Renal tumors of adults

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Urinary Tract Tumors

- **2%-3% of all cancers in adults.**
- **The most common malignant tumor of the kidney is renal cell carcinoma.**
- ***Tumors of the lower urinary tract are twice as common as renal cell carcinomas.***

→ Transitional cell carcinoma / Urothelial carcinoma

7%

↳ Renal Pelvis
Ureter
Bladder
Urethra

- "Hollow structures of urinary tract"
- Lined by transitional epithelium/ Urothelium

Renal Cell Carcinoma (RCC)

- Origin: renal tubular epithelium.
- in cortex. → Most common
- 2%-3% of all cancers in adults.
- 6^{th}-7^{th} decades.
- M:F 2:1

Predisposing factors

↗ increase likelyhood
↘ increase severity

- **smoking** → common PDF to many cancers
- **hypertension**
- **obesity**

} • No strong/good evidence
• No actual causing relationship

- **occupational exposure to cadmium** (nickel-cadmium batteries, etc).

Liquid

- **chronic dialysis & acquired polycystic disease**

Several Entities

New classification based on the molecular origins of these tumors

Cytogenic analysis

- 1-Clear Cell Carcinomas → most common, 80% of RCC
- 2-Papillary Renal Cell Carcinomas
- 3-Chromophobe Renal Carcinomas

1- Clear Cell Carcinomas

- **most common type (70%- 80% of RCC).**
- **cells with clear or granular cytoplasm.**
- **may be:**

*All RCC may be sporadic or familial.

1-Sporadic → spontaneous

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

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

on chromosome 3

Both endure mutation on same gene.

2- Papillary Renal Cell Carcinomas

- **10% to 15%.**
- **papillary growth pattern.** → finger like projections
- **multifocal** and **bilateral**
  - multifocal → several masses in the same kidney.
  - bilateral → several masses in both kidneys.
- **familial and sporadic forms.**
- ***MET* proto-oncogene on chromosome 7 → ↑ growth in proximal tubular epithelial cells**

Protooncogene: natural promotors of cell proliferation and development

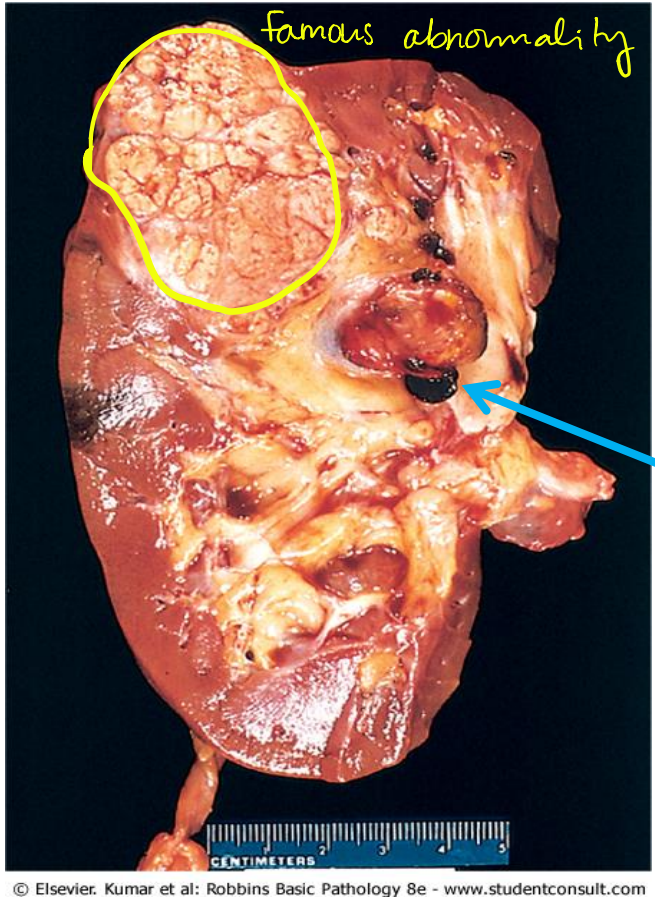
Over DOSE / Extra Copies → Excessive growth = papillae

color fear

3- Chromophobe Renal Carcinomas *these cells dont stain

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

open Kidney



Renal cell carcinoma: yellowish, spherical neoplasm in one pole /upper of kidney.

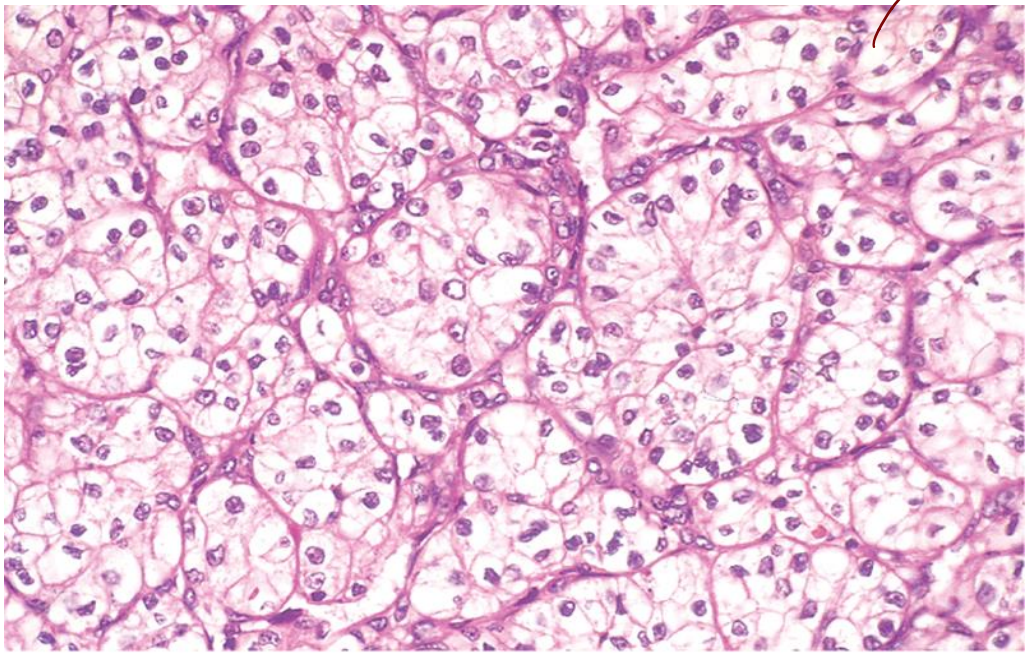
Note the tumor in the dilated (1), thrombosed renal vein (2).

invading vascular structures of kidney

*cells look clear + empty = Clear Cell Carcinoma

Renal cell carcinoma (clear cell type)

cells look clear & empty



Clinical Course of all RCC

→ alarming !

1- **Painless *hematuria (50%)*** → although patient still have flank pain

2- palpable abdominal mass → if mass is Large

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**
- **Metastasis: most commonly to lungs and bones.**
- **may invade the renal vein**

→ Remember what we took in the anatomy Lec. 2 about valveless veins

Urothelial tumors (transitional cell carcinoma)

remember they're 2x as common as RCC

- **classified into :**

1 -benign papilloma

2-papillary urothelial neoplasms of low grade

3-papillary urothelial carcinoma of high grade

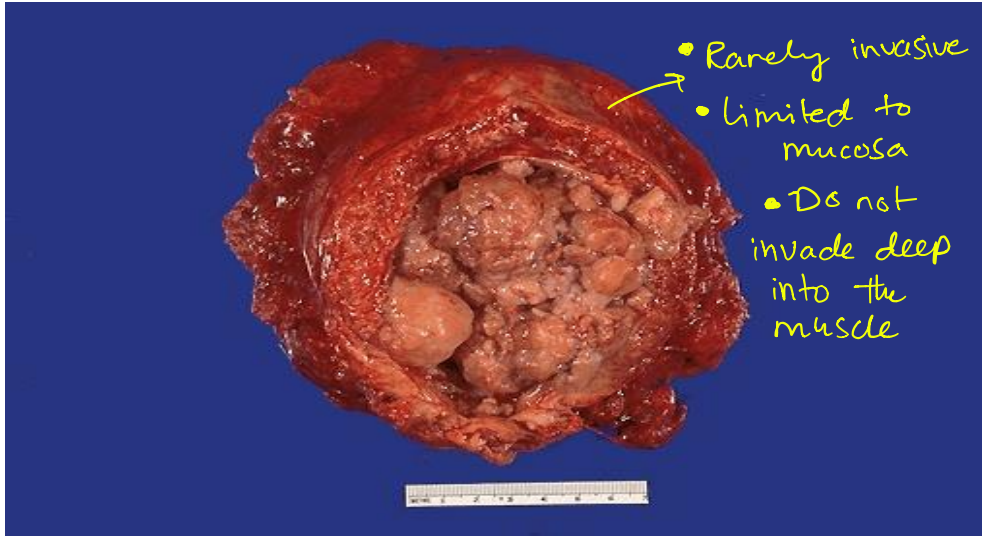
Well defnentiated, similar to normal urothelium

we will only take this one

Please pay attention to diffenence between RCC + TCC

they both have papillary types.

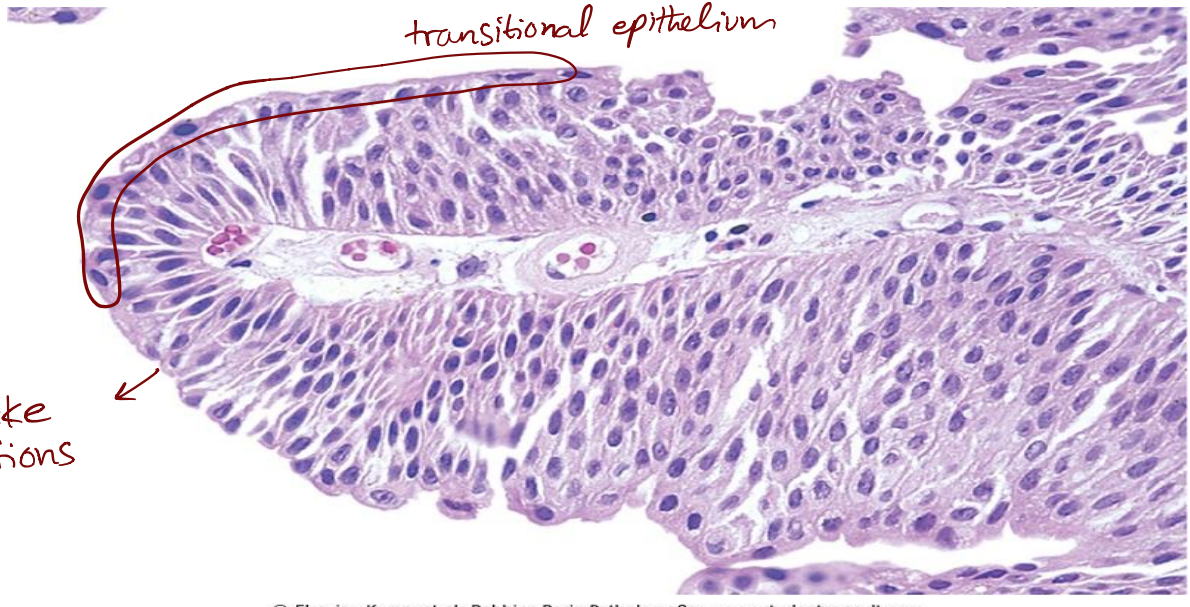
Transitional cell carcinoma of bladder → Most Common Location.



Urothelial (transitional) cell carcinomas

- **Low-grade carcinomas are rarely invasive.** → usually limited to mucosa
- **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

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

Cyst is abbreviated to anything related to the bladder
Cystitis → inflammation of Bladder
Cystoscopy → Bladder endoscopy

Clinical Course of bladder cancers

- ***Painless hematuria.*** → alarming! to dinicial's
- **M:F 3:1**
- **50 to 70 years.**
- **Prognosis**
- low-grade shallow → good prognosis.
- High grade lesions + deep → bad

cystoscopy
↓
to see where the lesion and remove it
↙ Macroscopic ↘ Microscopic

1. Diagnostic
2. Theraputic

May Recur, patient must have regular follow up using urine cytologic analysis + cystoscope every 6M or 1Y

- **Predisposing factors of bladder cancers :**
- **not familial.** → so PD have to do with the environment

1- β-naphthylamine (paints; cigarettes)

2- Cigarette smoking.

3- Chronic cystitis. → Recurrent inflammation of bladder

4- Schistosomiasis.

5- drugs as cyclophosphamide. → Side effect :- Hemorrhagic Cystitis

Treatment:

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

Renal tumors of childhood

Wilms Tumor

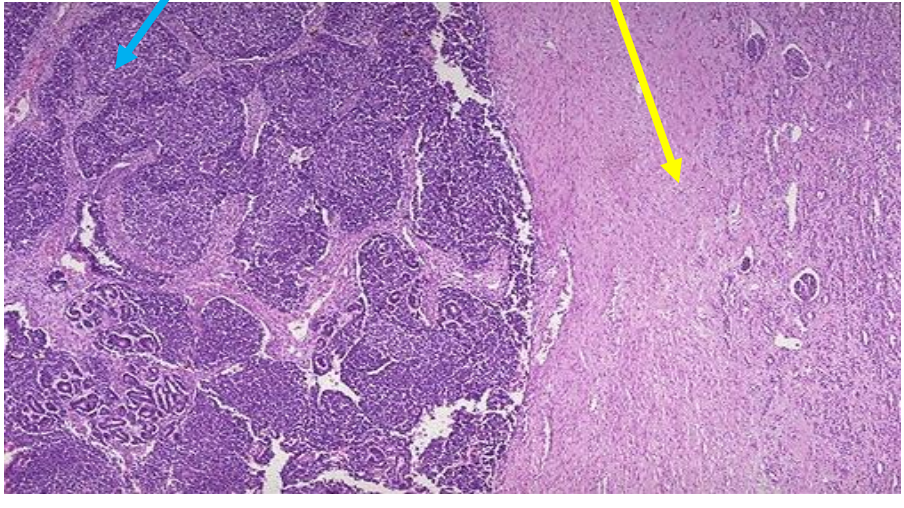
- 3rd most common solid cancer < 10 years.
- derived from the mesoderm. → Primitive cells → link to blue cells. ↑ DNA
- sporadic or familial (autosomal dominant).
- Mutations: **WT-1and 2** genes.
- primitive glomerular and tubular structures
- Treatment: surgery & chemotherapy

Wilm's tumor of the kidney

Wilm's tumor

nests and sheets of dark blue cells at the left with compressed normal renal parenchyma at the right.

Primitive 'mesoderm' cells have very high amount of DNA so cells look blue



Wilms tumor:

The tumor shows attempts to form primitive glomerular and tubular structures