Orthopedic Infections

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KEYWORDS

• Septic arthritis • Infectious arthritis • Orthopedic infections • Osteomyelitis
• Bone infections • Native joint infections

KEY POINTS

- The incidence of orthopedic infections is increasing owing to several population health factors.
- Orthopedic infections can be difficult to diagnose and treat owing to the nonspecific presentation and long list of differential diagnoses.
- The diagnosis and treatment of orthopedic infections is a multidisciplinary collaboration between orthopedic surgery, radiology, and infectious disease specialists.
- Treatment includes antibiotic therapy based on isolated pathogens; however, empiric therapy is often indicated in some clinical situations.

Orthopedic infections can be a frustrating situation for patients and a challenging diagnosis for clinicians. Infections of the joint and bone are increasing as a result of the increased incidence of diabetes and vascular disorders, as well as orthopedic surgeries. Orthopedic infections come in several forms with varying presentations and pathophysiologies.

INFECTIOUS ARTHRITIS OF NATIVE JOINTS

Definition

Infectious arthritis is a term used to describe an infection of a joint, usually caused by a microorganism. Infectious arthritis should be at the forefront of the differential diagnosis in patients presenting with 1 or more acutely swollen, painful, erythematous, warm joints, and is a medical emergency. Infectious arthritis carries substantial

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morbidity and mortality, especially when treatment is delayed or inadequate.[1,2] If not diagnosed and treated promptly, nongonococcal bacterial arthritis can lead to irreversible joint destruction.[3]

Epidemiology

The incidence of infectious arthritis in the general population is estimated to be around 2 to 5 cases per 100,000 persons per year.[4] The risk is higher in patients with inflammatory joint diseases like rheumatoid arthritis and patients with prior joint surgeries.[5] Given the increasing prevalence of joint surgeries and hence the at-risk population, there has been an increase in the worldwide incidence of infectious arthritis.[6]

Classification

Infectious arthritis can be classified based on duration of symptoms, microbiology, and route of infection. Acute-onset infectious arthritis is often secondary to bacterial, viral, or certain fungal infections. Chronic infectious arthritis is usually secondary to non-*Candida* fungal infections, tuberculosis, or nontuberculous mycobacterial infections. Pyogenic or bacterial infectious arthritis commonly occurs after hematogenous dissemination from endocarditis or bacteremia secondary to known or occult infective focus. Infectious arthritis can also be secondary to direct inoculation of microorganisms into the joint space and can complicate surgical procedures, intraarticular injections, and penetrating trauma or bite wounds. Finally, infectious arthritis can result from contiguous deep spread as a complication of skin and soft tissue infections.[7]

Risk Factors

The following risk factors increase the likelihood of developing infectious arthritis[1–3,5,8]:

- Age greater than 80 years,
- Diabetes mellitus,
- Rheumatoid arthritis,
- Osteoarthritis/degenerative joint disease,
- Prior intraarticular corticosteroid injections,
- Presence of prosthetic joint,
- Alcoholism,
- Intravenous (IV) drug use, and
- Skin disease/infections.

The most common predisposing conditions in the development of infectious arthritis are degenerative joint disease, rheumatoid arthritis, and corticosteroid therapy.[3] Patients with rheumatoid arthritis have an approximately 10-fold higher incidence of infectious arthritis than the general population.[3,6,9] Specific factors that put this patient population at increased risk include use of immunosuppressive therapy, glucocorticoids, and disease-modifying antirheumatic drugs.[6,9]

Pathophysiology

The pathophysiology of infectious arthritis depends on the route of infection and the microorganism involved. Several host factors, including local (joint-related factors including prior surgery) and systemic (age, comorbidities, and immune deficiencies), are at play in the pathogenesis of these infections. Factors unique to each microorganism, such as synovial tissue tropism and toxin production lead to synovial damage. Much of our understanding regarding the pathogenesis of nongonococcal infectious arthritis comes from animal models of these infections with *Staphylococcus aureus*.[10]

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