CASE REPORT

**Trichosporon asahii** sepsis in a patient with pediatric malignancy

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**Introduction**

*Trichosporon asahii* is a rare opportunistic yeast-like fungus causing rare infections in children. Despite antifungal therapy with amphotericin B, the mortality rate is high (80%) and early initiation of treatment may increase survival of these patients. Herein, we report on a previously treated patient with Ewing sarcoma who died because of *T. asahii* sepsis. Three days of liposomal amphotericin B therapy following 3 months of caspofungin therapy did not help to achieve a favorable outcome.
Case report

A 16-year-old boy previously had been treated for Ewing sarcoma in the region of the right superior pubic ramus. He had received intensive chemotherapy and underwent hemipelvectomy after radiotherapy. A lesion with recurrent pus discharge on the area of radiotherapy (right inguinal area) had worsened, with urine leakage from the lesion despite antibiotic therapy. The patient underwent a second operation for implant insertion to the right pelvic area in August 2008, and had been hospitalized seven times between September 2008 and January 2011 for pus discharge at the right inguinal area after receiving appropriate antibiotic therapy. He and his family had been advised that surgery was necessary for removal of the implant, but they did not provide consent for this process. He eventually was hospitalized to undergo implant removal in June 2011.

Surgery included implant excision and bypass between the saphenous vein, iliac artery, and femoral artery. Because of massive arterial bleeding postoperatively, the patient underwent a second operation for right hip dislocation, total right lower extremity amputation, and urinary bladder reconstruction. Because he could not be extubated and was in septic shock with hypotension, anuria, and worsening kidney function tests, antibiotic therapy was planned with meropenem, ciprofloxacin, colistin, and linezolid because of the extended spectrum beta-lactamase activity of Acinetobacter baumannii (colistin sensitive) and Escherichia coli (meropenem, imipenem, ciprofloxacin, and amikacin sensitive).

The patient’s hypotension did not respond to dopamine and dobutamine therapy, a chest X-ray revealed pleural effusion, thoracentesis revealed fluid with characteristics of transudate, and a black-colored necrotic edematous lesion was present in the nasal area (Fig. 1).

Although the patient did not have a positive blood culture, ongoing local infection was present. Therefore, antimicrobial therapy including meropenem, colistin, teicoplanin, and caspofungin was reorganized to include meropenem, colistin, teicoplanin, and liposomal amphotericin B. Paranasal CT yielded increased density in the right maxillary sinus compatible with infection or hemorrhage, with increased subcutaneous nodular density suggesting infection in the left middle meatus. In the following hours the patient had cutaneous necrosis in the dorsal area necrosis in the nasal bone. The patient’s disease progress was so rapid that mortality could not be prevented, 3 days after the skin findings occurred. Blood culture yielded T. asahii after minimum inhibitory concentration values were exceeded for that isolate at 4 μg/mL for fluconazole and 0.03 μg/mL for voriconazole. Postmortem study of tissues from the nose and conchae revealed widespread necrosis, karyorrhexis, and mixed inflammatory infiltrate along with septated fungal hyphae and spores (Fig. 2). Additionally, a group of nonseptated mucormycotic hyphae was also detected. However T. asahii was the only infectious agent isolated from the cultures of necropsy samples.

Discussion

The non-Candida yeast-Trichosporon species is an increasingly common pathogen in immunocompromised hosts. These species have been isolated from various types of clinical specimens, including blood, skin biopsy, and urine specimens, and reported as colonization of the gastrointestinal tract, skin, mucosal surfaces and in addition to stool, central venous catheter, sputum, and hair. T. asahii is the most frequent species involved in disseminated infections. Cutaneous involvement with papulonodular or pustular lesions, especially necrotic appearance, has been

![Figure 1. Necrotic lesion in the nasal area.](image1)

![Figure 2. Fungal elements including several true hyphae and blastoconidia in samples of conchal lesion.](image2)
frequently observed and could be indicative of trichosporonosis. Biopsies of these skin lesions have revealed Trichosporon species in more than 75% of the cases, and are helpful to promptly confirm the etiology and initiate appropriate treatment. Experienced rapid deterioration although he was treated with caspofungin and Trichosporon could only be cultured from the nasal region, T. asahii was cultured from the nasal region, hemodialysis catheter, and peripherally but mortality could still be associated with coinfection of T. asahii together with mucormycosis in our patient. The first case report of the coinfection with mucormycosis and Trichosporon in the literature was published in 20066; posaconazole together with a high dose of amphotericin B, aggressive surgical debridement and hyperbaric oxygen therapy resulted in cure of a disseminated fungal necrotizing fasciitis.

In the literature, breakthrough trichosporonosis has been reported during the administration of various antifungal agents, including amphotericin B, caspofungin, micafungin, and azoles. Unfortunately, our patient experienced rapid deterioration although he was treated with caspofungin and Trichosporon could only be cultured and shown in postmortem studies. Factors that enhance mucosal colonization and subsequent invasion of Trichosporon species include broad-spectrum antibiotic treatment and breaks in mucosal barriers. Because our patient had renal function impairment, antifungal therapy was initiated with caspofungin. It is highly likely that combination therapy with drugs acting synergistically on different sites such as caspofungin and amphotericin B for trichosporonosis, as aspergillosis, may have better outcomes than fungicidal activity of antifungal agents when used alone. Unfortunately, the antifungal treatment in our case did not yield a successful outcome. However, therapy with liposomal amphotericin B was found to be effective in eradicating T. asahii from blood, and was also well tolerated and associated with resolution of fever in our patient. The mortality of our patient makes it clear that it is vital to keep in mind the possibility of trichosporonosis even under antifungal therapy especially echinocandins. In addition, early diagnosis together with initiation of rapid and appropriate therapy could be a lifesaving process and assist in achieving a favorable outcome.

Conflicts of interest

All contributing authors declare no conflict of interest.

References

Trichosporon asahii sepsis in a child


