Use of Single Donor Cornea for 2 Lamellar Transplantation Procedures: DMEK and DALK

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Dr. Baig has the following relationships:

<table>
<thead>
<tr>
<th>Financial Interest/ Affiliation</th>
<th>Name of Company(s)</th>
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<tr>
<td>Grant/Research Support</td>
<td>Allergan, Bausch &amp; Lomb, Merck, Moria</td>
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<td>Employment/Honoraria/Consulting Fees/Travel Expenses</td>
<td>Alcon, Allergan, Bausch &amp; Lomb, Labtician</td>
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<tr>
<td>Major Stock Shareholder</td>
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<tr>
<td>Member: Advisory Panel, Standing Committee, Board of Directors</td>
<td>Allergan, Bausch &amp; Lomb</td>
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<td>Other Financial or Material Interest</td>
<td>None</td>
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Donor corneal tissue is a limited resource which may affect wait times

- **Single-purpose corneal tissue:**
  - One corneal tissue per procedure

- **Dual-purpose corneal tissue:**
  - In 2011, Heindl *et al.* reported splitting donor cornea tissue for multiple procedures
Methods

- Retrospective chart and operating room video review
- Inclusion criteria
  - Patients who had either DALK or DMEK using a dual-purpose donor cornea
  - A trephine-peel SCUBA technique was first used to harvest the DMEK grafts, and the remaining tissue was used for the DALK procedures
- Tissue preparation and operative use occurred on the same day
- Tissue preparation challenges, intraoperative complications, and visual recovery were assessed
Results

- Five dual-purpose corneoscleral rims were used to prepare tissue for 5 DMEK procedures and 5 DALK procedures.
- Preoperative diagnoses
  - DALK:
    - 3 - Keratoconus
    - 1 - Pellucid marginal degeneration
    - 1 - HSV scar
  - DMEK:
    - 4 - Fuchs’ endothelial dystrophy
    - 1 - Pseudophakic bullous keratopathy
Results

- 5 donor tissues for 10 patients
  - No donor tissue loss
  - No intraoperative complications

- At six-month follow-up, mean best corrected spectacle distance visual acuity improved from
  - 20/250 to 20/80 ($p = 0.10$) in the 5 DALK patients
  - 20/300 to 20/25 ($p = 0.02$) in the 5 DMEK patients
Surgical Experience

- Sequential graft and patient preparation (same day)
- DALK procedure performed first
- Dual-purpose versus single-purpose tissue
  - Same pre-operative evaluation
  - Same patient criteria
  - Shorter graft preparation time with dual-purpose tissue
## Flow Chart

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Single-Purpose</th>
<th>Dual-Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure</td>
<td>DALK</td>
<td>DMEK</td>
</tr>
<tr>
<td>Donor Ordered (optical quality)</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Surgery Outcome</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Donor Used</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Tissue Saved</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Conclusions

- Success of dual-purpose method depends on if DALK needs to be converted to full-thickness transplant and if DMEK peel performed without incident.
- In this study, all saved donor tissues were used for other patients.
- A single donor corneal graft can be used for both DMEK and DALK, and is a promising strategy to improve the efficiency of corneal transplantation.
- Complications with the preparation of dual-purpose corneal tissue were not encountered.
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