

Black Dot Type Capitis Tinea Appreciates Bacterial Folliculitis

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ABSTRACT

Tinea capitis is a superficial fungal infection of the scalp and hair, which is seen predominantly in children. In adults, it is usually related to immunocompromised patients and have an atypical features. In patients with end stage renal disease (ESRD), uremia is associated with immune suppression due to the impact of uremic milieu. All specimens of tinea capitis should be examined for microscopy, wood's lamp and culture. Reported a case of 50-year-old male, animal husbandry, presented with itchy papules, pustules, patch alopecia and a hair loss for 6 months. Dermatologic features showed papules, pustules, patch alopecia and black dot. The patient treated with ketoconazole shampoo for 3 weeks without any improvement. He had an ESRD for 2 years. Gram stain examination and culture showed no bacteri. Wood's lamp examination showed no fluorescent. Potassium hydroxide (KOH) 10% from scalp scrapings and KOH 20% from hair showed a fungal elements, which support diagnosis of black dot tinea capitis. The patient treated with griseofulvin tablet 500 mg twice a day for 8 weeks, cetirizine tablet 10 mg once daily and 3x/week of ketoconazole shampoo 2% showed improvement in clinical features and microscopic evaluation.

1. Introduction

Tinea capitis is a superficial fungal infection of the scalp and hair, especially in children aged 3-14 years.^{1,2} The fungistatic effect of fatty acids in sebum may explain the decreased incidence of tinea capitis after puberty.^{2,3} Tinea capitis in adults most occur in immunocompromised patients.¹ For example, in patients with end-stage chronic kidney disease (CKD) that is associated with decreased immunity due to uremia.⁴

The classification of superficial fungi according to habitat consists of *anthrophilic*, *zoophilic* and *geophilic*. The classification provides information about the source of infection. *Anthrophilic* disease is transmitted by direct contact of infected skin or hair. For example cloth, comb, socks and towels. *Zoophilic* transmitted from animals, such as cats, dogs, horses, birds or cows. *Geophilic* cause sporadic infections due to direct contact with the soil. Tinea capitis is often

caused by *Tricophyton* and *Microsporum* species with clinical features of inflammatory, non-inflammatory, favus, and *black dot* types.²

Inflammatory type tinea capitis is usually caused by *zoophilic* or *geophilic* ectothrix pathogens, such as *M. canis*, *M. gypseum* and *T. verrucosum*. Pathogens *M. gypseum* and *T. verrucosum* did not fluoresce on Wood's lamp examination, but *M. canis* would fluoresce green yellow. The non-inflammatory type is often caused by ectothrix anthropophilic pathogens such as *M. audouinii* or *M. ferrugineum*. The clinical presentation of the non-inflammatory type is a gray patch with yellowish green fluorescence. *T. schoenleinii* is the most common type of favus, although it can also be caused by *T. violaceum* and *M. gypseum*. The clinical features of the favus type are perifollicular erythema patches with yellow crust (scutula) and smell like cheese or mousy odor. Tinea favus will fluoresce blue-gray if caused by *T. schoenleinii*. *Black dot* type tinea capitis is

usually caused by the anthropophilic endothrix pathogens *T. tonsurans* and *T. violaceum*. Broken hair on the scalp causes alopecia patches with a black dot appearance. Black dot type tinea capitis tends to have minimal inflammation, can form follicular pustules, nodules, furuncles or in rare cases kerion. This type of tinea capitis does not have fluorescence.^{2,5}

All specimens from cases of tinea capitis should be subjected to microscopic examination and culture whenever possible.⁶ The study by Gupta et al. (2014) reported a high sensitivity (73.33%) on KOH examination, so that KOH can be used as the definitive procedure for screening and diagnosis of dermatophyte infections.⁷ The KOH test results can give false negative results in about 15% of cases, so patients who have a clinical picture of dermatophytosis must still be treated even though the KOH test results are negative.^{2,8}

2. CASE REPORT

A 50 year old man working as a farm employee

complained of erythematous papules, pustules, alopecia patches with black dot and hair loss since 6 months ago (**Figure 1**). The patient has been using ketoconazole shampoo for 3 weeks, but there is no improvement. The patient had a 2-year history of CKD and had undergone hemodialysis. No other family members have had similar lesions. Wood's lamp examination showed no fluorescence. KOH examination of 10% of scalp scrapings revealed hyphae and arthrospores (**Figure 2a**). KOH examination of 20% of the hair showed endothrix spores with magnification of 10x (**Figure 2b**) and 40x (**Figure 2c**). Culture with Saboroud dextrose agar was negative.

Patients were treated with 2x500 mg of griseofulvin tablets, 2% ketoconazole shampoo used 3 times / week and 1x10 mg cetirizin tablets. Treatment was carried out for 8 weeks and clinical improvement was obtained (**Figure 3**). Both clinical and microscopic follow-up observations with KOH examination showed improvement



Figure 1. Baseline clinical manifestations of papules, pustules, black dots, patches of alopecia

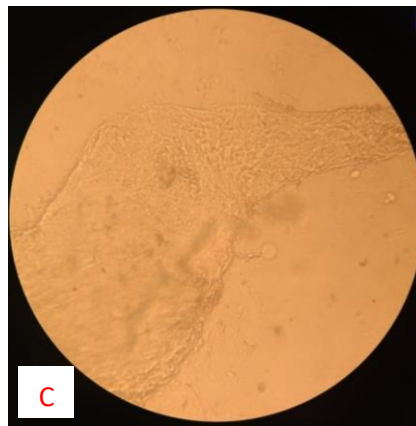
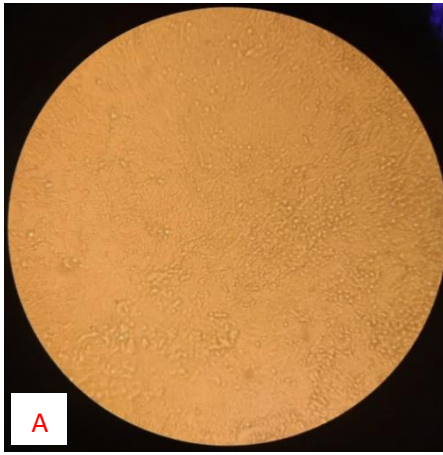


Figure 2. (a) Scalp scrapings (b) endothrix spores at 10x magnification (c) endothrix spores at 40x magnification



Figure 3. Clinical manifestations after 8 weeks of therapy

3. Discussion

In this case, a man with black dot type tinea capitis

that resembled folliculitis was reported. Tinea capitis is a rare dermatophytosis in adults (range 3-11% of all

cases). Most cases occur in immunocompromised patients.⁹ The comorbid factor in these patients is end-stage CKD, which affects the immune system. Research by Narain et al (2016) on patients with end-stage CKD there are a range of 2.2% of 150 patients suffering from tinea capitis. In CKD, uremia occurs due to uremic milieu, resulting in a decrease in the immune system.⁴

The features of the lesions in this patient were erythematous papules, alopecia patches with black dot and pustules that resembled bacterial folliculitis. The results of Gram stain did not show the presence of Gram positive or negative bacteria. Wood's lamp examination showed no fluorescence. KOH examination of 20% of hair specimens revealed fungal elements in the hair shaft. KOH examination of 10% of scalp scrapings revealed fungal hyphae and arthrospores. The fungal culture in this patient was negative.

In adults, tinea capitis caused by ectothrix or endothrix fungal pathogens can produce atypical features such as alopecia and dermatitis that mimic bacterial folliculitis. Therefore, further tests are needed such as examining Wood's lamp, KOH and culture. Examination of Wood's lamp (365 nm) can show pteridine fluorescence in hair infected with ectothrix fungal pathogens. The fluorescent hair was then removed for KOH examination and culture. The results of the 20% KOH examination had a specificity value of 91% and a sensitivity of 91.9%. Therefore, doctors can start treatment with just 20% KOH examination results without having to do culture.^{10,11} In some superficial mycoses, the microscopic image of fungal elements is very distinctive so that culture is not required to build a diagnosis.⁵ Research by Kadhim et al (2018) reported 10.5% of 200 dermatophytosis patients having negative fungal culture results. This occurs because of differences in staff skills and the quality of sampling.¹⁰ Another examination that can be done is a biopsy for histopathological examination. Skin biopsy is not routinely performed in dermatophytosis. A biopsy was performed to confirm the diagnosis when administering systemic drugs in cases of recalcitrant or widespread infection.² In this patient, the results of Wood's lamp examination, KOH 20% and 10% were sufficient to

support the diagnosis of black dot type tinea capitis.

In this case report, the patient was treated with 2x500 mg griseofulvin tablets, 2% ketoconazole shampoo 3 days / week, and 1x10 mg cetirizine tablet. Treatment was carried out for 8 weeks and showed both clinical and microscopic improvement.

One type of drug that can be used to treat tinea capitis is griseofulvin. Griseofulvin is a fungistatic drug that inhibits nucleic acid synthesis, blocks cell division at metaphase and impairs cell wall synthesis. Griseofulvin is known as the gold standard therapy for tinea capitis.¹² A randomized controlled trial (RCT) by Gupta et al. (2013) reported that 8 weeks of griseofulvin treatment showed significant improvement over terbinafine.¹³ Evidence of resistance to griseofulvin in vitro is not available. A higher dose of griseofulvin and a longer period (12-18 weeks) may be required in infections caused by Trichophyton. Griseofulvin contraindications include severe liver disease, lupus erythematosus and porphyria.

4. Conclusion

Tinea capitis is more common in children. In adults, it is often associated with immunocompromised conditions, one of which is CKD and presents a picture of atypical lesions. The lesion in this patient resembled bacterial folliculitis, but KOH examination of 20% of the hair specimen revealed hyphae and endothrix arthrospores. This result is very important because it has a specificity value of 91% and a sensitivity of 91.9%, so that therapy can be given without doing culture. The therapy in this case was griseofulvin tablets because it was considered safe for CKD patients and was the gold standard therapy. Other therapies include ketoconazole shampoo and cetirizine tablets. Both clinical and microscopic improvements occurred within 8 weeks after treatment.

5. References

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