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## LATE PULMONARY EMBOLISM IN LONG COVID SYNDROME PATIENT: A FATAL CASE REPORT

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### ABSTRACT

*Long COVID syndrome refers to a condition in which individuals experience a range of persistent symptoms and health issues following the acute phase of a COVID-19 infection. A 26-years-old Indonesian lady presented to ER department with complaining shortness of breath since 10 days before admission. Patient had history of Covid-19 one year ago, since then she always complaining shortness of breath. Research Objectives to identify the range of symptoms that persist in individuals with long COVID, characterize the severity and variability of these persistent symptoms among affected individuals, to Evaluate the Duration and Severity of Long COVID Symptoms. General condition unwell, BP 143/89 mmhg HR 116 x/mnt RR 24 x/mnt T 36.4°C BMI 19.1 kg/m2. SpO2 77% in room air, then 94% with NRM 15 lpm. On physical examinations showed thorax vesicular +/+, ronchi -/-, wheezing -/-. Lung auscultation was normal and abdominal palpation was unremarkable. Laboratory test revealed CBC, LFT, RFT, Electrolyte normal, Lac 2.0 D-dimer 1183 Fibrinogen 276 LDH 181, ECG showed RAD RVH global T inverted, S1 (+) Q3 (-), T3 (+), CXR Pneumonia bilateral typical covid. Assessment Long covid syndrome with respiratory failure type 1, severe ARDS. Treatment Antibiotics, nebulizer farbivent: fluticasone/ 8 hrs, Spiriva 1x2 puff, heparinizations, Unfortunately the patient passed away on 23 May 2023. This case report describes an unusual case in which an established pulmonary embolism (PE) was detected more than 1 year in a patient declared cured of SARS-CoV2 infection. Conclusion This case showed that the risk of late pulmonary embolism remains high in Long Covid Syndrome patient. Early diagnosis and treatment should be addressed quickly to prevent the mortality.*

***Keywords: Long COVID Syndrome, Late Pulmonary Embolism, Fatality***

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### INTRODUCTION

Long COVID syndrome refers to a condition in which individuals experience a range of persistent symptoms and health issues following the acute phase of a COVID-19 infection (Seeble et al., 2022). While most people who contract COVID-19 recover within a few weeks, some individuals continue to experience symptoms that last for months or even longer.

The specific symptoms and their severity can vary widely among individuals, but common manifestations of long COVID include fatigue, shortness of breath, chest pain, joint pain, muscle weakness, cognitive difficulties (sometimes referred to as "brain fog"), sleep disturbances, and mental health issues such as depression and anxiety. Other reported symptoms include loss of taste or smell, headaches, dizziness, heart palpitations, and gastrointestinal problems (Baj et al., 2020).

Diagnosing long COVID is primarily based on the presence of persistent symptoms that last beyond the acute phase of COVID-19, typically for more than 12 weeks (Kayaaslan et al., 2021).

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Various medical tests and evaluations may be conducted to rule out other potential causes and assess organ function.

Treatment for long COVID focuses on managing individual symptoms and providing support to improve quality of life (Cha & Baek, 2021). This can involve a multidisciplinary approach that may include medication to address specific symptoms, physical therapy, occupational therapy, cognitive-behavioral therapy, and mental health support. Lifestyle modifications, such as pacing activities and gradually increasing physical exertion, are often recommended (Owens, 2019).

Research Objectives to identify the range of symptoms that persist in individuals with long COVID, characterize the severity and variability of these persistent symptoms among affected individuals, to Evaluate the Duration and Severity of Long COVID Symptoms, determine the duration for which symptoms of long COVID persist, extending beyond the acute phase of COVID-19 dan assess the severity levels of various long COVID symptoms in the studied population, to Examine Diagnostic Methods for Long COVID and To Investigate Multidisciplinary Approaches for Managing Long COVID.

Increase scientific understanding of the symptoms and characteristics of long COVID, provide further information to health practitioners and researchers, Potentially contribute to the development of more accurate and efficient diagnosis methods for long COVID, help identify cases more quickly and precisely, Provide a basis for the development of better management and care approaches for individuals experiencing long COVID, improve the quality of life of patients, Provide a basis for the development of better management and care approaches for individuals experiencing long COVID, improve the quality of life of patients, and This research is expected to make a significant contribution in understanding and handling long COVID, enrich scientific knowledge, and provide guidance for health practitioners in responding to this condition.

## **RESEARCH METHOD**

The method used is the case report method The purpose of this method is to present in-depth information about a particular case, including symptoms, diagnosis, treatment, and results.

A 26-years-old Indonesian lady presented to ER department on 19 May 2023 with complaining shortness of breath since 10 days before admission, coughing (-), fever (-). Patient has history of Covid-19 on March 2022, since then she always complaining shortness of breath especially during exercise, and diagnosed with long covid syndrome. General condition unwell, BP 143/89 mmhg HR 116 x/mnt RR 24 x/mnt T 36.4°C height was 1.55 m weight was 46 kg giving BMI 19.1 kg/m<sup>2</sup>. SpO<sub>2</sub> 89% in room air, then 94% with NRM 15 lpm. On physical examinations showed thorax vesicular +/+, ronchi -/-, wheezing -/-. Laboratory test revealed Hb 17.2 L 8.1 T 191 AE 6.32 Hmt 51.7 MCV 81.8 MCH 27.2 S 90.3 L 4.3 M 5.3 E 0.0 B 0.1 ANC 7330 Alb 4.35 AST 46 ALT 39 GDS 116 BUN 8 Creat 0.68 CCT 123 Na 138 K 3.7 Cl 107 Ppt (K) 13.9 Aptt (K) 35.6 INR 1.27 BGA FiO<sub>2</sub> 0.90 pH 7.42 pCO<sub>2</sub> 23.4 pO<sub>2</sub> 61.9 SO<sub>2</sub> 93.8 HCO<sub>3</sub> 14.8 Be -7.03 AaDO<sub>2</sub> 544 PO<sub>2</sub>/FIO<sub>2</sub> 68.7 Lac 2.0 D-dimer 1183 Fibrinogen 276 LDH 181 Wellscore PE 4.5 (moderate risk) Swab Antigen Negatif ECG showed RAD RVH global T inverted, S1 (+) Q3 (-), T3 (+), CXR Pneumonia bilateral typical covid. Assessment Long covid syndrome with respiratory failure type 1, severe ARDS, moderate risk pulmonary embolism, suspect pulmonary hypertension tipe III. Treatment Inj Meropenem 1gr/8 hrs, inj Levofloxacin 750 mg/24 hr, N-acetylcistein 200 mg/8 hrs, nebulizer farbivent: fluticasone/ 8 hrs, Spiriva 1x 2 puff, from cardiologist planned echocardiography for suspect pulmonary hypertension. Unfortunately the patient passed away on 23 May 2023

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Figure 1. CXR:  
Pneumonia bilateral  
typical Covid

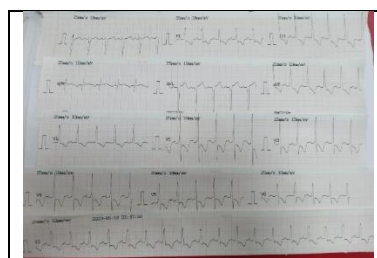


Figure 2. ECG: RAD RVH  
global T inverted, S1 (+)  
Q3 (-), T3 (+)

## RESULTS AND DISCUSSION

This case report describes an unusual case in which an established pulmonary embolism (PE) was detected more than 1 year in a patient declared cured of SARS-CoV2 infection. Acute pulmonary embolism (PE) refers to a potentially life-threatening condition in which a blood clot forms in one of the pulmonary arteries, which are the blood vessels that carry blood from the heart to the lungs.

Long COVID syndrome, also known as post-acute sequelae of SARS-CoV-2 infection (PASC), is a condition in which individuals experience persistent symptoms following a COVID-19 infection (Proal & VanElzaker, 2021). While there have been reports of individuals with long COVID experiencing pulmonary embolism, the exact relationship between the two is still being studied.

Some studies have suggested an increased risk of blood clotting disorders, including pulmonary embolism, in individuals with severe COVID-19 infection. COVID-19 itself is known to cause a hypercoagulable state, meaning it increases the tendency of blood to clot. This can be due to various factors such as inflammation, damage to blood vessels, and disturbances in the body's clotting mechanisms.

It is believed that some individuals with long COVID may continue to have an increased risk of blood clotting even after the acute phase of the infection. The underlying mechanisms for this are not yet fully understood but may involve persistent inflammation and ongoing abnormalities in the coagulation system.

If a person with long COVID develops symptoms such as sudden onset of shortness of breath, chest pain, rapid heart rate, or lightheadedness, they should seek immediate medical attention. A pulmonary embolism can be diagnosed through various tests, including imaging studies such as computed tomography pulmonary angiography (CTPA) or ventilation-perfusion (V/Q) scan.

Treatment for acute pulmonary embolism typically involves anticoagulant medications to prevent further clotting and allow the body's natural mechanisms to dissolve the existing clot (Riedel, 2001) (Hattab et al., 2017). In severe cases, more aggressive interventions such as thrombolytic therapy or surgical procedures may be necessary.

It's important to note that the occurrence of pulmonary embolism in individuals with long COVID is relatively rare, and not all individuals with long COVID will develop this complication (Paul et al., 2021). However, if someone with long COVID experiences symptoms suggestive of pulmonary

embolism, it is crucial to seek immediate medical care for proper evaluation and treatment (Venturelli et al., 2021).

The exact mechanisms underlying acute pulmonary embolism (PE) in individuals with long COVID are not yet fully understood and are an area of ongoing research. However, there are several potential factors and mechanisms that may contribute to the increased risk of PE in these individuals:

1. **Hypercoagulability:** COVID-19 infection itself can lead to a hypercoagulable state, meaning an increased tendency for blood clot formation. The virus can cause inflammation and endothelial dysfunction, leading to an imbalance in the body's clotting mechanisms (Abou-Ismael et al., 2020).
2. **Endothelial Dysfunction:** COVID-19 can cause damage to the lining of blood vessels, known as endothelial cells. This damage can disrupt the normal functioning of the endothelium, leading to increased clotting activity and a higher risk of clot formation (Tarnawski & Ahluwalia, 2022).
3. **Immobility and reduced physical activity:** individuals with long COVID may experience ongoing symptoms such as fatigue, muscle weakness, and exercise intolerance. These symptoms can lead to reduced physical activity and immobility, which are known risk factors for blood clot formation. Prolonged immobility can result in sluggish blood flow and stasis, promoting the formation of clots in the veins that can travel to the lungs and cause PE (Scurati et al., 2022).
4. **Persistent inflammation:** long COVID is associated with chronic inflammation in some individuals. Inflammation can promote blood clot formation by activating clotting factors and impairing the body's natural anticoagulant mechanisms (Turner et al., 2023).
5. **Post-COVID complications:** some individuals with long COVID may develop cardiovascular complications, such as myocarditis (inflammation of the heart muscle) or cardiomyopathy (weakening of the heart muscle). These conditions can disrupt blood flow and increase the risk of blood clot formation, including PE (Magadum & Kishore, 2020).

It's important to note that while these mechanisms are potential contributors to the development of PE in long COVID, further research is needed to fully understand the relationship between long COVID and acute pulmonary embolism. The exact prevalence and specific risk factors for PE in individuals with long COVID are still being investigated.

## **CONCLUSION**

This case showed that the risk of late pulmonary embolism remains high in Long Covid Syndrome patient. Early diagnosis and treatment should be addressed quickly to prevent the mortality. Thoracic CT should also be used in patients who are cured of SARS-CoV2 who present with dyspnea post SARS-CoV2 for pulmonary embolism, especially since data from the literature suggest a high thrombogenic potential of this infection.

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