

Utilizing MicroVaults to improve comfort and cosmesis in scleral lens wearers with pingueculae



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Introduction

Gas permeable (GP) scleral contact lens use has dramatically improved the quality of life for patients with irregular corneas and ocular surface diseases. The fluid reservoir both protects the corneal surface and negates irregular astigmatism, which improves both comfort and vision for the majority of our scleral lens wearing patients. Occasionally, scleral lens wear can irritate pingueculae and cause redness and discomfort during lens wear and after removal. Lens notches have been tried in the past, but the lack of reproducibility and size control makes notching less desirable. This poster will describe the utilization of MicroVaults (MV), a new method in improving redness, irritation and lens comfort in scleral lens wearing patients with pingueculae.

Case Report

BA, a 37-year-old Caucasian male presented to our office in May of 2014 for a complete examination and contact lens fitting. BA is in good overall health and has a history of keratoconus in both eyes, for which he was using scleral lenses for vision correction. His chief complaint was consistent redness and mild discomfort of the nasal conjunctiva in the right eye during and after scleral lens use.

Upon examination, BA's entering acuities were 20/20 OD and OS with scleral lenses. Other than the observation of Vogt's striae OU and a small, nodular pinguecula on the right nasal conjunctiva, his anterior segment and posterior segment ocular health was unremarkable. His scleral lens reveals complete corneal and limbal clearance, with the only significant conjunctival blanching being over his nasal pinguecula OD (figure 1). The scleral contact lens parameters were as follows:

Material: Optimum Extra
BC: 7.67 mm
Power: -1.25 DS
Diameter: 16.8 mm
PC radii: 1.00 mm flat from standard



Figure 1: Scleral lens impingement on pinguecula

Treatment Options

We discussed modifying his scleral lens with toric peripheral haptics with the goal to reduce bearing on his pinguecula OD. He was refit in the Zenlens by Alden Optical with toric peripheral curves. While his comfort was slightly improved, the toric haptics did not reduce lens bearing on the pinguecula. At this time, we decided to use a MV in attempt to better align to the shape of the pinguecula to reduce impingement.

Methods

The dimensions of the pinguecula was measured in the slit lamp and communicated to the lab. With the goal of improving BA's comfort without losing the semi-sealed environment of his scleral lens, Alden Optical provided five lenses with identical power, vault and base curve to his current lens, with each having different sized micro-vaults. The MV ranged in sagittal depth from 50 microns to 200 microns with a 2.0mm diameter.

Beginning with the 50 micron sagittal depth lens, we increased the MV depth in 50 micron steps to the 150 micron lens. We noticed a significant decrease in pinguecula blanching and dispensed the lens to AB. The lens parameters are as follows:

Material: Boston XO
BC: 7.67 mm
Sagittal depth: 5100 microns
Power: -1.25 DS
Diameter: 17.0 mm
PC radii: 1 step steep vertical meridian by 1 step flat horizontal meridian
MV diameter: 2.0 mm
MV depth: 150 microns

At the follow up, BA noted significant improvement in his nasal conjunctival appearance and comfort with the lens. He did note a small amount residual redness at the end of the day, and the MV now appeared smaller compared to the pinguecula size. The MV was reordered with diameter increased to 2.2 mm in overall diameter.

Results

BA was seen for a follow up 2 weeks after lens dispensed and he noted complete resolution of nasal conjunctival redness and lens related discomfort (figure 2). The final lens parameters are as follows :

Material: Boston XO
BC: 7.67 mm
Sagittal depth: 5100 microns
Power: -1.25 DS
Diameter: 17.0 mm
MV diameter: 2.2 mm
MV depth: 150 microns
PC radii: 1 step steep vertical meridian by 1 step flat horizontal meridian



Figure 2: Resolution of scleral lens impingement on pinguecula by use of a microvault

Discussion

Scleral GP lenses continue change the quality of life for many patients with both ocular surface disease and irregular corneas. Studies continue to prove they are valuable for both visual improvement and ocular surface protection, with risks for microbial keratitis and other contact lens related complications similar to that of corneal GP lenses. The comfort behind scleral lenses is primarily driven by the large overall diameter, which decreases lens movement and lid interaction. While the large lens diameter can simplify the fitting process when dealing with an extremely irregular corneal shape, conjunctival abnormalities like pingueculae, pterygia, and trabeculectomy blebs, can complicate the process.

Discussion, cont.

Pingueculae are the most common conjunctival abnormality that can affect a scleral lens fitting, at almost 48% prevalence. Patients with pinguecula that wear scleral lenses experience eye soreness, conjunctival injection during lens wear and heavy rebound redness upon lens removal. Hand tools can be used to sculpt a notch into the lens, but the ability to reproduce a notched lens is difficult. MV are added into the lens design application and can be reproduced very easily for consistency during the fitting process.

MicroVaults can be described as a small, round raised area located in the peripheral curves of the scleral contact lens. The MV can be customized to the location, size, and depth of the conjunctival anomalies (figure 3).

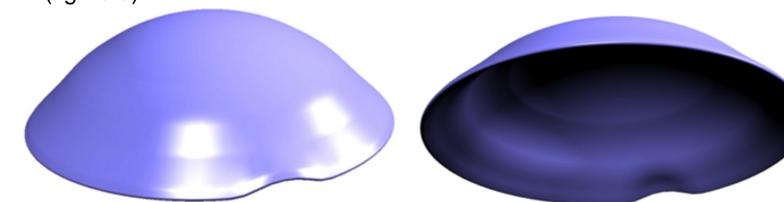


Figure 3: MicroVaults can reduce focal conjunctival irritation

At the time of this fitting, a formal method of measuring a pinguecula for a MV had yet to be established. Alden Optical now provides a graphic to help with the description of the pinguecula for improved initial lens fitting (figure 4). While many practitioners will use slit lamp measurements, if an anterior segment OCT is available, measurement of the pinguecula with the caliper tools can allow for near perfect sizing of the MV.

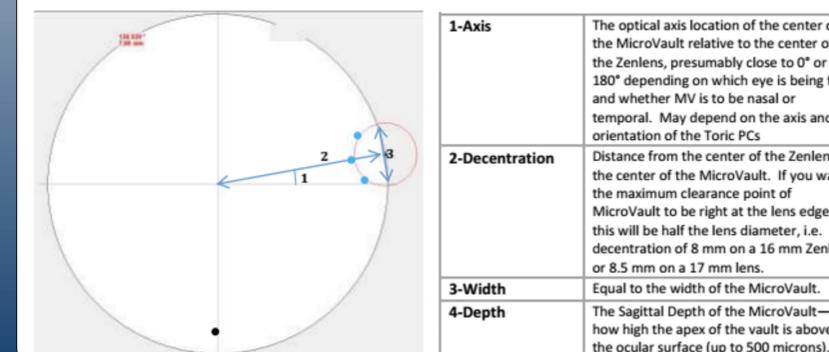


Figure 4: "Defining the MicroVault Prescription"