

Retinal hemorrhage in a patient with a recent diagnosis of COVID-19

Hemorragia retiniana em paciente com diagnóstico recente de COVID-19

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KEYWORDS:

COVID-19, Retinal hemorrhage; SARS-CoV-2 infection.

ABSTRACT

The ophthalmological manifestations resulting from SARS-CoV-2 infection have been documented in the scientific community, but the knowledge about the related affections to the posterior ocular segment is still scarce. In this study, we report a young patient with visual complaint after a recent COVID-19 infection, showing important retinal hemorrhages and bevacizumab was the treatment of choice, leading to clinical improvement. We highlight the importance of fundoscopic monitoring in post-COVID-19 patients for non-invasive assessment of systemic circulatory patterns.

PALAVRAS-CHAVE

COVID-19; Hemorragia Retiniana; Infecção pelo SARS-CoV-2.

RESUMO

As manifestações oftalmológicas decorrentes da infecção pelo SARS-CoV-2 estão sendo estudadas no meio científico, entretanto, o conhecimento acerca das afecções relacionadas ao segmento ocular posterior ainda é escasso. Neste trabalho relatamos uma paciente jovem com queixa visual após infecção recente por COVID-19, evidenciando importantes hemorragias retinianas. O uso de bevacizumab foi o tratamento escolhido, levando à melhora do quadro. Destacamos, então, a importância do monitoramento fundoscópico em pacientes pós-COVID 19 para avaliação dos padrões circulatórios sistêmicos de forma não invasiva.

INTRODUCTION

In December 2019, the first cases of severe acute respiratory syndrome-coronavirus-2 (SARSCoV2) pneumonia were diagnosed in Wuhan, China. The main clinical manifestations show great variability in signs and symptoms, and some studies have reported ophthalmological findings^{1,2}. Ocular manifestations of coronavirus disease-2019 (COVID19) are uncommon, with an estimated prevalence of $\leq 4\%$ ³. The

most frequent changes are dry eyes, blurred vision, foreign-body sensation⁴, conjunctivitis, epiphora, conjunctival hyperemia, and chemosis².

The presentations of this disease in the posterior segment of the eye point to nonspecific lesions, such as hyper-reflective bands at the level of the ganglion cells⁵. There are also reports on retinal venous occlusions and macular edema⁶. This report presents a case of presumptive retinal vein occlusion shortly after COVID19 infection^{6,7}.

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CASE REPORT

In September 2020, a 32-year-old woman sought care owing to the presence of dark “spots” in the left eye (OS) for approximately 3 days. She had experienced a mildly symptomatic SARS-CoV-2 infection 1 month prior to the onset of visual symptoms. COVID-19 was diagnosed with molecular testing using the polymerase chain reaction technique. No lesions were seen on chest computed tomography, and blood test findings were normal, without signs of coagulopathy. The patient’s clinical history had no comorbidities, and she denied a history of trauma, smoking, or use of any drugs with risk of a thromboembolic event. There was no need for hospitalization because of COVID-19.

On examination, she presented a corrected visual acuity (VA) of 20/20 in the right eye (OD) and 20/100 in OS. Biomicroscopic examination was within normal limits, without anterior chamber reaction and with an intraocular pressure of 10 mmHg in both eyes (OU). On fundus examination, an increased and asymmetric excavation was observed in OD. In OS,

preretinal and vitreous bleeding could be observed, which affected the upper and lower retinal arcade, proximal to the disk, with vitreitis. Optic disk edema was also present. An optical coherence tomography (OCT) of the macula and optic disk in OU (Figures 1 and 2) was performed on the same day, which showed a swollen optic disk, preretinal bleeding in the upper and lower arcades proximal to the disk, and punctual bleeding in the terminal arcades, with no macular edema.

Under the diagnostic hypothesis of venous hemioclusion, treatment with bevacizumab (Avastin[®]; Genentech, Inc., San Francisco, CA, USA) 1.5 mg was instituted, aiming to reduce vasculitis and pathological angiogenesis, because no protocol had been established for this kind of condition at the time. On a return consultation 1 week later, the patient reported improvement. OCT showed a significant decrease in the area of bleeding, with improvement in VA. The VA observed before the diagnosis of the retinal event was restored: 20/20 OD and 20/60 OS (Figures 3 and 4). It should be noted that the patient’s best VA in OS since 2018 had been 20/60 owing to amblyopia in OS.

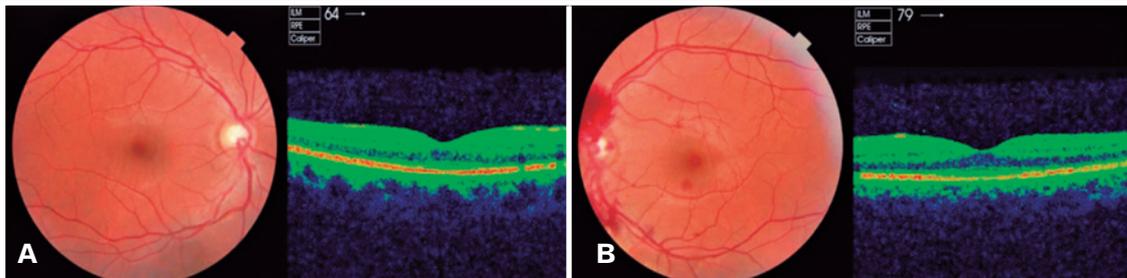


Figure 1. A) Retinography and optical coherence tomography (OCT) of the right-eye macula showing an aspect of the retina without important changes. B) Left-eye macula retinography and OCT showing an area of vitreous bleeding, without macular edema.

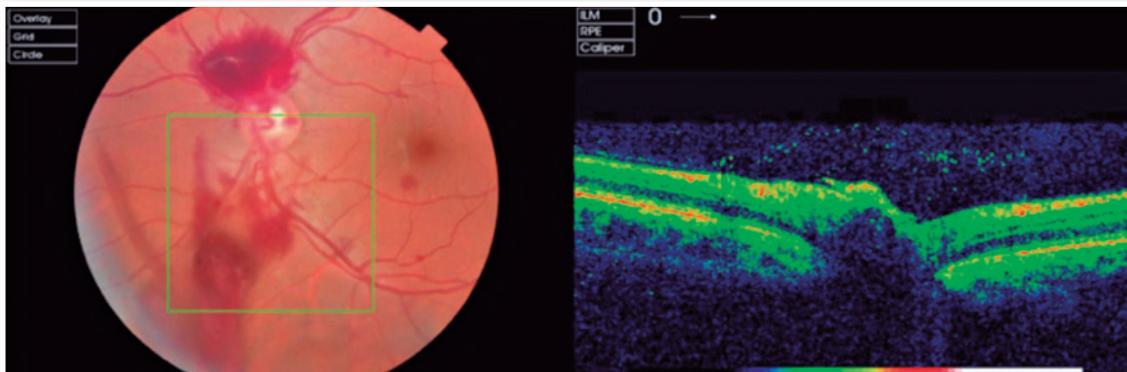


Figure 2. Retinography and optical coherence tomography of the right eye showing a hemorrhagic aspect and disk edema.

One month after diagnosis, there was an improvement in OS, with no more hemorrhage and 20/60 vision, with other ophthalmological examination standards unchanged and within the normal range. VA remained 20/20 in OD.

DISCUSSION

COVID19 is mainly characterized by symptoms of cough, fever, dyspnea, and pneumonia⁽¹⁾, but it may be related to other clinical outcomes not yet well elucidated in the literature, as in the case of the patient reported in this study. Little is known about ophthalmologic involvement, especially retinal lesions, although there are already reports on punctual hemorrhage and central retinal vein occlusion in COVID-19^(8,9). In the present report, hemorrhage was observed proximal to the optic disk, in addition to optic disk edema.

According to the current literature, these alterations are characteristic of retinal venous occlusion.

In most cases, this condition is found in people over 40 years of age, and more frequently in elderly people over 60 years of age⁽¹⁰⁾. It is characterized by unilateral vision loss after engorgement and dilatation of retinal veins, followed by retinal hemorrhage and areas of ischemia⁽¹⁰⁾. Hemorrhage extends from the optic nerve head to the periphery of the retina; candle flame-shaped hemorrhages, which are mostly superficial, and cotton-wool spots, which represent ischemia, can also be observed. Less frequently, macular and optic nerve edema are present⁽¹¹⁾.

Currently, it is suggested that COVID-19 infection may be a predisposing factor for thrombotic events⁽¹²⁾. Studies have already put forth the hypothesis that the involvement of the retinal microvasculature seen in patients with COVID19 may be a result of the disease and consequently lead to significant ophthalmological manifestations, with a potential risk of retinal vascular complications^(8,9,13,14).

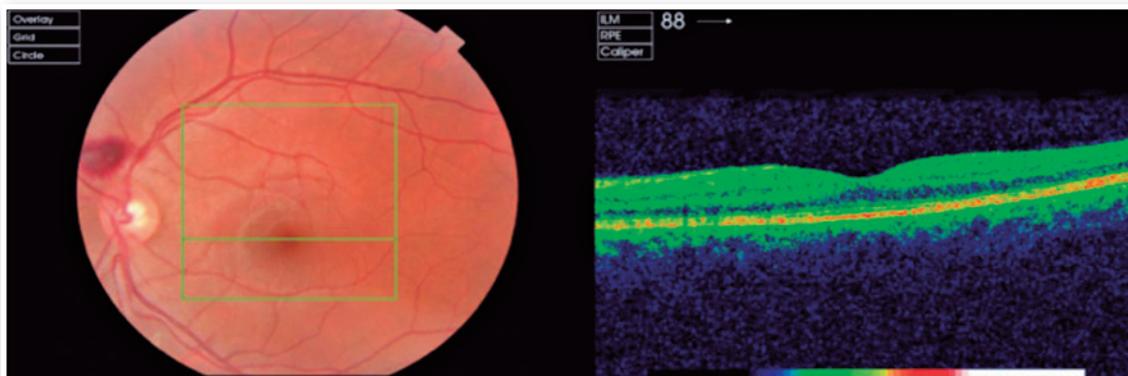


Figure 3. Retinography and optical coherence tomography of the right eye showing macular appearance 7 days after anti-vascular endothelial growth factor medication. No macular edema is observed.

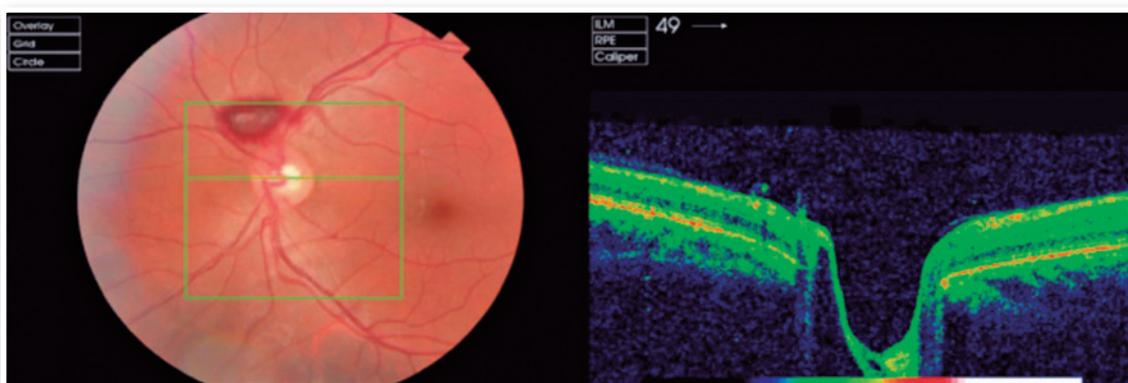


Figure 4. Retinography and optical coherence tomography of the right eye showing the appearance of the disk 7 days after anti-vascular endothelial growth factor medication. No disk edema is observed.

It is known that the involvement of the microvasculature can cause eye diseases owing to the fact that the retinal circulation is a terminal arterial system⁽¹⁴⁾. However, mechanisms that explain vascular damage in COVID19 are still not well understood. Two main hypotheses are being studied: first, a state of pseudovasculitis as a result of viral infiltration into endothelial cells⁽¹⁵⁾, and second, a condition of hypercoagulability characterized by disseminated intravascular coagulation^(16,17).

These characteristics make the correlation between the COVID19 infection and the retinal manifestations found in the present case plausible, according to the literature^(8,9,13,14).

Immunobiologicals are being used to treat the complications of COVID19, not acting directly on the cause (virus) or on the state of hypercoagulability but rather on the body's response to infection, such as vasculitis, pathological angiogenesis, and increased cytokine levels^(18,19).

The proposed treatment aimed to protect the subretinal space from damage caused by hemorrhage and consequent insidious or sudden edema. Therefore, anti-vascular endothelial growth factor medication was administered to treat vasculitis and pathological angiogenesis, thereby reducing leaks, edema, inflammatory complexes, hemorrhages, and neovascular phenomena^(6,8,19).

There is evidence of retinal vascular involvement in cases of COVID19 infection, including postvaccine events, because thrombotic events are known to be involved in the pathophysiology of the disease⁽²⁰⁾. The ophthalmological findings in this case coincide with those reported in most current studies; however, the appearance of vitreous hemorrhage a short time after the infection stands out, thereby suggesting deposits of immune complexes causing occlusion of the retinal vessels^(6,21,22).

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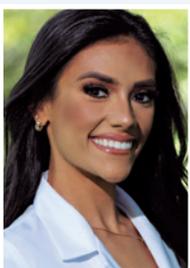
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