A Scroll Inside a Tube Inside a Chamber: A Method for Sterile Post-Processing Evaluation of Preloaded DMEK Grafts

Joshua Galloway, CEBT
Khoa D. Tran, PhD., Philip K. Dye, CEBT, Kelly Odell, Michael D. Straiko, MD, Mark A Terry, MD, Christopher G. Stoeger, CEBT, MBA
Financial Disclosures

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Evaluation of DMEK Grafts: Suitability for transplantation.
A Scroll Inside a Tube Inside a Chamber
Preloaded tissue provided in a familiar setting

Pre-stripped and Preloaded DMEK

- Corneal Scleral Cap (Carrier)
- DMEK Graft
- Viewing Chamber
- Glass Tube (Carrier)
Methods

1. Peel tissue
2. Apply S-stamp
3. Trephinate
4. Load injector
5. Slit lamp and specular microscopy evaluations
6. Analyze with Calcein-AM
Methods (Video)
Slit lamp microscopy
Slit lamp microscopy includes damage estimate
Specular microscopy can be obtained
Unloading scrolls for analysis (Video)
Verification of slit lamp and damage estimation

- **Slit-lamp**
- **Calcein-AM**
- **FIJI Segmentation**

10.2% ECL
Data analysis

Results

<table>
<thead>
<tr>
<th></th>
<th>% ECL Estimate</th>
<th>% ECL Measured</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg</td>
<td>15</td>
<td>15.6</td>
<td>4.7</td>
</tr>
<tr>
<td>SD</td>
<td>5.6</td>
<td>5.8</td>
<td>3.5</td>
</tr>
<tr>
<td>Median</td>
<td>14.5</td>
<td>14.2</td>
<td>4.2</td>
</tr>
</tbody>
</table>
Graft damage and estimation of damage improves over time.

**Tissue damage**

- $R^2 = 0.1791$

**Difference in estimated and actual ECL**

- $R^2 = 0.333$
Final steps in processing can cause damage (Video)
Conclusion

• Preloaded grafts can be evaluated using methods required by EBAA Medical Standards to assess the health of DMEK grafts inside an injector and viewing chamber.

• There is a learning curve experienced by technicians evaluating preloaded DMEK grafts

• A validated method for evaluating preloaded tissue provides a novel and valuable service to surgeons by:
  • Assuring the surgeon the graft being transplanted has been evaluated in its final state and determined suitable for transplant
  • Saving time in the operating room by eliminating the tissue preparation portion of surgery
  • Saving costs associated with materials needed to prepare tissue prior to transplant
THANK YOU

Khoa Tran, PhD, Phil Dye, Kelly Odell, Chris Stoeger, Mark Terry, MD, Michael Straiko, MD

Distribution department at LVG

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