

Exposure keratopathy secondary to lagophthalmos with facial nerve palsy – Challenges in management

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ABSTRACT

Exposure keratopathy is a corneal damage that occurs from prolonged exposure of the ocular surface to the outside environment. Exposure keratopathy can lead to keratitis, ulceration, and cornea scarring. Lagophthalmos is the inability to close the eyelid completely and this leads to a portion of the eye remaining open and subject to cornea damage. Here, we describe the 72-year-old man with a case of exposure keratopathy secondary to facial nerve palsy with complications of cornea ulceration and scarring that cause permanent vision loss. We discuss difficult challenges during management from medical to surgical management.

Key words: Cornea ulcer, Exposure keratopathy, Facial nerve palsy, Lagophthalmos, Tarsorrhaphy

Exposure keratopathy is caused by the breakdown of corneal epithelium due to cornea dryness. One of the causes is the inability to close the eyelid, which results in ocular surface disturbance due to reduced lubrication [1]. Incomplete blinking and prolonged unclosed eyelid are the main causes of exposure keratopathy [2]. The causes of lagophthalmos vary from paralytic, traumatic, nocturnal, and idiopathic lagophthalmos. There are serious complications that can develop from prolonged exposure to the corneal surface, such as keratitis, corneal ulceration, and corneal thinning, which can cause perforation and, eventually cornea scarring [3]. This manifestation often occurs in the lower part of the cornea [4]. Treatment can be divided into medical and surgical modalities. Medical treatment aims at maintaining the stability of tear film. Surgical treatment can be temporary or permanent and the decision of surgery depends on the severity, compliance of medical treatment, causes of lagophthalmos, patient expectations, and cosmetic reasons.


The importance of this case report is delineating the crucial timing of medical intervention and surgical intervention, as late surgical intervention results in permanent vision loss due to corneal scarring. Another aspect is the importance of thoroughly explaining the post-surgical cosmetic changes by the treating clinician and managing them if they have any psychological issues.

CASE REPORT

A 72-year-old man with comorbidity of hypertension for 20 years on T. Amlodipine 5 mg daily presented to the ophthalmology clinic with recurrent right eye redness and pain for 1 week. His previous ocular history was bilateral eyes pseudophakia and he had undergone a cataract operation for bilateral eyes 2 years prior. Post-cataract surgery was uneventful, and his best-corrected visual acuity bilateral eyes was 6/6 and he was happy with his vision.

After 2 years, he first presented to the ophthalmology clinic again with right eye redness and pain. His right vision was 6/9 and his left vision was 6/6. It was due to the inability to close his right eye for 1 week and the drooping of his right eyelid. On general examination, he was conscious and well-oriented to time, place, and person. His vital sign was stable with a blood pressure of 120/80 mmHg, pulse rate of 92 beats/min, and SpO₂ of 98% on room air. His lung examination was clear with equal air entry, the cardiovascular examination was dual rhythm with no murmur, and the abdominal examination was soft and non-tender with no palpable mass. There was a facial asymmetry of his right face with the drooping of the right corner of the mouth. On facial nerve examination, the patient was unable to close the right eye tightly and puff out the cheeks. Other cranial nerve examination was intact and there was no lymph node palpable.

The right eye was not proptosed and was confirmed with an exophthalmometer. Computed tomography brain imaging was done and there was no evidence of brain insult. His ear

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examination and blood investigation were otherwise normal. He was diagnosed with idiopathic right facial nerve palsy known as Bell's palsy. His condition worsened during the night until he was unable to sleep due to eye pain.

Anterior segment examination of the right eye shows lagophthalmos measuring 3 mm vertically, blepharitis, superficial punctate keratitis of the right eye, and decreased tear film breakup time of the cornea. Conjunctiva was injected but there was no evidence of cornea ulceration. The left eye anterior segment examination was normal. The intraocular lens of both eyes was clear and fundus examination of bilateral eyes was unremarkable. He was treated with artificial tears, lubricating eye drops, and ointment and advised to apply every 4.4 hours. He was also treated with antibiotic eye drops.

After 3 weeks, he came back with worse symptoms and was treated with another course of antibiotics, artificial tears, and ointments. During this visit, he developed a small cornea ulceration over the paracentral cornea at 6 o'clock inferior. He was also advised to tape his eyelid at night and was treated with a bandage contact lens. During the course of treatment, he had another four episodes of recurrent cornea ulceration for 6 months, which leads to larger corneal scarring. His right vision worsened due to hand movement and his left vision remains the same at 6/6. The slit-lamp examination of the right eye showed persistent lagophthalmos 3 mm vertical diameter, same as the first presentation, lagging lower lid exposing the inferior half of the conjunctiva and cornea. Infiltrate 2.3 mm (vertical) and 5.8 mm (horizontal) were seen at the cornea involving the visual axis which was stained with fluorescein. There was an area of white scar surrounding the lesion with corneal edema inferiorly. The corneal ulcer was query perforated and then self-sealed (Fig. 1). The anterior chamber was deep and quiet. His intraocular pressure was normal at 15 mmHg.

After a few episodes of having recurrent right eye corneal ulceration that affected his daily life, we discussed with him for surgical approach and decided for the right eye permanent tarsorrhaphy. His Bell's palsy symptoms do not show any improvement after 6 months, which leads to this decision. Permanent tarsorrhaphy was decided in view of his right vision hand movement and corneal scarring centrally. Permanent right eye tarsorrhaphy was done successfully (Fig. 2a). Post-tarsorrhaphy was uneventful and there were no more episodes of cornea ulceration. His life function significantly improved, he recovered well and was able to sleep with his eyes closed (Fig. 2b).

DISCUSSION

The cause of exposure keratopathy for this patient was lagophthalmos. The leading cause of lagophthalmos was paralytic lagophthalmos, which was facial nerve palsy [5]. The patient's investigation for facial nerve palsy was unremarkable and we diagnosed him with idiopathic facial nerve palsy or Bell's palsy. Bell's palsy is an acute, unilateral facial nerve palsy that usually has a good prognosis. About 84% of patients have full recovery from Bell's palsy [6]. However, this patient did not have any

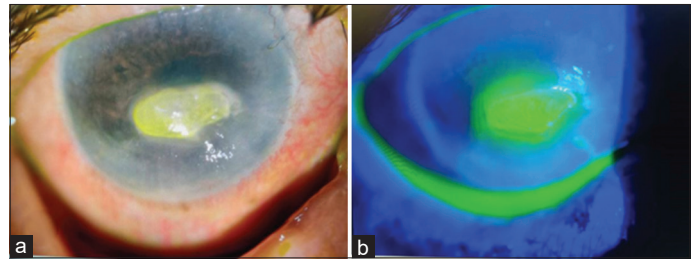


Figure 1: (a) Right eye corneal ulcer involving visual axis and edema. Query perforated and then self-sealed; (b) Right eye infiltrate over central cornea and picked up fluorescein staining under cobalt blue light.



Figure 2: (a) Post-operative right eye permanent tarsorrhaphy when the patient opens eyes; (b) Good closure of his right eye post-permanent tarsorrhaphy.

improvement of facial paralysis for 6 months, even though adhered strictly to facial exercise physiotherapy. He did feel distress due to the facial disfigurement and recurrent eye pain. Any asymmetry in a person's face will likely have a psychological impact [7].

The treatment poses difficult challenges in trying medical methods before surgical decision because we cannot predict the outcome of the recovery of Bell's palsy for the patient to regain full eyelid function even though most studies show a good prognosis. The patient was given artificial tears and ointment four hourly when he was having mild symptoms of keratopathy during the first presentation. However, the symptoms worsen, and we need to change to preservative-free artificial tears to increase the frequency of medication. It is needed because preservatives in eye drops can cause further cornea toxicity if applied regularly. We asked him to apply every hour since he developed corneal ulceration. This leads to an increase in the expenses of managing this case. He was advised to tape the lid at night to "tape tarsorrhaphy" to further preserve the ocular surface and for avoidance surgery [8]. After a few weeks of taping, this patient developed skin irritation due to prolonged taping and has not complied with taping since then. In a prospective randomized study of 50 consecutive intensive care unit patients receiving propofol or neuromuscular blockade, lubricating ointment applied every 5.4 hours significantly reduced the incidence of exposure keratopathy compared to passive eyelid closure alone [9]. During the first episode of small cornea ulceration, we offered him surgery for temporary tarsorrhaphy to

alleviate the symptoms. He did not agree to surgical intervention due to cosmetic changes and believed the paralysis would improve over time. However, over a period of time, the condition worsens and the right vision drops from 6/6 to hand movement due to complications of recurrent ulceration and scarring that involves the visual axis. After a thorough discussion, he finally agreed to permanent tarsorrhaphy due to this condition severely affected his daily life. He did express distress that the tarsorrhaphy procedure would further cause his facial disfigurement.

Referral to a psychologist is needed if the patient is keen in this case because a psychologist can also aid the patient's recovery from the psychological impact of facial nerve paralysis [10,11].

CONCLUSION

Exposure keratopathy secondary to lagophthalmos is a common presentation. The complication can be from mild cornea irritation to blindness. The mainstay of treatment is to treat the cause of lagophthalmos first. Managing idiopathic facial nerve palsy is challenging in view that the clinician cannot predict the recovery outcome. The patient who is compliant with medical treatment can adhere to medical treatment without surgical treatment. However, once it seems not to comply with medical treatment, surgical management of lagophthalmos should be taken seriously into consideration. The aim of the surgeon is to give good reassurance to the patient for the surgical procedure and to address post-procedure cosmetic changes thoroughly to the patient. Early surgical intervention is important before complications of ulceration, perforation, and scarring because it is inevitable.

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