2012-04-16

The Impact of Modern Soft Contact Lens Wear on Corneal Curvature and Thickness and on the Outcomes of Refractive LASER Surgery

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**Recommended Citation**  
Lloyd, A, Simo Mannion, L, O’Dwyer, V. Moore, L, 'The impact of soft contact lens wear on corneal curvature and thickness and on the outcomes of refractive LASER surgery. Paper presentation, European Academy of Optometrists. Dublin, April 2012.'
The impact of modern soft contact lens wear on corneal curvature and thickness & on the outcomes of refractive LASER surgery.

Aoife Lloyd FAOI
Background
Refractive laser surgery

• A large number of laser candidates are previous CL wearers \textsuperscript{1,2}
• Accurate topography & pachymetry vital - corneal refractive surgery (CRS) outcomes
  • McGhee 1996, Naroo 2000

Topography: Pre-op, Post-op
Pachymetry: Pre-op, Post-op
Changes to corneal structure with SCL wear

- Reduced epithelial thickness \textsuperscript{1,2}
- Stroma:
  - reduced transparency \textsuperscript{3,4}
  - oedema \textsuperscript{4,5,6,7,8}
  - reduced healing \textsuperscript{9,10}
- Reduced endothelial cell function \textsuperscript{11}

Resolution of corneal changes following cessation of CL wear

• Recovery may take more than 2 weeks for some patients\textsuperscript{1,3}

• Recovery rates vary according to lens type: 2.5 ± 2.1 to 11.6 ± 8.5 weeks\textsuperscript{2}

• No study looked at effect on CRS outcomes

Current guidelines regarding cessation of soft contact lenses

- Unregulated: large amount of discrepancy

- FDA guidelines: remove SCL “at least two weeks prior to examination and treatment” (FDA 2011)

- The Royal Collage of Ophthalmologists: remove SCL 24 hrs prior to consultation (RCOO 2011)
Aims

Proposal:
• examine the impact of SCL wear on corneal thickness and curvature
• investigate if 2 weeks sufficient for recovery assess outcome of CRS
Methods

• Retrospective analysis
• Comparison of corneal parameters (Pentacam, Oculus)
• Dominant eye only

• First visit (C1)
• Second visit (C2)
• Post-operatively (PO)

SCL
• N=45
• CLs worn > 5/7 days

NCL
• N=45
• no CL > 12/12
## Results: demographics

<table>
<thead>
<tr>
<th></th>
<th>SCL n=45</th>
<th>NCL n=45</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>32 ± 7.5</td>
<td>37 ± 10</td>
<td>0.02</td>
</tr>
<tr>
<td>MSE (D)</td>
<td>-3.98 ± 1.64</td>
<td>-2.85 ± 1.49</td>
<td>0.01</td>
</tr>
<tr>
<td>Gender</td>
<td>23M 22F</td>
<td>29M 19F</td>
<td>0.20</td>
</tr>
<tr>
<td>BCSVA (VAR)</td>
<td>107 ± 2</td>
<td>105 ± 3</td>
<td>0.50</td>
</tr>
<tr>
<td>BCSVA (Snellen)</td>
<td>6/5 +2 ± 2</td>
<td>6/5 ± 3</td>
<td>0.50</td>
</tr>
</tbody>
</table>
# Results: topography

## Tangential curvature

<table>
<thead>
<tr>
<th>First Visit</th>
<th>Difference between first and second visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCL (n=45)</td>
<td>SCL (n=38)</td>
</tr>
<tr>
<td>Mean ± SD mm</td>
<td>Mean ± SD mm</td>
</tr>
<tr>
<td>7.83 ± 0.32</td>
<td>7.81 ± 0.34</td>
</tr>
<tr>
<td>7.84 ± 0.26</td>
<td>7.93 ± 0.26</td>
</tr>
<tr>
<td>7.77 ± 0.30</td>
<td>7.90 ± 0.30</td>
</tr>
</tbody>
</table>
Results: pachymetry

• At C1: no significant differences in corneal thickness between the SCL and NCL groups.

• At C2, nasal CT was significantly increased in SCL group (SCL > 6.30 ± 8.38μm; NCL < 4.64 ± 10.60μm, p= 0.028).
# Results: post-operative

<table>
<thead>
<tr>
<th></th>
<th>LASIK</th>
<th>LASEK/ PRK</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 month</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAR VA Mean ± SD</td>
<td>103 ± 6, 100 to 105.5</td>
<td>102 ± 8, 98 to 106</td>
<td>.532, .043</td>
</tr>
<tr>
<td>Snellen VA</td>
<td>6/6+2, 6/6-1</td>
<td>6/6-1, 6/6+2</td>
<td></td>
</tr>
<tr>
<td><strong>3 months</strong></td>
<td></td>
<td></td>
<td>.070</td>
</tr>
<tr>
<td>VAR VA Mean ± SD</td>
<td>103 ± 6, 84 to 110</td>
<td>102 ± 7, 80 to 108</td>
<td>.312, .070</td>
</tr>
<tr>
<td>Snellen VA</td>
<td>6/5-2, 6/6+1</td>
<td>6/6+1, 6/6+1</td>
<td></td>
</tr>
<tr>
<td><strong>6 months</strong></td>
<td></td>
<td></td>
<td>.031</td>
</tr>
<tr>
<td>VAR VA Mean ± SD</td>
<td>105 ± 5, 89 to 110</td>
<td>103 ± 4, 95 to 110</td>
<td>.058, .031</td>
</tr>
<tr>
<td>Snellen VA</td>
<td>6/5-1, 6/5-2</td>
<td>6/5-2, 6/5-2</td>
<td></td>
</tr>
</tbody>
</table>
Conclusion

Despite the influence of previous SCL on corneal parameters, there were no negative implications on CRS outcomes.
Many thanks for your attention!