

Septic Arthritis

Septic arthritis is inflammation of the joint space due to infection, which can occur in both native and prosthetic joints.

Clinical Features

- Pain, particularly on movement of the joint
- Fever in 60-80% of patients
- Swelling of joint
- Systemic symptoms e.g. fever, sepsis

Definition of Prosthetic Joint Infection

- Presence of a sinus tract that communicates with prosthesis
- Intra-operative tissue histology showing acute inflammation
- Joint pus with no other aetiology
- Positive culture from pre-operative arthrocentesis **OR** ≥ 2 intra-operative samples growing the same bacteria

Causes

Entry of bacteria into the joint can either be haematogenous, via the bloodstream from another source such as a UTI, or by direct inoculation from trauma or surgery.

Native Joint	
Common	<ul style="list-style-type: none">• <i>Staphylococcus aureus</i>• Beta-haemolytic <i>Streptococcus</i> (Groups A, C and G)
Children	<ul style="list-style-type: none">• <i>Staphylococcus aureus</i>• Beta-haemolytic <i>Streptococcus</i> (Groups A, C and G)• <i>Kingella kingae</i>• <i>Streptococcus pneumoniae</i>• <i>Haemophilus influenzae</i> type b (Hib)
If diabetic / elderly	<ul style="list-style-type: none">• <i>Staphylococcus aureus</i>• Beta-haemolytic <i>Streptococcus</i> (Groups A, B, C and G)• Enterobacteriaceae e.g. <i>Escherichia coli</i>, <i>Klebsiella</i> spp.
Sickle Cell	As for common plus: <ul style="list-style-type: none">• <i>Salmonella</i> spp.
Following bites	As for common plus: <ul style="list-style-type: none">• <i>Pasteurella multocida</i>• <i>Capnocytophaga canimorsus</i>• <i>Eikenella corrodens</i>

Prosthetic Joint	
Acute OR early presentation (days to weeks)	<ul style="list-style-type: none">• <i>Staphylococcus aureus</i>• Beta-haemolytic <i>Streptococcus</i> (Groups A, B, C and G)• Enterobacteriaceae e.g. <i>Escherichia coli</i>, <i>Klebsiella</i> spp.
Chronic OR late presentation (months to years)	<ul style="list-style-type: none">• Coagulase negative <i>Staphylococcus</i>• <i>Corynebacterium</i> spp.• <i>Propionibacterium</i> spp.

Investigations

- Haematology and Biochemistry
 - Raised white blood cell count, Erythrocyte Sedimentation Rate (ESR) and C-Reactive Protein (CRP)
- Blood cultures
- Synovial Fluid
 - For microscopy, culture and sensitivity
 - Preferably before antibiotics are started, but do not delay antibiotics unnecessarily
 - Raised white blood cell count
 - Gram stain positive in 50% of cases
 - Culture positive in 80-90% of cases
- Swabs are not suitable as they should not be Gram stained
- Additional for **Suspected Prosthetic Joint Infection**
 - Consider pre-operative diagnostic arthrocentesis for total white blood cell count (WBC) and percentage neutrophil count (if no inflammatory arthropathy) **PLUS** culture
 - Intra-operative 5-6 peri-prosthetic samples for culture

Interpretation of Diagnostic Arthrocentesis

Procedure	Result suggestive of infection
Total Knee Arthroplasty (1-3 months post implantation)	>27,800 WBC/ μ L >89% neutrophils
Total Knee Arthroplasty (>3 months post implantation)	>1700 WBC/ μ L >65% neutrophils
Total Hip Arthroplasty	>4200 WBC/ μ L

Treatment

Urgent drainage of the joint space and removal of prosthetic material if possible. Bacteria form biofilms on prosthetic material and this makes these types of infections very resistant to treatment. Ideally patients should be antibiotic free for at least 2 weeks prior to excision of old prosthesis in order to enhance the yield of microorganisms on culture.

Native Joint	
1 st line	PO or IV Flucloxacillin PLUS PO Fusidic Acid
2 nd line (if 1 st line contraindicated)	IV Teicoplanin OR IV Vancomycin PLUS PO Fusidic Acid
Children	IV Ceftriaxone
If diabetic / elderly	IV Ceftriaxone
If MRSA positive	IV Teicoplanin OR IV Vancomycin PLUS PO Fusidic Acid
Sickle cell	IV Ceftriaxone
Following Bites	IV Co-amoxiclav

Prosthetic Joint	
1 st line	IV Teicoplanin OR IV Vancomycin PLUS PO Rifampicin
2 nd line (if 1 st line contraindicated)	IV Daptomycin PLUS PO Rifampicin

Total Duration

Native joint: 6 weeks (at least 2-4 weeks intravenous)

Prosthetic joint: 3 months (normally 6 weeks intravenous)

Dosing

See section - Antibiotics, Empirical Antibiotic Guidelines.

Prognosis and Complications

Prosthetic joints are unlikely to respond to antibiotics alone without removal of the prosthesis.

Prophylaxis and Prevention

No role for antibiotics to prevent recurrence.