2012-4

The impact of modern soft contact lens wear on corneal curvature and thickness & 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.

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Aoife Lloyd FAOI

Background

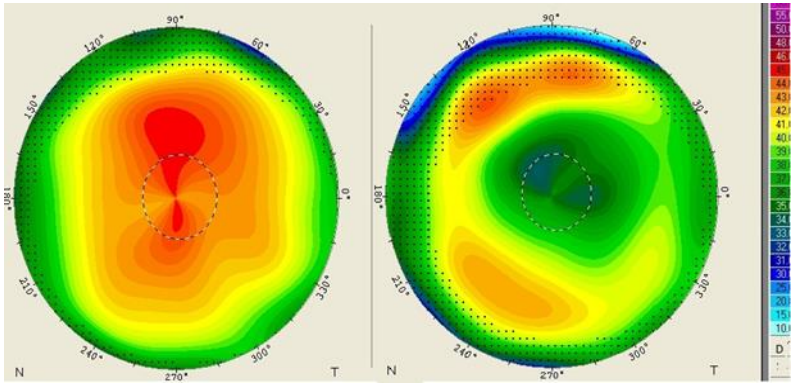
RESEARCH WITH PLYMOUTH UNIVERSITY

Dublin Institute of Technology · D·I·T · Institiúid Teicneolaíochta Átha Cliath

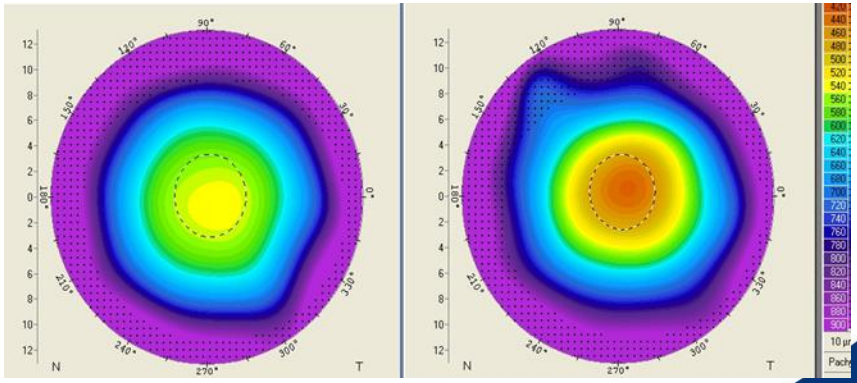
ultralase
the specialists in correcting vision

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



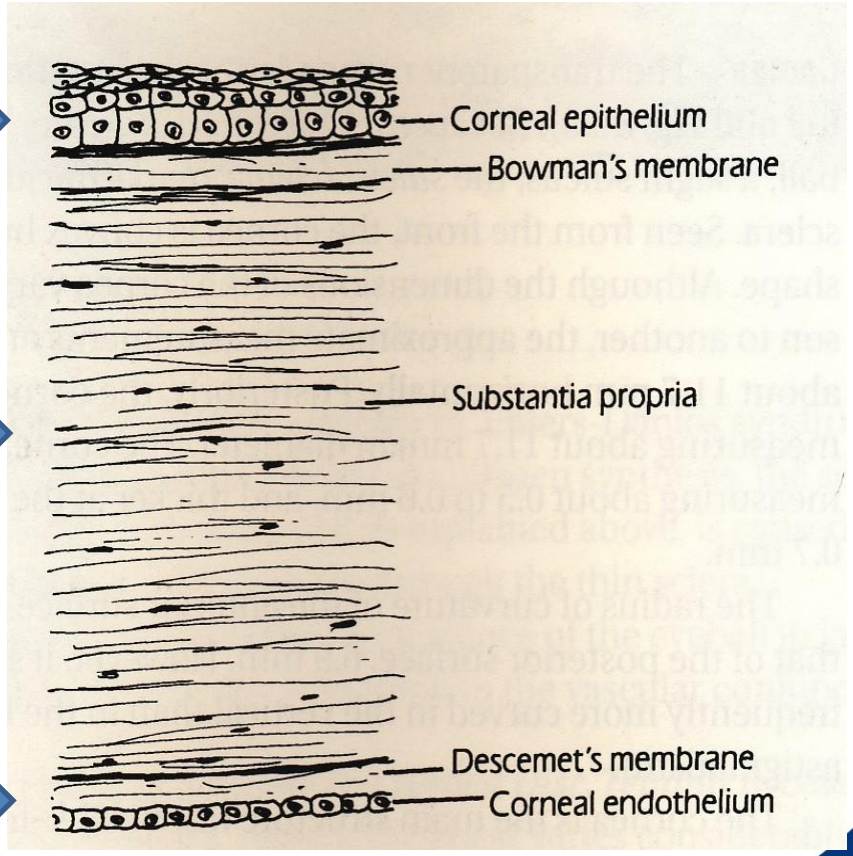
Topography: Pre-op, Post-op



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-Meijome 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 weeks[2]
- No study looked at effect on CRS outcomes

- 1.Nourouzi et al 2006, 2.Wang et al 2001, 3. Hashemi et al 2008

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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:

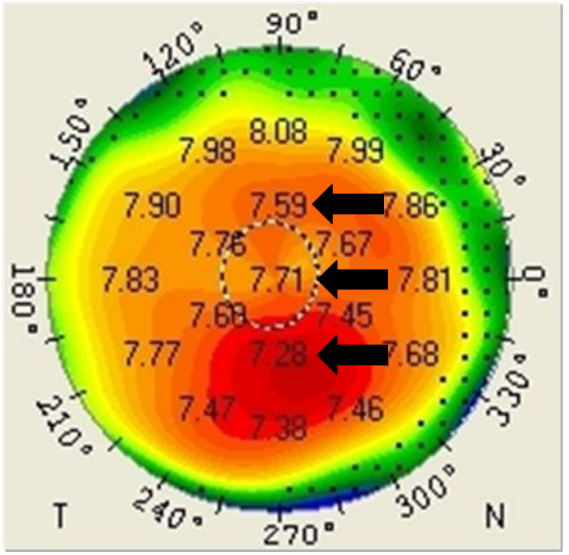
- examine the impact of SCL wear on corneal thickness and curvature
- investigate if 2 weeks sufficient for recovery

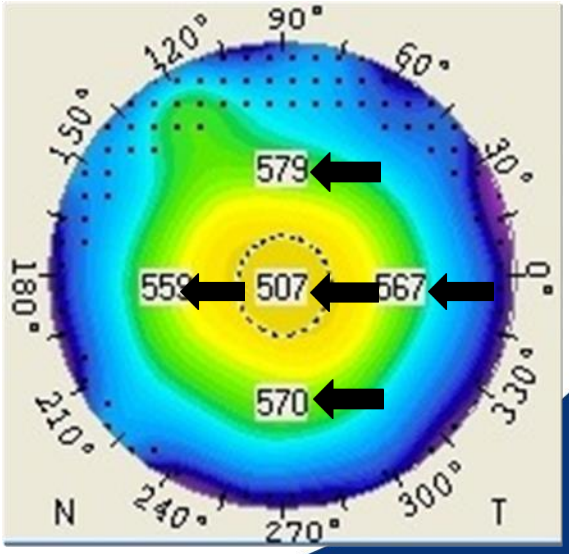
  assess outcome of CRS

Methods

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

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





SCL	NCL
•N=45	•N=45
•CLs worn >5/7 days	• no CL > 12/12

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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

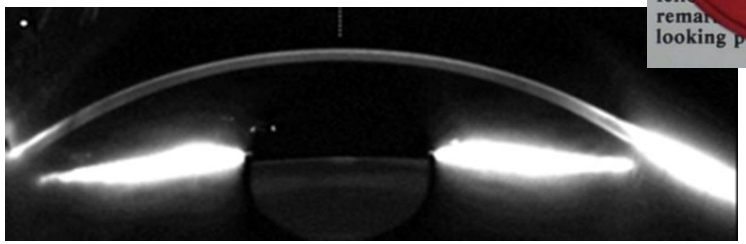
- At C1: no significant differences in corneal thickness between the SCL and NCL groups.
- At C2, nasal CT was significantly increased in SCL group (SCL >6.30 ± 8.38µm ; NCL <4.64 ± 10.60µm, p= 0.028).

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						
VAR VA	103 ± 6	102 ± 7	.312	105 ± 2	103 ± 3	.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	.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.



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Many thanks for your attention!