CASE REPORT

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Subacute Osteomyelitis of the Talus in a Teenager: A Case Report

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ABSTRACT

Subacute osteomyelitis of the talus is relatively rare and usually run an indolent course with symptoms such as pain, limping, and an antalgic gait with associated little or no constitutional symptom of low-grade fever. We present a case report of an 18-year-old female secondary school student in Niamey, Niger Republic who had a one-year history of recurrent pain in the right ankle, limping, and an absence of constitutional symptoms. Physical examination, radiological imaging, and histopathological results were in keeping with a diagnosis of subacute osteomyelitis of the talus. She underwent surgical debridement and a course of antibiotic therapy. She made an uneventful recovery but had residual short limb gait. In conclusion, subacute osteomyelitis of the talus is uncommon, a good outcome can be achieved with surgical debridement and antibiotic treatment.

Key words: Subacute osteomyelitis, talus, surgical debridement

1. INTRODUCTION

The overall incidence of osteomyelitis in children in the developed countries ranged from 1.94 to13 case per 100,000 population, compared to 43 to 200 cases per 100,000 population in low-income countries. The incidence may be disproportionately higher in sub-Saharan Africa where poverty, -a major factor associated with its occurrence – remains widespread[1,2]. Over 90% of the acute osteomyelitis are hematological in origin, out of which 15 -30 % become chronic with a male preponderance[3]. Chronic osteomyelitis is often the result of inadequate treatment in the acute phase or delayed presentation, though it may present as chronic de novo when caused by tuberculosis or other granulomatous diseases.

Chronic osteomyelitis usually affects the long bones, predominantly the femur, tibia, humerus, radius, and ulna in close to 80% of cases, because of the hairpin configuration of the capillary loops, which slows down blood flow favouring bacterial seeding[2]. While commonly affecting a single bone, it can extend to multiple long bones in people with other health conditions and compromised immune systems. The flat and irregular bones are seldom involved, when it does the calcaneum and the talus are predominantly affected. Researchers have reported acute osteomyelitis of the talus [4], with a few reporting sub-acute osteomyelitis as well[5–7].

Subacute osteomyelitis is a distinct form of osteomyelitis that is often difficult to diagnose and sometimes running an indolent course. Brodie's abscess is the term for a localized, well-circumscribed collection of pus affecting long bones, forming a wall and presenting as a persistent ache with an insidious onset of two weeks or more. It is often associated with few and unremarkable constitutional symptoms. The most common sites of infection are the metaphysis of the proximal third of the tibia and the distal third of the femur, occasionally affects the radius and humerus and rarely the small bones of the foot[5]. Brodie's abscess is a quiescent disease; the pathogenesis is unknown, however, its indolent nature suggests a combination of the interaction of high host resistance and low virulent organism as causative pathogens. This theory is supported by reports of subacute osteomyelitis of the talus caused by uncommon, low virulent organisms [7–10]. Shah et al., for instance, described the case of a six-year-old patient diagnosed with Pasteurella canis despite a negative history of dog bites[7]. On the other hand, Harris et al. isolated Morganella morgani as the aetiolog-

ical agent of their own report of talus' Brodies' abscess[11].

The talus, which is a critical weight-bearing bone in the ankle mortise, may be particularly susceptible to infection because of its precarious blood supply, which share some similarities with the capillary loops in the metaphysis of long bones[12]. We describe the clinical presentation, radiological features, and diagnosis of subacute osteomyelitis of the talus in an 18-year-old female college student in Niamey.

2. CASE REPORT

An 18-year-old female secondary school student in Niamey, Niger (who gave consent for this case report) presented with a one-year history of pain in the right foot, recurrent discharge from the right ankle associated with low-grade fever, and limping. The last episode of discharge was six months prior to her presentation at our facility. She had no history of trauma or other comorbidities. Physical examination revealed an antalgic gait, multiple puckered scars, mild swelling, and tenderness over the medial side of the talus, with no sinus discharge. The ankle dorsiflexion was 10 degrees and plantar-flexion was 15 degrees. Chronic osteomyelitis of the talus was the tentative diagnosis.

Laboratory results showed a haemoglobin level of 15.5 g/dl, complete blood count of 8.7 ×109 /l, C- reactive protein and erythrocyte sedimentation rates were within normal ranges, with an ESR of 11mm/hr, C-reactive protein of 0.3 mg/dl respectively. The sickling test was negative. The preoperative radiograph showed generalized osteopnea of the visualized bones with mal-alignment of the ankle joint. The ankle mortices is distorted with marked sclerosis of the articular surfaces of the tibia, talus, navicular, and anterior aspect of the calcaneum. There is obliteration of the tibio-talar and talocalcaneal joints. A linear lucency with a sclerotic rim suggestive of possible abscess formation is seen projected over the ankle joint on the AP radiograph. There is soft tissue swelling over the ankle with distortion of fat and muscle planes. An ankle radiograph revealed a distinct cavity with a radiopaque wall, dense sclerosis within the talus body, secondary osteoarthritic features in the ankle and partial ankylosis, Fig. 1.

Operative intervention was performed using an anteromedial approach along the tendon of tibialis posterior. The incision begins about 2 cm posterior and inferior to the tip of medial malleolus extending it toward the base of the first metatarsal for 3 cm. No skin flaps were raised, and care taken to protect the vascular bundles. The periosteum on the talus was incised and reflected to expose the posterior part of the talus using the subtalar joint as a guide. The cavity within the talus was de-roofed, and curetted, revealing infected granulation tissue with other whitish-yellow material within the cavity. A specimen was taken and sent for histopathological examination. The cavity was irrigated generously with a dilute 3% hydrogen peroxide solution and normal saline, then packed with gauze soaked in povidone-iodine. The patient received twice-weekly dressing of the wound until complete healing was achieved. Postoperatively, intravenous ceftriaxone 1 g daily was administered for 7 days and oral antibiotic medication with cefixime 400mg continued for 5 weeks. The patient was discharged following the completion of the intravenous antibiotics. The histopatholoy report showed inflammatory cell infiltrates with a predominance of lymphocytes, plasma cells and histiocytes, along with an increased trabecular thickness, some woven bone formations, and bone necrosis. These findings confirmed a diagnosis of subacute osteomyelitis. The culture was negative for bacterial growth. The post-operative radiograph is as shown in figure 2. Post operatively, the limb was supported with plaster of Paris boot back-slab. She was mobilized on non-weight bearing bilateral axillary crutches for 6 weeks followed by partial weight bearing for 6 weeks. Subsequently full weight bearing was commenced. She was seen at the clinic monthly for 3 months before she was lost to follow-up. As at the last followed up in the surgical outpatient clinic, she reported no pain with the full weight bearing, although, she still limped with limb length discrepancy of two centimetres. The patient was lost to follow-up at 5 months, preventing the scheduled 6-month post-operative ankle radiograph.

4. DISCUSSION

Subacute osteomyelitis is characterised by an osseous infection lasting over two weeks without acute symptomatology. It often presents with mild or absent systemic symptoms, inconclusive laboratory results, and negative bacterial growth[13]. The talus is weight bearing bone in the ankle mortice, therefore its involvement in inflammatory process is often associated with chronic pain, limping, and reduced quality of life. While chronic osteomyelitis usually affects the metaphysis of long bones because of hair-pin like capillary loops with adjacent joint involvement in children less than 2 years; the involvement of flat and irregular bones like the talus is very rare. Recent anatomical studies on cadaveric specimens found capillary loop arrangement analogous to the metaphysis of long bones, which may explain its susceptibility to infection[14].

Several reports documenting acute and subacute osteomyelitis of the talus exist. Pabla et al., for instance, reported a case series of five patients with primary acute hematogenous osteomyelitis who underwent surgical debridement and received antibiotics intravenously and orally with favourable outcomes[6]. Their paper emphasised the diagnostic challenges of this condition and suggested

Figure 1: Showing the Preoperative Radiograph of the Patient with well Circumscribed Cavity in the Talus Surrounded by Dense Sclerotic Wall with Obstruction of the Subtalar Joint and Tibiotalar Joint

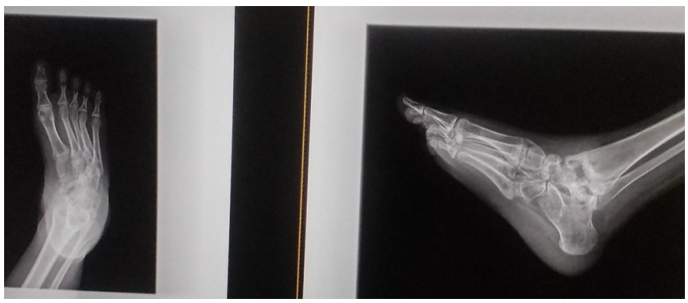

Figure 2: Immediate Postoperative Radiographs Showing the Reduction in the Size of the Cavity in the Body of Talus. There is Marked Sclerosis and Irregularities of the Distal End of the Tibia with Widening of the Tibio-Talar Joint Space

ways to overcome them. Similarly, Abdulmuhsen et al. published a case report of subacute osteomyelitis of the talus successfully treated with surgical debridement and a short course of antibiotic therapy[5]. There are also case reports of primary subacute osteomyelitis caused by Serratia marcescens8, Pasteurella canis (with a negative history of dog bite) [7], Candida krussel[9], and melioidosis[15].

In our case report, there was a history of recurrent discharging sinuses in the ankle, but this stopped prior to presentation in our facility, although the pain and limping persisted. Histopathology examination showed evidence of subacute osteomyelitis. The history of sinus discharge hinted at a chronic aspect to the condition, despite no sequestrum being observed intraoperatively. Radiographic findings of dense sclerosis in the surrounding bone, tibiotalar joint destruction, and talar collapse with associated limb shortening further supported a diagnosis of chronic osteomyelitis. The previous history of discharging presented a diagnostic conundrum in our case report, but the absence of sequestrum and histopathological findings are in keeping with the diagnosis of subacute osteomyelitis of the talus. Therefore, conducting a detailed history, clinical examination, and appropriate investigations are necessary to confirm the diagnosis.

The C-reactive protein and erythrocyte sedimentation rates of our patient were within normal limits. This is consistent with a previous report by Spyropoulus et al. where the C-reactive protein was normal in 52% of the cases but had elevated erythrocyte sedimentation rates in 67.7% of cases in their retrospective review. However, the erythrocyte sedimentation rate in our patient was within the normal range. Sometimes ancillary imaging like CT scan and MRI are needed to make a diagnosis of subacute of the talus. While these radiological investigations have high sensitivity, a tissue diagnosis is still needed for confirmation[16]. However, in a resource -constrained environments, some investigations may not be readily available and the affordability of these investigations might also pose a challenge for the patient. We couldn't perform this investigation on our patient due to her financial constraints. Additionally, clinical pictures could be not taken as the patient was lost to follow-up. One of the bane of clinical practice in most suburban communities in Sub-Saharan Africa is difficulty with follow-up of patients when they have recovered from their illness[17].

In subacute osteomyelitis, most of the culture results are often negative, although recent studies reported higher bacterial growth rate with the use of polymerase chain reaction[18]. Access to the technique may be limited for those practising in resource constraints environment. Our patient's culture was negative for bacterial growth but she still received an empirical prescriptions of a 7 day's course of intravenous anti-staphylococcus antibiotics, followed by oral antibiotics for 5-weeks. The patient had an uneventful recovery. This is in agreement with a published report by Floyed et al[19] of 40 culture negative osteomyelitis whose initial presentation differed from the culture positive cases. Similarly, Zhorne et al. observed that the rate of negative culture was 70% in those who received antibiotic treatment before tissue biopsy, whereas it was 63% in those who did not[20]. In our patient, over-the-counter prescription of antibiotics could have contributed to the negative culture from the intraoperative specimen.

In females aged 9–19, normal ankle movement is 15.6–19 degrees of dorsiflexion and 54.4–59.8 degrees of plantar flexion; males show slightly lower values[21]. Joint stiffness resulting from injury or disease is called ankylosis. Complete rigidity results from bony fusion, while partial rigidity involves fibrous tissue across the joint. Partial ankylosis allow some joint movement, but complete ankylosis result in zero motion. The definition of partial ankle ankylosis is unclear, unlike the knee, where;50 degrees ROM is stiff and 30 degrees is ankylosis[22]. In our 18-year-old female patient, we observed 10 degrees of dorsiflexion and 15 degrees of plantar flexion. Therefore, the joint may be described as partially ankylosed or stiff.

4.1 Conclusion

In conclusion, subacute osteomyelitis of the talus is not common, but with thorough surgical debridement and antibiotic therapy, a good outcome is possible even in resource constrained environments.

Consent for Publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review on request.

Contributor Roles Taxonomy (CRediT) Statement

AAO operated the patient, conceived and drafted the manuscript,
US and FL were involved in the editing of the manuscript,
OFO reported the radiographs and
CM partook in the management of the patient.
All the authors read and approved the final manuscript for submission

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The authors declare that they have no conflict of interest.

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