L17

Common genitourinary tract malignancy

Objectives:

- Discuss the renal tumors.
- Identify bladder tumor.
- Discuss the testicular cancer.
- Recognize prostate cancer.

Color index:

Main Text
Males slides
Females slides
Past notes
442 notes
Textbook
Important
Golden notes
Extra

Editing file

Important doctor's notes:

- **Dr: This lecture is high-yield, most likely you'll have it as MCQs or OSCE.**
- **Here you'll only find the questions mentioned by the doctor, other imp. notes are highlighted. You need to study the whole lecture.**
- **Dr: I want you to read about pheochromocytoma (click here).**

Renal (Kidney) Tumors:

- **True or false, most of the kidney tumors are benign?**
  - False, All renal neoplasms should be regarded as potentially malignant until proven otherwise.
- **What is the most common histopathological type of kidney cancer?**
  - Clear cell renal cell carcinoma (ccRCC).
- **From where does the kidney tumor originate?**
  - Proximal tubular cells of the nephron.
- **What is the inheritance pattern in von Hippel-Lindau syndrome?**
  - Autosomal dominant. Thus, family screening is a must.
- **Which gene is affected by von Hippel-Lindau syndrome?**
  - In the short arm of chromosome 3 (p3).
- **What is the classical triad for kidney tumors?**
  - Hematuria + Loin pain + Palpable mass.
- **What is the most common site for metastasis in primary kidney tumors?**
  - Lungs.
- **What is the only paraneoplastic syndrome manifestation that can be treated medically?**
  - Hypercalcaemia.
- **Do we morcellate kidney tumors (cut it into small pieces)?**
  - No, because that will put the patient at risk of metastasis.
- **Scenario: The patient presented with metastatic renal cell carcinoma involving the abdominal lymph nodes, what is the management?**
  - This is a microscopic metastasis, thus lymphadenectomy (lymph node dissection) will not work because there is a high chance of relapse. So there is no point in putting the patient into surgery. But if the metastasis is solitary (lung, brain, liver) do resection for the kidney + the organ.
- **What is the most important factor in deciding whether to give immunotherapy to a patient with kidney cancer or not?**
  - Performance factor (status).
- **What is the most common route for metastasis in renal tumors?**
  - Hematogenous spread.

Important doctor‘s notes:

Bladder Tumors:

★ **What is the most common type of bladder cancer?**
- Transitional cell carcinoma (TCC). Because it’s the lining epithelium for the bladder.

★ **What are the conditions that cause squamous carcinoma of the bladder?**
- Any chronic irritation to the bladder causes metaplasia and transformation to the lining epithelium. Such as; Chronic infections - Stones - Chronic inflammation - Bilharziasis - Chronic foley catheter.

★ **Where is the location of adenocarcinoma of the bladder?**
- In the remnant urachus (dome of the bladder).

★ **List the risk factors for bladder tumors.**
- Cigarette smoking - Occupational exposure - Chemical implicated - Analgesic abuse - Schistosoma haematobium - Pelvic irradiation.

★ **Scenario: A 45 y/o woman kept being treated for UTI for 6 months.**
- Suspected bladder tumors. Need further investigations; US - Cystoscopy - etc…

★ **What are the superficial stages of bladder tumors (TCC)? And what is the management?**
- Tis - Ta - T1 (from T2 and above → muscle invasion “*invasive/deep TCC*”).
- Transurethral resection of the tumor then give prophylaxis to prevent recurrence by chemotherapy (Mitomycin C) or immunotherapy (BCG).

★ **List the indications for intravesical therapy.**
- Multifocal carcinoma in situ (Tis).
- Carcinoma in situ associated with gross tumor Ta or T1.
- Any G3 tumor (poorly differentiated).
- Multifocal tumor and rapidly recurrent tumor.

★ **When should we approach bladder tumors by radical resection?**
- In deep/invasive TCC (T2-T3a-T3b-T4).

Important doctor‘s notes:

Prostatic Tumors:

★ **What is the commonest malignancy in the body?**
- Lung > Colorectal > Prostate.

★ **What is the most common malignancy in the urogenital tract?**
- Prostate tumors.

★ **What is the histopathology of most prostatic tumors?**
- Adenocarcinoma. Because it mostly arises from the peripheral zone of the gland.

★ **What is the commonest location of prostatic tumors?**
- In the peripheral zone of the gland (the posterior lobe).

★ **What is the most common location of benign prostatic enlargement (BPH)?**
- In the transitional zone (central).

★ **What is the most common route for metastasis in prostatic tumors?**
- Lymphatic spread.

Testicular Tumors:

★ **What is the most common type of testicular tumor?**
- Seminoma.

★ **What are the differences between prostatic and testicular tumors?**
- **Testicular tumors:**
  - **Advantage:** High curability. In early detection → 95% cure rate.
  - **Disadvantage:** Have faster doubling time, doubles from 1cm to 2cm in 3 weeks. Thus higher risk of metastasis.
- **Prostatic tumors:**
  - **Advantage:** Have slower doubling time, doubles from 1cm to 2cm in 4 years. Most patients die with the tumor, not from it.
  - **Disadvantage:** Poor curability.

★ **True or false, radical orchiectomy is done within the scrotum?**
- False, done through the groin to prevent metastasis (fatal mistake).

★ **What is the treatment for seminoma in the testicles only (early stages)?**
1. Inguinal radical orchiectomy (not through scrotum).
2. Observe **or** single-dose chemotherapy **or** radiotherapy.

★ **What is the most common route for metastasis in testicular tumors?**
- Hematogenous spread.

Renal (kidney) Tumors

Benign Tumors

- Benign tumours of the kidney are rare.
  - All renal neoplasms should be regarded as potentially **malignant** until otherwise is proven.
  - **Possible MCQ: True or false "the most common type of renal tumor is benign"?** False

- **Oncocytomas**
  - The most common one.
  - Difficult to differentiate from a kidney cancer on imaging.

- **Angiomyolipomas**
  - Associated with tuberous sclerosis. (autosomal dominant disease with multisystem benign tumours , caused by mutation in TSC1 or TSC2 tumor suppressor genes)
  - Characterised by a typical appearance on CT due to their high fat content.

- Benign tumors **treatment**: observation, embolization or surgery .

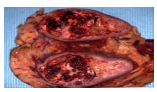
Malignant Tumors

- **Nephroblastoma**.
- **Renal cell carcinoma:**
  - **Clear cell (most common).**
  - Papillary (Type 1 & 2).
  - Chromophobe.
  - Collecting duct.

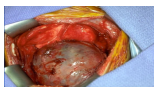
★ **Possible exam question: What is the most common type or renal cell carcinomas?** Clear renal cell carcinoma

- Renal tumors can be localized in the kidney or can extend to the surrounding tissues, or spread hematological to the lung through the renal vein and IVC.

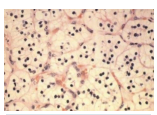
- In gross pathology, clear cell carcinoma (most common type) is embedded within the kidney, and sometimes is outside the kidney.



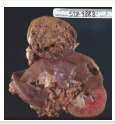
- Introphytic, well circumscribed, sharp margins, sometimes we see areas of hemorrhage and necrosis.



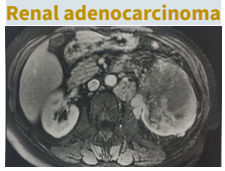
- Clear cell renal cell carcinoma is named after how the tumor looks under the microscope with clear cytoplasm because during the histo preparation we give material that dissolve the cytoplasm, showing clear cell boundaries and distinctive nuclei
  Dr. important note ccRCC is the commonest histopathological type of kidney tumor. and makes up about 80% of all renal cell carcinoma cases.


Microscopic CRCC

- In this picture, we see a bulging mass of the kidney, this is "chromophobe" (exophytic) (2nd most common type) which is another type of kidney tumors.



Renal cell carcinoma:


Renal adenocarcinoma

★ **Renal cell carcinomas** are adenocarcinoma that usually arise from the epithelial cells of the **proximal tubule cells**

★ **Possible MCQ Question: What is the most common site for the origin for renal cell carcinoma (kidney tumors)?** Arises from Proximal convoluted tubules

- Male : female ratio approximately **2:1** (more common in males)
- Increased incidence seen in **von Hippel-Lindau syndrome (VHL):** an autosomal dominant disorder due to mutation in VHL gene in short arm of chromosome 3, associated with multiple somatic manifestations **including:** pheochromocytoma, renal cysts, renal cancer, pancreatic cyst, epididymal cyst, brain tumor & hemangioblastoma of the eye or spinal cord and **Birt–Hogg–Dubé** (diagnosed by family hx of either: 1- Fibrofolliculomas (benign tumors of the hair follicles) 2- pulmonary cysts 3- kidney tumors. confirmed by a genetic test for mutation in FLCN gene, which codes for the protein folliculin.)
- **Rule of 3**: A mutation in the **VHL** (**v**on **H**ippel-**L**indau) gene on **chromosome 3** causes **RCC** (**r**enal **c**ell **c**arcinoma).
- **Possible MCQ Question: Where is the origin of abnormality in VHL?** Short arm of chromosome 3 (p3) p for petite
- Any patient with this disorder (VHL) we have to screen other family members

Renal (kidney) Tumors

Clinical features

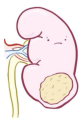
Classical triad "In 10%"
(**most** of the cases are discovered **incidentally** by routine examination)
Mnemonic: لحم 🍖 LHM

Paraneoplastic Syndrome
Tumor cells generate hormones that causes it's own signs and symptoms
(systemic symptoms outside the tumor site)
Paraneoplastic **RCC** **S**yndrome: **P**olycythemia (EPO), **P**yrexia, **R**enin (hypertension), hyper**C**alcemia (PTHrP) and hyper**C**ortisolism (ACTH), **S**tauffer's syndrome.

★ Gross Haematuria

- Loin pain

- Mass (palpable flank mass)



Treatment usually Nephrectomy

- **Pyrexia (fever):** unknown origin.
  The tumor secretes cytokines that increase the temperature. Doesn't resolve by antibiotics.
- **Hypertension** (This tumor can release renin this will lead to hypertension)
- **Polycythaemia:** due to erythropoietin production which increases the production of new RBCs this will lead to polycythemia
- **Stauffer's syndrome**
  - Signs and symptoms of liver dysfunction due to presence of renal cell carcinoma without tumor infiltration of the liver. (Non-metastatic hepatic dysfunction)
  - Abnormal liver enzymes, which get back to normal after tumor resection.

Can be treated medically

- **Hypercalcaemia:** due to a PTH-like hormone production

★ Hypercalcaemia is the only Paraneoplastic symptoms that can be treated medically other symptoms can not be treated until we remove the tumour

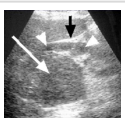
★ **Possible exam question: What is the only medical condition that can be treated medically in paraneoplastic syndrome?**
Hypercalcemia

Investigations

Most of the cases are diagnosed incidentally by imaging (U/S and CT) that is indicated for another purpose (ex. Abdominal pain).
- US or CT urogram (**initial investigation)**
- CT of abdomen and chest (**Key investigation)**

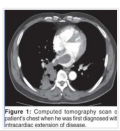
Renal ultrasound (US)

Diagnosis can be confirmed.
In the US you can see a filling defect this is the tumor thrombus. White arrow shows a mass in the right ventricle.

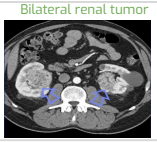


CT scan

Assessment of renal vein and caval spread.
To assess the extend and stage of tumor.

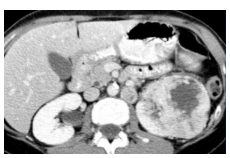


Bilateral renal tumor



Renal tumors may present :
- **Solitary**
- **Bilaterally:** in this cases you have to think about heredity disorders like VHL & tuberous sclerosis and you have to do genetic screening for the family also.

Most of renal cell carcinoma localised in one site (solitary) , so if we see bilateral or multifocal mass in the kidney we should think about genetic , hereditary abnormalities , also we should screen other members family.

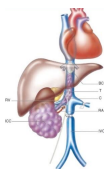


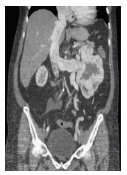
Echocardiogram or MRI

Should be considered if clot in IVC extends above diaphragm.

Very specialised test if we suspect the tumour have already reach to higher level above the diaphragm like heart.

Right pic: huge left kidney tumor extending to the left renal vein and IVC and extending to the diaphragm to the heart.



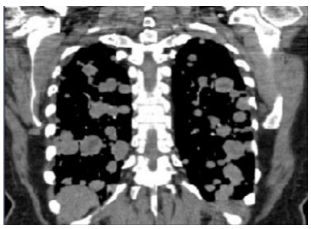


Renal (kidney) Tumors

Metastases:

- **Spread:**
  - **Direct spread :** perinephric tissues **(common)**
    The whole fascial envelope and kidney should be removed at the same time.
  - **Lymphatic:** para-aortic nodes.
- Pathologically may extend into renal vein and inferior vena cava and reaches the right atrium. It's highly spreading that is why we should be careful with any renal mass.
- Blood borne spread can result in 'Cannon ball' pulmonary metastases.
  - ★ Cannon ball pulmonary metastases: multiple white patches (deposits of renal cancer metastasis) that resemble miliary TB.
  - Multiple patches tumour in the lung , the lesions is highly vascular because of tumor that will help us to differentiate this picture from the military TB which is presented as a decrease in vascularity.

CT scan



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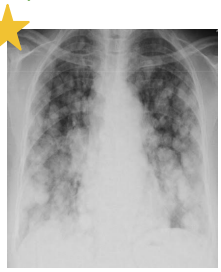
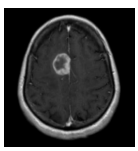


- **In lymph nodes:** Can't do anything
- **In solitary metastasis:** resect

Metastasis	
Lymph node dissection	• No proven benefit • May be applied if the tumor metastasized only into renal lymph nodes. • If the lymph node spread was distant and wide there is no benefit from lymph node dissection because we can't remove the whole lymph nodes of the body.
Solitary (e.g. lung metastases) Also in brain or liver	Occasionally resected, remove the kidney and the organ (e.g. lung). 
Radiotherapy & chemotherapy	• Have No role ★ (Radio & chemo resistant) • Multitarget tyrosine kinase inhibitors (TKIs) **(antiangiogenic)** ○ Median 12 months progression-free survival benefit.
Immunotherapy	★ Can help (Performance status). • We must evaluate the performance status of the patient before starting immunotherapeutic agents. Because if the patient is bed ridden or have a performance which is not good he will not tolerate this therapy and it's not recommended to give it to them. • **Performance factor/status** is an important prognostic factor. • (T-cell checkpoint inhibitors). Survival advantage in the 2nd line setting • E.g: IL-2 or IFN-gamma • It can control the disease and improve survival for few months (Not curable option but can improve the survival)

Renal (kidney) Tumors

Staging:

- **Staging:** TNM staging

T= Size of tumor, Grown into nearby areas
N= Degree of spread to lymph nodes
M= Degree of metastasis

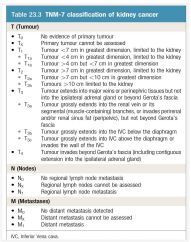


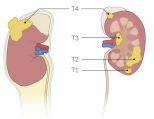
Table 23.3 TNM-7 classification of kidney cancer

T (Tumour)
- T_0 No evidence of primary tumour
- T_x Primary tumour cannot be assessed
- T_1 Tumour <7 cm in greatest dimension, limited to the kidney
  - T_{1a} Tumour <4 cm in greatest dimension, limited to the kidney
  - T_{1b} Tumour >4 cm but <7 cm in greatest dimension
- T_2 Tumour >7 cm in greatest dimension, limited to the kidney
  - T_{2a} Tumour >7 cm but <10 cm in greatest dimension
  - T_{2b} Tumours >10 cm limited to the kidney
- T_3 Tumour extends into major veins or perinephric tissues but not into the ipsilateral adrenal gland or beyond Gerota's fascia
  - T_{3a} Tumour grossly extends into the renal vein or its segmental (muscle-containing) branches, or invades perirenal and/or renal sinus fat (peripelvic), but not beyond Gerota's fascia
  - T_{3b} Tumour grossly extends into the IVC below the diaphragm
  - T_{3c} Tumour grossly extends into IVC above the diaphragm or invades the wall of the IVC
- T_4 Tumour invades beyond Gerota's fascia (including contiguous extension into the ipsilateral adrenal gland)

N (Nodes)
- N_0 No regional lymph node metastasis
- N_x Regional lymph nodes cannot be assessed
- N_1 Regional lymph node metastasis

M (Metastasis)
- M_0 No distant metastasis detected
- M_x Distant metastasis cannot be assessed
- M_1 Distant metastasis

IVC, Inferior Vena cava.



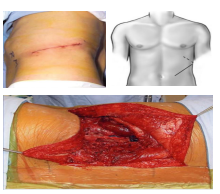
TNM	Tissue invasion
T1	• Tumor is limited to the kidney • Tumor size is ≤ 7 cm in greatest dimension
T2	• Tumor is limited to the kidney • Tumor size is > 7 cm in greatest dimension
T3	• Tumor extends into major veins or perinephric tissues but not into the ipsilateral adrenal gland or beyond the Gerota fascia
T4	• Tumor extends beyond the Gerota fascia (including contiguous extension into the ipsilateral adrenal gland)
N0	• No metastasis in regional lymph node(s)
N1	• Metastasis in regional lymph node(s)
M0	• No distant metastasis
M1	• Distant metastasis

Management:

- Its resistant to chemotherapy and radiation so, the treatment is usually by surgical removing of the kidney
- Unless extensive metastatic disease it invariably involves surgery (bottom line the only curative treatment for kidney tumors is to remove the kidney unless in extensive metastasis).
- **Organ-confined:** laparoscopic or open nephrectomy.
- **<7 cm confined to one pole:** partial nephrectomy
  - Open, robot assisted or laparoscopic
- Surgical option usually involves a **radical nephrectomy.**
- **Nephrectomy** is a surgical procedure to remove all or part of the kidney. **There are three types** of nephrectomy for a diseased kidney **partial, simple and radical.** In a **partial nephrectomy**, they removes only the tumour mass and small part of normal tissue and leave the healthy part. Partial nephrectomy is recommended for patients with one (solitary kidney) if the tumor is localised and less that 4cm ether in the upper or lower part of the kidney in order to save some functioning kidney and avoid dialysis however if it is in the middle part we can't remove it partially so in this case we should remove the whole kidney then go to dialysis in **simple nephrectomy**, they just remove the kidney without the surrounding tissues.
- **Radical nephrectomy** → removal of the kidney & its surrounding tissues: upper part of ureter, and lymph nodes that close to the kidney , renal artery and vein, gerota's fascia and sometime the adrenal gland if the tumor was big or in the upper pole.
- **Surgery is only curative treatment.**
- **Radio or chemotherapy have no role in kidney cancer.**
- Treatment for localized RCC is radical or partial nephrectomy. Partial nephrectomy is the preferred option for small tumors, even in the presence of a normal contralateral kidney.

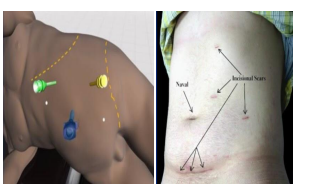
Radical Nephrectomy		
	Approach (Incision)	- **Transabdominal** - **Loin incision**
	Ligation	**Renal vein:** early to reduce tumor propagation
	Excision	- **Kidney** - **Adjacent tissue:** Adrenal fat - Perinephric fat

- **Possible MCQ: True or false "we will morcellate (cut it into small pieces) the kidney" ?** False, because you are spreading the tumor.



Open Radical Nephrectomy

Flank thoracoabdominal approach. This is the old method, unfortunately it's painful & extensive surgery due to cutting the muscle and sometimes we remove part of the ribs. Patients hospitalized for week to 10 days after surgery, it takes time to recover from this surgery.

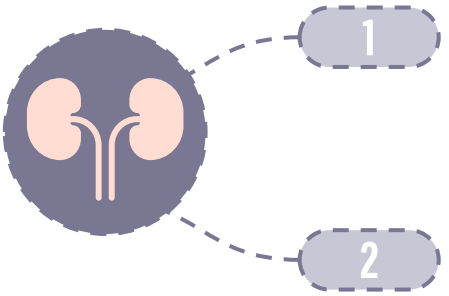


Laparoscopic Nephrectomy

Now, we excise tumor by this method. Not painful, patient hospitalize for nearly only 1 day or maximum 2 days after surgery. Without cutting the muscle so less painful and we maintain same advantage of open nephrectomy. During laparoscopic radical nephrectomy, approximately 3 to 4 small keyhole (< 1cm) incisions are made in the abdomen which allow the surgeon to insert a telescope (called laparoscope). Then we remove it thorough a big incision (Pfannenstiel incision same as the one in cesarean section) where the muscles in this incision isn't cut it's splitted and the tumor is removed as one intact whole piece we should not fragment the mass inside the abdomen to remove it from small incision because the tumor will spread more

Malignant tumors: Nephroblastoma (Wilm's tumor)

- Most common childhood urological malignancy (<4 years).
- Better prognosis in those presenting in 1st year of life.
- Rapid Growth → early local spread → invasion of the renal vein.
- Invasion of the renal pelvis occurs late → hematuria not common.
- Distant metastases to the lungs, liver and bones.
- **Causes:** Mutations of tumor suppressor genes on chromosome 11 (11P13)
  WT1(Wilms tumor 1 gene) the most important gene mutated and WT2 (Wilms tumor 2 gene)
- **Associated syndromes:** 10% of Wilms tumors occur in children with syndromes.
  - **WAGR Syndrome** (**W**ilms tumor, **A**niridia, **G**enitourinary anomalies and **R**etardation) → Deletion of the 11P13 band leads to the deletion of the WT1 gene and other genes such as PAX6
  - **Denys-Drash Syndrome** → Is a mild form of WAGR without aniridia or intellectual disability
  - **Beck with - wiedemann Syndrome**



- Large abdominal mass **(cardinal sign)**
- Unusual: fever, hypertension(As a result of renin secretion), Hematuria

Table 23.2 Childhood renal tumours

Feature	Nephroblastoma	Neuroblastoma
Frequency	7 per million children	1 per 8000-10,000 children
Age	Between 3 and 5 years of age	<2 years of age
Origin	Kidney	Adrenal, also extra-adrenal
Symptoms	Hypertension in 25–60%	Uncommon
Abdominal lump	Unilateral, never crosses midline	May cross midline
Radiologically	No change in renal axis	Outward and downward displacement of kidney; calcification common
Metastases at presentation	Uncommon	Bony metastases common
Tumour markers	Serum LDH may be raised	VMA may be raised
Treatment	Surgery mainstay, adjuvant chemotherapy for metastases	Chemotherapy, radiotherapy and surgery

LDH, lactate dehydrogenase; VMA, vanillylmandelic acid.

Investigations and Markers	• CT of the abdomen and chest **(Essential for diagnosis and staging)** ○ **Differential diagnosis:** - Adrenal neuroblastoma. - Hydronephrosis. - Cystic kidney disease. • **Confirmed** by biopsy. • **Markers:** Serum LDH (Lactate dehydrogenase) may be raised.
Management (Depends on the stage)	• Chemotherapy followed by transabdominal nephrectomy with wide excision of the mass. • Further chemotherapy with or without radiotherapy dependent upon the histopathological features. • Stage I,II,III,IV → Nephrectomy • Stage V → No nephrectomy

Pheochromocytoma ★

Very important, it isn't mentioned in the slides but you are expected to read about it.

- It's a catecholamine - secreting tumor
- The most common tumor of the adrenal medulla in adults.
- Arise from chromaffin cells in adrenal medulla (80%) and extra-adrenal paraganglionic tissue (20%)
- 10% are multiple and 10% are malignant (Usually benign in 90% of cases)
- Associated with neurofibromatosis, medullary carcinoma of the thyroid, duodenal ulcer, and renal artery stenosis.

Clinical Features	• Related to fluctuating levels of excess epinephrine, norepinephrine and dopamine secretion. • 40 years is typical presentation. • Hypertension and paroxysmal hypertension may be precipitated by abdominal pressure, exercise, or postural changes. • 5 most important **P**roblems of **P**heochromocytoma (**5P's**) - Head **P**ain(Headache) , **P**alpitation,Increased blood **P**ressure, **P**allor, **P**erspiration, sweating, anxiety, chest and abdominal pain, pallor, dilated pupils, and tachycardia are prominent features.
Investigations and Markers	• All young hypertensive patients aged 40 and under should be screened for a catecholamine secreting tumor. • 24 hour urine samples analyzed for metadrenaline (metabolites of catecholamines) and normetadrenaline.(Confirmatory Test) • CT or MRI may show the tumor. (After positive biochemistry tests to localize the tumor because this tumor can be in adrenal medulla, sympathetic ganglion and multiple locations • Radiolabeled metaiodobenzylguanidine scanning may demonstrate the tumor.
Management (Treat PHEochromocytoma with PHEnoxybenzamine)	• **Surgical removal** of the tumour is the **treatment of choice**. • The use of α- and β-blocking drugs has greatly reduced the risk of hypertensive crisis, tachycardia and arrhythmias during induction of anaesthesia or tumour handling. • The patient should come to operation with blood pressure and pulse rate controlled. Adrenergic blockade also allows restoration of blood volume, so that sudden hypotension after removal of the tumour is unusual. • To achieve blockade, an **α-adrenergic** receptor blocker such as phenoxybenzamine or doxazosin should be used. • Once and only once **α-blockade** has been established, unopposed β effects, such as tachycardia, may become evident and are treated with a **β-blocker** such as propranolol. ○ **β-blockade** should not be instituted first, as this may allow unopposed α-agonist effects, which may make hypertension worse and precipitate heart failure. • Preoperatively, short-acting α- and β-blocking agents and sodium nitroprusside (which acts directly on vessels independent of adrenergic receptors and gives additional control of hypertension) should be available.

Bladder Tumors

Pathology of all bladder carcinomas:

90% are transitional cell carcinoma (TCCs) (Urothelial cell carcinomas)

- Is the most common cancer because the lining epithelium of bladder is transitional cell.
- **Vast majority**
- 3 times more common in men
- The bladder is more susceptible to urinary carcinogens (extensively dyes), as urine is stored in for relatively long periods of time.
    - Naphthylamine
    - Benzidine
- **Appearance:**
    - **Delicate papillary**
        - Superficial
        - Less aggressive
    - **Solid ulcerating**
        - More aggressive
- TCCs should be regarded a 'field change' disease with a spectrum of aggression. Because it start as superficial small tumor then start to get larger and go deeper in the muscle of the bladder.

Bladder tumor is divided into two types:

- Tumor above muscle layer (muscularis propria) (urothelium, in the mucosal membrane particularly) → superficial
- Tumor reached muscle → deep
    - Why? Different management approach and prognosis

- **80%** of TCCs are superficial and well differentiated: They have better prognosis (more common)
    - Only 20% progress to muscle invasion (cardinal feature of bladder cancer).
    - Associated with good prognosis.
- **20%** of TCCs are high-grade and muscle invasive. Below and through the bladder muscle (detrusor muscle)
    - 50% have muscle invasion at time of presentation.
    - Associated with poor prognosis.
    - 50% of them will have metastasized tumor.

5% are squamous carcinoma

- In urothelium that has undergone **metaplasia due to chronic irritation in the bladder:**
    - Chronic inflammation.
    - Irritation by a stone.
    - Schistosomiasis (bilharziasis)
    - Chronic UTI
    - Chronic foley catheter
    - TB
    - It is the most common type of cancer of the distal urethra in males and the entire urethra in female.

2% are adenocarcinoma

- **Rare**
- It happens in bladder urachus, which is an embryonic remnant inside the dome of the bladder.
- Local infiltration e.g., bowel cancer.
- **Possible exam question: Where is the location of adenocarcinoma of the bladder?** In the urachus (dome of the bladder)

Bladder Tumors

Etiological factors: ★

A carcinogen **A**C**T**S on the bladder

★ **Possible exam question: What are the etiological factors for bladder cancer?**

1. **Cigarette smoking** (**T**obacco) ★
2. **Occupational exposure**
   20% of TCCs are believed to result from occupational factors. Those who work in industries and deal with dyes and rubbers are of highly susceptible.
3. **Chemical implicated**
   Aniline dyes, **C**hlorinated hydrocarbon.
4. **Analgesic abuse e.g. Phenacetin**
   Old medication that have been banned.
5. **Schistosoma haematobium**
   Associated with increased risk of squamous carcinoma.
6. **Pelvic irradiation**
   For carcinoma of the cervix in female , colorectal cancer in male and female.

Presentation:

1

★ **80%** present with **painless hematuria** either gross or microscopic and usually the hematuria is terminal at the end of the stream. REMEMBER! **Painful** hematuria in UTI and Stones

- Should be assumed a tumor until proven otherwise.
- In women it may be thought as part of occasional cystitis since symptoms are so common.
- Mid stream urine → no growth → further investigations.

★ **Possible OSCE question:** 65 years old male coming to clinic complaint of 3 days history of painless hematuria (how to do history, how to do physical examination and what are your work up?)

2

- **Obstructive symptoms**
  - Tumour at the lower end of a ureter.
  - Tumour in the ureteric orifice.

3

- Also, presents with **treatment-resistant infection** or **bladder irritability** and **sterile pyuria**.
  - You should investigate patients with recurrent UTIs by doing US, don't give the patients antibiotics and let them go because bladders cancer can cause recurrent UTI infection especially in women.
  - It is wrong to give them antibiotics before investigating bladder cancer.

Bladder Tumors

Pathological Staging	Grade of tumor
• 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** Perivesical fat invasion. **T4** Prostate or contiguous muscle. Most aggressive (outside the bladder)	**G1** Well differentiated. **G2** Moderately well differentiated **G3** Poorly differentiated. **G3 indicate a very aggressive tumor with a high risk of invasion and metastases.**

How are staging and grading done?:

by TNM, starting from superficial to deep.

Biopsy

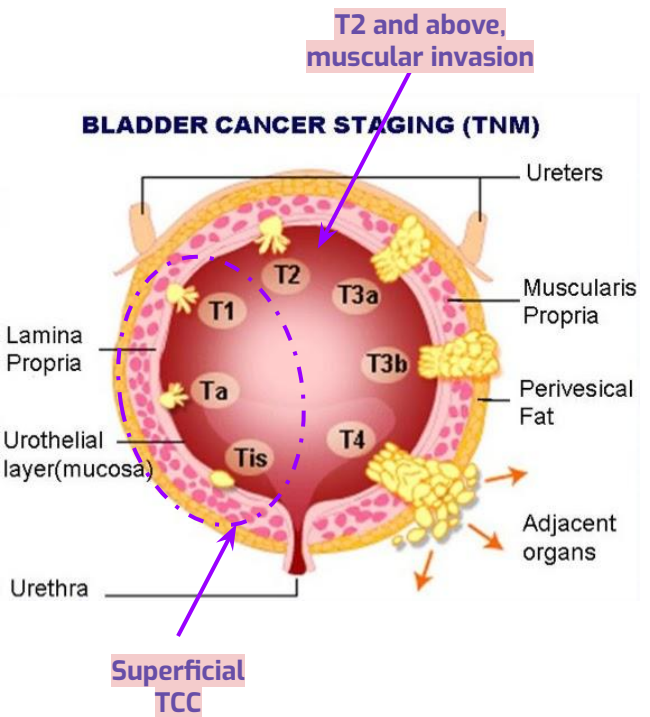
- Confirm the diagnosis **(cell type)**
- Guide choice of treatment
- Degree of differentiation **(grade)**
- Depth of penetration **(T in TNM stage) *prime clinical importance**

Any patients with painless hematuria should do cystoscopy.

Biopsy is the best test done for urinary bladder carcinoma.

Clinical examination, urography & CT

- Regional and juxtaregional lymph nodes **(N)**
- Distant metastases **(M)**
- Upper tract tumor involvement



Bladder Tumors

Carcinoma in-situ characteristics

1. An aggressive disease. Any tumor with higher stage has poor prognosis except the bladder → carcinoma in-situ is aggressive tumor even though it is T1 we should treat it aggressively.
2. The mucosa appears normal. With only generalized redness of the bladder.
3. Often associated with positive cytology (proliferative tumor).
4. It's a superficial tumor 50% of patients progress to muscle invasion.
5. Immunotherapy - BCG. Immunotherapy wash the bladder with BCG lead to intensive immune reaction against the tumor.

   How does a vaccine kill cancer cells?

   The PTEN protein normally acts as a tumor suppressor; impaired PTEN function appears to increase a cell's vulnerability to becoming cancerous and also to mycobacterial infection. Just as macrophages are more vulnerable to TB infection & CD4+ cells for HIV.
6. If BCG fails patient may need radical cystectomy.
7. **Should be considered in:**
   - Ongoing storage urinary symptoms. W/pain.
   - Symptoms of ongoing UTI with negative culture.
   - High risk of progression to cancer if not treated.

★ **Indications of intravesical chemotherapy (immunotherapy):**
1) **Multifocal carcinoma in situ.**
2) **Carcinoma in situ associated with gross tumor Ta or T1.**
3) **Any G3 tumor.**
4) **Multifocal tumor and rapidly recurrent tumor.**

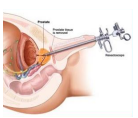
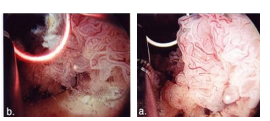
★ **For the differentiation between deep or superficial we need:**
- **Staging (by TNM) & Histopathology (by resection)**

★ **Superficial TTC: Resection → prophylaxis by either:**
- **Chemotherapy (mitomycin C).**
- **Immunotherapy (BCG).**

Management of bladder carcinomas:

Superficial TCC (Ta,T1)

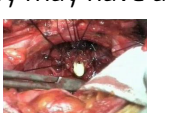
- This is not CIS it's a superficial tumor but with growth (papillary)
- Requires transurethral resection **of the tumor** with sampling of detrusor muscle and regular cystoscopic follow-up.
- How to remove the tumor? By transurethral resection of bladder tumor (TURBT)
- Intravesical chemotherapy with **mitomycin C** (reduces the risk of recurrence)
  - Single intravesical dose
  - 6-week course
    - Treat multiple low-grade bladder tumours
- Consider prophylactic chemotherapy (mitomycin C) 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
  - 50-70% response rate recorded
  - Occasionally associated with development of systemic mycobacterial infection


TURBT

Invasive TCC (T2-T4)

- <70 years → **Radical cystectomy:** Removal of the bladder along with the surroundings (prostate - pelvic lymph nodes - seminal vesicles - lower part of distal ureters - in female worse; uterus + cervix + upper ⅓ of the vagina which contain the urethra) **= 15% mortality rate**
- Older→ Radiotherapy→ if not treated → 'salvage' cystectomy
- Invasive T4 fixed to the pelvis or surrounding organs → palliative treatment
- Radical cystectomy has an operative mortality of about 5%.
- Cystectomy always necessitates urinary diversion. To restore continuity of the urinary tract
- Urinary diversion achieved by:
  - Ileal conduit (simplest, more common)
  - Neo-bladder better An artificial bladder that's synthesised by deriving segments from the bowel.
- Local recurrence rates after surgery are approximately 15% and after radiotherapy alone 50%.
- Pre-operative radiotherapy is no better than surgery alone.
- Adjuvant chemotherapy may have a role.

Bladder Tumors

Investigations Of Painless Hematuria

Urinalysis
First step

Ultrasound of the bladder and kidneys

Cystoscopy
When you find a mass or erythema, you have to take a biopsy.

- Very important modality for investigate or treat patients with painless hematuria
- The confirmatory test of bladder tumor is biopsy through cystoscopy

Urine Cytology

To discover if there is high grade cancer or carcinoma in-situ.

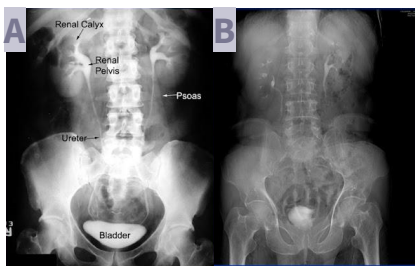
KUB
kidney,ureter,and bladder X-ray

To exclude urinary tract calcification because stone causes painless hematuria.

IVU- CT scan
Intravenous urogram CT scan

Considered if no pathology identified
For staging

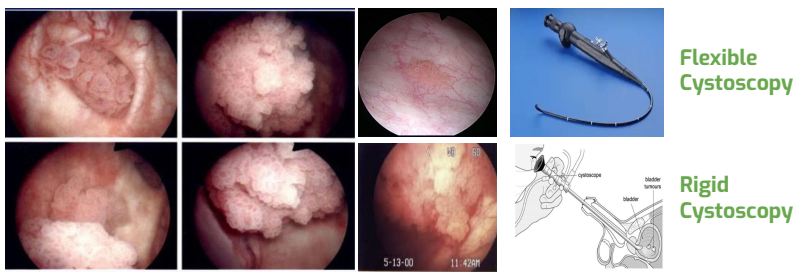
- **Investigations**
  - Visible hematuria → local anaesthetic flexible cystoscopy & CT urogram (CTU).
  - If lesion is found within the bladder → cystourethroscopy under general anaesthesia the bladder and tumour are examined bimanually to determine the depth & physical features of tumor → transurethral resection of bladder tumour **(TURBT)** & biopsy.



IVP same as IVU

Picture A: Normal bladder with smooth outline and no filling defect with smooth non dilated collecting system.

Picture B: Filling defect (apple core appearance). When there is a big tumor there will be an increase back pressure leading to dilation and hydronephrosis of the kidney in the affected side.



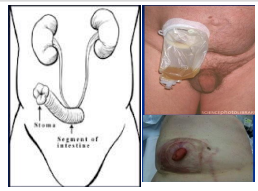
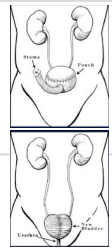
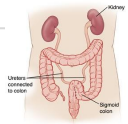
Cystoscopy

- Usually done after IVP image that suggests filling defect
- There are two types of cystoscope: Flexible and rigid cystoscopy

Bladder Tumors

Types of Urinary Diversion

(Urinary diversion is a surgical procedure that creates a new way for urine to exit from the body when urine flow is blocked)

Urinary Diversion	• There are two types of urinary diversion (continent & non-continent) • Continent: The surgeon will make a pouch inside the body from part of your intestines to hold urine and there are 2 basic types: those that have a stoma brought out of the belly and those in which a neobladder is made. With a neobladder, you are able to pee in a normal way.The advantage of both types of continent urinary diversion is that you don't need to wear an ostomy bag. • Non-continent: linking the ureters to a piece of intestine that is brought out of the belly. The urine then drains continuously into an ostomy bag you wear under your clothes	
Ileal Conduit	• Incontinent diversion to skin. • In less favorable circumstances. • The ureters are anastomosed to drain the urine in the detached section of the ileum, which is brought out through an opening (stroma) in the abdominal wall. The urine is collected through a bag that attaches on the outside of the body. It's prefered because it has the least complication.	
Continent Cutaneous Reservoir	• Continent diversion to skin. • Connected to the body surface via a continent conduit (ileum or appendix). • The patient drains the urine at regular intervals with a catheter.	
Orthotopic Neobladder	• Continent diversion to urethra. • Construct a new bladder from colon or small bowel. • Urethra can be retained.	
Ureterosigmoidostomy	• Ureters implanted into the sigmoid colon. • In some countries where ostomy is not acceptable. • Serious complications: renal infection and metabolic disturbances.	

Management of recurrences:

- Repeat diathermy or Resection
- If Frequent & excessive → cystectomy

Prostatic Tumors

- **Commonest** malignancy of male urogenital tract. Not in the body (1st lung / 2nd colorectal / 3rd prostate). You need to differentiate this will come as MCQs. Unfortunately most cases in KSA are discovered in an advanced and late stage because either that the patients ignore their symptoms or are unaware of screening program at certain age.
- Rare before the age of **50 yrs**. A tumor of **old people** (in comparison to testicular tumors which is for the young) (Recommended age to screen for prostate cancer is 40-49)
- More men die **with** than **from** prostate cancer. Incidental finding
- Found at post-mortem in **50%** of men **>80 yrs**.
- **5-10%** of operation for benign disease reveal **unsuspected** prostate cancer.
- Very slow growing , patient usually die with the tumor, they don't die from the tumor. The doubling time of the tumor for 1cm to become 2cm is **4 years** while in testicular cancer which is a fast growing tumor it takes **3 weeks** to double

Table 23.7 TNM classification of prostate cancer*

T (Tumour)

- T_0 No evidence of primary tumour
- T_X Primary tumour cannot be assessed
- T_1 Tumour clinically inapparent and not palpable
  - T_{1a} Incidental finding following TURP in <5% prostate chips
  - T_{1b} Incidental finding following TURP in >5% prostate chips
  - T_{1c} Prostate cancer detected by prostate biopsy
- T_2 Tumour confined within the prostate
  - T_{2a} Palpable nodule involving half of one lobe
  - T_{2b} Palpable nodule involving one lobe
  - T_{2c} Palpable nodule involving both lobes
- T_3 Tumour extends through the prostatic capsule
  - T_{3a} Extracapsular extension of prostate cancer
  - T_{3b} Prostate cancer involving the seminal vesicles
- T_4 Tumour is fixed or invades adjacent structures other than seminal vesicles: external sphincter, rectum, levator muscles, and/or pelvic wall

N (Nodes)

- N_0 No regional lymph node metastasis
- N_X Regional lymph nodes cannot be assessed
- N_1 Regional lymph node metastasis

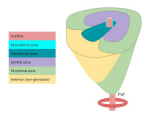
M (Metastases)

- M_0 No distant metastasis detected
- M_X Distant metastasis cannot be assessed
- M_{1a} Metastasis to non-regional lymph nodes
- M_{1b} Skeletal metastasis present
- M_{1c} Metastasis to other sites

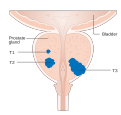
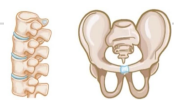
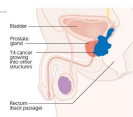
TURP, transurethral resection of the prostate.
*Sobin LH, Gospodariwicz M, Wittekind C (eds). TNM classification of malignant tumors. UICC International Union Against Cancer. 7th edn. Wiley-Blackwell, 2009 Dec; pp. 243–248.

Prostatic Cancer

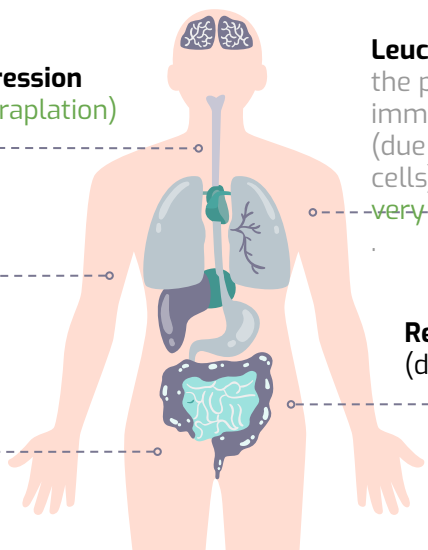
Pathology:

Type	★ **Adenocarcinoma** ★ **MCQ: Most of the cases are adenocarcinomas**
Location	• **The prostate have 5 zones.** • **In the peripheral zone (the posterior lobe) of the gland** (70%) • **Benign enlargement of the prostate / BPH → transitional (central) zone** • 25% in the central zone • 5% in the transitional zone 

Grading	• **Tumors are graded by Gleason classification. Other tumors by G1** (well-differentiated) **G2** (intermediate) **G3** (poorly-differentiated)
	• **Cells are graded 1–5** depending upon their level of differentiation
	  ○ Grade 1 = most differentiated
	  ○ Grade 5 = least differentiated or most anaplastic
	• **Gleason score = most common type+ 2nd most common type**
	  ○ Range from 2 to 10 (the higher the score, the worse the prognosis)
	  ○ Always expressed as an equation (e.g., 4+3=7)

	Gleason grading and scoring in prostate cancer is very useful in predicting the prognosis of a patient but staging of prostate cancer depends on the TNM system, itis the most important indicator of prognosis. 
Spread	• Lymphatic spread is the commonest route for metastasis. • Differentiate prostate cancer from other types of cancer. In **prostate the commo route** is via **lymphatic** spread while **renal & testicular tumors the commonest route is** through **hematogenous** spread. • **Prostate Cancer** can spread through **Bloodstream** but less common
	• Haematogenous spread occurs to axial skeleton. 
	• Capsule: perineural spaces, bladder neck , pelvic wall , rectum 

Clinical Features:



01 **Cord compression** (causing paraplation)

02 **Bone pain**

03 **Leucoerythroblastic anaemia** the presence of nucleated erythrocytes and immature white cells in the peripheral blood. (due to replacement of the marrow with cancer cells) (due to metastases to the bone) and it is very rare .

04 **Renal failure** (due to bilateral ureteric obstruction)

05 **Alteration in bowel habit** (the tumor extends posteriorly around the rectum)

Prostatic Cancer

Diagnosis: by PSA

Majority

Picked up by screening

Asymptomatic unless it's advance and late and it's symptoms is similar to BPH so we can't differentiate between the two only based on the symptoms

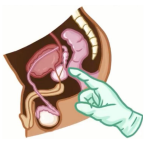
10%

Incidental findings at (TURP)

transurethral resection of the prostate

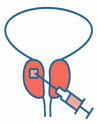
Remainder

Present with the clinical features mentioned above



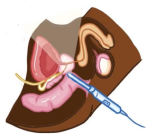
Rectal examination

- A DRE (Digital Rectal Examination) should be performed in individuals with elevated serum PSA level to determine the prostate nodule.
- Diagnosis can be confirmed with locally advanced tumors.
- ★ **Features**: hard nodule or loss of central sulcus.



Trans-Rectal biopsy

- ★ Should be performed in men with elevated PSA or abnormal DRE (digital rectal examination).
- **Confirms** the diagnosis (the only confirmatory test for prostate cancer)



Multi-parametric MRI

- May be useful in the **staging** of the disease. (Stage prostate cancer to determine the appropriate management and prognosis
- Evaluate for abnormal foci in men with a persistently elevated PSA with previous negative prostate biopsy.
- Assess pelvic lymphadenopathy and evidence of locally advanced disease.

Bone scanning

- Detect the presence of **metastases**.
- Prostate > surrounding tissue > bone

Serum prostate specific antigen (PSA)

- **Prostate specific antigen (PSA):** tumor marker. A protein secreted by the prostate (in case of prostate cancer, BPH, or prostatitis) **but** not exclusive to the prostate (in case of breast cancer in men).
- Kallikrein-like protein produced by prostatic epithelial cells.
- Can be significantly raised in BPH. (Because it is an organ specific marker not cancer specific marker however, as levels may also be elevated in benign conditions)
- Useful for monitoring response to treatment.
- **Normal : <4 ng//ml**
- **Prostatic carcinoma : >10 ng/ml**
- < **10 ng/ml** & asymptomatic → Unlikely to be abnormal or due to infections and BPH.
- **>100 ng/ml** almost always indicate bone metastases.
- **Routine screening** after the age of 50, however with family history from the age of 40.
- It may be high in infections or BPH, but, it's sky high in prostatic cancer "usually"
- Not diagnostic. Above 4 is suspicion for tumor, above 10 indicate high risk of metastasis.
- In infections if the patient is given the appropriate treatment the PSA comes down but in cancer whether antibiotic is given or not the PSA is still high.

Treatment:

Treatment depends on:

Age | **Stage of disease** | **General fitness**

Treatment options are for:

- **Local disease.**
  - **↓ 70 y/o → Radical prostatectomy.**
  - **↑ 70 y/o → Radiotherapy (prostate cancer is radiosensitive).**
- **Locally advanced disease.**
- **Metastatic disease → chemotherapy / hormonal therapy.**
- **↑ 80 y/o → Observation ONLY**

	Local	Locally advanced	Metastatic
Observation	✓		
Radical Radiotherapy	✓	✓	
Radical Prostatectomy	✓		
Hormonal therapy			✓

Hormonal therapy:

★ **The prostate cancer is the only genitourinary tumor that is hormonal sensitive because prostate cancer cells grows with the androgen (testosterone) and when these cells are deprived from androgen the tumor will shrink. This won't cure.**

01 **Produces good palliation**
- Until tumours escape from hormonal control.

02 **Involves androgen depletion**
- 80-90% of prostate cancers are androgen dependent for their growth.

03 **Can be achieved by: only in metastases**
1. Bilateral orchidectomy (castration). Removing the testicales since it's the primary source of androgen.
2. LHRH agonists **(Goseraline).** (Medical castration)
3. Anti-androgens **(cyproterone acetate, flutamide, Bicalutamide).** (Medical castration)
4. Complete androgen blockade (Combination of both LHRH agonist and anti androgens which blocks the androgen production from the testis and from the adrenals) It can be given oral or by injections

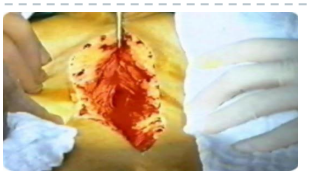
Prostatic Cancer

Organ- confined disease	**A small focus, well-differentiated (Gleason score 3+3=6)**	Close follow-up with DRE, PSA, MRI, repeat TRUS biopsy.

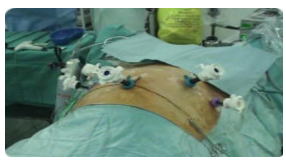
	Less well-differentiated Gleason score 7 or more	• **Radical prostatectomy**
		  ○ Laparoscopic
		  ○ Robotic
		  ○ Traditional open route
		• **Radiotherapy**
		  ○ External beam radiotherapy (EBRT)
		  ○ Intensity-modulated
		  ○ The insertion of radioactive seeds in the prostate (brachytherapy)
		• The choice of treatment tends to be based upon patient preference.

Locally advanced disease the cancer has invaded directly outside the prostate but has not metastasized		• **EBRT along with hormonal therapy is the standard.** • In patients not able to tolerate EBRT ○ Hormone therapy alone or conservative symptomatic treatment.
Castrate-resistant prostate cancer (CRPC)		• Happens in a small number of patients who fail to respond to endocrine treatment • PSA levels are a useful marker of response, ideally falling to <0.01 ng/ml in well-controlled cases. • Chemotherapy with taxanes has shown improvement in both symptoms and survival. • Newer hormonal agents such as enzalutamide (androgen receptor inhibitor) and abiraterone acetate (androgen biosynthesis inhibitor) provide some survival benefit.

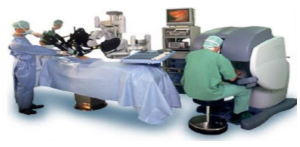
Skeletal metastases		• **Bone-protective agents** (i.e., denosumab and zoledronic acid)
		  ○ Palliate bone pain.
		  ○ Prevent loss of bone mass.
		  ○ Reduce the risk of metastatic bone fractures.
		• **Radiotherapy**
		  ○ Effective treatment for localised bone pain.



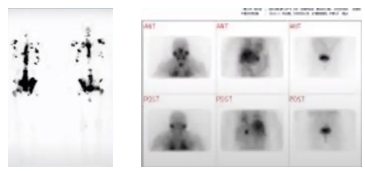
Open **radical prostatectomy**



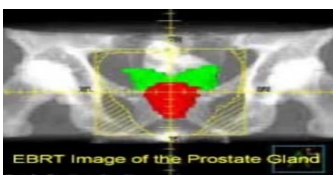
Laparoscopic **prostatectomy**



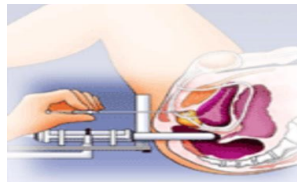
Robotic **prostatectomy**

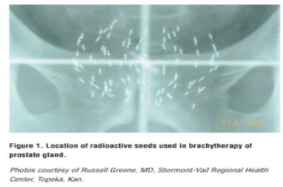


Bone scan for patient with metastatic prostate cancer (black deposits over the bony pelvis and the spine)



EBRT





Brachytherapy

Two types of radiotherapy: External and internal radiation have same effect however the internal radiation has less side effect.

- **From outside:** External Beam Radiation Therapy (EBRT)
- **From inside:** Brachytherapy (better because it doesn't affect adjacent tissues as EBRT)

Testicular Tumors

01

- Commonest presentation is painless testicular swelling on the side of the tumor[1]. Unlike infection which is painful.

02

- Commonest malignancy in **young** men.
- Peak incidence is between 25-35 years.
- Highest incidence in Caucasians in northern Europe and USA.
- Peak incidence for teratomas is 25 years and seminomas is 35 years.

03

- 5 year survival possible In those with disease localized to testis more than 95%.
- **It's a rapid growing tumor, it only needs 3-4 weeks to duplicate it's size.**

04

★ **Risk factors include cryptorchidism** (undescended testis) & **Klinefelter's syndrome (47, XXY)**

- Orchidopexy (a surgery to move a testicle that has not descended or moved down to its proper place in the scrotum) does not reduce this risk but it allow the testis to be moved into a position where it allows regular self-examination.

Testicular tumors classification:

Occasionally, both types occur in the same testis.

Non-Seminomas (50%)

- Arise from primitive germinal cells.
- Classified according to the degree of differentiation.

Seminomas (50%)

- **MCQs: The most common testicular tumor**
- Arise from seminiferous tubules
- Relatively low-grade
- Metastases occur mainly via the lymphatics and may involve the lungs
- Microscopy: Fried egg cell appearance

Teratomas

Yolk sac tumors

Sexual activity and infection are NOT risk factors for testicular cancer
Microscopic findings: Schiller-Duval bodies

Embryonal

Mixed Germ cell tumor

(Most common type of Non-Seminomas)

Investigations:

Imaging

- **Diagnosis** is confirmed by testicular ultrasound.
- Disease can be **Staged** by thoraco -abdominal CT scanning.[2]

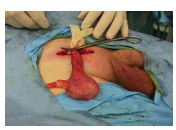
Pathological diagnosis

Pathological diagnosis made by performing an inguinal orchiectomy.

No biopsy is taken through the scrotum due to the risk of tumor cells spillage and metastasis, thus they perform an inguinal incision and clamp the spermatic cord before taking biopsy so no tumor cells goes up no more spread, and then if it is a cancer the precede removing the whole testis by doing radical orchiectomy .

If a testicular tumor is suspected, the testis should be removed and sent to pathology.

True or false: radical orchiectomy is done within scrotum? False, done through the groin.



Tumor markers

Tumor markers[3] are useful in staging and assessing response to treatment.

- **Alpha-fetoprotein (alpha FP):**
  - Produced by **yolk sac elements.**
  - Not produced by **seminomas.**
- **Beta-human chorionic gonadotrophin (beta HCG):**
  - Produced by **trophoblastic elements** .
  - Elevated in both **teratomas** and **seminoma.**
- **(LDH) lactate dehydrogenase**

Those tumor markers if they were elevated they highly suggest the presence of testicular cancer but on the other hand if they are normal they don't rule out the presence of cancer. The only way to prove or exclude a cancer is to take a biopsy.

1. A hydrocoele in a young man mandates investigation, as testicular tumours may be accompanied by blood-stained effusion in the tunica vaginalis. There may be pain and swelling suggesting inflammation. The patient may have wrongly received treatment for 'acute epididymitis'. Very rarely, patients with teratoma may complain of gynaecomastia. As a result of increased hcg (LH analogue) → stimulate leydig cell → increased secretion of testosterone & estrogen.
2. CT is used to follow the response of enlarged lymph nodes to treatment.
3. Measured as soon as a tumour is suspected, and before orchiectomy useful to increase the suspicion if there are +Ve. if they are normal that doesn't exclude tumor.

Testicular Tumors

Stage definition:

dr said you are not required to know the staging

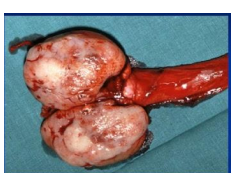
- **I** — Disease confined to testis.
- **IM** — Rising post-orchidectomy tumour marker.
- **II** — Abdominal lymphadenopathy.
  - **A** < 2 cm
  - **B** =2-5 cm
  - **C** > 5 cm
- **III** — Supradiaphragmatic disease.

Management:

- Be aware when you have a patient with testicular cancer, you have to diagnose early and treat early. Any delay in diagnosis and treatment may compromise the outcome.
- **Radical orchiectomy** with division of the spermatic cord (at the level of the deep inguinal ring)

Seminomas

- **The commonest testicular tumor.**
- **Radiosensitive**[1].
- The overall cure rate for all stages of seminoma is approximately **90%.**
- Stage I and II disease treated by **inguinal** orchiectomy plus (if only in the testicle)
  - Start with radical inguinal orchiectomy then either observe, one dose chemotherapy, or radiotherapy.
  - Radiotherapy to ipsilateral abdominal and pelvic nodes ('Dog leg').
  - Surveillance close surveillance will avoid unnecessary radiotherapy in 80%.
- Stage IIC and above treated with chemotherapy
- **Orchiectomy should be inguinal and NOT through the scrotum, to prevent metastasis.** If you were a urology resident and answered it "through scrotum" i will sign your death sentence & ask you to come next year.

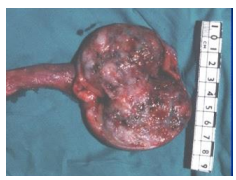


Grey, glistering, and encapsulated mass. Whitish homogenous comprising the normal parenchyma of the testis

VS

Non-Seminomas[2]

- **Not radiosensitive**.
- Stage I is treated by orchidectomy and surveillance for 2 years (by measuring tumor markers) Vs RPLND (Retroperitoneal lymph node dissection) Vs Chemo.
- (RPLVD) to prevent recurrence, or for residual or recurrent nodal masses.
- Chemotherapy (BEP = Bleomycin, Etopiside, Cisplatin) given to:
  - Stage I patients who relapse.
  - Metastatic disease at presentation .



1. First orchiectomy and then radiotherapy to control the disease, and chemotherapy in advanced cases.
2. First orchiectomy and surveillance, RPLVD if lymph nodes are affected, and chemotherapy in advanced cases.

Quiz! 438#

Q1:Q1: A 58-year-old man is found to have high serum prostate–specific antigen (PSA) concentration with a normal prostate examination. A biopsy of the prostate confirms low-grade carcinoma. The patient wishes to avoid therapy involving any risk for impotence. Which of the following is the most appropriate management of this patient?

A) Observation
B) Chemotherapy
C) Prostatectomy
D) Radiation therapy
E) Hormonal therapy

Q2: A 45-year-old woman presents with a 7-cm renal cell carcinoma with radiologic evidence of abdominal lymph node involvement with no distant metastases. Which of the following is the most appropriate management of this patient?

A) Radical nephrectomy
B) Radiation
C) Chemotherapy
D) Radiation followed by nephrectomy
E) Chemotherapy followed by nephrectomy

Q3:Renal cell carcinoma (adenocarcinoma of the kidney):

A) Characteristically radiosensitive
B) Rarely metastasizes
C) Commonly occurs in von Hippel Lindau (VHL) disease
D) The commonest urological malignancy
E) Usually presents with blood in the urine

Q4: A 60-year-old man sees a urologist for what he describes as bloody urine. A urine sample is positive for cytologic evidence of malignancy. Cystoscopy confirms the presence of superficial transitional cell carcinoma. Which of the following is the recommended treatment for stage A (superficial and submucosal) transitional cell carcinoma of the bladder?

A) Topical (intravesicular) chemotherapy
B) Radical cystectomy
C) Radiation therapy
D) Local excision and topical (intravesicular) chemotherapy
E) Systemic chemotherapy

Q1) **A** / Q2) **A** / Q3) **C** / Q4) **D**

438#

Explanations

Q1 Explanation: Observation, or active surveillance, is an appropriate management option in a patient with early prostate cancer who wishes to avoid the risk of impotence involved with radiation, surgery, and hormonal therapy. Most early prostate cancers are slow-growing tumors and will remain confined to the prostate gland for a significant length of time. Active surveillance involves frequent visits to the doctor (every 3-6 months) with questions about new or worsening symptoms and digital rectal examinations for any change in the prostate gland. In addition, blood tests are done to watch for a rising PSA, and imaging studies can be conducted to detect the spread of the cancer. Chemotherapy is not indicated in the treatment of early-stage prostate cancer and is most often given to patients with metastatic disease who no longer respond to hormonal therapy.

Q2 Explanation: Renal cell cancer is not responsive to radiation and chemotherapy; therefore, radical nephrectomy remains the main treatment for localized renal cancer. A radical nephrectomy should be offered as a possible curative procedure in this patient because many nodes initially suspected of having metastatic disease on imaging are enlarged due to reactive inflammation.

Q4 Explanation: Ninety percent of bladder cancers are of transitional cell origin. It is most prevalent among men with a history of heavy smoking and is usually multifocal and superficial, even when recurrent. When the disease is still superficial, transurethral resection of visible lesions and intravesicular chemotherapy are most often recommended. More radical surgical resection, systemic chemotherapy, and radiation are reserved for advanced stages of the disease.

القادة

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شكر خاص لتيم الجراحة دفعة ٤٣٩

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