Notes on Urology

There are four main clinical presentations to know about for finals:
1. Haematuria
2. Acute retention of urine
3. Scrotal swelling
4. Renal colic

Haematuria

History
- When did it start
- How much blood and how frequently
- What colour/consistency/any clots?
- Mixed in with urine or separate. Timing: beginning, middle or end of urination
- Painful or painless
- On anticoagulants (warfarin/aspirin etc)
- Known coagulopathies/clotting disorders
- Do they eat a lot of beetroot? On Rifampicin? (both colour urine red)
- Associated symptoms of anaemia (SOB/lethargy/dizziness)
- As haematuria is often associated with cancer you need to ask about weight loss/loss of appetite/lethargy/night sweats/family history
- Employment history (dye/rubber industry)
- Smoking & alcohol
- Foreign travel (renal TB/schistosomiasis)

Examination
- Signs of bleeding from any other site
- Cachectic?
- Signs of anaemia: koilonychia/pallor/pale conjunctiva
- Abdominal examination: bladder palpable?

Causes of haematuria

Pre-renal: anticoagulants
coagulopathies/clotting disorders

Renal: glomerulonephritis
acute tubular necrosis
renal cancer (renal cell carcinoma)
stones

Ureter: stones
tumour

Bladder: cancer (TCC most common)
cystitis
schistosomiasis

Prostate: cancer

Urethra: trauma (eg. from pulling out catheter)
stones
infection
Investigations
All haematuria should be investigated. There are fast-track haematuria clinics for non-urgent cases, but if the patient is bleeding excessively or haemodynamically unstable they need to be admitted to hospital.

Bedside tests: BP, heart rate, oxygen sats, respiratory rate
Urine sample for dipstick and MSU for culture & sensitivity

Basic: Bloods – FBC, U+Es, Group & Save, CRP, Coag, INR

Radiological: Intravenous urogram (IVU) looking for obstruction
Pelvic Ultrasound scan looking for tumours/hydronephrosis

Special: Cystoscopy +/- biopsies
CT for staging if cancer suspected

Management options
1. Catheterisation: if they are passing clots it may be necessary to perform bladder washouts or irrigation to prevent clot retention
2. Blood transfusion if Hb low
3. Management thereafter depends on the cause of the haematuria
Bladder cancer

Transitional cell carcinoma (TCC) most common type in the West

Risk Factors:
- Smoking
- Employment in rubber/dye industry
- Chronic cystitis
- Schistosomiasis (associated with squamous cell carcinoma)
- 4 times more common in males than females

Presentation
- Painless macroscopic haematuria
- Recurrent UTIs
- Irritative urinary symptoms (frequency, dysuria)

Investigation
- Urine: microscopy & cytology
- IVU: may show filling defect and ureteric involvement
- Cystoscopy with biopsy is diagnostic
- CT/MRI for staging

Staging
- Grade 1 to Grade 3 (grade 3 = poorly differentiated = worst)

TNM staging:
- Ta – confined to epithelium
- T1 - lamina propria
- T2 – superficial muscle involvement
- T3 - deep muscle involvement
- T4 – invasion beyond bladder

Management
- Ta to T1 (80% of all patients): cystoscopy with diathermy. Intravesical chemotherapy (Mitomycin C inserted into bladder to prevent tumour progression)
- T2-T3: Radical cystectomy (with ileal conduit or “urostomy”)
- T4: palliative chemo/radiotherapy

All patients need follow up with regular cystoscopies
Acute retention of urine

History
- Onset: sudden/gradual
- Preceding symptoms of obstruction: hesitancy, poor stream, terminal dribbling
- Neurological symptoms: limb weakness/back pain/loss of sensation
- Constipation
- Alcohol
- Drugs (anticholinergics / anaesthetics)
- Recent surgery

Examination
- Palpable bladder; Dull to percussion
- PR in males: size and consistency of prostate gland. If hard & irregular ‘craggy’ likely to be malignant
- Neurological exam including perianal sensation: especially in females as acute retention can be presenting symptom of Multiple Sclerosis

Investigation
Bedside: Bladder scan, MSU & dipstick (once catheterised)

Blood: PSA, FBC, U+E, CRP, LFTs, Bone

Radiological: IVU, renal ultrasound, Trans-rectal ultrasound (TRUS) +/- biopsy

Management
1. Catheterise!! Record residual volume. If <1000mls it’s likely to be acute retention. If >1000mls likely to be acute on chronic retention. Monitor urine output for diuresis.

2. IV fluids. Replace with 50% of the volume of the urine output

3. If neuro symptoms/signs of spinal cord compression they need urgent MRI scan and neurologist review

4. Trial without catheter (TWOC) after 7 days. If this fails, catheterise with long-term catheter and arrange outpatient follow-up.

5. If prostate feels smooth and enlarged, likely diagnosis is BPH (benign prostatic hyperplasia) Should be started on alpha-blocker (eg. Tamsulosin) or anti-androgen (eg. Finasteride) or both. Alpha-blockers relax smooth muscle in BPH, producing an increase in urinary flow rate. Finasteride is a 5-alpha reductase inhibitor which inhibits testosterone metabolism, leading to a reduction in prostate size- may take several months to work.

6. If these medications fail, the patient could be considered for TURP (transurethral resection of the prostate) where a camera is passed through the urethra and the prostate gland is ‘chipped away’ to create a larger passage for urine flow.
Patients need to be made aware of the complications of TURP:

- Haematuria
- Haematospermia
- Retrograde ejaculation (common)
- Infection / prostatitis
- Impotence ~10%
- Incontinence <10%
- Post TURP syndrome – the bladder is washed out with hypotonic fluid and occasionally results in dilutional hyponatraemia. This can cause fluid overload and cerebral oedema so U&Es must be monitored closely

If the prostate feels malignant they will need TRUS and biopsy.
# Prostate cancer

Second commonest malignancy in men.
Most commonly metastasises to lymph nodes and bone.

**Presentation**
May be asymptomatic
Obstructive urinary symptoms
Haematuria
Weight loss/anorexia/night sweats/anaemia/bone pain

**Investigations**
Bloods: FBC, U&Es, LFTs, Bone chemistry, PSA
Imaging: Transrectal USS and biopsy.
Bone scan and CXR looking for metastases
MRI or CT thorax /abdo /pelvis for staging

**Staging**
Gleason scoring system is used to grade the tumour:
Two separate areas of tumour specimen are analysed histologically and graded 1 to 5 (5 being the highest grade with poorest prognosis). Score is then added together to give total score (eg. Gleason 3+4)

Staged using TNM system

**Treatment**
1. Watchful waiting (conservative management)
2. Radiotherapy combined with hormonal therapy
3. Brachytherapy (insertion of iodine seeds for low-grade tumours)
4. Medical: Anti-androgen (GNRH Agonists) eg. Goserelin (Zoladex(R)) inhibits pituitary gonadotrophin production leading to a fall in androgen levels and therefore reducing tumour growth. Given as injections every 12 weeks.
5. Surgical: Radical prostatectomy. Under GA, whole prostate gland and seminal vesicles are removed +/- pelvic lymph node dissection. Usually offered to men under 70 with localised prostate cancer and few co-morbidities. Carries usual surgical risks of bleeding & infection. Impotence and urinary incontinence are common but usually resolve over time.
6. Symptomatic /palliative

**Prognosis:** variable - 10% die in 6 months, but 10% live > 10 years
Scrotal swelling

History
- Onset: when did it start? Sudden/gradual
- How long has it been swollen?
- Progression: getting bigger?
- Site: one testicle/both
- Painful/painless: do they have abdo pain?
- Associated dysuria/discharge/frequency/haematuria
- Family history of testicular cancer

Examination
Inspection: Site, size, colour, discharge from penis
Palpation: size, consistency, separate from testicle or attached, hard or fluctuant, temperature, tethering, transillumination

4 questions to ask:
1. Can I get above it? If not it is likely to be an inguino-scoral hernia
2. Is it separate from testicle or not?
3. Is it cystic or solid?
4. Does it transilluminate?

Common causes and how to differentiate them:
- **Testicular Torsion**
  - SURGICAL EMERGENCY!
  - Can occur at any age but most common aged 11-30.
  - Sudden onset of pain in one testis. Uncomfortable to walk. Associated with abdominal pain, nausea & vomiting.
  - On examination: one testis tender, hot & swollen. Testis may lie high and transversely. Exquisite pain on lifting the testicle.
  - If you have any suspicion that this could be torsion, call the on call urology SpR immediately and with the patient’s consent they will be taken for surgical exploration without any investigations.
  - If not diagnosed and treated within 4 hours of onset, testis will not be salvageable

- **Hydrocele**
  - Fluid within the tunica vaginalis. May be primary (often presenting within 1st year of life) or secondary (to testicular tumour/trauma/infection). If presenting in adults it is important to aspirate the fluid to examine the testicles. If they feel abnormal, the patient needs a testicular ultrasound scan.

- **Epididymo-orchitis**
  - Very tender, swollen, hot & erythematous testicle
  - Insidious onset over a few days
  - Often associated with dysuria/urethral discharge

  Causes - *Chlamydia, E.Coli, mumps, gonorrhoea, TB*

  Investigation – MSU/urine dipstick
  - Consider GUM screen
  - FBC, U&Es, CRP
Management; Usually 2 weeks Ciprofloxacin
If caused by Chlamydia can give Doxycycline
Appropriate analgesia
May need outpatient testicular ultrasound
(tumours can present as infection)

- Testicular cancer
  Commonest malignancy in males aged 15-44. Usually presents as a testicular lump. Most common are germ cell tumours:

<table>
<thead>
<tr>
<th></th>
<th>Germ Cell</th>
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<tbody>
<tr>
<td><strong>Type</strong></td>
<td><strong>Seminoma</strong> (30-65yrs)</td>
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<tr>
<td></td>
<td><strong>Teratoma</strong> (20-30yrs)</td>
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<tr>
<td><strong>Seminiferous tubules</strong></td>
<td>All 3 germ cell layers</td>
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<tr>
<td><strong>Metastasis</strong></td>
<td>To para-aortic lymphnodes</td>
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<td></td>
<td>Aggressive</td>
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<td><strong>Investigations</strong></td>
<td>Fetal Alkaline Phosphatase</td>
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<td></td>
<td>Beta-HCG</td>
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<td></td>
<td>Alpha fetoprotein</td>
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<td><strong>Staging</strong></td>
<td>CXR, CT, excision biopsy</td>
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<tr>
<td><strong>Management</strong></td>
<td>Surgery: orchidectomy</td>
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<td></td>
<td><strong>Seminomas</strong> respond to radiotherapy</td>
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<td></td>
<td><strong>Teratomas</strong> respond to chemotherapy</td>
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<td><strong>Prognosis</strong></td>
<td>Good. 5 year survival &gt;90% in all groups</td>
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Renal Colic

Renal stones consist of crystals that form in the collecting ducts and may be deposited anywhere between renal pelvis and urethra. 75% are made up of calcium oxalate.

History

- Presents as abdominal pain
- Site – usually right/left flank radiating to groin (‘loin to groin’)
- Onset – sudden
- Character – colicky pain
- Severity – usually worst pain ever 10/10
- Timing – comes and goes
- No exacerbating/relieving factors. Usually cannot lie still
- Often associated with vomiting due to severe pain
- Ask about dysuria/ haematuria/ urine flow
- Pyrexia/ rigors (can be associated with pyelonephritis)
- Bowel symptoms – to rule out other causes of acute abdomen
- Risk factors for abdominal aortic aneurism? This can present in similar way, is a surgical emergency and must not be missed!!
- Risk factors
  - diet (chocolate, tea, rhubarb & spinach increase oxalate)
  - employment (Can they drink freely at work? Are they dehydrated?)
  - drugs (loop & thiazide diuretics, antacids, aspirin, allopurinol, vit C&D, corticosteroids, theophylline)
  - recurrent UTIs
  - metabolic abnormalities (hypercalcaemia/ addisons/ cushings/ hyperparathyroidism)
  - congenital urinary tract abnormalities
  - family history (increases risk x 3-fold)

Investigations

Bedside: temp (infection?), HR, BP, RR, SpO2 sats
MSU and urine dipstick (usually +ve for blood)
Can also do 24hr urine collection looking for stone biochemistry (calcium/oxalate/urate etc)
Urine can be sieved to see if stone passes spontaneously

Blood: FBC, U+Es, CRP, Ca$^{2+}$, PO$_3^{-}$, glucose, bicarbonate, urate

Imaging: KUB (x-ray kidneys,ureter,bladder) looking for calcification
90% of renal stones are radio-opaque (visible on x-ray)
IVU (intravenous urogram) looks for renal tract obstruction
US abdo/pelvis: looks for hydronephrosis/hydroureter
helps exclude abdominal aortic aneurism

CT-KUB can be useful to give better views of renal tract
Management:

- Analgesia – preferably NSAID (eg diclofenac suppository or IM injection). May require opiates if not settling.
- IV fluids if vomiting
- Antibiotics if evidence of infection – Gentamicin gives good broad-spectrum cover. Ciprofloxacin/ Cefuroxime can also be used
- If evidence of obstruction – seek help from urology SpR on call. Delay may lead to infection & permanent loss of renal function.
- Can be managed conservatively; if <5mm encourage lots of oral fluids and sieve the urine. In 90% of cases the stone passes spontaneously within 48 hours.
- If pain persists and stone does not pass spontaneously, options include:
  1. **ESWL** (extracorporeal shock wave lithotripsy) using ultrasonic waves to break up the stone, usually for stones <2cm diameter
  2. **Percutaneous nephrostomy** (antegrade stent), under radiological guidance, can relieve obstruction. Retrograde stents can be inserted via ureteroscopy and often the stone can be removed via this route.
  3. **PCNL** (percutaneous nephrolithotomy) reserved for larger stones within the kidney. Involves general anaesthetic and keyhole techniques.

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Please Note

These notes were written by Jane Richardson, as an F1 doctor in 2008. They are presented in good faith and every effort has been taken to ensure their accuracy. Nevertheless, medical practice changes over time and it is always important to check the information with your clinical teachers and with other reliable sources. Disclaimer: no responsibility can be taken by either the author or publisher for any loss, damage or injury occasioned to any person acting or refraining from action as a result of this information.