

Post COVID 19 *Candida Guilliermondii* Lung Abscess: A Case Report

Jamal Zaini¹, Muhamad Rizqy Fadhillah², Anna Rozaliyani

¹Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Indonesia

²Department of Pharmacology and Therapeutics, Faculty of Medicine, Universitas Indonesia

³Department of Parasitology, Faculty of Medicine, Universitas Indonesia

Abstract

Late complications of COVID-19 are still not fully understood, especially post-COVID-19 fungal infection. We reported a post-COVID-19 lung abscess caused by *Candida guilliermondii* in a young immunocompetent man who did not have significant risk factors and successfully showed a desirable clinical response after antifungal therapy. The practitioner should be aware of such complications and treat them properly.

Keywords: *Candida guilliermondii*, Lung Abscess, Post COVID-19

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*Corresponding author: jamal.zaini@gmail.com

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Introduction

Amid the COVID-19 pandemic, the delayed complication of COVID-19 is one of the subjects that are not fully understood, especially post-COVID-19 infections caused by a fungal infection. Even rare, fungal infections among post-COVID-19 patients are possible, such as fungal infection in the oral-sinus cavity^{2,3}, and lung infection⁴. *Candida* is one of the pathogens that cause fungal infection among COVID survivors. Post-COVID 19 candida lung abscess is rare and has not been comprehensively investigated and reported in studies. We reported a post-COVID-19 lung abscess caused by *Candida guilliermondii* in a young immunocompetent patient with no significant risk factors that successfully showed a desirable clinical response after antifungal therapy.

Case

A male, 27 years old, was admitted to the emergency unit with cough, fever, nausea, and vomiting for three days. He also complained of weakness, dry cough, and shortness of breath during daily activities. He had a history of COVID-19 three months ago and has recovered well.

On the physical examination, he was alert, febrile, tachypneic, with an initial blood pressure of 120/90 mmHg, and pulse rate 100x per minute. The chest was clear bilaterally with dullness in the left apex on percussion. The remainder examination was normal.

Initial laboratory examination showed haemoglobin level 10.4 g/dl (normal value, 13.2-17.3 g/dl), hematocrit 31.3% (normal value, 40.0-52.0%), leucocyte 14.960/ μ L (normal

value, 3.800-10.600/ μ L), thrombocytes 496.000/ μ L (normal value, 150.000-440.000), lymphocytes 30.8%, CRP 5.46 mg/L (CRP, normal value <5 mg/L), normal procalcitonin and D-Dimer 260 ng/mL (normal value, <500 ng/ml). IGRA test was negative and non-reactive HIV test.

Chest X-Ray (CXR) taken at discharge from the COVID-19 ward three months earlier showed a fine fibro-reticular pattern mainly on the right hemithorax consistent with covid recovery phase (Figure 1A), but a new CXR taken in the emergency unit demonstrated homogenous opacity on the left lung (Figure 1B), and thoracic CT-Scan confirmed a large pulmonary abscess (Figure 2). The patient refused to undergo a bronchoscopy and lung biopsy; thus induced sputum examination was done. The sample was sent for bacterial, fungal culture, acid-fast bacilli test, and Xpert MTB/RIF assay.

The patient was empirically treated with intravenous moxifloxacin 1x400 mg, along with fluids, symptomatic drugs, adequate nutrition, and a bronchodilator. However, the treatment showed no significant responses after five days of treatment. The induced sputum culture showed a growth rich in *Candida guilliermondii*. Drug susceptibility test showed still sensitive to caspofungin, flucytosine, fluconazole, micafungin, amphotericin B, and voriconazole. Bacterial culture, AFB, and Xpert MTB/RIF assay showed negative results.

Regarding the microbiological results, the treatment was adjusted. Intravenous fluconazole with a loading dose of 400 mg q.d. was administered and continued with 200 mg q.d. for

seven days. The antifungal treatment exhibited good clinical responses, as fever, cough, and dyspnea were subsided. The patient was discharged after 12 days of hospitalization. Oral

fluconazole was continued up to 2 months 200 mg q.d. with favorable clinical and radiological outcomes.

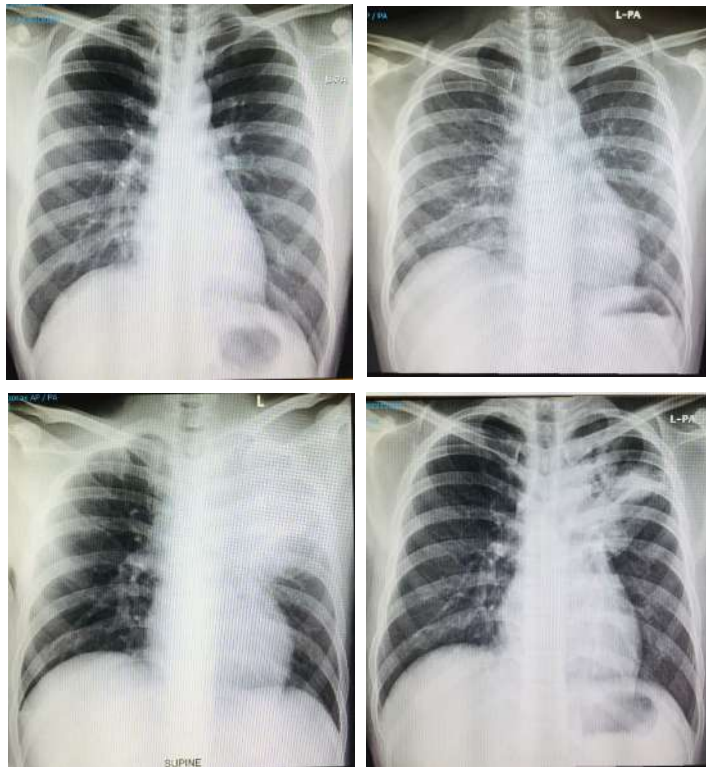


Figure 1. Serial CXR taken before COVID-19 (A), one months after COVID-19 (B) and patient hospitalized three months after COVID-19 (C) and two weeks after anti mycosis treatment (D). Note that CXR before COVID-19 and AFTER COVID-19 was not significantly different (A and B), but CXR taken on Emergency Unit admission (day 0) or three months after COVID-19 showed significant homogenous opacities on the upper left hemithorax (C). CXR taken after 2 weeks of antifungal agent (day 19) showed significant partial improvement on the left hemithorax.

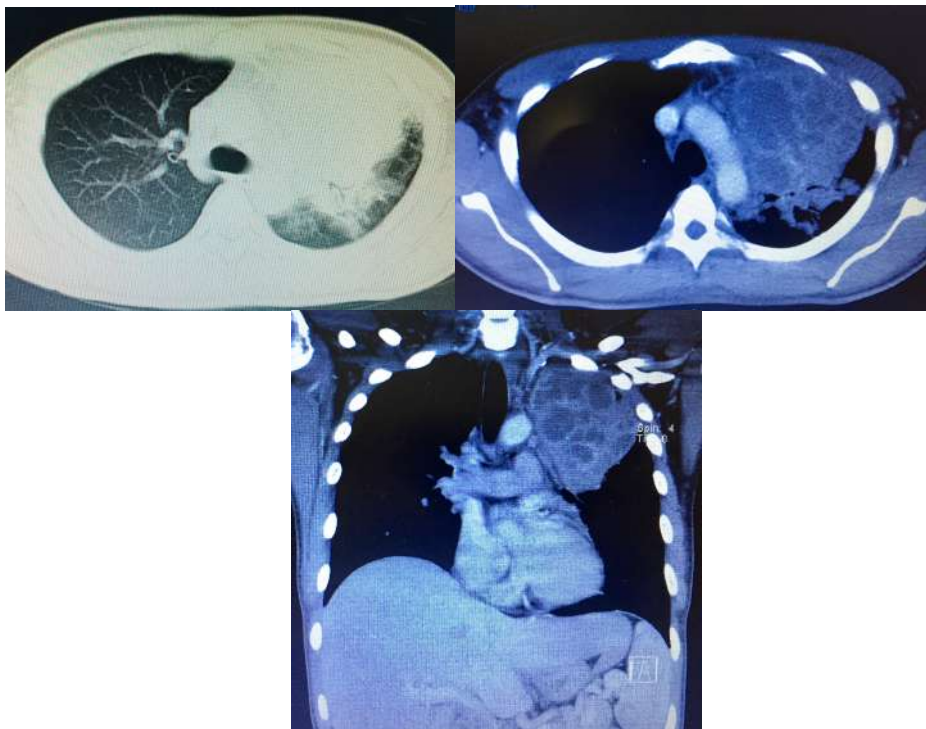


Figure 2. Thoracic CT scan was taken on admission (day 0) or 3 months after COVID-19, large pulmonary abscesses on the left lung but normal lung parenchyma on the right lung was observed.

Discussion

A lung abscess is a localized infectious pus-filled cavity of the lung tissue caused by viral, bacterial, and fungal. Typically, lung abscess was diagnosed through history and physical examination combined with modalities such as imaging study and microbiological analysis⁵ The common presentations of lung abscess were fevers, chills, weight loss, productive cough, fatigue, and anorexia. The patient showed similar symptoms, except no productive cough. These symptoms are often misdiagnosed as bacterial infection, making the team empirically treat the patient with systemic antibiotics initially.

Candida lung abscess is a rare condition in immunocompetent host⁶ but reported in non-COVID-19 patients.^{7,8} Lung abscess formation in post-COVID-19 patients is not clearly understood. Since the patient did not have any known significant risk factor, the cavitary and fibroectatic lesion due to COVID-19 might be the possible causative factors.⁹

Candida guilliermondii is saprophyte fungi ubiquitously found in the environment.¹⁰ It is an opportunistic pathogen with low pathogenicity and is rarely present as the cause of candidosis in humans. This pathogen could manifest as a local or systemic disease. The known risk factors for candida infection, in general, are malignancies, neutropenia, recent surgery, broad-spectrum antibiotic use, intravascular catheter, immunocompromised status, and immunosuppressant use.¹¹ The patient in this case report did not have any significant risk factors for developing such an infection but had a recent history of COVID-19 infection and in-hospital corticosteroid use.

The lung abscess was diagnosed through clinical and additional examination, including microbiological and radiological examination. Bacterial and fungal lung abscesses could have differed through culture. Fungal culture and drug susceptibility testing from airways or lungs are recommended to guide specific antifungal choices. In most cases, specimens from invasive procedures such as bronchoscopy or lung biopsy are needed for definitive diagnosis. Specimen from induced sputum is still accepted if done correctly.^{7,8} Since the patient refused to perform bronchoscopy and lung biopsy, induced sputum is the best feasible option.

The drug of choice for systemic antifungals for candidosis is azole derivatives and echinocandins.^{11,12} However, the incidence of drug resistance is higher in *Candida guilliermondii*.^{10,11} Before starting to administer fluconazole therapy, we tested the drug susceptibility test and fortunately exhibit drug sensitive to fluconazole.

In conclusion, COVID-19 is a newly emerging disease with long-term consequences that are sometimes unpredictable. In this case report, we present a young immunocompetent patient without comorbidities who developed a lung abscess caused by *Candida guilliermondii* after being hospitalized for COVID-19 three months earlier. Post-COVID-19 could be one of the risk factors for developing *Candida* lung abscess. The practitioner should be aware of such complications and treat the disease properly.

Acknowledgment

None

Conflict of Interest

The authors affirmed no conflict of interest

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