Morganella morganii osteomyelitis affecting both great toes – A rare case report

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ABSTRACT

The *Morganella Morganii* infection is very uncommon in current orthopaedics practice. It is mainly been known to cause nosocomial infections and infections in immunocompromised individuals, especially related to the urinary tract. Orthopaedic infections by this organism are rare and typically affects the joints and bone infections are reported in late findings during the course of infection. However the possibility of such a rare infection cannot be ignored. *Morganella Morganii* osteomyelitis has been known for its delayed course of involvement in the bone and subsequent destruction of it, which usually takes a chronic course. Sometimes, heavy growth of *Morganella Morganii* causes septicaemia and death in individuals who are in an immunocompromised state. We hereby report a child who developed a *Morganella Morganii* infection of the distal phalanx of the great toe with relatively early destruction and resorption of the bone, probably secondary to soft tissue infection surrounding the bone in an otherwise healthy child. The principles of management for effective eradication of such infection remain serial debridement as necessary and appropriate antibiotics for at least six weeks.

KEY WORDS: Immunocompromised individual
Morganella Morganii
Osteomyelitis

Introduction

Morganella morganii is a commensal gram negative bacteria, and is widely distributed in the gastrointestinal tract of human being. It uncommonly causes community-acquired infection, and is sometimes responsible for post-operative nosocomial infections such as urinary tract infections. This organism may also rarely cause nosocomial surgical wound infections, peritonitis, central nervous system infection, endophthalmitis, pneumonia, chorioamnionitis, neonatal sepsis, pyomyositis, necrotizing fasciitis, and arthritis occasionally in patients. Bacteremia is uncommon with this organism and occurs in patients who are diabetic, immunocompromised, elderly population or other associated medical illness.

It rarely causes infection alone, it is commonly encountered in people with suppressed immunity and in cases of hospital acquired infection or it may also manifest itself as a superinfection. *Morganella morganii* often demonstrates a slowly progressive course with exacerbations and remissions and diagnosis is usually late and confusing due to its rarity. Osteoarticular pathologies are not commonly observed with *Morganella morganii* infections and bone involvement is a late feature - mortality rate is quite high with this infection in immunocompromised individuals.

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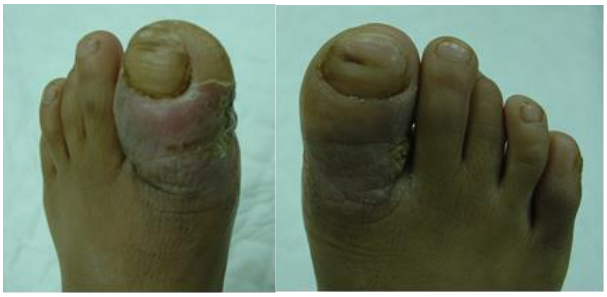
Osteomyelitis is a progressive disease caused by damage to the osseous tissue due to infectious and inflammatory processes evoked by a microorganism [1]. Many microorganisms can lead to osteomyelitis, however, the most commonly encountered pathogen is Staphylococcus aureus. We present a rare case of chronic osteomyelitis caused by *Morganella morganii* affecting both great toes where the bony involvement is early in the course of the disease.

Case Report

An 11-year-old otherwise healthy male child was admitted to orthopedic facility with increasing pain, redness, induration, pus discharge and swelling in both great toes which had started near the left sided nail bed about 10 days ago without a history of trauma. The pain started around the

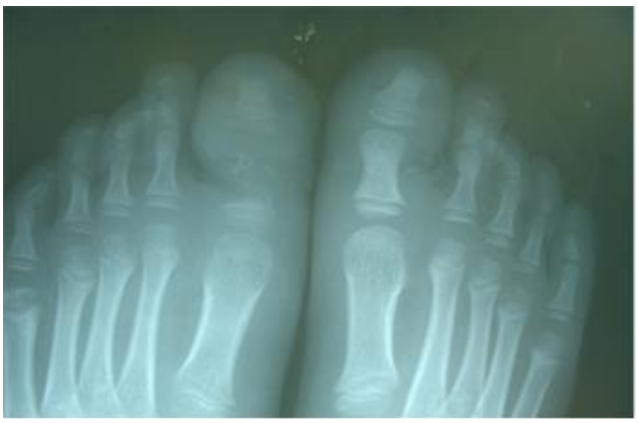
left great toe and after about four days similar symptoms were reported in right great toe region. There was no associated fever or constitutional symptoms and hence the parents did not seek medical treatment for last 10 days. The initial symptoms were inability to wear footwear while getting ready for school. Local examination revealed erythema, elevated local temperature and ulceration at the great toes (figure 1).

Figure 1. Clinical picture of bilateral foot showing erythema and swelling of bilateral great toe



There was a limitation and painful movements of the interphalangeal joints of both great toes. The left toe was more painful and seemingly more involved than right side. There was no lymphadenopathy of popliteal or femoral group. Radiological evaluation of bilateral feet revealed a complete absorption and lysis along with irregular destruction of the proximal phalanx of the great toe on the left side, with sparing of epiphysis of the left great toe. The right foot looked normal on radiographs, except for soft tissue swelling surrounding the proximal phalanx of right great toe. The chest radiographs were normal (figure 2).

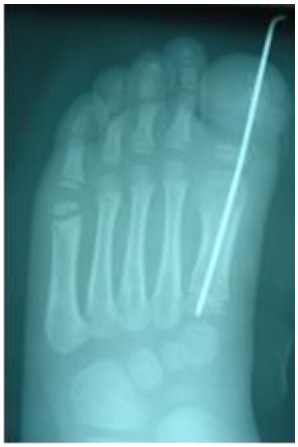
Figure 2. Radiological picture of both great toe showing left toe destruction of proximal phalanx along with lysis and absorption of near complete proximal phalanx of great toe, excluding the epiphysis



Child was healthy and not previously a diabetic, or with any associated diseases leading to immunocompromised status. He had no history suggestive of sickle cell disease. Complete blood count revealed: haemoglobin of 12.2gm/dl , total leucocyte counts were 8600/ cumm, C-reactive protein (CRP) of 12 mg/l; Erythrocyte Sedimentation Rate (ESR) of 30 mm/hr. The ASO titre was 210 IU and the Blood glucose was 85mg/dl. The liver and renal function test were normal. The urine microscopy and culture did not reveal any abnormality. Subsequently pus culture was done from both feet at great toes which revealed heavy growth of *Morganella morganii* after 48 hours of incubation Antibiotic sensitivity testing revealed that the pathogen was resistant to trimethoprim/sulfamethoxazole, cefuroxime, ciprofloxacin, amikacin, ampicillin/sulbactam and amoxicillin/clavulanic acid and was sensitive to gentamycin, cefotaxime, and cefaperazone/ sulbactam, and Cefdinir. The sickling and Hemoglobin electrophoresis test showed normal AA pattern.

Following culture antibiogram, intravenous therapy with piperacillin/tazobactam (2.25 gram every 6 hours intravenously) was initiated and local treatment included a radical debridement of left great toe along with trans articular fixation with a K – wire to stabilise the left great toe. The right great toe needed superficial debridement only (figure 3).

Figure 3. Post-Operative Radiological picture of left great toe showing trans articular K wire fixation



Initial antibiotics started after first debridement surgery was intravenous Cefuroxime calculated according to the weight presuming the organism to *be Streptococcus* or *Staphylococcus*, which were changed, once we received the microbial sensitivity analysis. The intravenous antibi-

otics were administered for 5 days, followed by oral therapy of Cefdinir in appropriate doses for six weeks. While the patient was on antibiotic therapy improvement was observed after five days. Three serial debridements at 48 - 72 hours interval were done for left great toe and materials were acquired from the infection site for histologic and microbiologic analyses at the last debridement after 6 days, which did not reveal growth of organism. Eventually, the patient recovered well and the infection subsided. The K wire was removed after 4 weeks of surgery and the child was fit to resume school after 6 weeks of treatment.

Discussion:

is an anaerobic, gram-negative, facultative, urease positive microorganism and is found in the natural flora of the gastrointestinal system. The microorganism usually shows low virulence and clinical progression of infection is in slow-pace with breakthrough remissions [2,3].Musculoskeletal pathologies caused by are extremely rare and till now, only few cases have been reported in the literature, which shows sporadic septic arthritis without bone involvement. The bone involvement reported is late in the course of disease; however, in our scenario, the bone involvement seemed early with near complete destruction of the proximal phalanx of left great toe. The bone involvement seemed to be secondary to local soft tissue infection causing spread of infection, since only left foot phalanx was affected and right sided phalanx was spared probably due to early initiation of intravenous antibiotics and these infections are more common in the diabetic and immunocompromised patients [4,5].Our patient was healthy and had no evidence of immunocompromised status. Risk factors for infection are Immunosuppression, long-term urinary catheterization, diabetes, rheumatoid disease, alcoholism, corticosteroid therapy, malignancy, intravenous drug use, and surgical interventions.6 High mortality rate can be expected when one or more of the risk factors are compounded [6]. infection is more commonly associated with urinary catheterization [7]. The basic principles of treatment of osteomyelitis is early recognition of the organism along with radical debridement of the necrotic soft tissues and bone fragments, and prevention of dead space formation along with long-term antibiotic therapy [7] . We can safely conclude that the can be successfully treated with serial debridements and a long term suitable antibiotic regimen. Clinicians involved in treatment of bone and joint infections must be aware that uncommon organisms like might also produce early bone destruction, leading to bone resorption and can be effectively inhibited by appropriate antibiotics for longer duration. The early bone destruction occurring in this child has not been reported in literature earlier, which made us delay the diagnosis for almost 24 hours.

Conflict of Interest

We declare that we have no conflict of interest.

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