



SCLERAL LENSES FOR POST-CORNEAL TRANSPLANT



This lens modality can be a great option for patients with corneal irregularities following surgery.

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Corneal transplantation has one of the highest success rates of any organ transplant surgery performed in the human body.¹ However, many patients experience significant amounts of aniseikonia, corneal irregularities, and astigmatism postoperatively, which can be difficult to correct with glasses. This article delves into the use of scleral lenses to achieve better visual outcomes for these patients.

THE SCLERAL LENS OPTION

It is expected that patients will require postoperative visual correction after a corneal transplant and will

likely experience a significant amount of residual corneal astigmatism. This makes scleral lenses an excellent option for patients with a corneal graft, whether they had a deep anterior lamellar keratoplasty (DALK) or penetrating keratoplasty (PK).

Performing corneal topography postoperatively can be helpful for empirical selection of the trial scleral lens. Topographic patterns after DALK for keratoconus may show a regular astigmatic appearance; however, oblate asymmetric bow-tie patterns are also quite common.² Depending on the postoperative topographic results, scleral lenses with regular aspheric

optics could work well for an initial fitting. For patients with topographies that appear oblate, consider a scleral lens with oblate optics or more options to customize lens parameters.

The midperipheral cornea (ie, the area over the graft-host junction) may still be elevated postoperatively. For this reason, it is advisable to increase the midperipheral clearance to completely vault and protect this area. This can be done by using a lens with oblate optics and a high amount of sagittal depth or by simply using a lens with customizable midperiphery parameters. Increasing the lens diameter can aid in vaulting over a significantly

irregular cornea. High plus powers should be fit with caution because of the decrease in transmissible oxygen due to lens thickness.

POSTOPERATIVE COMPLICATIONS

Some of the most commonly observed complications of a corneal transplant are postoperative glaucoma, late endothelial failure, and perforation.³ Newer surgical approaches, such as DALK, attempt to minimize tissue use, which consequently reduces the overall risk of graft failure, endothelial cell loss, graft rejection, and more serious side effects, such as choroidal hemorrhage and other suture-related complications.

Postoperative glaucoma should be considered very carefully when fitting patients with a corneal graft with scleral lenses. Although IOP increases due to scleral lenses have been shown to be statistically insignificant,⁴ it is still pertinent information for the corneal surgeon and the physician managing the patient's glaucoma.

SCLERAL LENS-RELATED CONSIDERATIONS

Patients can be fit with scleral lenses once the graft-host junction is healed, typically 3 to 6 months post-surgery, although the timing varies depending on the individual patient. It is ideal to wait until sutures are removed, as the corneal shape changes after suture removal. It should be noted that wearing scleral lenses can cause a small (1-2%) amount of corneal edema in healthy corneas after short periods of wear (ie, an average of 6 hours).⁵ The amount of corneal edema present in eyes after PK is typically higher and much more variable, with an even higher amount of edema closer to the graft-host junction. In addition, patients who undergo full-thickness transplants experience a greater loss of corneal endothelial cells than patients who undergo DALK.⁶ This is critical information when considering scleral lens wear postoperatively, as patients with low corneal endothelial

AT A GLANCE

- Regardless of the type of corneal transplant surgery, patients will likely experience residual corneal astigmatism and require postoperative visual correction.
- Scleral lenses can be an excellent option after corneal transplant surgery due to their oblate optics and customizable fitting parameters.
- Patients with high levels of corneal ischemia following a corneal transplant may not be good candidates for scleral lenses due to the heightened risk of graft rejection.

cell counts are at markedly higher risk of corneal hypoxic sequelae. If specular microscopy is accessible, it may be useful to determine the patient's endothelial cell count before attempting to fit them with a scleral lens; the minimum endothelial cell count recommended for a scleral lens fitting is 800 cells/mm² to 1,000 cells/mm².⁷ To minimize risk of hypoxia, select the highest Dk/t material available and decrease the center thickness of the lens as much as possible or opt for a fenestrated lens.

For patients with a high amount of corneal edema postoperatively, rigid gas permeable or hybrid lenses may be more suitable. Caution with limbal clearance is also advised with these patients, as mechanical stress from the landing zone can cause limbal edema due to pressure on the vasculature at the limbus; modifying the lens fit to increase limbal clearance can be helpful in these cases.

High levels of corneal ischemia can contribute significantly to the risk of graft rejection and failure.⁶ The risk of graft rejection also increases over time. For PK, the graft survival rate is reported to be around 91% at year 1 but drops to about 44% after year 20.⁸ Performing a partial-thickness corneal transplant (ie, DALK) can significantly improve graft survival rates. If there are

significant ischemic changes already present, opt instead for a rigid gas permeable lens, if possible.

A GREAT OPTION IN THE RIGHT CIRCUMSTANCES

Despite high surgical success rates, residual corneal astigmatism is expected post-transplant. Scleral lenses can be an excellent option due to their oblate optics and many customizable fitting parameters. However, their use may be contraindicated in patients with a corneal graft if there is a high risk for graft rejection. ■

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