Gross Hematuria in a 56-Year-Old Man

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A 56-year-old man presented to his primary care provider after noticing blood in his urine during the previous week.

History

A few weeks earlier, the patient had noticed red-tinged urine but thought it was due to dehydration after a long day of yard work.

The week before he presented to office, he noticed his urine was more prominently red-tinged and consistent with what he felt looked like blood. The patient took amlodipine for hypertension, which was well controlled, and tamsulosin for benign prostatic hyperplasia.

He was otherwise healthy. He never smoked tobacco or any other products and consumed 1 to 2 alcoholic beverages per month. He reported no family history of renal or bladder cancer. His most recent prostate-specific antigen level was 1.5 ng/mL, about 6 months ago.

Physical examination

The patient appeared well. His weight was unchanged from his last office visit. There was no abdominal or flank tenderness. His genitourinary examination showed a normal circumcised penis, normal urethral meatus, normal scrotum with normal scrotal skin, and normal bilateral testicles without testicular or paratesticular abnormality. Digital rectal examination revealed normal, nontender prostate with no nodules.

Diagnosis

The patient's urine was yellow. Urinalysis showed 2+ blood on dipstick analysis. On microscopic analysis, the patient had 5 red blood cells per high-powered field, 0 white blood cells, and negative leukocyte esterase. Because of the patient's gross hematuria, a computed tomography urogram (CTU) was performed. On the noncontrast view, a right renal lower pole stone measuring 4 mm was seen. The rest of the scan was normal. The patient was referred to a urologist, where a cystoscopy was performed, revealing a small bladder tumor.

Discussion

Gross hematuria is commonly intermittent, and thus, return of yellow urine does not obviate the need for urologic evaluation. Gross hematuria is not a normal finding among patients taking blood thinners; workup should be pursued in patients presenting with gross hematuria who take anticoagulants or antiplatelets, or both. In approximately 23% of patients with gross hematuria, urologic cancer is found on evaluation. As such, gross hematuria always requires evaluation by a urologist and usually consists of a CTU and cystoscopy.[1,2]

The differential diagnosis of gross hematuria includes neoplasms of the bladder, prostate, ureter or kidney, renal cysts, urinary tract stones, benign prostatic hyperplasia, urinary tract infection, and urinary tract trauma.[3,4] Additionally, sources external to the urinary system, such as menstruation or medications that change urine color, should be considered among patients who report gross hematuria. It is appropriate to perform the CTU before the urology appointment. All patients who have gross hematuria need cystoscopy and a CTU. However, if the CTU shows an operable pathology, the patient can be taken to the operating suite and avoid an in-office cystoscopy, as it would be performed with the patient under anesthesia. This emphasizes the need for CTU before cystoscopy and its helpfulness before urologic referral.

CTU consists of 3 phases, each of which assesses a different pathology **(Table)**. The scout imaging (abdominal x-ray) and the noncontrast CT phase is performed to assess for stone disease.[2] The nephrogenic phase is obtained approximately 90 seconds after intravenous (IV) contrast to provide enhanced images of the kidneys. The nephrogenic phase looks for symmet-

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Table. CTU Phases and Findings

PHASE	TIMING	EXAMPLES OF PATHOLOGY/FINDINGS
Noncontrast	Immediate	Stones, macroscopic fat, baseline attenuation for assessment of enhancement
Nephrogenic	90-100 seconds after contrast given intravenously	Benign and malignant renal masses, pyelonephritis
Delayed	12-15 minutes after contrast given intravenously	Inflammatory, traumatic, congenital, and neoplastic processes in the renal calyces, renal pelvis, and ureters

ric enhancement and abnormalities that may suggest obstruction or renal masses. The delayed phase is obtained after IV contrast fills the collecting system and allows for visualization of the collecting system and the ureters. The delayed phase is typically shot 7 to 15 minutes after administration of IV contrast.

Gross hematuria rarely requires an emergent intervention. An exception to this rule is an obstructing blood clot causing acute urinary retention. Catheter placement with bladder irrigation may be necessary along with pelvic imaging or cystoscopy if patients are suspected to have a large clot burden.[5]

When considering trauma as the etiology, it is important to note a foley catheter should not cause gross hematuria, even among patients on anticoagulation or antiplatelet therapies.[6] There are scenarios when traumatic balloon inflation in the prostate can cause gross hematuria; however, these patients still require evaluation by a urologist to discuss the risks, benefits, and alternatives to a gross hematuria workup.

Patient outcome

Our patient was found to have a renal stone and a bladder tumor. The patient was set up for transurethral resection of his bladder tumor. Because the patient was going to be taken to the operating room, we did offer to treat his stone while he was under anesthesia, even though many stones of this size can otherwise be observed. The patient preferred to monitor his stone with repeat imaging. The patient's pathology revealed low-grade noninvasive bladder cancer. The patient was followed with urine studies and cystoscopy to monitor for recurrence of bladder cancer.

To date, the patient has had no recurrences and his stone has remained stable without symptoms. The patient was counseled to notify his primary care provider and urologist should he have episodes of gross hematuria going forward.

Conclusion

This was a case of gross hematuria. The major work-up for gross hematuria consists of CTU and referral to urology for cystoscopy. CTU consists of 3 phases as outlined above. A number of pathologies are associated with gross hematuria. Cancer, specifically, urothelial carcinoma, must be ruled out after a patient has even one episode of gross hematuria.

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