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Kerion Barbae with Bacterial Superinfection Presenting as a Rapidly Growing Beard Mass: A Diagnostic Dilemma in a Resource-Limited Setting

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Abstract

Tinea barbae is a rare dermatophyte infection of the beard and mustache region, often seen in agricultural workers due to zoonotic transmission. Its inflammatory form, kerion barbae, can mimic bacterial infections, granulomatous dermatoses, or even malignancy, leading to misdiagnosis. We report a case of a 55-year-old male farmer from rural Nepal who presented with a one-month history of nodulo-ulcerative and pustular lesions over the chin and beard area. Clinical examination revealed an indurated plaque with purulent discharge, crusting, and easily pluckable beard hairs. Pus culture grew Staphylococcus aureus, while the potassium hydroxide mount and periodic acid–Schiff stain in skin biopsy sample were negative for fungal elements, whereas fungal culture was unavailable. Despite antibiotic therapy, only partial improvement was achieved. Considering kerion barbae, oral itraconazole was initiated, resulting in rapid clinical improvement and complete resolution within four weeks. This case highlights the possible misdiagnosis of kerion barbae, particularly when complicated by bacterial superinfection, as false-negative KOH and PAS results are not uncommon. Kerion barbae should be considered in rapidly enlarging nodulo-ulcerative beard lesions unresponsive to antibiotics, especially in resource-limited settings. A therapeutic trial of antifungal therapy is justified to avoid misdiagnosis and prevent sequelae such as scarring and alopecia.

Keywords: kerion barbae; misdiagnosis; secondary bacterial infection; tinea barbae; zoophilic dermatophytes

Introduction

Tinea barbae is a rare dermatophyte infection that affects the beard area, less commonly the moustache.[1] It is more prevalent in rural areas among agricultural workers due to zoonotic transmission.[2] The most common causative agents are zoophilic species, i.e., Trichophyton verrucosum and T. mentagrophytes.[3] Immunodeficiency conditions, such as human immunodeficiency virus infection and diabetes mellitus, are other predisposing factors.[4] Based on types of fungus and host immune response, clinically, tinea barbae occurs in two morphologies: Non-inflammatory superficial tinea barbae and deep inflammatory kerion.[2,5,6] Inflammatory form of tinea barbae can closely mimic bacterial abscess, carbuncle, botryomycosis, sporotrichosis, lupus vulgaris, or even cutaneous malignancy.[2,6] The diagnosis is confirmed by potassium hydroxide (KOH) mount and fungal culture of skin scraping, pus, and/or hair from the lesion. Secondary bacterial infection is common, which may further complicate diagnosis.[3,7]

In resource-limited setting, the absence of fungal culture and non-specific histopathology may make the diagnosis challenging. Here we present a case of kerion barbae with secondary bacterial infection in a middle-aged farmer. This case is reported to highlight the diagnostic dilemma and importance of considering kerion barbae in rapidly enlarging nodulo-ulcerative beard lesions.

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Case Report

A 55-year-old male farmer from rural Nepal, without significant co-morbidities, presented to the dermatology outpatient department (OPD) with nodulo-ulcerative and pustular lesions localized on the chin and beard area. He reported that the lesion initially started as a small, painless, erythematous nodule which gradually enlarged. Multiple nodules and pustules developed and coalesced to form a single indurated plaque with mild pain, purulent discharge, and surface crusting over a period of one month. A few separate nodules were also noted around the main lesion. No history of fever, trauma, or systemic symptoms was reported. However, he had a history of frequent handling of cattle. Before presentation, he had self-medicated with over-the-counter (OTC) oral and topical agents without improvement.

On examination, a well-defined, indurated, mildly tender plaque (approximately 5x4 cm^2) with purulent discharge, crusting, and yellowish debris was present on the chin and beard area (Figure 1). Removal of surface crust revealed a soft friable erythematous base (Figure 2). A few pustules and erythematous nodules were present surrounding the lesion. Beard hair was easily pluckable from the lesion, but no regional lymphadenopathy and no skin, mucosal, or hair lesions elsewhere.

Blood investigation, along with pus culture and sensitivity (c/s), and KOH mount, was done. Pus c/s grew Staphylococcus aureus (S. aureus) sensitive to clindamycin, while KOH mount was negative for fungal

Figure 1: showing erythematous plaque (approximately 5x4 cm) with purulent discharge, crusting, and yellowish debris on the chin and beard area

Figure 2: Showing soft friable erythematous base after removal of crust.

Figure 3: showing partial improvement of discharge after 1 weeks of oral clindamycin treatment but persistence of induration and loose hair

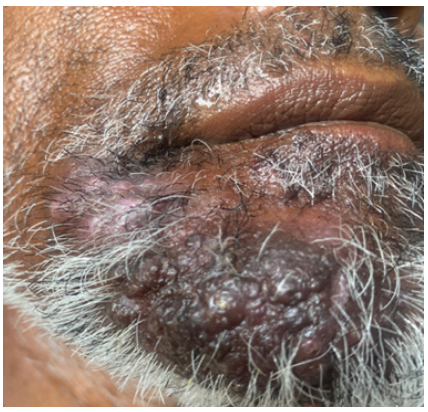

Figure 4: Showing decreased erythema and induration, with no discharge or pustules after 1 week of treatment with itraconazole.

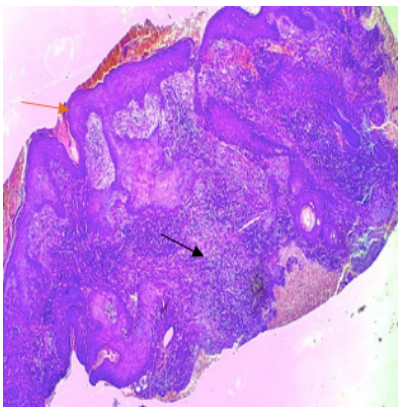

Figure 5: (4x magnification, hematoxylin and eosin stain) showing epidermal hyperplasia with ulceration (red arrow), dense dermal neutrophilic infiltrate admixed with lymphocytes and plasma cells (black arrow)

Figure 6: showing complete resolution with minimal post-inflammatory hyperpigmentation after 4 weeks of itraconazole

elements. Blood sugar levels were within normal range, and HIV serology was negative. Fungal culture was unavailable. Initially patient was treated for secondary bacterial infection with oral clindamycin 300 mg thrice daily for 7 days, which led to partial improvement of discharge but persistence of induration and easy pluckability of hair (Figure 3). Considering differentials of kerion, actinomycosis, botryomycosis, sporotrichosis, lupus vulgaris, cutaneous leishmaniasis, and squamous cell carcinoma,[6] an incisional biopsy was performed. With a clinical suspicion of kerion, oral itraconazole 100 mg and topical clotrimazole 1% cream twice daily was initiated.

Within one week, significant clinical improvement was noted with decreased induration and discharge, resolution of easy pluckability of hair, and no new pustules (Figure 4). Biopsy report subsequently revealed epidermal hyperplasia with ulceration, dense dermal neutrophilic infiltrate, admixed with lymphocytes and plasma cells without granuloma formation or evidence of malignancy (Figure 5). Periodic acid–Schiff (PAS) stain negative for fungal elements in skin biopsy sample.

Given the favorable clinical response, itraconazole was continued for 4 weeks and the patient was followed up regularly. After 4 weeks, complete resolution of induration and inflammation was noted, with no discharge or pustules. Only minimal post-inflammatory hyperpigmentation remained, and hair regrowth was evident in the affected area (Figure 6).

DISCUSSION

Tinea barbae is an uncommon dermatophyte infection of the beard and mustache region, usually seen in rural populations, particularly farmers handling cattle.[1] Based on types of fungus and host immune response, it has two clinical forms: a superficial type, presenting as scaly plaques or resembling bacterial folliculitis, and a deep inflammatory type (kerion), characterized by erythematous plaques, boggy nodules, pustules, and easily pluckable hairs.[2,5,6] Kerion is almost always caused by zoophilic dermatophytes due to the intense host immune response, whereas superficial form typically caused by anthropophilic dermatophytes, acquired via autoinoculation from fingernails or tinea pedis.[8]

Several predisposing factors for tinea barbae have been described, including chronic use of topical corticosteroids, unsanitary razors, and immunosuppressive states.[2,4] In our case, the patient had no comorbidities or lesions elsewhere but was a farmer with frequent exposure to cattle, suggesting a zoonotic source.

Kerion-like lesions often mimic bacterial abscess, sycosis barbae, chronic granulomatous infections, and even malignancy, leading to frequent misdiagnosis and unnecessary antibiotic or surgical treatment. Several case reports describe initial misdiagnosis and antibiotic or surgical management before mycology revealed tinea barbae.[1–3,9] In our case, the differential diagnoses considered included kerion, deep bacterial infections (such as actinomycosis and botryomycosis), sporotrichosis, lupus vulgaris, cutaneous leishmaniasis, and squamous cell carcinoma. However, the relatively short symptom duration of one month made chronic granulomatous and malignant conditions less likely.

The patient's pus culture grew S. aureus, while the KOH mount prepared from the beard hair and pus sample was negative for fungal elements, which initially misled the diagnosis. Diagnosis of tinea barbae generally requires both clinical suspicion and laboratory confirmation. KOH preparation of skin scrapings, pus, or plucked hairs typically demonstrates septate hyphae and/or arthroconidia. Fungal culture on Sabouraud dextrose agar (SDA) with chloramphenicol and cycloheximide, though time-consuming (3–4 weeks), is considered confirmatory. Histopathological examination is rarely necessary, and may show fungal elements with PAS staining.[1,5,6] In our case, both KOH mount and PAS staining were negative, and fungal culture was not available. Therefore, the diagnosis of kerion barbae with secondary S. aureus infection was made based on clinical presentation and the patient's favorable response to antifungal therapy.

False-negative KOH and PAS staining results are common in deep inflammatory tinea, where severe inflammation and superinfection obscure fungal elements. Shemer et al. reported that a high proportion (50%) of highly inflammatory kerion cases showed negative KOH mount results, while only 16.7% yielded a positive fungal culture at initial presentation.[10] Similarly, De Lacerda et al. in their analysis of tinea barbae, observed that direct microscopy and culture may frequently be negative despite strong clinical suspicion.[11] These findings highlights the importance of maintaining clinical suspicion of kerion barbae in indurated beard lesions that only partially respond to antibiotics with persistent boggy plaques and loose hairs. In such situations, a therapeutic trial of antifungals is justified, while histopathology helps rule out malignancy and granulomatous dermatoses.

The major limitation in our case was the lack of a fungal culture, which could have confirmed the diagnosis and identified the causative species.

CONCLUSION

Kerion barbae, although rare, should be considered in patients presenting with rapidly enlarging nodulo-ulcerative lesions of the beard area. Negative KOH mount and PAS staining may mislead the diagnosis, especially in the presence of secondary infection. In such cases, a high index of suspicion and a therapeutic trial of antifungal agents are justified to avoid misdiagnosis and delayed treatment, thereby preventing complications such as scarring and permanent alopecia.

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