

## Septic Arthritis in Children Following Trauma: An Orthopedic Emergency

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### Abstract

Septic arthritis is a severe infection of the joints either by bacteria or fungi causing joint inflammation. It is a debilitating septic condition that can result in permanent disability and even loss of life and can be averted by timely diagnosis and prompt and aggressive intervention. This condition usually presents with a hot swollen painful joint, the diagnosis for which may be missed by a doctor who is not familiar with musculoskeletal diseases. Usually a rare condition in developed countries, it is a major health concern in developing countries. We report a case of a child who after a normal fracture sustained septic arthritis following a fracture in the wrist joint which proved fatal for him. The authors aim to increase the awareness about this unforeseen complication which might prove fatal if not treated adequately.

**Keywords:** Septic Arthritis; Inflammation; Wrist Fracture; Bicycle Trauma.

### Introduction

Septic arthritis (SA) is a severe infection of joints, maybe be bacterial or fungal usually presenting as hot, swollen and painful joint with decrease in range of movement. This is a condition which if not diagnosed and treated promptly can result in irreversible joint damage and resulting disability and also significant mortality with an estimated case fatality rate of 11% [1]. This condition is usually caused by direct infection through open joint trauma, through haematogenous route (commonly seen in children), from a distant septic foci, through osteomyelitis of nearby bones and even through surgical instrumentation. Several studies showed that growing children are predominantly at risk of SA. It often occurs in

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children younger than 5 years of age with male to female ratio being 2:1 approximately [2], usually having a monoarticular presentation with the large joints like hip and knee being involved in 85% cases and having a polyarticular presentation in more severe cases of sepsis [2,3]. *S. aureus* is the most common organism causing SA as reported by most studies irrespective of age or area [1-9]. The MRSA has been a major cause of concern in SA. Other pathogens namely *Str. pyogenes*, *Str. pneumoniae*, *H influenza*, *Pseudomonas aeruginosa* have also been reported as the causative organism [2,8,9]. The authors report a case of septic arthritis which led to the fatality in a healthy child with a small fracture in wrist bone. The authors aim to highlight the importance of identifying the risk factors and timely intervention in preventing such unforeseen complications.

### Case Report

#### History

A 12 years old had a fall from bicycle following which he sustained an injury to his left hand and forearm. The incident occurred late in the evening due to which he was taken to hospital only on the next day when his arm was put in a temporary POP cast and was advised to come again after 3 days. He was taken to the hospital again after 3 days as

advised and his temporary POP cast was changed to a proper POP cast and again advised to come after 1 week. The next day he complained of severe pain in his arm which worsened the next day when he started complaining of pain all over his arms and legs. He expired on the way to the hospital and an autopsy was conducted.



**Fig. 1:** Collapsed blister was present on the dorsal aspect of hand with peeled skin margins



**Fig. 2:** Pus present in the space between the carpal bones and lower ends of ulna and radius

#### *Examination findings*

POP cast was present on the left wrist and forearm. On removing the cast, a collapsed blister was present on the dorsal aspect of hand with

peeled skin margins (Fig. 1). Greenish discoloration of skin was seen. On reflecting the different layers of hand and forearm, a large quantity of pus was present in the space between the carpal bones and lower ends of ulna and radius (Fig. 2). Reddish discoloration of superficial veins supplying the area with engorgement and inflammatory changes were also present. Bilateral lungs were edematous and had consolidation changes. Spleen was soft, pulpy and grossly enlarged weighing 310 gms. Bilateral kidneys were pale with obliteration of corticomedullary junction. The cause of death was given concluded as septicaemia as a complication of septic arthritis of left wrist joint.

#### **Discussion**

In this case, the condition clearly went undiagnosed causing a preventable unwanted fatality. What was identified and treated as a simple fracture lead to a life threatening septic arthritis of the wrist joint. Diagnosis of SA is sometimes missed even by experienced clinicians if they are not used to treating joint disorders. A number of conditions like transient synovitis, osteomyelitis, trauma, etc can have similar presentation making diagnosis difficult. In this case, there was a delay of one day before the patient presented to the hospital; this delay might have turned out to be fatal. More so in the Indian scenario where the patient load in government hospitals is huge and so is the doctor patient ratio, hurried patient evaluation combined with no preventive medication for SA led to the condition going undiagnosed.

SA may be a life threatening condition but with early diagnosis and treatment, fatality can definitely be prevented. The standard diagnosis of septic arthritis is made on the basis of clinical examination as the child presents with high grade fever ( $>38^{\circ}\text{C}$ ) and a painful swollen joint with or without history of trauma. Pus on aspiration is diagnostic but this procedure is often missed or skipped. Synovial fluid examination is the mainstay of diagnosis. Microscopic analysis and culture should be performed as soon as possible. Here culture proves to be more sensitive than microscopy alone. Other investigations include white cell count and differential cell count, erythrocyte sedimentation rate, C-reactive protein.

These tests also help in monitoring response to treatment. Plain radiography helps to exclude underlying osteomyelitis [1-9].

Antibiotics along with surgical drainage and joint lavage form the basis of treatment of SA. Culture and sensitivity usually guides the antibiotic to be used, but since this takes time, empirical treatment should be started keeping in mind the locale, prevailing resistance patterns, availability and cost of drugs and other parameters [7]. Since *S. aureus* is the most common organism responsible, antibiotics targeting it should primarily be use intravenously. MRSA status should also be kept in mind while choosing the antibiotic to be used. Currently, the Infectious Diseases Society of America (IDSA) guidelines suggest the use of vancomycin as a first line of treatment for suspected MRSA infection [7]. In clindamycin sensitive cases, its use is advocated for its pricing and tolerability in children. Linezolid use is recommended keeping in mind its safety issues in cases where vancomycin does not produce adequate response. After the culture and sensitivity reports are obtained, choice of antibiotic can be adjusted accordingly, and in the scenario that the causative organism cannot be identified, which is more often than not, the clinical response should act as a guideline in choosing the antibiotic [7-9].

### Conclusion

Childhood septic arthritis when diagnosed early can be treated effectively. A child presenting with hot, swollen joint, with decreased weight bearing and limitations in movement should be managed in lines of SA until diagnosed otherwise. Late presentation being a common problem, adequate measures should be taken to recognise the symptoms early and a precautionary antibiotic cover should be started to prevent any septic complications.

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