

USE OF SCLERAL LENSES FOR DRY EYE DISEASE



Patient education is an important part of the fitting process.

BY NADIA VIRANI, OD

There has been an increased focus on keratoconjunctivitis sicca (also known as dry eye syndrome or dry eye disease) in recent years. The Tear Film & Ocular Surface Society (TFOS) Dry Eye Workshop II (DEWSII) defined dry eye as “a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface.”¹ The prevalence of dry eye has been reported to be between 7% and 34%, and the prevalence increases with age.²

There are many strategies available for treatment of dry eye, and the range of options is still expanding.

One option that has received increasing attention recently is the use of scleral lenses in patients who have not responded to more conservative treatments. This article reviews some important points for practitioners interested in offering scleral lenses to their patients with dry eye disease.

Scleral lenses are large-diameter rigid gas permeable (RGP) contact lenses. They are designed to vault over the cornea, and, because of the large diameter, they extend all the way to the sclera. Scleral lenses are typically categorized based on diameter. The nomenclature goes as follows: lenses 13.0 to 14.9 mm in diameter are known as semi-scleral, those 15.0 to 18.0 mm in diameter are known as mini-scleral, and those 18.1 to 24.0 mm are known as full-scleral.²

The complete vault over the cornea creates a reservoir of fluid that sits on top of the cornea and is held in by the lens itself. This layer of fluid not only helps to normalize any corneal irregularities and provide better optical quality, but also helps to hydrate the ocular surface. Scleral lenses have been utilized for some time, but with modern advances in materials and manufacturing, their use has increased over the past 2 decades and now comprises nearly 1% of all contact lens fits.³

EXPANDING ROLE

The role of scleral lenses has primarily been for patients with corneal optical and topographic irregularities, but now that scope is expanding due to advances in technologies and manufacturing efficiencies. Scleral lenses have in the past been used off-label for dry eye treatment. In recent years, the FDA has for the first time included keratoconjunctivitis sicca as a therapeutic indication in the labeling of scleral lenses. Because of these new standards, scleral lenses are now more commonly used by specialty contact lens fitters and dry eye specialists. The movement away from off-label use allows insurance reimbursement that will support the momentum and growth of scleral lens use.²

TFOS DEWSII placed scleral lenses within the toolbox of treatment methods for dry eye disease. DEWS and DEWSII support scleral lens treatment when other conservative treatments have been ineffective. Those conservative treatments include artificial tears, lid therapy, topical

medications, and punctal plugs. The workshop authors suggested the use of scleral lenses before proceeding to antiinflammatory systemic medications, autologous serum tears, and/or surgeries.¹

FITTING FACTORS

To start the process of fitting a scleral lens for dry eye disease, several factors must be considered. A preliminary examination including complete ocular and medical history should always be the first step. Ancillary testing is then used to determine a patient's candidacy for scleral lenses. The patient should be adequately counseled on expectations regarding the fitting process and the maintenance of lenses. Many patients may not possess the time, patience, or temperance to successfully be fit in and maintain scleral lenses to alleviate symptoms and signs of dry eye disease.²

Surveys have been used to see how well scleral lenses performed. Overall outcomes were consistently positive when a good scleral lens fit was achieved.² The surveys studied include the Ocular Surface Disease Index and Visual Function Questionnaire.

Overall objective visual function as measured by acuity was also improved after a good scleral lens fit; fitting factors that exerted a positive effect on outcomes included corneal vault and limbal clearance. Corneal vault of approximately 0.3 mm and limbal clearance of 0.1 mm were noted as parameters for a good fit, although there is some debate regarding actual optimum clearance measurements. These values can be measured much more accurately with the use of imaging technology such as OCT.³

Scleral lens care, handling, and maintenance also play keystone parts in success with these lenses in dry eye treatment. It is important for patients to use a nonpreserved saline solution for filling the lens prior to insertion.

TOP TIPS

The following three considerations are crucial when fitting a scleral lens:

No. 1. Counsel the Patient Thoroughly to Set Expectations for the Process

This step is critical to the patient's success with fitting scleral lenses. The patient may easily underestimate the amount of time the fitting process will take and the number of visits required.

For example, in contrast to a soft contact lens fitting, a scleral lens fitting may start with a 1-hour diagnostic fitting followed by several 30-minute dispensing visits. The amount of time between the visits may vary depending on the scleral lens manufacturer. The insertion/removal training session may also take significant time compared with a typical soft contact lens fitting.

Counseling the patient thoroughly on this process helps eliminate frustration and manage patient expectations.

No. 2. Don't Underestimate Proper Insertion Technique

The process of inserting a scleral lens is not necessarily intuitive. Patients who are new to scleral lenses will inevitably have a learning curve and should be taught the process, including supervised practice. Even patients who have worn conventional soft contact lenses should be retrained on the process because the methods are vastly different.

A helpful technique is to instruct patients to tuck their chin toward their chest and look down toward the floor so that their head is parallel with the ground. The bowl of the lens must be filled with fluid to the brim, which helps maintain the fluid within the lens during the insertion process.

Filling the lens bowl excessively with preservative-free saline will help prevent bubbles during the insertion process. Some of the fluid will most likely spill during insertion, so overfilling ensures that enough fluid remains in the bowl for proper fit.

Patients should be instructed to hold their eyelids open, insert the scleral lens, then remove the device that they use to assist them. Many patients prefer to use a plunger, but others use their fingers instead. The common mistake here is that patients wait to release their lids until after

they remove the insertion device. Counterintuitively, releasing the eyelids first allows the lens to stabilize and become confined by the eyelids.

There are several ways to insert a scleral lens. Teaching patients a variety of options lets them choose the method they feel most comfortable with. For example, many patients use a plunger for insertion, but others will prefer using a scleral ring or even their fingers to give them greater control. Many patients also prefer not to depend on an insertion device for convenience purposes.

No. 3. Don't Underestimate the Effect of a Bubble Within the Lens

After inserting a scleral lens, look carefully to be sure no bubbles have been created. If there are any present, remove and reinsert the lens. The most common reason for the presence of a bubble is insertion error.

Many may think that a bubble will settle over time, but this is typically a false assumption. Bubbles tend to remain in the interface and will affect not only the evaluation of the lens but also the patient's vision and comfort.

A WELL-EARNED PLACE

The use of scleral lenses has grown greatly in the past few years and should continue to do so as indications increase. Scleral lenses have found a niche and are more commonly used in dry eye treatment than ever before. These specialty lenses offer remarkable potential to improve patient quality of life and the ability to grow a practice by offering such treatments. ■

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