



## Case report

## An interesting case report of cutaneous tuberculosis of the foot

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## ABSTRACT

**Introduction and importance:** Tuberculosis is an age old disease caused by *Mycobacterium tuberculosis* which has been a menace to public health and thwarting economic growth. Pulmonary tuberculosis being the most common type, extra pulmonary tuberculosis has a greater association with HIV and multidrug resistant tuberculosis. Cutaneous tuberculosis accounts for 1–1.5 % of extra pulmonary tuberculosis.

**Case presentation:** A 32 year old female presented to the outpatient department with a two month history of ulcer over the sole of the foot with multiple discharging sinuses and surrounding induration. Laboratory tests reported elevated total leukocyte counts. Magnetic Resonance Imaging of the foot showed diffuse intermuscular edema with an interconnecting sinus tract draining to the sole of the foot. Regular wound dressings and antibiotics showed no resolution. Patient eventually underwent near complete excision of the ulcer. The biopsy was suggestive of tuberculous etiology. She achieved complete resolution with antituberculous drugs by three months.

**Clinical discussion:** Cutaneous tuberculosis is often misdiagnosed as it can masquerade as many other commonly encountered dermatological conditions. Microbiological diagnosis plays a crucial role in the accurate diagnosis of cutaneous tuberculosis. These lesions are highly responsive to antituberculous drugs.

**Conclusion:** Cutaneous tuberculosis is a rare disease that should be considered in the differential diagnosis of patients with chronic non-healing wounds that are poorly responsive to conventional treatment methods.

## 1. Introduction

Tuberculosis (TB) is one of the most common diseases inflicting developing countries like India, China and Indonesia. These countries contribute to 45 % of the global TB cases. Pulmonary tuberculosis accounts for more than 80 % of the TB cases and 20 % of the cases are extrapulmonary which includes TB lymphadenitis, genitourinary TB, cutaneous TB, abdominal TB, ocular TB, breast TB etc. [1,2]. Cutaneous tuberculosis is a less frequently encountered manifestation of extrapulmonary tuberculosis and accounts for only 1–1.5 % of all cases. *Mycobacterium tuberculosis* and *Mycobacterium bovis* are the primary causative organisms of cutaneous tuberculosis. Cutaneous tuberculosis is acquired exogenously, endogenously or by hematogenous spread. The diagnosis of true cutaneous tuberculosis is established by Acid Fast Bacilli staining, MGIT (Mycobacterium Growth Indicator Tube) or CBNAAT – an automated, semi-quantitative polymerase chain reaction method. However, in spite of these latest advancements in diagnostic techniques, cutaneous tuberculosis continues to be an elusive disease and poses diagnostic challenges as it can present with varying clinical

morphologies. This case is reported in accordance with SCARE 2020 criteria [3].

## 2. Presentation of case

A 32 year old female, known diabetic for the past one year, presented to our outpatient department with an ulcer over the sole of the left foot since two months which initially developed as a blister and ruptured spontaneously to discharge pus resulting in an ulcer. Patient was managed conservatively with wound care and oral antibiotics in a primary medical centre. However, her complaints persisted and she presented to our institution for further management. She is a known diabetic for the last five years on regular oral hypoglycemic medications. On examination, 5 × 6 cm hyperpigmented patch was noted over the plantar aspect of the mid left foot with areas of ulceration with poorly defined margins with raised edges, multiple discharging sinuses and surrounding induration (Fig. 1). The discharge was seropurulent in nature. Ipsilateral superficial inguinal lymph nodes were palpable and mobile. The remainder of the limb was unremarkable with all peripheral

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**Fig. 1.** 5 × 6 cm hyperpigmented patch over the plantar aspect of the mid left foot with multiple discharging sinuses.

pulses palpable. The patient's blood reports revealed a hemoglobin level of 12.5 g/dl with an elevated total leukocyte count of 12,385/cu mm. The chest x-ray of the patient was reported as normal. Wound cultures taken from the discharge showed scanty growth of *Pseudomonas*. The X-ray of the foot was normal with no evidence of bony involvement. Arterial and venous Doppler studies of the limb were normal. MRI of the foot showed diffuse intermuscular edema with a linear interconnecting fluid filled sinus tract within the muscles and subcutaneous plane of the plantar foot, draining into the skin as two external openings in medial and posteromedial aspect of the foot. The patient was initiated on broad spectrum intravenous antibiotics according to the culture and sensitivity reports. She was managed as an inpatient for a week, following which she was followed up on an outpatient basis for three weeks with regular dressings and adequate glycemetic control. However, there was no regression in the size of the ulcer or any clinical improvement. Hence, the patient was planned for biopsy with debridement and curettage of the ulcer. Intraoperatively, near complete excision of the ulcer was done and partial tissue approximation was achieved (Fig. 2). Post operatively, regular dressings of the wound were done and the patient was discharged on the 3rd post operative day. The biopsy from the lesion revealed multiple focal necrotizing epithelioid granulomas with plenty of multinucleate foreign body type and Langhan's giant cells with necrosis and suppuration, suggestive of tuberculous etiology with super-added bacterial infection (Fig. 3). The CBNAAT (Gene-Xpert) of the patient was also reported as positive for *Mycobacterium tuberculosis*. Following this, a pulmonology consultation was obtained and the patient was further evaluated with CT Chest and sputum for AFB. However, there was no evidence of pulmonary tuberculosis. The patient was started on antituberculous regimen [HRZE] for 6 months. Regression of the ulcer was noted by the end of the first month (Fig. 4) and over the course of 3 months, the ulcer completely healed (Fig. 5).



**Fig. 2.** Near complete excision of the ulcer with partial tissue approximation was done.



**Fig. 3.** 2 weeks post operatively.

### 3. Discussion

Cutaneous tuberculosis has been part of the medical literature since ancient times. It was first described by Theophile Laennec and isolated by Robert Koch in 1882. In the 18th century it was known as the “king's evil” in Europe where the royal touch was believed to cure the disease [4]. The bacilli of cutaneous tuberculosis are transmitted through direct



Fig. 4. 1 month post-operatively.



Fig. 5. 3 months post-operatively.

inoculation, lymphatic or hematogenous dissemination. The host characteristics, load, pathogenicity of the bacillus strain and mode of infection determines the clinical outcome of cutaneous tuberculosis. Malnutrition, immunosuppressive status, age and sex are other factors accountable for the varied manifestations of cutaneous tuberculosis. Cutaneous tuberculosis can be endogenous or exogenous. Endogenous mechanism is secondary to existing infection of the body and transmission is via hematogenous or lymphatic dissemination. Exogenous

mechanism occurs via direct inoculation of the infective bacilli into the skin of the individual [5]. It can present as a myriad of dermatological condition; scrofuloderma and lupus vulgaris being the most common manifestations of cutaneous tuberculosis. A clinician must therefore be heedful of certain characteristic morphological features such as the scrofuloform picture, the annular plaque with verrucose border of lupus vulgaris or the frankly hypertrophic plaque with acral location of tuberculosis verrucosa cutis [6]. A carefully elicited history which includes the contact history and previous tuberculous disease can serve as an important diagnostic tool. However, our patient presented with a primary ulcer and did not give any history of tuberculosis or any contact with tuberculosis. In such clinical scenarios, microbiological diagnosis comes into play. Skin biopsy must be proceeded with in all suspected cases and specimens are stained and cultured for acid-fast bacilli. Polymerase chain reaction methods are becoming increasingly popular because of its rapidity, sensitivity and specificity. Since most cases of cutaneous tuberculosis go hand-in-hand with tuberculous disease of other organs, the same treatment regimens suffice. The lesions of cutaneous tuberculosis tend to be chronic but extremely responsive to anti-TB drugs with clinical response expected by 4–6 weeks [7]. This itself can aid in the diagnosis. However, in the present era of drug resistance, poor response to standard anti-tubercular drugs where no other cause is isolated, MDR-TB (multidrug-resistant TB) comes into play where CBNAAT (Gene-Xpert) is extremely useful in diagnosis and detecting drug resistance. In this scenario, a trial of second line antitubercular drugs is rational. In our case, a non healing ulcer was managed as a diabetic ulcer without any resolution. The diagnosis was established by histopathological examination following which antituberculous regimen was initiated and the wound healed. Since there was no evidence of pulmonary tuberculosis, the possible mode of infection could be exogenous inoculation of the bacilli.

#### 4. Conclusion

Cutaneous tuberculosis of the foot is an extremely rare disease and poses diagnostic difficulty. This case report serves to remind the importance of tissue biopsy in chronic non-healing wounds which aids in the identification and treatment of the same.

#### Consent

Written and 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 by the Editor-in-Chief of this journal on request.

#### Provenance and peer review

Not commissioned.

#### Ethical approval

Ethical approval has been exempted by our institution as this is a case report and no new studies or techniques were incorporated.

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#### Guarantor

Tharun Ganapathy.

**Research registration number**

Not applicable.

**CRedit authorship contribution statement**

Tharun Ganapathy: Operated on the patient, drafting the manuscript, literature research, reviewing the manuscript and supervision.  
Nidhi Mariam George: Operated on the patient, writing-original draft preparation.

Sundeeep Kumaran: Drafting the manuscript and literature research.  
Preetam Anguraj: Drafting the manuscript and literature research.  
Amit Gilani: Literature research.

**Declaration of competing interest**

The authors have no conflict of interest to declare.

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