

MACROSCOPIC HAEMATURIA (Non-Trauma)

Introduction

Macroscopic haematuria is also referred to as visible, or gross haematuria ie blood clearly visible to the naked eye.

This is in distinction to *microscopic haematuria*, which is not visible to the naked eye, and only detected on dipstick urinalysis.

The most common significant immediate complication of macroscopic haematuria will be clot retention.

The possibility of recent but unrecognized trauma must always be kept in mind, especially in patients who are unable to effectively communicate.

Pathophysiology

The causes of non-traumatic macroscopic haematuria include:

1. Malignancy:
 - This may be anywhere within the urinary tract, renal, ureters or bladder.
 - **This is the most important consideration in any patient who presents with macroscopic haematuria (particularly over the age of 40 years).**
2. Benign tumours:
 - e.g.: Polyps
3. Infection:
 - This is the most common cause.

Following treatment of UTI, a dipstick should be repeated to confirm the post-treatment absence of haematuria.

It should be remembered that UTI (regardless of haematuria) can be the first presentation of significant genito-urinary pathology, and should be further investigated if clinically indicated.

UTI is most readily excluded by a negative dipstick result for *both* leucocytes and nitrites.

4. Coagulopathy:
 - The most common presentation in this regard will be seen in patients who are taking warfarin.
 - It may also be seen in haemophiliacs.
 - It must be noted that bleeding in these cases may also be due to an underlying pathology.
5. Renal tract stones:
 - This is an uncommon cause, and if occurs is usually of a minor degree only.
6. Acute glomerulonephritis
 - This is a “nephrogenic” as opposed to a urological cause.
 - Here the urine is more usually “cola” coloured, rather than bright red.

Differential diagnosis

True haematuria must be distinguished from other potential causes of reddish or brown discoloration of the urine.

When bleeding is frank or has clots there is usually little doubt, however in lesser degrees of macroscopic haematuria, (eg “rose colored”) these other possibilities need to be kept in mind.

- 1 Trauma
 - Always keep in mind the possibility of unrecognized trauma, especially in patients who are unable to effectively communicate.
2. Menstruation (ie spurious)
3. Myoglobinuria
 - From rhabdomyolysis
4. Haemoglobinuria
 - From haemolysis
5. Bilirubinuria
6. Dietary factors

- Most commonly beetroot, (chemical staining of urine).
7. Drugs:
- Most commonly rifampicin, doxorubicin.

Clinical Assessment

Important points of history

1. Trauma:
 - A careful history must always be taken to exclude the possibility of recent trauma.
2. Co-morbidities:
 - Particularly of bleeding disorders.
3. Medication:
 - Warfarin
 - Other drugs which may discolor the urine, eg: rifampicin, doxorubicin.
4. Dietary factors
 - Beetroot.

Important points of examination

1. Vital signs:
 - Fever
 - Blood pressure
 - ♥ Check for hypertension: Renal disease/ nephritic syndrome
2. Anaemia, or other signs of significant blood loss
3. Abdominal examination:
 - Renal mass
 - Evidence of bladder distention (indicating possible clot retention).

Investigations

Blood tests

1. FBE
 - In particular for the Hb
3. Glucose
3. U&Es/ eGFR
 - Renal impairment is suggestive of intrinsic renal disease
4. PSA in males
5. Coagulation profile
 - If coagulopathy is suspected.

Urine

1. MSU
 - For microscopy, culture and sensitivity
2. Microscopy
 - For casts, if glomerulonephritis is suspected
3. Cytology
 - For evidence of malignancy.

Imaging

Ultrasound

Renal ultrasound is the best initial screening test.

CT scan

With the advent of multi-detector row CT, (MDCT) it is possible to perform a comprehensive evaluation of haematuria with a single investigation.¹

MDCT Urography should be employed in the evaluation of patients, when other diagnostic tests fail to elucidate a cause of painless macroscopic haematuria.

This protocol consists of a dedicated contrast Renal Tumour protocol to assess the kidneys followed by a CT-IVP protocol to assess the ureters and bladder.

- The non-contrast images are used to detect renal calculi
- The nephrographic phase is used to detect and characterise renal masses
- The excretory phase is used to assess the collecting system, ureters and bladder

The sensitivity of MDCT Urography is superior to intravenous pyelogram in the detection of upper tract urothelial malignancy.

Cystoscopy

Cystoscopy remains the gold standard in the detection of lower urinary tract (bladder) urothelial tumours, as neither IVP nor MDCT Urography have significant sensitivity to exclude an abnormality of the bladder mucosa.

Management

1. Initial resuscitation:
 - Rehydrate and/ or transfuse the patient as clinically indicated, although this will not usually be required in cases of non-traumatic haematuria.
2. Frank haematuria with clot formation:
 - Frank haematuria with clots will require a 3-way catheter and bladder washout, to avoid the risk of clot retention.
3. Patients on anticoagulation therapy:
 - It is important to note that patients on anticoagulant or anti-platelet therapy are not necessarily bleeding (with either visible or non-visible haematuria) due to their medication.
 - An underlying pathology may still exist.
 - **These patients should be evaluated regardless of these medications.**²

Disposition

Many patients with macroscopic haematuria, who are otherwise well may be investigated as outpatients, however there should always be **timely urological review**, in view of the possibility of urinary tract malignancy

Some patients may require hospital admission including those with:

- Frank bleeding with clots, (requiring a bladder washout to prevent clot retention).
- Any patient who is significantly unwell on clinical assessment and/ or on investigation results.

- Significant co-morbidities and/ or social complications.

References

1. Diagnostic Imaging Pathways: www.imagingpathways.health.wa.gov.au
2. [Joint Consensus Statement on the Initial Assessment of Haematuria Prepared on behalf of the Renal Association and British Association of Urological Surgeons.](#)
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