



SALUS
UNIVERSITY

Visualizing Scleral Lens Landing Zone Angles with OCT and White-Light Photography

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Introduction

When seeking to achieve a proper scleral lens fit, the alignment of the conjunctival surface with the posterior landing zone of a scleral lens is of the utmost importance. The alignment of the scleral landing zone directly impacts suction, centration, and tissue compression. In turn, maximizing patient comfort, while minimizing both tear lens fogging and negative physiological impacts, are in large part dependent upon optimal tangential alignment.

Slit lamp evaluation using white light has been the standard tool used to assess this congruity since the advent of such lenses. Recently, there has been increasing interest in the use of OCT technology for lens edge evaluation given the potential benefits of the cross-sectional nature of the imaging and the increasing ubiquity of the technology in many optometric practices. However, little has been done to systematically compare imaging of landing zone angles on the ocular surface using OCT and white-light slit lamp photography. This investigation aimed to compare such imaging of different trial lenses, varying only the landing zone angles while keeping other variables constant. The hope is that this compilation of images can serve as a teaching and reference tool for practitioners—neophytes and experts alike.

Methods

A single subject was enrolled at The Eye Institute of Salus University and was provided informed consent. The subject was confirmed to have normal corneal anatomy by Pentacam® (*OCULUS*) tomographical imaging. The subject was fit in-office with a standard Zenlens (*Bausch + Lomb SVP*) fitting set. Based on the in-office assessment, five scleral lenses were ordered with all parameters held constant aside from varying angles of the scleral landing zone ("Advanced Peripheral System" or APS as termed by *Bausch + Lomb SVP*).

The lenses all shared the following parameters:
Des: Prolate / Sag: 4.750mm / Diam: 16.0mm / BC: 7.10mm / Power: -3.75 D / CT: 0.35mm

Lenses were ordered with the following scleral landing zones geometries:
APS Flat 12, APS Flat 6, APS Standard, APS Steep 6, and APS Steep 10.

On separate visits, each lens was applied to the eye and allowed to settle for two hours. At the two-hour mark, lens edge relationship was documented with OCT imaging and white-light slit-lamp photography. Slit lamp photographs were taken of the nasal portion of each lens and OCT cross-sectional studies of the same location were obtained.

Results and Conclusions

Collected studies are organized below in a systematic, visually-conductive manner for observation. These images, provide the viewer with side-by-side comparative images of scleral lenses of varying landing zone angles, as visualized with OCT studies and white-light photographs. The observer can utilize these results to both understand what a "good" alignment looks like, as well as estimate how many "steps" of change may be necessary to achieve a better fit when working with a Zenlens design.

The standardized visualization of the landing zone of scleral lenses with OCT and white-light photography will prove valuable to practitioners as they seek to learn to fit scleral lenses, maximize their fitting efficiency, and communicate with manufacturing laboratories about necessary adjustments to landing zone parameters.

Acknowledgements

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Zenlens
APS **Flat 12**

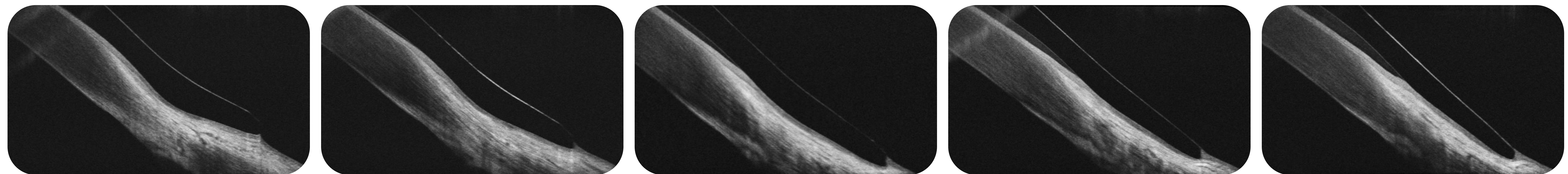
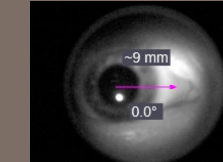
Zenlens
APS **Flat 6**

Zenlens
APS **Standard**

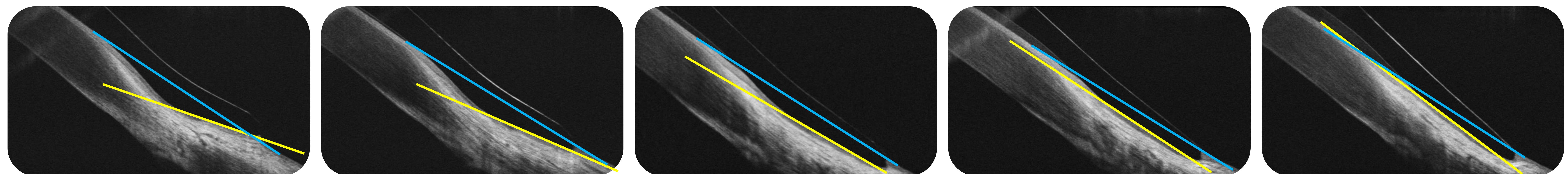
Zenlens
APS **Steep 6**

Zenlens
APS **Steep 10**

OCT Images of Nasal Haptic



OCT Images of Nasal Haptic –angle of posterior surface of haptic in **yellow**; approximate natural angle of conjunctival surface in **blue**



White Light Images

