Case Report

Cardiac candidiasis – An unexpected sudden cause of death with review of literature

Kanika Taneja*1, Shilpa Garg2, Nisha Sharma1, Arsh Gupta1, Sonia Hasija1 and Aditi Arora3

1Department of Pathology, Pt. B.D. Sharma PGIMS Rohtak, Haryana, India
2Department of Pathology, Shaheed Hasan Khan Mewati Govt Medical College, Nalhar, Mewat, India
3Department of Pathology, Ram Manohar Lohia Institute of medical sciences Vibhuti Khand Gomti nagar Lucknow, India

*Correspondence Info:
Dr. Kanika Taneja
Department of Pathology,
Pt. B.D. Sharma PGIMS Rohtak, Haryana, India
E-mail: drkanikataneja09@gmail.com

Abstract
Introduction: The incidence of invasive fungal disease has dramatically increased over the past few decades. Major risk factors include administration of broad spectrum antibiotics, corticosteroids and cytotoxic agents, invasive medical procedures and human immunodeficiency virus infection.
Case report: we report a case of myocardial candidiasis as incidental post mortem finding in 35 years old male whose probable cause of death was injury with sharp weapon.
Conclusion: Premortem diagnosis of fungal myocarditis is difficult since clinical findings of myocardial involvement are often absent or ambiguous and blood cultures are often negative. The disease is frequently fatal and usually first discovered at autopsy.
Keywords: myocardium, fungus, candida

1. Introduction

Candidiasis is a disease caused by fungi of Candida species which are part of the normal flora of the upper respiratory, gastrointestinal and female genital tracts of the human body. The most common species resulting in Candida infection is Candida albicans which causes an opportunistic infection occurring only in those with impaired immunity. Candida infections are usually superficial. However, occasionally they may infect the bloodstream and reach the deeper organs of the body like the kidneys, lungs, brain, heart and other structures. Cardiac infection by fungi was rarely reported in the past, but now they are increasingly recognised as major pathogens especially in critically ill patients.1 Factors proposed for the rise in invasive fungal infections include the use of immunosuppressive agents, broad-spectrum antibiotics, long-term catheterisation, hemodialysis and parenteral nutrition.2 The clinical diagnosis of cardiac Candidiasis is difficult. The disease is frequently fatal and usually first discovered at autopsy.3

We present here a case of cardiac Candidiasis/ Candida myocarditis diagnosed at autopsy in a clinically unsuspected case where the patient died due to unrelated reasons.

2. Case Report

The deceased was a 35 year old man who succumbed to injury inflicted with a sharp iron rod. Before death patient was apparently healthy and had no significant medical illness. HIV status of the deceased was not known. Post mortem performed revealed pus in bilateral pleural cavities. Heart was unremarkable. Other organs showed mild congestion. Based on the above post-mortem findings brain, heart, lungs, liver, spleen and kidney were received in our pathology department for histopathological examination. On gross examination, the heart and brain were unremarkable, while the lungs, liver, spleen and kidney showed autolytic changes, the latter confirmed on microscopic examination. The heart on microscopic examination showed multiple foci of myocardial necrosis along with spores and pseudohyphae of Candida and mixed inflammatory infiltrate in the surrounding myocardium comprising of lymphocytes, neutrophils and plasma cells. Spores and pseudohyphae of candida were highlighted by PAS and GMS special stains. Hence a diagnosis of cardiac Candidiasis was made.

Figure 1: Photomicrograph revealing multiple candidal microabscesses with an admixture of organisms and acute inflammatory cells (H&E X40)
3. Discussion
Cardiac fungal infections and specifically myocarditis are clinically difficult to diagnose. Although Hurley\(^1\) described the first case of a fungus (Blastomyces dermatitidis) infecting the right atrium, the first completely documented case of Candidal endocarditis was reported in a heroin addict in 1940. Since then the number of reported cases with cardiac involvement are increasing, this being an under-recognised entity in past years. Azizov \(^et\ al\)\(^2\) in an analysis of autopsy material from 40 patients showed that myocardial involvement by Candida was possible and was not as rare as an entity as previously accepted. Increased recognition of this condition is possible nowadays because of improved blood culture techniques, better section-cutting, special stains for identifying fungal hyphae and an addition of knowledge from autopsy studies.

Fungus can cause endocarditis, myocarditis as well as pericarditis and are usually due to multiple therapeutic interventions. Fungal endocarditis occurs in patients undergone any cardiac surgery or pre-existing valvular heart disease. Fungal myocarditis is frequently associated with gastrointestinal surgery, prolonged multiple antibiotic use and corticosteroid therapy. Pericarditis is seen in patients undergone pericardiectomy and on immunosuppression therapy. Pancarditis can develop as a progression of myocarditis to involve endocardium and pericardium.\(^1,2\)

Clinically manifestations of bacterial endocarditis are not seen in fungal endocarditis. Fever, anaemia and leukocytosis reported in 50% of patients and a new murmur in <25% patients. Embolic manifestations are seen in 1/3 of patients. However, absence of these symptoms and signs should not reduce the suspicion of fungal infection in the patients at risk. Fungal myocarditis occurs in the setting of fungal sepsis and is very difficult to diagnose before death. Myocarditis did not cause the embolic complications or new murmurs of endocarditis. However, contiguous myocardial abscesses may extend into the pericardial space and can cause pericarditis.\(^3\)

Candida and cryptococcal species are two most common yeasts involving the heart. Most common filamentous fungi isolated are aspergillus but fusarium, scedosporium, penicillium and zygomycetes are also seen. Candida is overwhelming cause of myocarditis whereas aspergillus is an important cause of endocarditis and serious complications.\(^4\)

Myocarditis is characterised as per “Dallas criteria” by presence of an inflammatory infiltrate and myocyte necrosis or degeneration. The inflammatory infiltrate is usually lymphocytic, which may be mixed with neutrophils and histiocytes depending on etiology. Fungal myocarditis in addition shows spores and hyphae of the causative fungus, seen as refractile structures. The morphology of the fungus can be better identified with special stains like PAS and GMS, which highlight the fungal spores and hyphae as bright pink and black respectively.

The gross appearance of a heart with Candidal myocarditis can vary from a completely normal morphology to grossly visible myocardial abscesses. Walsh \(^et\ al\)\(^5\) in an analysis of 51 autopsy cases of fungal carditis concluded that only 29% of the hearts with myocarditis showed grossly visible abscesses. In our case too, heart was grossly normal, the pathology being revealed only on microscopy. Walsh and colleagues also reported in their study that Candida was the most common fungus infecting the heart.\(^3\)

Few diagnostic modalities those can be used for early detection of fungal infection of heart include blood culture, echocardiography and serologic determination of precipitin antibodies against the cytoplasmic constituents and cell wall of candidal organisms by immunoelectrophoresis.\(^6\)

The importance and consequences of fungal myocarditis have been stressed only recently.\(^7\) Franklin \(^et\ al\)\(^8\) reported arrhythmias and conduction defects due to myocarditis. Candidal myocarditis can cause complete heart block at the bundle of His.

Early diagnosis is difficult but very crucial for successful treatment. Delay in diagnosis can lead to embolization to extracardiac sites, invasion of myocardium and poor penetration of drugs into vegetation. So most of these cases are diagnosed as incidental post-mortem findings.\(^1\)

To conclude, post mortem candidal infection of the heart should be reported as it may contribute to patient death. This is important as fungal myocarditis is difficult to recognize clinically. Moreover, more studies should be conducted for diagnosis of Candida infection so that patient death could be prevented.

References