

BRIEF ARTICLE

Unique Periocular Presentation of Tinea Faciei in an Adolescent Female: Case Report and Discussion

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ABSTRACT

Dermatophytosis of the face, also known as tinea faciei, may have a variable clinical presentation. A presumed clinical diagnosis of dermatophytosis should be confirmed with microscopy, culture, and or real-time polymerase chain reaction (RT-PCR). Initially misdiagnosed after negative real-time polymerase chain reaction, we report a case of bilateral periocular tinea secondary to *Trichophyton mentagrophytes*, a dermatophyte often transmitted from guinea pigs and rabbits.

INTRODUCTION

Dermatophytes are fungi of the genera *Microsporum*, *Trichophyton*, and *Epidermophyton* often superficially infecting hair, nails, and skin of their host.¹ Depending on their reservoir, dermatophytes are classified into anthropophilic, geophilic, and zoophilic species, transmitting to humans from human, soil, or animal, respectively.² Dermatophytes will invade the stratum corneum by releasing keratinase³, eliciting an inflammatory response. This results in the classic features of an erythematous, annular patch or plaque circumscribed by scales with a central clearing, vesicles, and or pustules.⁴ Up to 70% of patients with tinea faciei may be misdiagnosed¹, potentially due to prior inappropriate treatment masking these characteristic features, eliciting so-called tinea incognito. Clinical diagnosis of tinea faciei, which accounts for 3 to 4% of dermatophytoses³, should be confirmed with microscopy, culture, and or real-time polymerase chain reaction (RT-PCR) due to

its mimicry of other diagnoses. We report a case of bilateral periocular tinea, initially misdiagnosed and incorrectly treated, secondary to *Trichophyton mentagrophytes*, a dermatophyte often transmitted from guinea pigs and rabbits.⁵

CASE REPORT

A 14-year-old girl presented to the dermatology office for a third re-evaluation of a progressively worsening bilateral periocular rash of four months. Physical examination exhibited erythematous scaly plaques and pustules with moderate swelling around each eye (**Figure 1 and 2**). Lack of response to over-the-counter hydrocortisone cream, moisturizers, and fragrance-free, hypoallergenic soap prompted the patient to seek dermatologic counseling. She was initially diagnosed with seborrheic dermatitis and prescribed tacrolimus 0.1% ointment and then a trial of ruxolitinib 1.5% cream.

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Figure 1. Erythematous, papulosquamous pustules and plaques surrounding the left periorbital with associated eyelid swelling.



Figure 2. Erythematous, papulosquamous pustules and plaques surrounding the right periorbital with associated eyelid swelling.

After these topical prescriptions failed to improve her condition, she was diagnosed with periorificial dermatitis and prescribed oral doxycycline 50 mg and pimecrolimus 1% cream. A RT-PCR swab was obtained to rule-out bacterial or fungal causes, returning positive for *Cutibacterium acnes*. However, treatment failure prompted further investigation. Microscopy of a potassium hydroxide (KOH) preparation revealed branching hyphae with septation, diagnostic of dermatophytosis (**Figure 3**). A fungal culture was ordered for speciation, and the patient began ketoconazole 2% cream twice daily and terbinafine 250 mg daily for 30 days.

Four weeks later, fungal culture demonstrated growth of *Trichophyton mentagrophytes*. Upon further questioning, the patient was noted to have three cats and two rabbits, elucidating the potential inoculation source. After 1 month of treatment, the patient was clear with no residual periorcular erythema, scaly plaques, or pustules.

DISCUSSION

Trichophyton mentagrophytes is a dermatophyte frequently associated with small herbivorous mammals. Children commonly acquire zoophilic dermatophytoses due to increased interactions with household pets; our adolescent patient commonly had close contact with her pet rabbits, explaining why she alone in her family was infected. Another unique presentation in our patient's case was the bilateral periorcular distribution since superficial infectious processes are less likely to present symmetrically. A bilateral presentation statistically favors noninfectious, inflammatory dermatoses like

atopic dermatitis, psoriasis, contact dermatitis, or periorificial dermatitis.

A published case report in The Journal of Pediatrics details how a 6-year-old boy, presenting similarly to our patient with a periorcular erythematous plaque with scaling, was initially misdiagnosed with eyelid eczema.⁴ Only after several therapeutic failures was the correct diagnosis of tinea faciei determined. In a retrospective review between 2003 to 2009 from St. Louis Children's Hospital, ten cases of periorcular tinea were identified, all following a similar course of initial misdiagnosis and incorrect treatment.⁶ In all ten cases at St. Louis Children's Hospital, the patients experienced loss of eyelashes. However, our patient retained her eyelashes emphasizing the difficulty in determining a common trend to aid in diagnosis.

Interestingly, the initial RT-PCR swab, sensitive for bacterial and fungal agents, returned positive for only *C.acnes*. In a published article reviewing the sensitivity and specificity of RT-PCR in the detection of dermatophyte infection, trials 1 to 3 showed a consistently high percentage of detection. Trial 1 with 22 established dermatophyte samples resulted in 100% sensitivity and specificity with the RT-PCR. Trial 2 with 105 established dermatophyte samples resulted in an overall 90% sensitivity. Trial 3 with 195 samples compared RT-PCR to the gold standard of microscopy and culture, RT-PCR had a 100% sensitivity and an additional 21% dermatophyte detection compared to the gold standard. Despite these statistics, our patient's initial RT-PCR returned negative for fungal organisms.⁷ It is unclear whether the negative result was due to insufficient sampling or infection duration as the fungal culture, six weeks later, returned positive for *Trichophyton mentagrophytes*. However, that



Figure 3. Microscopy of a KOH preparation reveals branched, septated filamentous hyphae crossing over keratinocytes, diagnostic features of dermatophytosis.

initial negative result contributed to weeks of delay in appropriate treatment.

CONCLUSION

With any papulosquamous eruption, considering tinea is imperative due to its ability to imitate other conditions. Though RT-PCR has an almost two times greater sensitivity and specificity than the gold standard of microscopy and culture, our initial swab returned negative.⁷ A negative result should not exclude tinea as a differential diagnosis nor dissuade the diagnostician from obtaining a microscopic prep and culture. Only upon reassessment with a potassium hydroxide preparation was the correct diagnosis for our patient determined. Maintaining a level of clinical suspicion despite negative diagnostic results may hasten correct diagnosis in unusual presentations of tinea faciei.

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