Microhematuria Case Study

MEDICAL STUDENT CASE-BASED LEARNING
Patient: Presentation

75-year-old Caucasian male referred for asymptomatic (painless) microhematuria
What additional history would be pertinent?
Patient: History & Physical Exam

- Denies gross hematuria, dysuria, irritative voiding symptoms, or difficulties with urination
- No fevers, abdominal or flank pain
- Endorses 17 lb. weight loss over 10 months
- PMH: HTN. No prior GU history
- PSH: None
- Meds: Metoprolol, aspirin
- FHx: No known history of stones or malignancies
- SH: Retired veteran, 50 pack-year smoking history

- PE: No abdominal tenderness or distension, no costovertebral angle tenderness bilaterally, normal phallus with orthotopic meatus
What is your differential diagnosis?
Differential Diagnosis

- Urolithiasis
- Malignancy
  - Bladder cancer
  - Upper tract urothelial carcinoma
  - Renal cell carcinoma
- UTI
- BPH
- Non-infectious cystitis
- Glomerulonephritis
- Trauma
- Strenuous exercise
What laboratory evaluation would be appropriate?
Patient: Laboratory Evaluation

- Urinalysis:
  - Color: yellow
  - SG: 1.015
  - pH: 5.5
  - Nitrite: neg
  - Leukocyte esterase: neg
  - RBC: 3-5 / hpf (no RBC casts)
  - WBC: 0-2 / hpf
  - Protein: none
  - Bacteria: none
  - Squamous epithelial cells: none

- Cr: 1.1
- Hgb / Hct: 13.5 / 40.5

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Define microhematuria. How does this differ from gross hematuria?
Types of Hematuria

**Microhematuria**
- >3 RBC/hpf on a single urinalysis
- Not visible to the naked eye

**Gross Hematuria**
- Blood in the urine visible to the naked eye
Is a urine dipstick sufficient to diagnose microhematuria?
No!

- Must obtain urinalysis with reflex microscopy to confirm the presence of RBC’s
- False positives can occur with dipstick testing:
  - Myoglobinuria
  - Hemoglobinuria
  - Povidone-iodine
- False negatives can also occur:
  - Vitamin C ingestion
  - Urine pH <5.1
  - Prolonged exposure of dipstick to air prior to testing
What is the chance of malignancy in the setting of hematuria?
Malignancy in Hematuria

- Likelihood of identifying malignancy depends on type of hematuria:
  - Microhematuria: 3-5% chance of malignancy
  - Gross hematuria: 23% chance of malignancy
- Varies based on risk factors
What risk factors does the patient have that would predispose him to urologic malignancy?
Patient: Risk Factors/Clues for Malignancy

- Older age
- Male gender
- History of cigarette smoking
- Weight loss
What would be your next step in evaluating this patient’s hematuria?
Cystoscopy: Findings

- No urethral strictures
- Prostatic enlargement
- Orthotopic ureteral orifices with clear efflux of urine bilaterally
- No abnormal lesions or tumors
- No active bleeding
- Cytology wash obtained: “atypical cells” identified
Upper Tract Evaluation

• CT urography (CTU)
• What alternative modalities can be used to evaluate the upper tracts (e.g. if Cr elevated or patient allergic to iodine)?
  – MR urography
  – Retrograde pyelography with non-contrasted renal imaging
Is the excretory phase really necessary?
Can you see an abnormality (non-contrast imaging)?
How about now (excretory phase)?
What would you do next?
Diagnostic Ureteroscopy

• Right-sided retrograde ureteroscopy was performed, revealing large papillary-appearing protrusion into the renal pelvis, which was biopsied
  – Dx: high-grade urothelial carcinoma

• Tissue diagnosis can be obtained via retrograde or antegrade ureteroscopy or via percutaneous approaches if amenable
What is the incidence of upper tract urothelial carcinoma (UTUC)?

What are some unique risk factors for this disease?
UTUC

- Incidence: 2 new cases per 100,000 people
- 5% of all urothelial carcinomas
- Can occur in renal pelvis or ureter

- Risk factors:
  - Tobacco use
  - Cyclophosphamide exposure
  - Phenacetin use
  - Aristolochic acid use
  - Balkan nephropathy
  - Lynch syndrome
  - Chronic inflammation
  - History of bladder cancer

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What is the surgical management of non-metastatic UTUC?
Surgical Management

• Gold standard: radical nephroureterectomy
  – Performed in index patient

• Nephron-sparing approaches: must be considered on a case-by-case basis (e.g. tumor location, multifocality, grade, renal function, comorbidities)
  – Partial ureterectomy
  – Endoscopic resection/fulguration
What principles are important in surveillance of UTUC patients following treatment?
Post-op Surveillance in UTUC

• Periodic cystoscopy
  – Risk of metachronous bladder cancer: 22-47%
• Excretory urography of upper tracts (consider surveillance ureteroscopies following nephron-sparing approaches)
  – Risk of metachronous contralateral UTUC: 2-8%
• Monitor renal function
  – After nephroureterectomy
  – Following receipt of platinum-based chemotherapy (nephrotoxic)