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Poster Abstracts

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Profilometry-guided freeform scleral lenses to manage complex corneas

Bernd Brueckner, Cian Gildea

Affiliation: Appenzeller

Introduction: Scleral contact lenses are unquestionably an excellent corrective option for patients with irregular corneas. However, just as fingerprints are unique, so are the optical profiles of every eye. Subtle variations in corneo-scleral shape and elevation influence how a lens fits and performs. Corneo-scleral profilometry now allows freeform lens designs to match each patient's individual topography with exceptional accuracy, enhancing both vision and comfort.

Case Report: Two patients presenting with complex anterior segment anatomy were included in this case series. Profilometry measurements of both patients were obtained using the Eye Surface Profiler (ESP, Eaglet Eye, The Netherlands). For each patient, the accurate corneo-scleral elevation data were used to design a fully a customized i-Shape freeform scleral lens (Appenzeller Kontaktlinsen, Switzerland). At follow-up, both patients reported sustained comfort and clear vision, with no more midday fogging. Slit-lamp examination confirmed healthy ocular surfaces, and a good fit with absence of impingement. and no recurrence of midday fogging.

Conclusion: In eyes with significant corneal irregularity, such as those following LASIK, bilateral Penetrating Keratoplasty (PKP), or advanced Keratoconus (KC), achieving an optimal scleral lens fit can be challenging. These cases underscore the critical role of corneo-scleral Profilometry and freeform lenses in fitting complex ocular cases. By leveraging true elevation data, the ESP facilitated precise, fully customized i-Shape freeform scleral lens designs, providing superior fit, comfort, and vision correction. As a result, these patients achieved stable vision and comfortable full-day wear.