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Tuberculosis Verrucosa Cutis of the Hand: An Occupational Hazard

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KEYWORDS

Tuberculosis verrucosa cutis; cutaneous tuberculosis; occupational dermatosis; verrucous plaque; cattle handler; histopathology

ABSTRACT:

Tuberculosis verrucosa cutis is an uncommon paucibacillary form of cutaneous tuberculosis caused by exogenous inoculation of Mycobacterium tuberculosis into the skin of a previously sensitized individual. It typically affects trauma-prone exposed areas and may be associated with occupational exposure. We report the case of a 35-year-old male cattle handler who presented with a slowly progressive painless verrucous plaque over the dorsum of the right hand for eight months, beginning at the site of a healed cut sustained during handling of livestock and raw animal products. Examination revealed a solitary well-demarcated hyperkeratotic verrucous plaque measuring 4 × 3 cm, without ulceration, bleeding, discharge, tenderness, or regional lymphadenopathy. Routine haematological and biochemical investigations were within normal limits, while chest radiography and abdominal ultrasonography were unremarkable. Bacterial and fungal cultures were negative. Mantoux test showed 18 mm induration, whereas Ziehl–Neelsen and periodic acid–Schiff stains were negative. Histopathological examination of the excised lesion demonstrated marked hyperkeratosis, acanthosis, papillomatosis, pseudoepitheliomatous hyperplasia, and well-formed epithelioid granulomas with Langhans giant cells and lymphocytic infiltrates, without necrosis. Based on the characteristic clinical appearance, occupational history, positive tuberculin reactivity, and supportive histopathology, a diagnosis of tuberculosis verrucosa cutis was established. The patient was treated with standard antitubercular therapy, following which the lesion showed progressive flattening and complete clinical resolution with mild residual post-inflammatory pigmentation. This case highlights the importance of considering tuberculosis verrucosa cutis in chronic verrucous plaques over exposed sites in individuals with repeated occupational trauma and emphasizes the value of clinicopathological correlation for timely diagnosis and effective treatment.

Introduction

Cutaneous tuberculosis is an uncommon manifestation of Mycobacterium tuberculosis infection and accounts for approximately 1.5% to 3% of extrapulmonary tuberculosis.(1) Its clinical morphology depends on the route of infection, bacillary load, prior sensitization, and host immune response, leading to a wide spectrum of clinicopathological forms that may mimic several inflammatory, infectious, and neoplastic dermatoses.(2) Tuberculosis verrucosa cutis (TBVC) is a classic exogenous form of cutaneous tuberculosis that occurs after direct inoculation of tubercle bacilli into the skin of a previously infected or sensitized host with moderate to high immunity, resulting in a localized paucibacillary lesion.(3) Clinically, TBVC usually begins as a solitary papule or warty lesion at the site of inoculation and slowly enlarges into a verrucous or hyperkeratotic plaque over months to years. It preferentially involves trauma-prone exposed sites such as the hands, fingers, feet, knees, elbows, ankles, and buttocks, reflecting the role of repeated minor trauma in facilitating inoculation.(4) Occupational exposure has long been recognized in butchers, cattle handlers, farmers, pathologists, and others who handle infected biological material, leading to the traditional terms “prosector’s wart” and “butcher’s wart.”(5) Because TBVC may resemble verruca vulgaris, chromoblastomycosis, deep fungal infection, lupus vulgaris, hypertrophic lichen planus, and verrucous carcinoma, diagnosis requires a high index of suspicion and careful clinicopathological correlation.(6) In this context, the present case evaluated in the Department of Dermatology, Venereology and Leprosy, Sree Balaji Medical College and Hospital, Chennai was important

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because the lesion occurred on the dorsum of the hand in a cattle handler. This highlights the occupational relevance of such exposure and the need to identify this uncommon but characteristic form of inoculation tuberculosis.

Case Report

A 35-year-old male who worked as a cattle handler presented with a slowly progressive thick irregular painless lesion over the dorsum of his right hand for eight months. He reported frequent minor cuts and abrasions while handling livestock and raw animal products in his work. He reported that the lesion had initially appeared at the site of a healed cut and gradually increased in size. There was no history of cough, fever, weight loss, night sweats, or prior tuberculosis. His family history was not contributory. No diagnosis had been established, and no treatment had been given throughout the last 8 months.

On cutaneous examination, a solitary, well-demarcated hyperkeratotic verrucous plaque measuring approximately 4 × 3 cm was noted over the dorsum of the right hand [Figure 1]. The lesion had a rough, irregular surface and a firm consistency. There was no evidence of ulceration, discharge, bleeding, or tenderness. Regional lymph nodes were not enlarged. Examination of the mucosa and nails was normal, and no other cutaneous lesions were identified. Routine hematological and biochemical investigations were within normal limits, while chest radiography and abdominal ultrasound were unremarkable. Dermoscopy of the lesion at lower magnification showed dirty white thick scales with areas of thick irregular crusting with few scattered polymorphous vessels [Figure 2]. Fungal and standard bacterial cultures from the skin biopsy were negative. The Mantoux test was positive, with an induration of 18 mm [Figure 3]; however, Ziehl–Neelsen staining and periodic acid-Schiff stains did not reveal acid-fast bacilli.

In view of the clinical suspicion, the lesion was excised and the specimen was sent for histopathological examination. Microscopic examination revealed marked hyperkeratosis, acanthosis, papillomatosis, and pseudoepitheliomatous hyperplasia with the dermis showing well-formed epithelioid granulomas composed of Langhans giant cells and lymphocytic infiltrates with no sign of necrosis. Based on the characteristic clinical appearance, occupational exposure, positive tuberculin test, and supportive histopathological findings, a diagnosis of tuberculosis verrucosa cutis was made. The patient was started on standard antitubercular therapy. On follow-up, the plaque showed progressive flattening with reduction in hyperkeratosis and verrucosity, followed by clinical resolution with mild residual post-inflammatory pigmentation.

Discussion

Tuberculosis verrucosa cutis is classically regarded as a reinoculation form of cutaneous tuberculosis occurring after exogenous inoculation in a previously sensitized host with preserved cell-mediated immunity. Ntavari et al, in their review of multifocal TBVC, reiterated this immunopathologic basis and also noted that a history of skin microtrauma was documented in the majority of reported cases, supporting trauma as the principal facilitating factor.(7) The location of the lesion in our patient was therefore clinically meaningful. Hernández-Martín et al. reported a verrucous plaque on the back of the hand in a slaughter-house operator, illustrating that the hand is a plausible occupational inoculation site when repeated exposure and minor injury coexist.(8)

The occupational background in the present case adds further weight to this interpretation. Allen et al. documented cutaneous inoculation tuberculosis as prosector's wart in a physician after autopsy-related trauma, a classical observation that established direct occupational contact with infected material as a mechanism for inoculation tuberculosis.(9) The differential diagnosis of a chronic verrucous plaque over the hand is broad. Brito et al. emphasized that cutaneous tuberculosis is an important diagnostic mimic and may resemble several inflammatory, infectious, and neoplastic dermatoses, which explains why TBVC may be confused clinically with verruca vulgaris, chromoblastomycosis, deep fungal infection, lupus vulgaris, and verrucous carcinoma.(1) The diagnosis in such cases rests on clinicopathological correlation rather than on a single test. Dos Santos et al. noted that the diagnosis of cutaneous tuberculosis is usually based on the integration of clinical-epidemiological suspicion, tuberculin reactivity, histopathology, and adjunctive microbiologic or molecular methods because no isolated investigation is uniformly diagnostic. In the present patient, the occupational history, strongly positive

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Mantoux test, and compatible biopsy together provided a convincing diagnostic constellation.(10)

Khadka et al. highlighted that well-formed tuberculous granuloma, frequently accompanied by Langhans giant cells, are among the most useful histopathological clues in cutaneous tuberculosis, especially when the organism burden is low.(2) Likewise, Kaur et al. described pseudoepitheliomatous hyperplasia with upper dermal granulomatous infiltrate in hidden TBVC of the foot, findings that closely parallel the pseudoepitheliomatous epidermal change and granulomatous dermal reaction seen in our patient.(11) Delayed recognition in our patient is a known problem in this entity. Wedy et al. reported TBVC in a farmer that remained undiagnosed for 15 years, emphasizing how paucibacillary lesions can be mistaken for other chronic dermatoses and become longstanding when the occupational context is overlooked.(12) From a therapeutic perspective, van Zyl et al. reviewed current treatment regimens for cutaneous tuberculosis and noted that true cutaneous tuberculosis is treated with standard multidrug antitubercular therapy, which is consistent with the favorable clinical resolution observed in the present case.(13)

Conclusion

This case highlights tuberculosis verrucosa cutis as an important occupational dermatosis involving trauma-prone exposed skin, particularly the hands, in individuals handling livestock or contaminated animal material. A chronic verrucous plaque arising at the site of repeated occupational injury should prompt consideration of TBVC even in the absence of constitutional symptoms or demonstrable acid-fast bacilli. Careful occupational history, clinicopathological correlation, and timely initiation of antitubercular therapy are essential for accurate diagnosis and favorable clinical outcome.

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Figure 1: Verrucous lesion on dorsum of right hand

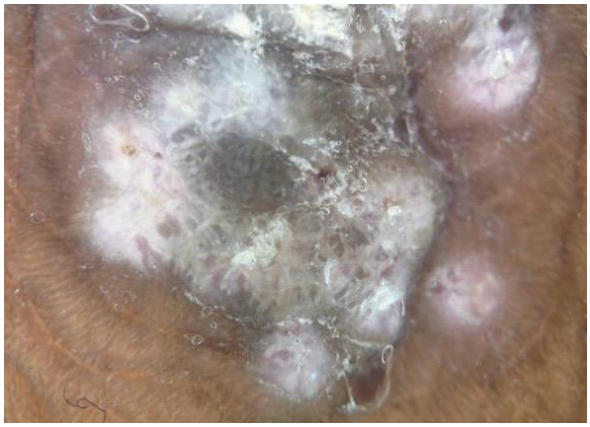

Figure 2: Dermoscopy showed white structureless areas with thick scales and areas of irregular crusting with few scattered polymorphous vessels

Figure 3: Mantoux test showing a strongly positive reaction with 18 mm induration over left forearm