

# Unilateral Optic Neuritis in Post COVID-19: A Case Report

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## ABSTRACT

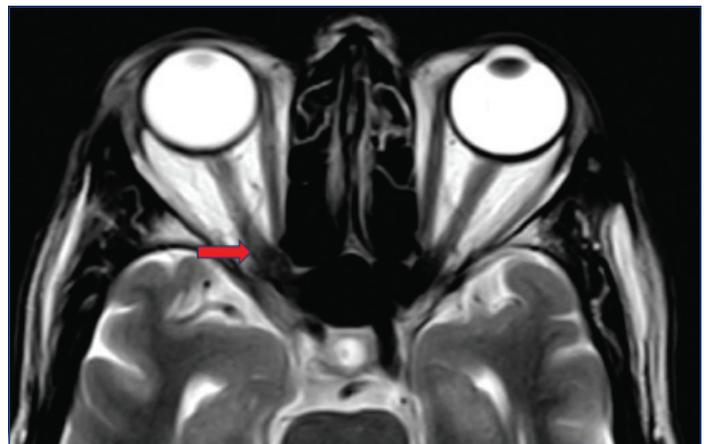
Optic Neuritis had been an unusual manifestation, reported in patients affected with Coronavirus disease-2019 (COVID-19). Here the authors report a case of 67-year-old male patient, who got manifested with optic neuritis as post COVID-19 sequelae. He was treated for COVID-19. Later on, after 21 days of treatment, he presented with blurring of vision and diplopia and was further evaluated and diagnosed as a case of optic neuritis with axial Time (T2) Magnetic Resonance Imaging (MRI) scan showing mild thickening and T2 hyperintensity of intracanalicular part of the optic nerve of the right eye. The patient was started on intravenous methylprednisolone followed by oral prednisolone. He had a good visual outcome. Post COVID-19, optic neuritis has become one of the possible neurological complications that may either present with unilateral or bilateral loss of vision. Hence, the clinicians should be aware of neuro-ophthalmic involvement and treatment should be initiated promptly for improved outcomes.

**Keywords:** Blindness, Coronavirus disease-2019, Myelin oligodendrocyte antibody, Neuro-ophthalmic

## CASE REPORT

A 67-year-old male patient with no known co-morbidities presented to Medicine Outpatient Department (OPD) with complaints of blurring misty vision and double vision aggravated on looking down for 12 days which was not associated with headache. No history of eye pain, redness and watery discharge. His vision was fine when he looks through his left eye. He denied a family history of any rheumatological or immunological diseases. He did not have any previous ophthalmological complaints in the past before COVID-19. He was recently diagnosed and treated in our hospital for COVID-19 (Mild asymptomatic) three weeks ago, was discharged on the seventh day of hospitalisation and advised for home quarantine for 10 days. Post-discharge on the 14<sup>th</sup> day, he developed all these symptoms. On presentation, his pulse rate was 70 per minute, regular and his blood pressure was 100/60 mmHg. His room air saturation was 95% with a respiratory rate of 20 breaths per minutes and his temperature was normal. Other systemic examination was unremarkable. On ophthalmological examination, his right eye visual acuity was 6/18 which did not show improvement with pinhole examination and his left eye visual acuity 6/6. His colour vision examination was impaired in the right eye and found to be normal in the left eye. Extraocular movements were in full range. Conjunctiva was normal. Anterior segment of both the eyes was normal. The Intra Ocular Pressure (IOP) in both eyes was 15 mmHg. In the slit lamp examination, both the anterior chamber and the vitreous chamber were free of inflammation and the optic disc was normal.

Routine lab investigations showed normal complete haemogram, metabolic panel and urine analysis. He had elevated C-Reactive protein (~ 48 mg/L) and erythrocyte sedimentation rate (~ 46 mm/hr). MRI brain was suggestive of mild thickening and T2 hyperintensity of the intracanalicular part of the right optic nerve (~ 5.2 mm), with the brain parenchyma and the left optic nerve, were normal [Table/Fig-1]. Myelin oligodendrocyte antibody (MOG) was detected with a titre of 1:160 (positive). Diagnosis of unilateral right optic neuritis post COVID-19 was made. The patient was started on 1 gm/day intravenous methylprednisolone for three days, followed by oral steroids 60 mg/day for 11 days and was tapered in following consultation with the physician. After one-month post-optic neuritis, his right eye vision improved to 6/6 and colour vision was normal.



**[Table/Fig-1]:** Axial T2 MRI scan showing mild thickening and T2 hyperintensity of intracanalicular part of the optic nerve of the right eye.

## DISCUSSION

The novel pandemic Coronavirus Disease 2019 (COVID-19), caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), has tested the health community. Diagnostic and therapeutic efforts have been focused on respiratory complications of the disease, while several ocular implications were also reported in patients. Optic nerve dysfunction, eye movement abnormalities and visual field defects have been described [1]. The development of optic neuritis is started by demyelination and swelling of optic nerve fibers due to systemic T-cell activation leading to immunological antigen-antibody reaction [2]. During the COVID-19 outbreak, conjunctivitis was stated as a manifestation of the disease and highlights the potential conjunctival transmission route. Neurological complications of COVID-19 include polyneuritis, Guillain-Barré syndrome (GBS), meningitis, encephalomyelitis, and encephalopathy. Following the diagnosis of COVID-19, there have been many reports in the study literature [3-5] in which, cases were reported with unilateral or bilateral optic neuritis and found to have improved in visual acuity and complete resolution of retinal findings and optic disc oedema after treating with steroids.

Additional presentations with diplopia, ophthalmoparesis and abnormal perineural or cranial nerve on MRI orbit have also been reported [6]. Optic nerve inflammation can be due to a variety of viral, bacterial, parasitic and fungal agents [7]. In the present case,

the most probable cause of optic neuritis is COVID-19 which also attributed to a similar presentation of a case that was reported on a 32-year-old male patient who presented with complaints of a sudden drop of vision in his left eye, throbbing left-sided headaches, central scotoma, colour depth affection, elevated effected colour depth, two weeks post COVID-19 infection [8].

Optic neuritis is more common in adults and usually presents as unilateral optic neuritis. But there are reports which have shown the bilateral involvement of the optic nerve with confirming radiological findings in a moderate seropositive covid patient with Myelin Oligodendrocyte Glycoprotein (MOG) positive [4]. MOG is a glycoprotein located on the myelin sheaths and oligodendrocytes. MOG antibodies can be found in serum. However, they do not cause nervous system disease until they cross the brain-blood barrier, usually due to inflammation or infection associated with elevated serum antibodies [9,10].

The treatment of acute optic neuritis is conservative with intravenous methylprednisolone led to more rapid recovery of the vision. The patients who were treated with only low dose oral prednisolone had early recurrences. In neurological and ophthalmological guidelines, it is mentioned that optic neuritis should be treated with methylprednisolone with 500-1000 mg/day for 3-5 days followed by 1 mg/kg/day for 11 days [11]. Patient in the present case was treated with i.v. methylprednisolone 1000 mg/day for three days and was changed to Prednisolone 60 mg/day for 11 days and tapered over the next one week.

## CONCLUSION(S)

The neuro ophthalmic manifestations of COVID-19 infection range from conjunctivitis, uveitis, scleritis, retinal changes, raised intracranial tension, neuritis etc. Probably in near future, the specialist may come across many manifestations of the COVID-19 rising further questions with multiple presentations, variable

manifestations, viral infection-related inflammatory, neurotrophic and coagulopathic processes triggered by the novel coronavirus. The physicians must be more vigilant in identifying the early signs and symptoms presented by the patients and investigate them accordingly to diagnose, treat and follow-up.

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