

How Toric Should Scleral Lenses Be For Most Patients?

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Introduction

A scleral lens with a toric haptic or alignment zone is far more common today than ever before. For many designs, the standard diagnostic and custom lens creates a non-symmetric landing on the scleral surface. This has been shown to improve comfort, alignment and physiologic response in scleral lenses.¹⁻³ Previous studies have suggested the average scleral toricity is between 50-225 depending on the axis of measurement and instrument employed.⁴⁻⁸ However, what is the average toricity required in the landing zone of the lens to fit most patients? What range of toricity do scleral lenses require to manage the various eye shapes and conditions? And how often are we likely to vary the toricity of landing?

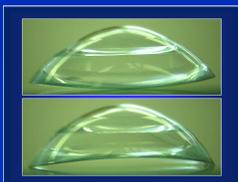
Methods

Retrospective data was collected over a one year period, between April 1, 2018 and March 30, 2019. This included every Ampleye 16.5mm diameter scleral lens manufactured and delivered by Art Optical (Grand Rapids, MI) during the sample period. The volume of lenses supplied is proprietary however, considering the size of Art Optical and its international reach in distribution, the number of patients and eyes can be considered substantial and measured in the tens of thousands. The Ampleye scleral lens is available in toricity steps of 25 microns from 0.0 (symmetric) to 350 microns of sagittal toricity. Table 1 exhibits the range of available toricities along with the percentage of lenses ordered in the various toricities.



Figure 1: Numerous OCT studies have indicated the average scleral toricity to be between 50-225 microns at a 15mm chord depending on the cohort.

Figure 2: Manufacturers provide scleral lenses with varying toricities in an attempt to best align to the toric or asymmetric shape of the sclera.



Results

Table 1 displays the percentage usage of each toricity from symmetric construction (0 microns) to the highest availability (350 microns). The most common landing employed was the 150 micron toricity which represented 76.4% of lenses. The next most frequently ordered was the 200 micron toricity representing 8.5% of lenses. Toricities from 175 – 250 microns represented 14.63% of lenses ordered. The highest toricities from 275 – 350 microns represented only 1.75% of orders. In lower toricities of 75 – 125 microns, 5.34% of orders placed required this range. Only 1.54% of lenses were required between 0 – 50 microns and therefore, 98.46% of orders had toricities of landing of ≥ 75 microns.

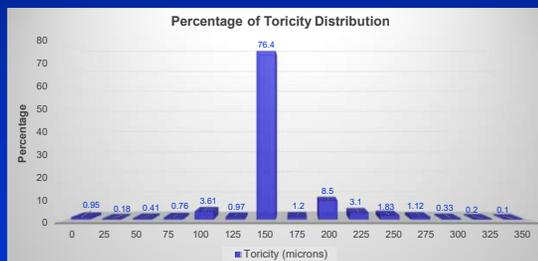


Table 1: The distribution of toricities ordered is displayed by percentage with the X-axis defining the toricity range in microns and the Y-axis defining the percentage each toricity represented in the total number of orders during the study period.

Discussion

This particular design has a standard 150 micron toricity in the diagnostic set. This would contribute to the high percentage of custom orders in the same 150 micron toricity range. Therefore, what is left unanswered is whether a slightly higher or lower amount of toricity would improve the fit, comfort, physiologic response or vision in a broad cross section of patients? Additionally, this study does not define what toricity should be prescribed on a specific eye or condition. However, the strength of this study is the significant number of eyes that it represents across a long data collection period to best understand prescribing trends.

Conclusion

From this review of the order patterns, the findings would suggest the following clinical considerations:

- 1) Scleral lens diameters of 16.5mm with toricity in the landing appear well tolerated by a significant cross section of the population.
- 2) A low percentage of patients require a symmetric or minimal toricity landing to achieve success.
- 3) A low percentage of patients require a high or extreme scleral toricity or asymmetry. These findings would suggest that a 150 micron toricity in the alignment zone of a 16.5mm scleral lens should create an acceptable alignment with the sclera in a high percentage of eyes.

References & Acknowledgements

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