

Monoarticular Arthritis

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Anatomy

3 types of joints: synarthrosis (skull suture lines), amphiarthrosis (e.g. pubic symphysis), and diarthrosis (e.g. shoulder, knee, etc.)

Degenerative Arthritis (Osteoarthritis)

- Most common form of arthritis in adults. Risk factors include obesity and prior injury. Trauma, activity, and weather change can exacerbate symptoms.
- Osteophytes: Bouchard's nodes at PIP joints, Heberden's nodes at DIP joints.
- Treatment: NSAIDs, rest, ice for acute exacerbation; acetaminophen, strengthening, weight loss for chronic symptoms.

Crystalline arthropathy

Gout

- Caused by monosodium urate crystal formation. Risk factors include thiazides and alcohol.
- The MTP joint is the most common site (Podagra) followed by the knee, ankle, and tarsal joints.
- Presents with warmth, erythema, swelling, and pain with movement of the affected joint.
- Serum uric acid levels are not helpful in ruling in or out disease. Diagnosis confirmed by the presence of needle-shaped, negatively birefringent crystals on synovial fluid microscopy.
- Treatment: 1st line = colchicine or NSAIDs; 2nd line = glucocorticoids.

Pseudogout

- Caused by deposition of calcium pyrophosphate. Often manifested by chondrocalcinosis on x-rays: calcification of the synovium and surrounding ligaments.
- Presentation is similar to gout. Diagnosis is made by the identification of rhomboidal, weakly positive birefringent crystals on

synovial fluid microscopy.

- Treatment is primarily with NSAIDs or glucocorticoids (colchicine may not be effective).

Septic Arthritis: 3 routes of infection: 1) hematogenous spread, 2) direct inoculation, and 3) contiguous spread.

Pediatric Septic Arthritis

- Primarily occurs by hematogenous spread, and 80-90% of cases involve the lower extremities (knees and hips most common). Can lead to avascular necrosis, particularly when the hip is involved in children < 1 year of age.
- Clinical presentation may be nonspecific or vague, particularly in the preverbal child (limp, decreased ROM, "pseudoparalysis," fever, sepsis, irritability). Erythema, warmth, and swelling are frequently noted over the joint; fever is absent in up to 1/3 of cases.
- The peripheral WBC is < 15K in about 1/2 of pediatric cases. ESR and CRP are not diagnostic. X-rays should be obtained to r/o fracture or other bony abnormality. Joint fluid should be sent for cell count/diff, gram stain, and culture; blood cultures should be sent as well.

< 2 months	<i>S. aureus</i> , Group B strep, gram-negative coliforms	vanc + cefotaxime
2 month - 5 years	<i>S aureus</i> , Group A strep, <i>S. pneumoniae</i>	clinda or vanc
5 years to adolescence	<i>S. aureus</i> , group A strep, <i>N. gonorrhea</i>	clinda or vanc + ceftriaxone

- Parenteral antibiotics should be tailored to the most likely bacteria based on age group:
- *N. gonorrhea* can also be seen in neonates. Patients with sickle cell disease are susceptible to *Salmonella* infections and should also be treated with a 3rd generation cephalosporin.

Adult Non-Gonococcal Septic Arthritis

- Risk factors include IV drug abuse, HIV, DM, immunocompromise, chronic arthritis, and prosthetic joints. Most commonly occurs by hematogenous spread.
- Predominantly involves gram positive organisms (75-90% of cases), most commonly *S. aureus*, though gram negative bacilli are involved in 10-20% of cases. *Pseudomonas* and *S. aureus* are most common in IV drug abusers.
- The absence of most risk factors (age > 80, HIV, DM) and exam findings (swelling, tenderness, erythema, warmth, fever) do not reliably exclude SA. The presence of a skin infection overlying a prosthetic joint is highly concerning for SA, while the absence of pain with joint movement essentially rules it out.
- Serum WBC, CRP, and ESR also perform poorly at ruling in or out disease. A synovial WBC < 1,700 makes the probability of SA in a native joint unlikely (negative LR 0.07). A synovial WBC > 100K makes the diagnosis highly likely (positive LR 13.2). A synovial WBC in between these values is not diagnostic by itself. Synovial lactate, while promising, is not yet ready to be used in evaluating SA.
- Treatment involves surgical arthrotomy with irrigation and debridement, though some studies suggest serial aspiration may be as effective. IV antibiotics should be used in conjunction with either treatment modality.
- **Prosthetic joint infection** is divided into early, delayed, and late types. Much lower synovial WBCs are seen compared to native joint SA, and WBC of 1,700 is sufficient to make the diagnosis. Treatment involves hardware removal, antibiotic spacers or beads, and IV antibiotics. When SA is suspected in a prosthetic joint, evaluation should proceed in consultation with the orthopedist.

Gonococcal Septic Arthritis

- The most common form of joint infection in sexually active patients. Less likely to result in joint destruction than nongonococcal SA. Systemic gonococcal infections occur in 0.5-3% of infected patients.
- Two musculoskeletal syndrome associated with systemic

gonococcus.

- Disseminated gonococcal infection: bacteremia, diffuse migratory arthralgias, tenosynovitis, and skin lesions. Not typically associated with purulent arthritis, but some overlap does occur.
- Localized purulent septic arthritis, more often oligoarticular than monoarticular.
- Synovial and blood cultures only positive in 10-50% of cases, so cervical, urethral, rectal, and pharyngeal cultures should be obtained. The synovial WBC is typically lower than in nongonococcal SA.
- Treatment involves parenteral third-generation cephalosporins (i.e. ceftriaxone).

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