Bentall Endocarditis by *C. Lusitaniae* After COVID-19: The Finger Covers The Moon

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Abstract

We report a case of endocarditis months after a Bentall procedure. This was caused by *Candida Lusitaniae,* in an immunocompetent patient with a recent SARS-CoV-2 infection. The patient underwent a new Bentall procedure. SARS-CoV-2 has been associated with co-infection by *Candida* species since the beginning of the pandemic, nevertheless, *Candida Lusitaniae* remains a very uncommon causative agent of prosthetic endocarditis. We suggest a possible role of the SARS-CoV-2, which may have delayed the diagnosis of endocarditis and the appropriate therapy.

Introduction

Fungal co-infection could be associated with SARS-CoV-2 viremia.[1] Few articles in the literature describe bacterial endocarditis following SARS-CoV-2 disease, however, there are no reports of fungal endocarditis. Furthermore, *Candida Lusitaniae,* first described as a human pathogen in 1979,[2] is an exceptionally rare cause of prosthetic valve endocarditis (PVE).[3,4] The mortality rate of *Candida* endocarditis is greater than 50%,[5] but in cases where *C. Lusitaniae* has been isolated, it reaches 100%.[3,4] We report the case of a boy with a *C. Lusitaniae* PVE diagnosed soon after a SARS-CoV-2 infection, who underwent a mechanical Bentall procedure with a good early clinical outcome.

Case Report

A 21year-old boy with regurgitant unicuspid aortic valve underwent a mechanical Bentall procedure. The postoperative course was uneventful. Eight months later he was febrile and diagnosed with COVID-19 disease. The clinical course of this infection was not atypical and resolved with no apparent complications. A month later, he suffered febrile relapse, initially attributed to SARS-CoV-2 infection and he went to the Emergency Room. On physical examination, the patient was febrile (temperature 38.5 °C) and hemodynamically stable. Laboratory results showed leukopenia (white blood cell count $3.1 \times 10^3/mm^3$) with absolute neutropenia (48%) and a C-reactive Protein of 23 mg/dL. Chest X-ray was normal. A diagnostic work-up for PVE was initiated and a transthoracic echocardiography showed normal left ventricular function, normal movement of the prosthetic valve discs and a large mobile vegetation (>1cm) located between the left main coronary trunk and the prosthetic valve ring. A subsequent transesophageal echocardiography confirmed these findings (Figure 1). Endocarditis was diagnosed and blood culture samples tested positive for *Candida Lusitaniae*. According to the antibiogram, anti-fungal therapy with Caspofungin was instituted. To complete the diagnostic process, a total body contrast CT scan was performed. A hypodense mass was evident at the aortic level (Figure 2) adhering to the aortic graft. The spleen was enlarged and an ischemic image was highlighted. We speculated that this was likely related to a possible embolic event. A complete lymphocyte typing was performed and results were within normal limits. The patient reported no recreational drug abuse and tested negative for HIV. He had not received any steroid therapy in the past three months. Although the patient was on Caspofungin for only 6 days, as the vegetation was voluminous, of fungal origin, and as there had been a presumed embolic event, surgery was deemed necessary. The patient was operated on and a redo Bentall aortic root replacement procedure was performed using a new composite mechanical valve/graft. The infected valve prosthesis showed a 1.5 cm yellowish friable vegetation located between the left main coronary artery and the prosthetic valve ring. The original prosthesis tested positive for *Candida Lusitaniae*. The postoperative course was uneventful. On the 16th postoperative day, antifungal therapy was changed from Caspofungin to Fluconazole, which was discontinued four weeks later. He was eventually discharged home and is currently in follow-up.

Comment

In the case we describe, the previously immunocompetent patient did not report any drug abuse or other high-risk behavior. Few cases of bacterial endocarditis following SARS-CoV-2 infection have been reported during this pandemic event. However, SARS-CoV-2 has been associated with immune dysregulation and candidiasis.[1,6] We hypothesize that the previous COVID-19 disease may have triggered a transient immunodeficiency that predisposed the patient to this unusual infection. As a matter of fact, there are recent reports suggesting a possible role of the SARS-CoV-2 virus in the predisposition of patients to infective endocarditis. In the case we report, the patient had a SARS-CoV-2 infection whose course was almost uneventful, with the exception of fever, and which did not require the use of steroids. It may be possible that during this period there was a latent co-infection related to *C. Lusitaniae*. We cannot exclude the possibility that the history of recent SARS-CoV-2 infection contributed to a delay in the diagnosis of this complication, as has been described by others in cases of infective endocarditis.[7,8] We recognize that the endocarditis, which occurred in the first year after surgery, could be directly related to the previous surgical procedure. However, in the two cases previously described,[3,4] the clinical onset of the infection occurred within a few weeks/months of surgery.

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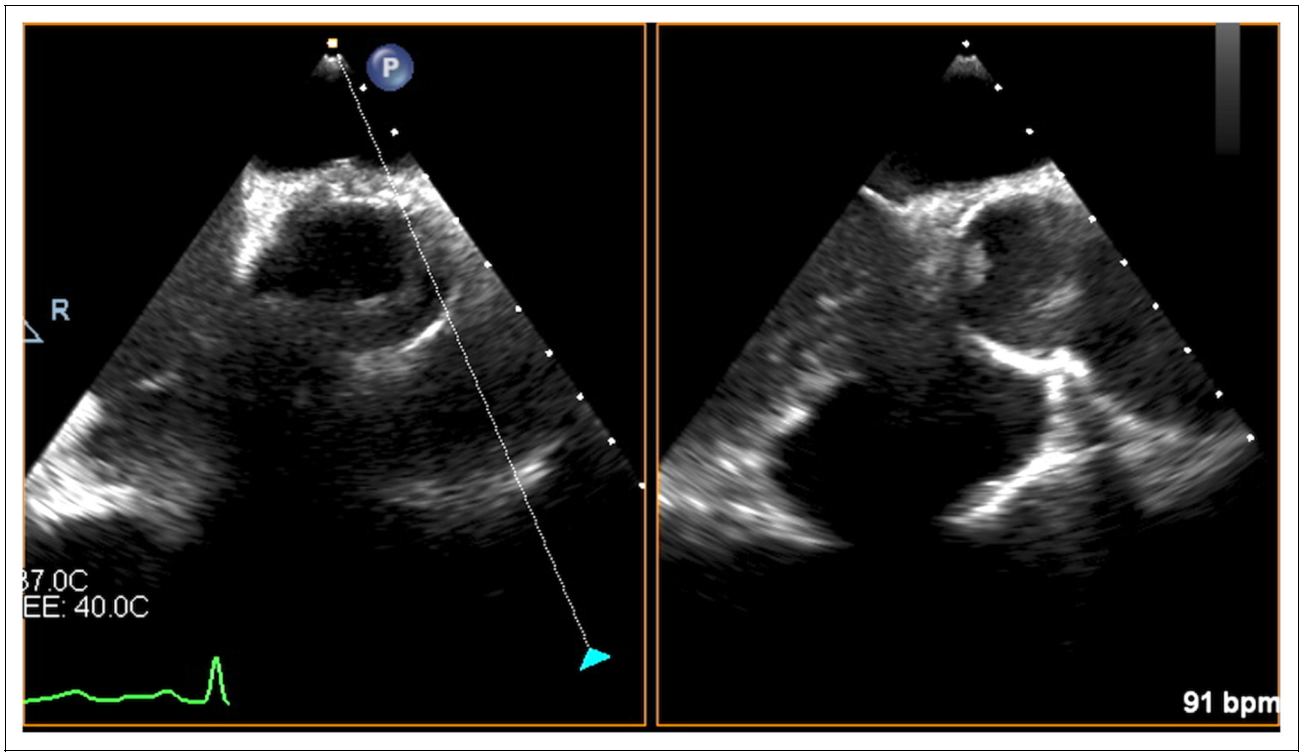

Figure 1. Transesophageal echo: middle esophageal, bi-plane short axis and long axis view of the vegetation in the aortic graft.

In our opinion, the best treatment for overcoming fungal infection on prosthetic material is surgery. The facts that the patient was young, that he had already undergone two previous surgeries and he was approaching his second Bentall, that it was possible to remove all the prosthetic material, and that the native annulus was apparently not involved in the infectious process, convinced us that a new mechanical Bentall would be a reasonable and safe strategy for this patient. Taking down a previous Bentall to perform a new Bentall operation posed obviously surgical difficulties.

Our case reinforces the importance of active alertness and low diagnostic thresholds for endocarditis in any febrile patient with a prosthetic valve. Clinical presentation is often atypical and the diagnosis is difficult, so persistent fever should trigger suspicion of PVE, even in the setting of current or recent COVID-19 infection.

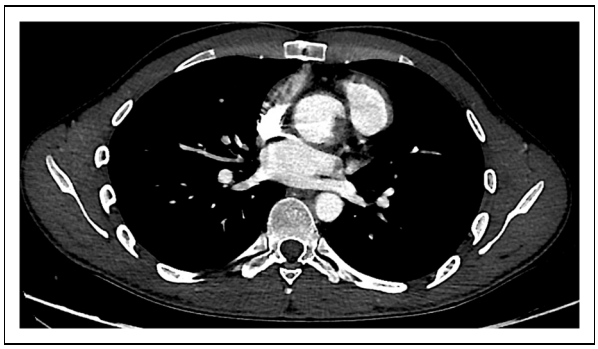

Figure 2. CT scan: vegetation highlighted in the lumen of the aortic graft.

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Author's Statement

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