High Impact Rheumatology
 When It Really Hurts

When It Really Hurts: Don’t Blow It

- Focused history and physical exam
- X-ray first
- Aspirate the Joint—The Eye of the Needle is the key to the diagnosis
- A few lab tests

When It Really Hurts: Case 1

- A 39-year-old man presents with severe pain in the forefoot and ankle that awakened him from sleep that morning. He twisted his ankle the day before at work while welding at the Johnson Battery factory. He has had hypertension treated with hydrochlorothiazide for 5 years. Over the past week, he has consumed 1 quart of whiskey per day in a “falling down bender.”
- BP 160/105, temperature 100.5°F
When It Really Hurts: Case 1

- General physical exam is normal
- Intense erythema over the ankle and first MTP
- Severe pain with active and passive motion
- Marked tenderness to palpation of ankle and MTP joint lines
- No inguinal or femoral lymphadenopathy

Question 1: What Is Differential Dx?

A. Reiter’s syndrome
B. Rheumatoid arthritis
C. Infection
D. Trauma
E. Crystalline arthritis

Question 1: Correct Answers

C. Infection, D. Trauma, and E. Crystalline are all possible based on the history and exam

Incorrect Answers:
A. Reiter’s syndrome includes acute arthritis and conjunctivitis, urethritis, or diarrhea
B. RA also may be acute but is usually more insidious in onset and tends to involve multiple small joints in a bilaterally symmetrical pattern
Initial Test Results

- Creatinine 1.8 mg/dL
- Synovial fluid analysis
  - WBC 50,000, 90% PMNs
  - Gram stain: No organisms
  - Culture sent
  - Compensated polarizing microscopy
  - Many crystals

Question 2: What Will You Prescribe?

- Probenecid
- Aspirin, 1 g/d
- Colchicine
- Indomethacin
- Prednisone
- Allopurinol

Question 2: Answer

- Don’t Blow It: The diagnosis of acute gout is correct, but hypouricemic therapy with probenecid or allopurinol should not be started during an acute attack
- ASA (1 g/d) would further elevate the uric acid level
Treatment of Acute Gout

- The earlier the better
- NSAIDs are effective but may be hazardous in this patient with mildly elevated creatinine
- Oral, IV, IM, or IA corticosteroids are effective with minimal toxicity in short course
- Colchicine: Used less often now because of side effects (intravenous injection probably should not be used)

Follow-Up Management of Gout

- Patient is seen 4 weeks after the acute attack. Pain and all signs of inflammation are gone. No tophi are seen and there is no history of renal stones. Possible lead exposure in battery factory. Creatinine is normal. Uric acid is 8.9 mg%
- Key point now: Don't Overtreat
  - Change to different antihypertensive
  - Stop alcohol binging
  - Monitor for and treat recurrences promptly with abortive therapy: Low dose po colchicine or an NSAID

Six Months Later

- The patient returns and reports four additional acute gouty attacks that responded to indomethacin, but he lost 2 days of work with each attack. He is now in AA and not drinking at all. BP is 130/80 with lisinopril. BUN and creatinine are normal. Uric acid is 9 mg% and urine uric acid is 650 mg/24 h
- Key question now:
  - Is the patient overproducing or under-excreting uric acid?
Determinants of Uric Acid Level

- 10% overproduction of uric acid: Urine uric acid >700 to 1000 mg/24 h
  - HGPRTase deficiency/PRPP synthase overactivity
  - Lymphoproliferative and myeloproliferative disorders, solid tumors
  - Drugs: Cytotoxic agents, pancreatic extracts, vitamin B₁₂
  - Alcohol consumption (especially beer)
  - Obesity, psoriasis, and tissue necrosis

Determinants of Uric Acid Level (cont’d)

- 90% under-excretion of uric acid: Urine uric acid <700 mg/24 h
  - Renal defect: Reduced GFR, tubular defect
  - Drugs: Cyclosporine, diuretics, nicotinic acid, salicylates (low dose), pyrazinamide, and ethambutol
  - Ethanol
  - Dehydration, acidosis, starvation
  - Lead nephropathy

Treatment for Overproducers

- For overproducers
  - Allopurinol: 100 to 300 mg/d; use the lowest dose to keep uric acid level <6.5 mg/dL. Use 100 mg/d in patients with renal insufficiency
  - Adverse effects
    - Mild to potentially serious dermatitis
    - Toxic hepatitis, nausea, diarrhea
    - Cytopenias
Treatment for Under-Excretors

- For under-excretors
  - Probenecid: 0.5 to 2.0 g/d
    - Adverse effects
      - Rash
      - Cytopenias
      - Reduces excretion of other drugs, eg, penicillin
  - Sulfinpyrazone: Rarely used

Summary of Allopurinol Therapy

- When to use it
  - Recurrent episodes of acute gout:
    - >3 Attacks per year
  - Tophaceous gout
  - Nephrolithiasis
- When NOT to use it
  - During an acute attack
  - For asymptomatic hyperuricemia
  - In full dose in combination with azathioprine
  - In full dose in patient with renal failure

Use low dose colchicine or an NSAID for prophylaxis when starting hypouricemic therapy

When It Really Hurts: Case 2

- A 35-year-old man with diabetes who has been on hemodialysis for 6 years developed severe pain and swelling in the right knee several hours after playing volleyball. He also noted that during the dialysis run that morning he had had a chill but felt well
- Past history includes three attacks of gout in the left great toe and the right knee 2 years before starting dialysis
When It Really Hurts: Case 2

- He has difficulty getting onto the examination table because of knee pain. Temperature 101°F, pulse 100 bpm, BP 150/90. He is diaphoretic over the face and arms. The skin over the AV fistula is slightly erythematous, but the bruit is strong. There are two small abrasions over the left elbow. Examination of HEENT, chest, and abdomen are normal.

Physical Findings

- The right knee is swollen, slightly reddened, warm, and tender to palpation over the medial and lateral joint margins. Both active and passive flexion and extension are limited by pain. There is no laxity, but the exam is limited by pain.

Step 1: Characterize This Illness

- Acute inflammatory monoarticular arthritis and fever within 24 hours of dialysis, vigorous physical activity, and perhaps trauma in a patient with a history of gout.
- Signs of systemic illness: Fever, diaphoresis
- Initial laboratory tests: WBC 22,000 with 95% PMNs, Hgb 10 g%
Question 1: What Is Differential Dx?
A. Knee trauma with hemarthrosis
B. Crystalline arthritis
C. Beta 2 microglobulin amyloidosis
D. Prepatellar bursitis
E. Septic arthritis

Incorrect Answers
C. Beta 2 microglobulin amyloidosis occurs in dialysis patients producing periarthritis, tenosynovitis, bone cysts, and pathologic fractures
D. Prepatellar bursitis produces pain, swelling, and erythema but does not limit extension of the knee

Differential Dx
- The differential diagnosis includes A, B, and E
- A. Hemarthrosis with mild trauma could occur in renal failure because of tissue fragility and platelet dysfunction
- B. Patients with crystalline arthritis in renal failure may show uric acid, oxalate, apatite (BCP), or CPPD crystals
- E. Bone and joint infections are common in dialysis patients because of vascular access and impaired immune defenses
Question 2: What Diagnostic Tests?
A. Bone scan
B. X-ray of knee
C. Arthroscopy
D. MRI of knee
E. Arthrocentesis and synovial fluid analysis

Question 2: Answer
- Key point: TAP THE JOINT! Diagnosis must be made immediately. X-ray of the knee should be done if the tap is bloody. Synovial fluid analysis will differentiate between infection and crystals

Synovial Fluid Findings
- Synovial fluid WBC 60,000 with 98% PMNs
- No crystals seen on polarizing microscopy
- SF culture and sensitivity test request sent to the microbiology lab
- Blood cultures sent
- SF gram stain
Organisms Causing Septic Arthritis

<table>
<thead>
<tr>
<th></th>
<th>Adults (%)</th>
<th>Children (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gram-positive cocci</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>S. aureus</em></td>
<td>35</td>
<td>50</td>
</tr>
<tr>
<td><em>S. pyogenes, S. pneumoniae</em></td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td><strong>Gram-negative cocci</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>N. gonorrhoeae, meningitidis</em></td>
<td>50</td>
<td>8*</td>
</tr>
<tr>
<td><em>H. influenzae</em></td>
<td>&lt;1</td>
<td>&lt;5</td>
</tr>
<tr>
<td><strong>Gram-negative bacilli</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>E. coli, Salmonella</em></td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>and <em>Pseudomonas species</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Mycobacteria and Fungi</em></td>
<td>&lt;1</td>
<td>&lt;1†</td>
</tr>
</tbody>
</table>

*Requires special media  
†Requires synovial tissue

Question 3: What Treatment?

A. Penicillin  
B. Tetracycline  
C. Nafcillin  
D. Vancomycin  
E. Aminoglycoside

Question 3: Answer

- The most common cause of gram-positive septic arthritis in adults is *Staphylococcus aureus*
- Most *S. aureus* isolates are penicillin resistant  
- An increasing number are methicillin resistant  
- Initial treatment should be with one dose of vancomycin until sensitivity test results are available  
- SF should be aspirated daily, or  
  - If needle drainage inadequate, arthroscopy
Key Points

- With acute arthritis and fever and an identified source of bacteremia, the most likely dx is septic arthritis

  Don't Blow It!

  - Tap the joint!
  - Search for crystals
  - Do SF gram stain immediately
  - Send SF for culture and sensitivity before starting antibiotics

Key Points (cont’d)

- Must treat immediately with antibiotics selected according to SF gram stain and clinical setting
- Adjust antibiotics when sensitivity tests available
- Needle or arthroscopic drainage

When It Really Hurts: Case 3

- 62-year-old woman calls for an urgent appointment because of sudden worsening of hip pain. You injected her trochanteric bursa 2 weeks ago, but the pain has increased. Now she is having trouble sleeping. The hip aches when walking
- Past history includes adenocarcinoma of the lung treated with chemotherapy 1 year ago. Meds include Prozac for depression and 2 to 4 Tylenol #3 for back pain, prednisone, 10 mg/d, for COPD. She has felt “down” and wonders if the Prozac dose should be adjusted
When It Really Hurts: Focused Exam

- On day of examination, she slowly limps into the office, grimacing in pain. Vital signs are normal. She is reluctant to stand on her right leg and needs help getting onto the examination table
- General physical exam is normal

When It Really Hurts: Focused Exam

- Patient is comfortable in the supine position
- ROM in upper extremity, neck, back, and lower extremity is normal
- Strength testing of hip flexors is limited because of pain
- No tenderness on deep palpation of the hip joint
- Greater trochanter is mildly tender

Step 1: What Is the Differential Dx?

A. Avascular necrosis of the hip
B. Hip osteoarthritis
C. Trochanteric bursitis
D. Osteoporotic fracture
E. Metastatic lesion

All of these diagnoses except hip osteoarthritis are possible in this patient. Because of her pain severity, age, cancer history, and steroid use, immediate work-up is required
Step 2: What Diagnostic Tests?

A. Hip x-ray  
B. CBC and ESR  
C. Chest x-ray  
D. Bone scan  
E. MRI

Step 2: Answer

A. Hip x-ray, B. CBC and ESR, and C. Chest x-ray can be done immediately in the office and will help differentiate malignancy from osteoporosis with fracture  
D. A bone scan can be done now at the hospital  
E. MRI will take a few days to schedule, so is not helpful today

Initial Results

- CBC: Hb 10 mg%, WBC 10,000, normal differential, platelets 400,000. ESR 85 mm/h
- X-rays are taken in the office. Generalized osteoporosis and normal hip joint and femoral neck
Initial Results (cont’d)

- Chest x-ray shows enlargement of original lesion and an additional nodular lesion

She Returns Later With Bone Scan

- Bone scan shows multiple areas of increased uptake, indicating metastatic disease

Repeat Hip X-Ray With Oblique View

- Oblique view of hip shows “moth-eaten” pattern of metastatic lesion in proximal femur
If She Has Avascular Necrosis of the Hip, Imaging May Show:

- Right hip normal, asymptomatic left hip, x-ray was also normal
- MRI shows necrosis in both femoral heads

Key Points

- Severe hip pain that interferes with sleep and limits weight bearing suggests serious bone pathology
- Multiple x-ray views and imaging studies may be needed to reveal bone changes
- Don’t Miss It: Don’t wait to x-ray and do not treat “conservatively”