Case Report

Candida albicans Endocarditis in a Child With Acute Lymphoblastic Leukemia: A Rare Case Report

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ABSTRACT

Fungal endocarditis is rare and has a mortality rate of over 80%. It must be suspected in all immunocompromised patients with culture-negative sepsis and failure of antibiotic treatment. In such cases, echocardiography can be diagnostic.

We herein describe a child with *Candida albicans* endocarditis presenting with heart failure, severe jaundice, and anasarca. A large obstructive mass of the tricuspid valve was detected by echocardiography, and blood culture confirmed the diagnosis. The patient was successfully treated with the surgical excision of the vegetation and intravenous liposomal amphotericin B for 3 weeks. ***(Iranian Heart Journal 2022; 23(1): 220-222)***

KEYWORDS: Fungal infection, Childhood cancer, Candida endocarditis

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Hospital-acquired endocarditis is often associated with unusual pathogens such as *Candida albicans*, *Aspergillus Spp*, and Gram-negative organisms. These patients usually have central venous catheters, and the right side of their heart is always involved. [1] Other predisposing factors are broad-spectrum antibiotics and immunosuppressive agents. In this population, *Candida albicans* is increasingly recognized as the causative organism. [2] Acute lymphoblastic leukemia (ALL), as the most common pediatric malignancy, is a risk factor for fungal endocarditis. Predisposing factors in these patients are prolonged neutropenia, steroid use, and intensive chemotherapy. Given the high mortality rate of about 80%, these patients need the prompt initiation of therapy with both antifungal medications and surgery. [2]

Clinical Summary

A 4-year-old girl with a history of ALL of 9 months' duration was admitted to our hospital due to relapse. While on the standard protocol for relapsed ALL, delivered through a chemo port, the patient developed fever, low blood pressure, tachycardia, ascites, and edema. She became severely icteric, with episodes of convulsions. On physical examination, she was ill, drowsy, and edematous most strikingly on her face with periorbital puffiness. No significant murmur was audible. The lungs were clear on auscultation. She had a blood pressure of 70/50 mm Hg, a heart rate of 126 bpm, and a

respiratory rate of 24 breaths per minute. Laboratory tests showed a hemoglobin level of 9 g/dL, a platelet count of 28000/hpf, an erythrocyte sedimentation rate of 20, a total bilirubin level of 12.6 mg/dL, a direct bilirubin level of 7.8 mg/dL, an albumin level of 2.1 g/dL, and 3+ proteinuria in urine. Blood gas tests showed hypokalemic alkalosis due to diuretic therapy.

The initial investigation for fever yielded no results for the source of infection, and the patient received antibiotics according to the hospital protocols. However, the fever persisted, and echocardiography showed an obstructing mass in the right atrium (4×5 cm in size), consistent with vegetation and endocarditis. The mass had caused severe tricuspid stenosis. With the suspicion of fungal endocarditis, amphotericin B was initiated. Due to the deterioration of her condition, the patient was transferred to the operating room for the emergent surgical excision of the mass.

Surgical Procedure

Surgery was performed through a median sternotomy. Cardiopulmonary bypass was performed using aortic and bicaval cannulation. Under normothermic bypass and beating heart, the right atrium was opened. A huge mass (4×5 cm in size) with attachments to the atrial side of the tricuspid wall and with a rough, fragile, and lobulated surface was observed and excised. The tricuspid surface was shaved with surgical curettes in such a way that the tricuspid valve remained virtually intact (Fig. 1). The total bypass time was 73 minutes. The patient was separated from bypass easily. The postoperative period was uneventful. Direct examination of the mass showed invasive pseudohyphae and pathogenic yeast bodies in huge numbers. The culture was positive for *Candida albicans*.

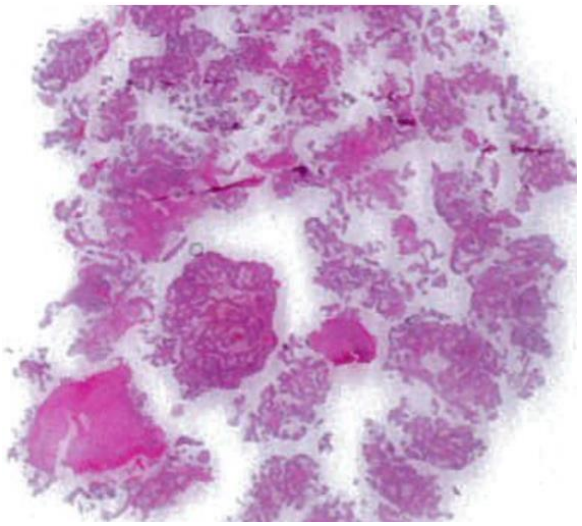

Figure 1. Gross histological section from right atrial vegetation is presented herein.

DISCUSSION

Fungal endocarditis is primarily seen in immunocompromised patients such as cases of bone marrow transplantations and malignancies. ALL, as the most common cause of pediatric malignancy, is a predisposing condition. [3] These patients may have leukemic myocardial infiltration, but true intracardiac masses or vegetation are rare. [4] Predisposing factors for infection include the use of indwelling central venous catheters, malnutrition, chemotherapy, and frequent hospitalization. Central venous lines by disrupting the atrial endothelial layer can initiate thrombus formation, on which microorganisms may adhere and cause subsequent endocarditis. [5]

Endocarditis caused by *Candida albicans* is very rare, with only 22 cases found between 1970 and 1999 through MEDLINE searches. [6] Mortality associated with fungal endocarditis may be as high as 80%. [2] Although there are some reports of the successful treatment of the condition with the use of either antifungal medication or surgery alone, in most cases, both treatments are necessary. [2] Some conditions require surgery, usually urgently, such as prosthetic

valve endocarditis, hemodynamic instability, and inadequate response to antifungal drugs or obstructive lesions. In our case, the patient's low cardiac output and exacerbated condition prompted us to perform surgery. The surgical results were striking as her condition was rapidly stabilized, icterus and edema were resolved rapidly, and her mental status became normal.

CONCLUSIONS

Fungal endocarditis must be suspected in any febrile pediatric patients with immunodeficiency and indwelling central venous catheters. The diagnosis is challenging, and blood culture may be negative. Surgery is needed in most patients because it provides direct specimens for pathology and culture. Accordingly, surgery has both therapeutic and diagnostic values.

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