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Case Report

Cataract following endothelial keratoplasty (EK) in a child

Lt Col Alok Sati^a, Muralidhar Ramappa^{b,*}, Sunita Chaurasia^b^a Fellow Cornea & Anterior Segment, L V Prasad Eye Institute, Banjara Hills, Hyderabad 500038, AP, India^b Consultant Cornea & Anterior Segment, L V Prasad Eye Institute, Banjara Hills, Hyderabad 500038, AP, India

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Introduction

Cataract formation may be accelerated after Descemet stripping automated endothelial keratoplasty (DSAEK) and these eyes may need cataract surgery subsequently. The reasons cited for cataract development are: intraoperative manipulation during surgery, use of air tamponade, multiple surgeries and postoperative long-term steroid use. Therefore, phakic patients with clinically significant cataract and endothelial dysfunction are preferably better managed by performing simultaneous cataract surgery with endothelial keratoplasty. However, in pediatric patients with clear lens or early incipient cataract, combined surgery is avoided in order to preserve accommodation. Cataract surgery in eyes undergone DSAEK previously is of concern as this may affect the graft adversely and threaten graft survival. Herein, we describe the intraoperative surgical details and postoperative clinical course of a 6-year-old child who underwent lens aspiration with intraocular lens implantation following cataract development 6 months after DSAEK.

Case report

A 6-year-old child underwent DSAEK for failed optical penetrating keratoplasty. The primary indication for penetrating keratoplasty was congenital hereditary endothelial dystrophy (CHED), which was performed at the age of 2 years. Following DSAEK, the graft cleared in one month postoperatively, the patient was treated with topical prednisolone acetate 1% eye drops in tapering doses.

At 6 months follow up after DSAEK, the parents brought the child with complaints of noticing sudden drop in his vision and pearly white reflex in the pupillary area of 2 weeks duration. At this visit, the vision was light perception with accurate projection of rays. Clinical findings showed intumescent cataract (Fig. 1) with clear graft and well apposed lenticule. Confocal specular examination showed a healthy endothelial count. He underwent lens aspiration with primary posterior capsulorrhexis with judicious anterior vitrectomy and posterior chamber intraocular lens implantation. Postoperatively, his graft was clear and lenticule was well attached to the graft and posterior intraocular lens was in situ (Fig. 2). At his last follow up visit, 1 year after the cataract surgery, his vision improved to 20/80 with +2.5D Sph/−2.25D Cyl @ 180. The individual lost 30% of endothelial cells after DSAEK until cataract surgery, and a further 18% loss after cataract surgery till last follow up visit as highlighted in Table 1.

Discussion

Descemet's stripping automated endothelial keratoplasty comprises of highly selective replacement of dysfunctional recipient endothelium replaced with healthy donor

* Corresponding author. Tel.: +91 40 30612623, +91 9441595860 (mobile); fax: +91 40 2354 8271.

E-mail address: muralidhar@lvpei.org (M. Ramappa).

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Fig. 1 – Slit lamp photograph showing clear graft with intumescent cataract.

endothelium.¹ DSAEK offers certain advantages like quick visual recovery, lesser demand of postoperative care, minimal induced refractive error, elimination of suture related complications and advantage against late wound dehiscence.^{1,2} Besides these advantages, it has certain complications like posterior graft dislocation, endothelial graft rejection, primary graft failure, iatrogenic glaucoma³ and cataract formation. Though most of these complications are well described in literature, cataract development after DSAEK is a less investigative field. Studies in adults have shown that prevalence of cataract after DSAEK is in between 40 and 45%^{4,5} which is questionable because of small sample size. Price et al⁶ have stated that the rate of cataract formation after DSAEK in adults is 20% at one year, 33% at two years and 44% at three years. However, no such report exists in the pediatric age group.

Factors responsible for cataract development after DSAEK include unfolding of donor button within the small anterior chamber of a child, which is more likely to cause inadvertent damage to the lens. Also exuberant post surgical inflammatory reaction of children along with intensive topical steroid is also contributory to the development of cataract.

Plausible explanation for the cataract development after DSEAK would be: low corneo-scleral rigidity thus unstable anterior chamber depth resulting in inadvertent lens injury, air tamponade, immature uveal barrier resulting in exuberant postoperative inflammation, secondary glaucoma, repeated multiple surgical interventions and long-term steroid usage.

Fig. 2 – Slit lamp photograph after cataract surgery with posterior chamber intraocular lens in place.

Table 1 – Endothelial changes.

Surgical intervention	ECD (cells/mm ²)	% Loss (duration)
Donor lenticule (13, Nov 2009)	3257	—
Prior to cataract surgery (10, Jun 2010)	2213	30% (7 months)
Post cataract surgery (3, Feb 2011)	1791	18% (8 months)

Cataract development in a child after DSAEK can be prevented by constricting the pupil preoperatively, minimizing the manipulation while inserting the lenticule, removing the air bubble after 7–10 min, and judiciously tapering the steroids.

The main concern in cataract extraction is to prevent graft failure secondary to surgical intervention. This can be prevented by making an internal incision away from edge of the lamellar graft, using liberal amounts of dispersive visco elastic agents to coat the endothelium well, by switching off irrigation while inserting hand piece, and by increasing working space in the anterior chamber. All these factors prevent endothelial cell loss during surgery. Y.M Janet Tsui et al⁷ have stated that out of four patients who underwent cataract surgery following DSAEK, one developed graft failure.

In conclusion, post DSAEK cataract in children has been less investigated and appropriate measures to be exercised while removing cataract in order to minimize injury to the cornea and endothelial damage.

Conflicts of interest

All authors have none to declare.

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