

D-dimer level elevation can aid in detection of asymptomatic COVID-19 presenting with acute cerebral infarction

Takeru Umemura (✉ takeru.u115@gmail.com)

Moji Medical Center

Hirohisa Kondo

Moji Medical Center

Hirotsugu Ohta

Moji Medical Center

Koichiro Futatsuya

Moji Medical Center

Takamitsu Mizobe

Moji Medical Center

Case Report

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Abstract

Coronavirus disease 2019 (COVID-19) mainly manifests as a respiratory syndrome, besides causing other complications. Severe COVID-19 may also present with coagulopathy, leading to venous thrombosis and cerebral infarction. Stroke is one of the complications associated with severe COVID-19. Generally, acute stroke is the second complication in patients with respiratory syndrome. Here, we present a case of COVID-19 in an 84-year-old female patient who did not manifest any respiratory symptoms; however, she presented with acute stroke. The patient had no cough or fever before the stroke onset, but the COVID-19 PCR was positive. The patient also had markedly elevated D-dimer levels. Our findings suggest that coagulopathy can occur, even in a patient with asymptomatic COVID-19 infection. To our knowledge, this is the first case of asymptomatic COVID-19 in a patient presenting with cerebral infarction. We concluded that elevation of D-dimer levels is one of the tools to ascertain COVID-19 infection in such patients.

Introduction

Although, COVID-19 most commonly manifests as a respiratory syndrome, severe COVID-19 may also present with coagulopathy, leading to venous thrombosis and cerebral infarction [1]. Coagulopathy induced by severe COVID-19 may lead to stroke [2]. Most reported cases present with respiratory symptoms initially, followed by stroke several days later [2, 3]. However, we present a case of asymptomatic COVID-19 in an 84-year-old woman, who presented with stroke.

Case Report

An 84-year-old woman with atrial fibrillation (AF) and a history of subarachnoid hemorrhage was transferred to our hospital owing to sudden onset of loss of consciousness and severe right hemiparesis. The initial NIH stroke scale (NIHSS) score was 28. She had not had cough or fever recently, and there was no fever on presentation. Chest computed tomography (CT) was performed to screen for COVID-19. Brain magnetic resonance imaging (MRI) was also performed. Chest CT showed bronchitis and mild pneumonia (Fig 1) and a COVID-19 PCR was performed. MRI revealed a large left cerebral infarction induced by left internal carotid artery occlusion (Fig 2). Laboratory data are presented in Table 1. It showed that the D-dimer level was more than 60 µg/mL, and prothrombin time-international normalized ratio (PT-INR) was 1.47 by warfarin. Endovascular thrombectomy was performed without intravenous alteplase because of the history of subarachnoid hemorrhage. Recanalization treatment failed, and she was treated in an isolated room. The next day, COVID-19 PCR was confirmed positive and fever was established after admission. However, there were no respiratory symptoms, and her percentage oxygen saturation was preserved in room air. Brain stem reflexes gradually disappeared owing to brain edema, and she died 7 days after admission.

Discussion

Stroke has been reported as a complication of COVID-19 [1, 2]. The cause is unclear. However, coagulopathy with high D-dimer levels and endothelial dysfunction induced by COVID-19 have been considered to be associated with stroke [1, 2, 3]. In most cases, cerebral vascular disease occurs several days after the onset of COVID-19 [4, 5].

The unique feature of our case was that stroke occurred before the presentation of any other symptoms of COVID-19. According to the literature, coagulopathy occurs as a severe complication of COVID-19 [1, 2, 3]. However, in the study of Fara et al., coagulopathy may occur even in mild cases [6]. In our case, the risk of cardiogenic stroke was high because of the history of AF, even though there were no other symptoms of COVID-19. Chest CT did not show ground glass opacities, a common feature of COVID-19. The patient was vomiting on arrival. Generally, she also would be considered usual cardiogenic stroke and aspiration pneumonia. However, she had already been diagnosed with COVID-19. It was really terrifying and we had to protect ourselves with personal protective equipment when we treat emergency patients with unknown diagnoses. Coagulopathy with D-dimer level elevation has already been reported earlier in the literature [1, 2, 3]. In this case, the D-dimer level was extremely high because of cardiogenic stroke; coagulopathy was also believed to be induced by COVID-19.

Therefore, we determined that a high index of suspicion for COVID-19 is necessary in stroke patients without fever and respiratory symptoms. Elevation of D-dimer levels are necessary to diagnose suspected occult COVID-19.

Table

Table 1. Initial laboratory data of the patient

Test	Score	Reference range
WBC	5800	3300-8600 / μ L
segmented cell	76%	32-73 %
Lymphocyte	17%	18-59 %
Platelet count	190,000	158,000-348,000 / μ L
CRP	2.19	0.00-0.14 mg/dL
PT-INR	1.47	
Fibrinogen	578	200-400 mg/dL
FDP	more than 120	0.0-4.9 μ g/mL
D-dimer	more than 60	0.0-0.9 μ g/mL

Declarations

The local Ethics Committee approved the scientific use of the collected data. Informed consent was obtained from patient's family. The authors declare no competing interest.

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Figures



Figure 1

A: Magnetic resonance (MR) diffusion image shows left cerebral infarction. B: MR angiography shows left internal carotid artery occlusion.

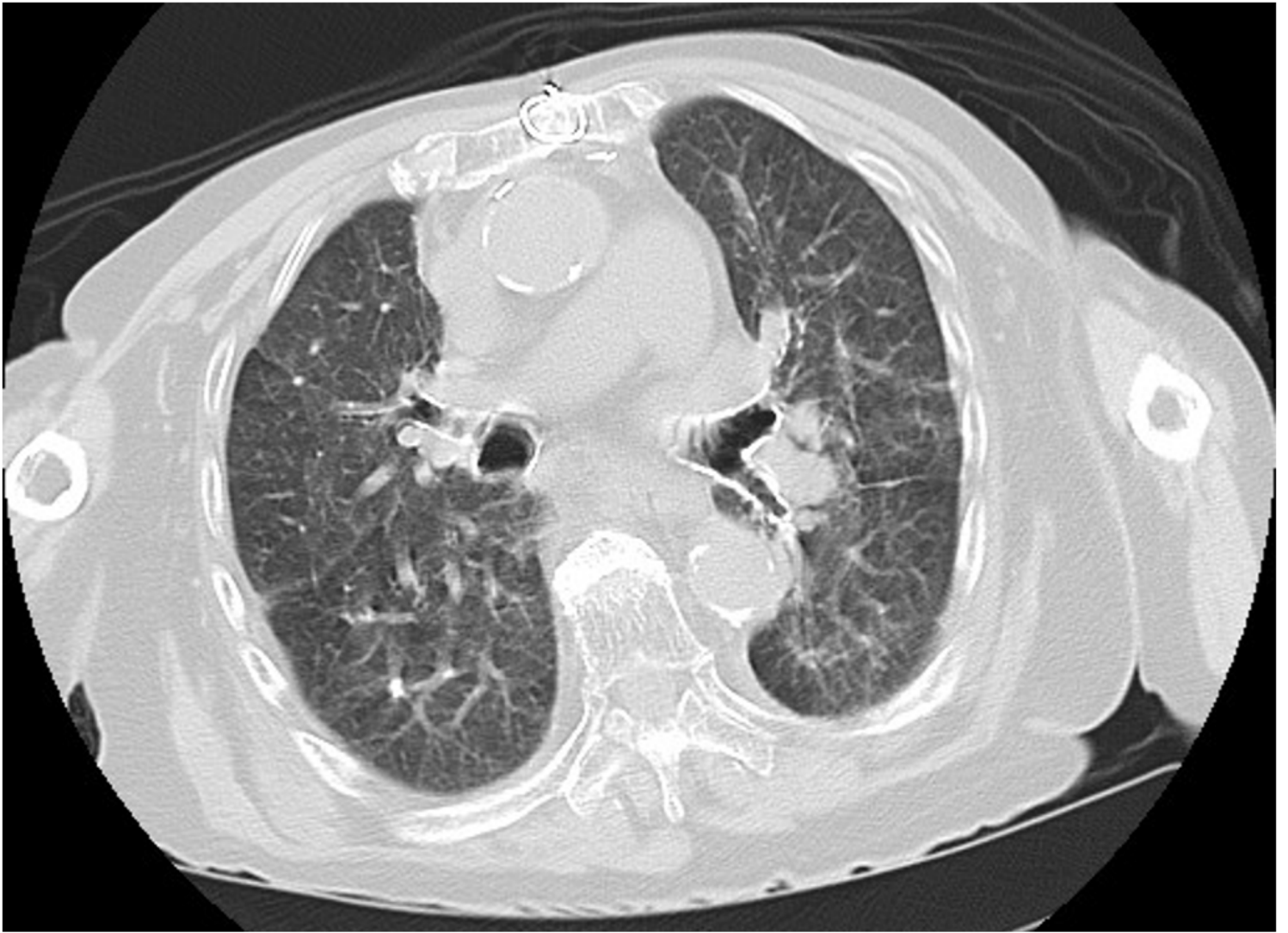


Figure 2

Chest computed tomography shows bronchitis and mild pneumonia.