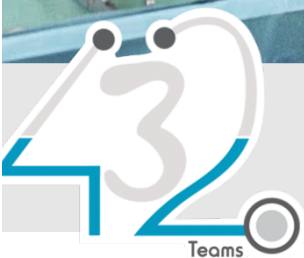




# 432 Surgery Team

2

GU Oncology



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جامعة  
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King Saud University



COLOR GUIDE: • Females' Notes • Males' Notes • Important • Additional

# Objectives

1. Not given

# 1. Renal Tumors:

## Pathology:

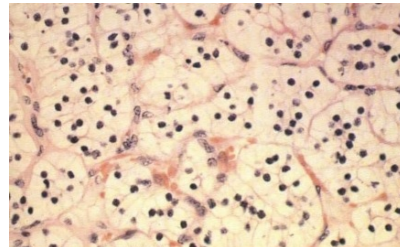
- Benign tumors of kidney are rare. All renal neoplasms should be regarded as potentially **malignant**.
- Male:Female ratio is approximately 2: 1

Types:

1. Onchocytoma: the commonest benign type.
2. Renal cell carcinoma (RCC): arise from proximal tubule cells. **(clear cell carcinoma is the commonest histological subtype)** **has higher incidence to be seen in VHL syndrome (von Hippel-Lindau)**
3. Collecting duct carcinoma: arises from collecting duct.
4. Papillary cell carcinoma.

- Pathologically may extend into renal vein and inferior vena cava:
  - o Could obstruct IVC and cause DVT (Deep Vein Thrombosis)
  - o Could reach the heart
- Metastases: **Lungs** are the commonest site for metastases. Blood born spread can result in '**cannonball**' pulmonary metastases. (Looks like a cannonball; large and well circumscribed)

Very clear and impacted cells, dark nuclei with clear cytoplasm: clear cell carcinoma.



## Note(s):

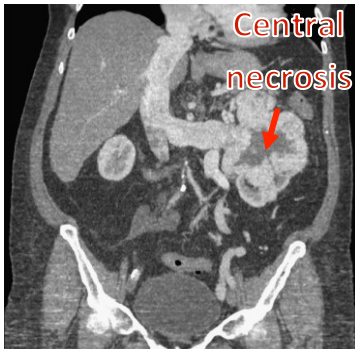
VHL syndrome: genetic, autosomal **dominant**, mutation in tumor suppression gene (**chromosome3, short arm**), may associate with CNS hemangioblastoma, **pheochromocytoma**, pancreas and kidney cysts, **cyst adenoma in epididymis, renal cell carcinoma**, and adrenal gland malignancies. (When having patient with VHL please screen for other tumors!)

## Clinical features:

- The commonest presentation is incidental finding.
- **10% only** present with classic triad of gross hematuria, loin pain and a palpable mass (in advanced stage). Others cases discovered before accidentally.
- Other presentations include (**Paraneoplastic Syndrome - PNS**): a unique feature of renal cancer where the tumor starts secreting hormones like ADH (anti-diuretic hormone) or EPO (Erythropoietin: increase RBC production)
  - **Systemic manifestations of PNS** include pyrexia of unknown origin, hypertension, polycythemia (due to high EPO), Hypercalcaemia (because of high PTH like hormone) and **non-metastatic hepatic dysfunction "Stuffer's syndrome"** characterized by high liver enzymes **without** jaundice.
  - **Treatment of PNS:** removal of the underlining cause (tumor) except for Hypercalcaemia could be treated medically.

## Investigations:

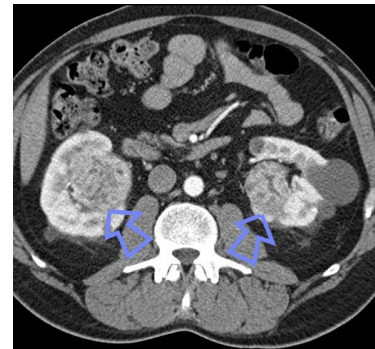
- **Diagnosis confirmed by renal ultrasound.**
- **CT scan** can be used diagnosis for **staging** by assessing renal vein and caval spread.
- Echocardiogram (TEE) should be considered if clot in IVC extends (extension **NOT** metastases) above diaphragm.



Huge left RCC, extended to the renal vein → IVC → heart



Figure 1: Computed tomography scan of patient's chest when he was first diagnosed with intracardiac extension of disease.



Bilateral tumor → familial syndrome like VHL.

## Management:

- Unless extensive metastatic disease it invariably involves surgical removal.
- Surgical option usually involves a **radical nephrectomy** (remove the whole kidney)
- Kidney approached through either a trans abdominal or loin incision.
- Renal vein ligated early to reduce tumor propagation.
- Kidney and adjacent tissue (adrenal, perinephric fat) excised.

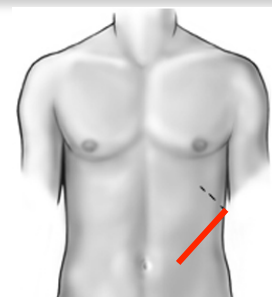
### Note(s):

1) Staging kidney tumor include:  
 1. Clinical staging by CT.  
 2. Histopathological staging.  
 Grading system for kidney cancer is called: **Fuhrman system**

2) Fat can get **diposed** in malignant cells → golden color grossly.

3) **Radio, chemo therapy has NO role in RCC management.**

Open radical nephrectomy: causes big scar that has to the muscles so patient will suffer with respiration.

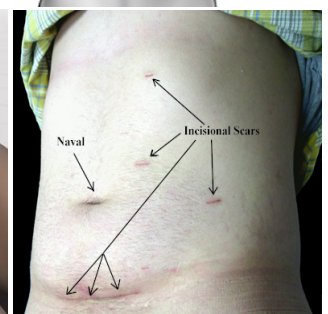
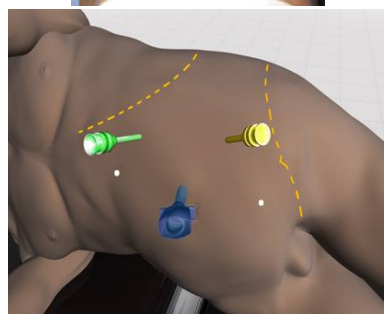


Laparoscopic nephrectomy: **(Gold standard)**  
 Advantages:

1. Shorter hospital stay
2. Less pain

**Groin incision** is used to remove large tumors, so we do not cut muscle. It is a muscle splitting incision.

For Post-menopausal women who have undergone hysterectomy; trans-vaginal approach.



### If there is metastases:

- Lymph node dissection of no proven benefit (whether you removed them or not patient will have recurrence.)
- Solitary (e.g. lung metastases) can occasionally be resected.
- Radiotherapy and chemotherapy have **No role** (unless in symptomatic bone metastases to reduce pain)
- **Immunotherapy** can help (for those having **good performance status**, not a very sick patient):
  - Monoclonal antibodies, interferon, cytokine inhibitors
  - Very cytotoxic
  - Given only to patient with good performance status
  - Not curable but can prolong his life few months

### Prognosis:

**Early stage:** 5 years survival 95% / **Metastatic:** 3-6 average survival.

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## 2. Bladder Tumors:

### Pathology:

- Of all bladder carcinomas:
  - 90% are transitional cell carcinomas (TCC)
  - 5% are squamous carcinoma (SC)
  - 2% are adenocarcinomas (comes with embryological deformities)
- TCCs should be regarded a 'field change' disease with a spectrum of aggression.
- 80% of TCCs are **superficial** and well differentiated
  - Associated with **good prognosis**
  - Only 20% progress to muscle invasion
- 20% of TCCs are high-grade and muscle **invasive**
  - 50% have muscle invasion at time of presentation
  - Associated with **poor prognosis**

### **Note(s):**

~~~~~  
**Squamous carcinoma**  
**(chronic irritations of**  
**bladder → SC):**

*The worst prognosis*

**High-risk groups:**

*Smokers*

*Chronic UTI*

*Stones*

*Chronic indwelling catheter*

*Spinal cord injury*

*Schistosomiasis*  
~~~~~

### **Etiology:**

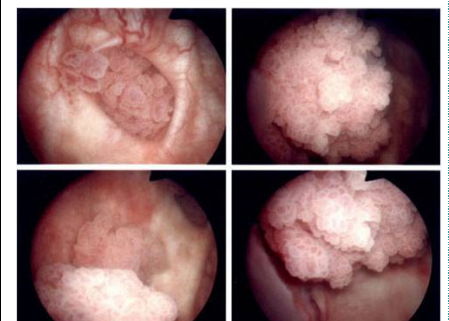
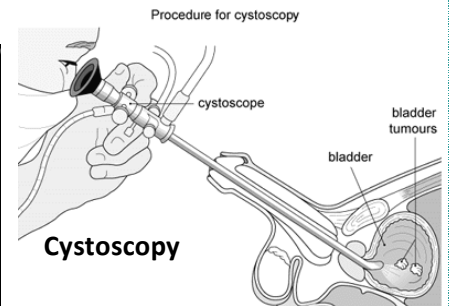
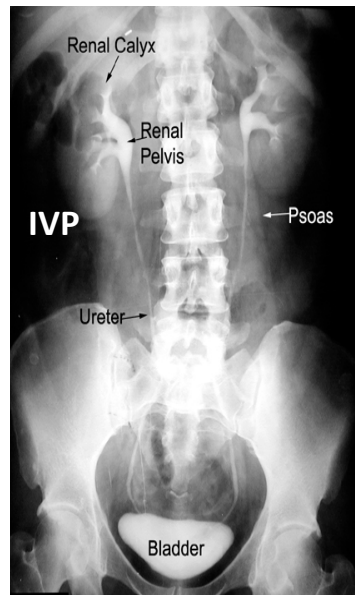
- Occupational exposure
  - 20% of transitional cell carcinomas are believed to result from occupational factors.
  - Chemical implicated - aniline dyes, chlorinated hydrocarbons.
- Cigarette smoking
- Analgesic abuse e.g. Phenacetin
- Pelvic irradiation - for carcinoma of the cervix
- *Schistosoma haematobium (Schistosomiasis) (also known as bilharzia, snail fever, and Katayama fever)* associated with increased risk of squamous carcinoma.

## Clinical features:

- 80% present with **gross, painless and terminal hematuria**.
- Also present with treatment-resistant infection or bladder irritability and sterile pyuria (urine contains pus - TB).

## Investigations: (you have to have full investigation)

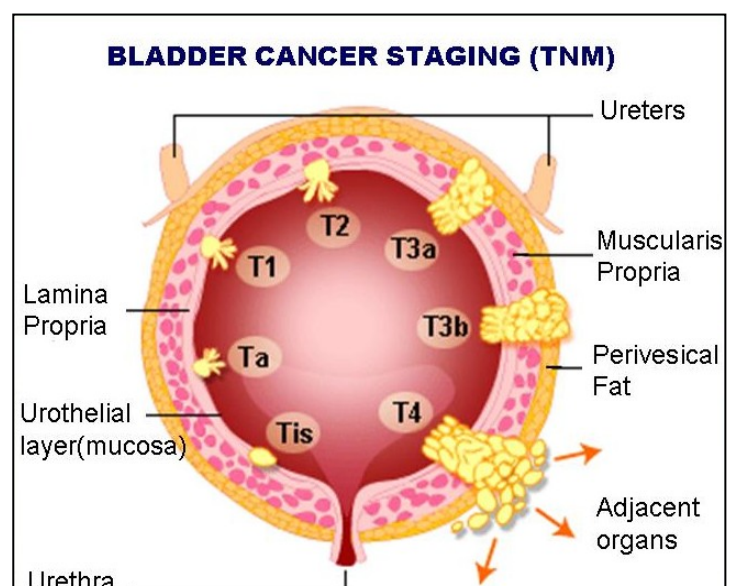
- Urinalysis
- Ultrasound - bladder and kidneys
- KUB - to exclude urinary tract Calcification
- **Cystoscopy (a must in this case)**
- Urine Cytology
- Consider IVU- CT scan if no pathology identified (intravenous urogram, other name IVP: shows filling defect, or sometimes hydronephrosis due to obstruction of the ureters).



## Pathological staging:

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

Superficial	Tis	In-situ disease
	Ta	Epithelium
	T1	Lamina propria invasion
Invasive (remove the whole bladder)	T2	Superficial muscle invasion
	T3a	Deep muscle invasion
	T3b	Perivesical fat invasion
	T4	Prostate or contiguous muscle



### Note(s):

*Painless hematuria is considered to be cancer (until proven otherwise).  
Deep (invasive) metastasize faster.*

## Carcinoma in-situ:

**Aggressive disease.**

**Often associated with positive cytology.**

**50% of patients progress to muscle invasion.**

**Consider immunotherapy**

**If fails, patient may need radical cystectomy.**

## Grading:

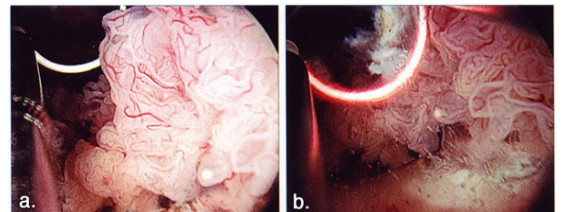
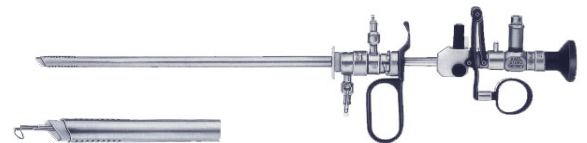
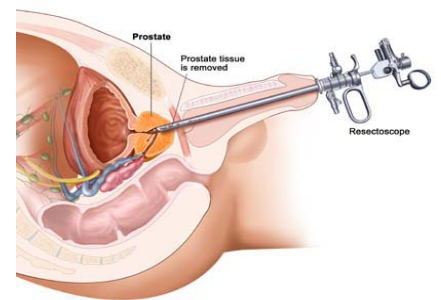
G1: well differentiated.

G2: moderately well differentiated.

G3: poorly differentiated.

## Treatment of bladder carcinoma (superficial TCC):

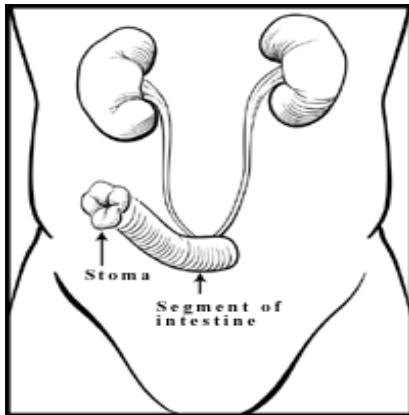
- Requires transurethral resection of bladder tumor (**TURBT**) and regular cystoscopic follow-up (to watch out for recurrence)
- Consider prophylactic chemotherapy if risk factor for recurrence or invasion (e.g. high grade)
  - High risk: **multiple** tumors, **big** tumors, carcinoma **in situ**
- Consider immunotherapy
  - BCG = attenuated strain of *Mycobacterium bovis* (Stands for: **Bacillus Calmette Guérin** – vaccine to kill the tumor cells in bladder)
  - Reduces risk of recurrence and progression.
  - 50-70% response rate recorded.
  - Occasionally associated with development of **systemic mycobacterial infection.**



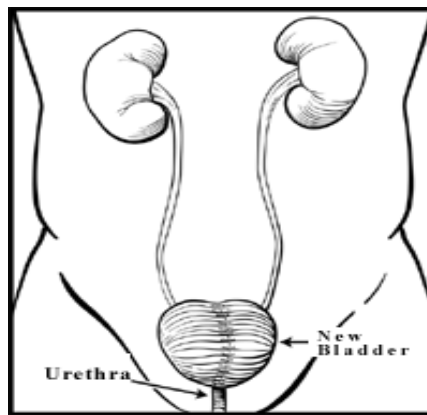
## Invasive TCC: (confirmed by biopsy)

- Radical Cystectomy has an operative mortality of about 5% (RC: removal of the **whole** bladder, prostate, distal ureter and lymph nodes. In female: + uterus, cervix and anterior vaginal wall)
  - Q: How will the patient excrete urine if bladder is removed?
  - A: Urinary diversion, which is achieved by:
    - Ileal conduit
    - Neo-bladder
- 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.

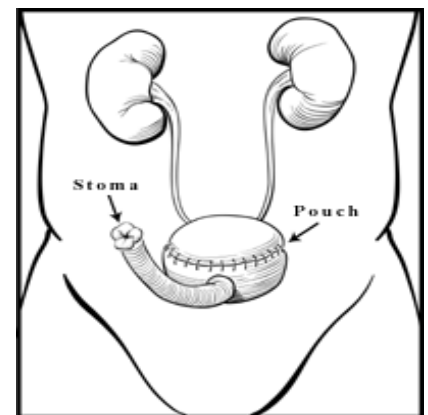
### Types of urinary diversion:



**ILEAL CONDUIT**  
(From ileum. Incontinent diversion to skin)



**ORTHOTOPIC NEOBLADDER**  
(Continent diversion to urethra)  
- Part taken from GIT → folded and used as new bladder.  
- Urine + secretion  
- Patient should be followed up because Urine on GI tissue → transition of cells → tumor arises.  
- Not preferred for elderly



**CONTINENT CUTANEOUS RESERVOIR**  
(Continent diversion to skin)  
- Same as the 2<sup>nd</sup>, but linked to the umbilicus to excrete urine  
- Easy for elderly to deal with.

## 3. Prostatic Tumors:

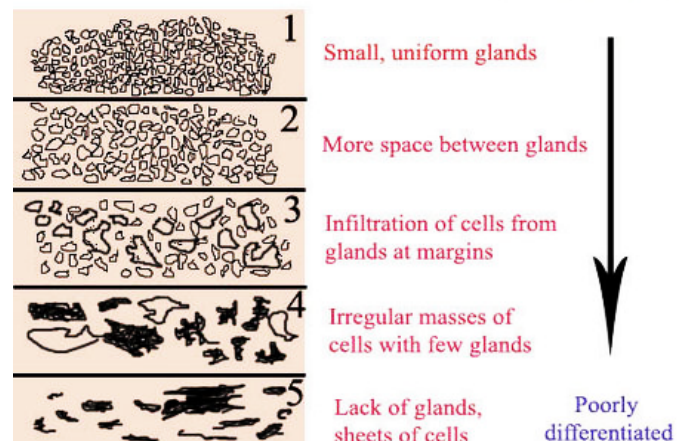
- **Commonest malignancy of male urogenital tract.**
- Rare before the age of 50 years (screening is recommended at age of 40)
- Found at post-mortem in 50% of men older than 80 years (patient usually dies from other causes, it does not kill the patient).
- 5-10% of operation for benign disease reveal unsuspected prostate cancer.

### Pathology:

- The tumors are adenocarcinomas; arise in the peripheral zone of the gland.
- Spread through capsule into peri-neural spaces, bladder neck, pelvic wall and rectum.
- **Lymphatic spread is common.**
- Hematogenous spread occurs to axial skeleton.
- Tumors are graded by Gleason classification.

### Gleason Scale

Well differentiated



Malignant prostate tumors usually arise in the peripheral zone while benign prostate hyperplasia (BPH) in the transitional zone.



## Clinical features:

- Majority these days are picked up by screening.
- 10% are incidental findings at TURP (trans-urethral resection of prostate)
- Remainder present with bone pain, cord compression or leuco-erythroblastic anemia.
- **Renal failure** can occur due to bilateral ureteric obstruction.

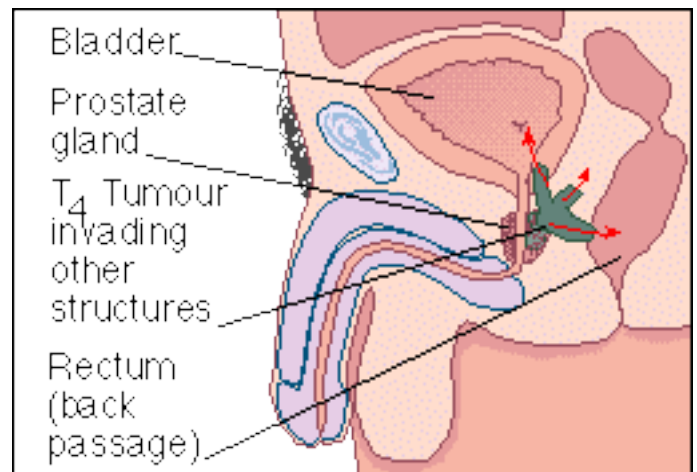
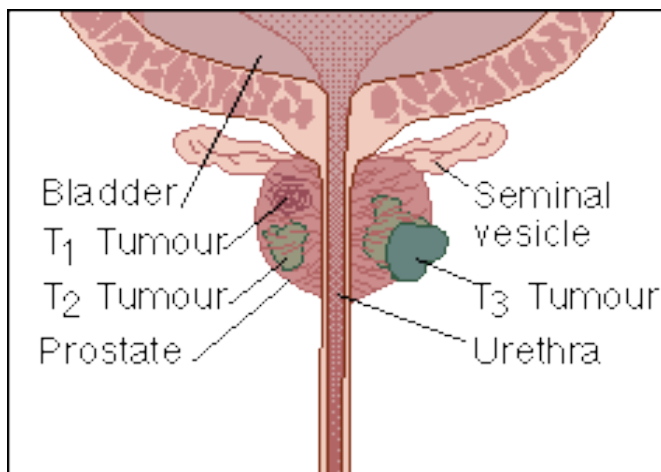
## Diagnosis:

- With locally advanced tumors diagnosis can be confirmed by **rectal examination**.
- Features include hard nodule or loss of central sulcus.
- Trans-rectal **biopsy** should be performed.
- Multi-parametric MRI may be useful in the **staging** of the disease.
- Bone scanning may detect the presence of **metastases**.
- Unlikely to be abnormal if asymptomatic and PSA < 10 ng/ml

## Serum prostate specific antigen (PSA)

- Kallikrein-like protein produced by prostatic epithelial cells.
- 4 ng/ml is the upper limit of normal.
- >10 ng/ml is highly suggestive of prostatic carcinoma.
- Can be significantly raised in BPH.
- Useful marker for monitoring response to treatment.

## Staging:



T1: Cannot be felt during a digital rectal exam and cannot be seen in imaging tests.

T2: Palpable and can be seen by naked eye.

T3: Cancer has spread beyond the outer layer of the prostate and may have spread to the seminal vesicles.

T4: has spread beyond the seminal vesicles to nearby tissue or organs, such as the rectum, bladder, or pelvic wall.

(From a website: <http://www.cancer.gov/cancertopics/pdq/treatment/prostate/Patient/page2#Keypoint9>)

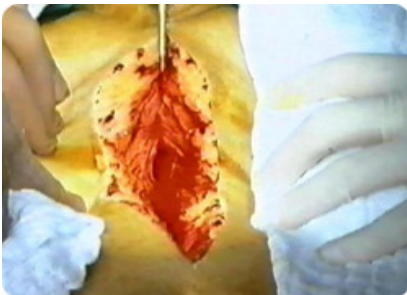
## Treatment:

- More men die **with** prostate cancer **than** from prostate cancer (they usually die because of other causes not prostate cancer).
- Treatment depends on **stage of disease, patient's age and general fitness**.
- Treatment options are for:
  - **Local disease:**
    - Observation (old men older than 80 y.o, it's very slow growing tumor).
    - Radical radiotherapy:  
(With cord compression → painful. whenever you have patient with prostatic tumor and suffers from lower motor neuron lesions, it is considered as ER case admit him and give him radiotherapy)
    - Radical prostatectomy
  - **Locally advanced disease:**
    - Radical radiotherapy
    - Hormonal therapy
- **Metastatic disease**
  - **Hormonal therapy**

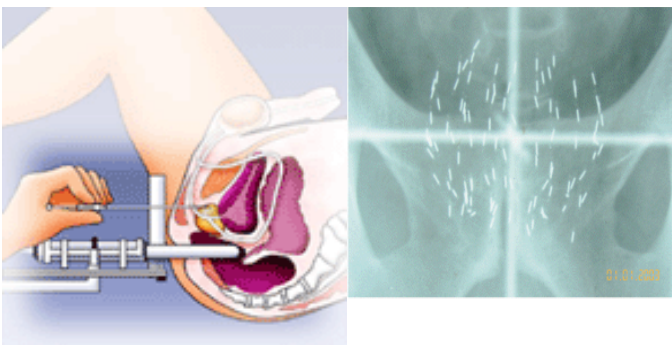
### Hormonal therapy:

- 80-90% of prostate cancers are **androgen dependent** for their growth.
- Hormonal therapy involves androgen depletion
- Produces good palliation until tumors 'escape' from hormonal control
- Androgen depletion can be achieved by:
  - Bilateral orchidectomy
  - LHRH agonists - gosereline
  - Anti-androgens - cyproterone acetate, flutamide, Bicalutamide
  - Complete androgen blockade

### Open/Laparoscopic/Robotic (respectively)



### Brachytherapy: internal radiotherapy in which the radiation source is in the body



### EBRT: External beam radiation therapy



# 4. Testicular Tumors:

- Commonest presentation: ipsilateral, **painless** testicular swelling on the side of the tumor.
- **Commonest malignancy in young men**
- Highest incidence in Caucasians in northern Europe and USA
- Peak incidence for teratomas is 25 years and seminomas is 35 years
- In those with disease localized to testis more than 95% 5 year survival possible
- **Risk factors** include cryptorchidism (absence of 1 or more testes), testicular and **Klinefelter's syndrome**, testicular torsion.

## Classification:

- Seminomas (~50%)
- None- Seminoma (~50%)
  - Teratomas
  - Yolk sac tumors
  - Embryonal
  - Mixed Germ cell tumor

### Note(s):

*Klinefelter's syndrome: a genetic disorder in which there is at least one extra X chromosome to a standard human male karyotype or an additional Y chromosome to a standard human female.*

## Investigation:

- Diagnosis can often be confirmed by **testicular ultrasound**.
- Pathological diagnosis made by performing an inguinal orchidectomy.
- Disease can be staged by thoraco-abdominal CT scanning.
- **Tumor markers** 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 levels seen in both teratomas and seminoma
  - **LDH** (lactate dehydrogenase) test.

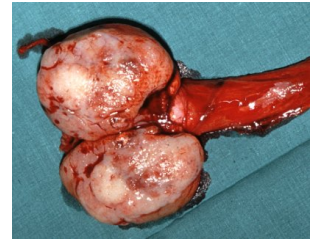
## Stage Definition

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

## Treatment:

### **Seminoma:**

- Seminomas are **radiosensitive**
- The overall cure rate for all stages of seminoma is approximately 90%.
- Stage I and II disease treated by inguinal orchidectomy plus
  - Radiotherapy to ipsilateral abdominal and pelvic nodes ('Dog leg') or
  - Surveillance
- Stage IIC and above treated with chemotherapy

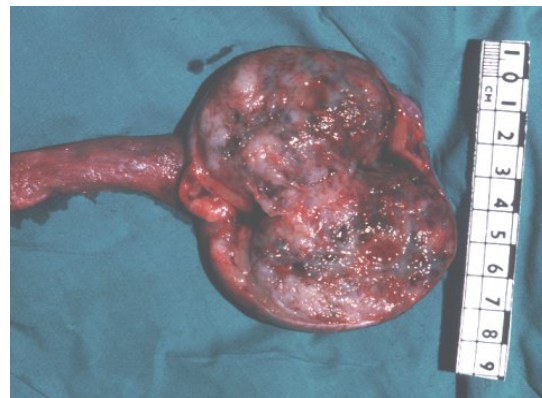


### **Non-Seminoma:**

- Non-Seminoma are not radiosensitive
- Stage I disease treated by orchidectomy and surveillance Vs RPLVD Vs Chemo
- Chemotherapy (BEP: Bleomycin, Etoposide, Cisplatin) given to:
  - Stage I patients who relapse
  - Metastatic disease at presentation



**Seminoma**



**Non-Seminoma**

## SUMMARY

### 1. Renal tumors:

- Almost all of them are malignant; RCC is the most common type.
- It has higher incidence to be seen in von Hippel-Lindau syndrome.
- Patients come with **loin pain**, painless hematuria, PNS (hypertension, Hypercalcaemia, polycythemia, pyrexia)
- It is chemo and radio resistant so treated surgically: radical nephrectomy (laparoscopic is the gold standard), CT to watch out tumor spread, echocardiogram to assess thrombus formation.

### 2. Bladder tumors:

- TCC is the most common.
- Patient comes with gross, painless **terminal** hematuria
- Could be either superficial (80%) or invasive (20%).
- You have to have full investigation
- Stage 2 and higher: removal of the whole bladder.
- Superficial TCC: trans-urethral resection, Invasive TCC: radical cystectomy.
- In squamous carcinoma the major risk factor is chronic irritations of bladder (Bilharzia, stones in the bladder or chronic indwelling catheterization).

### 3. Prostatic tumors:

- Commonest malignant tumor of male urogenital tracts.
- Might spread to other areas and organs (lymphatic spread is common).
- Can be diagnosed by rectal examination + trans-rectal biopsy + PSA
- Treatment depends on age and stage: radical radiotherapy, prostatectomy, hormonal therapy according to stage.

### 4. Testicular tumors:

- Ipsilateral painless testicular swelling
- Risk factors include: Cryptorchidism and Klinefelter syndrome
- Classified as: seminoma, non- seminoma
- Investigated by ultrasound and tumor markers
- Seminoma is radiosensitive, non-seminoma treated by orchidectomy.

## Questions

- 1) Which one of the following conditions associated with von Hippel-Lindau syndrome?
  - a. Papillary Cell Carcinoma.
  - b. Renal Cell Carcinoma.
  - c. Squamous Cell Carcinoma.
  - d. Renal oncocyoma.
  
- 2) Majority of patients with transitional cell carcinoma of the bladder present clinically with:
  - a. Gross hematuria with loin pain.
  - b. Bone pain and leuco-erythroblastic anemia.
  - c. Microscopic, Painful and initial hematuria.
  - d. Macroscopic, Painless and terminal hematuria.
  
- 3) Which one of the following syndromes is a risk factor of testicular tumors?
  - a. Von Hippel-Lindau syndrome.
  - b. Stuffer's syndrome.
  - c. Klinefelter's syndrome.
  - d. Paraneoplastic Syndrome.

### ***432 Surgery Team Leaders***

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#### **Answers:**

1st Questions: **B**

2nd Questions: **D**

3rd Questions: **C**