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# Urinary Tract Infection Due to *Trichosporon asahii* in a Pediatric Patient with Nephrotic Syndrome: A Case Report

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**Abstract:** - *Trichosporon asahii* is an emerging opportunistic fungal pathogen increasingly identified in immunocompromised hosts. We report a rare case of urinary tract infection (UTI) caused by *T. asahii* in a 6-year-old girl with nephrotic syndrome undergoing prolonged corticosteroid therapy. The diagnosis was confirmed at the Parasitology-Mycology Laboratory of the Mohammed VI University Hospital in Marrakech. This case highlights the diagnostic challenges, antifungal resistance patterns, and therapeutic considerations associated with this unusual infection in pediatric patients.

**Keywords:** Trichosporon asahii, Urinary tract infection, Nephrotic syndrome, Pediatric fungal infection, Immunocompromised host, Antifungal resistance.



## Introduction

Yeasts of the genus *Trichosporon*, particularly *Trichosporon asahii*, are ubiquitous environmental fungi found in soil, water, and air, as well as part of the normal human microbiota, especially in the gastrointestinal tract, skin, and respiratory system. While previously regarded as non-pathogenic commensals, these organisms are now increasingly recognized as emerging opportunistic pathogens capable of causing severe infections in immunocompromised individuals. (1)

Among the species, *T. asahii* is most frequently implicated in invasive infections, termed trichosporonosis, which may manifest as fungemia, pneumonia, meningitis, urinary tract infections, and skin involvement. The clinical presentation is often nonspecific, which contributes to diagnostic delays and worse outcomes.

Although most reported cases occur in adults with hematologic malignancies, organ transplants, or those receiving immunosuppressive therapies, pediatric data remain scarce. In children, nephrotic syndrome represents a predisposing condition due to both disease-associated immunologic alterations (notably loss of immunoglobulins via proteinuria) and the long-term use of corticosteroids or immunosuppressants. (1) (3)

Fungal UTIs account for a small fraction of pediatric urinary infections, and are typically due to *Candida albicans*. In contrast, *T. asahii* is rarely reported in this setting. The clinical rarity, coupled with diagnostic challenges—especially in the absence of molecular tools—makes these infections difficult to recognize and manage. (4) (5)

We report here an uncommon case of *T. asahii* UTI in a pediatric patient with steroid-dependent nephrotic syndrome. The case was confirmed through conventional mycological techniques at a hospital laboratory and emphasizes the need for heightened clinical awareness of fungal pathogens in vulnerable children.

## Case Presentation

A 6-year-old girl with a two-year history of idiopathic nephrotic syndrome under long-term corticosteroid therapy was admitted to the pediatric nephrology department with persistent fever (38.5 °C), dysuria, and urinary frequency for five days, unresponsive to third-generation cephalosporins.

Physical examination revealed no signs of pyelonephritis or systemic sepsis. Urinalysis showed marked proteinuria, significant leukocyturia (+++), and no hematuria. Laboratory workup revealed an elevated C-reactive protein (35 mg/L), hypoalbuminemia (22 g/L), and preserved renal function.

Urine cultures performed at the Parasitology-Mycology Laboratory of the Mohammed VI University Hospital in Marrakech; yielded creamy, white-to-beige colonies growing rapidly within 48 hours



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on Sabouraud dextrose agar. Direct microscopic examination revealed arthroconidia and blastoconidia. Identification of *T. asahii* was based on colony morphology and biochemical analysis using API 20C AUX, without molecular confirmation.

Antifungal susceptibility testing demonstrated intrinsic resistance to echinocandins (anidulafungin, caspofungin), intermediate sensitivity to amphotericin B, and high susceptibility to azole derivatives, particularly voriconazole.

The patient was treated with oral voriconazole at a weight-adjusted dose, under regular monitoring of liver and renal function. Clinical improvement occurred within the first week, with resolution of fever and urinary symptoms. A follow-up urine culture on day 10 was sterile. Antifungal therapy was maintained for 14 days. No relapse was observed at the three-month follow-up.

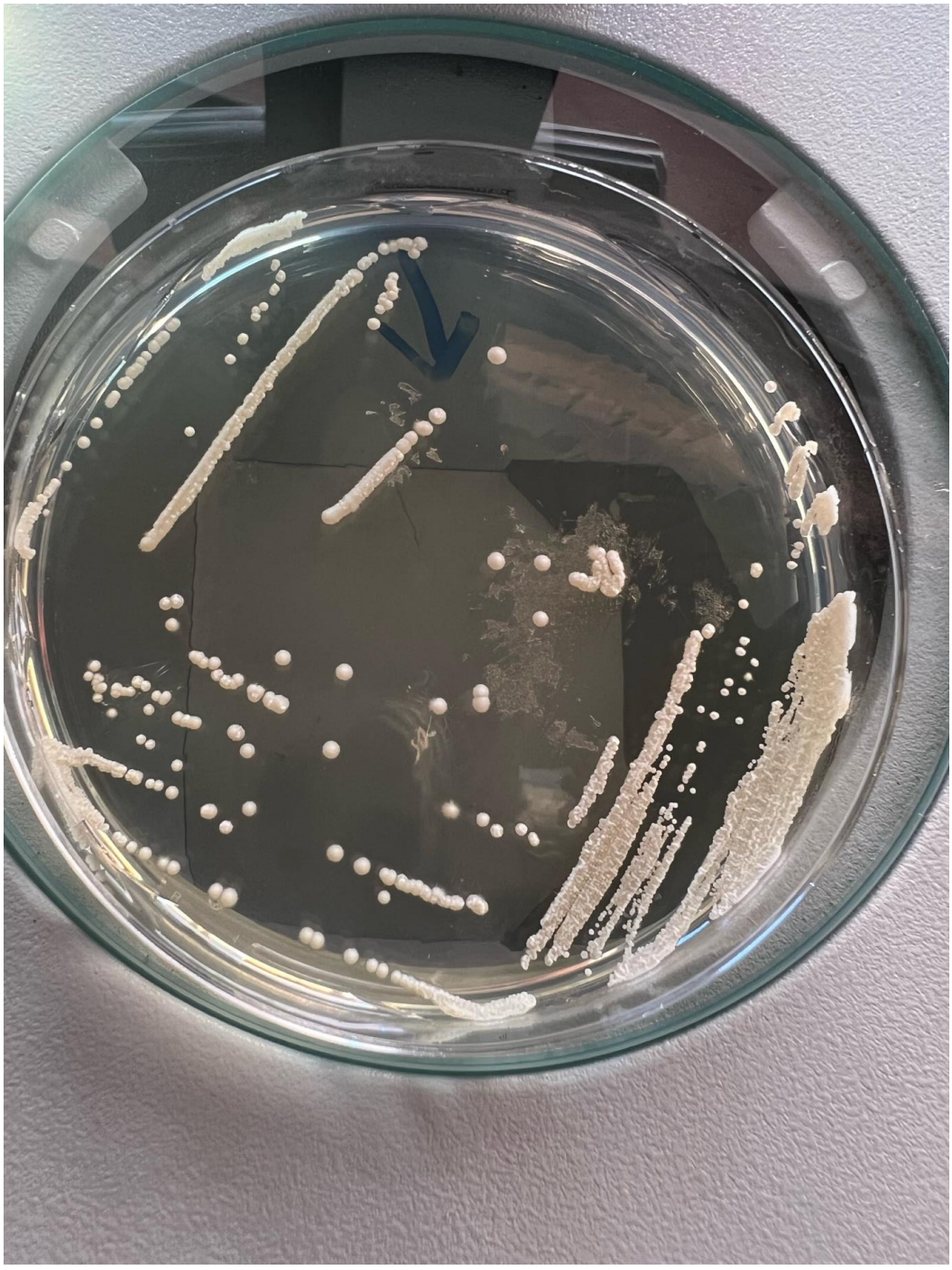

Figure 1. Colonies of Trichosporon asahii on Sabouraud agar: overview of morphological diversity and colony texture.

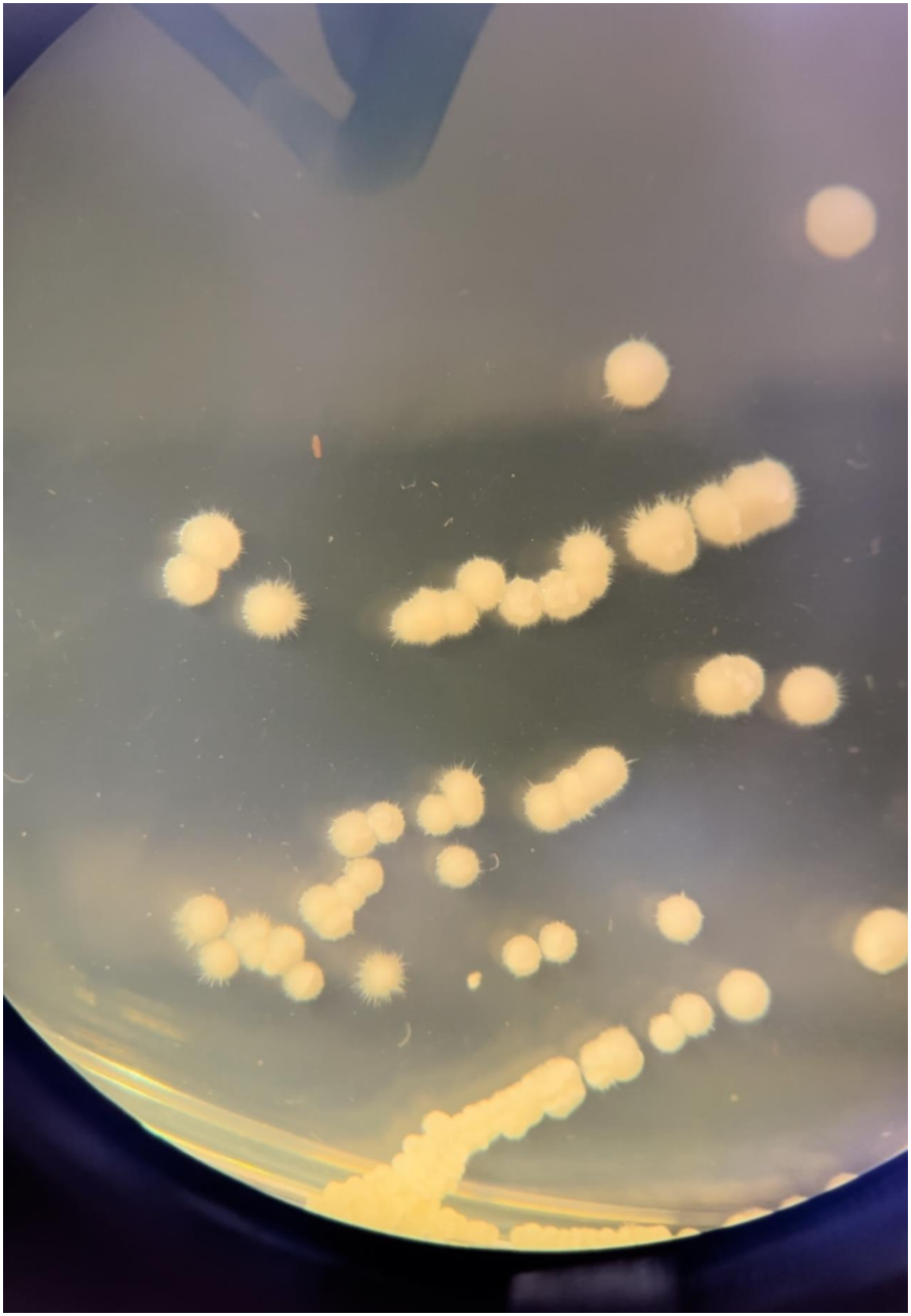

Figure 2. Enlarged macroscopic view of Trichosporon asahii colonies on Sabouraud agar, displaying raised, cerebriform, and irregular margins.

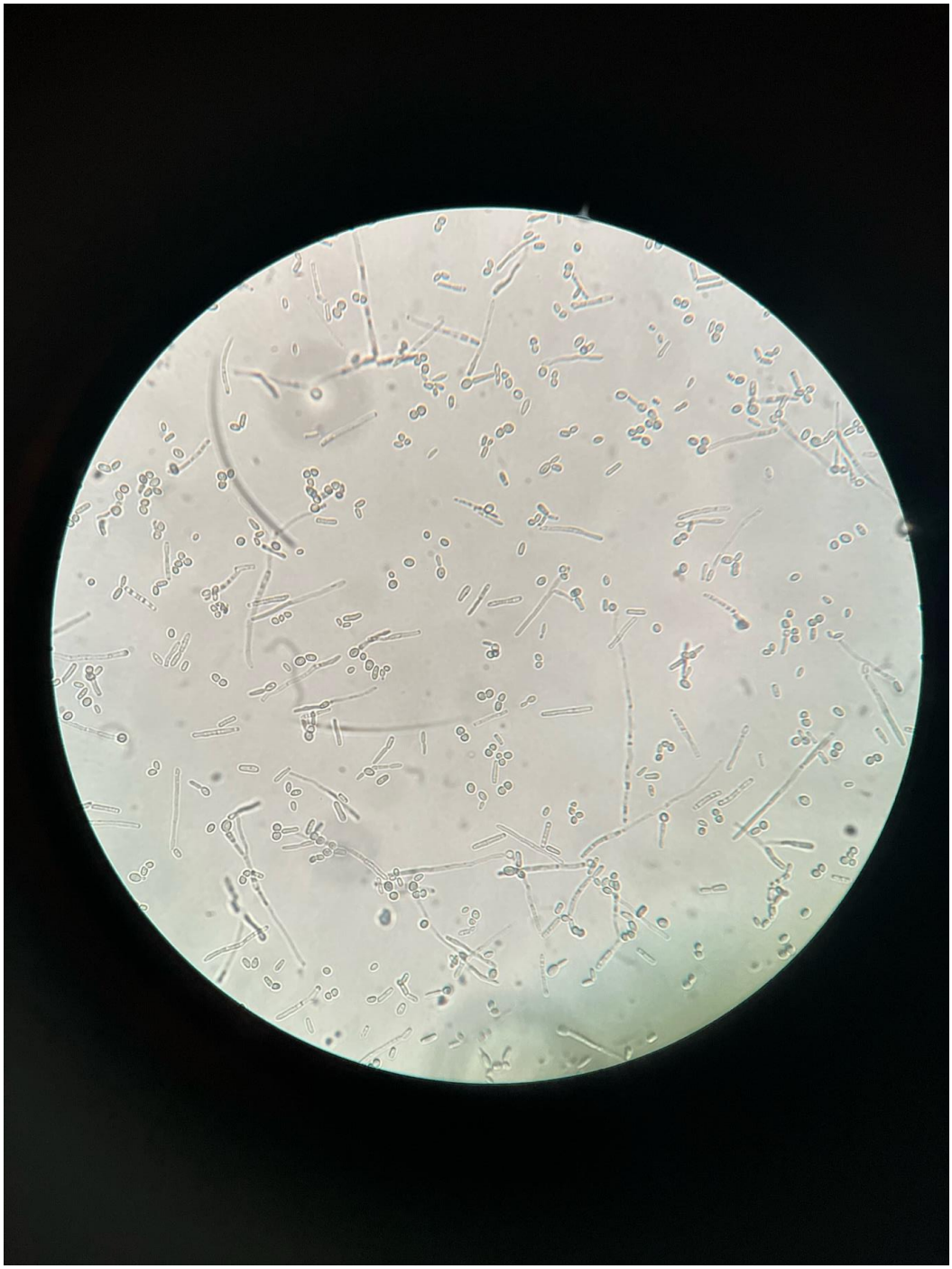

Figure 3. Microscopic appearance of Trichosporon asahii in a fresh preparation, showing arthroconidia and septate hyphae.

## Discussion

*Trichosporon* infections, once considered rare, are increasingly reported in immunocompromised populations. Pediatric cases remain exceptional, especially those involving the urinary tract. Nephrotic syndrome, due to its inherent and iatrogenic immunosuppression, creates a favorable environment for opportunistic fungi such as *T. asahii*. The lack of response to antibiotics in this case prompted targeted fungal investigations.

The primary challenge lies in diagnosis. While conventional methods (culture, microscopy) were adequate in this case, molecular confirmation—such as internal transcribed spacer (ITS) sequencing—was unavailable. Several studies now advocate for combining classical and molecular techniques for optimal identification, particularly of rare or atypical yeasts. (4)

Another difficulty lies in treatment selection. *T. asahii* exhibits **natural resistance to echinocandins**, which are frequently used empirically in high-risk patients. Amphotericin B, although historically employed, shows variable efficacy and notable nephrotoxicity, making it less suitable for patients with renal vulnerability such as those with nephrotic syndrome.

Azole antifungals, especially voriconazole, are currently recommended as first-line agents by recent international guidelines (ECMM/ISHAM 2021). Voriconazole offers favorable pharmacokinetics, high oral bioavailability, and excellent tissue

penetration, including the urinary tract. In our case, clinical resolution confirmed its efficacy. (6) (7)

From an epidemiological standpoint, most documented *T. asahii* infections involve adults with hematological cancers or organ transplants. Pediatric cases are sporadic, and localized urinary tract infections are exceptionally rare. The literature offers limited guidance, making each new case report a valuable contribution to clinical understanding. (8) (9)

This case underscores several critical considerations: the need to include fungal infections in the differential diagnosis of persistent pediatric UTIs, the importance of early communication between clinicians and microbiologists, and the necessity of reinforcing diagnostic mycology capabilities in hospital laboratories, including susceptibility testing and—ideally—molecular identification. (10)

## Conclusion

*Trichosporon asahii* should be considered a potential uropathogen in immunocompromised pediatric patients, especially when symptoms persist despite broad-spectrum antibiotics. Prompt diagnosis and antifungal susceptibility testing are essential for appropriate therapeutic decisions. Further studies are needed to define optimal management protocols for *Trichosporon* infections in children with nephrotic syndrome and other high-risk conditions.

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