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Case Report

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Miller-Fisher syndrome after COVID-19 pneumonia: case report

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ABSTRACT

Miller-Fisher syndrome is a rare variant of Guillain-Barré syndrome and is a disease with ataxia, areflexia, and ophthalmoplegia. Recent viral diseases are generally blamed for their etiologies. Our aim is to present a case of Miller-Fisher syndrome that developed after COVID-19 pneumonia.

Keywords: Miller-Fisher syndrome, COVID-19, ophthalmoplegia

INTRODUCTION

Miller Fisher syndrome (MFS) is a rare variant of Guillain-Barré syndrome and was first described by Fisher in 1956 and is an acquired neurologic disease characterized by ataxia, areflexia, and ophthalmoplegia.[1,2] Viral diseases such as recent gastroenteritis or acute respiratory tract infections are blamed for their etiology.[3] Although the diagnosis is mainly based on clinical findings, albumino-cytologic dissociation or a non-proportional increase in cerebrospinal fluid (CSF) protein in the absence of inflammation findings support clinical findings. In addition, electromyography (EMG), magnetic resonance imaging (MRI), and nerve biopsy help to confirm the diagnosis.[4,5] MFS has a good prognosis with treatment. In cases of MFS occurring after a viral infection, findings may resolve in 8-10 weeks.[6] Our aim is to present a case of Miller-Fisher syndrome (MFS) that developed after COVID-19 pneumonia.

CASE

A 63-year-old male patient presented to our outpatient clinic with a sudden onset of diplopia. The best corrected visual acuity (BCVA) in the right eye was 0.8 (with -0.50 axis 25) (Snellen), and the BCVA in the left eye was 0.7 (with -0.50 axis 100) (Snellen). Bilateral pupillary light reflex were positive. Anterior segment examination revealed bilateral posterior subcapsular cataracts. Ocular tension was 16 mmHg bilaterally. While the fundus examination of the right eye was normal, retinal collaterals secondary to a previous vein occlusion were present in the left eye. Eye movements were minimally restricted in bilateral outward gaze, and diplopia was present. There was lagophthalmos, which was more prominent on the right (Figure 1). In the anamnesis of the patient, it was learned that he was treated for COVID-19 pneumonia 3 weeks ago. Neurology was consulted. Dysphagia, hyponasal speech, and areflexia in deep tendon reflex (DTR) were observed. COVID-19 test was positive in hospital records. No acute neurological findings were found in brain MRI. Lumbar puncture was performed and CSF protein was detected as 75. A diagnosis of Miller-Fisher syndrome was made, hospitalization was given, and five cycles of plasmapheresis treatment were administered. After the treatment, the patient's DTRs returned to normal, and dysphagia and hyponasal speech improved. The patient's

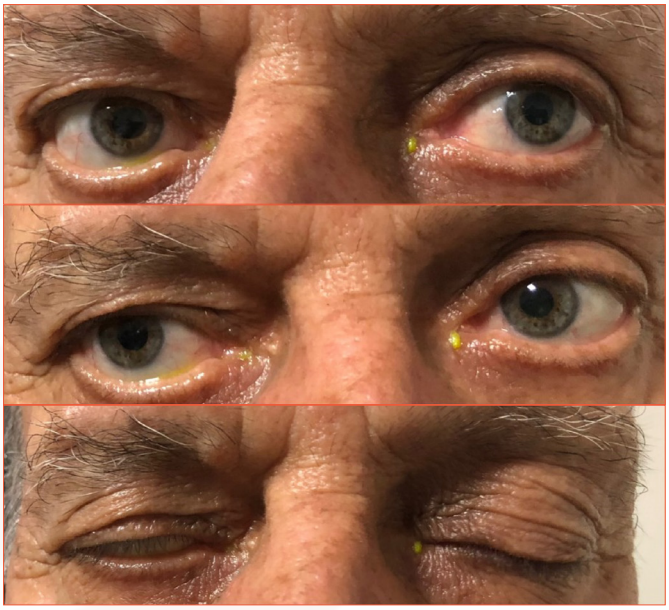

Figure 1. Bilateral gaze limitation and right lagophthalmos

bilateral outward gaze limitation improved in the early period (Figure 2). On examination 6 weeks after discharge, it was observed that eye movements and diplopia improved, but facial paralysis findings still persisted.

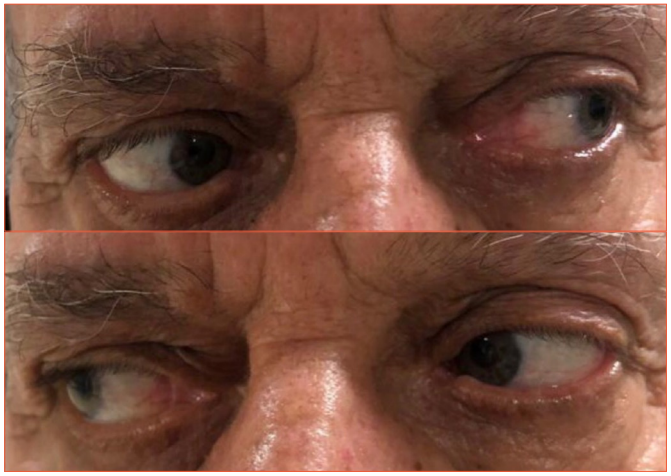

Figure 2. Improvement in gaze at week 6

DISCUSSION

Although the etiology of Miller-Fisher syndrome is not known exactly, the majority of patients have a history of upper respiratory tract infection or gastroenteritis 2 or 3 weeks ago. It is accepted that autoimmunity against glycopeptides in Schwan cells and axons with antigenic stimulation induced by viruses or bacteria is responsible for the pathogenesis of the disease. There are cases reported after mumps, varicella, measles, EBV, influenza, and *C. jejuni* infection.[3] COVID-19 Disease is a disease that causes an epidemic all over the world due to coronavirus infection, starts with upper respiratory tract infection findings, and affects many systems. It is generally known that coronaviruses exhibit neurotropic properties and therefore may cause neurologic conditions.[7] In the literature, a few cases of MFS with COVID-19 disease have been reported.[8,9] Our patient had COVID-19 disease three weeks ago. He was evaluated in our clinic with a complaint of diplopia that developed afterwards. The patient had normal pupillary light reflex and no afferent pupillary defects. The patient had bilateral outward gaze restriction in eye movements with diplopia. He also had lagophthalmos in the right eye. After a detailed evaluation with neurology, the patient was diagnosed with Miller-Fisher syndrome with dysphagia, hyponasal speech, and areflexia in DTRs and was treated with plasmapheresis. MFS generally has a good prognosis, and the symptoms regress in 8-10 weeks with treatment. Immunoglobulin (IVIG) and/or plasmapheresis treatment is given in the treatment of MFS. Ulaş et al.[10] treated a patient with MFS with intravenous immunoglobulin. Likewise, Fernández-Domínguez et al.[8] treated the patient who developed MFS after COVID-19 with intravenous immune globulin. In our patient, 5 cycles of plasmapheresis treatment were administered, and regression was observed in the majority of the findings afterwards. No complications related to plasmapheresis were observed in the early period. At 6 weeks, eye movements had improved. Diplopia was absent. But lagophthalmos was still persisting. Since the patient did not continue follow-up, we do not have longitudinal findings.

CONCLUSION

In our extensive literature review, we did not find a case of MFS developing after COVID-19 disease due to coronavirus in our country. It should be kept in mind that the COVID-19 infection can also cause MFS.

ETHICAL DECLARATIONS

Informed Consent

All patients signed and free and informed consent form.

Reviewer Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors declare no potential conflicts of interest.

Financial Disclosure

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Fisher M. An unusual variant of acute idiopathic polyneuritis (syndrome of ophthalmoplegia, ataxia and areflexia). *N Engl J Med.* 1956;255(2):57-65.
2. Snyder LA, Rismondo V, Miller NR. The Fisher variant of Guillain-Barré syndrome (Fisher syndrome). *J Neuroophthalmol.* 2009;29(4):312-324.
3. Li H, Yuan J. Miller Fisher syndrome: toward a more comprehensive understanding. *Chin Med J.* 2001;114(03):235-239.
4. Lo YL, Chan LL, Pan A, Ratnagopal P. Acute ophthalmoparesis in the anti-GQ1b antibody syndrome: electrophysiological evidence of neuromusculartransmission defect in the orbicularis oculi. *J Neurol Neurosurg Psychiatry.* 2004;75(3):436-440.
5. Chiba A, Kusunoki S, Obata H, Machinami R, Kanazawa I. Serum anti-GQ1b IgG antibody is associated with ophthalmoplegia in Miller Fisher syndrome and Guillan Barre syndrome: clinical and immunohistochemical studies. *Neurol.* 1993;43(10):1911-1917.
6. Yavaşcan Ö, Sütçüoğlu S, Dizdarer G, Özgür S, Aksu N. Miller-Fisher sendromu: iki vaka takdimi. *Çocuk Sağ Hast Derg.* 2004;47(4):283-286.
7. Wu Y, Xu X, Chen Z, et al. Nervous system involvement after infection with COVID-19 and other coronaviruses. *Brain Behav Immun.* 2020;87:18-22.
8. Fernández-Domínguez J, Ameijide-Sanluis E, García-Cabo C, GarcíaRodríguez R, Mateos V. Miller-Fisher-like syndrome related to SARS-CoV-2 infection (COVID 19). *J Neurol.* 2020;267(9):2495-2496.
9. Lantos J, Strauss S, Lin E. COVID-19-associated Miller Fisher syndrome: MRI findings AJNR. *Am J Neuroradiol.* 2020;41(7):1184-1186.
10. Ulaş B, Pelit A, Erol İ. Miller-Fisher sendromu: olgu sunumu. *TJO.* 2014;44(4):327-329.