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A Case of Unilateral Papillitis during COVID-19 Infection

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ABSTRACT

Coronavirus Disease 2019 (COVID-19) is a viral disease that can show different clinical findings in different patients, mainly affecting the respiratory tract and progressing with the outcome of pneumonia. Involvement of the virus in different ways, from the brain to the gastrointestinal-genitourinary system, except the respiratory tract, has been reported in so many publications so far. Although eye involvement due to the disease is a relatively rare condition, it may cause visual problems either by the direct neurotoxic effect of the virus, autoimmune reactions, or some vascular pathologies. These findings usually occur in the subacute-advanced period of the disease or after the infection. In this case report, it is aimed to present the magnetic resonance imaging findings and clinical findings of a case with unilateral papillitis without optic neuritis findings in the early period of COVID-19, unlike the others.

Keywords: COVID-19, optic neuritis, papillitis.



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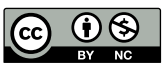
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INTRODUCTION

Coronavirus Disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, which entered our lives in late 2019, affects many different systems and organs with different mechanisms, except for the respiratory tract.^[1] Although the underlying mechanisms are not fully known yet, cytotoxic damages caused directly by the virus, autoimmune reactions caused by the virus, and vascular pathologies caused by the virus are generally held responsible for most of the pathologies caused by the virus. In addition, it is known that the virus causes some thrombotic events by activating coagulation.^[2] Deep vein thrombosis in the lower extremities, which we frequently see as a result of coagulation activation, is an important cause of morbidity encountered in some patients. It may also cause mortality by affecting the pulmonary vessels in the lungs, causing pulmonary thromboembolism, vascular involvement in the heart, and cardiomyopathies as a result of coronary vasculitis, or neurological findings as a result of myocardial infarction, neurotoxic and vasculitic damage in the brain vessels.

Neurological involvement of COVID-19 has been well described so far, and possible mechanisms such as direct neurotoxic effect caused by the virus, immunological effects such as cytokine storm, hypoxia caused by diffuse lung involvement, and vascular coagulopathy result have been presented.^[3,4] However, there are not enough reports about eye involvement, which is called the extension of the brain. This case report aims to present the magnetic resonance imaging (MRI) findings of a patient who developed papillitis due to COVID-19 together with clinical findings.

CASE REPORT

A 61-year-old male patient was admitted to the emergency department of our hospital with complaints of fever, cough, and chest pain for the past week. In his medical history, it was learned that he had a coronary bypass operation due to atherosclerotic coronary artery disease in December 2020 and therefore used acetylsalicylic acid (1 × 100 mg/day) and metformin (2 × 500 mg/day) due to impaired glucose tolerance. Low-dose non-contrast thorax computed tomography (CT) examination showed peripherally located, focal ground-glass areas accompanying parenchymal bands in the right lung middle lobe and bilateral basal lower lobes, and was evaluated as compatible with COVID-19 pneumonia. Ground-glass density infiltrates in bilateral lung lower lobe basals consistent with COVID-19 pneumonia in low-dose non-contrast thoracic CT scans are shown in Figure 1. Upon detection of SARS-CoV-2 PCR positive (+) in the nasopharyngeal aspirate sampling, the patient was started on moxifloxacin (2 × 400 mg/day), cefixime (2 × 400 mg/day), vitamin-mineral supplementation (3 times per day). On the 3rd day of the treatment, there was no significant feature in the neurological examination of the patient who had a complaint of unilateral vision loss in the right eye. In the eye examination, the right papilla was reported as slightly edematous and slightly pale compared to the other side.

No signs of ischemic or demyelinating disease or appearance suggestive of cerebral sinus thrombosis were detected in the brain MRI taken with a 32-channel head coil using a 3 Tesla scanner (Magnetom, Siemens, Erlangen, Germany). In the eye MRI; in the late phase T1 3D SPACE, FLAIR axial and related subtraction images of the case, the right optic disc circumference was obscurely thick in thin-section T2 SPACE images. A discoid area of 5.5 mm diameter and 1.3 mm thickness on the right was observed (Figs. 2-5). Peripapillary thickening and contrast enhancement were noted. There

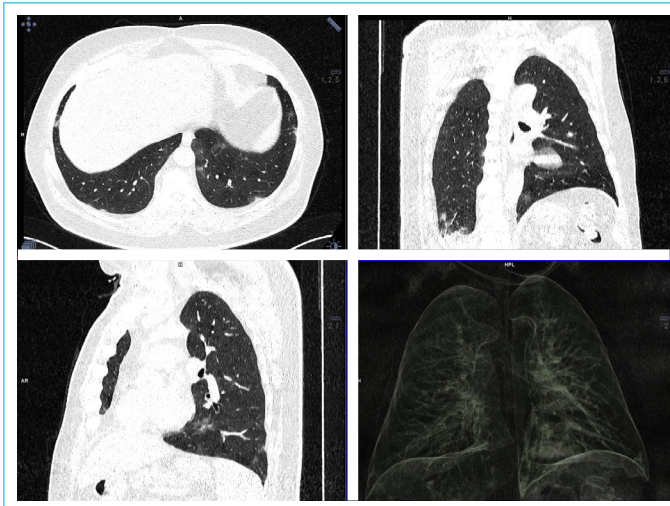


Figure 1. Ground-glass density infiltrates in bilateral lung lower lobe basals in low-dose non-contrast thoracic CT scan.



Figure 2. Thickening right optic disc circumference in thin-section T2 SPACE images.



Figure 3. Axial T1 3D SPACE images.

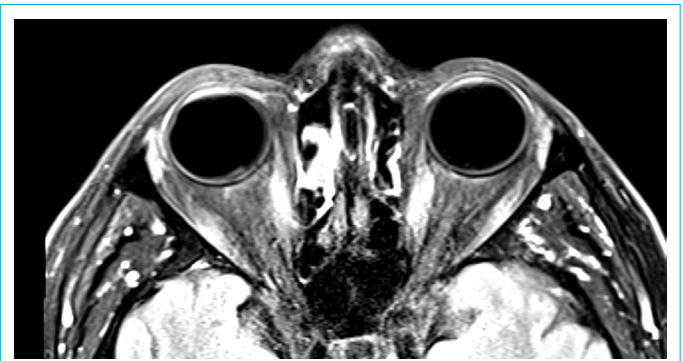


Figure 4. Orbital axial FLAIR images.

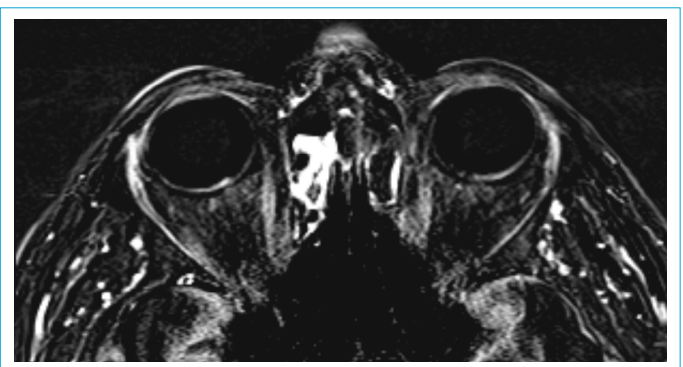


Figure 5. Thickening and contrast enhancement in the right peripapillary discoid area in subtraction images.

was no obvious optic neuritis finding on MRI either. Since central retinal artery and vein occlusion were not considered with neither physical examination, nor with MRI findings, and Doppler examination was not performed. Furthermore, there was no evidence of ischemia in diffusion-weighted images. An optical coherence tomography examination was not performed because patient consent was not available. The case was evaluated in favor of papillitis papillophlebitis based on clinical features and imaging findings. In addition to the COVID-19 treatment, the patient was given pulse steroid therapy (4 mg/day) and anticoagulant therapy (enoxparin 40 mg: 4000 anti-Xa IU/0.4 mL and heparin 25000 U/5 mL) for 5 days. In the patient who had almost complete regression in symptoms and fundus examination within 3 weeks, a control MRI was not required.

DISCUSSION

In this case report, imaging and clinical findings of a case with unilateral papillitis findings in the eye in the early period of COVID-19 are discussed. Papillitis is a clinical condition that we encounter in optic neuritis, which is often called optic nerve inflammation.^[5] It is usually detected in demyelinating diseases, in post-viral situations, or idiopathic. Often there is no clear etiology. It manifests when inflammation in the optic nerve extends to the level of the optic disc and affects vision. In the presence of optic neuritis in an adult patient, systemic, autoimmune, and granulomatous diseases should be considered rather than infective agents. Another cause of papillitis is papillophlebitis. It is a rare disease that usually results from retinal vein occlusion.^[6,7] Although it has been suggested to be caused by idiopathic inflammation of retinal and optic disc capillaries, other causes of the tendency to clot (related hereditary or acquired thrombophilia), vasculitic syndromes, blood hyperviscosity, and other known systemic vascular inflammatory disorders must be excluded. In COVID-19, which has a wide range of symptoms from asymptomatic clinic to mortality, the vascular damage caused by the virus can appear in different forms in different organs. There are a few cases of optic neuritis papillophlebitis reported during or after COVID-19 infection in literature.^[8] The neurotoxic effect of the virus is responsible for optic neuritis, and vascular damage primarily caused by the virus is responsible for papillophlebitis.^[7] These findings are generally seen in the recovery phase of the disease; in one of the cases who developed papillophlebitis, visual symptoms started 6 weeks after active COVID-19 infection.^[9] In a case report of optic neuritis, the findings appeared 4 weeks after COVID-19.^[10] The most important feature that distinguishes our case from others; the clinical and imaging findings of papillophlebitis appeared in the early stage of the infection while under antiaggregant treatment.

It is possible for visual disturbances to occur for different reasons in COVID-19.^[4,11] Visual dysfunction may occur with some autoimmune events such as impaired posterior circulation and involvement of the occipital lobes (posterior reversible vasoconstriction syndrome-PRESS syndrome), cranial nerve involvement, increased intracranial pressure syndrome as a result of cerebral sinus vein thrombosis, and acute disseminated encephalomyelitis. Although papillitis-optic disc edema, anterior optic neuropathy, etc. are prediagnosed by ocular examination, it is vital to visualize the bulbus oculi and all segments of the optic nerve with imaging. The patient was imaged with 3 Tesla units and a dedicated 32-channel head coil. However, it was not seen anything obvious in conventional sequences, or post-contrast routine T1 MPR images. However, as can be seen on very thin sliced high-resolution T2 SPACE images and late-phase post-contrast T1 SPACE and FLAIR images.

CONCLUSION

Vision problems during or after COVID-19 infection can be seen within many underlying mechanisms. It is mostly possible to diagnose with clinical history and imaging.^[12] While pulse steroid therapy provides rapid improvement in the clinical status of patients with optic neuritis, anti-coagulant/anti-aggregant therapies should be added to overcome the underlying vascular coagulopathy.^[4] Thus, the progression of complaints can be prevented with appropriate treatments.

Disclosures

Informed Consent: Written informed consent was obtained from the patient.

Conflict of Interest: The author declares that there is no conflict of interest.

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