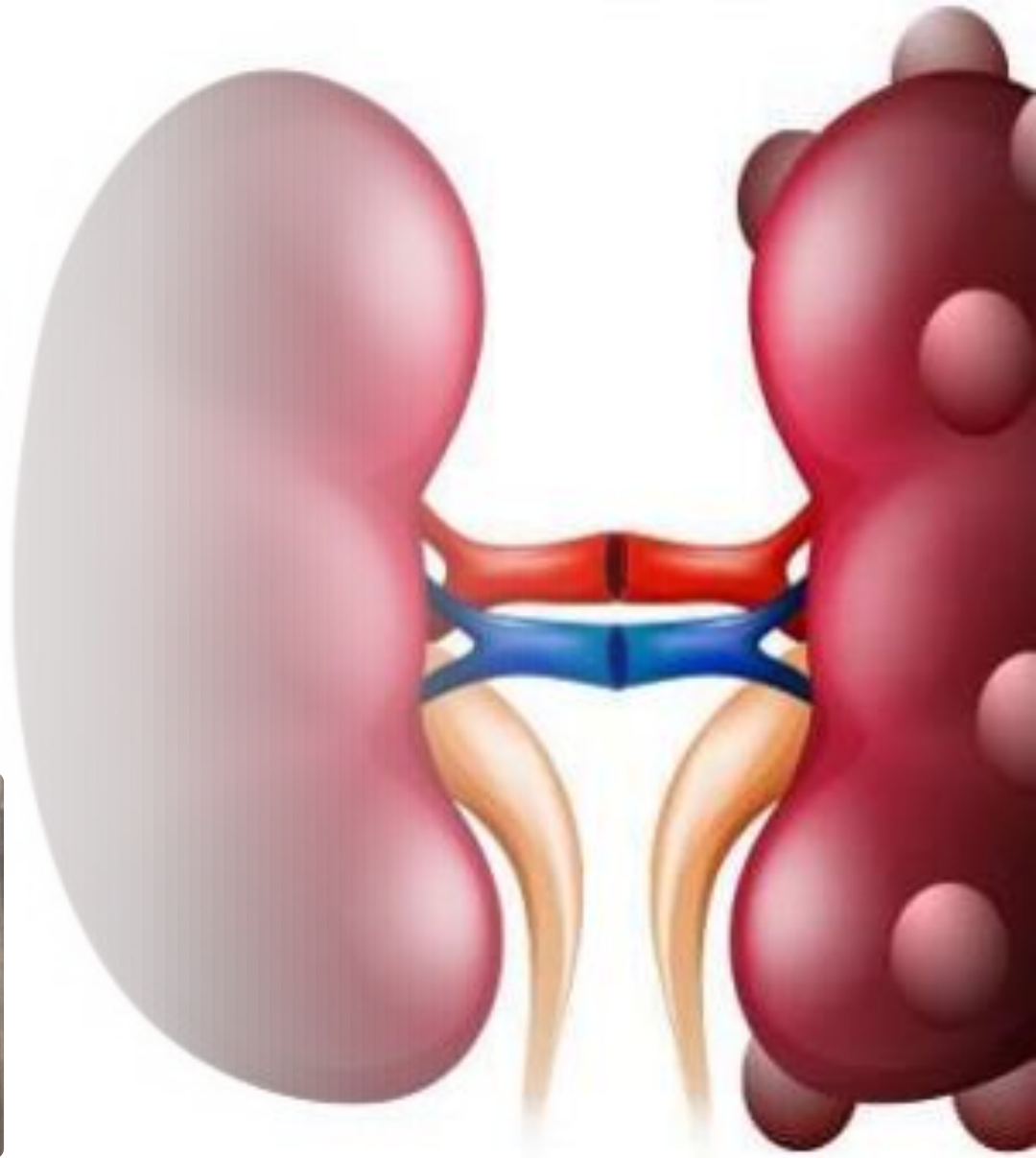
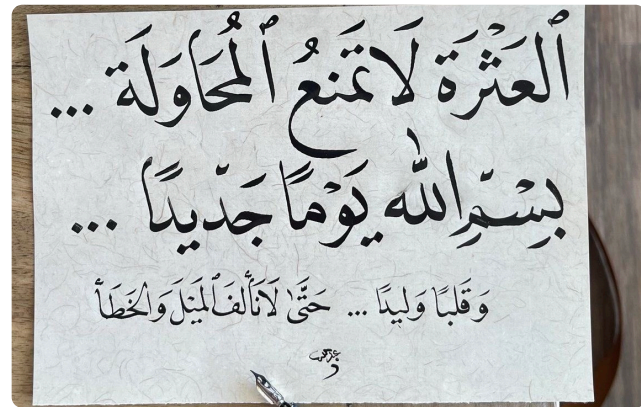


# Kidney cysts

## CYSTIC DISEASES of THE KIDNEY

Dr. Bushra Al-Tarawneh, MD

- Anatomical pathologist-  
Gynecologic and Breast pathologist
- Department of Microbiology &  
Pathology
- Mutah University , School of  
Medicine
- UGS lectures 2026



# Cystic diseases of kidney

A heterogeneous group that could be:

1. Hereditary.
2. Developmental.
3. Acquired disorders.

# Types of cysts:

1-Simple Cysts

2-Dialysis-associated acquired cysts

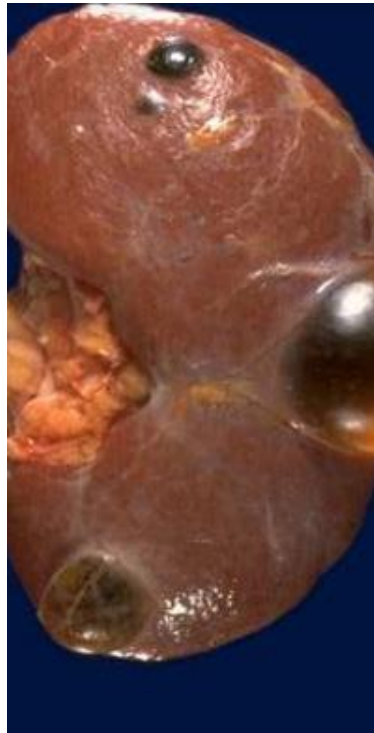
3-Autosomal Dominant (Adult) Polycystic Kidney Disease

4-Autosomal Recessive (Childhood) Polycystic Kidney Disease

5-Medullary Cystic Disease



# 1- Simple Renal Cysts



- 1-Simple Cysts : *Benign*
- Multiple or single
- 1-5 cm in diameter
- Filled with clear fluid.
- Confined to the cortex.
- No clinical significance.
- Usually discovered incidentally or because of hemorrhage and pain
- Importance: to differentiate from kidney tumors

↳ RCC  
Renal cell carcinoma

In patients with renal failure who have prolonged dialysis.

both cortex and medulla

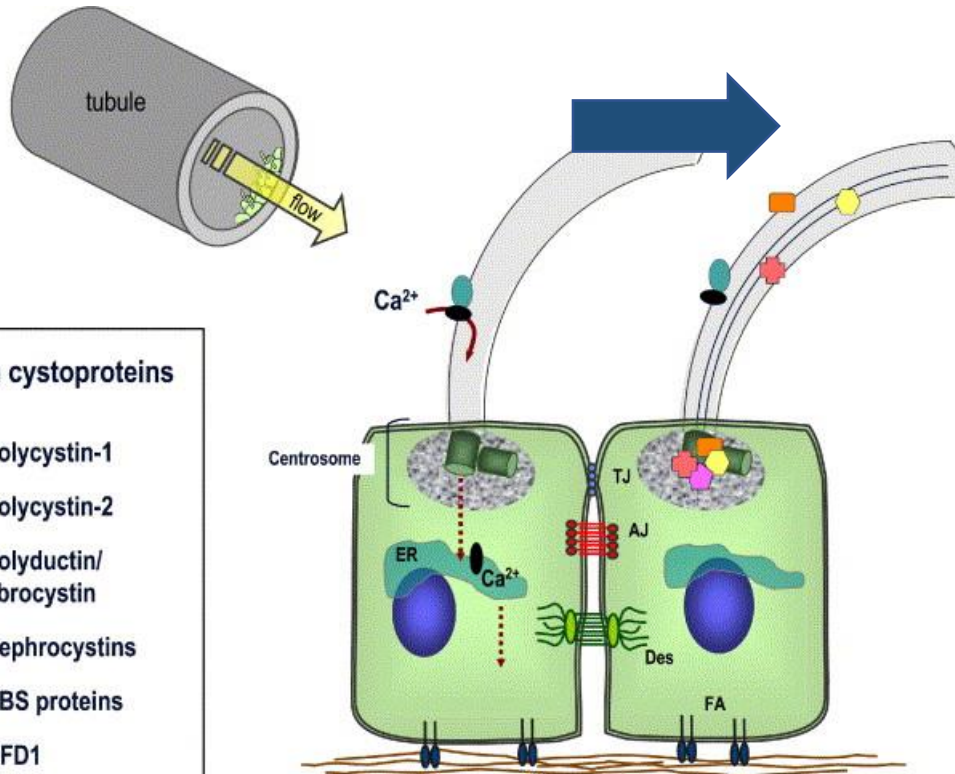
Complications: hematuria; pain

Increased risk of renal carcinomas (100 times greater than in the general population)

## Cystic change associated with chronic renal dialysis.

Kidney → smaller than normal size / shrinkage





### Human cystoproteins

- Polycystin-1
- Polycystin-2
- Polyductin/  
fibrocystin
- ⬡ Nephrocystins
- + BBS proteins
- ⬠ OFD1

Hereditary cystic diseases:  
Defect is in cilia-centrosome  
complex of tubular

epithelial cells, interfere  
with fluid absorption &  
cellular maturation

Cyst formation.

Most common form:

1. Simple cysts.
2. Polycystic kidney disease.



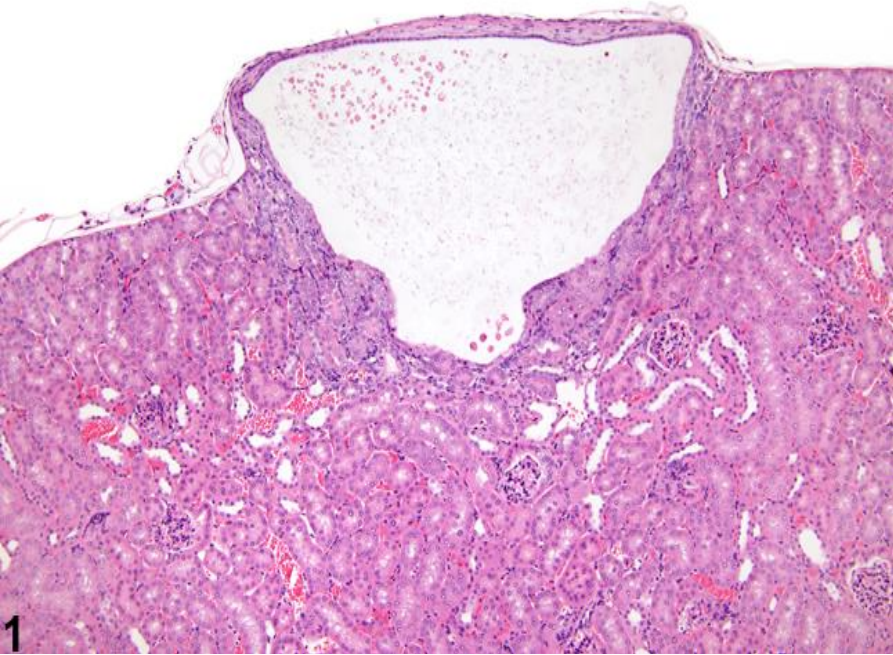
Microscopic examination:

Membranes are composed of single layer of cuboidal or flattened epithelium or completely atrophied.

Radiographic studies:

In contrast with renal tumors, renal cysts:

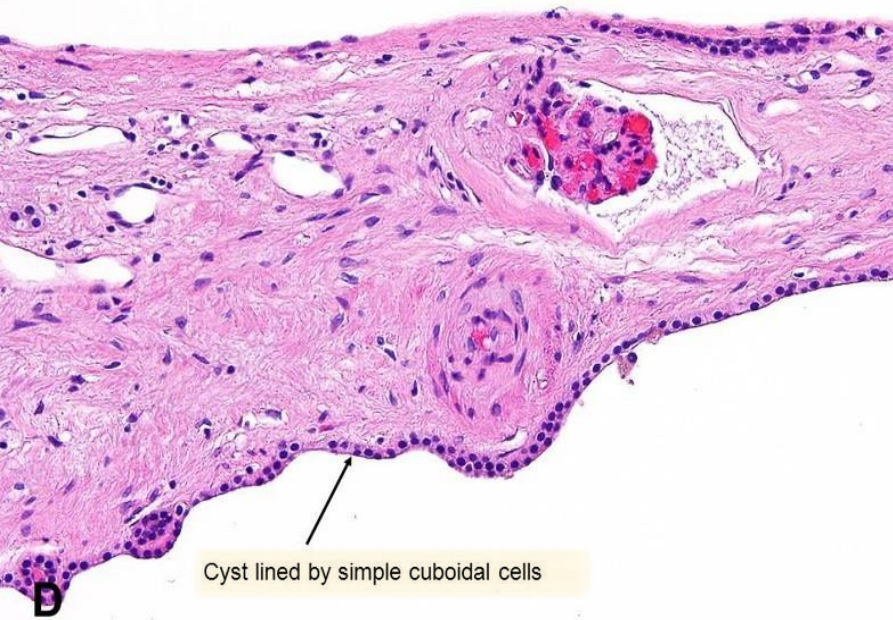
1. Have smooth contours.
2. Always avascular.
3. Produce fluid rather than solid tissue signals on ultrasonography.



1



B



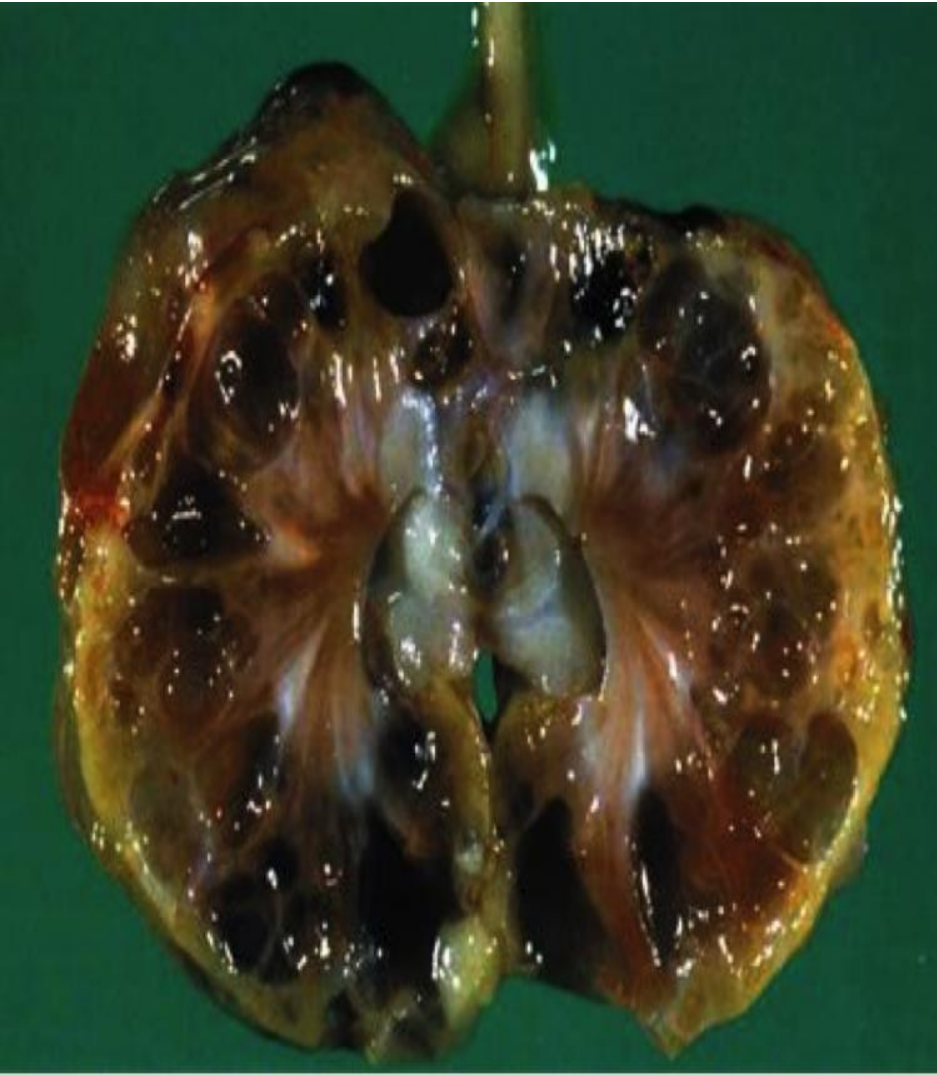
D



# SIMPLE RENAL CYSTS – U/S



# 3- Autosomal Dominant (Adult) Polycystic Kidney Disease



# 3- Autosomal Dominant (Adult) Polycystic Kidney Disease

- -Multiple bilateral cysts
- -Eventually destroy the renal parenchyma.
- 
- -Incidence (1: 500-1000) persons #
- -10% of chronic renal failure.
- -inheritance of one of 2 autosomal dominant genes:
  - (1)- PKD1: 85-90% (encodes polycystin-1)
  - (2)- PKD2 :10-15% (encodes polycystin- 2).

## \*Clinical presentation :

- -asymptomatic until the 4th decade *enlargement*
- -Symptoms: flank pain , heavy dragging sensation, abdominal mass, hemorrhage, obstruction, Intermittent gross hematuria

## \*Complications

- 1- hypertension ( 75% )
- - urinary infection
- 3- vascular aneurysms of circle of Willis (10% -30%) (subarachnoid hemorrhage ).
- 4- renal failure at age 50

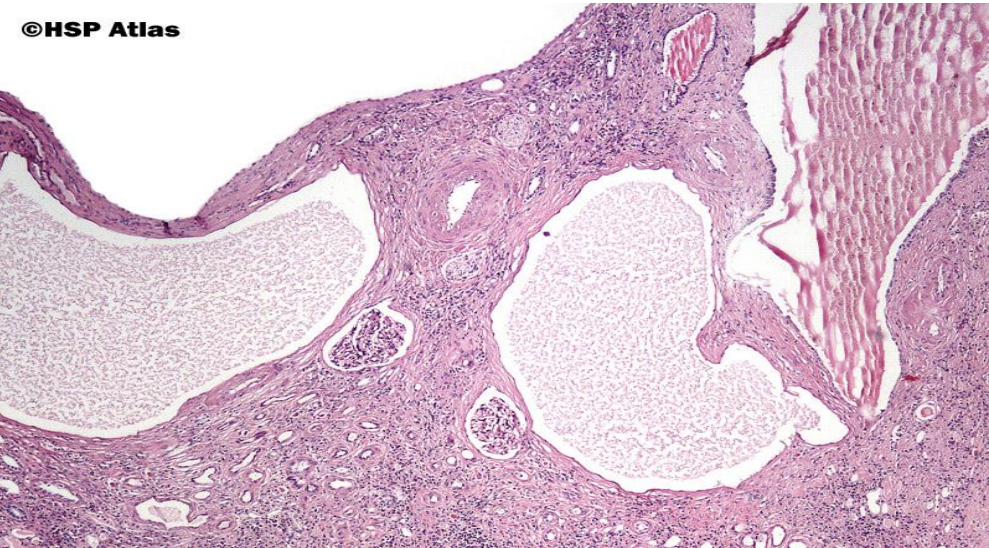
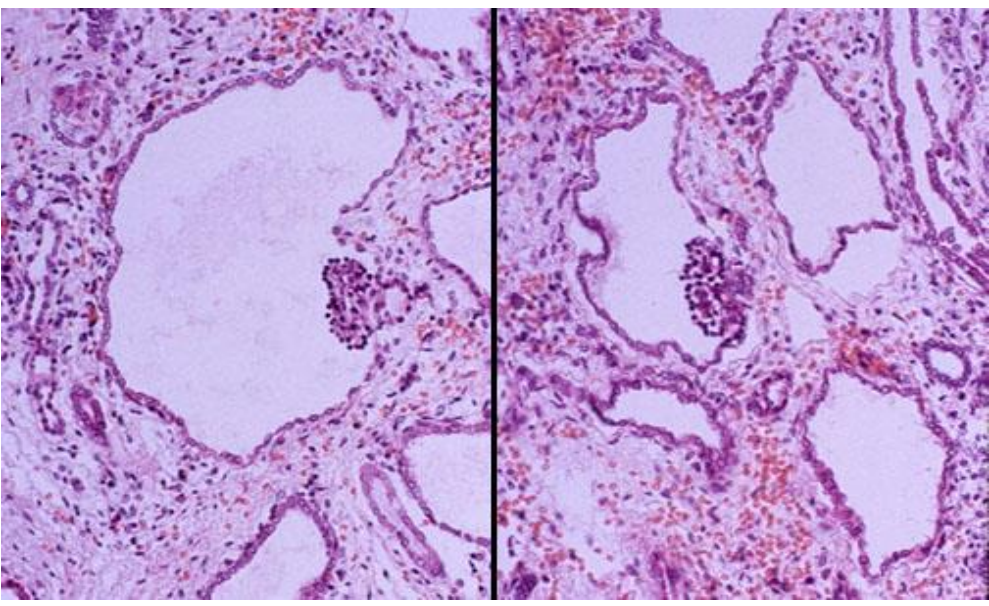
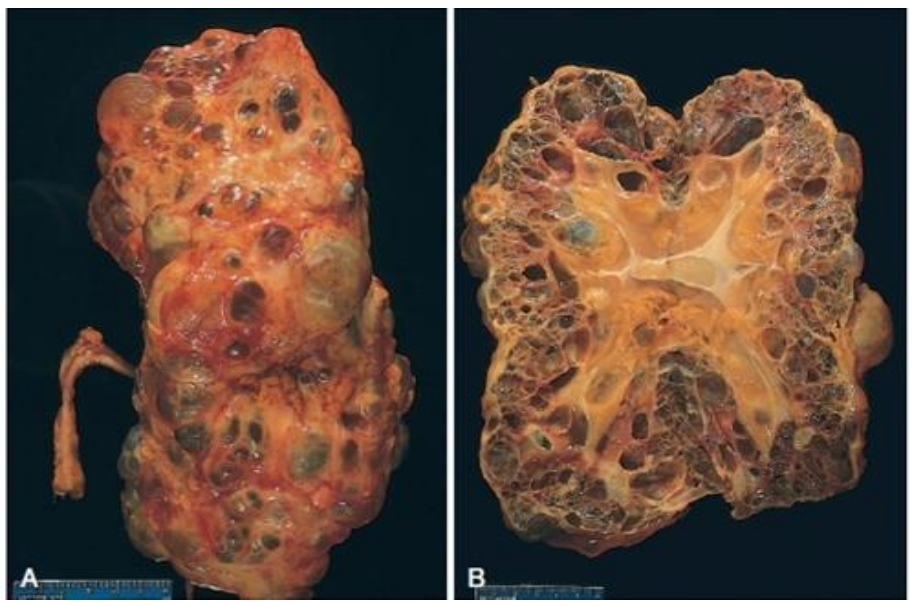
---

## Morphology

- Kidney reach very large size & weights as 4kg. (Normal: 125-170 mg)
- Large kidneys are palpable abdominally as masses extending into the pelvis.
- Gross examination:
  - Kidney is composed of mass of cysts of various sizes up to 3 or 4 cm in diameter.
  - No intervening parenchyma.
  - Cysts are filled with fluid:
    - Clear, turbid, or hemorrhagic.



**Autosomal dominant adult polycystic kidney:**  
**Kidney is enlarged, with numerous dilated cysts.**



+

0

# 4-Autosomal Recessive (Childhood) Polycystic Kidney Disease

●

Adults → circle of willis  
child → liver

- ▶ Autosomal recessive
- ▶ 1:20,000 live births.
- ▶ Types: perinatal, neonatal, infantile, and juvenile.
- ▶ Associated with liver cysts
- ▶ Mutations in PKHD1 gene coding for fibrocystin.
- ▶ Fibrocystin may be involved in the function of cilia in tubular epithelial cells .

---

## Autosomal recessive (childhood) polycystic Kidney disease

- Perinatal: Period immediately before & after birth
- Neonatal: Newborn.
- Infantile: babies or very young children.
- Juvenile: Youth or young person.

+

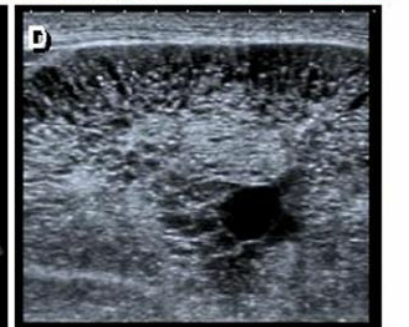
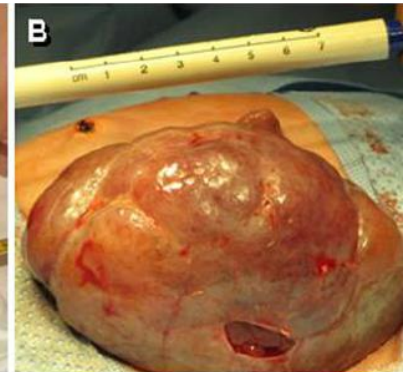
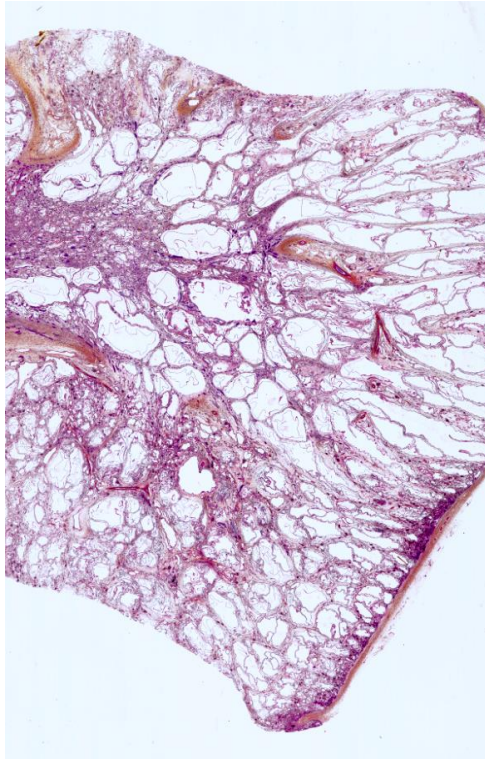
o

Baby with autosomal recessive polycystic kidney disease (ARPKD).

A. Distended abdomen due to large kidneys.

B. Nephrectomized kidney.

---



*Palisading*

# Normal vs childhood polycystic kidneys

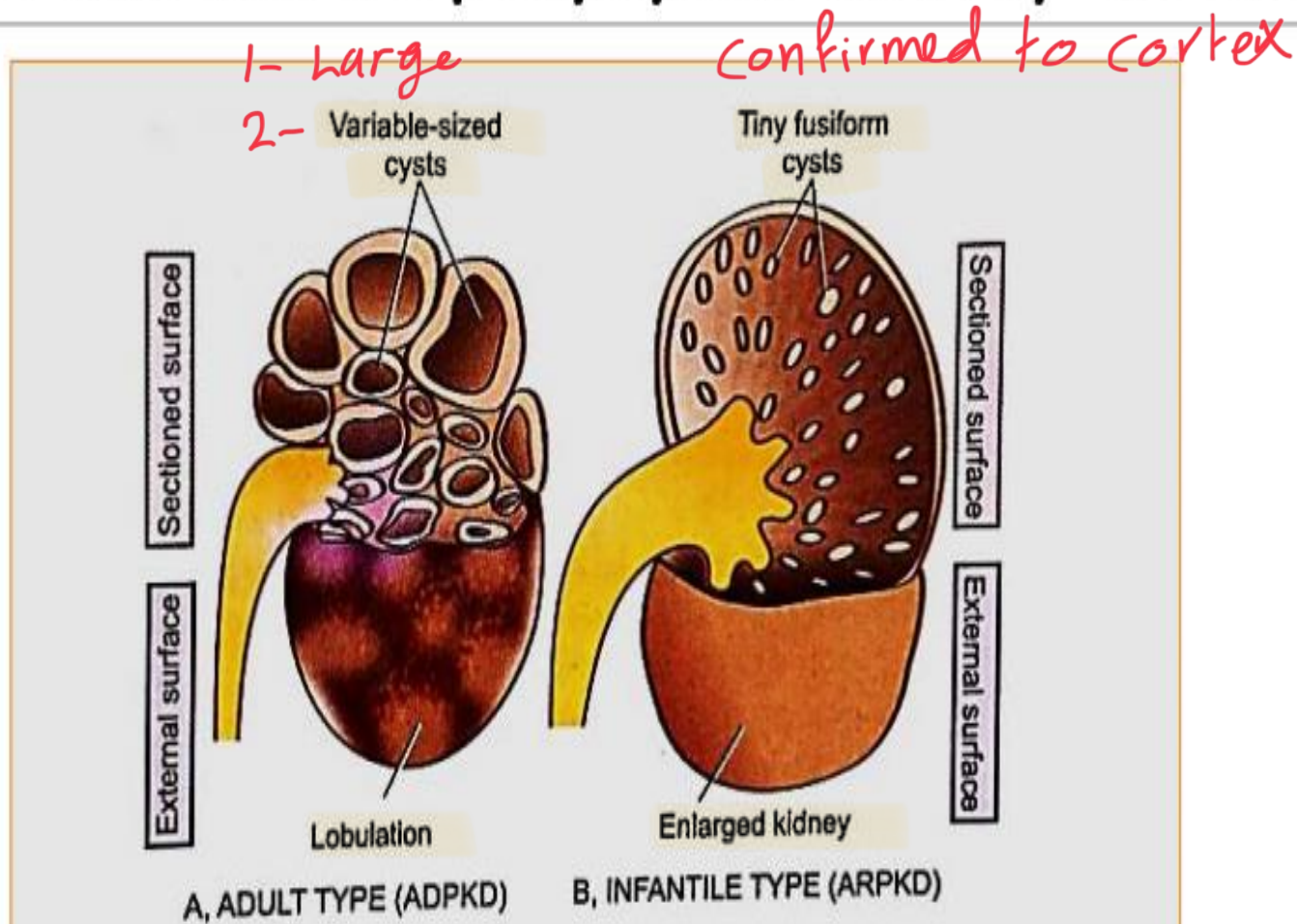
**NORMAL TERM INFANT KIDNEYS**



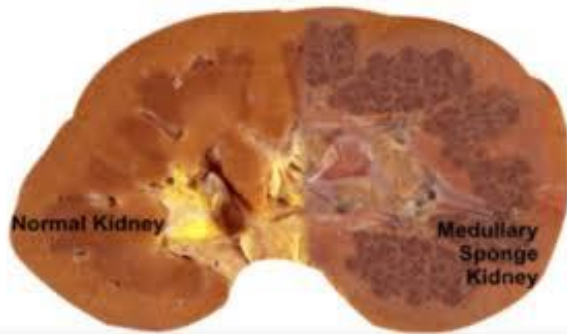
**CHILDHOOD) POLYCYSTIC KIDNEYS**



# Adult vs childhood polycystic kidney disease



**Figure 22.8** Polycystic kidney disease. Diagrammatic representation of comparison of gross appearance of the two main forms.



## 5-Medullary Cystic Diseases

Two major types:

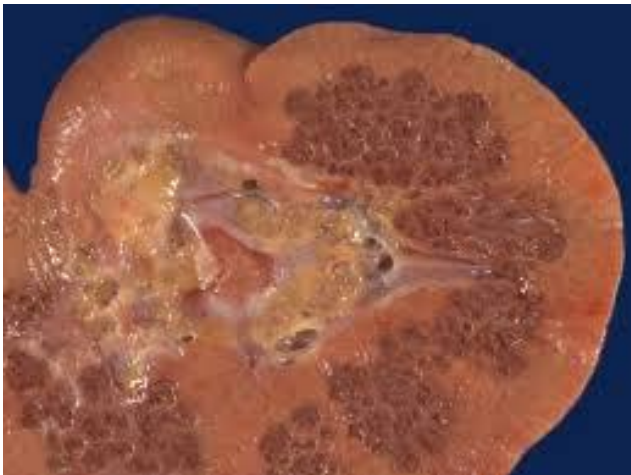
1-Medullary sponge kidney

2-Nephronophthisis-medullary cystic disease complex

[- almost always associated with renal dysfunction.


[- usually begins in childhood.

[- Cysts are at cortico-medullary junction.





## Clinical Course

- polyuria and polydipsia (↓ tubular function).
  - renal failure over 5-10-year
  - A positive family history and unexplained chronic renal failure in young patients should lead to suspicion of medullary cystic disease.
- 

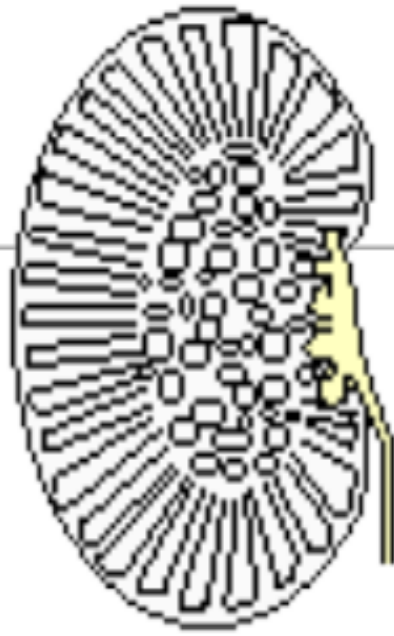
# Kidney Cysts



No cysts



Simple cysts



Recessive polycystic



Dominant polycystic



Hydronephrosis is not cysts



"Dysplasia"



Medullary sponge



Medullary uremic

*Handwritten notes:*  
② Fibrosis  
① Smallest  
① Shrinkage  
② Scarring  
Dialysis cystic

The image features a white background with several abstract geometric elements. On the left, there are two vertical yellow dashes, a blue oval, a green square outline, and a cluster of four yellow dashes. At the top, there is a green triangle and a yellow circle. A large orange semi-circle occupies the right side of the frame, containing the text 'Congenital anomalies' in white. The overall style is clean and modern.

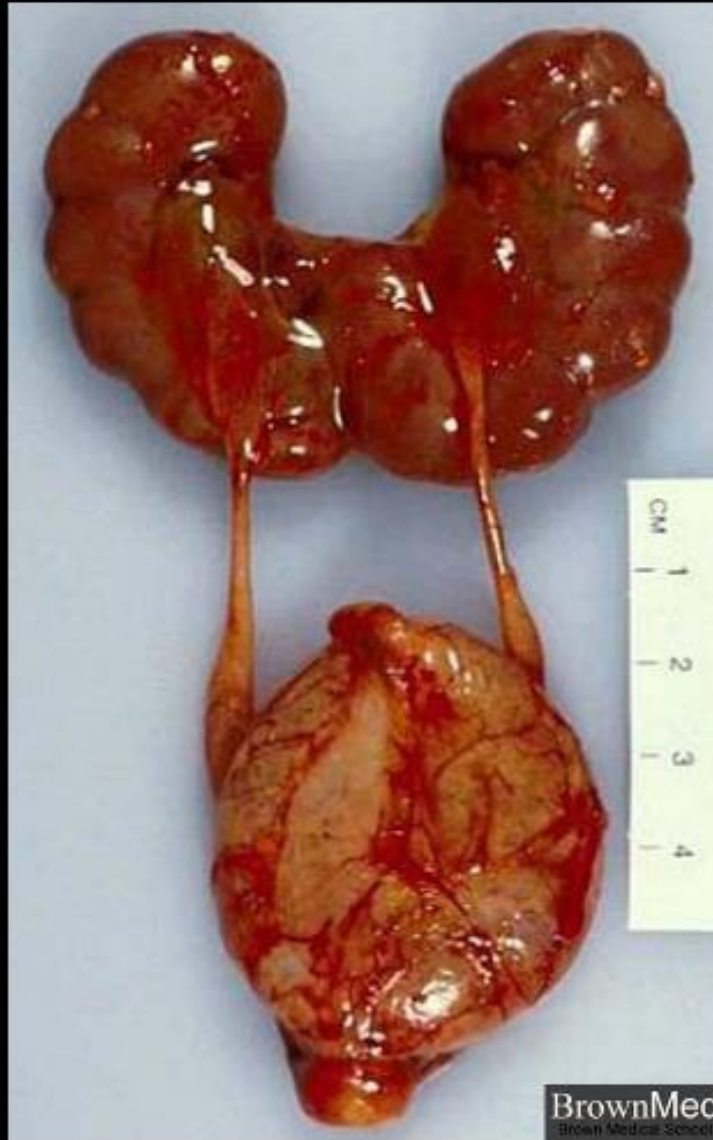
# Congenital anomalies

- **Agenesis** : Complete absence of renal tissue; unilateral or bilateral.
- **Bilateral agenesis**: incompatible with life; associated with large adrenal glands; leads to Potter (oligohydramnios) sequence.
- **Unilateral agenesis**: not fatal
- **Duplication of ureters** : < 1% of individuals *each kidney contain two ureter*
- **Ectopic (displaced) kidneys** : Usually at pelvic brim
- **Horseshoe kidney** : Most common congenital kidney anomaly, 0.15 - 0.25% of all newborns , 90% are fused at lower pole. Associated with obstruction, anomalous superior vena cava . Complete fusion of the kidneys produces a formless mass in the pelvis (pancake kidney)
- **Hypoplasia** : Rare; failure of kidney to develop to normal size without scarring.

# CONGENITAL ANOMALIES OF THE KIDNEY

- ▶ Congenital cystic diseases
  - ▶ *Multicystic dysplasia* is the **most common** form of renal cystic disease in childhood.
  - ▶ The term *dysplasia* refers to a developmental rather than a preneoplastic lesion.
  - ▶ Often associated with obstruction in the lower urinary tract, increased hydrostatic pressure in the developing kidney is thought to play a role in its development.
  - ▶ The kidneys are usually grossly distorted; the cysts range from microscopic to several centimeters in diameter.
- 

## Fused kidney (horseshoe)



90% in  
the lower  
lobe



Thank you

Good luck