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Cutaneous Tuberculosis: Clinical Spectrum Highlighted by a Case of Scrofuloderma

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Abstract | **Case Report**

Cutaneous tuberculosis (CTB) represents a rare but significant extrapulmonary manifestation of *Mycobacterium tuberculosis* infection, constituting approximately 1–2% of all tuberculosis (TB) cases worldwide (Barbagallo *et al.,* 2002; WHO, 2023). Its presentation is clinically heterogeneous and often misdiagnosed, especially in non-endemic regions where the index of suspicion is lower. CTB can manifest either through endogenous spread—via hematogenous dissemination, contiguous extension from underlying foci such as lymph nodes or bones—or via exogenous inoculation through skin breaches (Bravo & Gotuzzo, 2007). Several clinical variants of CTB exist, with scrofuloderma being among the most prevalent multibacillary forms. Scrofuloderma results from direct extension of TB from infected lymph nodes or bones into the overlying skin. Its presentation is typically chronic and suppurative, often leading to the development of cold abscesses and sinus tracts. Immunocompromised states, such as diabetes mellitus or malnutrition, may predispose individuals to more severe forms (Gopinathan *et al.,* 2001). This article presents a case of scrofuloderma in a patient with underlying metabolic comorbidities and reviews the current understanding of CTB's clinical spectrum, diagnostic tools, and treatment strategies.

Keywords: cutaneous tuberculosis, scrofuloderma, skin lesions, extrapulmonary tuberculosis, granulomatous inflammation, antituberculous therapy.

INTRODUCTION

Cutaneous tuberculosis (CTB) is a rare form of extrapulmonary tuberculosis caused by *Mycobacterium tuberculosis*, accounting for less than 2% of all tuberculosis cases globally. The clinical manifestations of CTB are diverse, ranging from lupus vulgaris and tuberculosis verrucosa cutis to scrofuloderma and miliary tuberculosis, depending on the route of infection and immune status of the host (Barbagallo *et al.,* 2002). Scrofuloderma, the most common multibacillary form, typically results from direct extension of an underlying infected lymph node, bone, or joint into the overlying skin (Kumar *et al.,* 2021). It is often associated with systemic symptoms and chronicity, and it may mimic neoplastic or fungal conditions. This article presents a case of scrofuloderma in a patient with comorbid diabetes mellitus and hypertension, underlining the clinical spectrum, histopathological features, and therapeutic considerations in CTB. A concise review of the literature is included to highlight the importance of early recognition and multidisciplinary management

CASE REPORT

A 65-year-old male with a medical history of type 2 diabetes mellitus and systemic arterial hypertension presented in November 2022 with a chronic, progressive dermatosis. The lesions were distributed bilaterally and asymmetrically, affecting the neck, right supraclavicular and infraclavicular thoracic areas, and bilateral axillae.

On physical examination, multiple subcutaneous nodules of varying sizes were observed. These lesions had well-defined borders, an erythematous surface, and were non-tender. Some nodules showed signs of suppuration, with cold abscess formation, purulent discharge, and multiple draining fistulas (Figura 1,2). He denied constitutional symptoms at that point. The patient was initially evaluated by the surgical oncology department, and a skin biopsy was performed. Empirical antibiotics were prescribed, though the specific agents were not documented.

In March 2023, the patient developed intermittent fever without a defined temporal pattern and noted the appearance of new lesions in the thoracic and axillary regions. Additional testing included an interferon-gamma release assay (QuantiFERON-TB Gold), which was positive. Serologic testing also revealed hepatitis B virus infection.

Histopathological evaluation of the biopsy specimen revealed fibroadipose and skeletal muscle tissue with chronic granulomatous inflammation. Granulomas composed of lymphohistiocytic infiltrates, multinucleated giant cells, and sparse neutrophils were identified, with central areas of caseous necrosis (Figure 3). No acid-fast bacilli were observed on Ziehl–Neelsen stain; however, the constellation of findings supported the diagnosis of scrofuloderma. The patient was referred to the Infectious Diseases department and was started on standard anti-tuberculous therapy (DOTBAL, intensive phase). He showed a favorable clinical response, and continues to be followed regularly by Dermatology and Infectious Diseases clinics.

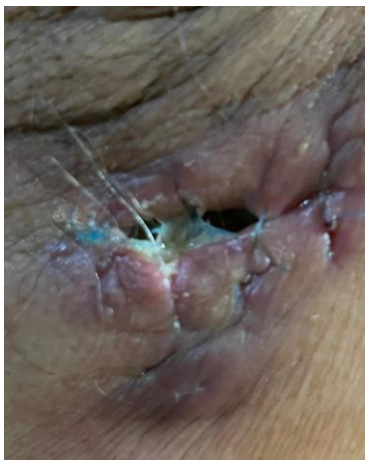

Figure 1. Disseminated nodular and gummatous lesions

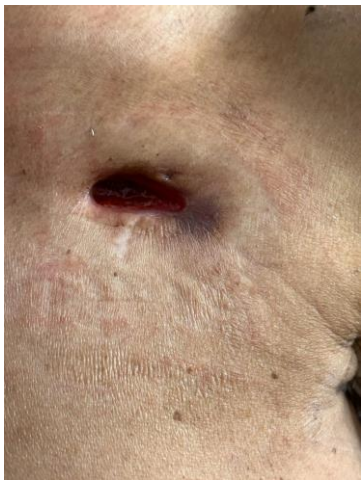

Figure 2. Lesions that progressed to fistulas

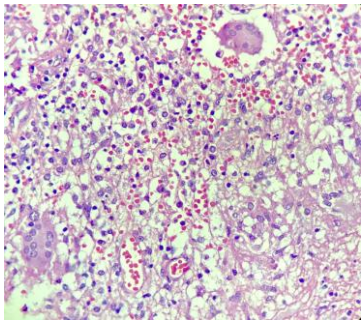

Figure 3. Granulomatous reaction with lymphohistiocytic cells, multinucleated giant cells, few polymorphonuclear cells, and necrosis in the lower right corner

DISCUSSION

Cutaneous tuberculosis poses significant diagnostic and therapeutic challenges due to its protean clinical manifestations and chronic course. The classification of CTB can be approached based on bacterial load (multibacillary vs. paucibacillary) and the route of infection (exogenous vs. endogenous) (Santos *et al.,* 2014). Common clinical variants include:

- **Scrofuloderma**: Most frequent multibacillary form. Results from direct extension from underlying infected lymph nodes, bones, or joints. Presents as subcutaneous nodules progressing to ulcers with sinus tract formation.
- **Lupus vulgaris**: Most common CTB form in developed countries. Slowly progressive plaques with "apple jelly" appearance on diascopy.
- **Tuberculosis verrucosa cutis**: Warty lesions seen in individuals with strong immunity and prior sensitization.
- **Tuberculous chancre**: Result of primary inoculation in previously uninfected individuals.
- **Miliary tuberculosis**: Seen in severe disseminated disease with cutaneous involvement, rare but fatal if untreated.

In our patient, the classical clinical pattern of scrofuloderma—nodules with cold abscesses and fistulas in the cervical and axillary regions—was compounded by systemic disease and comorbid diabetes mellitus, a known risk factor for TB reactivation and progression (Frankel *et al.,* 2009). While tuberculosis is traditionally associated with pulmonary involvement, the incidence of extrapulmonary forms such as CTB may increase in the context of immunosuppression, HIV, or metabolic diseases (Singal & Sonthalia, 2010).

Histopathology plays a pivotal role in diagnosis, often revealing tuberculoid granulomas with central caseous necrosis and Langhans-type multinucleated giant cells (Ramesh *et al.,* 1999). However, microbiological confirmation can be challenging due to the paucibacillary nature of many lesions. Acid-fast bacilli are often undetectable by conventional staining. Ancillary methods, including PCR, culture on Löwenstein–Jensen medium, and IGRA tests (e.g., QuantiFERON-TB Gold), improve sensitivity (Hanekom *et al.,* 2012).

Therapeutically, the World Health Organization (WHO, 2023) recommends the same treatment regimen for CTB as for pulmonary TB: a two-month intensive phase with isoniazid, rifampicin, pyrazinamide, and ethambutol, followed by a four-month continuation phase with isoniazid and rifampicin. The importance of adherence to treatment, regular follow-up, and monitoring for drug toxicity—particularly in elderly or comorbid patients—cannot be overstated.

This case reinforces the necessity for clinicians to maintain a high index of suspicion for CTB in chronic cutaneous lesions, especially in endemic areas or in patients with immune-compromising conditions. Misdiagnosis can lead to inappropriate treatments and prolonged morbidity.

CONCLUSION

Scrofuloderma is a form of cutaneous tuberculosis that exemplifies the diagnostic complexity of extrapulmonary TB. This case highlights the importance of clinicopathological correlation and the role of ancillary diagnostic tools in establishing the diagnosis. Given the diversity of CTB presentations, dermatologists, infectious disease specialists, and primary care providers must remain vigilant in recognizing its varied forms. Prompt diagnosis and initiation of anti-tuberculous therapy are key to achieving favorable outcomes and reducing transmission.

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