An Analysis of Tissue Loss Due to Descemet Membrane Endothelial Keratoplasty Preparation in an Eye Bank
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Introduction

• Descemet Membrane Endothelial Keratoplasty (DMEK) surgeries are increasing in frequency
  – 344 DMEK cases in 2011*
  – 748 DMEK cases in 2012*

• Demand for pre-stripped DMEK tissue is growing for LVG
  – 113 total in 2012, 82 in first 5 months of 2013

• Our initial concerns surrounded the amount of tissue wastage and an eye bank’s ability to handle the tissue loss reported in literature\(^{1-3}\)

*2012 EBAA Statistical Report
Purpose

• To determine the real impact of a DMEK program on the pool of available donor tissue in one eye bank

• Is our DMEK program really wasting tissue?
Methods

• A retrospective analysis of all preparation attempts

• Success rate was broken down into three categories:
  – Tissue suitable for any use at time of preparation
  – Tissue suitable for DMEK only at time of preparation
  – Overall success rate
Is this suitable for transplant?
Is this suitable for transplant?

ECD = 2639
Is this suitable for transplant?
Is this suitable for transplant?

ECD = 2451
Defects in Descemet Membrane... Suitable for Transplant?
Suitable for Transplant?

ECD = 3106
Results

– Success rate for tissue suitable for any use at time of preparation: 132/137 (96.3%)
– Success with tissue suitable for DMEK only at time of preparation: 5/6 (83.3%)
– Combined success rate for total DMEK program: 137/143 (95.8%)

• Guerra, et al. reported 136 successful DMEK preparations in first 142 cases (95.8%)² in 2011
Results

- Tissue suitable for DMEK only at time of preparation fell into these categories:
  - Graft irregularities & unsuitable graft thicknesses post cut (3)
  - Conductive Keratoplasty (1)
  - DM detachment induced at time of recovery (1)
  - Deep stromal scar/probable old ulcer (1)
## Results

<table>
<thead>
<tr>
<th>Tissue</th>
<th>Reason suitable for DMEK only</th>
<th>DMEK preparation outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1473.CNOS</td>
<td>Irregular graft</td>
<td>Success</td>
</tr>
<tr>
<td>0166.CNOD</td>
<td>Graft thickness &gt;200µ</td>
<td>Success</td>
</tr>
<tr>
<td>0358.CNOS</td>
<td>Irregular graft</td>
<td>Success</td>
</tr>
<tr>
<td>0169.CNOS</td>
<td>Conductive Keratoplasty</td>
<td>Success</td>
</tr>
<tr>
<td>0372.CNOS</td>
<td>DM Detachment</td>
<td>Success</td>
</tr>
<tr>
<td>0035.CNOD</td>
<td>Well healed ulcer</td>
<td>Failure*</td>
</tr>
</tbody>
</table>

*failure due to inability to evaluate endothelium under area of scarring*
Discussion

• Take a look at our numbers again...
  – Overall reported success rate: 137/143
  – 132/137 means we lost five corneas that otherwise might have been transplanted
  – 5/6 corneas suitable for DMEK only were rescued- adding five corneas back into the donor pool
Conclusion

• In a high volume processing eye bank, DMEK can become a nearly waste-neutral procedure
• When evaluating tissue loss due to DMEK processing, it is important to consider tissue unsuitable for other uses can still be used for DMEK
Conclusion

- As DMEK grows, the relative percentage of these grafts that are suitable for only DMEK may diminish, but as stewards of a precious gift, it is still important to consider this.
References


