Cessation of Soft Contact Lens Wear Prior to Refractive LASER- is Two Weeks Long Enough?

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Cessation of soft contact lens wear prior to refractive LASER surgery- is two weeks long enough?

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Introduction
• Soft contact lens (CL) wear can result in changes to corneal structure. Resolution time, following removal of the CL, can vary with recovery rates of between 2.5 ± 2.1 to 11.6 ± 8.5 weeks depending on lens type.
• Regulations regarding cessation of CL wear prior to refractive laser surgery can vary according to the regulating body. Currently FDA guidelines recommend soft CLs are left out for ‘at least two weeks prior to examination and treatment’.
• The Royal College of Ophthalmologists (U.K.) recommend leaving CL for 1 day before consultation and do not specify any time before refractive surgery treatment.

Aims
• To investigate the influence of CL wear on corneal measurements prior to refractive surgery.
• To assess impact of CL wear on outcomes of refractive laser surgery.

Materials and methods
• A retrospective analysis was undertaken for a group of full-time CL wearing patients, CL group (n=45); and a group of patients that did not wear CL, NCL group (n=45), who presented for refractive laser surgery between 2007 and 2009.
• Myopic patients with astigmatism of ±1.50DC were included for analysis.
• Full-time CL wear was deemed as wearing soft CL >5 days a week in the previous year.
• Data was obtained from the first consultation (C1) and the second consultation (C2) when the CL wearers had ceased CL wear for at least 2 weeks.

Anterior segment image using a Pentacam

Results
The profile of the CL and NCL groups are described in table 1.

Demographic data

<table>
<thead>
<tr>
<th></th>
<th>Age (years)</th>
<th>Sex (CL)</th>
<th>Corneal thickness</th>
<th>Corneal curvature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ± SD</td>
<td>34.2 ± 7.5</td>
<td>0.65</td>
<td>37.1 ± 15.9</td>
<td>0.076</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Analysis of demographic data obtained from the CL and NCL groups showed the CL group is significantly younger, and have a statistically significantly higher myopic refractive error compared with the NCL group (P<0.05).

Refractive surgery outcomes
• VA in Lasik surgery patients showed no significant differences between CL wearers and non CL wearers.

Post-operative visual acuity measurements

<table>
<thead>
<tr>
<th></th>
<th>CL (n=43)</th>
<th>NCL (n=45)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ± SD</td>
<td>102 ± 5</td>
<td>99 ± 5</td>
<td>0.033</td>
</tr>
<tr>
<td>Snellen VA</td>
<td>6/5.2</td>
<td>6/5.2</td>
<td>0.870</td>
</tr>
</tbody>
</table>

Table 2. VA in LASIK surgery patients showed no significant differences between CL wearers and non CL wearers.

Conclusions
• Central and sagittal curvature showed no statistically significant differences between CL groups at C1 or C2. This would indicate corneal stability between the two visits.
• The significant flattening in tangential curvature seen at the inferior cornea in the CL group could indicate that there was a resolution of inferior stromal warping following cessation of CL wear as the cornea returned to a normal probe shape. If this reinforces the fact that tangential curvature is more sensitive than keratometry or sagittal curvature in the detection of small changes in corneal warpage.
• Central and nasal corneal thickness following 2 weeks cessation of CL wear were increased in the CL group, which indicated a restoration of the normal shape after corneal warping.
• Contact lens wear appeared to have an influence on corneal measurements prior to refractive LASER surgery, however, it did not appear to have a negative implication for outcomes following refractive surgery.

Figure 1. Corrected curvature and thickness data were obtained using a Pentacam high definition topographer (Oculus, Germany). The anterior segment image is used to help differentiate corneal surfaces.

Figure 2. Ocular warpage.

Figure 3. Sagittal and tangential corneal topography was measured at the pupil centre and 4-mm superior, temporal, nasal and inferior to pupil centres.

Figure 4. Tangential corneal curvature was measured at the pupil centres and 4-mm superior, temporal, nasal and inferior to pupil centres.

Conurnal Curvature
Central keratometry and sagittal curvature showed no statistically significant differences between groups (CL vs. NCL).

Tangential curvature was significantly steeper at the inferior cornea for the CL group at C1.

Differences between first and second visit were not significant in neither the CL nor the NCL groups with exception of the inferior cornea which flattened in the CL group and steepened in the control group at C2.

Figure 5. Corneal curvature.

Table 3. Corneal curvature data measurements taken for the CL and NCL groups at C1 and C2. Data show significant inferior steepening in the CL group at C1. Repeated measures ANOVA show relative stability between C1 and C2.

Table 3. Corneal curvature data measurements taken for the CL and NCL groups at C1 and C2. This difference was statistically significant compared with the NCL group (p<0.05).

Refactive surgery outcomes
• The difference in VA between the CL and NCL groups that underwent LASER surgery was statistically significant but not clinically significant.
• Improved vision was found in the CL group at 1 and 6 months post - LASER surgery.

Table 4. Corneal thickness values examined were: pupil centre, thinnest corneal location and 4 peripheral points - inferior, nasal, superior and temporal, see figure 3.

Conertal thickness
At C1 no significant differences in corneal thickness between the CL and NCL groups.

At C2, after a two week cessation of CL wear, central and nasal corneal thickness were significantly increased in the CL group.

Table 5. Unrelated distance VA measurements taken post operatively at 1, 3 and 6 months show that results at 1 month were retained at 6 months. LASIK patients showed no significant difference in VA measured between pre-operative CL and NCL groups. LASER/PRK patients had improved VA in group 1 and 6 months compared with the NCL group (p<0.05). Visual Acuity rating VA.

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For further information
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Literature cited