

Case Report of Invasive Candidiasis with Cavitory Lung Lesion in A Post-Covid-19 Diabetic Patient

Harveen Kaur¹, Dilbag Singh¹, N.C Kajal¹, Rupali²

¹Department of Pulmonary Medicine, Government Medical College, Amritsar, Punjab, India

²ENT Departments, Government Medical College, Amritsar, Punjab, India

Abstract

There have been reported several complications after corona virus disease-2019 (COVID-19). Superinfections, especially secondary fungal diseases are now on rise in post-COVID-19 patients. Candida usually reflects airway colonization and true Candida pneumonia is rare but, can occur after hematologic dissemination from other body sites, such as the skin, gastrointestinal and genitourinary tract. Diabetes mellitus (DM) is an independent risk factor for both severe COVID-19 and increased susceptibility to fungal infections. We describe a case of invasive candidiasis in a 72-year-old post-COVID-19 diabetic male, who presented with cough, fever and cavitory lesion in lung seen on contrast-enhanced computed tomography (CECT) Chest. The patient's sputum and blood cultures were positive for Candida.

Keywords: Invasive Candidiasis • Cavitory lesion • COVID-19 • Diabetes Mellitus (DM) • CECT Chest

Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is associated with many opportunistic bacterial and fungal infections. The main fungal pathogens reported for co-infection in people with COVID-19 are both Aspergillosis and Candida.

Although in the background of COVID-19 pandemic, Mucormycosis is seen more often in immunocompromised individuals and *Aspergillus fumigatus* is an important reason of fungal super-infections among critically patients, but the incidence of candidiasis in such patients is yet to be evaluated.

The hematogenous spread of Candida, rather than oropharyngeal secretion aspiration is responsible for lung infection. The various predisposing factors include immunosuppression, neutropenia, sepsis, prolonged antibiotic use, total parenteral nutrition.

Individuals with DM have several alterations in cell-mediated immunity, such as chemotaxis, phagocytosis and cytokine secretion along with reduced natural killer cell activity, which affects the host response and paves the way for secondary fungal infections.

The various radiological presentations of pulmonary candidiasis can vary from pneumonia, nodules, ground-glass opacity, micro-abscesses, miliary patterns, bronchial wall thickening and a rare occurrence of cavitory lesions.

High mortality is reported in adult patients of invasive candidiasis, approximately 15%-25% infected individuals.⁵ Thus, it is important to have a high index of suspicion for fungal coinfection in post-COVID-19 patients with comorbidities, who present with worsening symptoms.

All studies of fungal infections reported in COVID-19 patients usually occur mostly 14 days after appearance of COVID-19 symptoms. In the current case, the patient was previously diagnosed with COVID-19 one and a half month back; after a few weeks from his recovery, he developed breathlessness, cough and fever again.

Case Report

A 72-year-old diabetic male, post-COVID-19 infection presented with chief complaints of fever, cough and breathlessness. Cough was associated with small amount of expectoration, progressively worsening for 15 days. He was a known diabetic, with poor glycaemic control. He had no previous history of tuberculosis.

Five weeks before this complaint, he had cured of COVID-19.

On physical examination, he was alert, pale, febrile 101.0F and oxygen saturation 94% on room air. On auscultation basilar crackles on left side present with normal heart sounds.

*Address to correspondence: Harveen Kaur, Department of Pulmonary Medicine, Government Medical College, Amritsar, Punjab, India; E-mail: hk_94basra@gmail.com

Copyright: © 2021 Harveen K, et al. This is an open-access article distributed under the terms of the creative commons attribution license which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Received: 04 October, 2021; Accepted: 18 October, 2021; Published: 26 November, 2021

Initial laboratory evaluation revealed – Haemoglobin 9.1 g/dl; TLC 14,000; HbA1c 10.4; renal and liver function tests were within normal limits. Mantoux test was negative. Sputum for AFB was negative and sputum for CBNAAT did not detect *Mycobacterium tuberculosis*. Sputum and blood cultures tested positive for *Candida*.

CECT Chest showed areas of consolidation with cavitation and surrounding coarse ground glass opacities (GGO) along with inter & intra lobular septal thickening in left upper lobe along with pleural thickening in apical region and focal invasion of the left subclavian artery.

Bronchoscopy with bronchoalveolar lavage subsequently showed white exudate and examination of tissue culture obtained during transbronchial biopsy revealed *Candida*.

The patient was started on antifungal medications. Subsequently, repeat blood cultures tested negative for fungus.



Figure 1. Chest X-ray showed areas of consolidation with cavitation in left upper lobe along with elevated left dome of diaphragm.

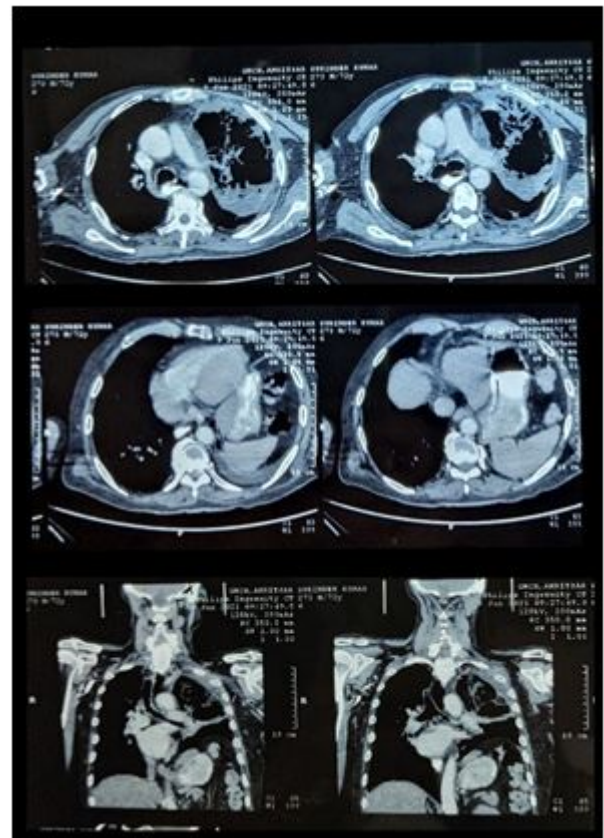


Figure 2. CECT Chest showing consolidation with cavitation and surrounding coarse ground glass opacities (GGO) along with inter & intra lobular septal thickening in left upper lobe.



Figure 3. Budding yeast cells seen on Gram staining of bronchoalveolar lavage.

Discussion

Recently, the pandemic of COVID-19 has paved way for super-infections in individuals with immune alterations. In majority of the viral respiratory diseases, such as influenza, SARS, MERS, and others secondary infections are a well-described occurrence. But in COVID-19 pneumonia, super-infections and co-infections are under exploration. Presence of comorbidities, including DM further predispose an individual to secondary fungal infections.

The wide usage of antibiotics, steroids, along with insult by SARS CoV-2 infection, causes commensal *Candida* to invade internal organs. When *Candida* enters the blood and spreads to other body sites, there occurs Invasive candidiasis. The various predisposing factors include immunosuppression, surgical procedures, renal

failure, prolonged placement of central venous catheter, malignancy, prolonged antibiotic usage, late sepsis.³ Candida-related immune dysfunction adds on to the increased susceptibility to other respiratory pathogens.

Invasion of the pulmonary parenchyma by *Candida* is rare, due to which its presence in respiratory specimens is usually regarded as contamination. Kassner et al. describes three histologic forms of pulmonary candidiasis: embolic, disseminated and bronchopulmonary.⁶ As determined by el-Ebiary, the incidence of *Candida*-pneumonia is 8%, and pattern of colonization is uniform throughout the lung usually.⁷

To reliably establish the diagnosis of bronchopulmonary and disseminated *Candida* infection, bronchoalveolar lavage, cultures with cytologic and morphologic analyses, and histopathology (the gold standard) should be performed.

Cavitary pneumonia presentation of pulmonary candidiasis is rare but was seen in the present case. We diagnosed this case as invasive candidiasis by the patient's positive blood cultures, chest CT and BAL findings.

The fungal diseases add insult to the injury in a significant proportion of post-COVID-19 patients with immune alterations and are associated with high mortality, thereby require early diagnosis and initiation of appropriate antifungal treatment.

Conclusion

The presence of DM in post-COVID-19 patients increases the risk of contracting secondary fungal infections. The colonization of respiratory tract by *Candida* often leads to poor outcomes clinically, along with development of complications. In invasive candidiasis, delay in therapy initiation adds on to the increased mortality. Emphasis should be given for early and comprehensive diagnosis of invasive candidiasis in immunosuppressed patients, for timely initiation of antifungal therapy appropriate for infection clearance.

Financial Support and Sponsorship

Nil.

Conflicts of Interest

There are no conflicts of interest.

Ethical Approval

Not applicable.

Declaration of Patient Consent

All appropriate consent forms obtained from the patient.

References

1. Song, Ge, Liang Guanzhao, and Liu Weida. "Fungal co-infections associated with global COVID-19 pandemic: a clinical and diagnostic perspective from China." *Mycopathologia*185, (2020): 1-8.
2. Azoulay, Elie, Timsit Jean-François, Tafflet Muriel, and Lassence Arnaud de, et al. "Candida colonization of the respiratory tract and subsequent pseudomonas ventilator-associated pneumonia." *Chest* 129, (2006): 110-117.
3. Taschdjian, Claire L, Kozinn Philip J, and Toni Evelyne F. "Opportunistic yeast infections, with special reference to candidiasis." *Ann N Y Acad Sci* 174, (1970): 606-622.
4. Franquet, Tomás, Müller Nestor L, Lee Kyung S, and Oikonomou Anastasia, et al. "Pulmonary candidiasis after hematopoietic stem cell transplantation: thin-section CT findings." *Radiology* 236, (2005): 332-337.
5. Zaoutis, Theoklis E, Argon Jesse, Chu Jaclyn, and Berlin Jesse A, et al. "The epidemiology and attributable outcomes of candidemia in adults and children hospitalized in the United States: a propensity analysis." *Clin Infect Dis* 41, (2005): 1232-1239.
6. Kassner, EG, Kauffman SL, Yoon JJ, and Semiglia M, et al. "Pulmonary candidiasis in infants: clinical, radiologic, and pathologic features." *Am J Roentgenol* 137, (1981): 707-716.
7. El-Ebiary, Mustafa, Torres Antoni, Fabregas Neus, and Bellacasa Jorge Puig de la, et al. "Significance of the isolation of *Candida* species from respiratory samples in critically ill, non-neutropenic patients: an immediate postmortem histologic study." *Am J Resp Crit Care Med* 156, no. 2 (1997): 583-590.

How to cite this article: K Harveen, S Dilbag, Kajal NC, Rupali. "Case Report of Invasive Candidiasis with Cavitary Lung Lesion in A Post-Covid-19 Diabetic Patient." *J Pulm Respir Med* 11 (2021) : 573.