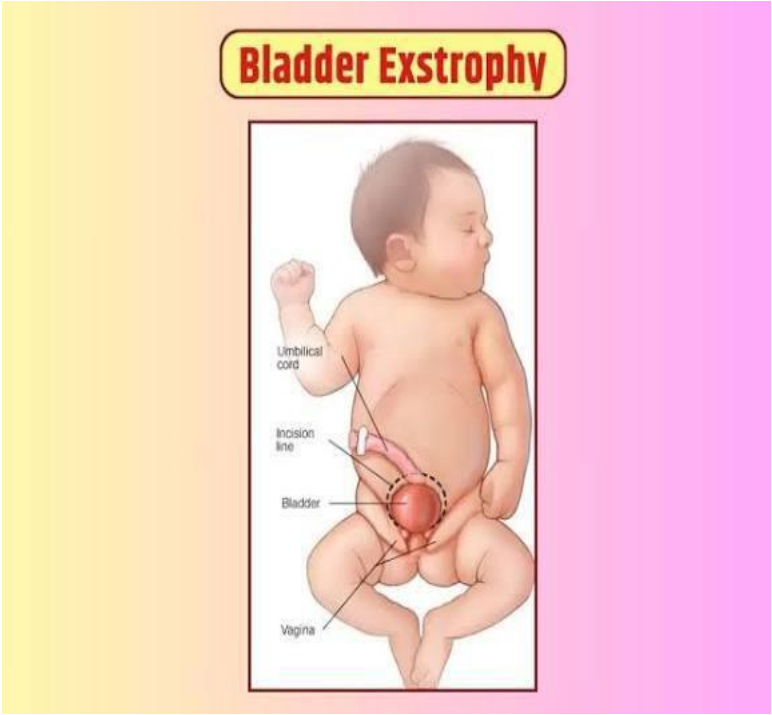
Congenital Megaureter

- Ureteral dilation without reflux or obstruction
- May resolve spontaneously or need surgery
- Common cause of antenatal hydronephrosis
- Classified as primary or secondary



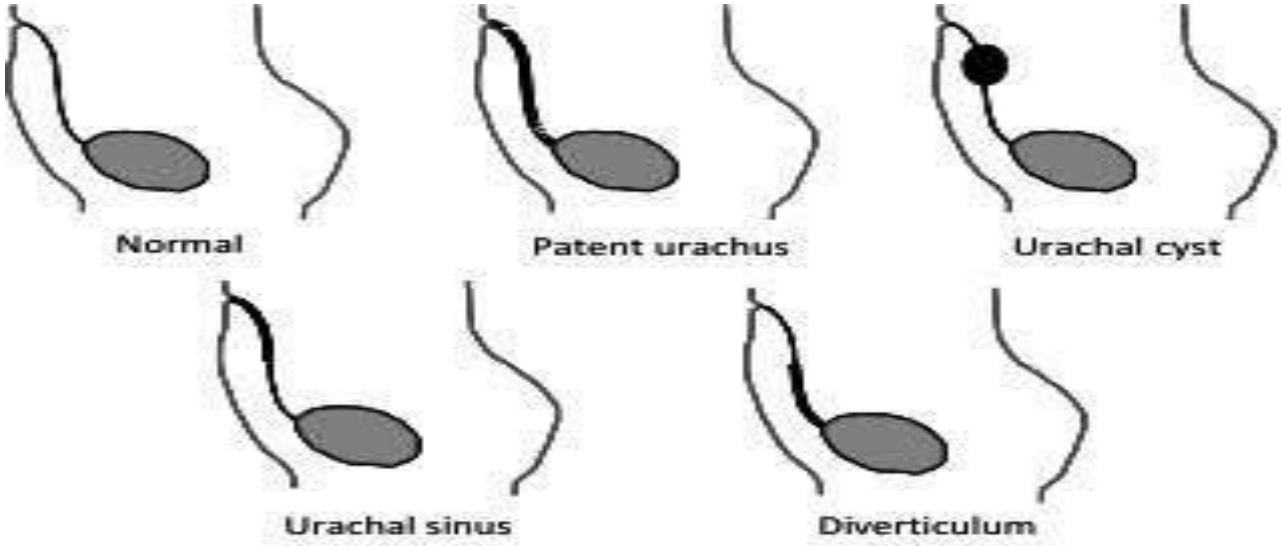
Bladder Exstrophy

- Failure of closure of lower abdominal wall and anterior bladder
- Exposed bladder mucosa at birth
- Associated with epispadias
- Requires staged surgical repair



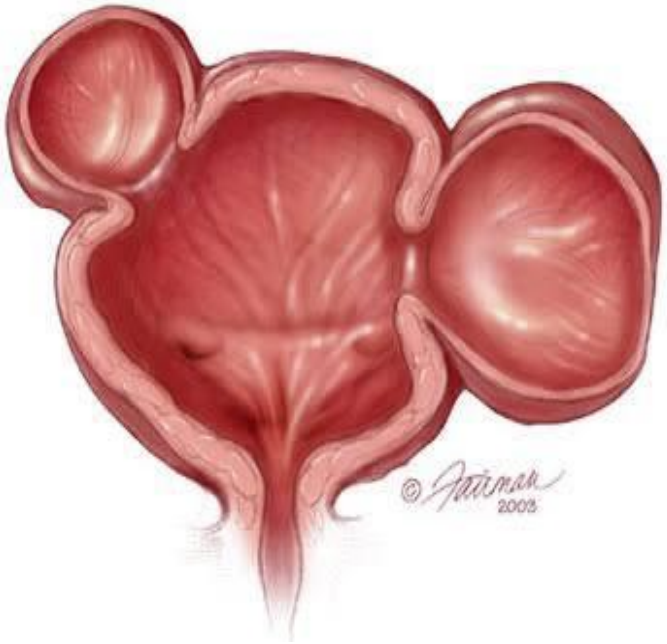
Urachal Anomalies

- Persistent urachus connecting bladder to umbilicus
- Types: patent urachus, cyst, sinus, diverticulum
- May present with umbilical discharge or infection



Bladder Diverticula

- Outpouchings of bladder mucosa through muscular wall
- Congenital or secondary
- May cause stasis, infection, stones
- Diagnosed by cystography or endoscopy



Clinical Presentation

- Antenatal: hydronephrosis, cystic kidneys
- Postnatal: UTI, palpable mass, poor urine stream, incontinence
- Some anomalies remain silent and found incidentally

Investigations

- Antenatal ultrasound: screening tool
- Postnatal renal ultrasound
- Voiding cystourethrogram (VCUG) for reflux or obstruction

Management Principles

- Depends on anomaly and severity
- May involve observation, medical therapy, or surgery
- Aim: preserve renal function, prevent infection, relieve obstruction
- Multidisciplinary follow-up often required

- Congenital urinary anomalies are common and diverse
- Early detection allows timely intervention
- Many are asymptomatic but some can lead to renal damage
- Imaging plays a central role in diagnosis and follow-up

Thank you