

Muriel Schornack OD¹, Jennifer Harthan OD², Cherie Nau OD¹, Amy Nau OD³, Jennifer Swingle Fogt OD⁴, Ellen Shorter OD⁵

schornack.muriel@mayo.edu

¹Mayo Clinic, Rochester MN; ²Illinois College of Optometry, Chicago IL; ³Korb & Associates, Boston MA; ⁴The Ohio State University, Columbus OH; ⁵University of Illinois, Chicago IL

Purpose

- To identify indications for scleral lens wear in patients who were fit with impression-based scleral lenses (EyePrint PRO™ design)
- To describe previous contact lens wearing experience of patients who were fit with impression-based lenses

Introduction

- Studies have shown that the sclera is not rotationally symmetrical in most eyes(1). In a recent study by DeNaeyer, 66% of 140 eyes evaluated with a wide-field ocular surface imaging device had neither spherical or regular toric scleral contour (2).
- Although haptic customization is possible with most scleral lens designs currently available, it may be necessary to order multiple lenses with incremental changes in haptic design in order to achieve adequate fit (3). Furthermore, available haptic modifications may not be sufficient to provide adequate alignment in eyes with highly irregular surfaces.
- The EyePrint PRO™ is designed from a physical impression of the ocular surface. The lens haptic should therefore align perfectly with the ocular surface, and should therefore provide optimal fit, vision, and comfort (4).

Methods

Study Design:

- Multi-center retrospective chart review
- Study design was reviewed and approved by Mayo Clinic IRB
- Data was collected using REDCap (housed at Mayo Clinic)
- 3 practices (academic medical centers, private practices)
- Data were collected on all patients for whom an impression-based lens fit was initiated between January 1 2013 and June 30 2019

Data Collected:

- Age
- Gender
- Laterality of impression-based lens fitting
- Indication for scleral lens wear
- Previous contact lens history
- Conclusion of fitting process (complete/incomplete)

Statistical Analysis:

- Descriptive statistics are reported

Results

Overall Demographics

44 patients (70 eyes)

Mean age: 51.5 ± 13.5 years
(Range 17-77 years)

28 male (64%)
15 female (36%)

Outcome of Fitting Process

Successful physiological fit was achieved in all eyes

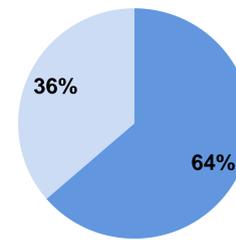
- Bilateral fits were accomplished in 26 patients
- Right eye only was fit in 9 patients
- Left eye only was fit in 9 patients

Indications for Scleral Lens Wear

Ocular Surface Disease (36%):

(# of patients/# of eyes)

- Undifferentiated dry eye syndrome (6/11)
- Exposure keratopathy (4/4)
- Neurotrophic keratopathy (3/4)
- Sjogren's syndrome (2/4)
- Graft versus host disease (1/2)



Corneal Irregularity (64%):

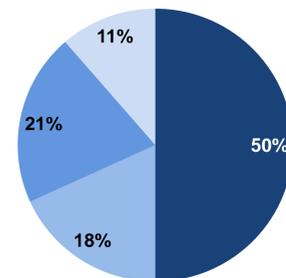
(# of patients/# of eyes)

- Keratoconus (16/28)
- Penetrating keratoplasty (8/10)
- S/P refractive surgery (2/4)
- Pellucid marginal degeneration (1/2)
- S/P corneal infection (1/1)

■ Corneal Irregularity
■ Ocular Surface Disease

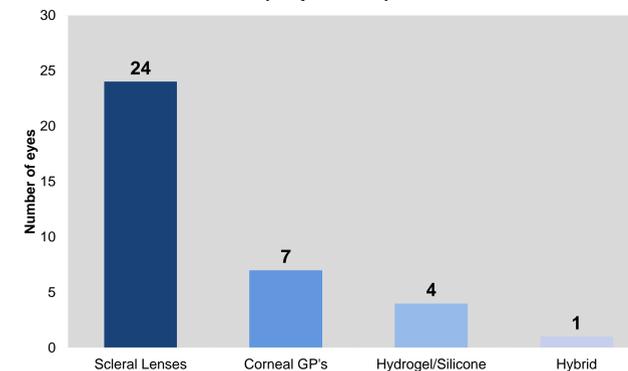
Prior Correction

Habitual Correction Worn Immediately Prior to Impression-Based Lens Fitting



- Contact Lenses (22 patients, 35 eyes)
- Spectacles (8 patients, 15 eyes)
- No Correction (9 patients, 11 eyes)
- Spectacles and Contact Lenses (5 patients, 9 eyes)

Previously Worn Contact Lens Modalities (29 patients)



(Total number of lens modalities is greater than 29 because several patients had worn multiple contact lens modalities.)

Conclusions

- Ocular surface disease was reported as the primary indication for scleral lens wear at a higher percentage than other studies: 36%.
- Most patients successfully fit with impression-based lenses had previously worn scleral lenses of other designs. It is reasonable to consider impression-based lenses for patients who have been unsuccessful with other scleral lenses.

References

- Van der Worp E, Caroline P (2010). Exploring beyond corneal borders. Contact Lens Spectrum, 2010(June): 26-32.
- DeNaeyer G, et al. (2017). Qualitative assessment of scleral shape patterns using a new wide field ocular surface elevation topographer. Journal of Contact Lens Research and Science 1(1).
- Pecego M, Barnett M, Mannis MJ, Durbin-Johnson B. (2012). Jupiter scleral lenses: the UC Davis Eye Center experience. Eye Contact Lens 38(3): 179-182.
- Nguyen MTB, Thakrar V, Chan CC. (2018). EyePrintPRO therapeutic scleral contact lens: indications and outcomes. Can J Ophthalmol 53(1): 66-70.

Support



Center for Clinical and Translational Science:
UL1TR002377

Disclosure

None: C. Nau, M. Schornack
J. Fogt: Alcon, Contamac, EyeLab, Eye Novia, Innovega, Nevakar, NovaSight, Ocugen, Shire, Valeant
J. Harthan: Allergan, Essilor, Kala, Metro, Takeda/Novartis, Tangible Science, Shire, Synergeyes
A. Nau: Avedro, Johnson & Johnson
E. Shorter: Johnson & Johnson