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Case Report
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A Case Report of *Trichosporon asahii* Septic Shock Following Lower Extremity Amputation

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Abstract

Trichosporon colonizes the skin, vagina, gastrointestinal and respiratory tract of humans. *Trichosporon asahii* is an opportunistic fungus that causes infections in immunosuppressed patients. It is rarely seen in children and immunocompetent hosts. The mortality rates are still high despite early treatment with proper antifungal drugs. We present a case of *T. asahii* septic shock in a 59-year-old immunocompetent individual following lower extremity amputation.

Background

The incidence of fungal infections has been dangerously increasing over the past 30 years resulting as one of the major causes of morbidity and mortality especially in immunosuppressive individuals. Now a days, in addition to common fungal infections such as candidiasis and aspergillosis, infections by non-candida yeast like *Trichosporon* which was identified as a cause of benign infection with white Piedra in 1865 are rising in immunocompromised individuals with deteriorating conditions and high mortality [1,2]. However, *Trichosporon* has been known to cause superficial infections in the past, but these days it has been progressively reported to cause disseminated infections in immunocompromised patients with 42% to 90% mortality rate despite of antifungal therapy [3]. *T. asahii* is the most common fungus in this genus and causes considerable mortality [4]. *T. asahii* is a basidiomycetous yeast, in recent times it has been reported to cause fatal opportunistic life-threatening systemic infections in both immunocompromised and immunocompetent patients with resistance to common antifungals used [5].

We present a case *T. asahii* septic shock in an immune competent host following lower extremity amputation.

Case Presentation

A 59-year-old male patient was rushed to emergency care with complaints of swelling, severe pain, black discoloration of skin of left leg, fever, rapid breathing, and unstable vitals. He had a medical history of controlled diabetes and chronic kidney disease on dialysis. Basic investigations showed high total leukocyte count, elevated PT and APTT. Emergency Left above knee amputation was done and patient was shifted to ICU and started with IV Cefuroxime 750 mg q8h, IV Augmentin 500 mg q12hrs, IV Metronidazole 500 mg q8h with other supportive postoperative care. Five days after surgery patient developed intermittent high-grade fever with shallow breathing. On examination patient had hypotension, tachycardia and tachypnea with 88% of O_2 saturation. Blood investigations showed high total leukocyte count, increased D-dimer, elevated PT and APTT, high procalcitonin. Patient was started on IV Meropenem, oxygen support of 12 L / min through nasal prongs and other supportive measures. Two sets of aerobic blood culture were given, which turned positive on 2nd day of incubation in BAC T alert. Grams stain from blood culture bottle showed budding yeast cells with hyphal forms (Figure 1). On Sabouraud dextrose agar cream colored colonies with wrinkled and raised surface colonies were observed which is suggestive of *Trichosporon* species (Figure 2). Lactophenol Cotton Blue from culture colonies showed yeast cells with arthrospores, blastospores and septate hyphae (Figure 3). The isolated colonies were further processed in Vitek 2 compact and identified to be *T. asahii*. Antifungal sensitivity is not included in the data base of Vitek 2 compact for *Trichosporon* species. Immediately this was reported to physician. Patient attendees were not willing to go ahead with microbroth dilution for antifungal

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Figure 1: Cream-colored wrinkled colonies of *Trichosporon asahii* on sabouraud dextrose agar isolated from blood culture.

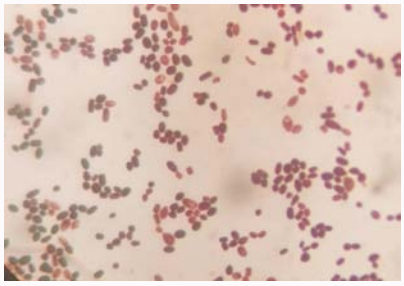

Figure 2: Gram stain of *Trichosporon asahii* showing budding yeasts and barrel shaped arthroconidia.

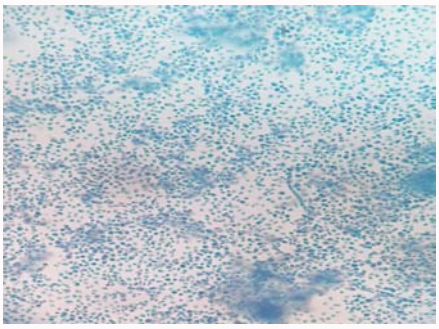

Figure 3: Microscopic appearance of *Trichosporon asahii* with pseudohyphae, arthroconidia and blastoconidia in Lactophenol cotton blue stain, magnification 40 X.

sensitivity which is the recommended method according to CLSI guidelines. According to ECMM guidelines patient was started with a combined IV Amphotericin B 3 mg/kg/day + IV voriconazole 6 mg/kg every 12 hrs for day 1 and then, 4 mg/kg every 12 hrs. After two days of treatment with antifungals, again two sets of blood culture were given which revealed growth of *T. asahii*. But patient condition deteriorated, clinically showed worsening of ventilator functions, episodes of desaturation, fluctuations in systemic blood pressure, peripheral cyanosis and edema and patient expired because of multiorgan failure due to septic shock.

Discussion

Trichosporon species are of the typical flora of the respiratory, human skin and gastrointestinal tracts. They are anamorphic and ubiquitous in nature. There are six *Trichosporon* species, which are responsible for invasive and superficial infections of the skin and mucosa namely, *T. asahii*, *Trichosporon asteroides*, *Trichosporon cutaneum*, *Trichosporon inkin*, *Trichosporon mucoides*, and *Trichosporon ovoides*, of all these *T. asahii* is the most common etiological agent in invasive *Trichosporon* infections [4]. In consonance with the definitions of opportunistic Invasive Fungal Infections (IFI) published by the European Organization for Research and Treatment of Cancer/ Invasive Fungal Infection Cooperative Group (EORTC/IFICG) and the National Institute of Allergy and Infectious Disease Mycoses Study Group (NIAID/MSG), invasive *trichosporonosis* may be defined as follows: patients with proven invasive *trichosporonosis* should have at least one of the following criteria: (i) Blood cultures yielding *Trichosporon* species in patients with related symptoms and clinical signs of infection, (ii) Cerebrospinal fluid (CSF) culture yielding *Trichosporon* species, or (iii) Biopsy specimens that are culture positive and present histopathological evidence of fungal elements compatible with *Trichosporon* spp. [10].

Disseminated infection by *Trichosporon* species is seen in patient with indwelling devices, patient on immunosuppressive agents, immunocompromised status, and patient on broad-spectrum antibiotic therapy, autoimmune disorders and postoperative complications [6,10]. Invasive trichosporonosis infection primarily caused by colonization of skin, mucosal surfaces of the respiratory or gastrointestinal tract followed by bacteremia when mucosal surface integrity is compromised [10]. The most important virulence factor of *Trichosporon* is the secretion of enzymes like Proteases and phospholipases which cleaves host protein, causes disruption of host cell membrane and scavenges nutrients from environment [6]. *Trichosporon* has the unique ability to form biofilms on implanted devices which is one of the major reasons for its virulence and resistance to antifungals [6]. Clinical features of Invasive trichosporonosis include pneumonia, septic shock and renal failure [3].

T. asahii diagnosis is based on clinical findings and confirmation made by microscopy and culture. It is usually isolated from blood, urine and sputum. Combined morphological and biochemical methods are most commonly used for identifying *T. asahii*. These methods include ID 32C yeast identification system, API 20C AUX yeast identification system and Vitek automatic microbial identification system [8].

A study conducted by Li H, Guo M et al. in 2020, investigated 140 global *T. asahii* infection cases reported within the past 23 years. According to the study it has been found that number of *T. asahii* infections dramatically increased from 2006 to 2015 (107 cases) and Triazole antifungals like Fluconazole, Itraconazole, Voriconazole are the most effective drugs in the treatment of *T. asahii* infections, which is consistent with the guidelines developed by European Society for Clinical Microbiology and Infectious Diseases and European Confederation of Medical Mycology (ESCMID/ECMM) in 2014. Further it was found that combination therapy with Amphotericin B and Triazole was less efficient than individual Triazole drug usage [1].

Conclusion

In the present case, possibly the organism colonized the wound would have caused haematogenous dissemination and prior treatment with broad-spectrum antibiotics, and presence of diabetes, chronic kidney disease as comorbid conditions could be other possible contributory risk factors. In recent days *Trichosporonosis* is increasingly reported both in immuno-compromised and immuno-competent individuals. Microbiological analysis of the clinical sample

for fungal pathogens is obligatory for identification and timely commencement of appropriate antifungal therapy.

References

1. Li H, Guo M, Wang C, Li Y, Fernandez AM, Ferraro TN, et al. Epidemiological study of *Trichosporon asahii* infections over the past 23 years. Epidemiol Infect. 2020;148:e169.
2. Mehta V, Chander J, Gulati N, Singla N, Vasdeva H, Sardana R, et al. Epidemiological profile and antifungal susceptibility pattern of Trichosporon species in a tertiary care hospital in Chandigarh, India. Curr Med Mycol. 2021;7(1):19-24.
3. Subramanian A, Devi S, Abraham G, Honnavar P. *Trichosporon asahii* infection associated with glomerulonephritis in a diabetic patient. Medical Mycology Case Reports. 2021;35:15-7.
4. Shamshuzoha M, Menon I, Sowjanya H. A rare case of fatal sepsis caused by *Trichosporon asahii* in an immunocompetent chronic obstructive pulmonary disease patient. Indian J Case Reports. 2022;8(10):325-7.
5. Go SE, Lee KJ, Kim Y, Choi JK, Kim YJ, Lee DG. Catheter Related *Trichosporon asahii* Bloodstream Infection in a Neutropenic Patient with Myelodysplastic Syndrome. Infect Chemother 2018;50(2):138-43.
6. Mada PK, Ayoade F, Li A, Todd J. BMJ Case RepPublished Online First: 2018.
7. Ali GA, Husain A, Salah H, Goravey W. *Trichosporon asahii* fungemia and COVID-19 co- infection: An emerging fungal pathogen; case report and review of the literature. IDCases. 2021;25:e01244.
8. Momani MA, Yusef DH, Hamasha D, Moh'd Rawhi Abu Hamad, Farran S. Complicated *Trichosporon asahii* mastoiditis in immunocompetent child. BMC Infectious Diseases. 2021;21(1):1229.
9. Yang MF, Gao HN, Li LJ. A fatal case of *Trichosporon asahii* fungemia and pneumonia in a kidney transplant recipient during caspofungin treatment. Therapeutics and Clinical Risk Management. 2014;10:759-62.
10. Menon D, Saha S, Mandal S. A case report of disseminated *Trichosporon asahii* and covid-19 co-infection in an immunocompetent patient. International Journal of Contemporary Medical Research. 2022;9(11): K1-K3.