Contact Lens Institute of San Antonio

Molding Something Different: Impression-Based Scleral Lens for a Keratolimbal Allograft

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Background

Ocular graft-versus-host disease (GVHD) results in inflammation and infiltration to many ocular structures, including the limbal stem cells.[1] When limbal stem cell deficiency occurs, the corneal epithelium is unable to repair itself and may result in ulceration and perforation.[2] To replenish the limbal stem cell population, transplantation of a keratolimbal autograft (KLAT) or allograft (KLAL) may be performed.[2] Scleral gas permeable contact lenses are used to protect the compromised ocular surface affected by ocular GVHD.[1] Because the grafted tissue must be properly vaulted, impression-based scleral lenses may be designed to ensure a proper fit.

Case Presentation

A 40-year-old Hispanic male presented for a scleral lens impression with a history of KLAL transplantation and penetrating keratoplasty of the right eye secondary to limbal stem cell deficiency from severe ocular graft-versus-host disease. Per his corneal ophthalmologist, his graft was exhibiting more vasculature from probable inadequate fit of the previous impression-based scleral lens and needs a re-impression of the right eye for a new lens. His left eye presents with a permanent tarsorrhaphy and conjunctival Gunderson flap secondary to a history of recalcitrant corneal transplant-related infections.

Ocular Evaluation

Visual Acuities
- **OD**: 20/20-
- **OS**: LP

Keratometry
- **OD**: 35.00@119°/39.25@029°
- **OS**: unable to obtain

Manifest Refraction
- **OD**: +13.25 DS
- **OS**: Balance

Slit Lamp Examination:
- **OD**: full KLAL with engorged vasculature 360 and 18 sutures, full sutureless PK with mild stromal haze and mild MCE
- **OS**: lid tarsorrhaphy with 7 sutures, small corneal PED, diffuse corneal opacities and neovascularization, aniridia

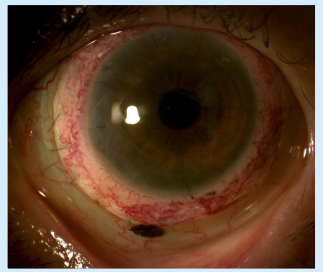

Figure 1. OD presenting with prominent vasculature

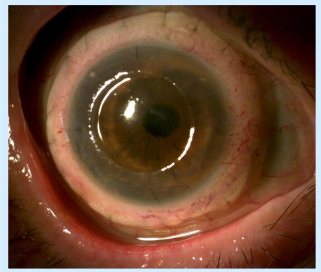

Figure 2. OD after 6 months of wearing new lens

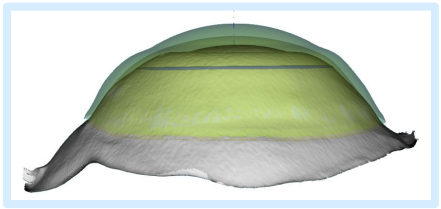

Figure 3. OD lens design based off impression mold

New Scleral Lens

- A molding impression of the right eye was performed and a consultation was done to order a lens of the following parameters: 11.66/+10.87/18.0.
- The lens was dispensed to the patient on follow-up after demonstrating proper vault over the corneal and LSC grafts.
- After 6 months of wearing the new impression-based lens, the eye exhibited significant improvement in appearance of the perilimbal vasculature. Good quality of vision and comfort were maintained.

Discussion

Patients living with LSCD and ocular GVHD have delicate ocular surfaces and benefit from scleral lenses for their therapeutic and visual rehabilitative properties.[2] The use of a highly customized scleral lens is often needed to fit the anatomy of patients who have undergone ocular tissue transplants, resulting in irregular ocular surfaces. Despite wearing such designs, the grafted tissues may also exhibit change over time and affect the fit of the lens. Frequent monitoring is needed in order to maintain the health of the grafted tissues in the presence of scleral lenses.

References

1. Bae, Steven S, et al. "Outcomes of Scleral Lenses for Dry Eye Disease in Chronic Ocular Graft-versus-Host Disease." Contact Lens & Anterior Eye, 2022, p. 101721.
2. Deng, Sophie, et al. "Global Consensus on the Management of Limbal Stem Cell Deficiency". *Cornea*, vol. 39, no. 10, October 2020, pp. 1291-1302. doi: 10.1097/ICO.0000000000002358.