

Bullous Tinea Pedis – Misdiagnosed for Long Time

Rahaman M¹, Wahab MA², Kader MR³, Siddique MRU⁴, Kumar SB⁵
Rahman MM⁶, Uddin MK⁷

Abstract

Fungal infection is very common in Dermatological practice in Bangladesh. Most of the cases can be diagnosed clinically and simple laboratory examination. But here we present a case of recurrent bullous tinea pedis that had been misdiagnosed for a long time and treated with oral steroids. Initially, direct microscopy of potassium hydroxide preparations was negative and culture did not reveal any fungal organism. In a biopsy taken simultaneously from the edge of a bulla and stained with periodic acid-Schiff, septate mycelia were clearly visible. Trichophyton mentagrophytes was later identified in repeated cultures. The patient was treated with oral Terbinafine 250 mg daily for 2 months cured completely.

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Introduction

The three major clinical variants of tinea pedis are (1) interdigital infection with subsequent toe-web maceration and leukokeratosis resulting from overgrowth of bacteria, (2) plantar, moccasin-type of squamous hyperkeratosis, and (3) vesiculobullous infection on the instep and side of the foot¹. The bullous type is often misdiagnosed. The diagnostic procedures are, clinically, direct microscopy of potassium hydroxide (KOH) preparations and fungal cultures. Additionally, biopsies are sometimes performed. The histopathological pattern differs according to the clinical variant. Periodic acid-Schiff (PAS) or methenamine silver stains reveal the presence of hyphae in the horny layer.

Case report

A 35-year-old-male presented with a multiple blisters on right sole. On routine examination, minimal scaling and two large, tense bullae (2 × 2.6 cm; 1 × 1.3 cm) were seen on the sole of his right foot. The patient reported that the condition was recurrent and slightly pruritic, but that it usually slight improvement within a few days after taking steroid tablets. In scrapings of the roof of the bullae and the neighbouring skin and in swabs of fluid from a bulla, there was no evidence of a dermatophyte or yeast infection by either direct microscopy of KOH smears or culture. A biopsy from the edge of the largest bulla revealed an intracorneal blister containing

sparse numbers of lymphocytes and neutrophils and a dense lymphocytic infiltrate in the papillary dermis. On PAS-staining, the stratum corneum was found to be populated by septate hyphae

1. * Dr. Md. Mahabubur Rahaman
Senior Consultant, Aurora Skin & Aesthetic,
Dhaka,
2. Prof. Lt. Col.(Retd.) Dr. M A Wahab
Professor of Dermatology
BSMMU, Dhaka.
3. Dr. Md. Rezaul Kader
Senior Consultant,
BSMMU, Dhaka.
4. Dr. Md. Rahmat Ullah Siddique
Research Assistant,
BSMMU, Dhaka.
5. Dr. Saha Bijoy Kumar
Assistant Professor
Comilla Medical College. Comilla.
6. Dr. Md. Moksedur Rahman
Associate Professor
Rajshahi Medical College.
7. Dr. Md. Kamal Uddin
Senior Consultant,
General Hospital, Noakhali.

*Address of correspondence

Mobile: 01817009488

E-mail : wahab_skinvd@yahoo.com



Fig: 1



Fig: 2



Figure 1.

Subcorneal blister with spongiosis of the surrounding epidermis and a superficial perivascular lymphocytic infiltrate ($\times 40$).

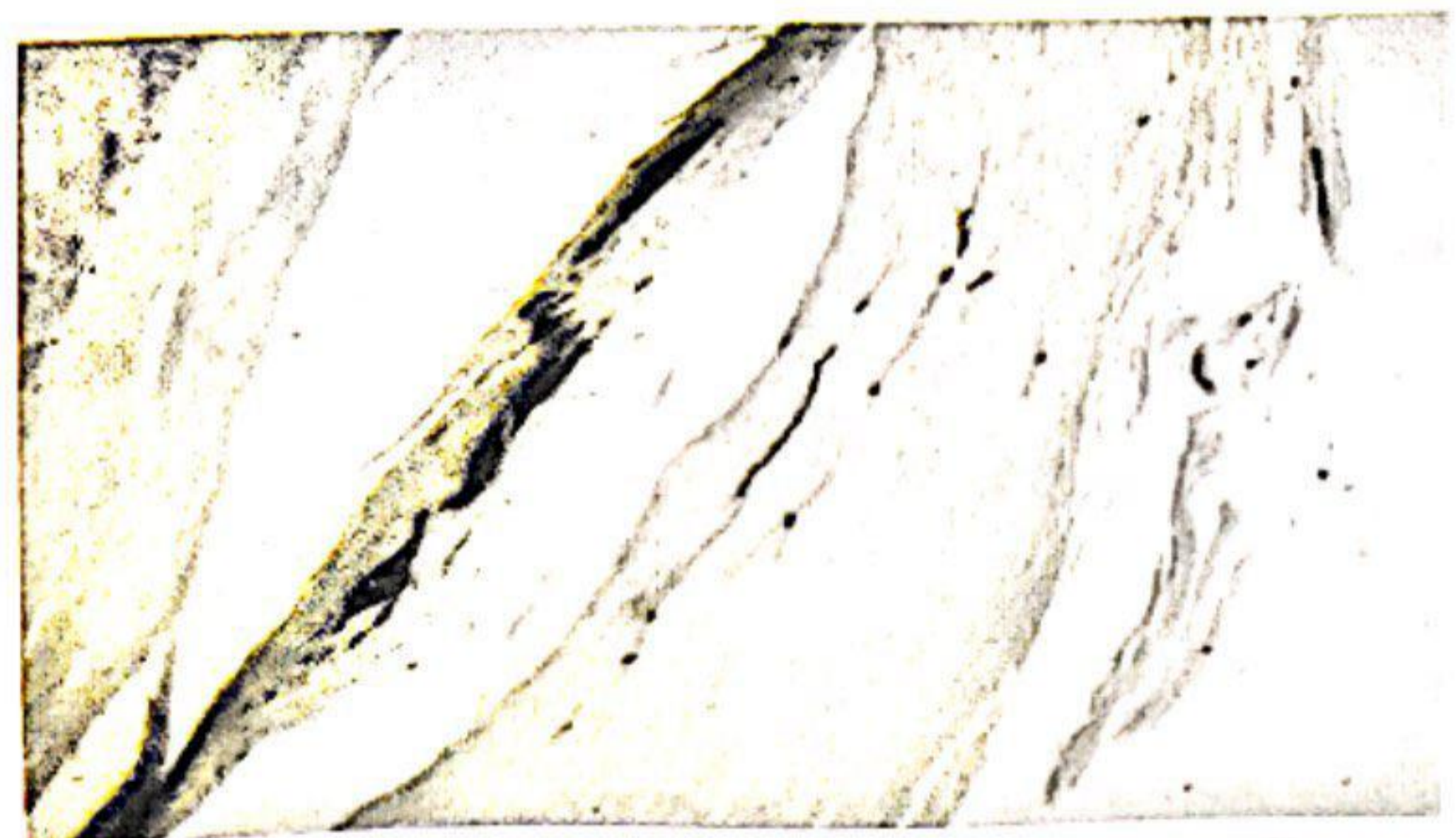


Figure 2

The PAS stain reveals numerous hyphae in the cornified layer ($\times 200$).

Ten days after initiation of the oral therapy the vesicles and bullae on the feet were almost completely resolved. Direct microscopy was again negative, but culture of both scrapings from the soles and from the base of an old bulla yielded *Trichophyton mentagrophytes*. Treatment with oral 250 mg day terbinafine for 60 days resulted in complete clinical clearance. An intradermal trichophytin test at the time of the squamous hyperkeratotic presentation was negative.

Discussion

Pompholyx, the Greek word for bubble, is a non-specific term that has been used to refer to a variety of diseases characterized by acute vesiculobullous eruptions on the hands and feet. Among them are dyshydrotic dermatitis that is often associated with atopy; allergic contact dermatitis, especially due to type IV hypersensitivity reactions against nickel; and bullous id reactions secondary to distal infections with fungi². Although reported as early as 1892³ bullous epidermophytic infections of the soles are often misdiagnosed as dyshydrotic or allergic contact dermatitis. Helpful diagnostic clues favouring a fungal infection are the confinement of bullae to only one foot and the simultaneous presence of more classical forms of tinea pedis, such as macerated toe-webs and plantar scaling. According to three major studies, the prevalence of tinea pedis in children ranges from 2.2% to 8.2%^{4,5,6}. In 63.7% of the cases, the infection was found to be of the vesiculobullous type which is often misdiagnosed, especially as atopic dermatitis⁷. Thus, mycological investigations must always be performed in cases of bullous eruptions on palms and soles. In the case described here, the history of a quick response to steroid treatment initially favoured the misdiagnosis of dyshydrotic dermatitis. Steroid treatment also resulted in the masking of the early clinical manifestations of the disease, i.e. bullae. *Trichophyton mentagrophytes* is a potent sensitizer⁸ and a delayed hypersensitivity response seems to

be the main mechanism of immune defence against dermatophytes⁹. The change of the clinical pattern after the intake of steroids from bullous to hyperkeratotic indicates that an allergic reaction to the fungus is important for the formation of bullae. In addition to an allergic reaction, other mechanisms contributing to the formation of bullae may be friction and production of keratinolytic enzymes by the fungus^{10,11}. *Trichophyton rubrum* is the main causative organism producing the dry, squamous, hyperkeratotic, moccasin-type of tinea pedis^{12,13}, but it has also been reported as a cause of the vesiculobullous type^{14,15}. The opposite is true for *Trichophyton mentagrophytes* which has widely been said to be responsible for the vesiculobullous type and only occasionally for the hyperkeratotic type¹⁶. In our patient, *Trichophyton mentagrophytes* produced both types of tinea pedis. It seems that the clinical presentation depends on the host's immune response. The intake of steroids did not produce a case of tinea incognito, totally masked by steroids, but it modified the clinical course and manifestations to the effect that the disease presented itself with another clinical variant.

Early in the disease, hyphae were identified by PAS-stained sections of a biopsy at a time when routine mycological investigations failed to prove their presence. This reinforces the role of biopsy for early diagnosis of blistering conditions on the soles. Alternatively, repeated cultures may be performed if original mycological investigations remain negative in cases that are suspected clinically to represent tinea pedis. It should also be remembered that a well-trained clinician's eye is the best diagnostic tool, initiating other diagnostic procedures that serve to verify the clinical diagnosis.

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