Herpes zoster keratouveitis with hypopyon and hyphema

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Abstract:
This study aims to report two cases with an uncommon, early manifestation of herpes zoster ophthalmicus which is keratouveitis. The first patient is a 61-year-old female who had presented with painful facial skin eruption and right eye redness without impairment of vision. She was treated initially as herpes zoster blepharoconjunctivitis; however, the disease had progressed to neurotrophic keratitis with severe anterior chamber reaction manifested by a mixture of hypopyon and hyphema. The second patient is a 74-year-old female who had presented after 2 weeks of facial skin eruption with blurring of vision and similar keratouveitic manifestations. Both patients had poor visual outcome due to severe ocular inflammation.

Keywords:
Herpes zoster ophthalmicus, hyphema, hypopyon, keratitis, uveitis

Introduction

Herpes zoster ophthalmicus (HZO) occurs following reactivation of varicella-zoster virus (VZV) in the ophthalmic division of the trigeminal nerve. It is known to affect any part of the eye whereby common acute ocular manifestation includes blepharoconjunctivitis, epithelial keratitis, or anterior uveitis.[1-3] We report two cases of HZO complicated by early severe neurotrophic keratitis (NK) with severe anterior chamber reaction manifested by a mixture of hypopyon and hyphema, which are uncommon late[3] complications following HZO, its clinicopathological features, clinical outcome, and management.

Case Reports

Case 1
A 61-year-old female had presented to us with 2-day history of right eye redness and painful unilateral vesicular skin rashes over her right forehead and the upper eyelid. Her visual acuity was 6/12, pinhole was 6/9 oculus dextrus (OD), and 6/6 Oculus Sinister (OS). Examination revealed dermatomal vesicular rashes distributed in an area along the first division of the trigeminal nerve with an absent Hutchinson’s sign. The upper right eyelid was swollen, and there was a mild generalized conjunctival injection. The right cornea and anterior chamber were clear with normal intraocular pressure and fundus examination. The ocular examination of the left eye was unremarkable. She was treated as herpes zoster blepharoconjunctivitis with oral acyclovir 800 mg 5 times a day, topical acyclovir 5 times daily, and topical lubricants.

One week later, her right eye vision deteriorated to hand movements. The herpetic skin lesions were dry and resolving; however, Hutchinson’s sign was positive while her right eyelid was still swollen. She was also found to have a large central epithelial defect (5 mm × 7 mm) with central stromal infiltrates, and the anterior chamber was filled with hypopyon and hyphema which occluded the iris and view of the
fundus [Figure 1]. There was a loss of corneal sensation, and the intraocular pressure was 35 mmHg. B-scan ultrasound showed no abnormalities.

Broad-spectrum antibiotic eyedrops (ceftazidime and gentamicin) were immediately commenced in view of the clinical picture of microbial keratitis along with antiglaucoma, lubricants, cycloplegic, and continuation of oral and topical acyclovir. Culture results from corneal scapping yielded *Streptococcus pneumonia* with no fungal elements identified.

Given a persistent epithelial defect, a temporary tarsorrhaphy was carried out at 2 weeks into treatment after which there was a notable improvement of keratitis, healing of epithelial defect with a resolution of hypopyon, and hyphema with patchy iris atrophy [Figure 2] by the 2nd month of presentation. View of the pupil and lens was obscured by corneal edema. However, her vision remained poor at light perception and then clinically progressed to cornea scarring with vascularization and intrastromal hemorrhage by the 3rd month of presentation [Figure 3].

**Case 2**
A 74-year-old female had presented to us with blurred vision of the left eye for 3 days with 2-weeks history of left periorbital vesicular rash and eye redness. She had received a course of oral acyclovir and topical ciprofloxacin a week before her initial presentation.

Her visual acuity was 6/9 OD and 5/60 OS at presentation. Clinical examination of the affected left eye revealed edematous upper eyelid, diffuse injection of the conjunctiva, and cornea stromal edema with a central horizontal epithelial defect (7.2 mm × 3.4 mm). As there was no evidence of corneal infiltration clinically, the culture was not obtained.

Anterior chamber showed the presence of a streak of hypopyon with a hyphema level (3.4 mm) below it [Figure 4]. The intraocular pressure was normal. In addition, there was a reduced corneal sensation, positive relative afferent pupillary defect over the left eye. Hutchinson’s sign was negative at presentation but was positive the next day. Due to the corneal edema, the left eye lens and fundus were not assessable. However, the B-mode echo examination did not detect any abnormality. The right eye examination was unremarkable. A clinical diagnosis of HZO with keratouveitis was made, and the patient was started on acyclovir eye ointment, lubricants, and ciprofloxacin eyedrops with topical dexamethasone 0.1%.

Given the persistent epithelial defect, the patient was put on bandage contact lens on day 4 of treatment. There was also a notable improvement in the hyphema level (3 mm) and resolution of hypopyon after 1 week. However, she developed raised intraocular pressure and was started on antiglaucoma. After 10 days into treatment, there was
a resolution of the epithelial defect with reduction of hyphema level (1.2 mm); however, cornea edema persisted with mid-dilated pupils, ectropion uvea, iris atrophic patches, and fibrin on the lens. Two weeks thereafter, her hyphema had resolved, and there was reduced cornea edema with vision at counting finger. There was a small epithelial defect (1 mm × 1 mm) seen centrally with surrounding punctate epithelial erosions, and the patient was also noted to have upper lid cicatricial entropion whereby epilation was done. After 1 month into treatment, the epithelial defect had resolved, and her vision had improved to 4/60. Topical dexamethasone 0.1% was tapered off after 2 months of treatment. Unfortunately, there was a recurrence of the epithelial defect with hypopyon hyphema level (1 mm) after 3 months of follow-up. Hyphema resolved after retreatment with topical dexamethasone 0.1% for 2 weeks; however, cornea edema and epithelial defect persisted [Figure 5] which necessitated surgical intervention such as tarsorrhaphy. However, the patient opted for conservative management. Her condition was similar to her last follow-up and vision remained poor at counting finger. There was no clinical evidence of recurrence of severe anterior chamber reaction but keratopathy persisted.

**Discussion**

HZO is a disease of varying severity from acute lesions to chronic complications. It most typically manifests as unilateral pain in a dermatomal distribution accompanied by a vesicular rash. HZO is characterized by herpes zoster infection of the first branch of the trigeminal nerve with associated skin lesions. Our cases describe an uncommon, early severe keratouveitis manifested as NK and hemorrhagic hypopyon following HZO in elderly immunocompetent individuals with the typical vesicular skin rashes along the dermatomal distribution of the ophthalmic branch of the trigeminal nerve. In contrast, Biswas et al. had reported a similar case of hemorrhagic hypopyon but in the presence of pinna vesicular lesions without NK in a HIV-positive patient. This suggests that older patients are more susceptible to ocular surface abnormalities, including neurotropic keratopathy, in the presence of reactivated VZV compared to young patients. This is further supported by a study done by Ghaznawi et al., where NK and secondary corneal infections were seen in higher frequency in older patients with HZO. Other possible similar manifestations caused by VZV include hyphema (without hypopyon) without accompanying facial skin lesions better known as zoster sine herpete and HZO with hyphema in the absence of hypopyon.

Other differentials of hemorrhagic hypopyon have also been reported in uveitic conditions such as rheumatoid arthritis, erythema nodosum, Behçet’s disease, and herpes simplex infections. The dreaded corneal complication from HZO is NK which is a persistent epithelial defect with impaired corneal sensation. The first patient had presented with Stage 3 NK with concomitant microbial infection while the second patient has Stage 2 NK according to the classification proposed by Mackie et al. In Case 1, NK occurred concurrently with bacterial keratitis as suggested by bacterial culture. It was unclear if hemorrhagic hypopyon was a consequence of HZO or secondary to the microbial infection. However, viral-induced hyphema is more likely to be the cause as it is a well-known complication of HZO-related uveitis due to occlusive vasculitis of the inflamed iris vessels, whereas hemorrhagic complications of microbial keratitis are fairly uncommon. The presence of iris atrophy as seen in this patient is also common in HZO-associated uveitis.

The presence of Hutchinson’s sign where the skin lesions of herpes zoster extend to the tip, side, or root of the nose...
is known to be a strong predictor of ocular inflammation and corneal denervation in HZO.[13] This sign was absent in both of our patients in the initial stages of the disease. In conclusion, an acute and severe manifestation of HZO occurring in the elderly population can present as NK in conjunction with hypopyon, hyphema, and skin rashes without Hutchinson’s sign. Therefore, an elderly patient when presenting to the clinician should be treated with the utmost vigilance as clinical sign, such as the Hutchinson’s sign, may be absent at its early phases. Nontraumatic hyphema and hypopyon associated with HZO as seen in these cases appear to be an early clinical sign leading to a poor visual outcome.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
The authors declare that there are no conflicts of interest of this paper.

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