Short Report

Tinea Corporis Due to Trichophyton erinacei Probably Transmitted from a Hedgehog: The Second Case Report from Japan

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ABSTRACT

A 26-year-old female homemaker presented with an approximately 2-month history of an erythematous lesion with agminated seropapules in the right popliteal fossa associated with scales and crusts. The lesion was initially treated as contact dermatitis, but there was no improvement. KOH examination revealed filamentous fungi. The fungal culture was positive, and the morphological characteristics were identical to those of Trichophyton mentagrophytes complex. The fungus was identified as T. erinacei based on genetic analysis. This is the second case report of human tinea corporis due to this fungus in Japan.

Key words: hedgehog, tinea corporis, Trichophyton erinacei

Introduction

We report here a case of tinea corporis due to Trichophyton erinacei that was likely transmitted from a hedgehog. This is the second case report of human infection by T. erinacei in Japan, following the first case reported by Mochizuki et al1.

Case

A 26-year-old female homemaker visited a clinic with an approximately 2-month history of eruptions in the right popliteal fossa. A diagnosis of contact dermatitis was made, and she was treated with topical corticosteroid; however, the lesion expanded. Hence, she was referred to our department in April 2017. The patient lived with her husband, who had a history of tinea pedis. She had no significant medical history. However, she had acquired a pet hedgehog 2 months prior to the occurrence of the eruptions.

Clinical findings at presentation included an almost well circumscribed itchy erythema, approximately 10 cm in diameter, in the right popliteal fossa, multiple seropapules at the margin, and adhesion of scales and crusts at the center of the erythema (Fig. 1). Treatment with topical corticosteroid was continued, presuming it to be contact dermatitis; however, there was no improvement at 2 weeks after the first examination. Since bacterial culture was negative, mycosis was suspected. KOH examination revealed filamentous fungi, and the fungal culture showed growth of a dermatophyte.

The clinical isolate exhibited a white velvety surface and a powdery margin of the colony on a Mycosel agar at 27°C at 28 days. Microscopic examination of the isolate revealed the growth of many tear-shaped microconidia and club-shaped macroconidia on the Mycosel agar (Fig. 2a, b). From these findings, the isolates were identified as Trichophyton mentagrophytes complex. The ITS sequence of the isolate was 98% identical to the sequences of AB048192 deposited for Group I in Genotype 1 and AB088677 deposited for Trichophyton benhamiae A-E race Group II in Genotype 1, respectively. These genotypes were isolated from rabbit and rodent skin in Europe. In addition, the ITS sequence of the isolate was 100% identical to the sequence Z97996, deposited for T. erinacei, which was isolated from hedgehog skin. From these findings, the isolates were identified as T. erinacei.

Based on the findings of mycological culture and molecular examination, the patient was diagnosed with tinea corporis due to T. erinacei. Her pet hedgehog did not have any obvious skin manifestations such as hair loss. Toothbrush culture of the sample obtained from the posterior auricular area of the animal was negative; hence, the source of infection could not be
ascertained. However, given that she had been keeping the hedgehog for 2 months before the occurrence of eruptions, her pet hedgehog was strongly suspected to be the source of infection. The eruptions improved after treatment with luliconazole cream and itraconazole pulse therapy (for 7 days).

**Discussion**

The taxonomy of dermatophytes remains to be established. In particular, the *T. mentagrophytes* complex has been classified into several variants despite the morphological similarities among members of the complex. In 2017, a new classification system was proposed by the International Society for Human and Animal Mycology Dermatophytes Working Group (https://www.isham.org/working-groups/dermatophytes), emphasizing consistency with the traditional classification system and results of the genetic analysis. Worldwide use of the new classification system is anticipated. According to the new classification system, *T. mentagrophytes* var. *erinacei* carried by hedgehog hosts is distinguished from *T. benhamiae* that is carried mainly by hosts such as guinea pigs or rabbits. Although the teleomorph of *T. mentagrophytes* (*Arthroderma benhamiae*) is common, *T. erinacei* is recognized as an independent species from *T. benhamiae* based on the nucleotide sequence analysis of the internal transcribed spacer regions of ribosomal DNA.

Human infection with *T. erinacei* was first reported in 1960 by Marples and Smith. It is reported that 40% of the hedgehogs in New Zealand, Europe, and Southeast Asia are carriers of the fungus. Human infection, however, with *T. erinacei* is relatively rare, with less than 40 cases reported in literature worldwide. Common infection sites are the extremities, such as hands and wrist, which are likely to be in direct contact with the hedgehogs. The symptoms include intense itching and inflammation, and the condition is frequently misdiagnosed as eczema. The patient in the present study was diagnosed with contact dermatitis at the first examination and treated accordingly, but the symptoms did not improve. Although KOH examination was positive, we failed to isolate the fungus from the pet hedgehog by the toothbrush method. However, we speculate that the pet hedgehog was the source of infection.

Fig. 1. Clinical findings showed an almost well-circumscribed itchy erythema with a size of 10 cm diameter in the right popliteal fossa, multiple seropapules at the margin, and adhesion of scales and crusts at the center of the erythema.

Fig. 2. 
(a) The clinical isolate was characterized by white velvety surface and powdery margin of the colony on Mycosel agar at 27°C at 28 days. 
(b) Microscopic examination of the isolate revealed that many tear-shaped microconidia and club-shaped macroconidia were produced on Mycosel agar (original magnification × 400).
hedgehog was the source of this infection because *T. erinacei* is a zoophilic dermatophyte, whose main host is the hedgehog. Hedgehogs have become increasingly popular as pets in Japan due to their exotic appearance. Hence, there is concern about an increased risk of infection, as observed in the present case. Dermatologists should inculcate awareness of the possibility of zoophilic dermatophyte infections. A history of contact with pets, KOH examination, and fungal culture are important for proper diagnosis.

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**Conflicts of interest**

None declared.

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