CLINICAL OUTCOMES OF
TRANSEPITHELIAL
PHOTOREFRACTIVE KERATECTOMY
IN HYPEROPIA:
FOLLOW-UP STUDY

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Conflict of interest
All authors have no financial interests in the subject matter of this poster.
BACKGROUND

• TRANS-PRK
  • An one-step combined ablative procedure in which laser is used to ablate both the epithelium as well as the underlying stroma with no lag of time; neither mechanical nor chemical insult applied. The risk of stromal dehydration is diminished.

• Objectives of the study
  • To assess the clinical outcomes of Trans-PRK in hyperopic eyes:
    • Quantitative visual function
    • Visual quality
    • safety
METHODS & MATERIALS

• A follow up study with a mean follow up duration of 429 days
• 23 eyes (13 patients) with pure hyperopia or mixed hyperopic astigmatism; all undergone Trans-PRK by the same expert surgeon (S.A.M.)
• Surgical parameters
  • Optical Zone: 6.7 – 7.3
  • Centration point for laser beam axis:
    • eyes with pupillary offset distance < 0.35 = pupillary center
    • eyes with pupillary offset distance > 0.35 = corneal vertex
  • MMC protocol: 0.02%, 5-30 seconds
METHODS & MATERIALS

• SCHWIND AMARIS 500 excimer laser used in the procedures

• Preoperative and at least 12 months post-operative examination of the intended parameters are presented here:
  • Visual acuity
  • refraction
  • Contrast sensitivity
  • Higher order aberrations
  • haze

• Bina eye hospital, Tehran, Iran, July 2011 to September 2013
RESULTS

- **Demographic**
  - Age: $33.52 \pm 10.7$ years
  - Gender: female (44%), male (56%)

- **Refraction**
  - Preoperative SE of $1.37 \pm 0.18$ D improved to post-op value of 0 D ($p=0.04$)
  - Preoperative hyperopia ranged from 1.15 to 4.25 D
  - Preoperative astigmatism ranged from -0.25 to -4.75 D
RESULTS

- **Visual acuity** (pre-op VS 12 months post-op)
  - *UDVA*: Improved from $0.58 \pm 0.09$ to $1.21 \pm 0.06$ ($p<0.001$)
  - Post-operative UDVA was significantly better than preoperative CDVA ($1.21 \pm 0.06$ vs $1.01 \pm 0.18$, $p=0.04$)
  - 89% of eyes reached UDVA of 20/20 or better.
  - *CDVA*: Preoperative value was comparable to post-op value ($1.01 \pm 0.18$ vs $1.14 \pm 0.03$, $p=0.17$).
  - Just one eye lost two Snellen lines of preoperative BSCVA. The rest gained better results.
RESULTS

- **Contrast sensitivity**
  - *Both Photopic and Mesopic contrast sensitivities showed a trend of improvement.*
  - *Note that in our contrast sensitivity scaling system, the smaller the value is, the better contrast sensitivity is interpreted.*

<table>
<thead>
<tr>
<th>CS type</th>
<th>Preoperative</th>
<th>12months post-op</th>
<th>P.value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photopic</td>
<td>1.54±0.42</td>
<td>0.8±0</td>
<td>0.06</td>
</tr>
<tr>
<td>Mesopic</td>
<td>1.44±0.37</td>
<td>0.85±0.03</td>
<td>0.08</td>
</tr>
</tbody>
</table>
RESULTS

- Higher order aberrations
  - The changes observed were not statistically nor clinically significant.

<table>
<thead>
<tr>
<th>Type</th>
<th>preoperative</th>
<th>12 months post-op</th>
<th>P.value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defocus</td>
<td>0.3±0.4</td>
<td>0.142±0.07</td>
<td>0.38</td>
</tr>
<tr>
<td>coma</td>
<td>0.23±0.01</td>
<td>0.131±0.13</td>
<td>0.24</td>
</tr>
<tr>
<td>trefoil</td>
<td>0.13±0.02</td>
<td>0.1±0.03</td>
<td>0.17</td>
</tr>
<tr>
<td>Spherical Aberration</td>
<td>0.18±0.03</td>
<td>0.09±0.02</td>
<td>0.07</td>
</tr>
<tr>
<td>tetrafoil</td>
<td>0.035±0.008</td>
<td>0.065±0.01</td>
<td>0.07</td>
</tr>
</tbody>
</table>
RESULTS

• Post-operative Haze
  • No record of haze was registered in any of the slit-lamp examinations made.

• Other complications
  • No notable other complication was detected throughout the follow up period.
CONCLUSION

- One-step combined trans-PRK by SCHWIND AMARIS 500 excimer laser in hyperopia ± astigmatism:
  - A safe procedure
  - Resulted efficiently in significant improvements in quantitative visual parameters (visual acuity and refraction).
  - Visual quality in terms of contrast sensitivity showed a trend of improvement which might be established if power of the study is increased.
  - No higher order aberration was induced.
CONCLUSION

• To the best of our knowledge, it was the first report of its kind presented so far to demonstrate trans-PRK success in hyperopia.

• Upcoming studies with more cases assessed could yield more robust results.

• Stability of the achieved results and safety of the procedure remains to be definitely confirmed by longer follow-ups.