

# Piggybacking prosthetic color contact lens and rigid gas permeable lens in a traumatic aniridia patient

Anna Xie OD; Shikha Yadav OD, FAAO; Janet Garza OD, FAAO

University of Houston College of Optometry

## BACKGROUND

- Each year in the US, there are approximately 2.4 million new ocular trauma incidents occurring.<sup>1</sup>
- Sustained ocular injuries can cause complications leading to significant changes in refractive error and ocular structures, affecting patient quality of life.
- Contact lenses can be used to correct refractive error as well as for therapeutic use.
- This case discusses the management of a 70 year-old patient with a history of traumatic corneoscleral laceration by using a piggyback contact lens system to improve cosmesis and his quality of life.

## CASE DESCRIPTION

- Patient demographics: 70 year old Caucasian male
- Purpose of Visit: Contact lens re-fit OD
- Chief Complaint: Patient would like to improve cosmesis and comfort as well as reduce glare and photophobia. Patient is happy with current monovision set-up using right eye for near and left eye for distance.

### Significant ocular history

- Corneoscleral laceration OD
- Vitrectomy with subsequent endophthalmitis OD
- Cataract extraction OD
- Glaucoma tube shunt OD

### Current topical medication

- Cosopt BID OD

BCVA with monovision contact lens:  
OD J1+, OS 20/20

### Pertinent Exam Findings:

	OD	OS
Conjunctiva	Superiotemporal shunt with elevated plate	White and quiet
Cornea	Central linear laceration scar with buried sutures	Clear
Iris	Aniridia	Flat and even
Lens	Aphakia	Tr NS
Vitreous	Surgically removed	Syneresis
Optic nerve	0.75 C/D with thin superior and inferior rim	0.15 C/D with healthy rim tissue

### Lens Design

#### Original lens parameters

	Brand	Base Curve (mm)	Diameter (mm)	Power (D)	Additional Specs
OD	Essilor Tricurve	7.34	9.0	+10.00	
	Ocu flex	8.60	14.5	+12.00	Baby blue transparent tint with 4mm clear pupil
OS	BioTrue 1Day	8.60	14.2	+2.50	
Fit:	OD – RGP showed central bearing with excessive edge lift OS – good centration, movement, coverage				

#### Final lens parameter in OD to best match OS:

	Brand	Base Curve (mm)	Diameter (mm)	Power (D)	Additional Specs
OD	Essilor Tricurve	7.26	9.5	+10.00	Green color with steep peripheral curve
	ABB concise colors	8.60	14.5	+12.00	3.3mm pupil size, U3 underprint, 41 aqua enhancer, CB1 color
Fit:	- RGP showed good lid attachment with adequate fluorescein pattern - Soft CL showed good centration, movement, coverage				
Patient response	- The patient reported overall increased of comfort and resolution of glare with new system - The patient was satisfied with a smaller pupil size compared to OS (as shown in figure 1B) due to the significant reduction in photophobia				

Follow-up: Patient will return to clinic in 3 months for contact lens check



A



B

Figure 1: Photos of patient without contact lenses in the right eye (A) and with the piggyback system in the right eye to best match the fellow eye (B).

## CASE DISCUSSION

- A corneal RGP was used to correct the corneal irregularities (shown in figure 2A) resulting from the injury and subsequent ocular surgeries by providing a smooth optical surface. This allows significant improvement in vision over spectacle and soft contact lens only options. Scleral lens was not fit due to the presence of aqueous shunt device and the lack of options to include an artificial iris to reduce glare complaints.
- ABB concise prosthetic color contact was chosen to piggyback underneath the corneal RGP. The standard pupil size of 4.2mm was chosen originally to match the left eye. However, patient was still photophobic. Therefore, a 3.3mm pupil size was finalized with a U3 underprint to minimize the amount of light entering. Patient was very happy with the outcome and was not concerned with the induced anisocoria by the contact lens. Another reason ABB concise was chosen for this case was because it allows different combination of colours, undertones, starburst effect and the option of limbal ring to be trialed in office to best match the fellow eye.
- The piggyback system also helped with reducing localized pressure on the cornea from the RGP to prevent scarring and visual discomfort.

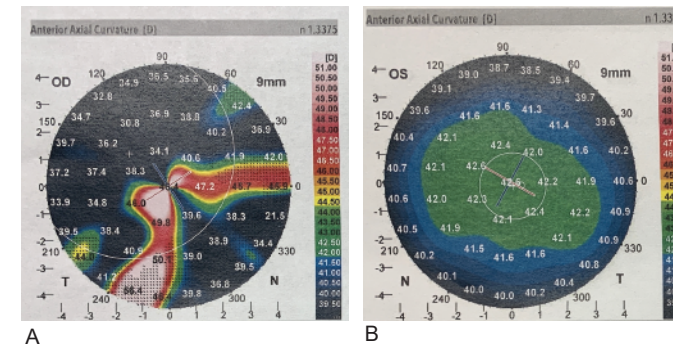


Figure 2: Axial map of patient's right eye (A) which indicates irregular corneal surface and left eye (B) imaged using Gallei topographer.

- Other considerations
  - Oxygen transmissibility/permeability
    - Combined system has a lower oxygen transmissibility compared to a single lens
      - Low oxygen transmissibility can lead to hypoxia with signs of hyperemia, corneal edema and neovascularization
    - This is important especially if the cornea is fragile from injuries and surgeries
    - Literature has shown that a low minus lens with silicone hydrogel and high Dk RGP material is best at achieving successful physiologic condition of the cornea.<sup>2</sup> However, it is also difficult to predict the overall performance from each individual component.<sup>3</sup>
    - In this case, RGP with material of Optimum Extra (Dk 100) was chosen however, patient reported with incidents of lens chipping and increased lipid deposits. Therefore, patient elected to switch back to original lens material of PPO2 (Dk 16.5). This also warranted a shorter follow-up interval to monitor patient's ocular health instead of annual eye exam.
  - Other treatment option
    - Iris prosthesis
      - HumanOptics: FDA approved 2018 and BrightOcular<sup>4</sup>
      - Made with silicone and placed in the sulcus<sup>4</sup>
      - Complications: increase IOP, corneal endothelial decompensation, persistent inflammation<sup>5</sup>

## CONCLUSION

- Prosthetic soft color contact not only improved vision but also visual comfort
- RGP can help create new optical surface on irregular corneas to help reach maximal visual potential
- Piggyback systems can provide great benefits to patients. This case demonstrated a creative way of using such a system to address patient concerns and improve quality of life

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