

JAMA Pediatrics Clinical Challenge

An Unusual Inflammatory Rash

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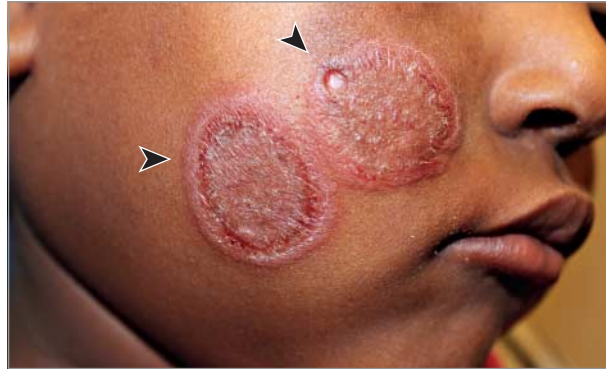


Figure 1. A 4-year-old girl presenting with two 5-cm-diameter annular patches (arrowheads) slowly increasing in size over 3 weeks on the right cheek.

A 4-year-old, 15-kg girl presented with a 3-month history of a pruritic rash bilaterally on the cheeks, initially thought to be related to mosquito bites. Treatment with desonide, 0.05%, ointment twice daily proved to be ineffective. The patient's rash also failed to clear with a therapeutic trial with griseofulvin liquid (125 mg/5 mL), 5 mL daily, and econazole, 1%, cream twice daily for 2 weeks and later ciclopirox, 0.77%, cream twice daily for 2 weeks, although the patient reported some improvement. The presence of persistent acneiform papules on the cheeks with postinflammatory hyperpigmentation led to a therapeutic trial of erythromycin, 400 mg/5 mL, 1.3 mL orally twice a day, with food. Test results for antinuclear antibody and rheumatoid factor were negative. Three weeks later, the patient presented with 2 slowly expanding, hyperpigmented, ringlike lesions with a tendency toward central clearing and peripheral scaling and erythema on the right cheek (**Figure 1**).



Quiz at jamapediatrics.com

WHAT IS YOUR DIAGNOSIS?

- A. Numular eczema
- B. Erythema annulare centrifugum
- C. Erythema chronicum migrans
- D. Tinea incognito

Diagnosis

D. Tinea incognita.

Discussion

This patient had a complex course most notable for the absence of a definitive diagnosis. One therapeutic trial after another was attempted until the clinician's therapeutic armamentarium was exhausted. In patients with scaling rashes, a simple, reproducible, inexpensive test, the potassium hydroxide (KOH) preparation, can immediately confirm the diagnosis of tinea and guide treatment. In this case, KOH test results of the patchy rash demonstrated hyphae (Figure 2), confirming the diagnosis of tinea faciei.

A more detailed history revealed that a dog lived in the house and no siblings or friends were known to have tinea. Zoophilic dermatophytes like *Microsporum canis* produce more inflammatory rashes than anthropophilic fungi such as *Trichophyton rubrum*. Treatment was initiated with terbinafine 250 mg, ½ tablet orally daily, and ketoconazole, 2%, cream twice daily. The rash cleared completely within 4 weeks.

Once a definitive diagnosis was made, the patient's lack of response to treatment was less of a mystery. Desonide, 0.05%, ointment is a topical steroid of mild to moderate potency. Its vasoconstrictive effects can decrease redness and its antipruritic effects can decrease itching, but it will not kill the dermatophyte fungus that was the root of this problem. The anti-inflammatory effects do change the appearance of tinea, often eliminating classic features of ringworm and producing an appearance sometimes termed *tinea incognita*.

Although the Food and Drug Administration package insert for griseofulvin recommends a dose of 10 mg/kg, often 20 mg/kg is required to clear tinea.¹ A dose of 12.5 mL taken with milk to increase absorption for at least 4 weeks could have been more effective. The topical antifungals may well have cleared superficial scaling caused by the tinea but left behind inflammatory papules caused by

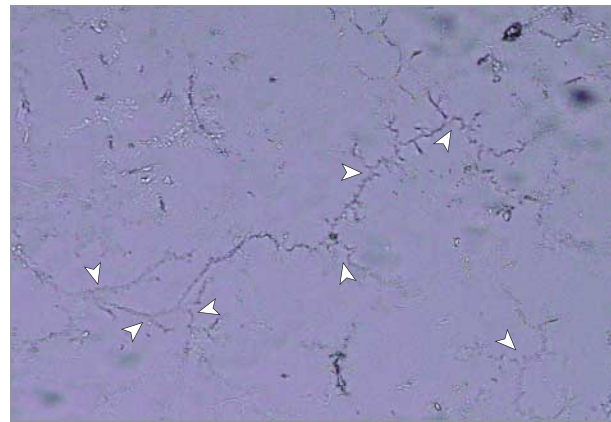


Figure 2. Clorazol black E potassium hydroxide preparation showing black, branching septate hyphae (arrowheads) (original magnification $\times 100$).

dermatophyte fungus within hair follicles producing an acneiform eruption (Majocchi granulomata). Antibacterial antibiotics have no effect on dermatophytes. Once a definitive diagnosis was made, treatment with oral terbinafine and topical antifungal cream for 1 month cleared the condition.

Studies have demonstrated that performing KOH examinations can significantly decrease errors in diagnosis and treatment.²⁻⁴ A review of 7 double-blinded diagnostic tests found KOH examinations to be highly sensitive (94.3%) and the most cost-effective means of confirming fungal infections.² In another study, treatment plans were altered in 25% of cases following a KOH preparation and the proportion of correct therapeutic decisions increased from 54% to 69%.³ When it is impractical to perform a KOH preparation, a fungal culture can be obtained by "scraping" scale into a sterile container and sending this to the laboratory, but a result may not be available for 4 weeks.

ARTICLE INFORMATION

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REFERENCES

1. Elewski BE. Treatment of tinea capitis: beyond griseofulvin. *J Am Acad Dermatol*. 1999;40(6, pt 2):S27-S30.

2. Lilly KK, Koshnick RL, Grill JP, Khalil ZM, Nelson DB, Warsaw EM. Cost-effectiveness of diagnostic tests for toenail onychomycosis: a repeated-measure, single-blinded, cross-sectional evaluation of 7 diagnostic tests. *J Am Acad Dermatol*. 2006;55(4):620-626.

3. De Kock CA, Sampers GH, Knottnerus JA. Diagnosis and management of cases of suspected dermatomycosis in the Netherlands: influence of general practice based potassium hydroxide testing. *Br J Gen Pract*. 1995;45(396):349-351.

4. Brodell RT, Helms SE, Snelson ME. Office dermatologic testing: the KOH preparation. *Am Fam Physician*. 1991;43(6):2061-2065.