MONOARTICULAR INFLAMMATORY ARTHRITIS

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CASE

- 37 year old man awoke this morning at 3 am with a swollen big toe (on the right). He doesn’t remember injuring it. His physical activity and his diet for the previous 3-4 days has been unchanged. He took 2 ibuprofen tablets earlier this morning but it hasn’t helped much. He denies any fever, feeling ill or being around anyone who has been ill. He has never had anything like this before. The pain is 10/10 in intensity and he presented to your urgent care clinic.

- PMH: none Tobacco: none Alcohol: 3-5/week Medications: none

- Exam: 37.2 °C 95 152/82 He appears uncomfortable. His examination is normal except for his right 1st MTP:

http://www.webmd.com/arthritis/ss/slideshow-gout

What will you do next? …take a moment and discuss with your neighbor…
ADDITIONAL DATA

- CBC
  - WBC 10.8 (4-10.5)
  - Hgb 14.8
  - MCV 88
  - Plts 352
- Electrolytes
  - Na 142
  - K 4.3
  - Cl 104
  - CO2 22
  - Creatinine 0.8
- ESR (pending)
- CRP 1.2 (< 0.5)
- Uric Acid 4.8 (4.0-7.0)

Arthrocentesis

- What is the diagnosis?
- How will you treat?
OBJECTIVES

- List at least 3 causes of monoarticular arthritis
- Know the value of arthrocentesis in the diagnosis of monoarticular arthritis
- List the key clinical features of infectious arthritis
- List at least one feature that suggests the diagnosis of malignancy
- List the most likely joint to be affected by gout
- List 2 joints most likely to be affected by CPP Arthritis
OUTLINE

• Differential Diagnosis
• Crystalline arthritis
• Infectious arthritis
• Pearls (How not to miss…)
• Summary
• Cases…scattered throughout
MONOARTHRITIS: DIFFERENTIAL DIAGNOSIS

• Take a minute and discuss with your neighbor – list 5 causes
• When we re-convene, shout out potential causes
MONOARTHRITIS: DIFFERENTIAL DIAGNOSIS

• Infectious arthritis

• Crystals
  • Gout
  • CPP Arthritis
  • Basic Calcium Phosphate

• Trauma/Overuse

• Tumor
  • Lymphoma
  • Metastatic malignancies
  • Pigmented villonodular synovitis

• Autoimmune/Systemic Inflammatory diseases (e.g. RA, SLE, JIA)

• Other
  • Hemarthrosis
  • Loose body/Foreign body
  • Avascular necrosis
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• Complete list
• Most serious
• Most likely
CRYSTALLINE ARTHRITIS

CPPD
Pseudogout

http://www.hindawi.com/journals/crirh/2014/458708/
https://clubpenguinpd.files.wordpress.com/2009/03/cppd.jpeg
GOUT

• Recurrent attacks of acute arthritis
• Caused by
  • MSU* crystals in the synovium
  • elevated serum uric acid
• Tophi (aggregated deposits of urate crystals)

*MSU = MonoSodium Urate (Gout)
ACUTE GOUT

- 85-90% monoarticular onset
  - 50% involve 1st MTP initially
  - 90% involve 1st MTP eventually
- Typical:
  - abrupt onset (usually at night)
  - no constitutional symptoms
  - self-limited in one week
  - complete resolution of symptoms
- Erythema & desquamation
ACUTE GOUT
(CONTINUED)

• Joints:
  • MTP >> instep, ankles, knees > wrists, fingers, elbows (other sites rare)
  • Prepatellar/olecranon bursae common also
• ~50% w normal Uric Acid during acute attack
• Potential triggering events:
  • trauma (surgery),
  • dietary/alcohol excess,
  • diuretic use/change
CLINICAL STAGES:

- Asymptomatic hyperuricemia
- Acute Gout
- Intercritical Period
- Chronic/Tophaceous Gout
DIAGNOSIS

- Demonstrate crystals
  - Needled-shaped
  - Intracellular
  - Negatively birefringent ("parallel-yellow")
PRESumptive Diagnosis:
(UNABLE to DEMonstrate Crystals)

- Rapid development of severe pain (≤ 24 hrs)
- Pain, erythema, swelling – 1st MTP
- Hyperuricemia

- ~80% probability of having gout
ACUTE THERAPY

• Colchicine 0.6 mg once or twice daily – or -
• NSAID (usually better tolerated then colchicine) — or-
• Corticosteroids (prednisone) 0.5 mg/kg x 5-10 days –or-
• Joint injection (exclude infection first)
URATE LOWERING THERAPY

• Medications
  • Xanthine Oxidase Inhibitors (XOI):
    • Stop purine metabolism
    • Uric acid doesn’t form
  • Uricosurics: increase renal excretion of uric acid
  • Uricase: converts uric acid to allantoin

• Indications
  • 1 gout attack & chronic kidney disease
  • Tophi
  • ≥ 2 attacks/year
  • History of urolithiasis
CPP (CALCIUM PYROPHOSPHATE) ARTHRITIS

• Deposition of calcium pyrophosphate (CPP) crystals in...
  • articular cartilage
  • Menisci
  • synovium or
  • periarticular tissues
• Associated with aging
• Disease associations:
  • Hyperparathyroidism,
  • Hemochromatosis
  • Trauma
  • Hypophosphatasia
  • Hypomagnesemia
CLINICAL PRESENTATIONS

• Acute CPP (Previously called pseudogout)
• Chronic CPP crystal inflammatory arthritis
  • Previously called pseudo-rheumatoid
  • Polyarticular, symmetric arthritis involving small joints of hands and feet
• OA with CPP (previously called Pseudo-osteoarthritis)
• Asymptomatic CPP
  • Previously called Lanthanic or “silent”
  • seen only on X-ray with no symptoms
CRYSTAL DIAGNOSIS

- Weakly birefringent
- Positive birefringence
  - Aligned
  - Blue
  - Calcium
- Rhomboid crystals
- Intracellular
- Inflammatory SF fluid
- CPP arthritis and infection can coexist
RADIOLOGIC FEATURES

- **Cartilage Calcification** (previously called chondrocalcinosis)
- *Normal mineralization*
- *Uniform joint space loss*
- *No erosions*
- *Variable osteophyte formation*

**Locations:**
- knees, hands, symphysis
- *also hips, shoulders and elbows*
CARTILAGE CALCIFICATION (CHONDROCALCINOSIS)

- Deposition of CPP crystals into fibrous or hyaline cartilage
- Wrists, knees, symphysis
CARTILAGE CALCIFICATION (CHONDROCALCINOSIS)
THERAPY FOR ACUTE CPP (SIMILAR TO GOUT)

- Corticosteroid injection
- NSAIDs
- Colchicine
- Oral corticosteroids
QUESTIONS?
CASE

• 19 yo woman seen in the ER/ETC with joint pain and fever
  • Started 11 days ago with sore throat and fatigue.
  • 7 days ago, nasal congestion, oral ulcers and cervical adenopathy developed
  • 1 day ago, developed nausea, vomiting, shaking chills and abdominal pain
  • Today – pain in right elbow and diffuse myalgias

• PMH: Acne, Allergic rhinitis
• SHx: College student; Tob: None; ETOH: “social”
• Meds: OCP

• PE:
  • 38.6  105  120/84  appears ill
  • R elbow swollen/painful
  • Tenderness over L Achilles tendon
  • Skin...
  • Rest normal

• WBC 22  Hgb 10.5  MCV 88  Plts 247; Creat 0.9; ALT 38, ALP 72; ESR 36; CRP 5.1 mg/dl
• Differential Diagnosis?
• Next steps?
  • Diagnostically
  • Therapy
SEPTIC ARTHRITIS

- Pathogenesis: hematogenous spread
- Most common bacterial organisms
  - S. aureus – most common
  - N. gonorrhea in young, sexually active patients
    - Pseudomonas in IV drug abusers
    - Salmonella in those with sickle cell anemia
    - Polymicrobial in immunocompromised
- Diagnosis: Arthrocentesis (Don’t hesitate, aspirate!) → Culture and Sensitivity
- Management: parenteral antibiotics
CLINICAL FEATURES

- Joint pain and erythema
  - Knee >> Others
- Severely affected Range of Motion (ROM)
- Fever, elevated WBC and ESR in most
- Monoarticular (80%) – migratory joints in gonococcal
- Disseminated Gonococcal Infections: Rash
DIAGNOSIS:
SYNOVIAL FLUID

- Viscosity low
- Opaque or purulent
- WBC usually > 50,000 (> 90% PMN)
- Crystals do not rule out infection
DIAGNOSIS: CULTURES

• Synovial Fluid
  • positive in nearly 100% (with Staph)
  • synovial biopsy (& culture) increases yield
  • gram stain (centrifuged) positive
    • 75% with staph
    • 50% with gram negatives

• Blood: positive in 50%

• Culture any potential site
  • GC – Urethra (men)
  • GC – Cervix (women)
THERAPY:
ANTIBIOTICS

• **Parenteral**  (*not intra-articular*)

• **Empiric therapy** (*guided by gram stain, demographics and underlying illnesses*)
  
  • **Gram Stain:**
    
    • GPC with low MRSA: Cefazolin
    
    • GPC with High MRSA: Vancomycin
    
    • GNC: Ceftriaxone
    
    • GNR: Cefepime or Pip/Tazo
  
  • **No Organisms**
    
    • Low MRSA – Cefazolin
    
    • MRSA high – Vanc + (Cefepime or Pip/Tazo)
QUESTIONS?
PEARLS
INFECTED JOINTS
HOW NOT TO MISS….

- Usually monoarticular
- Patients look sick
- Knee is most common location
- Beware Disseminated GC
  - Young, sexually active patient
  - Tenosynovitis
  - Rash (small papules – patient may not know)
  - Migratory joint complaints
MALIGNANCY:
HOW NOT TO MISS…

- In General
  - Night time pain
  - Systemic features
    - Weight loss
    - Severe fatigue
  - X-ray abnormalities
    - Periosteal elevation
    - Focal destructive lesions

- Osteodysrophy
  - Dependent pain
  - Periosteal elevation

- Metastatic Disease
  - Usually monoarticular

- Carcinomatous Polyarthritis
  - Spares PIPs, MCPs

- Leukemia
  - Children – asymmetric polyarticular
CASE

- 56 yo woman presents with right knee pain; started 2 months ago – no clear precipitating event; associated with swelling and warmth; no fever, chills or sweats; naproxen 440 mg twice daily helps somewhat but not completely; she now has difficulty walking and sleeping because of the pain; Other review of systems negative in detail.
- PMH: Hypertension, Hyperlipidemia
- Medications: Metoprolol 100 mg BID, Atorvastatin ( ) mg daily; aspirin 81 mg daily
- Tobacco: none Alcohol: 3-5/week Homemaker
- Exam: 37.6 C 74 118/72 comfortable sitting in the chair; Right knee with small-moderate effusion and warmth. Ligaments are stable. MacMurray negative.
- WBC 11.4 Hgb 12.2, MCV 86, PLTs 320; Total Protein 6.5, Albumin 3.5, ALP 89, ALT 17, Creatinine 0.8; ESR 34, CRP 1.5
• Differential Diagnosis?
• Next steps?
  • Diagnostically
  • Therapy
CASE

- 48 yo man with left ankle pain; Started 2 weeks ago – no precipitating event; Seen by local physician – gout suspected; Given naproxen 500 BID with improvement; Near resolution until yesterday – worse; History of gout – one attack 5 years ago; This attack just like others
- PMH: HTN, Gout
- SH: Works full time Tobacco: 1 pack/day; ETOH – gallon beer/day
- Meds: ACE inhibitor
- Exam: 37.8 93 142/92 Appears uncomfortable; Left ankle swollen, warm and tender, especially around lateral malleolus; No tophi; Rest normal
- WBC 8.9  Hgb 15.1  MCV 99  Plts 250  Potassium 4.3  Creatinine 1.1; Uric Acid 14.1; ESR 18  CRP < 0.5
CASE (CONTINUED)

- Differential Diagnosis?
- Next steps?
  - Diagnostically
  - Therapy
KEY POINTS: MONOARTHRITIS

- Medical Emergency
- Aspiration: most important initial step
- Differential Diagnosis
  - Septic Joint
  - Crystals
  - Trauma
  - Tumor
  - Others

- Infection
  - Gonococcal
    - migratory tenosynovitis
    - young, sexually active pt
    - look for the rash
  - Staph
    - Most common
    - usually knee
    - Pre-existing joint damage

- Crystals
  - Gout: Acute MTP arthritis
  - CPP Arthritis:
    - Acute Knee/Wrist arthritis
    - Older patient
QUESTIONS?