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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

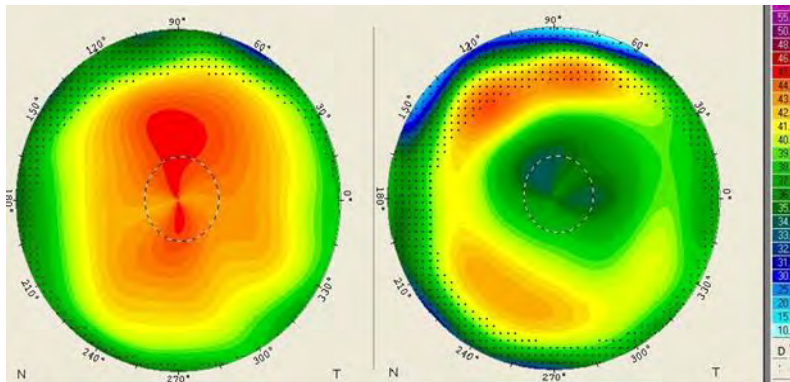
Background

**RESEARCH
WITH
PLYMOUTH
UNIVERSITY**

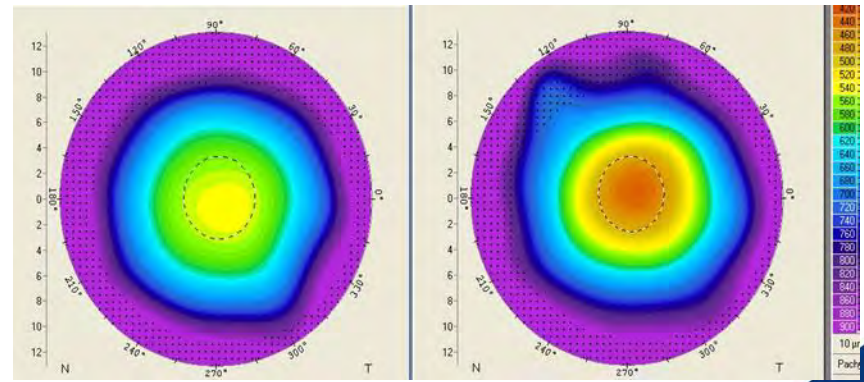


Refractive laser surgery

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



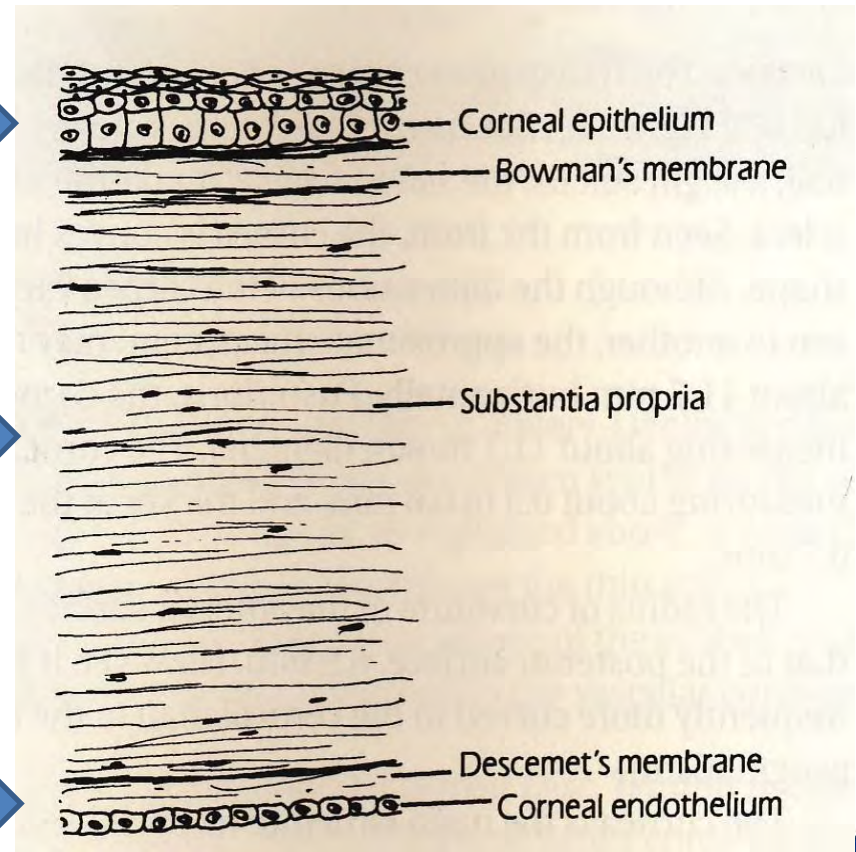
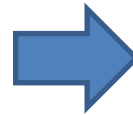
Topography: Pre-op, Post-op



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



1. Holden 1985, 2. Gonzalez-Perez 2003, 3. Kaufman 2002, 4. Bergmanson 1982, 5. Doughty 2003, 6. Gonzalez-Mejome 2003, 7. Holden 1985, 8. Liu & Pflugfelder 2000, 9. Kallinikos 2004, 10. Efron 2007, 11. Sweeney 1992

Resolution of corneal changes following cessation of CL wear

- Recovery may take more than 2 weeks for some patients_{1,3}
- Recovery rates vary according to lens type: 2.5 ± 2.1 to 11.6 ± 8.5 weeks₂
- No study looked at effect on CRS outcomes
- 1.Nourouzi et al 2006, 2.Wang et al 2001, 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

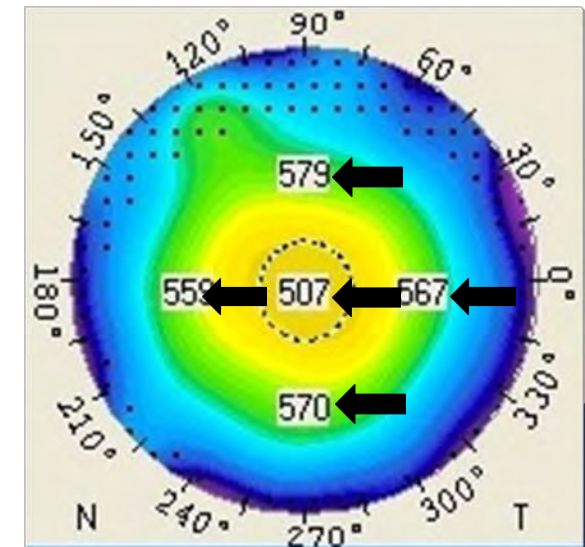
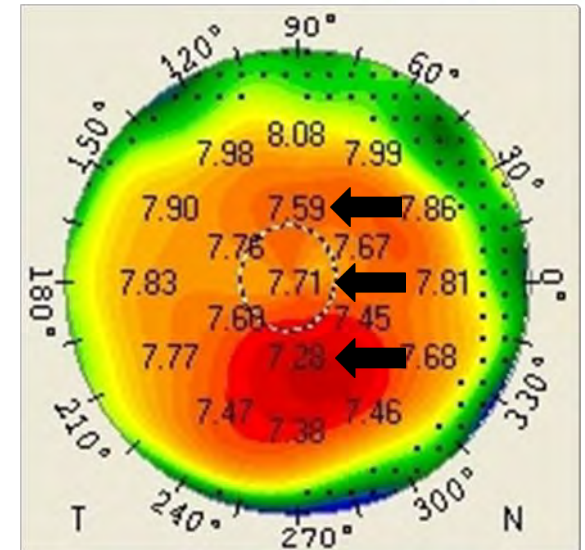
- Retrospective analysis
- Comparison of corneal parameters (Pentacam, Oculus)
- Dominant eye only
- First visit (C1)
- Second visit (C2)
- Post-operatively (PO)

SCL

- N=45
- CLs worn >5/7 days

NCL

- N=45
- no CL > 12/12



Results: demographics

	SCL n=45	NCL n=45	Sig.
Age (years)	32 ± 7.5	37 ± 10	0.02
MSE (D)	-3.98 ± 1.64	-2.85 ± 1.49	0.01
Gender	23M 22F	29M 19F	0.20
BCSVA (VAR)	107 ± 2	105 ± 3	0.50
BCSVA (Snellen)	6/5 +2 ± 2	6/5 ± 3	0.50

Results: topography

Tangential curvature

First Visit			Difference between first and second visit			
SCL (n=45) Mean ± SD mm	NCL (n=45) Mean ± SD mm	Sig. P-value	SCL (n=38) Mean ± SD mm	NCL (n=37) Mean ± SD mm	Sig. P-value	Sig. 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

Results: pachymetry

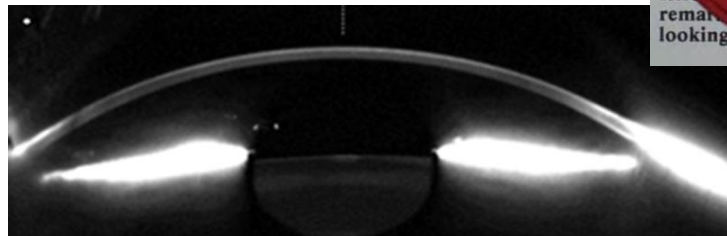
- At C1: no significant differences in corneal thickness between the SCL and NCL groups.
- At C2, nasal CT was significantly increased in SCL group (SCL $>6.30 \pm 8.38\mu\text{m}$; NCL $<4.64 \pm 10.60\mu\text{m}$, $p= 0.028$).

Results: post-operative

	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	.532	102 ± 5	99 ± 5	.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						.070
VAR VA	103 ± 6	102 ± 7	.312	105 ± 2	103 ± 3	
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	.058	105 ± 4	102 ± 4	.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	

Conclusion

Despite the influence of previous SCL on corneal parameters, there were no negative implications on CRS outcomes.



Many thanks for your attention!

