

A GP's Checklist: Gross Hematuria



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The detection of gross hematuria often frightens patients and precipitates medical evaluation. A urinalysis examination is useful to confirm red cells on microscopy and can suggest other conditions that mimic gross hematuria when visualization of red cells is not seen. These other conditions include hemoglobinuria, myoglobulinuria and porphyria, which test positive for the heme pigment on urinary dipstick, but present no visible red cells on microscopy. The urinalysis is also useful for diagnosis of urinary tract infection, which remains the most common etiology of gross hematuria.

The profile of gross hematuria during voiding may direct the clinician to the expected source of bleeding. Urethral lesions clear during the void and bladder neck lesions typically have terminal stream hematuria. Once the above issues are considered with no clear diagnosis emerging, the following disease profiles should be considered.

Trauma?

Patients with trauma to the urethra, pelvis or abdomen are at risk of injury to the kidney and urogenital system. These patients are easy to identify based on the mechanism, location and impact of their injury and are managed relative to the focus of the injury.

Underlying renal parenchymal disease?

Index patients with simple renal cysts, polycystic kidney disease, ureteropelvic junction obstruction, ectopic kidneys (including horseshoe kidneys) and developmental anomalies, who may present with spontaneous gross hematuria. These patients may have flank pain and hypertension at presentation and are effectively diagnosed by renal ultrasound.

Glomerulonephritis?

Glomerulonephritis and Berger's disease/IgA nephropathy typically present with painless gross hematuria at times of intercurrent stress or illness. Post-infectious glomerulonephritis emerges two to three weeks after group A streptococcal infection and has features of glomerulonephritis, along with positive streptococcal antibody titers. These patients may also have proteinuria, hypertension, bilateral flank discomfort and variable degrees of renal insufficiency, in addition to the typical red cell casts and features of gross hematuria.

Benign recurrent hematuria?

Familial nephritis will often progress to gross hematuria during illnesses. Family members are often aware of their family's profile of sensorineural hearing loss and renal failure rate, which predict a poorer outlook for renal survival, especially in males. Typically, an index case has a renal biopsy to evaluate the glomerular basement membrane. Electron microscopy is also performed for features of benign familial nephritis versus Alport's syndrome.

Pregnancy?

Presentation with gross hematuria during pregnancy that is not explained by a urinary tract infection is atypical and is nearly always due to an organic process. Pre-eclampsia causes proteinuria, but gross hematuria is not expected and often predicts renal disease. Urinary red cells and, in particular, red cell casts, indicate an underlying renal problem and will require investigation for an underlying glomerulonephritis. The safety and need for a renal biopsy is debated in this scenario and often an empiric trial of steroids is given.

Renal and urogenital neoplasms?

Renal cell carcinoma presents with the classic triad of flank pain, hematuria and palpable renal mass. It occurs in the third or fourth decade and represents the late stage of renal carcinoma. Renal tumours incidentally discovered during routine investigation have a better prognosis. Wilms' tumour is more typical of a young child who presents with abdominal/flank mass and gross hematuria. One in 40 men develop urogenital neoplasms during their lifetime, with prostate carcinoma accounting for the vast majority. Urologic consultation and cystoscopy is recommended for men with unexplained gross hematuria.

Kidney stones?

Stone presentations typically have renal colic to direct the clinician in consideration of this category. However, atypical presentations without colic can be misleading when only gross hematuria is apparent. Some calculi are missed on ultrasound evaluation, especially when distention of the renal pelvis and/or ureter is not visualized. Computerized axial tomography scans remain the most sensitive to exclude calculi in patients at risk. Collection of passed calculi with stone analysis or urinary solute evaluation can direct medical management for patients at risk of recurrence in > 70% of cases.

Sick cell disease?

Hematuria is not an uncommon feature in patients with sickle cell disease, sickle cell trait and hemoglobin sickle cell disease. It has always been considered a "sickle crisis" in the renal medullary capillaries causes relative hypoxia, hypertonicity with water extraction and results in acidemia. Therapy that supports intravascular volume status is most effective.

Patient origin?

The profile of the disease is different around the world and must be considered. Bladder schistosomiasis is a common causes of gross hematuria in certain areas of the world and must be considered in evaluation of bladder wall lesions. Tropical hookworm may invade the body and reside in the kidney. Tuberculosis may also be seen in at-risk patients. The classic presentation of renal tuberculosis is sterile pyuria, but primary invasion of the kidney or urologic tract can present with gross hematuria.

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