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Case Report

If Bacterial Endocarditis Wasn't Enough, Here's A Fungal One! A Rare Case Report

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Abstract

An 80-year-old male, autonomous, with a history of cardiovascular risk factors, underwent aortic bioprosthesis placement for symptomatic severe aortic stenosis. He presented with acute bacterial endocarditis of the aortic valve prosthesis caused by methicillin-resistant Staphylococcus epidermidis (MRSE). The patient also had a pacemaker for atrial fibrillation and required catheter replacement due to infectious vegetation.

Admitted one year after a previous episode of bacterial endocarditis, he exhibited fever of unknown origin, prostration, anorexia, and elevated inflammatory markers. Empirical treatment was initiated with ceftriaxone, gentamicin, and vancomycin. Hemocultures revealed Candida metapsilosis, leading to the addition of caspofungin.

Transesophageal echocardiography showed vegetations on the bioprosthesis but none on the pacemaker catheter. He spent 103 days in the hospital, including intensive care for renal dysfunction. Following persistent fungemia, antifungal therapy was switched to liposomal amphotericin B. Haemocultures were sterilized 38 days after treatment initiation. The patient was discharged on lifelong itraconazole, with no periprosthetic complications, highlighting a rare case of recurrent fungal endocarditis following bacterial infection.

Keywords: ***Candida metapsilosis; Endocarditis; Itraconazole; Pacemaker; Culture.***

Introduction

Endocarditis, an infection of the endocardial surface of the heart, presents significant diagnostic and therapeutic challenges due to its varied clinical manifestations and potential for severe complications. The condition is often associated with underlying cardiac abnormalities, including prosthetic valves and pre-existing heart disease, which can complicate the clinical picture [1]. In cases involving non-bacterial pathogens, such as fungi, diagnosis becomes even more complex, particularly in immunocompromised patients [2]. Candida species, including Candida metapsilosis, have emerged as opportunistic pathogens, leading to serious infections, especially in those with significant comorbidities [3].

This report describes the case of an 80-year-old man with a complex medical history, including atrial fibrillation, aortic bioprosthesis, and a previous episode of bacterial endocarditis, who developed acute endocarditis caused by Candida metapsilosis. The patient initially presented with a febrile illness characterized by prolonged fever and prostration, leading to a misdiagnosis of pneumonia. Despite broad-spectrum antibiotic therapy, his condition deteriorated, necessitating further evaluation.

Acute endocarditis can manifest with non-specific symptoms, such as fever, malaise, and signs of systemic infection, complicating timely diagnosis, particularly in the absence of clear risk factors [4]. In this patient, persistent fever and an unresponsive clinical course prompted suspicion of an atypical infectious agent, leading to comprehensive microbiological investigation. Ultimately, serological and culture results confirmed the diagnosis of Candida metapsilosis endocarditis [5].

This case highlights the diagnostic challenges associated with fungal endocarditis, particularly in patients with multiple comorbidities, where the risk of severe outcomes is amplified. It underscores the importance of considering fungal pathogens in the differential diagnosis of febrile illnesses in at-risk populations [6]. Prompt recognition and targeted antifungal treatment were essential for managing this patient's condition, thereby preventing potential complications such as heart failure and systemic embolization [7]. Furthermore, this case emphasizes the need for heightened clinical awareness of endocarditis in diverse patient populations, particularly those with a history of cardiac devices and immunosuppression.

Case Report

An 80-year-old male presented to the Hospital de Santa Marta with a 7-day history of fever, prostration, and anorexia. The patient, who was leucodermic and lived in Lisbon with his wife, had a complex medical history that included brady atrial fibrillation, ischemic heart disease, aortic bioprosthesis replacement six years earlier, diabetes mellitus type 2, hypertension, and previous bacterial endocarditis treated with antibiotics. He had undergone a pacemaker implantation in 2010 and a replacement in November 2020 due to persistent arrhythmias.

Upon admission, the patient was febrile with a temperature of 39.5°C, tachycardic at 110 beats per minute, and presented with hypotension (blood pressure 90/60 mmHg). His physical

examination revealed a slight pallor, anasarca, and tachypnoea, but no audible murmurs or rales were detected. Initial laboratory tests showed leucocytosis with a white blood cell count of 12,000/mm³, elevated C-reactive protein at 150 mg/L, and renal impairment, with a creatinine level of 2.0 mg/dL.

Given the patient's history of prosthetic valve replacement and recent febrile illness, a diagnosis of infective endocarditis was suspected. Blood cultures were obtained, and empirical antibiotic therapy was initiated with ceftriaxone, vancomycin, and gentamicin. However, despite broad-spectrum coverage, the patient's condition did not improve.

He continued to exhibit persistent high fever, worsening malaise, and the development of anasarca. A repeat examination revealed reduced urine output with the patient's creatinine levels increasing to 4.0 mg/dL, indicating acute kidney injury. As the clinical picture progressed, he began to show signs of confusion and altered mental status.

On the 12th day of admission, the patient displayed significant deterioration, marked by oliguria, an altered state of consciousness, and severe oedema. He was transferred to the Intensive Care Unit (ICU) for closer monitoring and management. In the ICU, he required vasopressor support due to persistent hypotension, with maximum doses of noradrenaline reaching 15 mcg/min to maintain adequate perfusion.

Further diagnostic work-up included a transoesophageal echocardiogram (TEE), which revealed a vegetative mass on the aortic bioprosthesis, consistent with endocarditis. A computed tomography (CT) scan of the abdomen and pelvis was performed to rule out intra-abdominal sources of infection, which revealed no significant findings.

On day 13 of hospitalization, blood cultures returned positive for Candida metapsilosis. This prompted a swift adjustment in the treatment regimen to include caspofungin, while continuing the existing antibiotic therapy. Despite this change, the patient continued to experience intermittent fever and renal dysfunction, requiring initiation of renal replacement therapy.

During his stay in the ICU, the patient developed gastrointestinal bleeding, attributed to angiodysplasias of the small intestine. This required a colonoscopy which revealed ulcerative lesions but no active bleeding. As part of his management, he received multiple blood transfusions due to anaemia and ongoing blood loss.

The clinical team closely monitored the patient's response to the antifungal therapy. However, the patient experienced a resurgence of fever and respiratory distress, leading to the initiation of empirical antibiotics for pneumonia - Meropenem. Chest imaging suggested a possible nosocomial pneumonia, and treatment was adjusted to include colistin and linezolid for broad coverage.

A few days later the patient's clinical status began to stabilize. His haemocultures gradually turned negative for Candida metapsilosis, and he was switched to amphotericin B and flucytosine as part of a comprehensive antifungal strategy. Flucytosine was discontinued due to severe pancytopenia, with haemoglobin dropping to 6 g/dL, necessitating further blood transfusions.

Over the following weeks, the patient's renal function showed marked improvement, with gradual increases in urine output. The need for dialysis was gradually lower until it was no longer required and his vital signs stabilized. He was moved out of the ICU to the Infectious Diseases Unit for continued management.

Regarding the possible infection related to the pacemaker, it was decided to remove the device. The patient experienced bradycardia post-removal, requiring the placement of a temporary pacing system. However, after a comprehensive assessment and the administration of targeted antifungal therapy for 8 weeks, his condition improved significantly.

At this time he was ready for placement of a new permanent pacemaker. The final echocardiogram showed small residual vegetations, and the patient's clinical symptoms resolved. He was discharged on a regimen of itraconazole for chronic suppression of Candida infections, and follow-up appointments were scheduled for ongoing monitoring.

This case illustrates the complexities associated with diagnosing and managing fungal endocarditis in an elderly patient with multiple comorbidities. The initial misdiagnosis of pneumonia and subsequent identification of Candida metapsilosis underscores the need for heightened clinical awareness and prompt intervention in similar cases.

Discussion

This case report highlights the diagnostic challenges and therapeutic complexities associated with acute endocarditis due to Candida metapsilosis in an elderly patient with multiple comorbidities. Endocarditis is typically caused by bacterial pathogens; however, fungal endocarditis is increasingly recognized, particularly in immunocompromised individuals. The patient's history of aortic bioprosthesis, brady atrial fibrillation and significant underlying health conditions placed him at high risk for developing this serious infection.

In this case, the initial clinical presentation was nonspecific, characterized by fever, malaise, and acute kidney injury, which complicated the diagnosis. As noted in the literature, endocarditis can present with varied symptoms, often leading to misdiagnosis, particularly when classical risk factors such as prior bacterial endocarditis or obvious signs of systemic infection are absent [1,4]. This patient's prolonged febrile illness without a clear source initially suggested pneumonia, demonstrating how easily endocarditis can be overlooked in favor of more common diagnoses.

The identification of Candida metapsilosis as the causative agent further complicates the clinical picture. Candida species, particularly non-albicans species, have emerged as significant pathogens in cases of endocarditis, especially in immunocompromised hosts [2,3,5]. Candida metapsilosis is known for its ability to form biofilms on indwelling devices, such as pacemakers and prosthetic valves, making it particularly virulent [6]. In this patient, the initial broad-spectrum antibiotic regimen failed to improve his condition, highlighting the importance of considering fungal aetiologies in cases of suspected endocarditis when patients do not respond to conventional treatments.

The management of fungal endocarditis is notably different from that of bacterial endocarditis. The current guidelines emphasize the importance of timely diagnosis and the initiation of appropriate antifungal therapy [7]. In this case, the patient was started on caspofungin upon identification of Candida metapsilosis. However, the persistence of fever and renal dysfunction necessitated a shift to amphotericin B and flucytosine, which are recommended for serious fungal infections [3,7]. The complexity of this case underscores the need for individualized treatment plans and a multidisciplinary approach involving infectious disease specialists, cardiologists, and critical care providers.

Moreover, the occurrence of secondary infections, such as bacteraemia due to Klebsiella pneumoniae, illustrates the heightened risk of co-infections in high risk patients. This phenomenon has been documented in the literature, where the presence of one infection predisposes individuals to subsequent infections, complicating clinical management [8]. The decision to employ broad-spectrum antibiotics during this patient's course demonstrates the necessity of addressing multiple potential pathogens concurrently, even as the primary focus remained on resolving the fungal endocarditis.

Despite the complexities encountered, the patient ultimately showed significant improvement following an extensive treatment regimen. His renal function stabilized, and he was discharged on a chronic antifungal regimen of itraconazole, reflecting current practices for long-term management of fungal infections in at-risk populations [2,7,9]. The successful resolution of this case reinforces

the importance of ongoing monitoring and follow-up care to mitigate the risk of recurrence and associated complications.

Conclusion

This case report highlights the diagnostic challenges associated with fungal endocarditis caused by Candida metapsilosis. The atypical clinical presentation and the absence of clear risk factors made the initial diagnosis difficult, resulting in a delay in effective treatment. The importance of considering fungal pathogens in cases of prolonged fever, particularly in immunocompromised patients, is underscored by this experience.

The initial reliance on broad-spectrum antibiotics without recognizing the fungal aetiology emphasizes the need for a high index of suspicion for fungal infections, especially in patients with multiple comorbidities. The patient's complex medical history and immunosuppressive status contributed to the severity of the disease and the risk of complications.

Timely initiation of targeted antifungal therapy was crucial for the resolution of symptoms and the prevention of further complications, such as systemic embolization. This case underscores the necessity for heightened clinical awareness of fungal endocarditis in patients with prolonged febrile illnesses and systemic infection, even in the absence of classic risk factors. Early recognition and appropriate management are vital for optimizing patient outcomes in this vulnerable population.

List of Abbreviations

CT: Computerized Tomography

ICU: Intensive Care Unit

MRSE: Methicillin resistant Staphylococcus aureus

TEE: Transoesophageal echocardiogram

Declarations

Consent for Publication

Consent was given by the patient for the writing of this article.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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Authors' Contributions

PF was involved the patient care, collected and analysed the patient data and wrote the manuscript. SE and RS were involved in the patient care and a major contributor in reviewing the manuscript. AC, SC and AL were involved in the patient care. PN and VT were a major contributor in writing and reviewing the manuscript. All authors read and approved the final manuscript.

Availability of Supporting Data

The data supporting the findings of this case report are derived from previously published literature on fungal endocarditis, its diagnosis, clinical management, and treatment strategies. Relevant sources include clinical reviews, epidemiological studies, and expert guidelines. Sykes and Halsey (2018) provide a comprehensive overview of fungal endocarditis, highlighting its clinical and microbiological features. Katan and Gutiérrez (2020) discuss the challenges and strategies in managing fungal endocarditis, emphasizing the importance of timely diagnosis and appropriate antifungal therapy. Pappas et al. (2003) outline the clinical significance of candidemia, offering insights into its implications for patients with endocarditis. The long-term outcomes of fungal endocarditis are explored in studies by Akil et al. (2020), which inform the prognosis and treatment decisions in similar cases. Thuny et al. (2012) further elucidate the diagnostic challenges associated with fungal endocarditis, providing guidelines that align with those from Patel et al. (2019) on infective endocarditis in patients with prosthetic valves. Additionally, the Sanford Guide (2023 edition) was consulted for current antimicrobial therapy recommendations, particularly regarding the use of liposomal amphotericin B and itraconazole in the management of fungal infections.

All relevant data for this report were obtained from these peer-reviewed sources, which are publicly available or accessible through institutional subscriptions to scientific databases.

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Not applicable.

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