

## Cataract surgery after Descemet stripping endothelial keratoplasty

*Sunita Chaurasia, Muralidhar Ramappa,  
Virender Sangwan*

Management of endothelial dysfunction in phakic patients is sometimes a dilemma for corneal surgeons. Phakic patients with visually significant cataract and endothelial dysfunction are

preferably managed by performing combined cataract surgery with endothelial keratoplasty. However, combined surgery may be deferred in eyes with early incipient cataract, younger age and where anterior chamber is poorly visualized. As cataract formation may be accelerated after endothelial keratoplasty, these eyes may need cataract surgery subsequently. Surgical intervention in eyes with endothelial keratoplasty is of concern as this may affect the graft adversely and threaten graft survival. In this report, we describe the intraoperative surgical details and postoperative clinical course of a patient who underwent phacoemulsification with intraocular lens implantation after Descemet stripping automated endothelial keratoplasty (DSAEK).

**Key words:** Cataract surgery, endothelial keratoplasty, phacoemulsification

Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/0301-4738.103803

Cornea and Anterior Segment Services, LV Prasad Eye Institute, Hyderabad, India

**Correspondence to:** Dr. Sunita Chaurasia, LV Prasad Eye Institute, LV Prasad Marg, Banjara Hills, Hyderabad – 500034, India. E-mail: sunita@lvpei.org

Manuscript received: 28.12.10; Revision accepted: 08.06.11

The preferred approach to manage phakic patients with cataract and an endothelial disorder is to perform a combined procedure of cataract extraction along with endothelial keratoplasty. Simultaneous cataract surgery and endothelial keratoplasty is deferred when cataract is insignificant, anterior chamber cannot be properly visualized and in younger patients to preserve the accommodation. However, these patients may require cataract extraction later. Cataract surgery after endothelial keratoplasty is a challenging procedure. Care must be taken to prevent the potential complications such as graft dislodgement, endothelial trauma, and graft failure. There is limited literature on cataract extraction after endothelial keratoplasty.<sup>[1]</sup> We describe our observations of sequential phacoemulsification with intraocular lens (IOL) implantation

performed after Descemet stripping automated endothelial keratoplasty (DSAEK).

### Case Report

A 37-year-old male underwent endothelial keratoplasty in the right eye for primary graft failure following large diameter (11.5 mm) therapeutic penetrating keratoplasty. The therapeutic penetrating keratoplasty was done for advanced fungal keratitis 6 months prior to DSAEK. Following therapeutic keratoplasty, there was no recurrence infection. The graft was edematous with 10 intact sutures covered by conjunctiva, the anterior chamber was deep with few peripheral anterior synechiae, pupil showed posterior synechiae, and lens showed early nuclear sclerosis. The intraocular pressure was within normal range throughout the postoperative period.

DSAEK was done using Moria microkeratome system (Moria/Microtek Inc., Doylestown, PA, USA) with a 350-mm head. Considering the patient’s age and the absence of significant cataract, simultaneous cataract surgery was deferred. The endothelial cell density of the donor cornea was of 2272 cells/mm<sup>2</sup>. The posterior lamellar graft was inserted by the push-in technique using the sheet IOL glide (BD Medical-Ophthalmic Systems, Franklin Lakes, NJ USA) protecting the endothelium with sodium hyaluronate 1%. The graft clarity recovered in 1 month after the surgery. At 3 months postoperative visit, the graft was clear; however, a significant progression of cataract was noted. The vision was 20/400 due to a nuclear cataract of grade 2+. The patient underwent uneventful phacoemulsification with IOL implantation 3 months after DSAEK. Pre-operative evaluation by confocal microscopy (Nidek, Confoscan 4) revealed an endothelial count of 1937 cells/mm.<sup>[2]</sup> Biometry was performed using the keratometry readings obtained from Orbscan II (Bausch and Lomb’s, Florida, USA) and IOL power was calculated for a postoperative targeted refraction of -0.5 diopters of myopia.

A superior scleral incision approach was used. Synechiolysis was done and phacoemulsification was performed by the stop and chop technique. Irrigation was kept off while inserting the phaco handpiece into the anterior chamber to avoid dislodging the graft. During surgery, a dispersive ophthalmic viscosurgical device (hydroxypropyl methylcellulose 2%, Viscomet, Sun Pharmaceuticals Industries Ltd., India) was used to protect the endothelium. A foldable, acrylic IOL was implanted in- the bag. The phaco time used was 15 seconds.

On the first postoperative day, vision was 20/160, improving to 20/80, and the graft was compact [Figs. 1 and 2]. He was treated with ofloxacin 0.3% eyedrops 6 times/day for a week and prednisolone acetate 1% eyedrops 8 times/day for the initial 1 week, followed by tapering of one drop a week and finally maintained on 3 times/day. One month after the cataract surgery, his vision was 20/50. At the last visit, 3 months later, the graft was compact and the best corrected visual acuity was 20/30 with a -0.75 D Sph/-1.50 D Cyl at 160°. Table 1 shows the visual acuity, donor thickness [assessed by anterior segment Optical Coherence Tomography (OCT), Visante: Carl Zeiss, Germany] and visual acuity pre- and post-cataract surgery. Fig. 3 shows the changes in the endothelial cell density.

### Discussion

Cataract surgery following penetrating keratoplasty is a safe and effective procedure, with a low but definite risk of corneal

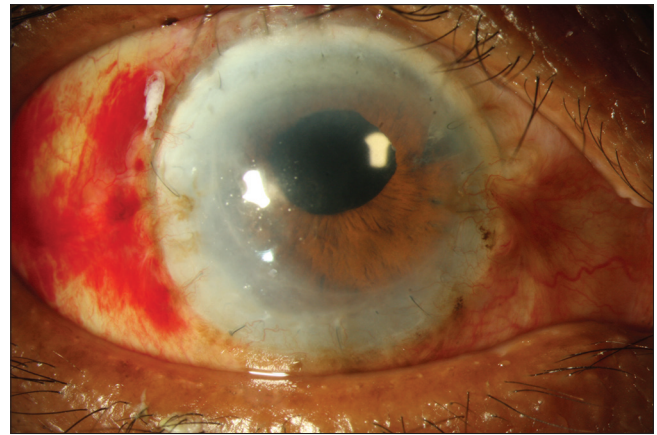


Figure 1: Slit-lamp photograph of the right eye after DSAEK (Day 1 post op)

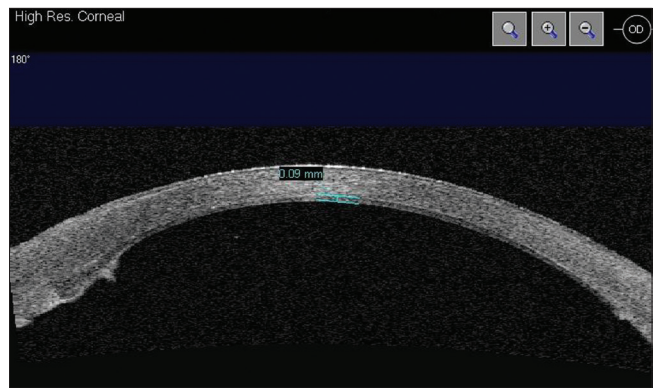


Figure 2: Post-op Day 1 anterior segment OCT image showing well-attached, compact graft

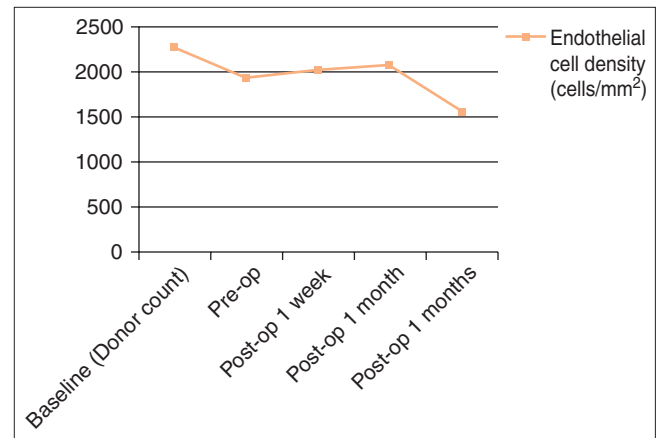


Figure 3: Endothelial cell density changes

Table 1: Pre and post-cataract surgery parameters

Parameters	Pre-op	1 week	1 month	3 months
Visual acuity	20/400	20/50	20/30	20/30
Donor thickness (in μm)	90	90	90	90
Endothelial cell density (cells/mm <sup>2</sup> )	1937	2012	2078	1562

graft failure.<sup>[2]</sup> However, the safety and efficacy of intraocular intervention in eyes that have undergone DSAEK is not well established. Post-DSAEK surgical interventions may be fraught with the risk of endothelial cell damage or donor graft detachment or subsequent endothelial rejection. Therefore, patients with visually significant cataract often undergo cataract surgery at the time of endothelial keratoplasty.<sup>[3]</sup> It may be deferred in eyes where the anterior chamber cannot be properly visualized. In eyes with crystalline lens or early nuclear sclerosis that have undergone only endothelial keratoplasty, cataract formation may be hastened due to surgical manipulation, air tamponade at the time of surgery and use of postoperative steroid medications.<sup>[4]</sup> It is likely that all the mentioned factors might have led to accelerated cataract progression in this case.

The specific surgery-related issues to be considered in these eyes are: the site of internal incision in relation to the edge of the lamellar graft, turbulence during insertion of the phaco handpiece with irrigation, which can potentially lead to graft dislodgement, reduced working space in the anterior chamber, and endothelial cell loss during surgery. The main postoperative concern is to prevent graft rejection secondary to surgical intervention.

The case described here had an uneventful intraoperative and postoperative course. Appropriate surgical measures were taken to protect the graft throughout surgery. Intraoperatively, no deformation or detachment of the donor graft was noticed. The graft remained compact and well apposed. There was no noticeable corneal edema in the postoperative period. An endothelial cell loss of 14.7% was noted at 3 months after DSAEK and an additional loss of 19.3% was noted from the time of cataract surgery to 3 months later. The overall cell loss at 6 months post-DSAEK was 31.2%, which is comparable to

the endothelial cell density changes reported after DSAEK in various series.<sup>[5,6]</sup>

This case shows that subsequent intraocular surgery with appropriate precautions can be performed safely in post-DSAEK eyes. However, the long-term effect on the endothelium and graft survival needs to be better understood.

## References

1. Price MO, Price DA, Fairchild KM, Price FW Jr. Rate and risk factors for cataract formation and extraction after Descemet stripping endothelial keratoplasty. *Br J Ophthalmol* 2010;94:1468-71.
2. Nagra PK, Rapuano CJ, Laibson PL, Kunimoto DY, Kay M, Cohen EJ. Cataract extraction following penetrating keratoplasty. *Cornea* 2004; 23:377-9.
3. Covert DJ, Koenig SB. New triple procedure: Descemet's stripping and automated endothelial keratoplasty combined with phacoemulsification and intraocular lens implantation. *Ophthalmology* 2007;114:1272-7.
4. Price MO, Price FW Jr. Cataract progression and treatment following posterior lamellar keratoplasty. *J Cataract Refract Surg* 2004;30:1310-5.
5. Terry MA, Chen ES, Shamie N, Friend DJ. Endothelial cell loss after Descemet's stripping endothelial keratoplasty in a large prospective series. *Ophthalmology* 2008; 115:488-96.
6. Lee WB, Jacobs DS, Musch DC, Kaufman SC, Reinhart WJ, Shtein RM. Descemet's stripping endothelial keratoplasty: Safety and outcomes: A report by the American Academy of Ophthalmology. *Ophthalmology* 2009;116:1818-30.

**Cite this article as:** Chaurasia S, Ramappa M, Sangwan V. Cataract surgery after Descemet stripping endothelial keratoplasty. *Indian J Ophthalmol* 2012;60:572-4.

**Source of Support:** Nil, **Conflict of Interest:** None