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# Bilateral Septic Arthritis Resulting in Mortality in the Elderly: A Case Report

<sup>1</sup>Kadir, Dotun Musiliu, <sup>2</sup>Ahmed, Bola Abdulkadir, <sup>3</sup>Ibraheem, Gbadebo Hakeem

<sup>1</sup>Orthopedic unit, Department of Surgery, General Hospital, Ilorin, Nigeria

<sup>2</sup>Department of Orthopedics, University of Ilorin Teaching Hospital, Ilorin, Nigeria

<sup>3</sup>Department of Orthopedics, University of Ilorin Teaching Hospital, Ilorin, Nigeria

### ABSTRACT

Bilateral septic arthritis is a rare presentation and when present is seen in the elderly resulting in morbidity and mortality. We present a 79 year old lady who died as a result of complications arising from bilateral septic arthritis.

### Keywords:

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### \*Correspondence to Author:

A. Kadir Dotun M.  
Orthopedic unit, Department of  
Surgery, General Hospital, Ilorin,  
Nigeria

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## Introduction

Septic arthritis is usually an acute inflammatory condition involving the joints diagnosed by isolation of pathogens from the synovial fluid with subsequent complications.(1) It has an annual incidence of 7.8/100,000 person years in the US.(2) It is usually a mono-articular rather than poly-articular disease and in most cases mono-microbial(3,4). The commonest joint involved is the knee followed by the hips both in the young and elderly.(5) There are few reports of bilateral septic arthritis with an incidence of 16.6%. (4,6,7) Bilateral cases are common in elderly individuals.(6–11) Even rarer is mortality resulting directly from the condition. Factors implicated in mortality include poly-articular involvement and age greater than 60 years.(5) We present a case of bilateral septic arthritis in a 79 year old woman that died.

## Case Report

LA was a 79yr old retired teacher who presented to our facility following a 7 day history of high grade fever with chills and rigors, initially intermittent and later continuous. There was 5 day history of bilateral aching knee pain, swelling and inability to bear weight. There were no ulcers around the knees and no past history of trauma, instrumentation or surgery to both knees. She was a known hypertensive diagnosed more than 20 years ago and she was regular on antihypertensive. She had self-medicated on antibiotics prior to presentation. She was not a known diabetic. No past history of surgical procedures.

Examination revealed an acutely ill looking elderly woman, conscious, alert and in painful distress. She was not pale but febrile (38.1°C), mildly dehydrated and bilateral axillary lymph node enlargement and no pedal edema. Heart rate was 98/min, normotensive with no added heart sounds and oxygen saturation was 98 in room air. The chest was clinically clear, normal respiratory rate and breath sounds were vesicular in all lung zones. She had bilateral knee swelling with the right more than the left

(girth: Rt=41cm, Lt=38cm). There was tenderness bilaterally, severe decreased range of movement, differential warmth but no skin changes. Joint aspiration yielded free flowing pus bilaterally.

An assessment of bilateral septic arthritis of both knees was made. Random blood sugar was 9.4mmol/l, haemoglobin 8.9mg/dl, white cell count of  $16 \times 10^9$  with toxic granulations, neutrophilia of 60% of the differential count. Erythrocyte sedimentation rate (ESR) was 112/hr. Culture of the aspirate yielded no growth. ECG and urinalysis were within normal limits while the electrolyte, urea & creatinine showed low sodium and elevated creatinine level. Radiographs of both knees were unremarkable. Resuscitation commenced with Intravenous fluids, analgesics and parenteral antibiotics while she was being prepared for surgery. There was a blood pressure dropped to 90/50mmhg by 3<sup>rd</sup> day of admission making her ASA score 3E.

Due to financial constraints, bilateral arthrotomy was carried out on the 3<sup>rd</sup> day of admission under local anaesthesia and conscious sedation with ketamine and diazepam. A total of 220mls of copious pus was evacuated from both knees followed by copious irrigation with 5 litres of saline each.

Analgesics and antibiotics were continued post-surgery but there was persistent postoperative pyrexia (temp 36.6 – 38.1°C). There was no repeat swelling in both joints and as such did not require repeat lavage. On the 7<sup>th</sup> post-op, there were basal crepitations on both lung bases, fever was still present and urea and creatinine were elevated, the blood culture yielded no growth while her urine output was adequate and her sensorium became altered. An impression of acute confusional state secondary to septicaemia with renal impairment (pre-renal azothemia) was made. She was being prepared for dialysis when she died on the twelfth day of admission. An autopsy was not carried out as consent was not granted.

## Discussion

Septic arthritis is an acute inflammatory condition involving the joints and characterised by pain, difficulty/inability to ambulate, fever and swollen joints. Diagnosis is clinical and is confirmed by a positive arthrocentesis of either pus or synovial fluid with white cell count of greater than 50,000 and over 75% neutrophils. A culture of the aspirate reveals the infecting organism which in most cases is staphylococcus aureus.(2,3,5,9,12) Other isolates include Streptococcus sp, Pneumococcus, Gonococcus, E.coli and Influenza in children. Shirlif state that approximately 10% of all cultures from joint aspirates are polymicrobial and another 10% of cultures are negative.(12) Joint aspirate in our patient did not yield any pathogen probably because of indiscriminate self-medication with antibiotics prior to presentation or as a result of lack of testing for mycobacterium or fungal organisms. This makes treatment quite challenging.

Predisposing factors include age greater than 60 years, alcoholism, comorbid conditions such as diabetes and rheumatoid arthritis, presence of joint prosthesis, corticosteroid use, joint surgery, skin infections and ulcers around the joint and intra-articular injections.(8,11,13) Other predisposing factors are low socioeconomic status and intravenous drug abuse.(9) Rare etiological factors in literature in the pathogenesis of septic arthritis include injection of noxious chemicals such as petrol into the joint(11), administration of methotrexate(14) and endocarditis.(7)

Pathogenesis is multifactorial and depends on the host's immune response, bacterial load and the virulence of the infecting organism. These factors alongside the toxins elaborated by the bacteria, namely plasmin, cathepsin and prostaglandins are responsible for cartilage destruction while the presence of pus in the joint leads to the destruction of ligaments and joint capsule.(12) Thus cartilage, ligament and capsular destruction ultimately result in joint destruction.

Due to lack of arthroscopic facilities, open arthrotomy was carried out for our patient. However there have been conflicting reports on which of these two methods (i.e. arthroscopic or open) is better.(2,15) Arthroscopic debridement is believed to have less post-operative pain, less bleeding, less complications but has a prolonged operating time with better outcome as compared to the open technique.(15–17) Another study reported a reduced incidence of recurrence after open arthrotomy compared to arthroscopic debridement in septic arthritis of the shoulder.(15)

Mortality from septic arthritis can be significant especially in patients with poly-articular involvement. Julien et al and John et al reported mortality rates of 5.6% and 19% respectively in patients that had poly-articular involvement.(5,9) In the later study, all the deaths were in adults and none in children. Factors that have been reported to result in mortality following septic arthritis include older age, multiple joint involvement, bacteraemia, skin involvement, rheumatoid arthritis, diabetes, confusion on admission and low creatinine clearance.(9) Our patient fulfilled the first two of these and later on went to develop an acute confusional state while on admission. While synovial joint aspirate and subsequent blood cultures were negative, the presence of symptoms of systemic inflammatory response syndrome (SIRS) was an undeniable indicator of the presence of sepsis. Dubost et al also found that blood cultures were negative in 13.6% of cases.(4) Considering that there were no chest symptoms on admission, we can only deduce that vascular inoculation leading to bacteremia during open arthrotomy in addition to prolonged immobilisation post-op could have been the reasons why she developed a chest infection. The sepsis coupled with pre-renal azotemia and possible uremic encephalopathy were the factors leading to death in this patient. This working theory was also corroborated by shirliff who stated that mortality associated with septic arthritis is as a result of transient/chronic

bacteremia.(12) He also found that the mortality rate in elderly patients was higher (19 – 33%) when compared to younger adults. This mortality rate is similar to that found by Dubost et al and the average mortality rate reported in literature (30%).(4) Reasons that may be deduced include a decline in natural immunity and pre-existing medical conditions such as diabetes and rheumatoid arthritis. The presence of these two factors, i.e. low immunity and bacteraemia in patients with poly-articular septic arthritis are poor prognostic factors.(5,12)

The response of elderly patients to antibiotic therapy may be negatively influenced by decreased organ residual capacity, altered pharmacokinetics, pharmacodynamics and poly-pharmacy. There is also an age associated decline in normal renal function which also contributes to erratic drug absorption and excretion.(12) These are also possible reasons resulting into mortality in elderly patients.

## Conclusion

Polyarticular septic arthritis, though rare, is a risk factor for mortality in elderly patients whose immunity is suboptimal. Prompt diagnosis and an aggressive treatment policy which should include good drainage, isolation of infecting organisms, testing for unconventional organisms and adequate intravenous antibiotic cover remains key in our environment.

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