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CASE REPORT

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Foot and ankle tuberculosis: A case report and review of the literature

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Key clinical message

It is important to consider foot and ankle tuberculosis (TB) as a potential cause of cystic lesion around the ankle, especially in patients with a history of TB. Early diagnosis and treatment with a rifampin-based regimen for a duration of 12 months can lead to good functional and clinical outcomes.

Abstract

Skeletal TB is an uncommon accounting for 10% of extra-pulmonary TB may present slowly over an extended period of time, making a diagnosis difficult and time-consuming (Microbiology Spectr. 2017;5:5). For the best possible outcome and to reduce the risk of deformity diagnosis must be early (Foot (Edinb). 2018;37:105). For the treatment of drug-susceptible musculoskeletal illness, a rifampin-based regimen lasting 12 months is advised (Clin Infect Dis. 2016;63:e147; J Bone Joint Surg Br. 1993;75:240; Tubercle. 1986;67:243). A 33-year-old female who are working as nurse with diffuse, persistent and low in intensity ankle pain not aggravated relieved by analgesia and swelling over a period of 2 months, static not related to activity. With past medical history of partially treated pulmonary TB 1 year ago. She reported night sweats and low-grade fever during this period, and she denied any history of trauma. 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. 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. This case report highlights the importance of considering skeletal TB as a potential cause of musculoskeletal symptoms, especially in patients with a history of TB. Early diagnosis and treatment with a rifampin-based regimen for a duration of

12 months can lead to good functional and clinical outcomes. Further research on the management and prevention of musculoskeletal TB is warranted to improve patient outcomes. 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.

KEYWORDS

bone infection, extrapulmonary TB, foot and ankle TB, orthopedic, tuberculosis

JEL CLASSIFICATION

Orthopaedics

1 | INTRODUCTION

1.1 | Background

Skeletal tuberculosis (TB) is overall rare (15%–25% of TB cases) and is even rarer in the ankle and foot, representing only (0.13% of extra-pulmonary TB).[1] An unusual form of skeletal TB is TB 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 (Microbiology Spectr. 2017;5:5). 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 6–9 months is advised.[6,7]

1.2 | 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.

1.3 | Guidelines and literature

Approximately 10% of extrapulmonary cases of 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 magnetic resonance imaging (MRI) (the preferred imaging approach) and computed tomography (CT), has improved the diagnosis of patients with musculoskeletal TB and the ability to perform targeted biopsies from damaged musculoskeletal system regions.[1–3] 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 6–9 months is advised.[1]

2 | 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 2 years prior to presentation which was partially treated due to poor compliance of the patient. On presentation she stated that her condition affects 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.

3 | 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.

4 | 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 affects 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.

5 | 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 (Figures 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.

6 | INTERVENTION

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

Surgery was done after proper counseling and informed consent. It was done under the effect of spinal anesthesia. 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 postoperatively using long walker boot for 6 weeks. The patient underwent uneventful postoperative 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.

7 | FOLLOW-UP AND OUTCOME

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

8 | DISCUSSION

Approximately 10% of extrapulmonary cases of 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 etiology of skeletal

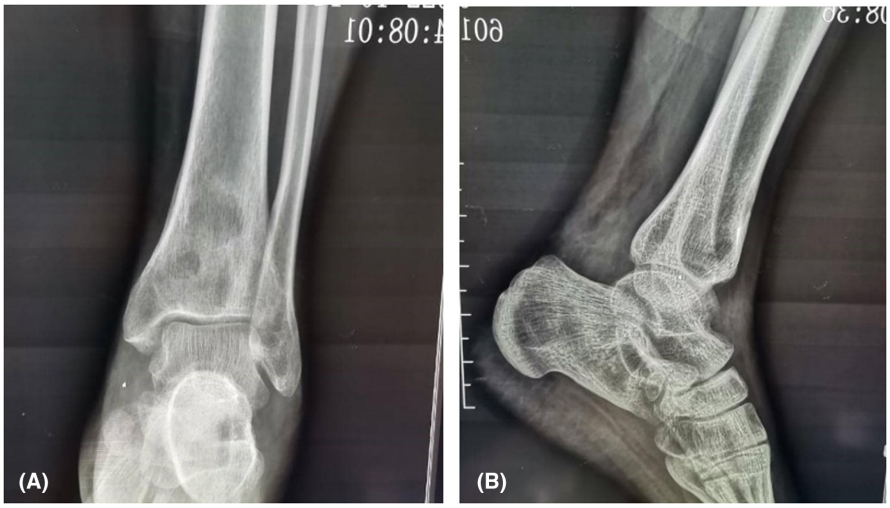

FIGURE 1 Right ankle plain x-ray. (A) AP view. (B) Lateral view shows three cystic lesion at the distal tibia, one cyst at the lateral malleolus and another one at the calcaneum.

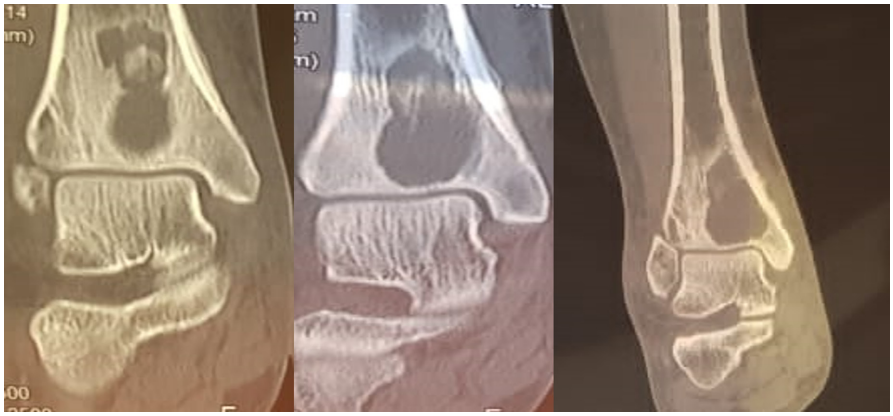

FIGURE 2 Pretreatment CT scans of the ankle and foot (coronal bone window) shows multiple intraosseous cystic lesions with sclerotic, well-defined margins with narrow zone of transition in tibia, calcaneum, talus and many taral bones.

FIGURE 3 Pretreatment CT scans of the ankle and foot (sagittal bone window) showed multiple intraosseous cystic lesions with sclerotic, well-defined margins with narrow zone of transition in tibia, calcaneum, talus and many taral bones.

discomfort because pain is the most frequent complaint that prompts a patient to seek medical attention.[1] It is 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, CT, and 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 is 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

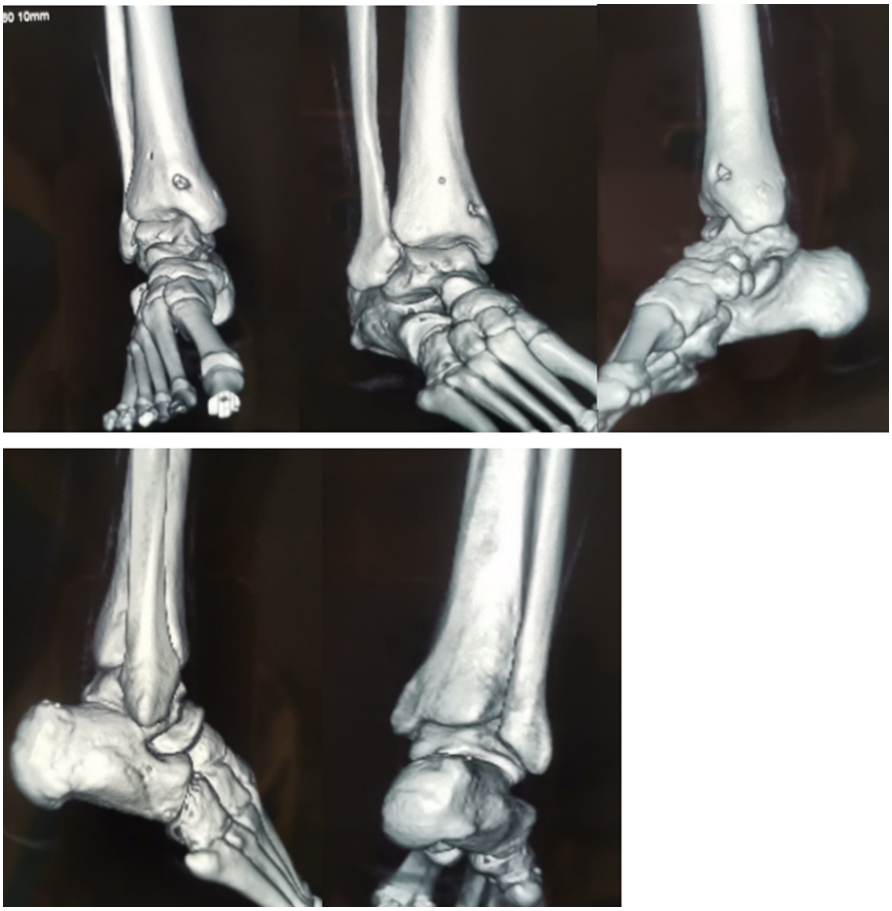

FIGURE 4 Three-dimensional CT scans of the ankle and foot 6 months after surgery.

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]

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 TB 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 et al. conducted a case series involving two 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 et al. reported a case of a 19-year-old man came with lateral right ankle pain and edema for 2 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 3 years of follow-up.[13,14]

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 TB 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.

8.1 | Conclusion

This case report highlights the importance of considering skeletal TB as a potential cause of musculoskeletal

symptoms, especially in patients with a history of TB. Early diagnosis and treatment with a rifampin-based regimen for a duration of 12 months can lead to good functional and clinical outcomes. Further research on the management and prevention of musculoskeletal TB is warranted to improve patient outcomes.

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

AUTHOR CONTRIBUTIONS

Sami Nogdallah: Conceptualization; resources; supervision. **M.Elghazali Abuelgassim E. Mustafa:** Methodology; writing – original draft; writing – review and editing. **Alaa Mohamed Khairy:** Investigation. **Montaser Fatooh:** Investigation. **Hozaifa Mohammed Ali Abd-Elmaged:** Data curation; investigation.

CONFLICT OF INTEREST STATEMENT

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

DATA AVAILABILITY STATEMENT

The data used in this case report are available from the corresponding author upon reasonable request. The data were collected from publicly available sources and through interviews with the patient. All data have been anonymized to protect the privacy of the individual involved. Any additional data that were not included in the report can be provided upon request.

ETHICS STATEMENT

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

CONSENT

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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