Scleral Contact Lens in the Treatment of Anisometropia and Rheumatoid Arthritis Related Dry Eyes

Melanie Frogozo, O.D.

Abstract

A visually impaired woman is being fit for a therapeutic scleral contact lens to decrease the anisometropia between her two eyes, and to treat her rheumatoid arthritis related dry eye syndrome.

I. Case History

-Patient demographics:
    43-year-old Asian female

-Chief complaint:  
    The patient is concerned about the disparity in vision between her eyes, which causes balance problems while walking, and has made it very difficult to read textbooks as well as the board at school.

-Ocular, medical history:

    Ocular medical history is remarkable for myopic degeneration in both eyes. Although she could not recall the name of the procedure, the patient stated that at age 21, while living in China, she underwent an eye surgery where muscle around the thigh was removed and inserted into both eyes to help with myopic degeneration. A full thickness macular hole associated with other macular cysts had developed in the right eye from her myopic degeneration. The patient had blunt trauma inflicted to her left eye in 2005, which resulted in optic atrophy that led to severe constriction in the visual field 360°. In addition, the blunt trauma caused lens subluxation that was treated with an anterior chamber intraocular implant.

    Medical history is remarkable for hyperthyroidism and rheumatoid arthritis. The patient reported that at the age of 14 she was put on bed rest for 3 years and given potent medication (type unknown) for rheumatoid arthritis.

-Medications:
    The patient is currently applying a prescription topical steroidal drop twice a day in both eyes for her dry eye syndrome. Currently, she does not take any systemic medications.
- Other salient information:
The patient was referred to our clinic for a therapeutic contact lens fitting to improve the large anisometropia between her eyes that remained after cataract surgery. Cataract surgery is not recommended in the right eye because the risk of retinal complications from her degenerative myopia. Since the age of 14 she has worn soft disposable contact lenses, which has caused large amounts of corneal neovascularization and fibrosis in both eyes. Two years before presenting to our clinic, she was fitted into corneal gas permeable lenses, but could not tolerate the discomfort in either eye. Her ophthalmologist believes that her anterior ocular health problems are related to her rheumatoid arthritis.

II. Pertinent Findings

-Clinical:
Cataract pre-operative acuities were 20/100 in both the right and left eyes with a manifest refraction of -33.00, and -34.00 diopters sphere respectively. Best-corrected visual acuities presently are 20/100- in the right eye and 20/50- in the left eye with a manifest refraction of -30.00 diopters sphere, and +2.00-0.50x174 respectively. Humphrey visual field 30-2 sita fast revealed an enlarged blind spot in the right eye, and less than 20º of central vision in her left eye. Anterior ocular biomicroscopic examination revealed large patches of fibrosis and neovascularization scattered 360º in the peripheral cornea. Inferior superficial punctate keratitis in both eyes was also observed. Sutures were noted in the superior cornea of the left eye from cataract surgery. Grade 1+ nuclear sclerotic cataract was noted in the right eye, and an anterior chamber intraocular implant was noted in the left eye. Bulbar conjunctival folds were noted in the right eye temporally.

-Physical:
The patient’s hand and wrist joints are deformed from rheumatoid arthritis.

-Laboratory Studies:
Extensive blood work is being done to test liver and kidney function. The patient is awaiting the results so she can start proper medications to treat her rheumatoid arthritis.

III. Differential Diagnosis

- Primary/leading
There is no differential diagnosis for the patient’s anisometropia. The differential diagnosis for the patient’s corneal findings is keratoconjunctivitis sicca that is unrelated to secondary Sjogren’s syndrome.
IV. Diagnosis and Discussion

Refractive error is one of the most common causes of visual impairment, and globally is the second leading cause of treatable blindness\(^1\). Refractive error can have a severe social and economic impact, restricting educational and employment opportunities in otherwise healthy individuals\(^2\). Anisometropia is defined as a difference of $\geq 2$ diopters in refractive error between the two eyes\(^3\). In adults, however, even a small amount of anisometropia can significantly impact binocularity\(^4,5\). Loss of stereoacuity is potentially debilitating to such an extent that a large proportion of the population may experience impairment in the performance of their everyday activities\(^6\). Contact lenses are widely recognized as being effective in refractive correction of anisometropia\(^7\).

Sjogren’s syndrome is a chronic systemic disease that causes destruction of tissue in multiple exocrine glands, mainly the lacrimal and salivary glands. It is characterized by keratoconjunctivitis sicca (dry eyes) and xerostomia (dry mouth). The disease is classified into two types: primary and secondary Sjogren’s syndrome. Patients who are diagnosed with the primary type show clinical findings of keratoconjunctivitis sicca and xerostomia in the absence of a systemic autoimmune disease; those diagnosed with the secondary disease manifest a systemic autoimmune disease, usually rheumatoid arthritis\(^8,9\). Although the patient did not offer any symptoms of xerostomia, secondary Sjogren’s syndrome is suspected.

The most common ocular symptoms in patients with Sjogren’s syndrome are foreign body sensation, itching, excessive discharge, alacrima, burning, heavy lids, pain, and redness. Anterior ocular biomicroscopic examination may reveal decreased tear meniscus, mucous debris in the tear film, and mucous strands may be seen in the inner canthus. At the bulbar conjunctiva hyperemia, edema, keratinization, and folding of the conjunctiva may be observed. The cornea may show signs of superficial punctate keratitis, usually inferior. In severe cases corneal ulcers, which can result in corneal melting, may occur\(^8\). The lids may show signs of blepharitis\(^9\).

Treatment of the ocular symptoms in Sjogren’s syndrome is mainly aimed at relieving the patient’s symptoms, and to healing the ocular surface\(^8\). Preservative-free artificial tears used during the day, and lubricating ointments applied at night are beneficial for dry eye relief. Topical cyclosporine, steroids, and non-steroidal anti-inflammatory also decrease symptoms\(^8,9\). Techniques such as punctal occlusion are used to preserve the tear film and maximize topical therapy\(^9\). Scleral contact lenses decrease symptoms, and
treat the signs of ocular surface disease related to rheumatoid arthritis and Sjogren’s syndrome. They do this by providing a constant oxygen rich aqueous interface to the front of the eye. The contact lens also protects the cornea from friction of the lids that allows for further healing.

V. Treatment, management

Contact lenses are used for the therapeutic treatment of refractive errors such as anisometropia. Scleral contact lenses are gaining prevalence for treatment and management of ocular surface disease. Thus, the patient is being fitted with a scleral contact lens on her right eye to decrease the anisometropia between the eyes, and to treat her rheumatoid arthritis related dry eye syndrome. In this case, the lens of choice is the Jupiter scleral contact lens (Essilor of America, Inc.) with an overall diameter of 18.2 mm. At this time, because she fears a contact lens may negatively affect the sutures on her cornea remaining from her cataract surgery, the patient prefers to defer treatment with a contact lens in the left eye. The patient was educated that scleral contact lens therapy was safe, and would not compromise the health of her left eye, and to consider this treatment in the future. After successful fitting of the right eye, the patient is to wear glasses over her contact lens to correct for her distance refractive error in her left eye, and for reading in both eyes. She is to continue care with her rheumatologist for systemic treatment of her rheumatoid arthritis.

VI. Conclusion

If left uncorrected, refractive error can cause severe impairment of daily activities. As primary eye care providers, optometrists have the ability to easily detect and treat these patients and thus, greatly improving their quality of life. After correction of high myopia and anisometropia with a scleral contact lens the patient hopes to succeed in school, graduate, and become employed.

Systemic rheumatoid arthritis is a cause of keratoconjunctivits sicca, which can lead to severe ocular discomfort and damage. Treatment is primarily aimed at relieving the patient’s symptoms, and healing the ocular surface. Scleral contact lenses are effective in managing and treating ocular surface disease.

Specialty contact lens fitting is challenging and takes a great amount of expertise to be successful. It is a service that optometrists can uniquely offer to patients for the medical treatment of eye disorders. Scleral contact lenses are gaining popularity as therapeutic management option.
References