Early Surgical Intervention and Optimal Medical Treatment for *Candida parapsilosis* Endocarditis

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Abstract

We herein report the case of a 72-year-old man with endocarditis of the aortic valve who underwent urgent aortic valve replacement 36 hours after admission due to an aggravation of aortic valve regurgitation. Postoperative cultures of the blood and site of valve vegetation identified *Candida parapsilosis* as a pathogen. Antifungal therapy with amphotericin B and fluconazole was initiated after surgical treatment. Thereafter, the patient displayed a favorable clinical course. *Candida parapsilosis* endocarditis involving the native valves is extremely rare and associated with a very high mortality rate. Prompt surgical treatment and the aggressive use of antifungal agents are required to save the patient's life.

Key words: *Candida parapsilosis*, endocarditis, native valve, surgery

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Introduction

Fungal endocarditis is an uncommon disease, accounting for only 1.3-6% of all cases of infectious endocarditis (1). *Candida albicans* represents the main etiology of fungal endocarditis. Although fungal endocarditis caused by *Candida parapsilosis* is very rare, it is a serious disease associated with a high mortality rate (2). We herein report a case of *Candida parapsilosis* fungal endocarditis involving the native aortic valve in which the patient survived due to early surgical intervention and optimal medical treatment.

Case Report

A 72-year-old man was admitted to our hospital complaining of severe dyspnea. He had been hospitalized 12 years ago for alcohol dependence, after which he stopped consuming alcohol. The patient had no history of diabetes. Prior to admission to our hospital, he had been admitted to a local hospital due to *Legionella* pneumonia and received doripenem hydrate for 14 days. During two months of hospitalization, he also received vancomycin hydrochloride for 16 days for methicillin-resistant *Staphylococcus aureus* infection of a central venous catheter. His body temperature had been 39.0°C on admission; however, it decreased to 37.0°C after antibiotic treatment. One month after discharge from the local hospital, he was admitted to our hospital with clear consciousness and a blood pressure of 96/54 mmHg, heart rate of 103 beats/min and body temperature of 36.7°C. A grade III/VI blowing diastolic murmur was heard maximally at the third to fourth intercostal space along the left sternal border. No Janeway lesions or Osler nodes were detected. The percutaneous oxygen saturation was 96% under oxygen inhalation via a face mask at 4 L/min. The following laboratory findings were obtained: a white blood cell count of 4.70×10⁹/L, red blood cell count of 2.93×10¹²/L, hemoglobin level of 8.0 g/dL, C-reactive protein level of 7.9 mg/dL, brain-type natriuretic peptide level of 2,231 pg/mL, procalcitonin level of 0.34 ng/mL and β-D-glucan level of 239 pg/mL. An electrocardiogram showed no significant abnormalities except for sinus tachycardia, while a chest X-ray disclosed cardiomegaly and pulmonary congestion. In addition, echocardiography showed a large area of vegetation (10×10 mm) on the non-coronary cusp of the aortic valve with moderate aortic regurgitation (Fig. 1). Based on these

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showed a large fungal mass widely distributed around the area of vegetation. A histopathological examination showed the presence of vegetable on the aortic valve (arrow) with moderate aortic regurgitation (arrowhead). LV: left ventricle, RV: right ventricle, LA: left atrium, AO: aorta, AV: aortic valve

**Figure 1.** Transthoracic echocardiography performed on the first day of admission. A long-axis view (A) and short-axis view (B) at the left sternal border showed a large area of vegetation (10x10 mm) on the non-coronary cusp of the aortic valve (arrows). Color Doppler imaging in the apical view (C) disclosed the presence of vegetation on the aortic valve (arrow) with moderate aortic regurgitation (arrowhead). LV: left ventricle, RV: right ventricle, LA: left atrium, AO: aorta, AV: aortic valve

**Figure 2.** Histopathological findings of the site of vegetation based on periodic acid-Schiff (PAS) staining. (A) A large fungal mass stained dark purple was found to be widely distributed around the area of vegetation, although inflammatory cells were absent. (B) The large fungal mass was widely distributed throughout the site of vegetation, whereas minimal inflammatory cells were present (arrows).

findings, a diagnosis of infective endocarditis was suspected. As methicillin-resistant *Staphylococcus aureus* had been isolated from a blood culture performed at the local hospital, intravenous antibiotic therapy with vancomycin (1.5 g/day) was started. Initially, surgical treatment was postponed because the patient was hemodynamically stable. However, on the second day after admission to our hospital, his blood pressure and arterial blood oxygen saturation both decreased. Furthermore, echocardiography demonstrated serious aggravation of aortic regurgitation; therefore, a biological prosthetic valve was urgently replaced 36 hours after admission. According to the operative findings, the vegetation adhered to the non-coronary and right coronary cusps of the native aortic valve. The results of a preoperative blood culture, which were evident on the second postoperative day, showed *Candida parapsilosis* as a causative pathogen. In addition, *Candida parapsilosis* was isolated from a culture of the area of vegetation. A histopathological examination showed a large fungal mass widely distributed around the site of vegetation, although with minimal infiltration of inflammatory cells (Fig. 2). A blood culture performed on the fifth hospital day also isolated *Candida parapsilosis*. Consequently, liposomal amphotericin B (250 mg/day) was administered for nine weeks. Following nine weeks treatment and a negative blood culture, the antifungal agent was switched to fluconazole (100 mg/day). Thereafter, the patient demonstrated a favorable clinical course.

**Discussion**

*Candida* endocarditis occurs primarily in subjects with one or more of the following risk factors: recreational drug abuse, prolonged intravenous hydration, previous cardiovascular surgery, malignancy, malnutrition, use of multiple antibiotics, corticosteroid therapy or a central venous catheter (3-5). *Candida parapsilosis* is an important nosocomial pathogen found on 26% of the hands of health-care workers, although it is a rare cause of infectious endocarditis (6).
Candida parapsilosis endocarditis is often detected on prostatic, but rarely native, valves (6). The present patient underwent urgent aortic valve replacement 36 hours after admission due to aggravation of aortic valve regurgitation, and Candida parapsilosis was subsequently identified as a pathogen for endocarditis based on a culture of the site of vegetation and a preoperative blood culture. In this case, the use of two antibiotics at the local hospital (doripenem and vancomycin) may have been a predisposing risk factor, whereas the patient’s prior history of alcohol dependence was not associated with the onset of endocarditis. Since Candida parapsilosis results in biofilm formation, it has recently been identified to be a major cause of catheter-related infections (7, 8). In the current case, the use of a central venous catheter at the local hospital may have been another predisposing risk factor. A histopathological examination of the vegetation tissue demonstrated a large fungal mass widely distributed around the site of vegetation without obvious inflammatory cell infiltration, which appeared to correspond to fungal endocarditis, but not specifically Candida parapsilosis endocarditis. The Infectious Diseases Society of America (IDSA) guidelines recommend the administration of liposomal amphotericin B with or without flucytosine for native valve fungal endocarditis. Aggressive valve replacement and postoperative antifungal treatment with these agents are also recommended, and the initial induction therapy should be applied for at least six weeks. In addition, the IDSA guidelines recommend the use of subsequent long-term (or lifelong, if needed) suppressive therapy with fluconazole (9). In this case, no recurrence was noted under continuous oral fluconazole treatment. Although the present patient experienced life-threatening hemodynamic instability, the administration of aggressive urgent surgical treatment followed by prolonged antifungal medication resulted in a favorable outcome.

Candida parapsilosis fungal endocarditis involving the native valves is very rare. However, due to its high mortality rate, obtaining an early diagnosis and providing prompt surgical intervention with optimal medical treatment is necessary to save the patient’s life.

The authors state that they have no Conflict of Interest (COI).

References