TUMORS OF THE URINARY TRACT

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- **Renal cell carcinoma:**
  - **Clear cell carcinoma**
  - **Papillary carcinoma**
  - **Chromophobe carcinoma**
- **Urothelial carcinoma**
  - **Transitional cell carcinoma**
  - **Squamous cell carcinoma**

TUMORS IN ADULTS TO BE DISCUSSED TODAY

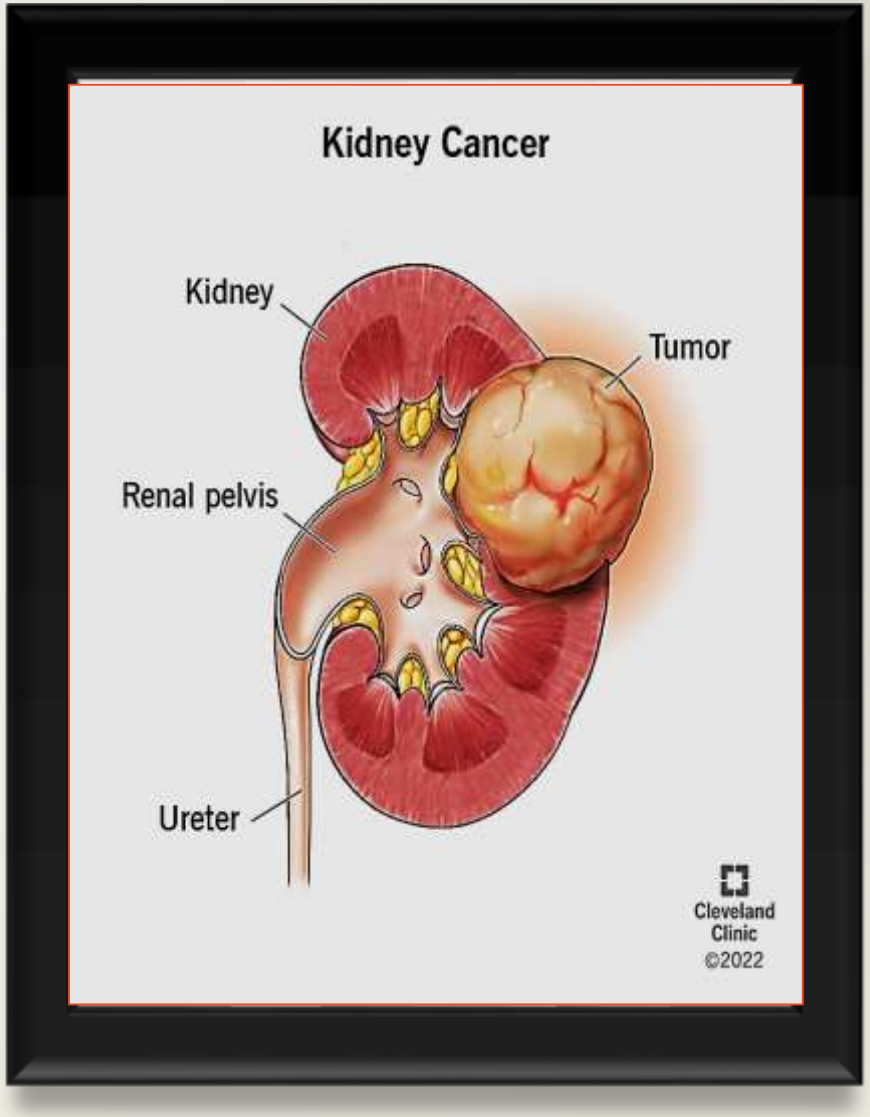
URINARY TRACT TUMORS

- ***Tumors of the lower urinary tract (7%) are twice as common as kidney tumors (3%).***

- **The most common malignant tumor of the kidney is renal cell carcinoma.**
- **The most common lower urinary tract tumor is urothelial carcinoma.**

RENAL CELL CARCINOMA (RCC)

- Origin: renal tubular epithelium
- in cortex.
- 2%-3% of all cancers in adults.
- M:F 2:1



PREDISPOSING FACTORS

- SMOKING
- HYPERTENSION
- OBESITY
- OCCUPATIONAL EXPOSURE to CADMIUM (NICKEL-CADMIUM BATTERIES, etc).
- CHRONIC DIALYSIS (ACQUIRED POLYCYSTIC DISEASE)

CURRENTLY, CLASSIFICATION IS BASED ON THE MOLECULAR ORIGINS OF THESE TUMORS

- We will discuss:
- 1-Clear Cell Carcinomas
- 2-Papillary Renal Cell Carcinomas
- 3-Chromophobe Renal Carcinomas

1- CLEAR CELL CARCINOMAS

- most common type (≈ 80% of RCC).
- cells with clear cytoplasm.
- may be:

1-Sporadic

2-Familial (including von Hippel-Lindau (VHL) disease)

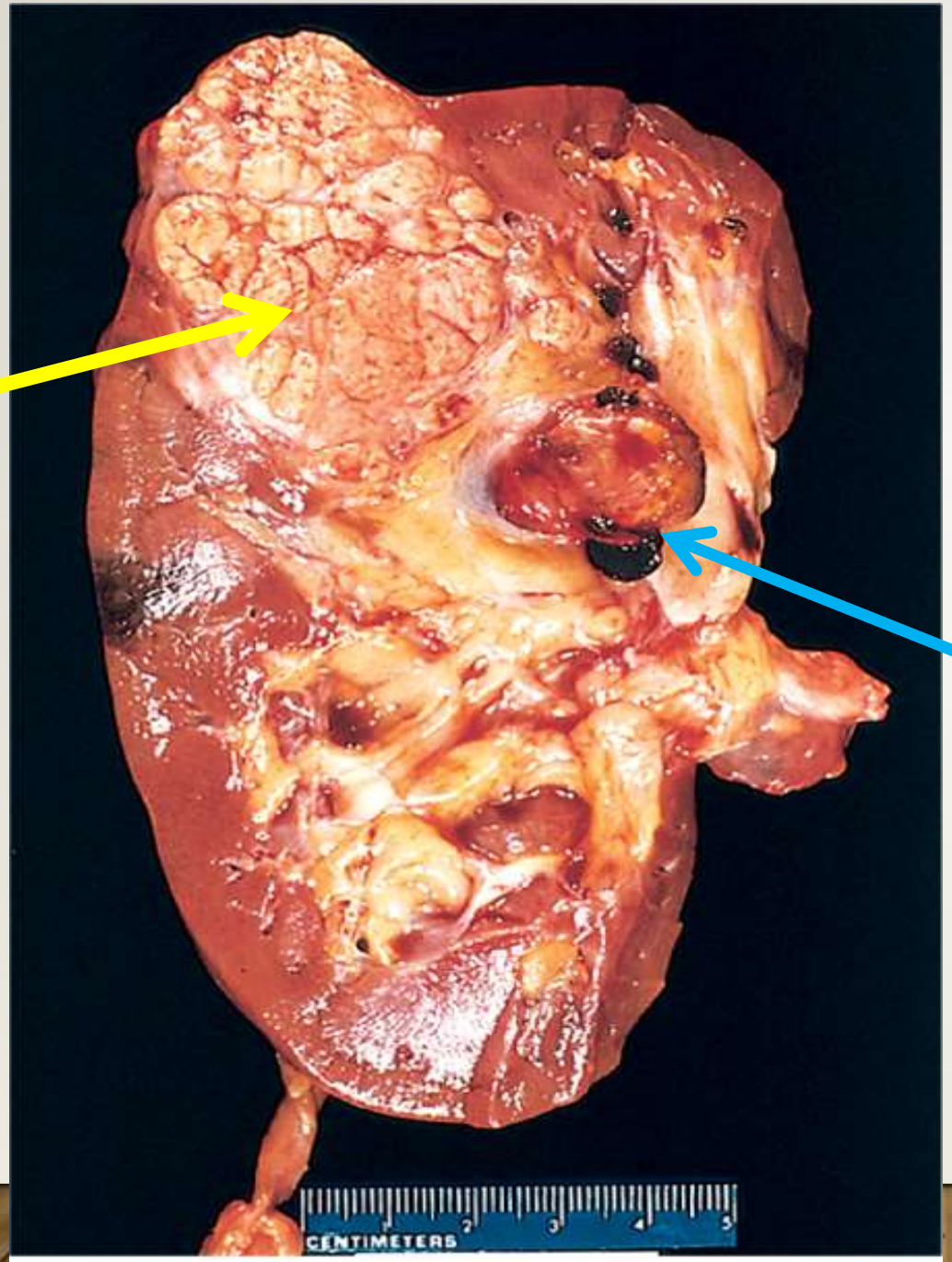
- The *VHL* gene is involved in familial and also sporadic clear cell carcinomas (60%).

2- *PAPILLARY RENAL CELL CARCINOMAS*

- ≈15%.
- papillary growth pattern.
- Maybe multifocal and bilateral
- familial and sporadic forms.
- *MET* proto-oncogene on chromosome 7 →↑ growth in proximal tubular epithelial cells

3- CHROMOPHOBE RENAL CARCINOMAS

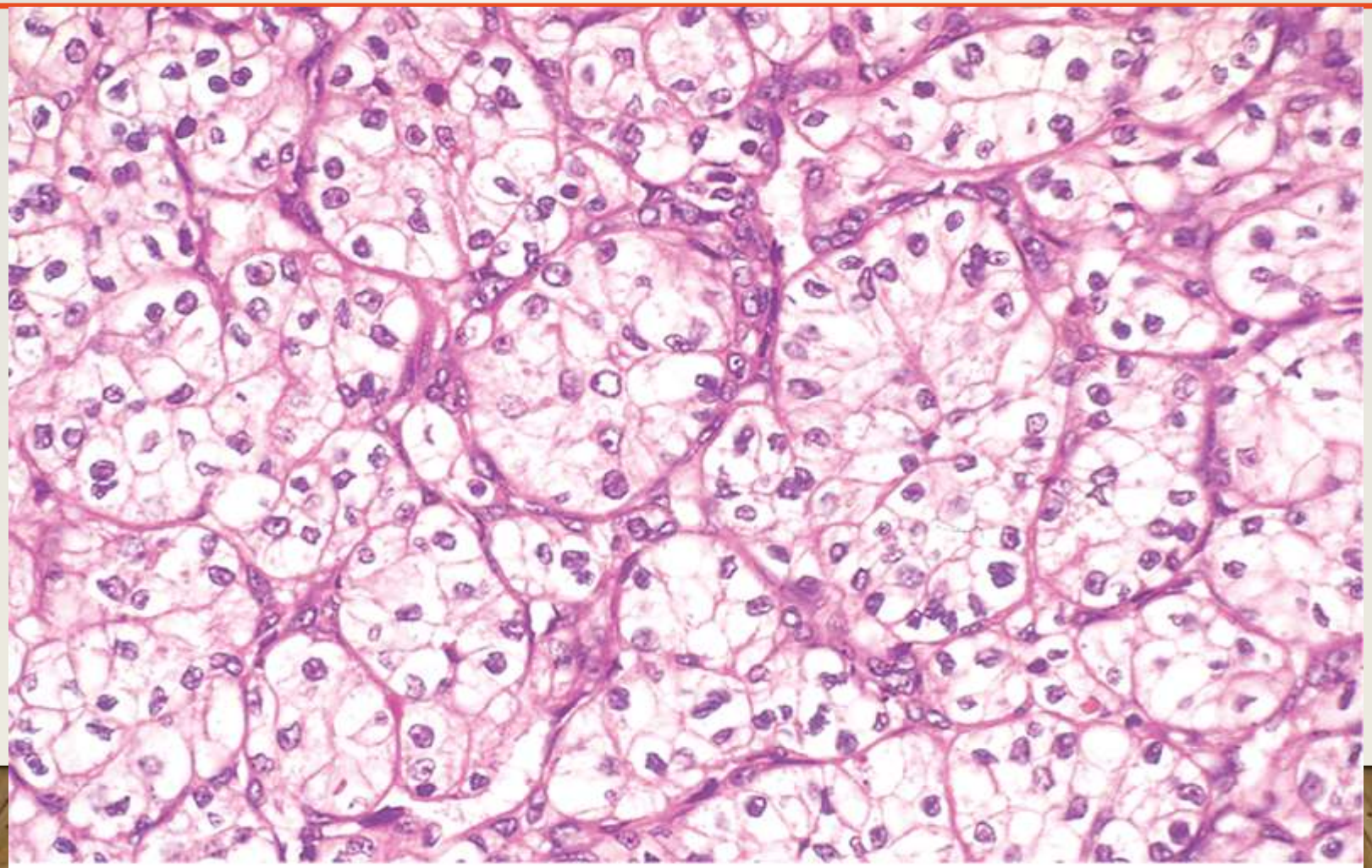
- least common (5%)
- from intercalated cells of collecting ducts.
- tumor cells are "less clear" than cells in clear RCC
- multiple losses of entire chromosomes, including 1, 2, 6, 10, 13, 17, and 21.
- extreme hypodiploidy.
- good prognosis.



<u>Renal cell carcinoma</u>: yellowish, spherical neoplasm in one pole of kidney (yellow arrow)

Note the tumor in the dilated, thrombosed renal vein (blue arrow)

RENAL CELL CARCINOMA (CLEAR CELL TYPE)



CLINICAL COURSE OF ALL RCC

1- Painless hematuria (50%)

2- palpable abdominal mass

3- dull flank pain

4-Fever

5-Polycythemia (5% - 10%): elaboration of **erythropoietin** by tumor.

CLINICAL COURSE OF ALL RCC

6- other Paraneoplastic syndromes:

- 1-hypercalcemia
- 2-Hypertension
- 3-Cushing syndrome
- 4-feminization or masculinization

7- Metastasis: most commonly to lungs and bones.

8- may invade the renal vein

UROTHELIAL TUMORS (TRANSITIONAL CELL CARCINOMA)

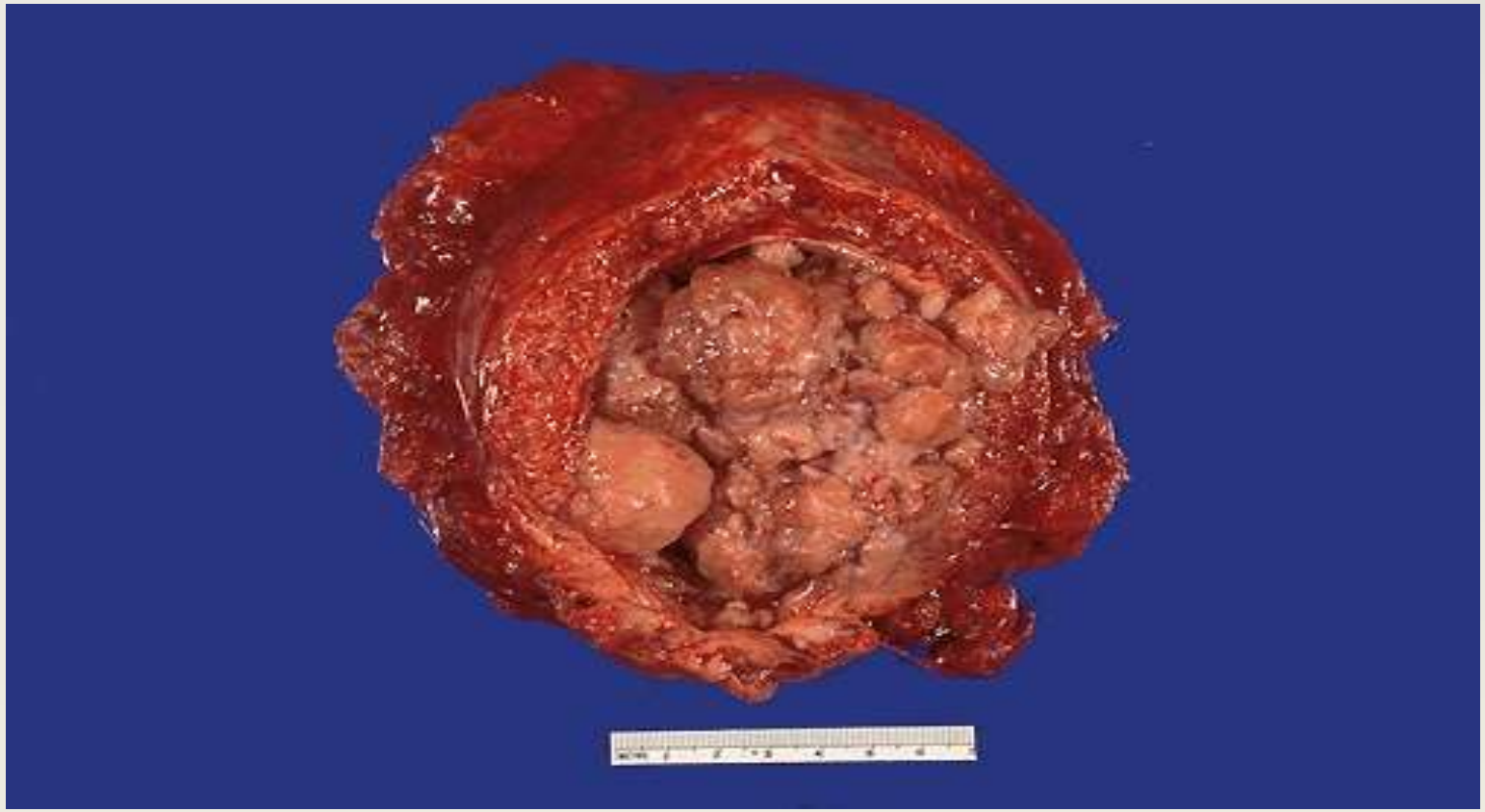
- classified into :

1 -benign papilloma: rare

2-papillary urothelial neoplasms of low grade: most frequent

3-papillary urothelial carcinoma of high grade

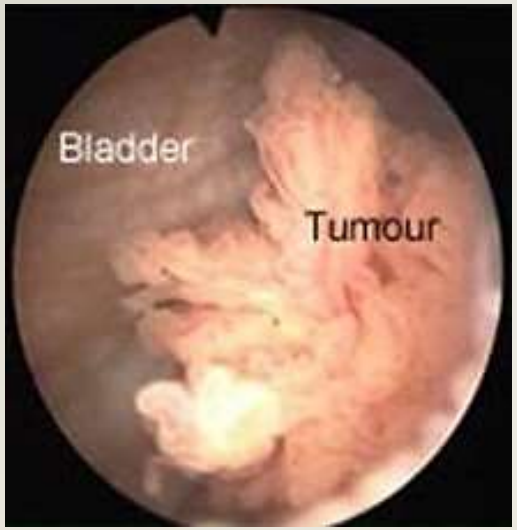
TRANSITIONAL CELL CARCINOMA OF BLADDER

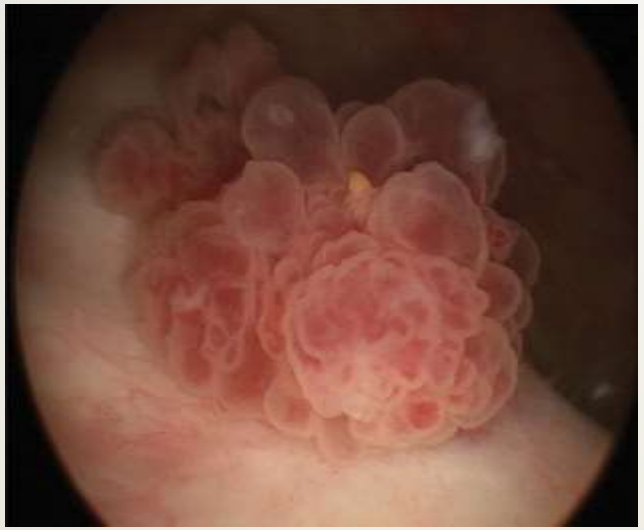


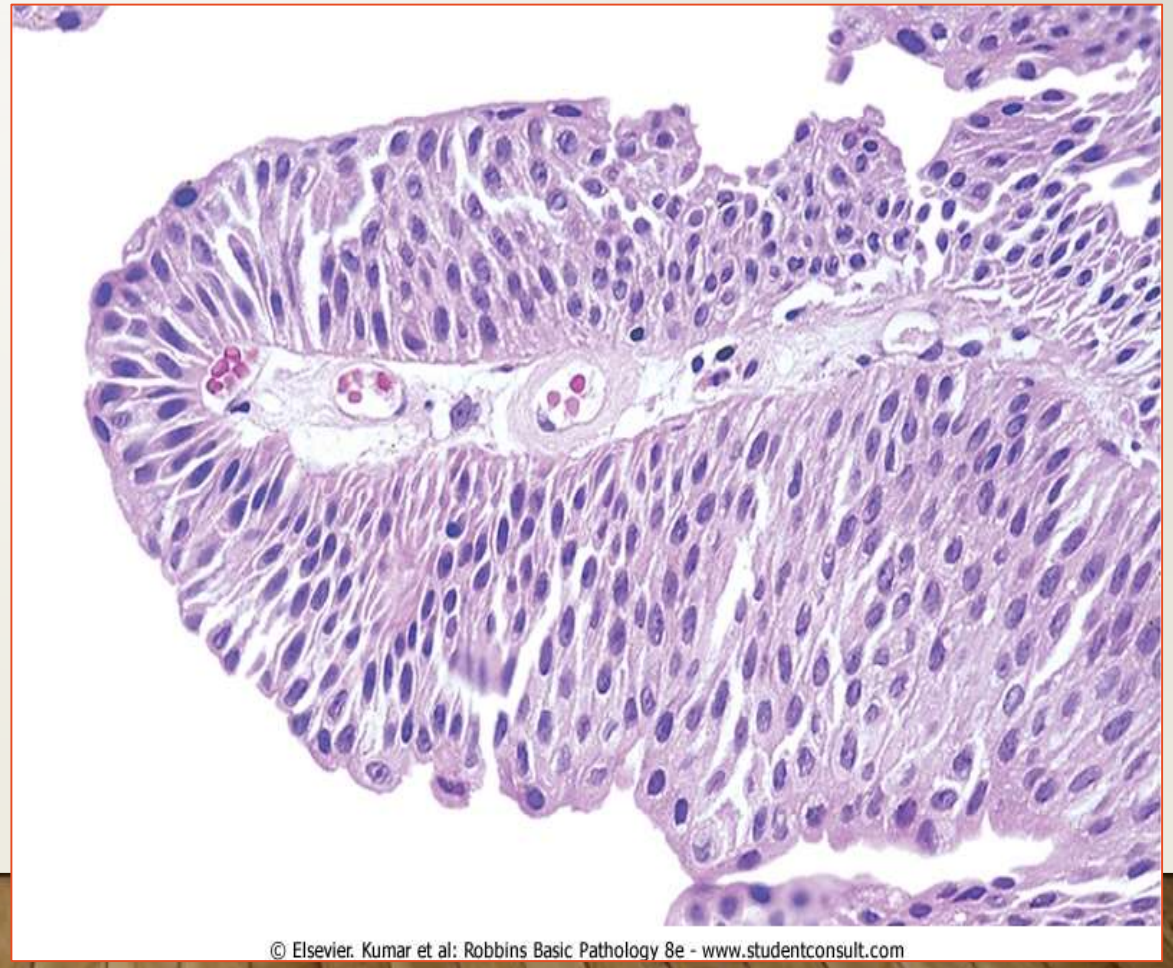
UROTHELIAL (TRANSITIONAL) CELL CARCINOMAS

- Low-grade carcinomas are rarely invasive.
- may recur after removal.
- staging at the time of initial diagnosis is the most important prognostic factor

PAPILLARY UROTHELIAL (TRANSITIONAL) CARCINOMA-LOW GRADE







SQUAMOUS CELL CARCINOMAS OF URINARY BLADDER

- only 5% of bladder cancers
- Associated with:
  - **Schistosomiasis** infection
  - **chronic inflammation**
  - **stone** formation

CLINICAL COURSE OF BLADDER CANCERS

- ***Painless* *hematuria***
- **M:F 3:1**
- **50 to 70 years of age**
- **<u>Prognosis</u>**
  - low-grade + shallow non-invasive lesion→good prognosis.
  - High grade lesions + deep →bad

- **Predisposing factors of bladder cancers :**
- **NOT familial.**

1- β-naphthylamine (paints; cigarettes)

2- Cigarette smoking.

3- Chronic cystitis.

4- Schistosomiasis.

5- drugs as cyclophosphamide.

Treatment:

- TURT (trans-urethral tumor **resection) in cystoscopy**
- (**BCG**) injections➔ granulomatous reaction (immune response against cancer)
- Radical **cystectomy** and **chemotherapy** for advanced cases
- **Follow-up** for recurrence with **cystoscopy** and urine cytologic studies for the rest of life.

Renal tumors of childhood

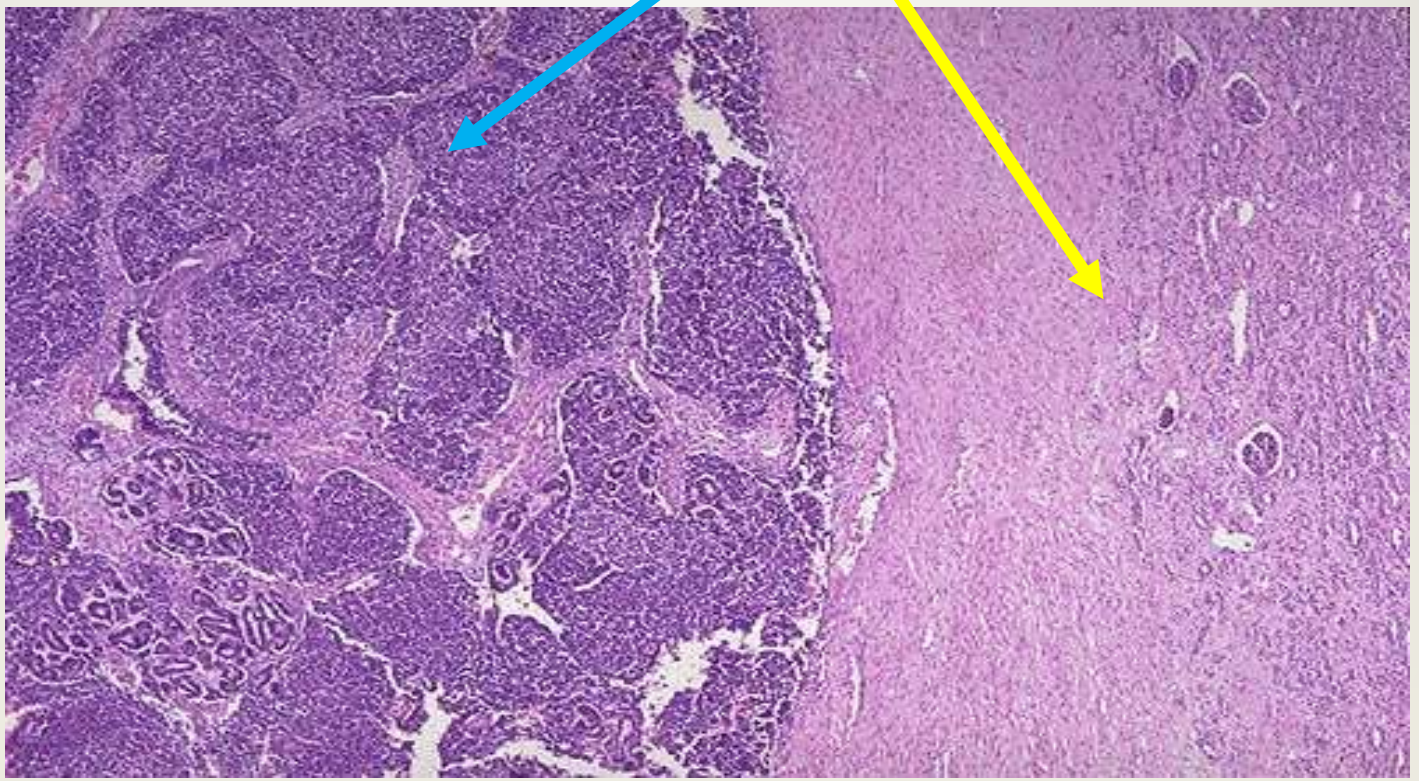
- Many types
- We will discuss :
  - Wilms Tumor

WILMS TUMOR

- 3rd most common solid cancer in < 10 years-old.
- derived from the mesoderm.
- sporadic or familial (autosomal dominant).
- Mutations: **WT-1 and 2** genes.
- primitive glomerular and tubular structures
- Treatment: surgery & chemotherapy

WILM'S TUMOR

NESTS AND SHEETS OF DARK **BLUE** CELLS OF WILMS TUMOR AT THE LEFT WITH COMPRESSED NORMAL RENAL PARENCHYMA AT THE RIGHT.



WILMS TUMOR:
THE TUMOR SHOWS ATTEMPTS TO FORM PRIMITIVE GLOMERULAR AND TUBULAR STRUCTURES