

Descemet Endothelial Thickness Comparison Trial (DETECT) - 2019



Objective

To compare outcomes between DMEK (Descemet membrane endothelial keratoplasty) and Ultra-thin DSAEK (Descemet Stripping Automated Endothelial Keratoplasty)

Methods

Design: single-blinded RCT

Sample Size: 50 eyes (38 pts)

Treatment Groups:

- 25 to UT-DSAEK
- 25 to DMEK

Outcome Measures:

- Primary: Best spectacle-corrected visual acuity (BSCVA) at 6 months
- Secondary: BSCVA at 3 & 12 months, change in pachymetry, graft failure/rejection rates
- Supplemental: VFQ and 2-year outcomes

Results

Point 1: DMEK provides improved visual acuity compared to DSAEK

- At 3, 6, and 12, DMEK eyes had a statistically significantly better BSCVA: 3 months - 1.5 lines, $P = 0.002$; 6 months - 1.8 lines; $P < 0.001$, 12 months - 1.4 lines, $P < 0.001$)
- At 2 years, DMEK continued to have better BSCA: logMAR -0.13, $P = 0.001$
- According to VFQ-39 composite scores, there was not statistically significant difference (0.9, $P = 0.80$) in vision quality of life for DMEK and DSAEK at 12 months, but both had significant improvement from prior to treatment

Point 2: DMEK may cause increased endothelial cell loss (ECL) and require higher rates of rebubbling, but the study was underpowered for these assessments

- At each time point, ECL was greater for DMEK, but never statistically significant ($P = 0.53$ at 3 mo, 0.17 at 6 mo, 0.051 at 12 mo, and 0.08 at 24 mo)
- 6 DMEK eyes compared to 1 DSAEK eyes required rebubbling, but the study was underpowered for determining statistical significance

TLDR: DMEK has superior visual acuity outcomes to DSAEK, with no statistically significant increase in adverse outcomes

Chamberlain W, Lin CC, Austin A, et al. Descemet Endothelial Thickness Comparison Trial: A Randomized Trial Comparing Ultrathin Descemet Stripping Automated Endothelial Keratoplasty with Descemet Membrane Endothelial Keratoplasty. *Ophthalmology*. 2019 Jan;126(1):19-26.

Ang MJ, Chamberlain W, Lin CC, et al. Effect of Unilateral Endothelial Keratoplasty on Vision-Related Quality-of-Life Outcomes in the Descemet Endothelial Thickness Comparison Trial (DETECT): A Secondary Analysis of a Randomized Clinical Trial. *JAMA Ophthalmol*. 2019 Jul 1;137(7):747-754.

Rose-Nussbaumer J, Lin CC, Austin A, et al. Descemet Endothelial Thickness Comparison Trial: Two-Year Results from a Randomized Trial Comparing Ultrathin Descemet Stripping Automated Endothelial Keratoplasty with Descemet Membrane Endothelial Keratoplasty. *Ophthalmology*. 2021 Aug;128(8):1238-1240.