Common urogenital tumors

Objectives:

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

- Definition
- Classification
- Clinical presentation
- Investigation
- management

Resources:

- Davidson.
- Slides.
- Surgical recall.
- Raslan's notes.

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[Color index | Important | Notes | Extra]

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Once you stop learning
you start dying.

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	**Renal cell carcinomas**: 1. **Clear cell renal cell carcinoma** (most common) 2. Papillary renal cell carcinoma (collecting duct) aggressive 3. Chromophobe renal cell carcinoma. 4. Transitional cell carcinoma. 5. Wilms tumor (nephroblastoma) "anaplastic"

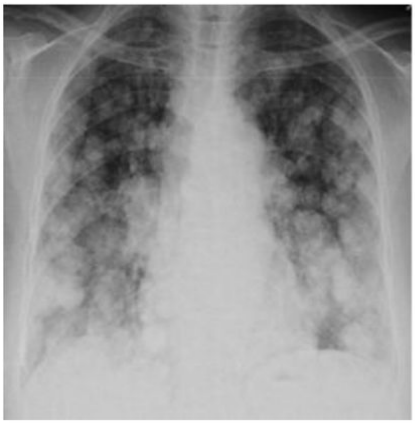
if you see any complex cyst always consider it as a malignant until proven otherwise

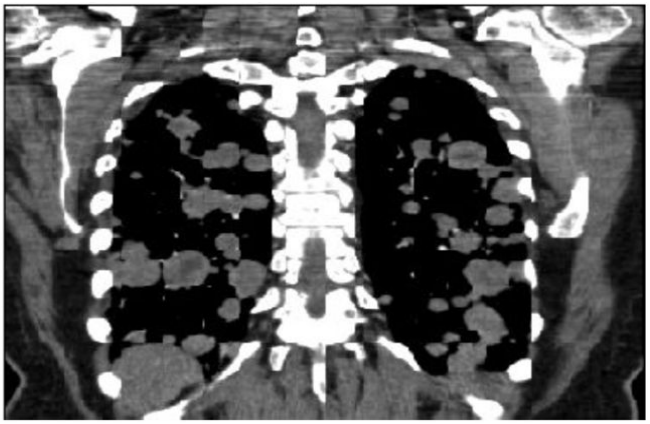
- All renal neoplasms should be regarded as potentially malignant until proven otherwise.
- Renal cell carcinomas arise from the proximal tubule cells. Usually invade different parts of one kidney or even both, this is important when you're considering nephrectomy, radical or partial
- · Male:Female ratio is 2:1. The patients are usually 40 years of age or over.
- · Increased incidence seen in **Von Hipple-Lindau syndrome**[1].
- · It may be associated with familial conditions such as tuberous sclerosis.

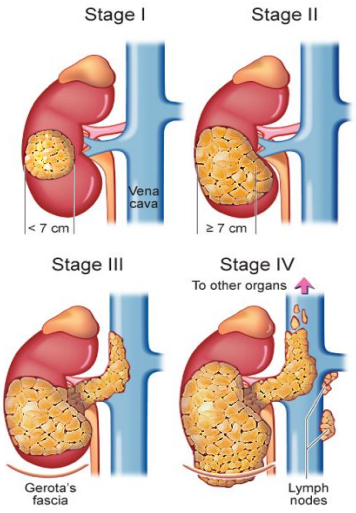
Metastases:

- **Blood** borne spread e.g. Lungs can result in '**Cannon ball**' 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.
- Route of spreading: Pathological may extend into renal vein & inferior vena cava. TNM staging system (see the picture in the next page).
- Up to the heart through thrombus from tumor > renal vein > IVC > left atrium.
- 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.

Cannon Ball' (well circumscribed and multiple) Pulmonary Metastases (most common site)
(seen in patients with a history of RCC and choriocarcinoma.)







[1] 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

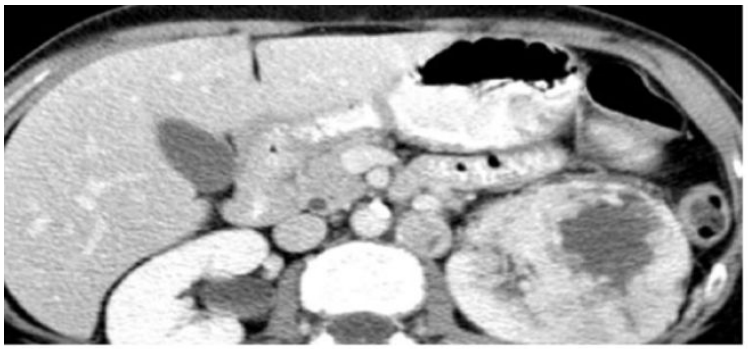
Clinical features:

- 10% present with old **classic triad** of: (It is usually a sign of advanced disease)
- Hematuria, Loin pain & a mass. pts present with microscopic hematuria, usually followed by US & CT for further investigation.
- pts can also present with metastatic symptoms (depend on which organ)
- Other presentations include (**paraneoplastic syndrome**-PNS) "Renal cancer is one of the most common cause of PNS." Which include:
    - Pyrexia (fever) of unknown origin, hypertension (renin production)
    - Stauffer's syndrome[2] (abnormal liver enzymes)
    - Polycythemia due to erythropoietin production.
    - Cushing syndrome, hypercalciuria & SIADH.
    - Hypercalcemia due to production of a PTH-like hormone (can be managed medically).
    - Treatment of PNS is usually nephrectomy.

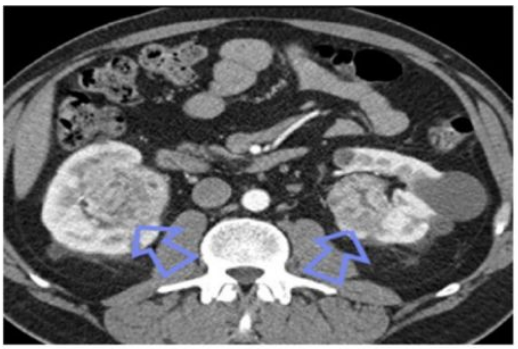
Investigation:

- Diagnosis can often be confirmed by **renal ultrasound** diagnostic purpose.
- 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.
- **CT scanning** with contrast allows assessment of renal vein and caval spread (to operate) (**the investigation of choice**) it is also used for staging & confirmatory purpose, also used to know the anatomy in case of surgical intervention
- Echocardiogram should be considered when you suspect a thrombus in the IVC extending above diaphragm.
- Staging of kidney tumor includes: 1/CT 2/pathology 3/grading system for kidney cancer is called fuhrman system (see the picture above).

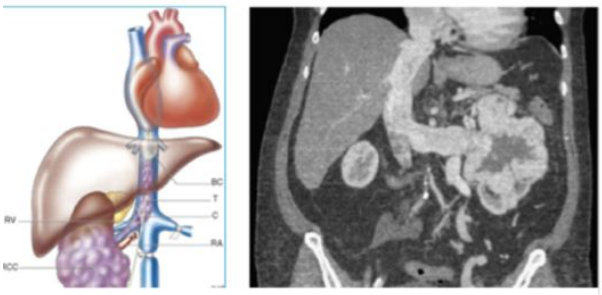
RCC with IVC thrombus:



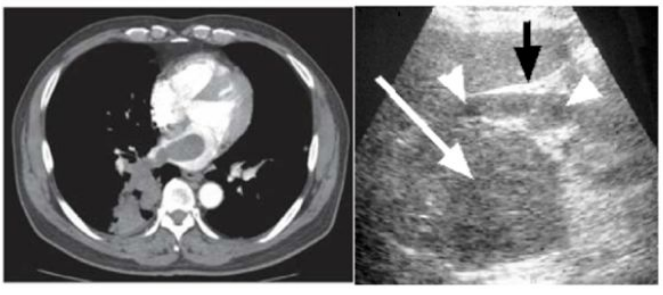
Tumor with central necrosis (Chromophobe)



CT of a bilateral RCC



RCC with IVC thrombus
Reach above liver level 3



CT and Echocardiogram of a
thrombus in the right atrium

[2] is a constellation of signs and symptoms of liver dysfunction that arise due to presence of renal cell carcinoma (metastases),

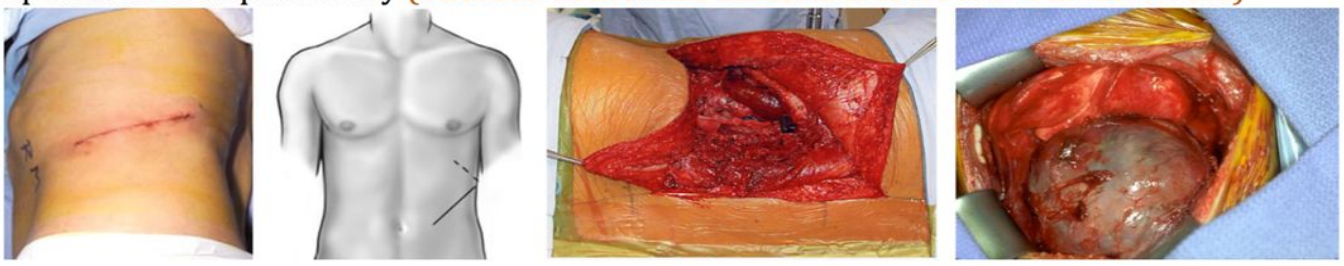
Management: when you're going with nephrectomy make sure pt has another existing kidney that is **functioning** well.

- Unless extensive metastatic disease it invariably involves surgery.
- Bilateral RCC → do partial nephrectomy and follow up.
- Surgical options usually involve a radical nephrectomy.
- RCC is not sensitive to chemo & radiotherapy, if metastasized use immunotherapy, if not, use nephrectomy.
- Kidney approached through either:
    - Transabdominal (subcostal) for **better** anterior **access,** painful.
    - Loin (flank) incision is Better for recovery but less access for vessels.
- **Renal vein ligated** early to reduce tumor propagation: Ligate the Artery first then the vein, but do it very fast. As an indication to ligate the vein, but when you're removing the kidney **you should cut the artery first**, otherwise the kidney will get congested. You touch it it will bleed.
- Kidney and adjacent tissue (especially adrenal, **perinephric fat**) excised.
- Removal of the Paraortic 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.

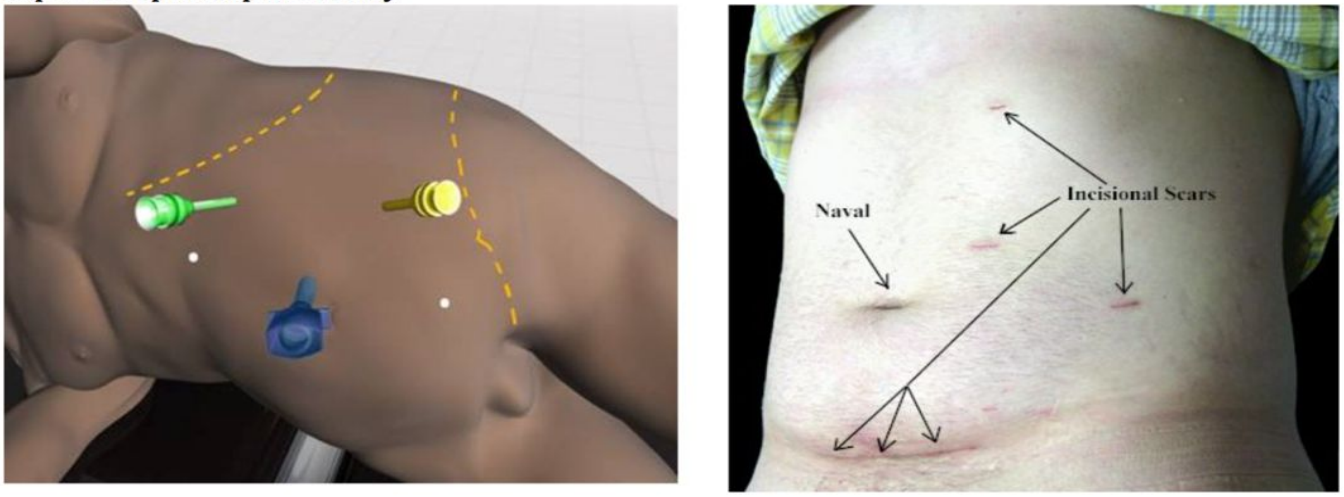
Prognosis:

1- **Early stage:** 5 years survival is 95%.
2- **Metastatic disease:** 3-6 m average survival.

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



Laparoscopic Nephrectomy

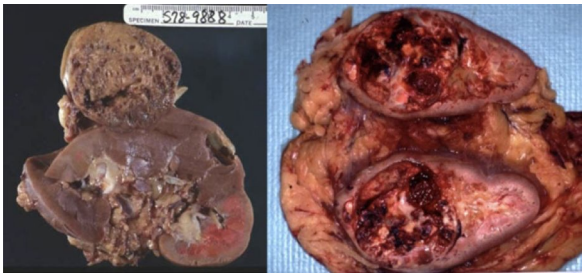


* Why should it be big incision? Bc u wanna take the whole tumor out (don't wanna cut it) to send it to the lab to **stage** it.

Clear cell renal cell carcinoma (CCRCC)

Is typically a solitary tumor. The 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.

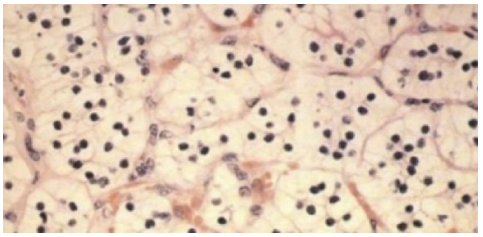
1st pic: the partial nephrectomy is a good decision.
2nd pic: partial resection is not recommended.



Microscopic CRCC

Typical histological appearance of clear cell renal cell carcinoma on hematoxylin and eosin stain, showing nests of epithelial cells with clear cytoplasm and a distinct cell membrane, separated by a delicate branching network of vascular tissue.

- There is abundant cytoplasm.

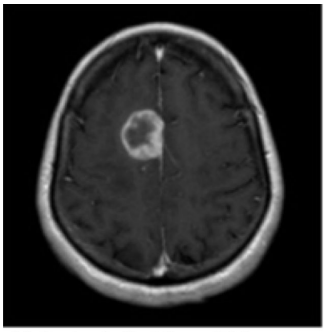


Metastasis management:

- 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). infliximab and interleukin 2 very effective but bad side effect and interferon gamma 2nd line.

MCQs! What is recommended for pt with multiple metastatic?
→ Immunotherapy!

- If young (44yrs) → more likely this metastatic caused by kidney tumor.
- If old pt (70-80 yrs) → more likely this metastatic caused by prostate tumor.



Metastasis first from **kidney** or second from prostate

Recall:

What is renal tumors?
Most common solid renal tumor 90%, originates from proximal renal tubular epithelium.
What is epidemiology?
Primarily tumor of adults 40-60 y with a 3-1 male-female ratio, 5%of cancers overall in adults.
What percentage of tumors are bilateral ?
1%
What are the risk factor?
Male sex, tobacco, von Hippel-Lindau syndrome, polycystic kidney.
What are the symptoms?
Pain (40%), hematuria (35%), weight loss (35%) flank mass (25%), HTN (20)
What is the classic TRIAD of renal cell carcinoma ?
Flank pain, hematuria, palpable mass
How are most cases diagnosed these days?
Found incidentally on an imaging study (CT, MRI, U\S) for another reason

What radiologic tests are performed?

- IVP
- Abdominal CT scan with contrast.

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 , positive regional lymph node but<2 cm, no metastases .
- **Stage IV ;** distant metastasis or positive lymph nodes > 2 cm, or tumor extends past Gerotas 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 syndrome of RCC & liver disease?

Stauffer's syndrome

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. now it's called UC (urothelial cancer)
- 5% are squamous carcinoma (found in a urothelium that has undergone metaplasia, usually due to chronic inflammation or irritation e.g. stone or schistosomiasis)
    - In Egypt the **squamous cell carcinoma is the most common** due to **schistosomiasis**.
- 2% are adenocarcinomas. Due to congenital fistula developed in the dome of bladder.

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:
    - 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.
    - 50% have muscle invasion at time of presentation
    - Associated with poor prognosis.

Etiological factors:

- Occupational exposure (Rubber and asbestos) painters, such as naphthylamine and benzidine
- 20% of transitional cell carcinomas are believed to result from occupational factors
- Chemical implicated - aniline dyes, chlorinated hydrocarbons.
- Cigarette **smoking**.
- Analgesic abuse e.g. phenacetin no longer used
- Pelvic irradiation - for carcinoma of the cervix
- **Lynch syndrome**: main colon cancer but affect bladder and both kidneys
- Schistosoma haematobium associated with increased risk of squamous carcinoma.

Presentation:

- 80% present with **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.
- Also may present with treatment-resistant infection or bladder irritability and sterile pyuria. (sterile: WBCs without organism, it might caused by stones, bladder tumors & TB!)
- Timing of hematuria:
  1- Initial hematuria → urethral causes.
  2- Terminal hematuria → Bladder neck problems
  3- Total hematuria(persistence of blood throughout micturation) → Upper UTI, rest of bladder or pre-renal causes.
- Men usually comes with a sign of urine flow obstruction +/- bleeding.

Investigation:

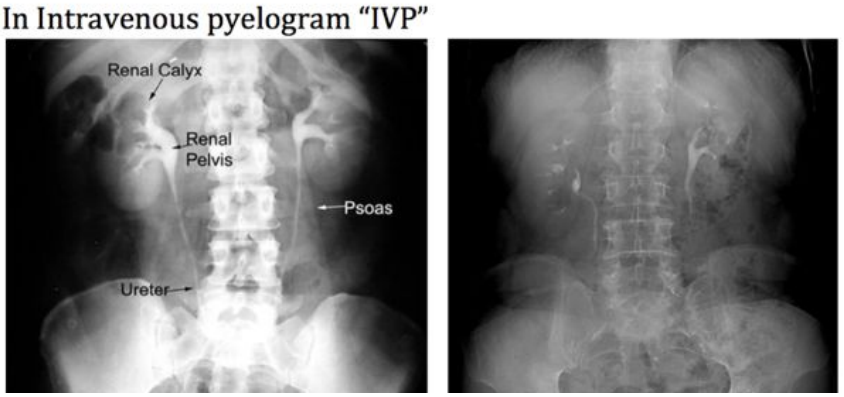
Microscopic hematuria: 3 or more red blood cells in the urine.
More than 2 cells \ high power field in at least 2 or 3 properly collected sample.

- **work up of bladder tumors:**
  - History
  - Physical exam usually unhelpful
  - Ultrasound or CT to assess the upper tract
  - Cystoscopy
  - Urine cytology looking for malignant cells
- **In the case of gross hematuria:** US is not enough. Do CT and CTU.
- **Investigation of Painless Hematuria:**
  - Urinalysis: MSSU[3]
  - Ultrasound - bladder and kidneys
  - KUB - to exclude urinary tract calcification
  - **Cystoscopy** (we can see the tumor in its initial level (carcinoma in-situ), this is not applicable in other imaging modalities)
  - Urine Cytology +ve due to shed of cells as it go out.

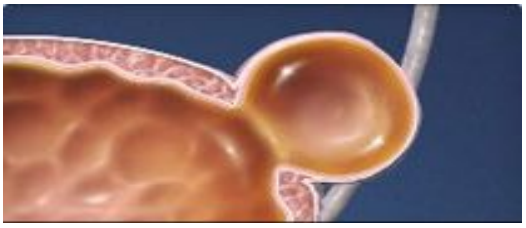
[3] mid stream sample of urine



Consider IVU-CT scan if no pathology identified > Shows filling defect or hydronephrosis due to ureteral obstruction > a bad sign.



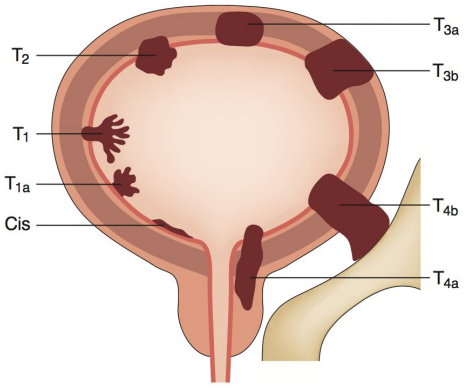
- **Bladder Diverticulum:**
  - It is an outpouching of bladder wall characterized by the absence of the muscular layer. If a tumor develops on it, there will be no T2 stage (check the staging system in the next page). Thus, it goes from T1 to T3 directly > Causing urine stagnation > chronic irritation.



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
    - Tis → In-situ disease.
    - Ta → epithelium only.
    - T1 → Lamina propria invasion.
  - Invasive
    - T2 → superficial muscle invasion.
    - T3a → Deep muscle invasion.
    - T3b → Pericesical fat invasion.
    - T4 → prostate or contiguous muscle.

Grade of Tumor: nowadays its differentiated only into high and low grade

- G1 > well differentiated.
- G2 > Moderately differentiated.
- G3 > Poorly differentiated.

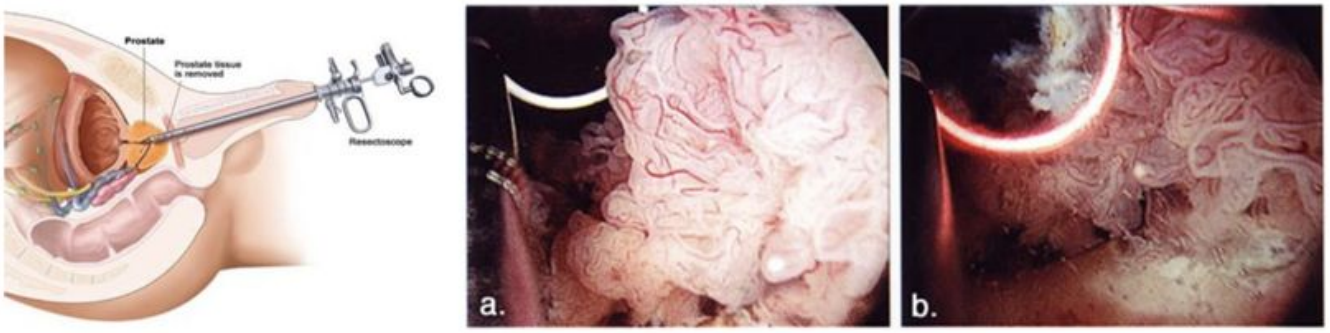
Treatment:

- **Carcinoma in-situ:**
- it's an aggressive disease (behave like invasive)
- Often associated with positive cytology
- 50% patients progress to muscle invasion high grade
- Consider **immunotherapy** (BCG 6 weeks of reduction then 3 weeks) in case of bladder cancer we use chemotherapy & immunotherapy agent, inject them intravesically and keep them in the bladder for an hour at least.
- Didn't work? > patient may need radical cystectomy.

Bladder carcinomas superficial TCC:

- Requires transurethral resection and regular cystoscopic follow-up
- Consider prophylactic chemotherapy (intravesical) if risk factor for recurrence or invasion (e.g. high grade). We need to make sure if it reaches the muscle or not
- 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. BCGiosis and sepsis. Any pt has clear evidence of bladder tumor, give intravascular chemotherapy.

Transurethral Resection of Bladder Tumor (TURBT)



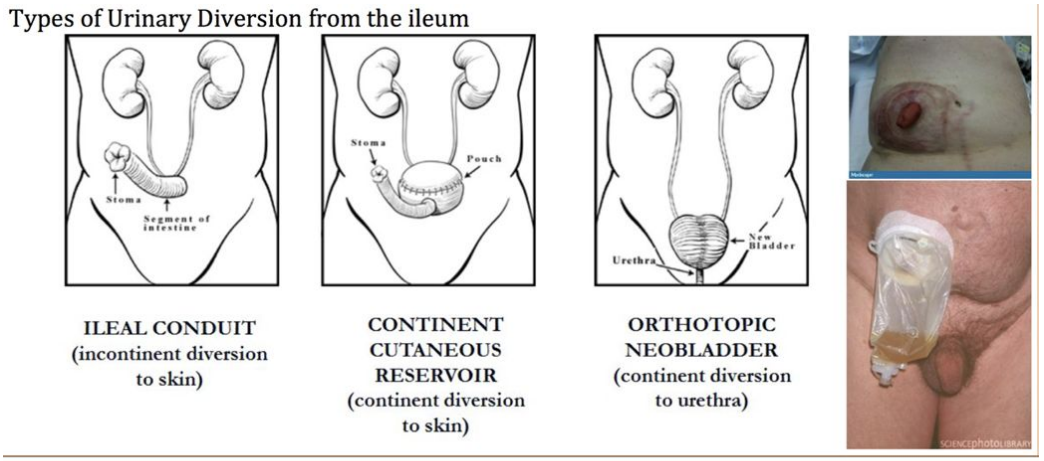
Invasive TCC:

- Radical **cystectomy** has an operative mortality of about 5%
- Non continent Urinary diversion achieved by:
  - **Ileal** conduit (it has the least absorption ability, we dissect 20cm proximal to cecum)
  - Neo-bladder
- Continent urinary diversion is achieved by: cutaneous reservoir
- Local recurrence rates after surgery are approximately 15% and after radiotherapy alone 50%. (= surgery is the main tx unless there is metastsatic)
- 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.

1- **Ileal conduit** → Part of ilium is taken out, ureters anastomosed with each other, Urine will leak through this conduit (urination is not controlled).
The 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.



- ما يشيلون الileum كله! ليه؟ لأن امتصاص vit. B12 يحدث هنا.. فيستخدمون جزء منه فقط.

Ureterostomy is not done any more do to complications like infections.

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 perivesisical 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.
- Rare before the age of 50 years.
- Found at post-mortem in 50% of men older than 80 years > Will not kill the pt
- 5-10% of operation for benign disease reveal unsuspected prostate cancer.
- The tumors are **adenocarcinomas:**
  - Arise in the peripheral zone of the gland
  - 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 G6-G10 is a high risk cancer.

Clinical feature:

Majority nowadays are picked up by screening (usually they don't produce urinary symptoms early in the course).

- 10% are incidental findings at TURP.
- Remainder present with bone pain, cord compression or leuco-erythroblastic anaemia
- Renal failure can occur due to bilateral ureteric obstruction.
- Most pts 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**

- 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.
- 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
- >10 ng/ml is highly suggestive of prostatic carcinoma (CT and bone scan to find metastasis)
- 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!

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 - watchful waiting
- < 74 - active surveillance, to catch the cancer.
- Radical radiotherapy
- Radical prostatectomy

Locally advanced disease:
- Radical radiotherapy
- Hormonal therapy

Metastatic disease:
- Hormonal therapy (Androgen depletion therapy)

Hormonal therapy:

- 80-90% of prostate cancers are androgen dependent for their growth
- Hormonal therapy involves androgen depletion
- 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 orchidectomy
    - LHRH agonists - goseraline (You need to give anti androgen before LHRH to prevent flare)
    - Anti-androgens - cyproterone acetate, flutamide, Biclutamide
    - Complete androgen blockade. (can be done by several medications, anti-fungal might be one of them)

EBRT → used for prostate especially for low & intermediate risk.

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 deferential.

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

Testicular tumors

- Most common presentation: testicular swelling on the side of the scrotum.
- Most common malignancy in young men. Peak age is 31 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 and testicular torsion**, Infertility, personal hx & family history.

Classification:

- Seminomas (~50%)
- Non-Seminoma (~50%)
    - Teratomas
    - Yolk sac tumors
    - Embryonal
    - Mixed Germ cell tumor

Investigation:

- Diagnosis can often be confirmed by **testicular ultrasound** here it's the opposite
- Pathological diagnosis made by performing an inguinal orchiectomy. Why not through the scrotum? Bc they are abdominal organ not extra-abdominal. Their lymphatics and vasculature are in the abdomen.
- Disease can be staged by thoraco-**abdominal CT scanning** (used also to asses staging)

Tumor markers are useful in staging and assessing response to treatment:

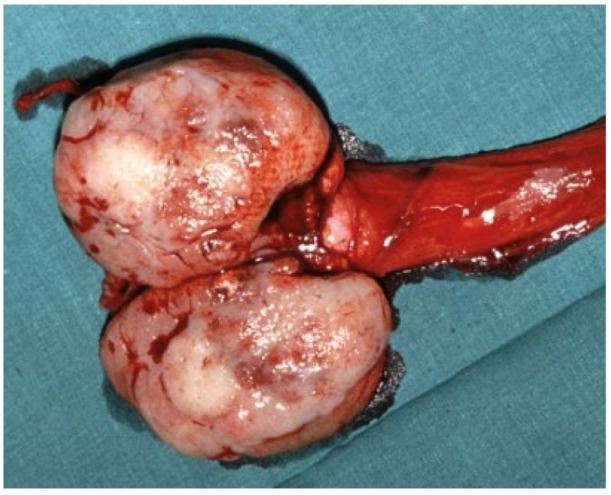
Alpha-fetoprotein	beta HCG	LDH
Produced by yolk sac elements Not produced by seminomas	Produced by trophoblastic elements Elevated levels seen in both teratomas and seminoma	Not specific

Stages:

- I > Disease confined to **testis**
- IM > Rising post-orchidectomy tumour marker
- II > Abdominal lymphadenopathy:
    - A < 2 cm
    - B 2-5 cm
    - C > 5 cm
- III > Supra-diaphragmatic disease

Seminomas

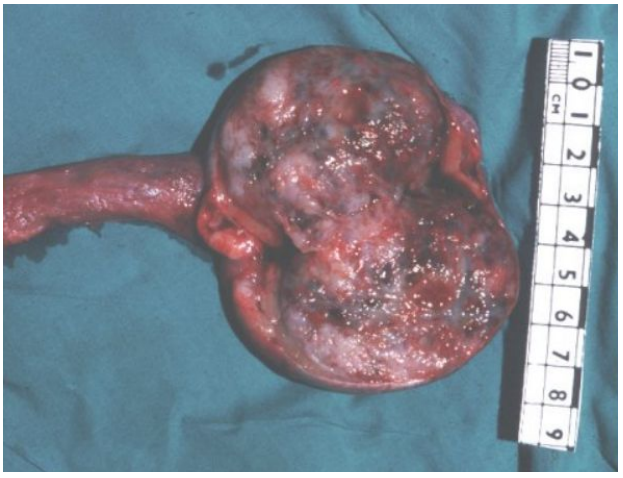
- Seminomas are **radiosensitive**
- The overall cure rate for all stages of seminoma is approximately 90%.
- Stage I and II disease treated by inguinal **orchidectomy** plus **Radiotherapy** to ipsilateral abdominal & pelvic nodes ('Dog leg') or Surveillance. The 1st thing to do in radical Orchiectomy is to identify the the cord & ligate it.
- Stage IIC and above treated with chemotherapy.



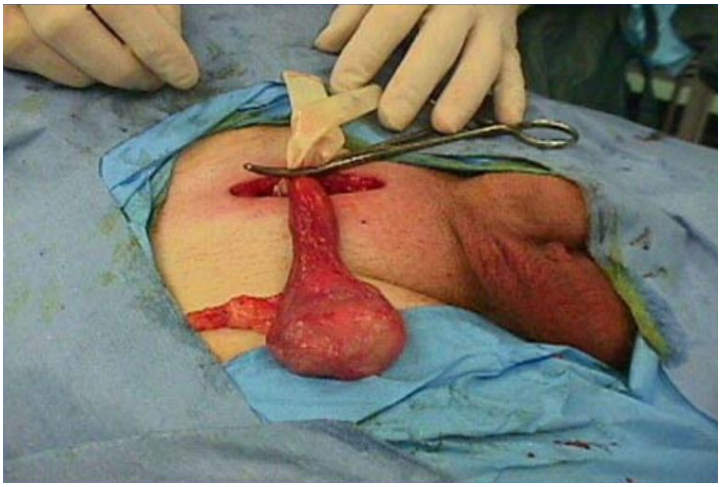
This pic will come in the exam!
Why is this seminoma?
1- Seminoma usually **white**.
2- Seminoma is the **commonest.**

Non-Seminoma

- Non-Seminoma are **not radiosensitive**.
- Stage I disease treated by orchidectomy and **surveillance** Vs **RPLVD** retroperitoneal lymph node dissection. Vs **Chemo**
- **Chemotherapy** (BEP = Bleomycin (ADRs: pulmonary fibrosis), Etopiside, Cisplatin) given to:
  - Stage I patients who relapse
  - Metastatic disease at presentation
- If you have semi and non-semi treat as nonsemi because more aggressive



Remember: Orchiectomy is done through the groin not scrotum.



Recall:

What is testicular tumors claim to fame?
Most common solid tumor of young adult males (20-40 yrs)
What are the risk factors ?
Cryptorchidism
What are the symptoms ?
Painless lump, swelling,
What are the tumor markers ?

- B-HCG = choriocarcinoma and embryonal , rarly in pure seminomas
- AFP = embryonal and yolk sac tumors , nonseminomatous

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
- **Nongerminal :**
  - 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.