

## Case Report

# Inflammatory Tinea Manuum due to *Trichophyton Erinacei* from a Hedgehog: A Case Report and Review of the Literature

Hui L<sup>1\*</sup>, Choo KJL<sup>1</sup>, Tan JBX<sup>2</sup> and Yeo YW<sup>1</sup>

<sup>1</sup>Department of Dermatology, Singapore General Hospital, Singapore

<sup>2</sup>Department of Microbiology, Singapore General Hospital, Singapore

\*Corresponding author: Laura Hui, Department of Dermatology, Singapore General Hospital, Singapore

Received: September 30, 2017; Accepted: November 16, 2017; Published: November 23, 2017

## Abstract

There have been an increasing number of reports of hedgehog related zoonotic diseases, which is reflective of the growing popularity of hedgehogs as exotic household pets. We present a case of an acute inflammatory tinea manuum following a hedgehog prick in a healthy 24-year-old veterinarian assistant. She developed an inflamed erythematous plaque studded with pustules on her left palm initially misdiagnosed as a bacterial infection. Fungal culture of the pustules grew *Trichophyton mentagrophytes var erinacei*. Her lesion resolved with oral terbinafine for two weeks. We use this case to highlight zoonotic dermatophyte cutaneous infections associated with hedgehogs.

**Keywords:** Hedgehog; Tinea manuum; Dermatophyte; Zoonoses

## Introduction

There have been an increasing number of reports of hedgehog related zoonotic cutaneous diseases, which is reflective of the growing popularity of hedgehogs as exotic household pets. Pricks from the spines of a hedgehog can cause inoculation of dermatophytes, such as *Trichophyton erinacei* (*Trichophyton mentagrophytes var erinacei*). The resulting cutaneous infection is typically intensely pruritic and highly inflammatory.

## Case Presentation

Our patient is a 24-year-old veterinary assistant who presented with a one week history of an acute onset, persistent and progressively enlarging itchy dermatoses on her left palm after sustaining a prick from a hedgehog (African Pygmy Hedgehog, *Atelerix albiventris*). The hedgehog had been brought in for veterinary examination after it was found on the road.

Initial treatment by a general practitioner included topical betamethasone dipropionate, and when it had not improved, topical acyclovir was used instead. She also received three days of oral ciprofloxacin and azithromycin. She eventually came to our hospital emergency department when her left hand developed pustules, redness and pain despite her earlier treatment.

Physical examination revealed a localised well demarcated erythematous and oedematous plaque studded with multiple pustules on her left palm (Figure 1). She was afebrile and there was no ascending lymphangitis or palpable lymphadenopathy. No retained quills or foreign bodies were seen.

In view of the inflammatory and pustular nature of her rash, she was initially treated for a secondary bacterial infection with oral augmentin and a swab of the pustules taken for pyogenic, fungal and mycobacterial cultures. Pyogenic and mycobacterial cultures were negative. The fungal culture returned as positive for *Trichophyton mentagrophytes*. After 1 week of incubation under aerobic condition

at 30°C on Sabouraud Dextrose Agar, the appearance of mould colonies were noted with white, flat, downy surface and buff reverse (Figure 2). Further Polymerase Chain Reaction (PCR) was performed via sequencing of the internal transcribed spacer region of the fungal ribosomal DNA, which subtyped the species as *Trichophyton mentagrophytes var erinacei*.

The diagnosis was revised to an inflammatory tinea manuum. Our patient received systemic terbinafine 250mg OD for 2 weeks with complete resolution of her rash.

## Discussion

Hedgehogs are small, primarily nocturnal animals belonging to the Erinaceinae subfamily, in the eulipotyphlan family Erinaceidae. They are characterised by short sharp spines which are hollow hair made stiff by their keratins. Unlike the porcupine, the quills of a matured hedgehog are not easily detached from their body unless they are sick or are under significant duress.



Figure 1: Inflammatory plaque on the left palm.

**Table 1:** Published cases of Tinea manuum from *Trichophyton mentagrophytes* var. *erinacei* resulting from contact with Hedgehogs.

Authors	Year	Country	Cases	Gender (M, F)	Age at diagnosis (Y)	Transmission	Morphology	Treatment
Philpot et. al. [5]	1992	New Zealand	2	F	27-35	Direct contact	Annular, scaly, pustules, nodules, nail dystrophy	Oral Griseofulvin for 8 weeks
Rosen et. al. [6]	2000	Italy	3	1M, 2F	28-60	Direct contact	Annular, erythematous bullae	Oral itraconazole for 1 week
Mochizuki et. al. [7]	2005	Japan	1	F	26	Direct contact	Scaly, erythematous plaques	Topical terbinafine and fluocinoloneacetonide for 4 weeks
Schauder et. al. [8]	2007	Germany	8	2M, 6F	23-59	Direct contact and hedgehog bite	Annular scaly patches, Dry erythematous patches	Topical econazole or clotrimazole for 6-12 weeks and oral itraconazole or terbinafine for 8-12 weeks
Rhee et. al.[9]	2008	Korea	1	F	15	Direct contact	Scaly erythematous patches and pustules	Oral itraconazole, topical diflucortolone valerate for 4 weeks
Hsieh et. al. [10]	2010	Taiwan	1	F	36	Direct contact	Erythematous plaques	NA
Weishaupt et. al. [2]	2013	Germany	1	F	29	Direct contact	Erosions	Oral and Topical Terbinafine
Drira et. al. [11]	2015	Tunisia	1	F	10	Direct contact	Erythematous patch	NA

Y: Year (s); M: Male; F: Female; NA: Not Applicable.

**Figure 2:** *Trichophyton erinacei* on Sabouraud Dextrose Agar.

Hedgehogs are known to be asymptomatic carriers of fungi frequently isolated from their spines or underbellies. The most common dermatophyte isolated is *Trichophyton mentagrophytes* var. *erinacei*, which is the same dermatophyte encountered in our patient's case [1]. Albeit rare, it typically invades the keratinised layers of the skin via wounds or abrasions. The contact with a hedgehog can be as short as one to two minutes which reflects its high fungal load. It can present with an erythematous annular scaly plaque with pustules at the site of inoculation as in our patient. Weishaupt et al reported a case that presented with bulla and erosions over the right fifth finger [2] (Table 1 for summary of case reports).

In all the published case reports, systemic antifungals such as azoles or allylamines are required. We used terbinafine to treat our patient.

Apart from cutaneous dermatophytosis, hedgehogs have been implicated in a number of dermatoses such as contact urticarial with its quills, salmonella, and mycobacteria (*Mycobacteria marinum*) infections [3,4]. It is thus recommended that heavy duty gardening gloves be used when handling a hedgehog to protect from accidental inoculation. Immediate hand washing after handling is also advised to protect from salmonellosis.

This case highlights the need for a detailed clinical history and a high index of suspicion for inflammatory fungal infection when dealing with hedgehog zoophilic dermatosis.

## References

- Ellis C, Mori M. Skin diseases of rodents and small exotic mammals. *Vet Clin North Am Exot Anim Pract.* 2001; 4: 493-542.
- Weishaupt J, Kolb-Maurer A, Lempert S, Nenoff P, UhrhlaB S, Hamm H, et al. A Different Kind of Hedgehog Pathway: Tinea Manus Due to *Trichophyton Erinacei* Transmitted by an African Pygmy Hedgehog (*Atelerix Albiventris*). *Mycoses.* 2013; 57: 125-127.
- Tappe JP, Weitzman I, Liu S, Dolensek EP, Karp D. Systemic *Mycobacterium marinum* infection in a European hedgehog. *J Am Vet Med Assoc.* 1983; 183:1280-1281.
- Centers for Disease Control. African pygmy hedgehog-associated salmonellosis-Washington, 1994. *MMWR Morb Mortal Wkly Rep.* 1995; 44: 462-463.
- Philpot CM, Bowen RG. Hazards from Hedgehogs: Two Case Reports With a Survey of the Epidemiology of Hedgehog Ringworm. *Clin Exp Dermatol.* 17: 156-158.
- Rosen T. Hazardous Hedgehogs. *South Med J.* 2000; 93: 936-938.
- Mochizuki T, Takeda K, Nakagawa M, Tanabe H, Ishizaki H. The first isolation in Japan of *Trichophyton mentagrophytes* var. *erinacei* causing tinea manuum. *Int J Dermatol.* 2005; 44: 765-768.
- Schauder S, Kirsch-Nietzki M, Wegener S, Switzer E, Qadripur SA. From hedgehogs to men Zoophilic dermatophytosis caused by *Trichophyton erinacei* in eight patients. *Hautarzt.* 2007; 58: 62-67.
- Rhee DY, Kim MS, Chang SE, Lee MW, Choi JH, Moon KC, et al. A case of tinea manuum caused by *Trichophyton mentagrophytes* var. *erinacei*: the first isolation in Korea. *Mycoses.* 2009; 52: 287-290.
- Hsieh CW, Sun PL, Wu YH. *Trichophyton erinacei* infection from a hedgehog: a case report from Taiwan. *Micropathologia.* 2010; 170: 417-421.
- Drira I, Neji S, Hadrich I, Sellam H, Makni F, Ayadi A. Tinea manuum due to *Trichophyton erinacei* from Tunisia. *J Mycol Med.* 2015; 25: 200-203.