

# Dendritic ulcer leading to impaired vision in a young man

ANDREW APEL MB BS, FRANZCO

Prompt diagnosis and treatment of herpes simplex keratitis are essential for reducing the associated long term ocular morbidity – most commonly, corneal scarring and reduced vision.

## Case presentation

### A simple problem?

A 23-year-old man presented to his GP with an irritated right eye. The irritation had begun after he visited a nightclub three days earlier, with the eye being slightly watery and photophobic since. He thought that he might have got cigarette smoke in his eye when he was at the club. He said his vision was a little blurry, which he believed to be due to the watering eye, and that he needed to wear sunglasses outdoors because sunlight particularly irritated the eye. He had no personal or family history of eye disease.

Dr Apel is an Ophthalmologist with fellowship training in corneal surgery and external disease from the University of Toronto, Canada. He now



works in private practice in Brisbane and Bundaberg, Qld, and is Ophthalmic Co-ordinator of the Royal Blind Foundation of Queensland's 'Shades Day' on Wednesday 16 October 2002.

On examination, the patient's uncorrected visual acuity was slightly decreased to 6/9 in the right eye (6/6 in the left eye) and did not improve with use of a pinhole. The irritated eye was observed to be slightly injected and epiphoric. Torchlight elicited photophobia and showed mild limbal injection. Examination under a cobalt blue light after fluorescein staining revealed a dendritic ulcer (Figure 1); this finding was then confirmed with the slit lamp.

The patient was diagnosed with a dendritic ulcer affecting the corneal epithelium caused by herpes simplex virus. Treatment with aciclovir ointment (Zovirax) was commenced, five times per day for 10 days.

The patient was reviewed five days after commencing treatment. Significant resolution of the ulcer was observed, with contraction of the dendrite and much less photophobia. Two weeks later the epithelium had healed completely, visual acuity had returned to 6/6, and the eye was white and quiet. The patient was discharged.

### The second episode

Six months later, the patient returned to his GP with a watery and injected right eye. This time the photophobia was much worse and his uncorrected visual acuity was reduced to 6/12.

The patient described symptoms that had commenced about five days ago and were similar to those he had suffered six months previously. He explained that he was staying with his grandparents and had used some eyedrops given to his grandmother after her cataract surgery. Initially he felt that the drops gave some relief, but the eye had become worse. The GP noted the drops to be Prednefrin Forte, a combination of phenylephrine hydrochloride (1%) and prednisolone acetate (0.12%).

Examination with a magnifying loupe showed the eye to be quite injected and revealed the presence of a geographic ulcer (Figure 2). An area of geographic epithelial defect resulting from a dendritic

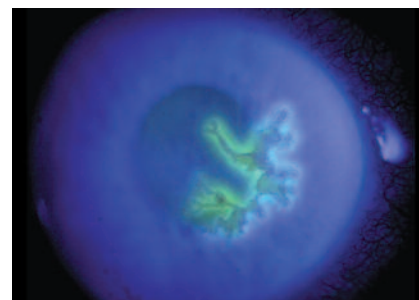


Figure 1. Dendritic ulcer stained with fluorescein examined under a cobalt blue light.

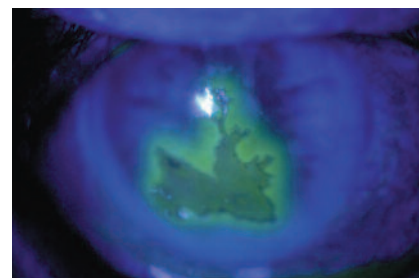


Figure 2. A geographic ulcer caused by application of topical corticosteroids.

ulcer had been exacerbated by the use of topical corticosteroid and thus allowed to spread. Use of the corticosteroid eyedrops was immediately stopped and treatment with aciclovir ointment was commenced, five times per day.

Over the following two weeks the eye became more settled and the geographic ulcer healed. Three weeks after treatment was commenced, visual acuity was 6/9 and a slight corneal haze caused by a faint subepithelial scar in the visual axis was apparent. The patient failed to return for further follow up.

### The third episode

One year later, the patient presented with a week-long history of an irritable right eye. The eye was observed to be slightly injected; uncorrected visual acuity was significantly reduced to 6/24 and did not improve with a pinhole.

Examination with a magnifying loupe revealed a large central area of corneal opacity. Slit lamp examination showed

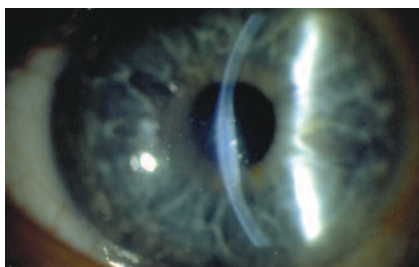


Figure 3. Disciform keratitis, with corneal swelling and keratitic precipitates.

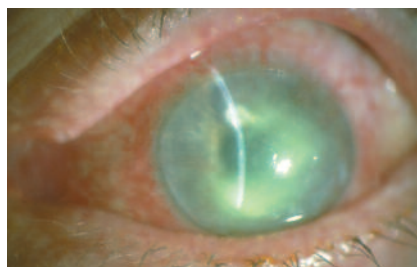


Figure 4. Corneal stromal inflammation and surface staining with fluorescein.

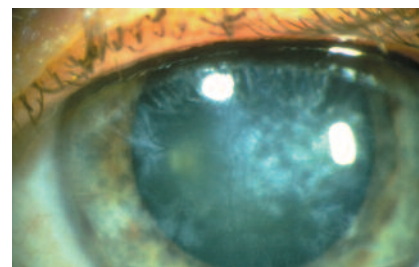


Figure 5. Corneal scarring in the visual axis with vascular invasion.

mild stromal oedema with some keratitic precipitates on the posterior cornea. (Keratitic precipitates are accumulations of pigment and white blood cells that are generally associated with corneal or iris inflammation.)

The patient was diagnosed with disciform keratitis (a disciform area of corneal oedema and inflammation – see Figure 3) and referred to an ophthalmologist.

The ophthalmologist concluded the disciform keratitis was related to the herpes simplex. As no dendritic ulceration was present over the surface of the area, topical corticosteroid therapy was commenced, four times per day for one week and then gradually tapering over the next six weeks. During this time the corneal opacity and swelling diminished and the keratitic precipitates resolved. The eye became white and visual acuity returned to 6/12.

Over the next three months, visual acuity returned to 6/9, but a corneal scar remained from the previous epithelial disease. Some deep stromal blood vessels that had entered the cornea in response to the disciform keratitis were also present – these vessels became less active as the disease process abated but remained patent.

### Outcome

Over the next few years the patient suffered recurrent episodes of corneal inflammation (Figure 4) that were treated with either topical antivirals (if epithelial changes were present) or topical corticosteroids (if corneal stromal inflammation

only was present). Ultimately the disease process abated, leaving the patient, now aged 28 years, with a central corneal scar (Figure 5) and decreased visual acuity of 6/24 in that eye.

### Discussion

Corneal disease caused by herpes simplex type 1 keratitis can take various forms. The most common is the classic dendritic ulcer, which is relatively easily treated with aciclovir ointment. About 99% of these ulcers are responsive to the ointment; resistance is rare and more likely to be seen in immunocompromised patients.

Dendritic ulceration caused by herpes simplex virus can cause corneal scarring, but the use of aciclovir ointment has significantly reduced the long term ocular morbidity of the disease process. Topical aciclovir is relatively nontoxic to the corneal epithelial surface compared with previously used medications such as idoxuridine; however, oral aciclovir or valaciclovir (Valtrex) can be used if the ocular surface shows evidence of toxicity. Note that epithelial healing may be slowed in patients who have suffered recurrent episodes if the virus has damaged corneal nerves and reduced corneal sensation. Oral antiviral agents are not listed on the PBS for ocular herpes.

Topical corticosteroids such as prednisolone acetate do not have any role in epithelial disease and actually worsen the situation by allowing the virus to spread in the epithelium. Corticosteroids have a role to play only when stromal disease is

present in the cornea. Stromal disease is a result of an immune response to the presence of viral particles or the virus-altered corneal stromal tissue, and is generally the cause of long term ocular morbidity. The inflammation may be quite marked and can involve the sclera and, in extreme cases, the tissues surrounding the eye – the extraocular muscles, Tenon's capsule and lacrimal gland. Occasionally, patients who have substantial stromal disease require oral corticosteroids to quell the inflammation; in recalcitrant cases, use of topical corticosteroids may be needed for several months.

The only useful way to improve vision decreased by central corneal scarring is a corneal transplant. However, patients who have had herpetic disease often have damaged sensory nerves and thus poor corneal sensation, a neurotrophic effect that may retard healing. Another potential problem is recurrence of the disease, but the probability is reduced if the scar is centrally located and can be removed entirely. Finally, the presence of corneal blood vessels caused by stromal disease dramatically increases the chance of a transplant rejection and graft failure.

### Key points

Prompt diagnosis of herpes simplex keratitis and treatment with topical antiviral agents in the early phases are essential for reducing the associated long term ocular morbidity. Maintaining good vision in patients who have suffered herpetic disease of the cornea can be quite challenging. **MT**