Case Report

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A rare form of tuberculosis: a case of tuberculosis verrucosa cutis

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ABSTRACT

Cutaneous involvement is a relatively uncommon manifestation of tuberculosis. Cutaneous lesions account for less than 2 percent of all extrapulmonary manifestations. Due to the paucibacillary nature of the lesions, there is a potential for misdiagnosis, which could result in the chronicity of the skin infection. This article presents the case of a 34-year-old male butcher who presented with plaques exhibiting characteristics of verrucosa, acanthosis, and hyperkeratosis on both fingers for a period of 10 years. The diagnosis of *Mycobacterium tuberculosis* was confirmed by histopathologic examination. The patient was subsequently treated with a standard anti-tuberculosis regimen, which resulted in notable improvement in the skin lesions.

Keywords: Tuberculosis verrucosa cutis, *Mycobacterium tuberculosis*, extrapulmonary tuberculosis, cutaneous lesions

INTRODUCTION

Tuberculosis is a public health problem due to its high prevalence, severe morbidity and high mortality. In 2020, 9.9 million people were diagnosed with tuberculosis worldwide.[1] Cutaneous tuberculosis is a rare manifestation of the disease, accounting for only 1-1.5% of all extrapulmonary tuberculosis cases and 8.4-13.7% of all tuberculosis cases.[2] Cutaneous tuberculosis was first documented in 1826, when Laennec reported his own "prosector's wart," a lesion that likely represented tuberculosis verrucosa cutis, a variant of tuberculosis that results from direct entry of the organism into the skin.[3] *Mycobacterium tuberculosis*, a slow-growing, acid-fast bacillus, is the predominant causative organism of cutaneous tuberculosis. Additionally, both *Mycobacterium bovis (M. bovis)* and the Bacille Calmette-Guérin (BCG) vaccine, which is composed of attenuated *M. bovis*, have been linked to the emergence of cutaneous lesions.[4] Classification systems for cutaneous tuberculosis vary. Commonly, cutaneous tuberculosis is divided into two major groups: true cutaneous tuberculosis and tuberculids. The skin diseases covered by true cutaneous tuberculosis include: scrofuloderma, tuberculosis cutis orificialis, lupus vulgaris, acute miliary tuberculosis, metastatic tuberculous abscess, tuberculosis verrucosa cutis.[2] Those at greatest risk for infection with this pathogen are children who play in contaminated areas and adults with occupational exposure to mycobacteria, including pathologists, laboratory technicians, undertakers, butchers, and farmers.[5] Tuberculosis verrucosa cutis lesions are typically solitary, painless, and most prevalent in anatomical locations susceptible to trauma, such as the fingers and toes. The lesions initially manifest as erythematous papules with a purplish inflammatory halo. Over time, they evolve into asymptomatic verrucous plaques, which can reach a diameter of 5 cm.[6] The primary method for diagnosing tuberculosis verrucosa cutis is the correlation of the physical findings with a skin biopsy and other evidence of tuberculosis infection, such as a positive tuberculin skin test (TST) or interferon-gamma release assay (IGRA).[7] The histopathologic findings of tuberculosis verrucosa cutis include the following: pseudoepitheliomatous hyperplasia, marked hyperkeratosis, and a frequent presence of an inflammatory infiltrate composed of epithelioid cells and giant cells in the upper and middle dermis.[8] If left untreated, skin lesions may persist for years; however, spontane ous resolution is also a possibility.[8] Patients typically improve with anti- tuberculosis therapy.[2] We present a case of 34-year-old male patient with tuberculosis verrucosa cutis of the fingers.

CASE

A 34-year-old male butcher presented with a wound on his fingers. The patient exhibited verrucous plaque-like lesions on the fingers (Figure 1). The patient has been afflicted with lesions for approximately a decade, with the lesions increasing in size over time. In other medical services, he was treated with topical and oral drugs, including corticosteroids, antimycotics, and antiallergics, with no improvement in his condition. Moreover, no similar lesions were observed in his family members. The patient is not afflicted with any chronic disease. Upon physical examination, the patient exhibited pale erythematous plaques with squamous plaques on the first and fifth fingers of the left hand. The complete blood count and biochemistry tests yielded normal results. Furthermore, the tests for HIV, hepatitis B and C, and syphilis were negative. The patient was subjected to a TST, which exhibited a positive result 48 hours following inoculation, displaying a diameter exceeding 15 mm. The patient was not found to have active pulmonary tuberculosis. Additionally, it was ascertained that there was no familial history of pulmonary tuberculosis. A

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biopsy was performed on the patient's finger, and histologic sections were stained with hematoxylin-eosin (HE) and the Ziehl-Neelsen technique. The skin fragments were cultured in Lowenstein-Jensen medium, and a polymerase chain reaction (PCR) was employed to identify the etiological agent. The histologic section of the skin stained with HE revealed the presence of hyperkeratosis, acanthosis, and papillomatosis in the epidermis, as well as a notable degree of inflammation comprising a multitude of polymorphic leukocytes in the upper dermis. Additionally, the immunohistochemical study identified the presence of giant cells and granuloma-like structures (Figure 2). No bacilli were observed to be present in the culture of the skin fragments, nor were any bacilli seen in sections stained with the Ziehl-Neelsen technique. The samples did not yield any acid-resistant bacilli (ARB), and the tuberculosis PCR was negative. However, given the compatibility of the pathology result with a granulomatous infection, the appearance of the lesions was consistent with that of tuberculosis, and the patient exhibited a positive reaction to the skin tuberculin test, the diagnosis was rendered as tuberculosis verrucosa cutis. The patient was initiated on quadruple antituberculosis treatment, comprising isoniazid (INH) 300 mg, rifampicin (RIF) 600 mg, ethambutol (ETM) 1500 mg, and pyrazinamide (PZA) 2000 mg. The patient's lesions demonstrated regression with the initiation of treatment. Following a four-month course of treatment, the lesions had completely resolved. The patient's treatment was terminated after a six-month period.

Figure 1. Pale erythematous plaques with squamous plaques on the first and fifth fingers of the left hand

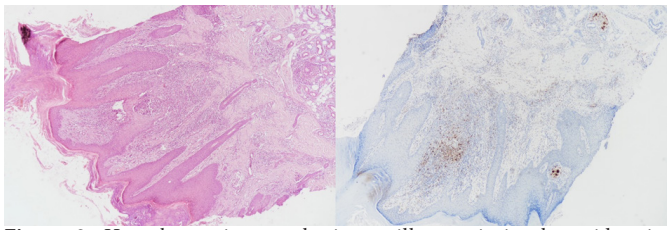

Figure 2. Hyperkeratosis, acanthosis, papillomatosis in the epidermis; intense inflammation and giant cells rich in polymorphonuclear leukocytes in the dermis

DISCUSSION

Cutaneous tuberculosis represents a rare form of tuberculosis that is challenging to diagnose due to the non-specific clinical characteristics exhibited by the lesions. The clinical manifestations of cutaneous tuberculosis can be mistaken for those of other diseases due to their resemblance and the low bacillary load. Nevertheless, it is a skin infection that should be considered in the differential diagnosis of cases presenting with long-lasting, non-healing skin lesions that fail to respond to basic antibacterial treatments.[2,9] The differential diagnosis of cutaneous tuberculosis includes leishmaniasis, leprosy, chromomycosis, sporotrichosis, mycetoma and granulomatous and verrucous lesions of different origin.[9] The histopathologic evaluation of tuberculoid granulomas, lymphocytes, Langhans-type giant cells, and caseous necrosis is a characteristic presentation of tuberculosis.[9] The diagnosis was made on the basis of a histopathologic examination. The diagnosis of cutaneous tuberculosis is frequently complicated by the absence of ARB positivity, which is often attributed to the low bacillary load present in such cases.[10] The results of the ARB test were negative in this case. This has been linked to a low bacillary load in cutaneous tuberculosis.[10] In this instance, there was no observable growth in the culture. The low rate of growth observed in the culture was attributed to the low bacillary load present in the case of cutaneous tuberculosis. In general, the treatment of cutaneous tuberculosis is six months in duration, comprising a quadruple regimen (isoniazid, rifampicin, pyrazinamide, and ethambutol) for a period of two months, followed by four months of a dual regimen (isoniazid and rifampicin).[9] The standard antituberculosis treatment was administered. The patient was monitored meticulously, and the course of treatment was completed.

CONCLUSION

In conclusion, cutaneous tuberculosis presents with a range of clinical features that can be mistaken for those of other diseases. In patients presenting with atypical skin lesions, a diagnosis of cutaneous tuberculosis should be considered and appropriate diagnostic procedures should be initiated. The treatment of cutaneous tuberculosis is a lengthy and arduous process. It is imperative that patients be monitored closely.

ETHICAL DECLARATIONS

Informed Consent

The patient signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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