CASE REPORT / OLGU SUNUMU

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MEDICAL SCIENCES / DAHİLİ TIP BİLİMLERİ

Trichosporon Asahii Superinfection in a Patient with COVID-19

COVID-19 Hastasında *Trichosporon Asahii* Süperenfeksiyonu

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Abstract

The use of immunosuppressant drugs to treat immunological storms in patients with severe coronavirus disease-2019 (COVID-19) infection has increased considerations concerning fungal infections. In this patient subset with immune compromise, *Trichosporon Asahii (T. asahii)* may cause significant mortality. In this case report, a 60-year-old patient who developed *T. Asahii* fungemia while being followed in the intensive care unit due to COVID-19 pneumonia was presented.

Key Words: COVID-19, Trichosporon Asahii, Superinfection

Öz

Şiddetli koronavirüs hastalığı-2019 (COVID-19) enfeksiyonu olan hastalarda immünolojik fırtınaları tedavi etmek için immünosüpresan ilaçların kullanılması, mantar enfeksiyonlarına ilişkin endişeleri artırmıştır. *Trichosporon Asahii (T. asahii)*, özellikle kritik hastalarda ve bağışıklığı baskılanmış bireylerde önemli mortaliteye sahip, oldukça dirençli bir patojendir. Bu olgu sunumunda, COVID-19 pnömonisi nedeniyle yoğun bakım ünitesinde takip edilirken *T. Asahii* fungemisi gelişen 60 yaşında bir hasta sunulmaktadır.

Anahtar Kelimeler: COVID-19, Trichosporon Asahii, Süperenfeksiyon

Introduction

Trichosporon species are widely found in nature and is a member of human flora but may cause fatal opportunistic fungal infections in immunocompromised individuals (1). The most frequently isolated Trichosporon species is *T. asahii* (2). Conditions associated with invasive trichosporonosis include antibiotic use, acquired immune deficiency syndrome, use of corticosteroids, prolonged intensive care unit (ICU) stay, central catheter and invasive medical equipment. Early diagnosis of Trichosporium fungemia and administration of variconazole are important (3).

Case Report

A 60-year-old male unvaccinated patient with a history of benign brain tumor surgery ten years ago, epilepsy and hypertension, was admitted to ICU on the 9th day of his hospitalization due to respiratory failure, while he was being followed in ward due to Coronavirus disease-2019 (COVID-19) pneumonia. Corticosteroid treatment which was started on 4th day of his hospitalization in ward was terminated. He was in spontaneous breathing with oxygen support by reservoir mask and followed up with carbamazepine, levetiracetam, pitavastatin, trimetazidine, ceftriaxone, and piperacillin

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treatment. On the 4th day of the ICU admission the patient was intubated and mechanical ventilator support was initiated due to the progressive respiratory failure. The patient was evaluated as severe Acute respiratory distress syndrome (PaO_2/FiO_2<100). He was placed in prone position intermittently. Norepinephrine was administered to manage hypotension. Vancomycin and meropenem was initiated on the 7th of ICU admission. On the 10th day due to the fever; sputum, blood and urine cultures were taken and fluconazole and colistin were added. On the 15th day due to the acute renal failure the patient was consulted with the nephrology department and calcium-citrate hemodiafiltration was started. Antibiotherapy was terminated on the 17th day. On 22th day, hemodiafiltration and norepinephrine infusion were terminated as the hemodynamics and renal function were recovered. On the 28th day *Trichosporon asahii* was detected in blood cultures, and variconazole was started. Thorax computed tomography and chest X-ray demonstrated diffusely located ground glass opacities in both lungs (Figures 1, 2). On 30th day of admission the patients was lost due to the septicemia and progressive multi-organ failure.

Discussion

Trichosporon is a yeast-like fungus found in the normal flora of the human body. However, it may become pathogenic and cause superficial infections in immunocompetent individuals or invasive infections in immunodeficient patients (2). *T. asahii* is the most frequently detected species (3). The 30-day mortality of COVID-19-related *T. asahii* fungemia was reported to be 80% despite variconazole therapy (4). The use of steroids and immunomodulatory agents may cause invasive fungal infections during the course of COVID-19 (5,6). Therefore, periodic fungal surveillance approach is recommended for COVID-19 patients managed in the in ICU. Critically ill COVID-19 patients posses several risk factors for *T. asahii* fungemia, including prolonged ICU stay, venous catheters, hemodialysis, corticosteroid and antibiotic use, as in the patient in our case (7). Treatment of *T. asahii* fungemia is complicated and challenging; therefore, recognition and prevention of the infection is crucial for patients with predisposing risk factors. It has been shown that the use of variconazole as the first choice can reduce mortality in *T. asahii* fungemia, particularly in early stages of the infection (2).

Data is limited concerning *T. asahii* infections developing during the course of COVID-19. The rarity of the reports indicates that *T. asahii* in COVID-19 subset is extremely rare. Data derived from the case reports reveal that *T. asahii* fungemia is encountered in the 3rd week of the hospitalization and underlying corticosteroid use ca facilitate *T. asahii* fungemia (8,9).

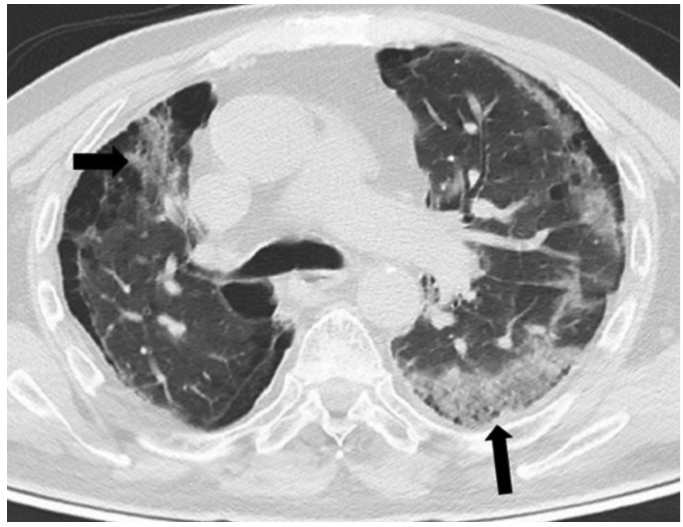

Figure 1: Thorax computed tomography shows peripheral and diffusely located ground glass opacities (black arrows) in both lungs

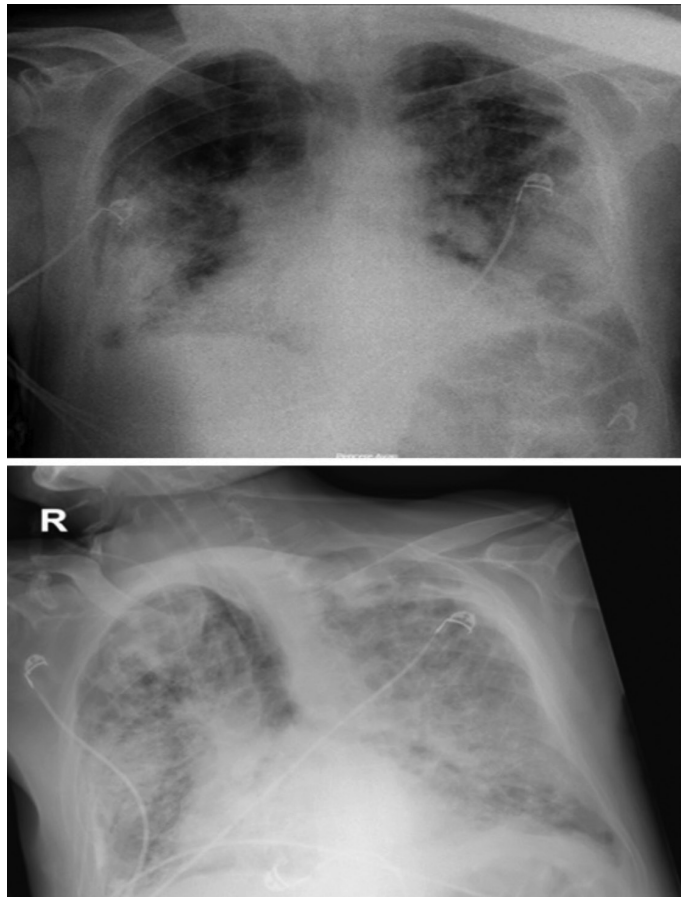

Figure 2: A) Admission chest X-ray demonstrating consolidations accompanying peripherally located ground glass opacities, particularly in the lower and middle zones of both lungs. **B)** A white lung appearance formed by mixed densities (ground glass opacities and consolidation) involving both lungs in the late stage

Conclusion

Trichosporon asahii is an invasive pathogen that has an increased incidence in critical COVID-19 patients and should be considered due to its high mortality rate and unique resistant profile. It is important to screen the immunocompromised patient population for fungal infections. In this patient subset, immunosuppressant drug administration should be limited to those not recovering with conventional treatment, considering the benefit-harm ratio of immunosuppressant agents. Recognition of fungal infections and reduction of the risk factors in vulnerable, critically ill patients may prevent *Trichosporon asahii* fungemia and resulting mortality.

Ethics

Informed Consent: Consent form was filled out by all participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: G.Y., Concept: O.K., Design: A.S.Ş., Z.S., Data Collection or Processing: E.K., Ü.T., Analysis or Interpretation: R.A.A., Literature Search: T.B., G.C., E.K., Writing: S.B., G.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

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