



# **TUMORS OF THE URINARY TRACT**

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# TUMORS IN ADULTS

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

# URINARY TRACT TUMORS

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- 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)

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- Origin: renal tubular epithelium.
- in cortex.
- 2%-3% of all cancers in adults.
- 6<sup>th</sup>-7<sup>th</sup> decades.
- M:F 2:1

# PREDISPOSING FACTORS

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- **smoking**
- **hypertension**
- **obesity**
- **occupational exposure to cadmium (nickel-cadmium batteries, etc).**
- **chronic dialysis (acquired polycystic disease)**

# **NEW CLASSIFICATION BASED ON THE MOLECULAR ORIGINS OF THESE TUMORS**

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- **1-Clear Cell Carcinomas**
- **2-Papillary Renal Cell Carcinomas**
- **3-Chromophobe Renal Carcinomas**

# I- CLEAR CELL CARCINOMAS

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- most common type ( $\approx$  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

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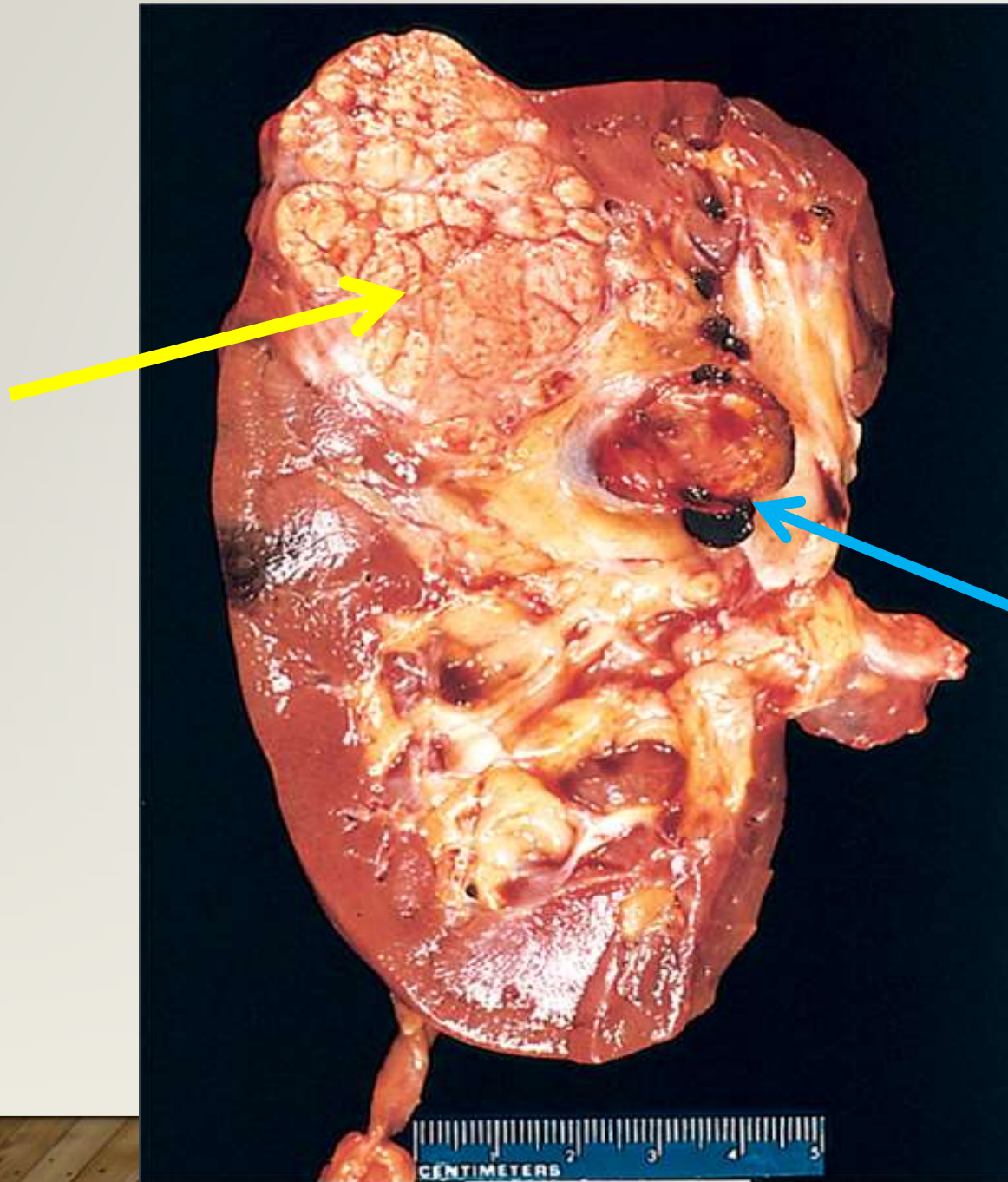
- ≈15%.
- papillary growth pattern.
- **Maybe multifocal** and **bilateral**
- familial and sporadic forms.
- **MET proto-oncogene on chromosome 7** → ↑  
growth in proximal tubular epithelial cells



## 3- CHROMOPHOBE RENAL CARCINOMAS

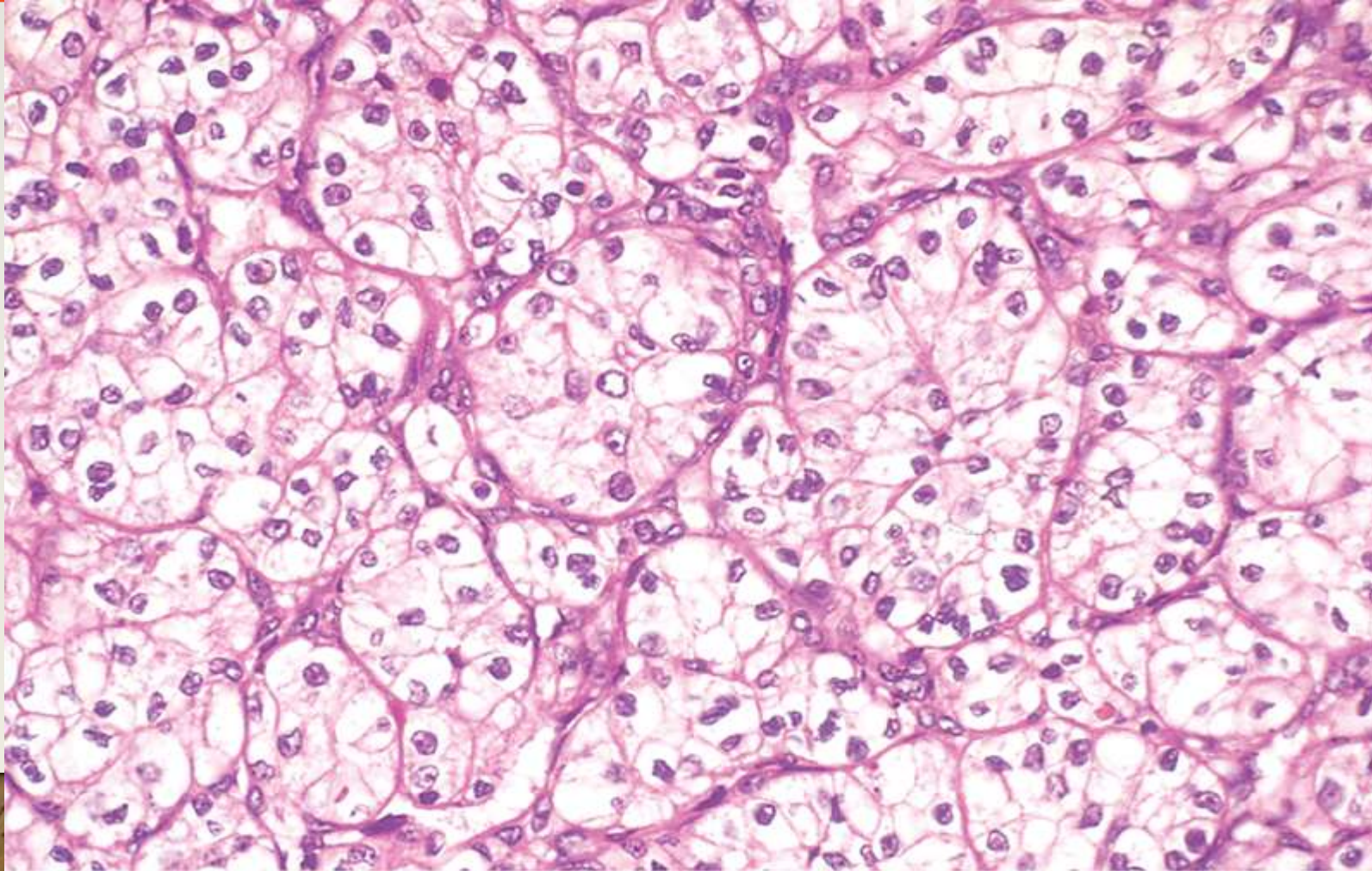
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- least common (5%)
- from **intercalated cells** of collecting ducts.
- tumor cells are “less clear” than cells in clear RCC
- multiple losses of entire chromosomes, including 1, 2, 6, 10, 13, 17, and 21.
- extreme **hypodiploidy**.
- good prognosis.



**Renal cell carcinoma:**  
**yellowish, spherical neoplasm**  
**in one pole of kidney.**  
**Note the tumor in the**  
**dilated, thrombosed renal**  
**vein.**

# RENAL CELL CARCINOMA (CLEAR CELL TYPE)



# CLINICAL COURSE OF ALL RCC

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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

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## 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

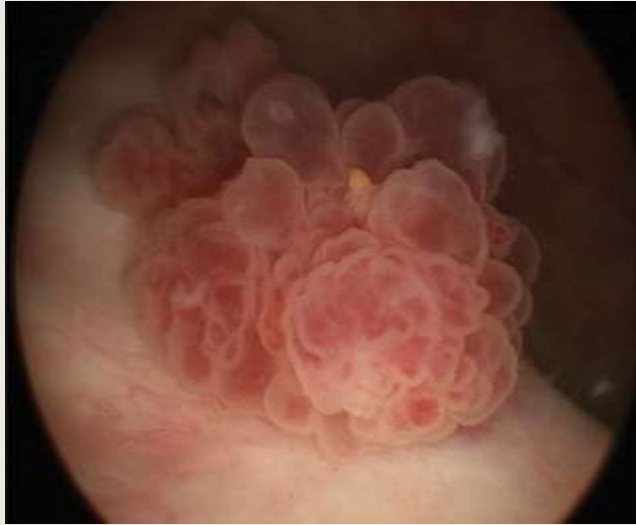
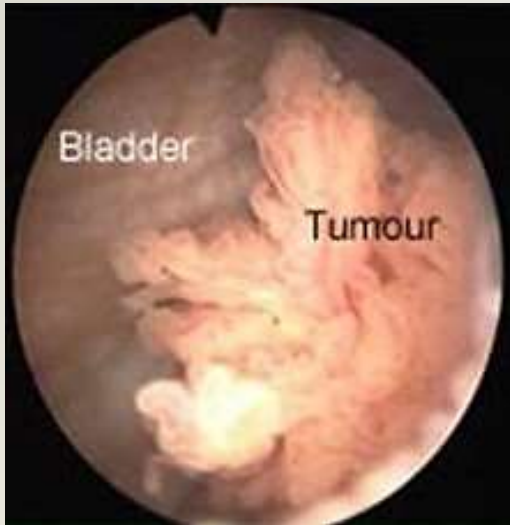


# **UROTHELIAL (TRANSITIONAL) CELL CARCINOMAS**

- **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

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

# CLINICAL COURSE OF BLADDER CANCERS

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

- **Predisposing factors of bladder cancers :**

- **not familial.**

- 1-  **$\beta$ -naphthylamine (paints; cigarettes)**

- 2- **Cigarette smoking.**

- 3- **Chronic cystitis.**

- 4- **Schistosomiasis.**

- 5- **drugs as cyclophosphamide.**

## Treatment:

- transurethral **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

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- **Wilms tumor**

# WILMS TUMOR

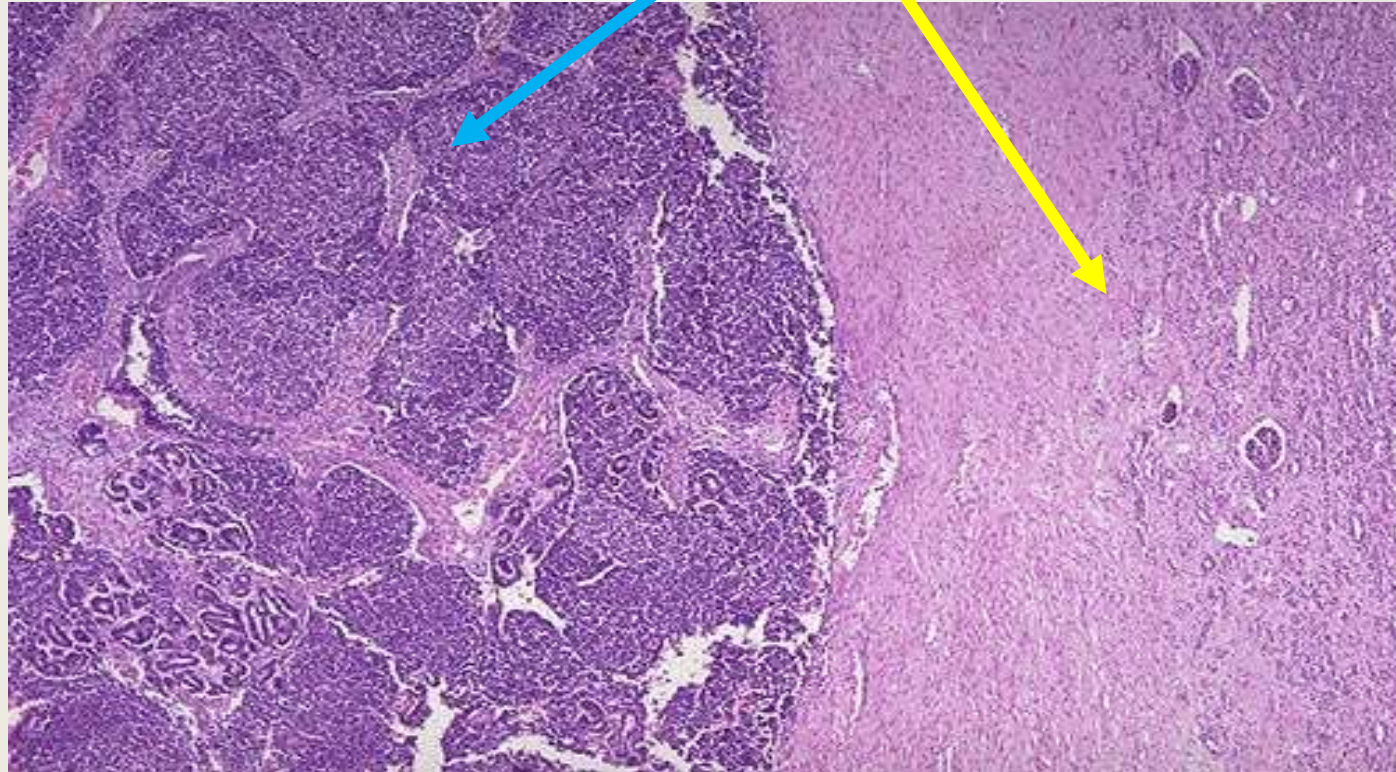
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- 3<sup>rd</sup> most common solid cancer < 10 years.
- derived from the mesoderm.
- sporadic or familial (**autosomal dominant**).
- Mutations: **WT-1 and 2** genes.
- primitive glomerular and tubular structures
- Treatment: surgery & chemotherapy



# WILM'S TUMOR

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





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

