Septic Arthritis

Disclaimer

See also:

- Adult Sepsis Syndrome (including Meningitis)
- Bone and Joint Infections in Children

Contents

Disclaimer ........................................................................................................................................... 1
Red Flags ......................................................................................................................................... 2
Background – About Septic Arthritis ............................................................................................... 2
Assessment ....................................................................................................................................... 2
Management ..................................................................................................................................... 4
Referral ............................................................................................................................................ 5
Information ....................................................................................................................................... 6
For health professionals .................................................................................................................... 6
For patients ....................................................................................................................................... 6
Disclaimer ....................................................................................................................................... 6
Red Flags

- Signs of shock
- Recurrence of acute inflammation in a joint previously treated for infection
- Immunosuppressed, including inflammatory arthritis

Background – About Septic Arthritis

- Septic arthritis is a dangerous and destructive form of acute arthritis:
  - usually caused by haematogenous spread of bacteria to the joint, and
  - occasionally by direct inoculation e.g., local bone, perforated diverticulum, local wound or injection.
- Unrecognised or inadequately treated septic arthritis may cause permanent joint damage or death in up to 11% of patients.
- Staphylococcus aureus is the most common pathogen.
- Gonococcal infections are a rare but important cause in sexually active adults, can be polyarticular and slow to culture, although there is often less associated morbidity due to less articular damage.
- Oral antibiotics are not usually sufficient treatment. Most patients require hospital admission, intravenous (IV) antibiotics and joint wash-out.

Assessment

1. Take a history of symptoms.

   **Symptoms**
   - **Features of pain:**
     - Sudden onset suggests a mechanical cause.
     - Pain over hours to a day suggests septic arthritis, gout, or inflammatory arthritis.
     - Pain that is worse:
       - with any movement (very painful), suggests septic arthritis.
       - after rest, suggests inflammatory arthritis.
       - with activity, suggests osteoarthritis.

   - Previous joint swelling suggests gout or inflammatory arthritis.
   - Systemic symptoms of sepsis, e.g. fever, rash, or myalgia suggest joint infection. Low-grade fevers may occur with gout.
   - Infections elsewhere suggest reactive arthritis, e.g. gonorrhoea, chlamydia, gastroenteritis, rheumatic fever.
   - Extra-articular symptoms, e.g. nodules, eye irritation, bowel symptoms, or rash, suggest gout, inflammatory arthritis, or sarcoidosis.
2. Check for **predisposing factors**.

**Predisposing factors**  
May include:  
- Aged > 80 years  
- Conditions with a joint focus for infection:  
  - Prosthetic joint  
  - Gout  
  - Osteoarthritis  
  - Recent joint injury or surgery  
  - Previous intra-articular corticosteroid injection  
  - Tuberculosis  
  - Sexually active adult with other signs of gonococcal infection  
- Chronic immunosuppressive conditions:  
  - Diabetes mellitus  
  - Rheumatoid arthritis  
  - Alcoholism  
  - Poor nutrition  
  - Intravenous drug abuse  
  - Skin infection, cutaneous ulcers  

*Combinations of independent factors substantially increase risk.*

3. Perform examination looking for **signs suggesting sepsis**. If sepsis suspected, manage as per Adult Sepsis Syndrome.

**Signs suggesting sepsis**  
*Infection confirmed or suspected plus:*  
- Temperature > 38.3C or < 36C (but normal temperature does not exclude sepsis)  
- Respiratory rate > 20/min  
- Heart rate > 90/min  
- Acute confusion or decreased level of consciousness  
- Hyperglycaemia (blood glucose > 7.7 mmol/L in patient without diabetes)  
- Oliguria (urine output < 0.5 mL/kg/hour)  

4. Consider septic arthritis if:  
  - rapid onset of a swollen, tender, exquisitely **painful joint**.  

**Painful joint**  
- A single large joint is usually involved, especially the knee (> 50%). Other joints include wrist, ankle, hip, and shoulder – but can occur anywhere.  
- More than one joint is involved in about 20% of patients with septic arthritis.  
  - redness around the joint – diagnosis may be either infection or gout.
associated fevers or systemically unwell.

5. Arrange investigations:

- Consider performing a joint fluid aspiration in the practice if skilled and confident, the results will be available immediately, and if the transfer to the Emergency Department involves significant delay. If septic arthritis is suspected, it is mandatory to aspirate the joint before antibiotics are started.

**Aspiration results**

- If septic arthritis is likely, synovial fluid white cell count (WCC) will be between 50,000 and 150,000 with neutrophil predominance. The higher the WCC, the more likely a septic process.
- Gram stain sensitivity 30 to 50% and needs to be interpreted with whole clinical picture in mind.
- Synovial fluid culture will positive > 60% of the time in non-gonococcal infections – but will take hours, so do not wait before starting antibiotics for most likely pathogen.

**Joint fluid aspiration**

- Never aspirate a prosthetic joint. This must be performed by a specialist in theatre.
- Ensure that aspirating the joint does not require imaging control. Ultrasound control and possibly theatre is required for deeper joints, including shoulder and hip.
- Use strict aseptic technique.
- Ensure access to immediate pathology reporting.
- Request Gram stain, bacterial culture, white cell count (WCC) with differential and assessment for crystals.
- Ensure appropriate collecting tubes are on hand to place the synovial fluid into:
  - Blood culture bottles (for culture of bacteria) and sterile urine container to allow Gram stain.
  - Urine specimen jar or heparin (green top) or EDTA (lavender top) blood tubes for birefringent crystals.

- FBE, ESR, CRP, blood cultures, (and if risk factors, urine MCS for chlamydia or gonorrhoea) – should be taken before starting broad-spectrum antibiotic therapy, but test results should not delay referral.
- Plain X-ray is usually not diagnostic in acute septic arthritis and should not delay referral.
- If chronic low-grade symptoms are present, secondary to an infected prosthetic joint, consider FBE, ESR, CRP, blood cultures, and X-ray to aid diagnosis, and seek orthopaedic or infectious disease advice.

**Management**

1. If sepsis or shock:
   - call 000 to arrange ambulance transfer for emergency assessment.
   - obtain IV access and resuscitate.

2. If septic arthritis suspected:
   - refer urgently for immediate rheumatology assessment.
   - request that the ED aspirate the joint,
• discuss with infectious disease consultant and appropriate orthopaedic surgeon if needed,
• manage sepsis, and give IV antibiotics.
• notify the patient’s treating rheumatologist, if they have one.

If not already tested, the ED will arrange FBE, ESR, CRP, blood cultures, urine tests, and joint aspiration before starting antibiotics in discussion with ID physician.

3. If low-grade infection is suspected, arrange **acute orthopaedic assessment**.

4. If the patient has had joint replacement surgery on the affected joint, urgently contact the treating surgeon for advice. If delay in contacting the surgeon, urgently refer for **immediate rheumatology assessment**.

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**Referral**

5. If sepsis or shock:
   • call **000** to arrange ambulance transfer for **emergency assessment**.
   • obtain IV access and resuscitate.

6. If septic arthritis suspected:
   • refer urgently for **immediate rheumatology assessment**.
   • request that the ED aspirate the joint,
   • discuss with infectious disease consultant and appropriate orthopaedic surgeon if needed,
   • manage sepsis, and give IV antibiotics.
   • notify the patient’s treating rheumatologist, if they have one.

If not already tested, the ED will arrange FBE, ESR, CRP, blood cultures, urine tests, and joint aspiration before starting antibiotics in discussion with ID physician.

7. If low-grade infection is suspected, arrange **acute orthopaedic assessment**.

8. If the patient has had joint replacement surgery on the affected joint, urgently contact the treating surgeon for advice. If delay in contacting the surgeon, urgently refer for **immediate rheumatology assessment**.
Information

For health professionals

- Patient – [Septic Arthritis](#)

For patients

Patient – [Septic Arthritis](#)

Disclaimer

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