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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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 \(1,2\)
- Accurate topography & pachymetry vital - corneal refractive surgery (CRS) outcomes

Topography: Pre-op, Post-op

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

• Reduced epithelial thickness $^1,2$

• Stroma:
  - reduced transparency $^3,4$
  - oedema $^4,5,6,7,8$
  - reduced healing $^9,10$

• Reduced endothelial cell function $^{11}$

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

\textsuperscript{1}Nourouzi et al 2006, \textsuperscript{2}Wang et al 2001, \textsuperscript{3}Hashemi et al 2008
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></th>
<th>First Visit</th>
<th></th>
<th>Difference between first and second visit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean ± SD mm</td>
<td>NCL (n=45) Mean ± SD mm</td>
</tr>
<tr>
<td>SCL (n=45)</td>
<td>7.83 ± 0.32</td>
<td>7.81 ± 0.34</td>
<td>0.806</td>
</tr>
<tr>
<td></td>
<td>7.84 ± 0.26</td>
<td>7.93 ± 0.26</td>
<td>0.121</td>
</tr>
<tr>
<td></td>
<td>7.77 ± 0.30</td>
<td>7.90 ± 0.30</td>
<td><strong>0.042</strong></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></th>
<th>LASEK/ PRK</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CL (n=23)</td>
<td>NCL (n=22)</td>
<td>P value</td>
<td>CL (n=22)</td>
</tr>
<tr>
<td><strong>1 month</strong></td>
<td></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</td>
<td>102 ± 5 85 to 110</td>
</tr>
<tr>
<td></td>
<td>6/6+2 6/6-1</td>
<td></td>
<td></td>
<td>6/6+2 6/6</td>
</tr>
<tr>
<td><strong>3 months</strong></td>
<td></td>
<td></td>
<td></td>
<td></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</td>
<td>105 ± 2 98 to 108</td>
</tr>
<tr>
<td></td>
<td>6/5-2 6/5+1</td>
<td></td>
<td></td>
<td>6/5 6/5-2</td>
</tr>
<tr>
<td><strong>6 months</strong></td>
<td></td>
<td></td>
<td></td>
<td></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</td>
<td>105 ± 4 95 to 110</td>
</tr>
<tr>
<td></td>
<td>6/5-1 6/5-2</td>
<td></td>
<td></td>
<td>6/5 6/5-2</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!