Foot and ankle tuberculosis, A Case Report & Review of The Literature

Sami Nogdallah[1], MOHMMEDELGHAZALI MUSTAFA[2], Alaa Mohamed Khairy[3], Montaser Fatooh[1], and Hozaifa Abd-Elmaged[2]

[1]Al-Neelain University
[2]Alzaiem Alazhari University
[3]Sudan Medical Specialization Board

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Abstract

Foot and ankle TB is rarest form of skeletal TB. It's symptoms may present slowly over an extended period of time, making a diagnosis difficult. For the best outcome and to reduce the risk of deformity diagnosis must be early. The treatment is 12 months rifampin-based regimen for drug-susceptible TB.

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(1)Dr. Sami Nogdallah

(2)Dr. M. Elghazali Abuelgassim E. Mustafa

(3)Dr. Alaa Mohamed Khairy

(4)Dr. Montaser Fatooh

(5)Dr. Hozifa Mohammed Ali Abd-Elmaged

(1) Orthopedic surgeon, Assistant professor, Alneelain University, Khartoum, Sudan.

(2) Al-Zaiem Al-Azhari University, Khartoum north, Khartoum, Sudan.

(3) Orthopedic Registrar Sudan Medical Specialization Board.

(4) Assistant professor, Alneelain University,Khartoum-Sudan

(5) Assistant Prof of orthopedic, Fellow of orthopedic oncology, department of orthopedic Al-Zaiem Al-Azhari University– Khartoum, Sudan.

Keywords:

Foot and ankle TB; extrapulmonary TB; bone infection; orthopaedic; tuberculosis.

Abstract:

Introduction and importance: Skeletal TB is an uncommon accounting for 10% of extra-pulmonary TB [(1)]. The symptoms of musculoskeletal TB may present slowly over an extended period of time, making a diagnosis difficult and time-consuming[(2)]. For the best possible outcome and to reduce the risk of deformity diagnosis must be early [(1)]. For the treatment of drug-susceptible musculoskeletal illness, a rifampin-based regimen lasting 12 months is advised. [(9–11)]

Case presentation: A 33-year-old female who are working as nurse with ankle pain and swelling over a period of 2 months. She had history of partially treated pulmonary TB one year ago. She reported night sweats and low-grade fever during this period, and she denied any history of trauma.

Clinical findings and investigations: The right ankle was globally swollen and tender anteriorly and on the lateral malleolus. The skin over the ankle showed dark discoloration with cautery marks with no discharging sinuses. The range of motion of the right ankle was decreased. The plain

X-ray of the right ankle showed three cystic lesion at the distal tibia, one cyst at the lateral malleolus and another one at the calcaneum. Surgical biopsy and Expert gene test confirmed the diagnosis of tuberculous osteomyelitis.

Interventions and outcome: The patient was planned for surgical curettage of the lesion. After the confirmation of the diagnosis of TB with the biopsy and gene expert test, with consultation of senior chest physician the patient fitted to anti-tuberculous regimen. The patient had good functional and clinical outcome.

Conclusions: skeletal TB is overall rare and even TB of the foot and ankle TB is rarest. The diagnosis of foot and ankle TB is challenging due to unusual presentation and the variety of foot pathologies which can mimic the TB with its varied spectrum of clinical and radiological presentations, which frequently misleads the treating clinician. High index of suspicion is needed in order to establish an early diagnosis and to early start of anti-tuberculous therapy to minimize the complications if not full recovery of the patient.

Relevance and impact: The lesson behind this case is that the diagnosis TB osteomyelitis should be on the top of differential diagnosis of multiple cystic lesions around the foot and ankle especially in area where TB is endemic. Early diagnosis and early start of anti-tuberculous therapy can lead to full cure of the patient and in bad situation can minimize the complications.

Introduction:

Background:

Approximately 10% of extra-pulmonary cases of tuberculosis (TB) are skeletal in origin [(1)]. An unusual form of skeletal TB is tuberculosis of the foot and ankle; delays in diagnosis and treatment are caused by the rare site, ignorance of the condition, and capacity to mimic other conditions clinically and on radiographs; the symptoms of skeletal TB may present slowly over an extended period of time, making a diagnosis difficult and time-consuming [(2)]. The absence of concurrent pulmonary disease can further muddle the diagnosis[(1)]. For the best possible outcome and to reduce the risk of deformity, bone and joint disorders must be diagnosed early[(2,3)]. The use of modern imaging modalities has improved the diagnosis of patients with musculoskeletal TB and the ability to perform targeted biopsies on the affected regions[(4,5)]. To establish a firm diagnosis suitable specimens for culture and other diagnostic procedures must be obtained[(3)]. For the treatment of drug-susceptible musculoskeletal illness, a rifampin-based regimen lasting 6 to 9 months is advised [(1)].

Rationale:

Musculoskeletal TB is an uncommon presentation. In this article, we report a foot and ankle TB in a 33-year-old female. The case was managed with surgical curettage and anti-tuberculous regimen. The surgery involved the main lesion and the specimen was send for histopathology. After confirmation of the diagnoses the anti-tuberculous regimen was started.

Guidelines and literature:

Approximately 10% of extrapulmonary cases of tuberculosis (TB) are musculoskeletal in origin [(1)]. The most prevalent form of skeletal TB is vertebral involvement, often known as Pott's disease or tuberculous spondylitis [(1)]. Because TB may not be the first thing to be considered in the differential diagnosis, the symptoms of musculoskeletal TB may present slowly over an extended period of time, making a diagnosis difficult [(1,2)]. The absence of concurrent pulmonary disease can further muddle the diagnosis [(2)]. For the

best possible outcome and to reduce the risk of deformity, bone and joint disorders must be diagnosed early [3,4]. The use of modern imaging modalities, such as MRI (the preferred imaging approach) and CT, has improved the diagnosis of patients with musculoskeletal TB and the ability to perform targeted biopsies from damaged musculoskeletal system regions[1,2]. To establish a firm diagnosis and recover M. tuberculosis for susceptibility testing, suitable specimens for culture and other diagnostic procedures must be obtained [1]. For the treatment of drug-susceptible musculoskeletal illness, a rifampin-based regimen lasting 6 to 9 months is advised[1].

Patient information:

The patient is a 33-year-old female working as laboratory technician, with no known history of allergies and not known to have diabetes or hypertension or any other chronic illnesses. She has history of pulmonary TB before two years prior to presentation which was partially treated due to poor compliance of the patient. On presentation she stated that her condition affect her work performance and daily activity due to pain and restriction of ankle motion. She does not take any chromic medications. She does not smoke nor drink alcohol. She has no family history of similar presentation.

Clinical findings:

Physical examinations revealed an unwell, vitally stable patient who was slightly pale but not jaundiced, cyanosed or febrile. All other systems were normal. The right ankle was globally swollen and tender over the joint line anteriorly and on the lateral malleolus. There was skin discolouration overlying the lesion and cautery marks with no discharging sinuses. The temperature was abnormal. Decreased ankle range of motion. Distal neurovascular bundle examination was normal.

Timeline:

Her condition started 2 months prior to presentation with right distal leg and ankle pain. The pain is dull aching, deeply seated and mild in nature. It started gradually. The pain increase with any type of effort and associated with night sweating. This pain affect her work performance and her walking distance.

The pain was associated with swelling on the anterior side of the ankle. There was skin discoloration and no associated sinus discharge. She also complained of night fever and weight loss and no loss of appetite or fatigability. She has no significant past or family history and her other systems were clear.

Diagnostic assessment and interpretation:

Lab investigation showed WBC 8000 lymphocytosis mainly, elevated ESR (118) and normal CRP levels. X-ray of the right ankle showed three cystic lesion at the distal tibia (the most distal one was peri-articular and subchondral), one cyst at the lateral malleolus and another one at the calcaneum no periosteal reaction (figure-1). A CT scan reveals multiple intraosseous cystic lesions with sclerotic, well define margins with narrow zone of transition in tibia, calcaneum, talus and many tarsal bones; largest one at distal tibia (Figure-2 and -3). An MRI reveals edema and bone destruction and new bone formation. Surgical core needle biopsy showed chronic granulomatous inflammation which suggests tuberculous osteomyelitis. Expert gene test was confirmative for this diagnosis.

AB

Figure-1:- Right ankle plain X ray A: AP view B lateral view showed three cystic lesion at the distal tibia, one cyst at the lateral malleolus and another one at the calcaneum.

Figure-2:- Pre- treatment CT scans of the ankle and foot (coronal bone window) showed multiple intraosseous cystic lesions with sclerotic, well define margins with narrow zone of transition in tibia, calcaneum, talus & many taral bones.

Figure-3:- Pre- treatment CT scans of the ankle and foot (sagittal bone window) showed multiple intraosseous cystic lesions with sclerotic, well define margins with narrow zone of transition in tibia, calcaneum, talus & many taral bones.

Intervention:

The patient was planned for surgical biopsy at distal tibia in order to establish tissue diagnosis.

Surgery was done after proper counselling and informed consent. It was done under the effect of spinal anaesthesia. Surgical intervention in form of curettage of the distal tibial lesion through anterior approach.

The skin, subcutaneous tissue, extensor retinaculum and ankle joint capsule were opened respectively. The periosteum of the anterior tibia was opened and small bone window was formed. The tibial cyst was approached through this window and biopsy is taken from the lesion with no need for bone graft. Careful protective curettage was achieved and taken for histopathology and gene expert analysis. The patient was mobilized immediately post-operatively using long walker boot for 6 weeks. The patient underwent uneventful post-operative recovery period without complications.

After the confirmation of the diagnosis of TB with the biopsy and gene expert test, with consultation of senior chest physician the patient fitted to anti-tuberculous regimen.

Follow-up and outcome:

She is showing an excellent progress and improvement clinically and radiologically. Two weeks post-operatively, the surgical wound heal with no complication. Four weeks post- operatively ESR returned to (13). Six weeks post-operatively, she was weaned from the long walker boot and advised to start physio-therapy for the right ankle. Monthly X-ray and every 3 months CT are the radiological tools of follow up (figure-4).

Figure-4:- 3 Dimensional CT scans of the ankle and foot 6 months after surgery

Discussion:

Approximately 10% of extrapulmonary cases of tuberculosis (TB) are musculoskeletal in origin; the most prevalent form of skeletal TB is vertebral involvement, often known as Pott's disease or tuberculous spondylitis [(1)]. A less prevalent kind of skeletal TB is that which affects the foot and ankle [(2)]. Diagnostic and therapeutic delays are brought on by the rare site, ignorance of the condition, and the condition's clinical and radiographic mimicry of other conditions; medical treatment results in great healing and no residual

problems when the disease is in its early stages and is restricted to the bone [2].

To correctly diagnose musculoskeletal TB, one must have a strong index of suspicion; TB should be taken into consideration in the differential diagnosis of the aetiology of skeletal discomfort because pain is the most frequent complaint that prompts a patient to seek medical attention[1]. It's interesting to note that sometimes local discomfort, edema, and restricted movement occur up to 8 weeks before radiographic findings [3]. Patients with suspected musculoskeletal TB and other skeletal disorders can benefit from being evaluated using imaging modalities such as conventional radiography, computed tomography (CT), and magnetic resonance imaging (MRI)[4]. The diagnostic process has been transformed, leading to more precise diagnosis, thanks to the use of more recent procedures including CT, MRI, and CT-guided fine needle aspiration biopsy [4, 5]. Since there are no pathognomonic radiographic signs, tissue biopsy and/or culture data are typically used to make the diagnosis [6]. To prevent function and mobility loss, it's crucial to get a proper diagnosis and start treatment as soon as possible, if the diagnosis is established early enough, full restoration of function without deformity can be safely expected even if only mild radiologic abnormalities have taken place[1]. The biggest benefit of surgery in the current management of musculoskeletal TB may in fact be early diagnosis[3]. Extra-pulmonary forms of the illness are also managed according to the same fundamental principles as pulmonary TB[7, 8]. Studies on the treatment of bone and joint TB have indicated that 6- to 9-month regimens incorporating rifampin are at least as successful as 18-month regimens that do not contain rifampin for the treatment of drug-susceptible illness [9–11].

M S Dhillon et al. conducted a case series involving 13 patients in 1993, in which they have evaluated the foot and ankle TB from diagnosis and management aspect and concluded that early detection and thorough treatment will result in full recovery without the uncomfortable side effects of a damaged joint; Bone and joint tuberculosis frequently misleads the treating physician with its vast range of clinical and radiological manifestations, which can mimic a variety of foot pathologies; few instances had the typical constitutional signs[2]. Only situations where medical management has failed or painful, damaged joints where arthrodesis is a great alternative warrant surgical surgery is indicated [2].

In 2014, Korim M et al. conducted a case series involving 2 patients to highlight the diagnostic pit falls leading to delay in the initiation of treatment; they have stated that foot ankle TB is an uncommon diagnosis that needs a high index of suspicion to enable prompt medical intervention [12]. Before beginning protracted multimodal medical therapy, prompt cross-sectional imaging and tissue diagnosis are essential; an incomplete diagnosis could result in worse outcomes; rarely is surgical intervention necessary, and it is only done to make a diagnosis [12].

Not very much different to this case, Kumar P et al. reported a case of a 19-year-old man came with lateral right ankle pain and edema for two months; the skin was attacked to the underlying bone and had an undermined discharge sinus with surrounding induration; diagnosed as lateral malleolar and calcaneal TB; after receiving treatment with antitubercular medications, the patient's condition completely resolved after three years of follow-up [13].

The educational objective for this case is that skeletal TB is rare and foot and ankle TB is rarest. The diagnosis of foot and ankle TB is challenging because the un-usual presentation and Bone and joint tuberculosis can mimic a variety of foot pathologies with its varied spectrum of clinical and radiological presentations, which frequently misleads the treating clinician. So high index of suspicion is needed in order to establish an early diagnosis and to early start of anti-tuberculous therapy so that to minimize the complications if not prevented.

Conclusion: despite being uncommon, skeletal TB needs to be suspected when multiple bony lesion were present and appropriately treated in the developing countries and in patients with or without history of pulmonary TB.

This case has been reported in line with the SCARE criteria (xx).

Conflict of interest:-

All authors declare that no conflict of interest and receive no fund.

Ethical approval

This study was performed in accordance with the ethical standards of the IRB of the hospital.

Consent for Publication:

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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