

# Pulmonary Cavitation: A Rare Complication of COVID-19 Pneumonia

Vijairam Selvaraj\*

Department of Medicine, Warren Alpert Medical School of Brown University, Rhode Island, USA.

## Corresponding Author\*

Vijairam Selvaraj

Department of Medicine,

Warren Alpert Medical School of Brown University,

Rhode Island Area, USA

E-mail: vijairam.selvaraj@lifespan.org

**Copyright:** © 2021 Selvaraj V. 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** 01 February 2021; **Accepted** 15 February 2021; **Published** 22 February 2021

## Description

Since 2020, there have been over 44 million cases of COVID-19 in the United States. There have been rare cases of pulmonary cavitation in early and late stages of COVID-19 illness. Cavitory lung lesions are usually related to infectious, immunologic, traumatic, or neoplastic etiologies. Typical radiologic features of COVID-19 include peripheral ground-glass pulmonary opacities, crazy paving pattern, bronchograms, consolidation, and interlobular septal thickening. Notably, there is absence of lung cavitation. Prior literature has shown that there have been rare cases of cavitation in patients with Middle Eastern Respiratory Syndrome (MERS) virus as well [1].

We reported a male in his 50s who presented with multiple episodes of hemoptysis, intermittent cough, and dyspnea. He had been discharged one week prior for right-sided segmental and subsegmental pulmonary emboli and right leg deep venous thrombosis, which was treated with apixaban. CT scan of the chest revealed opacity in the left upper lobe with cavitation and small left-sided pneumothorax, which were new from prior imaging. He maintained adequate oxygen saturation on room air and was discharged home on apixaban. He presented to the hospital two weeks later with recurrent hemoptysis and dyspnea. CT scan of the chest done at that time revealed multiple cavitory lesions

bilaterally with the largest lesion in the left lower lobe. He had an extensive workup done including mycobacterial, autoimmune, HIV and fungal tests that were negative. Bronchoscopy was performed, and bronchoalveolar lavage samples had no growth. He gradually improved and was discharged home with no further hemoptysis episodes [2].

Lung cavitation following pulmonary embolism and infarction has been described previously in non-COVID-19 patients [3]. Patients with pre-existing lung disease or emphysema are more prone to cavitation, especially if there's presence of prior bullae. The exact mechanism of cavitation in COVID-19 patients is unknown. One postulated mechanism may be related alveolar to diffuse damage and intra-alveolar hemorrhage based on prior autopsy reports. These patients had severe capillary congestion and variegated findings of lungs suggesting vascular dysfunction [4].

At times, bacterial, fungal, or opportunistic super-infections may contribute to the development of cavities. Use of corticosteroids (and sometimes tocilizumab) in COVID-19 patients may suppress the immune system and cause delay in detecting these infections. In our case, the speed of development of multiple cavitory lesions in a few weeks was felt to be atypical for Mycobacterium tuberculosis or fungal infections such as aspergillosis.

Ye, et al. discussed that cavities may be related to pathological dilatation of a physiological space or associated with the process of consolidation and resorption. Necrotizing processes with development of cavity and air-fluid level in areas with initial consolidation have been previously described in viral pneumonias [5]. Coronaviruses can also cause severe dysregulation of the host immune system, resulting in endothelial cell injuries and apoptosis of cells, in turn causing localized destruction and cavitation [6]. Mechanical causes of cavitation are sometimes related to non-invasive ventilation such as high flow oxygen or bilevel positive airway pressure therapy, resulting in pneumothorax and pneumomediastinum [7].

## Conclusion

Lung cavitation remains a rare occurrence in COVID-19 patients. Bacterial, fungal, mycobacterial, and autoimmune causes must be ruled out in COVID-19 patients presenting with hemoptysis or cavitory lesions. Close outpatient surveillance and follow up imaging is essential in these patients. Longitudinal studies and pulmonary function tests will be helpful to study the long-term effects of COVID-19 in these patients.