

## Inflammatory Tinea Capitis: Non-healing Plaque on the Occiput of a 4-year-old Child

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### Abstract

**Introduction:** Inflammatory tinea capitis is an uncommon condition in Singapore. In this case report we present a patient whom we managed for this condition. **Clinical Picture:** A 4-year-old girl presented to us with multiple pustules over the occipital scalp for 6 weeks, associated with painful cervical lymphadenopathy. Her condition did not respond to topical and oral antibiotics. **Treatment:** The patient was diagnosed with kerion (inflammatory tinea capitis) and fungal culture of plucked hairs from the kerion grew *Microsporum* species of dermatophyte. She was treated with a course of oral griseofulvin and topical selenium sulfide shampoo. She was advised to bring her pet cats to the veterinarian for screening, as well as not to share combs with her other siblings. **Outcome:** Her condition improved with the antifungal therapy, and there was no residual alopecia. **Conclusion:** Physicians should consider tinea capitis when they encounter a patient with scalp folliculitis or scarring alopecia in the appropriate clinical context.

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**Key words:** Kerion, *Microsporum* species, Scalp folliculitis

### Introduction

Tinea capitis is a fungal infection of the hairs of the scalp. Although commonly described in children, it is uncommonly seen in Singapore.<sup>1</sup> We will like to share our experience in managing a patient with inflammatory tinea capitis (kerion), and hope that physicians will consider it as a differential diagnosis when they encounter a patient with scalp folliculitis or scarring alopecias in the appropriate clinical context.

### Case Report

A 4-year-old girl developed multiple pustules on the scalp for 6 weeks. She was given topical and oral antibiotics, without any improvement. Some of the pustules on the occiput had coalesced to form a plaque and there was patchy localised hair loss over the same area. Her father commented that the condition started shortly after the family adopted 4 pet cats. The patient and her father did not notice any bald patches on the pet cats.

On examination, there was a 10 x 10 cm boggy plaque on the occipital scalp, with multiple pustules and sinuses discharging pus. The hair on the plaque came out in clumps with gentle tugging (Fig. 1). She also had multiple swollen tender posterior cervical lymph nodes.

Possible differential diagnosis for her presentation includes a kerion (inflammatory tinea capitis), carbuncle, dissecting cellulitis of the scalp, folliculitis decalvans or acne keloidalis nuchae.



Fig. 1. A large plaque with multiple pustules and hair loss was seen on the occiput of a 4-year-old girl.

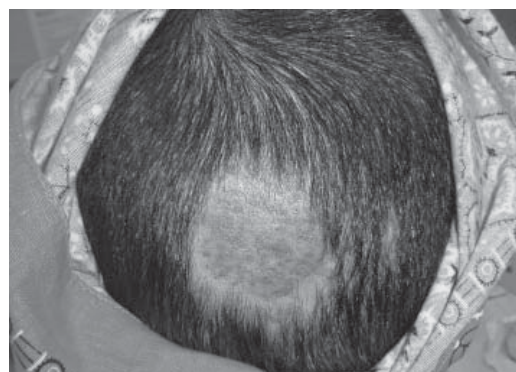


Fig. 2. The plaque had almost resolved and growth of fine hairs was seen a month later.

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Based on the clinical history and physical examination, a kerion is the most likely diagnosis for her condition. Fungal cultures from plucked hairs on the kerion grew *Microsporum* species. She was treated with a course of oral griseofluvin 125 mg bd for 6 weeks and topical selenium sulfide shampoo daily. On review a month later, the plaque had almost resolved and growth of fine hairs were seen (Fig. 2). The enlarged posterior cervical lymph nodes had also resolved. She was advised not to share combs and hats with siblings and not to have contact with the cats until they are checked by a veterinarian. She is currently receiving another one month course of griseofulvin and is on follow-up.

## Discussion

Tinea capitis is a fungal infection of the scalp hair follicles and the surrounding skin. It is most commonly seen in pre-adolescent children. *Trichophyton tonsurans*, an anthropophilic dermatophyte, is the most common cause of tinea capitis in North America and the UK while *Microsporum canis*, a zoophilic dermatophyte found on cats and dogs, accounts for <10% of cases in the UK.<sup>2</sup> While *Trichophyton tonsurans* spreads from person to person, humans are a terminal host for *Microsporum canis* infection. In a retrospective review of cases of superficial fungal infection at the National Skin Centre from 1999 to 2003,<sup>1</sup> tinea capitis was rare, accounting for only 4 out of 12,903 cases of superficial fungal infections seen over 5 years. These cases were mainly caused by *Microsporum canis*. The possible reasons for the low incidence of tinea capitis in Singapore include better hygiene and less overcrowded living conditions, both of which are essential for the spread of the dermatophytes.

The fungal hyphae grow in the stratum corneum of the scalp skin and invade the hair shaft from within (endothrix) or without (ectothrix). Tinea capitis presents in several ways:

- i) Patchy hair loss. The hair shaft breaks at the scalp surface, leaving black dots.
- ii) Scaling of the scalp, occasionally in an annular distribution.
- iii) Scattered pustules with crusting and matted hair and painful cervical lymphadenopathy.
- iv) Favus, where there are yellow cup shaped crusts (scutula) surrounding infected hair follicles with matted hair. This is usually caused by *Trichophyton schoenleinii*.
- v) Kerion, where there is a severe acute inflammatory reaction in the scalp, with pustule formation and reactive painful cervical lymphadenopathy and patchy hair loss.

If untreated, favus and kerion can lead to permanent scarring alopecia. Wood's lamp examination shows fluorescent green hairs in cases of tinea capitis caused by *Microsporum* species but not *Trichophyton* species, with

the exception of *Trichophyton schoenleinii* (which gives a dull blue fluorescence under Wood's lamp). This is because *Microsporum* species produce the chemical pteridine,<sup>3</sup> which fluoresce under UV light (365 nm) from the Wood's lamp. Comma-shaped hairs can also be seen on close examination of the affected scalp with dermatoscopy<sup>4</sup> in tinea capitis. This is believed to be a result of cracking and bending of the hair shaft from the growth of fungal hyphae. Fungal hyphae can be identified on microscopic examination of infected hairs prepared in potassium hydroxide. A fungal culture is the most sensitive and reliable test in the diagnosis of tinea capitis. It allows identification of the dermatophyte and can be positive even when fungal microscopy is negative.<sup>2</sup> In kerions, the hair sample for fungal studies should be collected from the edge of the lesion, not the inflammatory centre.

Treatment should be started when there is sufficient clinical evidence for tinea capitis (i.e. positive fungal microscopy or positive Wood's lamp examination in a patient with a suggestive clinical history and physical examination). The treatment regime involves the use of oral antifungal agents together with adjunctive topical antifungal shampoo, as topical antifungal agents alone cannot penetrate the hair shafts sufficiently. Oral griseofluvin remains the standard treatment for tinea capitis and treatment needs to be continued until there is clinical and mycological evidence of cure, typically for 4 to 6 weeks after the lesion is culture negative. The overall duration of treatment with griseofulvin lasts from 8 to 10 weeks.<sup>2</sup> Griseofulvin should be taken together with a fatty meal, such as whole milk or ice cream to enhance absorption. Griseofulvin is a safe drug to use, with minor adverse reactions like nausea and rashes occurring in 8% to 15% of patients.<sup>2</sup> Photosensitivity may develop in patients on griseofulvin. Griseofulvin is contraindicated in patients who are pregnant or those with lupus erythematosus, porphyria or liver disease.<sup>2</sup> Potential drug interactions exist with warfarin, cyclosporine and the oral contraceptive pill.<sup>2</sup>

Other antifungal agents, such as oral terbinafine and itraconazole, have been shown to be comparable in efficacy and safety to griseofluvin with the added benefit of shorter treatment duration. However, these newer medications are not Food and Drug Administration (FDA) approved for treating tinea capitis. They should be reserved for patients who do not respond to a course of griseofluvin or who develop side-effects to griseofulvin.<sup>2</sup> The patient should also avoid sharing combs or caps with other people to avoid spreading the dermatophytic infection, and these fomites should be washed with bleach.<sup>2</sup> When a zoophilic dermatophyte is identified as the causative organism, the family pet should also be screened by a veterinarian. Children can be allowed to go back to school once treatment is started.<sup>2</sup> Oral corticosteroid has not been shown to shorten

the disease clearance time compared to griseofulvin alone,<sup>2</sup> and is not routinely used in the management of kerion.

### Other Differential Diagnoses to Consider

Scalp carbuncle is an extensive bacterial infection of the hair follicles. It presents with a boggy inflamed mass with discharging sinuses, usually in an adult with poorly controlled diabetes mellitus. The diagnosis is confirmed by a positive bacterial culture and treatment involves systemic antibiotics and surgical drainage.

Dissecting cellulitis of the scalp presents as multiple scalp folliculitis, nodules, cysts and draining sinuses associated with permanent hair loss. The condition is known as follicular occlusion triad if the patient also has acne conglobata and hidradenitis suppurativa, and follicular occlusion tetrad when pilonidal sinuses are present in addition to the above conditions.

Folliculitis decalvans presents in young and middle-aged adults with erythematous follicular pustules or papules on the scalp, face, beard area or neck that may be painful or pruritic. Eventually round to irregularly shaped, atrophic flesh-coloured areas of scarring alopecia develop. The hairs on the scalp can become tufted with multiple hairs emerging from a common dilated follicular orifice. The

condition is often caused by *Staphylococcus aureus* and may be associated with intranasal carriage of *Staphylococcus aureus*.

Acne keloidalis nuchae presents after adolescence and affects the occipital portion of the scalp and the nape of the neck presenting with soft to firm, flesh-coloured to reddish-brown follicular papules. These may be crusted, umbilicated, or pustular and contain hair. The papules and pustules coalesce to form nodules or broad keloidal plaques that can be disfiguring. In rare cases, large sclerotic tumours result and can significantly impact daily living.

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