



# Patients with COVID-19 Developing Acute Cerebrovascular Accidents: A Case Series

Clarisse San Juan MD, Amrit Ahluwalia, MD, Lawrence Chan, DO, Sonny Ahluwalia, DO, Susan Stickevers, MD

Department of Orthopedic Surgery & Rehabilitation Medicine, SUNY Downstate Medical Center, Brooklyn, NY



## Case Description

These patients presented to the PM&R consult service from April-May, 2020 with acute ischemic stroke and were SARS-CoV-2 positive. Patient 1: 69-year-old man presented and treated for COVID symptoms then discharged. He returned 19 days later with similar symptoms and developed a stroke the next day with MRI showing embolic phenomenon. Patient 2: 73-year-old female with right-sided facial droop and hemiparesis, she was asymptomatic but positive for COVID. MRI showed ischemic infarcts in bilateral corona radiata, but less likely due to hypercoagulability or intravascular microthrombi. Patient 3: 55-year-old male presented with COVID symptoms and developed a stroke 10 days later. Imaging showed acute right frontal and basal ganglia stroke due to intracranial atherosclerosis. Patient 4 was a 66-year-old male who presented with COVID symptoms and 6 days later developed a right MCA territory infarct.

## Assessment/Results

The median age was 66.5, 75% male and 50% African-American, 50% Afrocarribean. The average estimated days from COVID symptom onset to stroke symptoms is 18.75, and the average days from COVID positive test to stroke symptoms is 10.25. Average D-dimer on admission was 3848.51 ng/mL, and on day of stroke was 4272.29 ng/mL. Levels of fibrinogen on day of stroke were elevated with an average of 559 mg/dL. Average ferritin on admission was 3652.64 ng/mL and average ferritin on day of stroke 2521.02 ng/mL. Average CRP on admission was 198.33 mg/L, while average CRP on day of stroke was 188 mg/L. Average LDH on day of admission was 852.4 U/L, and on day of stroke was 633.34 U/L.

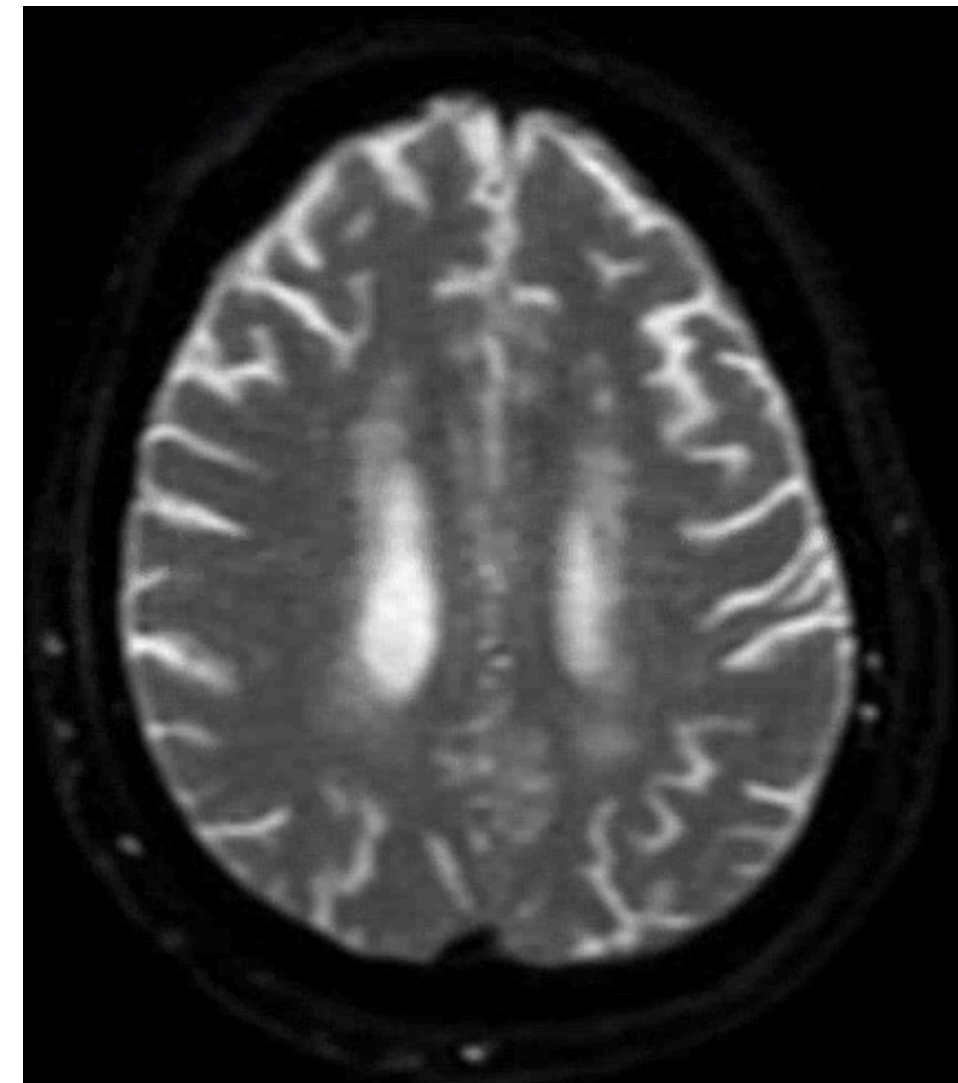


Figure 1. Patient 1 Brain MRI DWI with L with punctate foci of positive diffusion trace in high L centrum semiovale, Embolic.

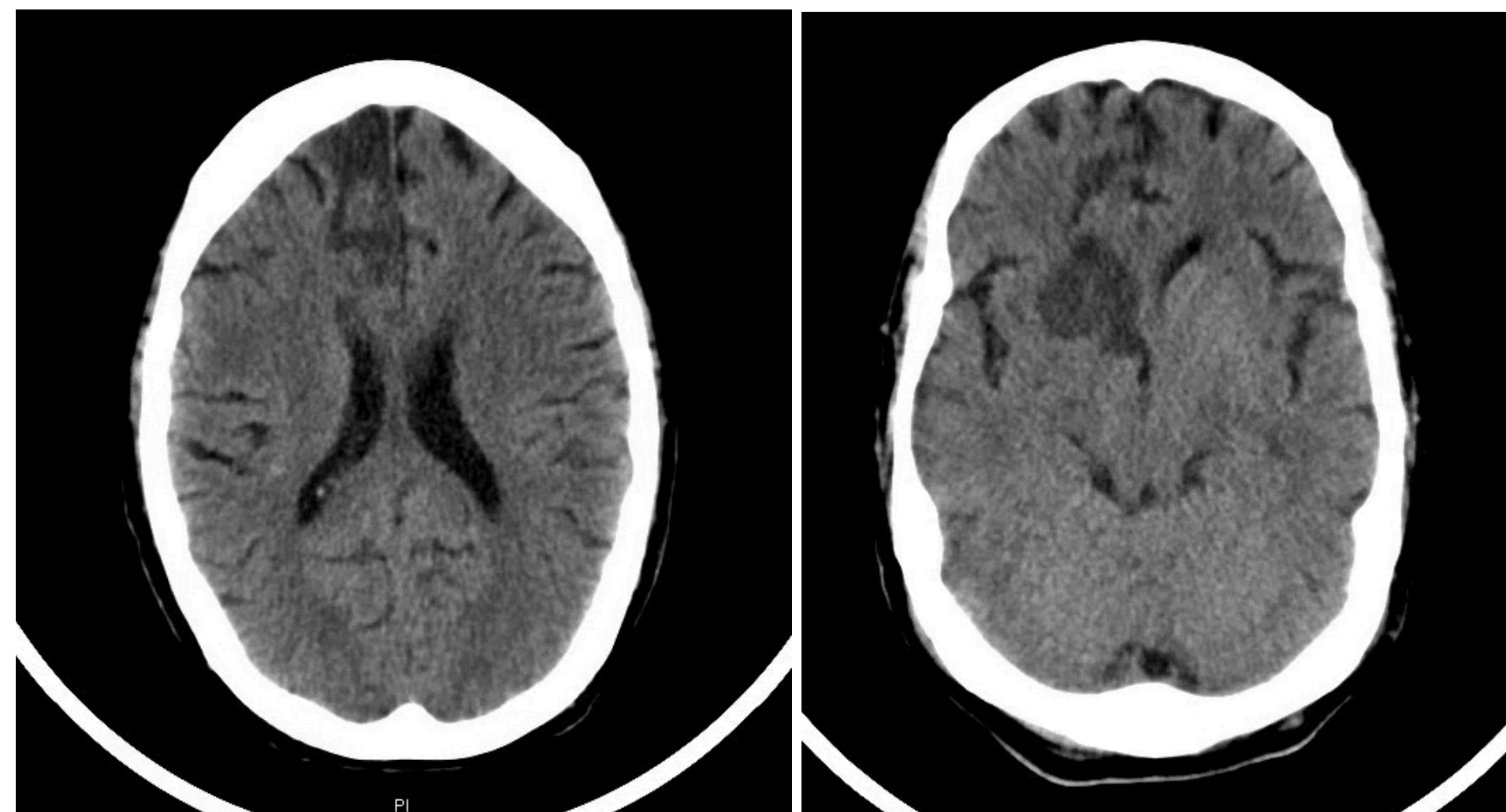


Figure 2. Patient 3 CT head showing R frontal and basal ganglia acute infarct likely due to intracranial atherosclerosis, but hypercoagulable state can be contributory.

## Discussion

D-dimer levels were increased on the day of stroke. The acute phase reactants, although elevated, seem to have lower levels closer to the day of stroke and levels of LDH, also elevated, were decreased. The association of these levels with the onset of acute stroke may not be accurate due to our sample size being very limited. Stroke can happen up to 20 days after COVID symptoms onset.

## Conclusion

COVID-19 has been shown to increase the risk for stroke. These cases give us an idea of the COVID-19 patient characteristics and lab findings that develop acute stroke.

