Urogenital Tumors and Adrenal Tumors

Surgery Team
MED 433

Objectives :

1st Renal System:

1. Upper Urinary Tract (Kidney And Ureter)

- **Renal Tumors**
- **Benign Tumors**
- **Nephroblastomas** (Clinical Features, Investigations, Management)
- **Renal Adenocarcinoma** (Clinical Features, Investigations, Management)
- Transitional Cell Carcinoma Of The Upper Tracts.

2. Lower Urinary Tract (Bladder, Prostate And Urethra)

- **Bladder Tumors** (Pathology, Staging, Clinical features, Investigations, Management and Prognosis)
- **Carcinoma Of The Prostate** (Pathology, Clinical features, Investigations, Management and Prognosis)

3. External Genitalia :

- **Testicular Tumours**
- **Carcinoma Of The Penis**

2nd Adrenal Medulla:

- **Phaeochromocytoma** (Pathology, Clinical features, Investigations, Management)

Sources : Slides, Principles & Practice of Surgery by: O. James Garden

Color Index : Slides | Textbook | Doctor's Notes | Extra Explanation

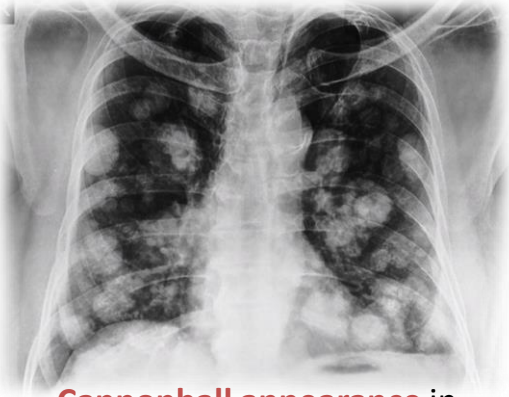
1st : Renal Tumors

1- Malignant Tumors

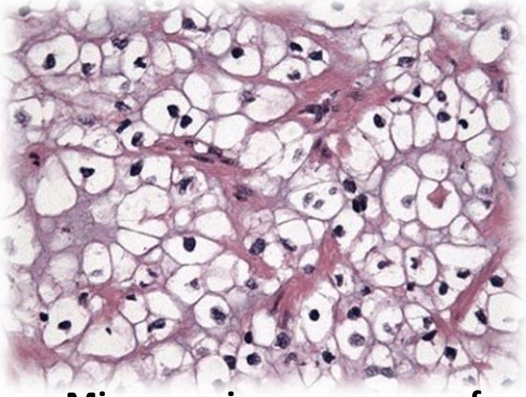
- Most renal tumor are **malignant** (benign are rare), and more common in male (2:1 ratio).
- Uncommon before the age of 40 years and has a peak incidence between **65 and 75** years of age.
- Most renal tumor arise from **proximal tubule cells.**
- Like to invade **veins** (renal vein, IVC).
- **Commonest** histopathological tumor in kidney is **Clear Renal Cell Carcinoma** (A.K.A Hypernephroma or Grawitz tumor)
- Most renal tumor are **sporadic,** it can be familial like; VHL syndrome[1] .
- **Hematogenous spread** is most common, and the Commonest site for metastasis is the **lungs.**

Clinical Presentation :

- 10% of patient come with triad of: **Hematuria,** loin pain, palpable mass*
- **Some patient present with: Paraneoplastic Syndrome[2].**
- **Others present with : 1- Hyperyetnsion**, **2- Pyrexia** (fever) of unknown origin, **3- Polycythemia:** (due to ⬆ of erythropoietin)
  4- Hypercalcemia:
  (due to production of PTH-like Hormone)
  5- Increased ESR [3].
  6- Disorders of coagulation.
  7- Abnormalities of plasma proteins.
  8- Abnormalities of **L**iver **F**unction **T**ests.
  9- Neuromyopathy .



Cannonball appearance in pulmonary metastasis



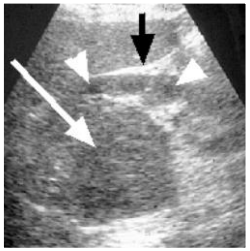
Microscopic appearance of Clear Renal Cell Carcinoma

(1) **Von Hipple-Lindau Syndrome:** Mutation of VHL gene in short arm of chromosome 3, it's Autosomal dominant, associated with renal cell carcinoma, renal-hepatic-pancreatic-epididymal cysts, pheochromocytoma, angiomatosis and hemangioblastomas. When suspected, bring the whole family for screening.

(2) **ParaNeoplastic Syndrome**: A unique feature of renal cancer, and the tumor starts secreting hormones e.g. ADH or EPO.

* Nowadays it disappear due to earlier diagnosis due to **ultrasound.** **(3) E**rythrocyte **S**edimentation **R**ate

Investigation

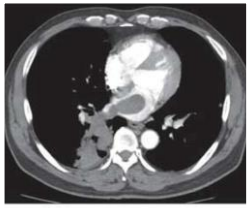


1-Ultrasound

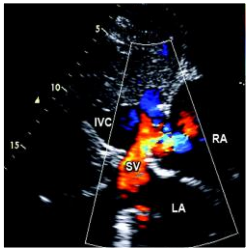
(Initial + confirmetive)

2- CT contrast of abdomen and chest

- allows assessment of renal vein and caval spread (IVC)
- **It is used for staging**



igure 1: Computed tomography scan
atient's chest when he was first diagnosed wi
tracardiac extension of disease.



3- Echocardiogram

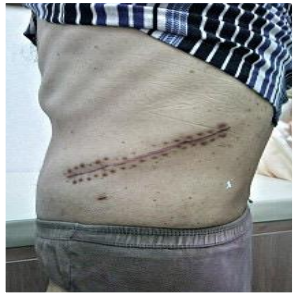
- should be considered if clot in IVC extends above diaphragm

2- Benign Tumors

- **Renal adenomas** are small and are usually an **incidental finding.**
- **Haemangiomas** are a rare cause of dramatic haematuria.

① Open Radical Nephrectomy (Sart at 1:00)
② Laparoscopic Nephrectomy
③ what's Immunotherpy ?

Management: the only choice is surgery



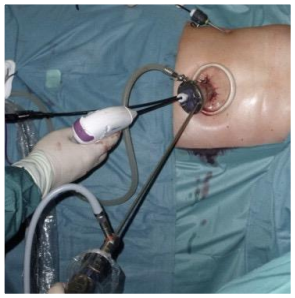
1-Open Radical Nephrectomy

- Kidney and **adjacent tissue** (adrenal, perinephric fat) excised (in both open and laproscopic Nephrectomy)
- (big scar, more pain especially with respiration)

2- Laparoscopic Nephrectomy

(Gold Standard)

- **Groin Incision** (muscle splitting incision): to avoid cutting through muscle.
- **Transvaginal Approach:** For post-menopausal women who have undergone hysterectomy
- **(Advantages:** smaller scar, Less pain)



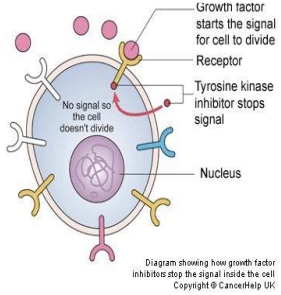


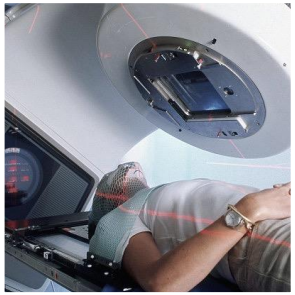
Diagram showing how growth factor inhibitors stop the signal inside the cell
Copyright © CancerHelp UK

3- Immunotherapy

- **Monoclonal antibodies, interferon, cytokine inhibitors and tyrosine kinase inhibitors.**
- Very cytotoxic. Given only to patients with good performance status
- Not curable but it can prolong his life for **6-8 months**
- In case of metastasized

Chemo and Radiotherapy

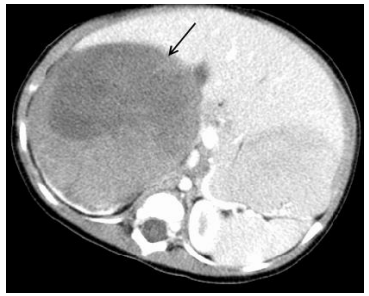
- Kidney tumors are **resistance** to both.
- **Indicated In:** cases of symptomatic bone metastasis, in order to relieve pain



Renal Tumors in Children (From the textbook)

3- Nephroblastoma: (**A.K.A.** Wilm's Tumor)

- The **most common** childhood urological malignancy
- occurs in children **under 4 years**.
- **Very rapid growth** with early local spread including **Renal Vein.**
- **Distant metastasis including:** liver, lung and bones.
- Bilateral in 5-10% of cases.



✸ Clinical Featurs:

⇢ **Large abdominal mass**. And unusally, fever and hypertension may present.

⇢ Hematuria only present in 15% of cases.

⇢ The affected child is not gaining weight and not playing (الطفل خامل)

⇢ Clinically it needs to be differentiated from **Neuroblastoma**

✸ Investigation:

- **CT** of the abdomen and chest : for diagnosis and staging.
- Diagnosis is confirmed by **biopsy**.

✸ Management :

- **Chemotherapy**, followed by transabdominal **Nephrectomy** with wide excision of the mass.
- **Post Operative: further chemotherapy ± Radiotherapy.**

4- Neuroblastoma : (See the table)

Table 23.2 Childhood renal tumours

Feature	Nephroblastoma	Neuroblastoma
Frequency	MC childhood tumour of renal origin	MC extracranial solid malignant childhood tumour
Age	Between 3–5 years of age	< 2 years of age
Origin	Kidney	MC 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

2nd: Bladder Tumors (BT)

✸ Pathology :

- Like kidney, most of bladder tumors are **malignant.**

Transitional Cell Carcinoma (90%)	✸ **Risk Factor:** • **Smoking** • chemical exposure • analgesic abuse (phenacetin) • **Occupational Exposure(~20%)**: Chemical implicated: aniline dyes, chlorinated hydrocarbons.	**Superficial and well differentiated: (80% of TCCs)** • Above the muscle layer (muscularis propria) • Only 20% progress to muscle invasion • **Associated with good prognosis, but higher recurrence rate (50%)** **Deep, high-grade & muscle invasive: (20% of TCCs)** • 50% have muscle invasion at time of presentation. • Associated with poor prognosis
Squamous Cell Carcinoma (5%)	✸ **Risk Factors:** **Chronic irritation** (e.g. UTI, Stone, catheter, Bilharziasis* **"Schistosoma haematobium"**)	
Adenocarcinoma (2%)	✸ **Risk Factors:** Crohn's disease, Urachal remnant abnormalities	

✓ **Other Risk factors:** Pelvic irradiation - for carcinoma of the cervix

✸ Clincal Presentation:

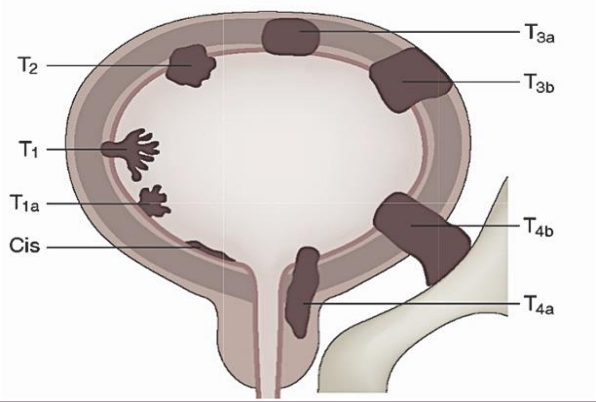
- 80% present with **Gross Painless Terminal Hematuria*** It should be assumed that such bleeding is from a tumor until proved otherwise.
- Also, present with **treatment-resistant infection** or bladder irritability and sterile pyuria (other DDx: TB)
- If the tumor involved the ureteric orifice ➔ obstructive symptom .
- Patient with **UTI resistance** to treatment ⟼ think of tumor.

*Haematuria Classification: indicate the site of problem. initial hematuria (urethral), terminal hematuria (trigone of bladder, prostate), total hematuria (bladder, ureter, kidney)

*Common in Jizan

✸ Staging :

- ✓ **Biopsy:** (Requires bladder muscle to be included in specimen)
  - is essential to: **confirm the diagnosis (cell type)**, determine the degree of **cell differentiation (grade)** and **Assess the depth** to which the tumor has penetrated the bladder wall **(stage)**.
  - It gives accurate information on **superficial tumors**, but depth of invasion of invasive tumors cannot be assessed precisely (as the biopsy does not examine the full thickness of the bladder wall).
- ✓ **The TNM system of tumor classification** :
  - **1- Assessment of The Primary Tumor (T)**: requires **bimanual examination** under anesthesia (important, especially **for T2 and T3**)
  - **2-Assessment of The Involvement Of Regional And Juxtaregional Lymph Nodes (N):** By Clinical examination, urography and CT.
  - **3- Assessment of Distant Metastases (M)**: By clinical examination and CT.
- ✓ **Histo-Pathological Examination :** to **guide the choice of treatment**.

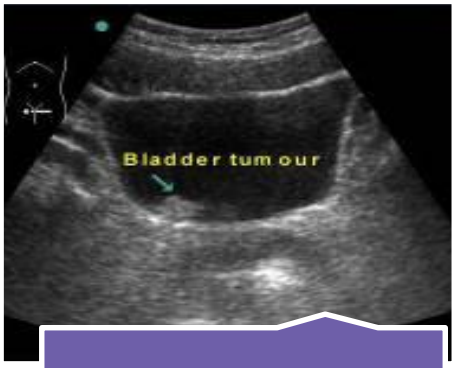


Grade of Tumor	
G1	Well differentiated
G2	Moderately well differentiated
G3	Poorly differentiated

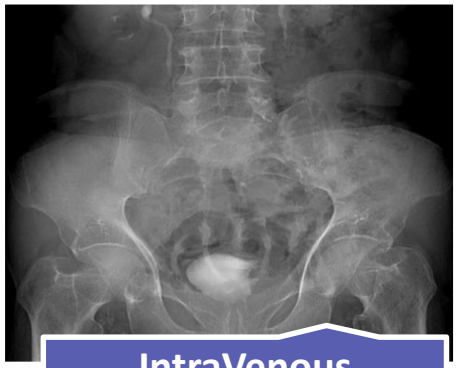
Staging : according to depth of tumor invasion		
Superficial	Tis	In-situ disease
	Ta	Epithelium only
	T1	Lamina propria invasion
Invasive	**T2**	Superficial muscle invasion
	T3a	Deep muscle invasion
	T3b	Perivesical fat invasion
	T4	Prostate or contiguous muscle

✸ Investigation :

Urinalysis

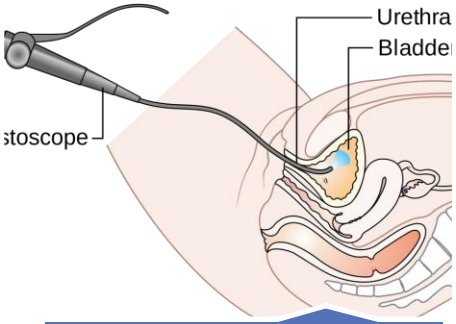


Ultrasound

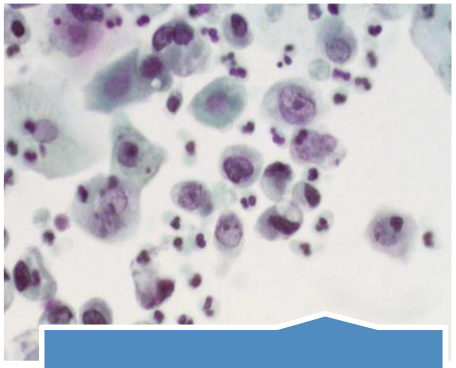


IntraVenous Urogram

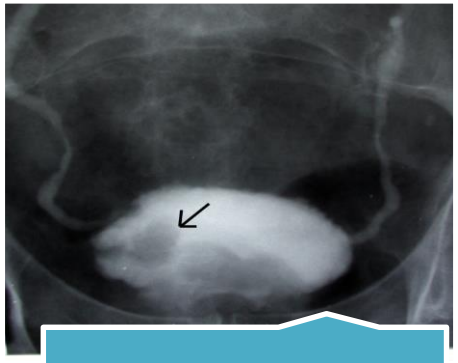
A.K.A. Intravenous Pyelogram. It is used if no pathology is identified, (*shows filling defect, or sometimes hydronephrosis due to obstruction of the ureters, which is a bad sign indicating progressive disease*)



Cystoscopy (A must in this case)



Urine Cytology

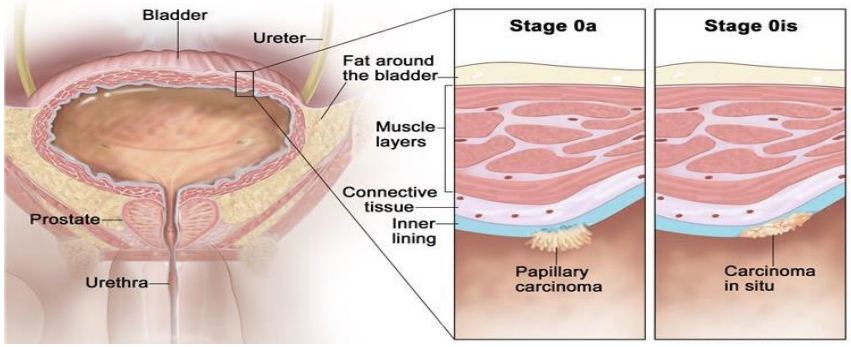


KUB X-ray

KUB = **K**idneys, **U**reters, and **B**ladder

★ Carcinoma In-situ

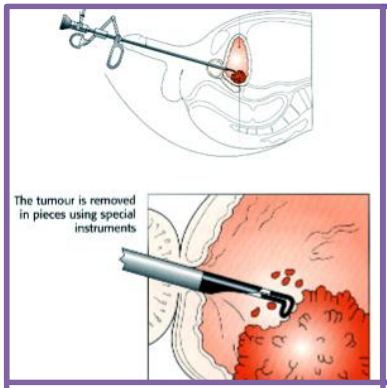
- Carcinoma-in-situ is an aggressive disease
- Often associated with positive cytology
- 50% patients progress to muscle invasion
- Consider immunotherapy
- If fails patient may need radical cystectomy



✸ Management :

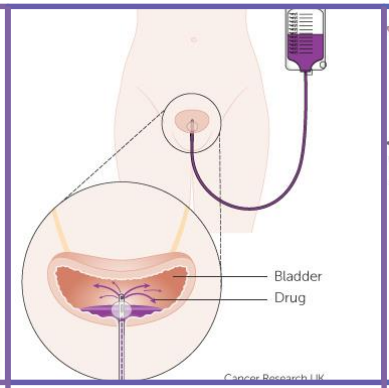
[1] **Intravesically = they** are put directly into the bladder through a catheter.
[2] BCG = attenuated strain of **Mycobacterium bovis**

1) For *Superficial Bladder Tumors (Ta,T1) :*



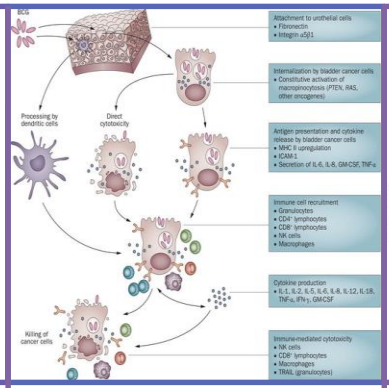
1- TransUrethral Resection of the Blabber Tumour (TURBT)

- The ideal choice



2- Intravesical[1] Chemotherapy

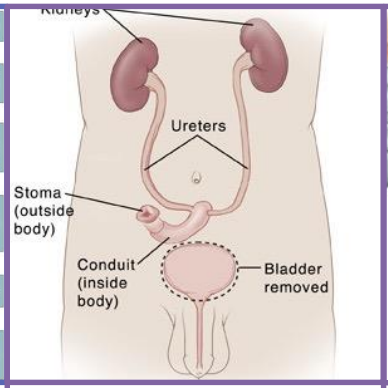
- **Prophylactic:** if risk factor for recurrence or invasion (e.g. high grade). **High risk:** 1.Multiple tumors 2. Big tumors 3.Carcinoma in situ
- **Used For :**multiple low-grade bladder tumors.



3- Immunotherapy

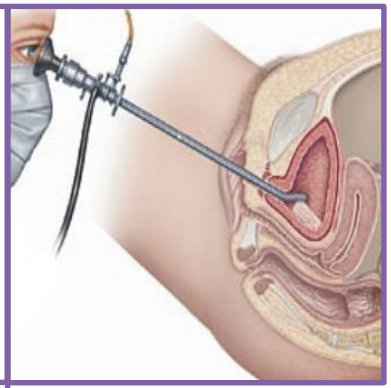
➔intravesical **B**acille **C**almette **G**uérin(BCG)[2]

- **Used to:** Reduces risk of recurrence and progression. And for Carcinoma in situ
- Occasionally, associated with development of systemic mycobacterial infection



4- Cystectomy

- If Recurrences become very frequent and excessive



Cystoscopy

- For follow-up
- To watch out for recurrence due to the high recurrence rate of **superficial TCC**

2) For Invasive Bladder Tumor (T2–T3s):

1- Radical Cystectomy: (Local recurrence rates = 15%)

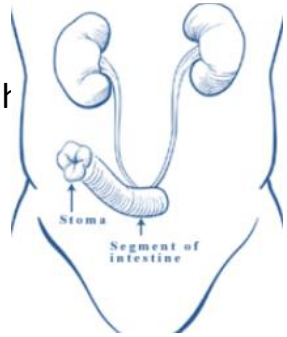
- It's the removal of bladder, prostate, distal ureter and lymph nodes and In females: also the uterus, cervix and anterior vaginal wall
- Treatment of choice for patients **under 70** years of age.

2- Radiotherapy: (Local recurrence rates = 50%)

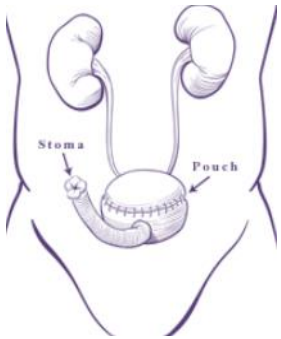
- Alone, in patients **older than** 70 of age.
- Not needed Pre-operativly.

3- Chemotherapy: Adjuvantly, it may have a role.

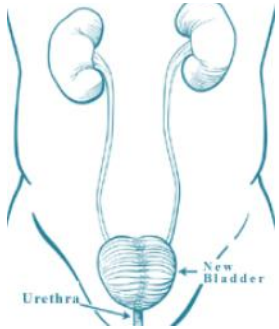
★ Types of Urinary Diversion:



Ileal conduit
(most common one)
(incontinent diversion to skin)

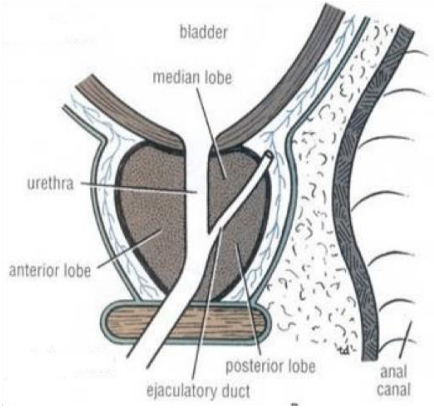


Continent cutaneous reservoir
(Continent diversion to skin)



Orthotopic neobladder
(Continent diversion to urethra)

3rd : Prostate Tumors



- It's **the commonest** malignancy of male urogenital tract.
- Usually between the **age 50-75** . **(A rare tumor of males under the age of 50)**.
- Found at post-mortem in 50% of men older than 80 years.
- **5-10%** of operations for **benign** disease reveal **unsuspected prostate cancer.**

Pathology

- **Adenocarcinoma:** A slow growing malignant tumor originated from the glandular tissue of the **peripheral zone** (in 70% of cases) of the prostate.
- **Very common** in western countries. **Rare** in Japan and china
- The tumor itself is not lethal, but it can spread and cause serious manifestations, **Patients die with the tumor not from the tumor.**
- spread locally to the adjacent **perineal structures** (bladder neck, pelvic wall and rectum)
- Commonly spread through **lymphatic** especially to **pelvic lymph.** In 1/3rd of cases it already reaches the **Regional Lymph Node** at the time of presentation (**Regional Lymph Node =** a lymph node that drains lymph from the region around a tumor)
- 15% of cases show **bone metastases** (e.g. Lumbar spine and Pelvis) through **hematogenous spread.**

Clinical Features

The tumor is usually **asymptomatic.** But if not, **the patient may present with :**

1- Acute Retention: in 25% of patients, especially if the tumor size is large enough to narrow the urethra. (Although the tumor may not involve the transitional zone of the prostate, yet its presentation is similar to BPH)

2- Altered Bowel Habits: If the tumor extend posteriorly around the rectum.

★ **Metastatic Manifestations :**

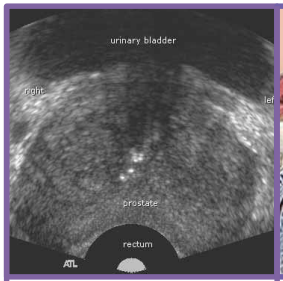
- ✓ **Back Pain, Spinal cord compression, Leukoerythroblastic Anemia and Leukopenia (↓ WBCs): all** due to the involvement of bone marrow.
- ✓ **Weight Loss**
- ✓ **Renal Failure:** if the tumor obstruct both ureters.

Typical Scenario: An 87-year-old man presents with a history of prostate cancer presents with low back pain. **Think→** Bony metastases and possibly cord compression.

Diagnosis

- In majority of patients, the diagnosis is made by screening **(PSA)**
  - ***Prostate Specific Antigen (PSA)***
    - A protein produced by prostatic epithelial cells.
    - Normally, **serum levels < 3.5 ng/ml** (if less than 65 years of age) *and some say 4ng/ml*
    - > 10 ng/ml highly suggests prostate cancer.
    - > 100 ng/ml almost **always** indicate distant bone metastases.
    - Not specific (Can also be raised in BPH).
    - The **main** test for monitoring **response to treatment** and disease progression
- In 10% of cases, the tumor detected **incidentally** after Transurethral prostate resection in people with other prostatic diseases (e.g. BPH).

Investigations :



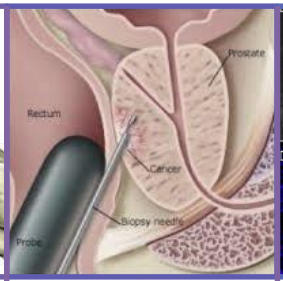
1-Ultrasound

2-Serum Creatinine

- to assess the **any** urinary tract obstruction.

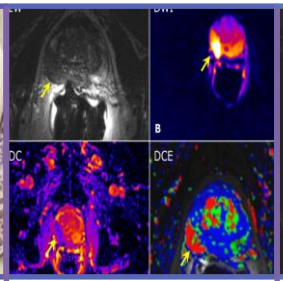
3-Rectal Examination

- Locally **advanced** ones can be **confirmed** by the examination **alone**
- **Findings:** hard nodule or loss of central sulcus



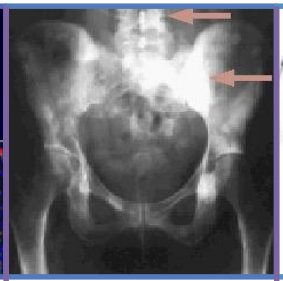
4-TransRectal UltraSound (TRUS) biopsy

- To **Confirm** the diagnosis



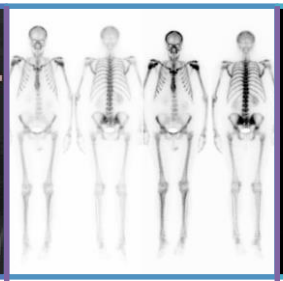
5-MultiParametric MRI*

- useful in the **staging** of the disease (although there are some interesting debates about its benefit)



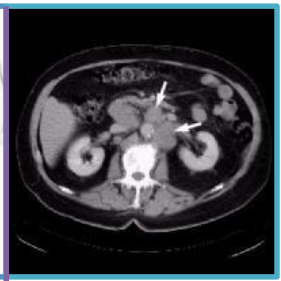
6-Pelvic/ lumbar spine X-ray

- to investigate back pain
- May show **osteosclerotic** metastases



7-Bone Scan

- may be carried out at follow up to localize and define the **extent of metastases**



8- CT Scan

- is useful to assess pelvic **lymph-adenopathy.**

*Multiparametric MRI of the prostate

Grading / Staging

Prostate cancers are graded using Gleason's Score:

- Gleason grading system is based on a histologic evaluation of prostate tissue samples.
- The Gleason score is the sum of the two most common cell patterns seen in the tissue sample. The patterns can range from 1 (well differentiated) to 5 (poorly differentiated, highly malignant).
- Over-all scores range from 2 to 10. A grade of 2 has the best prognosis, while a grade of 10 represents poorly differentiated tissue and confers the worst prognosis.
- Staging is done using **TNM** classification . (see the tables below)

Table 23.2 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_{2a}	Palpable nodule involving half of one lobe
T_{2b}	Palpable nodule involving one lobe
T_{2c}	Palpable nodule involving both lobes
T_{3a}	Extracapsular extension of prostate cancer
T_{3b}	Prostate cancer involving the seminal vesicles
T_{4a}	Prostate cancer involving the bladder neck and/or external sphincter and/or rectum
T_{4b}	Prostate cancer involving the lateral 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

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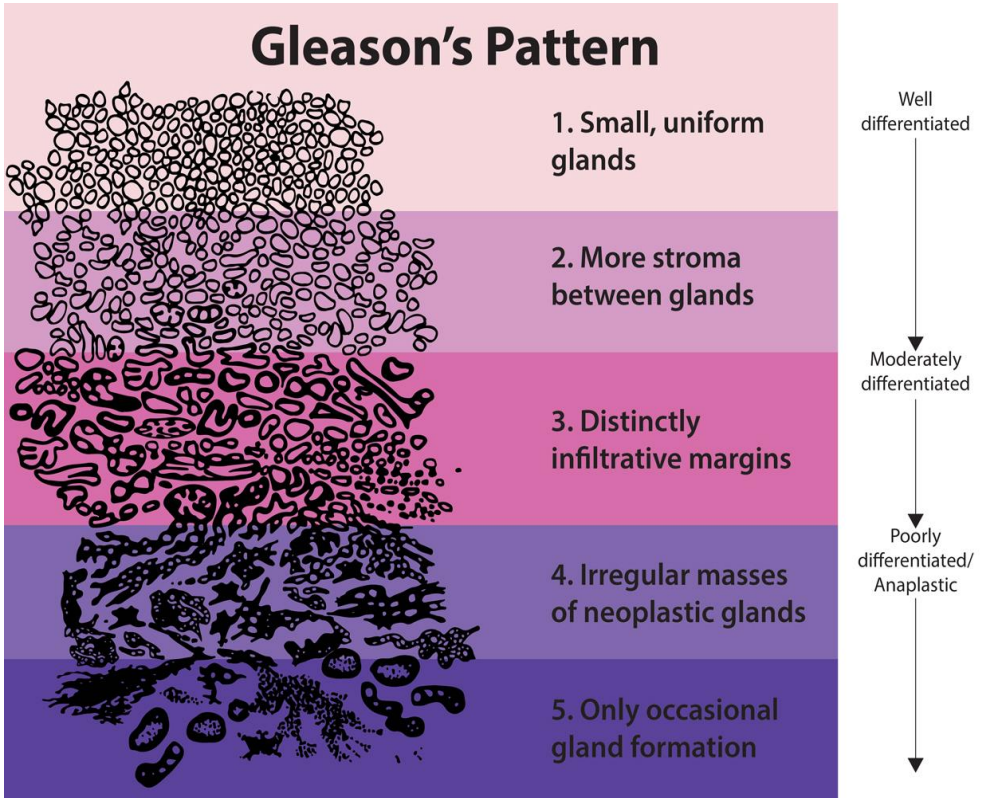

Prostate Cancer: Gleason Score

Management

- **Treatment depends on:** stage of disease, patient's age and general fitness.
- **The option of the treatment depends on the degree of spread:**

Degree of Spread	Options	Used In
Local	**1- Observation**	In patients with small focus of well- differentiated carcinoma
	2- Radical Radiotherapy* **3- Radical Prostatectomy**	• In young patients • In **large tumors** with a less well-differentiated cell pattern (Gleeson score 7 or more)
Locally Advanced	**Radical Radiotherapy (EBRT)** and/or **Hormonal Therapy**	In cases where the prostate cancer has invaded directly outside the prostate but **has not metastasized**
Metastatic	**1) Hormonal Therapy (Androgen Depletion) :** • 80-90% of prostate cancers are **androgen dependent** for their growth. ★ **Androgen depletion can be achieved by:** 1. **Surgical Castration:- Bilateral Orchiectomy** (removal of both testicles) 2. **L**uteinizing **H**ormone **R**eleasing **H**ormone **(LHRH) Agonists:-** example: **Goseraline** 3. **Anti-Androgens:-** examples: **Cyproterone Acetate, Flutamide and Biclutamide** 4. **Complete Androgen Blockade** (using **both** LHRH Agonists and Antiandrogens) 5. **Estrogen administration.** **2) Chemotherapy With Taxanes:** has shown improvement in both symptoms and survival **3) Radiotherapy:** for localized bone pain.	

* **Radical:** a resection of the main organ along with the structures surrounding it.

✓ **Prostatectomy can be done by:** Open surgery, Laparoscopically or robotically.

✓ **Radiotherapy can be performed using: 1- External beam Radiotherapy (EBRT):** where The patient sits or lies on a couch and an external source of radiation is pointed at a particular part of the body. **2- Intensity modulated RT (IMRT):** a computer controlled delivery of precise radiation doses to a malignant tumor or specific areas within the tumor

3- Brachytherapy: Insertion of radioactive seeds in the prostate.

4th : Testicular Tumors

- **Commonest malignancy in young men** (20-40 years old).
- Highest incidence in Caucasians in Northern Europe and USA.
- 5 years survival rate is higher than 95% in localized tumors.
- **Risk Factors: Cryptorchidism**(Undescended testis), **Testicular Maldescent, *Testicular Torsion*** and **Klinefelter's syndrome**.
- However, **Orchidopexy**(Surgical fixation of an undescended testis in the scrotum) doesn't reduce the risk of developing testicular tumor.
- **Metastases** occur commonly through **lymphatics,** the tumor can also reach the lung **hematogenously.**

Pathology :

1) Germ Cell Tumors		2) Non Germ Cell Tumors
Seminomas	**None Seminomas**	
• Most **Common.** • Arises from **seminiferous tubules.** • Peak incidence 35 years old. • Low grade malignancy. • **Radiosensitive,** with cure rate 90%. • Treatment depend on the stage of the seminoma	**1- Teratoma** • Arises from **primitive germ cells.** • Peak incidence 25 years old. • May contain bone, cartilage, muscles, fat and other tissues. • Classified according to **degree of differentiation.** • **Chemosensitive. Radioresistant** **2- Embryonal Carcinoma** **3- Yolk Sac Tumors** **4- Choriocarcinoma** **5- Mixed Germ Cell Tumor**	**1- Malignant Lymphoma** **2- Sertoli Cell Tumor** **3- Interstitial Cell Tumors**

Occasionally, Seminoma and teratoma occur in the same testis and account for 85% of testicular tumors

✸ Clinical Features:

1. **Painless Lesion**(testicular lump)**:** discovered **incidentally. (Most common** presentation**)**
2. **Swelling and Pain:** suggesting inflammation, those patients may have **wrongly received a treatment of acute epididymitis**.
3. **Gynecomastia:** in patients with **Teratoma** (Very **rare** presentation).
4. **Hydrocele:** painless buildup of watery or blood fluid around one or both testicles.

✸ Staging:

Accurate staging is based on **Thoraco-Abdominal CT-scan.** (of the lungs, liver and retroperitoneal area)

Stage I	Disease Confined To Testis.
IM	Rising Post-orchiectomy Tumor Marker.
Stage II	Abdominal Lymphadenopathy (**A** <2cm - **B** 2-5cm – **C** >5cm)
Stage III	Supra-diaphragmatic Disease.

Table 23.4 Royal Marsden classification for testicular cancer

- Stage 1 Tumour confined to testis
- Stage 2 Tumour spread only to lymph nodes below diaphragm
- Stage 3 Tumour spread only to lymph nodes above and below diaphragm
- Stage 4 Tumour spread to inguinal lymph nodes or distant metastases

✸ Investigation

1- Testicular Ultrasound: to confirm the Diagnosis

2- Performing An Inguinal Orchiectomy: to make a Pathological diagnosis

3- Tumor Markers: are useful in staging and assessing response to treatment.

- But remember, The absence of the tumor marker **doesn't exclude malignancy**.

★ **Markers include:**

a) **α-Fetoprotein** : an indicator of yolk sac tumor. (Not produced by seminomas)

b) **B-hCG** (human Chorionic Gonadotropin): an indicator of trophoblastic elements such as **Choriocarcinoma** and **Hyditiform** mole it can also be **elevated** in **Seminomas** and **Teratoma** as well.

c) **Lactate Dehydrogenase.**

4- Ultrasound: for lungs, liver and peritoneum.

5- Assessment Of Renal And Pulmonary Function.

✸ Management:

Tumor Type	Management
Seminoma	• **Early stage (Stage I – IIB)** ➡ inguinal orchiectomy + Radiotherapy {to ipsilateral abdominal and pelvic nodes 'Dog leg'} • **Stage IIC and III** ➡ Chemotherapy.
Non-Seminoma	• **Stage I** ➡ Orchiectomy • **Relapsed Stage I & Metastatic cases** ➡ Chemotherapy (Bleomycine, Etopiside, Cisplatin)
2 years follow-up by the three tumor markers and CT-scan is essential.	

5th : Carcinoma of The Penis

- This uncommon tumor. It is **very rare in circumcised men** and almost always occurs in the **elderly.**
- The cancer may be a papillary or an ulcerating squamous cell carcinoma.
- **Lymphatic spread** to inguinal lymph nodes is common; associated infection may also lead to lymphadenopathy.

✸ **Clinical Features:** The patient may present with a **purulent or blood-stained discharge**. Unfortunately, many patients do not seek help until the lesion is advanced.

✸ **Diagnosis :** The diagnosis must be confirmed by **biopsy.**

✸ **Treatment :**

1-Circumcision: may cure early tumors confined to the prepuce.

2- Excision Of The Glans And Skin Grafting : in Early tumors confined to the glans.

3- Partial Or Total Penile Amputation With Bilateral Block Dissection Of The Inguinal Lymph Nodes: required in Advanced tumors.

4- Radiotherapy: for Inoperable tumors.

6th :Pheochromocytoma

- Are tumors originated either from the adrenal medulla (80%) or paraganglionic tissue (20%).
- Adrenal type secrete both Catecholamines while the latter secretes only norepinephrine.
- Can be associated with MEN-II syndrome, **Von Hippel-Lindau** disease and **neurofibromatosis**.

Clinical Features	★ **Symptoms :** • Headache • Palpitation • Sweating • Extreme anxiety • Chest and abdominal pain. ★ **Signs:** • Sever **paroxysmal hypertension** (200/100 mmHg). • Pallor • Dilated pupils • Tachycardia. • Mottled skin. • Glycosuria. ✓ Sudden death after trauma and during surgery is common due to severe hypertension which can cause CVA.
Investigations	✓ Measurement of Urinary levels of Metadrenaline and Normetadrenaline. ✓ CT Scan ✓ MRI
Management	▸ Surgical removal of the tumor **is the treatment of choice.** ▸ **α- and β-blocking drugs:** are widely used in order to control the hypertension.

※ Summary

Renal Tumors	- Most renal tumor are malignant (benign are rare), and more common in male - Commonest histopathological tumor in kidney is clear renal cell carcinoma - Hematogenous spread is most common and the Commonest site for metastasis is lung - Triad of symptoms: 10% of patient come with Hematuria, loin pain, palpable mass - Some patient come with paraneoplastic syndrome - Kidney tumors are resistance to chemo and radiotherapy, only choice is surgery "Radical nephrectomy"
Bladder Tumors	- Like kidney, most of bladder tumors are **malignant** - Usually patient come with **Gross Painless Terminal Hematuria*** - In staging, **T2 or more** consider as **deep**, **below T2** is **superficial** - Patient with **UTI resistance** to treatment ⟼ think of tumor - Treated be resection **(radical cystectomy)** with **10%** mortality rate, + consider **Immunotherapy.**
Prostate Tumors (Prostate Cancer)	- A slow growing malignant tumor originated from the glandular tissue of the peripheral zone of the prostate - It's the commonest malignancy of male urogenital tract. - It could spread locally to the adjacent perineal structures , causes acute retention and altered bowel habits. - In majority of patients, the diagnosis is made by screening (**PSA**) - Locally advanced ones can be confirmed by **rectal examination.** - Treatment depends on stage of disease, patient's age and general fitness.
Testicular Tumors	- Commonest malignancy in young men (20-40 years old) - Most common risk factors include **cryptorchidism**. - The tumors mostly discovered **incidentally** as it's a **painless** lesion. - However, patients can present with swelling and pain. - The Classification includes : Seminomas (~50%) Radiosensitive, Non-Seminoma (~50%) Radio-resistant - Diagnosis can often be confirmed by testicular ultrasound. - Tumor markers are useful in staging and assessing response to treatment like Alpha-fetoprotein, Beta HCG , Lactate Dehydrogenase
Pheochromocytoma	- Adrenal type secrete both Catecholamines while the latter secretes only norepinephrine. - Can be associated with MEN-II syndrome, Von Hippel-Lindau disease and neurofibromatosis. - The patient presented with sever paroxysmal hypertension (200/100 mmHg). - Investigations include Measurement of Urinary levels of metadrenaline and normetadrenaline, CT and MRI can show the tumor. - Surgical removal of the tumor is the treatment of choice.

Thank You..

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