Life-Saving Treatment Causes Debilitating Sequelae: Treating Radiation-Induced Ocular Surface Disease with Therapeutic Scleral Lenses

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Introduction

- **Scleral contact lenses** are large diameter gas permeable lenses that are commonly prescribed for patients with irregular corneas to provide optimal vision correction.
- Scleral contact lenses are also great **therapeutic devices** for treating ocular surface disease, as the post-lens tear reservoir provides **continuous protection and hydration** to the corneal and conjunctival surfaces to support proper ocular surface physiology.

Case Report

A 50-year-old female with chronic ocular surface disease was fit into scleral lenses following **ocular radiation**.

With regular wear of the scleral lenses, the patient's **signs and symptoms significantly improved**, allowing the patient to perform daily activities that were previously intolerable with more ease and comfort.

History

Chief complaint:
- Chronic and incapacitating eye pain and photophobia, minimal relief with current therapies
- **Patient's goal is to drive comfortably and safely on her own**, as pain would cause involuntary eye closure

Ocular history:
- Stage 4 bilateral orbital and conjunctival mucosa-associated lymphoid tissue (MALT) lymphoma, successfully treated with 14 days of radiation

Dry eye treatment/regimen:
- Cyclosporine 0.05% BID OU
- Lifitegrast 5% BID OU
- Extended duration punctal plugs LL OU
- Omega 3 supplements
- Lid hygiene (lid scrubs and warm compress)
- **Non-preserved artificial tears q1:15h**

Clinical Findings

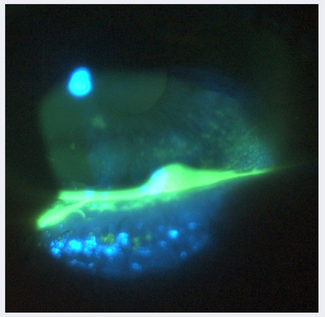

Fig 1. Right eye, pre-treatment

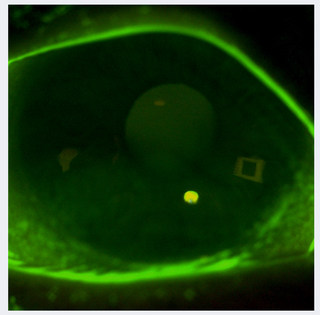

Fig 2. Right eye, post-treatment

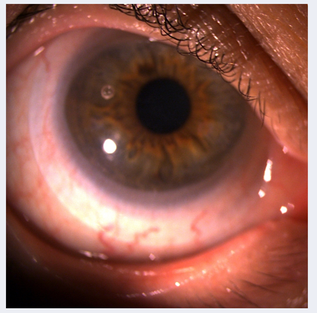

Fig 3. Right eye with scleral lens

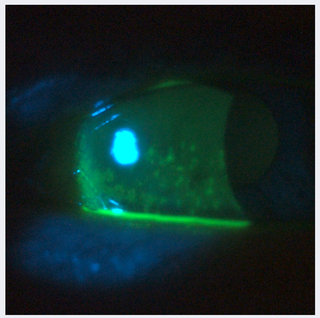

Fig 4. Left eye, pre-treatment

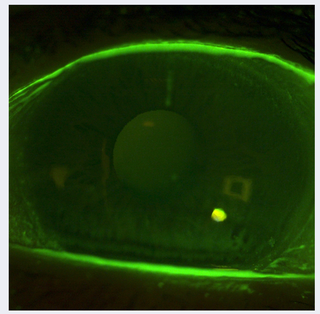

Fig 5. Left eye, post-treatment

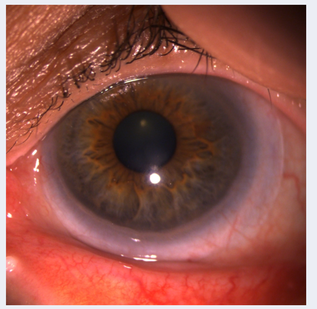

Fig 6. Left eye with scleral lens

Anterior segment evaluation: Prior to lens wear, the patient was extremely photophobic with marked sodium fluorescein staining in both eyes (Fig 1 & Fig 4). At follow up with daily wear, there is significant improvement in staining, and the patient can better tolerate bright lights for better quality anterior segment photos (Fig 2 & Fig 5).

Scleral lens evaluation: Fig 3 & Fig 6

	BC	Power	Diameter	Center Thickness	Central Clearance	Visual Acuity
OD	8.20	+2.00 sph	15.6mm	0.27mm	270um	20/20
OS	8.00	+0.87 sph	15.6mm	0.25mm	250um	20/20

- Limbal clearance 360°
- Scleral alignment without blanching
- Good centration
- Material: Optimum Extra

Patient satisfaction: The patient is extremely satisfied with the benefits of clear distance vision, significantly improved comfort, and the ability to perform tasks such as **driving independently.** The patient also feels **liberated** as she no longer depends on artificial tears.

Discussion

- MALT lymphoma, or extranodal marginal zone lymphoma, accounts for approximately 80% of conjunctival B-cell NHL. Ocular adnexal lymphoma has a 5-year overall survival rate ranging between 50% to 94% [(1)].
- Radiation to the orbit or surrounding structures can damage ocular structures responsible for maintaining a healthy tear film (e.g., main lacrimal gland, meibomian glands, accessory lacrimal glands, and conjunctival goblet cells) and may induce iatrogenic dry eye [(2)].
- In a retrospective study, 92% of patients using scleral lens therapy for ocular surface disease reported improvement in their visual function and quality of life, as reflected by improvement in their ability to perform daily activities such as reading, driving, and working [(3)].
- **Future Consideration:** Refit and increase overall diameter of the patient's scleral lenses as an experienced wearer to protect a larger area of the ocular surface. At the time of fitting, application training was difficult even with this smaller diameter and was **only successful with the help of a stand applicator device.**

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Clinical Pearls

- Consider scleral lenses for chronic ocular surface disease, especially when recalcitrant to more traditional therapies
- Regardless of treatment type, the goal is to promote well-being by reducing symptoms and allowing the patient to lead a more normal life (e.g., decrease use of artificial tears)

Acknowledgements & References

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3. Romero-Rangel, Tatiana, et al. "Gas-permeable scleral contact lens therapy in ocular surface disease." *American journal of ophthalmology* 130.1 (2000): 25-32. Review case in 2000