

OVERNIGHT CORNEAL SWELLING WITH A SILICONE-HYDROGEL (BALAFILCON A) TORIC LENS

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Introduction

- Overnight corneal swelling is regarded as a key indicator of the physiological acceptability of a contact lens.^{1,2}
- Spherical silicone-hydrogel lenses approved internationally for continuous wear produce on average less than 4% overnight swelling,³ which is within the range commonly encountered without a contact lens in place.⁴⁻⁸
- Bausch & Lomb have manufactured a toric contact lens made from a silicone-hydrogel material (balafilcon A).
- The aim of this study was to measure the overnight corneal swelling produced with this toric lens.

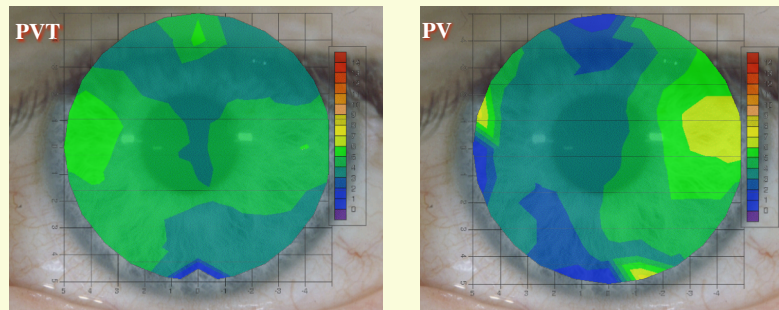
Methods

- The protocol was approved by Melbourne Ocular Science & Technology enterprises Human Research Ethics Committee.
- A total of 23 subjects were enrolled in this study after the nature of the procedures was fully explained.
- Contact lenses were worn for a minimum of 8 hours overnight at our premises.
- Central corneal thickness (CCT) was measured with the Orbscan before and after sleep.
- 20 subjects wore a balafilcon A toric lens (PUREVISIONTM Toric, Bausch & Lomb) in one eye and a balafilcon A spherical lens (PUREVISIONTM Toric, Bausch & Lomb) in the other eye.
- 20 subjects wore a balafilcon A toric lens in one eye and an etafilcon A toric lens (ACUVUE[®] TORIC, Vistakon) in the other eye.

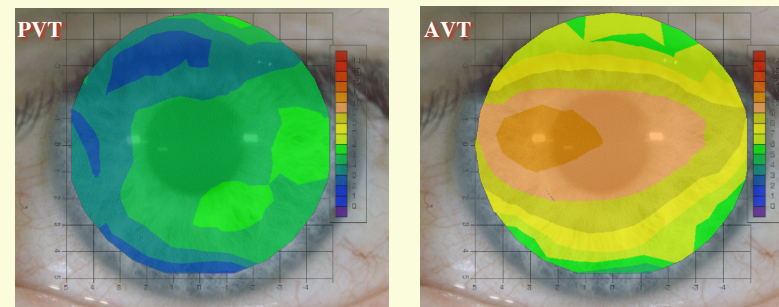
Results

	CCT before (µm)			CCT after (µm)			EDEMA (%)	
	Mean	Group SD	Indiv SD	Mean	Group SD	Indiv SD	Mean	Group SD
PHASE 1								
Balafilcon A toric	536	50	3.4	557	57	3.3	3.94	2.0
Balafilcon A spherical	534	56	3.7	555	60	2.9	3.85	2.1
PHASE 2								
Balafilcon A toric	538	49	3.4	562	50	3.6	4.37	2.6
Etafilcon A toric	539	48	3.1	591	45	3.3	9.91	4.8

Figures 1 and 2: Mean topographical corneal swelling for the balafilcon A toric lens (PVT) and the balafilcon A spherical lens (PV) as indicated by the color-coding.



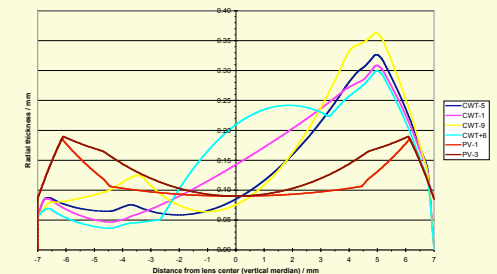
Figures 3 and 4: Mean topographical corneal swelling for the balafilcon A toric lens (PVT) and the etafilcon A toric lens (AVT) as indicated by the color-coding.



Discussion

- The balafilcon A toric induced swelling of approximately the same amount as the balafilcon A spherical lens across the corneal topography.
- This similarity of swelling occurs despite a different thickness profile (see Fig 5). This may be due to a limbal compression effect, average lens thickness effects, limbal oxygen supply or insensitivity of the measurement equipment.
- The balafilcon A toric induced considerably less swelling than the etafilcon A toric lens which is one of the better physiologically performed hydrogel toric lenses.⁹

Fig 5: Radial Thickness Profiles
PureVision, PureVision Toric and SoftLens 66 Toric



References

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