

Post COVID-19 Late Hemoptysis Managed with Bronchial Artery Embolization

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ABSTRACT

SARS-COV-2 has been one of the most massive pandemics in modern history with typical radiological findings. As the follow-up on patients who have survived this infection has been rising, newer studies have emerged detailing the long-term sequelae of this disease and well as its complications. Bronchiectatic changes in the lungs can lead to hemoptysis in the patient. We present the case of a patient who recovered from COVID-19 pneumonia and presented with hemoptysis after two months secondary to bronchiectatic changes in lung fields. The patient underwent bronchial artery embolization with uneventful one-month post embolization follow-up.

Keywords: *Bronchial Arteries; Bronchiectasis; COVID-19; Hemoptysis*

INTRODUCTION

COVID-19 pneumonia is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which has evolved into a global pandemic affecting many countries worldwide. [1] Little is known about the long-term lung radiographic changes in patients who have recovered from COVID-19 pneumonia. Some complications that have been seen are lung fibrosis and residual ground-glass opacities. [2] especially those with severe disease. Purpose To prospectively assess pulmonary sequelae and explore the risk factors for fibrotic-like changes in the lung at

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6-month follow-up chest CT of survivors of severe COVID-19 pneumonia. Materials and Methods A total of 114 patients (80 [70%] men; mean age, 54 years \pm 12) Another complication that has been observed is bronchiectasis which can manifest with hemoptysis. However, there has been sparse studies showing an obvious link between the two due to a lack of follow-up study. [3] We report a case of post-COVID hemoptysis in a male patient who was treated with bronchial artery embolization.

CASE REPORT

A 53-year-old male presented to the emergency with a complaint of fever, cough and shortness of breath. He tested positive for COVID-19 by reverse transcription-polymerase chain reaction (RT-PCR) on May 2, 2021. He was treated conservatively with antibiotics, anticoagulants, steroids and antipyretics. He was kept on high flow oxygen and no intubation was required. His HRCT chest at the time showed the findings of multifocal peripheral predominant ground-glass opacities and consolidation in bilateral lung fields which were consistent with COVID-19 pneumonia (Figure. 1A, B). After 21 days of hospital admission, his conditions improved and he was then discharged with domiciliary oxygen. Almost a month after the discharge, the patient started to develop multiple episodes of the scanty amount of hemoptysis. His blood investigation showed a slightly decreased platelet count of 140,000/ cubic mm. Other than that, the rest of his blood work was unremarkable. As the conditions worsened HRCT was performed which showed areas of residual ground-glass opacities and consolidation in bilateral lung fields. In addition to that, there were fibrotic and bronchiectatic changes as well (Figure. 1C, D).

As the frequency of hemoptysis increased, the patient was then planned for bronchial artery embolization. Through a right femoral arterial access and a 5F vascular sheath, we performed selective bronchial arteriographies using a 4F Vert catheter and microcatheter

set. Initially, the right bronchial artery was evaluated which showed dilated arteries with blushing in areas corresponding to bronchiectasis in HRCT (Figure. 2A, B). Embolisation was performed with PVA particles (350-500 nm).

The left upper bronchial artery showed no dilatation and abnormal branches. However, arteriographies of the lower-left bronchial artery showed a common trunk with multiple dilated branches and blushing at the bronchiectatic areas in bilateral lungs (Figure. 2C, D). We proceeded with embolization of the branches on both sides with PVA particles and gel foam. Final arteriography was done after the embolization was completed (Figure. 3). No episodes of hemoptysis were observed in the patient in one week and one-month post embolization follow-up.

DISCUSSION

Typical radiological manifestations of COVID-19 pneumonia are pulmonary opacities (both ground-glass attenuations and consolidations) with a peripheral/subpleural distribution, often involving the posterior regions of both lungs specifically.[1] It is not uncommon to have patients presenting with long-term respiratory consequences like breathlessness and/or hypoxia and deranged pulmonary function test (PFT) results.[2-4] One study conducted in China showed fibrotic changes in the lung in more than one-third of patients who survived severe coronavirus disease 2019 pneumonia on six-month follow-up CT along with residual ground-glass opacity and consolidation in other one-third of the patients.[2]

Along with lung fibrosis, there have also been cases of bronchiectatic changes seen as a complication of COVID-19 pneumonia. In one retrospective study detailing radiological findings in 81 patients with COVID-19, bronchiectasis was described in nine of the 81 patients (11%). The prevalence of bronchiectasis was higher in the groups who were

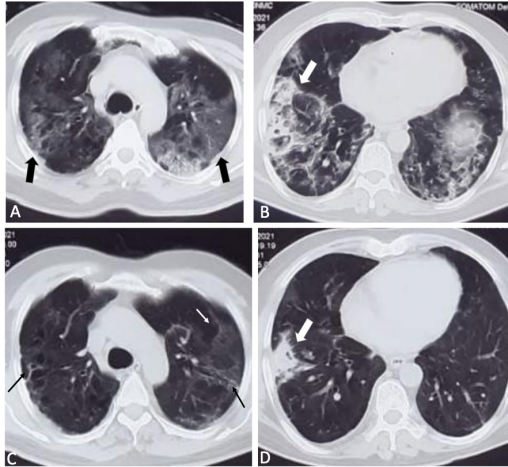


Figure 1: (A, B) Axial HRCT chest images showing peripheral predominant ground-glass opacities (black blocked arrows) and consolidations (white block arrow) in bilateral lung fields. (C, D) Axial HRCT chest images showing fibro-bronchiectatic changes (black arrows), residual ground-glass opacities (white arrow) and consolidations (white block arrow) in bilateral lung fields

followed up at >2 weeks after symptom onset in comparison to those at <2 weeks.[3] This also suggests that there are higher chances of finding bronchiectasis in long-term follow-up imaging on a patient with COVID-19 pneumonia. In our case report patient developed bronchiectatic changes in the lungs after 9 weeks of initial COVID-19 pneumonia.

Hemoptysis is a rare and atypical manifestation of COVID-19 pneumonia, with one Chinese cohort study showing haemoptysis in 0.9% of 1099 COVID-19 patients (2.3% in severe cases).[5] Another study by Lapostolle et al. reported a 3% haemoptysis rate in a large cohort of confirmed COVID-19 patients. [6] Pulmonary infarct following pulmonary thromboembolism is one of the important causes of hemoptysis in COVID-19 pneumonia. [7] Hemoptysis in patients with COVID-19 infection could be related to diffuse alveolar damage along with severe endothelial injury, alveolar-capillary microthrombi, and increased angiogenesis. [8] Bronchiectasis has been well recognized as the important cause of hemoptysis. As bronchiectatic changes are seen in patients with a history of

COVID-19 pneumonia, there is a likely possibility of increased incidence of hemoptysis in such patients.

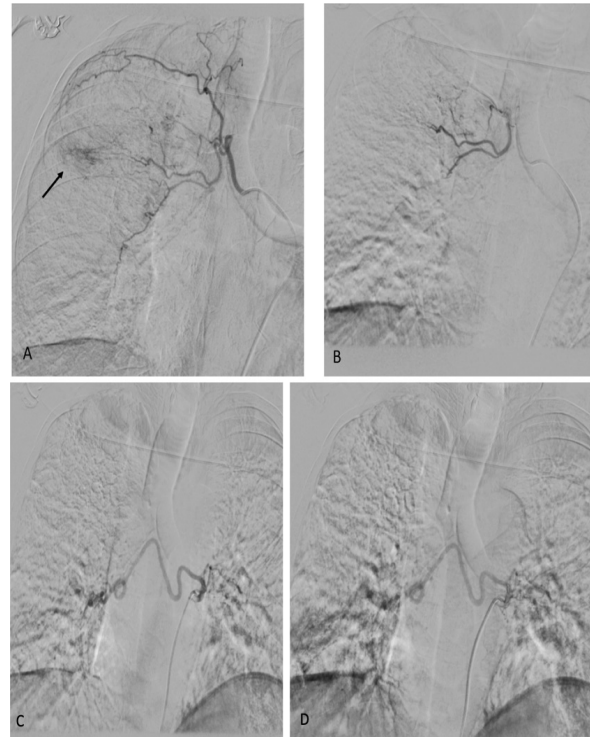


Figure. 2: (A, B) Pre-embolization right bronchial arteriography showing tortuous peripheral branches with blushing (black arrow). B. Post embolization arteriography shows non-opacification of peripheral branches in that area. (C,D) Left bronchial arteriography shows dilated branches on the left side and common trunk supplying the dilated branches in the right lung field

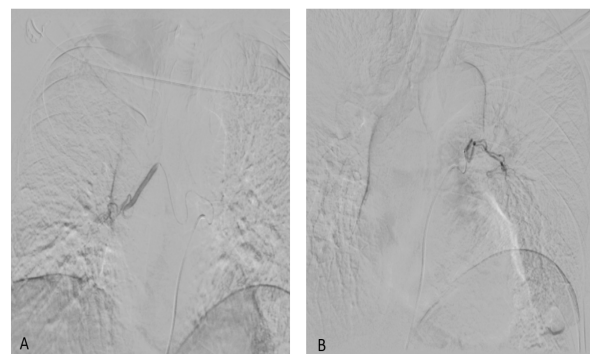


Figure. 3: Post-embolization arteriography showing non-opacification of dilated branches of the right bronchial artery (A) and left bronchial artery (B)

Massive hemoptysis in patients with COVID-19 pneumonia can be treated by bronchial artery embolization which has been shown to be feasible and efficient.[9] Massive hemoptysis (defined as bleeding greater than 240 to 300 mL/24 hours) carries a 50 to 85% mortality rate when treated conservatively. Death is most often due to asphyxiation from the aspiration of blood, leading to airway obstruction.[10] Bronchial artery embolization is often a first-line and definite therapy in the management of massive hemoptysis. Even though there is a lack of study regarding the management of hemoptysis in patients with COVID-19, one study showed bronchial artery embolization as a feasible and efficient management of spontaneous hemoptysis for patients with COVID-19 pneumonia.⁹ We also effectively managed to post COVID-19 hemoptysis with bronchial artery embolization in our case.

CONCLUSION

The full spectrum of COVID-19 disease is still emerging. Post COVID-19 fibrosis and bronchiectasis is one of the complications that are emerging in patients who recovered from COVID-19 pneumonia with prevalence in almost one-third of the infected patients. One of the complications of bronchiectasis is hemoptysis which can be life-threatening. Bronchial artery embolization is efficient and feasible management in such cases of hemoptysis.

CONFLICT OF INTEREST

None

SOURCE OF FUNDING

None

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