

# A Bright Idea for Photophobia: Managing Aniridia Symptoms with a Prosthetic Contact Lens

Jessica Walter, OD



## Introduction

Aniridia is a rare disorder in which the iris is underdeveloped or absent, affecting up to 1 in 40,000 people. It is most often a bilateral congenital condition. Others may acquire traumatic aniridia through injury or surgery. Common symptoms include photophobia, glare, and halos due to the loss of the eye’s natural aperture. Various contact lenses are available to manage these symptoms. This case discusses the use of a soft prosthetic iris-occluding contact lens for aniridia.

## Case Presentation

A 47-year-old Hispanic male was referred by his glaucoma specialist for a prosthetic contact lens evaluation due to aniridia in the right eye. The cause of his aniridia was unknown but assumed to be traumatic or surgical.

**Chief complaint:** Right eye light sensitivity, occurs in bright light and sunlight; also glare at night

**Ocular history:** Recurrent Varicella zoster virus-induced anterior uveitis OD, secondary glaucoma OD

**Ocular surgeries:** Cataract extraction w/ IOL OD, Ahmed valve OD

**Ocular medications:** Valacyclovir 1g qd, prednisolone acetate qid OD, dorzolamide/timolol bid OD, brimonidine bid OD, artificial tears prn

**Medical history:** Human immunodeficiency virus, anxiety disorder, depression, hypertension, hypercholesterolemia

Table 1. Initial Examination Data

	Right	Left
Manifest Refraction	+0.75-1.50x080	pl-0.50x085
BCVA	20/60	20/15
Lids/Lashes	Normal	Normal
Conjunctiva/Sclera	Superior temporal bleb	White and quiet
Cornea	1+ SPK, 1+ stromal haze, 1+ KPs	Clear
Anterior Chamber	Deep and quiet, (+) Ahmed valve	Deep and quiet
Iris	Aniridia	Brown, flat
Lens	IOL, tr PCO	1+ NS
IOP	18mmHg	20mmHg

## Methods and Results

A custom iris-occluding soft prosthetic contact lens was recommended for the right eye.

Keratometry measurements were obtained on the right eye. Pupil size and visible iris diameter were measured on the normal left eye to ensure an anatomical match. An iris swatch wheel was used to select a color match via observation, flash photography, and non-flash photography.

**K’s OD:** 40.75/42.75 x 070  
**OS pupil size:** Bright: 2.5mm, Dim: 6mm  
**HVID OS:** 11.5mm

- Clinical Outcomes:**
- OD BCVA: 20/40
  - Well-centered fit with adequate coverage and movement
  - No corneal staining or edema upon lens removal
  - Resolution of light sensitivity and glare, improved clarity of vision, improved cosmetic appearance

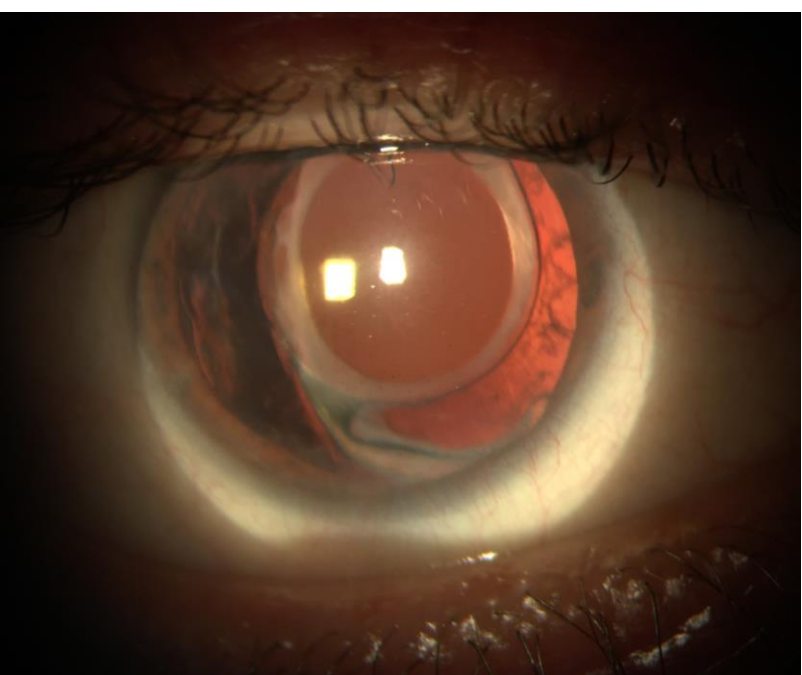


Image 1. Slit lamp photo of the right eye, showing aniridia, intraocular lens, and Ahmed valve (superior) via retroillumination.

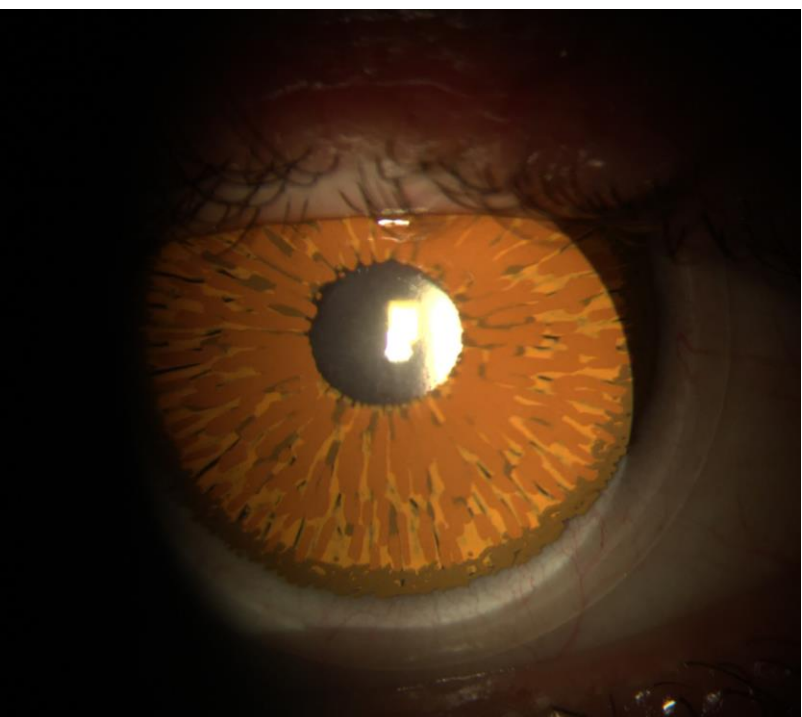


Image 2. Slit lamp of the right eye with initial prosthetic contact lens with computer-printed iris. The lens fit well and provided good vision, but was deemed to be too light in color.

## Discussion

The iris is the eye’s natural aperture, responsible for controlling the amount of light that can enter by regulating the size of the pupil. When part or all of the iris tissue is missing, excess light rays are incident on the retina, causing significant photophobia, glare, and aberrations.

Management options for these symptoms range from spectacles to custom-made prosthetic contact lenses. Spectacles may be prescribed with tints to be worn both indoors and outdoors, reducing the amount of ambient light entering the eye. Photochromic spectacles and contact lenses are also an option, however, the amount of darkening of these lenses may not be adequate for the severity of the condition in very bright settings. Standard-manufactured color contact lenses may provide a cosmetic benefit, but because the iris color is printed on an otherwise clear lens, they prove minimally effective at reducing photophobia and glare. In this case, the patient had previously tried wearing a widely available cosmetic brown contact lens which provided no improvement in his visual symptoms. Thus, a custom-order soft prosthetic lens was recommended.

Image 3. External photo of the patient wearing the final prosthetic lens in the right eye. Note the excellent cosmetic match to the normal left iris.



Table 2. Final Contact Lens Parameters

Lens	Base Curve	Diameter	Power	Color	Pupil
Cantor Prosthetic	8.9mm	14.5mm	+0.50-1.50x080	Brown #9, black underprint	Open, 3.5mm

Soft prosthetic contact lenses for aniridia can improve both function and cosmesis. A black lens underprint with an open pupil acts as an artificial iris, limiting the amount of light that may enter the eye. Iris artistry, which may be computer-generated or hand-painted, is added to match the normal eye as closely as possible. Depending on the selected lens design, the color may be determined via trial of in-office diagnostic lenses, comparison of printed swatches, or taking high-definition photos for the lab to then custom match.

When designing a lens, pupil sizes in bright and dim lighting and visible iris diameter should be obtained from the normal eye. Keratometry measurements of the eye intended for lens wear should be obtained, but if the cornea is significantly disfigured and unable to be measured, values from the normal cornea may provide a starting point.

This patient suffered from unilateral traumatic aniridia. Because his childhood ocular development was normal, his vision was well-correctable and able to be improved with contact lens wear. The diagnosis of aniridia typically refers to the congenital, bilateral condition, which is often accompanied by foveal hypoplasia, poor visual acuity, and nystagmus. Patients with congenital aniridia may also benefit from the use of prosthetic contact lenses to manage symptoms and improve cosmesis, but visual acuity prognosis should be guarded.

## Conclusion

Glare and photophobia due to aniridia or other iris structural abnormalities can be managed with tinted spectacles or contact lenses that are tinted, photochromic, or prosthetic. A prosthetic contact lens has the added benefit of improving the cosmetic appearance of the eye. While a clinician’s priority is to properly manage a patient’s multiple ocular diseases, it is important to consider that the patient’s main priority may be their daily experience and visual function. Optometrists can make a significant improvement in a patient’s quality of life by offering or referring out for these contact lens options.

## References

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