

Intralimbal Lens Design for an Elderly Patient with Extensive Corneal Scarring

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Background

Gas permeable (GP) contact lenses have been a clinical mainstay for improving vision for patients with myopia, hyperopia, and astigmatism since their inception in the late 1970's. (Williams, 1979) The benefit of GP lenses is even more impressive for patients with irregular astigmatism, including those with keratoconus, post graft or refractive surgeries, or advanced corneal scarring. (Jupiter & Katz, 2000) Because of the complexities of corneal fit, accompanying dry eye, and reduced manual dexterity, elderly patients might often be overlooked for GP fitting. The following case will show that persistence is worth the effort.

WH, a 78-year-old Caucasian female, presented as a referral for a contact lens evaluation from a local colleague. The patient's entering acuities were Hand Motion OD, Counting Fingers at five feet OS with no improvement by pin hole in either eye. Of significance externally, WH had lagophthalmos OU and significant bilateral corneal scarring and conjunctival fibrosis extending well past the limbus, encroaching on the visual axis OD and sparing the visual axis OS. The patient's complaints included pain and foreign body sensation, photophobia, and excessive tearing due to exposure and inability to process tears with routine blinking. This patient's surgical history included multiple corneal surgeries, a bilateral blepharoplasty, and tear duct surgery OD to repair stenosis. The previous eyelid surgery and age-related changes resulted in extreme limitation in eyelid movement. Both corneas showed extensive SPK and her vision could not be improved with refraction alone. WH simply wanted to see better for ambulation and to be able to recognize those around her.

Case Description

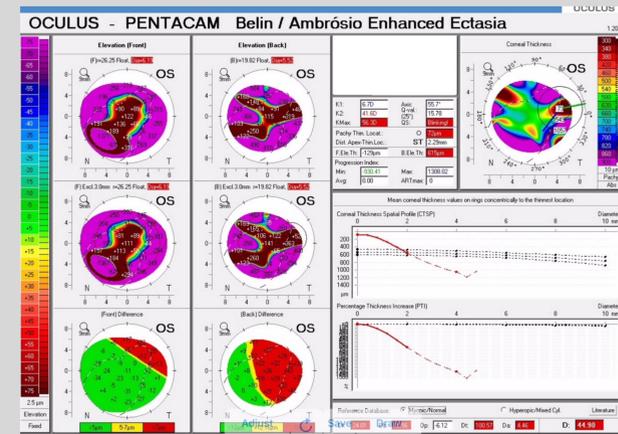
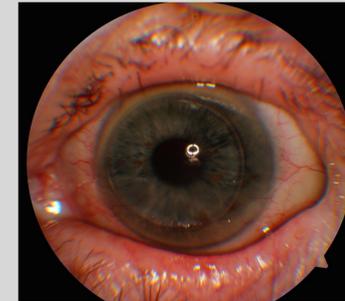


Figure 1: Included is the Pentacam from the left eye which shows extremely variable results due to the badly distorted anterior corneal surface. Elevation values are not predictable and simulated K's range from 6.7 to 41.6, which are difficult to derive an initial fit for empirical purposes. Therefore, it was necessary to perform a diagnostic trial lens fit.

The patient was fit with an Essilor BEC lens cone design. While the patient did not show keratoconus, a cone design GP was chosen because of its improved back surface geometry and small design, which was better suited to the patient's small lid aperture and the small corneal surface for fitting. Because of the extensive fibrosis and visual axis involvement in the right eye, the decision was made to fit the left eye only. Due to the topography and K's being impossible to collect, trial and error methods were used to approximate a best fit scenario. Incredibly, the best corrected visual acuity achieved in the left eye was 20/40 -3. WH reported great comfort and much better vision. Upon manufacture and dispense, the patient experienced some challenges with insertion and removal, but was aided by her son on a daily basis. She has been wearing the lens successfully for eight months at the time of this poster generation.



Picture 1: Left eye with RGP in place. The cornea looks deceptively better because the attention is focused on the appearance of the lens. However, 2+ neovascularization, peripheral scarring, and fibrous tissue extends across the corneal surface as a result of persistent lagophthalmos and severe dry eye. The patient is wearing an Essilor BEC lens with BC 6.80 and Diameter 8.70.



Picture 2: Left eye without the lens, showing evidence of 2+ neovascularization and fibrous tissue peripherally extending inward across the corneal surface.

Discussion

While the work of Jaynes, Edrington, and Weissman was specifically referenced towards sclerals and their data showed that prescribing a high DK, low corneal vault, and a minimally acceptable GP thickness was the most beneficial in minimizing hypoxia, it is well known and can be easily inferred that intralimbal lenses will be thinner and have less vault and likely provide more oxygen. (Jaynes, Edrington, & Weissman, 2015) If neovascularization of the cornea is present as it was in this case, it is crucial to fit an intralimbal GP lens/tear system to minimize the risk of hypoxia.

It is important to note that an older patient may need to have help to assure proper insertion and removal of the lens each day. Recruitment of a family member can be particularly useful in these instances. Great caution should be exercised if considering sclerals, as evidenced with this patient and her incredibly small lid apertures. In the elderly patient, and especially in the presence of pre-existing neovascularization, it may be necessary to have more frequent visits to monitor for possible progression of the neovascularization, ensure that a family member is still able to achieve insertion and removal of the lens, and verify that the lens is properly centering.

Conclusion

WH is a prime example of how useful GP lenses can be for elderly and reduced vision patients. Improving her vision to 20/40 acuity restored her dignity by allowing her to see and do simple daily tasks such as reading larger print books and ambulating more easily and safely, changing her life completely.

References

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- Jupiter, D. G., & Katz, H. R. (2000). Management of irregular astigmatism with rigid gas permeable contact lenses. *Eye & Contact Lens*, 14.
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