DOI: 10.4274/jmsr.galenos.2023.2023-5-1

Journal of Multiple Sclerosis Research 2023;3(2):37-39

CASE REPORT

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Seeing is Deceiving: Optic Neuritis Parading as Glioma

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Abstract

Optic neuritis and optic glioma are diseases that affect the optic nerve and cause visual disturbances. Although they can have different clinical presentations, they can also mimic each other. Optic glioma is a slow-growing tumor that causes gradual vision loss, whereas optic neuritis is an acute inflammatory disease that causes sudden onset vision loss and pain with eye movements. Due to the limitations of magnetic resonance imaging, distinguishing between the two conditions is not always possible. Herein, we have reported the case of a patient who was diagnosed with optic neuritis after extensive investigations and who recovered completely with medical treatment.

Keywords: Optic neuritis, optic glioma, vision loss

Introduction

Optic neuritis (ON) and optic glioma (OG) are conditions that can affect the optic nerve and cause visual problems. ON is an acute inflammatory disorder that primarily affects young individuals and presents as pain with eye movements and sudden vision loss (1). In ON, the myelin sheath is considered to be the target of an autoimmune response, which results in demyelination and inflammation (2). In contrast, OG is a slow-growing tumor that constitutes 5% of all juvenile brain tumors and is the most common primary optic nerve tumor (3,4). It can cause progressive vision loss, proptosis, and ocular misalignment, and is reportedly associated with neurofibromatosis type-1 (4). OG and ON can be mistaken for each other due to the similarities in presentation and imaging.

Herein, we have discussed the case of a patient in whom, despite the initial findings suggesting OG, a diagnosis of ON was ultimately made based on subsequent testing. We have described the patient's clinical progress and radiographic findings as well as emphasized the value of a complete clinical assessment with the right diagnostic workup.

Case Report

A 37-year-old right-handed woman presented to us with progressive vision loss in the right eye for 10 days, which eventually progressed to complete vision loss. The patient first visited an ophthalmologist when her symptoms began. The ophthalmic examination revealed a relative afferent pupillary defect and partial loss of visual field in the right eye. The patient had no complaints regarding the left eye, no pain associated with the eye movements, and no papilledema. Optical coherence tomography, color fundus photography, and fundus fluorescein angiography findings were normal. The patient was referred to a neurosurgeon for further evaluation.

A cranio-orbital magnetic resonance imaging (MRI) (Figure 1) was obtained, which revealed a lesion in the right optic nerve close to the chiasm with marked enhancement and nerve thickening. The lesion was considered to be an OG. A positron emission tomography/computed tomography was ordered, which revealed uptake in the area of the lesion. This also suggested that the lesion was an OG. Although surgery was recommended, the patient sought a second opinion.

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Received: 26.05.2023 **Accepted:** 25.06.2023

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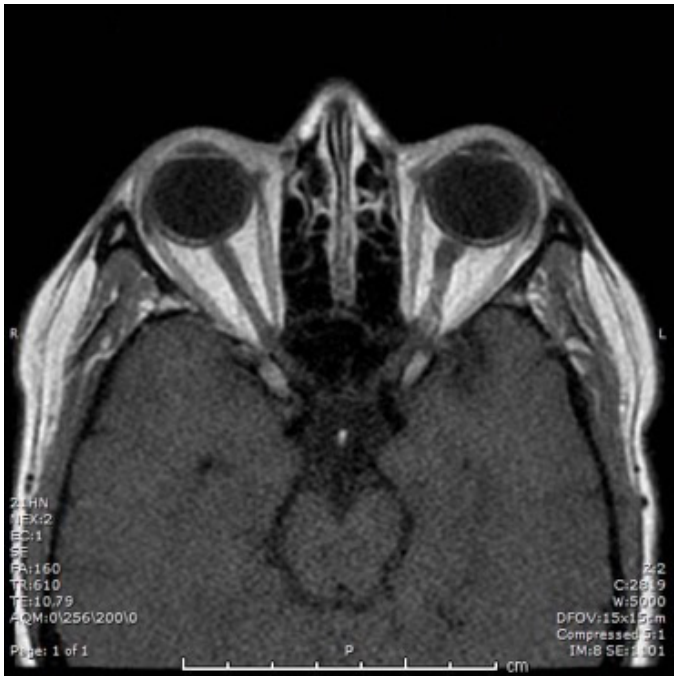

Figure 1. Cranio-orbital MRI stills before treatment

MRI: Magnetic resonance imaging

A visual evoked potential (VEP) test was performed, which could not record any response in the right eye. Thus, the patient was referred to the neurology department.

A comprehensive set of blood tests was performed to identify vasculitis markers [ANA, ENA, RF, anti-cardiolipin immunoglobulin G (IgG), and ACE], C3, C4, homocysteine, thrombophilia, anti-Borrelia and anti-Brucella IgG and IgM, herpes simplex virus-1 (HSV) and HSV-2 IgG and IgM, HLA-B27, and HLA-B5. All the tests yielded negative results. A lumbar puncture revealed increased protein content and type-2 oligoclonal bands. Additionally, serum IgG for neuromyelitis optica (NMO) and anti-MOG were negative. Considering these results, the patient was diagnosed to have ON and was treated with intravenous corticosteroids for 10 days. The patient recovered completely, and no lesions were detected on the MRI following the treatment (Figure 2). The patient was followed up for ON and the possibility of progression to multiple sclerosis without any additional treatments. Informed consent was obtained from patients.

Discussion

In this case report, we have highlighted the challenges associated with diagnosing ON and the importance of comprehensive testing via the case discussion of a 37-year-old woman with progressive vision loss in her right eye. An MRI revealed a lesion, and it was assumed to be an OG. However, a second opinion was sought. A VEP was performed, and the patient was diagnosed to have ON after extensive testing. The patient recovered completely after being treated with intravenous corticosteroids.

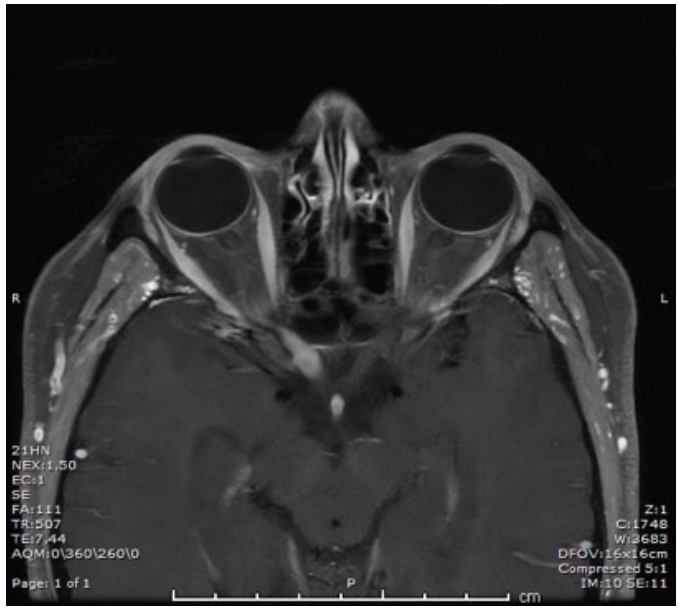

Figure 2. Cranio-orbital MRI stills after treatment

MRI: Magnetic resonance imaging

Our study findings are in accordance with those of previous studies that emphasize the challenges of differentiating between conditions that affect the optic nerve. Tumialán et al. (5) reported a case in which OG and ON mimicked each other and the diagnostic process was similar to that utilized in our patient. Even though the MRI suggested OG, the comprehensive testing led to a diagnosis of ON. Similarly, Bergmann et al. (6) reported a case that was initially thought to be OG based on the MRI findings. However, a biopsy that was subsequently performed confirmed ON.

In some cases, ON can mimic other diseases. Chacko et al. (7) reported a case of multicentric malignant glioma that was initially misdiagnosed as ON. Furthermore, Ramakrishnan et al. (8) and Kalnins et al. (9) described cases of ON that were later determined to be malignant OG.

VEP can be abnormal in conditions that affect the retina, visual pathways, or visual cortex. Hence, we considered several differential diagnoses, including NMO; ischemic and hereditary optic neuropathies; infectious ON (due to Lyme disease, syphilis, tuberculosis, or brucellosis); retinal artery occlusion; HSV; and autoimmune diseases (sarcoidosis, systemic lupus erythematosus, Sjögren's syndrome, and Behcet's disease) (10). Having an extensive differential diagnoses list is essential, especially for unusual conditions that may not be immediately diagnosed. Roy et al. (11) reported a case of ON, which was diagnosed late because his only symptom was neurosyphilis. Furthermore, Kataoka et al. (12) and Shima et al. (13) reported cases of ON that were caused by sarcoidosis and HSV type-2 infection, respectively. These reports highlight the importance of an extensive differential diagnoses list and their careful evaluation.

Other diseases that should be considered when ON is suspected are NMO and myelin oligodendrocyte glycoprotein antibody disease (MOGAD). In NMO, patients can present with ON and inflammation of the spinal cord and brain, causing more severe and longer-lasting visual issues (14). In MOGAD, ON may be the first symptom, along with disc edema (15). Although both conditions can occur bilaterally with extensive longitudinal lesions, MOGAD usually affects the intraorbital optic nerve and sheet, while NMO affects the intracranial optic nerve, chiasm, and tracts (15).

Conclusion

In summary, thorough assessment of the patient, an extensive differential diagnoses list, and appropriate diagnostic test are essential for diagnosing optic nerve diseases. The presentation of the diseases can be very similar, and thus, they can get mistaken for each other. Previous studies have demonstrated diagnostic pitfalls that are comparable to those in our case. Collectively, these reports highlight the value of a thorough clinical examination and imaging tests in distinguishing between optic nerve diseases.

Ethics

Informed Consent: Informed consent was obtained from patients.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: H.A.U., Design: S.B., H.A.U., Data Collection or Processing: H.G., Analysis or Interpretation: O.Y.K., Literature Search: S.B., H.A.U., Writing: S.B.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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