EVALUATION OF GROSS AND MICROSCOPIC HEMATURIA

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OBJECTIVES

- Define the terms gross hematuria and microscopic hematuria.
- Identify etiologies of hematuria.
- Identify risk factors for a urologic cancer in a patient with gross or microscopic hematuria.
- Define the term "full evaluation."
- Identify indications for a full evaluation.
- Identify labs and diagnostics to evaluate hematuria.
- Identify the appropriate follow-up for patients with hematuria.

CASE #1

Ms. T is a healthy 50 year-old female, s/p TAH/BSO 15 years ago for severe endometriosis. She presents today for her annual physical exam required by her employer. She has no new complaints and there is no history of any urologic complaints.

Physical exam is completely normal

Urine dipstick shows 1+ blood, pH 6.0, negative for ketones, glucose, nitrites and leukocyte esterase

Microscopic evaluation shows 8 RBCs, no WBCs, bacteria, yeast, crystals, or casts

CASE #1

- Should you prescribe an antibiotic for Ms. T today?
- Does she need any further follow-up?
- If yes, what would follow-up include?

CASE #2

Mr. D is a 38 year-old healthy, monogamous married male with 4 children, presenting for a vasectomy consultation. He denies any complaints, including urologic complaints. He takes no medications. He tells you he ran a marathon 2 days ago and then finished building a deck in his backyard yesterday.

Physical exam is completely normal

Urine dipstick shows 1+ blood, pH 6.0, negative for protein, ketones, glucose, nitrites and leukocyte esterase

Microscopic evaluation shows 3 RBCs, no WBCs, bacteria, yeast, crystals, or casts

CASE #2

- Should you prescribe an antibiotic for Mr. D today?
- Does he need any further follow-up?
- If yes, what would follow-up include?

CASE #3

Mrs. K is a 25 year-old monogamous, married female with one lifetime partner who is also monogamous. She complains of repeated UTIs since becoming sexually active in her late teens. She presents today with her usual UTI symptoms of burning, frequency, urgency, and low urine output which began this morning. She looks uncomfortable as well.

Physical exam reveals an afebrile patient with mild suprapubic pain.

Urine dipstick shows 1+ blood, pH 6.0, + nitrites, + leukocyte esterase, negative for ketones and glucose

Microscopic evaluation shows 8 RBCs, 20 WBCs, + bacteria. No yeast, crystals, or casts.

CASE #3

- Should you prescribe an antibiotic for Mrs. K today?
- Does she need any further follow-up?
- If yes, what would follow-up include?

CASES

- What do these 3 patients have in common?
- What is different about these 3 patients?

CONSIDER…

- Which patients will you prescribe an antibiotic for today in the office?
- Which patients need further evaluation?
- Which patients need no further follow-up for their hematuria beyond reassurance?
- What types of evaluation might be necessary for patients needing further testing?

HEMATURIA INTRODUCTION

- Microscopic hematuria is defined as > 2 RBC/hpf.
- Microscopic hematuria is also detected by dipstick.
- Gross blood is blood that is visible to the patient or to the examiner.
- Gross and microscopic blood are often asymptomatic and intermittent.
- "Hematuria without other symptoms must be regarded as a symptom of tumor of the bladder or kidney until proved otherwise." (McAninch, 2008)
- "Hematuria is a danger signal that cannot be ignored." (McAninch, 2008)

HEMATURIA INTRODUCTION

- Isolated hematuria without proteinuria, other cells, or casts is usually bleeding from the urinary tract.
- If the source of blood is assumed secondary to UTI, other infection, BPH, stones, heavy labor, etc., then subsequent rechecks of urine once the condition has cleared are required and should show no further blood. (Seal, G.M., 1995)
- **Persistence of blood, even microscopic, is an indication for a full evaluation.**

HEMATURIA ETIOLOGY

- **Bladder cancer**
- **Kidney cancer**
- **Prostate cancer**
- Urolithiasis
- Tuberculosis
- Prostatitis
- BPH - dilated veins
- UTI
- Pyelonephritis
- Interstitial cystitis
- Urethral caruncle
- Cystocele
- Interstitial cystitis
- Menstruation
- High pressure voiding
- Urethral stenosis
- Exercise
- Benign familial hematuria
- Viral illness

HEMATURIA ETIOLOGY

- Radiation/chemical induced cystitis
- Ureteral cancer
- Urethral cancer
- Allergy
- Mild trauma
- Trauma
- Glomerular diseases
- Schistosomal infection

A WORD ON TUBERCULOSIS

- The urinary tract is the second most common site for tuberculosis and presents with asymptomatic hematuria
- Incidence of TB is on the rise in the U.S.
- All of the following with hematuria should be tested:
  - Medical workers
  - School personnel
  - Incarcerated individuals (or those who work with them)
  - Institutionalized individuals (or those who work with them)
- PPD skin test and/or CXR
  - Positive TB result indicates the need for HIV testing

RISK FACTORS FOR CANCER

- > 35 yo
- SMOKING!
- Occupational exposures (chemicals or dyes)
  - Printers, painters, chemical plant workers
- History of gross hematuria
- History of chronic cystitis or irritative voiding symptoms
- History of pelvic irradiation
- History of exposure to cyclophosphamide
- History of a chronic indwelling foreign body
- History of analgesic abuse

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EVALUATION OF GROSS HEMATURIA

- The evaluation of gross hematuria includes a "full evaluation"
  - Regardless of age or symptoms!
  - CT of the abdomen and pelvis with and without contrast
    - Evaluates the upper tracts
  - Cystoscopy
    - Evaluates the bladder, urethra, prostatic urethra
  - Continue appropriate follow-up to ensure resolution of hematuria

EVALUATION OF THE SYMPTOMATIC PATIENT WITH MICROSCOPIC HEMATURIA

- Blood in the urine with associated symptoms may suggest a diagnosis:
  - Sudden onset of urgency, frequency, dysuria, & fever
  - Onset of severe unilateral flank pain
  - 50+ yo male with hesitancy, frequency, dribbling, slow stream, incomplete emptying, nocturia
- Gross or microscopic hematuria?
- Remember… all patients with gross blood get…

EVALUATION OF THE SYMPTOMATIC PATIENT WITH MICROSCOPIC HEMATURIA

- Microscopic hematuria and the symptomatic patient:
  - Treat the underlying cause of symptoms and recheck
    - When?
    - Blood still present?
      - No: Follow transient microscopic hematuria plan
      - Yes: Follow persistent microscopic hematuria plan
  - Unless you have reason to suspect malignancy
    - Full evaluation
- Continue to follow-up appropriately to ensure hematuria is completely resolved

EVALUATION OF THE ASYMPTOMATIC PATIENT WITH MICROSCOPIC HEMATURIA

- Transient or persistent microscopic hematuria?
- Confirm with urinalysis
- Consider risk factors
  - Especially age and occupation
- Proceed with labs and diagnostics

INITIAL EVALUATION OF MICROSCOPIC BLOOD LABS

- UA: several rechecks over several weeks
  - Dipstick
  - Microscopic evaluation*
- AUA guideline: If 2 of 3 rechecks are positive for 3 or more RBCs microscopically, refer to urology!
- Patients need to abstain from all strenuous activity and sexual activity for 48 hours prior to urinalysis
  - These activities cause minimal trauma to the kidneys, bladder, and/or the urethra that breaks integrity of the lining and can create a positive outcome
- If blood in urine fails to clear over several rechecks, full evaluation is indicated

GROSS BLOOD & PERSISTENT MICROSCOPIC BLOOD LABS & DIAGNOSTICS

- Urine dipstick: pH, blood, protein, ketones, nitrites, leukocyte esterase
- Micro: RBCs, WBCs, bacteria, yeast, crystals, casts
- Urine culture and sensitivity
- Urine cytology for abnormal cells?
- PPD skin test
- **CT with & without contrast – Gold standard**
- **Cystoscopy – Gold standard**
- Contrast concerns (allergy or renal function):
  - Spiral CT (stone protocol), cystoscopy
  - Bilateral retrograde pyelogram, renal US, cystoscopy
  - Older adults: KUB, renal US, cystoscopy
  - Pregnant female: ultrasound

FOLLOW-UP POSITIVE DIAGNOSTIC EVALUATION

- A cause for gross or microscopic blood was found on CT and/or cystoscopy
  - Or other testing
- Treat the underlying condition and continue the appropriate evaluation for the condition as indicated

FOLLOW-UP NEGATIVE DIAGNOSTIC EVALUATION

- Negative evaluation does not mean the patient is "in the clear"
  - Very early cancers can be undetectable on initial evaluation
- Transient hematuria
  - Annual urinalysis x 2
  - Urine cytology?
- Persistent hematuria
  - Negative CT, cystoscopy, cytology - a good sign!
  - Continue annual urinalysis
  - Repeat full evaluation in one year
- Gross hematuria presenting during the observational time is an indication for immediate repeated full evaluation

FOLLOW-UP NEGATIVE DIAGNOSTIC EVALUATION

- Another option: recheck urine every 3 months by dipstick and microscopic evaluation for 1 year
  - Then every 6-12 months x 2 years
  - Clinically based, not evidence based
- Continued persistent microscopic hematuria warrants a repeated evaluation at one year
  - High risk patients
- Two negative evaluations spaced nearly 12 months apart is nearly 100% reassurance of no cancer

CONSIDER…

- Which patients will you prescribe an antibiotic for today in the office?
- Which patients need no further follow-up for their hematuria beyond reassurance?
- Which patients need a urology referral?
- Which patients need further evaluation or testing?
- What types of evaluation or testing are indicated?

MS. T

- Should Ms. T, our 50 yo patient with asymptomatic microscopic hematuria, receive an antibiotic today?
- Is further evaluation indicated?
  - Why or why not?
- If yes, what would evaluation include?

MR. D

- Should Mr. D, our 38 yo patient with asymptomatic microscopic hematuria, receive an antibiotic today?
- Is further evaluation indicated?
  - Why or why not?
- If yes, what would evaluation include?

MRS. K

- Should Mrs. K, our 25 yo patient with symptomatic microscopic hematuria, receive an antibiotic today?
- Is further evaluation indicated?
  - Why or why not?
- If yes, what would evaluation include?

MRS. K

- Mrs. K returns to the office in two weeks and six weeks for repeat urinalysis. There is no blood in the urine on either recheck.
- Mrs. K calls the office three months later with another urinary tract infection and tells your nurse she also sees blood in her urine.
- What will you say?

MRS. S

Mrs. S is a 62 yo smoker, new to your office, who reports she has a bladder infection. Symptoms include urgency, frequency, and suprapubic pressure. She denies dysuria, fever, chills, and sweats. She states this is her third UTI in 6 months. She has taken trimethoprim/sulfamethoxazole and ciprofloxacin, but the same symptoms continue to return. She reports urine cultures were negative for infection. Her provider told her she has microscopic blood in her urine.

Physical exam is noncontributory except for mild suprapubic pressure with palpation.

Urine dipstick shows 2+ blood, pH 6.0, negative for ketones, glucose, nitrites and leukocyte esterase

Microscopically, 20 RBCs are found. No WBCs, bacteria, crystals, yeast, or casts.

RECOMMENDATIONS

- Gross blood – refer now for full evaluation
  - They have cancer until proven otherwise
  - Even young patients with an "obvious infection" need a full evaluation
- Suspected UTI – get a clean catch midstream urine for culture and sensitivity
  - Then prescribe an antibiotic
  - Recheck urine for persistent microscopic hematuria
    - Avoid menses and no physical or sexual activity 48 hours prior to recheck
    - Refer if 2 of 3 rechecks are abnormal

RECOMMENDATIONS

- Asymptomatic hematuria
  - Recheck over several weeks
  - Avoid menses and no physical or sexual activity for 48 hours prior to recheck
  - Refer if 2 of 3 rechecks are abnormal
- Patient states "UTI, UTI, UTI, UTI" with microscopic blood and negative cultures
  - Think interstitial cystitis or cancer – no antibiotics! REFER!
- Documented UTI x 3 in one year - REFER

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Thank you!
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Questions?