MED437
KING SAUD UNIVERSITY

SURGERY TEAM 437

Common Urogenital Tumors

Objectives:

To know the following about Renal,Bladder,Prostate and Testis Tumors also pheochromocytoma:

- Definition
- Classification
- Clinical presentation
- Investigation
- Management

Lecturer: Prof. Saleh Binsaleh

Same as 436's lecture: Yes

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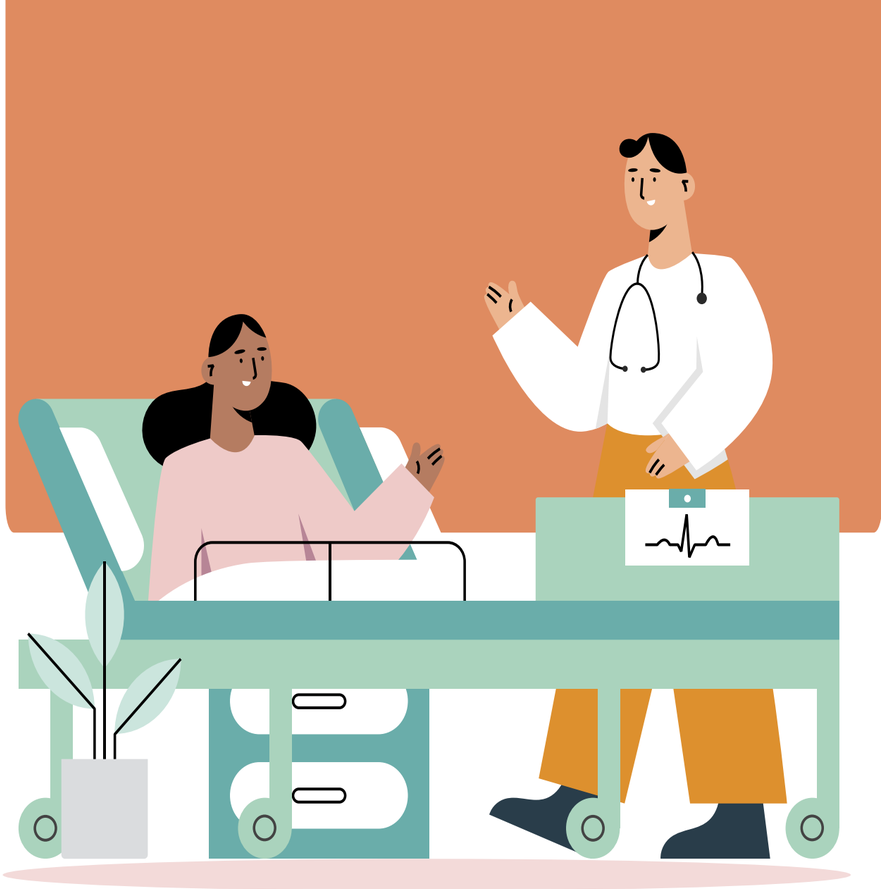
Color Index:

- Important
- Doctor's Notes
- Extra
- Davidson's

Editing File / Feedback



Renal Tumors

Benign (rare)	Malignant
1. Oncocytoma (the most common): On CT it shows an enhancement & central necrosis like Chromophobe renal cell carcinoma. 2. Angiomyolipoma	**<u>Renal cell carcinomas:</u>** 1. Clear cell renal cell carcinoma (most common) 2. Papillary renal cell carcinoma (collecting duct). 3. Chromophobe renal cell carcinoma. 4. Transitional cell carcinoma. 5. Wilms tumor (nephroblastoma) "anaplastic"

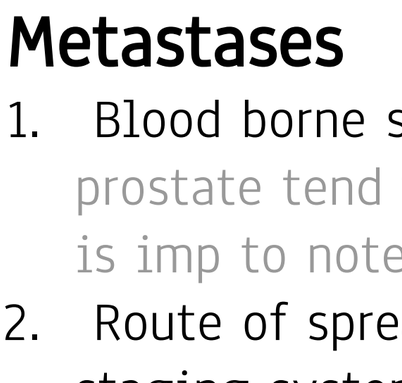
Most of renal tumors are malignant

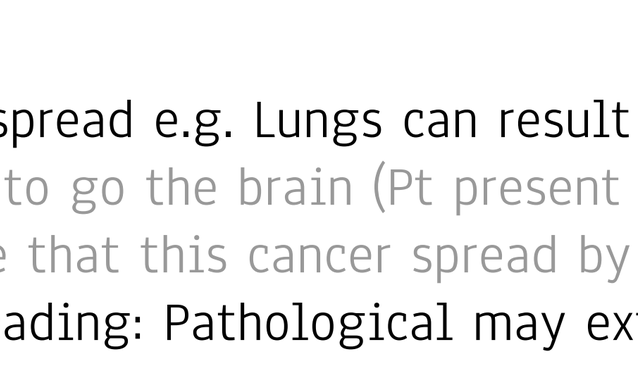
- So, if you see in ultrasound any complex cyst always consider it as a malignant until proven otherwise.
- All renal neoplasms should be regarded as **potentially malignant**
- Renal cell carcinomas arise from the proximal **tubule cells**
- Usually invade different parts of one kidney or even both, this is important when you're considering nephrectomy, radical or partial
- Male:Female ratio **is 2:1.** The patients are usually **40 years** of age or over.
- Increased incidence seen in Von Hippel-Lindau syndrome,
  - So the first step when diagnose this condition is to screen the whole family. It is genetically determined. At chromosome **<u>3p25-26</u>**
- It may be associated with ***familial*** conditions such as tuberous sclerosis.
- Risk Factors: Male sex, tabaco, polycystic kidney & Von Hippel-Lindau syndrome*

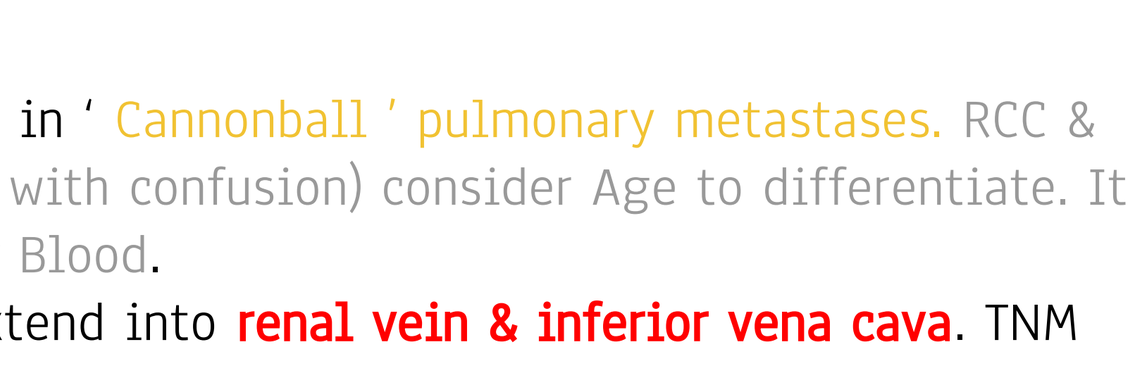
Metastases

1. Blood borne spread e.g. Lungs can result in ' Cannonball ' pulmonary metastases. RCC & prostate tend to go the brain (Pt present with confusion) consider Age to differentiate. It is imp to note that this cancer spread by Blood.
2. Route of spreading: Pathological may extend into **renal vein & inferior vena cava**. TNM staging system .
3. Up to the heart through thrombus from tumor ⟶ renal vein ⟶ IVC ⟶ Right atrium.
4. The lymphatics are not very useful, lymphatics dissection without gross lymph nodes on CT is not very helpful because it doesn't show any survival benefit.
5. Cannon Ball' (well circumscribed and multiple) Pulmonary Metastases (most common site)
   Other differential diagnosis for cannon ball is <u>miliary TB</u>

(seen in patients with a history of RCC and choriocarcinoma). (picture below)







*VHL: The disease is caused by mutations of the VHL gene on the SHORT arm of the third chromosome (3p26-p25). Autosomal dominant. Predisposing to a variety of malignant and benign tumors: hemangioblastomas of the eye, brain, spinal cord, kidney (RCC, cysts), pancreas (cysts), and adrenal glands (pheochromocytomas), epididymis cystadenoma. When a patient with kidney tumor comes to you and you find VHL gene mutation you have to screen the whole family

Renal Tumors

Clinical Features

- 10% present with classic old triad of: *hematuria, loin pain, & fank mass,*
- Other presentations include (paraneoplastic syndrome-PNS). "Renal cancer is one of the most common cause of PNS."
- Symptoms include: hematuria, flank pain, flank mass, weight loss, & HTN
- **Pyrexia** (fever) of unknown origin, hypertension (renin production)
- **Stauffer's syndrome** (syndrome of RCC & liver disease)
  - non metastatic manifestation of the tumor on the liver (non metastatic liver dysfunction) .
  - Hepatic dysfunction → High liver enzymes due to kidney tumor. Once the tumor is removed the liver enzymes will go back to normal
- **Polycythemia** due to **erythropoietin** production.
- **Cushing** syndrome, hypercalciuria & SIADH.
- **Hypercalcemia** due to production of a PTH-like hormone
  - Hypercalcemia is the only condition of PNS can be managed medically and the tumor still there
- HTN and polycythemia etc → surgical removal of offending tumor
- Treatment of PNS is usually nephrectomy.

Investigation

1. Diagnosis can often be confirmed by renal ultrasound diagnostic purpose.
2. US is a good for detecting the size and characteristic of the tumor, but doesn't show how many renal vein, artery or lymphatics involved or any invasion to adjacent structures. will differentiate cystic from solid mass.
3. Renal US is the simplest mood of investigation. But to confirm you have to do more specific investigation such as CT or Echocardiogram to see the extension of tumor thrombus.
4. Abdominal CT scanning with contrast allows assessment of renal vein and caval spread (to operate) the investigation of choice
5. Echocardiogram should be considered when you suspect a thrombus in the IVC extending above diaphragm.
6. Staging of kidney tumor includes: 1/CT 2/pathology 3/grading system for kidney cancer is called fuhrman system

Management

- Renal tumors are chemoresistant and radioresistant, surgery is the only treatment!
- Unless extensive **metastatic** disease it invariably involves **surgery**.
- Bilateral RCC → do partial nephrectomy and follow up. could be genetic or familial (thats why we do genetic investigation her).
- Surgical options usually involve a radical nephrectomy.
  a. Radical nephrectomy is removal of kidney and tissue surrounding it (ureter, renal vessels, adrenal)
  b. But We want to preserve adrenal for its functions
  c. For example a tumor in the lower lobe we save adrenals. But if multicentric kidney plus adrenal removal
- Kidney approached through either:
  a. Transabdominal (subcostal) for better anterior access, painful.
  b. Loin (flank) incision is Better for recovery but less access for vessels.
- Renal vein ligated early to reduce tumor propagation:
  a. We ligate artery first because if we ligate veins first this will increase the chance of bleeding
- Never cut the tumor into pieces while operating. Why? Because it will spread, so you have to remove it as one piece. (Never use a morcellator! فرامه)
  a. So what do we do? We do pfannenstiel incision to take out the tumor. (check next slide)
- Kidney and adjacent tissue (adrenal, perinephric fat) excised.

Shall we do extensive lymphadenectomy? NO only around hilum

- Removal of the Para-Aortic Lymph node is only done for lab and staging purposes and has no proven benefits.
- Immunotherapy in the form of tyrosine kinase inhibitors can be used.

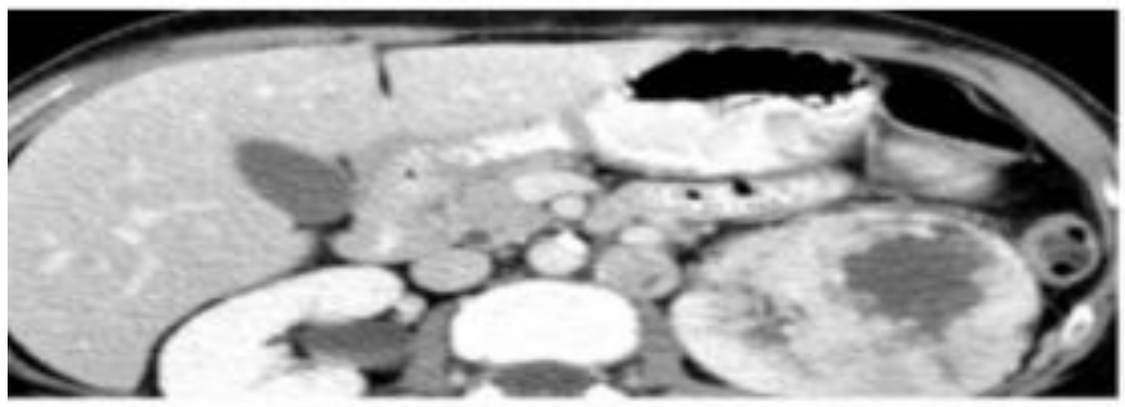
Prognosis

1. Early stage: 5 years survival is 95%.
2. Metastatic disease: 3-6 m average survival.
   a. The most important prognostic factor in patients with metastatic renal cell carcinoma is kidneys Performance status

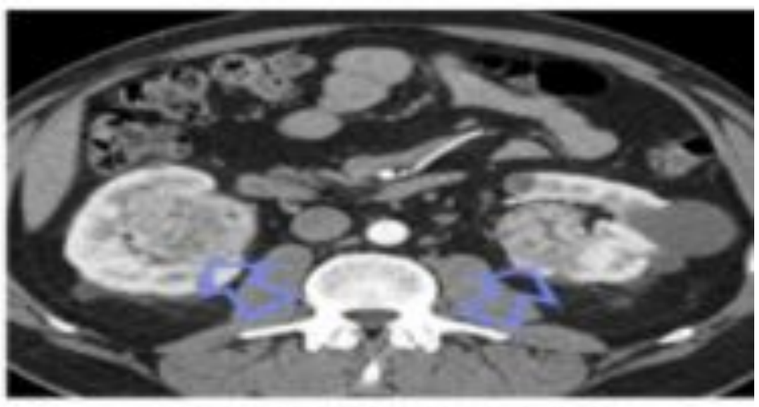
Renal Tumors

Renal Cell Carcinoma (RCC) with IVC thrombus:

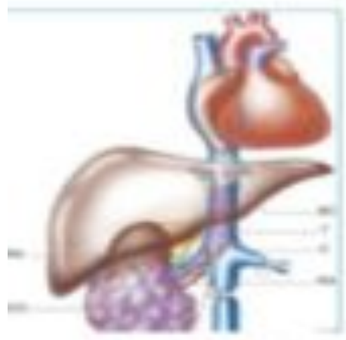
Bilateral renal cell carcinoma? First thing to think about is genetic!

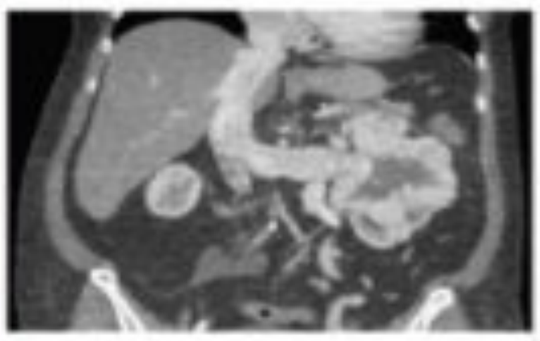


Tumor with central necrosis (Chromophobe)

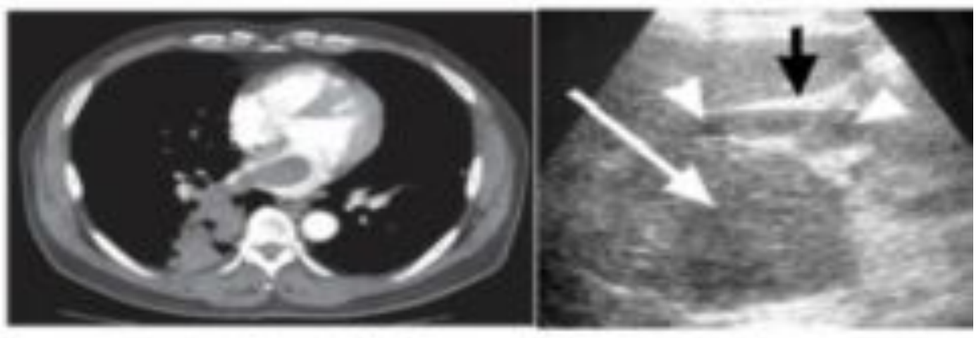


CT of a bilateral RCC



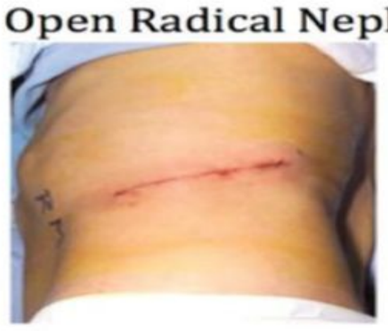


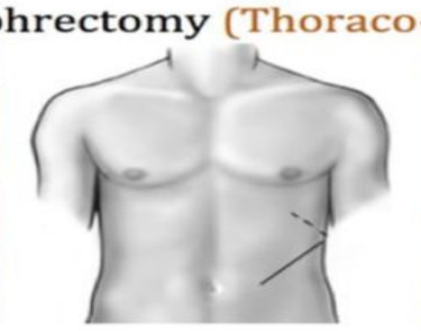
RCC with IVC thrombus
Reach above liver level 3

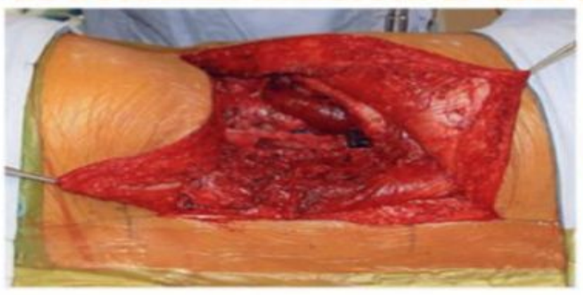


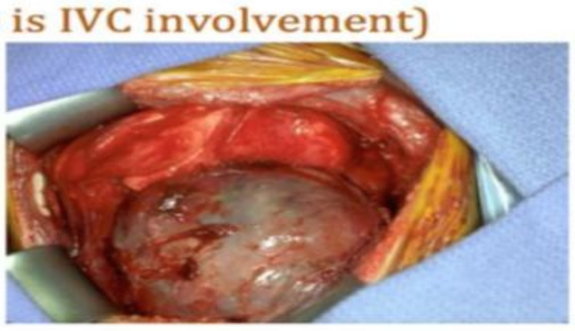
CT and Echocardiogram of a thrombus in the right atrium

Open Radical Nephrectomy (Thoraco-abdominal incision. If there is IVC involvement)

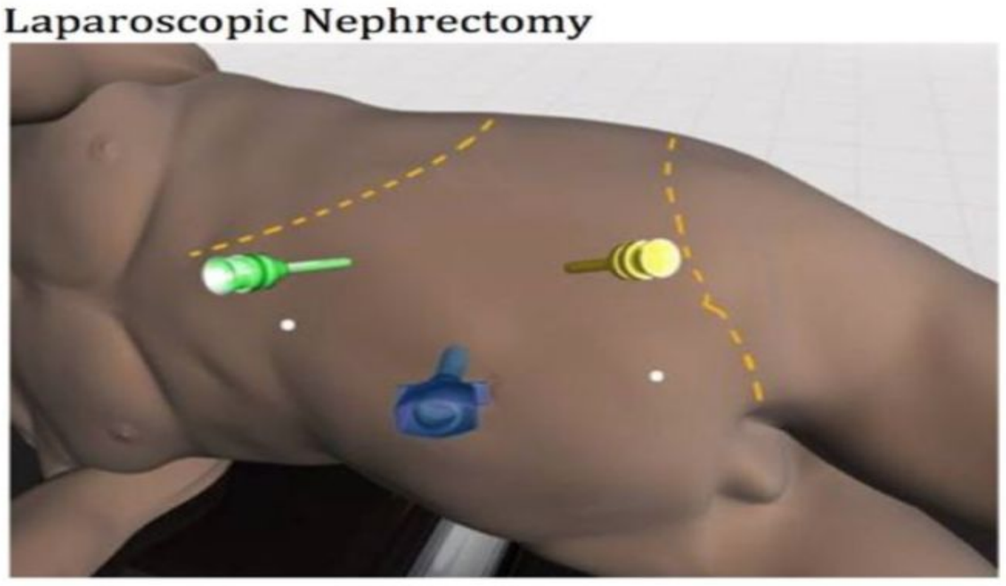


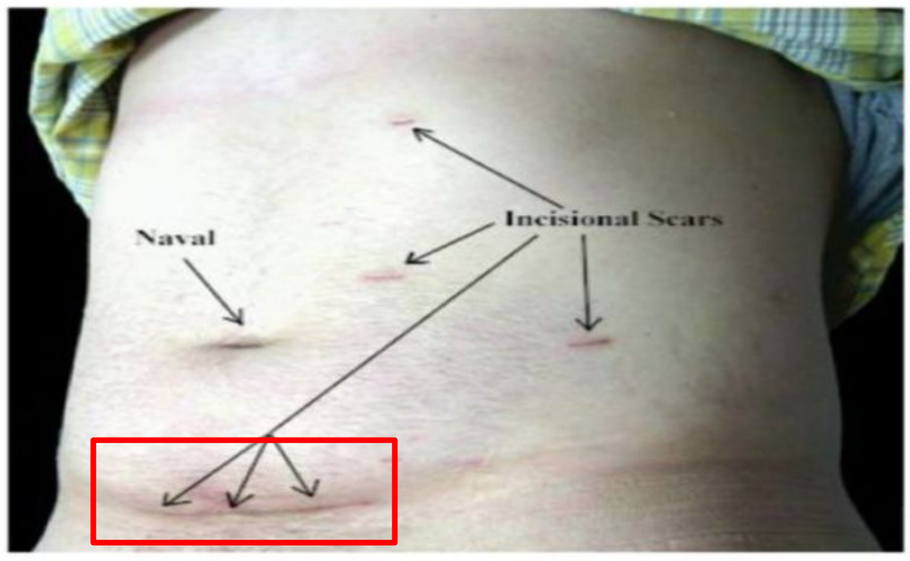






Laparoscopic Nephrectomy

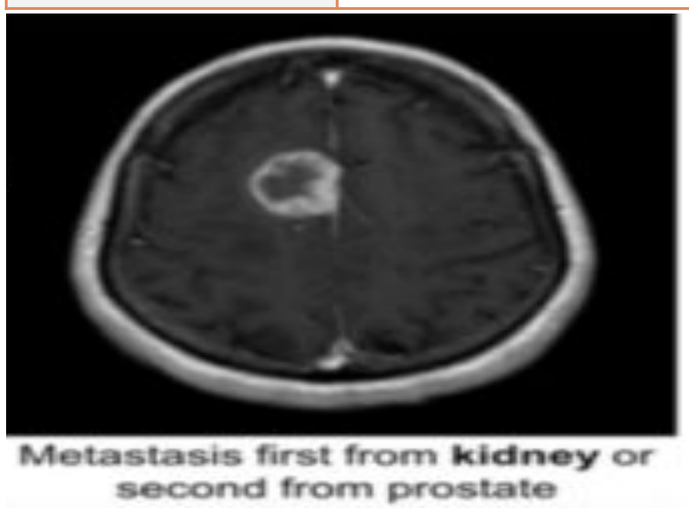


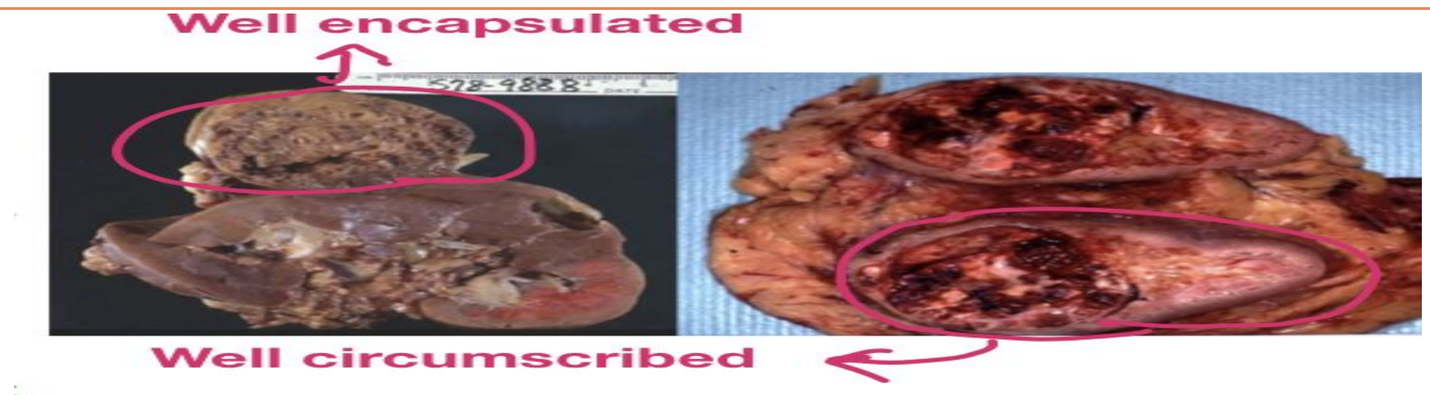


This is the pfannenstiel incision that we will do remove a large tumor because we will never use a morcellator why? SPREAD

Clear Cell Renal Cell Carcinoma (CCRCC)

Clinical Features	• Is typically a solitary tumor. • Commonly presents as a bosselated, well-circumscribed mass with a capsule or pseudocapsule and a pushing margin. Occasionally, an infiltrative margin is seen. • On cut section, CCRCC is typically a golden color because of the accumulation of lipid in the malignant cells, while areas of hemorrhage (brown), fibrosis (gray), necrosis, and cystic degeneration often give a variegated appearance. • Commonly arise from proximal convoluted tubules. • In gross pathology, it is always well-circumscribed, inside the kidney not outside with golden fat deposit which is a characteristic for CCRCC
Microscopic Features	Typical histological appearance of CCRCC on hematoxylin and eosin stain, showing nests of epithelial cells with clear cytoplasm ,a distinct cell membrane, and black nuclei separated by a delicate branching network of vascular tissue. 
Management	• Lymph node dissection have no proven benefit. • Solitary (e.g. Lung metastasis) can occasionally be resected. • Radiotherapy and chemotherapy have No role. • Immunotherapy can help (Performance status). Not curative but might help them live a bit longer a. Infliximab & IL-2 are very effective but bad side effect & IFG second line. • What is recommended for pt with multiple metastatic? ⟶ Immunotherapy. a. If young (44 yrs) ⟶ more likely this metastatic caused by kidney tumor. b. If old pt (70-80 yrs) ⟶ more likely this metastatic caused by prostate tumor.





Chromophobe is another type of renal tumor, which is grey & tan outside the capsule. (partial resection not recommended)

Partial nephrectomy is a good decision. (CCRCC)

Surgical Recall:

What percentage of tumors are bilateral? 1%
How are most cases diagnosed these days? Incidentally on an imaging study (CT, MRI, U\S) for another reason
Define the stages?
- Stage I: tumor < 2.5cm , no nodes,no metastases
- Stage II: tumor > 2.5 cm limited to kidney, no no node, no metastases
- Stage III: tumor extend to IVC or main renal vein +ve regional lymph node but < 2cm, no metastases
- Stage IV: distant metastasis or +ve lymph nodes > 2 cm, or tumor extends past Gerota's fascia

What is metastatic workup? CXR,IVP,CT,LFT, calcium.
What are the sites of metastases?
- Lung, liver ,brain , bone , tumor thrombus entering renal vein or IVC is not common

What is the unique route of spread? Tumor thrombus into IVC LUMEN
What is the treatment of RCC?
- Radical nephrectomy (excision of the adrenal gland and kidney including gerota's fascia) for stage 1 through IV

What gland is removed with a radical nephrectomy? Adrenal gland.
What is the unique treatment for metastatic spread?
- alpha interferon, Lymphokine-activated killer and IL-2

What is the concern in an adult with new onset left varicocele?
- Left RCC – the left gonadal vein drains into left renal vein

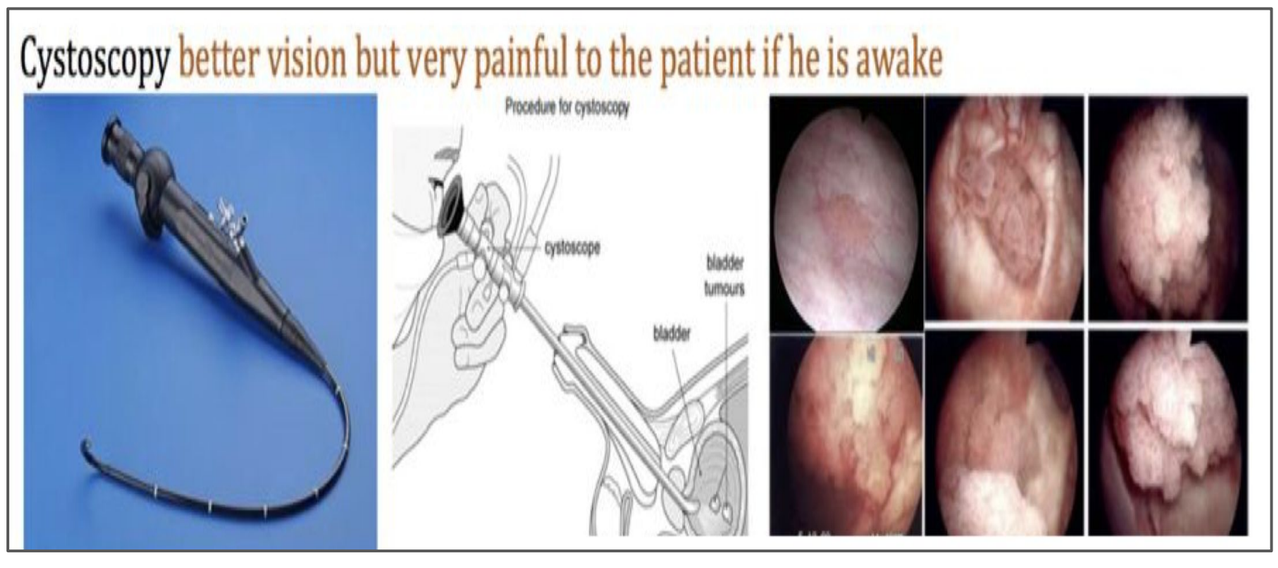
Bladder Tumors

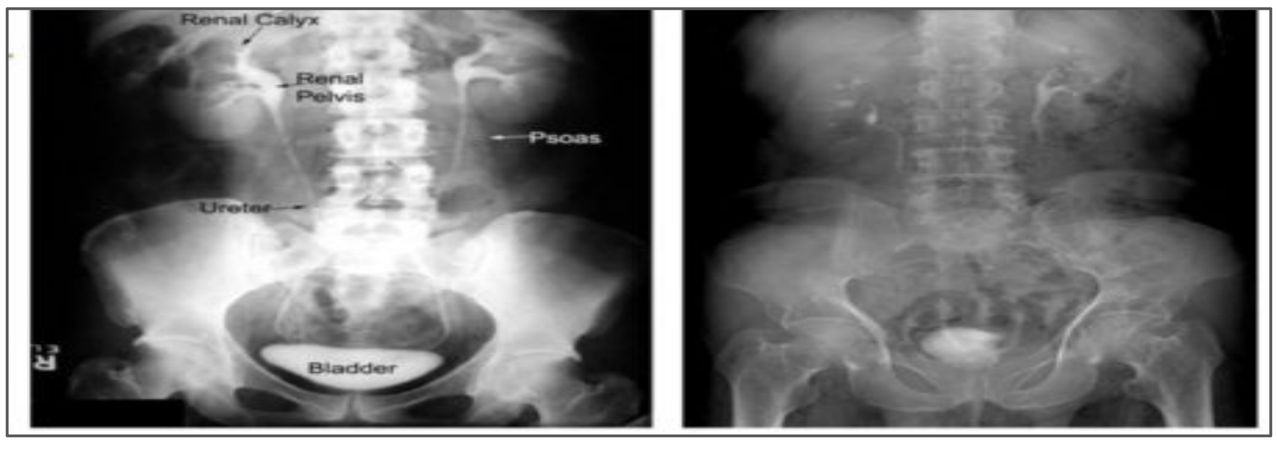
Classification	• 90% are Transitional Cell Carcinomas (TCCs) now it's called UC (urothelial cancer).
	  ○ **TCCs**: should be regarded as a 'field change' disease with a spectrum of aggression. (look everywhere in the bladder may found more than one tumor)
	  ○ **80% of TCCs are superficial and well differentiated:** (above the detrusor muscle)
	  ■ Only 20% progress to muscle invasion (cardinal feature of bladder cancer) The rest: above the muscle layer (muscularis propria)
	  ■ Associated with good prognosis, but have high recurrence rate.
	  ○ 20% of TCCs are high-grade and muscle invasive (**DEEP**). (below detrusor muscle)
	  ■ 50% have muscle invasion at time of presentation
	  ■ Associated with poor prognosis.
	• 5% are squamous carcinoma (found in a urothelium that has undergone metaplasia, usually due to chronic inflammation or irritation e.g. stone or schistosomiasis, chronic UTI & on a catheter. In Egypt the squamous cell carcinoma is the most common due to schistosomiasis .
	• 2% are adenocarcinomas. (due to urachal remnant)

Etiological Factors (very imp for OSCE & MCQs)	1. Occupational exposure (Rubber and asbestos) 2. 20% of transitional cell carcinomas are believed to result from occupational factors (Chemical implicated, aniline dyes, chlorinated hydrocarbons) 3. Cigarette smoking. (with TCCs) 4. Analgesic abuse e.g. phenacetin no longer used 5. Pelvic irradiation - for carcinoma of the cervix or colorectal. 6. Lynch syndrome: main colon cancer but affect bladder and both kidneys 7. Schistosoma haematobium associated with increased risk of squamous carcinoma 8. Pt. w/ prev history of schistosoma haematobium 10 yrs ago & he got treated, he came today w/ hematuria; most likely tumor? squamous carcinoma 9. When someone come and he is Extensive Smoker ⟶ TCC 10. Other risks for Squamous cell carcinoma is : prolonged catheterization, infections which causes chronic irritation.

Presentation OSCE!	• 80% present with terminal painless hematuria in > 40 years old
	  ○ Painless is more harmful than painful, think of cancer if it is painless unless proven otherwise.
	  ○ If developed pain after that, This may indicate hydronephrosis.
	• May present with treatment-resistant infection or bladder irritability and sterile pyuria.
	  ○ Sterile: WBCs without organism, cause might be stones, bladder tumors & TB
	  ○ Men usually comes with a sign of urine flow obstruction +/- bleeding.
	  ○ Recurrent UTI may be due to bladder cancer, so you have to do US to rule it out

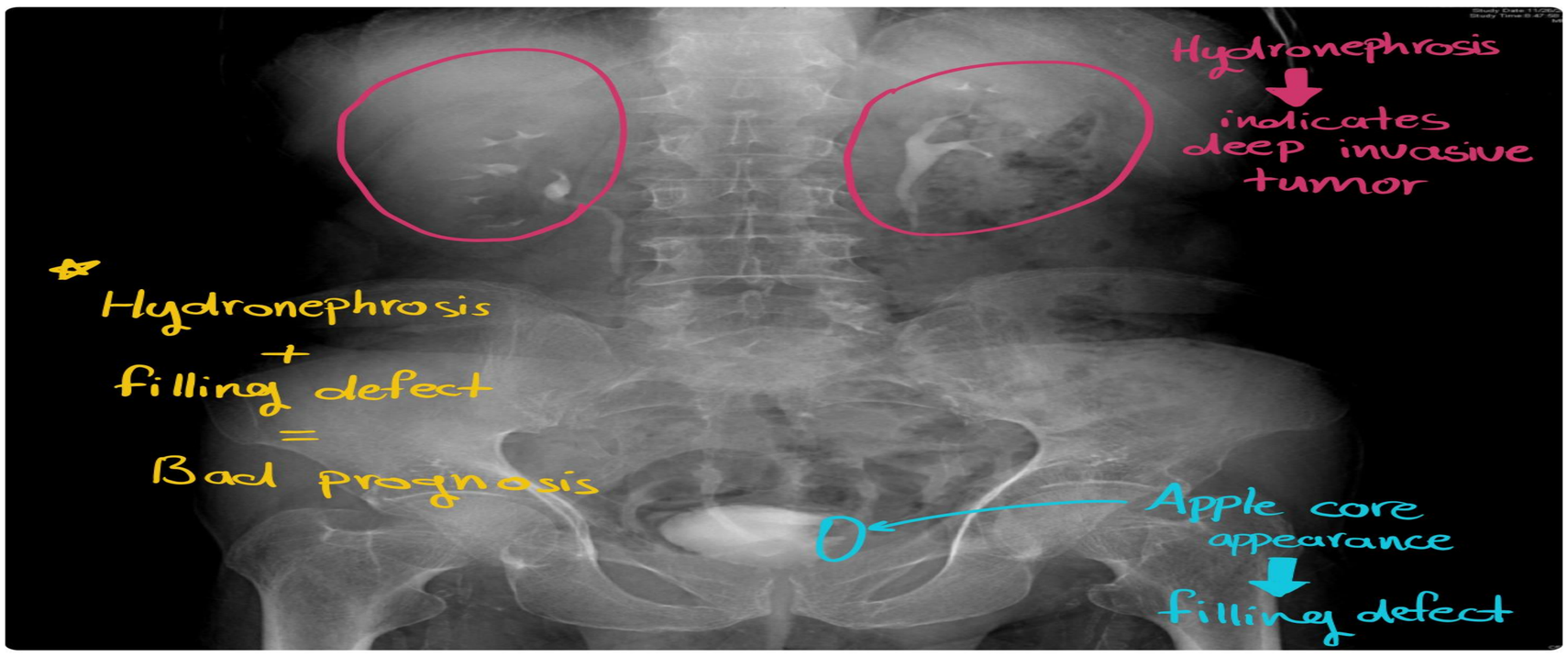
Investigation	**Investigation of Painless Hematuria:** • Urinalysis: MSSU • Ultrasound - bladder and kidneys • KUB - to exclude urinary tract calcification (abdominal x-ray) • Cystoscopy ○ We can see the tumor in its initial level (carcinoma in-situ), this is not applicable in other imaging modalities • Urine Cytology • Consider IVU-CT scan if no pathology identified





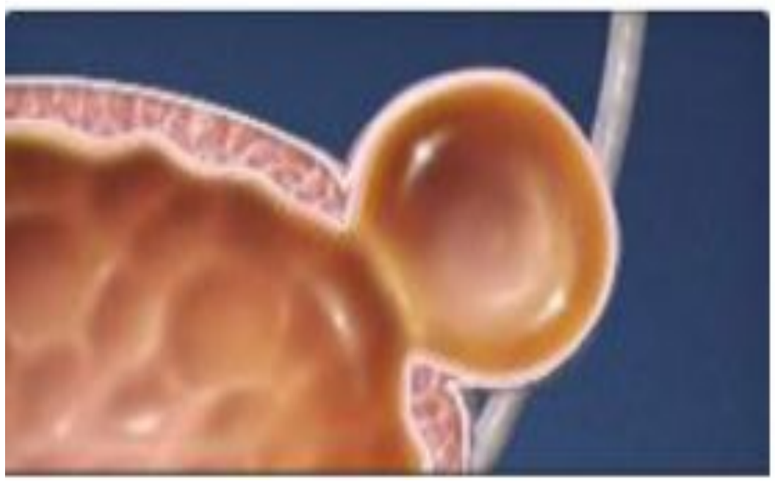
(IMPORTANT) Lt picture is a Normal IVP shows the renal calyces, unblunted renal pelvis on both sides, we can see the ureters also, normal bladder and there is no filling defect.

Bladder Tumors



Bladder Diverticulum:

- It is an outpouching of bladder wall characterized by the absence of the muscular layer. If a tumor develops on it, there will be no T2 stage. Thus, it goes from T1 to T3 directly ⟶ causing urine stagnation ⟶ chronic irritation.
- How to identify a tumor in kidney or ureter or bladder on IVP and CTU not regular CT? You will see filling defect.



What is the differential diagnosis of the filling defect?

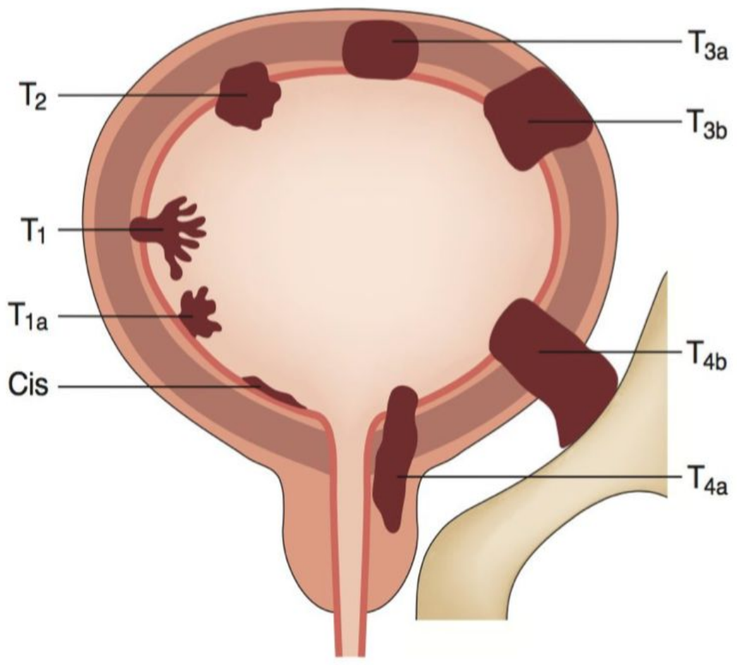
- Stones (radiopaque and radiolucent it depends)
- Tumors
- Hematoma
- Depri or vangal born
- Sickle cell

Pathological Staging:

- Requires bladder muscle to be included in specimen.
- Staged according to depth of tumor invasion.

★ **Superficial** (stage 0)
- Tis ⟶ In-situ disease
- Ta ⟶ Epithelium only
- T1 ⟶ Lamina propria invasion

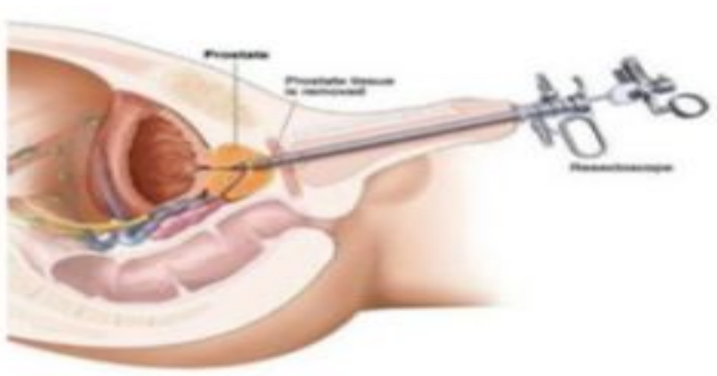
★ **Invasive**
- T2 ⟶ Superficial muscle invasion (stage I)
- T3a ⟶ Deep muscle invasion (stage II)
- T3b ⟶ Perivesical fat invasion (stage III)
- T4 ⟶ Prostate or contiguous muscle (stage IV)

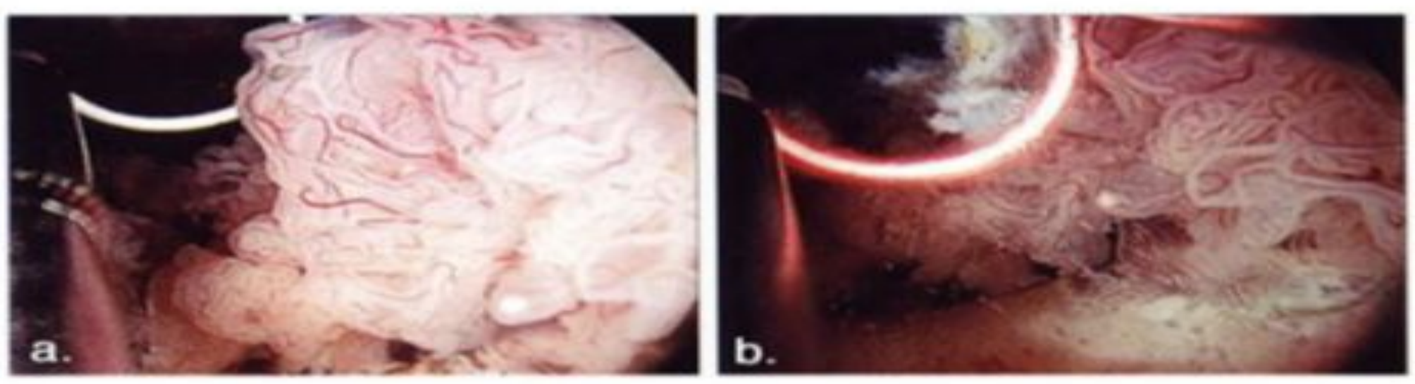


Grade of Tumor:

- Nowadays it's differentiated only into high and low grade
  - ★ G1 ⟶ well differentiated.
  - ★ G2 ⟶ Moderately differentiated.
  - ★ G3 ⟶ Poorly differentiated. (it's bad even if it's superficial)
    - Muscle invasive + G3 = the worst

Transurethral Resection of Bladder Tumor (TURBT)





Bladder Tumors

Treatment of Bladder Tumors:

1. Carcinoma-in Situ

- ➔ It's an aggressive disease, treat it aggressively (the only superficial tumor we will treat)
- ➔ Often associated with positive cytology
- ➔ 50% patients progress to muscle invasive high grade
- ➔ Consider immunotherapy (BCG 6 weeks of reduction then 3 weeks)
- ➔ Didn't work? patient may need radical cystectomy.

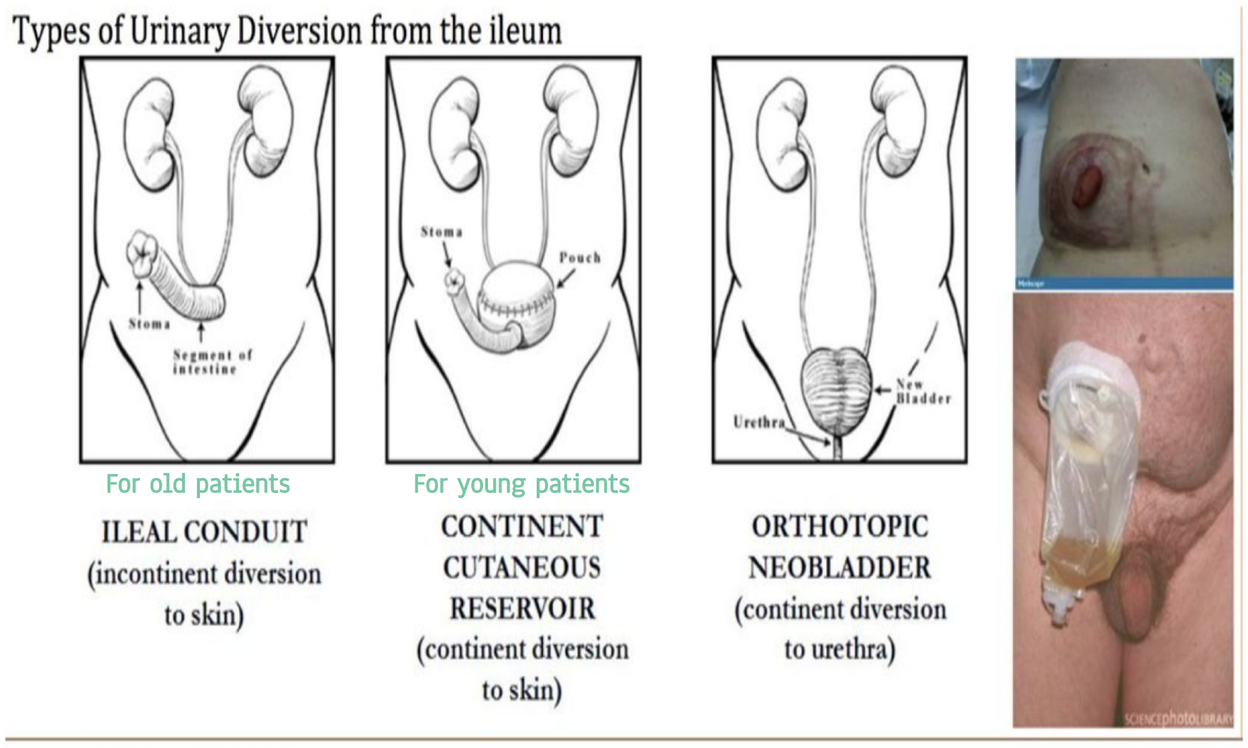
2. Superficial Transitional Cell Carcinoma

- ➔ Requires transurethral resection. So treat it locally and don't remove the bladder and need regular cystoscopic follow-up.
- ➔ Consider prophylactic chemotherapy (intravesical) if risk factor for recurrence or invasion (e.g. high grade).
- ➔ Consider immunotherapy:
  - ◆ BCG = attenuated strain of Mycobacterium bovis .
  - ◆ Reduces risk of recurrence and progression chemotherapy reduce risk of recurrence only
  - ◆ 50-70% response rate recorded
  - ◆ Occasionally associated with development of systemic mycobacterial infection .

3. Invasive Transitional Cell Carcinoma

- ➔ Radical cystectomy has an operative mortality of about 5%.
  - ◆ In male we remove the bladder with prostate, seminal vesicle, distal part of ureter & proximal urethra. In female bladder with uterus,cervix ,anterior wall of vagina & tubes.
- ➔ Non continent Urinary diversion achieved by:
  - ◆ Ileal conduit (it has the least absorption ability, we dissect 20 cm proximal to cecum).
  - ◆ Neobladder (we take a part of their body (mostly the ileum) and shape it like a bladder).
- ➔ Continent urinary diversion is achieved by: cutaneous reservoir
- ➔ Local recurrence rates after surgery are approximately 15% and after radiotherapy alone 50%.
- ➔ Pre-operative radiotherapy is no better than surgery alone.
- ➔ Adjuvant (after surgery) chemotherapy may have a role.

- **Complication of urinary diversion:** Infection, Stones, metabolic abnormality, growth retardation in kids,renal failure, hydronephrosis. It may lead to transformation into other type of cancer if it is connected to rectum due to chronic irritation.



1. Ileal conduit: part of ilium is taken out, ureters anastomosed with each other > urine will leak through this conduit 'urination is not not controlled' (least complication)
2. Continent cutaneous reservoir: To make a reservoir & make small tubule works as a duct. It can be done with small bowel alone or with the right colon. The idea of this to make a reservoir & small tubule work as a duct. If we use the terminal ileum & right colon, the ileocecal valve would work as valve mechanism.

- Why don't they remove the whole ilum? b/c vit. B12 absorption happen there thus they only take a remove a small part
- Ureterostomy is not done any more do to complications like infections.

Bladder Tumors

Surgical Recall:

What is the incidence of bladder tumors?
2nd most common urologic malignancy
Male : female ratio of **3:1**
White puts are more commonly affected than are **african American pts.**
What is the most common histology ?
TCC - 90% remaining cases are squamous or adenocarcinoma
What are the risk factors?
Smoking, industrial carcinogens (aromatic amines), schistosomiasis, truck drivers, petroleum workers,cyclophosphamide
What are the symptoms ?
Hematuria, with or without irritative symptoms like dysuria, frequency.
What is the classic presentation of bladder cancer?
Painless hematuria.
What tests are included in the workup ?
Urinalysis and culture ,IVP , cystoscopy with biopsy and cytology
Define TCC stages?
stage 0 : superficial, carcinoma in situ

- **stage I ;** invades subepithelial connective tissues
- **stage II ;** invades superficial or deep muscularis propria
- **stage III ;** invades perivesical tissues
- **stage IV ;** positive nodal spread with distant metastases and or invades abdominal pelvic wall

What is the treatment according to the these stages ?

- **stage 0 :** TURB and intravesical chemo
- **stage I ;** TURB
- **stage II AND III:** radical cystectomy, removal of lymph nodes, prostate,uterus,ovaries, vagina and urinary diversion , chemo
- **stage IV ;** cystectomy and systemic chemo

WHAT is TURB ? Transurethral resection of the bladder
What are the indications for a partial cystectomy ? Superficial, isolated tumor ,apical with 3 cm margin from any orifices .
If after TURB the tumor recurs , then what? Repeat TURB and intravesical chemo or bacillus calmette-guerin (TB vaccine)

Prostate Tumors

★ The most common malignancy of male urogenital tract.
- In western country is the third most common cancer after lung and colorectal, in Saudi Arabia it is 8th cancer among males.

★ Rare before the age of 50 years.

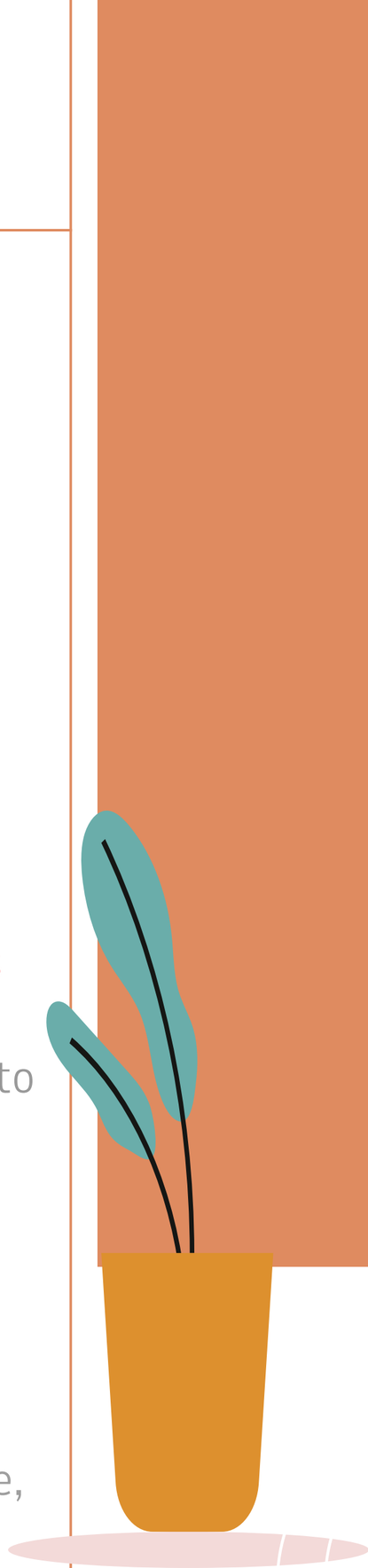
★ Found at post-mortem in 50% of men older than 80 years.
- Males may die with prostatic cancer more than due prostatic cancer. It is need 4 years to increase from 1cm to 2cm while testicular cancer need 2 weeks to increase from 1cm to 2cm.

★ 5-10% of operation for benign disease reveal unsuspected prostate cancer. Most of the time is asymptomatic.

★ The tumors are adenocarcinomas:
- Arise in the peripheral zone of the gland in 70% that's why we do PR examination.
- While the benign hyperplasia is in **transition zone.**
- Spread through capsule into perineural spaces, bladder neck, pelvic wall and rectum ·
- Lymphatic spread is common. that's why u have to do pelvic lymph node dissection if it is aggressive.
- Haematogenous spread occurs to axial skeleton.
- Tumors are graded by Gleason classification.
  - From G2-G10 and the higher of grade the worst of disease, and we can know the grade by biopsy .

Clinical Features	• Majority nowadays are picked up by screening (usually they don't produce urinary symptoms early in the course). • 10% are incidental findings at TURP (transurethral resection of the prostate) • Remainder present with bone pain, cord compression or leukoerythroblastic anemia • Renal failure can occur due to bilateral ureteric obstruction. • Most patients will come complaining of back pain rather than any symptoms related to the prostate.

Diagnosis	• With locally advanced tumors, diagnosis can be confirmed by rectal examination
	  ○ if you find a nodule or hardening then it is cancer until proven otherwise
	• Features include hard nodule or loss of central sulcus.
	• Transrectal biopsy should be performed PSA is not enough to confirm the diagnosis.
	• Multi-parametric MRI maybe useful in the staging of the disease.
	• Bone scanning may detect the presence of metastases.
	• Most of patients with hematuria have it due to BENIGN prostatic tumor
	• If asymptomatic and PSA < 10 ng/ml it's less likely to be abnormal.
	• Serum prostate specific antigen (PSA):
	  ○ Kallikrein-like protein produced by prostatic epithelial cells
	  ○ 4 ng/ml is the upper limit of normal, if it is >4 we confirm the diagnosis by biopsy.
	  ○ >10 ng/ml is highly suggestive of prostatic carcinoma (CT and bone scan to find metastasis)
	  ○ Normal PSA depends on the age: young <2.5 / intermediate <3.5 / old <4
	  ○ Can be significantly raised in BPH, if it not BPH then it's cancer
	  ○ Useful marker for monitoring response to treatment
	  ○ What can rise PSA? Cancer, prostatitis, any damage to the bladder, ejaculation, some race
	• Anything would cause destruction ⟶ it increases PSA level, so it is sensitive, but not specific!



Prostate Tumors

Treatment

- More men die with prostate cancer than from prostate cancer.
- Treatment depends on stage of disease, patient's age and general fitness
- Treatment options are for:
  - **Local disease:**
    - Observation: > 75 yo watchful waiting & < 74 yo
      active surveillance, to catch the cancer.
      - Active treatment:
        - Radical radiotherapy (if he's 70 or above offer him this)
          - External Beam Radiotherapy (EBRT)
          - Brachytherapy (insert radioactive seeds inside the prostate)
        - Radical prostatectomy (if he's young offer him this)
          - Open surgery (not done anymore)
          - Laparoscopic
          - Robotic
  - **Locally advanced disease:**
    - Radical radiotherapy
    - Hormonal therapy
  - **Metastasis disease:**
    - Hormonal therapy (androgen depletion therapy) not curative
      - 80-90% of prostate cancers are androgen dependent for their growth
      - Produces good palliation until tumours 'escape' from hormonal control → at this point it is called castrate-resistant prostate cancers, start chemotherapy
      - Androgen depletion can be achieved by:
        - Bilateral orchiectomy
        - LHRH agonists - goseraline (You need to give antiandrogen before LHRH to prevent flare)
        - Anti-androgens - cyproterone acetate, flutamide, Bicalutamide
        - Complete androgen blockade. (done by several medications, antifungal is one of them)

Surgical Recall:

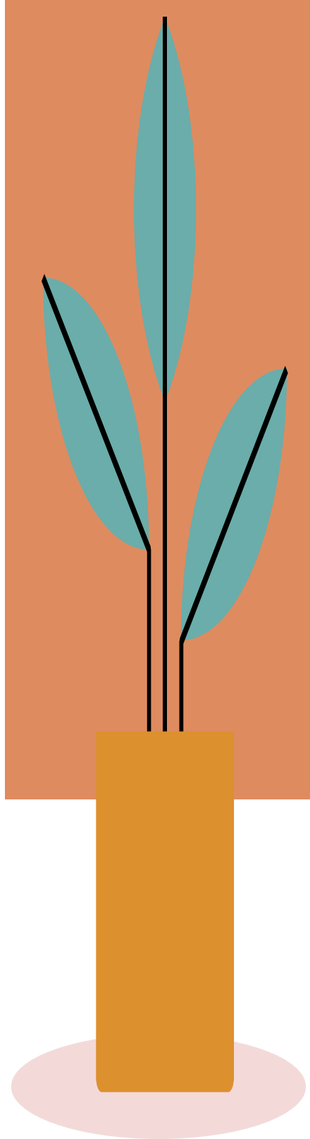
What is the histology of prostate tumors? Adenocarcinoma
What is the incidence? Most common GU tumor
What are the symptoms?
- Often asymptomatic, usually present as a nodule found on routine rectal examination' in 70% of cases, cancer begins in the periphery of the gland and moves centrally; thus, obstructive symptoms occur late. 40% of patients have metastatic : bone pain and weight loss

What are the common sites of metastasis? Osteoblastic bony lesions, lung, liver, adrenal
What provides lymphatic drainage? Obturator & hypogastric nodes.
What is the significance of Batson's plexus?
- Spinal cord venous plexus; route of isolated skull\brain metastasis.

What are the steps in early detection? PSA and DRE
What is the imaging test for prostate cancer? TransRectal UltraSound (TRUS)
How is the diagnosis made? Transrectal biopsy.
What is the gleason score?
- Histologic grades 2-10
  - Low score = well differentiated
  - High score = poorly differentiated

What does a "radical prostatectomy" remove?
- Prostate gland.
- Seminal vesicles.
- Ampullae of the vasa deferentia.

What is the medical treatment for systemic metastases?
- Androgen ablation by LH or orchiectomy



Testicular Tumors

★ Most common presentation: PAINLESS testicular swelling on the side of the scrotum.
★ Most common malignancy in young men. (from 25-35 yrs).
★ Highest incidence in Caucasians in northern Europe and USA.
★ Peak incidence for teratomas is 25 years and seminomas and others are 35 years.
★ In those with disease localized to testis more than 95% 5 year survival possible.
★ Risk factors include cryptorchidism testicular Maldescent, Klinefelter's syndrome (47XXY)* and testicular torsion.
* They have higher risk of developing infertility, breast cancer and testicular cancer
★ Tumor of young male ⟶ testicular, fast growing! Have to interfere quickly and curable if detected early
★ Tumor in old male ⟶ Prostate.

Classification	• Seminomas (~50%) Most Common
	• Non-Seminoma (~50%)
	  ○ Teratomas
	  ○ Yolk sac tumors
	  ○ Embryonal
	  ○ Mixed Germ cell tumor

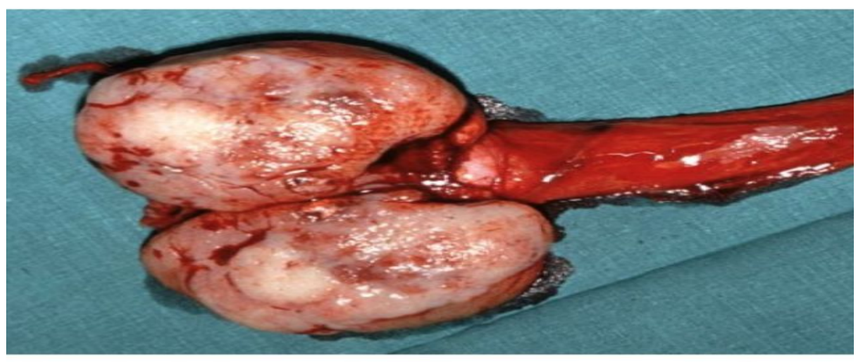
Investigation	• It is self examination like breast cancer and find abnormal lump. • Diagnosis can often be confirmed by testicular ultrasound • Pathological diagnosis made by performing an inguinal orchiectomy. • Why not through the scrotum? Bc they are abdominal organ in origin not extra-abdominal. Their lymphatics and vasculature are in the abdomen. • Disease can be staged by thoraco-abdominal CT scanning • Biopsy is contraindicated!

Tumor Markers	• Useful in staging and assessing response to treatment.
	• If this tumor markers are normal can we say it's not cancer? No bc it can be there and not secrete hormones -ve does not exclude
	1. Alpha-fetoprotein (AFP)
	  a. Produced by yolk sac elements
	  b. Not by seminomas
	2. Beta HCG:
	  a. Produced by trophoblastic elements
	  b. Elevated levels seen in both teratomas and seminoma
	3. LDH: Not specific
	4. Gamma GT

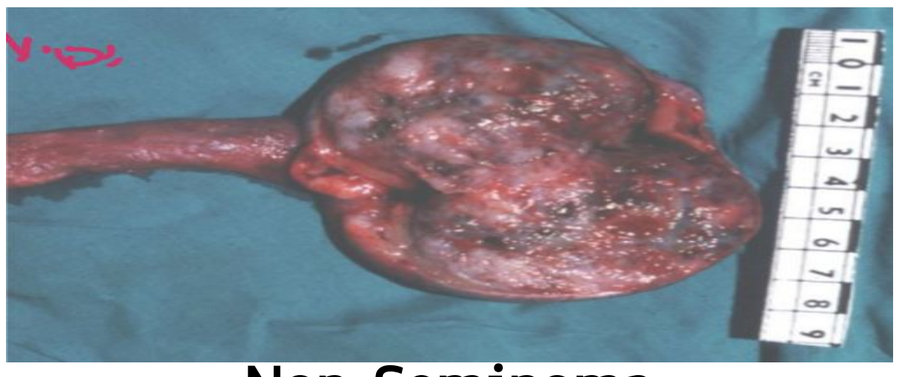
Stages	• Stage I: Disease confined to testis
	• Stage IM: Rising post-orchiectomy tumour marker
	• Stage II: Abdominal lymphadenopathy:
	  ○ IIA < 2 cm
	  ○ IIB 2-5 cm
	  ○ IIC > 5 cm
	• Stage III: Supradiaphragmatic disease.

Treatment	1. **Seminomas**: radiosensitive
	  a. The overall cure rate for all stages of seminoma is approximately 90%.
	  b. Stage I and II disease treated by inguinal orchiectomy plus Radiotherapy to ipsilateral abdominal & pelvic nodes ('Dog leg') or Surveillance.
	  c. 1st thing to do in radical Orchiectomy is to identify the the spermatic cord & ligate it.
	  d. Stage IIC and above treated with chemotherapy.
	2. **Non-Seminoma: (not radiosensitive)** chemosensitive
	  a. Stage I disease treated by orchiectomy and surveillance Vs RPLND Vs Chemo
	  b. Chemotherapy (BEP = Bleomycin (ADRs: pulmonary fibrosis), Etoposide, Cisplatin) given to: Stage I patients who relapse & Metastatic disease at presentation
	  c. If you have seminoma and nonseminoma, treat it as nonseminoma because it is more aggressive.
	Remember: when you do an orchiectomy u open through the inguinal area (groin) not scrotum.

Testicular Tumors



Seminomas



Non-Seminoma

Surgical Recall:

Which tumor almost never have elevated AFP?

- Choriocarcinoma
- Nonseminomatous common = 90% have positive AFP AND/OR HCG
- Seminomatous rare = only 10% are AFP positive

What are the classification?

- Germ cell tumor 95%:
  - Seminomatous
  - Non-seminomatous
  - Embryonal cell carcinoma
  - Teratoma
  - Mixed cell
  - Choriocarcinoma
- Non Germinal :
  - Leydig cell
  - Sertoli cell
  - Gonadoblastoma

In which tumor is Beta-HCG almost always found elevated? Choriocarcinoma.

What is the initial treatment for all testicular tumors?

- Inguinal orchiectomy (removal of testicle through a groin incision)

Why not remove testis with cancer through a scrotal incision? It could result in tumor seeding of the scrotum.

What is the major side effect of retroperitoneal lymph node dissection? Erectile dysfunction.

Pheochromocytoma

★ Pheochromocytomas are tumours either of the adrenal medulla (80%) that secrete large amounts of adrenaline (epinephrine) and noradrenaline (norepinephrine), or of the extra-adrenal paraganglionic tissue (20%) that secrete only noradrenaline.

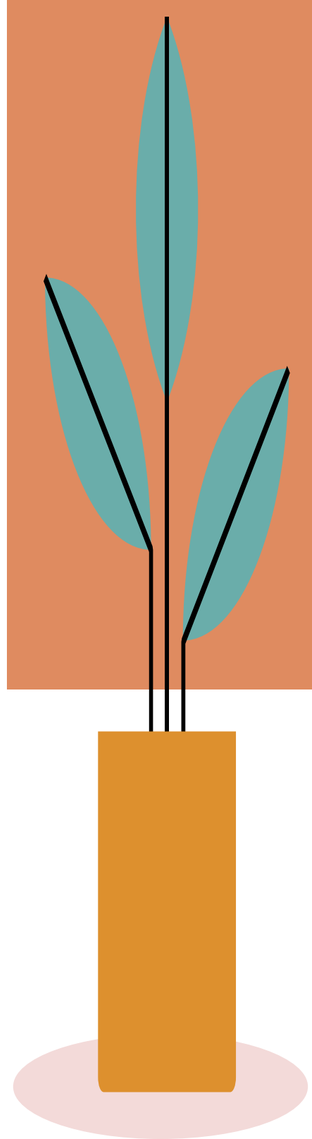
★ Virtually all (99%) arise within the abdomen, 10% are multiple and 10% are malignant.

★ May be associated with neurofibromatosis, medullary carcinoma of the thyroid (MEN II).

Clinical Features	• The median age for presentation of pheochromocytomas is 40 years. • Excess noradrenaline secretion causes hypertension; adrenaline excess has metabolic effects (e.g. diabetes and thyrotoxicosis). • **Paroxysmal hypertension is a very characteristic symptom, during a paroxysm the blood pressure may rise to 200/100 mmHg and there is headache, palpitation, sweating, extreme anxiety, chest & abdominal pain.** • Pallor, dilated pupils and tachycardia are prominent features.
Investigation	• All young hypertensive patients (age < 40 years) should be screened for a catecholamine-secreting tumour. • 24 hour overnight collections of urine should be analysed for **metadrenaline and normetadrenaline levels.** • **A CT or MRI may show the tumour.**
Management	• **Treatment consists of adrenalectomy after careful Preparation to control blood pressure and heart rate and To re-expand blood volume (by α-adrenergic blockade ex;Prazosin or phenoxybenzamine With β-blockade).** • The use of α- and β-blocking drugs has greatly reduced the risk of hypertensive crisis, tachycardia and arrhythmias.

Important

- ★ **Most** of renal tumors are? Malignant.
- ★ Where is the **origin** of renal cell carcinoma ? it comes from the proximal convoluted tubule of nephron.
- ★ Where is the commonest site for metastasis of renal cell carcinoma ? the lungs.
- ★ What is the first site for metastasis of renal cell carcinoma? Lymphones
- ★ Patient with **paraneoplastic syndrome** for example fever and RCC, how can we treat
- ★ him? shall we give him **Antipyretic** or **antibiotic** ? none of them, the treatment of PNS is not medical treatment, it is surgical by removing the tumor (nephrectomy).
- ★ What is the treatment of choice for RCC ? the surgery (radical nephrectomy), as long as it is in site or included and not metastatic far away.
- ★ What is the **only** condition of PNS can be **managed medically**? Hypercalcemia
- ★ What is the **commonest histopathological type in RCC**? Clear Renal Cell Carcinoma.
- ★ Is the **kidney tumors chemo or radiosensitive** ? No, the surgery is the **only hope** for the patient.
- ★ You have to read and know about how to work out the patient with hematuria it is very important.
- ★ What is the **most common bladder Tumor?** TCC (Transitional cell carcinoma).
- ★ One of the **most common causes of TCC?** Smoking
- ★ **Squamous cell carcinoma** are due to? Chronic irritation of the bladder
- ★ Who are the ppl that are suspected to develop **adenocarcinoma**? Ppl who have urachal remnant.
  - The urachus is a fibrous allantoic remnant that connects the bladder to the umbilical cord during embryogenesis. After birth, the lumen of the urachus is usually obliterated. However, an autopsy series has found that urachal remnant persists as a tubular or cystic structure in the dome and elsewhere along the midline of the bladder in one third of adults. Its very rare though
- ★ Is **carcinoma** in **situ benign condition or malignant**? it is malignant but superficial and should be treated aggressively before turn into huge bladder cancer.
- ★ What is the **commonest histopathological type in prostate cancer?** Adenocarcinomas
- ★ How we **grade the prostate tumors?** They are graded by Gleason classification
- ★ What is the **Most common risk factor of testicular cancer?** Cryptorchidism.
- ★ You never take biopsy or do orchiectomy in case of Seminomas from scrotum. It's done through **groin**. (Remember! If you touch the scrotum you will spread the tumor)
- ★ Renal tumors are radioresistant and chemoresistant!
- ★ Prostate tumor is radiosensitive but chemoresistant expect for cases of metastasis diseases. Here we use chemotherapy
- ★ Seminoma is radiosensitive after surgical removal if needed in some pt
- ★ Non-Seminoma is chemosensitive after surgical removal if needed in some pt



Summary

Renal Tumors

Classifications : benign , malignant

Clinical features :
- 10% present with classic triad of : hematuria, loin pain, mass.
- May present with paraneoplastic syndrome.

Investigations :
- Renal ultrasound (diagnosis).
- CT scanning (staging & confirmatory purposes) (Modality of choice)

Management :
- *unilateral mass :* radical nephrectomy.
- *Bilateral mass :* partial nephrectomy
- *Metastasis :* immunotherapy.

Remember :
- Clear cell renal cell carcinoma (most common RCC)
- RCC arises from the proximal tubule cells.
- Blood borne spread to lungs results in "cannonball" pulmonary metastases.
- Most important prognostic factor in patients with metastatic RCC is kidneys performance status.

Bladder Tumors

Classifications :
- 90% are transitional cell carcinomas.
- 5% Squamous carcinoma (schistosomiasis).
- 2% are adenocarcinomas.

Clinical features :
- 80% present with painless hematuria.
- May present with treatment-resistant infection or bladder irritability and sterile pyuria.

Investigations : mainly cystoscopy .

Management :
- *carcinoma in-situ :* immunotherapy ± radical cystectomy .
- *Bladder carcinomas superficial TCC:* Transurethral resection.
- *Invasive carcinomas :* radical cystectomy.

Remember :
- Cigarette smoking is the most important etiological factor .
- Schistosoma haematobium associated with increased risk squamous carcinoma.

Prostate Tumors

Classifications : adenocarcinomas

Clinical features :
- 10% incidental finding in TURP.
- May present with bone pain, cord compression or leukoerythroblastic anemia.
- Renal failure can occur.

Investigations :
- Rectal examination (diagnosis).
- MRI (staging)
- Transrectal biopsy (confirm diagnosis).
- Serum PSA

Management :
- depends on stage, age, general fitness.
- *Local disease :* observation, radical radiotherapy, radical prostatectomy.
- *Locally advanced disease* : radical radiotherapy, hormonal therapy.
- *Metastatic disease :* hormonal therapy.

Remember :
- Arise in peripheral zone of the gland in 70%.
- Graded by gleason classification.
- Most important metastasis is to bones, especially in the back (back pain)

Testicular Tumors

Classifications : seminomas, non-seminomas

Clinical features :
- Painless testicular swelling on the side of the scrotum.

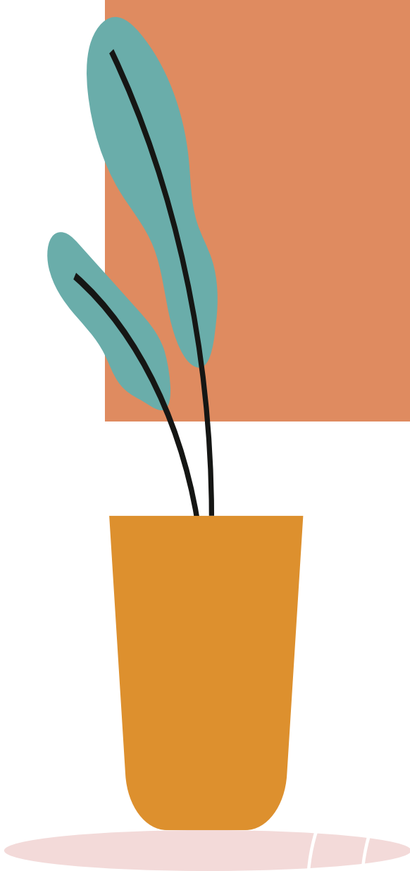
Investigations :
- testicular ultrasound (diagnosis).
- Thoraco-abdominal CT scanning (staging).

Management :
- S*minomas :* stage I and II treated by inguinal orchiectomy + radiotherapy.
- Stage IIc and above: chemotherapy.
- *Non-seminomas :* stage I : orchiectomy and surveillance Vs RPLND Vs chemo .

Remember :
- Peak incidence for teratoma is 25 years and seminomas and others are 35 years
- Risk factors include : cryptorchidism, testicular maldescent, klinefelter's syndrome and testicular torsion.
- SEminomas are radiosensitive while non-seminomas are not radiosensitive

Quiz

1. **Renal cell carcinoma has been more commonly associated with which of the following disorders?**
   a. Down syndrome
   b. Von hippel-lindau disease
   c. Williams syndrome
   d. Multiple endocrine neoplasia type 2 (MEN 2)
2. **The most common site renal cell carcinoma arises from ?**
   a. Distal convoluted tubules
   b. Proximal convoluted tubules
   c. Collecting duct cells
   d. Loop of henle
3. **The most common site of RCC metastasis is ?**
   a. Lung
   b. Bone
   c. Liver
   d. Brain
4. **The most important prognostic factor in patients with metastatic RCC is ?**
   a. Age
   b. Kidneys Performance status
   c. Gender
   d. Patient physical activity
5. **Which of the following paraneoplastic manifestation can be managed by medication?**
   a. Pyrexia
   b. Hypertension
   c. Hypercalcemia
   d. Polycythemia
6. **The most common bladder carcinoma is ?**
   a. Squamous carcinoma
   b. Transitional cell carcinoma
   c. Adenocarcinoma
   d. Columnar cell carcinoma
7. **Which of the following is the most common etiological factor for bladder tumors?**
   a. Occupational exposure
   b. Cigarette smoking
   c. Alcohol intake
   d. Analgesic abuse
8. **Malignant prostate tumors usually arise from which zone of the gland?**
   a. Transitional zone
   b. Peripheral zone
   c. Central zone
   d. A and B



1-B, 2-B, 3-A, 4-B, 5-C, 6-B, 7-B, 8-B

Quiz

9. A 29-year-old man with no past medical history presents to a urologist after 2 years of unsuccessful attempts at conceiving a child. The man states that his wife is 24 years old and has no medical problems. She was evaluated for infertility by a gynecologist, and no abnormalities were found. The man has no history of sexually transmitted disease or urologic diseases. Physical examination reveals a tall man with long legs who appears younger than his stated age. He has minimal facial hair and a slightful fullness to his breasts bilaterally. The patient's testicles are 2.2 cm long and firm. A semen sample is obtained, which shows no sperm. For what disease is this man at increased risk?

a. Germ cell tumor
b. Paraphimosis
c. Peyronie's disease
d. Renal cell carcinoma
e. Transitional cell carcinoma

10. A 28-year-old man presents to the clinic complaining of heaviness in his testicle for 2 weeks. He says he feels as though his testicles are enlarged. The man has temperature of 37.2 C (98.9 F), heart rate of 60/min, and blood pressure of 115/70 mm Hg. He has a normal abdominal examination with no palpable masses. The right testicle is noticeably larger than the left testicle. There are no discrete nodules. Testicular ultrasound is performed, followed by an orchiectomy. He is found to have a seminoma and a retroperitoneal lymph node that is enlarged at 1.8 cm. He is given a diagnosis of stage IIA testicular seminoma (T2N10M0). What additional treatment is needed?

a. Contralateral orchiectomy
b. Platinum-based chemotherapy and bilateral orchiectomy
c. Prophylactic mediastinal radiation
d. Retroperitoneal lymph node dissection
e. Retroperitoneal radiation

9-A, 10-E