

# Pulmonary Aspergillosis After Covid-19, A Case Report

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## Abstract

This study presents a 57-year-old male patient with COVID-19 who had had no lung disease before COVID-19 pneumonia. However, after COVID-19 pneumonia with sequels and treatments that include corticosteroids and IL-6 receptor antagonists, an invasive pulmonary aspergillus (IPA) cavity occurred immediately.

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### Summary

COVID-19 is an infectious disease that spreads worldwide, can progress rapidly, affect individuals of all ages, and cause death, especially in the elderly and people with chronic diseases. It has predisposed a relatively high number of patients to acute respiratory distress syndrome, and co-infections are a frequent complication, especially during prolonged hospital stays. Bacterial or viral co-infections with SARS-CoV-2 have been reported in many studies, but knowledge of Aspergillus co-infection in patients with COVID-19 is limited.

This study presents a 57-year-old male patient with COVID-19 who had had no lung disease before COVID-19 pneumonia. However, after COVID-19 pneumonia with sequels and treatments that include corticosteroids and IL-6 receptor antagonists, an invasive pulmonary aspergillus (IPA) cavity occurred immediately.

In addition to the fact that COVID-19 infection progresses with destructive parenchymal damage and sequelae, the effectiveness of treatment is limited, and treatment-related side effects and complications can be examined. Therefore, clinical and radiological follow-up of patients whose symptoms persist after infection is essential.

### Introduction

Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which appeared in China in late 2019. Several opportunistic infections as *Aspergillus* spp. , *Candida* spp. , *Cryptococcus neoformans* , *Pneumocystis jirovecii* ( *carinii* ), mucormycosis, *Cytomegalovirus* (CMV), *Herpes simplex virus* (HSV), *Strongyloides stercoralis*, *Mycobacterium tuberculosis*, and *Toxoplasma gondii* have been identified following severe respiratory viral infections in COVID-19 patients (1, 2). Especially the incidence of fungal infections is high (3).

### Case Report

A 57-year-old male patient, who applied to our clinic with complaints of hemoptysis, was hospitalized for further examination and treatment due to a cavitary lesion in the right upper lobe. Nine months ago, he was treated for 55 days as non-intubation in the intensive care unit for five days due to COVID-19 pneumonia

(Figure-1). During this period, steroid treatment and four flacons of 162 mg Tocilizumab (a monoclonal antibody against the interleukin-6 receptor) was given because of respiratory symptoms and sequelae COVID\_19 pneumonia (Figure-2). Pulmonary rehabilitation and steroid therapy were continued for three months because dyspnea continued in the patient whose treatment was terminated (Figure-3). In thorax Computed Tomography (CT), a cavitary lesion was observed in the right upper lobe who administered with complaints of swelling in the legs and hemoptysis in the fourth month of his treatment (Figure-4). After taking a non-specific culture, the patient continued prophylactic fungal treatment and steroid treatment due to dyspnea. Blood culture, sputum culture, urine culture, fungal culture, and tuberculosis tests, Aspergillom specific IgE, was negative, Total IgE was normal. On the 12th day of his treatment, the patient's general condition was good, and he was discharged after colchicine and steroid treatment were arranged. In the control HRCT after antibiotic treatment, the cavity persisted in the right upper lobe (Figure-5). Due to intermittent complaints of hemoptysis, right upper lobectomy via thoracotomy was performed. The postoperative pathology result was reported as Aspergilloma (Figure-6) and discharged on the seventh postoperative day without complications. He is in the third month of his follow-up, and any complications occurred.

Figure-1: First hospital admission Chest X-Ray

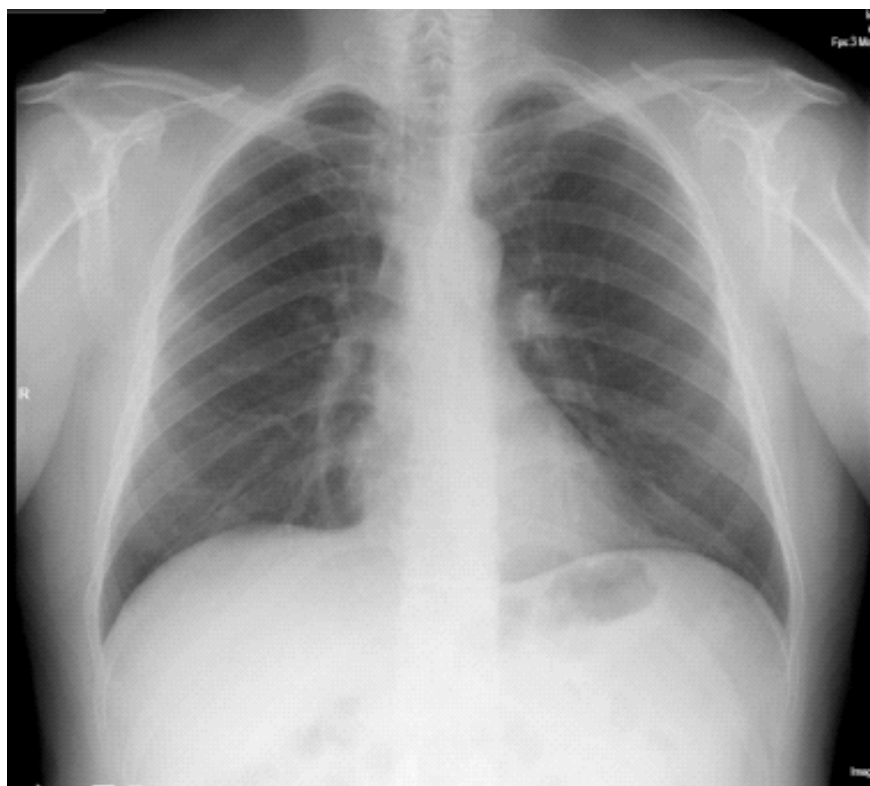


Figure-2: Thorax CT when the patient applied to the hospital for the second time, on 15th day: bilateral ground glass were determined

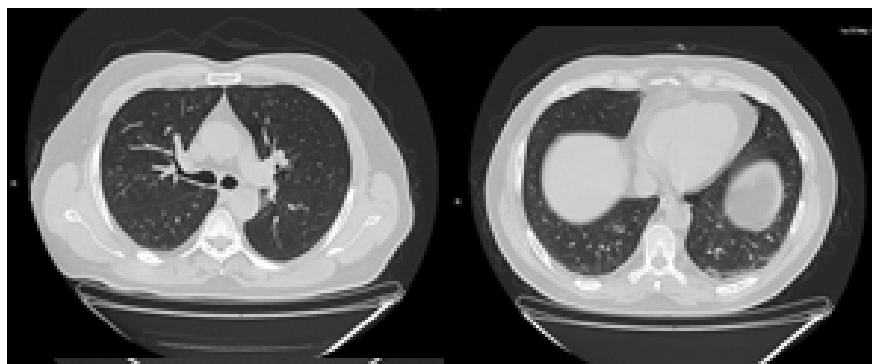


Figure-3: Thorax CT on the 45th day. Ground glass and fibrotic lesions, right upper thin-walled cystic lesion were determined

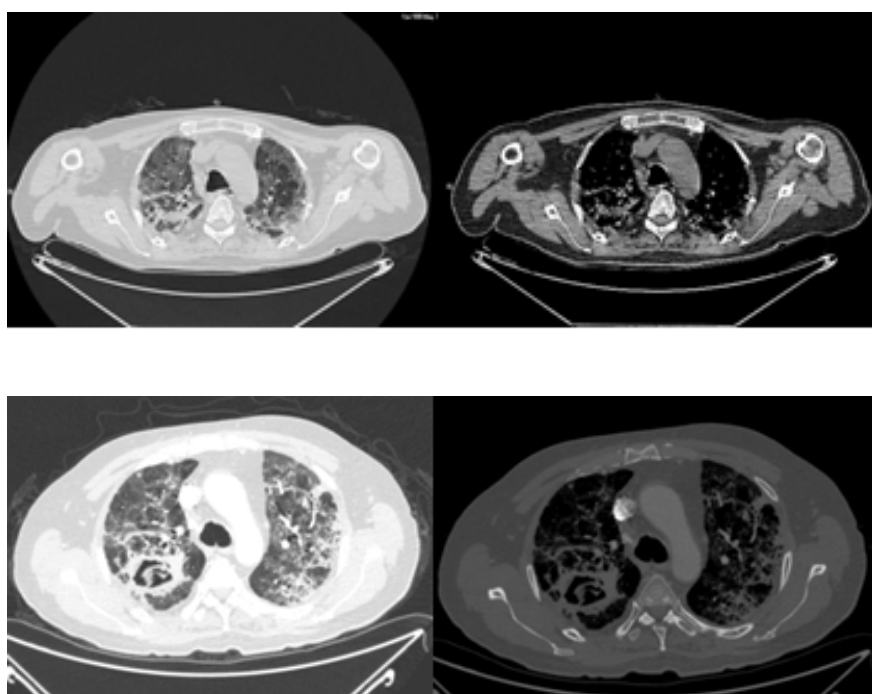


Figure-4: Right upper lobe cavitory lesion was detected in Thorax CT angiography

Figure-5: Right upper lobe cavity persisting on control thorax CT, one month after the treatment

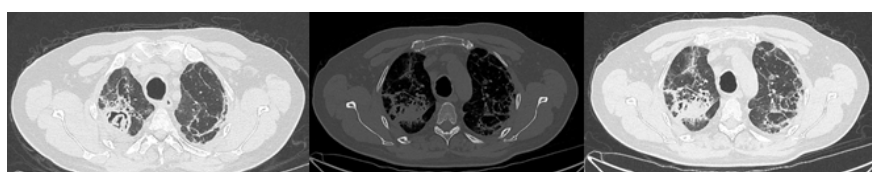
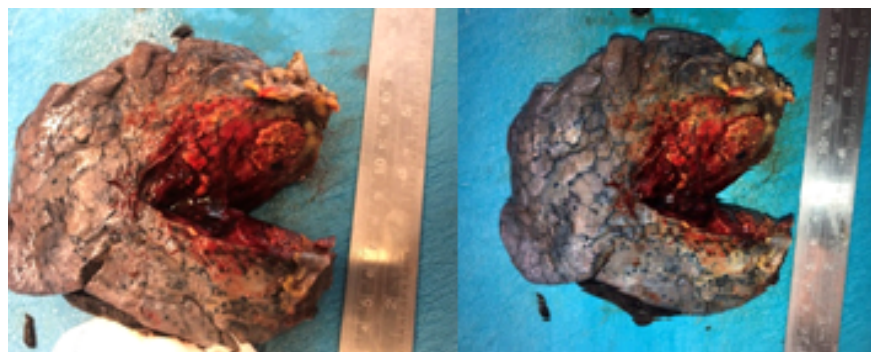


Figure-6: The macroscopic appearance of Postoperative specimen of right upper lobectomy with aspergilloma



## Discussion

Since the new pneumonia was first recognized in Wuhan, China, at the end of 2019, the causative pathogen SARS-CoV-2 has been identified, and its associated infection, COVID-19, has rapidly evolved worldwide. While SARS-CoV-2 is responsible for severe pneumonia and ARDS, COVID-19 is associated with a wide variety of extrapulmonary complications; many other organs can be affected, including cardiovascular, immune, nervous, and gastrointestinal systems, therefore, can be considered a systemic disease. In addition to common bacteria and viruses, *Aspergillus* can cause co-infection in COVID-19 patients, especially in severe/critical illnesses. The possibility of co-infection with bacterial or fungal infections is higher in patients who require follow-up in intensive care units or require mechanical ventilation(4). Among the possible pathogens in COVID-19 patients, Invasive pulmonary aspergillosis (IPA) carries more attention to *Aspergillus* as it is challenging to diagnose and can be associated with high morbidity and mortality. In particular, respiratory samples for mycological studies such as fungal culture, galactomannan test, and PCR from respiratory tract samples can help early diagnosis. In our case, the culture results of the patient who was followed up and treated with the non-intubated high flow for five days in the intensive care unit during this period were typical.

All studies of COVID-19 fungal infections have reported that they occur during COVID-19 infection, mostly 14 days after the onset of COVID-19 symptoms(5). In this case, a cavitary lesion in the right upper lobe was observed in the fourth month of the patient's COVID-19 treatment.

In COVID-19-associated pulmonary aspergillosis, diabetes, immunosuppressive drug use, steroid therapy, and intubating are risk factors for patients followed. It also increases the risk of pulmonary aspergillosis in COVID-19 patients using IL-6 antagonists (6). In our case, four vials of 162 mg tocilizumab were given on the 12th day of the patient's treatment. The patient had fibrotic lesions on the thorax CT, and dyspnea continued. The patient was followed up under steroid and colchicine treatment for about four months after discharge, and a cavitary lesion in the right upper lobe was observed in the fourth-month tomography.

Aspergillosis is one of the most common opportunistic fungal co-infections caused by certain *Aspergillus* species, mainly affecting immunocompromised individuals such as COVID-19 patients. It can critically affect the respiratory system, leading to a mild/serious lung infection known as pulmonary aspergillosis, a severe form of aspergillosis that worsens over time and has no effective treatment.

## Conclusion

In patients with severe acute respiratory disease associated with SARS-CoV-2, invasive aspergillosis should be suspected in case of clinical worsening, even in immunocompetent patients. At the same time, aspergillosis should not be forgotten in patients with worsening after steroid and immunomodulator therapy.

Pulmonary aspergillosis is a severe complication of COVID-19 patients that may not respond well to medical therapy. Pulmonary resection is the most effective treatment to control the disease.

## Author Contributions:

Authors 1: Have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data

Authors 2: Been involved in drafting the manuscript or revising it critically for important intellectual content; and

Authors 3: Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content

Authors 4: Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

## References

Talento A.F., Hoenigl M. Fungal Infections Complicating COVID-19: With the Rain Comes the Spores. *J. Fungi*. 2020;6:279. doi: 10.3390/jof6040279.

Abdoli, A., Falahi, S., & Kenarkoohi, A. (2021). COVID-19-associated opportunistic infections: a snapshot on the current reports. *Clinical and experimental medicine*, 1-20.

Mulet Bayona J.V., Tormo Palop N., Salvador García C., Fuster Escrivá B., Chanzá Aviñó M., Ortega García P., Gimeno Cardona C. Impact of the SARS-CoV-2 Pandemic in Candidaemia, Invasive Aspergillosis and Antifungal Consumption in a Tertiary Hospital. *J. Fungi*. 2021;7:440.

Bassetti M., Giacobbe D.R., Grecchi C., Rebuffi C., Zuccaro V., Scudeller L. Performance of existing definitions and tests for the diagnosis of invasive aspergillosis in critically ill, adult patients: a systematic review with qualitative evidence synthesis. *J. Infect.* 2020;81 (1):131–141.

Marr K.A., Platt A., Tornheim J.A., Zhang S.X., Datta K., Cardozo C. Aspergillosis complicating severe coronavirus disease. *Emerging Infect. Dis.* 2021;27 (1):18.

Bartoletti M., Pascale R., Cricca M., Rinaldi M., Maccaro A., Bussini L. Epidemiology of invasive pulmonary aspergillosis among COVID-19 intubated patients: a prospective study. *Clin. Infect. Dis.* 2020;1 (1)

