

Atraumatic Septic Arthritis of the Elbow in a Young Immunocompetent Host Secondary to Distant Hematogenous Spread

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Abstract

We present the case of elbow septic arthritis without trauma, due to hematogenous spread from a distant source in a young immunocompetent host. We discuss the importance of early recognition and treatment of septic arthritis, despite unusual presentation and history, as well as advocate aspiration of the elbow joint in equivocal cases as a low morbidity/high-yield test.

Septic arthritis is a surgical emergency. Diagnosis and treatment have to proceed in expeditious manner. History and a high index of suspicion are important in making the correct and timely diagnosis.¹ We report a case of elbow septic arthritis caused by hematogenous spread of Methicillin-sensitive *Staphylococcus aureus* (MSSA). The likely source was a foot lesion in a young, healthy man with no history of trauma to the elbow. The patient provided written informed consent for print and electronic publication of the case report.

CASE REPORT

A 21-year-old man presented to the emergency department with 24 hours of increasing pain, swelling, and decreased range of motion of the right elbow. He reported a temperature of 39.5°C at home. The patient denied any history of trauma. Surgical history was significant for arthroscopic left knee surgery with partial meniscectomy 1 month prior to presentation with persistent knee swelling. He also noted a “blister” on his right heel for several weeks that recently started draining.

On physical examination, the patient was afebrile. The right elbow had moderate swelling and increased

warmth with tenderness to palpation and limited range of motion (20° short of full extension to 40° flexion). The forearm rotation was full and painless. Examination of the left knee demonstrated well-healed surgical incisions with full painless active range of motion, a small effusion, but no increased warmth or erythema.

Radiographs of the right heel demonstrated no acute fracture, dislocation, or osteomyelitis. Radiographs of the right elbow revealed anterior and posterior fat pad sign, indicating joint effusion, but were otherwise normal (Figure).

Elbow arthrocentesis was performed under sterile conditions and 1-2 mL of purulent fluid was aspirated and sent for gram stain, culture, and crystal analysis. Significant laboratory data at the time of admission revealed a white blood cell (WBC) count of 10,600 cells/μL, erythrocyte sedimentation rate (ESR) of 18 mm/h, and a C-reactive protein (CRP) level of 38.2 mg/L. Blood cultures were obtained. The heel blister was unroofed and cultured. Combined clinical suspicion and laboratory findings led to a diagnosis of septic elbow arthritis and the patient was taken to the operating room where a right elbow incision and drainage was performed.

Lateral incision was utilized and frank pus was visualized upon entering the elbow joint. This was sent for gram stain and culture, and a soft tissue specimen was sent to pathology. After thorough irrigation, a Jackson-Pratt drain was inserted and incision was closed in layers.

A left knee aspiration was performed in the operating room while the patient was under general anesthesia, because of the history of persistent knee swelling. This aspirate showed WBC count of 79,000 cells/μL and no crystals. Intravenous antibiotics were started after specimens were sent to microbiology.

Final pathology of the specimen from the elbow demonstrated dense connective tissue with organizing acute and chronic inflammation. Final cultures obtained from the right heel, left knee, and right elbow revealed MSSA. Involvement of multiple sites with the same organism prompted a search for possible immune deficiency but ultimately was negative, including negative blood cultures obtained on admission. The patient was also negative for cytomegalovirus, chlamydia, gonorrhea, and lyme disease. Rheumatologic assays

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Figure. Admission right elbow lateral x-ray. Note the anterior and posterior fat pad sign indicating joint effusion (marked by arrows).

were negative for anti-nuclear antibodies or rheumatoid factor.

After surgery, the patient's elbow range of motion improved and pain decreased with no further signs of infection. The patient was discharged in stable condition with range of motion of 10° short of full extension and 130° of flexion on appropriate antibiotic coverage. At the final 1-year follow-up after surgery, the patient was asymptomatic and had full range of motion of the right elbow.

DISCUSSION

Hematogenous spread of *S aureus* infection to distant joints has been reported in the past. MSSA has been shown to be the most common organism.¹⁻⁴ It is most commonly seen in immunocompromised patients either due to advanced age, medical conditions, or medication use.^{1,2} We report a case of an immunocompetent young man who was not on any immunocompromising drugs. The presumed source of the infection was a distal foot wound that grew out the same

organism that was also cultured from the elbow and knee joint aspirates. This case is especially significant since our patient's presentation was atypical due to his young age, lack of trauma, and a relatively benign initial physical examination.

Diagnosis of acute septic arthritis should be based on history as well as clinical and laboratory examinations, including joint aspiration and blood cultures that can be positive in as much as 82%.⁴ Other investigators emphasized the need to combine not only clinical and routine laboratory values such as ESR and CRP, but also joint aspiration results. Li and colleagues⁵ reviewed 156 cases of suspected septic arthritis and concluded that ESR and WBC counts were not reliable. However, joint WBC count had a specificity of 0.88 and was "a fairly good test."⁵ The authors caution that "none of these tests are perfect and the clinician should be conservative in approaching the patient with a hot joint."⁵ Margaretten and colleagues⁶ conducted a meta-analysis of 14 studies with 653 patients meeting their inclusion criteria.⁶ They also concluded that synovial WBC and percentage of polymorphonuclear cells are vital in early diagnosis of septic arthritis prior to culture results.

Our case is another important reminder that septic arthritis should be an important part of differential diagnosis, even in a young patient without history of trauma and no underlying immune deficiency. With clinical findings suggestive of septic arthritis, arthrocentesis should be performed and treatment initiated to preserve native cartilage and decrease morbidity to the patient.

AUTHORS' DISCLOSURE STATEMENT

The authors report no actual or potential conflict of interest in relation to this article.

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This paper will be judged for the Resident Writer's Award.
