

Short Report*Open Access, Volume 4***Development of pulmonary embolism in a patient after COVID-19 disease: A case report****Hetvi Tanna¹; Harshil Patel^{1*}; Nirav Thakar; Roy Mali***Pramukhswami Medical College, Shree Krishna Hospital, Karamsad, Gujarat, India.****Corresponding Author: Harshil Patel**Pramukhswami Medical College, Shree Krishna
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Abstract

Pulmonary embolism (PE) is a life-threatening condition in which a blood clot occurs in the pulmonary artery. It can damage part of the lung due to decreased blood flow and can be fatal due to decreasing oxygen levels in blood [1]. Here we present the case of a 49-year-old male patient presented in trauma and emergency with LRTI symptoms. His RT-PCR test for COVID-19 was positive. On echocardiography patient's right ventricle and right atrium were dilated, blood reports showed an increasing D-Dimer level and the patient had persistent hypoxia. Therefore, he was thrombolysed with Alteplase 50 mg and managed with conservative treatment. PE is a life-threatening complication of COVID-19. Doctors should not underestimate this and it must be ruled out for better outcomes of patients.

Keywords: COVID-19 disease; Pulmonary embolism; Thrombolysis.**Introduction**

COVID-19 disease is a viral infection caused by the SARS-CoV-2 virus. It was declared a pandemic in March 2021 by WHO. Many serious effects of this disease are pulmonary embolism, Stroke, Pulmonary fibrosis, and deep vein thrombosis. This all must be ruled out and cured in a timely manner to combat life-threatening complications of it. Study shows that among patients hospitalized in general wards and intensive care unit (ICU), the pooled in-hospital incidence of Pulmonary embolism was 14.7% of cases and 23.4%, Respectively [2]. This case report shows the development of pulmonary embolism which is a complication of COVID-19 disease.

A 49-year-old male patient with no known co-morbidity presented to trauma and emergency in view of deteriorated health condition. The patient had complained of fever, Mild cough, Abdominal pain, and chest pain for 5 days. He developed sudden breathlessness which worsened over a few hours. On admission, The patient had a fever which was insidious in onset, Gradually progressive, Intermittent, and relieved with medication. It was associated with a cough with minimal expectoration

and shortness of breath. He had no complaints of headache, Loss of consciousness, burning micturition. The patient was conscious, Cooperative, Well oriented to time, Place, And person. He had a respiratory rate of 34 per minute, 136/90 mmHg of blood pressure, and oxygen saturation was 60% with reduced bilateral air entry. The patient was kept on a non-re-breather mask (NRBM) but oxygen saturation was not maintained therefore he was kept on a high-flow nasal cannula (HFNC) and oxygen saturation was about 90% on it. COVID-19-related reports were not done before admission. The patient's Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) Test for COVID-19 was done and it was positive on 04/04/21. His initial blood tests reports were showed raised levels of D-Dimer, Total Count, C-reactive protein, and Ferritin. Treatment was started as per COVID-19 protocol. Enoxaparin (low molecular weight heparin) 0.6 mg BD was started. Remdesivir injections were given 200 mg IV of bolus on the first day followed by 100 mg IV OD for 4 days. Injection Tocilizumab 400 mg IV was given to prevent cytokine storm as IL-6 levels were high. In view of the persisting raised D-Dimer level and increased O₂ requirement on 3rd day of admission (Table 1), His screening Echocardiography was done which showed a dilated right ventricle and dilated right

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atrium, Which was clinically suggestive of pulmonary hypertension due to pulmonary embolism. Hence the patient need to be investigated for Computed Tomography Pulmonary angiography (CTPA) which was not possible due to the patient was on HFNC. With a view of screening Echocardiography, Raised D-Dimer level, and persistence O₂ requirement patient was thrombolysed with Injection of Alteplase 50 mg diluted in 50 CC normal saline and infused at 25 mL/hr over 2 hours without any pre or post-complication-followed by Heparin 1000 IU/hr. infusion. The patient had a past history of vaccination in which he had taken two doses of the Covishield vaccine (4 weeks apart) 30 days prior to the onset of his symptoms. After thrombolytic therapy and other treatments, All the symptoms subsided and D-dimer levels were in decreasing trend. But due to the persistent O₂ requirement of about 4 liters via nasal prongs, Computed tomography pulmonary angiography (CTPA) Was done which showed acute thromboembolism in the lumen of a segmental branch of a right lower lobar artery supplying the anterior segment and subsegmental branch of a right lower lobar artery supplying posterior basal and medial basal segments as well as a segmental branch of left lower artery supplying lateral segment. Other supportive medications were continued and then the patient was stable on room air. Hence, Discharged with stable hemodynamics. After 1 week Patient came to the outpatient department for a follow-up at that time patient had post-covid breathlessness on exertion.

Table 1: D-Dimer and CRP level.

Day from admission	D-Dimer (ng/ml)	CRP (mg/l)
Day 1	718	254
Day 2	9864	163
Day 3 (Thrombolytic therapy given)	>10,000	102
Day 4 (after thrombolytic therapy)	7295	90
Day 5	7000	82
Day 6	3989	36.5

Discussion

The pathogenesis of PE in COVID-19 is multifactorial. Viral-induced cytokine storm with increased interleukin 1 (IL-1), Interleukin 2 (IL-2), Interleukin 1 β (IL-1 β), interleukin 6 (IL-6), tumor necrosis factor (TNF- α), interferon γ (INF- γ), Monocyte chemoattractant protein, Granulocyte colony-stimulating factor (G-CSF), results in a hyper-inflammatory state in the circulatory system [3]. The endothelial dysfunction acts as a milieu for the formation of thrombus in the pulmonary arteries [4]. Pulmonary embolism is associated with COVID-19. This indicates higher PE prevalence in COVID-19 than usually encountered in non-infected critically ill patients, have emerged in the literature [5-7]. D-dimer level was significantly higher in the PE group; Meaning the D-dimer increase is not only a marker of pneumonia severity but is also associated with a higher risk of PE [8]. Contrast-enhanced CT should be more widely used when assessing patients with COVID-19 pneumonia, particularly in those with marked elevation of D-Dimer [8]. The study points to a high prevalence of acute pulmonary embolism in patients with COVID-19 (23%, [95%CI, 15-33%]) [9]. Patients having COVID-19 pneumonia are at risk of coagulopathy and pulmonary embolism. Elevated D-dimer levels on admission or sudden clinical deterioration should raise suspicion of pulmonary

embolism. Selected patients may benefit from CT pulmonary angiography to confirm pulmonary embolism and initiate appropriate therapy [10].

Conclusion

Pulmonary embolism is a complication of COVID-19 disease which can be life-threatening. Thus, all the patients with COVID-19 should be screened for Pulmonary embolism. Patients with high levels of D-Dimer should undergo CTPA. Pulmonary embolism is a serious complication as it can cause stroke and pulmonary hypertension for that it must be screened and treated with thrombolysis therapy. There is also a chance of failure of this thrombolysis therapy and therefore blood tests should be done even after therapy. Doctors should look for pulmonary embolism in COVID-19-positive patients as it can save the lives of the patients.

References

1. <https://www.healthline.com/health/pulmonary-embolus> Accessed on January 2023.
2. Roncon L, Zuin M, Barco S, Valerio L, Zuliani G, Zonzin P, Konstantinides SV. Incidence of acute pulmonary embolism in COVID-19 patients: Systematic review and meta-analysis. *Eur J Intern Med.* 2020; 82: 29-37. doi: 10.1016/j.ejim.2020.09.006. Epub 2020 Sep 17. PMID: 32958372; PMCID: PMC7498252.
3. Singh S, Desai R. COVID-19 and new-onset arrhythmia. *J Arrhythmia.* 2020; 10: 1002/joa3.12354.
4. Zhang Y, Xiao M, Zhang S. Coagulopathy and antiphospholipid antibodies in patients with Covid-19. *N Engl J Med.* 2020; 12; 382(17): 38. doi: 10.1056/NEJMc2007575.
5. Klok FA, Kruip MJHA, van der Meer NJM, Arbous M, Gommers DAMPJ, Kant KM, et al. Incidence of thrombotic complications in critically ill ICU patients with COVID-19. *Thromb Res* 2020;10.1016/j.thromres.2020.04.013.
6. Poissy J, Goutay J, Caplan M, Parmentier E, Duburcq T, Lassalle F, et al. Pulmonary embolism in COVID-19 patients: Awareness of an increased prevalence. *Circulation.* 2020; 10.1161/CIRCULATIONAHA.120.047430.
7. Danzi GB, Loffi M, Galeazzi G, Gherbesi E. Acute pulmonary embolism and COVID-19 pneumonia: a random association? *Eur Heart J* 2020; 41: 1858. <https://doi.org/10.1093/eurheartj/ehaa254>
8. Bompard F, Monnier H, Saab I, Tordjman M, Abdoul H, Fournier L, Sanchez O, Lorut C, Chassagnon G, Revel MP. Pulmonary embolism in patients with COVID-19 pneumonia. *European Respiratory Journal.* 2020; 56(1). DOI: 10.1183/13993003.01365-2020
9. Grillet F, Behr J, Calame P, Aubry S, Delabrousse E. Acute Pulmonary Embolism Associated with COVID-19 Pneumonia Detected with Pulmonary CT Angiography. *Radiology.* 2020; 296(3): E186-E188. doi:10.1148/radiol.2020201544
10. DC Rotzinger, C Beigelman-Aubry, C von Garnier, SD Qanadli. Pulmonary embolism in patients with COVID-19: Time to change the paradigm of computed tomography, *Thrombosis Research.* 2020; 190: 58-59. <https://doi.org/10.1016/j.thromres.2020.04.011>