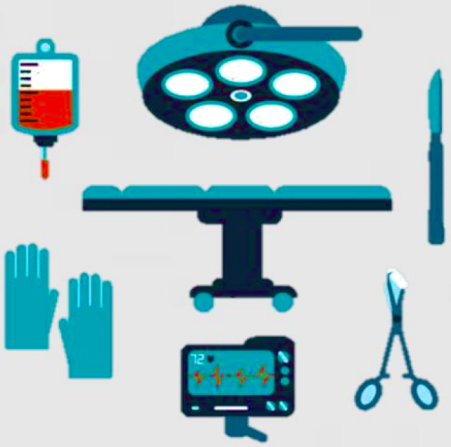

Common Urogenital Tumors

Objectives:

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

These topics you have to know about them, including adrenal tumor especially pheochromocytoma

- Definition
- Classification
- Clinical presentation
- Investigation
- management

Resources:

- Davidson's.
- 436 doctors slides.
- Surgical recall.
- 435' team work

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Color Index:

Notes , Important , Extra , Davidson's

Editing File

Feedback

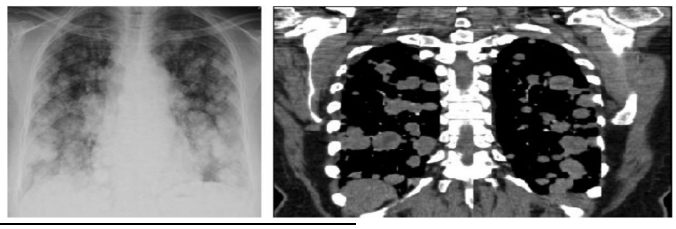
Renal Tumors Helpful video

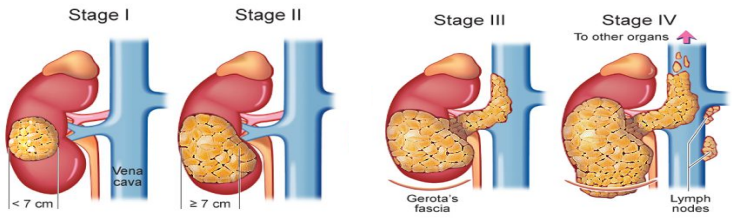
Benign (Rare)	Malignant
1. Oncocytoma (**the most common**): On CT it shows an enhancement & central necrosis like Chromophobe renal cell carcinoma. 2. Angiomyolipoma	**Renal cell carcinomas:** 1. **Clear cell renal cell carcinoma** (most common) **(IMPORTANT).** 2. Papillary renal cell carcinoma (collecting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

- Most of renal tumors are **malignant (IMPORTANT).** 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 **(IMPORTANT).**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[1]. So the first step when diagnose this condition is to screen the whole family. It is genetically determined. At chromosome 3p25-26
- It may be associated with familial conditions such as tuberous sclerosis.

Metastases:

- 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.
- Route of spreading: Pathological may extend into renal vein & inferior vena cava.TNM staging system.
- 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). (picture below)





[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

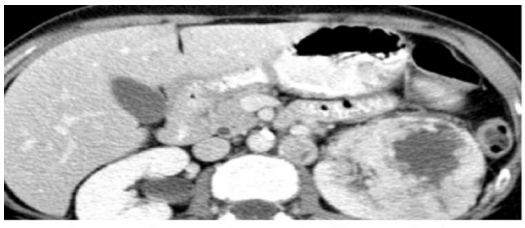
Clinical features:

- 10% present with old classic triad of: Hematuria, Loin pain & a mass. Patients present with microscopic hematuria, usually followed by US & CT for further investigation.They can also present with metastatic symptoms (depend on which organ)
  It is a late sign unfortunately.
- Other presentations include (paraneoplastic syndrome-PNS) **(IMPORTANT).** "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] stauffer's syndrome is by definition, a NON metastatic manifestation of the tumor on the liver (non metastatic liver dysfunction) .
  - 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) **(IMPORTANT).** . The other (hypertension, fever and abnormal liver test) no matter what do you do they will not disappear until you remove the tumor itself)
  - Treatment of PNS is usually nephrectomy.

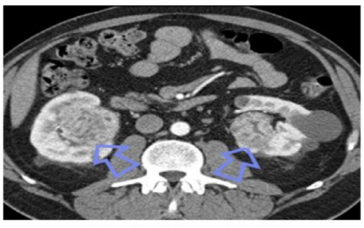
Investigation:

- 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.
- 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.
- **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,
- 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

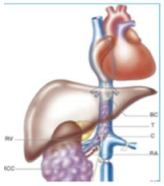
RCC with IVC thrombus:

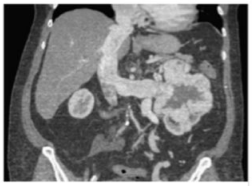


Tumor with central necrosis (Chromophobe)

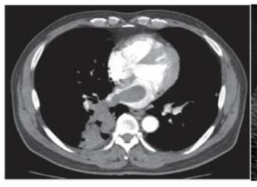


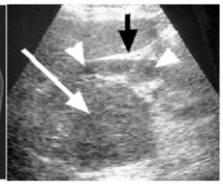
CT of a bilateral RCC





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,

Management:

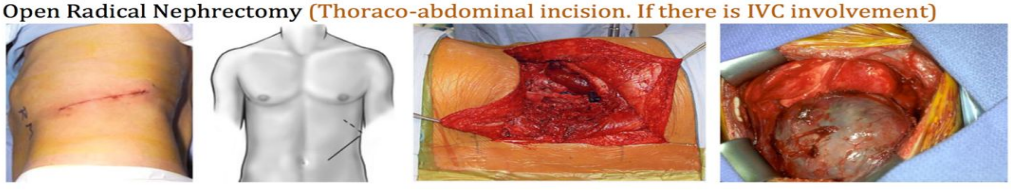
- Unless extensive metastatic disease it invariably involves surgery.
- Bilateral RCC → do partial nephrectomy and follow up. could be genetic or familial.
- Surgical options usually involve a radical nephrectomy. The simple nephrectomy for benign condition such stone, nonfunctional kidney or infection, we remove only the kidney. While the radical nephrectomy we remove the kidney and everything surrounding it such adrenal gland, fascia and lymph nodes and the ureter.
- RCC is not sensitive to chemo & radiotherapy, if it metastasizes use immunotherapy, if not perform 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 (adrenal, **perinephric fat**) excised.
- 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.
- when you're going with nephrectomy make sure pt has another existing kidney that is functioning well.
- Never cut the tumor into pieces while operating. Why? Because it will spread, so you have to remove it as one piece.

Prognosis:

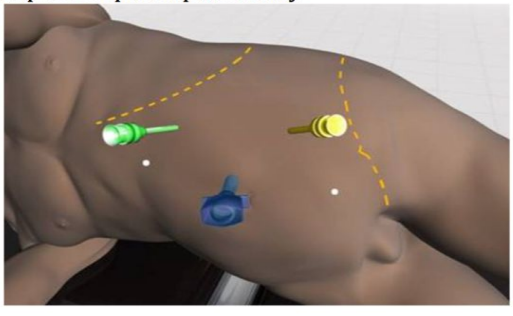
1- **Early stage:** 5 years survival is 95%.
2- **Metastatic disease:** 3-6 m average survival.

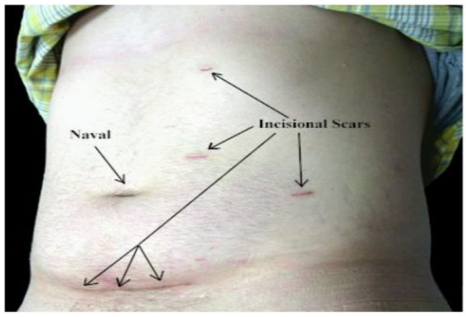
The most important prognostic factor in patients with metastatic renal cell carcinoma is kidneys Performance status

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



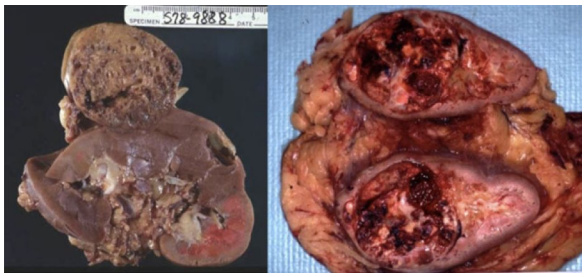
Laparoscopic Nephrectomy





* Why should it be big incision? Because we 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.

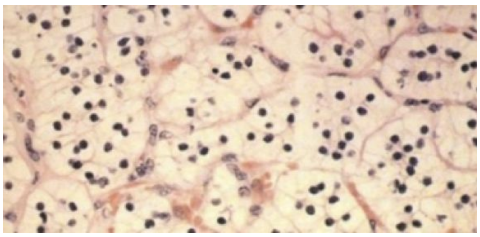
Commonly arise from proximal convoluted tubules.

In gross pathology, it is always well-circumscribed, inside the kidney not outside with golden fat deposit which is a characteristic for CCRCC

Picture on the right :the partial nephrectomy is a good decision.(CCRCC)

Picture on the left : (Chromophobe is other type of renal tumor). Which all grey tan and outside of the capsule. Partial resection is not recommended.

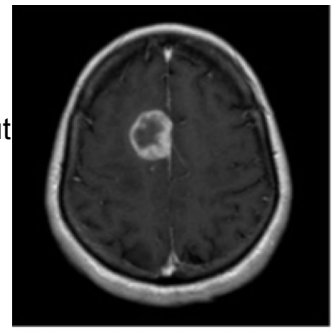
Microscopic CRCC:



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.

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). Can help to extend the survival but not cured the patient. infliximab and interleukin 2 very effective but bad side effect and interferon gamma 2nd line.



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

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.

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 Helpful video

Classification:

- 90% are Transitional Cell Carcinomas **(TCCs) (IMPORTANT).** 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 (DEEP).
    - 50% have muscle invasion at time of presentation
    - Associated with poor prognosis.

Etiological factors (EXTREMELY IMPORTANT) MCQs!!

- Occupational exposure (Rubber and asbestos)
- 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 or colorectal.
- **Lynch syndrome**: main colon cancer but affect bladder and both kidneys
- Schistosoma haematobium associated with increased risk of squamous carcinoma.
- Other risks for Squamous cell carcinoma is : prolonged catheterization, infections which causes chronic irritation.

Presentation:

- 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.
- 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!)
- 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:

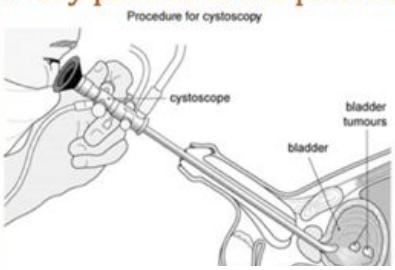
Microscopic hematuria: 3 or more red blood cells in the urine.

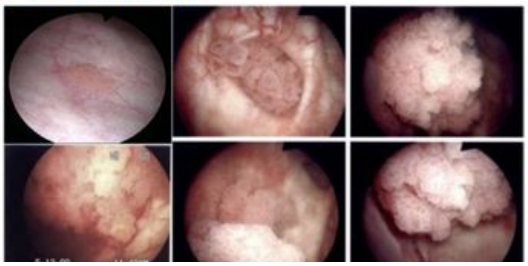
- **work up of bladder tumors:**
  - History
  - Physical exam usually unhelpful
  - Ultrasound or CT to assess the upper tract
  - Cystoscopy
  - Urine cytology looking for malignant cells

- **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.

- Consider IVU-CT scan if no pathology identified > Shows filling defect or if it is big enough it may occlud the pelvic drainage of the kidney and lead to hydronephrosis due to ureteral obstruction > a bad sign.

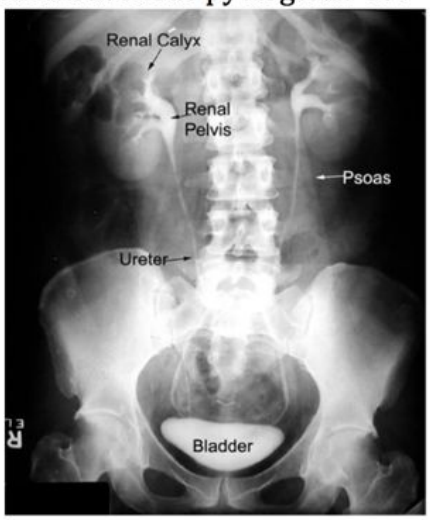
Cystoscopy better vision but very painful to the patient if he is awake

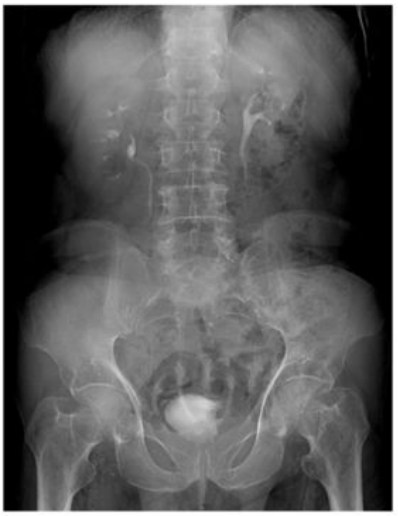




This Picture could come in the exam and we can ask you to describe what you see.

In Intravenous pyelogram "IVP"

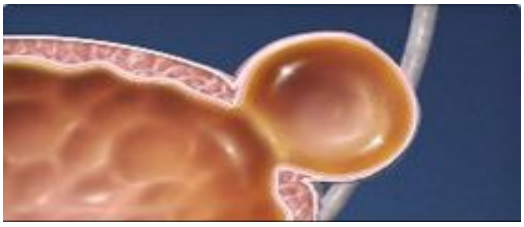




This is a **normal IVP** which shows the renal calyces, unblunted renal pelvis on both sides, we can see the ureters also, normal bladder and there is no filling defect.

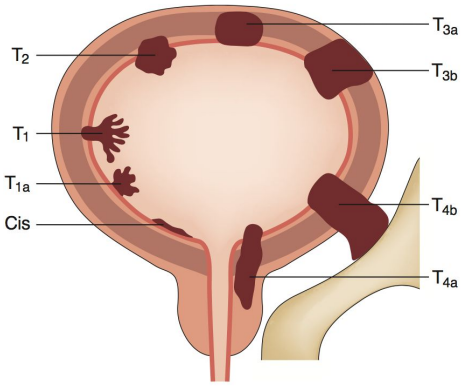
[3] mid stream sample of urine

- **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 it's differentiated only into high and low grade

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

Treatment:

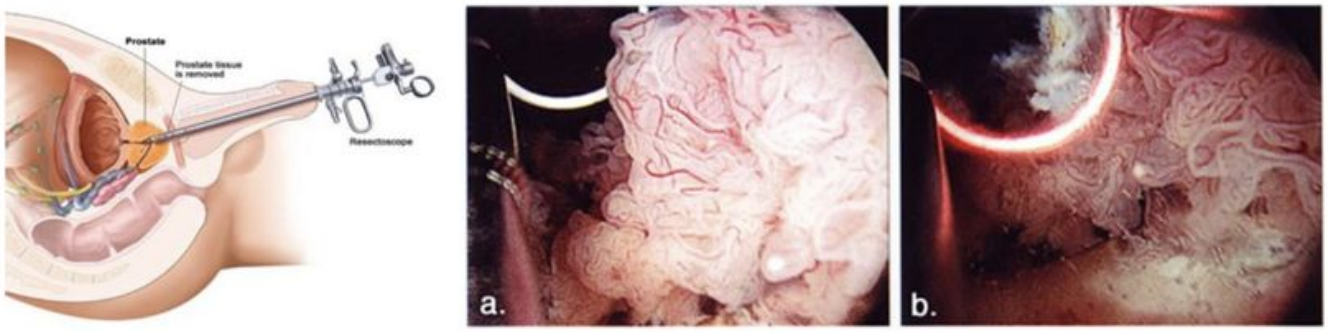
1. Carcinoma in-situ:

- it's an aggressive disease, we should treat it aggressively **(IMPORTANT)**.
- Often associated with positive cytology
- 50% patients progress to muscle invasion high grade
- Consider immunotherapy (BCG 6 weeks of reduction then 3 weeks)
- Didn't work? > patient may need radical cystectomy.

2. Bladder carcinomas superficial TCC:

- 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.

Transurethral Resection of Bladder Tumor (TURBT)



3. Invasive TCC:

- Radical **cystectomy** has an operative mortality of about 5%. In male we remove the bladder with prostate, seminal vesicle, distal part of ureter and proximal urethra. In female bladder with uterus, cervix and upper third of vagina.
- 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.

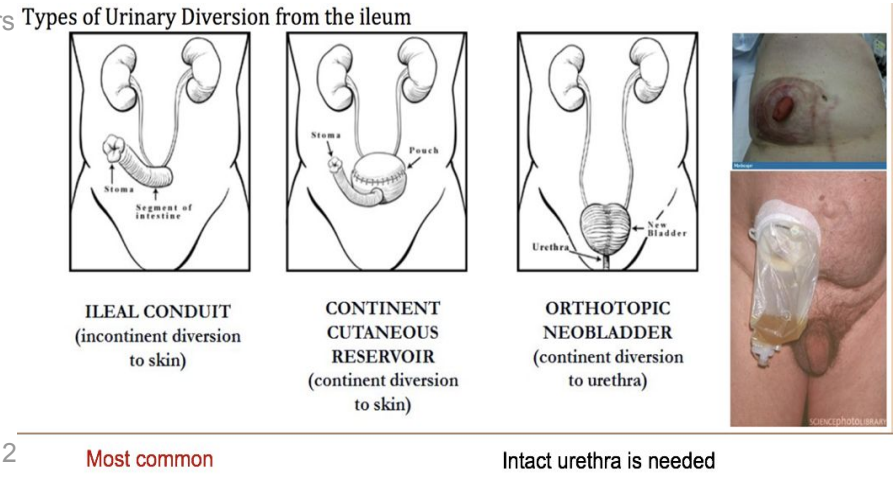
Complication of urinary diversion: Infection, Stones, metabolic abnormality, growth retardation in kids, renal failure, hydronephrosis. It may lead to transformation into other type of cancer if it is connected to rectum due to chronic irritation.

1- **Ileal conduit** → Part of ilium is taken out, ureters anastomosed with each other, Urine will leak through this conduit (urination is not 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 ال ileum 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 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 Helpful Video

- The **most common malignancy of male** urogenital tract. In western country is the third most common cancer after lung and colorectal, in SA 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** > Will not kill the pt.
  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 (IMPORTANT):**
  - 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 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 (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)
- 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:		
Local disease	**Locally advanced disease**	**Metastatic disease**
• Observation : ➔ 75 – watchful waiting ➔ < 74 Active surveillance, to catch the cancer. • Radical radiotherapy. • Radical Prostatectomy: may lead to infertility and sometime erectile dysfunction because the nerve response for erection it goes parallel to the capsule of prostate.	• Radical radiotherapy • Hormonal therapy	• Hormonal therapy (Androgen depletion therapy) Does not cure but controls it.

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 orchiectomy
    - LHRH agonists - goseraline (You need to give antiandrogen 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 (External beam radiation therapy) → 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: PAINLESS 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 (IMPORTANT), testicular Maldescent, Klinefelter's syndrome** (47XXY) **and testicular torsion**.
- Tumor of young male → testicular and it is curable if you detect it early.
- Tumor in old male → Prostate.

Classification:

- Seminomas (~50%)
- 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**

Tumor markers :

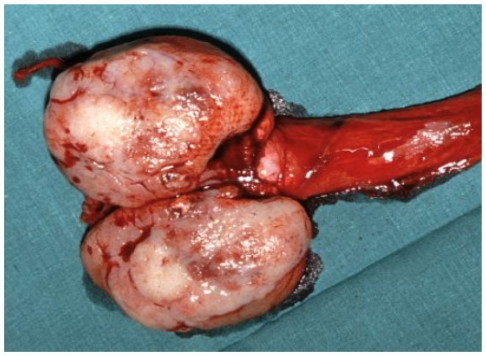
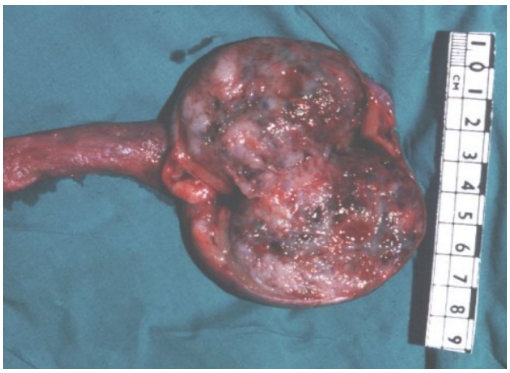
- useful in staging and assessing response to treatment.
- If they are elevated means there is cancer, but if they are normal DON'T exclude cancer.

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-orchiectomy tumour marker
- II > Abdominal lymphadenopathy:
  - A < 2 cm
  - B 2-5 cm
  - C > 5 cm
- III > Supradiaphragmatic disease.

Treatment: Helpful video

Seminomas	Non-Seminoma
• Seminomas are radiosensitive for metastatic not for local disease. For local always treatment is surgery. **Without biopsy.** • The overall cure rate for all stages of seminoma is approximately 90%. • Stage I and II disease treated by inguinal orchiectomy 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.**	1. Non-Seminoma are **not radiosensitive**. 2. Stage I disease treated by orchiectomy and **surveillance** Vs **RPLVD** Vs **Chemo** 3. **Chemotherapy** (BEP = Bleomycin (ADRs: pulmonary fibrosis), Etoposide, Cisplatin) given to: a. Stage I patients who relapse b. Metastatic disease at presentation If you have seminoma and nonseminoma, treat it as **nonseminoma** because it is more aggressive. 

Remember: when you do an orchiectomy you open through the inguinal area (groin) **not the 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
- **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

(**Not** in the slides but the doctor said you should know about it)

- 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 and abdominal pain.
- Pallor, dilated pupils and tachycardia are prominent features.

Investigations

- All young hypertensive patients (age < 40 years) should be screened for a catecholamine-secreting tumour.
- Twenty- four hour or 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 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.
- 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 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 Bladder cancer?** Smoking
- Is **carcinoma in situ benign condition or malignant ?** it is malignant 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.

Summary

	Classifications	Clinical features	Investigations	Management
Renal tumors	- Benign (rare) -Malignant	-10% present with classic triad of: Hematuria, Loin pain & a mass. -Other presentations include paraneoplastic syndrome	- renal ultrasound. - CT scan allows assessment of renal vein and caval spread. -Echocardiogram when you suspect a thrombus in the IVC extending above diaphragm.	- Unless extensive metastatic disease it invariably involves surgery. - Surgical options usually involve a radical nephrectomy. - Renal vein ligated early to reduce tumor propagation. - Kidney and adjacent tissue (adrenal, perinephric fat) excised.
Bladder Tumors	-90% are Transitional Cell Carcinomas. -5% are squamous carcinoma -2% are adenocarcinomas	-80% present with painless hematuria. -Also may present with treatment-resistant infection or bladder irritability and sterile pyuria.	- Investigation of painless hematuria: →Urinalysis →Ultrasound of bladder and kidneys →KUB - to exclude urinary tract calcification →Cystoscopy →Urine Cytology -Consider IVU-CT scan	**1.Carcinoma in-situ:** Consider immunotherapy, if didn't work? → patient may need radical cystectomy. **2.Bladder carcinomas superficial TCC:** - Requires transurethral resection and regular cystoscopic follow-up. - Consider prophylactic chemotherapy. -Consider immunotherapy. **3.Invasive TCC:** -Radical cystectomy. -Pre-operative radiotherapy is no better than surgery alone. -Adjuvant chemotherapy may have a role.
Prostate Tumors	The tumors are adenocarcinomas	-10% are incidental findings at TURP. -Remainder present with bone pain, cord compression or leucoerythroblastic anemia. -Renal failure can occur due to bilateral ureteric obstruction.	1.Rectal examination with locally advanced tumors 2.Serum prostate specific antigen.	Treatment depends on stage of disease, patient's age and general fitness. Treatment options are: **Local disease:** -observation; -Radical radiotherapy; -Radical prostatectomy **Locally advanced disease:** -Radical radiotherapy; -Hormonal therapy **Metastatic disease:** -Hormonal therapy Hormonal therapy: -Hormonal therapy involves androgen depletion -Produces good palliation until tumours 'escape' from hormonal control
Testicular Tumors	-Seminomas -Non-Seminoma	Testicular swelling on the side of the scrotum.	-Diagnosis can often be confirmed by testicular ultrasound. - Pathological diagnosis made by performing an inguinal orchiectomy. -Disease can be staged by thoraco-abdominal CT scanning.	1.Seminomas are radiosensitive. 2.The overall cure rate for all stages of seminoma is approximately 90%. 3.Stage I and II disease treated by inguinal orchidectomy plus: Radiotherapy to ipsilateral abdominal & pelvic nodes ('Dog leg') or Surveillance. 4.Stage IIC and above treated with chemotherapy.

Questions

1) Which of the following is considered the most common malignant renal tumor?

A) Clear renal cell carcinoma
B) Papillary renal cell carcinoma
C) Transitional cell carcinoma
D) Oncocytoma

2) The most common site renal cell carcinoma arises from

A) Distal tubular cells
B) Proximal tubular cells
C) Collecting duct cells
D)Loop of Henle

3)When you see a mass in the kidney, most likely it is:

A) Benign
B) Malignant

4) Which of the following paraneoplastic manifestation can be managed by medication?

A) Pyrexia
B) Hypertension
C) Polycythemia
D) Hypercalcemia

5) A 65-year-old male presents with painless haematuria, loin pain. Ultrasound of the kidney revealed a large homogeneous solid mass in the right kidney, what is the best next step to evaluate the renal vein and metastasis?

A) CT-scan with contrast
B) MRI of the kidney
C)KUB X-ray
D) Kidney biopsy

6) Which of the following is recommended for the management of patients with multiple metastasis caused by renal cell carcinoma

A) Surgical excision of the tumor
B) Radiotherapy
C) Chemotherapy
D) Immunotherapy

7) The most common bladder carcinoma

A) Adenocarcinoma
B) Squamous carcinoma
C) Transitional cell carcinoma

8) Which of the following risk factors is specifically associated with squamous cell carcinoma of the bladder?

A) Schistosoma haematobium
B) Smoking
C) Occupational exposure
D) Radiation exposure

9) The most common presentation of testicular cancer

A) Haematuria
B) Painless testicular swelling on the side of the tumor
C) Painful testicular swelling on the side of the tumor
D) Dysuria

10) 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 slight 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

11) 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 testicle is enlarged. The man has a 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 (T2N1M0). 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

Answers:

1:A 2:B 3:B 4:D 5:A 6:D 7:C 8:A 9:B

10:A (Its Klinefelter syndrome which increases the risk of testicular cancer) 11:E (Seminomas are radiosensitive)