Descemet’s Membrane Endothelial Keratoplasty (DMEK)
Corneal Anatomy

- 50 epithelium
- Bowman's
- 500 stroma
- Descemet's endothelium
ALK - Superficial
PK
PLK = DLEK
DSAEEK
Visual Recovery Time

- **PK**: 12 Months
- **PLK/DLEK**: 6 Months
- **DSLEK**: 5 Months
- **DSAEK**: 1 Month
Treatment of Endothelial Disease

- Penetrating Keratoplasty

- Endothelial Keratoplasty
  - Posterior Lamellar Keratoplasty (PLK)
  - Descemet’s Stripping Automated Endothelial Keratoplasty (DSEK/DSAEK)
  - Descemet’s Membrane Endothelial Keratoplasty (DMEK)
"SELECTIVE REPLACEMENT OF DISEASED OR DAMAGED POSTERIOR LAYERS OF THE CORNEA"
DSAEEK Procedure
3 Major Challenges with DSAEK

• Visual Acuity
  • Suboptimal
  • Visual rehabilitation is relatively slow

• Accessibility to tissue
  • Investment in equipment
  • Purchase of predissected tissue

• Drop in donor endothelial cell density in the early postoperative phase
Who Moved My Cheese?
History of DMEK

• 2002, Melles et al published a possible technique for transplanting DM and endothelium.

• 2006, Melles published a case of a patient achieving 20/20 vision at week 1 with DMEK.

• 2007, Art Giebel presented the SCUBA technique at AAO for harvesting the graft.

• 2009, Francis Price presented results of DMEK indicating they may be superior to DSAEK.
Potential Advantages of DMEK

• Great Visual Results
• Quick Recovery
• Use of inexpensive techniques
• Increased availability
• Decrease crowding of the anterior chamber (i.e. tube shunt)
Challenges with DMEK

• New skills and techniques
• Successful and reliable harvesting of the donor graft
• Intraocular placement and positioning of the graft
• Postoperative management – successful attachment of the graft
Harvesting the Graft

• SCUBA technique
  • Art Giebel
  • Submerged Cornea Using Backgrounds Away
• Addresses:
  • Handling
  • Visualization (Red Reflex)
• Viewing Chamber for Donor Graft
• Barron Donor Punch

• Trypan Blue

• Use a trephine
Implanting the Donor Membrane

• Insertion of the membrane
  • Staar injector

• Orientation
  • “Dead Sea Scrolls”

• Unwrapping
  • BSS with a cannula
  • Air

• Positioning
Edge of DMEK Graft
Edge Interface
DSAEK Graft
Partial Detachment with DMEK
Conclusions

• DMEK appears to be an effective method in managing corneal endothelial disorders providing quick and excellent visual rehabilitation.

• Need more long-term follow-up and data.

• Need improved techniques in handling, positioning, and attaching graft.
Thank You

Charles S. Ahn, MD
Medical Director
Dupage Medical Group Eye Specialists
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