

Twinkle Eyes: A Unique Way to Manage IOL Reflections

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Background

- The “twinkle” patients are describing is actually the sum of the third and fourth Purkinje images, plus the additional internal reflections, generated by the IOL optic.



- This is due to the phenomenon that occurs when light passes through a surface separating two media with different indices of refraction.

Material	Index of Refraction
Aqueous	n= 1.337
Crystalline lens	n= 1.42
Acrysoft Acrylic (SN60WF)	n= 1.55
Tecnis acrylic	n= 1.47
Silicone Optics IOL	n= 1.422

- The Fresnel equation can calculate the coefficient of reflection (R) for a light ray passing perpendicular to the IOL optic front surface from the aqueous.
- The light ray enters the IOL optic and continues to be reflected internally, this is the total reflection.
- Acrysoft acrylic lens (total reflection % 1.08) is greater than what is seen with Tecnis acrylic lens (total reflection % .45) and Silicone optic IOLS (total reflection % 0.29).

Case Details

61 y/o F s/p PCIOL AcrSof SN60WF lens OU complains of a reflection from her IOLs being obvious for work. Patient has an ocular history of Fuchs’s endothelial dystrophy. Best corrected vision is 20/20 OD and OS. Keratometry OD: 44.50/46.00 OS: 43.25/43.75. Average pupil diameter is 3.5mm, dim 4mm, light 3mm OU. Custom soft contact lens fitting using Orion trial set was performed in office.

Results

The patient was fit in Orion Biosport soft contact lenses. The lenses had 4.0mm suntac tint with a base curvature of 8.6 and diameter of 14.5. This 4mm of suntac tint completely resolved the issue of reflection from the patients IOL.



Conclusion

In conclusion the natural lens reflects less than 0.2% of light, while Acrysoft IOL reflects more than 1%, which is why such a large reflection is seen

References

[Refractive index and its impact on pseudophakic dysphotopsia](#)

Bryce R Radmall, Anne Floyd, Zack Oakey, Randall J Olson

Clin Ophthalmol. 2015; 9: 1353–1358. Published online 2015 Jul 20. doi: 10.2147/OPHTH.S86980