

Little Lenses For Little Eyes: Correcting Aphakic Children

A Case of Bilateral Congenital Cataracts

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INTRODUCTION

Congenital cataracts are opacities in the crystalline lens due to genetic mutations or infectious and environmental insults during the embryological stages. Lack of cataract removal imposes a higher risk of developing deprivation amblyopia. Late postoperative complications after cataract extraction include glaucoma, which directly correlates with age and corneal diameter¹. Following cataract extraction, refractive correction options are implantation of an IOL or remaining aphakic and correcting with contact lenses to reduce the risk of developing refractive amblyopia.

CASE DESCRIPTION

An 8-year-old Caucasian male presents to the The Eyecare Institute at Nova Southeastern University for his bilateral aphakic contact lens fitting for recreational purposes. He presented with longstanding blurry vision in the distance and at near with bifocal spectacles.

His ocular history revealed:

- Bilateral aphakia s/p cataract extraction, lensectomy and vitrectomy (2013) due to congenital CMV syndrome.
- Esotropia s/p bilateral medial rectus resection (2014).
- Aphakic glaucoma OD, glaucoma suspect OS - managed with Xalatan® QHS and Cosopt® BID.

His current spectacle prescription and Visual Acuities:

OD: +18.00-2.50x165 ADD +2.75 DVA 20/50 NVA 20/30
OS: +17.50-3.00x003 ADD +2.75 DVA 20/50 NVA 20/30

Anterior segment evaluation findings:

- IOP: OD 27 mmHg OS 19 mmHg
- Keratometry: OD 40.60/42.10 @ 43.0 OS 40.10/44.00 @ 81.8
- HVID: OD 7.0 mm OS 8.0 mm - microcornea
- Microphthalmia
- Inferior lid margin: 3 mm below inferior limbus

CONTACT LENS SELECTION

With the corneal irregularity, a soft contact lens would not provide an ideal fit. A scleral GP lens would have provided excellent vision and centration but was not a viable option as a result of the glaucoma contraindication. A customized small diameter GP lens was found to be ideal with the tailored parameters of high plus power, diameter, base curve, DK and material. Given the lid anatomy and the high plus power of the lens, a reduction of center thickness and modification of the lens design was necessary for appropriate centration.



Figure 1: Bilateral presentation of microphthalmia, microcornea, pinpoint pupils and lower set inferior eyelid margin.

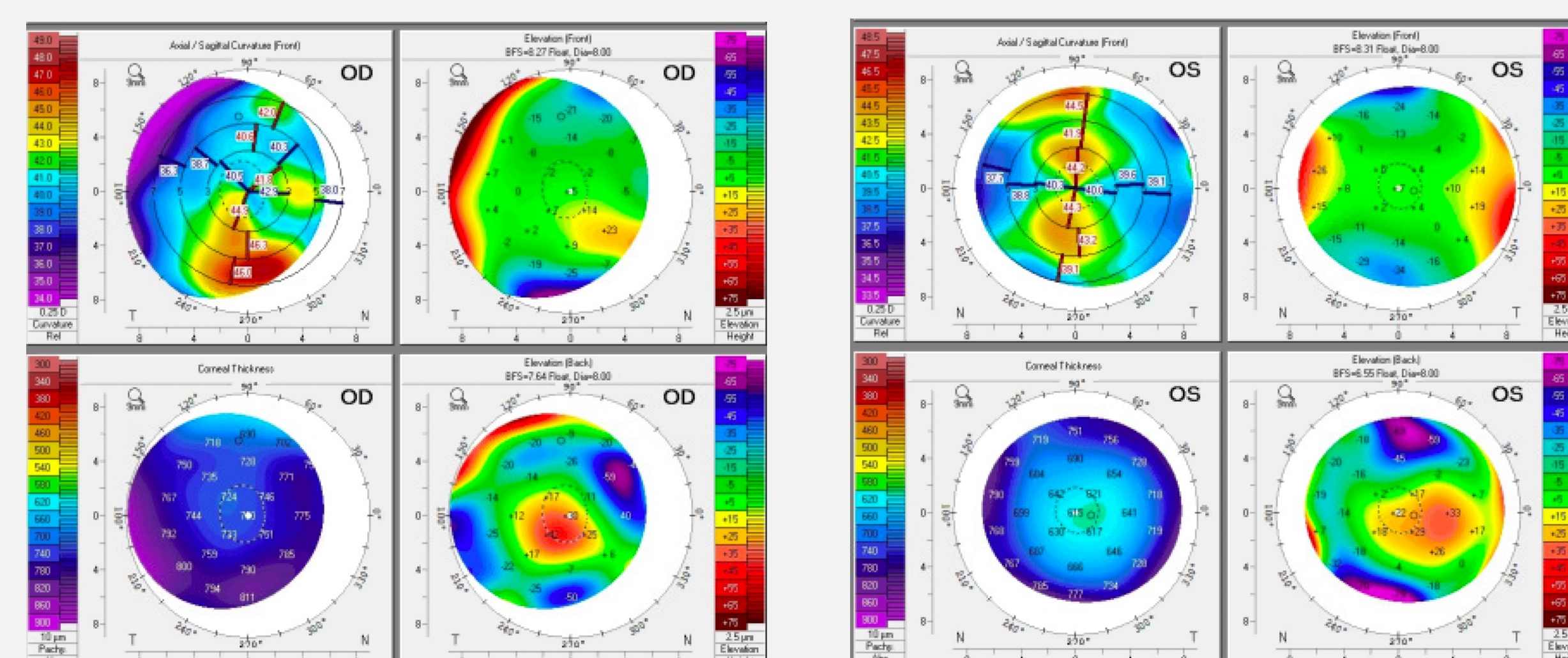


Figure 2: Oculus Pentacam® 4 Map Refractive Topography results reveals an irregular astigmatism OD and regular WTR astigmatism OS.

Eye	BC (mm)	DIA (mm)	Power (D)	CT (mm)	Edge	Material	DVA
OD	8.31	6.8	+22.87	0.38	3 Flat	Optimum Extreme	20/30
OS	8.37/7.90	6.8	+22.62/ +20.12	0.38	2 Flat		20/25

Figure 3: The final contact lens order from Advanced Vision Technologies® PediaSITE™

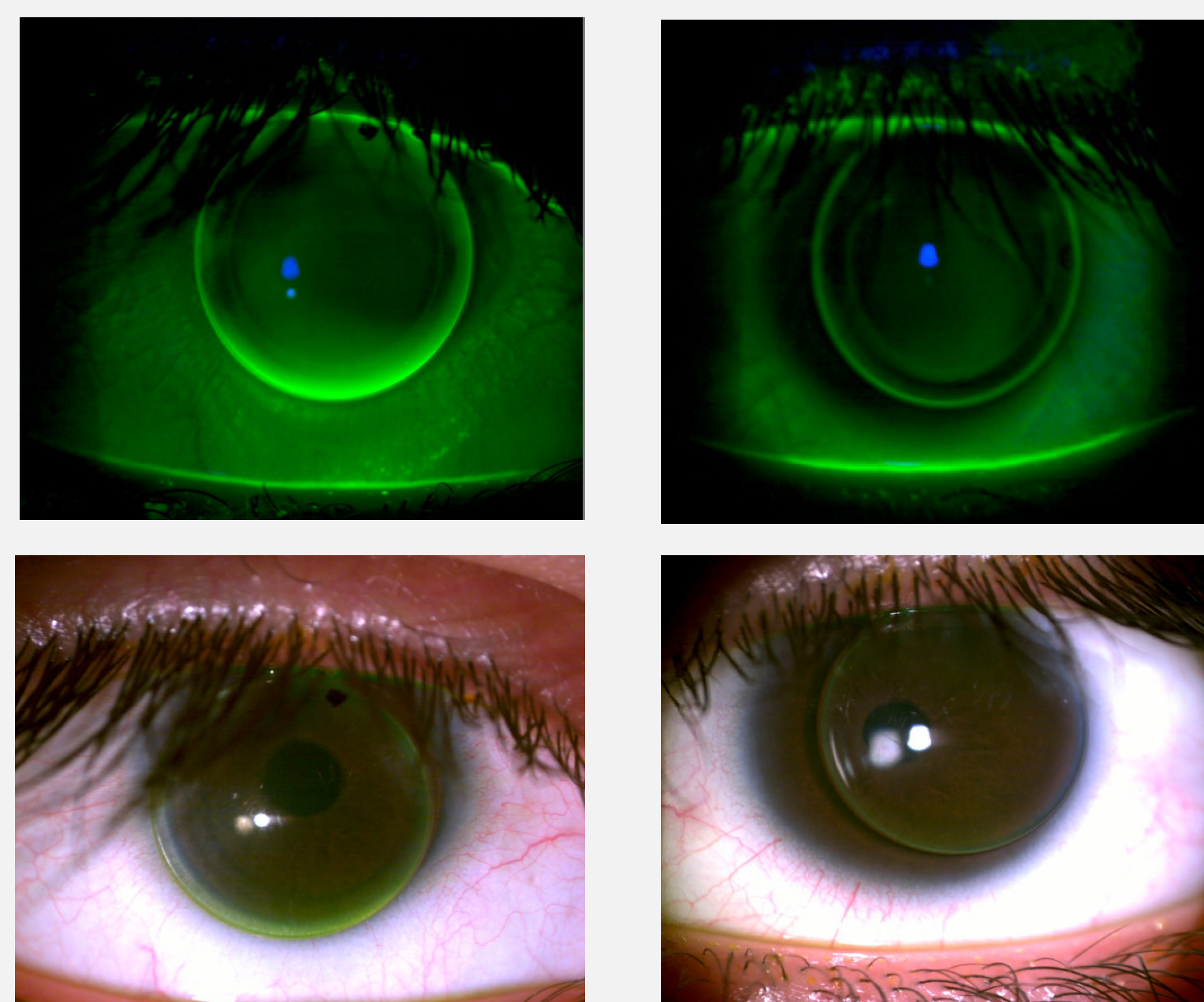


Figure 4: Anterior Segment photos of the final GP lens fit with Sodium Fluorescein pattern (above) and under white light (below).

DISCUSSION

Congenital CMV syndrome results in a number of neurological defects such as polymicrogyria, microcephaly and ventromegaly². Along with the neurological defects, it is one of the leading causes of congenital cataracts³. Although there is no direct link between CMV and microcornea (HVID < 10 mm) or microphthalmia, they are likely associated with developmental disruption during the embryological stages.

Congenital cataracts carry increased complications due to the extension of the sensitivity period beyond the age of 4.5 years old⁴. Due to the fragile nature of the visual system during that given phase of development, any insult or delay may disrupt the development of the binocular system, therefore increasing the risk of developing amblyopia and strabismus. Studies have shown that although children following lens extraction have a high risk of developing strabismus, the infants who underwent IOL implantation following the extraction were more likely to develop strabismus⁵.

Furthermore, the development of glaucoma is a common complication after pediatric cataract surgery, which can occur within 10 years. Studies have concluded that the younger the child is at the time of surgery, the higher the risk. Secondary to age is the size of corneal diameter. The smaller the corneal diameter, the higher the risk of developing aphakic glaucoma¹.

CONCLUSION

The American Academy of Ophthalmology determined that the ideal course of treatment for infantile cataracts is keeping the child aphakic and correcting with contact lenses following lens extraction as it reduces the risk of complications⁶. The two options are Silicone Elastomer (SE) soft contact lenses or GP lenses due to their availability of high plus powers, high DK material and increased parameters⁶. The limitations of our contact lens fitting was the microcornea, microphthalmia, irregular cornea, inferior eyelid anatomy and aphakic glaucoma. His main motive for contact lens wear was recreational use. As a result, a small diameter corneal GP was successfully fit to allow for improved distance vision. Bifocals were later fit for improved near vision with school work.

References:
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