Case report

Horner Syndrome induced by toxoplasmosis infection in a patient with AIDS and disseminated herpes simplex virus

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ABSTRACT

Purpose: This case report describes a case of Horner syndrome resulting from central nervous system (CNS) toxoplasmosis in an immunocompromised patient. Horner Syndrome is a neurological condition characterized by unilateral miosis, ptosis with apparent enophthalmos, and anhidrosis due to inhibition of the sympathetic pathway. The ocular sympathetic pathway runs from the posterolateral hypothalamus to the ophthalmic branch of the trigeminal nerve (cranial nerve V1). Central nervous system (CNS) toxoplasmosis infection is typically only seen in immunocompromised patients. To our knowledge, toxoplasmosis has never been reported as a cause of Horner syndrome.

Observations: A forty-four-year-old Caucasian male was admitted to the hospital for left upper extremity paraesthesias, gait instability, and painful vesicular skin lesions, and Horner syndrome. Upon review, he had an 18-year history of HIV initially controlled on anti-retrovirals but had been lost to follow-up for several years until he developed severe headaches determined to be caused by Toxoplasmosis lesions in his brain. Over several months he was treated for the Toxoplasmosis but had poor adherence to medications. After subsequent admission and workup, we found multi-focal ring enhancing lesions on MRI in the basal ganglia, hypothalamus, thalamus, and internal capsule. We postulated that the hypothalamic lesion was the cause of his Horner syndrome. After treatment for both toxoplasmosis and HSV his Horner syndrome and other neurologic symptoms resolved.

Conclusions and Importance: This is the first reported case of Horner syndrome resulting from CNS toxoplasmosis. This case report and the accompanying questions provide an opportunity to review and explore the neuroanatomy and subtle symptomatic differences between various etiologies of Horner syndrome (primary, secondary, tertiary) in the context of a novel presentation. In conclusion, toxoplasmosis should be considered when investigating Horner syndrome in immunocompromised patients.

1. Introduction

Horner Syndrome is a neurological condition characterized by unilateral miosis, ptosis with apparent enophthalmos, and anhidrosis due to inhibition of the sympathetic pathway. The ocular sympathetic pathway runs from the posterolateral hypothalamus to the ophthalmic branch of the trigeminal nerve (cranial nerve V1). Thus, inhibition can occur at multiple levels including central (hypothalamus, pons, brainstem), preganglionic (proximal to the superior cervical ganglion), and postganglionic with subtle differences in presentation depending on location of the lesion.1 CNS toxoplasmosis is a manifestation of toxoplasmosis infection typically seen in immunocompromised patients.2 To our knowledge, toxoplasmosis has not previously been reported as a cause of Horner syndrome.

2. Case report

A forty-four-year-old Caucasian male was admitted to the hospital for complaints of left upper extremity paresthesia, gait instability, anisocoria, and painful vesicular skin lesions on the left nostril and intergluteal region. Upon review, he had an eighteen-year history of HIV initially controlled on anti-retrovirals but had been lost to follow-up for several years until he developed severe headaches determined to be caused by Toxoplasmosis lesions in his brain. Over several months he was treated for the Toxoplasmosis but had poor adherence to medications. After subsequent admission and workup, we found multi-focal ring enhancing lesions on MRI in the basal ganglia, hypothalamus, thalamus, and internal capsule. We postulated that the hypothalamic lesion was the cause of his Horner syndrome. After treatment for both toxoplasmosis and HSV his Horner syndrome and other neurologic symptoms resolved.

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basophilic tachyzoites and bradyzoites with no evidence of malignancy and immunohistochemical staining was positive for toxoplasmosis. Antiretroviral medications were started along with pyrimethamine. Over several months he had poor adherence and went to an infectious disease doctor where a repeat CT showed that the lesions had increased in size and now also involved the hypothalamus, thalamus, and basal ganglia. Multifocal ring-enhancing lesions were demonstrated on brain magnetic resonance imaging (MRI) (Fig. 1), and the patient was diagnosed with systemic toxoplasmosis. He was put on a steroid tapering dose, pyrimethamine, clindamycin, and leucovorin.

One week later upon consultation with his infectious disease physician, he was referred to ophthalmology for rule out of HIV retinopathy. Ophthalmology at the time noted that the patient had developed ptosis of the left upper eye and reverse ptosis of the lower eyelid causing apparent enophthalmos. Ocular motility testing was found to be normal, with normal dilated eye exam. The patient demonstrated clinical signs of anhidrosis of the left face, including a significantly dry left sided face when compared to the right, and mild facial pain. Due to the findings of upper eyelid ptosis, lower lid reverse ptosis, and left sided anhidrosis, combined with positive apraclonidine drop testing, he was diagnosed with Horner syndrome.

Over the following week the patient continued to have a downward course, developing painful vesicles in his intergluteal region. He was found to have a CD4 count of 44 and was diagnosed by an infectious disease provider with disseminated herpes simplex virus (HSV) and started on Valacyclovir. The following day the patient developed a superficial left nostril pustule along with increased pain. He was admitted to the hospital for intravenous treatment of his disseminated HSV which had not improved since starting Valacyclovir. He was initially treated with foscarnet due to a remote history of acyclovir resistant HSV. This quickly improved his dermatological symptoms and pain. By the fifth day of hospitalization the patient had significant skin improvement. Throughout this time period the patient was continued on pyrimethamine for his toxoplasmosis. His symptoms of Horner syndrome persisted during his stay in the hospital, but steadily improved. By his fifth day he endorsed improved vision, likely due to decreased ptosis, and improved sweating from his left facial area. Upon discharge, the patient followed up with his ophthalmologist after one week and his symptoms had further resolved.

3. Discussion

Horner Syndrome is an uncommon syndrome with variable etiology. It is caused by a lesion of the sympathetic trunk anywhere between the posterolateral hypothalamus and the oculosympathetic pathway of the trigeminal nerve's ophthalmic division (cranial nerve V1). In one study 40% of 450 cases had an unknown etiology but were presumed to be of vascular origin (e.g. carotid artery ischemia or dissecting carotid aneurysm). Neoplasms, most commonly pancoast tumors, constituted the second most common cause. Less commonly, lesions in the brainstem, midbrain, or pons can precipitate Horner syndrome (Fig. 2).

Toxoplasmosis in AIDS patients often produces lesions in the brain, diagnosed with the characteristic ring-enhancing lesions on an MRI. Subcortical involvement, usually seen in the basal ganglia, is seen in approximately 50% of cases. Toxoplasmosis in HIV/AIDS patients typically presents with symptoms of headache, confusion, and fever. Focal neurological deficits are common, but systemic involvement with paresthesia plus Horner syndrome is rare.

Symptoms of Horner syndrome often do not resolve as they had begun to do in this patient. One study showed that in iatrogenic Horner syndrome only 27% of cases were reported as resolving completely and the authors hypothesized that reduced time to treatment was probably associated with better outcomes. Similarly, a case report of Horner syndrome secondary to cervical lymphadenopathy in the setting of bartonella infection resolved entirely after antibiotic therapy.

Other causes of Horner syndrome were ruled out in our patient. For example, his CT scans showed no evidence of carotid pathology or a
Pancoast tumor. His case was also complicated by his concurrent diagnosis of HSV, but central HSV infection in immunocompromised patients typically presents as diffuse encephalitis with frontal necrotic lesions whereas this patient's radiographs were overtly suggestive of toxoplasmosis. He had manifested HSV several times in the prior year at the same nasal and intergluteal locations without any associated paresthesia, ophthalmologic deficits, or neurologic deficits. Similarly, HSV has, to our knowledge, never been reported as affecting the ophthalmic branches of the sympathetic nerves. In the hypothetical event that Horner syndrome had been driven by a postganglionic HSV flare (i.e. neuritis of the ophthalmic branches of the sympathetic nerve) he would not have shown anhidrosis because sympathetic innervation to the facial sweat glands branches before the superior cervical ganglion. Similarly, if HSV was affecting cranial nerve 3, he would not have shown miosis or anhidrosis. Finally, it is important to note that this patient's Horner syndrome symptoms did not develop until after being diagnosed with toxoplasmosis. In conclusion, this patient's Horner syndrome was most likely caused by toxoplasmosis which should be considered when investigating causes for Horner syndrome in immunocompromised patients.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Declaration of competing interest

The following authors have no financial conflicts of interest to disclose: IS, NV, IP, and CM.

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No other contributors to this article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ajoc.2020.100679.

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