

## “Lateral Medullary Syndrome in a patient with Covid 19 disease”

Zeeshan Ali Ansari<sup>1</sup>, Priya Govil<sup>2</sup>, Kishalay Datta<sup>3</sup>

### Author's Affiliation:

<sup>1</sup>Emergency Medicine Resident, <sup>2</sup>Consultant, <sup>3</sup>Head of Department, Department of Emergency Medicine Max Hospital, Shalimar Bagh, New Delhi - 110088, India.

### Corresponding Author:

Priya Govil, Consultant, Department of Emergency Medicine Max Hospital, Shalimar Bagh, New Delhi - 110088, India.

E-mail: [drpriyasharma5@gmail.com](mailto:drpriyasharma5@gmail.com)

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### Abstract

A 68 years old male diabetic patient presented to the Emergency Department with chief complaints of slurring of speech and weakness in the left lower limb for 1 day. The patient was also experiencing respiratory symptoms from the last 4-5 days, cough, and dyspnea. On arrival in the emergency department, the patient was pyrexial. Covid-19 rapid antigen test was done and came positive. The patient was shifted to covid ICU, a Covid RT PCR sample was sent, and an MRI stroke protocol was planned. MRI BRAIN was suggestive of right-sided lateral medullary infarcts. Right vertebral artery flow void absent. MR ANGIO BRAIN- Eccentric short segment plaque involving the proximal segment of the left subclavian. Eccentric plaques involving the posterior aspect of left proximal ICA left petrous ICA and both cavernous ICA. Lack of flow-related enhancement in right vertebral artery! occluded. Non-visualized inferior division of right MCA.

**Keywords:** Lateral Medullary Syndrome; Covid 19 disease.

### Introduction

The evidence from SARS-CoV-2 studies implies that the virus can have central nervous system involvement.<sup>3-5</sup> Since the Coronavirus pandemic in 2020, there has been ever-growing evidence of neurologic complications associated with COVID-19. A retrospective study from china with 214 COVID-19 patients reported 4 ischemic strokes.<sup>6</sup>

#### *Lateral Medullary Syndrome*

Lateral medullary syndrome (LMS), known as Wallenberg's syndrome and posterior inferior cerebellar artery syndrome, is a rare cause of stroke.

The typical signs and symptoms are crossed hemisensory disturbance (ipsilateral face, contralateral body), ipsilateral Horner syndrome, and ipsilateral cerebellar signs.

In 2003, Kim<sup>1</sup> found that the onset was sudden in most cases. Among non-sudden onset, first signs and symptoms are usually vertigo, headache, gait ataxia, or dizziness. Sensory signs (as dysphagia, hoarseness, and hiccups) are tended to occur later. The patient's signs and symptoms are divided into very common (90%), moderately common (50% to 70%) and less common (<40%). The most common signs and symptoms are sensory symptoms/ signs, gait ataxia, dizziness, and Horner sign. Sensory signs and symptoms are the most frequent manifestation.



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Moderately common signs and symptoms are dysphagia, hoarseness, vertigo, nystagmus, limb ataxia, nausea, vomiting, and headache.

There are sensory signs affecting the trunk and extremities opposite site of lesion and face and cranial nerves on the same side of the lesion. The syndrome is characterized by loss of pain and temperature sensation on the contralateral side of the body and the ipsilateral side of the face.<sup>2</sup>

### Case Study

A 68 years old male diabetic patient presented to the Emergency Department with chief complaints of slurring of speech and weakness in the left lower limb for 1 day.

The patient was also experiencing respiratory symptoms from the last 4-5 days, cough and dyspnea.

On arrival in the emergency department, the patient was pyrexial.

Covid-19 rapid antigen test was done which comes positive.

The patient was shifted to covid ICU, Covid RT PCR sample was sent, together with a COVID-19 blood panel (In addition to full blood count (FBC), urea and electrolytes, C-reactive protein (CRP), it also included fibrinogen, troponin, lactate dehydrogenase, D-dimer, ferritin, and a clotting screen.) and MRI stroke protocol planned.

Physical examination revealed the stable, conscious, oriented, vitally stable: Pulse: 88/min, BP: 120/70 MMHG, RR: 18/min, Temperature: febrile, Spo2-94% on room air, No Pallor seen.

On examination, he was found to have a respiratory rate of 20 breaths/min. He was not in respiratory distress and was not using his accessory muscles. On chest auscultation, there were bilateral crackles but no wheeze. Cardiovascular examination was unremarkable with a regular pulse. Abdominal examination was also unremarkable. He was well perfused and had no peripheral edema. He was alert and oriented.

Neurological examination:

GCS 15/15, conscious oriented

TONE- B/L UL and LL normal

SENSORY- normal

MOTOR- normal

POWER- Right UL and LL - 5/5

Left UL and LL - 5/5

DTR - normal

PLANTERS - B/L flexors +

NYSTAGMUS - Negative

INTENTIONAL TREMORS - No

Slurring of Speech - Yes

HYPOTONIA - Negative

No Neck rigidity present

Meningeal sign absent

MRI BRAIN ( FIG 1 & 2) suggestive of right-sided lateral medullary infarcts. Right vertebral artery flow void absent.

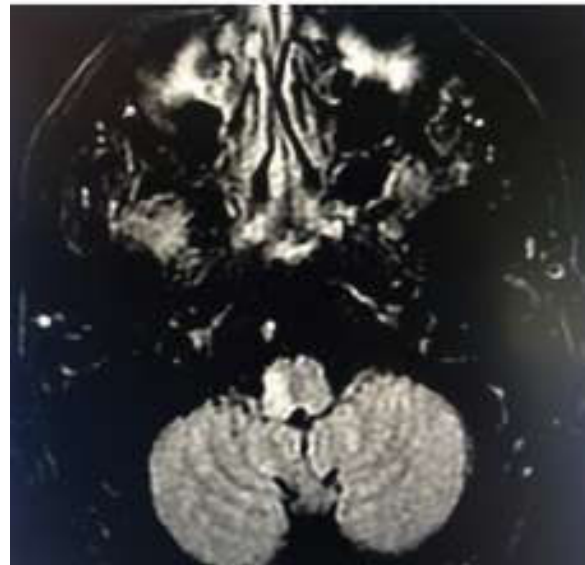


Fig. 1: MRI Brainstroke Protocol

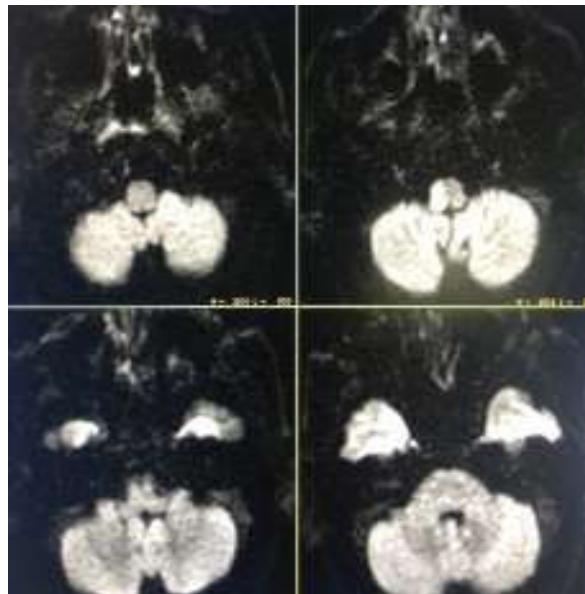
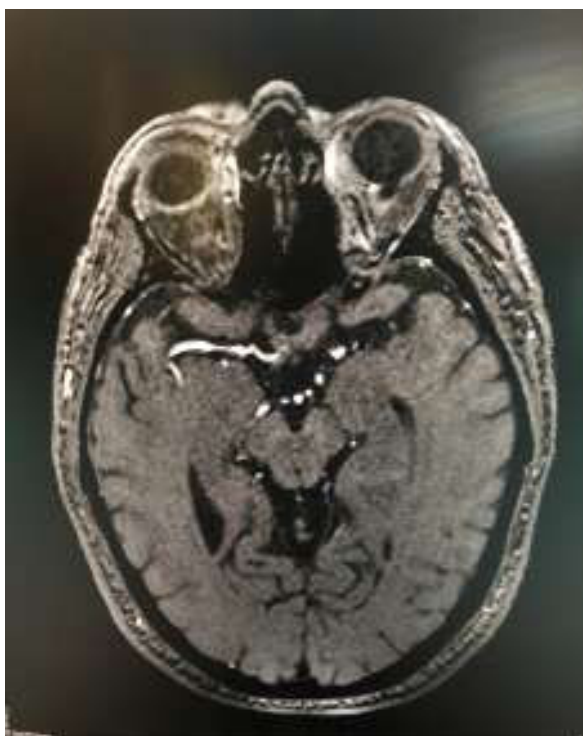


Fig. 2: MRI Brainstroke Protocol



**Fig. 3: MR Angio Brain**

MR ANGIO BRAIN (FIG 3) - Eccentric short segment plaque involving the proximal segment of the left subclavian. Eccentric plaques involving the posterior aspect of left proximal ICA left petrous ICA and both cavernous ICA. Lack of flow-related enhancement in right vertebral artery! occluded. Non-visualized inferior division of right MCA.

### Course in the Hospital and Outcome

On arrival in the emergency department, the patient was pyrexial.

Covid-19 rapid antigen test was done was comes positive.

The patient was shifted to covid ICU, Covid RT PCR sample was sent, together with a COVID-19 blood panel (In addition to full blood count (FBC), urea and electrolytes, C-reactive protein (CRP), it also included fibrinogen, troponin, lactate dehydrogenase, D-dimer, ferritin, and a clotting screen.) and MRI stroke protocol planned.

MRI BRAINSTROKE PROTOCOL ( FIG 1 & 2) suggestive of right-sided lateral medullary infarcts. Right vertebral artery flow void absent.

Then MR Angio Brain was planned.

MR ANGIO BRAIN (FIG 3) - Eccentric short segment plaque involving the proximal segment of

the left subclavian. Eccentric plaques involving the posterior aspect of left proximal ICA left petrous ICA and both cavernous ICA. Lack of flow-related enhancement in right vertebral artery! occluded. Non-visualized inferior division of right MCA.



**Fig. 4: Chest Xray**

CHEST XRAY (FIG 4) - Lung markings are prominent with the presence of non-homogenous opacities in the left upper/mid zones and right mid-zone. Associated atelectatic changes are seen in the right mid-zone.

THE right CP angle appears hazy. The left-sided CP angle is acute. Atherosclerotic changes are seen along the arch of the aorta.

The patient also complains of difficulty in swallowing during the stay in the hospital.

Patients Labs suggestive of Serum Creatinine 0.54, Sodium 137.7, Potassium 3.96, Chloride 100.8, Serum Calcium 8.62, Bicarbonate 28.2, Serum Urea 16.6, HBA1C 11, CRP 11, Lactate dehydrogenase 190, normal coagulation profile, trop I 0.01 ng/ml, D-dimer 230

The patient was taken for surgery attempted Cerebral DSA under LA.

Physiotherapy with speech and occupational therapy was advised for 1 month.

### Discussion and Therapeutic considerations

There are reports showing that thromboembolic events are increased in patients with COVID-19<sup>7</sup> and apart from headache and dizziness, cerebrovascular accidents (CVAs) are amongst the common neurologic complications in this disease. It has been postulated that the state of hypercoagulation along with endothelial injury following massive inflammatory response in COVID-19 could be a potential contributor to developing ischemic

stroke<sup>8</sup>. The main outstanding characteristics of this stroke patient was the size of the infarct, the larger size artery involvement, and the relative absence of conventional cerebrovascular risk factors. The only risk factor he possessed was smoking and curiously one can assume that prothrombotic state associated with COVID-19 infection might have played an important role in his disease. The lab tests for genetic thrombophilia conditions will be performed after the anticoagulant regimen.

Dysphagia was also experienced by the patient according to R. Saha et al.<sup>12</sup>. Paralysis of the palate and vocal cord (the ninth and tenth cranial nerves) is related to dysphagia, hoarseness, and diminished gag reflex.

It appears that COVID-19 disease can be associated with an increased thrombotic state that can be associated with large artery thrombosis. A case series study in New York has reported 5 COVID-19 patients under 50 years with large-vessel stroke.<sup>9</sup> Several mechanisms could contribute to low blood pressure in acute ischemic stroke including cardio emboli, heart failure, gastrointestinal bleeding, and sepsis.<sup>10</sup> In general, patients who are normotensive at the presentation of acute ischemic stroke tend to have cardio emboli sources.<sup>11</sup> It seems that in the context of COVID-19, cardiogenic shock or sepsis could be the plausible causes of low blood pressure. In the previous reports<sup>7</sup>, severe neurologic complications were more common in the severe COVID-19 cases. Nevertheless, in this patient, the pulmonary involvement was mostly mild and never reached a severe respiratory distress pattern prior to the stroke. Even the arterial oxygen saturation was acceptable. Also, in this patient the absence of fever and breathing difficulty and the fact that the COVID-19 disease was diagnosed upon admission was noteworthy. Therefore, it is of utmost importance to note that the patient was not aware of having COVID-19 disease and did not primarily complain of respiratory symptoms. In our hospital, 2 separate emergency rooms exist 1 designated for COVID patients and the other for regular patients. Most of our patients came to the non-COVID ER. This once again emphasizes screening all patients for COVID-19 during the epidemic since many patients may lack telltale signs of the infection such as fever. Furthermore, performing a simultaneous chest/brain CT scan seems to be a convenient method in patients with CVA.

## Conclusion

Ischemic strokes in COVID-19 patients tend to occur as large infarcts mostly due to large artery thrombosis and can be seen in patients with mild to moderate pulmonary involvement who are not aware of having COVID disease.

Antiplatelet and anticoagulant therapy was not harmful in our patients, however, recombinant tissue plasminogen activator administration should be investigated in COVID-19 patients to understand the potential benefit or harm of this treatment about COVID-19 coagulative/thrombotic complications.

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