

# Analysis of Lamellar Thickness and Visual Outcomes of Single-pass Ultra-thin (SP-UT) DSAEK using the Gebauer 500 $\mu$ m and 550 $\mu$ m Cutting Head

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# Introduction

Descemet-Stripping Automated Endothelial Keratoplasty (DSAEK) is a proven corneal transplant technique that has been replacing penetrating keratoplasty in endothelial disease (1-2). Descemet Membrane Endothelial Keratoplasty (DMEK) is another alternative, but is technically difficult, has higher complication rates and greater endothelial cell loss (2).

Ultra-Thin DSAEK (UT-DSAEK) (preoperative graft of <130 microns) offers the excellent visual outcomes of DMEK, but eliminates the associated difficulties (2). Donor preparation of UT-DSAEK has traditionally involved either drying of the donor cornea prior to preparation or using the double pass technique with the Moria system.

We present outcomes of a series of UT-DSAEK cases where the donor lenticule has been prepared with the Gebauer SLc microkeratome, using cutting depths of 500 or 550 $\mu$ m.



*Gebauer cutting system*



# Methods

DSAEK surgery with graft cuts of 500 or 550 $\mu$ m, performed after November 2012 was included.

A standardised technique was used: donor preparation performed first, followed by transplantation to the recipient. Blade heads were 500 or 550 $\mu$ m. The donor tissue was punched using the Barron Vacuum Punch (Katena Products).

The corneal lenticule was transplanted using the Endosaver (Ocular Systems) via a 4.1mm temporal clear corneal incision. All surgery was performed under either topical or general anaesthesia.

Graft thickness was measured using Zeiss SL-OCT and Pentacam-HR images at 1, 3 and 6 months postoperatively. Visual acuities were measured on Snellen 6m charts

Retrospective analysis of clinical notes, Pentacam, SL-OCT images and Medisoft operation notes was performed.



*DSAEK graft 3 months post operatively*

# Outcomes: 3-month Data

Case	Graft cut depth (μm)	Visual Co-morbidity	Graft thickness (μm) intra-operatively	Acuity (snellen)	Graft thickness (μm)
1	500	Nil	105	6/9	104
2	500	AACG	104	6/9	Not known
3	500	AACG	105	6/36	149
4	500	Nil	129	6/24	138
5	550	Nil	138	Not known	Not known
6	500	Nil	117	6/24	145
7	550	Nil	121	6/9	84
8	550	Nil	120	6/6	68
9	500	Albinism	127	6/18	81
10	500	ERM + previous CMO	103	6/24	135
11	500	Traby + previous CMO	138	6/24	112

# Discussion

Our results show good acuity 3 months after surgery with thin pachymetry and grafts.

Results show rapid visual recovery (average 6/13 at 3 months). The procedure was more reliable than double-pass technique, producing less irregular astigmatism. 66% of our patients without visual co-morbidities achieved vision of 6/9 or better.

Study limitations include short follow-up (maximum 6 months), and difficulties in comparative graft measurement between handheld, SL-OCT and Pentacam methods.

As a pilot study, it has identified the need for more case numbers and longer follow-up, as recent literature indicates that visual acuity post-DSAEK may continue to improve years later (2). A protocol for post-operative follow up has been established, which will allow for better outcome evaluation in all UT-DSAEK patients.



Scheimpflug image of UT-DSAEK 3 months post operatively

# References

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