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# Fresnel Prism for a Patient with a Scleral Lens

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## BACKGROUND

A 41-year-old male was previously diagnosed with keratoconus, and after a corneal transplant OD in 2011 and scleral lens fitting OS in 2021 achieved visual acuities of 20/40 OD (no correction, pinhole to 20/25) and 20/40 (corrected, no improvement with pinhole). He was happy with his vision overall, particularly considering that his vision was 20/600 at 6 feet when he first transferred to our clinic in 2021.

Despite his excitement over such great improvement in his vision, there was one issue: he was experiencing intermittent diplopia now that vision was relatively equal between eyes. A constant left exotropia had been noted since his first appointment for the scleral lens fitting, however he had always suppressed the eye due to the poor vision. Now that the vision was improved, he was symptomatic.

## CASE PRESENTATION - VISIT #1

The patient reported that his diplopia was primarily horizontal, and upon further questioning revealed he was most symptomatic while watching TV in the evening.

**TABLE 1:** Visual Efficiency Exam Summary

Distance VA	OD - 20/40-2 sc	OS - 20/40-2 cc
Distance Cover Test	30 CLXT, 4RHyperP – control score 2, comitant	
Near Cover Test	18XP', 4 RHyperP'	
Stereo	No stereopsis (Randot local or global)	
Worth 4-Dot	Shallow diplopia at near Shallow intermittent suppression at distance	
Pertinent Anterior Segment Findings	OD: junctional haze secondary to PKP transplant, 2+ pigment inferiorly; (-) sutures	
	OS: apical thinning, trace apical scar, (+) Fleischer's ring, Vogt striae	
Over-refraction (DVA) (OU 20/25+1)	OD: pl-0.50x045 (20/40)	OS: -0.25-0.75x030 (20/30)

## CASE MANAGEMENT

The patient's circumstances did not allow for vision therapy at the time, so prism options were explored. Fresnel prism was considered first, as the intermittent and fluctuating nature of the patient's binocularity meant that the amount of prism that would best suit the patient may vary from what he accepted in-office. A spectacle prescription was released with his small over-refraction, allowing insurance to contribute to a pair of glasses to which prism could be applied.

**TABLE 2:** Visits

Visit 1	Visit 2	Telehealth 1	Visit 3	Telehealth 2
VEE + ORx spec Rx released	In-office prism trial, 10pd Fresnel applied OS	Symptoms persist, patient asks to increase prism	10pd removed, 15pd applied OS	Patient happy with 15pd OS

## VISIT #2

Once he had his glasses, the patient appreciated 10pd BI Fresnel applied in-office. He preferred monocular 10BI over smaller amounts of binocular prism. The Fresnel prism and instructions for care were dispensed with the understanding that the prism could be increased if the patient became more symptomatic outside of the office. The patient understood that the prism did not need to be worn full-time, only when he was symptomatic.

## VISIT #3

Three weeks later, the patient reported he was still experiencing double vision with the prism glasses, mostly at night, and that he had to work hard to make the image single. He returned to the clinic for additional prism trialing, at which time the prism was increased to 15pd BI. One week later the patient reported he still had occasional diplopia but was able to fuse with effort and overall felt more comfortable with 15pd than 10pd.

## CONCLUSIONS

Improving a patient's visual acuity with management of their ocular disease can be life-changing, however it may also reveal previously undiagnosed or asymptomatic binocular or functional vision concerns. Whether or not vision therapy is a viable option, Fresnel prisms can be a great resource for patients as they create an opportunity to provide immediate relief of debilitating symptoms, with a more flexible trial period and reduced wait time compared with ground-in prism.

**TABLE 3:** Working with Fresnel Prisms

PROS	CONS	TIPS
<ul style="list-style-type: none"> <li>- Easily removed or adjusted</li> <li>- Can be used for temporary or permanent purposes</li> <li>- Lightweight</li> <li>- ~17 steps, ranging from 1 to 40pd</li> <li>- May adjust size, shape to fit individual needs</li> </ul>	<ul style="list-style-type: none"> <li>- VA typically degraded with &gt;20pd</li> <li>- Risk of being lost</li> <li>- Cosmesis</li> <li>- Prone to becoming dirty</li> </ul>	<ul style="list-style-type: none"> <li>- Instruct patients on proper care</li> <li>- Discuss impact on vision, clarity</li> <li>- Split high amounts between eyes</li> </ul>

**Example of BO prism OS**, as was used in our patient. Ideally, the prism would be fit so that the prism fills the entire lens.



## REFERENCES

Available upon request.

## CONTACT

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