



Livin' on the Edge (Profile)

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Introduction

When fitting a scleral lens, practitioners often get caught up in the central vault during their evaluation and do not pay as much attention to the scleral landing portion of the lens, which is equally important. Patients may experience different comfort levels with numerous lenses, yet all seem to have the same central vaulting. The main difference is often the scleral landing area. This poses the question of "What is the ideal edge profile for a scleral lens?"

Based on evaluations at the Vision Research Institute in the Michigan College of Optometry, three key elements were identified in an ideal edge profile:

- 1) Adequate limbal clearance
- 2) Appropriate distribution of weight upon landing
- 3) Rounded edge profile

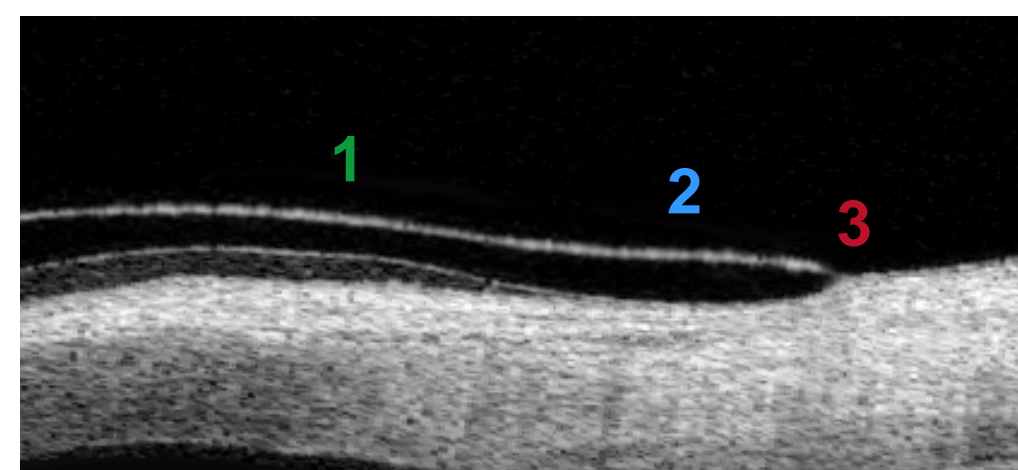


Figure 1

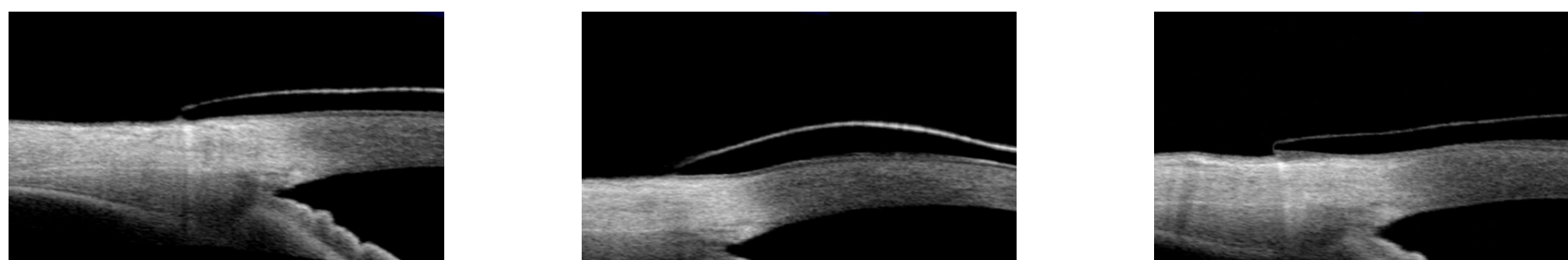
Methods

Scleral and corneal-scleral lenses were fit using diagnostic sets for 11 different popular lens designs. The same subject was used for all lenses. The subject was chosen based on average/normal parameters (horizontal visible iris diameter and keratometry readings) and no corneal irregularities or pathology. Each test lens was then randomized to determine the order of evaluation. Fitting was based on each individual fitting guide for that lens design. Lenses were applied until an optimal or best fit (according to the manufacturer) was achieved by using only the diagnostic set. Each lens was allowed to settle for 20 minutes prior to scanning the center and edge profiles with anterior segment OCT.

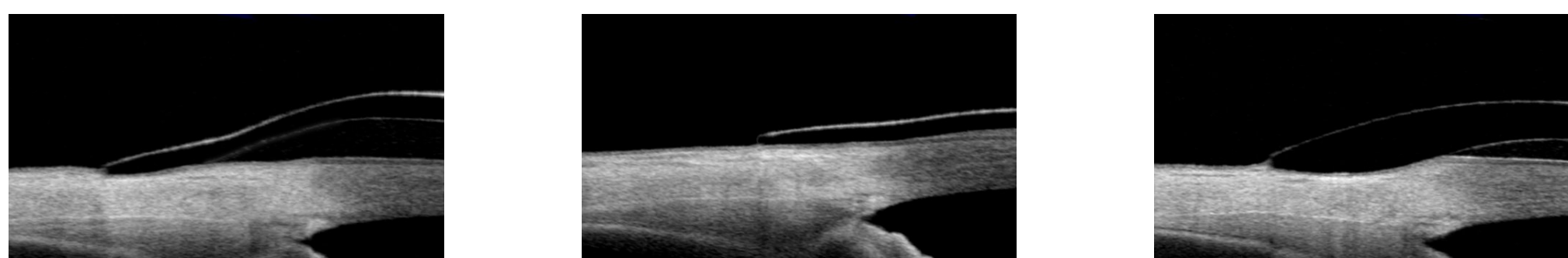
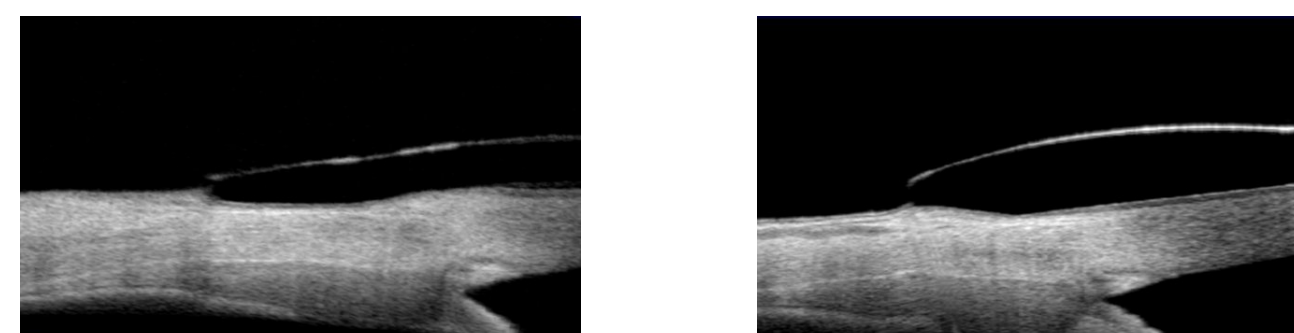
Results

Although the test lenses were all based on the same ocular data, there were differences in the resultant lens parameters from one manufacturer to another. All lenses had appropriate central vault (according to manufacturer guidelines) when anterior segment OCT was performed.

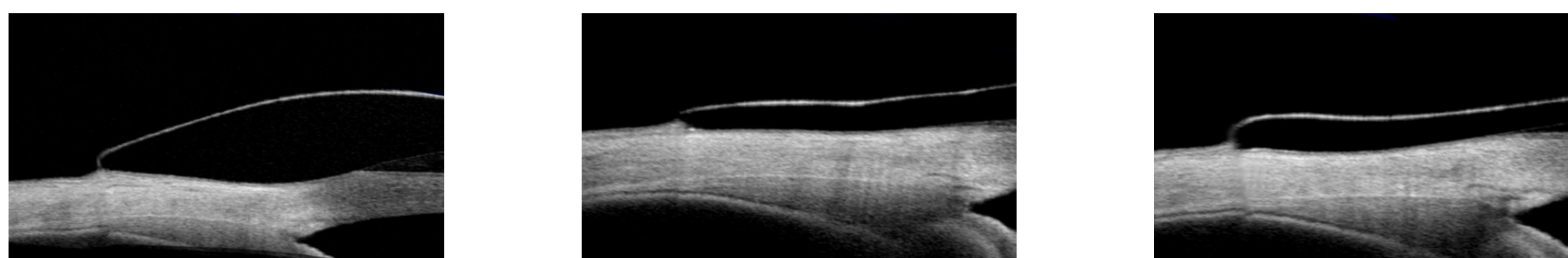
14.5 - 15.0 mm (Corneal-Scleral)



15.8 - 16.2 mm



18.0 - 18.2 mm



Discussion & Conclusion

The findings show a significant difference in edge profile between manufacturers. Varying the amount of limbal clearance, the area of weight distribution, and the shape of the edge profile shows each design is indeed different.

If a patient notes poor comfort during blinking this may be attributed to the shape of the edge. If inadequate limbal clearance is present, fluorescein will not be visible over that area when scanning with an optic section (*Figure 2*) and a ring of corneal staining around the limbus is likely to be noted upon removal of the lens. Minimal area of weight distribution on landing will impinge blood vessels and cause blanching (*Figure 3*).

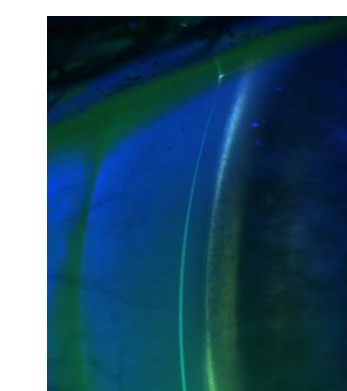


Figure 2

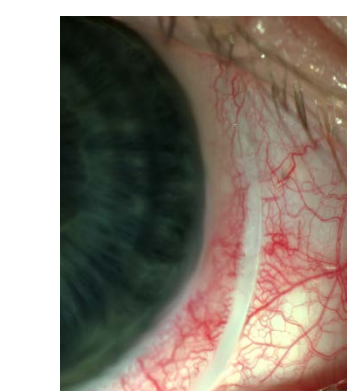


Figure 3

When appropriate limbal clearance is present, a thin band of fluorescein will be present below the limbus with an optic section scan (*Figure 4*) and no blood vessels will be impinged beneath the lens (*Figure 5*).

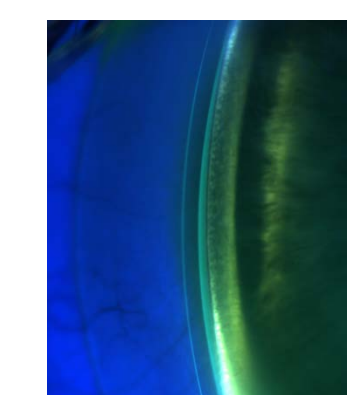


Figure 4

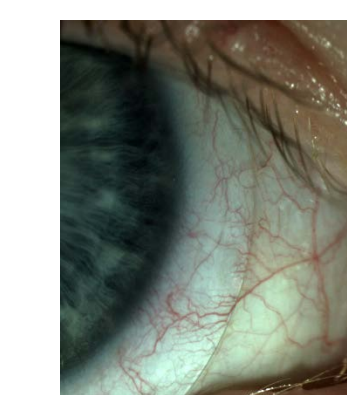


Figure 5

Further study with a larger sample size to look at various vaults, powers, and manufacturer repeatability is necessary to ensure the accuracy of this type of competitive analysis.