CASE REPORT

Orbital Apex Syndrome Secondary to Herpes Zoster Ophthalmicus

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ABSTRACT

A 49-year-old woman who complained of lacrimation, foreign body sensation, and eyelid oedema presented to our outpatient clinic. External examination identified erythematous rash with vesicles on the left eyelid, dorsum of the nose, and forehead of the patient. She was diagnosed to have herpes zoster ophthalmicus (HZO), and was started on oral brivudine and topical acyclovir. On the third day of the treatment, visual acuity of left eye was reduced; left blepharoptosis and total ophthalmoplegia had developed. Orbital magnetic resonance imaging (MRI) showed enlargement of the extraocular muscles, and perineural enhancement of the optic nerve on that side. Oral brivudine was replaced with intravenous acyclovir, and oral corticosteroid was initiated. Complete resolution of proptosis and restriction of eye movements were achieved, and significant improvement of visual acuity was observed within a week.

Orbital apex syndrome, a severe and rare complication of herpes zoster infection, can develop despite antiviral treatment. Rapid institution of appropriate therapy may provide complete recovery.

Keywords: Brivudine, herpes zoster ophthalmicus, ophthalmoplegia, orbital apex syndrome

INTRODUCTION

Orbital apex syndrome (OAS) is a clinical condition characterised with optic nerve dysfunction in association with oculomotor nerve, trochlear nerve, abducens nerve, and ophthalmic branch of the trigeminal nerve palsies. This syndrome can be caused by inflammatory, infectious, neoplastic, iatrogenic, traumatic, and vascular conditions.¹

In this case report, we present a patient with OAS caused by herpes zoster ophthalmicus (HZO). The clinical features, radiologic imaging findings, and treatment modalities are discussed.

CASE REPORT

A 49-year-old woman presented to our outpatient clinic with the complaints of lacrimation, foreign body sensation, and eyelid oedema of the left eye. Her past

medical history revealed prior presentation to a different ophthalmology clinic 5 days ago; she had used topical antibiotic and corticosteroid drops with minimal improvement.

External examination identified an erythematous rash with vesicles on the left eyelid, dorsum of the nose, and forehead of the patient. Snellen visual acuity was 20/50 and 20/20 in her left and right eyes, respectively. Eye movements were free in all directions. Biomicroscopic examination of the left eye revealed chemosis, and multiple dendritic lesions scattered over the cornea. Intraocular pressures were 16 mm Hg in both eyes. Fundus examination was within normal limits bilaterally. The patient was started on oral brivudine (125 mg/day) and topical acyclovir five times daily in the left eye. She came in for follow-up 3 days after starting the treatment. The examination revealed increased number of skin lesions and reduction of the visual acuity of left eye to 20/200. She was noted to have left upper eyelid

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blepharoptosis and non-pulsatile proptosis of the left eye. There was paralysis of elevation, depression, adduction, and abduction of the left eye (Figure 1). Her left pupil was dilated and unreactive to light. There were corneal keratic precipitates and 4 plus cells in the anterior chamber, with severe fibrinous reaction in the left eye. Orbital Magnetic resonance imaging (MRI) was obtained, and it showed enlargement of the extraocular muscles of the left eye along with perineural enhancement of the left optic nerve (Figure 2a and b).

The patient was hospitalised; oral brivudin was stopped. Intravenous acyclovir (30 mg/kg three times per day) and oral prednisolone (1 mg/kg/day) along with topical corticosteroids were started. Acute clinical signs showed regression within a week; blepharoptosis had resolved, and the patient's vision improved to 20/100 in the left eye. Oral prednisolone was tapered gradually. Intravenous acyclovir treatment (15 days) was followed by oral acyclovir treatment (5×800 mg), and was continued for 3 months on tapering doses.

During her follow-up, gradual improvement of proptosis and complete recovery of extraocular motility of the left eye was observed (Figure 3). On her last

follow-up visit, 5 months after the initial presentation, the best-corrected visual acuity was 20/30 in the left eye.

DISCUSSION

HZO is a clinical situation resulting from involvement of the ophthalmic division of the fifth cranial nerve by herpes zoster virus. Ophthalmoplegia has been reported to occur in 11–29% of cases with HZO.² Oculomotor nerve palsy is the most frequently involved nerve, followed by the abducens nerve palsy.³ Orbital apex syndrome (OAS), where all extraocular muscles, ophthalmic branch of the fifth cranial nerve, and pupil are involved, is, however, a very rare manifestation of HZO.^{1,4} A PubMed search with the key words “HZO” and “OAS” revealed six cases in the English literature.

Herpes zoster infection is believed to cause OAS either by direct viral invasion, vascular compromise, or tissue oedema.^{5,6} In the current case, orbital apex involvement was evident within 3 days of vesicular eruption; MRI had revealed thickened extraocular muscles and perineural enhancement of optic nerve. The mechanism with which the ophthalmoplegia

FIGURE 1 The appearance of the patient on the 3rd day of vesicular eruption. Note the development of proptosis, blepharoptosis, and restriction of ocular movements in all directions.

FIGURE 2 Orbital MRI images, axial (a) and coronal (b), revealed enlargement of extraocular muscles, enhancement of optic nerve and signals within orbital fat, suggesting the presence of an inflammatory process.

FIGURE 3 Complete resolution of proptosis, blepharoptosis, and ocular motility restriction at the 5th-month follow-up visit.

developed is unclear, yet both tissue oedema and direct viral invasion might have played a role.

Varicella-zoster infection is typically more severe in immunocompromised patients, elderly persons, neonates, and pregnant women. Many of the previously published orbital apex syndrome cases have been reported in association with either immune deficiency and/or triggering events. Arda et al. reported a 75-year-old male presenting with OAS who had history of trauma and concomitant viral infection.⁵ Kattah and Kennerdell reported an OAS case in a patient with Hodgkin lymphoma.⁷ Another case was published by Saxena et al. of a 29-year-old patient who had human immunodeficiency virus (HIV) infection.⁸ Dhingra et al. reported a 63-year-old man with multiple myeloma and OAS resulting from HZO.⁹ The current patient is a 49-year-old woman with no other medical problems. She was relatively younger than most of the cases previously published in the literature, and had no chronic illness, immune deficiency, trauma, or triggering events.

Various antiviral agents such as acyclovir, valacyclovir, famciclovir, and brivudine are available for herpes zoster infections. Acyclovir, the most commonly used agent, is limited with the need for frequent daily administration. Brivudine is a nucleoside analogue with high and selective antiviral activity against varicella-zoster and herpes simplex virus type 1. It has been approved for the treatment of herpes zoster in several countries. It had been used in a case of acute retinal necrosis with success.¹⁰ On the other hand, the authors of a recent review comparing acyclovir, valacyclovir, famciclovir, and brivudine concluded that superior pharmacokinetics and more convenient dosing regimens of valaciclovir and famciclovir made them the preferred treatment option.¹¹

In the current case, oral brivudine therapy was started as the initial systemic antiviral therapy, as suggested by our dermatology department. Despite brivudine therapy, the clinical presentation progressed to orbital apex syndrome. Changing the therapeutic regimen to intravenous acyclovir and oral prednisolone resulted in significant improvement. Use of oral

brivudine had not been previously reported in patients with OAS secondary to HZO. Valacyclovir and vidarabine had been used with success.⁴ It is not possible to identify the reason of clinical worsening; however, intravenous administration of an antiviral agent with better pharmacokinetics may be more appropriate in the case of OAS development.

The current patient showed significant improvement during the follow-up period; her vision improved to 7/10 with full recovery of extraocular motility. Similar improvement was observed in previously reported cases, even in cases with immune suppression. Of the two cases described by Kattah and Kennerdell, however, only one had recovery of motility and regression of proptosis. The other 54-year-old patient with left orbital apex syndrome developed total blindness. She had been given oral prednisone (80 mg/day); concomitant use of antiviral agents was not reported.⁷

OAS is a rare complication of herpes zoster infection. Systemic corticosteroid use together with antiviral agents seems to provide adequate control of the disease, and results in significant recovery of visual dysfunction and ocular motility. Close follow-up of the patients with HZO is essential to detect signs and symptoms suggesting orbital apex syndrome, even in immune competent patients.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Note: Figures 1 and 3 of this article is available in colour online at <http://informahealthcare.com/oph>.

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