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Chronic Osteomyelitis of the Navicular Bone: Case Report and Review of Literature

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Abstract **Case Report**

Osteomyelitis of the navicular bone is not common; the few reported cases are haematogenous osteomyelitis of the navicular bone and were mostly seen in children and another case seen in an adult. We are presenting a case of domestic accident resulting in chronic osteomyelitis of the navicular bone in an adult caused by direct inoculation of infection following traditional bone setter's mismanagement and subsequent surgery on the same foot. Consent is duly obtained from the patient to present this case report. The aim of this case presentation is to highlight the need for high index of suspicion of osteomyelitis of the bones of the foot in adult which are not necessarily secondary to haematogenous spread as seen in children but due to direct inoculation of micro- organisms, the study also seeks to demonstrate a complete cure of chronic osteomyelitis following proper debridement of the sequestrum with adequate use of the relevant antibiotics for the specified durations of administration. The patronage of traditional bone setters by most patients in Africa is still worrisome because this results in delayed presentation and attendant complications as seen in this index patient. In conclusion, chronic osteomyelitis of navicular in adults tend to follow direct inoculation of micro-organism but with a radical debridement with appropriate administration of antibiotics can result in cure. However, health education is necessary to discourage patients' patronage of traditional bone setters and encouraging early presentation with good outcomes.

Keywords: Navicular, osteomyelitis, adult, Traditional bone setters.

INTRODUCTION

Haematogenous Osteomyelitis of the navicular bone has been reported in children though not common [1]. Another case of haematogenous osteomyelitis in the foot also reported but to the metatarsal bones [2]. There are no many case reports of chronic osteomyelitis to the navicular bone. We are therefore presenting this rare case of direct inoculation following traditional bone setters' mismanagement and a surgical procedure on the foot [3]. When chronic osteomyelitis results from direct inoculation, there is adherence of bacteria to the bone extracellular matrix and if in an implant surgery, it adheres to the surgical implants. Staphylococci are known to possess large variety of adhesive proteins and glycoproteins which facilitate binding to bone through receptors to fibronectin and other structural proteins [4, 5]. This interface of bacterial surface components with immune system cells leads to cytokine production causing osteolysis. Through the lowering of their metabolic rates, formation of a glycocalyx coat and "hiding" intracellularly, the bacteria are capable of evading antibiotics and the host defence mechanism [6]. However, the challenges of diagnosis of osteomyelitis of navicular bone is quite important as it could also mimic a malignant synovioma of the ankle which presents with same history of trauma and subsequent presentation of swelling and mild growth with discharge [7]. Chronic osteomyelitis of navicular has similar presentations as seen in any chronic osteomyelitis of other bones. However, the site is unique as it presents in the foot at the location of the navicular bone with a discharging sinus, associated deformity of the medial aspect of the foot and discoloration of the skin around the discharging sinus.

We report this rare case to highlight the need for high index of suspicion of osteomyelitis of the bones of the foot in adult which are not necessarily secondary to haematogenous spread as seen in children but due to direct inoculation of micro- organisms, the study also seeks to demonstrate a complete cure of

chronic osteomyelitis following proper debridement of the sequestrum with adequate use of the relevant antibiotics for the specified durations of administration.

CASE REPORT

Mrs CEN, 45 years presented with a one year history of discharging sinus with small growth around the wound on the medial aspect of the left foot followimg a domestic accident which resulted from the twisting of her ankle with associated close injury to the medial aspect of midfoot and ankle. There was obvious deformity of the ankle with severe pain and swelling of the ankle and foot. She was initially taken to a traditional bone setter where she was grossly mismanaged until she sought medical attention in a private hospital. She was offered surgical treatment with no much improvement after several months, this was evident by a continuous discharge of pus from the sinus with a small growth around the wound. She was then referred to our medical facility.

On examination, there was discoloration around the medial aspect of the foot with a discharging sinus, small growth-like swelling around the wound measuring about 1cm by 2cm which was soft and attached to the wound edge, scarification marks, deformed midfoot, differential warmth felt, mild tenderness, with tettered skin, restricted movement at the midtarsal joint and ankle joint.

Xray showed features consistent with chronic osteomyelitis of the Navicular bone which were bone - in-bone appearance with thin involucrum of the navicular bone, reduction in the talo-navicular joint and the cuneiform bones, the white cell counts was $14X10^9/L$ with Haemoglobin of 12g/dl, swab of the sinus revealed methicillin sensitive *Staphyloccocus aureus*, she was then placed on intravenous antibiotics for two weeks and continued with tablets Fusidic acid for another six months. There was also a biopsy of the sinus tract which showed more of inflammatory cells. Patient was counselled for a debridement of the navicular bone which was done, there was a meticulous management of the dead-space with vancomycin-impregnated bone substitutes. Wound healing was considered satisfactory following six serial negative wound swabs which were done every 72 hours and clinical evidence of absence of infection. Patient was discharged home and has been on follow-up weekly for six weeks and later monthly for four months. She was seen after one year and then seen 5 years later with complete healing and no discharge or flares around the surgical site.

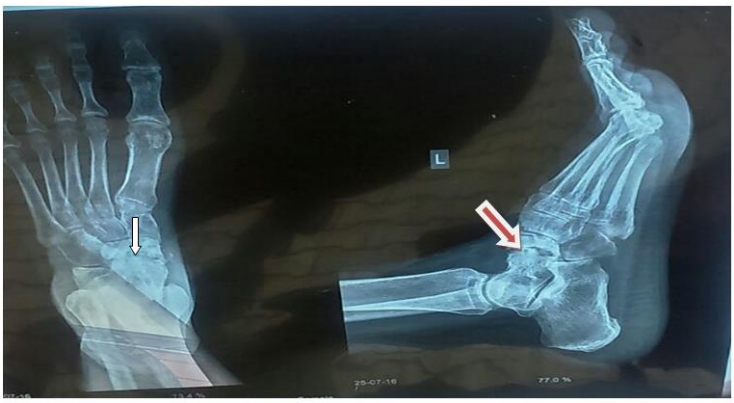

Figure 1: Xray showing the osteomyelitis of the navicular bone with bone-in bone appearance

Figure 2: Post-operative wound healing 2 weeks after surgery

Figure 3: Post –operative Xray after debridement showing removal most part of the navicular

Figure 4: 5 years later. There no more discharge, wound is been fully healed

DISCUSSION

Osteomyelitis is defined as the progressive infection of bone and bone marrow through bacteria seeding into the bone, resulting in local inflammatory reaction and eventual destruction of bone, necrosis and formation of a sequestrum [3, 8, 9]. Infections of the bone are determined by duration of infection, etiology, pathogenesis, degree of bone involvement and class of host [10, 11]. Most of reported cases of osteomyelitis affecting the navicular bone and other bones of the foot are in children and they are cases of haematogenous osteomyelitis (HOM) of the navicular or other bones of the foot [1, 2, 12]. However, we are presenting a rare case of chronic osteomyelitis (COM) of the navicular bone in an adult who had a closed injury of the foot and ankle but was first mismanaged by traditional bone setter who are still fully patronized by all categories of people in our environment, before being treated by an Orthodox medical practitioner [13]. The possibility of breaching the skin by the traditional bone setter's scarifications and application of herbal concoctions may have caused some direct inoculation of organism resulting in bone infection and consequently the chronic osteomyelitis of the navicular bone [14]. The discharging sinus and swelling around the wound also raised a suspicious of malignant synovioma of the ankle, this led to more aggressiveness in the management. However, the wound biopsy result was negative resulting in more focus on the diagnosis of COM of the navicular bone. Diagnosis of chronic osteomyelitis of navicular demands detailed history, physical examination and relevant investigations such a plain radiograph will show a clear picture of bone-in-bone appearance with sclerosis and reduction of joint space as seen in the xray (Fig 1), other investigative modalities like Full Blood Count (FBC), C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) are very necessary for follow-up [15].

Prompt debridement with appropriate antibiotics administration given intravenously for two weeks and orally for 4 weeks is central for a complete cure. In this case, we used intravenous Ceftriaxone and continued with Fusidic acid for six months which has found to be quite effective in chronic osteomyelitis. This has been shown to be effective against most microorganism especially bone infections caused by methicillin-resistant *Staphylococcus aureus* [16]. We see complete healing without recurrence and absence of 'flares phenomenon' characterized by acute exacerbation of pains, warmth and fever (Fig 4).

In Conclusion, Misdiagnosis and inappropriate treatment of chronic osteomyelitis of the navicular could lead to severe morbidity and reduced quality of

life. High index of suspicion by Orthopaedic Surgeon is paramount in the management of this condition.

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