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Case Report

Complicated septic arthritis—What all one can expect to see???

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ABSTRACT

Septic arthritis refers to the articular manifestations due to the presence of a pathogen within a joint. Most articular infections develop as a result of hematogenous seeding of the vascular synovial membrane after a bacteremia episode. It is usually divided into gonococcal and non-gonococcal septic arthritis. The division is useful in clinical practice because of the risk factors, clinical features, and treatment differs greatly between the groups. Prompt diagnosis and early initiation of treatment are a must as it can result in irreversible loss of joint function in up to 50% cases with overall mortality of close to 10% resulting from various complications. Intravenous drug users are at a higher risk for development of various septic complications such as infective endocarditis, septic pulmonary emboli, and endophthalmitis as seen in this particular case. Endophthalmitis is a very rare complication resulting from septic arthritis, which can result in loss of vision if not treated early and aggressively.

Keywords: Septic arthritis, Endophthalmitis, Septic pulmonary emboli, Infective endocarditis, Intravenous drug users

INTRODUCTION

Septic arthritis refers to the articular manifestations due to the presence of a pathogen within a joint. In the majority of cases, the causative organism is a bacterium – the most common etiological agent in Europe and in the United States being *Staphylococcus aureus*. Most articular infections develop as a result of hematogenous seeding of the vascular synovial membrane after a bacteremia episode. Bacterial arthritis may also arise secondary to penetrating cutaneous trauma, following, for instance, a plant-thorn wound or an animal bite. Rarely, septic arthritis occurs as a result of local glucocorticoid joint injection or other intra-articular procedures. Intravenous (IV) drug users are also predisposed to develop this complication.

CASE REPORT

A 32-year-old male, IV drug user for 2 years presented with high-grade fever, swelling of left knee joint, left wrist accompanied with pain, periarticular redness, and decreased range of motion routine investigations revealed leukocytosis. Magnetic resonance imaging (MRI) left knee joint was suggestive of heterogeneous collection showing T1/T2 internal heterogeneity involving distal end of femur with underlying bone destruction, i.e. osteomyelitis with septic arthritis. Subsequently left knee arthrotomy with drainage was done Figure 1. Pus culture

and blood culture showed the growth of *S. aureus*. The patient was managed with IV antibiotics depending on the sensitivity report. The patient went into septic shock and respiratory distress. IV antibiotics were upgraded, inotropes were started. Contrast-enhanced computed tomography chest was done which was suggestive of multiple parenchymal subpleural nodules, areas of consolidation with cavitations, with possibility of septic pulmonary emboli. During the hospital stay patient started complaining of decreased vision in both the eyes. Ophthalmology review revealed the findings suggestive of endophthalmitis. The patient was given intravitreal vancomycin twice and his vision showed marked improvement over the next week. The patient recovered from septic shock but continued to have persistent fever. Repeat blood culture, fungal culture was sterile. In view of persistent fever, two-dimensional echo was done which showed large vegetation at the posterior leaflet of tricuspid valve with moderate tricuspid regurgitation suggestive of infective endocarditis. IV antibiotics were upgraded. The patient was managed with the same for next 6 weeks. Subsequent echo showed marked decrease in the size of vegetation. The patient is currently stable afebrile and off antibiotics.

Figure 1: X-ray depicting changes like marked joint space narrowing, extensive destruction due to septic arthritis.

Table 1: Non-gonococcal and gonococcal arthritis – predisposing factors, clinical, and laboratory features.

Clinical feature	Non-gonococcal	Gonococcal
Age	Risk increases with age	Sexually active young adults
Gender	No difference	×4 more common in female subjects
Menstruation	No increased risk	Increases risk
Complement deficiency, systemic lupus erythematosus	Risk for *Neisseria meningitidis* infection	Risk for *Neisseria gonorrhoeae* infection
Presentation	Single joint involvement	Migratory polyarthritis
Tenosynovitis	Uncommon	Common
Polyarthralgia	Uncommon	Common
Pustular dermatosis	Absent	Does occur
Culture positivity	Nearly 90%	<50%

DISCUSSION

The occurrence of acute joint infection (septic arthritis) is 5–9/100,000 person-years (Margaretten *et al.*, 2007). A high suspicion of septic arthritis is mandatory because the joint can be destroyed if the treatment is postponed for a few days. Patients with advanced age, rheumatoid arthritis (RA), and those who are immunocompromised or have abnormal joint structure or joint prosthesis are at increased risk for joint infection.[1] Septic (purulent) arthritis is usually divided into two entities: (a) Non-gonococcal arthritis and (b) gonococcal arthritis Table 1. The division is useful in clinical practice because the risk factors, clinical features, and treatment differ greatly between the groups.[2]

Clinical symptoms and diagnosis

Usually, the patient presents with an acutely swollen joint, often a large joint such as the knee or ankle. The joint is usually swollen, warm, can be even erythematous, tender on palpation, and on movement. The clinical presentation may vary according to the virulence of the causative organisms, which is low for mycobacterial and fungal infections. Infection in more than one joint occurs in about 20% of patients, most with underlying chronic disease, with an immunosuppressive state or drug abuse. If septic arthritis is suspected, arthrocentesis of the joint is mandatory, and the synovial fluid is analyzed for Gram-stain, white blood cell (WBC) count and differential, and cultured for bacteria. Staphylococci or streptococci cover about 91% of the infections. Gram-negative organisms are more common in older patients and in those who are immunocompromised than in younger patients. The Gram-stain is positive in 71% of Gram-positive septic arthritis, 40–50% of cases of Gram-negative septic arthritis, and in <25% of cases of gonococcal septic arthritis.[3] The concentration of WBCs in the synovial fluid is usually increased, and a count of >50,000/dl with >90% of polymorphonuclear cells increases the likelihood of septic arthritis. Evidence of infection should also be searched outside the joint (chest X-ray examination, cultures of urine, blood, throat, from possible wounds, skin blisters, etc.).

Radiography of the joint, while usually normal, unless there is a chronic rheumatic condition (RA, osteoarthritis, etc.), is of great use to exclude other diseases, such as underlying chondrocalcinosis, and to exclude the

possibility of underlying osteomyelitis.[4] The severity of the structural damage and the rate at which it appears varies according to the virulence of the pathogens and the intensity of joint inflammation. These changes include juxta-articular osteoporosis, a diffuse joint space narrowing due to cartilage destruction, and erosions in areas of reflection of the synovium into the bone. MRI or computed tomography are also of little help in diagnosing septic arthritis. They can be used to assess the presence and extent of inflammation, destruction, and especially, periarticular soft tissue masses.

Treatment

A high suspicion of septic arthritis should prompt treatment with parenteral antibiotics without waiting for the results of bacterial cultures, and drainage of the infected joint, which are the cornerstones of the treatment. The decision about treatment can be guided by microscopy and routine analysis of the synovial fluid, but a negative Gram-stain does not exclude septic arthritis. The choice of antibiotic is primarily empirical and based on the likelihood of the organism involved, comorbidities, and on the local situation. When the culture results are available, the antibiotics can then be focused according to the sensitivity results.[5] The duration of the IV treatment can be 10–14 days, often followed by oral antibiotics. The total duration of treatment, usually 6 weeks, depends on the infecting micro-organism, the other diagnoses and treatments, and the initial response to the treatment.

Complications

Articular – joint destruction, osteomyelitis, secondary osteoarthritis, avascular necrosis extra-articular – sepsis and septic shock, disseminated infection, endophthalmitis (rare).

CONCLUSION

Septic arthritis is a condition which requires prompt diagnosis and early institution of treatment to prevent permanent joint damage and various other extra-articular complications. Arthrocentesis is a must and treatment should be tailored according to the organism.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms.

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Conflicts of interest

There are no conflicts of interest.

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