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# Scalp white Piedra: case report of a pediatric patient

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## Abstract

White piedra is a chronic, superficial mycosis of the hair shaft caused by yeast form of the fungus Trichosporon spp. that may affect all areas of the body. Over the last decade a rising number of cases of scalp white piedra affecting children have been reported. In spite of its increasing incidence, the disease is still frequently misdiagnosed by the medical team enrolled in the management of pediatric patients. A three-year-old female patient who had a diagnosis of scalp white piedra successfully treated with ketoconazole shampoo and a hair cut is reported. Clinically, the infection was characterized by yellowish-white nodules that were found attached to the distal portions of the hair.

## Introduction

White piedra is a chronic, superficial mycosis of the hair shaft, of rare occurrence, that may affect all areas of the body. Its etiological agent is the yeast form of the fungus Trichosporon spp. Recent studies employing morphological, biochemical and molecular

techniques established the taxonomic class T. beigelii containing six different human pathogenic species: Trichosporon ovoides, Trichosporon inkin, Trichosporon asteroides, Trichosporon cutaneum (synonym of T. beigelii), Trichosporon asahii, and Trichosporon mucoides.[1,2] The species T. ovoides and T. inkin are identified as the main etiological agents of white piedra of the hair scalp and genital region, respectively.[3]

Clinically, the infection is characterized by yellowish-white nodules, measuring 1 to 1.5 mm in diameter, fusiform, of soft consistency, mainly attached to the distal portions of the hair. Most case series and case reports published in the last century were about infections of genital hair.[4] However, over the last decade, more cases of children with involvement of the hair scalp have been reported in Americas.[5,6,7,8] We present the case of a pediatric patient with scalp white piedra diagnosed in the Service of Dermatology, University Hospital of Brasilia.

## Case Report

Female patient, three years old, from the Central West region of Brazil, with crossed renal ectopia and anorectal abnormalities, who had been presenting with white nodules attached to the hair of her scalp for fifteen days **(Fig 1)**. The mother stated that the nodules initially appeared in the distal portion of the hair and increased in number in an ascending manner. They did not cause itching and were easily seen when the hair was wet.

**Fig 1:** Clinical examination showing many yellowish-white nodules, of soft texture, attached to and surrounding the hair sheath, mostly in its distal portion (Red arrow heads)

The patient was not in daycare or kindergarten, but she had a habit of playing with other

neighborhood children and had close contact with her parents and grandparents. However, none of the contacts showed similar clinical manifestations. The patient had been previously treated for lice at another medical service, but without any improvement of her condition.

Clinical examination revealed woolly hair of medium length with signs of good hygiene, with yellowish-white nodules, of soft texture, attached to and surrounding the hair sheath, mostly in its distal portion. There was no involvement of the skin of the hair scalp or hair follicles. Direct mycological examination, 40% KOH clarified, revealed yellowish-white nodules formed by arthro-conidia and blastoconidia completely involving (360º) the hair shaft {Figure 2}. Culture of the affected hair on Sabouraud agar at a temperature of 28° to 30° revealed the growth of creamy, beige, cerebriform yeast colonies {Figure 2}. Micromorphology of the colony showed the presence of arthro-conidia and blastoconidia. Therefore, the diagnosis of Trichosporon spp was established; however, technical issues prevented the execution of molecular tests to isolate the species. **(Fig 2)**

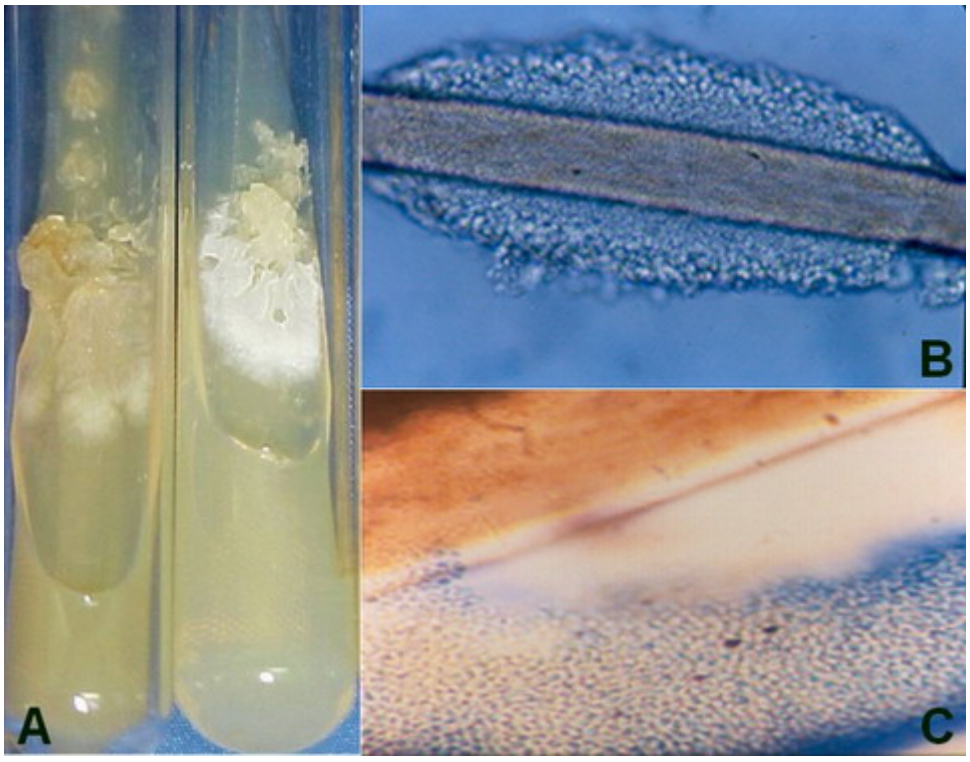


**Fig 2: (A)** Culture on agar-Sabouraud showing a creamy, yellowish-white and cerebriform yeast colony. **(B)** Direct mycological examination showing a clear, friable and soft nodule on the hair cuticle (10X), formed by arthro-conidia and blastoconidia **(C; 40X)** ("cotton blue" stain)

Treatment was carried out satisfactorily by cutting the child's hair and using 2% ketoconazole shampoo for 30 days without complaints of side effects or relapse.

## Discussion

Trichosporon spp. belongs to the fungal family Filobasidiaceae; it is a saprophyte found in the environment (soil, water and plants) as well as in the skin and excretion of mammals and humans.[9] In humans, it causes white piedra, a chronic superficial infection of rare occurrence which is mainly found in areas of tropical and temperate climate such as South America, South Asia, Middle East, Africa, Europe, Australia and the United States.[8,10,11] In Brazil, most recently reported cases refer to white piedra of the scalp.[5,6,7,10]

Although the mode of transmission of the disease remains unknown, some authors suggest that the rainy season, humidity, heat and use of hair conditioners are predisposing factors to infection.[5,7,8,12] The patient had woolly hair, of medium length, and made frequent use of large amounts of hair conditioners, supposedly maintaining higher local humidity, a factor that may have contributed to the occurrence and maintenance of infection.

The patient had low socioeconomic status, but recent studies have indicated that there is no evidence of infection associated with poor hygiene, socioeconomic status or sexual contact.[5,7,8] Nonetheless, the occurrence of the disease in dry weather with low humidity limits the role of climatic factors on the occurrence of infection in this patient. Although household animals may be affected, they do not appear to represent a source of transmission to humans.[13]

Most cases of white piedra affect the hair scalp of female children of preschool age (2-6 years), mainly the occipital region, in agreement with the case presented here.[5,7,8] Other areas affected include the genitals, beard and mustache, eyelashes and eyebrows, and armpits. A recent study conducted to establish the etiological agents of white piedra diagnosed in patients of the metropolitan region of Rio de Janeiro showed T.ovoides as the main agent affecting the hair scalp.[10] This corroborates data from the literature which indicate that the species is the main etiological agent of white piedra and the most common in infections of the scalp.[3,5,7]

Clinically, the differential diagnosis of white piedra with pediculosis, trichobacteriosis, black piedra and even with morphological changes in the hair shaft - trichorrhexis nodosa and trichoptilosis - can be difficult, with frequent treatment attempts before a visit to the dermatologist.[6] In cases of involvement of the genital hair, if skin changes are associated (usually erythematous-squamous moist plaques with poorly-demarcated borders), the diagnoses of dermatophytosis, candidiasis and erythrasma should also be considered.[5,11] In immuno-compromised patients, Trichosporon spp. can spread and cause severe systemic infection with fungemia, pulmonary infiltrates, renal damage, and pustular, nodular, purpuric or necrotic skin lesions, strengthening the recommendation of dermatologists for prompt recognition and adequate treatment of the disease.[14,15]

Microscopic observation of the affected hair after treatment with potassium hydroxide 20% revealed intrapilar nodules, with external growth under the cuticle without involvement of the cortex and medulla, composed of mycelial elements (arthro-conidia

and blastoconidia, a binomial that characterizes the genus Trichosporon) arranged perpendicularly to the hair surface. Culture on Sabouraud agar at room temperature shows growth of a yellowish-white colony, cerebriform, which subsequently acquires a grayish color. Micromorphology of the colony shows hyaline hyphae, arthroconidia and blastoconidia.[4,5]

Therapeutic measures involving cutting the hair and application of antifungal shampoos with pyrithione zinc 2%, ketoconazole 2% or cyclopiroxolamine 1% are widely effective.[5,15]

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