



Case report

White piedra on pediatric scalp: A case report

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ABSTRACT

This case report describes a rare fungal infection, piedra alba, in a 5-year-old female initially misdiagnosed. Treatment with 2 % ketoconazole shampoo led to significant regression within a week, without the need for hair cutting. We discuss the importance of early and accurate diagnosis, highlighting potential hair damage and complications in immunocompromised cases. Dermatoscopy aided diagnosis, and 2 % ketoconazole demonstrated efficacy, emphasizing the need for a multidisciplinary approach and dermatological follow-up.

Introduction

White piedra is a rare fungal infection of the hair caused by fungi belonging to the *Trichosporon* genus. It is characterized by the presence of white, spindle-shaped nodules firmly attached to the hair shafts [1,2]. The mode of human infection is not yet fully understood; however, literature suggests that poor personal hygiene, bathing in stagnant water [3], excessive use of hair creams, and the absence of hair combing habits may influence its onset [4].

White piedra can be found in various regions of the body with abundant hair, and it most commonly affects females, particularly children and young adults. The genital region is the most frequently affected and reported location, while the scalp is the least documented [3].

Several cases of white piedra are misdiagnosed, often confused with other conditions such as pediculosis [2]. Consequently, delayed treatment can lead to the condition becoming pathogenic, resulting in systemic infection in immunocompromised patients [2,4].

Case presentation

Patient, female, 5 years old, referred from primary care with suspicion of trichorrhexis nodosa, accompanied by parents. They reported the appearance of whitish spots in the child's hair 10 months ago (Fig. 1). Previous treatment for pediculosis was mentioned without improvement. There were no reports of hair fragility during this period, and the

use of a leave-in conditioner every other day was noted. The patient had no comorbidities.

Upon dermatological examination, there were whitish, hardened nodules firmly attached to and enveloping the hair shaft (Fig. 2).

Considering the clinical presentation, the diagnostic hypothesis of white piedra was considered. The direct mycological examination was performed, which showed the presence of arthroconidia and hyphae (Fig. 3). Subsequently, hair strands obtained from the patient were cultured on Sabouraud Agar and incubated at a temperature of 25°C. After 7 days, colonies with a whitish color and a rough surface were observed (Fig. 4). Microscopic analysis revealed septate hyphae, arthroconidia, and blastoconidia, consistent with *Trichosporon sp* (Fig. 5). Semi-automated microbiology testing using the Phoenix BD M50 apparatus confirmed *Trichosporon asahii* as the causative fungus.

Treatment with 2 % ketoconazole shampoo was initiated, along with guidance on the necessity of nodule extraction through hair cutting. A significant regression of the infection was observed in the first week of shampoo use. The patient was under outpatient follow-up with the dermatology team to monitor the treatment's progress and after 2 months of treatment she was in complete remission of the whitish nodules.

Discussion

The first description of white piedra was made in 1865 by H. Beigel and first reported in 1970 by Basu et al. [4]. It is considered a harmless

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Fig. 1. Overview of a white piedra.

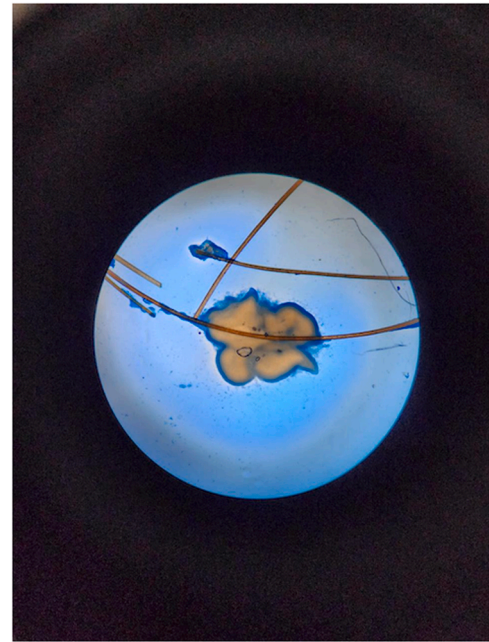


Fig. 3. Direct examination of a white stone nodule (lactophenol blue, x40).



Fig. 2. Dermoscopy: irregular white nodules.



Fig. 4. Trichosporon asahii colony in Sabouraud.

condition; however, due to frequent misdiagnosis, such as being mistaken for pediculosis, trichorrhexis nodosa, or moniletrix, treatment can be delayed or inappropriate, potentially resulting in hair damage, family outbreaks, and severe complications in immunocompromised individuals, such as pneumonitis, endocarditis, and cutaneous lesions [4].

The implementation of dermoscopy has simplified the diagnosis of white piedra, as the whitish nodules present differently from other fungal diseases and pediculosis nits [5]. Unlike the latter, which do not completely surround the hair shaft, white piedra nodules do [3].

The diagnosis is established through clinical evaluation, culture, and microscopic examination [3], with the observation of irregular whitish nodules surrounding the hair shaft. In culture, these nodules are

demonstrated by the clustering of hyphae with arthroconidia and blastoconidia [5].

In therapeutic terms, the management of white piedra is considered straightforward. In most cases, antifungal shampoos are employed, with 2 % ketoconazole shampoo being considered the most effective. Some studies also mention the efficacy of shampoos containing ciclopirox olamine, and others suggest the possibility of systemic antifungals such as itraconazole or topical keratolytic agents like salicylic acid [5]. The American Academy of Dermatology Guidelines Committee recommends complete shaving of affected hair and advises maintaining well-ventilated hair, avoiding tying it when damp [3,4]. In this case, we describe a patient who initially received two incorrect diagnoses and initiated treatment belatedly. The diagnosis of white piedra on the scalp

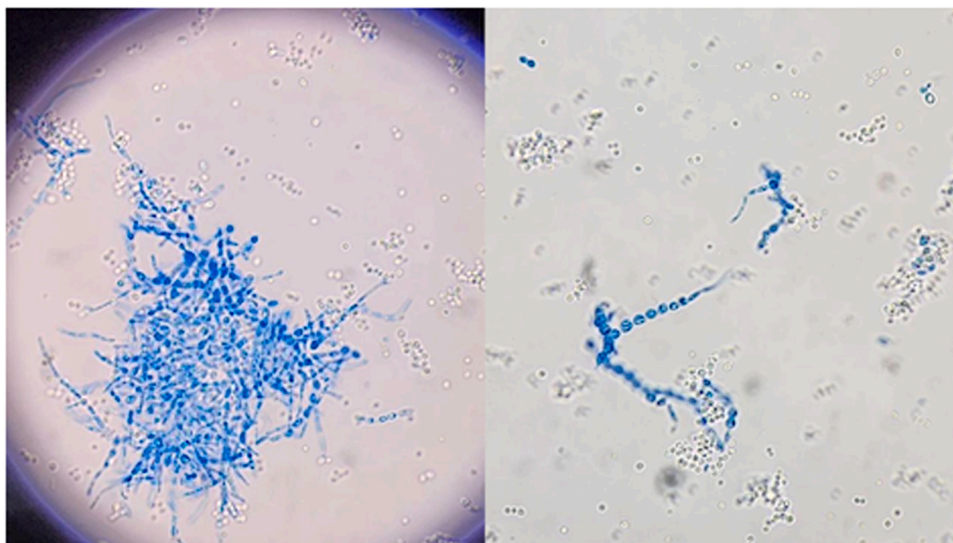


Fig. 5. Arthroconidia and blastoconidia of *T. asahii* (lactophenol blue, x400).

was established 10 months after the onset of infection based on clinical evaluation, trichoscopy, and complementary test results. The adopted treatment involved topical application of 2 % ketoconazole shampoo, with hair cutting recommended as a complementary measure. In the first week after starting treatment, the patient returned with a reduction of approximately 60 % of the whitish nodules in her hair. After 2 months of treatment, she was in complete remission.

Ethical approval

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Author agreement statement

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We understand that the Corresponding Author is the sole contact for the Editorial process. He/she is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs.

CRedit authorship contribution statement

Julia Sugai: Writing – original draft, Validation, Conceptualization.

Nayara Pelizaro Di Rito: Writing – review & editing, Visualization, Conceptualization. **Alexandre Lourenço:** Resources, Methodology, Investigation. **Ronei Luciano Mamoni:** Resources, Methodology. **Ana Carolina da Mota Falleiros:** Resources, Investigation. **Celia Antonia Xavier de Moraes Alves:** Supervision, Project administration. **Glaucos Ricardo Paraluppi:** Project administration.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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None.

Consent

Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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