



## TINEA FAVOSA IN A 7-YEAR-OLD INDONESIAN BOY: A RARE CASE REPORT

Michelle Wiryadana<sup>1,3</sup>, Nova Zairina Lubis<sup>2,3\*</sup>

<sup>1</sup>Dermatology, Venereology, and Aesthetic Program, Faculty of Medicine, Universitas Sumatera Utara, Jl. Dr. Mansyur No.66, Padang Bulan, Medan Baru, Medan, Sumatera Utara 20155, Indonesia

<sup>2</sup>Department of Dermatology and Venereology, Faculty of Medicine, Universitas Sumatera Utara, Jl. Dr. Mansyur No.66, Padang Bulan, Medan Baru, Medan, Sumatera Utara 20155, Indonesia

<sup>3</sup>Rumah Sakit Umum Prof. DR. CPL Universitas Sumatera Utara, Jl. Dr. Mansyur No.66, Merdeka, Medan Baru, Medan, Sumatera Utara 20155, Indonesia

\*[novazai82@gmail.com](mailto:novazai82@gmail.com)

### ABSTRACT

Tinea favosa is an inflammatory infection of the skin, most often found on the scalp, caused by *Trichophyton schoenleinii*. It is rarely reported and is more commonly found on immunocompromised patients, poor hygiene and nutrition, dense population, poverty, with limited access to healthcare. Transmission can occur directly from family members or close friends or indirectly through strands of infected hair or desquamation of affected epithelial. In this article, we reported a case of tinea favosa on a 7-year-old boy with itchy thick scale and mousy odor that occurred 2 months prior to medication. The patient responded well to oral antifungal (Griseofulvin) and antibiotic (amoxicillin) as well as topical treatment (fusidic acid cream, miconazole cream, and ketoconazole shampoo) after 6 weeks of treatment showing no dermatophyte growth on scalp scraping culture. Education of proper hygiene as well as reducing humidity on scalp area and improving the nutrition status are the main strategies to prevent the recurrence of this disease.

Keywords: dermatophyte infection; hyperkeratotic scalp; scutula; tinea favosa

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## INTRODUCTION

Tinea favosa or Favus is an inflammatory infection caused by anthropophilic dermatophyte with 95% of the reported cases caused by *Trichophyton schoenleinii*. Other causes of tinea favosa such as zoophilic dermatophytes (*Microsporum canis*, *Trichophyton mentagrophytes* var *quinckeanum* and *Trichophyton verrucosum*), geophilic dermatophytes (*Microsporum gypseum*), and antropophilic dermatophytes (*Trichophyton violaceum*). (Daadaa & Ben Tanfous, 2023) Several known risk factors that cause tinea favosa in children are poor hygiene, immunocompromised, socioeconomic status, use of antifungal therapy, genetic predisposition, drug resistance, migration pattern, and climate. Tinea favosa usually affects scalp hair, but it might also manifest on the glabrous skin and nails. (Akbari et al., 2024) Previously, the incidence was more commonly found, but now it is limited to some endemic regions due to improved socio-economic conditions and hygiene. This disease had been observed mainly in Southern and Northern Africa, Pakistan, the United Kingdom, Australia, South America, the Middle East, and Poland. (Sadati et al., 2023).

## CASE REPORT

A 7-year-old boy came to the outpatient Dermatology and Venereology Clinic, Prof. Chairuddin P. Lubis University of Sumatera Utara Hospital, Medan, Indonesia presented with oozing yellow sticky thick scale on the scalp with mousy odor and itchy sensation on the scalp for 2 months. Initially patient's guardian noticed hair fall and patchy alopecia on the scalp with erythematous base followed by extensive crust formation. Patient was living in an orphanage with one other child suffering the same condition. Patient had a habit of lying on the ground and playing with stray cats near his orphanage. Patient's guardian admitted to apply miconazole cream for 3 days before coming to the hospital after getting advice from the apothecary, however, no significant improvement was found. Patient's guardian denied previous illness and allergic towards food and medication.

Generalized examination shown patient was mildly ill. Patient was underweight (weigh=18 kg; height = 115 cm; BMI= 13,6 kg/m<sup>2</sup>; Z score = -1<SD<-2), blood pressure 100/70 mmHg, pulse 80x/min, respiratory rate 18x/min and axial temperature 37,2°C. Dermatologic examination shown multiple yellow crusted lesion that became confluence creating hyperkeratotic plaque with new scutula formation and multiple alopecic patch and erythematous papules with mousy odor in > 1/3 scalp region. Serous exudate and pus were found on the plaque with signs of secondary infection. Cervical lymphadenopathy was palpable on the posterior auricula region (Fig 1a). Patient was diagnosed with tinea favosa, with several differentials such as folliculitis, kerion, seborrheic dermatitis, scalp psoriasis, and discoid lupus erythematosus. Wood lamp examination shown green fluorescence (Fig 1b) Microscopic examination with 10% potassium hydroxide (KOH) on skin scraping from the scalp did not show long septate hyphae and spore. Culture examination of skin scraping from the scalp lesion using Sabouraud's Dextrose Agar (SDA) medium shown growth of *Trichophyton schoenleinii*. (Figure 2).

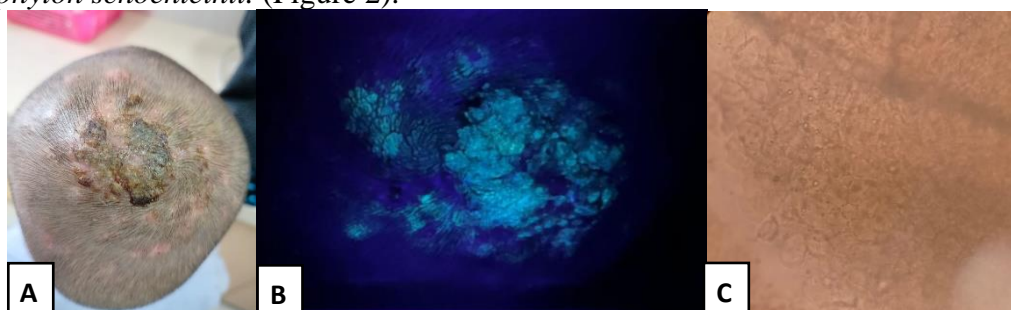


Figure 1. (A) Patient's first visit (B) Wood lamp examination shown green fluorescence. (C) Microscopic examination with 10% KOH shown no hyphae or spore was found on scalp scraping specimen (40x magnification).

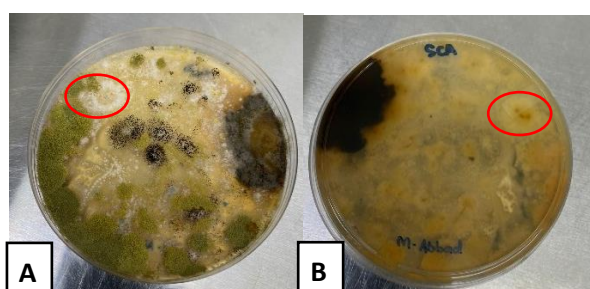


Figure 2. (A and B) Culture from scalp scraping specimen; Macroscopic: Heaped or folded whitish colonies. Colorless to yellow-tan reverse pigment showing growth of *Trichophyton schoenleinii* (red circle).

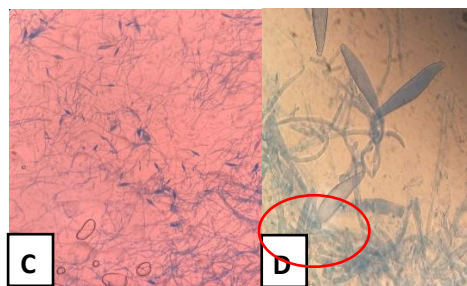


Figure 2. (C and D) Microscopic: Knobby antler-like hyphae(favic chandeliers) with numerous chlamydoconidia confirming *Trichophyton schoenleinii* infection (red circle). (40 and 100x magnification).

Patient was given several medications such as: oral antifungal (Griseofulvin 250 mg daily), antibiotic (amoxicillin 250 mg 3 times daily for 7 days), topical cream (combination of 2% fuscic acid and 2% miconazole cream twice daily, ketoconazole shampoo twice weekly), oral cetirizine 5 mg once daily, and wet dressing with normal saline 4 times daily. Patient was educated to conduct proper hygiene, change his pillowcase and clothes often, and avoid using hat for some times to avoid adding moisture on the scalp area.

One week after initial treatment, clinical improvement was shown by reduction of yellow hyperkeratotic plaque and itch sensation on the scalp. However, several scutula and alopecic patch with erythematous papules were present. No postauricular lymphadenopathy was found. Wood examination shown green fluorescence on some of the crusted lesion. Treatment was continued with oral antifungal (Griseofulvin 250 mg daily) and topical cream (combination of 2% fuscic acid and 2% miconazole cream twice daily, ketoconazole shampoo twice weekly), oral cetirizine 5 mg once daily, and wet dressing with normal saline 4 times daily. Patient was also advised to increase daily intake approximately 1650-1850 calories daily especially with diet rich in proteins. (Figure 3).

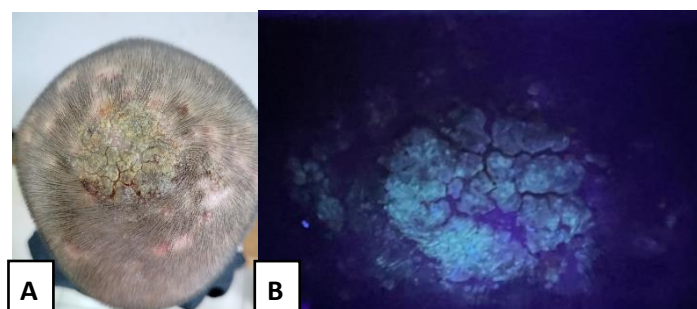


Figure 3. (A) Patient's first follow up (1 week after initial treatment). (B) Wood lamp examination shown green fluorescence on some of the crusted lesion.

The medications remained continued until 6 weeks after initial treatment, showing significant clinical improvement with no yellow hyperkeratotic plaque nor scutula. Patient also did not complain itchiness on the scalp. The alopecic patch with erythematous base remained, however, no green fluorescence was found on Wood lamp examination. Scalp scraping examination with 10% KOH examined under the microscope shown no hyphae or spore formation. (Figure 4) Culture from the scalp scraping shown no growth of dermatophyte, only growth of *Rhizopus spp*, a nonpathogenic fungus, was found. (Figure 5) Patient was advised to stop the medications and was advised to keep proper hygiene, maintain adequate nutritional intake, and avoid adding moisture to the scalp area.

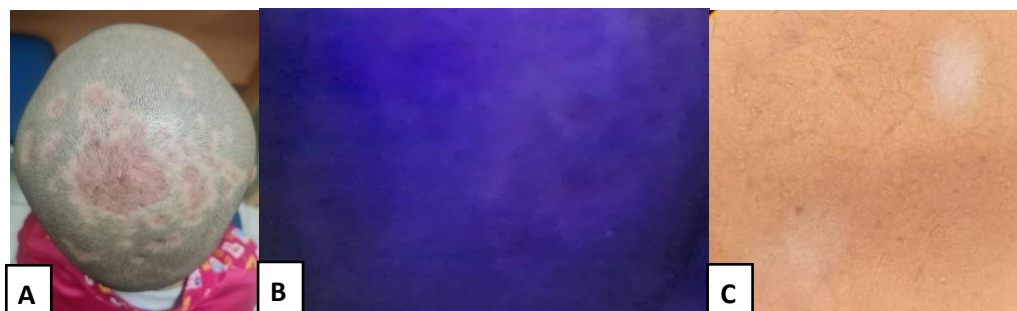


Figure 4 (A) Patient's last follow-up (6 weeks after initial treatment). (B) Wood lamp examination shown no green fluorescence. (C) Scalp scraping examination with 10% KOH under the microscope shown no hyphae or spore (40x magnification).

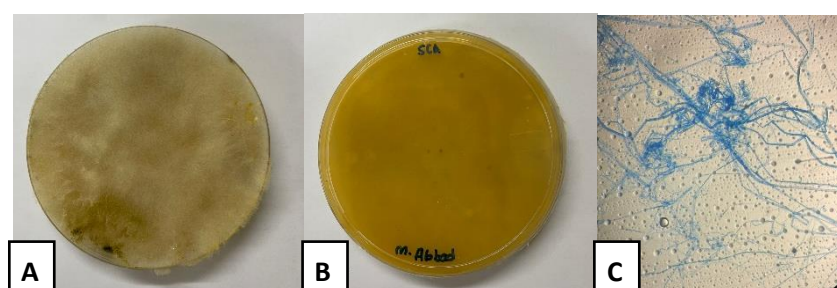


Figure 4. (A dan B) Macroscopic: Rapid growing colonies that filled the petri dish with cotton candy appearance. Colonies on the surface were initially white then turn into yellow-brown. Reverse pigment shown white-pale colonies. © Microscopic: Long hyphae with no septae.

## DISCUSSION

Tinea favosa or favus is more commonly found on childhood due to low long-chain fatty acid composition on their sebum. The incidence is more common on male children, especially between 5 to 10 years old, probably due to shorter hair creating easier access for circulating spores, frequent trimming using contaminated tools, increased external environment exposure and contact with animals.(Adisty & Astari, 2017; Akbari et al., 2024). Tinea favosa is characterized by yellow cup-shaped crusts, also known as scutula which was caused by *Trichophyton schoenleinii*. (Sadati et al., 2023) In 95% of the patient with favus, the scalp becomes pale, atrophic, and scarred. The hair becomes tangled, with tissue debris, and serous exudates, secondary infection, pus formation, and there is a strong cheesy or mousy unpleasant smell. There are three clinical stage of infection severity; stage 1: erythema are found on scalp especially around hair follicles and hair are not broken or easily plugged; stage 2: scutula formation and hair fall; stage 3: the most severe stage, there are large involvement of the scalp area of at least 1/3 of the scalp is involved, with severe hair loss, atrophy, and scarring. In this case, the patient was having the stage 3 infection severity. (Ilkit, 2010).

Differential diagnosis for tinea favosa is similar to inflammatory tinea capitis, including pityriasis amiantacea, folliculitis, pyoderma, pyogenic abscess, psoriasis, Langerhans cell histiocytosis, dissecting cellulitis, and folliculitis decalvans.(Ion et al., 2024) Treatment of tinea favosa is alike other tinea capitis which include administration of oral antifungal especially Griseofulvin for 6 – 12 weeks or until fungal test return negative.(Alkeswani et al., 2019) Oral antibiotic treatment was given for treatment of secondary bacterial infections. Topical antifungal therapies are not recommended as standalone treatment for tinea capitis

due to their inadequacy in penetrating the hair follicles. However, these topical antifungals aid in reducing transmission and can be given as adjuvant therapy to systemic antifungals (Song et al., 2023) Treatment for scarring alopecia can be given after the primary cause is treated. Previously, oral steroids were thought to reduce scarring, however, current studies show that compared with oral antifungal therapy alone did not reduce the time to clearance and therefore did not provide long-term advantage and are not recommended. If no scarring occurred, hair usually fully regrows after oral antifungal therapy alone.(Fuller et al., 2014) Ensuring proper hygiene practice, early detection, adequate therapy, and providing children with sufficient nutrition to help children's immunity, while also screening of close contact while is important to prevent transmission of tinea favosa.(Gupta et al., 2024)

## CONCLUSION

Correct identification of fungal infection on the scalp, especially tinea favosa, through history taking, examination of clinical and additional diagnostic measure (such as Wood lamp fluorescence, microscopic, fungal culture) is important for proper medication in children. This condition if left untreated and prolonged might lead to permanent hair loss and atrophy.

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