

## Herpetic endotheliitis postphacoemulsification – A case series

Sumana Chatterjee, Rupak Kanti Biswas<sup>1</sup>, Lav Kochgaway<sup>1</sup>, Jayanta Kuila

This case series represents 18 patients who presented from March 2021 to January 2023 with decreased vision after uncomplicated phacoemulsification and intraocular lens implantation. They all experienced a small postoperative window of good vision ranging from 4 to 20 days. The anterior segment optical coherence tomography (ASOCT) revealed an intact Descemet membrane, increased corneal thickness, and keratic precipitates in the endothelium. Based on the clinical features and the ASOCT findings, oral acyclovir tablet five times/day was started and topical prednisolone acetate was continued six times/day. Nobody improved with this regimen in the first 2 weeks, and five patients developed frank geographical keratitis. After starting topical acyclovir ointment and stopping topical prednisolone, all of them improved within 4–12 weeks, suggesting a possible role of topical steroid in precipitating herpes keratitis in this subset of patients.

**Key words:** Corneal edema, endotheliitis, herpetic keratitis, keratic precipitates

### Access this article online

#### Website:

<https://journals.lww.com/JCOR>

#### DOI:

10.4103/jcor.jcor\_68\_25

#### Quick Response Code:



Corneal edema has several differential diagnoses in the first 2 weeks after phacoemulsification (PE) and intraocular lens (IOL) implantation (PE + IOL). Descemet membrane detachment (DMD) and Toxic Anterior Segment Syndrome (TASS) are prominent among them, apart from the striate keratopathy that is encountered in hard nuclear cataracts with increased PE time and power, retained nuclear or epinuclear fragments in the anterior chamber (AC), age-related low endothelial cell count or Fuchs endothelial dystrophy diagnosed preoperatively. In all these scenarios, patients complain of dimness of vision (DV) on the first postoperative day. In this case series, all the patients enjoyed excellent vision in the initial postoperative period, and then after an average of four to 20 days, the dimness in vision developed. All of them were controlled diabetics (glycated hemoglobin value between 6 and 7), no history of atopy or eczema, immunocompetent and not on drugs like Amantadine. In preoperative assessment, all had good endothelial cell count and underwent uneventful PE with IOL implantation. They had no history of previous herpes viral infection anywhere in the body. There was no history of any prior surgery in the same eye or the other eye.

## Case Series

### Case 1

A 65-year-old diabetic male presented with counting finger (CF) 2 feet (LogMAR 0.33 approximately) vision in the right eye (RE) after 1 week of uncomplicated PE + IOL. Pinhole vision

recorded on the first postoperative day was 6/9 with a clear cornea. He was on eyedrops prednisolone acetate six times/day. Slit-lamp (S/L) examination revealed frank corneal edema with intense Descemet membrane fold [Figure 1a]. Anterior segment optical coherence tomography (ASOCT) [Figure 2a] showed corneal edema, intact Descemet membrane, and few keratic precipitates (KPs) which were not appreciated in the S/L due to edema. With normal pupil and no DMD, oral Acyclovir tablet 400 mg five times a day was started on the clinical suspicion of herpetic endotheliitis. Eyedrop Prednisolone Acetate six times/day was continued as it is the recommended treatment for herpetic endotheliitis. He returned after 5 days with intense irritation, redness, and watering in his RE. On S/L examination, frank geographical keratitis was found. Both fluorescein and Rose-Bengal staining revealed a typical geographic pattern, confirming the herpetic aetiology. Prednisolone Acetate eyedrop was stopped, and Acyclovir eye ointment 5 times/day was started. After a week, the epithelial lesion healed. However, as an AC reaction was present, eyedrop Loteprednol Etabonate 0.3% was started four times/day with a tapering dose under oral and topical acyclovir cover. After 2 weeks, the corneal edema decreased and vision improved to 6/18 (LogMAR 0.5). The patient regained 6/9 (LogMAR 0.18), n-6 vision after 3 months with compact cornea in S/L [Figure 1c] and ASOCT [Figure 2b].

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**For reprints contact:** WKHLRPMedknow\_reprints@wolterskluwer.com

**Cite this article as:** Chatterjee S, Biswas RK, Kochgaway L, Kuila J. Herpetic endotheliitis postphacoemulsification – A case series. J Clin Ophthalmol Res 2025;13:388-93.

Department of Cornea and Ocular Surface, Sunayan Advanced Eye Institute, Tamluk, <sup>1</sup>Netralayam Superspecialty Eye Care Centre, Kolkata, West Bengal, India

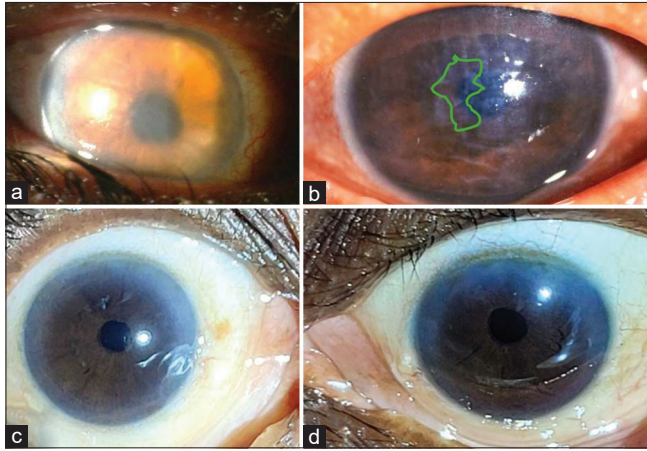
**Address for correspondence:** Dr. Sumana Chatterjee, Jeet Topaz, Flat B-6, 459, Kalikapur Road, Kolkata - 700 099, West Bengal, India. E-mail: dr.sumanachatterjee@rediffmail.com

**Submission:** 08.03.2025; **Decision:** 02.05.2025;

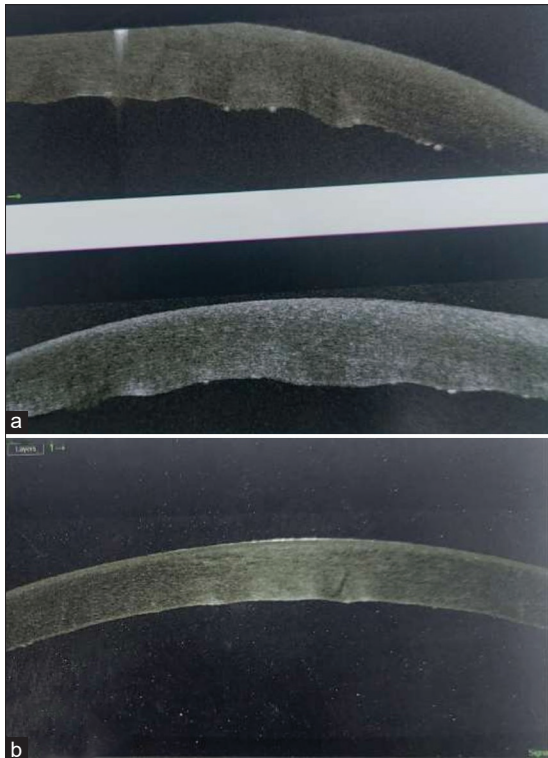
**Acceptance:** 09.05.2025; **Web Publication:** 28.07.2025

## Case 2

A 78-year-old diabetic female presented with CF 3 feet (LogMAR 1.3) in the left eye (LE) after 3 weeks of uneventful PE + IOL. The first postoperative day, pinhole vision was 6/9p with a clear cornea. Frank corneal edema with the epithelial defect was found in the S/L [Figure 1b]. In this case also, the epithelial lesion had a typical geographical pattern as



**Figure 1:** Anterior segment optical coherence tomography picture revealing. (a) Frank corneal edema right eye (RE) of Case 1. (b) Frank corneal edema and epithelial defect (line drawing with green) left eye (LE) of Case 2. (c) RE clear cornea of Case 1 after 3 months. (d) LE clear cornea of Case 2 after 3 months



**Figure 3:** Case 2 anterior segment optical coherence tomography picture revealing. (a) Increased corneal thickness with keratic precipitates (KPs). (b) Decreased corneal thickness and number of KPs after 1 month

revealed by Fluorescein and Rose-Bengal staining. ASOCT revealed increased corneal thickness with KPs on the endothelium [Figure 3a]. Prednisolone Acetate eyedrop was stopped, and the same treatment as given in Case 1 was started. After 1 month, LE was quiet with best-corrected visual acuity (BCVA) improving to 6/18 (LogMAR 0.5). ASOCT revealed a decrease in corneal thickness and number of KPs [Figure 3b]. After 3 months, the cornea was clear in S/L [Figure 1d] with BCVA of 6/6p (LogMAR 0.1), n-6.

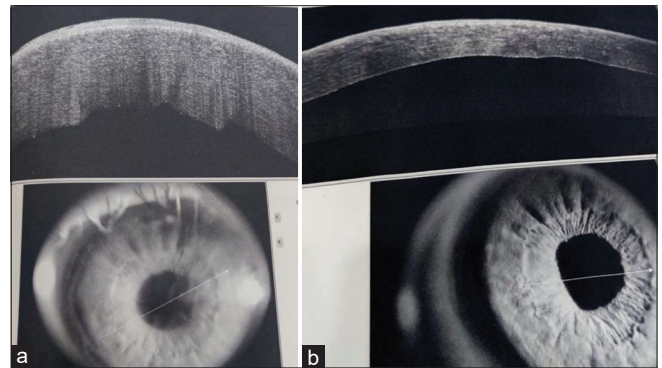
## Case 14

Case 14 presented on the 12<sup>th</sup> postoperative day with classical disciform keratitis and epithelial defect in S/L [Figure 4]. The rest are the same as other cases.

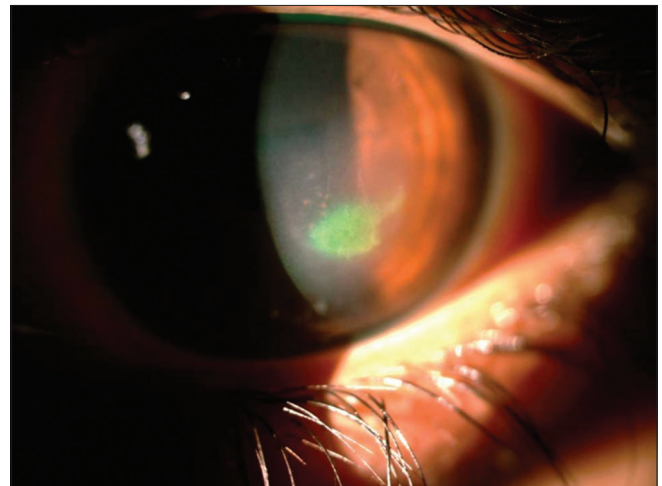
Details of all 18 cases are described in Table 1.

## Discussion

In this case series, we have incorporated 18 cases over 22 months with an average age of 70.22 years and no gender predilection. All of them presented with DV around an average of 10.61 days postoperative, enjoying a clear vision before that. They presented separately in different months in two different centres and not as



**Figure 2:** Case 1 anterior segment optical coherence tomography picture revealing. (a) Increased corneal thickness with keratic precipitates (KPs). (b) Compact cornea after 3 months



**Figure 4:** Typical disciform endotheliitis in Case 14 with epithelial lesion

**Table 1: Details of patients' characteristics**

Age and eye	Sex	Preoperative CD and CCT	Postoperative day DV noted	BCVA at presentation	S/L features	ASOCT features and CCT	Medical treatment regimen	Postoperative week oedema resolved	Final BCVA and GAT Values	Postoperative CD and CCT
65 RE	Male	CD: 2506 CCT: 520	4 <sup>th</sup> day	2/60 LogMAR: 1.47	Frank corneal edema with intense DM fold	Increased corneal thickness with KPs on endothelium CCT 600	Topical acyclovir eye ointment 5 times/day Oral acyclovir 400 mg 5 times/day for 2 weeks and then twice/day to continue Eyedrop Lotepred-nol etabonate 0.3% 4 times/day tapered weekly	12 weeks	6/9 LogMAR: 0.17 GAT - 18	CD: 2400 CCT: 524
78 LE	Female	CD 2300 CCT 530	20 <sup>th</sup> day	3/60 LogMAR: 1.3	Frank corneal oedema with epithelial defect	Increased corneal thickness with KPs on endothelium CCT 580	Do	12 weeks	6/6p LogMAR 0.17 GAT - 14	CD: 2200 CCT: 540
55 LE	Female	CD: 2680 CCT: 498	6 <sup>th</sup> day	6/60 LogMAR: 1	corneal edema and DM folds	Increased corneal thickness with KPs on endothelium CCT 590	Do	6 weeks	6/9 LogMAR: 0.17 GAT - 12 CD: 2500 CCT: 500	CD: 2580 CCT: 510
72 RE	Female	CD: 2348 CCT: 532	10 <sup>th</sup> day	3/60 LogMAR: 1.3	Central corneal edema with DM folds	Increased corneal thickness with KPs on endothelium CCT 588	Do	6 weeks	6/9p LogMAR: 0.17 GAT - 11	CD: 2300 CCT: 540
68 LE	Male	CD: 2600 CCT: 506	18 <sup>th</sup> day	6/36 LogMAR: 0.77	Do	Increased corneal thickness CCT 550	Do	4 weeks	6/6p LogMAR: 0.17 GAT - 16	CD: 2500 CCT: 520
80 LE	Male	CD: 2200 CCT: 492	3 <sup>rd</sup> day	2/60 LogMAR: 1.47	Limbus to limbus corneal edema with DM folds and epi defect	Increased corneal thickness with KPs on endothelium CCT - 620	Do	8 weeks	6/18 LogMAR 0.47 GAT - 18	CD: 2160 CCT: 560
56 RE	Female	CD: 2806 CCT: 520	8 <sup>th</sup> day	6/60 LogMAR: 1	Central corneal edema with DM folds	Increased corneal thickness CCT 554	Do	6 weeks	6/6p LogMAR: 0.17 GAT - 20	CD: 2740 CCT: 530
75 RE	Female	CD: 2376 CCT: 512	4 <sup>th</sup> day	5/60 LogMAR: 1.07	Do	Do CCT: 578	Do	10 weeks	6/9 LogMAR: 0.17 GAT - 14	CD: 2400 CCT: 500
66 RE	Male	CD: 2640 CCT: 502	20 <sup>th</sup> day	6/24 LogMAR: 0.6	Do	Do CCT: 564	Do	4 weeks	6/6p LogMAR: 0.17 GAT - 12	CD: 2586 CCT: 512

Contd...

Table 1: Contd...

Age and eye	Sex	Preoperative CD and CCT	Postoperative day DV noted	BCVA at presentation	S/L features	ASOCT features and CCT	Medical treatment regimen	Postoperative week oedema resolved	Final BCVA and GAT Values	Postoperative CD and CCT
79 LE	Male	CD: 2550 CCT: 524	11 <sup>th</sup> day	3/60 1.3	LE Limbus to limbus corneal edema with DM folds	Increased corneal thickness with KPs on endothelium CCT 580	Do	6 weeks	6/12 0.3 GAT - 16	CD: 2480 CCT: 540
64 RE	Female	CD: 2740 CCT: 512	6 <sup>th</sup> day	6/60 LogMAR: 1	Central corneal edema with DM folds	Do CCT: 558	Do	4 weeks	6/7.5 LogMAR 0.1 GAT - 14	CD: 2680 CCT: 530
73 LE	Female	CD: 2460 CCT: 530	16 <sup>th</sup> day	6/36 LogMAR: 0.77	Do	Do CCT: 582	Do	6 weeks	6/9 LogMAR: 0.17 GAT - 16	CD: 2360 CCT: 540
58 RE	Male	CD: 2800 CCT: 490	7 <sup>th</sup> day	6/24 LogMAR: 0.6	Do	Do CCT: 568	Do	4 weeks	6/7.5 LogMAR: 0.1 GAT - 12	CD: 2740 CCT: 510
82 RE	Male	CD: 2280 CCT: 540	12 <sup>th</sup> day	2/60 LogMAR: 1.47	Central corneal edema with epithelial defect	Do	Do CCT 630	8 weeks	6/12 LogMAR: 0.3 GAT - 16	CD: 1980 CCT: 560
69 LE	Male	CD: 2400 CCT: 530	5 <sup>th</sup> day	6/60 LogMAR: 1	Central corneal edema with DM folds	Do	Do CCT 590	5 weeks	6/7.5 LogMAR 0.1 GAT - 16	CD: 2370 CCT: 540
77 RE	Female	CD: 2600 CCT: 518	13 <sup>th</sup> day	3/60 LogMAR: 1.3	Limbus to limbus corneal oedema with epi defect	Do	Do CCT 610	10 weeks	6/12 LogMAR: 0.3 GAT 18	CD: 2550 CCT: 530
86 LE	Male	CD: 2190 CCT: 528	18 <sup>th</sup> day	3/60 LogMAR: 1.3	Do	Do	Do CCT 582	9 weeks	6/12 LogMAR: 0.3 GAT 12	CD: 2080 CCT: 540
61 LE	Female	CD: 2760 CCT: 524	10 <sup>th</sup> day	6/24 LogMAR: 0.6	Central corneal edema with DM folds	Do	Do CCT 598	6 weeks	6/9 LogMAR: 0.17 GAT 16	CD: 2680 CCT: 530

DV: Dimness of vision, RE: Right eye, LE: Left eye, BCVA: Best-corrected visual acuity, S/L: Slitlamp, ASOCT: Anterior segment optical coherence tomography, FC: Finger counting, DM: Descemet membrane, KPs: Keratic precipitates, GAT: Goldmann–applanation tonometry, SPM: Specular microscopy, CCT: Central corneal thickness, CD: Cell density

a cluster presentation. The average visual acuity at presentation was 1.07 in the LogMAR chart. The average cell density (CD) was 2513.11, and the average central corneal thickness (CCT) was 517.11  $\mu$  before cataract surgery. During endotheliitis, the average CCT was 584.55  $\mu$  as obtained from ASOCT. After 3 months, average visual acuity improved to 0.203 in the LogMAR chart, the average CD and CCT were 2432.55 and 530.88  $\mu$ , respectively, almost the same as before cataract surgery. The Goldmann–Applanation tonometry reading was normal when measured after their corneas became clear. During the active disease, finger tension of the affected eyes was normal. Five patients developed epithelial lesions along with endotheliitis in our case series may be due to the continuation of prednisolone acetate. Endotheliitis after cataract surgery is rare.<sup>[1]</sup> Surgical trauma can cause infection in a case with no previous history of viral eye disease, as preexisting latent virus might be reactivated by corneal incisions.<sup>[2]</sup> As described in previous literature,<sup>[3]</sup> we have also found a gap between the development of herpetic endotheliitis and cataract surgery, ranging from 4 to 20 days, and they worsened with the continuation of Prednisolone Acetate eyedrop under oral and topical antiviral cover. Although steroids help to reduce inflammation following cataract surgery, this may be a major contributing factor to the etiology of postoperative endotheliitis, causing local immunosuppression.<sup>[3]</sup> Previous reports have suggested that viral infection is more common among patients with diabetes mellitus.<sup>[4]</sup> Wang *et al.*<sup>[3]</sup> have shown that diabetic patients have a significantly higher incidence of endotheliitis than nondiabetic patients due to abnormalities in cell-mediated immunity associated with hyperglycemia or as the blood-aqueous barrier in diabetic patients is weakened, the virus-infected cells may move more easily into the corneal cells.<sup>[5,6]</sup> In our series, because of the positive clinical response to treatment and the inherent low positive rate of polymerase chain reaction (PCR) in endotheliitis with poor disease correlation,<sup>[7]</sup> we did not do AC tapping. However, we did send scrapings from patients who developed epithelial defects for routine microbiological examinations and PCR for bacteria and viruses. But the reports were inconclusive. The diagnosis of endotheliitis is based on the clinical features and response to treatment. As pupillary size and reaction were normal with normal iris configuration, the possibility of late-onset TASS was ruled out. The staining being limited to the affected cornea in a typical geographic pattern without any conjunctival staining helped us to rule out drug toxicity, too. The brand of prednisolone acetate used did not cause any toxic reaction in other postoperative patients. All of them improved with medical management in the average postoperative time frame of 7 weeks. We advised Oral Acyclovir 400 mg twice a day for a year for all the patients. We followed up with the patients for a minimum of 14.5 months from the presentation and longer. We also suspected cytomegalovirus (CMV) endotheliitis, as after cataract surgery, it has the same clinical signs as herpetic endotheliitis. It is a corticosteroid recalcitrant inflammation with high intraocular pressure and specific coin-shaped KPs, although diffuse edema is rare.<sup>[8]</sup> However, our patients had normal finger tension. Acyclovir treatment is less efficient in CMV, but topical Gancyclovir 0.15% gel five times/day is effective with good corneal

penetration and therapeutic levels in aqueous humor.<sup>[9]</sup> Our patients responded satisfactorily with topical and oral Acyclovir. There is no guideline for the perioperative management of herpes simplex keratouveitis after cataract surgery, although the same exists for corneal transplants. A high index of suspicion in areas endemic for the herpes virus should be maintained if postcataract surgery patients develop inexplicable endotheliitis, particularly after a window period of clear vision.

## Conclusion

This case series considers herpetic endotheliitis as an important differential diagnosis in postcataract surgery corneal edema, particularly if it develops after a period of absolute visual clarity and clear cornea in a diabetic patient. As the diagnosis is basically of exclusion and most patients presented with endotheliitis alone without the typical epithelial lesion of Herpes, the decision of whether to stop or continue the routine postoperative steroid was crucial. The finding of KPs in ASOCT, which was masked under corneal edema in S/L, was an aid to diagnosis. The appropriate timing to start a less potent topical steroid to combat inflammation under antiviral cover with close follow-up is the key to full recovery and improvement of visual acuity in these patients.

## Data availability statement

The data supporting the findings of this study will be made available upon reasonable request.

## Acknowledgement

Dr. Srinivas K Rao, srinikrao@gmail.com, Director, Consultant Cornea, Cataract and Refractive Surgery, Darshan Eye Clinic & Surgical Centre, Chennai.

## 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.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## References

1. Zamir E, Stawell R, Jhanji V, Vajpayee RB. Corneal endotheliitis triggered by cataract surgery in a Chinese patient with cytomegalovirus anterior uveitis. *Clin Exp Ophthalmol* 2011;39:913-5.
2. Lim DH, Kim J, Lee JH, Chung ES, Chung TY. A case of corneal endothelial dysfunction due to coxsackievirus A24 corneal endotheliitis after cataract surgery. *Cornea* 2014;33:533-5.
3. Wang H, Zheng J, Zheng Q, Yang F, Ye C, Woo DM, *et al.* Incidence and risk factors of new onset endotheliitis after cataract surgery. *Invest Ophthalmol Vis Sci* 2018;59:5210-6.
4. Kaiserman I, Kaiserman N, Nakar S, Vinker S. Herpetic eye disease

- in diabetic patients. *Ophthalmology* 2005;112:2184-8.
5. Geerlings SE, Hoepelman AI. Immune dysfunction in patients with diabetes mellitus (DM). *FEMS Immunol Med Microbiol* 1999;26:259-65.
  6. Moriarty AP, Spalton DJ, Moriarty BJ, Shilling JS, Ffytche TJ, Bulsara M. Studies of the blood-aqueous barrier in diabetes mellitus. *Am J Ophthalmol* 1994;117:768-71.
  7. McGilligan VE, Moore JE, Tallouzi M, Atkinson SD, O'Neill H, Feeney S, *et al.* A comparison of the clinical and molecular diagnosis of herpes simplex keratitis. *Open J Ophthalmol* 2014;4:65-74.
  8. Alfawaz A. Cytomegalovirus-related corneal endotheliitis: A review article. *Saudi J Ophthalmol* 2013;27:47-9.
  9. Koizumi N, Miyazaki D, Inoue T, Ohtani F, Kandori-Inoue M, Inatomi T, *et al.* The effect of topical application of 0.15% ganciclovir gel on cytomegalovirus corneal endotheliitis. *Br J Ophthalmol* 2017;101:114-9.