

Tender Nodules With Exudate and Alopecia of the Scalp: A Case of Kerion

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A 28-year-old active-duty man presented with a 4-week history of multiple tender, enlarging nodules on the scalp.

History. After an earlier visit to his primary care provider, the patient had started oral doxycycline for a presumed diagnosis of dissecting cellulitis of the scalp, as well as topical ketoconazole shampoo and topical terbinafine cream for superimposed tinea capitis. He had completed approximately 2 weeks of therapy when he developed an increase in size, tenderness, and drainage from the nodules. The patient also developed left-sided infraorbital facial edema, which prompted a visit to the local emergency department (ED).

A sample of the exudate taken in the ED was negative for bacteria on Gram stain and culture. He underwent incision and drainage as well as iodoform packing of the 2 larger lesions. He was discharged from the ED with oral terbinafine for tinea capitis and was continued on oral doxycycline; the ED staff contacted a dermatology clinic for follow-up evaluation.

The patient presented to the dermatology clinic, where he reported no significant interval change in the lesions from the time of ED evaluation. His medical history included no other medical conditions, no recent travel, no new medications, no new exposures, and no contacts with similar symptoms. A review of systems was otherwise negative.

Physical examination. On examination, 4 indurated, erythematous nodules with scale and crust and with mild tenderness to palpation were present on the patient's scalp. The lesions ranged in size from 1 to 4.5 cm in diameter (**Figures**). There were areas of alopecia and broken hairs overlying the lesions, as well as active serosanguineous exudate from 2 of the lesions. Left infraorbital edema was present. There was no lymphadenopathy noted on examination. The patient was otherwise well-appearing.





Diagnostic tests. A skin scraping was treated with potassium hydroxide and underwent microscopic examination in clinic; the findings were negative for fungal elements. Two punch biopsies were taken for histologic examination and tissue culture. On histopathological examination, periodic acid–Schiff staining was negative for hyphal elements. The patient was continued on oral doxycycline and oral terbinafine while tissue cultures were pending. He was advised against getting close haircuts or wearing headgear.

After 2 weeks of therapy, the facial edema had resolved, and the clinical appearance of the lesions had improved. Culture results were negative for bacterial and mycobacterial organisms; fungal culture was positive for growth of *Trichophyton* species.

Discussion. The patient's presentation was consistent with inflammatory tinea capitis or kerion; this diagnosis can easily be missed, thus delaying appropriate treatment.^{1,2}

Tinea capitis is more common in the pediatric population, and among adults who are affected, athletes and men are at increased risk.^{1,3} Tinea capitis can be divided into inflammatory and noninflammatory types. When left untreated, noninflammatory tinea capitis can progress to a more severe presentation of inflammatory tinea capitis, of which kerion is one manifestation. This is largely due to a hypersensitivity response to the presence of fungal organisms in the hair shaft or follicle.¹ This results in boggy, tender plaques and nodules, often with exudate and associated cervical or suboccipital lymphadenopathy.³ Without timely diagnosis and treatment, it can lead to scarring and permanent alopecia, making it important to identify this disease process and initiate treatment early.^{2,4}

Kerion is commonly misdiagnosed as bacterial abscess and is often treated with incision and drainage. Our patient lacked lymphadenopathy and symptoms of systemic illness, although these are not specific for a diagnosis of kerion or bacterial abscess. The patient did not demonstrate, however, significant clinical improvement after incision and drainage, making bacterial abscess less likely.

Another reasonable differential diagnosis for this patient with kerion is dissecting cellulitis of the scalp.^{2,5} The patient had multiple discrete lesions, which is not characteristic of kerion, which more often manifests as a single larger lesion. An important distinguishing feature, however, is that oral antibiotic therapy can provoke a worsening of disease,⁶ as seen in this patient's course. Given the patient's symptoms at presentation for follow-up in the dermatology clinic, and the lack of laboratory findings to confirm fungal infection, he was treated for both dissecting cellulitis of the scalp and tinea capitis while studies were pending.

Physical examination is key to the evaluation as opposed to relying heavily on diagnostic testing. Wood lamp examination is not helpful in confirming the diagnosis, since the occurrence of fluorescence depends on the dermatophyte species and pattern of infection.^{3,6} Fungal cultures of the exudate are often falsely negative; sampling with a toothbrush can be a more effective means to collect sample for culture, but awaiting these results can take weeks and thus delay treatment.⁷ Trichoscopy can be helpful in making the diagnosis early. In some cases, trichoscopy has demonstrated higher sensitivity than culture in diagnosing tinea capitis.⁸ The presence of comma hairs, corkscrew hairs, black dot hairs, and Morse code–like hairs are pathognomonic for this infection, and prompt identification of these features may aid in more rapid diagnosis and initiation of treatment.^{7,8} Trichoscopy was not performed at the time of this patient's evaluation.

The dermatophyte species *Microsporum* and *Trichophyton* are the most common causal organisms of tinea capitis, and the mainstay of treatment is oral antifungal therapy.³ Topical antifungal treatments are not curative due to the depth of penetration of the hair shaft or follicle by the fungal organisms, but they are a reasonable adjunctive therapy, since they can help prevent the spread of organisms.⁶ Appropriate oral antifungal agents include griseofulvin, terbinafine, and itraconazole as first-line therapy.⁴

In summary, incorporating trichoscopy early with the presence of alopecia overlying the lesions may expedite diagnosis. For those not comfortable with these examination techniques, it is important to maintain a high degree of clinical suspicion for kerion; a lack of positive laboratory findings for fungal organisms should not justify withholding treatment.

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