Pre-loaded DMEK Tissue

Shahzad Mian, M.D., University of Michigan
Lauren Johnson, Eversight Director Training & Education
DMEK vs. DSEK
Endothelial dysfunction/corneal edema

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Endothelial Keratoplasty

DSEK

DMEK

Tissue additive

Tissue neutral
DMEK

- Over the past 3 years, there has been a sharp increase in the number of DMEK surgeries being performed.

DMEK – improved visual acuity

N=200; First 100 cases of each procedure (retrospective case series).

DMEK – Reduced rejection risk

DMEK

• DMEK still only accounts for 23% of all EK procedures performed in the US

Endothelial Keratoplasty (EK)
DMEK

- DMEK is a technically difficult surgery
  - New surgical maneuvers
  - DMEK graft tissue is very fragile
  - Minimize manipulation
So why don’t we do DMEK on every case?
DMEK

• Optimal tissue delivery
  – Prestripped and pretrephined
    • Eye-bank preparation of prestripped tissue has aided in acceptance and increased conversion to DMEK
      – Similar to precut DSAEK nearly a decade ago
DMEK

• Optimal tissue delivery
  – Prestripped and pretrephined
  – Preloaded
    • Container type
    • Trypan staining
PURPOSE

• To determine the endothelial safety of pre-staining DMEK grafts with Trypan Blue prior to preloading

METHODS

• Twenty seven cadaveric corneas
• Prepared for DMEK using a standardized technique
  – Experienced DMEK eye bank technician
METHODS

- Twenty seven cadaveric corneas
- Prepared for DMEK using a standardized technique
- Loaded in Straiko Modified Jones Tube injector (Gunther Weiss Scientific Glass, Portland, OR)
  - Filled with Optisol GS
METHODS

• Twenty seven cadaveric corneas
• Prepared for DMEK using a standardized technique
• Loaded in Straiko Modified Jones Tube injector
• Stored with silicone caps covering each end
METHODS

• Corneas divided into three groups of nine
  
  – Group 1—Preloaded prestained DMEK Graft (psDMEK)
    • Pre-stained with Trypan Blue 0.06% (DORC International) for 3 minutes prior to preloading and storage in the modified Jones tube for 24 hours
  
  – Group 2—Preloaded DMEK Graft (pDMEK)
    • Directly preloaded in the injector prior to storage for 24 hours
  
  – Group 3—Immediately Injected DMEK Graft (Control)
    • Immediately injected into vital dye
RESULTS

• Appearance of preloaded and prestained DMEK tissue after 24 hours of storage
# RESULTS

## Table 1. Endothelial Cell Loss (%)*

<table>
<thead>
<tr>
<th></th>
<th>Preloaded prestained DMEK Grafts (Group 1)</th>
<th>Preloaded DMEK Grafts (Group 2)</th>
<th>Immediately Injected DMEK Grafts-Control (Group 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average (SD)</td>
<td>16.78 (7.11)</td>
<td>20.16 (7.52)</td>
<td>18.47 (6.36)</td>
</tr>
<tr>
<td>Range</td>
<td>6.86—32.27</td>
<td>12.81—33.29</td>
<td>10.27—30.50</td>
</tr>
<tr>
<td>p-value</td>
<td>0.67</td>
<td>0.57</td>
<td>REF</td>
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</tbody>
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CONCLUSION

• DMEK tissue can be stored in Optisol GS within the Straiko Modified Jones Tube for 24 hours without increased ECL

• Prestaining DMEK tissue with Trypan Blue 0.06% prior to preloading does not result in increased ECL

• DMEK Grafts retain sufficient blue coloration after 24 hours
PURPOSE

• Pilot study to assess feasibility and efficacy of pre-loaded corneal donor grafts for Descemet Membrane Endothelial Keratoplasty
Methods

• Prospective study
• Eye bank pre-stripped, pre-stained, pre-trephined donor tissue
• Outcome measures
  – Primary endpoints: rates of detachment, primary graft failure, rebubbling
  – Secondary endpoint: specular microscopy at 3 months
Surgeon Receipt of a Pre-loaded DMEK Graft
RESULTS

• 14 eyes of 13 patients
• Follow up: 7 weeks (1 week to 3 months)
• Primary Endpoints
  – Detachment: 4/14 (28.6%)
  – Rebubble: 1/14 (7.1%)
  – Primary graft failure: 0/14
• Secondary Endpoints
  – Specular at 3 months:
    – Mean ECD 2530 (-11.4%)
Complications

- CME: 1/14 (ERM)
- Pupillary block: 1/14
Summary

• Pre-stripped, pre-stained, pre-loaded DMEK (p3DMEK) may be a safe and efficacious alternative
Training Resources

www.eversightvision.org/onlinetraining

Journal articles, tissue prep options, demonstration videos and more
Questions?