Performing Descemet Membrane Endothelial Keratoplasty (DMEK) Corneal Transplantation With the Use of an Endoglide Pull-Through Insertion Device (E-DMEK)

Wei Han Ong[1], Emily Boulton-Jones[2], Huda Al-Hayouti[3], Douglas Lyall[1]

1. Department of Ophthalmology, University Hospital Hairmyres, NHS Lanarkshire 2. University of Dundee Medical School 3. Tennent Institute of Ophthalmology, Glasgow

Introduction

To describe the surgical technique and evaluate the early clinical outcomes of Descemet Membrane Endothelial Keratoplasty (DMEK) using a pull-through, “endothelium-in” insertion device, the DMEK EndoGlide (E-DMEK).

Purpose

- This retrospective cohort study analyzed patients who underwent E-DMEK between February 2023 and July 2024 at University Hospital Hairmyres.
- Tri-folded DMEK grafts were delivered into the anterior chamber using a pull-through technique via the EndoGlide (Network Medical, Ripon, UK) through a 2.75mm wound. Grafts were pulled through the device using 27-gauge forceps and unfolded in the anterior chamber with the graft positioned endothelium down. An 8.5-mm graft size was utilized in all cases.
- Clinical outcomes included best-corrected visual acuity (BCVA), post-operative complications, need for rebubbling, and rates of graft failure or decompensation.

FIGURE 1

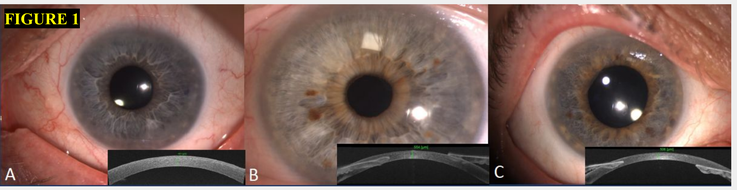


Figure 1: Postoperative appearance of patient demonstrating clear cornea with anterior chamber OCT images showing attached endothelial graft

FIGURE 2

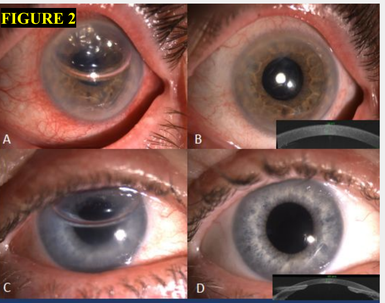


Figure 2: Clinical photograph of patients day 1 post op with bubble in anterior chamber (A) & (C), and clear cornea at 1 month (B) &(D)

FIGURE 3

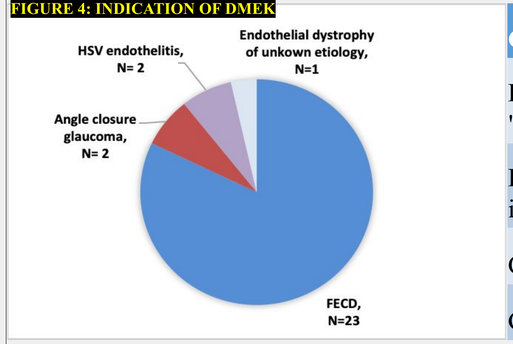


Figure 3: Photograph of DMEK endoglide (left) which can fit through a 2.75mm wound compared to the larger DSAEK endoglide (right)

Results

- The study included 28 eyes of 24 patients who underwent DMEK alone (n=21) or in combination with cataract surgery and intraocular lens implantation (n=7).
- The mean patient age was 69 years (range: 58–78 years) while the mean donor age was 74 years (range: 60–86 years). The mean endothelial cell count of donor tissue was 2699 ± 402 cells/mm².
- At minimum 5 months follow-up (range 5 - 22 months), all patients had an attached and clear corneal endothelial graft. Mean BCVA in LogMAR improved from 1.1 ± 0.60 (range 0.5–2) pre-operatively to 0.14 ± 0.15 (range -0.1–0.4) post-operatively ($p<0.01$).

FIGURE 4: INDICATION OF DMEK



Complications	Cases
Partial detachment requiring "rebubbling"	4
Partial detachment with no intervention	2
CMO	1
Graft failure	0

FIGURE 6

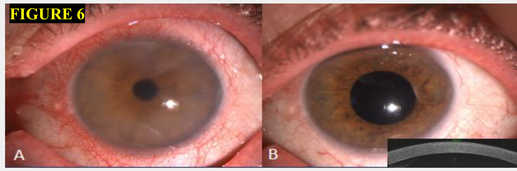


Figure 6: Clinical photograph of patient initial post op corneal oedema (A) was observed with resolution of corneal oedema by 4 weeks post op (B). Inserted anterior segment OCT image showing attached corneal endothelial graft

FIGURE 5

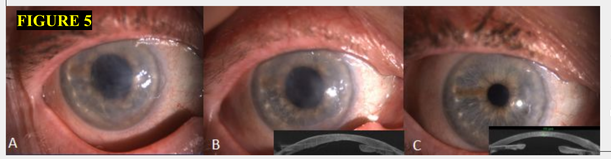


Figure 5: Pre-operative photograph of patient showing decompensated cornea (A), Initial partial detachment (B) treated with rebubbling , Complete resolution with clear cornea by 4 weeks (C)

Conclusion

- E-DMEK using the EndoGlide pull-through technique demonstrates promising early outcomes with good visual recovery and a low rate of complications.
- This method offers a controlled and effective approach to DMEK graft delivery, particularly in challenging surgical scenarios such as in cases with iris clipped intraocular lenses, glaucoma tubes, or vitrectomised eyes.
- Further studies are warranted to assess long-term outcomes.