A Patient Is Seen In The Office Complaining Of Severe Flank Pain And Hematuria. The Clinician Should

A Patient Is Seen In The Office Complaining Of Severe Flank Pain And Hematuria. The Clinician Should

When a patient presents with severe flank pain accompanied by hematuria, it raises immediate concern for potentially serious underlying urological or renal pathology. Such symptoms warrant prompt and thorough evaluation to determine the cause, initiate appropriate management, and prevent complications. The clinician's approach should be systematic, combining a detailed history, comprehensive physical examination, targeted laboratory investigations, and appropriate imaging studies. This structured approach ensures accurate diagnosis and timely treatment, improving patient outcomes.

Initial Assessment and History Taking

Gathering a Detailed Medical History

A meticulous history provides vital clues to identify the underlying etiology. The clinician should inquire about:

- **Onset and Duration:** When did the pain and hematuria start? Was the onset sudden or gradual?
- **Character of Pain:** Is the pain sharp, stabbing, dull, constant, or colicky? Does it radiate to other areas?
- **Location and Radiation:** Specifically, is the pain localized to the flank, and does it radiate to the groin, abdomen, or testicles?
- **Severity and Frequency:** How severe is the pain on a scale of 1-10? Has the patient experienced similar episodes previously?
- **Associated Symptoms:** Presence of nausea, vomiting, fever, chills, dysuria, urinary frequency, or urgency.
- **Hematuria Details:** Is the hematuria gross (visible to the naked eye) or microscopic? When was the hematuria first noticed? Is it persistent or intermittent?
- **Recent Trauma or Procedures:** Any recent falls, trauma, or urological interventions?

- **Past Medical and Surgical History:** Prior urolithiasis, urinary tract infections, kidney disease, coagulopathies, or malignancies.
- **Medication History:** Use of anticoagulants, antiplatelet agents, or medications affecting coagulation.
- **Family History:** Family history of kidney stones, hematuria, or renal cancers.
- **Social History:** Hydration status, occupation, exposure to nephrotoxins, or substance use (e.g., smoking, alcohol).

Physical Examination

A focused physical exam aims to identify signs of systemic illness, localize tenderness, and detect potential complications.

- **Vital Signs:** Check for fever, hypertension, tachycardia, or hypotension, which may suggest infection or bleeding.
- **Inspection:** Look for pallor, signs of trauma, or distension.
- **Palpation:** Assess for flank tenderness, costovertebral angle (CVA) tenderness, or abdominal masses.
- **Percussion:** Detect any abnormal dullness indicating fluid or mass.
- **Rectal and Genital Exam:** If indicated, to evaluate for masses or sources of bleeding.

Laboratory Investigations

Urinalysis

Urinalysis is the cornerstone initial test, providing rapid information about hematuria and other abnormalities.

- **Appearance:** Gross hematuria appears as red or dark urine; microscopic hematuria may require microscopy.
- **Dipstick Testing:** Detects blood, leukocytes, nitrites, protein, and pH.

- **Microscopy:** Confirms red blood cells (RBCs), presence of casts, crystals, bacteria, or pyuria.

Key findings suggestive of specific causes:
- RBCs without bacteria: Hematuria due to stones, tumors, or trauma.
- RBCs with bacteria: Possible urinary tract infection.
- Casts or crystals: Indicate renal pathology like nephrolithiasis or glomerulonephritis.

Blood Tests

Laboratory tests help assess systemic involvement and renal function.

- **Complete Blood Count (CBC):** Detect anemia from bleeding or infection.
- **Serum Creatinine and Blood Urea Nitrogen (BUN):** Evaluate renal function.
- **Electrolytes:** Detect imbalances caused by renal impairment.
- **Coagulation Profile:** PT, aPTT, INR, especially if bleeding is prominent or anticoagulant use is suspected.
- **Serum Calcium and Phosphate:** Elevated levels may suggest stones formation predisposition.
- **Serum Uric Acid:** Elevated levels can contribute to uric acid stones.

Additional Tests

Depending on initial findings, further tests may be necessary:

- **Urine Culture:** To identify bacterial pathogens if infection is suspected.
- **Serologic Tests:** For autoimmune causes like vasculitis or glomerulonephritis (e.g., ANA, complement levels).
- **Serum and Urinary Cytology:** To evaluate for malignancy.

Imaging Studies

Role of Imaging

Imaging is essential to visualize renal and urinary tract anatomy, locate stones, masses, or other abnormalities, and guide management.

Ultrasound

First-line imaging modality, especially in initial assessment.

- Detects hydronephrosis, kidney stones, masses, or cysts.
- Non-invasive and devoid of radiation.
- Limited in detecting small stones or ureteral stones.

Non-Contrast Computed Tomography (CT) KUB

Gold standard for detecting renal calculi.

- High sensitivity and specificity for stones ≥2 mm.
- Identifies location, size, and number of stones.
- Detects other causes like tumors or structural anomalies.

Contrast-enhanced Imaging

Reserved for specific indications such as suspected tumors, vascular abnormalities, or when ultrasound and CT are inconclusive.

Differential Diagnosis

Nephrolithiasis (Kidney Stones)

Most common cause of severe flank pain and hematuria.

- Colicky pain radiating to groin.
- Hematuria due to mucosal irritation.
- Risk factors include dehydration, metabolic disorders, and prior stones.

Urinary Tract Infection (UTI) and Pyelonephritis

May cause flank pain, hematuria, fever, and dysuria.

Trauma

History of recent injury can lead to renal contusion or laceration.

Vascular Causes

Renal infarction due to embolism or thrombosis can mimic renal colic.

Tumors

Renal cell carcinoma can present with painless hematuria, flank mass, or pain.

Other Causes

- Hematologic disorders causing bleeding.
- Coagulopathies.
- Structural abnormalities or congenital anomalies.

Management Strategies

Initial Stabilization

Ensure patient stability with measures such as:

- Addressing pain with appropriate analgesia.
- Monitoring vital signs.
- Managing bleeding if significant.
- Hydration to facilitate stone passage or prevent further renal injury.

Treatment Based on Underlying Cause

Management varies according to diagnosis.

Nephrolithiasis

- Pain control with NSAIDs or opioids.
- Hydration to promote stone passage.
- Medical expulsive therapy (e.g., alpha-blockers).
- Interventional procedures if stones are large, obstructive, or causing infection.

Infections

- Empiric antibiotics targeting common uropathogens.
- Drainage in cases of abscess or obstruction.

Trauma

Monitoring or surgical intervention if bleeding or renal injury is severe.

Tumors or Structural Abnormalities

Referral to urology for surgical management or further oncologic care.

Referral and Follow-up