



CASE REPORT

Septic Polyarthritis with Fatal Outcome in Rheumatoid Arthritis: A Consequence of Corticosteroid Injection and Unsupervised Immunosuppressive Polypharmacy

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ABSTRACT

Septic polyarthritis is a rare but severe form of septic arthritis associated with high morbidity and mortality, particularly in patients with rheumatoid arthritis receiving immunosuppressive therapy. We report the case of a 44-year-old woman with longstanding, deforming seropositive rheumatoid arthritis who developed fulminant polyarticular septic arthritis following a corticosteroid injection into the wrist. Within five days, arthritis extended to multiple large joints, accompanied by fever and sepsis. Before hospitalization, the patient had self-administered excessive doses of methotrexate, daily leflunomide, and dual high-dose nonsteroidal anti-inflammatory drugs, leading to severe bicytopenia and profound immunosuppression. Synovial and blood cultures yielded methicillin-sensitive *Staphylococcus aureus*. Imaging revealed widespread infection involving joints, soft tissues, the thoracic wall, lungs, and peritoneum. Despite urgent surgical drainage, broad-spectrum intravenous antibiotics, and subsequent regimen adjustment for acute kidney injury, the infection progressed to septic shock with multiorgan failure, resulting in death on day 20 of hospitalization. This case highlights how advanced rheumatoid arthritis, intra-articular corticosteroid injection, and unsupervised immunosuppressive polypharmacy combined to cause a rapidly fatal infection. It emphasizes that routine procedures can trigger catastrophic outcomes in vulnerable patients and underscores the need for early recognition, aseptic technique, prudent patient selection, and strict monitoring of immunosuppressive therapy.

Keywords: Rheumatoid Arthritis; Septic Arthritis; Methotrexate; Intra-Articular Injections; Fatal Outcome.

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Abbreviation:

AKI – Acute kidney injury
MSSA – Methicillin-sensitive *Staphylococcus aureus*
PASA – Polyarticular septic arthritis
RA – Rheumatoid arthritis
SA – Septic arthritis

1. INTRODUCTION

Septic arthritis (SA) is a rheumatologic emergency with high morbidity and mortality. The polyarticular form (PASA), defined by the involvement of two or more joints, is a severe clinical entity, accounting for up to 15% of all SA cases and carrying a mortality rate as high as 30-50% in vulnerable populations (1-2). *Staphylococcus aureus* is the most frequently isolated pathogen (3). Patients with rheumatoid arthritis (RA) are especially predisposed to SA due to chronic synovial inflammation and the use of immunosuppressive therapies, both of which impair local and systemic defence mechanisms (1,4).

Intra-articular corticosteroid injections, although beneficial for local inflammation control, may serve as an iatrogenic pathway for bacterial inoculation into the joint space (5). This case describes a patient with advanced RA who developed fulminant PASA after a wrist corticosteroid injection, further aggravated by dangerous self-administration of multiple immunosuppressive and anti-inflammatory agents, ultimately resulting in a fatal outcome.

2. CASE DESCRIPTION

A 44-year-old woman with a history of untreated depressive disorder and a complex rheumatologic background, namely juvenile-onset, deforming, seropositive rheumatoid arthritis (rheumatoid factor positive, anti-cyclic citrullinated peptide antibodies) complicated by interstitial lung disease, developed catastrophic septic PASA following a corticosteroid injection in her right wrist.

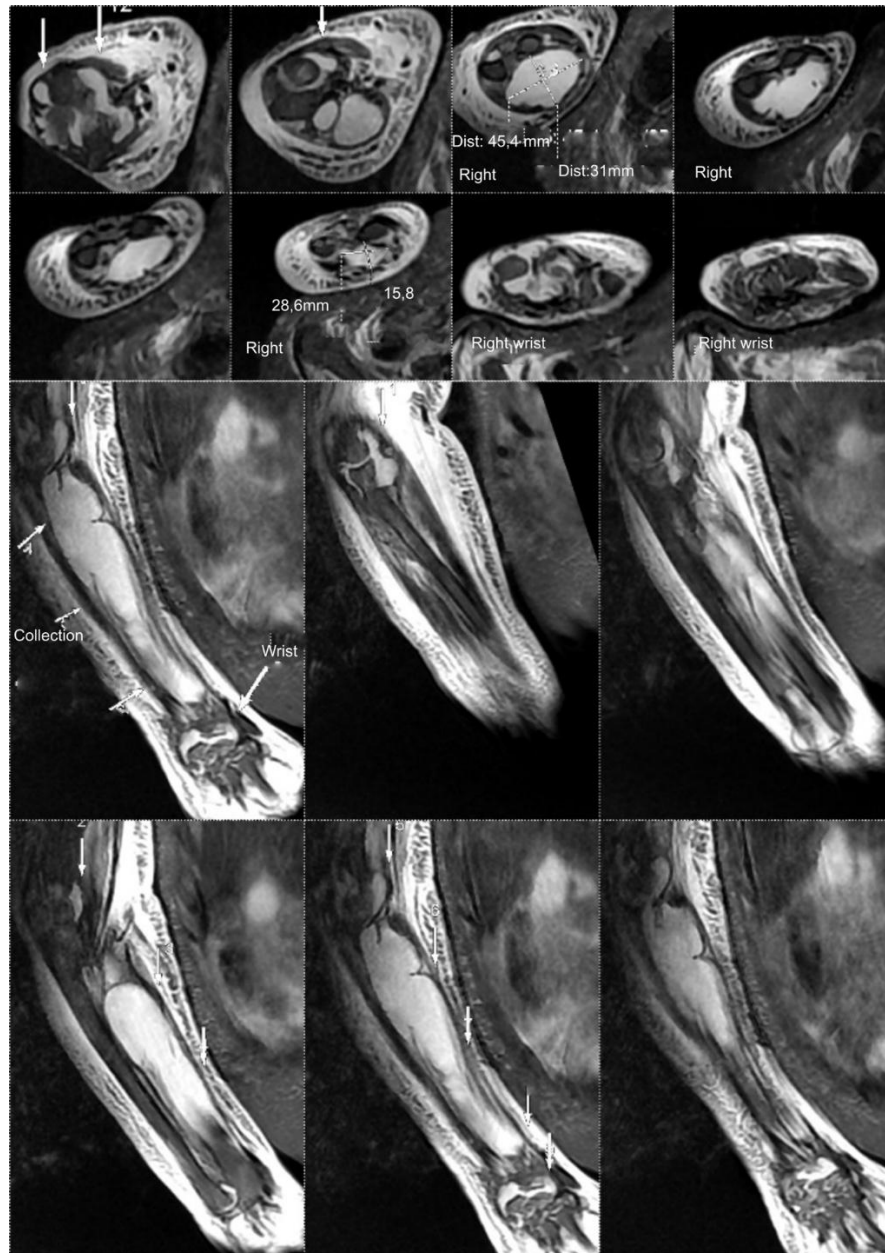


Figure 1. MRI of the right forearm and wrist showing extensive inflammatory changes. Fat-suppressed T2-weighted images demonstrate a large, septated fluid collection extending from the elbow to the wrist, in continuity with the elbow joint cavity. The collection measures up to 20 cm in length and 45 × 31 mm in cross-section, located along the deep palmar fascia and contacting both forearm bones without bone involvement. There is a marked joint effusion in the elbow and wrist, and diffuse lymphedema involving the soft tissues of the forearm and wrist.

The patient had been followed in our department from 2007 to 2022, during which she received one course of rituximab (1 g) in 2017, combined with methotrexate 10 mg/week, later optimized to 20 mg/week in 2022, along with 4 mg of methylprednisolone. She was lost to follow-up afterward and presented as an outpatient in early January 2024 for a polyarticular flare, treated with prednisone equivalent 15 mg/day, leflunomide 20 mg/day, continuation of methotrexate 20 mg/week, and a corticosteroid injection in the right wrist under anatomical guidance (drug and dosage unknown).

After initial improvement of the polyarticular flare, five days post-injection, she developed acute wrist arthritis and fever, which rapidly progressed to involve the elbows and knees. During this critical period, the patient engaged in dangerous self-medication, taking her weekly methotrexate dose of 20 mg daily, in conjunction with continuous leflunomide (20 mg/day), nonsteroidal anti-inflammatory drugs (diclofenac 150 mg/day and celecoxib 400 mg/day), and paracetamol 1 g/day for seven consecutive days. This resulted in severe bicytopenia (white blood cell count: 600/mm³, hemoglobin: 6.4 g/dL, platelets: 139,000/mm³).

She was hospitalized in early February for a febrile polyarticular flare. Joint ultrasonography revealed inflammatory synovitis with thick effusions suggestive of septic arthritis in the right wrist and both elbows. Synovial fluid analysis of the wrist and blood cultures confirmed septicemia, with cultures positive for methicillin-sensitive *Staphylococcus aureus* (MSSA). Laboratory tests were consistent with an infectious origin (ESR 145 mm/h, CRP 345 mg/L). Imaging (magnetic resonance imaging/computed tomography) revealed widespread infection, including purulent arthritis of the wrists, elbows, and knees; sternocostal and thoracic abscesses; temporomandibular joint involvement; pulmonary empyema; and peritoneal collections (figure 1).

Initial management included intravenous cefotaxime (4 g/day), ciprofloxacin (400 mg), and gentamicin (240 mg), as renal function was normal, along with open surgical drainage of the affected joints—the wrists, elbows, and knees—as well as associated abscesses.

The clinical course was further complicated by acute kidney injury (AKI) requiring hemodialysis on day 5, prompting adjustment of the antibiotic regimen to include rifampin (900 mg/day, renal dose) by day 7. Opportunistic infections developed, including oropharyngeal candidiasis treated with fluconazole and severe herpes labialis managed with acyclovir. Despite aggressive therapy, the patient ultimately progressed to terminal septic shock with multiorgan failure by day 20.

3. DISCUSSION

This case presents a tragic and powerful illustration of the convergence of multiple risk factors leading to a fatal outcome. The patient's severe RA placed her at a significantly elevated risk for septic arthritis. Chronic inflammation damages the synovial membrane, creating a nidus for bacterial seeding (1,4). Patients with RA often have compromised immune systems, further weakened by immunosuppressive therapies. Dubost et al. found that 54% of their RA patients with SA had polyarticular involvement, compared to only 9% of patients without RA (4). The patient's deforming, seropositive disease and pulmonary complications represented a particularly high-risk phenotype.

The intra-articular corticosteroid injection was the precipitating event, providing a direct route for bacterial inoculation into the synovial cavity. Although *S. aureus* is the predominant pathogen. An investigation by Ross et al. into a large outbreak of 41 cases of SA linked to a single outpatient clinic attributed the infections to multiple breaches in aseptic technique, including improper medication preparation and lack of hand hygiene (6). In this case, the isolation of MSSA is consistent with inoculation from the patient's own skin flora or the environment during the procedure.

The patient's rapid progression from a single infected joint to fulminant polyarthritis is characteristic of the hematogenous spread seen in PASA. This pattern is often associated with systemic signs of infection and a more severe clinical course. A study of 19 PASA cases by Mateo Soria et al. found a high rate of positive blood cultures (52.6%) and septic shock (15.8%), consistent with the patient's presentation (2). The case series by Riscanevo et al. also highlights the severity of PASA, with one of their three patients succumbing to the infection. Distinguishing PASA from an inflammatory flare in patients with RA remains a diagnostic challenge, given overlapping clinical features (1,4).

The patient's decision to self-administer daily doses of methotrexate, in association with two nonsteroidal anti-inflammatory drugs at maximal doses, unfortunately led to severe complications. Daily excessive methotrexate and nonsteroidal anti-inflammatory drug exposure induces severe bicytopenia, leading to bicytopenia and rendering the immune system incapable of controlling bacterial spread. In this context, an initially localized MSSA arthritis rapidly evolved into disseminated infection involving multiple joints, soft tissues, serous cavities, and internal organs. This case highlights the importance of structured therapeutic education and close medical follow-up, as well as the role of the healthcare system in supporting patients.

It is also important to highlight that her untreated depressive disorder and disadvantaged socioeconomic background were key contributors to the unsafe self-medication and delayed medical consultation, further compounding her already high risk. This case underscores the need for holistic patient management, addressing both medical and psychosocial factors, and ensuring adequate support and guidance throughout treatment.

Acute kidney injury in this patient was likely multifactorial, reflecting septic shock-induced hypoperfusion, nephrotoxic medications, and systemic inflammation (7). Once renal dysfunction develops, the prognosis worsens considerably due to limitations on antibiotic selection and dosing, metabolic disturbances, and increased risk of multiorgan failure.

Mortality in PASA remains unacceptably high. Mateo Soria et al. reported a mortality rate of 15.8% in PASA patients (1), while Dubost et al. found an overall mortality of 17% in RA-associated SA, rising to 49% in polyarticular infections (4). Our patient's outcome reflects this reality, with her initial risk factors compounded by an iatrogenic trigger and a catastrophic medication error, resulting in fulminant sepsis unresponsive to maximal therapy.

4. CONCLUSION

This case documents a fatal instance of polyarticular septic arthritis in a patient with rheumatoid arthritis, where a combination of underlying disease, an iatrogenic trigger, and a catastrophic medication error led to an uncontrollable systemic infection. It is a powerful reminder of the significant risks associated with routine procedures like corticosteroid injections in vulnerable populations and the lethal potential of potent immunosuppressive medications when misused.

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