

# Epithelial keratitis mimicking herpes simplex keratitis in a patient after cataract surgery

## A case report

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### Abstract

**Rationale:** Epithelial keratitis is a common complication after cataract surgery. Many factors have been attributed to this clinical phenomenon.

**Patient concerns:** An 82-year-old woman without previous herpes simplex keratitis (HSK) underwent an uncomplicated clear corneal phacoemulsification procedure in the right eye. In the late postoperative period, epithelial keratitis developed in this same eye.

**Diagnosis:** An initial diagnosis of HSK was made clinically. The lesion was refractory to antiviral treatment and had progressed. After topical acyclovir cessation and vigorous lubrication, a diagnosis of toxic keratitis was finally made.

**Outcomes:** The corneal epithelial defect and dendritic lesion presented initially. Responding to antiviral treatment, this corneal lesion aggravated and revealed large epithelial erosion. After topical acyclovir cessation and initiation of vigorous lubrication, the toxic keratitis was completely resolved.

**Lessons:** Epithelial keratitis following cataract surgery is a common complication and can be misdiagnosed early in its disease course. Physicians should be alert to the possibility of HSK. Polymerase chain reaction detection is helpful in diagnosing this disease.

**Abbreviations:** BCVA = best-corrected visual acuity, HSK = herpes simplex keratitis, HSV = herpes simplex virus, PCR = polymerase chain reaction.

**Keywords:** cataract surgery, corneal epithelium, herpes simplex keratitis, toxic keratitis

## 1. Introduction

Epithelial keratitis is a common complication following cataract surgery. Many factors have been attributed to this phenomenon, including preoperative and postoperative dry eye, surgical trauma, various medications and infection.<sup>[1–3]</sup> Due to the combination of surgical trauma and topical corticosteroid treatment, which is commonly prescribed after surgery, Herpes simplex virus (HSV) recurrence, or new-onset HSV following cataract surgery, is a common clinical scenario.<sup>[4–6]</sup> Early recognition of the cause of the keratitis and prompt treatment ensure a good visual prognosis. Here, we report a case of epithelial keratitis following uncomplicated cataract extraction.

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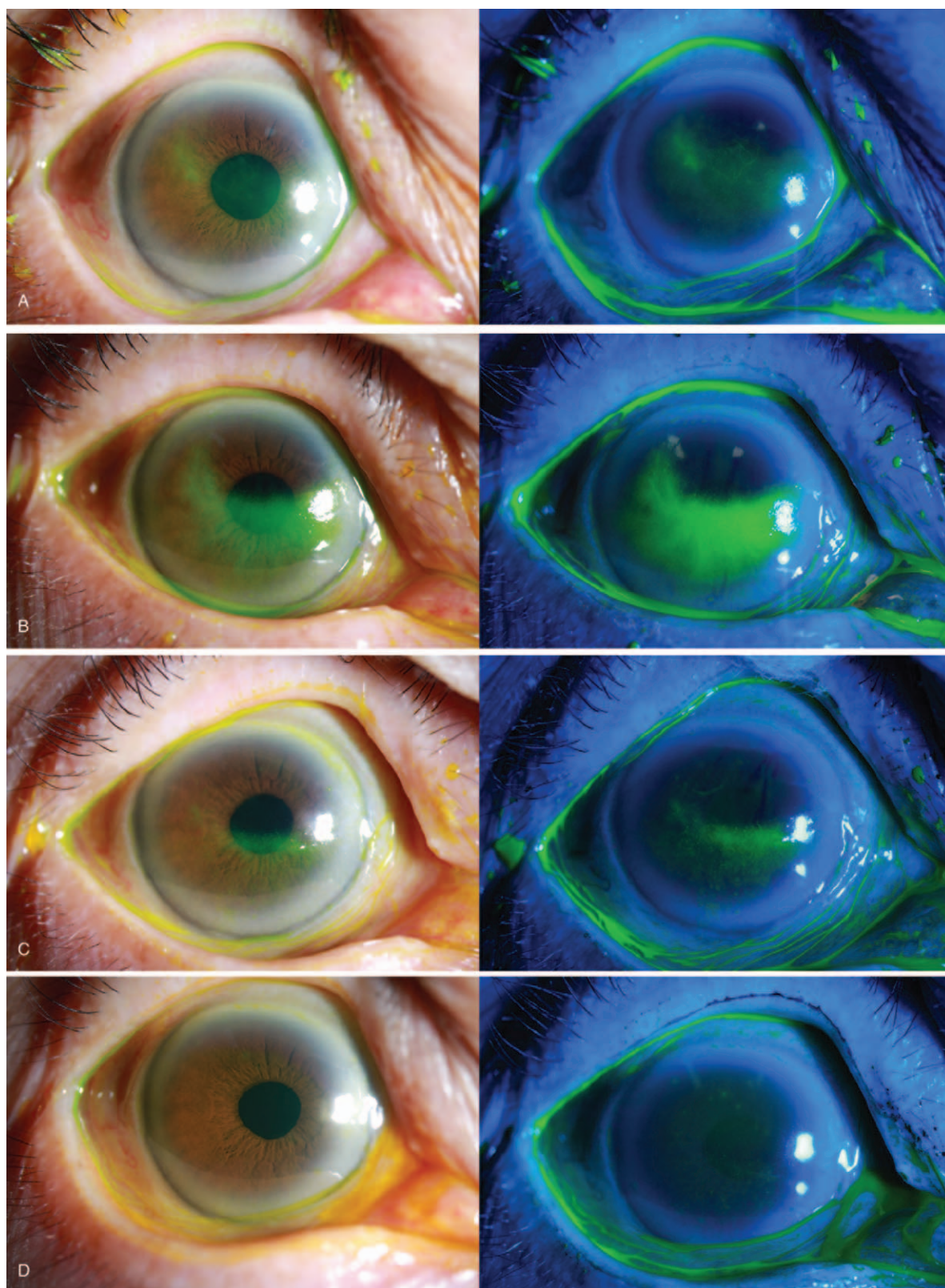
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The case was initially misdiagnosed as herpes simplex keratitis (HSK) and led to vision deterioration; however, a normal visual outcome was ultimately achieved.

## 2. Case report

An 82-year-old woman complained of visual acuity gradually declining over the course of 2 years in both eyes. She denied any past ocular infection or inflammation, including herpetic eye disease. Ophthalmic evaluation documented best-corrected visual acuity (BCVA) of 20/100 OD (Oculus dexter in Latin) and 20/40 OS (Oculus sinister in Latin), with 3+ nuclear opacity of the right eye and 2+ nuclear opacity of the left eye. Retinal examination was unremarkable in both eyes. The patient underwent uncomplicated phacoemulsification (Stellaris, BAUSCH&LOMB, Rochester, NY) of the right eye, with a foldable intraocular lens (Akreos AO MI60, BAUSCH&LOMB) placed in the capsule bag through a superior 2.0-mm clear corneal incision. The surgery was performed under topical anesthesia, with oxybuprocaine hydrochloride instilled 3 times at 5-minute intervals before the start of surgery. Topical antibiotics and steroids were prescribed for 4 weeks postoperatively. On postoperative day 1, BCVA improved to 20/25 in the right eye, the cornea was clear, and the patient reported no eye discomfort.

On postoperative day 23, the patient complained of an abrupt, serious decline of visual acuity in the right eye, accompanied by photophobia, redness, and eye pain. BCVA was 20/50 in the right eye. Slit-lamp examination revealed a staining epithelial defect with dendritic lesions (Fig. 1A). A diagnosis of HSV keratitis was made based on the initial clinical signs. The patient was treated with 400 mg oral acyclovir twice a day and topical acyclovir 4 times a day in the right eye.



**Figure 1.** Clinical course of epithelial keratitis (the OD) following cataract surgery. (A) Initial presentation of staining corneal dendrites on postoperative day 23. (B), Extended area of epithelial defect and progression of epithelial erosion after antiviral treatment on postoperative day 27. (C), Resolution of the epithelial defect after a course of lubrication on postoperative day 30. (D) Complete resolution of the epithelial lesion with small, punctate epithelial staining remaining on postoperative day 37.

**Table 1****Clinical course and features of the patient with epithelial keratitis.**

Time	BCVA	Cornea	Diagnosis	Medication
Preoperation	20/100	Clear	Cataract	Topical antibiotics
Operation	Phaco + IOL			Topical anesthetics
Postoperation				
Day 1	20/25	Clear	NA	Topical antibiotics and steroids
Day 23	20/50	Epithelial defect and dendritic branches	HSV keratitis	Oral and topical acyclovir
Day 27	20/80	Epithelial erosion	Toxic keratitis	Lubrication
Day 30	20/25	Epithelial defect	NA	Lubrication
Day 37	20/20	Clear and small punctate epithelial staining remained	NA	Lubrication

BCVA = best-corrected visual acuity, HSV = herpes simplex virus, NA = not applicable, Phaco + IOL = phacoemulsification and intraocular lens implantation.

On postoperative day 27, the corneal lesion had not responded to treatment, and the patient complained of aggravated eye pain and further vision deterioration. BCVA in her right eye had declined to 20/80 and a slit-lamp biomicroscopy revealed large corneal epithelial erosion (Fig. 1B) that was diagnosed as toxic keratitis. Oral and topical antiviral treatment was discontinued and vigorous lubrication of the eye was initiated.

Three days later (postoperative day 30), the corneal epithelial erosion had mostly resolved itself, and the defect area had reduced in size. The patient reported considerable lessening of pain, and her BCVA had improved to 20/25 (Fig. 1C). A week later (postoperative day 37), the corneal defect had completely resolved. Small, punctate staining remained and the patient had no complaints (Fig. 1D). The complete clinical course and treatments are shown in Table 1.

### 3. Discussion

Epithelial keratitis following cataract surgery is common, even in patients undergoing routine and uneventful surgery. There are various etiologies for the condition.<sup>[1–3]</sup> Published reports have described HSV keratitis, both newly acquired and reactivated, after uncomplicated cataract surgery.<sup>[4,5,7]</sup> Two factors may play a role in the possible etiologies of HSK following cataract surgery:

- (1) trauma to the subepithelial trigeminal nerve plexus by the corneal incision location, and
- (2) intensive treatment with topical corticosteroids during the postoperative period.<sup>[8]</sup>

A differential diagnosis of a corneal epithelial defect includes ocular surface breakdown from the toxic effects of eye drops administered perioperatively, which is vulnerable to the above 2 risk factors as well.<sup>[9]</sup> Different etiologies required different treatments and will have different effect on postoperative vision. Surgeons should be cognizant of the possible etiologies of the presenting lesions.

The time to initial onset of symptoms after cataract extraction is shorter in toxic keratitis than HSK.<sup>[6]</sup> Yang et al reported that the mean time to initial clinical manifestation of HSK occurred within 30 days postoperatively, while toxic keratitis developed within 7 days.<sup>[8]</sup> Nandesh et al reported a patient who developed HSK in the immediate postoperative period after undergoing uncomplicated cataract surgery with atopic dermatitis and oral immunosuppressive medications.<sup>[7]</sup> Our case developed a corneal epithelial defect on postoperative day 23, with vision deterioration after antiviral therapy, before being confirmed as a case of toxic keratitis. The time between surgery and symptom presentation varies under different circumstances,

and HSK might occur in the early postoperative period under immunosuppressive conditions.<sup>[7]</sup>

The clinical features of corneal defects are confusing in the early stages after an operation. The corneal toxic changes following cataract extraction included punctate epithelial keratopathy, pseudodendrite, central epithelial ulcer, and central stromal ulcer.<sup>[9]</sup> In previous studies, patients have shown corneal epithelial irregularities initially diagnosed as toxic keratitis, which then progressed to typical dendritic keratitis. These later proved to be HSK after detection using HSV-1 polymerase chain reaction (PCR).<sup>[7,8]</sup> In our case, the initial presentation showed a dendritic epithelial lesion and was diagnosed as HSK; however, the lesion was refractory to antiviral treatment and progressed. After cessation of antiviral treatment and initiation of lubrication, the epithelial keratitis was completely resolved and diagnosed as toxic keratitis. Yang et al reported manifestations of postoperative HSK as primarily punctate erosion, which is different from nonoperative manifestations of HSK, where dendrites are typically present from the outset.<sup>[8]</sup>

In a previous study, the incidence of HSK was higher than toxic keratitis after cataract surgery.<sup>[8]</sup> The prevalence of HSK is 1.80%; with a higher risk for the reactivation of HSK than a new-onset of the disease.<sup>[8]</sup> A history of ocular and nonocular herpetic diseases warrants attention. Other possible risk factors for HSK reactivation include underlying atopic disease, systemic immunosuppressive agents, and antiglaucoma drugs.<sup>[8]</sup> Clinical histories are helpful for recognizing herpetic infections. In our case, the diagnosis of HSK was made clinically from the typical manifestation of dendrites, the time to initial onset of symptom and the remarkable loss of vision. It is worth bearing in mind that HSV-1 PCR detection from epithelial scrapings or tear samples would have been helpful in confirming the diagnosis<sup>[8]</sup> despite the test sensitivity being 55.8% for HSV.<sup>[10]</sup>

This case presents a unique example of toxic keratitis during a late postoperative period following cataract surgery. The clinical features are easily confused with other etiologies, including HSV infection. Ophthalmologists should recognize and distinguish between the manifestations of different etiologies. HSV-PCR examination is helpful in confirming a diagnosis of HSK. Clinicians should be aware of the complicated progress of corneal epithelial lesions after routine cataract extraction, close follow-up and empiric treatment are warranted.

### Author contributions

**Data curation:** Ming Zou, Yi Zhang.

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**Investigation:** Ming Zou.



**Methodology:** Yi Zhang.

**Supervision:** Chunling Liu.

**Validation:** Xi Huang, Chunling Liu.

**Writing – original draft:** Ming Zou.

**Writing – review and editing:** Ming Zou, Sheng Gao, Chunling Liu.

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