



SCLERAL LENS FITTING TIPS AND TRICKS



Follow these pearls to reduce the risk of giant papillary conjunctivitis and contact lens intolerance.

BY AIMEE GRIMM, OD

Contact lens intolerance can be attributed to many different factors, including pathologic eyelid and corneal changes, poor lens fit and design, hypersensitivity to cleaning solutions, and unrealistic patient expectations. In today's contact lens industry, there are many specialty lens options that are highly customizable to achieve a successful lens fit and optimal vision. However, there is still a chance that

a patient wearing such lenses could develop mechanical irritation, foreign body sensation, or giant papillary conjunctivitis (GPC), which could lead to contact lens dropout (Figure 1). In this article, I discuss the use of scleral lenses, and share fitting tips to help prevent the aforementioned complications, which is especially critical in patients with corneal disease, who rely on specialty lenses to achieve adequate vision in their daily life.

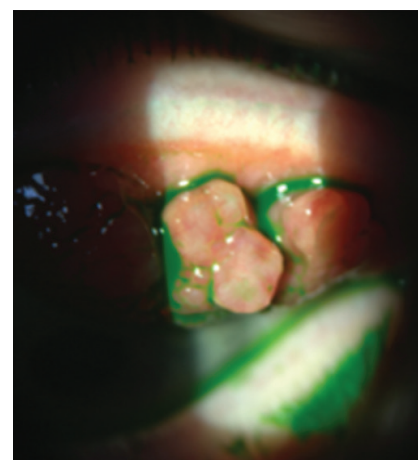


Figure 1. Enlarged GPC due to a poor-fitting rigid gas permeable lens.

IMPORTANT LENS PARAMETERS

When you have a patient with a history of mechanical irritation resulting in GPC complications, there are several lens parameters to consider: lens diameter, thickness, central clearance, and peripheral landing zone.

Lens Diameter

Lens diameter is a critical factor that should be chosen based on the patient's cornea size, which is measured by the horizontal visible iris diameter. The lens diameter should be 4 mm to 6 mm greater than the horizontal visible iris diameter for a mini scleral design and greater

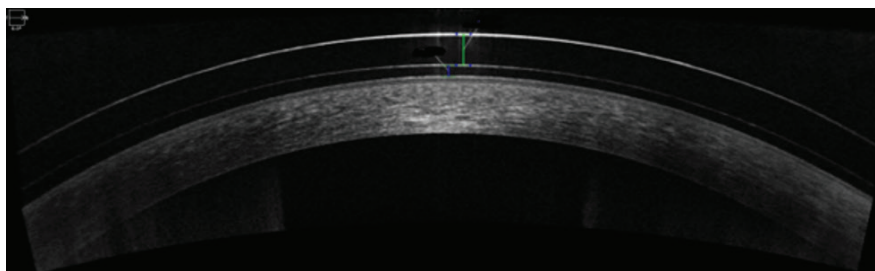


Figure 2. Central lens thickness and optimal central clearance after more than 6 hours of lens wear.

than 6 mm for a full scleral design.¹ The goal of lens alignment is to have 2 mm to 3 mm of complete clearance over the limbus to prevent any pathologic changes to the limbal stem cells and corneal surface.² A larger-diameter lens creates a greater sagittal depth or clearance, which in turn puts more pressure or bearing on the landing zone.³ This can also cause a more difficult lens fitting and requires specialized lens edges due to an asymmetric landing the further the lens extends beyond the limbus.¹ Therefore, in most cases, the smallest diameter lens that is adequate for proper corneal clearance is recommended for the initial fitting.

Lens Thickness

Scleral lens thickness is an important parameter to consider and depends on the lens type and manufacturing company. The average

scleral lens thickness ranges from 250 μm to 500 μm and usually increases toward the periphery, which plays a role in lens and lid interaction.^{1,4} This should be given special consideration when choosing a lens design in patients with a history of GPC or foreign body sensation with lens wear.

Lens Clearance

Adequate central lens clearance also varies according to the lens manufacturer and design (Figure 2). The number of microns recommended for central clearance is usually provided by the lens fitting guide. The minimal central clearance is desired to keep lens and corneal interaction at a minimum and increase oxygen transmissibility. Excessive central clearance can cause increased pressure on the lens haptics, resulting in a more difficult peripheral landing zone fitting.

Peripheral Landing Zone

This is arguably the most important factor to allow proper lens stabilization and interaction with the ocular surface. The sclera is toric in nature, specifically flatter in the nasal aspect due to the insertion of the medial rectus.² This can cause difficulties with excessive lens movement if standard curves are initially used for the landing zone.

Standard curves are adequate for a spheric sclera, but an asymmetric back surface design is indicated if sectoral blanching or edge lift is noted. A back toric lens design corresponds to toric curves and power correction meridians that are 90° apart.¹ The use of toric edges in the landing zone can help eliminate irregular alignment and provide a flush fit on patients with a toric sclera. If the landing zone needs to be steepened or flattened in one quadrant over another, a more advanced fitting design may be needed, such as a quadrant-specific lens design.

FITTING TIPS

Typically, an empirical lens fitting approach is used to order a quadrant-specific design. If a scleral topographer or OCT is not available, a fitting set and slit lamp can be used to evaluate the need for specialized peripheral edges. When trying to fit a lens with standard edges, evaluation of the edges will reveal asymmetric blanching or edge lift in one or more of the quadrants if a quadrant-specific design is indicated.

Blanching will appear as loss of blood flow through the conjunctival vessels at or near the lens edge (Figure 3). Edge lift can appear as a small shadow under the edge of the lens landing zone, but can sometimes be difficult to appreciate if viewing with a slit lamp. A fluorescein or lissamine green dye strip can be used to further assess edge lift.

After application of the dye on the inferior conjunctiva, diffuse light

AT A GLANCE

- ▶ Preventing mechanical irritation, foreign body sensation, and giant papillary conjunctivitis is critical in patients with corneal diseases, who rely on specialty lenses to achieve adequate vision for daily life.
- ▶ Consider factors such as lens diameter, thickness, central clearance, and peripheral landing zone when attempting to achieve an optimal lens fit.
- ▶ Peripheral landing zone is an important factor in allowing proper lens stabilization and interaction with the ocular surface.



Figure 3. Nasal injection OS due to steep lens edges.

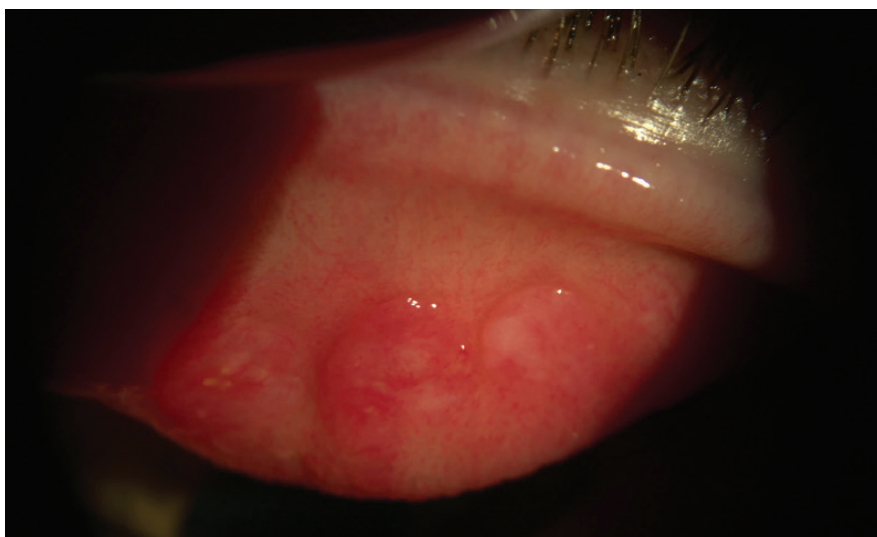


Figure 4. Healed papillae in the patient from Figure 1 after topical treatment and switching to customized scleral lenses.

upon slit-lamp evaluation can be used to view the lens edges during each blink. If the edge is too flat, dye intake under the lens will be seen with each blink. The severity of the edge lift is indicated by the amount of dye swept under the lens. A severely flat edge reveals quick intake of the dye, while a mildly flat edge will only show small areas of dye pooling under the lens and may take longer to observe.

It can be challenging to determine the amount of flattening or

steepening needed when ordering the first trial lens from the manufacturer. The quadrant-specific design and fitting can be discussed with consultation to assist in choosing correct lens parameters. If a slit-lamp camera or OCT is available, photos can also be sent to consultation to aid in the ordering process.

LENS SURFACE TREATMENTS AND CLEANING REGIMENS

To help increase the lubricity of a lens and create a smoother

transition with blinking, Tangible Hydra-PEG (Tangible Science) can be used. This coating limits lens deposits and improves surface wettability. Approved cleaning solutions for Hydra-PEG lenses include multipurpose solutions, such as Unique pH (Menicon) and Boston Simplus (Bausch + Lomb), and hydrogen peroxide systems, such as Clear Care (Alcon). Hydrogen peroxide systems are preferred for patients who wear gas permeable lenses because the surfactants in multipurpose solutions are not as effective in cleaning the lenses.^{5,6} Regular replacement of scleral lenses is also recommended, especially if deposits are noted on routine checks.

BE VIGILANT

GPC and lens awareness are chronic conditions that can lead to unsuccessful contact lens wear and dropout. These conditions can be especially detrimental in cases of diseased corneas that require specialty lenses, highlighting the importance of routine assessment of a patient's contact lenses and ocular tissue. With treatment of GPC, most patients can be successfully fit into customized scleral lenses (Figure 4). ■

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