Clinical Case Report

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Uncommon cause of fungemia in a patient with renal cell cancer

A case report of *Candida lusitaniae* Fungemia

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Abstract

Introduction: We present an interesting case of *Candida lusitaniae* infection in a patient diagnosed with renal clear cell carcinoma.

An 82-year-old male presented with worsening back pain for 1 week. Physical examination including neurologic examination was normal. A computed tomography scan of the abdomen revealed a mass in the right upper pole of the kidney suggestive of a renal neoplasm. Pathology from a percutaneous biopsy of the kidney revealed clear cell carcinoma. During his hospitalization the patient developed fungemia due to *C lusitaniae.* He was started on fluconazole, which was later switched to caspofungin due to worsening transaminitis. The patient's clinical status improved and repeat blood cultures were negative for fungal growth.

Conclusion: To our knowledge, this is the first case of *C lusitaniae* reported in a patient diagnosed with clear cell carcinoma of the kidney.

Keywords: bacteremia, *Candida lusitaniae*, fungemia, malignancy, opportunistic infection, renal cell cancer

1. Introduction

Candida lusitaniae was first identified in 1959 from warm blooded animals.[1] In 1979, it was first reported as a human pathogen in a patient with acute myeloid leukemia.[2] An opportunistic haploid yeast, it is a rare cause of fungemia. During the past decade there has been a steady increase in non-*C albicans* infection. Prior to 2000, most of the cases were reported in association with hematologic malignancies. However, in the last 2 decades, there has been a shift toward non-*albicans* infections in solid tumor malignancies.[3]

We report a case of *C lusitaniae* in a patient with renal cell carcinoma.

2. Case presentation

An 82-year-old male presented with worsening back pain for 1 week. He denied any weakness or numbness of his extremities or bladder or bowel incontinence. Physical examination showed an elderly male not in acute distress. Neurologic examination was within normal limits. Laboratory results at presentation were unremarkable. Magnetic resonance imaging of lumbar spine showed metastatic lesions involving multiple vertebral bodies. A computed tomography scan of the abdomen to look for primary lesion showed a mass in the right upper pole of the kidney, right infra-renal adenopathy, and numerous hypodense lesions in the liver. Percutaneous biopsy of the right kidney showed clear cell carcinoma. During the hospital course, the patient developed fevers that progressed to hypotension leading to septic shock requiring intubation and mechanical ventilation. He was started on broad spectrum antibiotic treatment with intravenous meropenem and vancomycin. Sepsis work up including blood, urine, and respiratory cultures did not reveal any bacterial pathogen. Fungal cultures grew *C lusitaniae*, and intravenous fluconazole was added to the patient's antibiotic regimen. Initial biochemical identification revealed Candida. Further identity of *C lusitaniae* was performed by matrix assisted laser desorption ionization/time of flight, phenotypic test. The patient had no recent intra-abdominal surgeries, was not on total parenteral nutrition, and had a central venous catheter placed less than 24 hours prior to developing fungemia. Due to worsening transaminitis, fluconazole was later switched to caspofungin. Patient's hemodynamic status improved and he was weaned off vasopressors. Meropenem and vancomycin were discontinued and caspofungin was continued to complete a total course of 14 days. Follow-up fungal blood cultures were negative after the treatment. Despite hemodynamic stability, patient was unable to be weaned off the ventilator. In view of his advanced malignancy and continued mechanical ventilator requirement, his family opted for hospice care where he died subsequently.

3. Patient consent

An institutional review board approval was waived since this is a case report. Patient's anonymity has been maintained throughout the manuscript.

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4. Discussion

C lusitaniae remains an infrequent cause of nonalbicans invasive candidias is accounting for 1.6% of Candida infections.[3] Patients with solid tumors and those undergoing surgical procedures during hospitalization are at greatest risk of developing this infection.[3] In immunocompromised patients, the infection often presents as a breakthrough fungemia. Review of the literature with regard to the epidemiology of *C lusitaniae* fungemia among patients with malignancy suggests that those with the greatest susceptibility include patients with hematologic malignancy or those who have undergone bone marrow transplantation.[4,5] Minari et al[6] reported *C lusitaniae* occurring in the context of hematological malignancies, bile duct carcinoma, breast cancer, and mesothelioma. Krcmery et al[7] reported that the most frequent risk factor for *C lusitaniae* fungemia was neutropenia, previous therapy with multiple antibiotics and recent catheter insertion. However, more recent reviews have found *C lusitaniae* associated with only 0.7% of all stem cell transplants and just 1.6% of patients with a hematologic malignancy.[3] Central venous catheters have been identified as a portal of entry along with erosion and colonization of the gastrointestinal tract or urinary tract infections identified in other cases.[6] Translocation from the gut was the suspected source of Candidemia in our patient. Another recent study found that among "uncommon" Candida infections at a cancer center which included *C guilliermondii*, *C lusitaniae*, *C kefyr*, *C famata*, and *C dublinensis*, *C lusitaniae* comprised 28% of these infections.[8] A review by Hawkins and Baddour among patients with *C lusitaniae* fungemia found that 41 of 55 patients had severe medical conditions before *C lusitaniae* fungemia was identified. Fifty three percent of the patients in the study had malignancy, a quarter of patients had received chemotherapy, and 34% of the patients were neutropenic.[9] A similar finding was reported by Minari et al,[6] where the onset of candidemia was preceded by serious medical conditions including bacterial and viral pneumonias, as well as bacteremia and multiorgan failure.

Fever has been noted to be the most common clinical manifestation of *C lusitaniae* fungemia.[6] Hypothermia and hypotension have also been presenting features of this infection.

Resistance to amphotericin B has become a distinguishing feature of this isolate.[6,10,11]*C lusitaniae* fungemia generally has a poor clinical response to amphotericin B and should never be used as monotherapy, especially in neutropenic patients.[12]*C lusitaniae* is generally susceptible to other systemic antifungal agents.[13] Echinocandins are 1st-line therapy for *C lusitaniae* fungemia. Echinocandins target beta-1,3-glucan synthetase encoded by FSK genes.[14] Due to their widespread use over the past decade, emerging resistance to echinocandins has been reported in *C lusitaniae*.[15,16] A missense mutation in *C lusitaniae FKS1* HS1 at position 645 (S645F) has been reported to result in increased MICs of several echinocandins.[15] Treatment with fluconazole alone has been noted to be very effective especially in patients with solid tumors and in immunocompetent patients.[17] However, there have been reports of echinocandin and multidrug resistance among *C lusitaniae* isolates.[15] In addition, there have been documented cross resistance between echinocandins and azoles while on antifungal therapy among *C lusitaniae* and *C glabrata*.[15] In addition, emergence of drug resistance while on mono or combined antifungal therapy has been reported.[15]

The relatively low prevalence and emergence of resistance among *C lusitaniae* isolates makes clinical suspicion and further treatment of this Candida difficult. Mortality rate associated with *C lusitaniae* invasive infection has been reported to be up to 25%.[3]

Our patient had received broad spectrum antibiotic exposure prior to developing *C lusitaniae* fungemia. He had a central venous catheter placed less than 24 hours prior to developing fungemia but he was not neutropenic. Our patient did not receive any chemotherapy for renal cell carcinoma. To our knowledge this is probably the first case of *C lusitaniae* occurring in a patient with renal cell carcinoma.

5. Conclusion

Our case brings to light the need to suspect this uncommon pathogen as a cause of sepsis, especially in patients recently diagnosed with malignancy. Recognizing Candidial infection early is important as it is intrinsically resistant to amphotericin B and more cases of echinocandin and azole resistance are being reported. To our knowledge, this is the first case of *C lusitaniae* infection reported in a patient with renal cell carcinoma who did not undergo chemotherapy prior to developing this infection.

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