

LARGE VESSEL ISCHAEMIC STROKE RELATED TO COVID19

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ABSTRACT

The coronavirus disease 2019 (COVID19) appeared in December 2019 in China and rapidly expanded all across the world, causing hundreds of thousands of deaths, mostly through respiratory distress syndrome. However, in a few months, the medical community noted other severe complications on COVID19 patients, and it is now clear there is an association between ischaemic stroke and COVID19. Objective: to report a neurological complication in a COVID19 patient. Case description: we report the case of a male, younger than 60 years-old, without chronic diseases, that presented with a large vessel ischaemic stroke during the course of a severe COVID19. The epidemiology, clinical characteristics, laboratory and imaging findings of this case are compared with literature data. Conclusion: this case helps to body the current knowledge of this novel infection and its neurological complications, highlighting the importance of knowing these complications in order to better manage the affected patients.

Keywords: Stroke; Coronavirus infections; COVID-19; Neurology; SARS coronavirus; Case reports.

ACIDENTE VASCULAR CEREBRAL ISQUÊMICO DE GRANDE VASO RELACIONADO A COVID19

RESUMO

A Doença causada pelo Novo Coronavírus (COVID19) apareceu em Dezembro de 2019 na China e rapidamente se espalhou por todo o mundo, causando centenas de milhares de mortes, principalmente devido síndrome de desconforto respiratório. Entretanto, em poucos meses, a comunidade médica percebeu outras complicações severas nos pacientes com COVID19, e agora já é claro que existe uma associação entre acidente vascular cerebral isquêmico e COVID19. Objetivo: reportar uma complicação neurológica em um paciente com COVID19. Apresentação de caso: nós reportamos o caso de um homem, com menos de 60 anos, sem doenças crônicas prévias, que apresentou acidente vascular cerebral isquêmico de um grande vaso durante o curso de uma grave quadro de COVID19. A epidemiologia, características clínicas, laboratoriais e radiológicas do caso são comparadas com os dados da literatura. Conclusão: esse caso ajuda a encorpar o conhecimento atual dessa nova infecção e suas complicações neurológicas, destacando a importância de se conhecer essas complicações para melhor manejar os pacientes acometidos.

Palavras-chave: Acidente vascular cerebral (AVC); Doença pelo Novo Coronavírus (2019-nCoV); COVID-19; neurologia; SARS-CoV-2; Apresentação de Caso.

INTRODUCTION

The coronavirus disease 2019 (COVID19) appeared in December 2019 in China and rapidly expanded all across the globe, being responsible for hundreds of thousands of deaths, mostly through respiratory distress syndrome^{1,2,8}. In parallel, medical community noted other severe complications on COVID19 patients, and a few months later it is now clear there is an association between ischaemic stroke (IS) and COVID19^{2,3,4}. So far, only small series of IS in patients with COVID19 have been published. The objective of this paper is to report one

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case of IS in a COVID19 patient, discuss its characteristics and compare it with the published data.

CASE REPORT

A male patient, 55 years-old, was admitted at the intensive care unit (ICU) of our hospital with a 10 days history of fever, myalgia, and progressive dispnea and desaturation. He was previously healthy, without any comorbidities and did not use any medication. His chest computed tomography (CT) had suggestive findings of viral pneumonitis (figure 1) and his RT-PCR assay was positive for the new coronavirus. His most relevant laboratory exams are shown in table 1. On the third day in the ICU he was intubated for severe respiratory distress, sedated, and connected to the mechanical ventilator. On the fourth day, when returning from the prone position, the physician noted anisocoria with left mydriasis; at that time he had also presented significant polyuria and hyponatremia. Head CT was performed and evidenced extense hypodensity in the territory of the left middle cerebral artery (CMA), with mass effect and midline shift (figure 2). On the next day, he had also developed hyponatremia. Appropriate measures aiming for neuroprotection were taken but unfortunately the patient passed away a few days later.

DISCUSSION

This case exemplifies SARS-COV2 relation with IS in many different aspects. Our hospital was made a public regional reference for COVID19 patients. From February to July 15th, 129 patients with confirmed COVID19 were treated in our facility. Among these, only this patient presented with IS, which represented a prevalence of 0.7%. International publications worldwide described prevalence of IS between 2,5-6% in COVID19 patients^{1,3,5}. The low percentage of IS found in our hospital could reflect the small sample of COVID19 patients of our hospital, but a recently published brazilian study described 11 cases of IS in 1208 hospitalized COVID19 patients (prevalence of 0.9%)⁸. The patient's age and his lack of chronic diseases are features recognized in several other cases of strokes related to COVID19^{5,6,7}. Also, the involvement of large vessels, exemplified in this case by the proximal occlusion of the left CMA, is a finding reported in these cases^{5,6,7}. It is well recognized that IS tends to occur in patients with more severe disease, like the one presented here⁷. The mechanisms responsible for its occurrence remain obscure but it is probable there is relation with a pro-coagulant and pro-inflammatory state caused by SARS-COV2 although

other mechanisms are still considered (cardiomyopathy and vasculitis, e.g.)^{5,7} At admission, our patient had high values of ferritin, CPK, DHL and especially D-dimer, what could indicate a high inflammatory state and abnormalities with coagulation cascade^{1,7}. There are reports of IS in COVID19 patients with high levels of D-dimer and other markers^{1,5} and this is a topic that deserves attention in order to identify groups in higher risk for stroke and other vascular complications. The real relation between IS and COVID19 is still to be defined.

Figure 1 – Chest CT: bilateral, predominantly peripheral ground glass opacities associated with interlobular septal thickening, characterizing crazy paving appearance and compromising over 50% of pulmonary parenchyma.

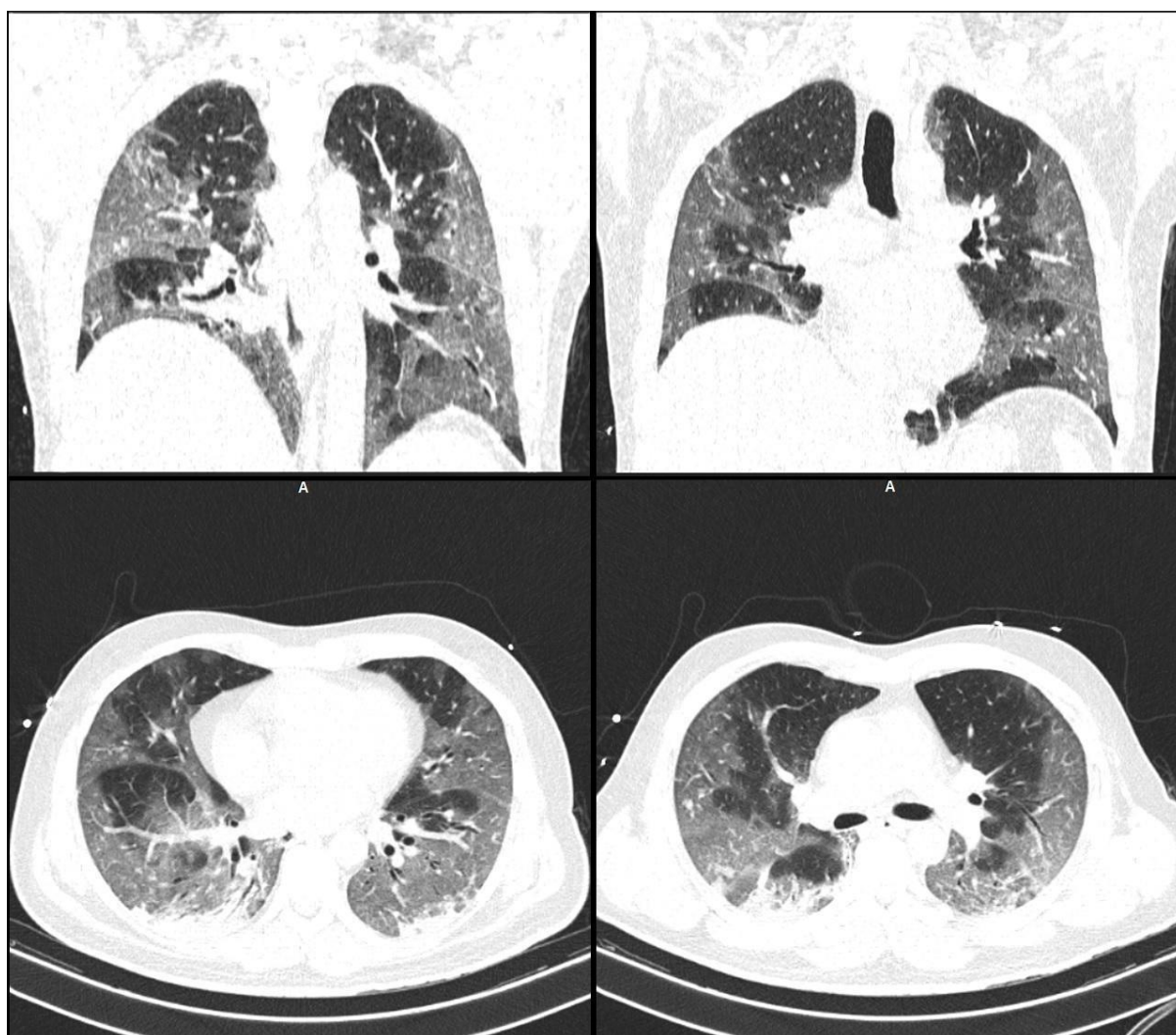


Figure 2 – Head CT - left hemisphere extensive hypodensity with mass effect and midline shift.

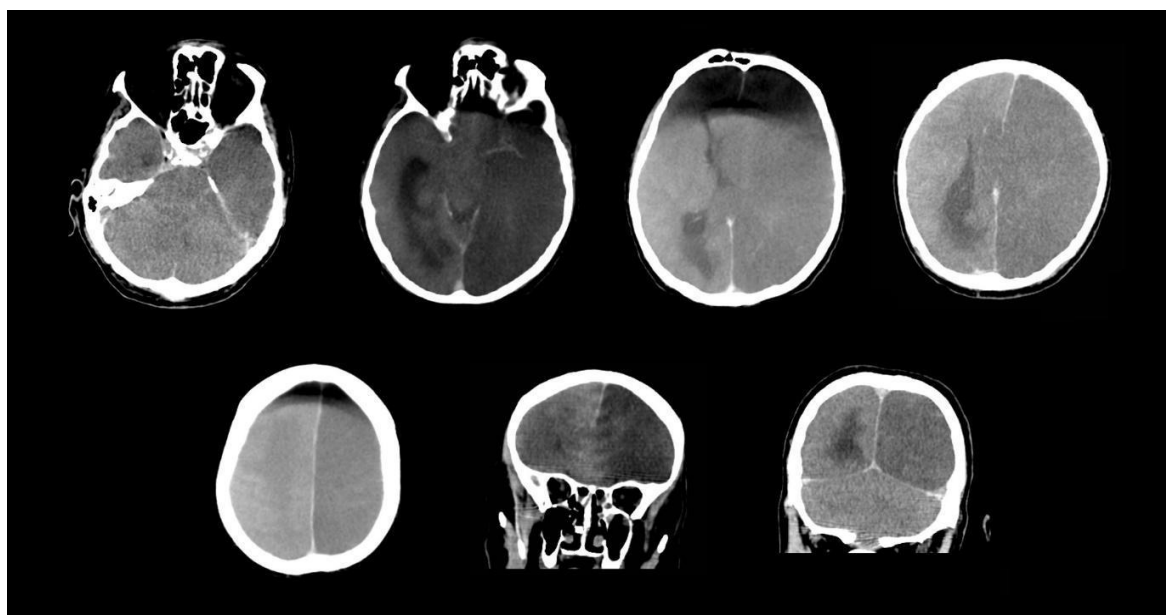


Table 1 – Main laboratory results. The main laboratory findings, organized chronologically

	Exam	Result
Day 01	Urea	28 mg/dL
	Creatinine	0.7 mg/dL
	TGO	73 U/L
	TGP	41 U/L
	Sodium	134 mmol/L
	Creatine phosphokinase (CPK)	636 U/L *
	Potassium	3.3 mmol/L
	D-dimer	1881,66 ng/mL *
	Ferritin	1585 ng/mL *
	C reactive protein	135 mg/L*
	Lactate dehydrogenase (DHL)	619 U/L*
	Hemoglobin	13,5 g/dL
	White blood count	6240 cells
	Platelets	197000 /mm ³
Day 03	Sodium	134 mmol/L
Day 04	Sodium	137 mmol/L
Day 05	Sodium	169 mmol/L**

*the altered values of ferritin, CRP, DHL, D-dimer and CPK at hospital admission; ** hypernatremia developed during treatment, probably due to central diabetes insipidus secondary to IS with mass effect.

CONCLUSION

Although IS is not a frequent complication of COVID19, it is one of the most common and most relevant neurological complication of the disease^{2,6,8}. The registry and publication of this case is important to provide data on this novel infection and its behavior, especially regarding severe neurological complications such as stroke, making it possible for better understanding and managing COVID19 patients.

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