



Hemoptysis in COVID-19: Pulmonary Emboli Should be Ruled Out

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Dear Editor,

We have read the case presentation of Shi et al. (1) with great interest. They report the clinical and radiological features of a 2019 novel coronavirus (COVID-19) patient presenting with hemoptysis. Serial computed tomography studies revealed the evolution of pulmonary involvement, and microbiological studies confirmed the diagnosis for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). However, the exact cause and mechanism of hemoptysis in the patient remain to be explained. Hemoptysis is not a typical symptom of COVID-19. Large studies and case-series of COVID-19 have either not reported hemoptysis or have reported very low rates of 0.9–5% (2-4).

SARS-CoV-2 is known to cause a proinflammatory and hypercoagulable state with elevated levels of lactate dehydrogenase, D-dimer, C-reactive protein, ferritin, and interleukins (5). Data on thromboembolic complications of the disease are appearing, and there are increasing reports describing thromboembolic events complicating the COVID-19 disease (6). A study from the Netherlands investigated the high incidence of thrombotic complications

among 184 COVID-19 patients in the intensive care unit (7). All patients received at least standard doses thromboprophylaxis and the cumulative incidence of the thrombotic complications was reported as 31%, with pulmonary embolism being the most frequent (n = 25, 81%).

While hemoptysis is a very rare presentation in COVID-19 patients, its incidence gets relatively higher reaching up to 13% in patients with pulmonary emboli (8). A very recent article reported a patient with SARS-CoV-2 presenting with hemoptysis (9). In addition to the findings of peripheral ground-glass opacities consistent with COVID-19 pneumonia, a computerized tomography angiography of the chest revealed bilateral segmental pulmonary emboli and an additional area of consolidation in the right lower lobe concerning for infarct.

COVID-19 patient may develop hemoptysis with or without pulmonary emboli; however the former is more likely. Moreover, attempts for delineation of mechanisms underlying this complication in COVID-19 can contribute to a better understanding. Therefore, we postulate that pulmonary emboli should be initially ruled out in all COVID-19 patients presenting with hemoptysis.

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REFERENCES

1. Shi F, Yu Q, Huang W, Tan C. 2019 novel coronavirus (COVID-19) pneumonia with hemoptysis as the initial symptom: CT and clinical features. *Korean J Radiol* 2020;21:537-540
2. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020;395:497-506
3. Guan W, Ni Z, Hu Y, Liang W, Ou C, He J, et al.; China Medical Treatment Expert Group for Covid-19. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med* 2020 Feb 28 [Epub]. <https://doi.org/10.1056/NEJMoa2002032>
4. Xu XW, Wu XX, Jiang XG, Xu KJ, Ying LJ, Ma CL, et al. Clinical findings in a group of patients infected with the 2019 novel coronavirus (SARS-Cov-2) outside of Wuhan, China: retrospective case series. *BMJ* 2020;368:m606

Received: April 17, 2020 **Revised:** April 17, 2020

Accepted: April 26, 2020

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5. Chen G, Wu D, Guo W, Cao Y, Huang D, Wang H, et al. Clinical and immunological features of severe and moderate coronavirus disease 2019. *J Clin Invest* 2020;130:2620-2629
6. Cui S, Chen S, Li X, Liu S, Wang F. Prevalence of venous thromboembolism in patients with severe novel coronavirus pneumonia. *J Thromb Haemost* 2020 Apr 9 [Epub]. <https://doi.org/10.1111/jth.14830>
7. Klok FA, Kruip MJHA, van der Meer NJM, Arbous MS, Gommers DAMPJ, Kant KM, et al. Incidence of thrombotic complications in critically ill ICU patients with COVID-19. *Thromb Res* 2020 Apr 10 [Epub]. <https://doi.org/10.1016/j.thromres.2020.04.013>
8. Stein PD, Terrin ML, Hales CA, Palevsky HI, Saltzman HA, Thompson BT, et al. Clinical, laboratory, roentgenographic, and electrocardiographic findings in patients with acute pulmonary embolism and no pre-existing cardiac or pulmonary disease. *Chest* 1991;100:598-603
9. Casey K, Iteen A, Nicolini R, Auten J. COVID-19 pneumonia with hemoptysis: acute segmental pulmonary emboli associated with novel coronavirus infection. *Am J Emerg Med* 2020 Apr 8 [Epub]. <https://doi.org/10.1016/j.ajem.2020.04.011>

Response

Pulmonary Embolism Excluded before Diagnosed as COVID-19 with Hemoptysis

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To the Editor,

Thanks for your comments regarding our publication.

The most common clinical presentations of pulmonary embolism include dyspnea, chest pain, hemoptysis, and elevated level of D-dimer (1). The 2019 novel coronavirus (COVID-19) patients with pulmonary embolism also presented with similar symptoms, such as worsening chest pain, shortness of breath, dyspnea, hemoptysis, and elevated D-dimer (2-4). The case we reported did not show any of the symptoms except hemoptysis during the first week of admission. In addition, several initial D-dimer tests were negative, and the patient was found with no predisposing factors. So, pulmonary embolism was ruled out according to guidelines of pulmonary thromboembolism by the Chinese Medical Association (4).

Furthermore, dyspnea and hemoptysis gradually disappeared after treatment with antivirals, anti-infection, and high flow oxygen therapy, and ground-glass opacities were cleared in the fourth chest CT. The diagnosis of pulmonary embolism was excluded again.

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1. Pulmonary Embolism and Pulmonary Vascular Disease Group, Respiratory Branch, Chinese Medical Association. Guidelines for diagnosis, treatment, and prevention of pulmonary thromboembolism. *Chin Med J* 2018;98:1060-1087
2. Casey K, Iteen A, Nicolini R, Auten J. COVID-19 pneumonia with hemoptysis: acute segmental pulmonary emboli associated with novel coronavirus infection. *Am J Emerg Med* 2020 Apr 8 [Epub]. <https://doi.org/10.1016/j.ajem.2020.04.011>
3. Ullah W, Saeed R, Sarwar U, Patel R, Fischman DL. COVID-19 complicated by acute pulmonary embolism and right-sided heart failure. *JACC Case Rep* 2020 Apr 17 [Epub]. <https://doi.org/10.1016/j.jaccas.2020.04.008>
4. Rotzinger DC, Beigelman-Aubry C, von Garnier C, Qanadli SD. Pulmonary embolism in patients with COVID-19: time to change the paradigm of computed tomography. *Thromb Res* 2020;190:58-59