Objectives

- be able to define **Septic Arthritis**
- know what factors predispose to development of joint infection, what **Bacteria** commonly cause joint infections
- be able to list the most **Common Pathogens** causing septic arthritis.
- be able to distinguish **Gonococcal Arthritis** from other forms of bacterial septic arthritis
**Definition**

- Inflammation of a synovial membrane with purulent effusion into the joint capsule, often due to bacterial infection
- Monoarthritis > oligoarthritis > polyarthritis
Frequency

- 2-10 cases per 100,000 in the general population

- 30-70 cases per 100,000 in patients with immunological disorders or deficiencies, and joint replacements
Etiology

• In all age groups, 80% due to gram-positive aerobes, 20% due to gram-negative anaerobes

• Neonates and infants < 6mos  *S. aureus* and gram-negative anaerobes
  
  – Incidence of *H. influenzae* has decreased due to the vaccine
Pathophysiology

• Adults
  – Knee 40-50 %
  – Hip 20-25 %
  – Infants and young children Hip 95 %

• Sacroiliac joint is affected in brucellosis
• Interphalangeal joints: human and animal bites
Septic Arthritis

Joints Involved

Knee | Hip | Ankle | Shoulder | Wrist | Elbow | Other | Polyart
---|---|---|---|---|---|---|---
60 | 10 | 20 | 30 | 40 | 50 | 60 | 0
Pathogenesis

1. Hematogenous
2. Dissemination from osteomyelitis
3. Spread from adjacent soft tissue infection
4. Diagnostic or therapeutic measures
5. Penetrating damage by puncture or cutting.
A Big Problem

• Despite advances in diagnostic studies, powerful antibiotics, and early drainage, significant joint destruction commonly occurs

• **Why?**
  – Lack of clinical suspicion
  – Delay in definitive diagnostic needle aspiration
  – Failure to adequately drain the joint
ANY
ACUTE MONOARTHRITIS
IS SEPTIC UNTIL
PROVEN OTHERWISE !!
SEPTIC ARTHRITIS
Differential Diagnosis

- Rheumatic fever
- Acute juvenile arthritis
- RA, gout, reactive arthritis
- Viral arthritis
- Fungal arthritis
- Tuberculous arthritis
- Osteomyelitis
- Cellulitis
- Bleeding into the joint (hemarthrosis)
Risk Factors for Development of Septic Arthritis

- Age >80 yr
- Diabetes mellitus
- a prosthetic joint in the knee or the hip
- Recent joint surgery
- Skin infection
- Previous septic arthritis
- Recent intra-articular injection
Risk Factors for Development of Septic Arthritis

- HIV or AIDS
- Intravenous drug abuse
- End-stage renal disease on hemodialysis
- Advanced hepatic disease
- Hemophilia
- Sickle cell disease
- Underlying malignancy
Clinical Presentation
“red, hot, painful joint”

- Fever
- Erythema
- Edema
- Heat
- Pain
- Markedly decreased passive and active Movement
Pediatric Presentation

- Fever, decreased appetite and irritability without obvious joint involvement is common

- **Differentiation from transient synovitis important:** 4 independent variables
  - History of fever
  - Non-weight-bearing
  - ESR > 40mm/h
  - WBC > 12,000/uL
Disseminated gonococcal infection

• Occurs in 1-3% on patients infected with GC
• Most patients have arthritis or arthralgia as a principal manifestation
• Common cause of acute non-traumatic mono- or oligo-arthritis in the healthy host
Gonococcal arthritis

Presentation

- Tenosynovitis, rash, polyarthralgia
  - Wrist, finger, ankle, toe
  - Painless pustules or vesicles***
  - Fever and malaise
  - Synovial cultures usually negative
  - Urethral and cervical cultures may be helpful

- Purulent arthritis
  - Knee, wrist, or ankle most common
  - Synovial cultures usually positive

- These two presentations may overlap
Gonococcal arthritis

Host factors

- women 3x > men
- Recent menstruation
- Pregnancy or immediate postpartum state
- Complement deficiency (C5-C9)
- SLE
Gonococcal arthritis

Other considerations

• Consider screening/treating for chlamydia
• HIV testing
• Syphilis testing
• Screen the sexual partner
IV Drug users

• **Multiple risk factors for septic arthritis**
  – Soft tissue infections,
  – transient bacteremias,
  – other comorbidities: hepatitis, endocarditis, HIV

• **Unusual sites**
  – Fibrocartilagenous joints- SC, costochondral, symphysis

• **Unusual organisms**
  – S. aureus still most common
  – Gram negative infections next most common
    • Pseudomonas, Serratia, Enterobacter sp.
  – Candida
Prosthetic joint infections

- **Stage I** within 3 months of surgery
  - Usually transmitted at the time of surgery
  - Staph and other gram positives most common

- **Stage II** 3-24 months

- **Stage III** >2 years post-surgery
  - Usually caused by hematogenous spread to abnormal joint surfaces
Prosthetic joint infections

- Synovial fluid analysis
- May require biopsy

- If cultures are positive:
  - Remove prosthesis
  - Treat with suitable antibiotics
  - Reoperate
    - Revision is at high risk for recurrent infection
Polyarticular Septic Arthritis

• More likely to be over 60 years

• High prevalence with RA

• Staph and Strep most common

• **POOR PROGNOSIS**
  – 32% mortality (compared to 4% with monoarticular disease)
"Of course I'll need to run some tests; but offhand I'd say it's some sort of fungus infection."
Synovial fluid analysis is essential in the diagnosis of infectious arthritis.
Synovial Fluid Analysis in Septic Arthritis

- **Cell count**: $>50,000\;\text{wbcs/mm}^3$
- **Differential**: $>75\%\;\text{PMNs}$
- **Glucose**: Low
- **Gram stain**: relatively insensitive test
- **Culture**: positive

Always use a wide bore needle when you suspect infection, as pus may be very viscous and difficult to aspirate.
When to order special cultures

- History of TB exposure
- Trauma
- Animal bite
- Live in or travel to endemic sites for Fungi or Borrelia
- Immunocompromised host
- Unresponsive to conventional therapy
Special Populations

- Prosthetic joints
- Patients on TNF inhibitors
- Sickle cell anemia
- HIV disease
- Transplant setting
Always look at where you're going...
Management

- **Joint aspiration**
  - Daily or more frequently as needed.

- **Antibiotic therapy**
  - Based on gram stain/culture and clinical factors
  - Duration is variable and depends on organism and host factors

- **Surgical intervention**
  - Only necessary if pt is not responding after 48 hrs of appropriate therapy
Empiric Therapy for Septic Arthritis

- You must cover Staph and Strep
  - Oxacillin nafcillin cephazoline clindamycin
  - Vanco if PCN-allergic or if concern for MRSA
- If infection is hospital acquired or prosthetic joint- cover gram negatives
  - 3rd generation cephalosporin, pepracilin genta
- Empiric coverage for GC is recommended because of the high prevalence rate
Gonococcal Arthritis

- Ceftriaxone 1gm IV or IM q24 hours
- Spectinomycin 2 gm IV or IM q12 hours for ceph allergic patients
- Fluoroquinolones
*CDC guidelines recommend treating of septic arthritis for at least 7 days.

Patients with purulent arthritis may need a longer duration of therapy.
Take Home Points

• **Acute monoarthritis** is septic until proven otherwise

• **Synovial fluid analysis** must be performed for diagnosis and to document clearance of infection

• Choose **appropriate empiric abx**

• Consider unusual pathogens in the setting of **immuno disorders**

• perform **Consultation to ortho** if not improving with aggressive percutaneous drainage and abx
Thank you

Please your Dua’a for SYRIA
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#سوريا#