Case Report

Emergence of *Candida famata* Fungemia in an Immunocompromised Patient: A Case Report Highlighting Clinical Presentation, Diagnosis, and Therapeutic Strategy

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ABSTRACT

Candida famata, once regarded as benign, is now being recognized as an opportunistic pathogen. This case presents an 88-year-old male with multiple comorbidities who developed *C. famata* bloodstream infection during treatment for healthcare-associated pneumonia complicated by prolonged central catheter use and hospital stay. Antifungal therapy with voriconazole led to clinical improvement and eventual discharge of the patient in stable condition. The rarity of *C. famata* infection presents diagnostic and therapeutic challenges. This case highlights the importance of timely antifungal therapy and a multidisciplinary approach in managing invasive candidiasis, particularly in immunocompromised patients. Further research is needed to optimize treatment.

Keywords: *Candida famata* fungemia, immunocompromised host, voriconazole, invasive candidiasis, case report

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Paper presented at the American College of Chest Physicians CHEST Annual Meeting, Massachusetts, USA, October 2024

ISSN 3028-1199 (Online)
Printed in the Philippines

DOI: 10.70172/pjcd.v22i2.9817

Received: 11 May 2024
Accepted: 29 September 2024

INTRODUCTION

Candida famata, formerly recognized as *Debaryomyces hansenii* and *Torulopsis candida* and historically regarded as a benign commensal yeast, has recently emerged as an opportunistic pathogen in human infections.[1] Initially isolated from dairy products, marine environments, and animals, its pathogenic potential was underestimated until the early 2000s.[2-4] Although *C. famata* accounts for 0.2 to 2% of *Candida* bloodstream infections, its clinical significance is growing due to its reduced susceptibility to antifungal agents such as fluconazole and echinocandins.[6]

The rise in *C. famata* infections emphasizes the need for heightened clinical vigilance, especially in patients with predisposing risk factors such as prolonged hospitalizations, invasive procedures, or prior antimicrobial use. This case report presents the diagnostic and therapeutic challenges of *C. famata* fungemia in an elderly, immunocompromised patient, stressing the importance of early recognition and prompt antifungal therapy. This report adds to the growing literature on rare fungal pathogens and their management in modern healthcare.

CASE PRESENTATION

We present the case of an 88-year-old Filipino male with chronic obstructive pulmonary disease, type 2 diabetes mellitus (non-insulin requiring), coronary artery disease, chronic kidney disease stage IV, and hypertension. The patient had recurrent hospitalizations due to various medical conditions such as sepsis, pneumonia, and post-Guillain-Barré syndrome. He also completed steroid therapy and received multiple antibiotics.

One month prior to admission, the patient experienced progressive loss of appetite and generalized body weakness without other symptoms. Six days before admission, he developed an undocumented fever and occasional dry cough. Progressive symptoms prompted the visit to the emergency department (ED). Upon arrival at the ED, the patient was bradycardic (pulse rate 30 to 40 beats per minute), tachypneic (respiratory rate 22 to 28 cycles per minute), and had oxygen saturation of 96% at room air. Physical examination revealed pale conjunctivae, dry lips, generalized crackles, occasional wheezing, and whitish plaques on the tongue, palate, and buccal mucosa. A chest X-ray revealed pneumonic infiltrates in the right paracardiac area and ipsilateral pleural effusion (Figure 1A). The patient was diagnosed with healthcare-associated pneumonia with right parapneumonic pleural effusion, atrial fibrillation with slow ventricular response, and congestive heart failure.

Cefepime was initially started but, on the seventh hospital day, the patient developed high-grade fever, tachycardia, tachypnea, and hypotension. He produced copious yellowish sputum and became progressively drowsier. Repeat laboratory investigations revealed leukocytosis with predominant neutrophilic response. A repeat chest X-ray revealed progression of basal pneumonia. Cefepime was shifted to meropenem.

On the same day, a peripherally inserted central catheter (PICC) was placed at the R basilic vein. Blood cultures were drawn from two peripheral sites which grew *Candida famata* (Figure 2) in one site and *Staphylococcus hemolyticus* in another. Based on these results, vancomycin and voriconazole 200 mg IV once daily were added.

On the 12th day, the patient developed red man syndrome from vancomycin, prompting the switch to linezolid. The right PICC line was removed and replaced with a new one in the left arm. Despite these measures, the patient remained febrile and developed respiratory failure, requiring high-flow oxygen and methylprednisolone. Meropenem was shifted to imipenem.

By the 15th hospital day, the patient appeared more comfortable and was clinically stable. High-flow oxygen was

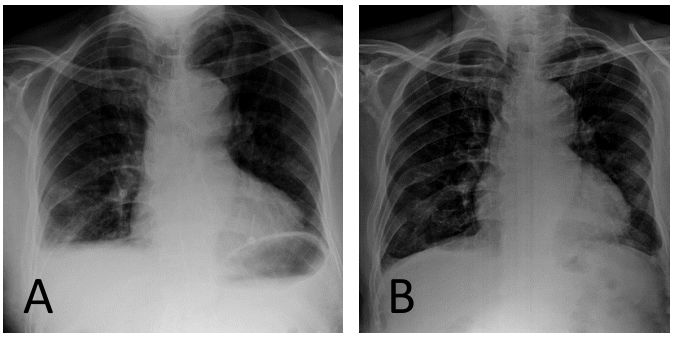

Figure 1. Chest radiographs on admission and upon discharge. Pneumonic infiltrates in the right paracardiac area and right-sided pleural effusion were noted during admission (A). There was regression of findings in the discharge chest X-ray (B).

gradually titrated down until weaned off. Repeat blood culture indicated persistent fungemia, with sensitivity to voriconazole. The dose of voriconazole was increased to 200 mg IV every 12 hours (weight-adjusted). The left PICC line was removed.

By the 17th hospital day, the patient showed marked improvement, without recurrence of fever, and with resolution of pneumonia on chest X-ray (Figure 1B). Repeat blood cultures from two sites showed no growth which confirmed resolution of the infection. After three weeks of voriconazole, two weeks of imipenem, and two weeks of linezolid, the patient was discharged in an improved condition.

DISCUSSION

Managing *Candida famata* bloodstream infections presents significant challenges, especially in immunocompromised patients with multiple comorbidities. Once considered non-pathogenic, *C. famata* has emerged as an opportunistic pathogen, particularly in individuals with weakened immune systems.[11,12,13] The rarity of *C. famata* infection, accounting for only 0.08 to 0.5% of invasive candidiasis cases, complicates diagnosis and treatment. Its reduced susceptibility to common antifungals such as fluconazole and echinocandins adds complexity to the management. [14,15]

In this case, voriconazole was chosen for its broad-spectrum activity and susceptibility profile on blood culture. A second-generation triazole, voriconazole is effective against a variety of fungi, well-tolerated, and distributes widely in body fluids, making it an effective agent in systemic fungal infections.[16] It is also available in both oral and intravenous formulations, making it suitable for patients requiring prolonged antifungal therapy.

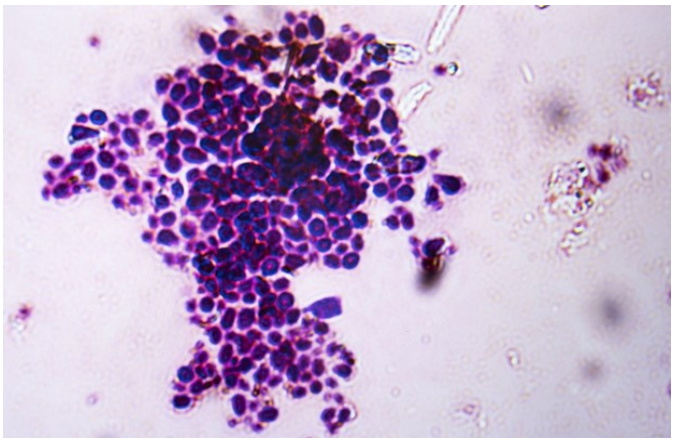

Figure 2. *Candida famata* seen under light microscope at 40x using Gram stain. The specimen was grown in blood culture using VITEC 2 technology and YST card or identification.

After dose adjustment of voriconazole following clinical guidelines and with removal of catheter, the patient's condition improved with prolonged three-week voriconazole therapy.[16] Studies have demonstrated voriconazole's similar efficacy to amphotericin B, and better safety profile especially in patients with renal impairment, because of fewer nephrotoxic effects.[17]

The rarity of *C. famata* infection makes standardized treatment protocols challenging. As highlighted in the case, prompt antifungal therapy and central venous catheter removal are critical to effective management.

The management of *C. famata* bloodstream infections requires close collaboration among infectious disease specialists, microbiologists, and intensivists to optimize therapeutic strategies and patient outcomes. While more extensive studies are needed to establish standardized treatment protocols, our experience suggests that voriconazole remains an effective therapeutic agent, especially in patients without prior antifungal exposure. Timely recognition, appropriate antifungal susceptibility testing, and individualized therapeutic adjustments are key to managing these rare infections effectively.

CONCLUSION

This case emphasizes the emerging importance of *Candida famata* as an opportunistic pathogen, especially in immunocompromised patients with central venous catheters. Its reduced susceptibility to common antifungals like fluconazole and echinocandins poses therapeutic challenges.

Voriconazole proved effective in this case, particularly given the patient's lack of prior antifungal exposure. Despite initial complications like persistent fungemia, adjustments in antifungal therapy, catheter removal, and close monitoring led to the patient's clinical improvement.

Early recognition and timely, targeted antifungal therapy are crucial for managing invasive candidiasis. A multidisciplinary approach is key to optimizing care, and further research is needed to refine treatment strategies and improve outcomes for vulnerable populations.

Acknowledgments (CRediT)

Mr. Lester Lucero: Writing – Review & Editing

Ethical Consideration

The authors declared that appropriate written informed consent was obtained for the publication of this manuscript and accompanying images.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Authors' Disclosure

The authors declared no conflict of interest.

Funding Source

The authors did not receive any funding related to the research, authorship, and/or publication of the article.

References

1. Voronovsky AY, Abbas CA, Dmytruk KV, et al. *Candida famata* (Debaryomyces hansenii) DNA sequences containing genes involved in riboflavin synthesis. *Yeast*. 2004;21(15):1307-1316. https://doi.org/10.1002/yea.1173
2. Desnos-Ollivier M, Ragon M, Robert V, Raoux D, Gantier J-C, Dromer F. *Debaryomyces hansenii* (*Candida famata*), a rare human fungal pathogen often misidentified as *Pichia guilliermondii* (*Candida guilliermondii*). *J Clin Microbiol*. 2008;46(10):3237-3242. https://doi.org/10.1128/JCM.00855-08
3. Jang YH, Lee SJ, Lee JH, Chae HS, Kim SH, Choe NH. Prevalence of yeast-like fungi and evaluation of several virulence factors from feral pigeons in Seoul, Korea. *Lett Appl Microbiol*. 2011;52(4):367-371. https://doi.org/10.1111/j.1472-765X.2011.03002.x
4. Nawange SR, Singh K, Naidu J, Singh SM. Naturally acquired systemic dual infection caused by *Candida famata* (Debaryomyces hansenii) and *Candida catenulata* in albino rats bred for sale in the market at Jabalpur (Madhya Pradesh), India. *Mycoses*. 2010;53 (2):173-175. https://doi.org/10.1111/j.1439-0507.2009.01777.x
5. Al-Hedaithy SS. The yeast species causing fungemia at a university hospital in Riyadh, Saudi Arabia, during a 10-year period. *Mycoses*. 2003;46(8):293-298. https://doi.org/10.1046/j.1439-0507.2003.00893.x
6. Beyda ND, Chuang SH, Alam MJ, et al. Treatment of *Candida famata* bloodstream infections: case series and review of the literature. *J Antimicrob Chemother*. 2013;68(2):438-443. https://doi.org/10.1093/jac/dks390
7. Clinical Pharmacogenetics Implementation Consortium (CPIC) Guidelines for CYP2C19 and Voriconazole Therapy. Clinical Pharmacogenetics Implementation Consortium (CPIC). Available at: https://cpicpgx.org/. Accessed October 20, 2024
8. Badee P, Badali H, Boekhout T, et al. Antifungal susceptibility testing of *Candida* species isolated from immunocompromised patients admitted to ten university hospitals in Iran: comparison of colonizing and infecting isolates. *BMC Infect Dis*. 2017;17(1):727. https://doi.org/10.1186/s12879-017-2827-y
9. Karapetsa M, Tsolaki V, Arabatzis M, Petinak E, Velegraki A, Zakynthinos E. Septic shock due to *Candida famata* (Debaryomyces hansenii) candidemia in an ICU immunocompetent trauma-patient. *Med Mycol Case Rep*. 2018;22:69-72. https://doi.org/10.1016/j.mmcr.2018.11.001
10. Silva S, Negri M, Henriques M, Oliveira R, Williams D, Azeredo J. *Candida glabrata, Candida parapsilosis* and *Candida tropicalis*: biology, epidemiology, pathogenicity, and antifungal resistance. *FEMS Microbiol Rev*. 2012;36(2):288-305. https://doi.org/10.1111/j.1574-6976.2011.00278.x
11. Deorukhkar SC, Saini S, Mathew S. Non-albicans *Candida* infection: an emerging threat. *Interdiscip Perspect Infect Dis*. 2014;2014:615958. https://doi.org/10.1155/2014/615958
12. Pfaller MA, Diekema DJ. Epidemiology of invasive candidiasis: a persistent public health problem. *Clin Microbiol Rev*. 2007;20(1):133-163. https://doi.org/10.1128/CMR.00029-06
13. García-Effron G, Lee S, Park S, Cleary JD, Perlin DS. Effect of *Candida famata* (Candida flareri) on susceptibility to amphotericin B and micafungin determined by CLSI and flow cytometric methods. *Antimicrob Agents Chemother*. 2009;53(5):1617-1622. https://doi.org/10.1128/AAC.01232-08
14. Pappas PG, Kauffman CA, Andes D, et al. Clinical Practice Guidelines for the Management of Candidiasis: 2009 Update by the Infectious Diseases Society of America. *Clin Infect Dis*. 2009;48 (5):503-535. https://doi.org/10.1086/596757
15. Caria J, Leal E, Dias A, Pinheiro H, Póvoas D, Maltez F. A case of central nervous system infection by *Candida famata* in an immunosuppressed patient with HIV-1 infection. *Med Mycol Case Rep*. 2022;38:69-72. https://doi.org/10.1016/j.mmcr.2022.09.004
16. Klasko S, et al. Voriconazole for Candida bloodstream infections. *Antimicrob Agents Chemother*. 2005;49(3):1161-1166. https://doi.org/10.1128/AAC.49.3.1161-1166.2005
17. Kullberg BJ, et al. Voriconazole versus amphotericin B for the primary therapy of invasive candidiasis. *N Engl J Med*. 2005;352 (9):889-890. https://doi.org/10.1056/NEJMe058039