

The use of bi toric multifocal gas permeable contact lenses for a patient with oculocutaneous albinism

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ABSTRACT

A 16-year-old patient with oculocutaneous albinism was fit with Renovation multifocal bi toric corneal gas permeable contact lenses which improved his distance and near visual acuity to achieve his goal of meeting the drivers licence visual requirement.

INTRODUCTION

Albinism refers to a group of rare, congenital disorders characterized by partial or complete lack of melanin in the eyes, skin or hair. Ocular albinism affects the eyes only, whereas oculocutaneous albinism (OCA) involves the eyes, skin and hair.¹ Clinical ocular manifestations of albinism include iris transillumination defects, fundus hypopigmentation, foveal hypoplasia and abnormal optic nerve fiber decussation at the chiasm leading to reduced visual acuity, photosensitivity, nystagmus and strabismus. Higher refractive errors are often present, with hyperopia being more common than myopia.² Larger degrees of with-the-rule astigmatism have been attributed to the mechanical interaction of the eyelids from nystagmic rhythmic oscillations and/or narrowing of the palpebral aperture due to photophobia.³ Additionally, one study found children with albinism demonstrated poor accommodative function – whether this finding is related to the high accommodation demand of a short working distance for a retinal magnification effect, convergence-related reduction of nystagmus, a sensory-motor anomaly or an alternative reason, is unknown.⁴

Contact lens (CL) correction can provide numerous benefits for patients with albinism, including correction of high spherical and astigmatic refractive errors, minimize eye movements, reduce photophobia. While optical rehabilitation is imperative at infancy for the amblyopia prevention, it is still important to consider CLs at older ages to cater to the unique needs of each patient, along with the opportunity to enhance cosmesis and self-esteem.³ The following case report outlines the use of Renovation multifocal bi toric gas permeable (GP) contact lenses for a patient with OCA.

CASE REPORT

Initial Visit:

A 16-year-old Caucasian male presented on referral from a local optometrist for a contact lens fit. He had a medical history of OCA with complaints of blurry vision, and he was discouraged after failing his driver's licence vision screening. He reported rare photophobia and glare when outside in which sunglasses relieved and no history of contact lens wear.

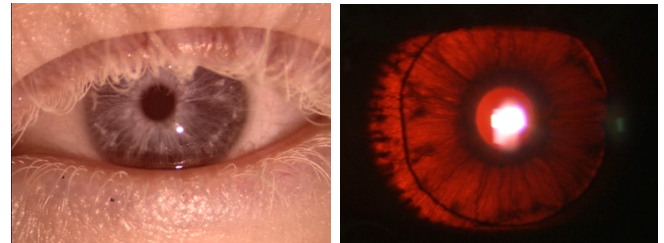


Figure 1a and 1b: Hypopigmentation of the iris with diffuse transillumination defects.

Entering uncorrected distance visual acuity (VA) was 20/100 OD and 20/150 OS. Other exam findings included horizontal nystagmus, iris transillumination defects (fig 1a, 1b), fundus hypopigmentation (fig 2) and foveal hypoplasia (fig 3). Keratometry (fig 4) and subjective refraction with VA's were as follows:

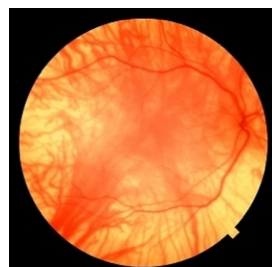


Figure 2: Retinal hypopigmentation.

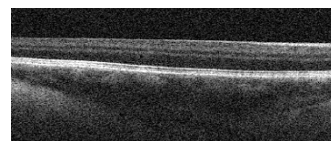


Figure 3: Foveal hypoplasia on OCT.

OD: 41.6/47.1D @89 +3.00-5.50x177 VA= 20/100+2
OS: 41.5/46.9D @93 +2.25-4.75x005 VA= 20/100+2

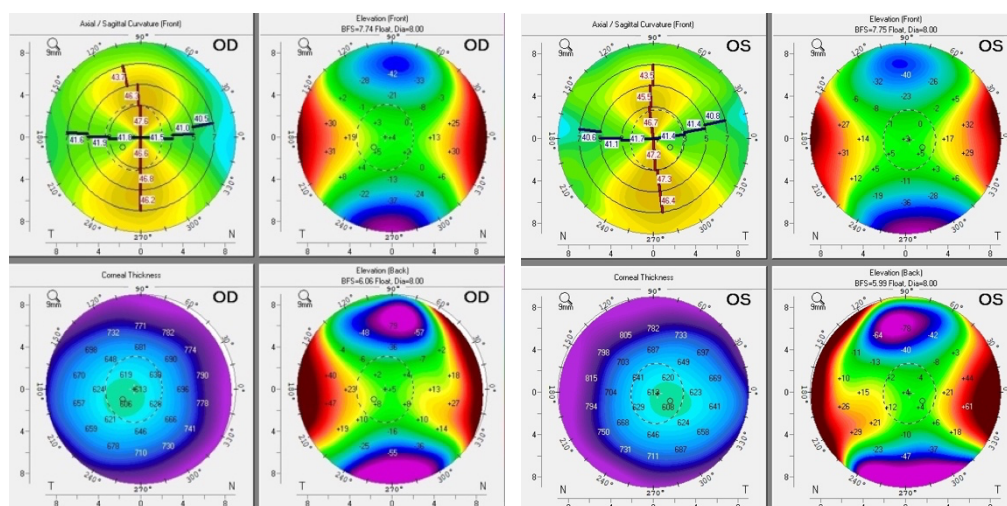


Figure 4: Corneal tomography measured with OCULUS Pentacam® demonstrating high corneal WTR astigmatism.

First CL trial attempt was a soft prosthetic iris-tinted lens with a annular black opaque iris zone and a clear pupil to decrease light transmission through the iris; however, the patient didn't notice any subjective improvement to his vision with over-refraction and didn't appreciate any reduced glare or photophobia.

The second CL trial attempt was a GP lens. The patient tolerated the lens well and there was a visible reduction in nystagmus frequency. Due to high corneal astigmatism, bi toric lenses were ordered.

The following bi toric corneal GP lenses manufactured by *ART Optical* were ordered:

OD: opt comfort, 8.10/7.31 BC 9.4mm diam +2.75/-2.00 D
OS: opt comfort, 8.13/7.35 BC 9.4mm diam +2.25/-1.75 D

Bi Toric Corneal GP Dispense:

The patient returned and the bi toric corneal GP lenses were inserted in both eyes. Contact lens VA was 20/70- OD and 20/60 OS with an over-refraction of -0.25 OD, plano OS.

Both lenses demonstrated a well-centered, aligned fit with an even sodium fluorescein pattern across the center of the lens and adequate edge lift 360 (fig 5).

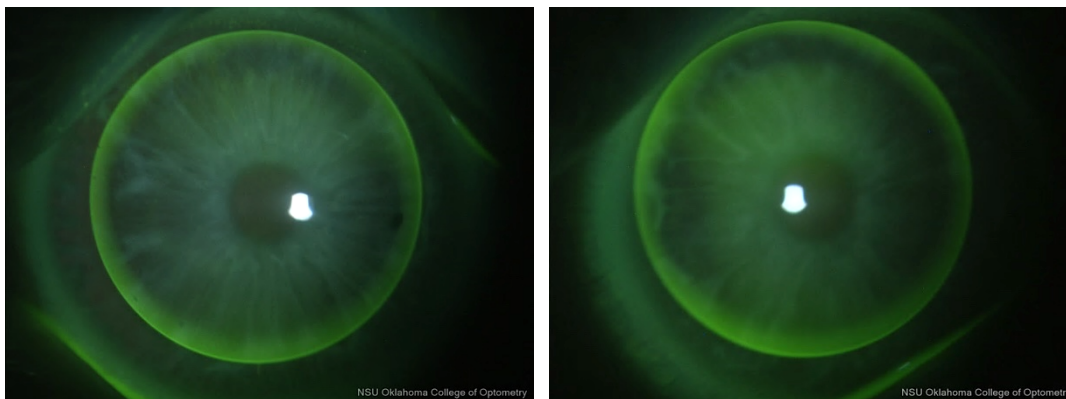


Figure 5: Corneal GP contact lenses on the patient's right and left eye, respectively.

A soft colour CL was trialed underneath the corneal GP lens as a piggyback and the patient didn't find any significant visual quality improvement. He preferred wearing his sunglasses outside.

The high corneal astigmatism correction and reduced nystagmus frequency improved the patient's distance vision; however, he reported he could not read his phone. Refraction at near and accommodation testing revealed accommodative insufficiency and he required a +2.00 add at near. All contact lens handling and hygiene instructions were given to the patient, and he was recommended to wear these lenses with +2.00 over-the-counter readers for near until the new multifocal GP lenses arrived.

The following Renovation multifocal bi toric corneal GP lenses (*ART Optical*) were ordered:

OD: opt comfort, 8.10/7.31 BC 9.4mm diam +2.50/-2.25 D distance +2.25 add

OS: opt comfort, 8.13/7.35 BC 9.4mm diam +2.25/-1.75 D distance +2.25 add

Renovation MF Bi Toric Dispense:

The patient returned and the Renovation multifocal bi toric lenses were inserted in both eyes. CL VA improved to 20/60 in each eye at distance and 20/50 at near with no over-refraction. The lens fit remained consistent with a well-centered, aligned fit and adequate edge lift 360.

The Renovation multifocal bi toric GP lenses were finalized, and the patient was thrilled his CL allowed him to achieve his goal of meeting the visual requirement for a driver's licence in his state so that he was able to proceed with acquiring his learners permit.

DISCUSSION

Ocular ramifications associated with albinism is multifaceted. Fortunately, there are a variety of contact lens options that offer potential refractive and therapeutic benefits to accommodate each individual's lifestyle and needs.

Patients with albinism should ideally be monitored from infancy to treat high refractive error and reduce amblyopia potential. Additional considerations such as sensitivity to light related to the lack of iris and retinal pigment can be debilitating, particularly in bright environments.⁵ Contact lenses can be augmented with customizable options to combat photosensitivity including conventional coloured CLs, custom tints, prosthetic opaque iris ring or CLs with Transitions™ technology. Furthermore, corneal GPs are a great option for clear and stable vision with high astigmatism and have been proven to ameliorate visual acuity through dampened frequency, amplitude and intensity of nystagmus.⁶ Finally, clinical evaluation of accommodative function should be performed at the preferred working distance and a reading add should be prescribed accordingly.⁴

In this case, multifocal bi toric contact lenses provided accurate correction of the patient's high corneal astigmatism, alleviated accommodative dysfunction, and suppressed motor disturbances of nystagmus, leading to a 3-line gain of visual acuity compared to spectacle correction. Despite this patient not appreciating the other tinted options, it is important to be aware of all the different possibilities to help manage patients with albinism. Ultimately the corneal multifocal GP CLs improved the capacity for visual function and met the patient's primary goal with additional psychosocial benefits through enhanced cosmesis and self-esteem for this teenager.

CONCLUSION

Albinism degrades visual function through various manifestations, thus optical rehabilitation should be tailored to the unique goals of each individual. Corneal multifocal GP CLs can provide significant improvements in visual acuity at both distance and near, minimize nystagmus, and simultaneously offer an enhanced quality of life for this vulnerable population.

References:

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