

Tinea Capitis in 31 Year Old Adult Male: A Rare Entity

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Abstract

Tinea capitis also called as ring worm of the hair is a superficial fungal infection (dermatophytosis) of the scalp. The clinical presentation is typically single or multiple patches of hair loss, sometimes with a 'black dot' pattern (often with broken-off hairs), that may be accompanied by inflammation, scaling, pustules, and itching. Tinea Capitis affects primarily pre-pubertal children between 6 and 10 years, it is more common in males than females; rarely does the disease persist past age sixteen. When it occurs in adults the clinical features may be atypical and this may delay the diagnosis. The most common clinical features are severe itching of the scalp, dandruff, and bald patches where the fungus has rooted itself in the skin. It is uncommon in adults, but an immune defect may facilitate hair invasion. Physical barriers such as the intact keratinized layer of skin, as well as the effect of UV light, physiochemical factors of temperature, moisture and pH, and fungistatic fatty acids on the skin play a vital role in resisting contact with the organism. The quantity of fungistatic saturated fatty acids in sebum increases at puberty, and this is thought to explain the rarity of tinea capitis in adults.

Keywords: Dermatophytosis; Seborrheic dermatitis; Flucloxacillin; Trichophyton tonsurans

Introduction

Tinea capitis also called as ring worm of the hair is a superficial fungal infection (dermatophytosis) of the scalp [1]. The clinical presentation is typically single or multiple patches of hair loss, sometimes with a 'black dot' pattern (often with broken-off hairs), that may be accompanied by inflammation, scaling, pustules, and itching. Tinea Capitis affects primarily pre-pubertal children between 6 and 10 years, it is more common in males than females; rarely does the disease persist past age sixteen [2]. When it occurs in adults the clinical features may be atypical and this may delay the diagnosis [3]. The most common clinical features are severe itching of the scalp, dandruff, and bald patches where the fungus has rooted itself in the skin. It often presents identically to dandruff or seborrheic dermatitis. From the site of inoculation, the fungus grows down into the stratum corneum, where it invades keratin. Dermatophytes are unique in that they produce keratinase, which enables them to use keratin as a nutrient source [4]. Infected hairs become brittle, and after three weeks, the clinical presentation of broken hairs is evident.

The term tinea originally indicated larvae of insects that fed on clothes and books. Subsequently, it meant parasitic infestation of the skin. By the mid 16th century, the term was used to describe diseases of the hairy scalp. The term ringworm referred to skin diseases that assumed a ring form, including tinea. The causative agents of tinea infections of the beard and scalp were described first by Remak and Schönlein, then by Gruby, during the 1830s. Approximately 50 years later, in Sabouraud's dissertation, the endothrix type of tinea capitis infection was demonstrated, and it was known that multiple species of fungi cause the disease. Simple culture methods were described and treatment using X-ray epilation was reported in 1904. Effective treatment of tinea capitis by griseofulvin became available in the 1950s [5].

Case Report

The history dates back to 3 months when this 31 year old man developed alopecia, pustules, and scaly patches on the scalp (Figure 1). He was a known case of type 1 diabetes. He came to medicine department and after initial checkup he was referred to dermatology department. He did not respond to treatment with a potent topical steroid and oral

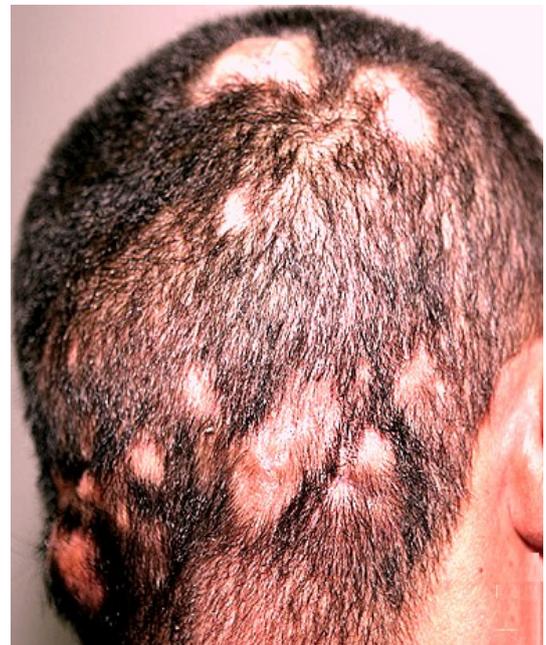


Figure 1: Developed alopecia, pustules, and scaly patches on the scalp.

flucloxacillin. Physical examination revealed diffuse thinning of scalp hairs. Hairs broken at the level of the scalp left behind groups of black dots (Figure 1). The scalp revealed fine crust and scale. Hair pulling test was negative. Wood lamp examination showed negative fluorescence

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of the lesional skin. KOH preparation revealed septate hyphae with arthroconidia of scalp scale and endotrix large conidia within hair shaft (Figure 2). Mycologic culture revealed *Trichophyton tonsurans* (Figure 3). The diagnosis of tinea capitis was made. Because spread is thought to occur through direct contact with afflicted individuals, all the close relatives and friends were called and were properly examined, but no such abnormality were detected in them. The patient was treated with itraconazole 400 mg/day for 1 week (1 pulse) and selenium sulfide 2.5% shampoo for daily hair wash.

Discussion

Tinea capitis is a dermatophytosis of the scalp and associated hair which is most commonly found in children ages 3-14 years. It is uncommon in adults, but an immune defect may facilitate hair invasion [6]. Physical barriers such as the intact keratinized layer of skin, as well as the effect of UV light, physiochemical factors of temperature, moisture and pH, and fungistatic fatty acids on the skin play a vital

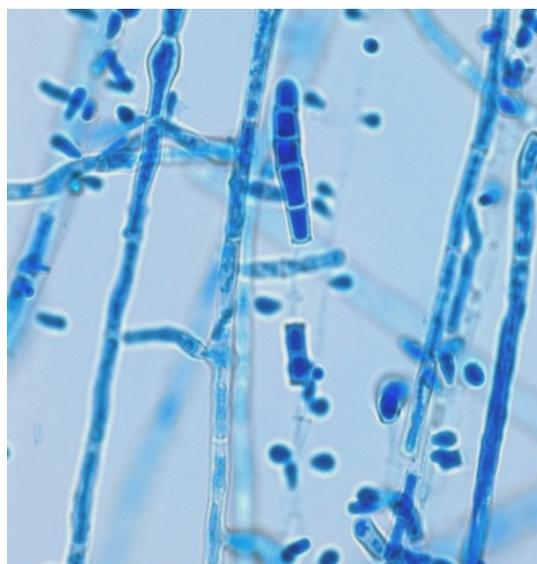


Figure 2: KOH preparation revealed septate hyphae with arthroconidia of scalp scale and endotrix large conidia within hair shaft.



Figure 3: Mycologic culture revealed *Trichophyton tonsurans*.

role in resisting contact with the organism. The quantity of fungistatic saturated fatty acids in sebum increases at puberty, and this is thought to explain the rarity of tinea capitis in adults [7]. Dermatophytic colonisation of the scalp disappears at puberty [8]. Colonisation by *Pityrosporum orbiculare* may interfere with dermatophyte contamination, and the thicker calibre of adult hair may protect against dermatophytic invasion [3]. Tinea capitis in adults generally occurs in patients who are immunosuppressed and those infected with HIV [3]. In immunocompetent adults, the clinical features are often atypical [3]. The disease may resemble bacterial folliculitis, folliculitis decalvans, dissecting cellulitis, or the scarring related to lupus erythematosus [9].

The risk factors of tinea capitis in adult include underlying conditions such as diabetes, anemia, immunosuppression, corticosteroids, hormonal change (e.g. menopause) and degree of exposure to the pathogen (e.g. tinea located elsewhere on the body, contact from infected children or fomites) [10-12].

Infected hairs appearing as broken stubs are best for examination. They can be removed with forceps without undue trauma or collected by gentle rubbing with a moist gauze pad; broken, infected hairs adhere to the gauze. A toothbrush may be used in a similar fashion [13]. Alternatively, affected areas can be scraped with the end of a glass slide or with a blunt scalpel to harvest affected hairs, broken-off hair stubs, and scalp scale. This is preferable to plucking, which may remove uninvolved hairs. Scrapings may be transported in a folded square of paper. Skin specimens may be scraped directly onto special black cards, which make it easier to see how much material has been collected and provide ideal conditions for transportation to the laboratory; however, affected hairs are easier to see on white paper than on black paper.

Definitive diagnosis depends on an adequate amount of clinical material submitted for examination by direct microscopy and culture. The turn-around time for culture may take several weeks.

Selected hair samples are cultured or allowed to soften in 10-20% potassium hydroxide (KOH) before examination under the microscope. Examination of KOH preparations (KOH mount) usually determines the proper diagnosis if a tinea infection exists.

Conventional sampling of a kerion can be difficult. Negative results are not uncommon in these cases. The diagnosis and decision to treat lesions of kerion may need to be made clinically. A moistened standard bacteriological swab taken from the pustular areas and inoculated onto the culture plate may yield a positive result [14].

Microscopic examination of the infected hairs may provide immediate confirmation of the diagnosis of ringworm and establishes whether the fungus is small-spore or large-spore ectothrix or endothrix.

Culture provides precise identification of the species for epidemiologic purposes [15]. Primary isolation is carried out at room temperature, usually on Sabouraud agar containing antibiotics (penicillin/streptomycin or chloramphenicol) and cycloheximide (Acti-Dione), which is an antifungal agent that suppresses the growth of environmental contaminant fungi. In cases of tender kerion, the agar plate can be inoculated directly by pressing it gently against the lesion. Most dermatophytes can be identified within 2 weeks, although *T. verrucosum* grows best at 37°C and may have formed only into small and granular colonies at this stage. Identification depends on gross colony and microscopic morphology. Specimens should be inoculated on to primary isolation media, such as Sabouraud dextrose, and incubated at 26-28°C for 4 weeks. The growth of any dermatophyte is significant. In some cases, other tests involving nutritional requirements and hair penetration in vitro are necessary to confirm the identification.

Wood lamp examination: In 1925, Margarot and Deveze observed that infected hairs and some fungus cultures fluoresce in ultraviolet light. The black light commonly is termed Wood lamp. Light is filtered through a Wood nickel oxide glass (barium silicate with nickel oxide), which allows only the long ultraviolet rays to pass (peak at 365 nm). Wood lamp examination is useful for certain ectothrix infections (eg, those caused by *M canis*, *M audouinii*, *Microsporum rivalieri*). In cases with endothrix infection as in this case there is a negative Wood lamp examination finding. Systemic antifungal is necessary for clearance of tinea capitis as it can penetrate into the hair follicle. Oral griseofulvin has been gold standard of therapy of tinea capitis for the past 40 years. At present, the newer systemic antifungal drugs such as oral terbinafine and itraconazole which have fungicidal action are more preferable because they are more effective and require shorter treatment than griseofulvin.

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