

Cataract Surgery on Post-RK Eyes

BY STEPHEN H. JOHNSON, MD; STEPHEN S. LANE, MD; KARL G. STONECIPHER, MD;
AND R. BRUCE WALLACE III, MD

CASE PRESENTATION

How do you construct cataract surgery incisions in post-RK (radial keratotomy) corneas? If an RK incision is disturbed, what methods do you use to repair it?

—Topic prepared by R. Bruce Wallace III, MD.

STEPHEN H. JOHNSON, MD

For post-RK corneas, I vary my usual routine pre- and intraoperatively. Prior to surgery, I use the slit-lamp beam, its length set to the width of my cataract incision (2.4 mm). I place the beam between the endothelial side of the RK scars to estimate where my cataract incision will enter the eye so as to avoid transecting any RK incisions. If there are more than eight RK incisions, this technique allows me see which of them I might have to cross and where it would be best to do so. I also get an idea of how far posteriorly my cataract incision may have to start. I prefer a 2-mm tunnel but will shorten it if need be and close it with a suture. I will look at the topography to see if there are some RK incisions with a lesser flattening effect, because they may be less likely to split under stress.

Intraoperatively, because I know which incisions I wish to go between and about how long a tunnel I can make, I lay the keratome between the RK scars to see where my anterior endothelial entry should be so that I do not transect the RK incisions. Then, I back up 2 mm or less to see where the keratome incision should start in the cornea or sclera. I lower the infusion bottle. If an RK incision begins to split or leak, I stop, close it with a 10-0 nylon suture(s), and leave the knot at or barely beneath the surface so that I can remove it postoperatively without disturbing the incision. I will close with a suture if stromal hydration of my cataract incision might disturb an RK scar.

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—Stephen S. Lane, MD

STEPHEN S. LANE, MD

Performing cataract surgery on a patient who previously underwent RK presents a number of challenges for the cataract surgeon. Chief among these is the technical challenge of performing the primary incision. First, it is critical that the surgeon determine the minimal size of the incision through which he or she is most comfortable working to perform all of the steps necessary for cataract removal and IOL insertion.

Second, based on that determined incisional length, it is necessary to determine if there is adequate space between RK scars for the primary cataract incision to fit at the peripheral limbus/clear cornea. Although the wound can be constructed in a manner identical to the surgeon’s typical convention, he or she must exercise great care to be sure the primary incision does not encroach on any of the RK scars.

Third, if there is insufficient space between RK incisions for the primary cataract incision to be placed at the limbus or through clear cornea, the best approach is to perform a small fornix-based conjunctival flap and create a 2- to 3-mm scleral tunnel incision while taking care to avoid entry into the anterior chamber across any radial incision.

Finally, if an RK scar is crossed by the primary incision, significant instability of the wound will likely result, with consequent incompetence and aqueous

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—Karl G. Stonecipher, MD

leakage. In this case, sutures or perhaps tissue glue (cyanoacrylate), tissue polymer (polyethylene glycol hydrogel), or a combination thereof is necessary to ensure a watertight closure.

KARL G. STONECIPHER, MD

The number of post-RK patients presenting for cataract surgery is rising, and they are expecting refractive results. We therefore have to start with biometry. I like to look at the effective optical zone based on measurements with the Pentacam Comprehensive Eye Scanner (Oculus Optikgerate). I use the American Society of Cataract and Refractive Surgery IOL calculator in addition to intraoperative aberrometry to guide me to better outcomes.

If I plan to perform laser cataract surgery, I do not use the femtosecond laser to make incisions. There is zero room for error. In most cases, I will increase the laser energy to account for the corneal incisions to ensure a quality capsulotomy and lens fragmentation.

I try to create a cataract incision that is 2.4 mm long or less, and I tend to operate on axis between the RK incisions when possible. This is not always an option, in which case I will make a near-corneal incision, again with a length of 2.4 mm or less. Some patients' RK procedures involved more than 16 incisions. I saw a patient who had over 80 incisions in one eye. I do not want to make any more incisions in a cornea such as that one.

I tend to use a monofocal or toric IOL if I can define an axis. My final pearl is to watch the RK incisions closely. They can split, especially in eyes with more than 16 incisions created before the era of diamond blades. If this occurs, the options are either to close them patiently with a 10–0 nylon suture or with ReSure Sealant (Ocular Therapeutix; off-label use).

R. BRUCE WALLACE III, MD

Cataract incisions are no longer a challenge in eyes that underwent four-incision RK. For corneas with 16 RK incisions, a scleral tunnel is performed for the phaco incision. Eight-incision RKs are far more common, and the number

of post-RK patients needing cataract surgery increases as baby boomers age.

Fortunately, there is enough space between the RK incisions for a 0.8-mm sideport incision. I use the 3-D Diamond Blade (Rhein Medical) to create phaco incisions with a 2.8-mm width. I try to make as much of a corneal incision as possible. Diamond knives allow me to stay in stroma longer and not dive prematurely through Descemet membrane, where self-sealing of these incisions is more predictable. Longer corneal incisions are easier to seal with stromal hydration. Making a cataract incision longer, however, also means possible interruption of the RK scars in the anterior portion of the cataract wound. I try to begin as close to the limbus as possible and, on occasion, have created a “corner” that does require sutures for sealing. My go-to options are a 10–0 nylon suture on an AU8 needle (Alcon). Two interrupted sutures sealing each side of the corner are generally all that is necessary. Some new sealants available may be more desirable than suturing. ■

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