

Other

2011-10

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

Aoife Lloyd McKernan

Technological University Dublin, aoifemarie.lloyd@tudublin.ie

Luisa Simo Mannion

Plymouth State University

Linda Moore

Technological University Dublin

Follow this and additional works at: <https://arrow.tudublin.ie/otpomoth>



Part of the [Optometry Commons](#)

Recommended Citation

Lloyd, A, Simo Mannion, L, O'Dwyer, V. Moore, L., Cessation of soft contact lens wear prior to refractive laser surgery- is two weeks long enough? Poster presentation, American Academy of Optometry. Boston, USA, October 2011.

This Presentation is brought to you for free and open access by ARROW@TU Dublin. It has been accepted for inclusion in Other by an authorized administrator of ARROW@TU Dublin. For more information, please contact arrow.admin@tudublin.ie, aisling.coyne@tudublin.ie, vera.kilshaw@tudublin.ie.

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

Lloyd, A¹, Moore, L¹, Simo, L²

¹ Optometry Dept. Dublin Institute of technology, Dublin, Ireland. ² Optometry Dept. Plymouth University, Plymouth, U.K.



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 type¹.
- Regulations regarding cessation of CL wear prior to refractive laser surgery can vary according to the regulating body. Current FDA guidelines recommend soft CLs are left out for "at least two weeks prior to examination and treatment"².
- The Royal College of Ophthalmologists (U.K.) recommend leaving out CL for 1 day before consultation and do not specify any time before refractive surgery treatment³.

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 soft 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 termed as wearing soft CL >5 days a week in the previous year.
- Data was obtained from the first consultation (C1) and at the second consultation (C2) when the CL wearers had ceased CL wear for 2 weeks.

Anterior segment image using a Pentacam

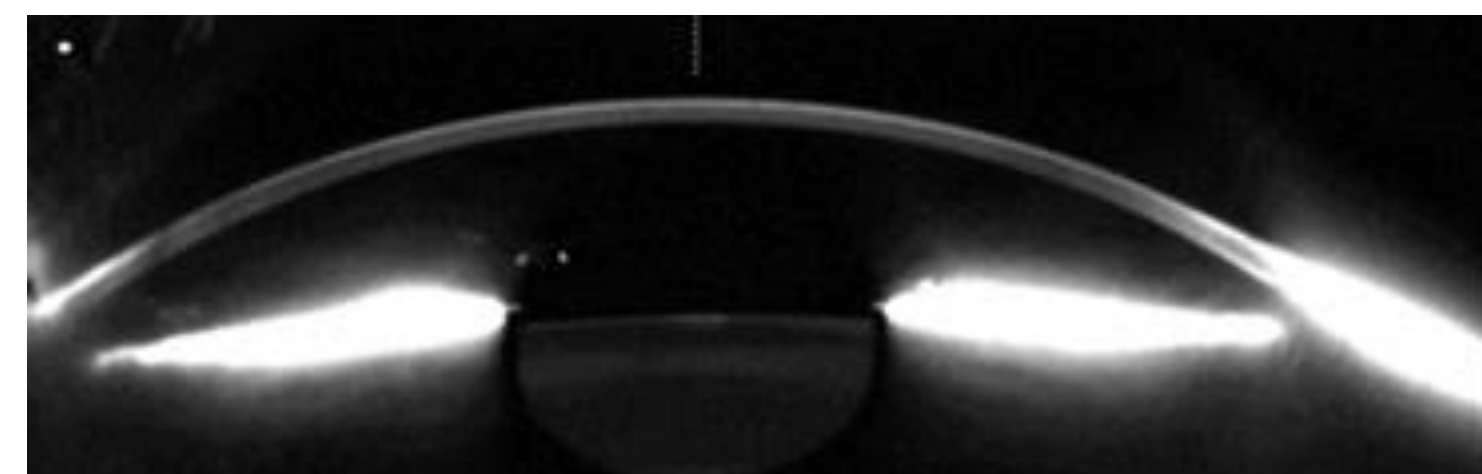


Figure 1. Corneal curvature and thickness data were obtained using a Pentacam ocular tomographer, this instrument uses a Scheimpflug camera to scan the anterior segment of the eye.

- Post-operative refractive results between the groups were examined at 1,3 & 6 months.
- Corneal measurements were taken using the Pentacam (Oculus, Germany), figure 1. Corneal curvature parameters assessed were: flattest and steepest simulated keratometry values within the central 3mm; sagittal and tangential topography from the anterior and posterior corneal surfaces at pupil centre and inferior and superior to centre, see figure 2.
- Corneal thickness values examined were: pupil centre, thinnest corneal location and 4 peripheral points- inferior, nasal, superior and temporal, see figure 3.
- Manifest refraction and best-corrected spectacle visual acuity (VA) were measured at C2. The unaided distance vision and residual refractive correction were measured post-operatively.

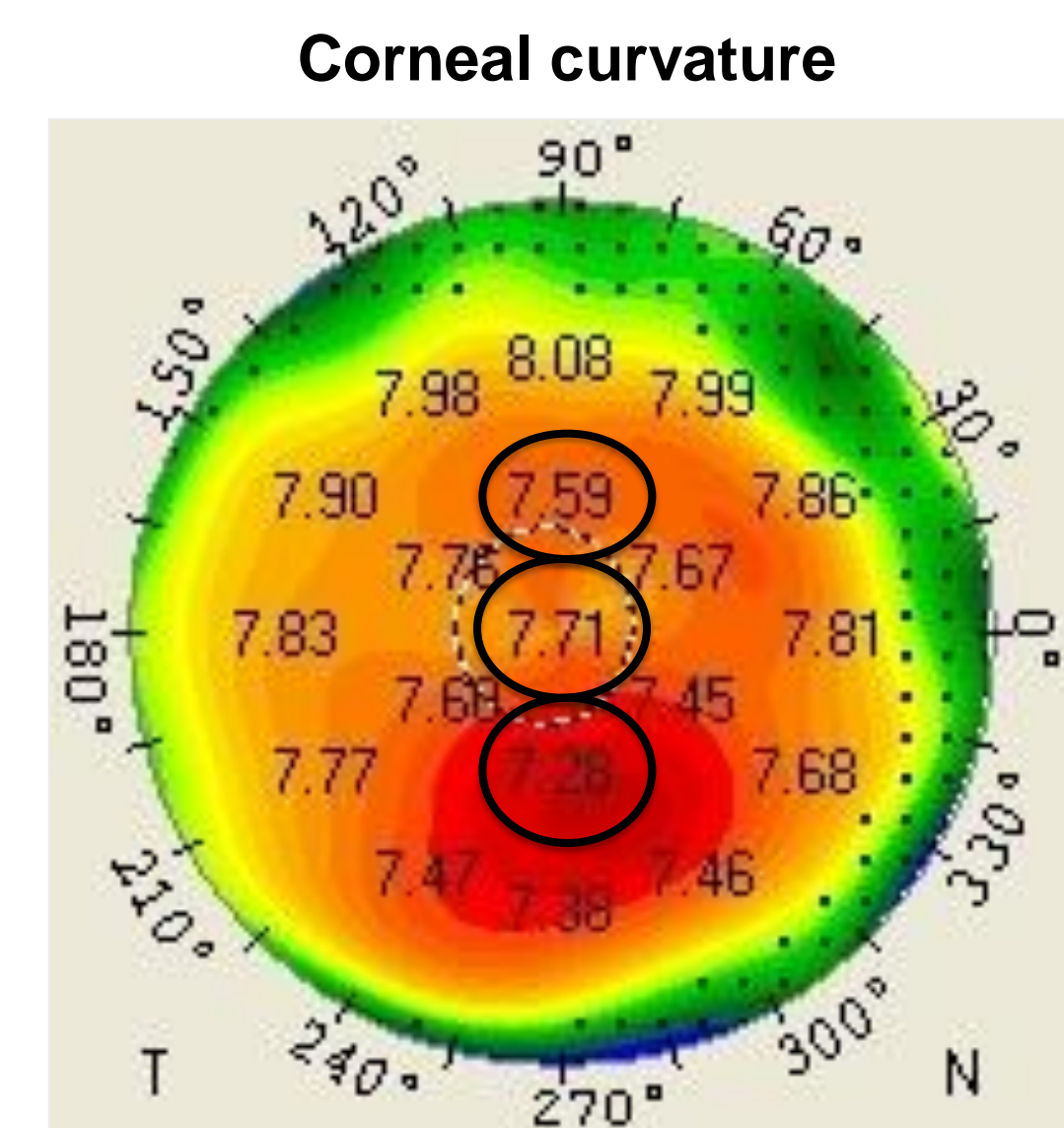


Figure 2. Sagittal and tangential corneal topography was measured at the pupil centre and 4.5mm superior and inferior to this value on the anterior and posterior surfaces.

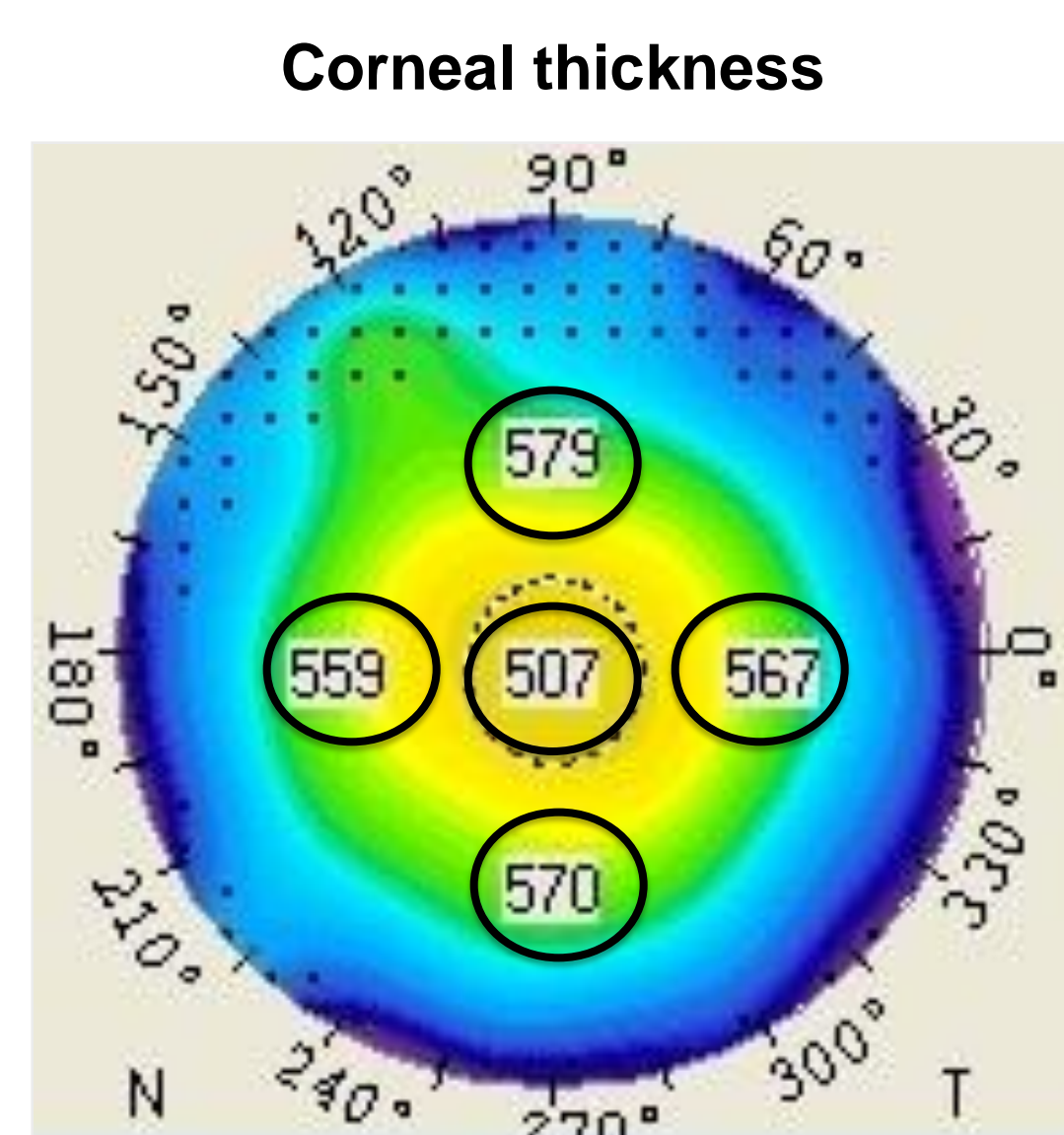


Figure 3. Corneal thickness was measured at the pupil centre, thinnest location and 4.5mm superior, temporal, nasal and inferior to pupil centre.

Results

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

| | Demographic data | | |
|-----------------|--------------------------|---------------------------|---------|
| | CL (n=45) Mean ± S.D. | NCL (n=45) Mean ± S.D. | P value |
| Age (years) | 32 ± 7.5 | 37 ± 10 | 0.015 |
| Sex | 23 males 22 females | 29 males 16 females | 0.200 |
| Rx (D) | -3.97 ± 1.84 | -2.75 ± 1.66 | 0.001 |
| CL wear (years) | 9 ± 4.5 | N/A | N/A |

Table 1. Analysis of demographic data obtained from the CL and NCL groups showed the CL group to be significantly younger, and to have a significantly higher myopic refractive error compared to the NCL group. There were no statistically significant differences between the gender of the groups (P<0.05).

Corneal 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.

Corneal Curvature

- Central keratometry and sagittal curvature showed no statistically significant differences between groups (CL v.s. 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.

| CL (n=45) Mean ± SD | Tangential curvature | | | | | |
|------------------------|-------------------------|---------|------------------------|-------------------------|---------|---------|
| | NCL (n=45) Mean ± SD | P value | CL (n=38) Mean ± SD | NCL (n=37) Mean ± SD | P Value | Z value |
| 7.83 ± 0.32 | 7.81 ± 0.34 | 0.806 | -0.05 ± 0.17 | -0.05 ± 0.17 | 0.984 | 0.592 |
| 7.84 ± 0.26 | 7.93 ± 0.26 | 0.121 | 0.00 ± 0.90 | -0.02 ± 0.12 | 0.417 | 0.811 |
| 7.77 ± 0.30 | 7.90 ± 0.30 | 0.042 | -0.08 ± 0.18 | 0.01 ± 0.08 | 0.015 | 0.003 |

Table 2. Tangential curvature data measurements taken for the CL and NCL groups at C1 and C2. Data show significant inferior steepness in the CL group at C1. Repeated measurements show relative stability between C1 and C2. A mean flattening was found in the CL group at C2, this difference was statistically significant 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 | | | | | |
|-----------------|---|------------|---------|------------|------------|---------|
| | LASIK | | | LASEK/ PRK | | |
| | CL (n=23) | NCL (n=22) | P value | CL (n=22) | NCL (n=22) | P value |
| 1 month | | | | | | |
| VAR* VA | 103 ± 6 | 102 ± 8 | 0.532 | 102 ± 5 | 99 ± 5 | 0.043 |
| Mean ± SD | 100 to 105.5 | 98 to 106 | | 85 to 110 | 94 to 108 | |
| Snellen VA | 6/6+2 | 6/6-1 | | 6/6+2 | 6/6 | |
| 3 months | | | | | | |
| VAR* VA | 103 ± 6 | 102 ± 7 | 0.312 | 105 ± 2 | 103 ± 3 | 0.070 |
| Mean ± SD | 84 to 110 | 80 to 108 | | 98 to 108 | 99 to 110 | |
| Snellen VA | 6/5-2 | 6/6+1 | | 6/5 | 6/5-2 | |
| 6 months | | | | | | |
| VAR* VA | 105 ± 5 | 103 ± 4 | 0.058 | 105 ± 4 | 102 ± 4 | 0.031 |
| Mean ± SD | 89 to 110 | 95 to 110 | | 95 to 110 | 96 to 110 | |
| Snellen VA | 6/5-1 | 6/5-2 | | 6/5 | 6/5-2 | |

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

Refractive surgery outcomes

- The difference in VA between the CL and NCL groups that underwent LASEK surgery was statistically significant but not clinically significant.
- Improved vision was found in the CL group at 1 and 6 months post- LASEK/ PRK procedures compared to the NCL group.

Conclusions

- Central and sagittal curvature showed no 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 steepening following cessation of CL wear as the cornea returned to a normal prolate shape. This reinforces the fact that tangential curvature is more sensitive than keratometry or sagittal curvature in the detection of small changes in corneal shape⁴.
- 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.

Literature cited

- Wang, X., McCulley JP, Bowman RW, Cavanagh HD (2002). "Time to resolution of contact lens-induced corneal warpage prior to refractive surgery." *The Contact Lens Association of Ophthalmologists Journal* 28(4): 169-171.
- FDA, U. S. F. D. A. (2009). Medical devices. Products and medical procedures. Surgery and life support devices. U. S. D. o. H. a. H. Services. Silver Springs, MD.
- Royal College of Ophthalmologists (2006). A patients' guide to excimer laser refractive surgery. 1-9.
- Klein, S., Mandell RB (1995). "Axial and instantaneous power conversions in corneal topography." *Investigative Ophthalmology and Visual Science* 36(10): 2155-2159.

Acknowledgments

Financial acknowledgement: Ultralase Ireland

For further information

Please contact aoifemarie.lloyd@dit.ie