GU Oncology

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429 Surgery Team

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Notes are in RED

Contents

- Renal Tumors
- Bladder Tumors
- Prostate Tumors
- Testis Tumors

1- Renal Tumors

Renal Tumors

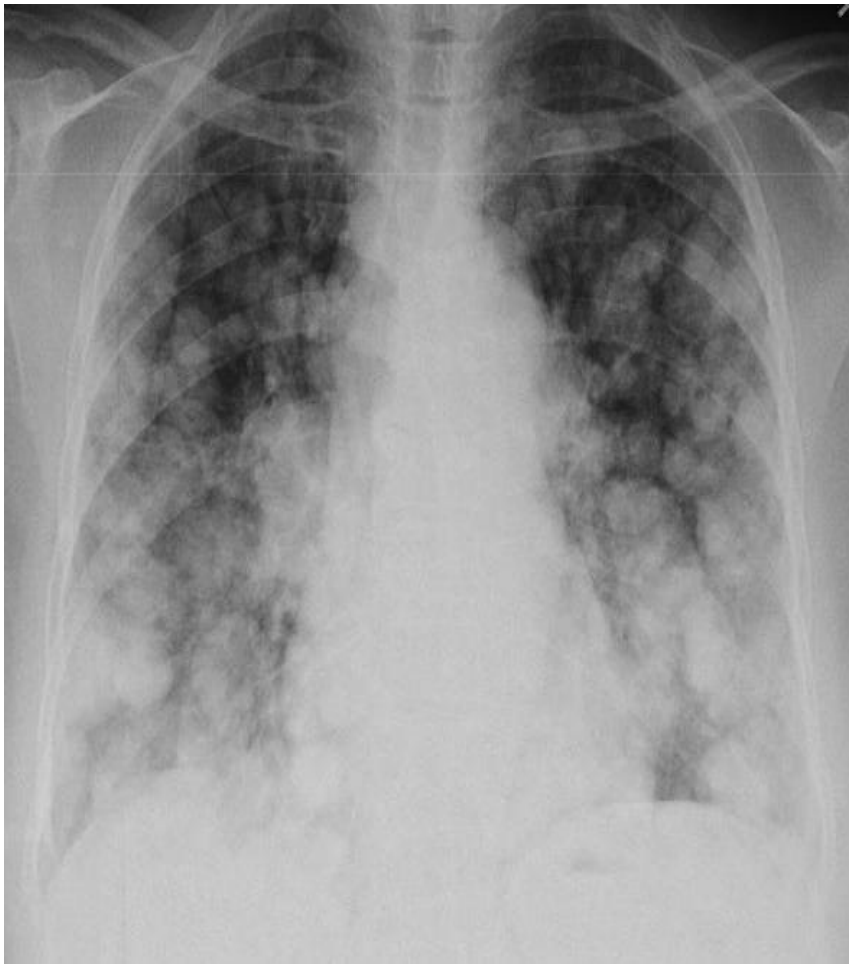
- Benign tumors of the kidney are rare

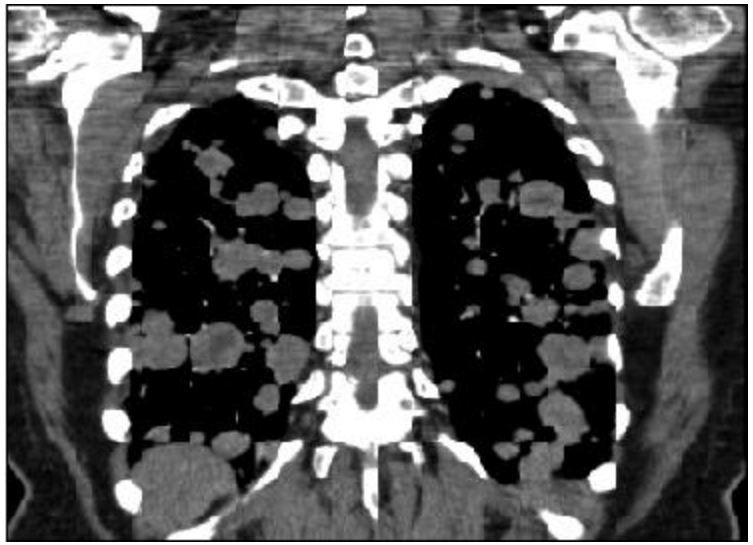
  - Onchocytoma is the commonest benign tumor.

- All renal neoplasms should be regarded as potentially malignant
- Renal cell carcinomas arise from the proximal tubule cells IMP!
  - Most common kidney cancer is renal cell carcinoma
  - The commonest renal cell carcinoma histological subtype is Clear Cell carcinoma
  - Renal cell carcinoma arises from the collecting duct is collecting duct carcinoma of the kidney
  - Familial papillary cell carcinoma is hereditary and runs in families (all family members should be screened)

- Male : female ratio is approximately 2:1
- Increased incidence seen in von Hippel-Lindau syndrome (type II)
  - Genetic disease
  - Mutation on the short arm of chromosome 3 !!MCQ!!
  - VHL can be apart of another syndrome (MEN-2)
  - Also associated with adrenal gland malignancies
- Pathologically may extend into renal vein and inferior vena cava
  - Can reach the heart
- Blood born spread can result in 'cannon ball' pulmonary metastases
  - Lung metastasis is the most common site !! MCQ !!

‘Cannon Ball' Pulmonary Metastases





You can see multiple solid patches of lung metastasis

Clinical features

- 10% present with classic triad of 1. gross haematuria , 2.loin pain and a 3.palpable mass
  - Classic triad features usually present with complicated stage
  - Nowadays the commonest presentation is incidental finding IMP!!
- Other presentation include a pyrexia of unknown origin, hypertension
- Polycythaemia due to erythropoietin production
- Hypercalcaemia due to production of a PTH-like hormone

- A unique feature is para-neoplastic syndrome
  - This is when the tumour starts secreting hormones like ADH or EPO
  - Treatment of this syndrome is by treating the underlying cause! Not symptomatic treatment. And that is surgical removal
  - The only condition which can be treated medically is Hypercalcaemia due to production of a PTH-like hormone !! MCQ!!

- **Paranoeplastic syndrome is a systematic manifestations of the tumor include :**

1- a pyrexia of unknown origin, hypertension

2- Polycythaemia due to erythropoietin production

3- Hypercalcaemia due to production of a PTH-like hormone

4- non metastatic hepatic dysfunction called Stauffer's syndrome , characterized by elevated liver enzymes

(remember: no liver metastasis , no jaundice !)

All treated by surgical removal of kidney tumor EXCEPT hypercalcaemia can be treated medically !! MCQ

Investigations

- Diagnosis can often be confirmed by renal ultrasound
- CT scanning allows assessment of renal vein and caval spread
  - CT also allows staging of the tumor
- Echocardiogram should be considered if clot in IVC extends above diaphragm
  - If there is a localized tumor in the heart then we should treat them surgically
    - Only if the mass is localized

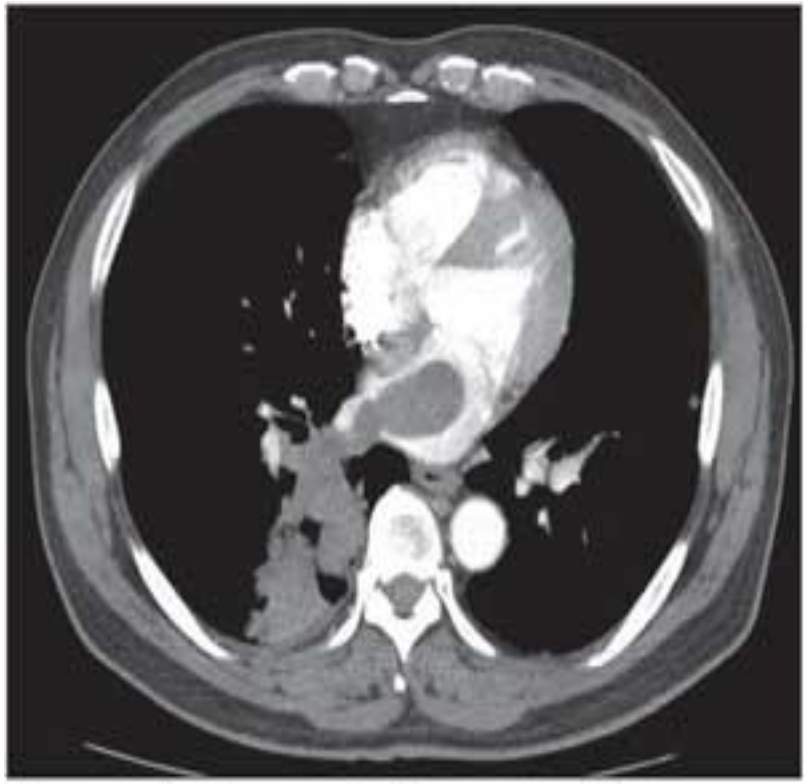
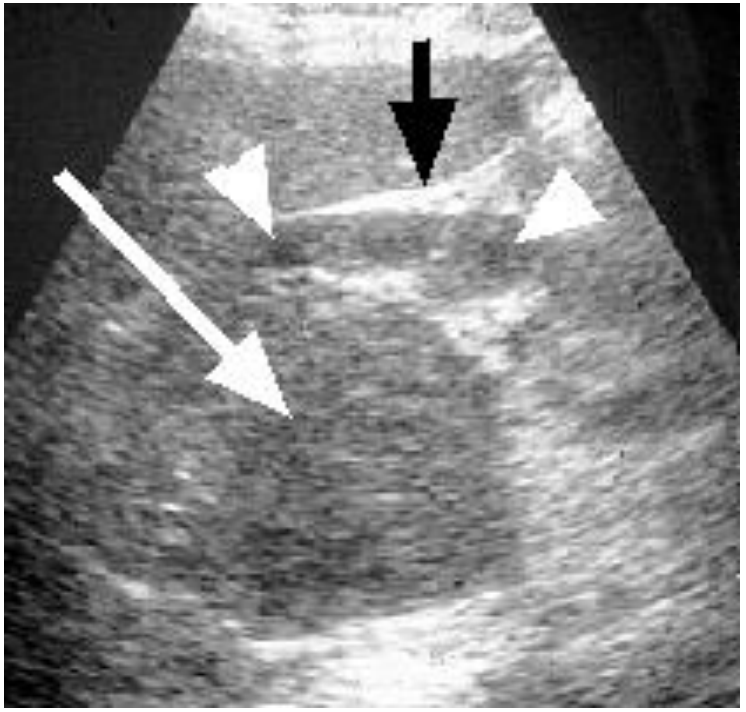
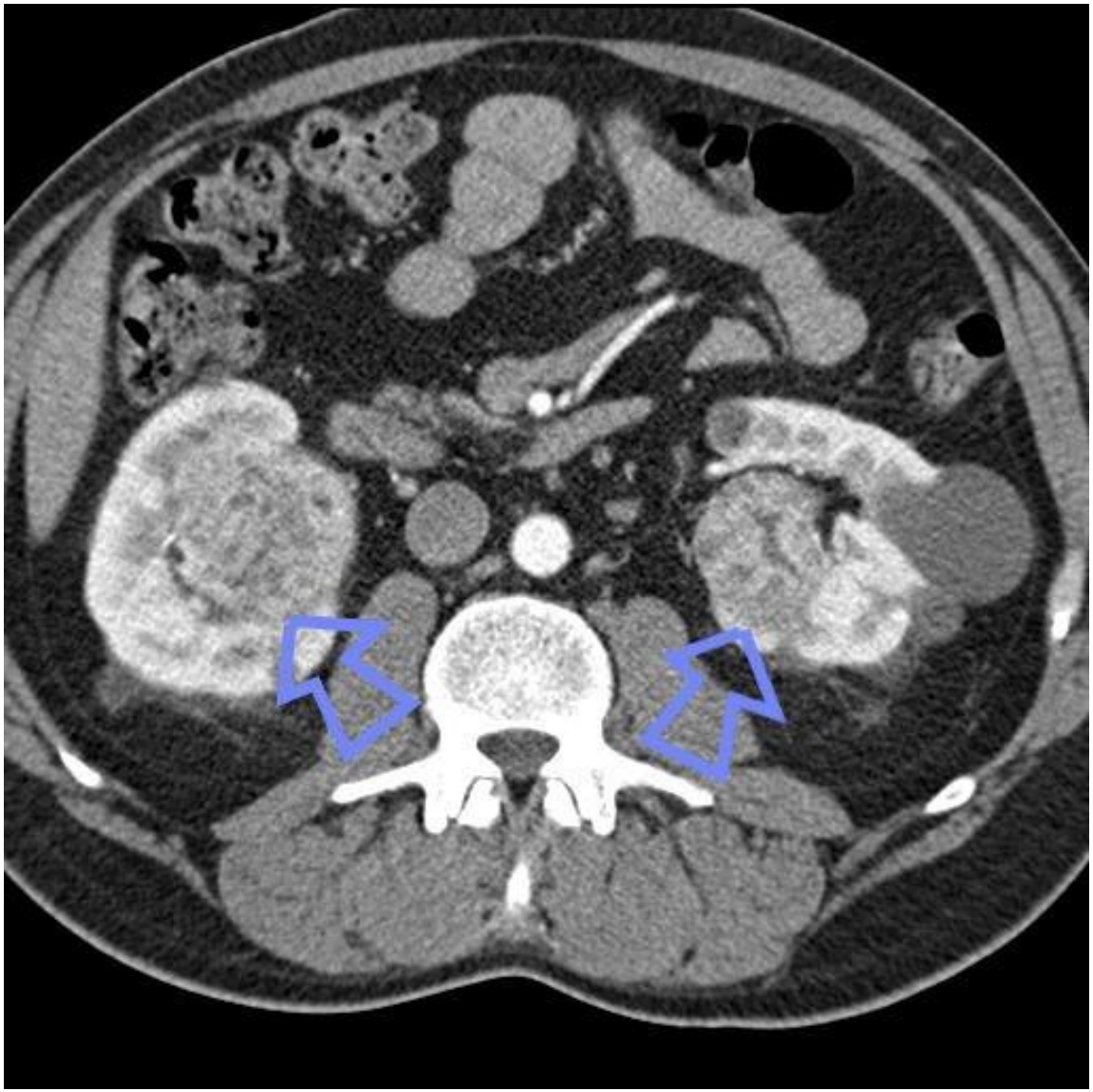


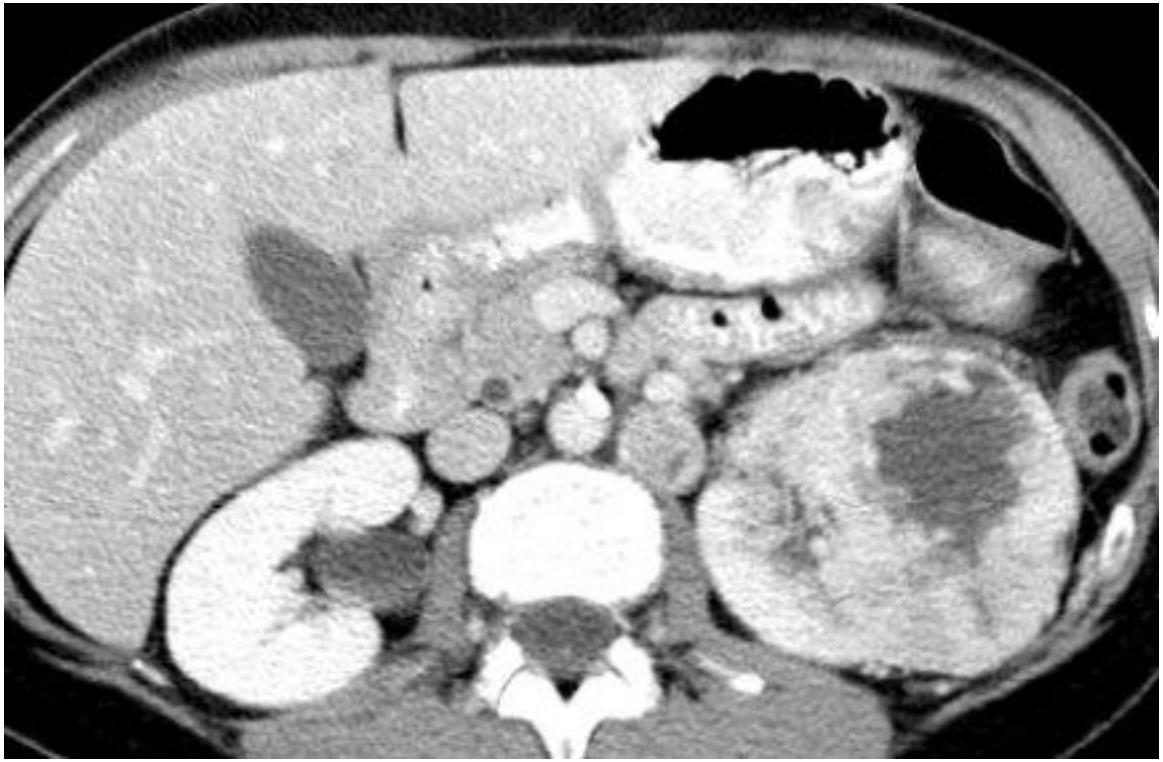
Figure 1: Computed tomography scan of patient's chest when he was first diagnosed with intracardiac extension of disease.



White arrow shows the mass in the right ventricle



When you find bilateral tumours think of familial syndromes like VHL



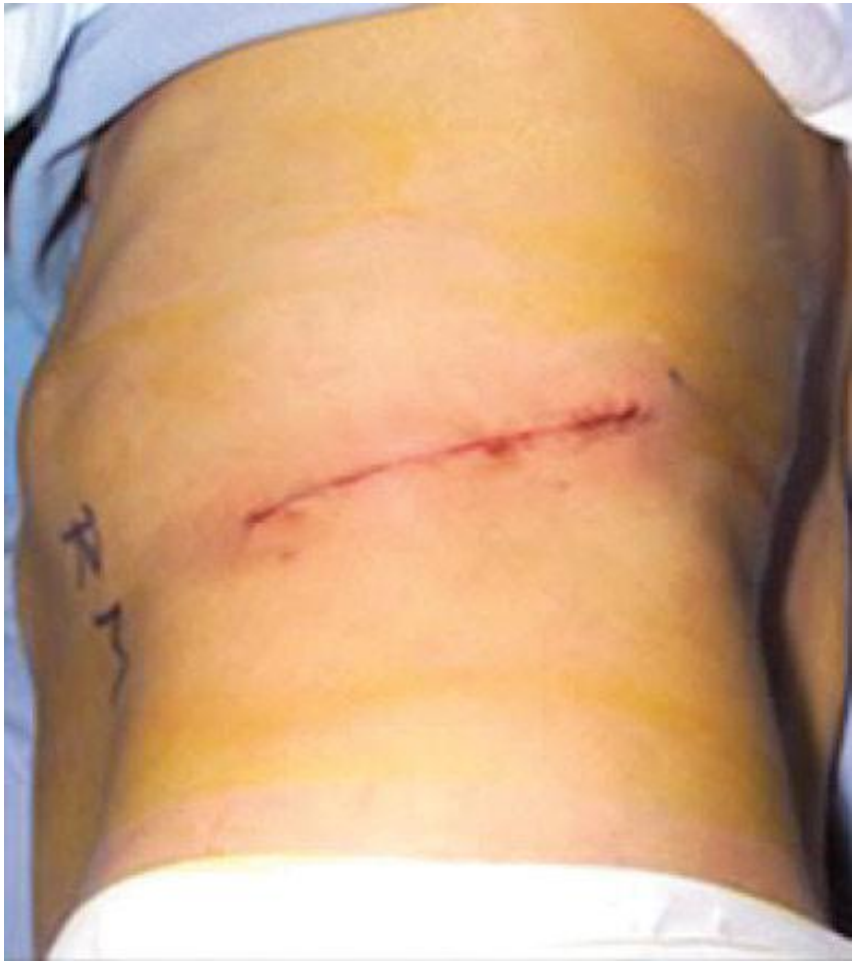
Management

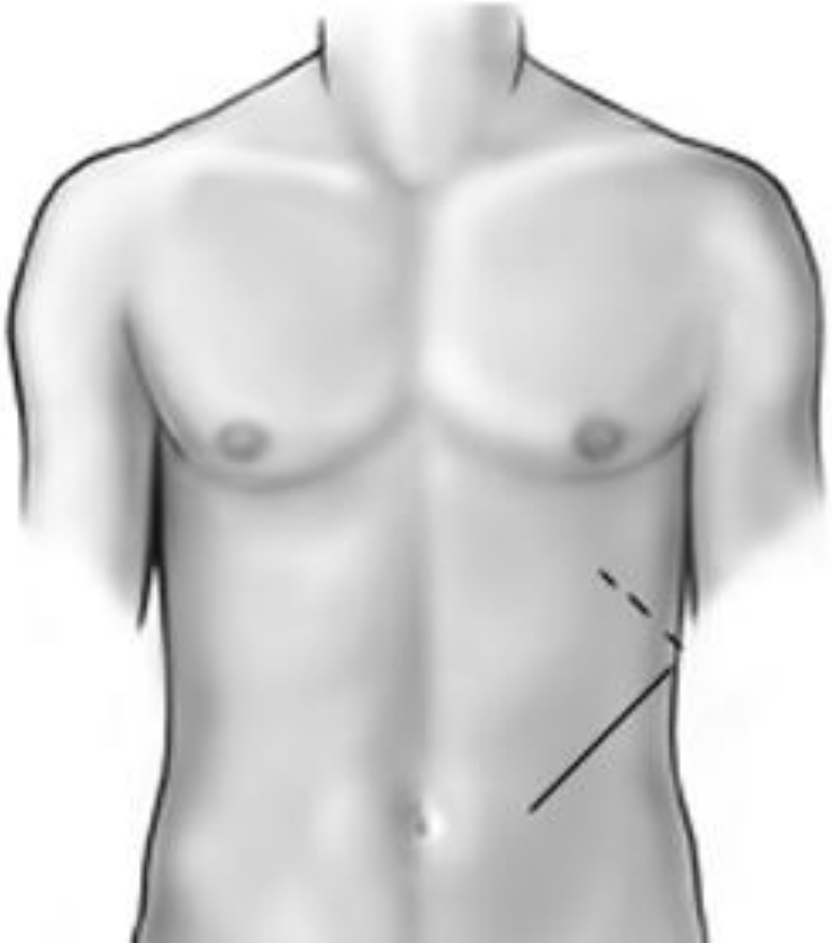
- Unless extensive metastatic disease it invariably involves surgery

Remember: Kidney tumors are both radioresistant and chemoresistant MCQ!

- Surgical option usually involves a radical nephrectomy
- Kidney approached through either a transabdominal or loin incision
- Renal vein ligated early to reduce tumour propagation
- Kidney and adjacent tissue (adrenal, perinephric fat) excised

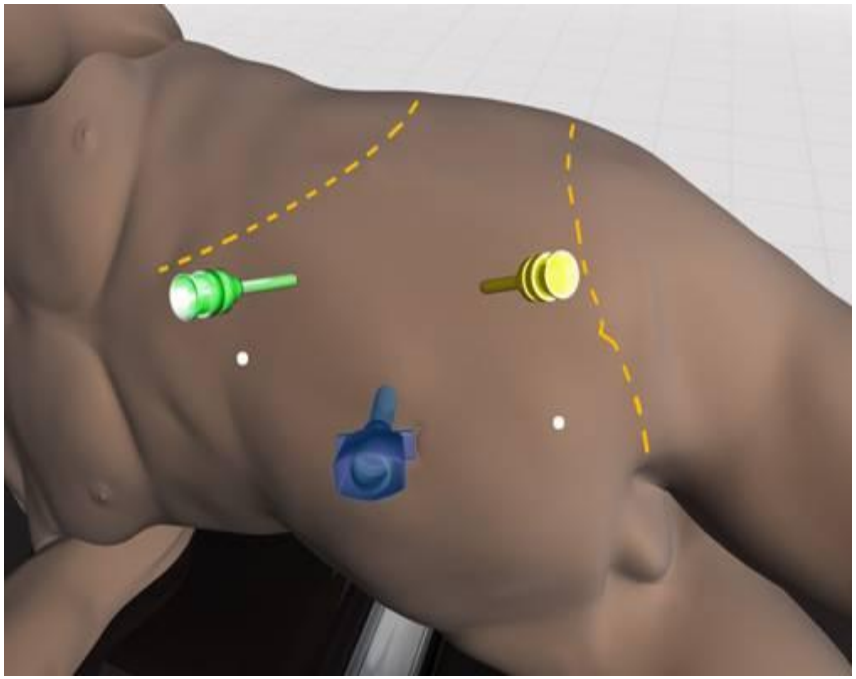
Open Radical Nephrectomy

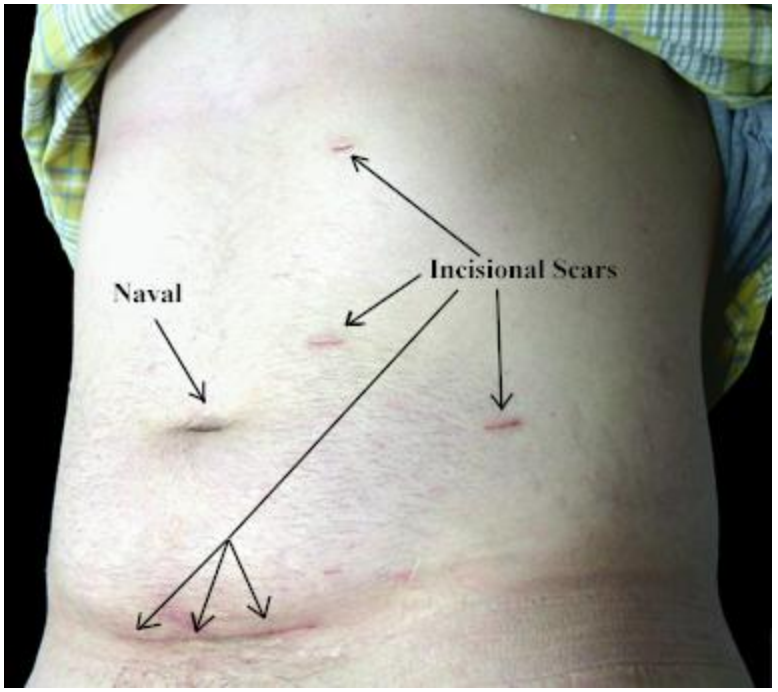




This is a surgery that causes a big scar that has to cut the muscles so the patient will suffer and feel pain with respiration,

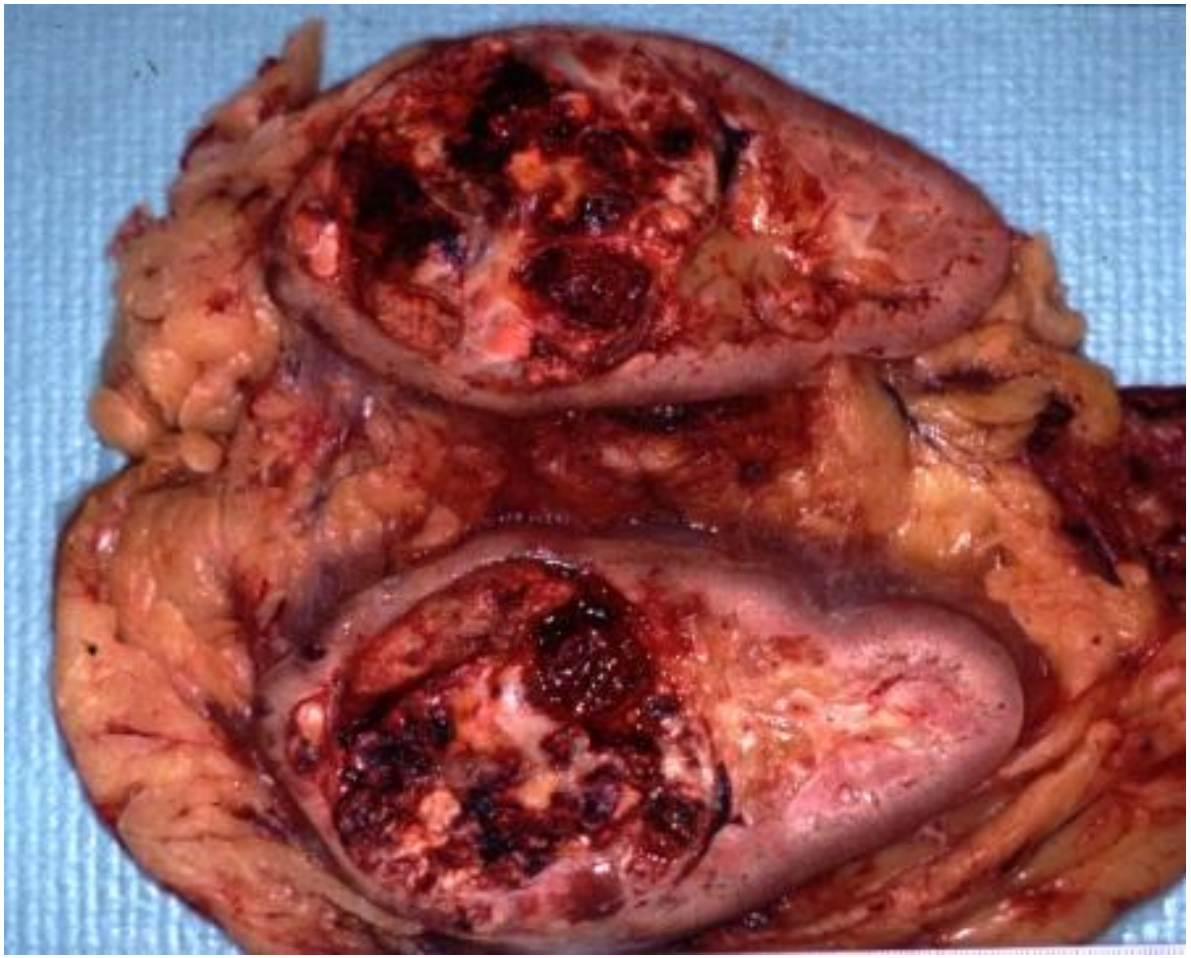
Laparoscopic Nephrectomy

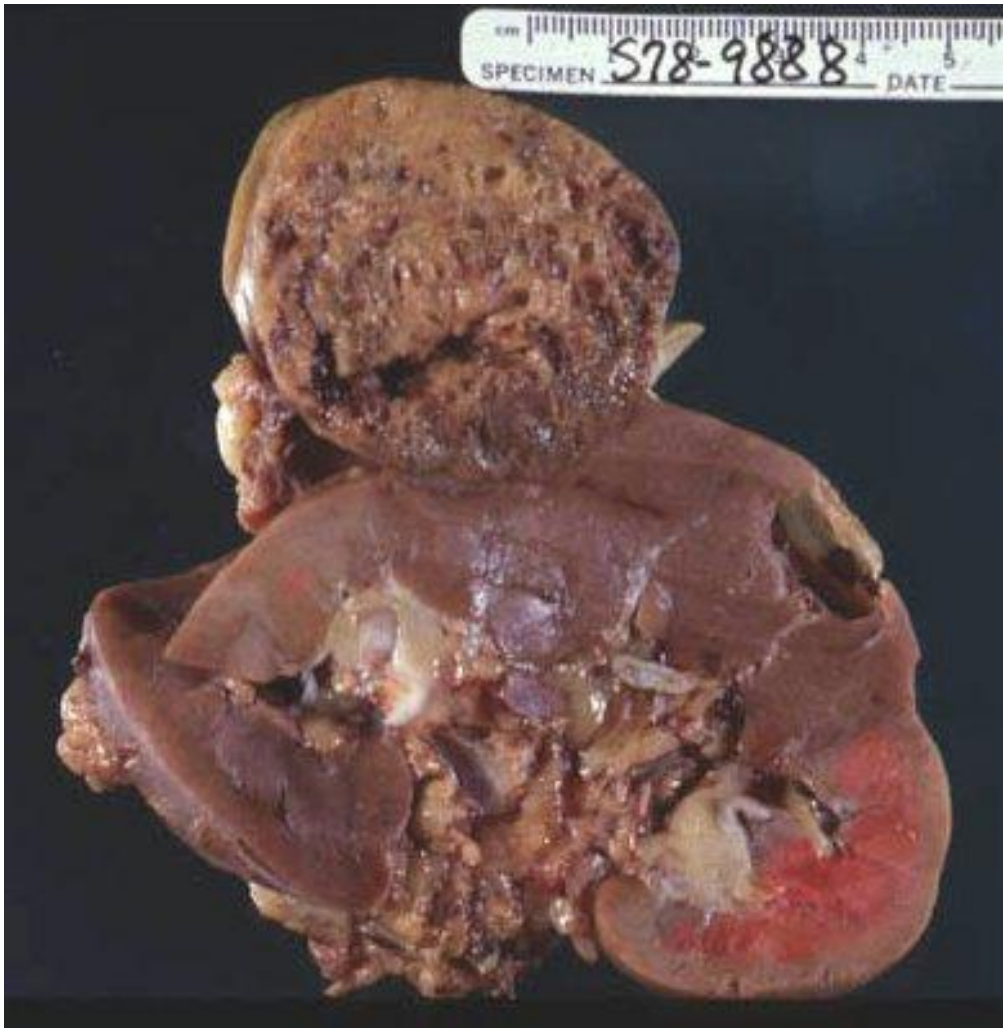




Advantages: 1. Shorter hospital stay 2. less pain 3. same results

We use the incision in the groin to remove large tumours because that incision does not need to cut muscles, It's muscle splitting incision

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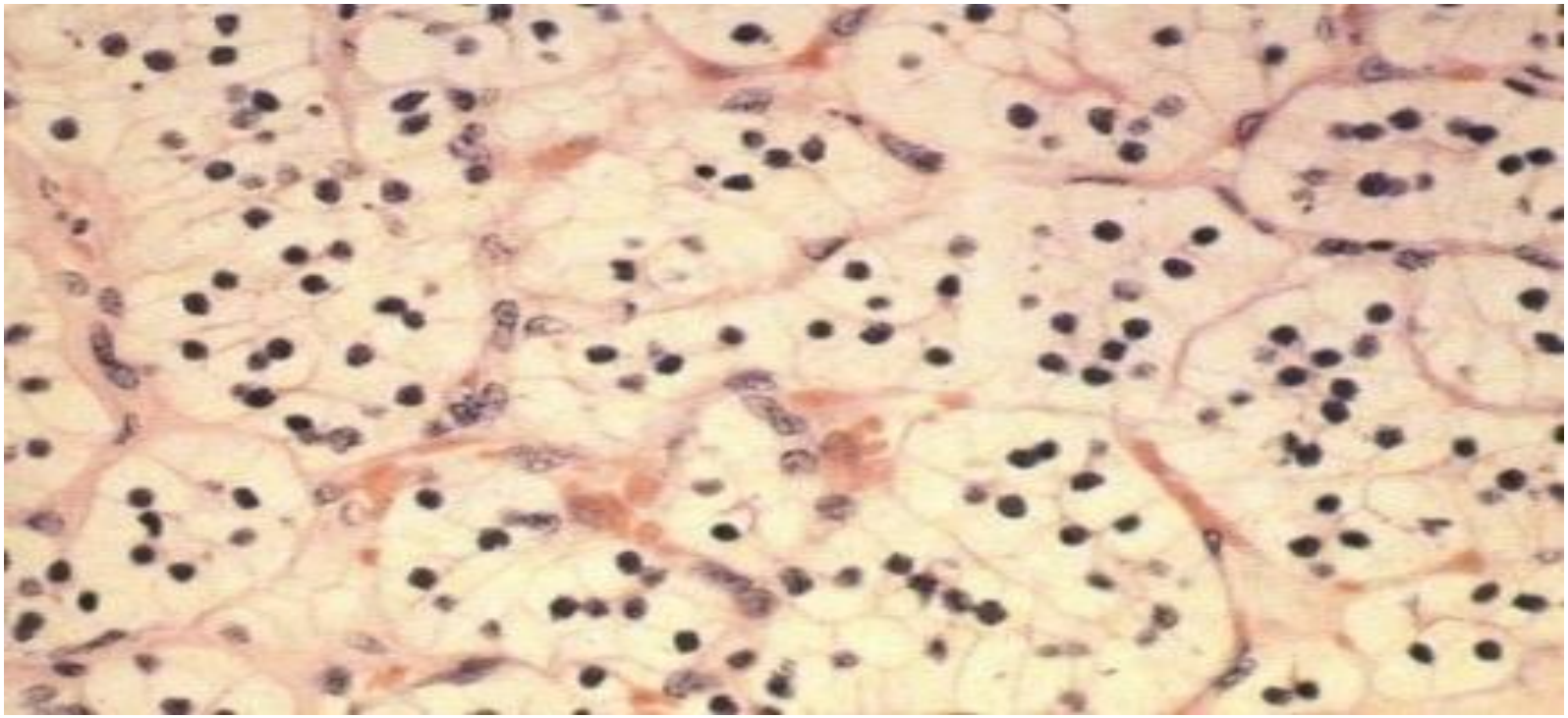
DATE



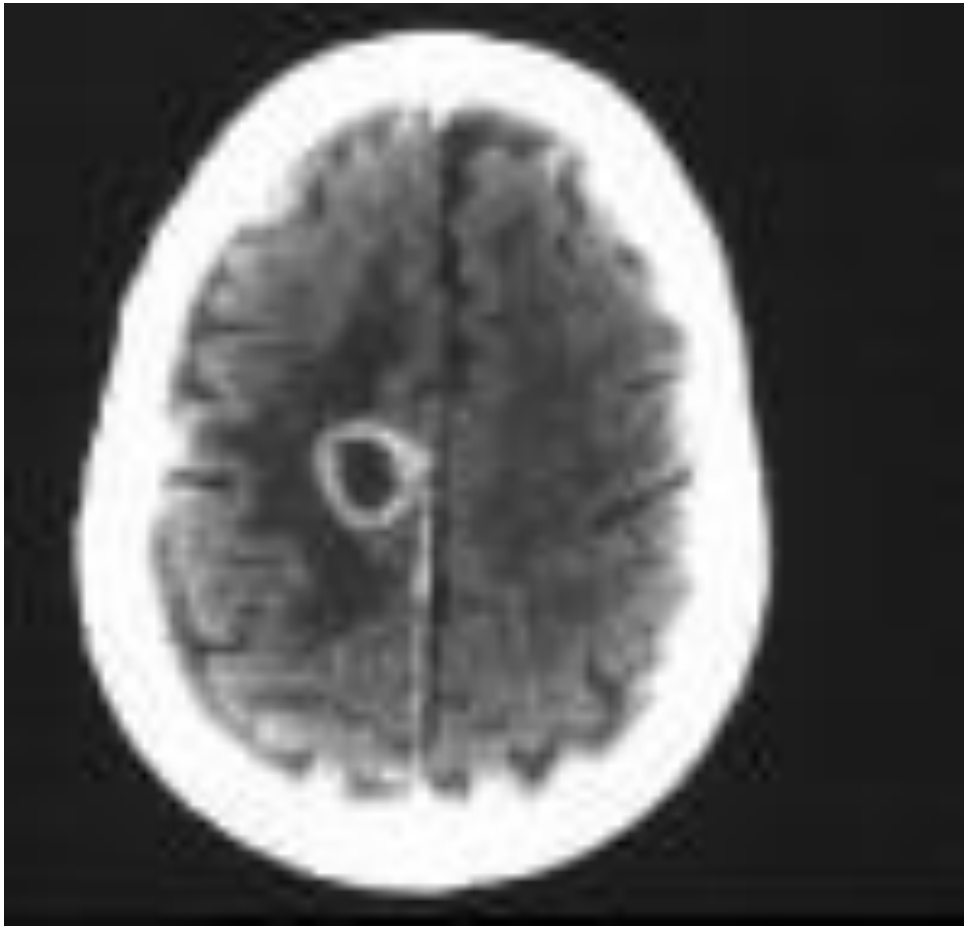
Very clear, impacted cells with dark nucleus and clear cytoplasm !! This is the commonest histopathological subtype of renal cell carcinoma

- Staging of kidney tumor include :
  1- clinical staging by CT scan
  2- pathological staging
- Grading system for kidney cancer is called Furhman system

Rx:

- Lymph node dissection of no proven benefit
  - Weather you remove them or not, patient will have a recurrence .
  - Remove only for lab purposes and staging
- 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)
  - Monoclonal antibodies, interferon, cytokine inhibitors
  - Very cytotoxic
  - Given only to patients with good performance status

  not curable but it can prolong his life for 6-8 months



Solitary mass in the brain due to metastasis.
Solitary masses should be surgically removed

- Prognosis: (survival rate)
  - Early stage
    - 5 year survival is 95%
  - Metastatic disease
    - 3-6 months survival

2-Bladder Tumors

- Bladder tumours
  - 90% is transitional cell carcinoma
    - Better prognosis
  - Squamous carcinoma
    - Bad prognosis, in fact the worst
    - High risk groups (chronic irritation) :
      - Smokers
      - **Chronic UTI**
      - Stones
      - Chronic indwelling catheter
      - **Spinal cord injury**
      - **Shicstosomaiasis**
  - adenocarcinomas

Pathology

- Of all bladder carcinomas:
  - 90% are transitional cell carcinomas
  - 5% are squamous carcinoma
  - 2% are adenocarcinomas
    - Due to congenital fistulas
- TCCs should be regarded a 'field change' disease with a spectrum of aggression
- 80% of TCCs are superficial and well differentiated
  - Only 20% progress to muscle invasion
  - Associated with good prognosis
  - Above the muscle of the bladder (muscularis proprea)
  - Higher recurrence
- 20% of TCCs are high-grade and muscle invasive
  - 50% have muscle invasion at time of presentation
  - Associated with poor prognosis
  - Invading the muscle

Etiological factors

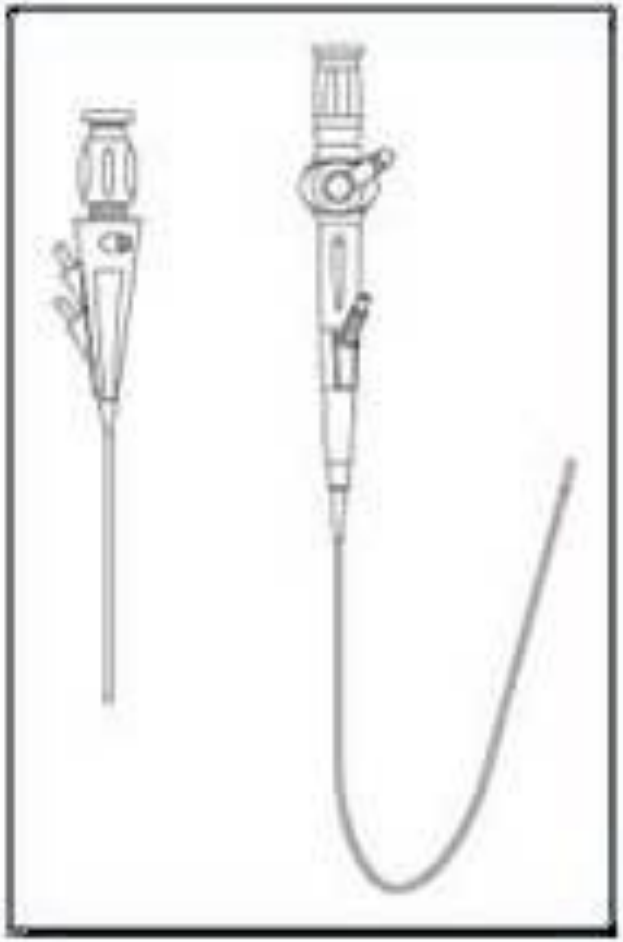
- Occupational exposure
- 20% of transitional cell carcinomas are believed to result from occupational factors
- Chemical implicated - aniline dyes, chlorinated hydrocarbons
- Cigarette smoking
- Analgesic abuse e.g. phenacitin
- Pelvic irradiation - for carcinoma of the cervix
- *Schistosoma haematobium* associated with increased risk of squamous carcinoma IMP!!

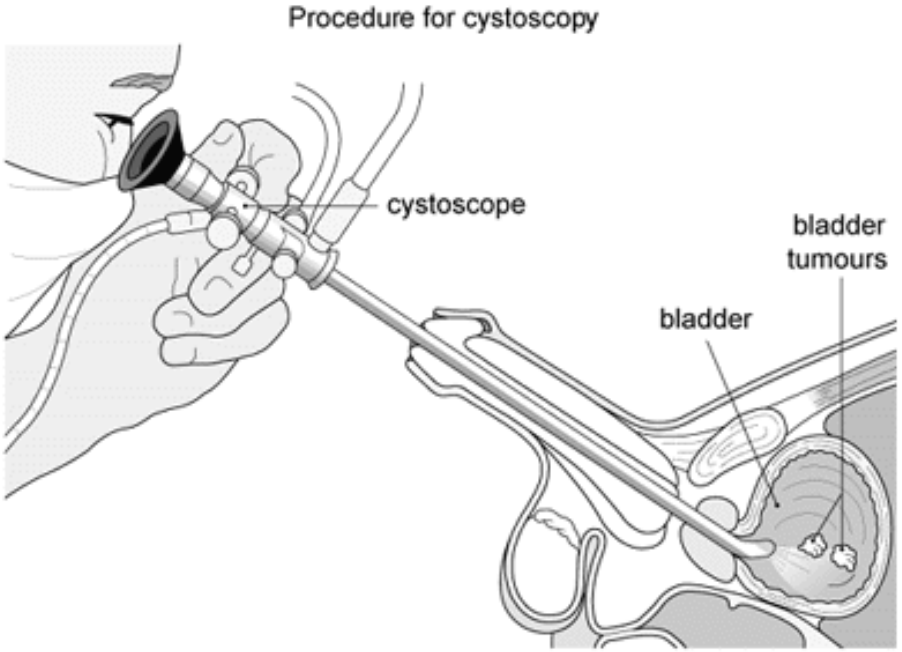
Presentation

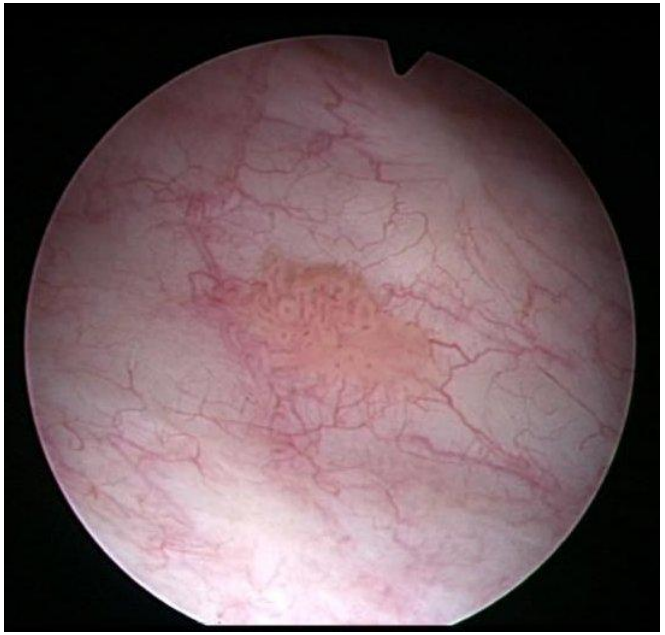
- 80% present with painless hematuria
  - Gross painless hematuria
  - Terminal hematuria
- Also present with treatment-resistant infection or bladder irritability and sterile pyuria

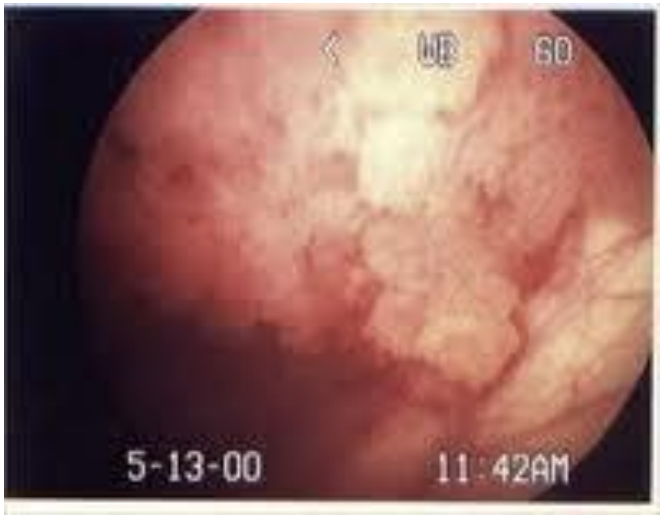
Investigation of Painless Haematuria

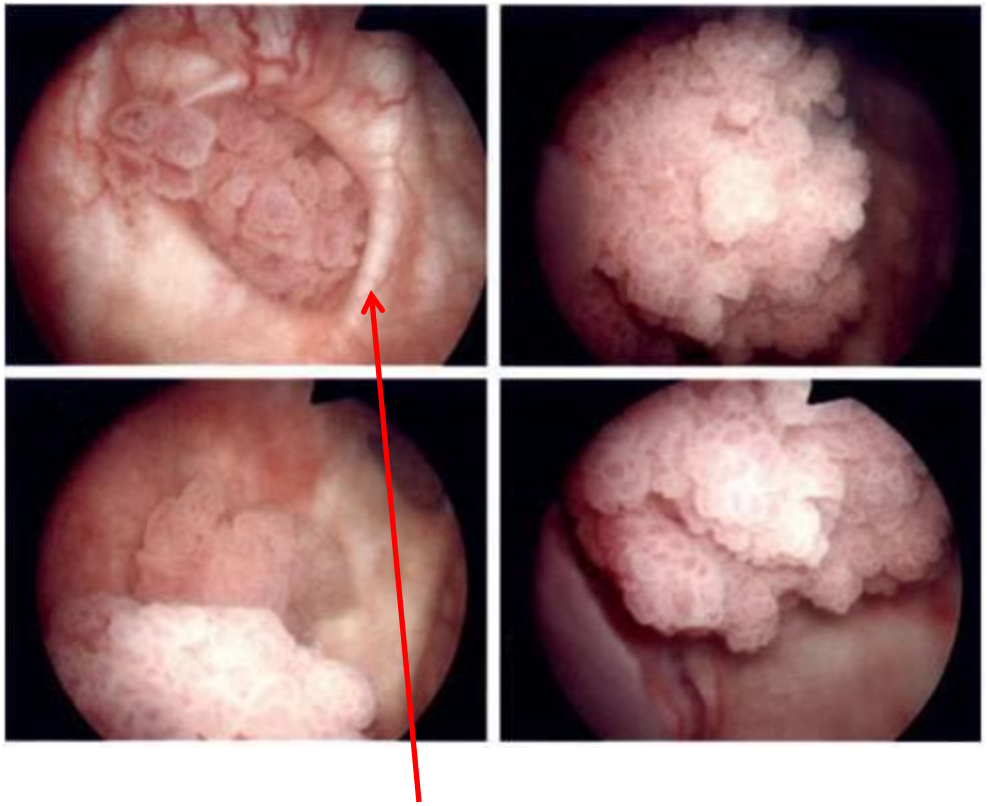
- Urinalysis
- Ultrasound - bladder and kidneys
- KUB - to exclude urinary tract calcification
- Cystoscopy
  - Is a must in this case
- Urine Cytology
- Consider IVU if no pathology identified
  - Gives filling defect




Procedure for cystoscopy
cystoscope
bladder tumours
bladder



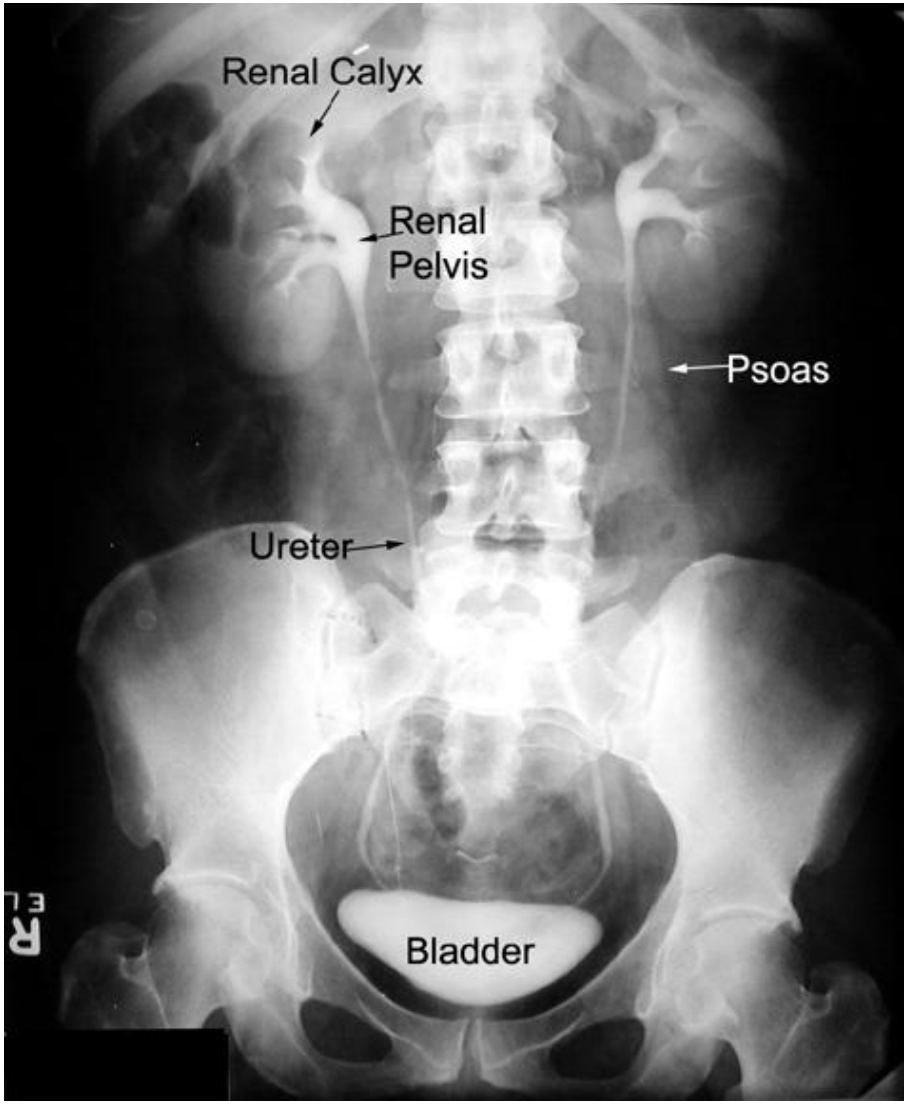




Bladder diverticulum causes stagnation of urine and this will lead to chronic irritation

Diverticulum appears as a pouch

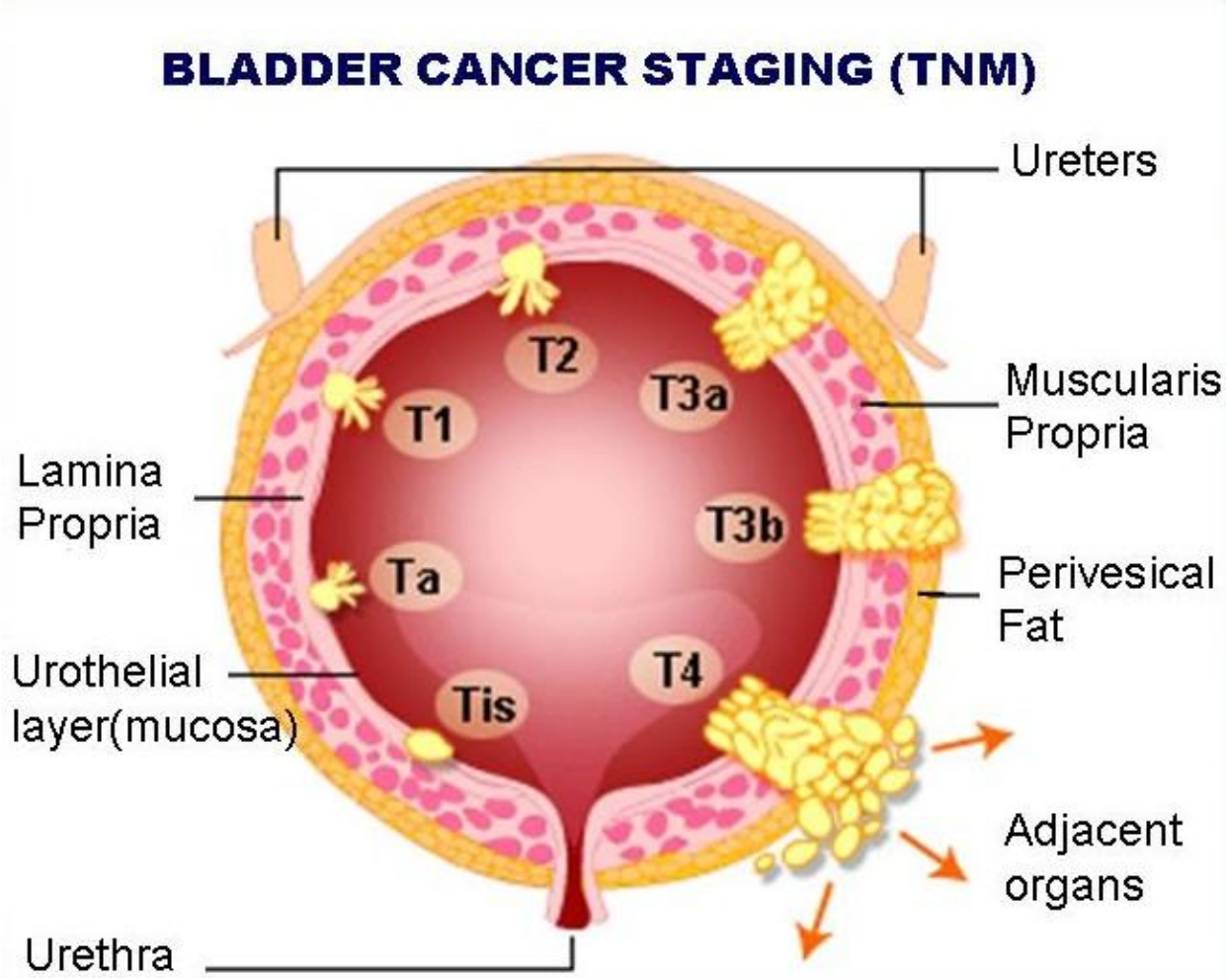
IVP (normal)



Bladder tumour will appear as a filling defect in IVP

Sometimes there will be hydronephrosis

obstruction blocking ureters which is a bad sign indicating progressive disease


BLADDER CANCER STAGING (TNM)
Ureters
T2
T3a
T1
Muscularis
Propria
Lamina
Propria
T3b
Ta
Perivesical
Fat
Urothelial
layer(mucosa)
T4
Tis
Adjacent
organs
Urethra

Pathological staging

- Requires bladder muscle to be included in specimen
- Staged according to depth of tumour invasion
- Tis In-situ disease
- Ta Epithelium only
- T1 Lamina propria invasion
- T2 Superficial muscle invasion
- T3a Deep muscle invasion
- T3b Perivesical fat invasion
- T4 Prostate or contiguous muscle

T2 and above (metastasis) needs removing the whole bladder

Grade of Tumor

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

Carcinoma in-situ

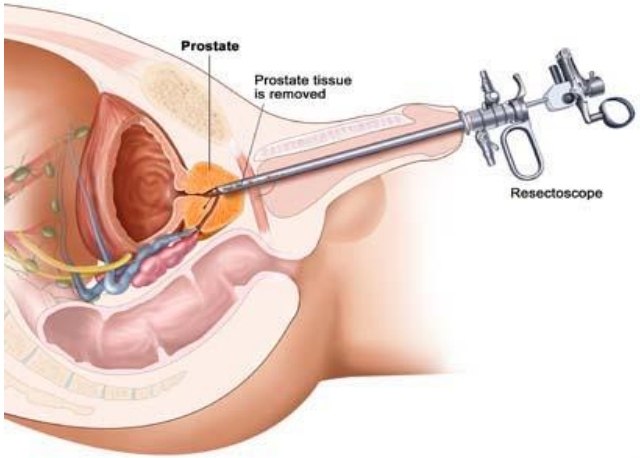
- Carcinoma-*in-situ* is an aggressive disease
- Often associated with **positive cytology** IMP!!
- 50% patients progress to muscle invasion
- Consider immunotherapy
- If fails patient may need radical cystectomy

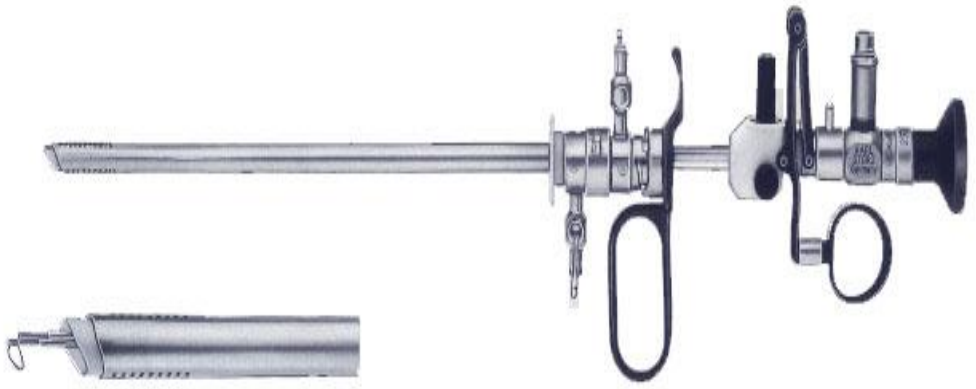
Treatment of bladder carcinomas Superficial TCC

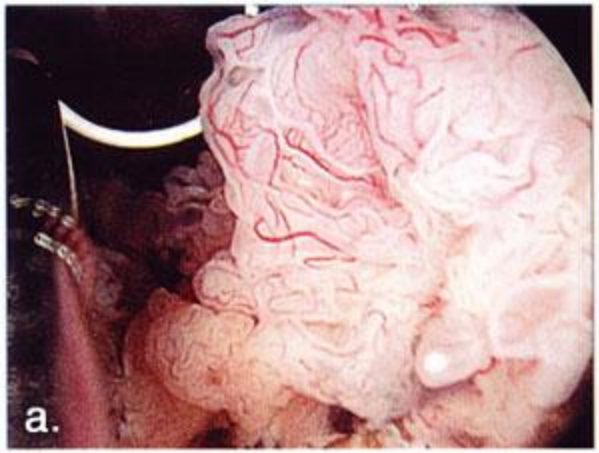
- Requires transurethral resection and regular cystoscopic follow-up
  - To watch out for recurrence due to the high recurrence rate of superficial TCC
- Consider prophylactic chemotherapy if risk factor for recurrence or invasion (e.g. high grade)
  - High risk: 1.multiple tumors 2. big tumors 3.carcinoma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

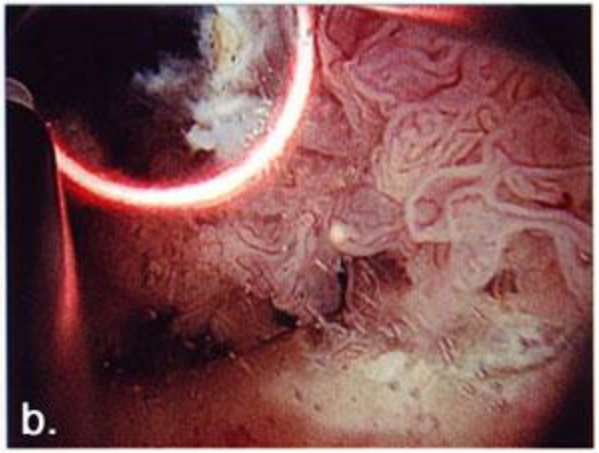
TURBT

Transurethral resection of bladder tumour



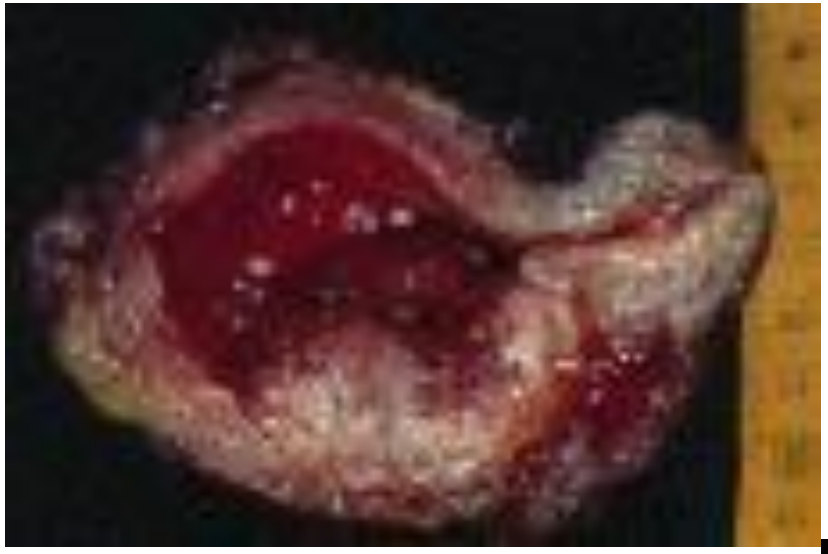


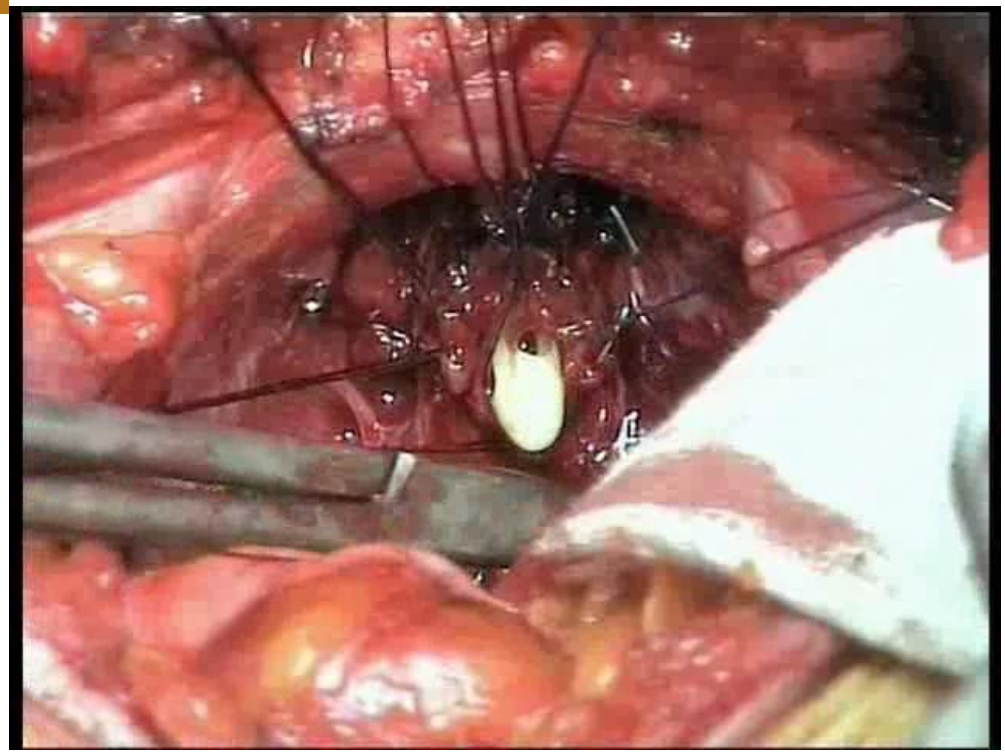


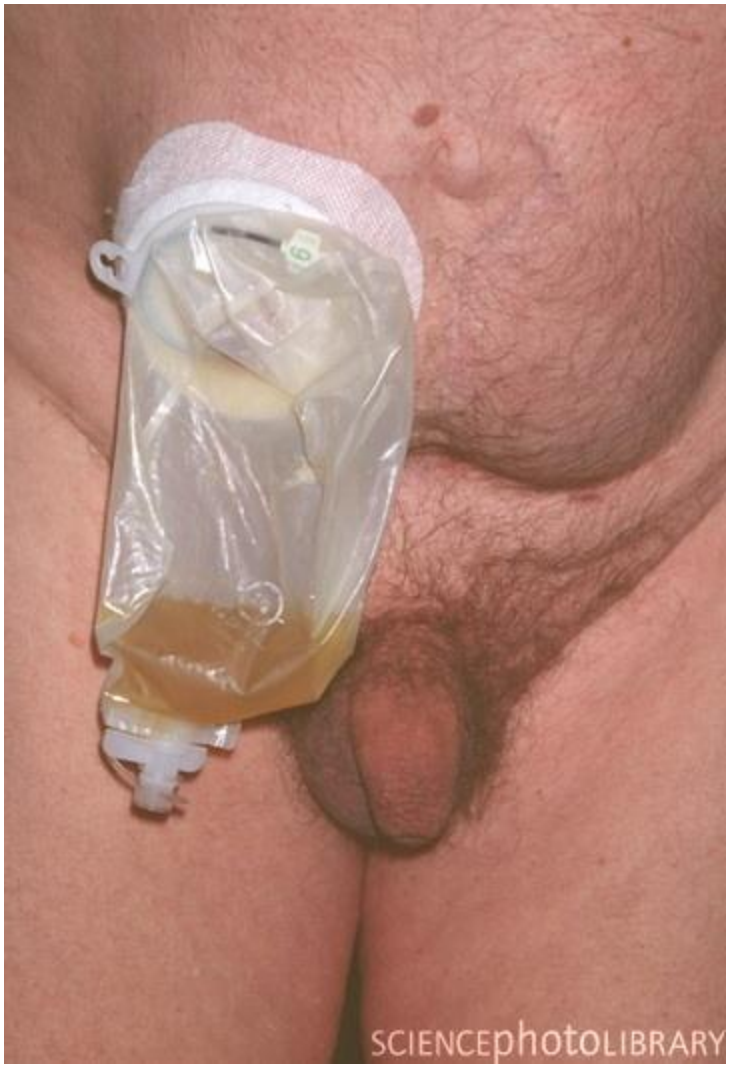


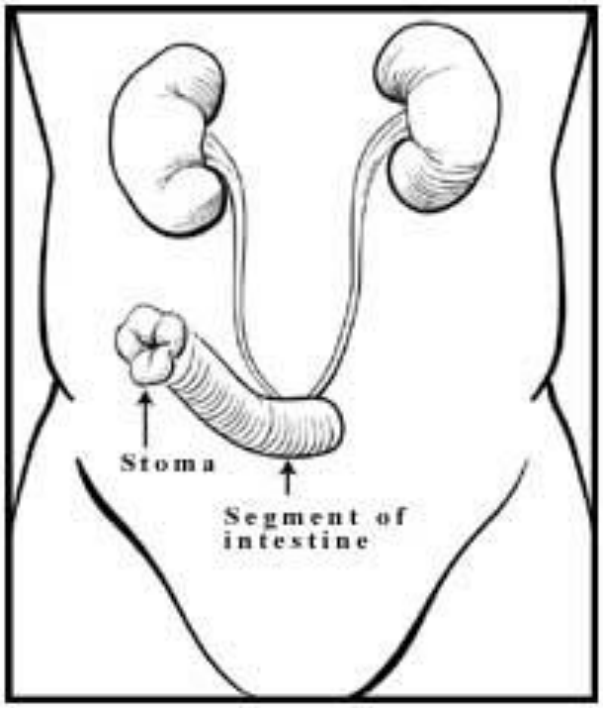
Rx: Invasive TCC

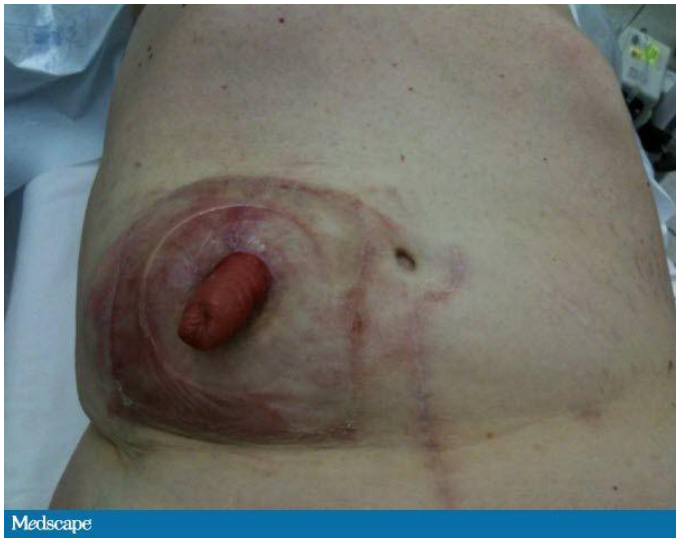
- Radical cystectomy has an operative mortality of about 5%
  - Radical cystectomy: removal of bladder, prostate, distal ureter and lymph nodes
    - In females also the uterus, cervix and anterior vaginal wall
- Urinary diversion achieved by:
  - Ileal conduit
  - Neo-bladder
- Local recurrence rates 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






SCIENCEphotoLIBRARY


Stoma
Segment of intestine


Medscape

3-Prostate Tumors

Prostate cancer

- Commonest malignancy of male urogenital tract IMP !!
  - 8th most common tumor here in Saudi
- Rare before the age of 50 years
  - Screening is recommended at the age of 40
- Found at post-mortem in 50% of men older than 80 years
  - Usually it doesn't kill and dies with the patient
- 5-10% of operation for benign disease reveal unsuspected prostate cancer

- Screening program in north America for males above the age of 40 every year
  - PSA test
  - Digital Rectal exam
  - If any of them positive this is an indication to take a biopsy

Pathology

- The tumors are adenocarcinomas IMP!
- Arise in the peripheral zone of the gland IMP!!
  - –prostate tumors “malignant component” usually arise in the peripheral zone while benign prostate Hyperplasia (BPH) “benign component“ arise 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 Gleeson classification
- The ONLY organ that will not have metastasis from prostate cancer is BRAIN

Clinical features

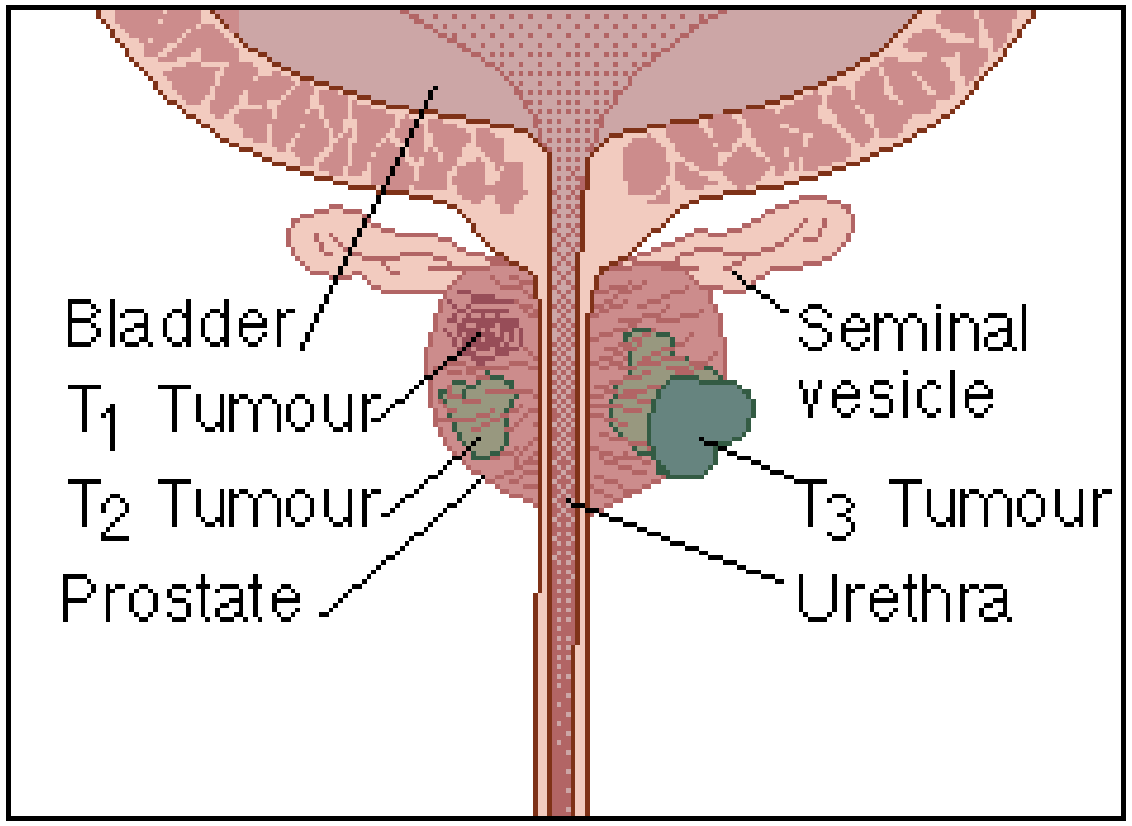
- Majority these days are picked up by screening
- 10% are incidental findings at TURP
- Remainder present with bone pain, cord compression or leuco-erythroblastic anaemia
- Renal failure can occur due to bilateral ureteric obstruction

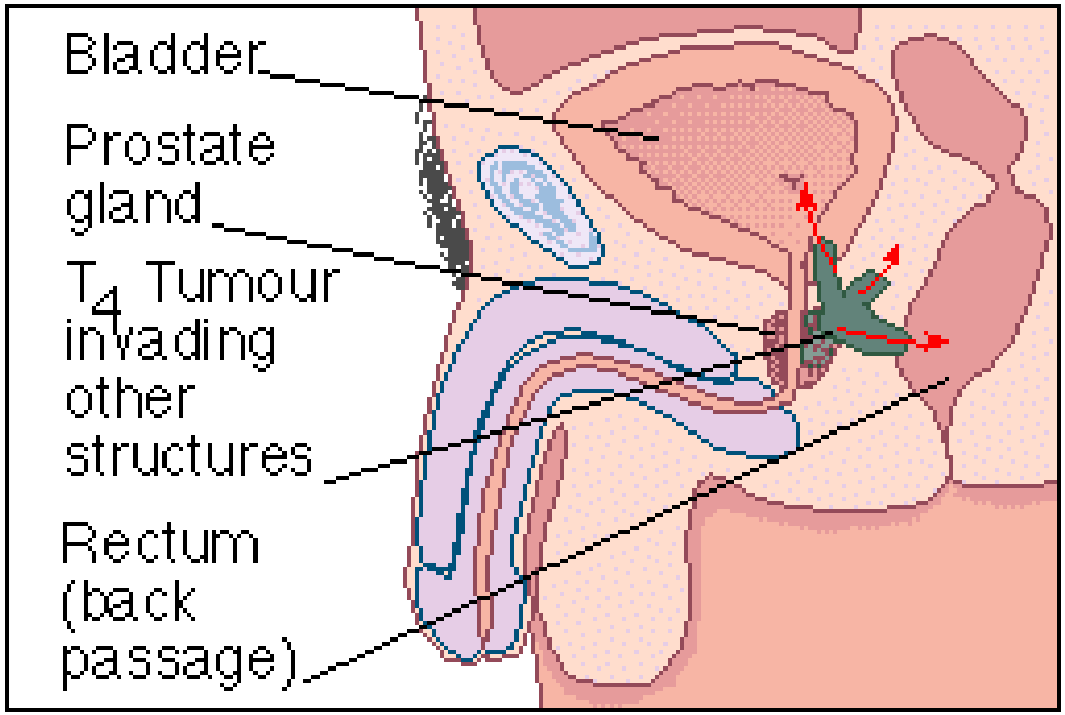
Diagnosis

- With locally advanced tumours diagnosis can be confirmed by rectal examination
- Features include hard nodule or loss of central sulcus
- Transrectal biopsy should be performed
- Multiparametric MRI maybe 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

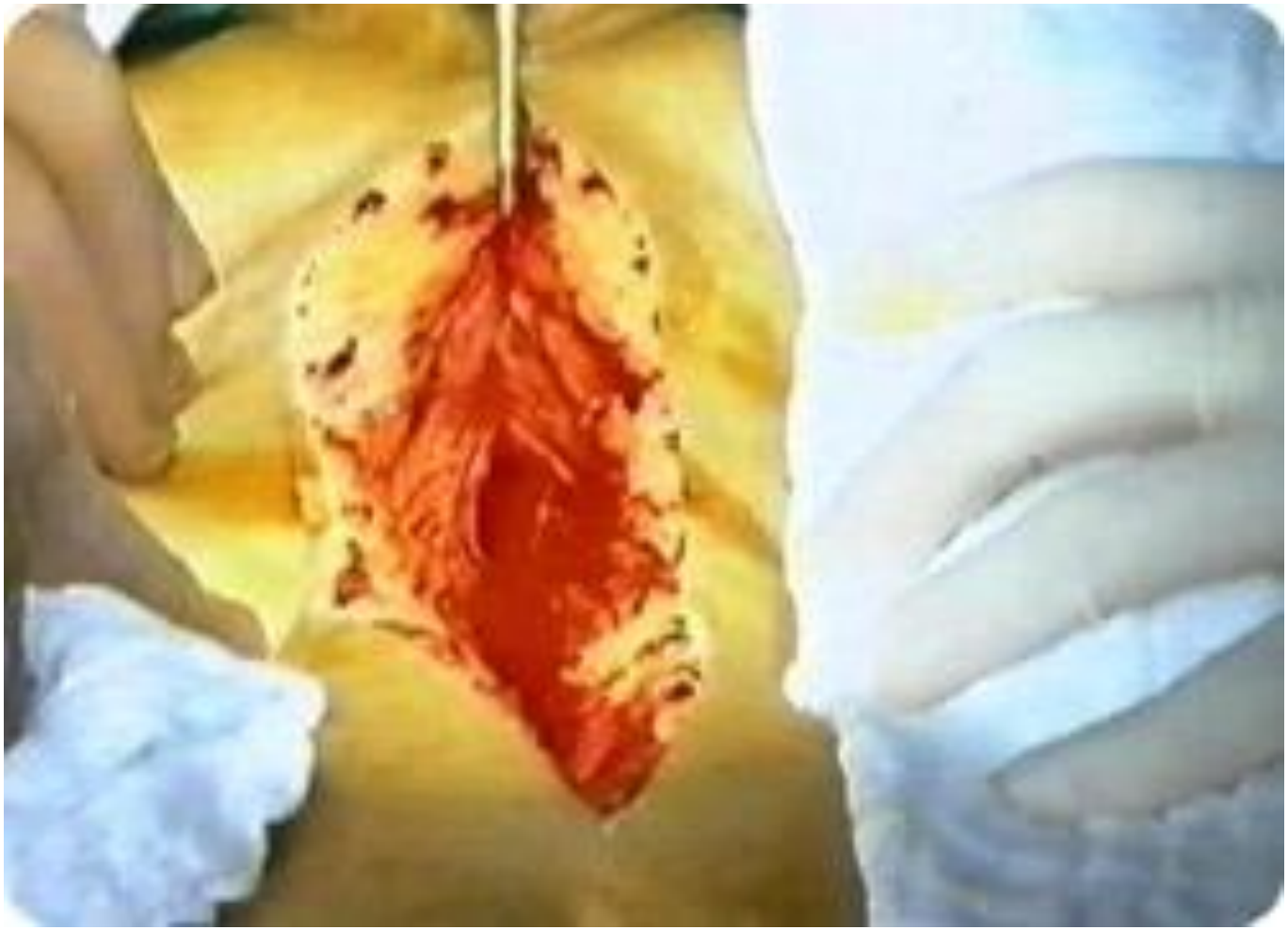

Bladder
T_1 Tumour
T_2 Tumour
Prostate
Seminal vesicle
T_3 Tumour
Urethra


Bladder
Prostate gland
T_4 Tumour invading other structures
Rectum (back passage)

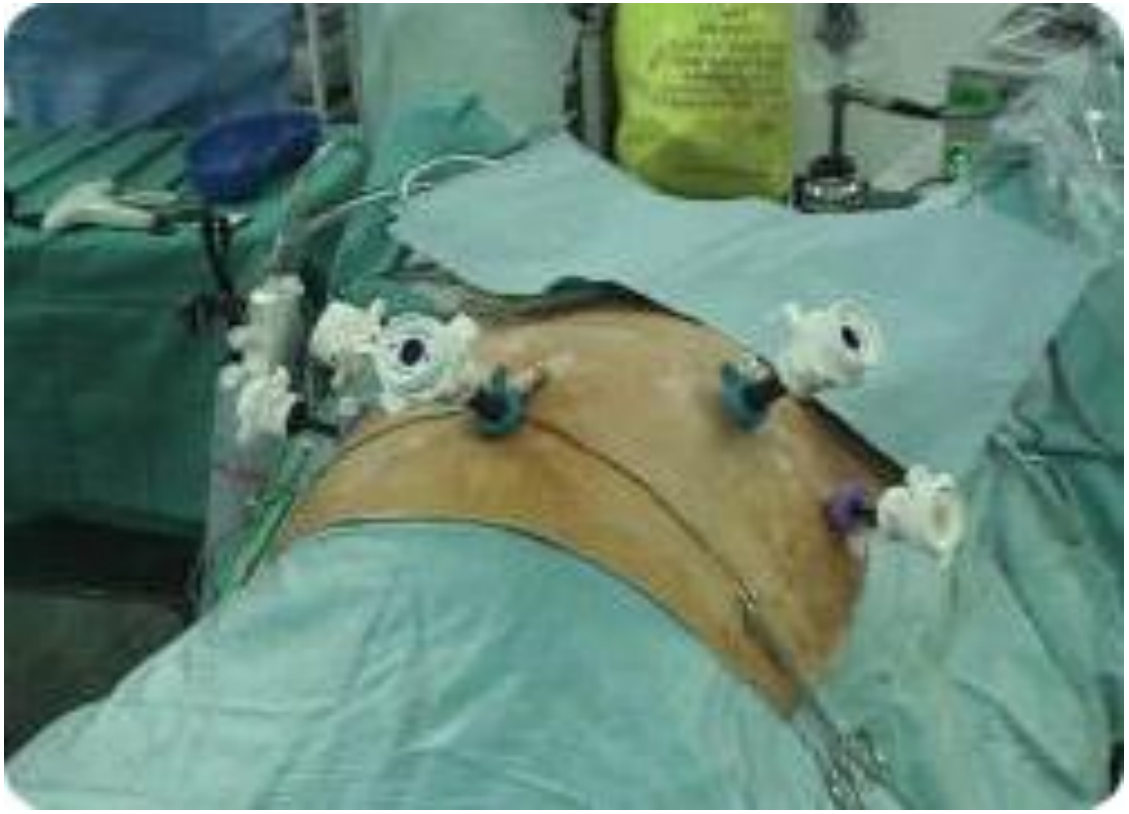
Treatment

- More men die with than from prostate cancer
- Treatment depends on stage of disease, patient's age and general fitness
- Treatment options are for:
- Local disease
  - Observation (old men ≥ 80 with localized disease)
  - Radical radiotherapy (prostate cancer is radio sensitive)
  - Radical prostatectomy
- Locally advanced disease
  - Radical radiotherapy
  - Hormonal therapy
- Metastatic disease
  - Hormonal therapy

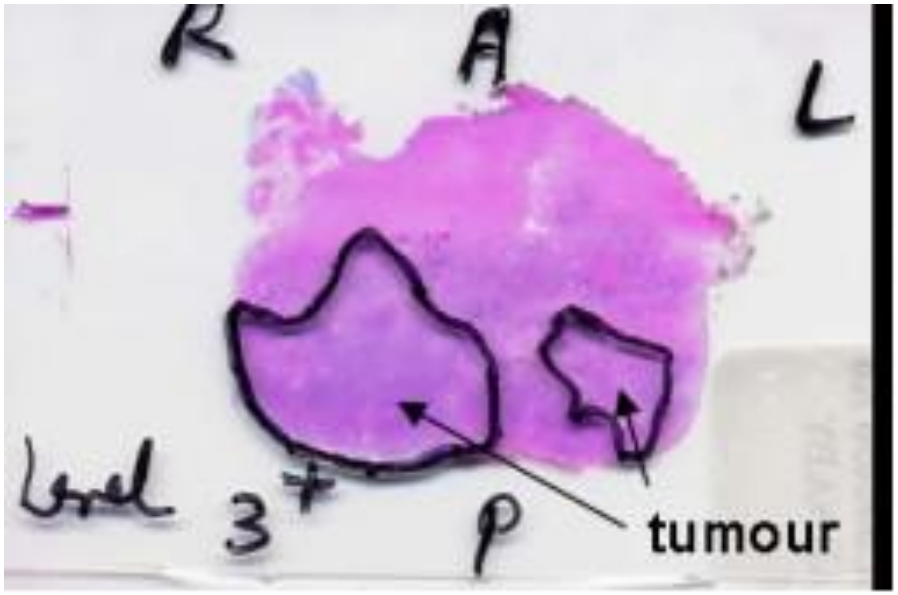
Open



Laparoscopic

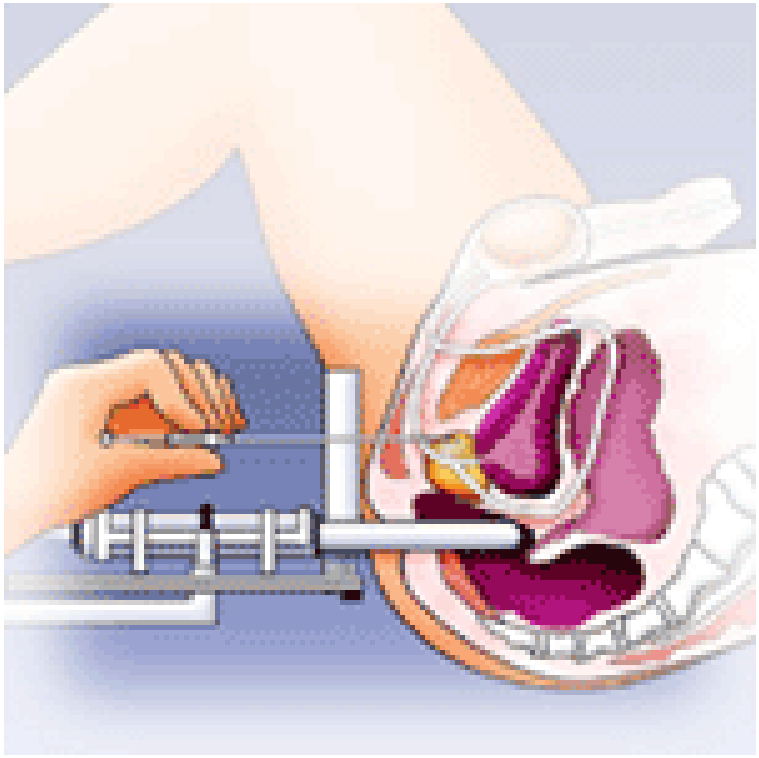


Robotic


R
A
L
Level 3
P
tumour

Brachytherapy

(internal radiotherapy,in which the radiation source is inside the body)



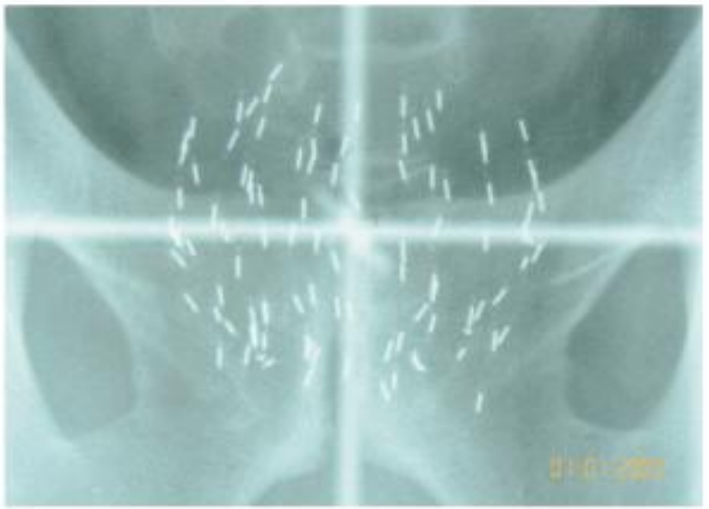
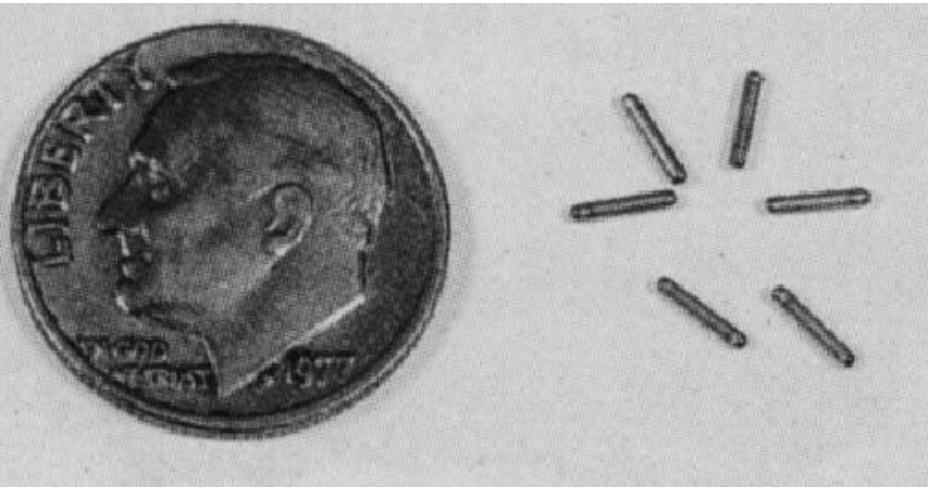
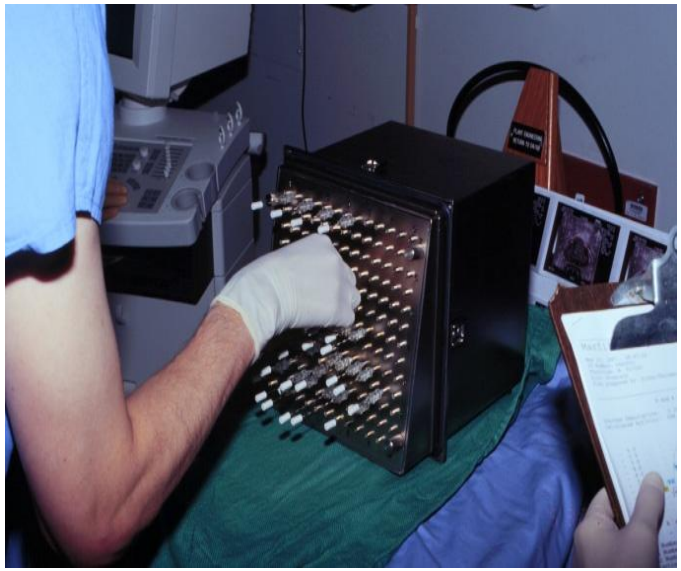
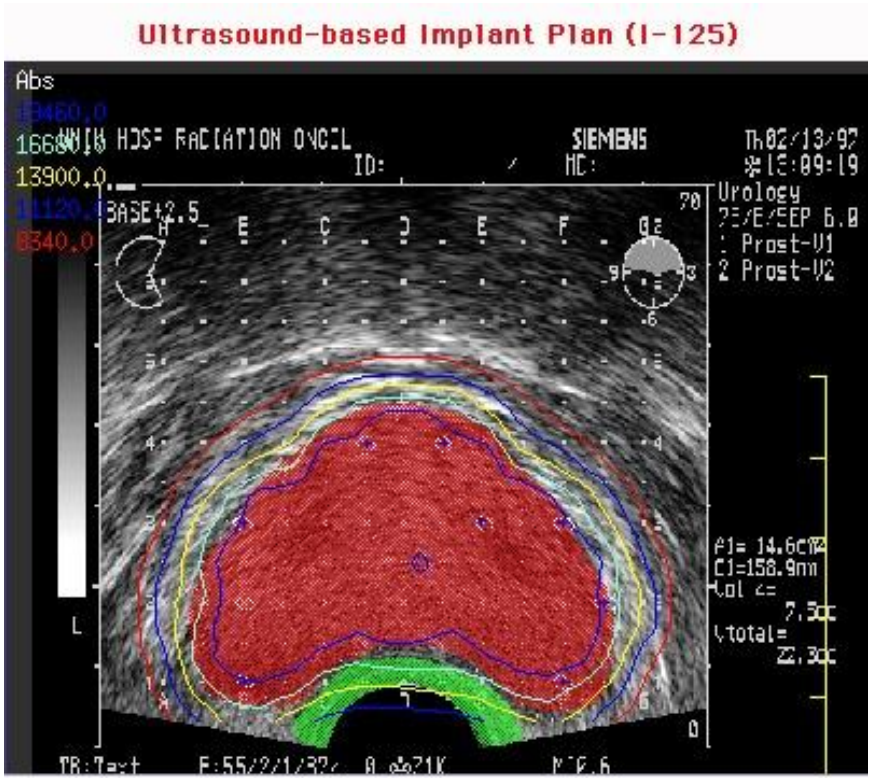


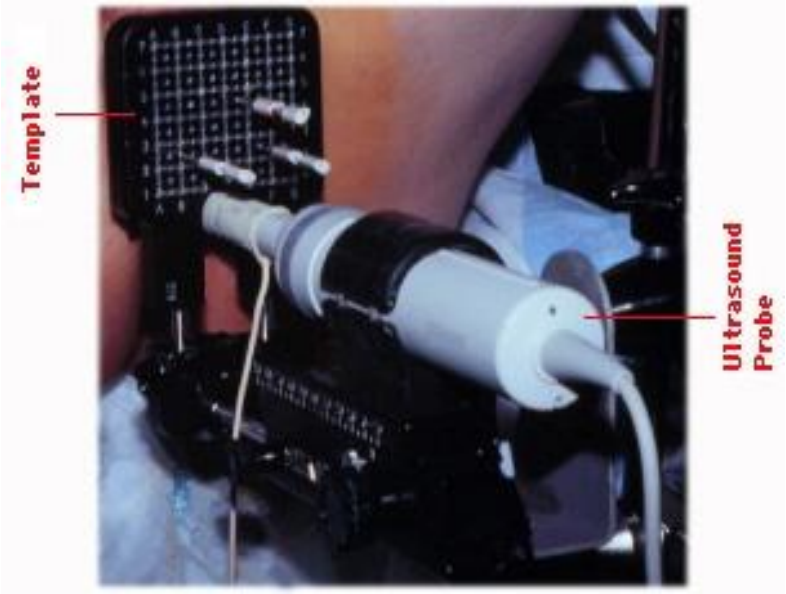
Figure 1. Location of radioactive seeds used in brachytherapy of prostate gland.

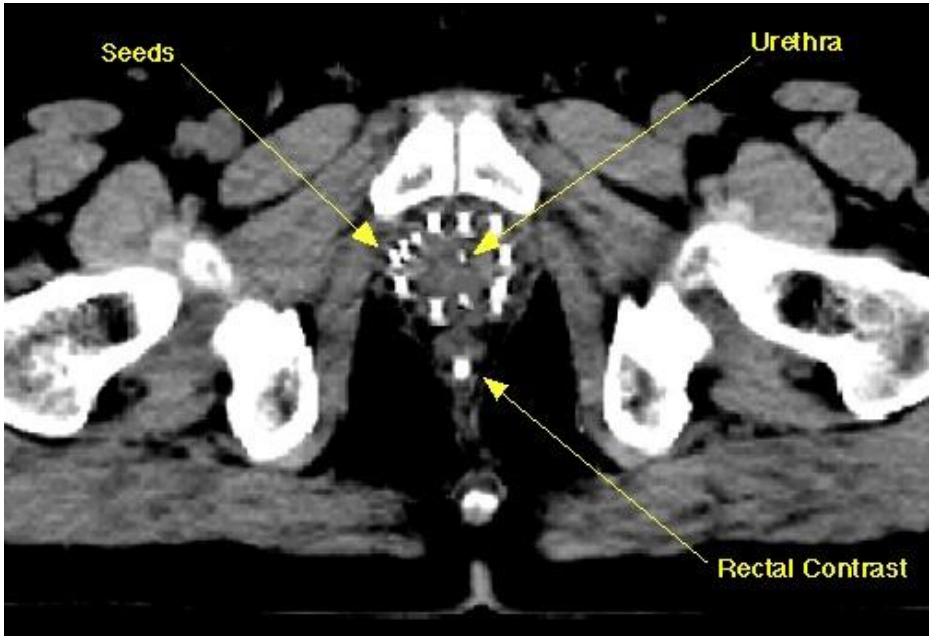
Photos courtesy of Russell Greene, MD, Stormont-Vail Regional Health Center, Topeka, Kan.






Ultrasound-based Implant Plan (I-125)
Abs
SIEMENS
Urology
Prost-V1
Prost-V2
TR:Text

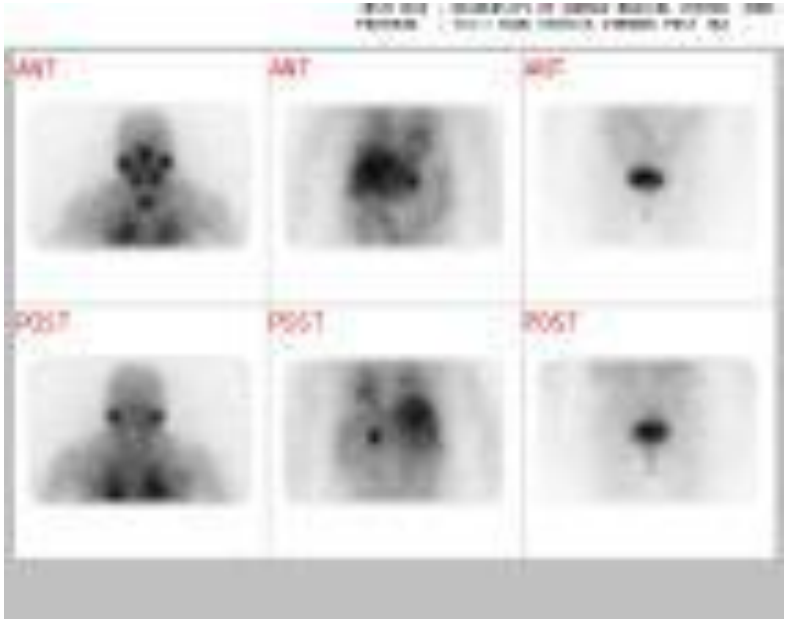

Template
Ultrasound Probe


Seeds
Urethra
Rectal Contrast

EBRT

External beam radiation therapy

EBRT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Hormonal therapy

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

4-Testicular Tumors

A disease of YOUNG men

Testicular Tumors

- Commonest presentation: testicular swelling on the side of the tumor.
  - Painless testicular swelling!
- Commonest malignancy in young men !! IMP !!
- Highest incidence in caucasians in northern Europe and USA
- Peak incidence for teratomas is 25 years and seminomas is 35 years !! IMP !!
- In those with disease localised to testis more than 95% 5 year survival possible
- Risk factors include cryptorchidism, testicular maldescent and Klinefelter's syndrome

Classification

- Seminomas (~50%)
  - Radiosensitive
- None-Seminoma (~50%) (radio resistant)
  - Teratomas
  - Yolk sac tumours
  - Embryonal
  - Mixed Germ cell yumor

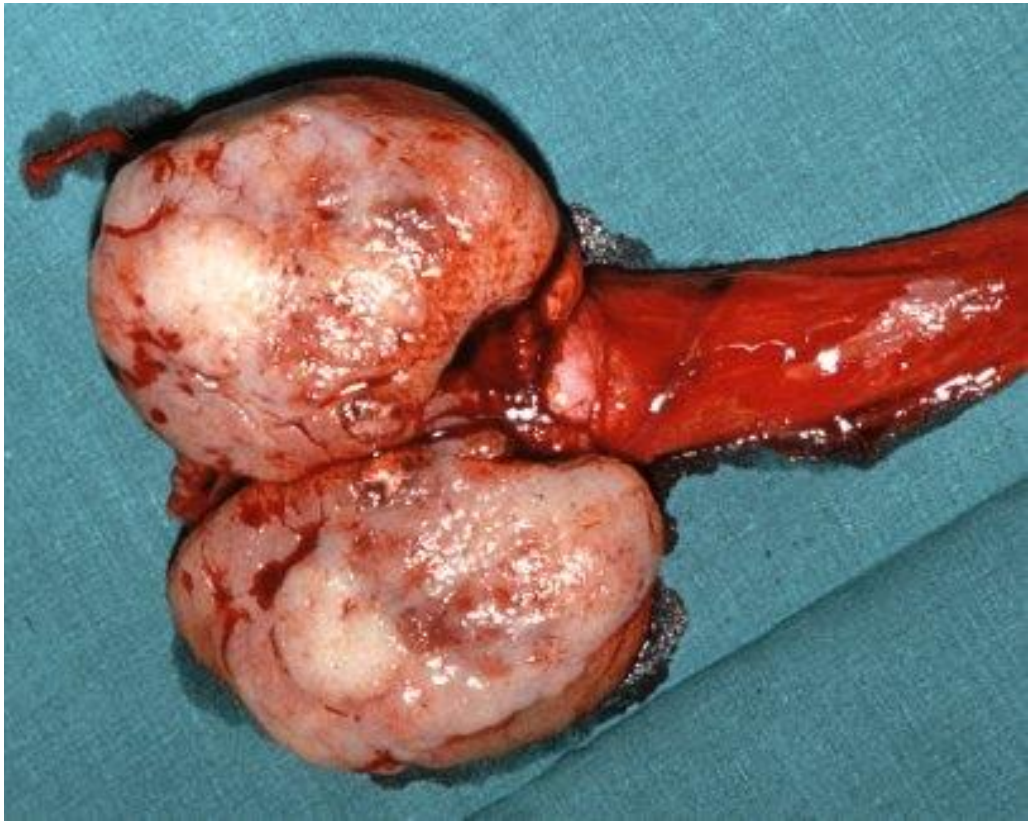
Investigation

- 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 (alphaFP)
    - Produced by yolk sac elements
    - Not produced by seminomas
  - Beta-human chorionic gonadotrophin (betaHCG)
    - Produced by trophoblastic elements
    - Elevated levels seen in both teratomas and seminoma
  - LDH

Stage Definition

- 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 Supra-diaphragmatic disease

Seminomas



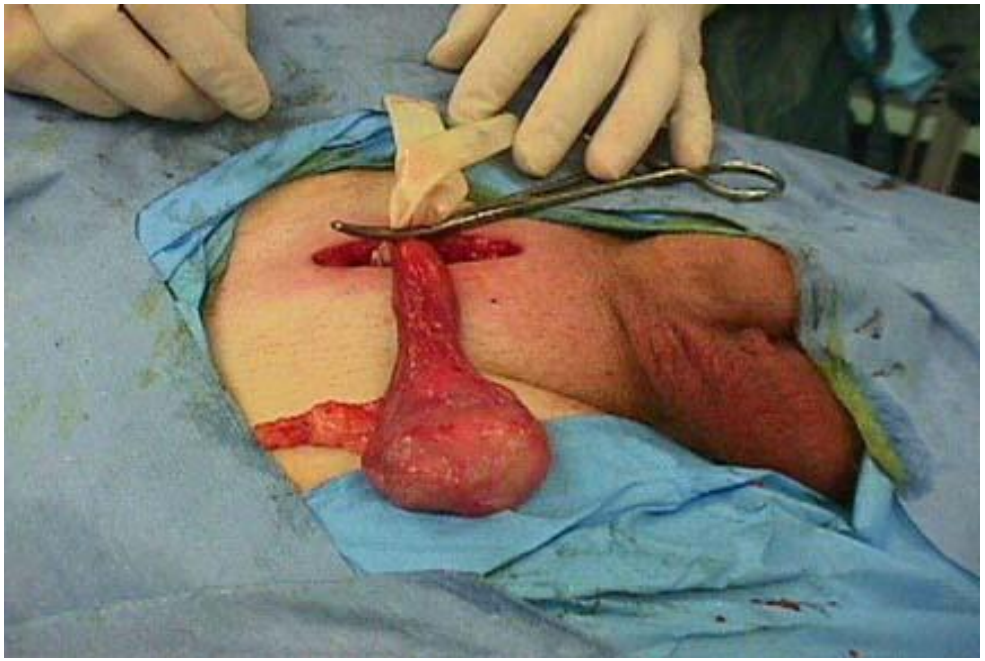
Seminomas

- 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

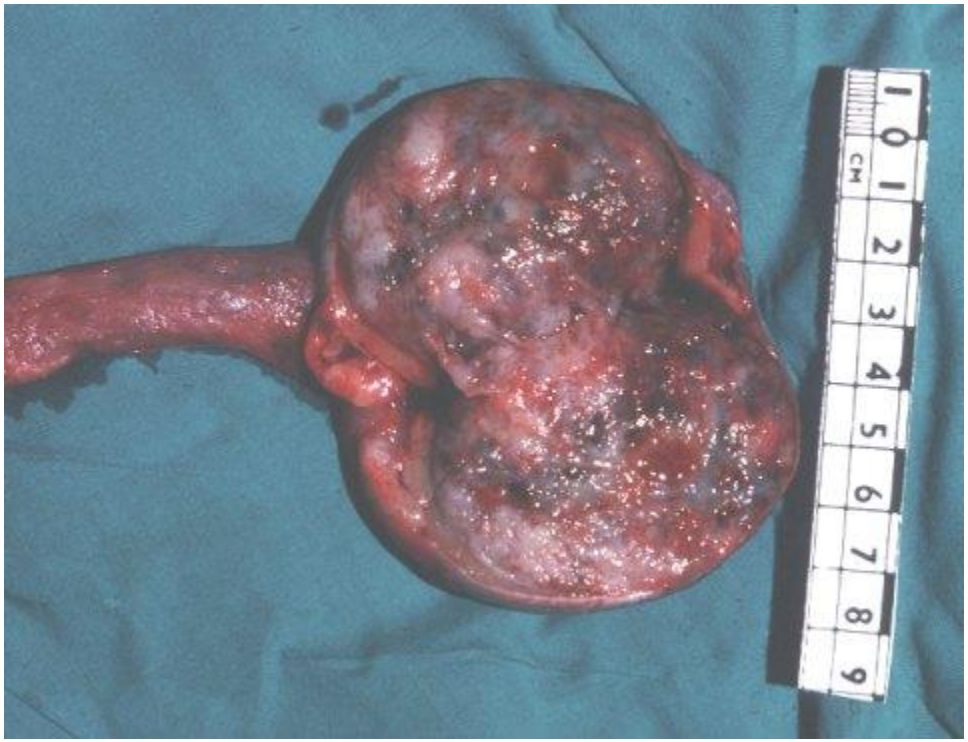
Radical Orchiectomy

- True or False :

Radical Orchiectomy done within scrotum (F)



None-Seminoma



None-Seminoma

- None-Seminoma are not radiosensitive
- Stage I disease treated by orchidectomy and surveillance Vs RPLVD Vs Chemo
- Chemotherapy (BEP = Bleomycin, Etopiside, Cisplatin) given to:
- Stage I patients who relapse
- Metastatic disease at presentation

MCQ

1- the most common presentation of renal tumors is:

-fever of unknown origin

-hypertension

-Incidental finding

-hematuria

MCQ

2-which of the following is the commonest malignancy in young men ?

-Lung

-Testicular

-Colon

-Bone

MCQ

3-Nephrouretroectomy is the treatment of choice in :

-Transitional cell carcinoma of the renal pelvis

-Renal cell carcinoma

-Non-functioning pyelonephrotic disease

-Non-functioning tuberculsis

-Angiomyolipoma

MCQ

4- Regarding cancer prostate all true except:

-It’s a very common disease in the kingdom

-The growth of the tumor can be affected by steroids.

-Usually treated by testerone.

-can be treated by oestrogens.

-can present with back pain.

MCQ

5- Benign prostatic hyperplasia all true except:

-is a disease of the young.

-usually presents with hematuria.

-can present with renal failure.

-usually present with hydronephrosis.

-can cause bladder stones.

Adrenal tumors :

- It’s included in the exam !
- You should cover :

- types (functioning & not functioning)
- most imp tumor is PHEOCHROMOCYTOMA
    - rule of 10%
    - clinical presentation
    - diagnosis