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RHEUMATOLOGY ADVANCED PRACTICE PROVIDERS

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VIRTUAL CONFERENCE

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Monoarticular Arthritis

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Faculty Disclosures

Michele Cerra, MSN, FNP-C

Speakers Bureau: Abbvie, Amgen, Novartis, Janssen

Common Causes

Inflammatory Causes

Infection

- Bacteria
- Fungi
- Mycobacteria
- Virus (HIV, Hepatitis B, others)

Crystal-induced arthritis

- Monosodium Urate (Gout)
- Calcium pyrophosphate dihydrate
- Calcium oxalate

Common Causes

Autoimmune systemic inflammatory disorders

- Spondyloarthritis
  - **Reactive arthritis**
  - **Psoriatic arthritis**
  - **Inflammatory bowel disease-associated arthritis**
- Rheumatoid arthritis
- Systemic lupus erythematosus
- Sarcoidosis

Common Causes

Non-inflammatory Causes

- Trauma
- Internal derangements
- Osteoarthritis
- Malignancy
- Foreign bodies

Evaluation

History of Present Illness

- Pain
  - Location, quality, time of onset (morning stiffness), exacerbating, remitting factors, severity, duration
- Acuity of onset (abrupt, gradual)
- Problem is new or recurrent
- Patterns (persistent vs intermittent)
- Associated symptoms (swelling)
- Any recent or past trauma to the joint
- Unprotected sexual contact
- Travel history or recent tick bites

Review of Systems

- **Constitutional**
  - Fever, fatigue, weight loss, night sweats
- **HEENT**
  - Adenopathy, alopecia, oral/nasal ulcers, dry mouth
  - Conjunctivitis, uveitis, scleritis, dry eyes
- **Cardiac/Pulmonary**
  - Chest pain, pleuritic chest pain, dyspnea
- **GI/GU Involvement**
  - Urethritis
  - History of abdominal pain, diarrhea or bloody stools, recent GI infections
- **Dermatologic**
  - Rash, hx of psoriasis, Raynaud's, alopecia

Past Medical History

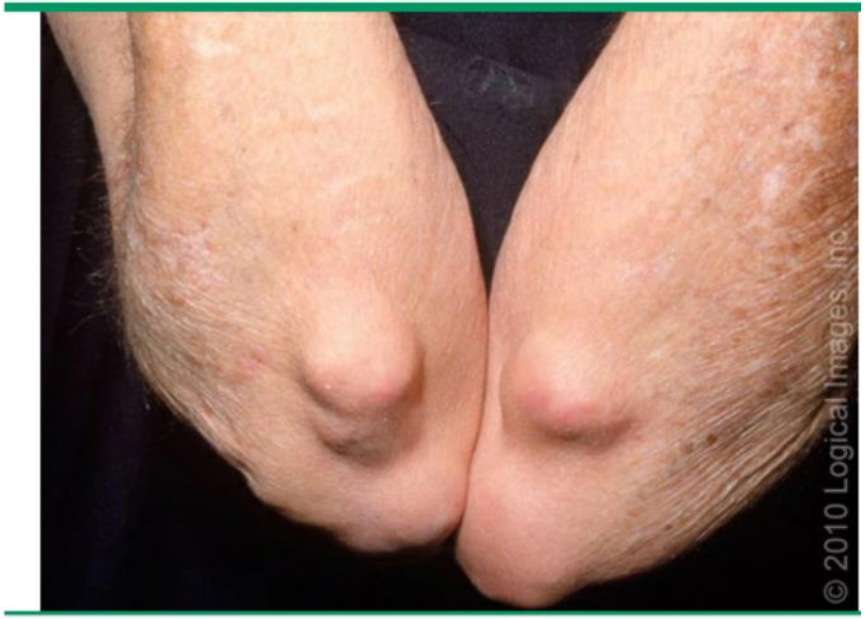
- Pain is chronic or recurrent
- History of known joint disorders (particularly gout and osteoarthritis)
- Current Medications history (anticoagulants, quinolone antibiotics)
- Family history
- History of immunosuppression
- History of chronic renal disease

Physical Examination

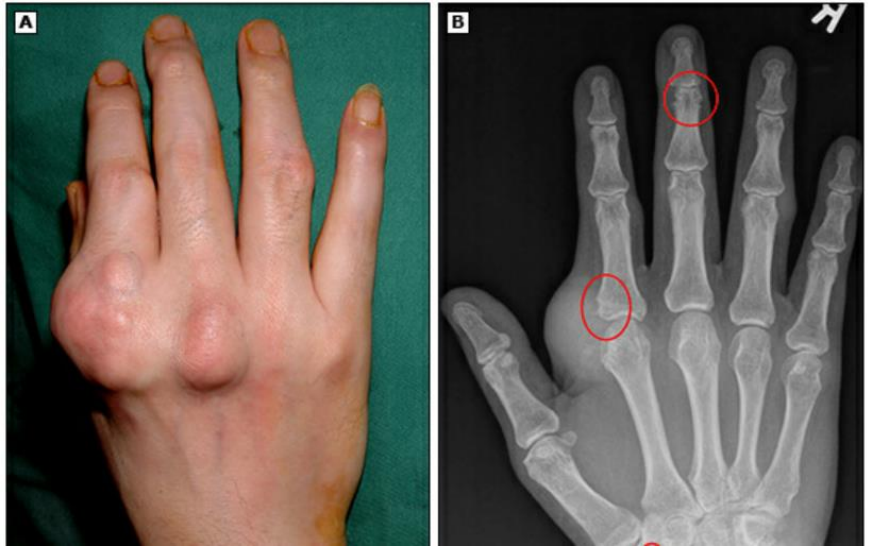
A complete physical examination which include skin and nails, eyes, genitals, mucosal surfaces, heart, lungs, abdomen, nose, neck, lymph nodes, neurologic system.

Physical Exam

Rheumatoid nodules



Inflamed gouty tophi



Red Flags

- Erythema, warmth, effusion, and decreased range of motion
- Fever with acute joint pain
- Acute joint pain in a sexually active young adult
- Skin breaks with signs of cellulitis adjacent to the affected joint
- Underlying bleeding disorder or use of anticoagulants
- Systemic or extra-articular symptoms

Laboratory Evaluation

- **Joint aspiration (arthrocentesis)**
  - **Categorizing the effusion as noninflammatory, inflammatory, hemorrhagic, or septic**
    - **Gross appearance**
    - **Cell count with differential**
      - ≥2,000 white blood cells/mm^3 is considered inflammatory
      - >10,000/mm^3) with higher proportion of PMN leukocytes (eg, >90 percent) is higher likelihood of septic arthritis
    - **Gram stain and cultures**.
      - Bacterial, fungal, TB, aerobic and anaerobic or request special medial if needed
    - **Microscopic examination for crystals**
      - Presence of crystals does not exclude infection

Laboratory Evaluation

Categories of synovial fluid based upon clinical and laboratory findings

Measure	Normal	Noninflammatory	Inflammatory	Septic	Hemorrhagic
Volume, mL (knee)	<3.5	Often >3.5	Often >3.5	Often >3.5	Usually >3.5
Clarity	Transparent	Transparent	Translucent-opaque	Opaque	Bloody
Color	Clear	Yellow	Yellow	Yellow	Red
Viscosity	High	High	Low	Variable	Variable
White blood cell, per microL	<200	0 to 2000	>2000*	>20,000¶	Variable
Polymorphonuclear leukocytes, percent	<25	<25	≥50	≥75	50 to 75
Culture	Negative	Negative	Negative	Often positive	Negative

*Inflammatory arthritis may include septic arthritis.
¶Septic arthritis is typically associated with synovial fluid white blood cell counts >20,000 cells/microL, but lower counts may be observed, especially for arthritis due to disseminated gonococcal infection. With most bacterial organisms, particularly *Staphylococcus aureus*, the fluid white blood cells count is typically >50,000 cells/microL (and often >100,000 cells/microL).

Laboratory Evaluation

- CBC with Differential
- Liver and kidney function panels
- Inflammatory markers (ESR, CRP)
- Coagulation studies (if bloody synovial fluid)
- Blood cultures
- Sexually active (culture of skin and genital lesions)
- Serum uric acid level if gout is suspected
- ANA, RF, CCP, HLA-B27 (if systemic symptoms)
- Lyme disease titers (if suspected)

Imaging

- **Plain Radiographs**
  - Fractures, tumors
  - Joint Effusion
  - Chondrocalcinonsis (CPPD Crystals)
  - Tophaceous erosions
  - Joint space narrowing with or without erosions
  - Soft tissue calcification
    (or calcific tendonitis)

Imaging

- **Ultrasound**
  - More sensitive than physical exam in the detection of synovitis
  - Can also be used to guide joint aspirations and injections
- **MRI**
  - Useful for diagnosing effusions in deep-seated joints such as the hips and shoulders
  - Used to distinguish synovitis from ligamentous or other soft tissue injuries or abnormalities
- **CT Scan**
  - Difficult-to-access areas such as the hip, sacroiliac, or sternoclavicular joints
- **Synovial Biopsy**
  - Refractory case, atypical infection, sarcoidosis

Key Points

- Infection is the most common cause of acute nontraumatic monoarthritis in young adults, whereas osteoarthritis is the most common cause in older adults.
- Crystals in synovial fluid confirm crystal-induced arthritis but do not rule out coexisting infection.
- Do not use serum urate level to diagnose gout.
- Joint pain that is still unexplained after arthrocentesis and x-ray should be evaluated with MRI to rule out uncommon etiologies (eg, occult fracture, osteonecrosis, pigmented villonodular synovitis) and molecular techniques, such as polymerase chain reaction, should be done to detect the presence of microorganisms.

Case Study

33-year-old male with right knee pain and swelling

HPI:

- Onset: Gradual, pain and swelling, progressive over weeks
- Injuries: None
- Stiffness: Yes, lasting over an hour in morning
- Other joint problems: Low back pain, smoldering since age 13
- Family history: No gout, father with arthritis.
- Social history: No risk factors for HIV/STD, occasional social drink

Physical Exam

- Low-grade synovitis of the left knee
- In his feet he had several sausage digit deformities (dactylitis)
- His fingernails revealed pitting and onycholysis
- Local tenderness over left SI joint

Diagnostic Testing

- **Labs**
  - CBC, Chemistry Profile
  - ESR CRP
  - RF, CCP, ANA, HLA-B27
- **Arthrocentesis**
- **Imaging**
  - Knees, Feet, SI joints

Results

- CBC: normal
- **ESR: 42mm/hr; CRP: 4.5 (0.4)**
- Chemistry profile: uric acid normal
- RF, anti-CCP, ANA: all negative
- **HLA-B27: positive**
- **Arthrocentesis: WBC 8,000**, No crystals
- X-rays of knees/feet and SI joints: normal

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Diagnosis

Psoriatic Arthritis

Case Study

- 24 yoAfrican American female.
- PMH:
- SLE dx at 18 yo(+ANA 1:2560, +Smith, +RNP, +Ro/La antibodies, elevated ds antiDNA, low C4.
- Lupus nephritis-biopsy Class V.
- Discoid lesions.
- Pregnancy on methotrexate.

Physical Exam

- Presented to clinic with acute onset of fever-100.7, chills, severe fatigue, & decreased energy.
- C/O painful “bumps” on legs, feet, arms, and hands. Difficulty walking, feet were “painful”.
- Skin with scattered erythematous macules B hands and arms. Pustular papules over R arm, B thighs & B foot, painful to palpation.
- R dorsum of hand and wrist swollen, erythematous and warm to touch.

Past Medical History

- Multiple PE’s.
- CAP
- Medications: HCQ 200 mg po bid, MMF 1500 mg BID & prednisone 5 mg QD. Amlodipine 10 mg QD and Benazepril 40 QD for renal protection.
- Contraception: IUD.

Plan

- Triaged to the Duke ED for suspected septic joint. Underwent joint arthrocentesis for 25 cc bloody synovial fluid. Dermatology consulted for skin rash. Orthopedics and Infectious disease consulted for ? septic arthritis.
- Labs:WBC-20K, CRP-4.99, ESR-85.
- Joint fluid sent for culture & sensitivity, Blood cultures obtained, STD work up completed.
- MRI R hand/wrist: marked synovitis throughout the carpus and involving the bases of the proximal 2nd-4th MCP's. No definite erosions or cortical destruction is identified. The overall appearance raises suspicion for intra-articular infection, including the possibility of indolent or atypical organisms.

Diagnosis

- Blood cultures returned positive for Neisseria Gonorrhea. Urine + for GC/chlamydia.
- **Dxwith disseminated gonococcal infection.**
- Treatment: IV ceftriaxone and 1 gm oral azithromycin. Discharged home on ceftriaxone IV 2 gms Q 24 hrs for 2 weeks.

General Algorithm

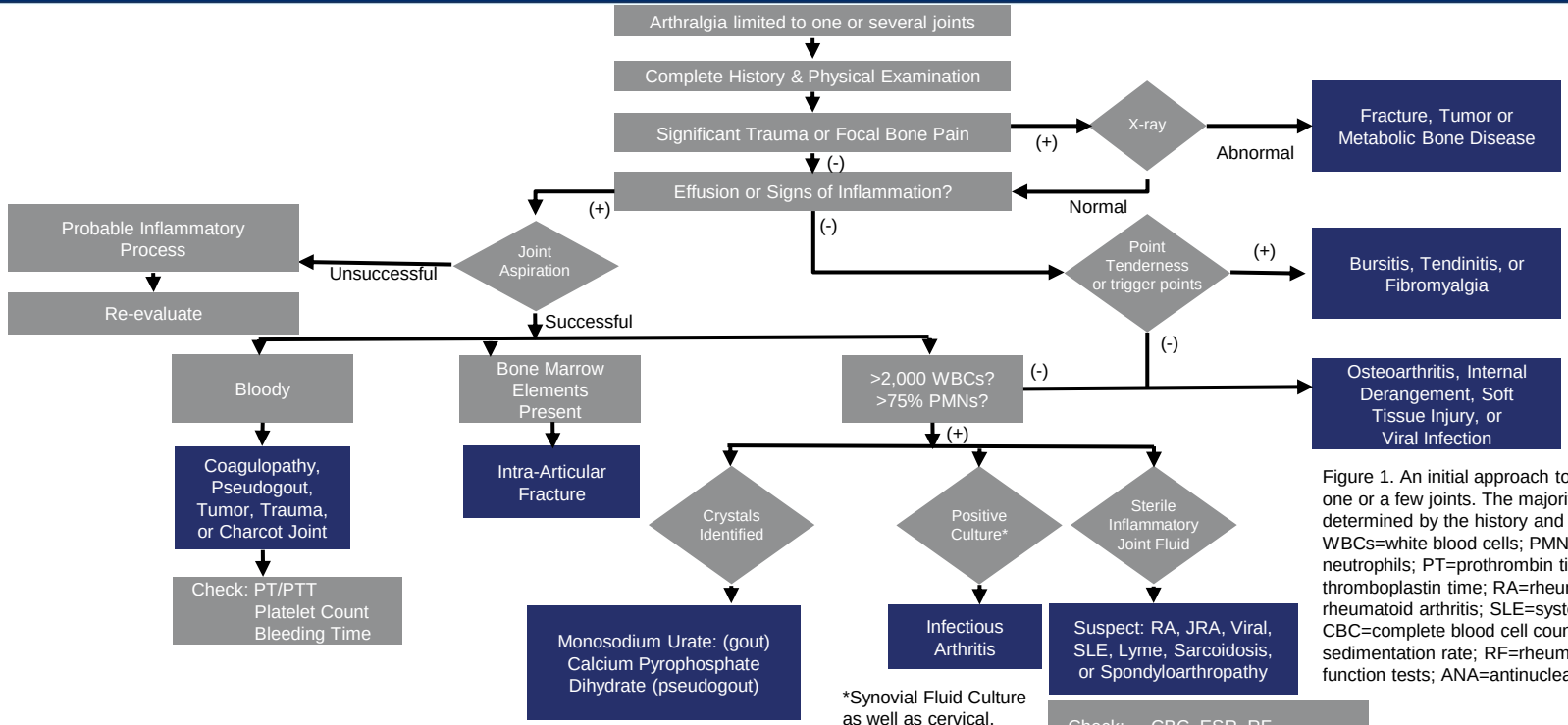

Figure 1. An initial approach to the patient with symptoms in one or a few joints. The majority of diagnoses will be determined by the history and physical examination. WBCs=white blood cells; PMNs=polymorphonuclear neutrophils; PT=prothrombin time; PTT= partial thromboplastin time; RA=rheumatoid arthritis; JRA=juvenile rheumatoid arthritis; SLE=systemic lupus erythematosus; CBC=complete blood cell count; ESR=erythrocyte sedimentation rate; RF=rheumatoid factor; LTFs=liver function tests; ANA=antinuclear antibodies.

*Synovial Fluid Culture as well as cervical, urethral, pharyngeal, and/or rectal evaluations for Gonococcus and Chlamydia when suspected

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- *Arthritis and Rheumatism*, Vol 39, No. 1, January 1996, pp 1-8 Copyrighted 1996, American College of Rheumatology

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Questions?

Thank You!