



# COMPARISON OF ENDOTHELIAL KERATOPLASTY TECHNIQUES IN PATIENTS WITH PRIOR GLAUCOMA SURGERY: A CASE-MATCHED STUDY | Shawn Lin, MD, MS, MBA | UCLA

## PURPOSE

To evaluate the outcomes of Descemet membrane endothelial keratoplasty (DMEK) and Descemet stripping endothelial keratoplasty (DSEK) in eyes with prior trabeculectomy and/or tube shunt implantation.

## METHODS

One hundred sixty-one consecutive DMEK and 597 consecutive DSEK procedures were performed between August 2006 and December 2016. Among these, 59 DMEK (36.6%) and 154 DSEK (25.8%) procedures were performed in eyes with prior trabeculectomy and/or tube shunt implantation. SAS 9.4 was used to match 47 DMEK and 47 DSEK procedures by preoperative visual acuity, lens status, and surgical indication.

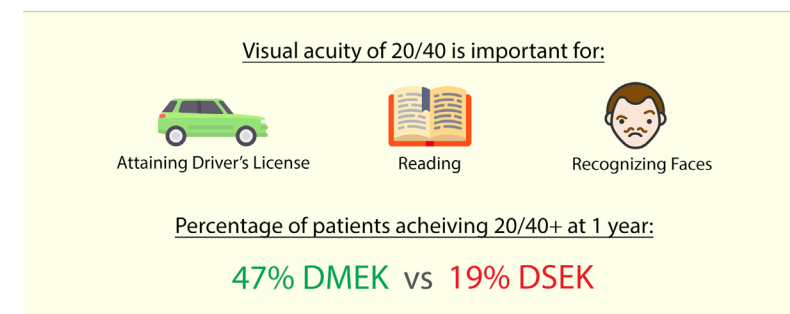
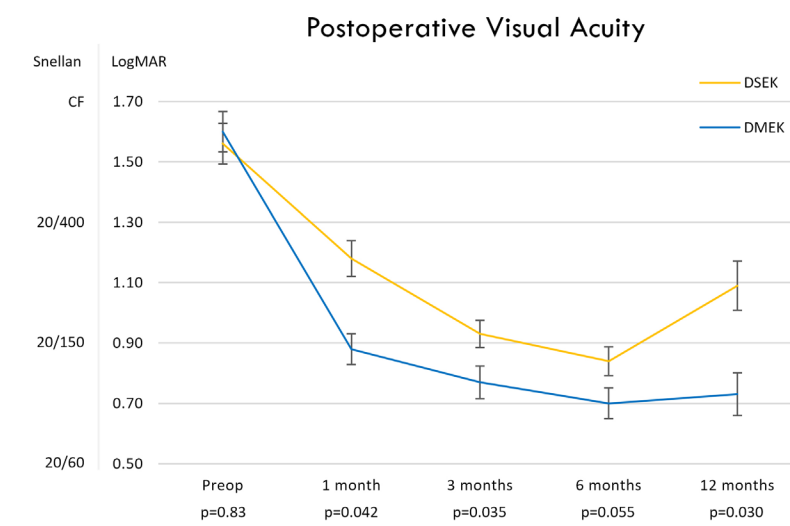
## RESULTS

The length of follow-up was 10.0 months in the DMEK group and 10.3 months in the DSEK group ( $P=.72$ ). Best corrected visual acuity (BCVA) improved by  $-0.87$  logMAR units in the DMEK group and  $-0.47$  logMAR units in the DSEK group ( $P=.03$ ). Visual acuity was significantly better in the DMEK group at 1, 3, and 12 months, with a trend toward significance at 6 months ( $P=.055$ ). The percentage of patients achieving 20/40 or better BCVA at 1 year was significantly higher in the DMEK group ( $P=.039$ ).

Secondary graft failure at 1 year was significantly lower in the DMEK group (2%) versus the DSEK group (17%;  $P=.016$ ). Air injection rate was higher in the DMEK group (23%) versus the DSEK group (11%), but this was not a significant difference ( $P=.17$ ). There were no significant differences in postoperative intraocular pressure (IOP) or need for additional glaucoma surgeries.

## CONCLUSION

This study is the largest matched comparison of DMEK and DSEK patients with prior glaucoma surgery, and demonstrates the advantages of the DMEK procedure in this population. Visual acuity improves faster in the DMEK group, and overall visual acuity at 12 months is significantly better. In addition, the risk of secondary graft failure is lower in the DMEK group. Given these benefits, we would advocate for the use of DMEK corneal transplant in eyes with prior glaucoma surgery.



## COMMENTS

It has been previously reported that DMEK results in better visual outcomes than DSEK in eyes with few ocular comorbidities (Droustas, 2016; average preoperative visual acuity: 20/100). We wanted to study the outcomes of DMEK and DSEK in eyes with complex anterior segment anatomy (average preoperative visual acuity: 20/800 and at least one prior glaucoma tube or trabeculectomy).

As far as we are aware, this is the largest and most statistically rigorous study of DMEK versus DSEK in patients with prior glaucoma surgery. We carefully matched two groups of patients by preoperative visual acuity, lens status, and surgical indication. We also show that age, sex, prior glaucoma surgeries, length of follow-up, preoperative cup-to-disc ratio, and baseline IOP were similar among the two groups.

This rigorous approach gives us the confidence to report that DMEK should be the preferred endothelial keratoplasty procedure in patients with prior glaucoma surgery. We found that DMEK visual recovery was significantly faster and secondary graft failure was significantly lower than for DSEK. We also found that visual acuity was significantly better at 12 months. Nearly half of the DMEK group achieved 20/40 or better vision, with 9% achieving 20/20 vision, despite an average starting preoperative acuity of 20/800.

There are over 50,000 glaucoma tubes and shunts performed yearly in the United States alone, and global estimates of well over 2 million glaucoma surgeries performed in the last 10 years. We hope our findings help these patients achieve better visual outcomes when endothelial corneal transplantation is necessary.