

Outline of Continuing Education Course

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CE for total of 1 hour course.

(45 min presentation)

Descemet's Membrane Endothelial Keratoplasty (DMEK) for treatment of endothelial failure: Review of this newest form of endothelial keratoplasty and presentation of data comparing outcomes to that of Descemet's Stripping Automated Endothelial Keratoplasty (DSEAK)

The recent developments in lamellar corneal transplant surgery will be discussed, with a focus on Decemets Membrane Endothelial Keratoplasty (DMEK). Participants will gain an up to date understanding on this procedure and its indications. They will better understand patient selection for DSAEK vs. DMEK surgeries.

- I. Corneal Transplant Surgery: Historical Perspective
 - a. Penetrating Keratoplasty
 - i. Over 100 years the standard of care
- II. Current indications for Penetrating Keratoplasty
 - a. Benefits of Penetrating Keratoplasty
 - i. Current indications for PK discussed.
 - ii. Shortcomings of Penetrating Keratoplasty
 - 1. Long road to visual rehabilitation
 - 2. High Astigmatism
 - 3. Suture related complications
 - 4. Wound integrity related complications
 - 1. Dehiscence
 - 2. Ruptured globes
- III. Endothelial Keratoplasty (EK)
 - a. History and Development of Endothelial Keratoplasty
 - i. First proposed as Posterior Lamellar Keratoplasty (PLK) by Jose Barraquer 1951
 - ii. First successful PLK: Charles Tillet 1956
 - iii. First Scleral Limbal approach in animal study ARVO 1993
 - 1. No corneal incisions
 - iv. First PLK preformed in human: Garret Melles 1998
 - 1. No corneal incisions. No corneal sutures
 - v. Rapid development from PLK to DLEK to DSEK to DSAEK to DMEK discussed.
 - b. Descemet's Stripping Automated Endothelial Keratoplasty (DSAEK)
 - i. Some of the hurtles of this technique
 - a. High dislocation rates nationally

- b. High primary graft failure (Iatrogenic failure) rates nationally
 - c. Pupillary block glaucoma
 - ii. Review of results of our IRB approved DSAEK studies at Sightline
 - a. Excellent results can be achieved.
 - i. Excellent vision outcomes
 - ii. Low dislocation rates.
 - iii. Low rates of Pupillary block episodes
 - iv. NO primary graft failures
 - b. Video Demonstration of our published DSAEK technique
 - c. Discussion of vision limitations of this technique
 - i. Why are we not getting more 20/20 vision?
 - 1. Unnecessary transfer of additional stroma
 - 1. Interface opacities
 - 2. Additional graft thickness
- c. Descemet's Membrane Endothelial Keratoplasty (DMEK)
 - i. A more anatomically pure (one to one) transfer of Decemet's membrane
 - ii. Video demonstrating our current DMEK technique
 - iii. What are the drawbacks of this procedure?
 - 1. More challenging donor preparation
 - 1. Video
 - 2. Now performed by the eye bank
 - 2. More challenging surgical technique
 - 1. More difficult handling of delicate tissue
 - 2. Use of inserter
 - 3. Challenging unfolding of tissue
 - i. Video demonstration of early struggles
 - ii. Video demonstration of newer techniques improving surgical outcomes
 - 4. Higher rates of post-operative dislocation
 - iv. What are the benefits of this procedure?
 - 1. Better vision outcomes
 - 2. Lower rejection risk
 - v. Review of Sightline study comparing DSAEK and DMEK outcomes in first 100 eyes with findings:
 - 1. DMEK = Better vision, similar rates of post-operative complications
 - 2. DSAEK = Lower endothelial cell loss (ECL) at 6 months
 - 3. Discussion of implications of results.
 - 4. Both surgeries have benefits and a role still today.
 - vi. DMEK Patient selection is critical
 - 1. Not ideal for certain situations

1. Complex eyes
 - i. Tubes/Trabs
 - ii. Open posterior chambers
 - iii. Anterior chamber lenses
 - iv. Eyes requiring complex procedures
 1. IOL exchanges
 2. Vitrectomies
2. Not ideal for all patients
 1. Monocular patients where possible later endothelial failure risk is too high.
3. Ideal for patients with very high visual function needs
 1. Hunters
 2. “A” type personalities
- vii. Summary
 1. DSAEK is still currently the “standard of care” for endothelial failure and will likely have a role into future in many circumstances
 2. DMEK is rapidly gaining popularity and will likely surpass DSAEK as the standard procedure for most cases.

(15minute presentation)

Superficial Lamellar Keratectomy (SLK): An underutilized surgical procedure for very common vexing corneal pathology.

After this portion of the talk, participants will better understand the common corneal conditions amenable to treatment with this procedure. Participants will learn to recognize these conditions and better understand when to treat and when to refer for corneal surgery.

IV. **Basement membrane dystrophy/Nodular degeneration**

- a. Review of Pathophysiology
- b. Cases
- c. Tips for recognition and classification of severity of BMD
 - i. History!
 1. Vision that fluctuates rapidly (blink to blink)
 2. Tough refractions
 1. Fluctuating amounts of astigmatism
 2. Can’t seem to correct patient to 20/20 or at least to 20/ “happy”...
 3. Foreign body type complaints or frank erosion symptoms
 - ii. Remember alternate name for dystrophy, “map, dot, fingerprint dystrophy”

1. “maps”: geographic irregularities
2. “dots”: small opaque spots
3. “fingerprints”: redundant curve-linear elevations
- iii. When not so obvious: look again...techniques for recognition:
 1. Use VERY LITTLE fluorescein and ask patient to hold eyes open and watch as tear break up occurs looking for small islands and lines of negative stain
 2. Re-eval cornea *after* dilation with red reflex
 3. Diffuse light beam incident to cornea
- d. Nodules often found coincident with this condition
 - i. Pathophysiology of nodules
 - ii. Case example
- e. Treatment
 - i. Non-surgical
 1. Treat dry eyes and blepharitis
 1. Lubrications, WC/LS, punctual plugs, retasis
 2. Consider Doxycycline or Azasite and mild topical steroids
 2. Treat erosions symptoms
 1. Muros 128 (NaCl)
 - ii. Surgical
 1. Epithelial debridement combined with:
 1. Bandage contact lens
 2. Stromal puncture
 3. Diamond burr polishing
 2. Superficial Lamellar Keratectomy
 3. PTK
 - iii. Cases will be discussed to illustrate
 1. BMD with
 1. Case 1: Recurrent erosions
 2. Case 2: Decreased vision
 3. Case 3: Combined with cataract
 2. Nodular degeneration
 1. Case 4: Decreased vision
 2. Case 5: Causing discomfort
- f. Summary
 - i. Superficial Lamellar Keratectomy is a highly successful procedure in appropriate patients and recognition is the first key step to achieve appropriate treatment.