Haematuria

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Introduction
Haematuria is a common call junior doctors are asked to assess on the wards. Management and appropriate follow up of haematuria are considered in this podcast. Macroscopic haematuria is blood in the urine which is visible to the naked eye, whereas microscopic haematuria is blood identified on dipstick analysis.

Case – You are a junior doctor working on the wards and you’re asked to review a 72 year old male who has an indwelling catheter (IDC) in. The nurse has now noticed that the urine is blood-stained.

1. What is your initial approach?
   - This is a common call and common problem on the wards. In older patients haematuria can happen spontaneously
   - Haematuria should always be taken seriously as there may be an underlying malignancy. Malignancy needs to be excluded in all patients with haematuria (unless they are very young). Anyone over 35 years old should have full investigations for any haematuria episode, and younger patients if there are concerning features
   - When assessing a patient with frank haematuria you need to determine if the patient is in clot retention (blood clot blocking the outflow of the bladder)

2. How do you determine whether the haematuria is from an underlying kidney problem or lower urinary tract issue?
   - On the wards, it is best to think about whether the problem needs to be fixed immediately
   - Questions to ask yourself include:
     - Is the patient in urinary retention and do they need a catheter?
     - Does the patient have a urinary tract infection (UTI) and is this causing the haematuria?
     - Does the patient have a urethral injury from a recent catherisation?
     - Is the patient in clot retention?
     - Does the patient have another pathology that needs investigating in hospital or out of hospital?
   - Consider common and uncommon causes, and how likely you think any of them might be present:
     - E. Coli UTI is a cause of about 13% of haematuria episodes
     - Less common causes – bladder cancer, kidney cancer, kidney disease, stone disease, prostate cancer, upper tract cancer, radiation cystitis

3. What are the common reasons why patients may get haematuria post-IDC insertion?
   - It is common for junior doctors to find that once they have inserted a catheter in an elderly patient with urinary retention that there is bright red bleeding from the urethra
     - Sometimes this means there has been a minor urethral injury with the insertion of the catheter
     - Sometimes it can be the catheter passing by the prostate in an elderly gentleman with fragile blood vessels growing over the surface of the prostate (which is quite common)

4. Sometimes, an hour after a catheter insertion, there is bright red haematuria. What’s happened?
   - Patients with chronic retention can develop decompression haematuria
   - There are some theories about the fragility of the blood vessels and that a static pressure from expansion of the bladder with chronic retention can help stop bleeding – usually self-limited. Occasionally it requires active management with washouts and bladder irrigation
5. Can anticoagulant medications cause haematuria?
- Patients may have a urinary catheter inserted during a cardiac event or vascular event requiring anticoagulation – the trauma of the IDC insertion can be enough to cause haematuria
- BUT, in many patients there may be an underlying bladder or kidney lesion and the herald bleed can be with the commencement of anticoagulation
  - It is common to see a patient on the cardiac ward (e.g. 65 year old smoker with a recent heart attack, started on dual anti-platelets now with a significant haematuria episode), that has a Computed Tomography Intravenous Pyelogram (CT IVP) done and you will see a bladder lesion
  - To avoid missing a bladder lesion, all patients with macroscopic haematuria need a full urological work up

6. What is the standard work up for macroscopic haematuria?
   
   **As a minimum:**
   - Urine cytology x 3
     - Best to collect this as the second void of the day – due to urothelial cells shed in the urine during the first void (cells have been sitting in the urine overnight); these cells can be more degenerated and therefore you can get a higher rate of atypical reporting
   - Cystoscopic examination
   - CT IVP
     - If the patient is very young and you are worried about radiation exposure, do an ultrasound instead of a CT IVP – note this is less sensitive at detecting cancer (so do this in consultation with the Urologist)

**You are a junior doctor on the wards and you arrive to review a patient that has haematuria with clots in the bag. What do you do?**

- In patients appearing to have suspected clot retention, give a stat dose of antibiotics – this is because patients can get a septic shower with any blockage of the bladder
  - High risk for infection – IV gentamicin and ampicillin
  - Low risk for infection – IV cephalozin or oral Keflex
- Then do a bladder scan to assess how well the current catheter is draining the bladder – most important

7. If you find that the patient is in clot retention, what should you do?
- Resuscitation: Airway, Breathing, Circulation (ABCs)
  - Make sure they are not hypotensive with the retention
  - Are they febrile?
- Bloods – Urea/electrolytes/creatinine, Full blood count (check Haemoglobin for anaemia)
- Bladder scan >100ml in bladder
  - Do a washout – use a tumo syringe and sterile saline to wash clot out of the bladder
  - If you can easily flush the clot out with the two-way catheter then leave it in
  - If you are having trouble clearing the bladder with a two-way catheter (e.g. pushing in 50-100ml of saline and not able to draw that much saline back out/clots), move onto a three-way catheter

8. Is inserting a three-way catheter the same technique as inserting a two-way catheter?
- Three-way catheter is quite specialised with an outflow channel for urine (largest channel), inflow channel for saline irrigation and then the balloon part
- The catheters come in different materials
  - Some are quite rigid and need to be put in with an introducer
  - If you are putting in a three-way catheter be sure it is one you are confident with and won’t cause any damage
  - There are softer and more flexible ones available – but these are less useful for evacuation of blood clots

Summarised by Dr Rose McCarthy, Intern, St Vincent’s Hospital. October 2017
9. Are there any patients you would not recommend that inexperienced people put a three-way catheter in?
- Patients with previous radiotherapy or small capacity bladder – there can be an increased risk of perforation
- Any patient with recent urological surgery – speak to the Urology registrar or consultant before insertion of a three-way catheter or removal of a two-way catheter; especially in recent TURP, or radical prostatectomy

10. What is the purpose of a three-way catheter?
- We rely on three-way catheters in post-operative patients because they stop clots from forming and blocking outflow – they allow the urine to drain freely without obstruction
  - Obstruction can cause sepsis from urine outflow obstruction; and can contribute to poor anastomosis healing
  - Since the bladder is an expandable muscle, healing relies on it being decompressed for a period of time
- The post-op three-way catheters are used for acute bleeding
  - Saline pushing through the catheter can cause local tissue oedema which can compress the vessels and reduce the amount of bleeding
  - This is relevant for radiation cystitis, and cyclophosphamide induced haemorrhagic cystitis

11. If you are worried about a clot in the bladder, would you use a three-way catheter for washout?
- A washout is manually using a syringe to evacuate a clot from the bladder
- Washouts can be done with a two-way or a three-way catheter
- In the Emergency Department it is safer to do a manual washout with a two-way first:
  - Use sterile saline via syringe into the main lumen that drains the urine, ideally in an 18-20Fr catheter
  - Remember that bladder irrigation is a relatively risky procedure, and if you haven’t done a proper washout first, a clot in the bladder can block the outflow of irrigation
    - With water inflow at 60-100 cm of water pressure (depending on the bag height from the patient’s pubic symphysis), you can cause a big intravesical pressure increase, and even rupture if the catheter becomes blocked with a clot
    - Patients will develop severe discomfort unresponsive to analgesia in clot retention
    - Any strain with bladder under extreme pressures could cause a bladder rupture
  - Confirm with a bladder scan to ensure you have done a good washout
    - Less than 30 mL is good
    - 30-50 mL is equivocal
    - More than 50 mL, depends on how high risk the patient is – consider repeating the washout to remove further clots
  - Some patients may need cystoscopic washout if unable to be done manually via catheter

12. What is the follow up post-haematuria episode?
Dependent on the patient:
- Macroscopic haematuria – referral to Urologist
  - Do not put the cause haematuria due to catheter insertion, this may miss an early diagnosis of urinary tract cancer
  - 30% of patients with macroscopic haematuria in the community have a finding of urothelial carcinoma
  - Follow up cystoscopy depends on the underlying risk of the patient for malignancy – higher risk in those that are older, have a heavy smoking history or occupational history
- About 10% of microscopic haematuria has an upper urinary tract cause (renal parenchyma cause)
  - Take a detailed medical history
  - Refer to a renal physician in patients with risk factors such as diabetes, end-organ complications or previous work up for microscopic haematuria 12 months earlier
  - In 60% of patients we are unable to find cause of their haematuria and it is suggested repeating urinalysis in the next 12 months then referring to a renal physician if there is persistent haematuria

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13. Take home messages

- Haematuria is common
- Learn how to do a basic manual washout
- Every patient with macroscopic haematuria should be fully investigated
  - Urine cytology, CT IVP and cystoscopic examination