

# From the Ground Up: Building a Soft Prosthetic Lens

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## INTRODUCTION

Ocular prosthetics comprise a wide variety of lens types and designs. One main area of differentiation is whether the prosthetic is a hard material, such as a scleral shell, or a soft contact lens. Even within the realm of soft contact lenses, there are significant differences, and multiple lens designs by which to help alleviate patient symptoms. These lenses can be helpful functionally, to allow for visual comfort, cosmetically, or as a combination of the two. For cosmesis, these lenses are able to be tinted or painted in order to mask a scarred or abnormal eye appearance relative to the fellow eye. For patient comfort, this can include color differentiation and glare control. There are many forms of ocular conditions, making glare control and post-concussion a common use for prosthetics. Regardless of the symptom, soft prosthetic lenses have a plethora of uses and can help many patients live more comfortably and confidently with their day to day activities.

## CASE REPORT

AF is an eighteen year-old hispanic male who presented to the Illinois Eye Institute with complaints of significant photophobia and glare, as well as poor cosmesis of his right eye.

### Ocular History

The patient had a penetrating globe injury to the right eye at age five from a radio antenna. Subsequently, the patient has had multiple surgeries in Puerto Rico to repair the globe, as well as a cataract extraction with insertion of a posterior chamber intraocular lens (PCIOL). In addition, he has since been diagnosed with a cone dystrophy and optic atrophy of the left eye, accounting for an overall decrease in vision.

**Medical History / Medications:** Unremarkable

### VA sc:

- OD: 20/400, PHNI
- OS: 20/80-1, 20/80+1 with PH

### Slit Lamp Findings

- Traumatically dilated, non-reactive pupil OD. Pupil is peaked inferiorly, with an iridectomy at the 1:00 position
- 2.5mmx2.5mm sub-epithelial scarring OD at the 5:30 position (site of globe penetration)
- PCIOL: Clear, centered, with iris capture inferiorly OD
- All anterior segment structures unremarkable OS

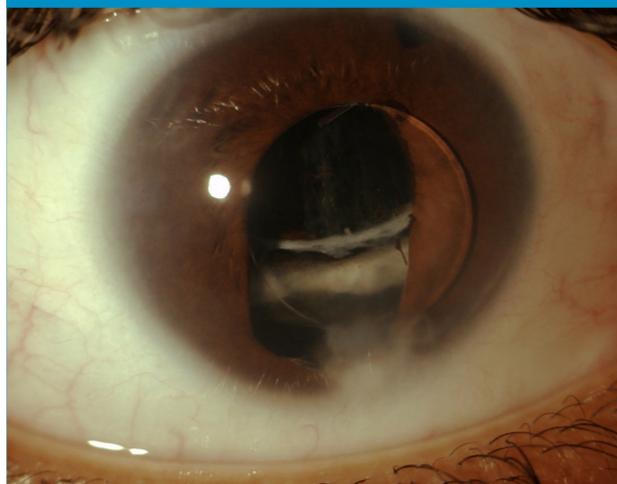
### Lens Design

With consultation, the lens parameters that would be most appropriate for the patient were created. The lens has a 15.0 diameter and 8.90 base curve due to his flatter corneal curvature. The lens has a 4.2 mm clear pupil and is built with the U2 (brown under print - see Figure 3) + 57V (orange) + 55V (pecan) colors, in that order to best match the fellow eye. Because of the patient's other ocular history, no improvement in vision was found on over-refraction, so the lens is Plano in power.

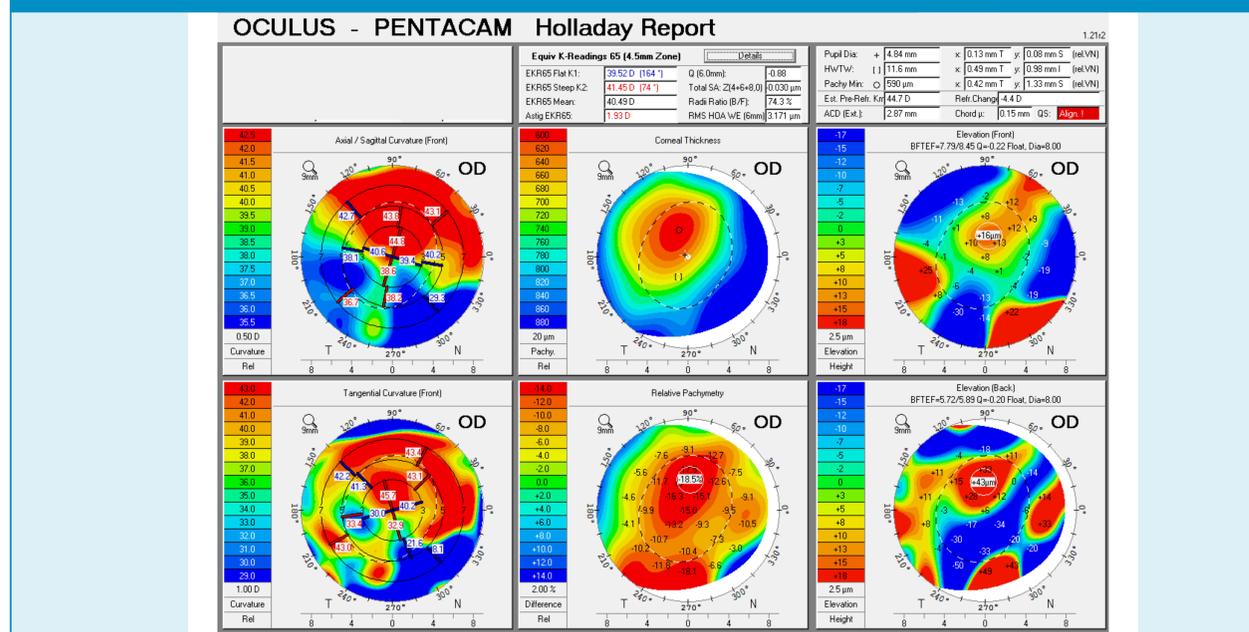
## DISCUSSION

The patient's main complaints are photophobia and significant glare secondary to his non-reactive pupil. Because of this complaint, the patient was fit into an Orion soft prosthetic - Biocolors soft contact lens. This particular lens is built from multiple lenses in tandem from the under print up to iris colors, and even details such as a limbal ring. At the diagnostic fitting visit, multiple lens options can be trialed on a patient by stacking the lenses on the eye in different sequences. The Orion prosthetic fitting set is designed so if you layer the lenses, specifically the iris colors and detail, in a particular order, it will look different than if the order was changed. There is significant creativity involved in designing the lens for each individual patient.

**FIGURE 1:**  
Appearance of the right eye



**FIGURE 2:** Pentacam topography and pachymetry of the right eye



**FIGURE 3:**  
Appearance of the soft prosthetic lens on the right eye (Under print only)



**FIGURE 4:**  
Consultation suggestion for lens appearance (Under print plus two iris colors)



For our particular patient, during the diagnostic fitting visit, the patient experienced less glare complaints once an underprint was placed on the eye. By taking a photo of the fellow (left) eye and sending this to the consultants at Orion, they were also able to assist in determining which lens sequence would be most appropriate to best-match the cosmesis between the eyes.

## CONCLUSION

As there are many different tissues that comprise the globe and orbit, ocular trauma, and specifically penetrating globe injury, can cause multiple complications and longlasting damage. When this occurs, or in any patient with an irregular pupil or complaints of glare and photophobia, ocular prosthetics can be a benefit to ameliorate their complaints. The Orion soft prosthetic lens makes many attempts to best match the cosmesis of the other eye, as well as offering many options to decrease the amount of light passing through the lens for patient comfort. Soft prosthetic lenses have the ability to significantly change a patient's daily life.

## REFERENCES

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