



Comparison of Vision: Custom Silicone Hydrogel Toric Contact Lenses vs Manifest Refraction – Case Reports

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Purpose



Silicone-hydrogel toric custom Made-to-Order (MTO) lenses have recently become available in the U.S. The purpose of these case studies is to assess the practical patient care and practice management aspects of utilizing this new modality. The specific question is:

- Could the initial diagnostic lenses sent from the laboratory provide acceptable fit and vision so they can be dispensed as diagnostic trials?

Accordingly, four soft lens patients were selected with significant refractive astigmatism, unusual toric prescriptions, or atypical corneal diameters, and

initial lenses were ordered with laboratory consultation.

- Distance visual acuities with these initial MTO toric silicone hydrogel lenses were compared to the visual acuity of four patients with their BVA manifest spectacle refraction.

The data could be a good indication of the accuracy and ease of utilizing these lenses in managing and caring for the unusual soft toric patient.

Background

One of the current patient care and practice management challenges is caring for soft lens patients with significant refractive astigmatism, unusual toric prescriptions, or atypical corneal diameters.

Commercially molded soft silicone hydrogel (SiHy) toric contact lenses are available. While appropriate for a majority of patients, it is difficult to fit patients who have unusual prescriptions and/or corneal diameters because these molded lenses are limited to the most common parameters.

With improved designs and increasing repeatability, custom MTO lathed toric hydrogels have been available for decades. While manufacturers can provide very accurate lenses for unusual or high prescriptions, the lathe cut hydrogel materials they use are typically limited to Dks below 20. Corneal hypoxia from low Dk lenses is a recognized risk factor for corneal edema, red eye, and microbial keratitis.

Contamac recently introduced its new Definitive material to the United States: Efrogfilon A through several laboratories. This latheable MTO, non-surface treated, daily-wear Silicone-hydrogel material has a 59.8 Dk with a 74% water content.

Art Optical utilizes this Contamac Definitive material and wavefront technology to incorporate aberration control features in their MTO Intelliwave Aspheric Toric lenses.

For any custom or MTO contact lenses product, there are significant Practice Management challenges to be met.

- **Minimal data needed** – to minimize disruption of patient examination schedule, clinicians should not be required to gather significantly more patient data than they would on a standard contact lens analysis.
- **Short turnaround time** – once ordered from the laboratory, the initially designed custom lenses must arrive quickly – as should modified lenses after the initial dispensing.
- **Minimize the number of patient return visits** – a must for positive patient management.
 - Initial lenses provide acceptable fit and vision so they can be dispensed as diagnostic trials.
 - Final lenses, based on any modifications from the initial lenses, must also have a quick turn-around time.



Methods

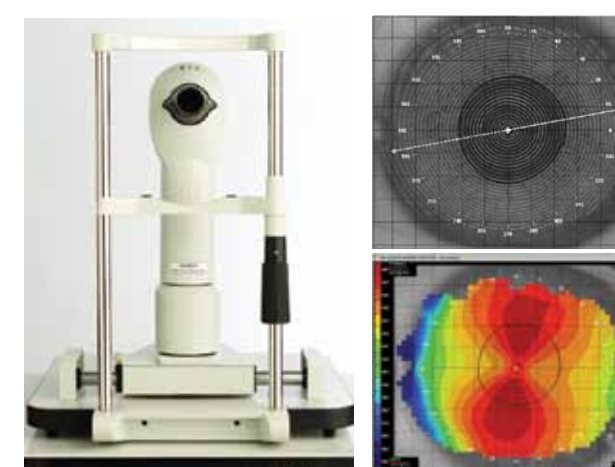
To be eligible for entry into the review, four patients were selected with significant refractive astigmatism or unusual prescriptions/corneal diameters.

Intelliwave Custom Aspheric Toric Lenses were ordered from Art Optical using:

- **Manifest spectacle Rx and acuity** – The best distance manifest spectacle refraction and corrected acuities were taken before ordering contact lenses.
- **Sim K's and HVID** (horizontal visual iris diameter/corneal diameter) – Taken from Medmont Topographer to minimize practitioner variability.

When the lenses arrived from Art Optical Laboratory, the contact lenses were inserted for evaluation:

- Following the fitting guide recommendation, the patients wore the contact lenses for at least 10 minutes before evaluation.
- Monocular distance visual acuities were taken.
- A spherocylindrical over-refraction of the initially inserted SiHy Aspheric Toric lens was performed.
- The position and physical fit of the lens was evaluated with biomicroscopy.
- Visual acuities, spherocylindrical over-refraction, and the fit of each lens were used to determine if these initial lenses could be dispensed.



Results

Manifest spectacle Rx and acuity – the best manifest spectacle refraction and corrected acuities taken before ordering contact lenses.

Toric CL Acuities – taken 10 minutes after inserting the initial custom Intelliwave SiHy Aspheric Toric lens received from Art Optical.

OR of Lens – the spherocylindrical over-refraction of the initially inserted SiHy Aspheric Toric lens performed at the initial dispensing visit.

Sim K's and HVID (horizontal visual iris diameter/corneal diameter) – taken from Medmont Topographer to minimize practitioner variability.

Patient	Manifest Spec Rx and Acuity	Toric CL Acuity	OR of Lens	Sim K's
SC	R: -22.25 - 2.75 x 165 (20/20-)	20/25	(+0.50-0.75x177)(20/20)	43.9@167 / 45.9@77
	L: -18.25 -1.50 x 164 (20/20)	20/15	(+0.75-0.25x 90)	43.2@176 / 44.9@86
LH	R: -0.25 -3.00 x 175 (20/15)	20/15	(Plano)	42.6@174 / 45.6@084
	L: -0.50 -2.50 x 177 (20/15)	20/15	(Plano)	43.2@180 / 46.2@090
AC	R: -1.00 -2.50 x 110 (20/20)	20/15	(+0.50)	44.3@120 / 46.3@030
	L: -1.75 -1.50 x 045 (20/20)	20/20	(+0.25)	45.5@042 / 46.3@132
MS	R: -6.00 -2.75 x 005 (20/20)	20/20	(+0.75-0.75x130)	43.9@001 / 47.1@91
	L: -6.00 -3.00 x 167 (20/20)	20/20	(+0.50-0.50x 135)	44.3@174 / 47.5@84

The results of these case studies demonstrated:

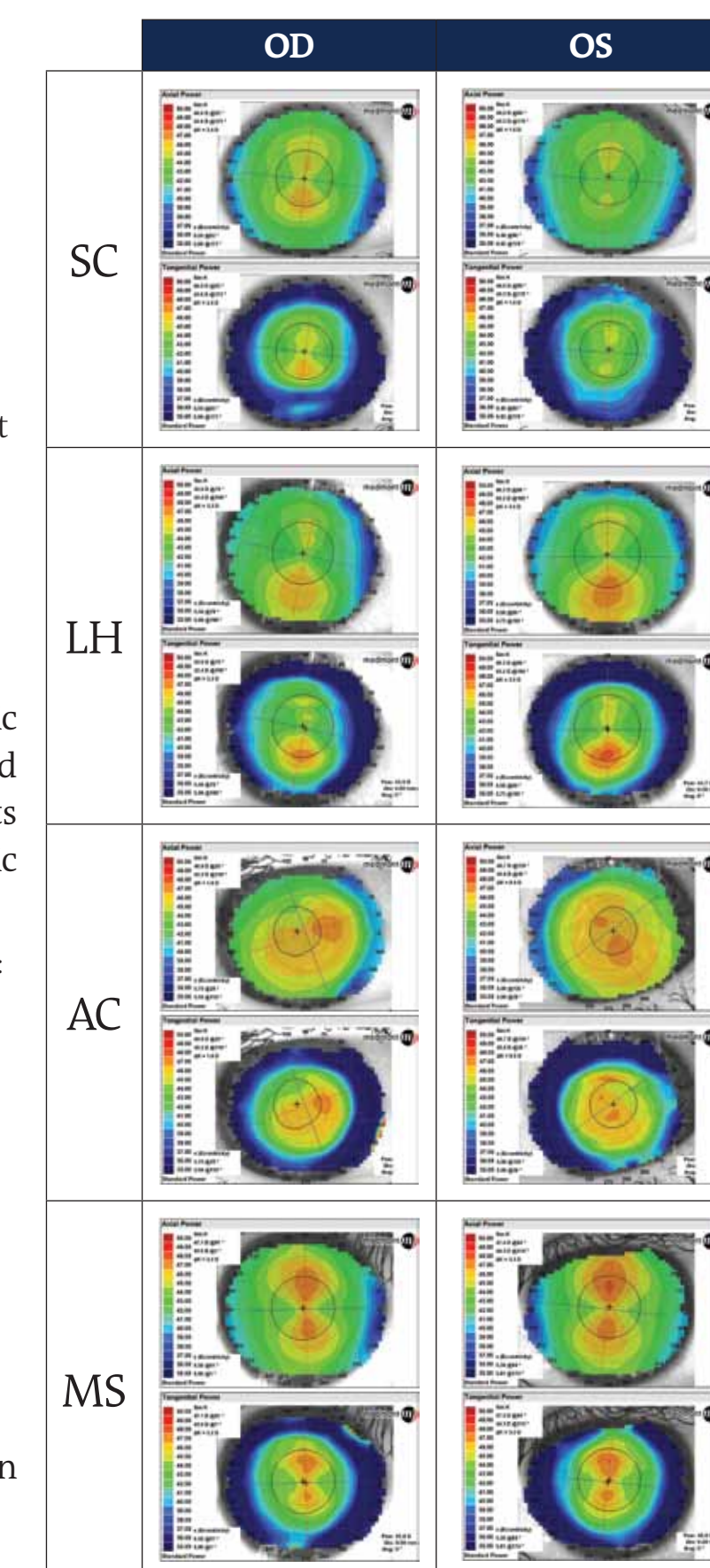
- All patient lenses arrived within four working days of ordering.
- All initial Custom SiHy Toric lenses provided acuities at or within one line of the acuity from BVA manifest refraction.
- All of the initial patient lenses, even with the most challenging prescriptions, could be dispensed with follow up appointments to determine the final contact lens prescription.

Conclusion

In these case studies, Intelliwave Custom Aspheric Toric Lenses from Art Optical have met both patient care and Practice Management challenges for soft lens patients with significant refractive astigmatism or unusual toric prescriptions.

- Minimal patient data was required to order the lenses:
 - Best Manifest Spectacle Refraction
 - Keratometry and HVID
- All of the initial Custom toric patient lenses, including those with -20.00D prescriptions, arrived from the laboratory within four days.
- Even though patients had challenging toric prescriptions, all initial Intelliwave Aspheric Toric lenses provided acceptable fit and vision, allowing them to be dispensed as diagnostic trials and minimizing patient return visits.

A further study involving more patients and including an assessment of quality of vision is planned.



References

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