

Posttraumatic deep anterior lamellar keratoplasty dehiscence: Descemet's resistance

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An 18-year-old girl who had undergone deep anterior lamellar keratoplasty in her left eye for keratoconus a year back presented with inferonasal graft dehiscence with intact host Descemet's membrane and intact anterior chamber after sustaining blunt injury a week prior. The graft was sutured to the host bed, and complete resolution of graft edema was seen in 4 weeks. One year later, she underwent cataract surgery with foldable intraocular lens implantation. At her final follow-up, the best-corrected visual acuity in her left eye was 20/40 with a clear corneal graft and a stable posterior chamber intraocular lens implantation.

Key words: Anterior segment OCT, deep anterior lamellar keratoplasty, trauma, wound dehiscence

The prevalence of posttraumatic graft dehiscence has been reported to be 3.2%^[1] to as high as 11.53%.^[2,3] There is a possible advantage of deep anterior lamellar keratoplasty (DALK) over penetrating keratoplasty in trauma in terms of it being partial thickness.^[4] This case reports a unique outcome of posttraumatic DALK dehiscence, which had a good prognosis postrepair with intact Descemet's membrane (DM).

Case Report

An 18-year-old girl reported to our hospital with sudden onset diminution of vision in her left eye with pain for the past one week. She gave a history of injury to her left eye with her younger brother's fist while playing.

She was a known case of keratoconus for the past 4 years and had undergone isotonic collagen cross-linking in the right eye following Dresden protocol. Initial records prior to cross linking showed best corrected visual acuity (BCVA) right eye 20/60 (-1.00 Dsph/-6.00 Dcylx 70°) and left eye

20/200 (+4.00 Dsph/-12.00 Dcylx 130°) with pachymetric values of 409 μm in right eye and 273 μm in the left eye. She was intolerant to semisoft contact lenses and a DALK was performed under general anesthesia in the left eye. Manual dissection was done due to the failed big bubble technique. While dissecting the thinnest portion of the host bed, 2 inadvertent micro-perforations of the DM occurred, which were sealed with fibrin glue. On the second postoperative day, a slight nasal separation of the DM was seen, so 14% perfluoropropane (C3F8) was injected intracamerally one week after the DALK. Postoperatively, the patient was advised topical prednisolone acetate (1%) 8 times a day, to be tapered weekly, and then once a day to continue. BCVA at one month post C3F8 injection was recorded as 20/80 (+6.00Dsph/-8.00Dcylx 80°). Intraocular pressure (IOP) recorded was 14 mm of Hg in both eyes. She was counseled for regular visits for suture removal in the left eye.

At the present visit, posttrauma in her left eye, BCVA in the right eye was 20/50 (-10.00Dsph/-6.00Dcylx 20°) and 20/2000 in the left eye. Inferonasal graft dehiscence with broken sutures and localized graft edema was seen [Fig. 1a]. Underneath the edematous graft, an intact host DM was seen. Anterior chamber was deep and the crystalline lens was intact. Irregular pupil with intermittent posterior synechia suggesting traumatic mydriasis was also seen. Anterior segment optical coherence tomography (ASOCT) showed separation of the donor graft from the host bed and an intact host bed [Fig. 1b]. Under general anesthesia, a paracentesis was made to reduce anterior chamber pressure and the surface of the host Descemet's membrane and of the graft was washed to remove any debris or epithelial cells. The broken sutures were removed and the area of graft dehiscence was re-sutured to the host bed with interrupted 10-0 nylon sutures. At 3 weeks, the uncorrected visual acuity (UCVA) in left eye improved to 20/400 (20/200 with pinhole). A month later, BCVA in left eye was 20/60 (-3.50 Dsph) with a clear graft and intact sutures [Fig. 1c]. Fundus examination was normal in both eyes.

A year later she reported with mild decrease in vision in left eye 20/80 (-3.00 Dsph/-3.50 Dcylx 120°), N 36 due to a posterior subcapsular cataract. Specular microscopy (Tomey EM 3000) at 2-year follow-up showed central density 1833 sq. mm, CV 46, hexagonality 36%, standard deviation of 249 and polymegathism. At 2-year follow-up post-DALK topography was done guiding suture removal. [Fig. 2a] Lens aspiration with foldable intraocular lens (IOL) implantation was performed successfully. Three weeks later BCVA improved to 20/40 (+3.00Dsph/-3.00Dcylx 120°) [Fig. 2b].

She continued to maintain good vision till her last follow-up with a BCVA of 20/40 (+2.50 Dsph/-6.00 Dcylx 130°,

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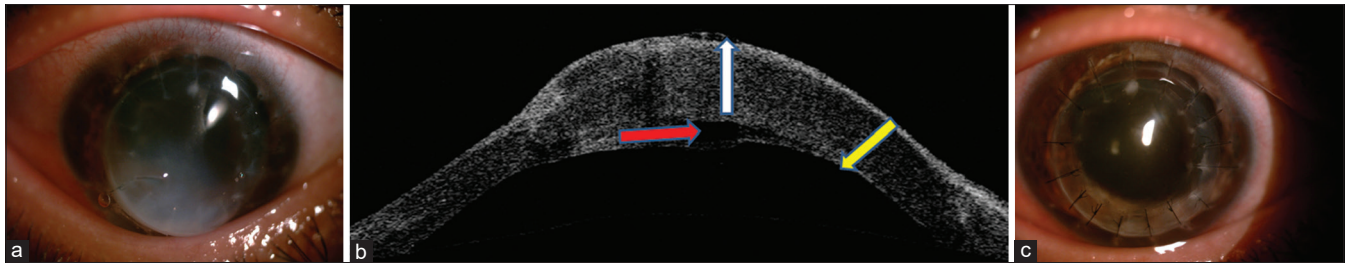


Figure 1: (a) Graft dehiscence infero nasally with intact Descemet's membrane and broken sutures. Graft edematous in the region of dehiscence. Intact anterior chamber. (b) Enhanced cross-sectional corneal image (ASOCT) captured postinjury showing overlying donor graft (white arrow), dislocation of the donor tissue to the recipient bed (yellow arrow), with space between (red arrow). (c) 3 weeks postresuturing shows intact sutures, clear graft with traumatic mydriasis

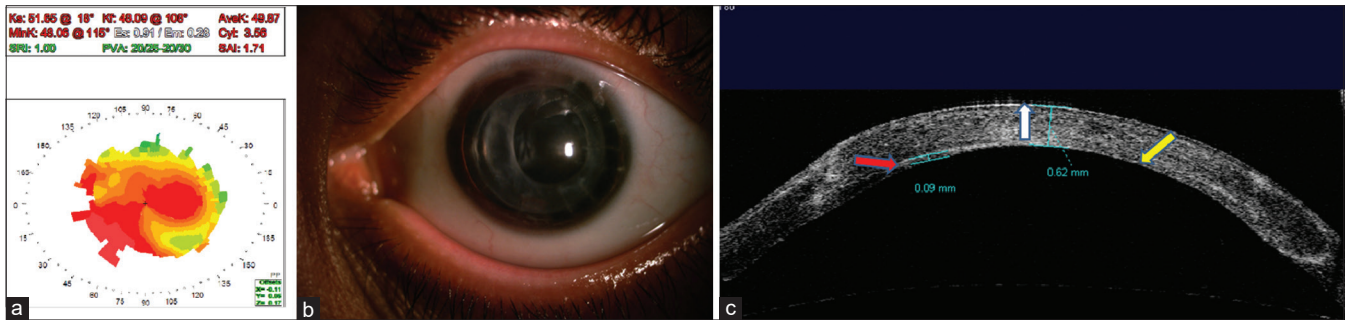


Figure 2: (a) Topography 2 years post-DALK. (b) Eighteen months postcataract extraction and IOL implantation. (c) High-resolution cross-sectional corneal image (ASOCT) captured at 3-year follow-up after re-suturing postinjury showing complete apposition of the donor tissue to the recipient bed, without any space between (yellow arrow). Corneal thickness measured was 620 μm (white arrow) and bed thickness of 90 μm (red arrow)

+3.00 Dsph N6), 4 years after the resuturing with a clear corneal graft showing mild interface scarring and a stable intraocular lens. BCVA with scleral contact lens was 20/20 in right eye and 20/30 in the left eye. Anterior segment ocular coherence tomography (ASOCT) done at the last visit showed well-apposed graft with central corneal thickness of 620 μm [Fig. 2c].

Discussion

The cause of posttraumatic injury in our case was blunt injury, which is the commonest cause of injury noted in a large study by Sari *et al.*^[1] The various studies have put together risk factors^[5] as young age,^[6,7] early suture removal and noncompliance to protective glasses postoperatively as significant risk factors. Post-DALK dehiscence has been reported with good outcome owing to retained intact DM at the site of dehiscence in a previous report.^[8] Retained host stroma in Melles technique of DALK surgery prevented total extrusion of intraocular contents similar to our case of manual dissection DALK surgery.^[9] Although routine examination and slit-lamp photography are of utmost importance, imaging of the cornea using ASOCT can help determine the extent of tissue damage. In addition, it allowed us to visualize the graft edema and the underlying DM. During follow-up, it allowed us to quantify the resolution of the corneal edema. Chaniyara *et al.* reported the use of intraoperative ASOCT to perform the repair in a post-DALK traumatic graft dehiscence.^[10] They were able to visualize the DM and perform an OCT guided descemetopexy along with primary repair.

We highlight that despite managing micro-perforations peroperatively, the DM did not rupture due to blunt injury and

our patient underwent successful cataract extraction with IOL implantation over a year after the graft repair.

Conclusion

Posttraumatic graft dehiscence may incur lesser injury to the intraocular contents when the DM is intact as in DALK compared to eyes that have undergone penetrating keratoplasty. In addition, these eyes may be able to withstand further intraocular interventions depending upon the severity of presentation posttrauma.

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.

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Conflicts of interest

There are no conflicts of interest.

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