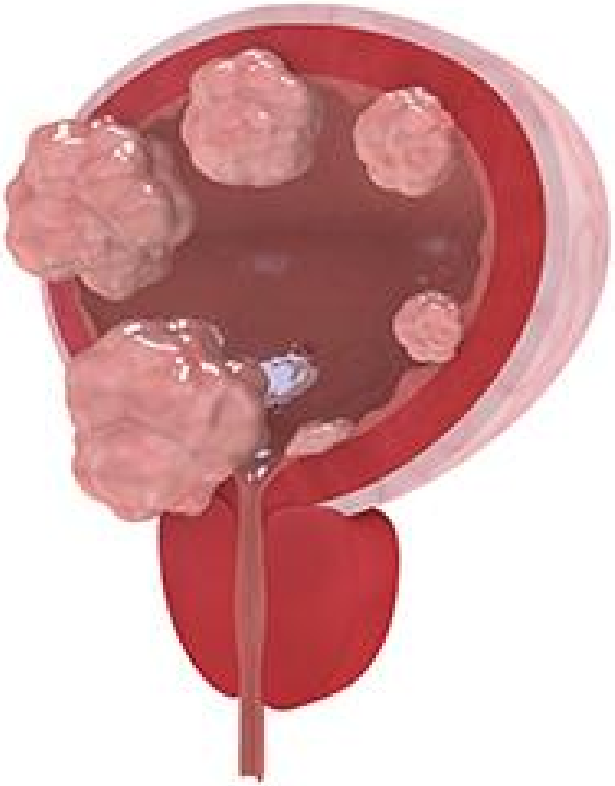

Genitourinary Oncology

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Objectives:
To have the basic knowledge on the following:
1.Urological tumors
2.Differential diagnosis
3&4.Symptoms, Signs
5&6.Physical exam, Work up
7.Tumors staging
8.Management options

Color Index:
-Doctor's Notes -Surgery Recall -Doctor's Slides+433 team -Important -Extra

Correction File

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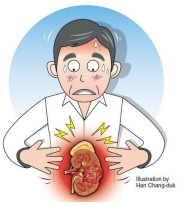
Renal tumors

General Information :

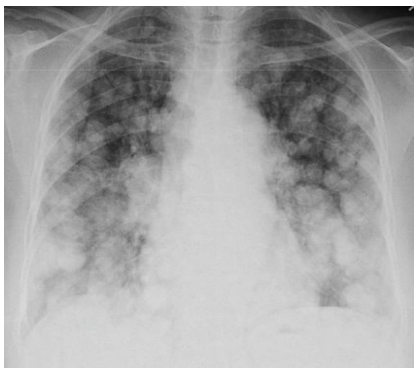
Note :
Why is the Penile cancer very rare in saudi Arabia ?
Circumcision



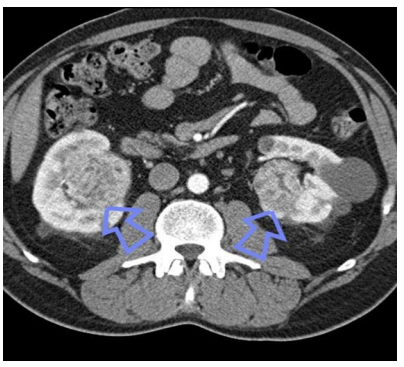
- Benign tumours of the kidney are rare.
- Oncocytoma is the commonest benign tumor.
- The most common renal tumors are malignant.
- Most common kidney cancer is renal cell carcinoma.
- There are 5 types of renal cell carcinoma and the most common one is clear cell
- Familial papillary cell carcinoma is hereditary and runs in families (all family members should be screened).
- All renal neoplasms should be regarded as potentially malignant
- Renal cell carcinomas arise from the proximal tubule cells
- Male : female ratio is approximately 2:1 .
- Increased incidence seen in von Hippel-Lindau syndrome.*

VHL: is autosomal dominant disease that is caused by mutation of the VHL gene on the short arm of the third chromosome Predisposing to a variety of malignant and benign tumors: Renal, hepatic, pancreatic and epididymal cyst , Renal cell carcinoma , angiomatosis , cerebellar hemangioblastoma and pheochromocytoma.

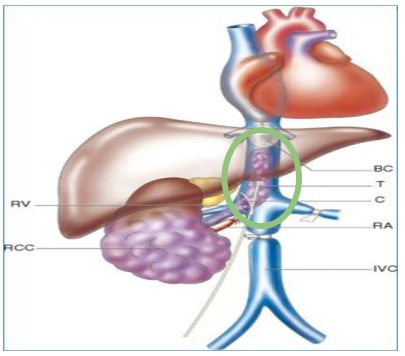
- Rarely lymphatic spread in renal cancer.
- The lungs are the commonest site for metastasis through blood (cannon ball in lungs seen in Renal cell carcinoma and choriocarcinoma, always do X-ray and CT)
- Pathologically may extend into renal vein then to inferior vena cava
  - It could reach the heart
  - Tumor thrombus could obstruct IVC and causes bilateral Deep vein thrombosis "DVT".



Cannon ball pulmonary metastasis



When you find bilateral tumors, think of familial syndromes like VHL



Renal cell Carcinoma with IVC thrombus

Clinical features :

- 10% present with classic trial of haematuria (painful) , loin pain and palpable mass. (Most of presentation now is only haematuria "when they see it they will come to hospital" or even it could be incidental finding in radiology for other disease) .
- Other presentations include Paraneoplastic Syndrome (PNS) which is a unique feature of renal cancer, This is when the tumor starts secreting hormones such as : anti-diuretic hormone (ADH) and Erythropoietin (EPO).

- The systemic manifestations of paraneoplastic syndrome includes : Pyrexia, Hypertension, Polycythemia (due to erythropoietin production) , Hypercalcaemia (due to production of a PTH-like hormone) , hypercalciuria , Stauffer's syndrome (elevation of liver enzymes) and cushing syndrome.
- Treatment of this syndrome is by treating the underlying cause by surgical removal of the kidney (nephrectomy), not symptomatic treatment.
- Others such as : weight loss and loss of appetite

Remember:

1-All preneoplastic syndrome are treated by surgical removal of kidney tumor EXCEPT hypercalcaemia, which can be treated medically.

2- NO LIVER METASTASIS = NO JAUNDICE

What are risk factors of Renal cell carcinoma?

Male, Tobacco, von hippel-lindau syndrome and polycystic kidney.

Investigations

- Diagnosis can often be confirmed by renal ultrasound (US is a good for detecting the size and characteristic of the tumour, but doesn't show the renal artery,vein and lymphatics involving)
- CT scanning allows assessment of renal vein and caval spread (It is used for staging) (Enhanced CT will give you anatomy, which helps you in surgery)
- Echocardiogram should be considered if clot in IVC extends above diaphragm

Management

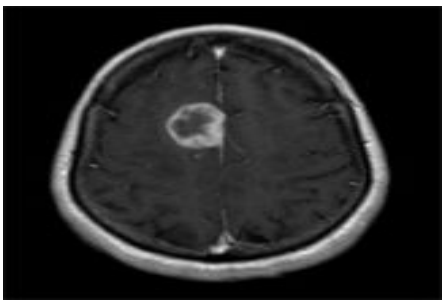
Localized	Metastatic
-Unless extensive metastatic disease it invariably involves surgery (Doctor always prefer surgery). -Surgical option usually involves a radical nephrectomy. Laparoscopic Nephrectomy: (Gold Standard) because of Smaller scar & Less pain than Open radical nephrectomy. -Kidney approached through either a transabdominal (subcostal) (better access and more pain) or loin (less access and better for recovery due less pain) incision. -Renal vein ligated early to reduce tumor propagation. -Renal artery should be ligated before renal vein. -Kidney and adjacent tissue (adrenal, perinephric fat) excised -In case of bilateral RCC, consider partial nephrectomy and follow up to prevent renal failure to occur	-Lymph node dissection has no proven benefit, Remove only for lab purposes and staging. Whether you remove them or not, patients will have recurrences. -Solitary (e.g. lung metastases) can occasionally be resected. -Radiotherapy and chemotherapy have No role. Indicated in case of symptomatic bone metastasis to reduce pain. -Immunotherapy can help (Performance status). Such as : Monoclonal antibodies, interferon, cytokine inhibitors and interleukin 2. It is ○ Very cytotoxic ○ Given only to patients with good performance status ○ Not curable but it can prolong his life for 6-8 months

Laparoscopic Nephrectomy https://www.youtube.com/watch?v=LINoCVd2Dcc

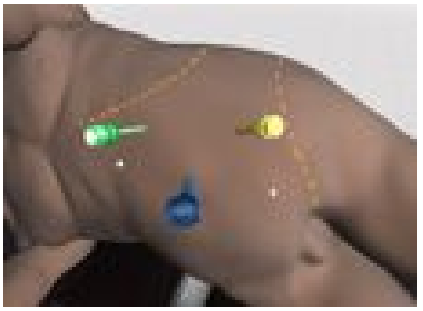
In cases of metastases: Staging of kidney tumor includes:

1. Clinical staging by CT scan
2. Pathological staging

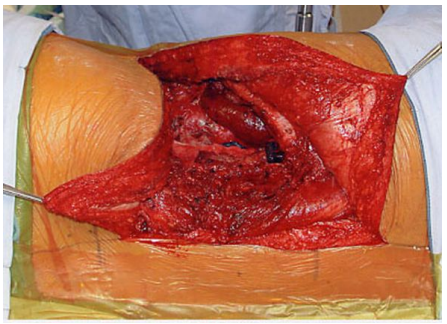
Grading system for kidney cancer is called: Fuhrman system



Differential diagnosis : Metastatic Renal cell carcinoma or prostatic cancer



Laparoscopic Nephrectomy



Radical nephrectomy

Bladder Tumors

Types Of all bladder carcinomas::

1- Transitional cell carcinomas (TCC) (now called urothelial carcinoma "US") (90%)

2-Squamous carcinoma (5%)

3- Adenocarcinomas (due to congenital fistulas; develops in the dome of the bladder) (2%)

Etiological factors :

Note :
In Egypt, the squamous cell carcinoma is the most common due schistosomiasis is endemic there.

1. Occupational exposure
   - 20% of transitional cell carcinomas are believed to result from occupational factors and petroleum workers.
   - Chemical implicated - aniline dyes, ,, cyclophosphamide ,chlorinated hydrocarbons, rubbers and asbestos
2. Cigarette smoking
3. Analgesic abuse e.g. phenacitin
4. Pelvic irradiation - for carcinoma of the cervix
5. Schistosoma haematobium associated with increased risk of squamous carcinoma.
6. Genetic : mutation of RBI, PTEN and lynch syndrome (mutation of HNPCC)

Transitional cell carcinomas (TCC) :

Malignant tumor originates from transitional cells of bladder.

- TCCs should be regarded a 'field change' disease with a spectrum of aggression (means look everywhere, ureters, kidneys, pelvic structures and do CTU. Also in Cystoscopy look everywhere in the bladder)

- 80% of TCCs are superficial and well differentiated:
  - Above the muscle layer (muscularis propria).
  - Only 20% progress to muscle invasion.
  - Associated with good prognosis.
- 20% of TCCs are high-grade and muscle invasive
  - 50% have muscle invasion at time of presentation
  - Associated with poor prognosis

Note

Bladder cancer, with colon and liver cancer : think about lynch syndrome

Squamous carcinoma:

- High risk groups (chronic irritation): Smokers, Chronic UTI, Stones, Chronic indwelling, catheter, Spinal cord injury, Schistosomiasis.
- Bad prognosis, in fact the worst

Clinical features:

- 80% present with painless hematuria. (if you develop the pain after hematuria, you should think about obstruction of the ureter which may lead to hydronephrosis)
  - Gross painless hematuria or even microscopic
  - Terminal hematuria (If it is in the neck or trigone of bladder) or a whole urine(if it is in the rest part of bladder)
- Also present with treatment-resistant infection or bladder irritability and sterile pyuria.

What is the bladder diverticulum?

Is a pouch of bladder wall that a person may either born with it or acquired it.
In the bladder diverticulum = no muscles in mucosa ,so in a case of bladder cancer the stage of cancer will shift directly from T1 to T3.

What is the workup of Microscopic hematuria ?

1-History
2-Physical exam
3-Investigation :

A-Ultrasound or CT: to assess upper urinary tract.
B-Cytology: looks for malignant cells .

Note

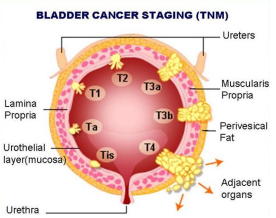
In the gross hematuria: don't use the ultrasound, use CT or CT without contrast

Investigation of Painless Haematuria:

- 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 (if there is tumor e , you will see filling defect, or sometimes hydronephrosis due to obstruction of the ureters, which is a bad sign indicating progressive disease)

DDx of filling defect :
1-Stones
2-Tumors
3-Hematoma
4-Sickle cell anemia

Pathological staging of bladder cancer



- 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
Deep	T2	Superficial muscle invasion
	T3a	Deep muscle invasion
	T3b	Perivesical fat invasion
	T4	Prostate or contiguous muscle

Grade of Tumor (Doctor: high or low, only)

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

Note :

T2 and above needs removing the whole bladder (cystectomy)

Carcinoma in-situ

- Carcinoma-in-situ is an aggressive disease (behave like invasive)
- Often associated with positive cytology
- 50% patients progress to muscle invasion
- Consider immunotherapy (BCG*) will stop progression and reduce recurrence.
- If fails patient may need radical cystectomy (removal of bladder, prostate, distal ureter and lymph nodes. In females: also the uterus, cervix and anterior vaginal wall)

Treatment of Superficial TCC :

- Requires transurethral resection and regular cystoscopic follow-up
  - To watch out for recurrence due to the high recurrence rate of superficial TCC
- Consider prophylactic chemotherapy "intravesical" if risk factor for recurrence or invasion (e.g. high grade)
  - High risk: 1. Multiple tumors 2. Big tumors 3.Carcinoma in situ
- Consider immunotherapy (for high grade and invasive)
  - 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

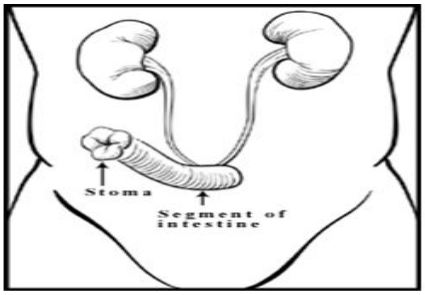
*BCG: Bacillus Calmette-Guérin immunotherapy.

Treatment of invasive or deep TCC :

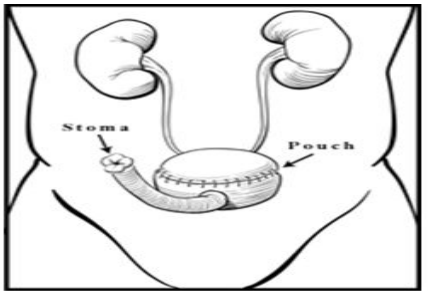
- Radical cystectomy has an operative mortality of about 5%.
- Urinary diversion achieved by:
  - Ileal conduit.
  - Neo-bladder.
- Local recurrence rates after surgery are approximately 15% and after radiotherapy alone 50%.
- Pre-operative radiotherapy is no better than surgery alone,
- Adjuvant chemotherapy may have a role.

Types of Urinary Diversion

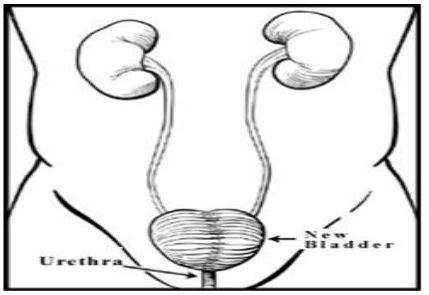
→ From ilium



ILEAL CONDUIT
(incontinent diversion to skin)



CONTINENT CUTANEOUS RESERVOIR
(continent diversion to skin)



ORTHOTOPIC NEOBLADDER
(continent diversion to urethra)

Mention some complications of urinary diversion ?

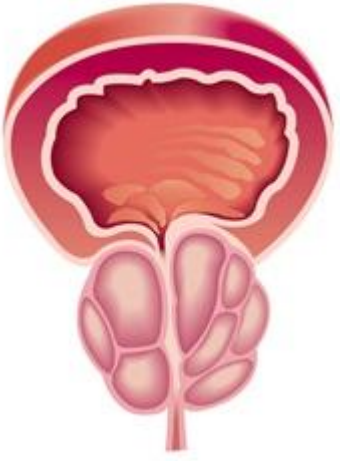
Infection, Stones and growth retardation in children.

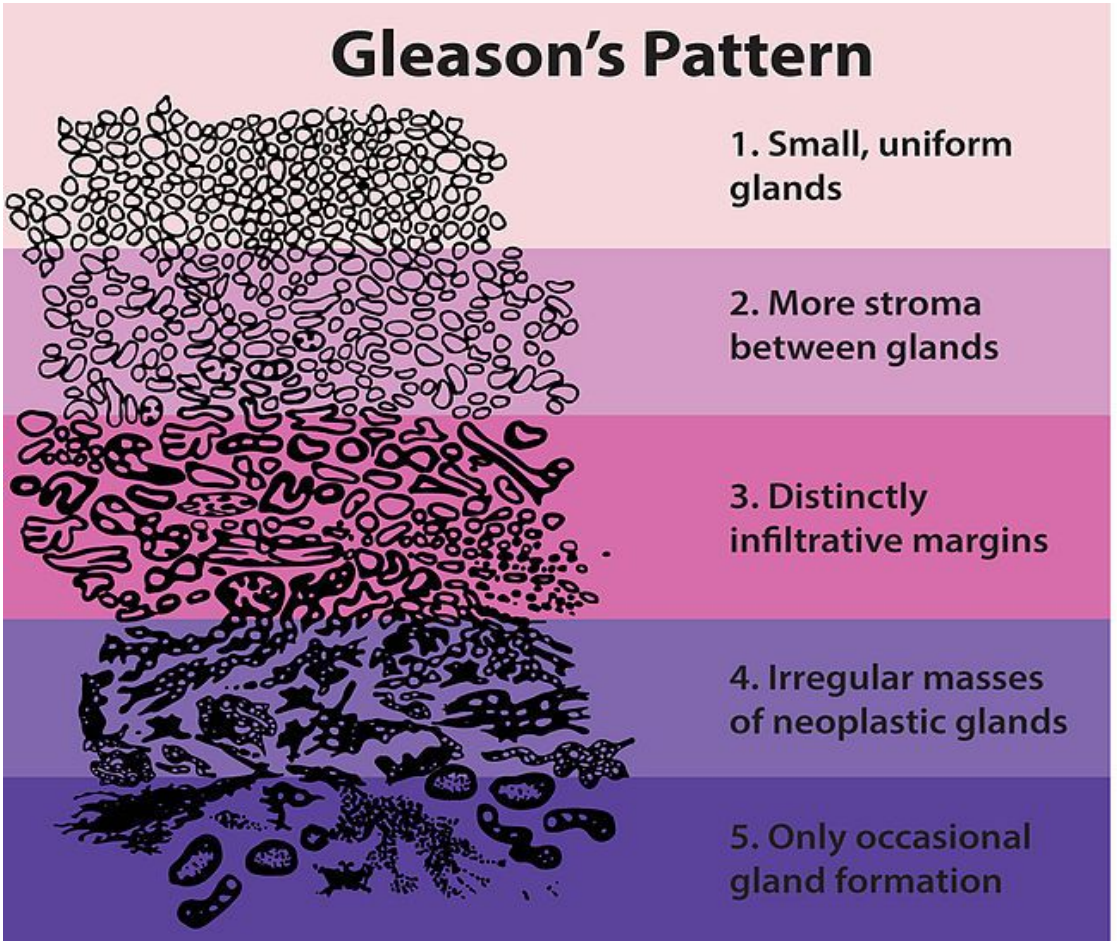
Prostate Tumors

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

Pathology

- The tumours are adenocarcinomas.
- Malignant prostate tumors usually arise in the peripheral zone 70%, while benign prostate hyperplasia (BPH) arises in the transitional zone.
- Spread through capsule into perineural spaces, bladder neck, pelvic wall and rectum
- Lymphatic spread is common
- Haematogenous spread occurs to axial skeleton
- Tumours are graded by Gleason classification (cells are classified according to how much aggressive changes happen to them. There are 5 stages for that. So the pathologist will report gleason score according to the most two stages for example 7(4+3) □ 7 is the overall score, 4 is the most common pattern, 3 is the second most common pattern)





Well differentiated

Moderately differentiated

Poorly differentiated/ Anaplastic

[Gleason Score]

Clinical features

- Majority these days are picked up by screening (No complain)
- 10% are incidental findings at TURP*
- Remainder present with bone pain, cord compression or leuco-erythroblastic anaemia
- Renal failure can occur due to bilateral ureteric obstruction

* Transurethral Bladder Resection

Diagnosis

- With locally advanced tumors diagnosis can be confirmed by rectal examination
- Features include hard nodule or loss of central sulcus
- Transrectal biopsy should be performed.(the most accurate test)
- The imaging test of Prostatic cancer is transrectal ultrasound(TRUS).
- Multi-parametric MRI maybe useful in the staging of the disease
- Bone scanning may detect the presence of metastases (most commonly metastasis of prostatic cancer to bone and lymph nodes).
- Could be also metastasize to liver, lungs and adrenal gland.
- Unlikely to be abnormal if asymptomatic and PSA < 10 ng/ml

Serum prostate specific antigen (PSA)

- Kallikrein-like protein produced by prostatic epithelial cells
- Usually it is measured before biopsy.
- 4 ng/ml is the upper limit of normal.
- Those are less than 50 years old, you should worry if PSA above 2.
- >10 ng/ml is highly suggestive of prostatic carcinoma (Do bone scan and CT to find metastasis)
- Can be significantly raised in BPH
- Useful marker for monitoring response to treatment
- PSA could rise also in trauma, ejaculation, prostatitis, Utl, black people, biopsy and even DRE (Digital Rectal Examination) will increase it very little.

Treatment

- More men die with than from prostate cancer
- Treatment depends on stage of disease, patient's age and general fitness

Treatment Options

Local disease	Locally advanced disease	Metastatic disease
• Observation (old men ≥ 75 with localized disease) (Doctor: observation only done in very old men ≥ 75 which means watchful waiting, if he develop symptoms start treatment. In case of less than 75 it is called surveillance, which means do tests regularly -in such case will be DRE and PSA. to catch the cancer before it develops and start treatment) . • Radical radiotherapy (prostate cancer is radiosensitive) • Radical prostatectomy	• Radical radiotherapy (surgeons don't like radiotherapy, surgery is better;they say!) • Hormonal therapy	• Hormonal therapy: *80-90% of prostate cancers are androgen dependent for their growth *Hormonal therapy involves androgen depletion therapy (ADT) *Produces good palliation until tumours 'escape' from hormonal control *Androgen depletion can be achieved by: 1-Bilateral orchidectomy 2-LHRH agonists (e.g. goseraline) 3-Anti-androgens (e.g. cyproterone acetate, flutamide, Biclutamide) 4-Complete androgen blockade ***Always before starting LHRH agonists give anti-androgen to prevent flare**

Surgical Recall:

-

Q1: What are the steps in early detection?
1-PSA: most sensitive and specific marker.
2-Digital Rectal Examination (DRE).
Q2: How is the diagnosis made?
Transrectal Biopsy.
Q3: What are the indications for trans rectal biopsy with normal rectal examination?
PSA>10 OR abnormal transrectal ultrasound.
Q4: What are the generalized treatment options according to stage?
Stage I: Radical prostatectomy, Stage II: Radical prostatectomy, lymph node dissection
Stage III: Radiation therapy, androgen ablation, Stage IV: Androgen ablation, radiation therapy.
Q5: What is the medical treatment for systemic metastatic disease?
Androgen ablation
Q6: What is the option for treatment in the early stage prostate cancer patient 70 years old with comorbidity?
XRT=Radiotherapy

Testicular Tumors

- Commonest presentation: 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**, testicular and Klinefelter's syndrome ، testicular torsion infertility.
- Surgery is a must, because it is an aggressive disease

Classification

Germ cell tumors and non-germ cell tumors (rare)

Germ cell tumors

Seminomas (most common)	Non-Seminoma Teratomas, Yolk sac tumors, Embryonal, Mixed Germ cell tumor
• Seminomas are radiosensitive • The overall cure rate for all stages of seminoma is approximately 90%. • Stage I and II disease treated by inguinal (not scrotal) orchidectomy plus: - Radiotherapy to ipsilateral abdominal and pelvic nodes ('Dog leg') or Surveillance • Stage IIC and above treated with chemotherapy	• Non-Seminoma are not radiosensitive • Stage I disease treated by orchidectomy and after do (surveillance Vs. RPLVD "retroperitoneal lymph node dissection" > if there is residual or recurrent lymph node masses Vs. Chemo > to stop progression) from textbook • Chemotherapy (BEP = Bleomycin, Etoposide, Cisplatin) given to: ○ Stage I patients who relapse ○ Metastatic disease at presentation

Investigation

- Diagnosis can often be confirmed by testicular ultrasound
- Pathological diagnosis made by performing an **inguinal orchiectomy**
- Disease can be staged by thoraco-abdominal CT scanning
- Tumor markers are useful in staging and assessing response to treatment

Tumors Markers

Alpha-fetoprotein (alpha FP)	Beta-human chorionic gonadotrophin (beta HCG)	LDH
*Produced by yolk sac , embryonal and teratoma *Not produced by seminomas	*Produced by trophoblastic elements *Elevated levels seen in teratomas , seminoma embryonal and choriocarcinoma) Choriocarcinoma is the almost always has high beta HCG	*(indicate bulk of the disease i.e presence or absence of the disease) Other markers such as HCS, GT and PLAP:

Stage Definition

not important

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

Note

Surgical must be done quickly because testicular cancer spread fastly (lymphatic of testis are paraaortic lymph nodes in the abdomen)

Thank you


THE ONE WHO FALLS
AND GETS UP IS
SO MUCH STRONGER
THAN THE ONE
WHO NEVER FELL
city
BICYCLE
COMPANY