

# Rapidly Progressing Polyarticular Septic Arthritis in a Patient With Rheumatoid Arthritis

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## Abstract

Septic arthritis is an orthopedic emergency that can lead to significant morbidity and mortality. Polyarticular involvement is a relatively rare phenomenon occurring primarily in high-risk patients.

In this article, we report the rare case of a patient with rheumatoid arthritis presenting with an acute episode of septic arthritis involving most of the joints of the body. Surprisingly, his bilateral total hip arthroplasties were completely unaffected.

Unusual polyarticular presentations of septic arthritis, though rare, must still be considered within the differential diagnosis by all healthcare providers when treating certain high-risk groups.

Acute septic arthritis classically presents as a single, warm, acutely swollen joint. Polyarticular involvement is a rare presentation and is not sufficiently recognized by medical personnel, particularly in the context of a suspected flare-up of an inflammatory arthritis. The consequences of delayed diagnosis can be devastating. Polyarticular septic arthritis has been reported to have a mortality rate of almost 30%.<sup>1</sup> Therefore, a high index of suspicion for the diagnosis of polyarticular septic arthritis must be maintained.

In this article, we report a case of polyarticular septic arthritis in a patient with rheumatoid arthritis (RA) having aspirate-confirmed bacterial sepsis involving 9 major joints (Table). Another 28 joints, bilateral metacarpophalangeal, proximal interphalangeal, and distal interphalangeal joints, were highly suspicious for involvement. The patient's right wrist and bilateral total hip arthroplasties were not involved. We are aware of a case with 14 joints involved,<sup>2</sup> but are unaware of

any others rivaling the extent of our patient's joint involvement.

The patient's next of kin provided written informed consent for print and electronic publication of this case report.

## CASE REPORT

A 62-year-old man presented to the emergency department with a 1-week history of a maculopapular rash on the medial aspect of his bilateral distal tibiae and effusions of joints in his upper and lower extremities. Past medical history was significant for severe RA, which was diagnosed 5 years earlier, bilateral total hip arthroplasties (right hip replaced 9 months and left hip replaced 6 months earlier), and previous hepatitis B infection. The patient reported a significant smoking and marijuana history, but denied use of intravenous drugs and alcohol. He managed his RA with methotrexate, sulfasalazine, leflunomide, and hydroxychloroquine, but opted to discontinue treatment 1 year before presentation.

At time of hospital admission, the patient was febrile (39.5°C) and showed signs of meningococemia. Therefore, vancomycin, cefotaxime, and ampicillin were started while a complete septic workup was performed. During later examination, the internal medicine team found that his vital signs were stable, that he was afebrile, and in no acute distress. Physical examination was essentially significant for multijoint arthritis. There were bilateral effusions of the shoulders, elbows, wrists, metacarpophalangeal joints, proximal interphalangeal joints, distal interphalangeal joints, and ankles. Range of motion was restricted because of pain. The knees had minimal effusion and were not painful during range-of-motion testing. No joints were warm to palpation and there were no other skin findings except for the rash on the distal tibiae. Photographs were not taken of the joints at any point in time.

Aspiration of the left knee yielded turbid fluid with an enucleated cell count of  $230 \times 10^6/\text{mL}$ , with neutrophils comprising 91%. Gram stain of the aspirate was positive for gram-positive cocci. Blood tests showed an elevated erythrocyte sedimentation rate of 102 mm/h and a C-reactive protein level of 324 mg/L. Lumbar puncture was negative and cerebrospinal fluid showed no growth, but the blood culture also grew gram-positive cocci. The patient was suspected to be immunocompromised and

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**Table. Septic Arthritis Joint Involvement Confirmed by Aspiration**

Joint	Right	Left
Shoulder	✓	✓
Elbow	✓	✓
Wrist	—	✓
Hip	—	—
Knee	✓	✓
Ankle	✓	✓

was initially treated with broad-spectrum antibiotics, but was subsequently put on cloxacillin after culture and sensitivity came back positive for *Staphylococcus aureus*. His joints worsened over a 48-hour period. Bilateral shoulders, elbows, wrists, knees, and ankles were aspirated, and all except for the right wrist were subsequently positive for *S aureus*. The strain of *S aureus* was later found to be methicillin-sensitive. To prevent the spread of infection to the hips, the patient was taken to the operating room on post-admission day 3 for irrigation and debridement of all these infected joints. Each joint was washed, debrided, and irrigated with 9 L of saline with the last 3 L containing bacitracin. Electrocardiograms were performed but no echocardiogram.

On postoperative day (POD) 3, the patient developed an abscess within the posteromedial and posterolateral aspect of the right leg. However, there was no evidence of recurrent joint involvement. During dressing changes, several of the previously debrided and irrigated joints were draining serous fluid with minimal blood. The patient was taken to the operating theater on POD 4 for open irrigation and debridement of the right leg and ankle abscess. On POD 7, there was suspected recurrence of septic arthritis in the ankles bilaterally, as well as recurrence of an abscess in the right calf and evidence of a new abscess in the left calf. The patient was taken to the operating room for a third time for open irrigation and debridement of bilateral ankles and calves.

The patient developed septic shock and was transferred to the intensive care unit on POD 27. Respiratory and urine cultures were found to contain multidrug-resistant *Pseudomonas* and colistimethate was started. On POD 33, the patient's family agreed to withdraw from life-sustaining measures and the patient subsequently died.

In summary, this patient was originally admitted for polyarticular septic arthritis but subsequently developed florid sepsis presumed to be secondary to either methicillin-sensitive *S aureus* or multidrug-resistant *Pseudomonas*.

## DISCUSSION

Septic arthritis is a relatively rare but potentially fatal orthopedic emergency resulting in poor functional outcomes if not diagnosed and managed promptly. Independent risk factors for septic arthritis include advanced age ( $\geq 80$  years), joint prosthesis, diabetes, biological agent therapy, nasal carriage of *S aureus*, history

of chronic joint disease, and superficial skin infection.<sup>1-5</sup> Our patient was at heightened risk because of previously diagnosed RA, joint prostheses, and what appeared to be a skin infection. According to the literature, RA, joint prostheses, and skin infection increase the likelihood of development of septic arthritis by 4-, 15-, and 27-fold, respectively.<sup>2</sup> Interestingly, our patient's bilateral hip joint prostheses were not affected, likely because of the early initiation of broad-spectrum antibiotics.

The increased risk for septic arthritis associated with RA development may stem from any of several hypothesized mechanisms. It is believed that the abnormal joint structure and chronic synovitis provide a friendly environment for bacterial survival and growth.<sup>3</sup> Moreover, diagnostic procedures, such as intra-articular corticosteroid injections, are commonly used in patients with RA and can become a prominent source of bacterial infection.<sup>4</sup> Finally, use of disease-modifying antirheumatic drugs and immunosuppressants has been implicated in increased risk for septic arthritis infection.<sup>5</sup>

Dubost and colleagues<sup>2</sup> reviewed 25 cases of polyarticular septic arthritis at their institution and another 184 cases that had been reported in the literature. They compared these cases with 95 cases of monoarticular septic arthritis and discovered that approximately 15% of all cases involved multiple joints, with a mean of 3 joints affected (range, 2-14). In a separate study,<sup>6</sup> they examined 24 cases of septic arthritis in patients with RA and another 238 previously reported cases and compared these with 99 cases of septic arthritis in patients without RA. Multiple septic joints were found in 54% of their case series and in 28% of the RA cases from the literature. Conversely, only 9% of patients with RA presented with polyarticular involvement.

## CONCLUSION

Our patient's case represents a rare presentation of acute polyarticular septic arthritis in a patient with RA. Physical examination may be incongruent with classical signs of septic arthritis. The definitive diagnosis is made by joint aspiration. Prompt treatment with antibiotics and surgical drainage may be necessary in rapidly progressing disease.

## AUTHORS' DISCLOSURE STATEMENT

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

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