

Community-Acquired *Pseudomonas Aeruginosa* Wrist Joint Arthritis in a Child - A Case Report

Manoj Kumar Jangid¹ and Mohamad Ahmed Selim²

¹Department of Paediatrics, NMC Royal Hospital, Dubai, United Arab Emirates

²Department of Orthopaedics, NMC Royal Hospital, Dubai, United Arab Emirates

Correspondence:

Manoj Kumar Jangid
Department of Paediatrics
NMC Royal Hospital
Dubai, United Arab Emirates
E-mail: drmanojjangid@gmail.com

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ABSTRACT

Pseudomonas aeruginosa is a rare cause of bone and joint infection in an immunocompetent child. Rapid diagnosis and prompt therapy are required to prevent serious joint damage. We hereby present our experience with a case of septic arthritis involving distal radioulnar joint with associated distal radius osteomyelitis in a previously healthy six years old girl who presented with fever, swelling and pain of the right lower forearm. *Pseudomonas aeruginosa* was isolated from both joint fluid and blood. The child was successfully treated with a combination of surgical debridement and two weeks of intravenous and four weeks of oral antibiotic therapy.

Keywords: *Pseudomonas aeruginosa*; distal radioulnar joint; osteomyelitis; septic arthritis



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INTRODUCTION

Septic arthritis of the wrist in children, though a rare occurrence, represents an orthopaedic emergency. *Staphylococcus aureus* is the usual offending microorganism at all ages. The infection usually occurs secondary to haematogenous spread from another site of infection, contiguous spread from adjacent tissue or by direct inoculation following puncture or trauma.^{1,2} Once an organism is seeded, cytokines and proteases are released which may ultimately lead to destruction of cartilage and if left untreated can result in adverse sequelae such as cartilage destruction, osteomyelitis, ankylosis, growth aberration due to physical damage, joint instability and restriction of movement.²

We present a six years old girl with *Pseudomonas* wrist arthritis and associated distal radius osteomyelitis, who had no risk factors and was successfully managed with a combination of surgical debridement and antibiotic therapy.

CASE REPORT

A six years old, developmentally normal girl child with no significant past history, presented to our hospital with a history of worsening pain, swelling and redness of the lower end of right forearm for five days and fever for four days. During this period she was consulted with a local practitioner and was prescribed oral cefixime and ibuprofen. There was no history of trauma or any significant medical problem. On examination, there was

swelling, erythema, warmth and tenderness of the lower end of right forearm, most prominent on dorsolateral side. The overlying skin did not show any skin trauma, bite marks, discharging sinuses or fluctuation. Systemic examination was all normal, including all other joints but she had dental caries. She was admitted for presumed bone and joint infection. Blood work up on admission revealed elevated inflammatory markers - C-reactive protein (CRP) 50 mg/L and erythrocyte sedimentation rate (ESR) 56 mm/1st hr. TLC was 15,000 cells/mm³ and differential counts were also within normal limits. Blood culture was also collected. Plain radiograph of right forearm showed no abnormality. A consultation with orthopaedic team was made and intravenous ceftriaxone was started empirically.

Over the next two days, she continued to have fever, persistence of pain and swelling with rising CRP (71 mg/L). A magnetic resonance imaging (MRI) study demonstrated osteomyelitic changes in the lower end of radius with effusion in right distal radioulnar joint with surrounding soft tissue edema (Figure 1).

Blood culture sent on admission showed *Pseudomonas aeruginosa* growth, so antibiotics were changed as per the sensitivity report to Cefepime and Amikacin administered intravenously every 12 hourly. She underwent open irrigation and debridement where, purulent fluid was encountered in the joint, though the articular cartilage appeared to be in good condition. The pus

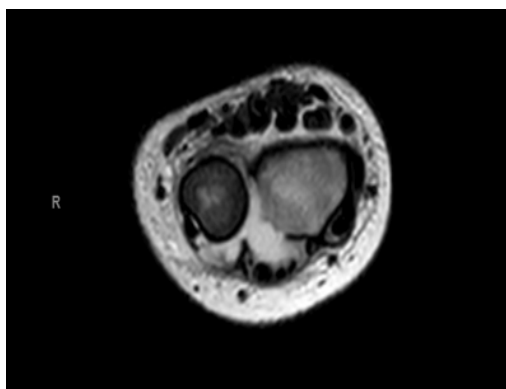


Figure 1. MR image of the distal forearm and wrist showing fluid collection in the right distal radioulnar joint and erosion along the distal metaphysis and epiphysis of the right radius



Figure 2. AP and lateral radiographs of forearm, one year after, showing complete recovery without any bony growth abnormalities

culture of the joint also grew *Pseudomonas aeruginosa*. Postoperatively the child continued with IV antibiotics and splint immobilisation for a short time. Thereafter she remained stable and continued to improve with good relief of pain, reduction of swelling and improvement of movement of hand. The child was discharged after a total of two weeks of intravenous antibiotics and continued with oral ciprofloxacin at home for the next four weeks. The patient remained well, pain free with normal range of motion, without any sign of complications with normal radiograph at one year in follow up visits. (Figure 2)

DISCUSSION

Septic arthritis in children most commonly affects the lower extremity joints with knee, hip and ankle infections accounting for nearly 80 percent of cases.³ Septic arthritis of the wrist is a rare entity in children and four cases has been described so far in the literature.⁴⁻⁷ To the best of our knowledge this is the first reported case of acute septic arthritis of distal radioulnar joint due to a community acquired *P. aeruginosa* infection in a previously healthy child.

Classically, the diagnosis is made on the basis of history, physical examination, supportive laboratory studies and various imaging modalities. Septic arthritis commonly presents with fever and features of acute joint inflammation in the form of erythema, warmth and swelling with joint pain and/or loss of function. Diagnosis of a septic wrist joint can be easily delayed in children especially in the absence of obvious penetrating trauma. In our child appropriate antibiotic therapy was delayed initially due to a sub acute presentation and later on there was a growth of unusual pathogen in blood culture -emphasising the importance of blood culture in such cases to make diagnostic and treatment decisions.

Most cases of septic arthritis are caused by haematogenous spread of bacterial pathogens while others can be caused from direct spread via trauma

or infection from other neighbouring tissues. In our case the source of infection remained unclear though possibly a haematogenous spread from the dental caries could have led to the infection. It is well known that *Pseudomonas aeruginosa* is frequently present in periodontal infections and even a simple act of chewing can induce bacteremia.⁸

Staphylococcus aureus remains the most common organism responsible for septic arthritis and osteomyelitis but our patient had *P. aeruginosa* infection.⁹ Patients developing *P. aeruginosa* joint infection usually have a history of prior traumatic events, hospitalisation, or chronic underlying disease but no such history was present in our case.¹⁰

Open surgical debridement is the preferred treatment and may be necessary depending on the extent of disease, response to antibiotic therapy and associated bone or soft tissue infections; though antibiotics for four to six weeks are generally sufficient in treating septic arthritis. With timely surgical debridement and an adequate course of antibiotics, our patient made a full recovery with complete resolution of clinical signs and symptoms with normalisation of inflammatory markers.

CONCLUSIONS

In conclusion, septic arthritis of wrist joint is a rare condition in children but should be considered seriously in all children with an acute onset of fever and features of acute joint inflammation such as swelling, pain or difficulty moving the wrist with elevated inflammatory parameters. Blood culture should always be sent in such cases as rare organisms like *Pseudomonas* can be the cause of septic arthritis in such instances and can be of paramount importance to have a good outcome.

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