CASE REPORT

APPLICATION OF A SCLERAL LENS
IN A DEGENERATIVE MYOPIA AND DISLOCATED
ANTERIOR CHAMBER INTRAOCULAR LENS

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ABSTRACT

This case is about the application of a scleral lens in a degenerative myopia and post lasik patient. A 37 year-old visually impaired woman was referred for a contact lens fit to correct her refractive error, optical aberration and improve her visual acuity and photophobia.

The present case is a typical degenerative myopia with retinal detachments and optical aberrations caused by a dislocated anterior chamber IOL. This patient had several surgeries in both eyes: lasik, retinal laser photocoagulation, pneumatic retinopexia, intraocular silicone oil tamponade, lens was extracted and an IOL implanted into her left anterior chamber to correct the remaining myopia. Her right eye had intraocular silicone oil tamponade left in place which did not allow any VA improvement with refractive correction, therefore the only option was to correct her left eye with the best extraocular optical device. A scleral lens was chosen as the optimal refractive correction as it offered solid optic and excellent physiology.

A 16 mm scleral RGP high DK lens was successfully fitted.

(A Keratos SG Scleral lens was fitted. Keratos SG are custom made scleral lens with flexible parameters and up to 17 mm diameter. It is made up of RGP Boston X02 material.)

KEYWORDS; Scleral lens, Degenerative Myopia, Low Vision Aid, Decentered Lens, Optical Aberration, Intraocular Silicon Oil Tamponade, Visual Axis.

INTRODUCTION

Pathological or degenerative myopia is a major alteration of the globe of the eye and retinal changes that causes an extremely high amount of myopia, which may lead to severe vision loss. It progresses rapidly, and visual outcome depends largely on the extent of fundus and lenticular changes. This condition is accompanied by chorioretinal degenerations and a high risk for retinal detachment and macular changes.

Patients with degenerative myopia typically complain of decreased vision, headaches, and sensitivity to light. Those with degenerative myopia have an increased incidence of nuclear cataract formation.

Pathological myopia patients may present with prescriptions over –7.00 diopeters. This creates problems in correcting the patient’s refractive error and the ophthalmic lenses may be unusually thick and heavy, therefore contact lenses are a good option. Contact lenses eliminate the weight and thickness of the lenses in eyewear and the side vision difficulties
inherent in these thick lenses. Myopic patients usually report having better vision when wearing contact lenses.

Laser refractive surgery is not a reasonable solution for patients with pathological myopia and it has not been as effective in the highly myopic corrections, as it has in the lower ranges of myopia. An alternative for the profoundly myopic patients are intraocular lenses affixed in the anterior chamber.

Patients with retinal detachments, myopic macular degeneration and staphylomas may have a poorer prognosis depending upon the location of the problem, and most patients respond well to low vision aids including magnifiers, telescopes and CCTVs.

Scleral custom made contact lenses are large-diameter rigid gas permeable lenses with diameters from 13.6 mm to 24 mm. The basic principle of a scleral lens is to rest on the sclera and vaults the cornea and limbus 360 degrees (corneal clearance and scleral bearing with minimal eyelid interaction).

**Background**

The patient (Initials LMG) is a 37-year-old Hispanic woman with degenerative myopia which led her visually impaired. After years of wearing regular RGP contact lenses, she had bilateral lasik 15 years ago to correct her high myopia, and as a result her corneas became very oblate. Subsequent to her refractive surgery, she had retinal detachment in both eyes which were treated with sequential sessions of laser photocoagulation and intraocular silicon oil endotamponade. Her right eye has no positive results as to VA improvement and the intraocular silicone oil was left in placed to avoid retinal redetachment. As to her left eye, a pneumatic retinopexy surgery was performed and an intraocular lens was affixed and dislocated in the anterior chamber. Topographies show an oblate pattern.

The IOL in her left eye remains descentered and its optical center does not align with her visual axis. This descentration and tilting created an optical aberration and induced a prismatic effect. The anatomic center of the eye is not necessarily the visual axis, and any shift in the IOL impact the quality of vision. Even though a malpositioned IOL can be surgically managed, specially if the patient satisfaction is too adversely affected, there are some risks involved, therefore, her option was to wear an aberration-free optical device. The scleral lens was considered as a first choice.
Her presenting manifest refraction was +2.00 (CF 5’) O.D., and +3.00 (20/200) O.S. Her left cornea showed an oblate shape with some peripheral irregularities.

In her evaluation, I observed a cloudy right vitreous, an attached left retina, a dislocated and tilted intraocular lens and a right exotropia (7 prisms in primary position). Corneal integrity was unremarkable.
OD: K Reading: 34.75 RX OD: +2.00 (CF 5')
OS: K Reading: 34.50 RX OS: +3.00 (20/200)

*Scleral Lens Alternative*

This patient was actually legally blind, however her vision could be improved by other devices other than eyeglasses or regular contact lenses. She was uncomfortably wearing a soft contact lens (Methafilcon +3.00 diopter) on her left eye and obtained a VA of 20/200 with contrast deficiencies, glare and photophobia.

I considered and tried a small diameter RGP lens for her left eye but I had no positive results (bearing area between 9:00 – 1:00) and the patient felt very uncomfortable with it. I then planned to fit a scleral lens since a large rather than a small diameter lens would minimize the risk of loss, displacement and decentration. Scleral lens was a good option for management in this case (stability, comfort, vision, aberration control and protection)

Large diameter lenses distribute their pressure over the insensitive sclera and vaults the sensitive cornea, thus avoiding the mechanical friction, making this lens more comfortable than a small diameter lens. I decided a large rigid lens rather than a soft one to correct any aberration and mask corneal irregularities.

*Figura 3. Malpositioned IOL into de anterior chamber. (Scleral lens in situ)*

*Figura 4. Small diameter lens*
I tried a scleral lens (Keratos SG), 16 diameter, BC: 7.76 mm, Power: -2.75; overrefraction -7.00 with a corrected VA of 20/80. Fluorescein pattern showed cornea and limbus 360 degrees clearance, and appropriate landing and full weight and distribution on the sclera. Patient felt very comfortable with this lens.

She was then fitted with a scleral lens OS: base curve 7.76mm; power –9.75; diameter 16mm with a corrected VA of 20/80. No correction was required to his right eye since no useful VA was obtained.

![Scleral lens in situ](image)

**Figure 5. Scleral lens in situ**

**Discussion**

Scleral lenses are large diameter contact lenses that have their resting point beyond the corneal borders and are one of the best vision correction options for irregular as well as healthy corneas; they decrease the risk of corneal scarring.

The present case is about the application of a scleral lens in a surgically overworked eye with degenerative myopia and a misplaced anterior chamber IOL. Even though the patient is still visually impaired, a scleral lens gave her a better VA, good image quality by decreasing optical aberrations and an opportunity to improve her self esteem.

Even though this patient does not wear any low vision aid, the challenge remains to combine the scleral lens wearing with an optical low vision aid (telescope glasses).
References


