Transitioning from DSAEK to DMEK

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Reasons to Transition

• DMEK - (Descemet membrane endothelial keratoplasty) has emerged as a technique that offers certain advantages over DSAEK
• Improved visual acuity:
  • 6 months post-op DMEK: 95% >20/40, 50% >20/15
  • 6 months post-op DSAEK: 45% >20/40, 0% >20/15
• Less hyperopic shift:
  • DMEK: 0.25-0.50
  • DSAEK: 0.75-1.0
• Decreased rejection rate:
  • DMEK: 0.7%
  • DSAEK: 4%
• Comparable cell loss - 30-40% for both at 6 months
• More rapid post-op visual rehabilitation

DSAEK

DMEK

DMEK Challenges

1. Tissue preparation
   • Strip Descemet’s membrane from the donor without destroying endothelial cells or ripping the membrane
2. Graft Manipulation
   • The tissue scrolls into a tight roll with the endothelium on the outside and behaves unlike DSAEK graft

Overcoming DMEK Challenges

• Tissue preparation
  • Multiple eye banks are offering “pre-stripped” tissue for use in DMEK
• Removes the burden of corneal tissue loss during preparation from the surgeon
Overcoming DMEK Challenges

- Graft Manipulation
  - There is a learning curve to be overcome with DMEK graft manipulation
- Courses
- Videos
- Discussions
- Trial and Error

DMEK surgical steps

- Temporal clear corneal incision - 2.4mm depending on injector
- Descemet’s Stripping similar to DSAEK, non-overlapping, some use air, some use OVD
- Stain graft with trypan blue
- Trephine graft and re-stain
- Place graft in injector
- Insert graft in anterior chamber
- Unfold graft making sure to verify orientation (S stamp makes it much easier)
- Place air or gas under the graft
- High Five surgical tech

DMEK injectors

- Dutch Ophthalmic glass pipette - 2.4mm incision size
- Modified Jones tube - 3.2mm
- Viscoject system - 2.4mm
- Modified IOL injectors
- Visian ICL injector - 3.0mm

DMEK manipulation techniques

- Shallow A/C is the key to unscrolling
- No air, tapping technique
- Bubble below
- Bubble above
- Use small bursts of BSS to flip the graft or open a tight scroll

DMEK videos

Initial Cases

- Start out with uncomplicated pseudophakic patients with Fuch’s dystrophy or PKB
- DMEK is possible but more difficult in the presence of glaucoma tubes
- DMEK is possible but more difficult in cases of failed prior PKP
- Avoid patients with prior PPV/ACIOL
Detachments

- Study by Yeh, Melles et al. in Ophthalmology Feb. 2013.
- "Predictive value of optical coherence tomography in graft attachment after Descemet's membrane endothelial keratoplasty"
  - By DMK cases: Anterior segment OCT was performed at 1 hour, 1 week, 1 month, 3 months, and 6 months.
  - No re-injection of air was performed through the study.
  - One hour post-op: 79% were completely attached, 2% were detached <1/3 surface area, 8% were detached >1/3 surface area.
  - One week post-op: 43% were completely attached, 53% were detached >1/3.
  - Six months post-op: 86% were completely attached, 8% were detached <1/3, 6% were detached >1/3.
- "100% of patients with a complete attachment or <1/3 detachment had vision of 20/30 or better at 6 months.
- Of those detached >1/3 at one week visit 65% improved at 6 months to complete attachment or <1/3 detachment.
- 2 patients needed a re-graft, 1 for full detachment.

References


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