



# A Case of Gas Permeable Lenses Dampening Nystagmus and Improving Vision



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## Introduction

- Ocular findings of oculocutaneous albinism (OCA) include infantile nystagmus, ametropia, iris transillumination, foveal hypoplasia, hypopigmentation of the retina and iris that leads to reduced visual acuity.
- Infantile nystagmus along with foveal hypoplasia and excessive nerve fiber crossing at the chiasm causes reduced vision in OCA.
- Gas permeable lenses have been proposed to dampen nystagmus, improve visual acuity and quality of life.

## Case History

A 31 year-old Caucasian male with oculocutaneous albinism and infantile nystagmus was interested in gas permeable lenses (GP) to improve vision and reduce nystagmus. The patient previously failed soft toric contact lenses (SCL) due to blurry vision caused by excessive lens rotation.

### Ocular history:

- Bilateral nystagmus surgery in 2016

### Medical history:

- 8 TBI incidents
- Chronic kidney disease
- Arthritis

### Current medication:

- None

## Clinical Findings

### Anterior Segment Evaluation:

OU: iris transillumination

### Posterior Segment Evaluation:

OU: foveal hypoplasia, hypopigmented fundus

### EOM:

OD & OS: FULL

### Pupil:

OD & OS: PERRL, (-)RAPD

- Binocular vision:** right jerk nystagmus with moderate amplitude and high frequency with null point at left gaze and a latent component

- Nystagmus with glasses at primary gaze: <https://youtu.be/VjHpqpFJ4KQ>
- Nystagmus dampened by GP at primary gaze: <https://youtu.be/ybh4Jar7ZvQ>
- Nystagmus evaluation with GP: <https://youtu.be/uZBqK04m9gg>

(received patient's permission to upload video)

## Gas Permeable Lens Fit

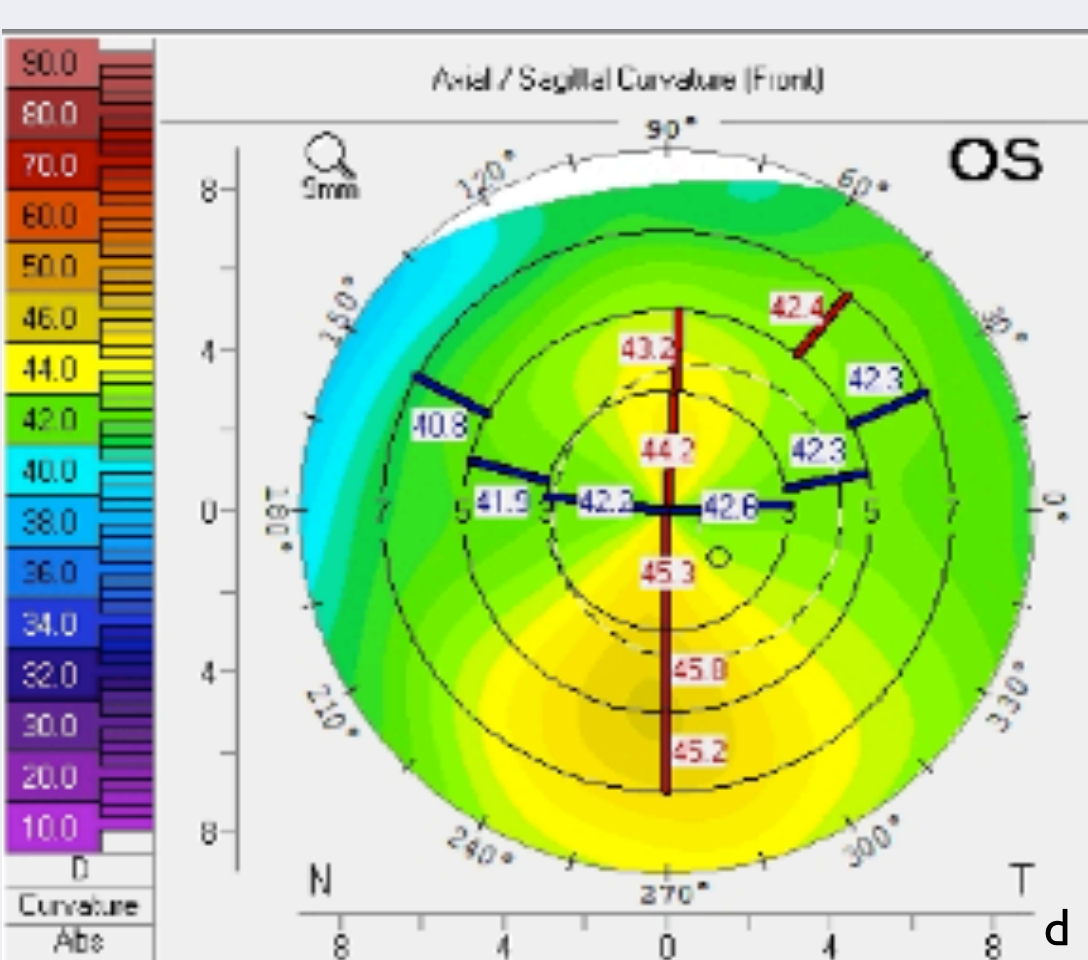
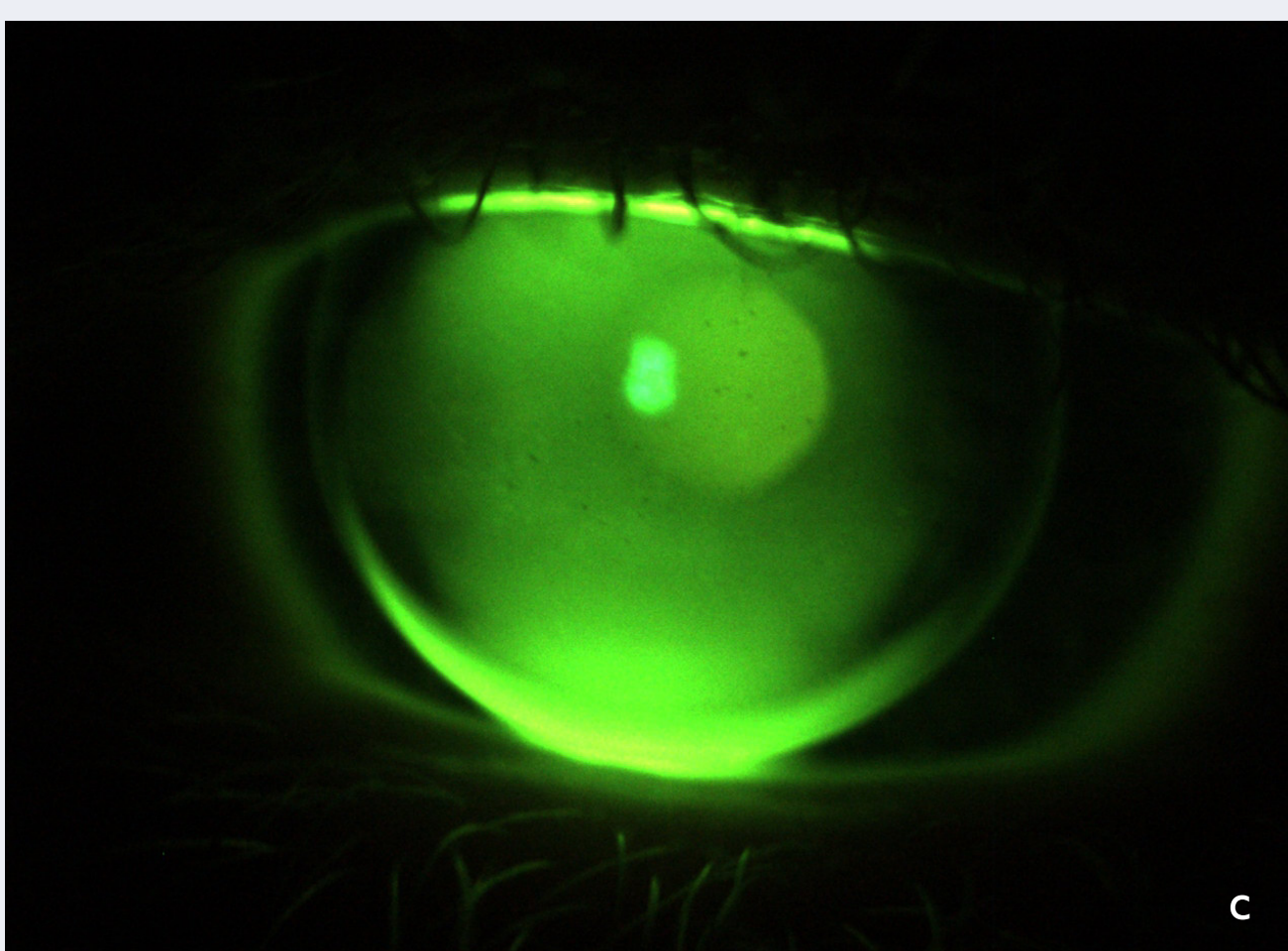
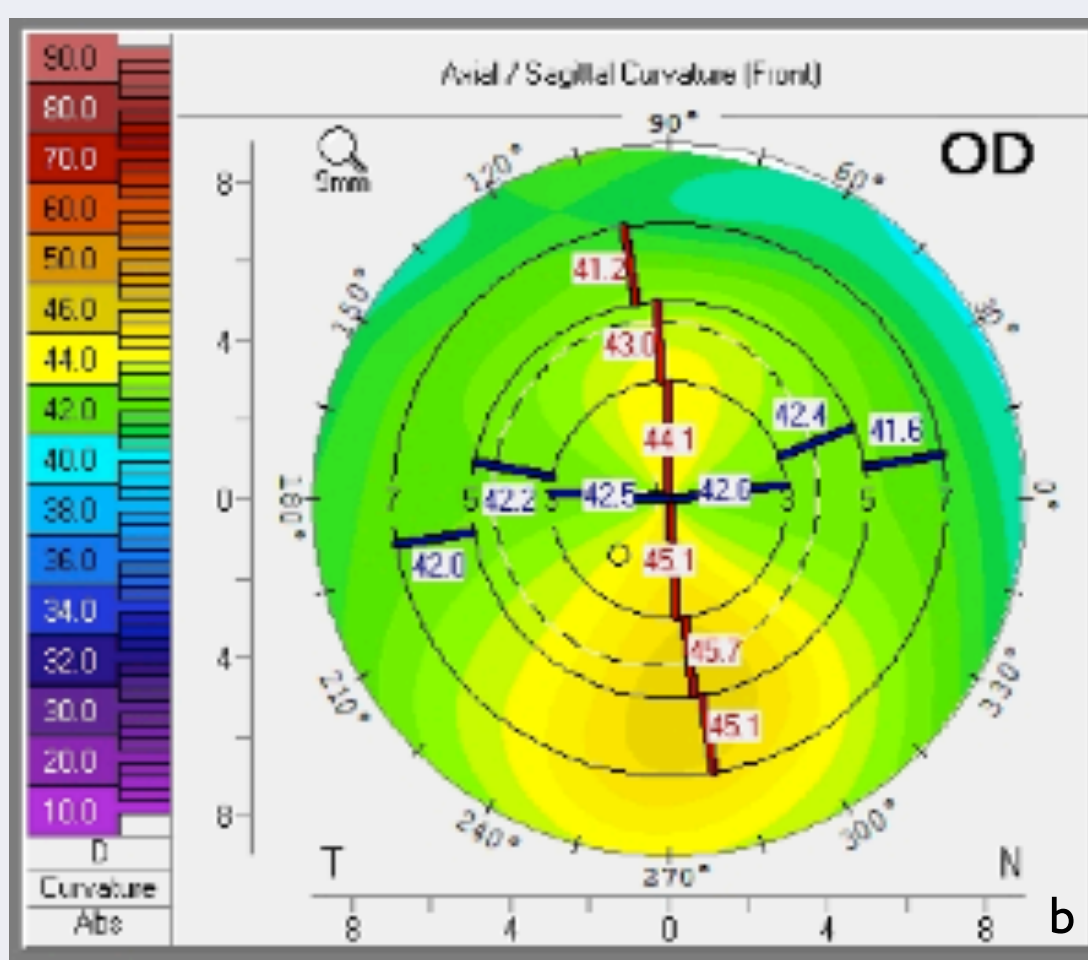
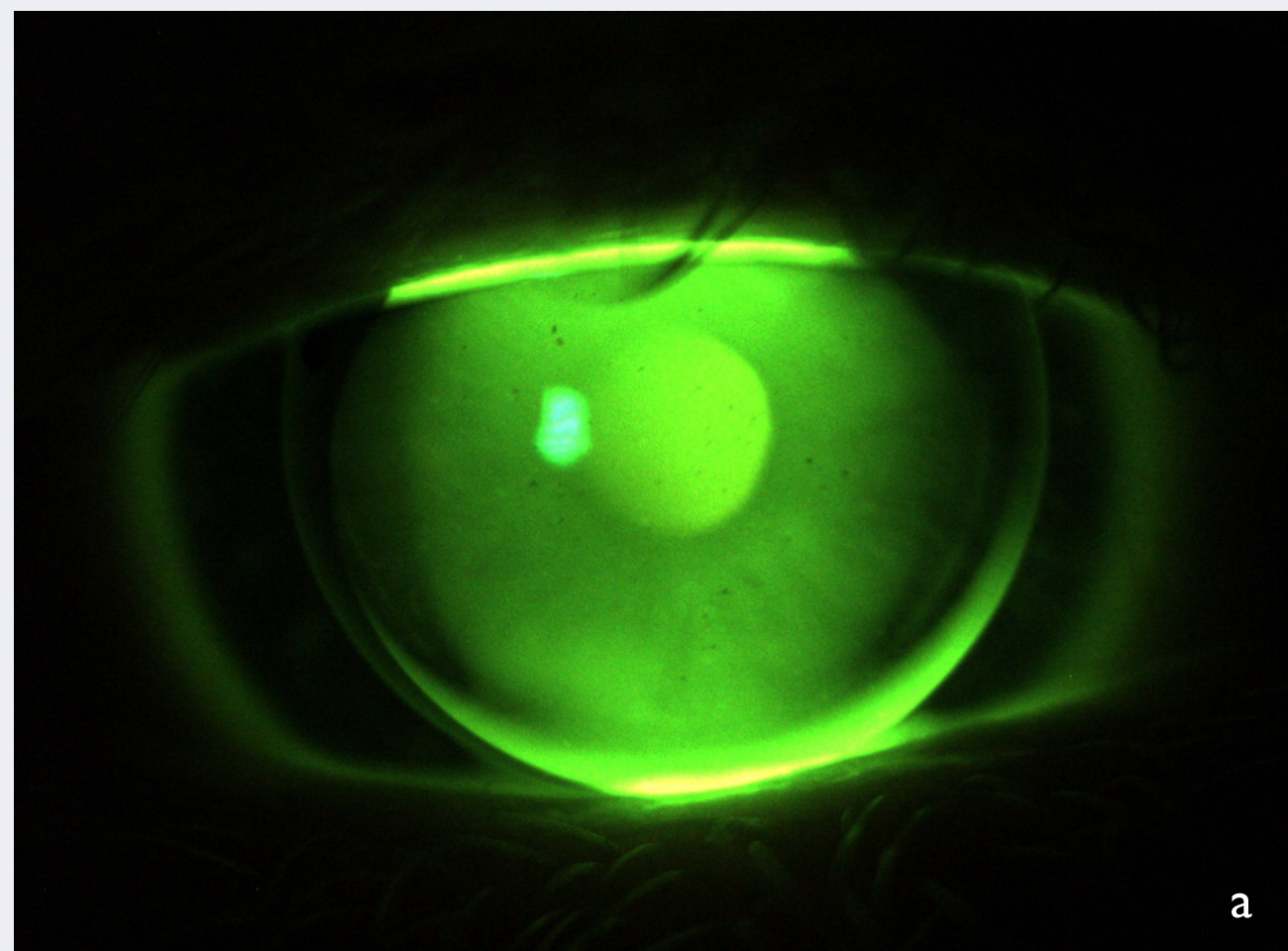


Fig a. OD GP fit under slit lamp with Wratten filter

Fig b. OD axial map by Pentacam (Oculus, Wetzlar, Germany)

Fig c. OS GP fit under slit lamp with Wratten filter

Fig d. OS axial map by Pentacam (Oculus, Wetzlar, Germany)

	OD	OS
VA with glasses	20/60-2	20/70+1
K-reading	42.75/44.50@086	42.50/44.75@087
Refraction	+2.00-1.75x175	+2.75-2.25x180
VA with GP	20/50	20/60+1
GP parameters	Tricurve spherical GP in Paragon HDS (Dk = 40)	
	BC 7.80/OAD 10.0/OZD 8.5/+0.50DS SCr 9.6x0.25mm PCr 10.80x0.30mm/Heavy blend	BC 7.81/OAD 10.0/OZD 8.5/+0.75DS SCr 9.6x0.25mm PCr 10.80x0.30mm/Heavy blend
GP fit	Lid attached, minimal apical clearance, soft WTR mid-peripheral bearing, average peripheral clearance, good movement on blink	Lid attached, feather apical clearance, soft WTR mid-peripheral bearing, average peripheral clearance, good movement on blink
Binocular vision	Right jerk nystagmus with small amplitude and high frequency with null point at left gaze and a latent component	
Subjective response	Excellent vision, comfort and cosmesis in GP <ul style="list-style-type: none"><li>Nystagmus frequency and amplitude both dampened by ~70% subjectively</li><li>Helped tremendously with his night driving vision and reduced the errors he made at his office job</li></ul>	

## Discussion

Infantile nystagmus usually presents in the first 6-8 weeks of life.<sup>1</sup> Infantile nystagmus causes reduced foveation and smearing of image across the retina thus reduces visual quality and acuity.

Gas permeable lenses have been proposed to dampen nystagmus and improve visual acuity in some patients. Several proposed mechanisms include: 1) refraction correction 2) provides better visual quality as the optical center of refractive correction moves with the eyes, thus reduces prismatic effect, spherical and chromatic aberrations, and increase peripheral visual field<sup>2</sup> 3) proprioceptive or tactile feedback of the contact lens from the cornea and conjunctiva through the ophthalmic division trigeminal nerve to the ocular motor system<sup>3,4</sup>.

Since moderate astigmatism is prevalent in OCA<sup>5</sup> and soft lenses tend to rotate causing deterioration of vision, GPs are a superior, non-invasive option for OCA patients. It has been shown that GP wear enhances patients' quality of life and confidence especially for driving, working and social interactions.<sup>2</sup>

There are a few things to note when fitting GP for OCA including difficulty in keratometry measurement<sup>2</sup> and making sure lens slippage during nystagmus does not impair the cornea.

Other methods of managing nystagmus include surgery, prism with over-minused spectacles, yoked prism and medications.

## Clinical Pearls

- GP can be an invaluable option for managing infantile nystagmus as it can dampen nystagmus and increase visual acuity thereby significantly enhancing quality of life<sup>4</sup>.
- GPs are less susceptible to rotation, provide better astigmatism correction, and greater tactile feedback<sup>4</sup>. Thus they can provide a better visual outcome than SCLs especially since high astigmatism is prevalent in infantile nystagmus<sup>5</sup>.

## References

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