

中文題目：新冠肺炎治療後之慢性肺麴菌病

英文題目：Chronic pulmonary aspergillosis after COVID-19 (CCPA) in an immunocompetent patient

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Introduction:

As the COVID-19 pandemic has developed, COVID-19-associated pulmonary aspergillosis (CAPA) have raised concern and increased morbidity and mortality. Though CAPA occurred more in critical ill patients with acute respiratory distress syndrome in previous studies, chronic pulmonary aspergillosis after COVID-19 (CCPA) in immunocompetent patients is rarely reported. Herein, we reported a 64-year male case of CCPA after recovering COVID-19.

Case Presentation:

A 64-year-old patient visited to chest clinic and presented with intermittent low-grade fever, cough and shortness of breath for 3 months. His past medical history included diabetes mellitus(DM), hypertension, hyperlipidemia and was diagnosed with COVID-19 pneumonia prior 4 months of symptoms occurred. He recovered from COVID-19 infection after using Molnupiravir 800 mg every 12 hours for 5 days. He was retired from an air conditioner worker and daily gardening. The clinical examination showed a blood pressure of 133/80 mmHg, heart rate of 99/minute, respiratory rate of 20/minute, oxygen saturation of 92%, and temperature of 37°C. Chest examination showed bilateral crackles. Other systems were within normal limits. Laboratory investigations showed leukocytosis of 10200 (4,000~11,000 cells/microliter), low C-reactive protein (CRP) level of 6.7(0~5mg/L), low Procalcitonin (PCT) level of <0.05(0~0.5ng/mL), but elevated Erythrocyte sedimentation rate (ESR) of 19(0~15/mm). Liver function tests, renal function tests, and serum electrolytes were within normal range. The bacterial cultures of blood, sputum, and urine were negative, and no evidence of pulmonary tuberculosis with negative for acid-fast bacilli and GeneXpert result of respiratory samples. Chest X-ray (Figure 1) showed bilateral consolidation in the bilateral lower zone. Contrast-enhanced computed tomography (CT) (Figure 2) revealed consolidation with cavitation in right middle-lower lungs. The positivity of *Aspergillus fumigatus* immunoglobulin G (IgG) and *Aspergillus niger* immunoglobulin IgG were noted (115 and 124 mgA/L, respectively), serum Galactomnnnan was 0.3 (<0.5), which was compatible with the diagnosis of CCPA. He was then admitted for treatment and received intravenous voriconazole. He responded to the antifungal therapy well, and the symptoms gets improving without oxygen support after 2 weeks of treatment and then keep continue oral voriconazole after discharge.

Discussion:

This report illustrates the diagnostic process of an immunocompetent patient with CCPA after COVID-19 and subsequent treatment with antifungal agents.

The prevalence of COVID 19-associated pulmonary aspergillosis (CAPA) varies widely between studies from different countries. A study in China reported the prevalent rate of CAPA was 23% (PMID 32408156). Higher prevalent rates of CAPA among COVID-19 cases with ARDS, ranging from 20–35%, was reported in European studies. High mortality rate (44.5–66.7%) was documented in cases series and even 100% of mortality in patients with comorbidities in Netherlands (PMID 32396381, 32339350, 32445626). However, the post COVID related CCPA is rarely reported (PMID 34818624)

Different to the risk factors invasive aspergillosis, the predictors of CPA included widespread use of broad-spectrum antibiotics in intensive care units, severe lung damage during the course of COVID-19, use of anti-interleukin-6 treatment, and the presence of comorbidities (PMID 32719848, 33316401). In a multinational study, CAPA was significantly more prevalent among older patients, patients receiving invasive ventilation and patients receiving tocilizumab. (PMID 33316401). Importantly, inhaled or systemic corticosteroid, which is commonly used during covid pandemic has been reported as another risk factor of CAPA. Back to our case, he is an old smoker for more than 20 years, diagnosed with DM, hypertension and old tuberculosis. Thus, we could conclude that the above as risk factors for CCPA.

To diagnose CCPA is challenging as the lack of direct microbiological evidence and the atypical radiographic findings of CPA but depending on the immunological markers. The presence of high Aspergillus IgG titer should be interpreted carefully to distinguish active disease from prior disease. Tracing back the patient's history, we consider his occupation as an air conditioner and daily gardening chores might be as a possible fungus exposure, since water and soil are common reservoir for Aspergillus. We can reasonably speculate that the latent aspergillosis was most likely activated after COVID-19 infection and make the diagnosis after excluding other differential diagnosis.

Conclusion:

Though CAPA was more common in critical ill patient with COVID, the possibility of this fungus infection should be always kept in mind in this pandemic. Early detection and treatment are warranted in prevention of lethal complications and mortality.



Figure 1.
Chest X-ray showed bilateral consolidation in the bilateral lower zone.

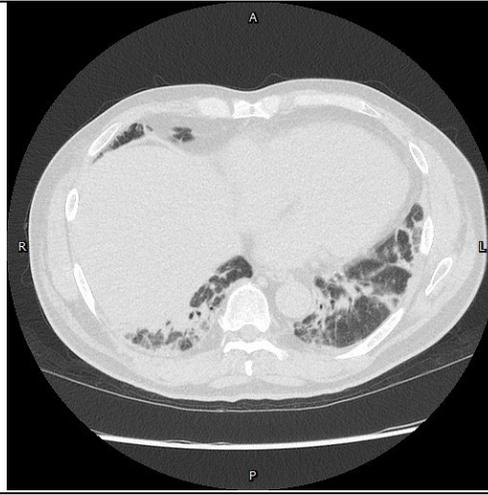


Figure 2.
Contrast-enhanced computed tomography revealed band-like and consolidation densities in both middle-lower lungs.