

# Osteomyelitis caused by proteus mirabilis in HIV negative young male with sickle cell disease – A rare case report

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## Abstract

One of the most debilitating types of infection is osteomyelitis; the infection of bone and its marrow. Most common cause of osteomyelitis is Staphylococcus Aureus, but in certain cases other organisms can be isolated. Proteus organisms are rare causes of osteomyelitis; may be seen in HIV positive cases. A 20 year old male, sickle cell positive, HIV negative patient came to our outpatient department with complaint of discharging sinus at upper third of tibia left side, since 4-5 months. Sequestrectomy was done with sinulectomy and drainage of pus. Pus was sent for culture and sensitivity reporting; which showed Proteus Mirabilis growth. Patient was treated with Linezolid and ofloxacin both intravenous and oral. Proteus Mirabilis causing osteomyelitis is a very rare phenomenon, but should be suspected in HIV seropositive cases. It should be suspected even in HIV seronegative patients not responding to long term use of antibiotics. Surgery is the mainstay of treatment. Antibiotics should be started only after doing the culture and sensitivity reporting.

**Keywords:**

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## INTRODUCTION

Infectious diseases are one of the leading causes of morbidity. It not only affects the general well being of a person, but also puts a huge financial burden on the affected individual. One of the most debilitating types of infection is osteomyelitis; the infection of bone and its marrow<sup>1</sup>. It affects the general functioning of the patient and also requires long term treatment. In certain cases it can lead to non-correctable deformities. Infectious diseases of the skeleton have been known from the

earliest stages of human development. Signs of burned-out osteomyelitis have been found in hominid fossils (*Australopithecus africanus*), and the symptoms are described in the oldest medical texts (Edwin Smith papyrus)<sup>1</sup>. Most common cause of osteomyelitis is Staphylococcus Aureus. But in certain cases other organisms can be isolated; like Salmonella in sickle cell, Group B Streptococci in neonates, fungi and other rare organisms in immunocompromised patients etc. Proteus organisms are rare causes of osteomyelitis<sup>2</sup>; may be seen in HIV positive cases<sup>3</sup>. We are presenting before you a rare case of osteomyelitis of proximal tibia caused by Proteus Mirabilis organism in a HIV negative, sickle cell positive young male patient.

## CASE REPORT

A 20 year old male patient came to our outpatient department with complaint of discharging sinus at upper third of tibia left side, since 4-5 months (Fig 1). He was known case of sickle cell anemia (SS pattern). He had taken treatment at different hospitals in last few months, but the discharge from the sinus did not stop. Patient also

complained of on and off fever from last 5 months. There was no history of any significant trauma. No significant medical (Diabetes, Hypertension, Tuberculosis or any other recent infection) and surgical history present. Laboratory investigations were done and found to be normal; except for slight rise in total leucocyte count and decreased haemoglobin. X-ray of tibia done; both anteroposterior and lateral views taken, which showed sequestrum in proximal tibia (Fig 2 and Fig 3). Patient was put off all medications. Pre-anaesthetic check up done and patient was posted for surgery. Sequestrectomy was done with sinuectomy and drainage of pus. Pus was sent for culture and sensitivity reporting. Patient was put



Figure 1



Figure 2

## DISCUSSION

Osteomyelitis is the infection of bone and its marrow. It occurs mostly secondary to open fractures of bones. But may also be caused in closed fractures and non-traumatic conditions like cellulitis, diabetic foot, sickle cell disease and other immunocompromised conditions. Most common route of spread is haematological i.e. through blood from other sites of infection in the body. In around 75% of cases of chronic osteomyelitis, the causative pathogens are *Staphylococcus aureus* and coagulase-negative staphylococci<sup>1</sup>. In reducing order of frequency, and depending on individual patient disposition, streptococci, gram-negative pathogens (enterobacteria, pseudomonads), and anaerobic bacteria have been demonstrated; rarely, mycobacteria and fungi are found<sup>1</sup>. What they all have in common is the ability to form a biofilm. Surgery combined with anti-infective chemotherapy leads to long-lasting containment of infection in 70% to 90% of cases<sup>1,5</sup>. *Proteus Mirabilis* is a very rare organism causing osteomyelitis<sup>2,3</sup>. It can be rarely isolated from cultures in patients who are HIV positive. *Proteus* species are part of the Enterobacteriaceae family of gram-negative bacilli<sup>4</sup>. *Proteus Mirabilis* causes 90% of *Proteus* infections and can be considered a community-acquired infection<sup>4</sup>. It is facultative anaerobe

on broad spectrum antibiotics till the reports came. The reports showed growth of *Proteus Mirabilis*. It was double checked and found to be the same. Then patient was put on IV Linezolid 600mg BD and IV Ofloxacin 200mg for 14 days, followed by tab linezolid 600 mg bd for 2 weeks and tab ofloxacin 200 for 2 weeks. Patient was also given haematenics and multivitamins for supportive therapy. He was advised dressing every 3<sup>rd</sup> day for 2 weeks, and suture removal done after 2 weeks. After that the patient was advised follow up every month for 3 months and 3 monthly thereafter. At present the patient is off all medications. He has no complaint of discharging sinus; also the fever and anemia have subsided.

characterised by swarming motility, ability to ferment maltose and inability to ferment lactose. It commonly causes urinary tract infections and sometimes lung infections like pneumonia<sup>4,5</sup>. It is resistant to nitrofurantoin and tetracycline; but sensitive to cephalosporins, floroquinolones and aminoglycosides<sup>5</sup>. It is very rare to have a case of osteomyelitis caused by *Proteus Mirabilis* in a HIV seronegative patient<sup>3</sup>. In our case, the patient was given antibiotics without doing culture sensitivity for 4-5 months at different hospitals. The patient was taking antibiotics on and off. This may have caused the common organisms growth to cease; but uncommon organisms like *Proteus* may have flourished.

## CONCLUSION

*Proteus Mirabilis* causing osteomyelitis is a very rare phenomenon, but should be suspected in HIV seropositive cases. It should be suspected even in HIV seronegative patients not responding to long term use of antibiotics. Antibiotics should be started only after doing the culture and sensitivity reporting. It decreases the inadvertent use of antibiotics and decreases the chances of antibiotic resistance. Also it decreases the chances of growth of uncommon organisms which are difficult to treat; and decreases the financial burden on the individual. Surgery is the mainstay of treatment in cases

of osteomyelitis. But surgery alone is not sufficient; it has to be combined with intravenous followed by oral antibiotics. A large study sample is required to assess the exact prevalence and management options in cases of *Proteus Mirabilis* osteomyelitis in HIV seronegative patients.

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