Optimizing Ocular Surface and Visual Acuity with Scleral Lenses in the Setting of Stevens-Johnson Syndrome

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INTRODUCTION

Stevens-Johnson syndrome (SJS) is a serious and rare condition of the skin and mucous membranes that is most often caused by a reaction to medication. It is characterized by initial flu-like symptoms followed by painful blistering and rashes. Ocular manifestations include corneal perforation and ulceration, iritis, followed by long term complications of dry eye and corneal and conjunctival scarring. In the management of the ocular sequelae of this condition, it is important to maintain the ocular surface integrity in order to provide the patient with adequate comfort and vision.

CASE STUDY

A 45-year-old male was referred for a scleral contact lens fitting OD/OS after an acute episode of Stevens-Johnson syndrome secondary to allopurinol use as a medication to treat gout. After a corneal perforation OD and subsequent tarsorrhaphy, the patient developed posterior synechiae secondary to intraocular inflammation and a cataract OD secondary to steroid use. During the patient's initial evaluation in our clinic, slit lamp findings were significant in both eyes for central corneal and conjunctival scarring, irregular astigmatism, peripheral corneal neovascularization, and diffuse 3-4+ SPK.

At his initial visit, his BCVA in spectacles was 20/50 OD/OS. Large diameter 18.00 mm scleral lenses were selected for initial fitting. The patient's BCVA through these lenses improved to 20/40 OD and 20/30 OS. The material selected was Optimum Extra with a high Dk of 100 to provide adequate oxygen permeability. A Hydra-PEG® coating was added for extra wettability and to minimize deposit accumulation. His dry eye was managed concurrently with use of cyclosporine 0.05% BID and preservative free artificial tears. After four years of scleral lens wear and aggressive dry eye treatment, the patient has experienced both an improvement in vision and in corneal health with current BCVA of 20/30 OD and 20/25 OS in scleral lenses.

LENS PARAMETERS

	Power	BC/Sag	Diameter	Edge	Material	Design
OD	-9.87 sph	7.58	18.0	15.0/0.5	Optimum Extra	200u toric PC, Hydra-PEG
OS	-6.62 sph	8.04	18.0	15.0/0.5	Optimum Extra	200u toric PC, Hydra-PEG

FIGURES

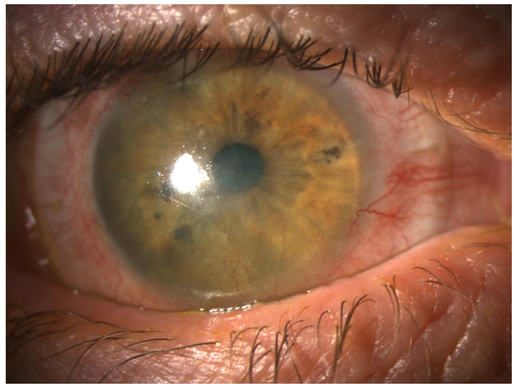

Figure 1a: Scleral lens fit of the right eye.

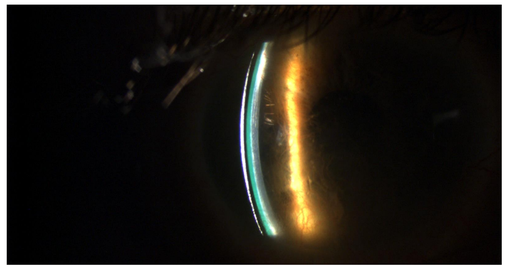

Figure 1b: Scleral lens vaulting the cornea of the right eye.

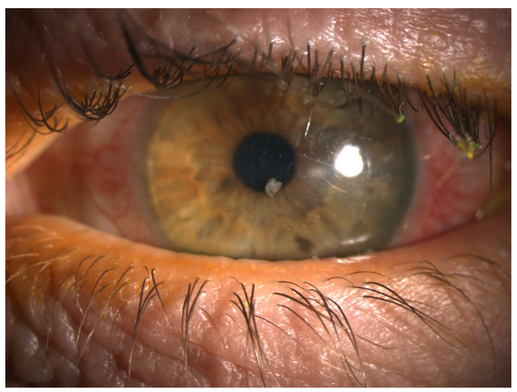

Figure 2a: Scleral lens fit of the left eye.

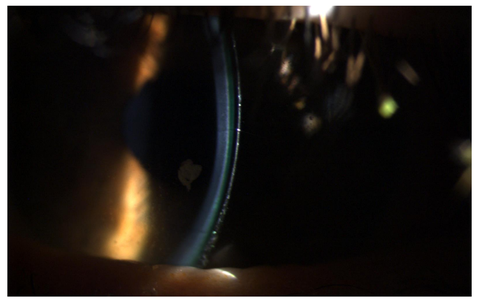

Figure 2b: Scleral lens vaulting the cornea of the left eye.

DISCUSSION

The fitting was initiated with a large diameter lens due to the large area of the patient's ocular surface that was compromised. Unlike cosmetic lenses, which are often contraindicated in SJS due to the compromised ocular surface, the large-diameter scleral lens provides a stable and protective vault over the sensitive cornea, offering a viable solution for patients seeking both improved vision and enhanced comfort.

It is especially important to consider oxygen permeability when fitting scleral lenses on patients with ocular surface conditions such as in SJS. Optimum Extra was selected with its high Dk of 100. Our patient presented with corneal neovascularization, so it was important to ensure adequate oxygenation to the cornea in order to prevent further progression.

Build-up of deposits on the inner surface of the lens were evident due to the poor quality of tear film. Modifications such as adding a Tangible® Hydra-PEG® coating were incorporated into the lens to improve wettability and minimize surface deposits. Proper lens hygiene is especially important for these patients. Due to the inflammatory nature of this condition in combination with long hours of rigid lens wear, the patient was advised to remove the lenses and refill with preservative free filling solution midday as well as to incorporate Tangible® Clean weekly for a stronger clean while avoiding compensating the integrity of the coating. Practitioners should monitor the integrity of their patient's lenses and perform thorough in-office cleanings regularly.

CONCLUSIONS

Patients recovering from Stevens-Johnson syndrome may experience significant long-term ocular discomfort and reduced vision due to the chronic inflammatory response resulting from this condition. In the management of such patients, large diameter scleral contact lenses, highly oxygen permeable materials, and coatings to increase wettability and comfort should be considered in order provide patients with greater ocular comfort and improved quality of vision. This case underscores the importance of personalized and innovative approaches in optometric care, highlighting the potential of scleral lenses as a valuable tool in managing ocular surface disorders. As we continue to explore advancements in contact lens technology, these findings emphasize the critical role optometrists play in enhancing the visual well-being of patients facing complex ocular challenges.

REFERENCES

1. Brousseau, B. Tougeron, et al. "Scleral Lens Therapy in Ocular Surface Disease Due to Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis." *Investigative Ophthalmology & Visual Science*, vol. 50, no. 13, Apr. 2009.
2. Metcalfe, Derek, et al. "Acute and chronic management of ocular disease in Stevens Johnson Syndrome/toxic epidermal necrolysis in the USA." *Frontiers in Medicine*, vol. 8, 2021.
3. Sotozono, Chie, et al. "Severe dry eye with combined mechanisms is involved in the ocular sequelae of SJS/TEN at the chronic stage." *Investigative Opthalmology & Visual Science*, vol. 59, no. 14, 2018.