Objective: To present the common features of periocular tinea to aid physicians in future diagnosis and therapy of this condition, because superficial fungal infections on the face are often misdiagnosed owing to the diverse morphologies that they manifest. This is especially true of dermatophytoses involving the periocular region.

Methods: A retrospective review was performed of patients with a diagnosis of periocular tinea who were seen between January 2003 and September 2009 in the pediatric dermatology clinic at St. Louis Children's Hospital.

Results: Ten cases of periocular tinea were identified (6 male patients and 4 female patients). Common features included prolonged misdiagnosis (all 10 cases), a normal ophthalmologic examination (all 10 cases), and inappropriate corticosteroid application (7 cases). Loss of the eyelashes occurred in all 10 patients. No cases had evidence of other tinea infections on examination. Only 2 cases had the central clearing classically associated with tinea corporis. Seven patients had a potassium hydroxide preparation and/or culture positive for fungal elements. Lesions improved with topical and oral antifungal treatment in all cases, and patients were able to regrow their eyelashes.

Conclusion: Periocular tinea should be considered in the differential diagnosis for periocular inflammation, especially in those patients refractory to therapy for more common conditions. Loss of the eyelashes is characteristic of these fungal infections, similar to the hair loss that occurs in kerions associated with tinea capitis.

DERMATOPHYTE INFECTIONS are common during childhood yet are frequently mistaken for other infections because of their pleomorphic appearance. Diverse presentations of tinea faciei have been reported in the literature, but the subset of facial fungal infections involving the periorbital region has not been described in detail. Physicians are often unaware of tinea’s capacity for targeting the periorbital area, specifically the eyelashes. We report 10 cases, all of which were initially misdiagnosed and treated incorrectly. The purpose of this review is to educate physicians about this entity and to present the common features to aid in future diagnosis and therapy.

Author Affiliations:
Departments of Internal Medicine and Pediatrics, Division of Dermatology (Drs Basak, Berk, and Bayliss), and Departments of Ophthalmology and Pediatrics (Dr Lueder), Washington University School of Medicine and St Louis Children’s Hospital, St Louis, Missouri.

We reviewed a total of 10 cases of periocular tinea seen in our hospital between January 2003 and September 2009 (Table). A typical case follows.

A healthy 5-year-old white boy presented with a 3-month history of an erythematous rash around the left eye (Figure 1). He initially received a diagnosis of eczema from his pediatrician and was treated with pimecrolimus, 1%, in cream form. The dermatitis did not respond, and he was further treated for presumed superimposed impetigo with oral erythromycin estolate and topical mupirocin calcium ointment. The eruption continued to progress, so his pediatrician added hydrocortisone, 2.5%, in cream form, which resulted in acute worsening of the eruption. A general dermatologist made the diagnosis of rosacea and started him on metronidazole benzoleate cream, which did not lead to improvement.

At St. Louis Children’s Hospital in St. Louis, Missouri, our examination of the child showed a large circular erythematous scaling plaque encompassing the left eye with scattered periorbital pustules and marked upper eyelid swelling with distortion of the palpebral fissure. He also had extensive loss of eyelashes on the lateral upper lid (Figure 1). Visual acuity was unaffected, the globes were not proptotic, canthi were normal, conjunctivae were noninflamed, pupils were reactive and responsive to light, and extraocular eye movements were intact. The potassium hydroxide (KOH) preparation was initially negative for fungal elements, but because of a strong clinical suspicion for tinea, an additional slide was prepared and demonstrated rare septated hyphae consistent with a fungal infection. The patient was treated with oral griseofulvin, 20 mg/kg/d, and topical econazole nitrate cream, once daily. At his follow-up visit 7 weeks later, the child’s condition improved.

significantly improved, and only minimal erythema remained on the left eyelid and cheek. He completed the 8-week course of griseofulvin and continued the econazole cream for 2 weeks after the infection appeared completely clear. He had no relapse.

**RESULTS**

This case epitomizes the features common to the presentations of the 10 patients in our review, including prolonged misdiagnosis, inappropriate corticosteroid application, normal ophthalmologic examination finding, and ciliary madarosis. All 10 children had been previously diagnosed and treated for at least one other condition prior to their diagnosis of tinea (Table). Most had a periorcular rash for over a month. Half of the patients were initially diagnosed with eczema. Four were diagnosed with impetigo. Three had a vesicular component to their eruptions resulting in the diagnosis of herpes simplex virus and were treated with oral acyclovir sodium (Figure 2A). These 3 patients ultimately had polymerase chain reaction test results that were negative for herpes simplex virus. Seven patients were treated with topical steroids, and 5 patients received at least 1 course of oral antibiotics. Eyelash loss occurred in all cases, and some patients also lost some of their eyebrows (Figure 2B). Upper eyelid involvement was most noticeable, but either or both lids were affected. Ophthalmoscopy was performed for 3 patients and showed normal findings. Only 2 cases had the annular appearance with central clearing classically associated with tinea corporis (Figure 3). The remaining 8 patients had confluent unilateral erythematous plaques. Scaleless varied for each patient, ranging from none to hyperkeratotic. Only 7 of the 10 patients had a KOH preparation and/or culture positive for fungal elements. The remaining 3 children were treated on the basis of a high degree of clinical suspicion for tinea. The diagnosis was confirmed by rapid response to antifungal treatment. Six patients were exposed to domestic animals, including dogs, cats, a horse, and a guinea pig. One child had a prior history of tinea capitis. None had evidence of other tinea infections on examination. No patients demonstrated regional lymphadenopathy. Treatment included oral griseofulvin, 20 mg/kg/d, plus a topical antifungal cream (terbinafine hydrochloride, micona-

### Table. Demographic and Clinical Characteristics of Patients With Tinea Orbitale Seen Between January 2003 and September 2009 at St. Louis Children’s Hospital

<table>
<thead>
<tr>
<th>Case No. / Sex/Age, y</th>
<th>Race</th>
<th>Culture</th>
<th>KOH Preparationa</th>
<th>Duration, wk</th>
<th>Prior Diagnosis</th>
<th>Prior Therapy</th>
<th>Tinea Treatment</th>
<th>Animal Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/M/5 White</td>
<td>White</td>
<td>Not performed</td>
<td>−</td>
<td>12</td>
<td>Eczema, impetigo, rosacea</td>
<td>Pim, HC 2.5%, Em, Mup, Mtz</td>
<td>Gris, Eco b,c</td>
<td>None</td>
</tr>
<tr>
<td>2/M/2 White</td>
<td>White</td>
<td>Not performed</td>
<td>−</td>
<td>5</td>
<td>Impetigo</td>
<td>Mup</td>
<td>Ter c</td>
<td>None</td>
</tr>
<tr>
<td>3/M/6 White</td>
<td>White</td>
<td>Not performed</td>
<td>+</td>
<td>6</td>
<td>HSV</td>
<td>Acy</td>
<td>Ter c</td>
<td>None</td>
</tr>
<tr>
<td>4/F/6 White</td>
<td>White</td>
<td>Not performed</td>
<td>−</td>
<td>12</td>
<td>HSV</td>
<td>Amox-Clv, TMP-SMZ, Clin, Mup, HC 2.5%</td>
<td>Gris, Ter b,c</td>
<td>Horse</td>
</tr>
<tr>
<td>5/M/7 White</td>
<td>White</td>
<td>Microsporum gypseum</td>
<td>+</td>
<td>6</td>
<td>HSV</td>
<td>Acy, Amox-Clv</td>
<td>Gris b</td>
<td>None</td>
</tr>
<tr>
<td>6/M/8 African American</td>
<td>White</td>
<td>Not performed</td>
<td>+</td>
<td>6</td>
<td>Eczema</td>
<td>HC 2.5%</td>
<td>Gris, Mic b,d</td>
<td>None</td>
</tr>
<tr>
<td>7/F/9 African American</td>
<td>White</td>
<td>Not performed</td>
<td>+</td>
<td>24</td>
<td>Eczema</td>
<td>Dif</td>
<td>Gris, Ter b,c</td>
<td>Cat</td>
</tr>
<tr>
<td>8/F/5 White</td>
<td>White</td>
<td>Not performed</td>
<td>+</td>
<td>24</td>
<td>Eczema</td>
<td>Dif</td>
<td>Gris, Ter b,c</td>
<td>Cat</td>
</tr>
<tr>
<td>9/F/8 White</td>
<td>White</td>
<td>Not performed</td>
<td>+</td>
<td>6</td>
<td>Eczema, impetigo</td>
<td>Prd, Cfad</td>
<td>Gris, Ter b,c</td>
<td>Dogs</td>
</tr>
<tr>
<td>10/M/4 White</td>
<td>White</td>
<td>Trichophyton rubrum</td>
<td>−</td>
<td>4</td>
<td>Impetigo</td>
<td>Nm, PmB, Amox-Clv</td>
<td>Gris, Ter b,c</td>
<td>Guinea pig, cat</td>
</tr>
</tbody>
</table>

**Abbreviations:** Acy, acyclovir sodium; Amox-Clv, amoxicillin–clavulanate sodium; Cfad, cefadroxil; Clin, clindamycin hydrochloride; Dif, diflorasone diacetate; Eco, econazole nitrate; Em, erythromycin estolate; Gris, griseofulvin; HC, hydrocortisone ointment; HSV, herpes simplex virus; Mic, miconazole nitrate; Mup, mupirocin calcium; Mtz, metronidazole benzoate; Nm, neomycin sulfate; Pim, pimecrolimus; PmB, polymyxin B sulfate; Prd, prednisone; Ter, terbinafine hydrochloride; TMP-SMZ, trimethoprim sulfate–sulfamethoxazole.

a Negative or positive for hyphae.
b Oral.
c Topical cream.
d Topical ointment.
zole nitrate, and/or econazole) for approximately 8 weeks. All cases resolved within 3 months of initiating therapy, and all patients regrew their eyelashes. No relapses were reported.

**COMMENT**

The diagnosis of periocular tinea is often missed. Only a few case presentations of periorbital dermatophyte infections have been reported in the literature, several of which were described as preseptal cellulitis. This is misleading, as dermatophytes do not invade dermal and subcutaneous tissue and therefore cannot technically cause cellulitis. However, they can cause a significant inflammatory response, such as occurs on the scalp as a keron, which can lead to the clinical appearance of a cellulitis. It should be recognized, however, that not all periocular tinea incites a strong inflammatory response, as shown in Figure 3. The diagnosis should be considered in less dramatic presentations that lack periorbital edema and red, tender, swollen eyelids.

Our clinical experience suggests that the paucity of data regarding periocular tinea is likely secondary to underdiagnosis rather than negligible prevalence. Periocular tinea has a highly pleomorphic appearance that often mimics other conditions, especially when partially or inappropriately treated. Key features that should arouse suspicion for tinea include the presence of scaling, exacerbation with the use of topical corticosteroids, and the loss of eyelashes or eyebrows. KOH preparations made with scrapings at multiple sites within the affected area can confirm the diagnosis in the majority of cases. If desired, fungal cultures can also be sent to the laboratory, but we do not routinely do them if the KOH preparation is positive for fungal elements. If one has a high degree of suspicion for tinea but the KOH preparation is negative for fungal elements, then rapid response to antifungal therapy is a cost-effective and sufficient method of confirming the diagnosis.

Treatment with oral griseofulvin is effective and analogous to treating tinea capitis, which requires oral medication for organism clearance. Patients typically had a noticeable response within 1 to 2 weeks of beginning the medication and achieved complete resolution after 8 to 12 weeks. Alternative systemic antifungals include oral terbinafine, itraconazole, and ketoconazole, but griseofulvin has fewer toxicities, fewer concerning potential drug interactions, and does not require monitoring of he-
Topical antifungals were a useful adjunct and, in cases of mild infections, were sufficient and curative as primary therapy. Although we prescribed topical econazole, miconazole, and terbinafine with success, we used topical terbinafine more often because of its fungicidal properties. To prevent relapses, topical therapy was continued for a minimum of 2 weeks after the eruption cleared clinically. In cases in which domestic animals were a potential source of infection, we recommended that they be examined by a veterinarian and, if need be, treated.

Periocular tinea can masquerade as other dermatoses, and diagnosis requires a high degree of clinical suspicion. Greater awareness of this diagnosis can result in faster resolution and decreased patient exposure to unnecessary systemic and topical medications. Physicians should consider periocular tinea in their differential diagnosis for periorbital eruptions, particularly those resistant to therapy for more prevalent conditions.

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Correspondence: David R. Berk, MD, Departments of Internal Medicine and Pediatrics, Division of Dermatology, Washington University School of Medicine, Campus Box 8123, 4921 Parkview Pl, St Louis, MO 63110 (dberk@dom.wustl.edu).

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REFERENCES