UROLOGY SUMMARY

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Congenital anomalies

Not uncommon 1/200. Kidney is formed from intermediate mesoderm. It consists of:

- excretory part: from metanephrus (at 5th wk).
- collecting part: from uteric bud with arise from mesonephric duct.
- genital duct in male arise from mesonephric duct (wolfian) but in female from paramesonephric (mullerian duct).

Kidney change position from pelvic to abdomen, also shape was lobulated, direction was forward hilum & change blood supply from median sacral, iliac to aorta.

CONGENITAL ANOMALIES:

1. **Agenesis (aplasia)**: more in female, uni or bilateral.
2. **Hypoplasia**: small normal kidney, risk of HTN (renal small artery).
3. **Pelvic (ectopic) kidney**: usually unilateral.
4. **Malrotated kidney**: pelvicalyceal system directed forward.
5. **Horse-shoe kidney:** united lower pole & malrotated.
6. **Crossed renal ectopia**: uni- or bilateral, more in male.
7. **Polycystic kidney**: always bilateral, AR. Full of cysts, no cortex.
8. **Medullary spongy kidney**: uni- or bilateral or segment.
9. **Double kidney**: more in female (1.9% of autopsy) usually lower kidney more functioning (3 collecting system (upper one 2 system)
10. **Double ureter**:
    - Incomplete type (Y-type).
    - Complete type upper ureter opens below & medial to lower ureter in UB.

    Upper → VUR.

    Lower → uretrocele.
11. **Uretrocele, VUR & PUJ obstruction**: see obstructive uropathy.

Penile Disorders

Hypospadis:

External urethral orifice opens on ventral aspect of penis.

- Very common 1/300 male birther , white >> black , +ve F/H in 8%.
- May associated with undescended testis , ing. Hernia , ventral penis curvature

Classified as:

1. Glandular
2. coronal
3. penile
4. penoscrotal
5. perineal

Treatment: by surgical correction before 2 years (circumcision postponed as foreskin may be utilized in the correction). Fibrous band (chorde) may replace missed part of urethra causing ventral curvature of penis.

Epispadis

- Reverse of hypospadias (urethra opens on dorsum of penis). (M:F=3:1)
- Rare 1/120,000 males , 1/450,000 females. (in female it has bifid clitoris , separation of labia & mostly with incontinence).

Classified in males as:

1. glandular > not ass. With incontinence.
2. penile > 75% ass. Incontinence.
3. peno-pubic 95% ass. With incontinence.
4. complete type > bladder extrophy (ectopia vesicae)

Treatment:

surgical correction at birth , later correction for incontinence , VUR & low blasser capacity may be needed.

Phimosis & Paraphimosis:

Phimosis:

Forskin (prepuce) can not be retracted over glans penis.

may be caused by blanitis (infection of glans) due to poor hygiene, or congenital.

Complications are: ballooning during micturation / balanopothitis (inflammation of prepuce), paraphimosis & penile cancer.

Paraphimosis:

Inability to reduce foreskin (cought behind glans penis) => glans edema. Treated by circumcision. Complications are: infection, glans ischemia, gangrene.

Circumcision:

Definition:

removal of foreskin (prepuce).

Incidence:

30% worldwide, varies according religion.

Indications:

1. Religions.
2. Phimosis, paraphimosis (recurrent), prior to radiotherapy of cancer penis.
3. Recurrent blano-posthitis, blanitis, UTI.

Contraindications:

- Hypospadius.
- F/H of bleeding disorders (investigate prior to circumcision).
- Unstable or sick infant.

Complications:

Bleeding, infections, glans injury, urethral injury, meatal stenosis.

MEATAL STENOSIS: caused by congenital web of epithelial cells (associated with hypospadias) and in adult by banitis.

Priapism:

- Prolonged unwanted erection lasting >4 hrs.
- Swelling of corpora cavernosa (no corpus spongiosum involvement → flaccid glans).
- Treated by urgent decompression via needle aspiration of blood if primary (unknown aetiology 50% of pt), or treat underlying cause if secondary to sickle cell, trauma, medications (alpha blockers, anti coagulants …etc.

NB: PEYRONIE›S DISEASE:

Benign curvature of penis commonly dorsal → upward curvature of erect penis. Usually secondary to fibrous thickening of tunica albuginea.

Penile tumours:

Benign:

Cyst, hemangioma, nevus, papilloma.

Malignant:

INCIDENCE: rare (<1% of cancer in male in UA, 10% of Africa), 6th decade.

AETIOLOGY: chronic inflammation, STD, phimosis, uncircumcised penis.

PATHOLOGY: Sqaumous cell carcinoma (>95%), basal cell, paget's dis of penis (rare).

DIAGNOSIS: definitive Dx requires full thickness biopsy of lesion.

TREATMENT: Wide surgical excision +/- lymphadenectomy. Less aggressive treatment is (cryotherapy, laser, etc).

TNM classification:

T1 = Invade buck›s fascia

T1a = No lymph or vessel involvement.

T1b = With lymph or vessel involvement.

T2 = Invade corpus spongiosum or cavernosum.

T3 = Invade urethra or prostate.

T4 = Invade other adjacent structure.

Ostructive uropathy

Obstructive uropathy includes any obstruction that occurs anywhere in urinary tract with the following

Symptoms:

1. Obstructive symptoms: hesitancy, weak interrupted slow stream and post-micturation dribbling of urine.
2. Irritative symptoms: frequency, dysuria, urgency of urgent incontinence.

NB: postatism includes obst + irritative symptoms.

Classification:

- Acute or chronic obstruction.
- Congenital or acquired.
- Unilateral or bilateral.
- Partial or complete.
- Extrinsic or intrinsic.

Aetiology:

ass. To level of obstruction.

RENAL:

1. Congenital → pelviureteric junction obstruction (PUJ obst), aberrant renal artery, horseshoe kidney.
2. Tumour → wilm's tumour, RCC , pelvic tumour.
3. stones in renal pelvis, TB stricture .

URETERIC:

1. Lumen → stones , blood clot..
2. Wall → cong.stricture (atresia), uretrocele, acquired stricture (TB , traumatic, … etc), tumour.
3. Outside wall → pelvis malignancy, idiopathic retroperitoneal fibrosis.

BLADDER:

Tumour (TCC) invading ureter, neurogenic bladder dysfunction, bladder neck stenosis (congenital, bilharzias, tumour), diverticulae.

PROSTATE:

BPH , cancer , prostatitis.

URETHRAL:

- Posterior urethral valve, cong. Stenosis.
- Urethral stricture (inflame, malignancy) stone.
- Phimosis & paraphimosis.

In CRF → high urea, high creatinine , high PO4, low Ca++ , low Hb.

IVU to see if secreting kidney, isotope scan to see if functioning.

NB: URINARY OBSTRUCTION (STASIS) CAN BE CLASSIFIED INTO:

- According to aetiology → congenital & acquired.
- According to duration → acute & chronic
- According to level of obstruction → upper, middle & lower.
- According to degree of obstruction → partial & complete obstruction.

CONGENITAL CAUSES:

- Pelvi-ureteric junction (PUJ) obstruction.
- Aberrant renal artery.
- Ectopic ureter.
- Vesicoureteric reflux (VUR).
- Ureterocele & cystocele.
- Neurogenic bladder injury (S1, S2, S3) as in spina bifida.
- Posterior urethral valve.
- Distal urethral stricture.
- Congenital external urethral meatal stenosis.

ACQUIRED CAUSES:

PRIMARY (WITHIN URINARY TRACT):

- Kidney stones, tumour, cyst, hydronephrosis.
- Ureteric stone, stricture, tumour.
- Bladder tumour.
- Prostate tumour.

- External urethral meatus stricture (after circumcision).
- Urethral stricture → (injury, catheter, infection as gonorrhea).

SECONDARY:

- Pregnancy (mechanical obstruction by fetal head, hormonal,decreased ureter peristalsis.
- Retroperitoneal fibrosis.
- Pelvic tumours or metastatic LN.

NOTES:

D/D of filling defect in bladder on IVU:

- Tumour, stone, blood clot, balloon of catheter.
- Cystocele, middle lobe of prostate.
- Diverticulum either congenital (all layers → true), or acquired (mucosa → false) & to differentiate between (true & false) ask the patient to pass urine,(if still full → acquired), as congenital has a muscle to void.

INDICATIONS OF NEPHRECTOMY:

- Tumour, TB, pyelonephrosis, donation.

Complications of obstructive uropathy:

- Infection due to stasis & stone formation.
- Hydroureter & hydronephrosis.
- Acute & chronic retension.
- Chronic renal failure (CRF) If bilateral.

HYDRONEPHROSIS

Definition:

it is a septic distension of renal pelvis and calyces due to partial or complete obstruction.

Aetiology:

(see causes of obstructive uropathy).

1. Unilateral hydronephrosis → ureteric stone, tumour, stricture, clot … etc.
2. Bilateral hydronephrosis → retroperitoneal fibrosis, prostatic & urethral causes.

ACCORDING TO AGE:

1. in children → PUJ obstruction, posterior urethral valve & VUR, congenital stricture, neurogenic
   bladder (bladder dyssenergia) …etc.
2. in adult → prostate enlargement, stone, urethral stricture, tumour in trigon → bilateral hyd.

Clinical picture:

1. **Pain**: commonest symptom, slight, dull aching or discomfort.
2. **Asymptomatic** → discovered accidentally by U/S.
3. **Swelling**: specially in children.
4. **S/S of underlying cause**, or S/S of complications (CRF, …etc).

Complications:

1. **Infection** → pyonephrosis, stone formation.
2. Complete cortical atrophy.
3. CRF (if bilateral).
4. Rupture "rare" → usually traumatic.

Investigations:

1. Urine analysis (RBC , WBC, SG, crystals, PH).

WBC = 10^5 → significant.

WBC = 10^3 in symptomatic patient → significant.

2. US, CT, IVU (to assess if secreting kidney), isotope scan (to assess functioning kidney).
3. Assending (retrograde) pyelogram, or descending (angerograde) pyelogram.

Treatment:

Treat underlying cause.

NEPHRECTOMY IF THERE'S:

1. Non-functioning kidney by infusion urography.
2. US showed very thin parenchyma.
3. renal scan shows zero function.
4. other kidney is normal.

NEPHROSTOMY till treating obstruction → then pyeloplasty (in advanced cases to decrease the size of pelvis) if kidney is functioning.

Polycystic kidney

Aetiology:

Failure of fusion of collecting system (developed from mesonephric ureteric bud) with secretory system (metanephric cap).

Types:

INFANTILE TYPE (AR) " RARE".

- Very large kidney may obstruct labour.
- May die of pulmonary hypoplasia.
- Renal failure, rickets is a known complication.

ADULT TYPE (AD).

Incidence:

- Common than infantile type (almost always bilateral). About 50% of patients have cyst in liver (normally functioning liver & pancrease, and 30-40% of patients have intracranial aneurysm.

Clinical picture:

- Before 10 years there are no S/S (cysts do not form before age of 10y)
- From 10-30yrs → no s/s but US shows cysts.
- After 30yrs → hematuria 25%, hypertension 70%, UTI, flank pain, uremia (renal failure by 50yr).
- Pain due to Hemorrahge inside cyst, renal colic due to clot or stone.
- Signs & symptoms of complications.

Investigations:

- Urine analysis (RBC , WBC,….etc)., US → DIAGNOSTIC.
- KUB, IVU (enlarged kidney with spider shaped calyces).
- CT, blood U/E/C.

Treatment:

- Control hypertension, treat UTI.
- Low protein diet, drink excess fluid (3L/day).
- Surgical (Rovsing's separation) to puncture superficial large cysts (to avoid compression & Hemoorage & pain) → not done because US aspiration is better.
- If renal failure occurs → hemodialysis or renal transplantation.

Simple renal (solitary) cyst

- Cyst not clear whether congenital or acquired.
- Commonly asymptomatic or dull flank pain.
- Maybe complicated by hemorrhage or infection inside cyst → acute symptoms.
- Must be differentiated from neoplastic renal mass (by US, CT).
- No treatment, if causes hydronephrosis →aspiration US guided or surgical excision (rarely needed)

PUG obstruction:

- Pelvic-ureteric junction obstruction (PUJO) is a common cause of hydronephrosis in children and adolescents.
- Seen more in males with left side predominating (10-15%) bilateral.
- Caused by failure of relaxation of PUJ.
- Diagnosed by U/S in uretra (if sesvere) but may be asymptomatic and detected incidentally during exam. (abdominal mass, pain in flank, UTI).
- Diagnosed by IVU → dilated pelvicalyceal system with abrupt contrast arrest at PUJ. With absent or normal caliber ureter.
- Treated by pyeloplasty or endoscopic endopyelotomy if failed surgery and if kidney not functioning → nephrectomy.

Ureterocele

- Cystic dilatation of terminal part of ureter (intramural part) .
- Presented with recurrent UTI, colic (due to stone inside it).
- IVU shows "cobra head" sign or by Cystoscopy → cyst.
- Treated by excision & reimplantation of ureter specially if complicated by (stone / hydronephrosis / recurrent UTI).

Posterior urethral valve

The most common cause of obstructive uropathy in infant & newborn. Occurs only in male.

Pathology:

Congenital membrane-like structure in distal prostatic urethra.

Clinical picture:

- In severe form → palpable kidney (hydronephrosis), renal failure.
- In less severe form → recurrent UTI, voiding dysfunction.

Investigations:

Voiding (micturating) cysto-urethrography (MCU) will show dialated posterior urethra and bladder with or without reflux).

Treatment:

Transurethral destruction of the valve.

Vesico-ureteric reflux:

Incidence: 5 times more in female. (commonest cause of UTI in children , 1/3 of cases).

Aetiology: due to defective valve at entry of ureter.

Clinical picture: recurrent UTI, hydronephrosis.

Investigations: MCU , Cystoscopy → ureteric openings are laterally placed, wide base of trigone, short submucosal ureter.

Bladder diverticula

Definition:

flask-shaped pouch of bladder wall (95% of patients are male).

Aetiology:

1. Congenital (rare) → true (all layers of bladder wall), solitary, above ureteric orifice, (empties urine with emptying bladder, no residual urine).
2. Acquired (common) → false (no muscle layer), often multiple, always associated with distal obstruction and trapeculation (increased pressure).
3. Nott emptying with bladder (residual urine inside).

Clinical picture:

- Usually asymptomatic, s/s of underlying disease.
- Double micturation → (filled with urine at micturation then empty to bladder → immediate desire to micturate again).

Complications:

- Rarely may obstruct ureters if large, hydronephrosis.
- Stone, infection, sq.metaplasia → sq.c.c.

Investigations:

IVU, ascending cystography, cystoscope.

Treatment:

- Treat underlying cause.
- Diverticula are not excised unless complicated.

Retroperitoneal fibrosis:

Primary (idiopathic) retroperitoneal fibrosis:

- Is of unknown aetiology but maybe drug induced, eg methysergide (used in prophylaxis of migraine).
- Patient may present acutely with anuria.

- There is increased ESR & urea & creatinine (usually increased).
- IVU shows medially pulled both ureters.
- CT shows retroperitoneal fibrous plaque (in which ther's ureters, aorta….etc).

TREATMENT:

- Release ureter from fibrous tissue (ureterlysis).

Secondary retroperitoneal fibrosis:

- Secondary to leaking aortic aneurysm.
- Secondary to diffuse infiltrating retroperitoneal malignancy.

UROLOGY INVESTIGATIONS

Semen analysis:

WHO GUIDELINES FOR NORMAL SEMEN ANALYSIS:

- Volume 2-5 ml.
- Liquefaction : 20min.
- Number of sperms : >15 million/ml (20-100)
- Morphology → 30% normal forms.
- Motility → >40% adequate forward progression.
- WBC → <10 HPF (or < 106/ml semen).
- PH → 7.2 – 7.8.

Urine examination:

1.PHYSICAL

Color: colorless.

Appearance: clear.

Specific gravity : 1010 - 1018.

Decrease in CRF / increase in concentrated urine.

2.CHEMISTRY

PH: 5.5 – 6.5 (acidic). (if alkaline urine indicate infection with proteus, kleibsella).

No protein, glucose, ketones, haemoglobin, or myoglobin.

3. MICROSCOPIC

- WBC <3 (pus cells → aspyuria), RBC.
- Cast indicate degeneration of proximal convoluted tubule (hyaline cast present in cortex, red cast in tubules).
- If there›s ovum, parasite, candida, yeast or crystals (urea, Ca + oxalate, crystine, phosphate).

4. BACTERIOLOGY

Culture in Makonky media, number of colonies 105 E-coli.

5. HORMONES

- alpha F.protein, Beta HCG.
- VMA, metabolite of catecholamine in pheochromocytoma.

Male infertility factors:

"SPERM COUNT"

- Systemic Factor / Smocking
- Psychological illness
- Endocrinopathy
- Retrograde ejaculation
- Medications
- Chronic disease
- Obstructive
- Unexplained
- Narcotics
- Testicular

URO INSTRUMENTS

URETHRAL CATHETER:

Indications:

- - urine retention (commonest).
- - pre& post op, coma, ICU, neurogenic UB, input/output.
- - installation of chemotherapy & antiseptics.

Types:

- non-self retaining (non balloon).
- self retaining (balloon):
- two way (latex, silicon)
- three way (latex, silicon)
- hematuria catheter

Two way → one way for urine drainage & other to inflate & deflate balloon (by normal saline).

Three way → as 2way +way for irrigation & installation of treatment.

Hematuria catheter → it is 3 way & silicon rubber (not latex «natural rubber») reinforced with nylon coil to resist collapse under suction.

NB:

Caliber of catheter written in French. Normally 20 (14-28), 1 French = 1/3 mm). capacity of balloon (NS) written in ml (cc).

Complications:

1. during insertion trauma & bleeding, infection.
   - while in urethra infection, stone (egg shaped)
   - when removed trauma to urethra or UB.
   - after removal stricture of urethra.

Contraindications:

- bleeding per urethra → do suprapubic.
- urethral trauma.

Insertion:

complete aseptic technique, k-y gel. Xylocain, insert slowly until urine escape inflate balloon.

SUPRAPUBIC CATHETER:

Indications :

1. Failed urethral catheter.
   - When urethral catheter is contraindicated.
   - Long term catheterization.

Insertion

1- percutaneous.

2- open surgery.

Done under complete aseptic tech/ midline/ two fingers suprapubic, UB must be full.

URETERIC CATHETER:

- 16 cm, radioopaque. Indicated as diagnostic at cystoscope (retrograde urography).

DOUBLE J. CATHETER:

35cm long, radioopaque, called «ureteric stent».

Indications:

- To pass obstruction.
- Prophylaxis with E S W L .
- Ureteric injury or tumour.

Complications:

- Displacement, increase frequency, urgency, infection, hematuria, retention.

NEPHROSTOMY TUBE

Indications:

Diagnostic (antegrade urography), measure renal pelvis pressure. **Therapeutic** (commonest) in pyonephrosis & obstruction.

URINE CONDOM

- External use in male who : unable to walk.
- Has urine retention.

URINE BAG

Collect urine & obtain output of urine.

Male infertility

Definition:

failure to conceive after one year of unprotected, properly timed intercourse. (either primary "never conceived" or 2ry "conceived before").

Incidece:

15% of all couples (1/3 male, 1/3 female, 1/3 combined problem).

Aetiology:

IDIOPATHIC:

25% of infertile males.

PRETESTICULAR (ENDOCRINAL):

eg kallman's syndrome (cong. Hypoth. Hypogonadism), excess androgens, excess estrogen.

TESTICULAR:

1. varicocele (30-40% of infertile males).
2. tumour, post infection (mumps, STDs), torsion.
3. cryptorchidism (<5%).
4. congenital → kleinfilter triad (small testis, gynecomastia, azoospermia).

POST-TESTICULAR (OBSTRUCTIVE): as Vas obstruction.

CONGENITAL:

kartageners syndrome(AR) → defective cilia.

others: retrograde ejaculation, drugs, CRF, ch.liver disease, medications (chemotherapy, anabolic steroid).

Physiology:

Testosterone is secreted 90% from Leydig cells of testis under influence of LH from anterior pituitary.

About 10% of secreted testosterone is from zona reticularis of suprarenal gland (in female100% of her testosterone from suprarenal gland).

Testis considered endocrinal (secrete testosterone hormone) and exocrinal at the same time (secrete sperm "not semen").

spermatogenesis takes about 72 days.

Diagnosis:

Good history & examination.

Investigations:

1. semen analysis (SA), at least 2 properly specimens over several weeks.
2. hormonal analysis (rare to be abnormal if normal SA), → Test, FSH, LH.
3. genetic evaluation, immunological study (antisperm Ab in ejaculate blood.
4. testicular biopsy in azospermia.
5. scrotal US (varicocele, testicular size).
6. vasography.

Treatment:

- Life style → exercise, healthy diet, sexual education.
- Eliminate alcohol, smoking, drugs.
- Treat underlying cause.

URINARY TRACT INFECTION

Definition & incidence:

- It is infection of urinary tract, more in female (close to anus, short wide urethra).

But In old male = female (BPH).

- 2nd commonest infection after URTI.

Classification:

- According to duration → acute or chronic.
- According to site → Upper UTI (Kidney), lower UTI (UB,…etc).
- According to organism → specific (TB), non specific (E-coli 85%).
- According to complications → uncomplicated (normal structure & function) & complicated UTI.
- According to process → isolated UTI (last > 6 months) . Recurrent UTI (reinfection 95% or bacterial resist).
- Unresolved UTi.

Rout of infection:

- Ascending (commonest) through urethra.
- Descending: from kidney down.
- Haematogenous (uncommon).
- Direct (Lymphatic) : eg → from appendicitis.

Organism is usually E.coli (85% of community acquired, 50% of hospital acquired).

Others → kleibsilla, proteus, staph, TB, Chlamydia.

Predisposing factors:

1. Stagnant urine → infrequent voiding, obstruction (PUV, VUR, BPH, PCK)
2. Foreign body → catheter ….etc.
3. decrease resistance DM, malignancy , steroids.
4. others congenital anomalies, fistula, female.

NB: PATHOGENESIS OF INFECTION INCLUDE :

Route of infection.

Organism.

Predisposing factors.

Clinical picture UTI:

1. storage s/s → frequency, urgency, dysuria (LUTS»lower UT»).
2. voiding s/s → hesitancy, post voiding dripppling.
3. others → suprapubic pain, hematuria, foul smelling urine.
4. Pyelonephritis → severe s/s (fever,chills,flank & costovertebral angle «CVA»tenderness)
5. Pyonephrosis → classic triad (fever, swelling & anemia).

Investigations:

- Urine R/E (high WBC ± nitrates ± hematuria), urine c/s (midstream or suprapubic).
- CBC, ESR, CRP, U/E/C.
- KUB, US, IVU, CT if indicated (MRU , CTU).

Treatment of UTI:

- good hydration, AAA (antibiotic, antipyretic, analgesic).
- The AB given I.V if acute pyelonephritis & any abscess with drainage + IV fluid >3L/d.
- drainage of pus in case of pyonephrosis (nephrostomy tube) and renal & peri-nephric abscess.
- treat the underlying cause (stone, anomalies …).
- nephrectomy may be needed if kidneyis not functioning due to pyonephrosis, chronic pyelonephritis, TB …. Etc.

Genito-urinary TB:

- Always 2ry, rare in children, usually unilateral in kidney.
- In kidney may → pyonephrosis, abcess, calcification, HTN.
- In ureter → mostly in lower ureter.
- In UB always around ureteric orifice (hydro-ureters,hyd-nehp).
- In testis & epididymis can cause ulcer at back of scrotum.

Treated by anti TB drugs, may need surgery.

Urinary stones

Incidence:

Affect 3% of people , male:female 3:1 , age 30 – 50 yrs .

Recurrence 10% , up to 60% (stone formers)

Risk factors :-

1- METABOLIC ERRORS (1RY STONES) DUE TO

- calcium stones --- hyperparathyroidism , sarcoidosis , histoplasmosis , tumor lysis syndrome , vit D intoxication
- uric acid stones --- gout , tumor lysis syndrome
- cysteine stones --- hereditary cystinuria
- xanthine stones --- hereditary xanthinuria

2- INFECTION (2RY STONES) :-

- Usually phosphate stone , more in females .
- Infection --- alkaline urine (phosphate) , acidic urine (other stones)
- And provide nucleus for stone formation .

3- LIFE STYLE

- Increase by sedentary work (Dr) , excess vit c , hot wether , dehydration , diet --- calcium stone by milk & it's products
- Oxalate by tomatoes , mango , spinach
- Urate by liver , sardines , salmon

4- MEDICATION

- Loop diuretics , acetazolamide .

5- MEDICAL CONDITIONS

--- UTI , IBD , DM , gout , obesity .

6- congenital anomalies like horse shoe kidney .

Pathogenesis (formation) :-

1. Hypersaturation of solutes .
2. Stasis & obstructions .
3. Nucleus --- (nidus)

Clinical picture :-

1. Silent (asymptomatic)
2. Pain --- flank non colicky (kidney) or sever sudden colicky (ureter) radiate to groin
3. Nausea , vomiting , hematuria +/- fever (infection)

Complication :-

1. Obstruction , migration , hematuria , infection , (malignancy if in bladder)
2. Hydroureter , hydronephrosis , acute retention , anuria .

Investigation :-

- Urine R/E , C/S , CBC , KUB (plain x ray)
- U/S , CT scan , IVU (not in acute) , cystoscope .

Treatment :-

1. Conservative:- (stone < 0.5 cm)
2. Intervention:- URS , PCL , ESWL
3. Open surgery :- only in 5%

CONSERVATIVE:

Indicated in small stone (<0.5cm) uncomplicated.

Analgesia (Voltaren) , antibiotic , increase fluid intake .

MET (medical expulsion therapy) alfa blockers (relax trigone) , ca++ channel blocker (adalat)

IV fluid if vomiting

INTERVENTION:

1- ESWL (extracorporeal shoch wave lithotripsy)

For kidney stone < 2cm or ureter <1cm / insert double J catheter before it .

Complication : hematuria , perinophric hematuria , UTI , pain , steintrasse (street) stones in ureter .

Contraindicated if : pregnancy & uncontrolled coagulopathy (absolute)

Febrile pt , large stone , single kidney , distal obstruction

2-PCNL (percut. Nephrolithotomy)

For stone kidney > 2 cm or ureter > 1 cm

Also indicated for staghorn , PUJ obst. , cysteine stone , anatomical anomalies , failed ESWL

Complication : bleeding , infection , A-V fistula , injury of colon or others , residual stone

3- endoscope :-

A- URS :- URETEROSCOPE :

For ureter stone < 1cm --- remove or laser or push to pelvis

It is 1st line with ESWL (male ESWL , female URS)

Endoscope can do --- lithotripsy , meatotomy , domia basket

B- CYSTOSCOPE & LITHOLAPAXY :-

For bladder stone < 2 cm --- crushing & lavage

4- open surgery :-

For bladder stone > 2 cm or multiple .

Also nephrectomy , partial nephroctomy , nephrolithotomy , pyelolithtomy , uretrolithotomy and cystolithotomy (UB)

	Oxalate	Phosphate	Urate	Cysteine	Xanthin
Incidence	60%	15-25%	10%	1-3%	v. rare
Chemistry	Ca-oxalate	Ca-phosphate Triple (ca-ammonia magnesium phosphate)	Uric acid	Non-essential aminoacid	Xamthine
No./size	Single/moderate	Single or multiple may large (staghorn)	Small & multiple	Small & multiple	Small & multiple
Surface	Spiky	smooth	Smooth	Smooth	Smooth
Colour	Brown or black by blood (oxalate white)	Dirty white	Yellow to brown	Yellow to green	Yellow
Consistency	Very hard	Chalky , friable	Hard	Very hard	Soft
x. ray	Radio-opaque	Opaque	Lucent	Opaque	lucent

Urology trauma

Urinary tract injury accounts for 10% of all injuries, the kidney is the most common ~ 50%.

Types of trauma:

- Blunt trauma RTA, fall.
- penetrating trauma:
  - iatrogenic.
  - gunshot.
  - stab wound.

Renal trauma:

mainly due to blunt trauma 80%

(male:female = 3:1).

Bladder trauma:

mainly due to blunt trauma 70%.

(90% associated with pelvic fracture, 50% fracture in pubic bone).

Ureteral trauma:

mainly due to iatrogenic as in Gynae operation.

Urethral trauma:

mainly due to pelvic fracture (blunt).

Clinical picture:

- **Renal inj:** pain in flanks, contusion, hematuria, shock, oliguria & urine retention (clot).
- **Bladder inj**: abdominal pain, tenderness, hematuria (90%), shock, inability to void urine, peritonitis.
- **Ureteral inj**: asymptomatic, loin pain, if bilateral anuria or oliguria.
- **Urethral inj**: urine retention, bleeding per urethra, distended bladder, high riding prostate on DRE, perineal hematoma.

Investigations:

Urine analysis (U/A) hematuria (degree not correlate with severity of injury).

U/S , CT scan, CTU, plain x-ray (KUB), IVU urine extravasation.

RUG (retrograde urethrography) for all pt with suspected urethral injury, if patient has bleeding per urethra.

Renal Trauma:

Classification:

- Grade I: contusion /hematoma.
- Grade II: <1cm cortical laceration without urine extravasation.
- Grade III: >1cm cortical laceration without urine extravasation.
- Grade IV: corticomedullary laceration with urine extravasation.
- Grade V: shattered kidney or pedicle avulsion.

(I.II.III minor) , (IV . V major).

Staging not necessary correlate with clinical picture.

Treatment:

- Microscopic hematuria + minor inj no hospitalization.

- Macroscopic hematuria + grade I,II conservative (bed rest, analgesia, antibiotic, repeat CT).

- Surgery indicated in class IV, V stitching or nephrectomy.

Complications:

HTN, perinephric abcess, hydronephrosis, nephroptosis, renal artery aneurysm, renal atrophy.

Bladder Trauma:

Classifications:

I- Contusion no urinary extravasation.

II- Extraperitoneal rupture: (80%) «commonest» , associated with anterior wall pelvic fracture & desire to micturate.

III- Intraperitoneal rupture: (20%) blow on distended UB posterior wall.

No desire to micturate.

Treatment:

- for contusion → catheter (Foley) until hematuria resolves.

- for extraperitoneal injury → non-op (Foley), may need surgery (failed conservative).

- for intraperitoneal injury → surgical repair & suprapubic catheter.

URETERAL TRAUMA:

Treatment:

Restore ureter by oblique stitching & put double for 2wk & put tube drain.

NB: commonly iatrogenic during hysterectomy or endoscope.

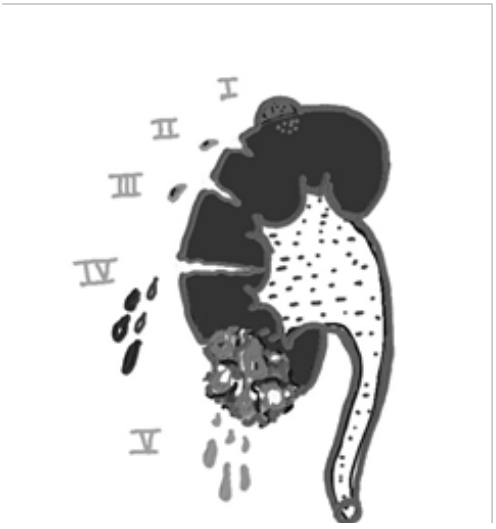
URETHRAL TRAUMA:

Classification:

posterior urethra injury: (commonest) in prosthetic & membranous.

anterior urethra injury: in bulbar or penile parts.

Mainly blunt «straddle injury».



Treatment:

Urethroplasty with end to end anastomosis, if big gap take flap.

Complication stricture.

PENILE TRAUMA:

Fracture penis:

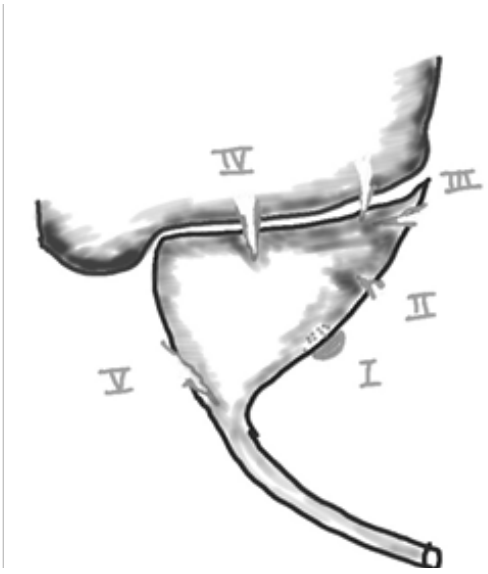
by sudden angulation of erected penis due to blunt trauma (usually vigorous sexual intercourse). It is common in 15-20 yrs.

Pain, bruises of penis. deformed shape

Evacuated hematoma and repair defect.

If patients comes late → fibrosis → impotence

Open under corona
Degloving penis
Wash clot with saline
Stitch with absorpable.



UROLOGY TUMOURS

TESTICULAR TUMOURS:

I-Primary:

GERM CELL TUMOURS (GCT):

represents 95%, all are malignant.

- Seminoma (35%).
- Non-seminoma: embryonal cell (20%), Teratoma (5%), mixed cell type (40%), chorio CA. (>1%), youlk sac (<1%).

NON-GCT: (5%), USUALLY BENIGN:

- Lydig (testosterone, precocious puberty).
- Sertoli (gynomastia, decreased lipido).

II- Secondary:

Usually lymphoma or metastasis (lung, prostate, GI).

KIDNEY TUMOURS:

I- Benign :

CYSTIC KIDNEY DISEASES:

Simple cyst (commonest), PCK (polycystic kidney disease), medullary sponge kidney, Von Hippel-Lindau syndrome.

BENIGN RENAL MASS:

Adenoma (commonest benign), angiomyolipoma (renal hamartoma), oncocytoma, others (fibroma, lipoma, angioma…etc).

II- Malignant:

- Primary: wilm's tumour, RCC, others.
- secondary: from surrounding or distant

PROSTATE TUMOURS:

- Benign: BPH "benign prostate hyperplasia".
- Malignant: primary or secondary.

URINARY BLADDER TUMOURS:

Urothelial tumours arise in collecting system (from pelvis to urethra) and they are usually multicentric with high recurrence.

I- Benign:

- Epithelial (villous papilloma "premalig", adenoma) o
- C.T (angioma).

II- Malignant:

- primary (carcinoma) or secondary.

PENILE TUMOURS:

I- Benign:

- - cyst, hemangioma, nevus, papilloma.
- - premalignant as leukoplakia, condyloma, blenitis xerotica obleterans.

II- Malignant:

SCC (>95%), BCC, melanoma, paget disease of penis (v.rare).

- NB: penile tumours are rare (<1% of cancer in USA), in 60 years.
- NB: risk factors for malignancy are: STD, phimosis, uncircumcised penis, ch.inflammatory disease.

Dx needs biopsy, spread by lymph > blood.

Treatment: wide excision +- lymphadenectomy, cryotherapy, laser.

TNM CLASS. OF CANCER PENIS:

- T1 = invade Buck's fascia
- T1a = no LN or vessel.
- T1b = Lymph or vessel.
- T2 = invade corpos spongiosum or cavernosum.
- T3 = invade urethra or prostate.
- T4 = invade other adjacent structure

BENIGN KIDNEY TUMOURS:

Simple renal cyst: usually solitary, very common (50% of above 50%), assessment by Bosniak classification.

- - PCK: AR (infantile RF, multiple bilateral) or AD (progressive RF, HTN bilateral).
- - MSK: (medullary sp. Kid) cystic dilatation of collecting duct, ↑ stone.
- -VHL: (von Hippel Lindau) multiple bilateral cysts, 50% incidence of RCC.
- - Renal adenoma : commonest benign M>F (3:1), premalignant, pea-like mass.
- - Angiomyolipoma: rare <1%, F>M , called renal hamartoma.
- - Oncocytoma: 3-7%, M>F, found also in adrenal, thyroid & parathyroid.

TESTICULAR TUMOURS

Incidence:

Rare, but most common solid malignancy in young males 15-34 yr. Represents 1-2% of male malignancy, 1-2% bilateral, (more in right).

Mostly malignant (99%), high social class.

Aetiology:

Cryptorchidism (undescended testis), atrophy, sex hormones, HIV, infertility, family history (10% of patients has history of undescended testis). Increase risk 10-40 times.

Pathology:

GERM CELL TUMOUR: (95% , ALL MALIGNANT)

- Seminoma (35%)
- Non-seminoma:
- Embryonal 20%.
- Teratoma 5%.
- Choriocarcinoma <1%.
- Yolk sac <<1%.
- Mixed cell 40%.

NON GCT: (5%, USUALLY BENIGN).

- Leydig (testosterone, precocious puberty).
- Sertoli (gynecomastia, decrease libido).

Spread:

- Direct: to epididymis, tunica, spermatic cord ..etc
- Lymph: to para-aortic LN, iliac, mediastinal LN.
- Blood: to lungs (mainly), or liver, bone, brain, kidney.

Staging:

- T1= limited to testis & epididymis , without lymphatic and vascular invasion.
- T2= limited to testis & epididymis, with lymphatic / vascular invasion.
- T3= invade spermatic cord + - lymph / vascular invasion.
- T4= invasion of scrotum + - lymph / vascular invasion.
- N1: <2cm, N2: LN 2-5cm , N3: >5cm (as RCC).
- M0: no mets, M1: distant metastasis.

OTHER STAGING:

- Stage I: limited to testis, epididymis or spermatic cord.
- Stage II: limited to retroperitoneal LN.
- Stage III: metastasis to supradiaphragmatic virchow›s.
- Stage IV: distant mets (lung).

Clinical picture:

- Painless testicular swelling with discomfort, heaviness.
- Pain 10% (He or infarction), hydrocele 10%, gynecomastia.
- S/S of metastasis (rare) → abdominal mass (LN), virchow›s LN, lung.

Investigations:

- Scrotal US (hypoechoic), tumour markers (B-hCG, LDH, AFP).
- Dx established by radical inguinal orchidectomy (needle aspiration is contraindicated,

no scrotal biopsy just inguinal).

- Trans-scrotal biopsy or orchidectomy is avoided because of different lymphatic drainage of testis (para-aortic) & scrotum (suprainguinal LN).

TUMOUR MARKERS ARE:

- Alpha fetoprotein (AFP): produced by yolk sac tumour – never elevated with seminoma.
- B-hCG: positive in 7% of pure seminoma.
- AFP & hcG +ve in 85% of non-seminoma.
- PAP (placental alkaline phosphatase): placental tumour.
- LDH: in advanced tumour size.

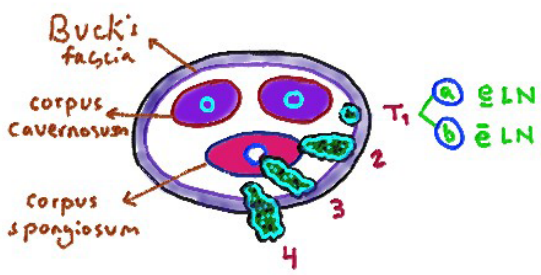
Treatment:

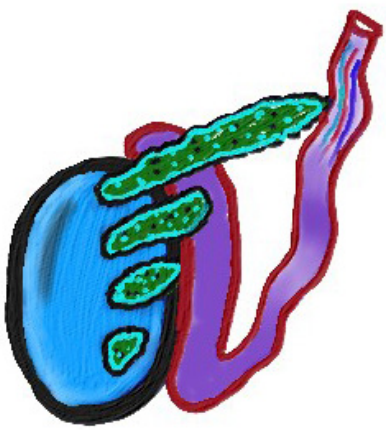
- Orchidectomy through inguinal approach for all stages. (consider sperm banking, testicular prosthesis) before ectomy freeze section biopsy can be done.
- Adjuvant therapies.
  - (Teratoma) → chemotherapy.
  - (Seminoma) → radiotherapy to para-aortic LN.

Prognosis:

- 99% cured with stage I & II.
- 70-80% complete remission with advanced disease.

Seminoma	Teratoma
• Originates from seminiferous tubule. • (30-45yr), usually unilateral. • Slow, low malignancy, radiosensitive. • Spread by lymph (para-aortic), better prognosis. • Pure seminoma NO increase in AFP, 7% has HCG.	• From embryogenic totipotent cells. • Rapid, higher malignancy, radioresistant. • Spread by blood (lung), bad prognosis. • AFP & hCG +ve in 85% of cases.





Benign prostate hyperplasia

Incidence:

About 50% of male > 50yrs has BPH (senile enlargement of prostate) SEP.

BPH is not premalignant, has low mortality & morbidity.

Aetiology: "unknown"

- Hormonal imbalance → between androgens & estrogen (aging).
- Neoplastic theory (less accepted) → BPH is benign T. (fibromyo adenoma).
- DHT required.
- Genetic: increase in 1st degree relatives and twins.
- Impaired apoptosis, estrogens & other GF.

Pathology:

MACROSCOPIC:

BPH more in median and/or lateral lobes, false capsule.

MICROSCOPIC:

hyperplasia of glands, fibrous & ms. → Stromal nodule. Mainly in transitional zone (periurethral).

Pathophysiology (effect):

Urethra: elongated , narrow, ↑ posterior curve.

Bladder: detrusor ms hypertrophy → trabeculation → herniation with diverticula → ms atony → residual urine.

Middle lobe project into UB → post. Pouch → residual urine & stone + UTI.

Compression of **prostatic venous plexus** → vesical piles→ hematuria.

Ureter & kidney; hydroureter, hydronephrosis → UTI → pyonephrosis.

Sexual organs: early ↑↑ libido, later may → impotence.

Clinical picture:

UNCOMPLICATED CASE:

- Urgency (1st symptom → first nocturia). Urgency = sudden compelling urge to urinate.
- Frequency (2nd symptom).
- Hesitency (difficult starting du to congestion by straining).
- Weak interrupted stream.
- Post-micturition strippling "detrusor failure".
- urge incontinence, overflow incontinence, dysuria.

American urologist society

AUA SCORE:

- **F**req.
- **U**rgency.
- **N**octuria.
- **W**eak stream
- **I**ntermittency.
- **S**training.
- **E**mptying incomplete feeling.
    - Each s/s grade 5
    - 0-7 mild
    - 8-19 mod
    - 20-35 severe

COMPLICATED CASES:

- acute (painful) & ch.(painless) retension.
- Retention = lack of ability to urinate.
- 2- Hematuria, cystitis, stone, CRF, impotence…etc.
- (NB: acute retention may be the first symptom).
- NB: frequency caused by ↑ incomplete emptying, bladder instability, and complications as cystitis, diverticulitis.

Investigations:

Urine analysis U/A, serum PSA .

Flowmetry (max. flow rate <15 ml/sec indicate obstruction).

- Urodynamic study is the best method but expensive & unavailable.

RADIOLOGICAL :

US → residual urine (> 100 significant), enlarged prostate, and assess kidney, bladder, hydronephrosis.

TRUS (transrectal US) → assess size & see if ho-

mogenous or heterogeneous, to take biopsy if high PSA.

IVU ⟶ kidney function, hydronephrosis, ureter… etc

Complications

Retention, infection, hydronephrosis, hematuria, stone, renal insuff.

Treatment:

A. MEDICAL TREATMENT:

For mild cases, unfit pt, who didn't complete his family.

ALPHA BLOCKERS:

e.g prazocin, omnic (selective alpha 1 blocker).

- block alpha1 adrenergic receptor → smooth muscle relax → decrease urethral compression (does not decrease size but increase flow).
- 1st line (less S/E), omnic is orthostatic hypotension.

5-ALPHA REDUCTASE INHIBITOR: (PROSCAR = FENASTERIDE).

- It inhibit conversion of testosterone to DHT "dihydrotestosterone".
- So decrease size by 30%, improve s/s.
- proscar S/E → decrease libido , decrease ejaculatory volume, impotence.

NB:

If BPH epithelial element give proscar. If stromal element give omnic.

C)- SURGICAL TREATMENT:

Indicated in:

- Acute & chronic retention;
- Severe UTI & obstructive s/s;
- Bladder stone, diverticulae.

CLOSED SURGERY (ENDOSCOPIC).

- a)- TURP (transurethral resection of prostate).
- b)- TULP (transurethral laser ablation of prostate).
- c)- Transurethral heat vaporization, balloon, stent ↑not done.

NB:

- TURP↑ done by using cysto-resectoscope, send to histopathology, limited use if very large adenoma, making the procedure long & hazardous. TULP ↑ has less bleeding, but no biopsy, high cost, long time catheter, prolonged irritaive s/s).

OPEN SURGERY (PROSTATECTOMY).

Used if large gland (>80g), if associated with bladder stone, diverticulae (normal weight of gland 7-15g).

- **transvesical prostatectomy** → done if associated with bladder pathology.
- **retropubic (Millin's) prostectomy** → via retropubic space(cave of retzius).

COMPLICATIONS OF PROSTATECTOMY:

1. bleeding (main problem), clot retention may occur.
2. retrograde ejaculation (>90% of cases) due to int. sphincter damage.
3. infection (UTI), bladder neck stricture, urethral stricture.
4. impotence (2-5%) due to pudendal nerve injury.
5. incontinence (1 in 1000) by sphincter damage.
6. **TURP syndrome**: occur in TURP due to over absorption of irrigating hypotonic fluid used during endoscopy, characterized by hypovolemia, dilutional hyponatremia &interavascular hemolysis.

   Use glycine (isotonic) for irrigation to avoid TURP syndrome (but if procedure lasts >2hrs also glycine absorbed).
7. CV and respiratory problems, death in 0.2 – 0.5%.

Biopsy taken by TURP, TRUS, or transperitoneal if abnormality in urethra and rectum.

	Urinary bladder carcinoma.	Prostate cancer "Man-killer".
Incidence	50 to 70 years. M > F (3:1). Second most common cancer in UT.	>60yrs. Risk of developing histologic CA. is 70% in 80yrs. - First common malignancy in male & second commonest cause of death from cancer. (3rd commenst death → Toronto).
Aetiology	1- Smoking (strongest) 4 → times increase in risk. 2- Aromatic amines, naphthylamines, benzidine, tryptophan. 20% occupational → Dye worker, painter, & Tyre worker. 3- schistosoma hematobium, Bilharzia. 4- Chronic irritation by cystitis, stones, catheterization. 5- Villous papilloma, diverticulae. NB: 3,4 causes Sq.C.C).	1-Age (strongest). 2- Race: higher in north America, Europe.(lower in china, Japanese due to vit-A ⍰ protective in asian food). 3- Diet: high fat diet & red meat. 4- Genetic: in 9% (increase risk 2-3 times in 1st degree relative). 5- Environmental exposure to cadmium, radiation, & U/V. Ca.prostate does not occur in castrated people
Pathology	**Macro**: - Mainly at base (trigone) in TCC (but in sq.cc common in inferolateral wall). - Fungating, Ulcerative, lump, papillary. **Micro**: -90% TCC "transitional cell ca -8% sq.c.c , 2% others. **Spread**: Direct: to adjacent. Lymph: int. & ext. iliac LN then para-aortic LN. Blood: (v.late) to lung, L.BB. - implantation in scar. **Staging & grading:** Grade I: well diff (10% invasive). Grade II: moderate diff (50% invasive). Grade III: poorly diff (80% invasive). Grading is the single most important prognostic factor for progression. 1. Non ms invasive: (super f). 75% (5y survival > 80%). 2. invasive ca.: 25% (5y 50% ⍰). 3. CA in situ.	Macro: - Mainly in peripheral zone, more in posterior lobe. - hard irregular nodule with area of H&N. Micro: - 95% adenocarcinoma. 5% others (TCC 85%, neuroendocrine 15%). Spread: Direct: to adjacent structures Lymph: hypogastric LN ⍰ iliac LN ⍰ para-aortic LN. Blood: 90% to bone (lumbar vertebra) osteoblastic. Staging & grading: Grade I: well differentiated. Grade II: moderate diff. Grade III: poorly diff. Grade IV: undifferentiated. Gleason grading: GI= 2-4 GII= 5-7 GIII= 8-10 Acc. To gland. Diff & growth pattern. PIT= prostatic intraepith. Newoplasm Signs of cancer without basement membrane destruction

	Urinary bladder carcinoma.	Prostate cancer "Man-killer".
pathology	**NM staging:** Ta= non.invasive papillary ca. T1= involves basement memb. (submucosa). T2= half musculosa. T3= whole musculosa. T4= outside : T4a = pericystic fat. T4b = adjacent organ. N1= <2cm. N2= 2-5cm. N3 = > 5cm. M0 = no mets. M1 = metastasis.	**TNM staging:** T1= impalpable T1a= <5% of tissue of TURP. T1b= >5% of tissue of TURP. T1c= Dx by needle biopsy (TPSA). T2= palpable (regular). T3= locally extensive (seminal vesicle, capsule). T4= fixed to organ as rectum. N1= <2cm N2= 2-5cm N3 = >5cm M0 = no mets. M1 = metastasis.
clinical picture	• 90% hematuria (painless, total, gross). • 50% pain. • 17% retention. • Asymptomatic in 20% incidental. • hydronephrosis, Uremia. • can mimic (LUTS) urgency, frequency, dysuria, weak stream. • - palpable mass on bimaural exam (ms invasion).	• usually asymptomatic discovered on TURP, DRE, high PSA. • S/S of urine obstruction retention, incontinence , hematuria, hemospermia. • S/S of mets : low back pain, LL edema (due to iliac vein invation). • Renal failure, weight loss, paraplegia. • tenesmus: due to rectal invasion. • frequency, urgency.
Investigation	1- cystoscope investigation of choice, biopsy. 2- US, CT, or IUV. 3- U/A , Urine C/S, Urine cytology . 4- Tumour marker (NMP-2L , BTA , immunocyt. FDP)	1- **TRUS** (trans rectal US) best with TRUS gueded biopsy 8-12 2- US, CT, CBC, U/E/E, bone scan. **3- Tumour marker:** PSA= prostate specific Ag. PAP= pros.acid phosphatase PCA3=(in urine) very expensive, not popular. ALP= high in bone mets.

	Urinary bladder carcinoma.	Prostate cancer "Man-killer".
Treatment	**Tis**: 1- TURBT (transurethral resection of bladder tumour). 2- Cystoscopy & follow up. 3- local installation of chemotherapy intravesical as BCG (decrease recurrence & progression). **Ta**: 1- TURBT. 2- Cystoscopy program. Every 3m for 2 yr. Every 6m for 2yr. Every 12m for 2 yr. **T2**: 1- TURBT. 2- Cystoscopy program. 3- radical resection gold standard. **T3**: 1- surgery if no mets by Partial cystectomy or Radical cystectomy with urinary diversion. 2- radiotherapy if no mets. 3- chemo therapy if no mets. **T4**: Palliative radio, chemotherapy (cisplatin). 5yr survival for:T1 90% , T255% ,T3 20% ,T4 5%>	**T1 + T2 cancer:** - radical prostatectomy (prostate, S.V, No LN) Complications include incontinence, impotence. -radiotherapy (brash radio) radioactive seeds implantation. complications rectal ulceration. - high intensity focused US (HIFU) for unfit pt. - Watchfull waiting (no treatment) old & unfit. **T3 + T4:** - for T3 hormonal treatment to decrease testosterone. LHRH agonist zoladex. Bilateral orchidectomy. for T4 radiotherapy + hormonal. **Metastatic :** Chemotherapy (docetoxil + prednisolone " Texotene", metoxantone) - give zolduronic acid "zometan" Preserve Ca++ inside bone if early bone mets. To prevent pathological fracture. 10 yr survival: T1+T2= as normal life , T3 +T4 = 40-70%.

NB:

PSA (N= 0-4ng) (4-10 gray zone) high in:

1- Prostate cancer (>10ng). 2- DRE. 3- BPH. 4- Prostatitis. 5- Cystoscope. 6- Catheter

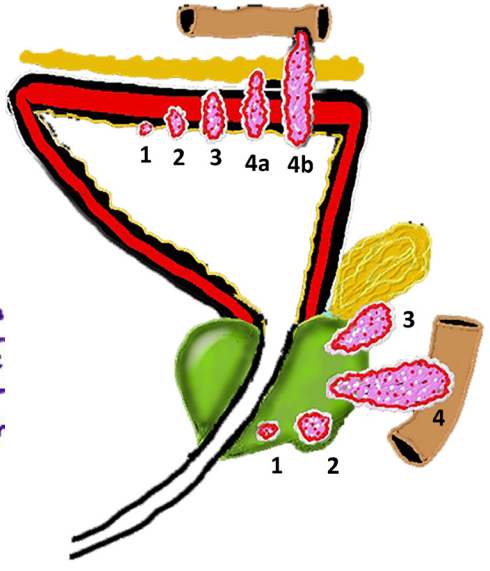
NB: TYPES OF PSA ANALYSIS;

1. PSA density = prostate mass/ PSA
2. PSA velocity.
3. PSA ratio = free/total .

If =<20 maybe malignant <10 cancer

If > 20 benign

PSA produced by prostatic epithelial cells to liquefy ejaculate. If PSA 4-10ng give Ab course, then repeat PSA.



N_1 = node <2

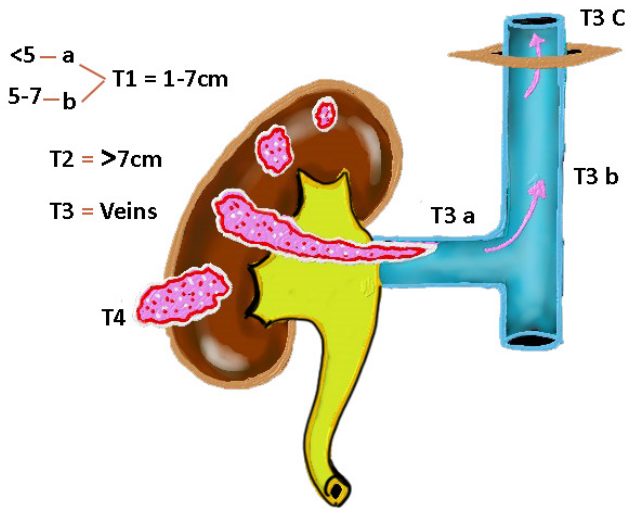
N_2 = 2–5 cm

or multiple <2 cm

N_3 = >5 cm

	WILM'S Tumour	RCC renal cell carcino-ma
Incidence	2-5 yrs M = F - 10% of childhood malignancy - 10% are bilateral - 90% of UT malignancy - 90% < 7 yrs - 90% has hematuria - 90% long life survival	- 50-60 yrs M>F (3:1) - 3% of adult malignancy (8th most common) - 1% bilateral - 3 other names hypernephroma , adeno ca , grawit'z tumour - 4% synchronous , 4% multiple at same kidney
Aetiology	1- hereditary in 30 % of pt 2- association in "WAGR" syndrome (wilm's , Aniridia , GU malformation , MR) associated with ch. 11 abnormality 3- ass. With beckwith – wiedmann syndrome or denys. Drash synd.	1- Top 3 risk factors are :(smoking , obesity , & HTN) 2- von – hipple landau (VHL) disease (AD, ch. 3 mutations), hepatopathy (stuffer syndrome) hereditary papillary cell ca. 3- adenoma 10% , PCK , horse shape kidney stag-horn , renal dialysis , age .
pathology	**Macroscopic** : Mainly in upper pole . c/s : area of he & necrosis , no capsule **Microscopic** : Mixed tumour (epith. & C.T) arise from embryonic tissue **Spread :** Direct : to adjacent structures Blood : to lung (canon ball) Lymph : (less common) to paraaortic LN. **Staging :** Stage I : limited to kidney (complete resection) Stage II : extended beyond kidney (but complete resection) Stage III : extend to abdomen (residual tumor) Stage IV : distant metastasis Stage V : bilateral tumour .	**Macroscopic** : Mainly in upper pole . **- c/s** : yellowish with area of hg & necrosis & fibrosis **Microscopic** - adenocarcinaoma , highly vascular . arise from PCT (proximal conv. Tubule). - direct spread : to adjacent structure - lymph: to paraaortic LN & virchow's LN - blood : to lung (canon ball) or L.B.B stage I : confined to kidney II : confined to gerotes's fascia III : involves renal vein +/- LN IV : metastasis (L.L.B.B) **TNM staging :** T1 = tumour < 7 cm , T1a = < 4 cm T1b = 4-7 cm T2 = > 7 cm limited to kidney T3 extended to major veins , T3a renal V , T3b = IVC infradiaph. , T3c = IVC supra-diaph. N1 = node < 2 cm N2 = 2-5 cm or multiple <2 N3 = > 5cm M0 . no mets M1= sidtant metastasis

	WILM'S Tumour	RCC renal cell carcino-ma
Clinical pic	- 90% presented with abdominal mass - 60% with HTN (renin) - 50% with pyrexia - Others : pain , hematuria , vomiting , wt loss , aniridia (1%) - s/s of metastasis : (pulmonary) - D/D : hydronephrosis , PCK , RCC , neuroblasto-ma (most common cancer in infant)	50% - hematuria (gross , painless, total) 40% - renal pain (capsule stretch , clot) 30% - renal mass (irregular , hard) (poor prognosis = wt loss , anemia , asthenia , bone pain) Non-typical: HTN , 2ry varicocele , night sweat Paraneoplastic syndrome : (PTH – like or due to bone mets) amyloidosis polycy-themia (erythropiotin) stuffers syndrome .
investigationn	- U/S , CT. - IVU, laboratory invest.	- U/S, CT, MRI (for vascular invation). - FNA to confirm. - U/A , U/E/C, CBC, LFT.
Treatment	Nephrectomy, followed by radiotherapy. - Partial nephrectomy if it is a bilateral disease. - Palliative treatment if unopearable	- Radical nephrectomy (kidney, adrenal, fat & LN). - Renal sparing surgery partial nephrectomy for < 4cm tumour, solitary kidney and bilateral disease. - immunotherapy : interferon alpha/ interleukin2. - For unfit patient embolization of renal artery (auto-nephrectomy), palliative radiation for bone mets.
Prognosis	- staging is the most important prognostic factor. -5% survival rate is 60%.	90% long-term survival. less good prognosis if older children. progno-sis



Urinary retention

Definition:

- Inability to pass urine (urinary incontinence = inability to control urine).
- Common in old male (BPH common cause).
- In young male commonest cause is acute prostatitis.

Aetiology:

LOACL CAUSES:

- Urethral obstruction.
- - Prostatic BPH, Cancer.
- - Urinary bladder Stone, Cancer, Neurogenic bladder.

GENERAL CAUSES:

- Spinal cord injury, coma, post operative (spinal anesthesia).
- Drugs anticholinergic, opiates, antidepressants and amphetamines.

Types:

ACUTE RETENTION:

(medical emergency) severe suprapubic pain, sudden anuria.

O/E: urinary bladder is palpable & tender / Normal bladder volume.

CHRONIC RETENTION:

gradual, maybe asymptomatic.

O/E

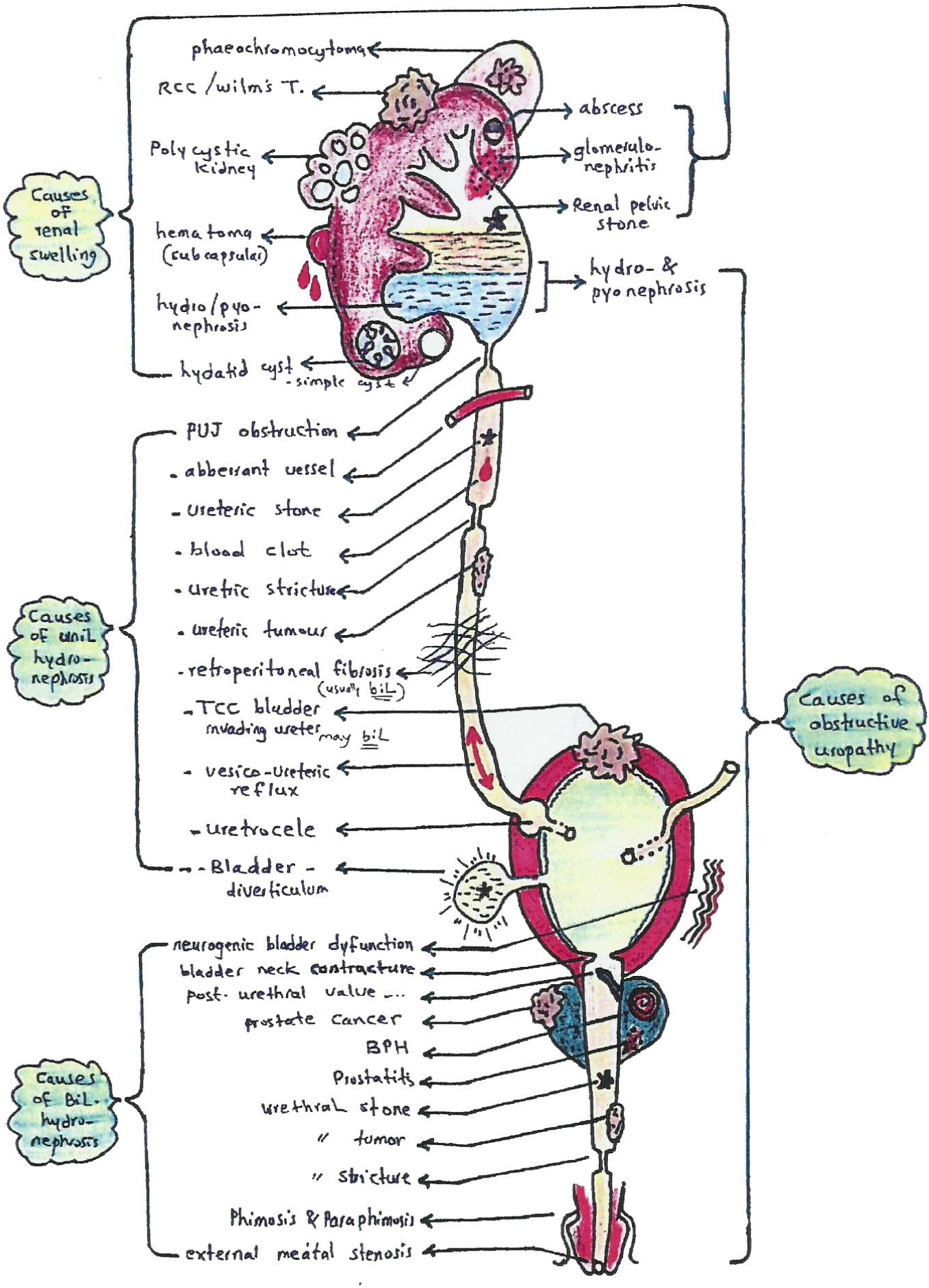
UB is palpable, increased UB volume and detrusor hypertrophy followed by atony (late).

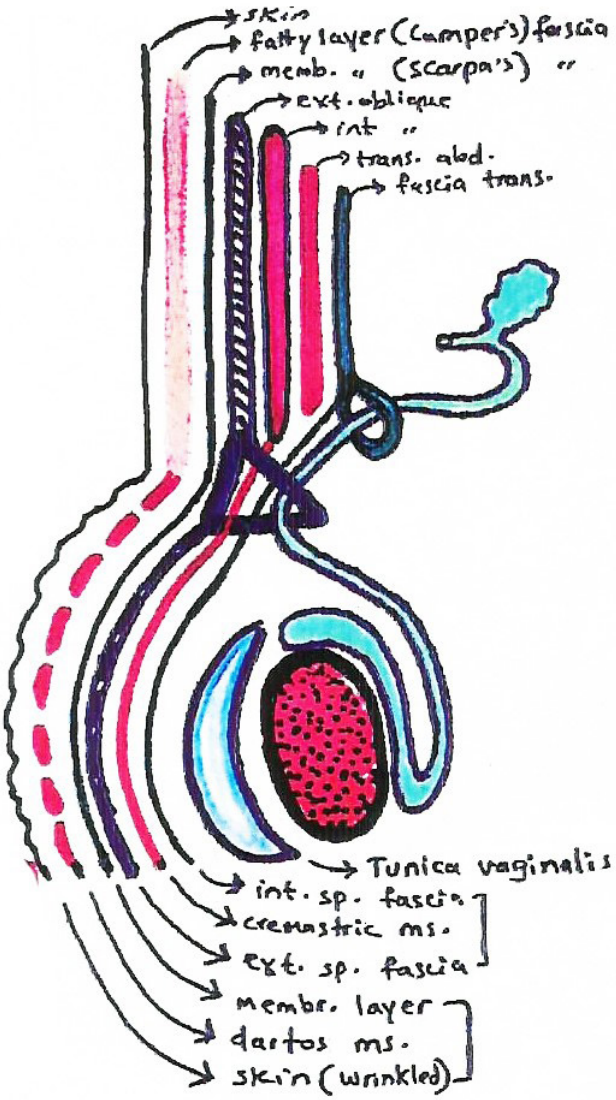
Investigations:

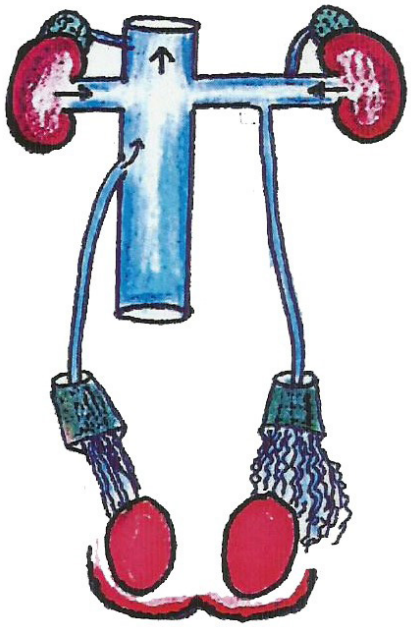
- CBC, Electrolytes, (U/E/C), U/A & Urine C/S.
- KUB, US, Uroflowmetry .
- Uroflowmetry maximum flow rate :
- Male: 13-15 ml/sec.
- Female: 17-20 ml/sec. (cystoscope)

Treatment:

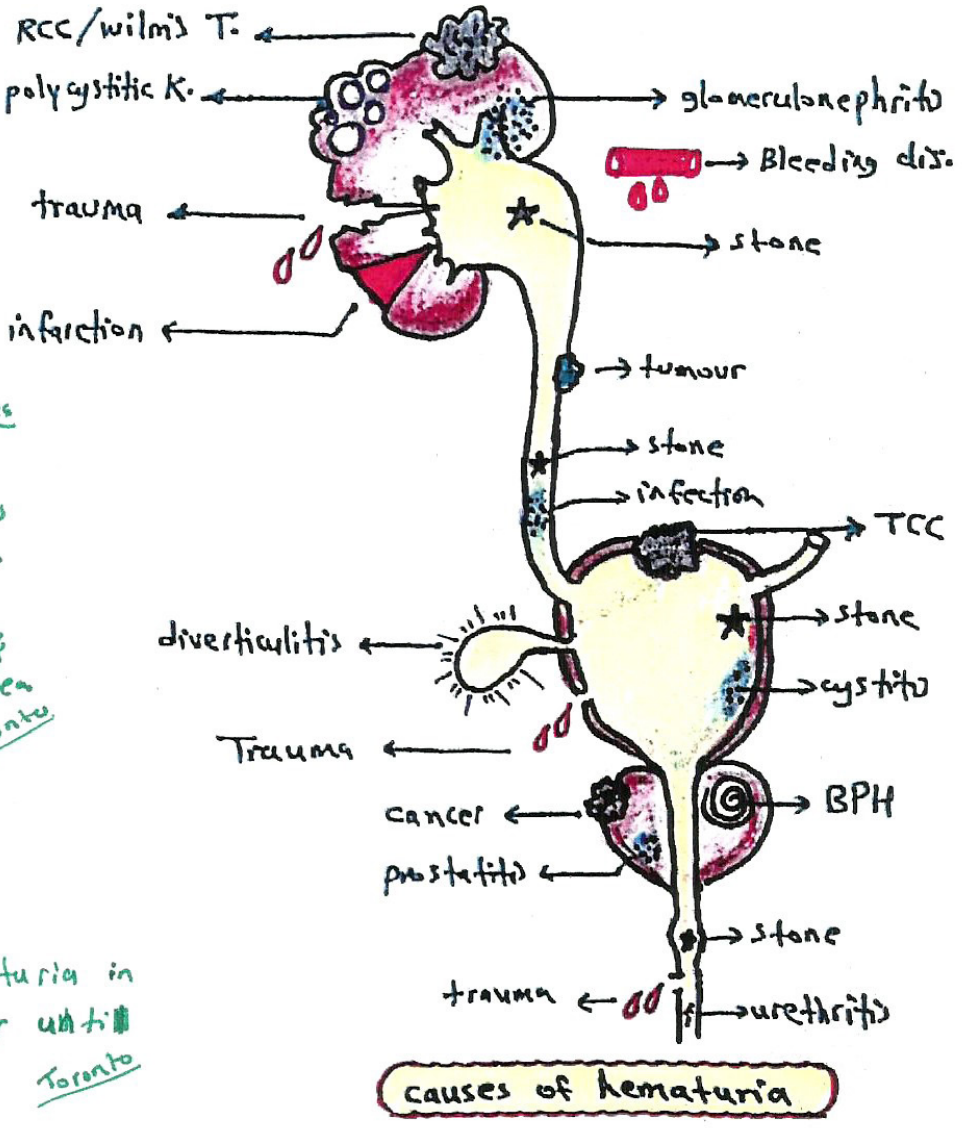
- Catheterization.
- Treat underlying cause.


Causes of renal swelling
phaeochromocytoma
RCC / wilm's T.
Poly cystic kidney
hematoma (subcapsular)
hydro/pyo-nephrosis
hydatid cyst - simple cyst
abscess
glomerulo-nephritis
Renal pelvic stone
hydro- & pyo nephrosis
Causes of uniL hydro-nephrosis
PUJ obstruction
- abberrant vessel
- ureteric stone
- blood clot
- uretric stricture
- ureteric tumour
- retroperitoneal fibrosis (usually biL)
- TCC bladder invading ureter may biL
- vesico-ureteric reflux
- uretrocele
- Bladder - diverticulum
Causes of obstructive uropathy
Causes of BiL. hydro-nephrosis
neurogenic bladder dysfunction
bladder neck contracture
post. urethral value ...
prostate cancer
BPH
Prostatitis
urethral stone
" tumor
" stricture
Phimosis & Paraphimosis
external meatal stenosis


skin
fatty layer (Camper's) fascia
memb. " (Scarpa's) "
ext. oblique
int "
trans. abd.
fascia trans.
Tunica vaginalis
int. sp. fascia
cremastric ms.
ext. sp. fascia
membr. layer
dartos ms.
skin (wrinkled)



Haematuria



Common urological causes

TICS

Trauma / Tumour / Toxins
Infection / inflamm.
Calculi / cysts.
Surgery / sickle cell & other bd dises

Toronto

Gross painless hematuria in adult is UB cancer until proven otherwis.

Toronto