Better Safe Than Scarry: The Use of Moonlens® to Correct the Non-Compliant Soft Lens Wearer

Riley Parker, BA; Chad Rosen, OD, MBA, FAAO; Josh Lotoczky, OD, FAAO; Emily Gottschalk, OD, FAAO

FERRIS STATE UNIVERSITY
MICHIGAN COLLEGE OF OPTOMETRY

Background

The art of orthokeratology involves the use of specialty designed gas permeable contact lenses to correct vision through corneal reshaping. These lenses are worn overnight and taken off during the day, replacing the need for contact lens or spectacle correction.[1] Corneal topography is used for lens fitting while manufacturing technology includes the use of reverse curves. These gas permeable lenses are made with highly permeable material and differ from soft contact lenses in that they do not absorb moisture.[2] The risk of microbial keratitis with orthokeratology is less than with overnight wear of SiHy soft contact lenses.[3]

The Moonlens® design by Art Optical uses three principle fitting zones to allow for superior customization. Moonlens is indicated in patients for myopia management, moderate myopia, and mild amounts of astigmatism. This lens is approved for overnight orthokeratology by the U.S. Food and Drug Administration.[4]

Case Details and Management

A 24-year-old white female presented to the clinic with a chief complaint of a suspected ulcer in the left eye. Symptoms reported included photophobia, blur, tearing, pain, and redness since that morning. The patient reported sleeping in soft contact lenses at least 6 nights per week. The patient had significant ocular history for a previous ulcerative event in the right eye ten years prior. Biomicroscopy revealed a 1.0 mm round ulcer at 3:00 in the corneal mid-periphery. The use of sodium fluorescein revealed a 1:1 ratio of staining with an underlying infiltrate. Stromal edema surrounding the ulcer and crossing the visual axis was also noted, causing reduced visual acuities of 20/50- OS. The patient was diagnosed with microbial keratitis and a corneal ulcer, OS.

This patient self-reported having an extremely type-A personality. To avoid ever noticing blur, the patient slept in contact lenses. Following patient education, the patient expressed no desire to discontinue sleeping in the soft contact lenses. Because the patient preferred to continue sleeping in lenses, orthokeratology was introduced as an alternative to the current refractive management plan. Upon complete resolution of the infection and re-epithelialization of the ulcer, the patient was fit for orthokeratology using the Moonlens® design. Corneal topographies were taken, and the Moonlens®Flex calculator was used to determine lens parameters.

Initial Assessment	OD	OS
Subjective Refraction	-3.00 DS	-3.75 DS
Visual Acuity	20/15	20/15
Pupil Size (dim)	5 mm	5 mm

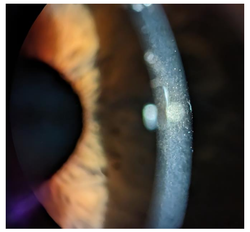

Figure 1. Re-epithelialized cornea with stromal scar following ulcerative event (left)

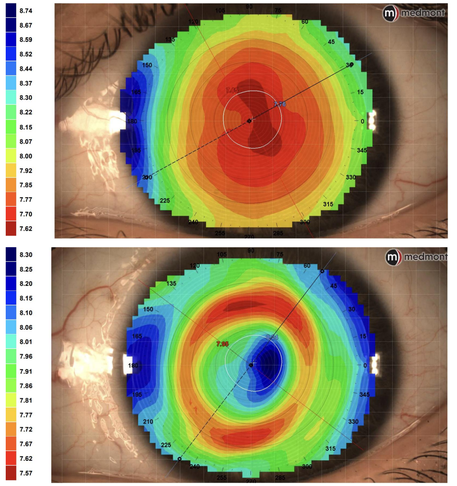

Figure 2. Baseline axial corneal topography (top right)

Figure 3. Axial corneal topography after one month of orthokeratology treatment (bottom right)

Art Optical Moonlens® 10.6 diameter, Toric

	Optic Zone Diameter	Base Curve	Reverse Curve Depth	Alignment Zone Angle	Distance VA with lenses	Distance VA without lenses
OD	6.0mm	8.57	0.518/0.538	31.40/32.40	20/15	20/15
OS	6.0mm	8.50	0.528/0.548	32.06/33.06	20/15	20/15

Discussion

For this patient, overnight orthokeratology replaced the need for refractive correction during the day, providing clear vision at all times. The patient was able to achieve visual acuities of 20/15 OD, OS, OU both with and without the lenses on, eliminating the blur which previously led to improper wearing habits and an adverse event. At the one-day and one-week follow up visits, the lens showed acceptable centration and no corneal staining was noted. Corneal topographies taken one month after dispensing the lenses showed optimal and complete correction of the patient's refractive error. The patient was educated on proper gas permeable lens cleaning methods and given a strict case replacement schedule. Six months later, the patient reports full compliance and has had no further adverse events

Conclusion

Treating patients with orthokeratology has the potential to:

- Eliminate the need for spectacles or soft contact lenses throughout the day
- Reduce the risk of microbial keratitis from sleeping in contact lenses when compared to SiHy soft lenses[3]
- Provide clear and comfortable vision to appease the type-A patient

The Moonlens®Flex calculator and use of topography allowed for a highly customizable lens with exceptional fitting success.

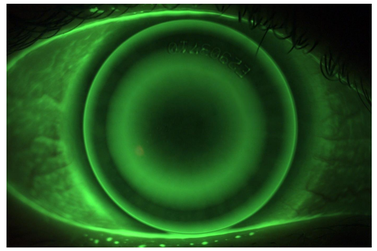

Figure 4. Centered Moonlens® on eye, showing a distinct bullseye pattern

References

1. Mukamal, Reena. (2023). What is Orthokeratology? American Academy of Ophthalmology.
2. Rosen, Chad, OD, FAAO. (2023). Orthokeratology. Michigan College of Optometry.
3. Bullimore, Mark et al. (2013). The Risk of Microbial Keratitis With Overnight Corneal Reshaping Lenses. American Academy of Ophthalmology.
4. Art Optical Contact Lens Company. Moonlens. Unique, Novel Overnight Orthokeratology Lens Systems.

Riley Parker
Student, Michigan College of Optometry
Jamesr9@ferris.edu