

# **Cataract Surgery after Prior Corneal Refractive Surgery**

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Many patients with cataracts have previously undergone refractive surgery, such as LASIK or PRK, to improve their distance vision by reshaping the cornea with a laser. Prior to LASIK, another refractive surgery procedure, radial keratotomy (RK), was the primary method used to treat nearsightedness. Unlike LASIK, RK involved making multiple spoke-like incisions in the cornea to reshape it.

If you have had any of these forms of refractive surgery in the past, you can still have cataract surgery using the same small incision technique. However, your cataract surgeon must be prepared to deal with special problems potentially created by the refractive surgery, and certain types of lens implants may not work as well. Because refractive procedures reshape the cornea, it becomes difficult to measure the power and curvature of the cornea properly before cataract surgery. Inaccurate cornea measurements make it much harder for the eye surgeon to calculate the optimal power for the artificial lens implant.

## **What is the artificial lens *power* and why is it important?**

Like contact lenses, every artificial lens implant (whether single focus, extended focus, or multifocal) is manufactured in more than 50 different “powers.” As with prescription eyeglasses or contact lenses, it is important to match the appropriate artificial lens implant power to your eye. To prescribe the correct spectacle or contact lens power, we utilize trial and error to preview various lens powers in front of your eye. When you are asked “which is better, one or two?” during an eye exam, you are selecting the lens power that you see best with. However, because your natural lens (cataract) must be removed before an artificial lens can be inserted inside the eye, it is impossible for you to preview or “try out” different powers. In other words, we cannot test different lens implant powers inside your eye during surgery. This inability to trial and switch lens powers means that cataract surgery is far less precise than fitting patients with glasses or contact lenses.

The cataract surgeon estimates what power of the artificial lens to implant using mathematical formulas that utilize preoperative measurements of your eye’s dimensions. Although the measurements are very accurate, there are individual variables that add unpredictability to the process. One variable is the exact location where the implant will sit inside your eye after healing is complete. Astigmatism is a naturally occurring imperfection in the optical shape of your cornea and is another variable that may reduce your ability to see without glasses.

With contact lenses, we can try different lens powers until we find which one best hits the desired target (e.g. distance focus). This would be like getting to take multiple putts on a golf green. However, with cataract surgery, we only get one “shot” to hit the target. We therefore can never guarantee that we’ll hit the target perfectly. For example, if perfect 20/20 distance vision is an “A,” you could end up with an “A,” or you might end up with “B” distance vision without

glasses. With the latter, you could then choose to wear prescription glasses to get your distance vision to an “A” for those tasks that require the best far distance focus, such as night driving.

### **Why does prior LASIK reduce the odds of seeing well without eyeglasses?**

One key measurement is the corneal curvature, and LASIK makes this somewhat uneven and difficult to measure accurately. With our putting analogy, this would be like an uneven golf green with many bumps instead of a perfectly uniform surface. When taking our one putt, the odds of hitting the target are now lower, and the chance of a larger miss is increased – such as getting a “C” instead of an “A” for uncorrected distance vision (i.e., without eyeglasses). This would necessitate stronger glasses to see well in the distance. It’s uncommon, but if the artificial lens power calculation is too far off, you may choose to exchange the lens implant with a second operation, which insurance may not cover.

### **Can LASIK patients still select from the same lens implant options?**

This often depends on how much corneal reshaping was needed with the original refractive procedure. Some patients required a second LASIK enhancement procedure. Larger amounts of LASIK or RK can result in some optical irregularities to the corneal surface. Multifocal lens implants can result in poor quality vision when combined with an irregular cornea and would not be recommended in this case.

The **light adjustable lens (LAL)** implant is the most advanced artificial lens technology to be FDA approved and available in the U.S. It is an option for all cataract patients, but is particularly advantageous for eyes that have had prior refractive surgery. This is the only system where the lens power can be changed and precisely adjusted several weeks following surgical implantation. This painless procedure is done in the office using a special light delivery device to shine a specific wavelength of UV light onto the artificial lens for approximately one minute. The light delivery device is not a laser but has the precision of a laser and is very accurate at correcting astigmatism as well. The LAL is the most accurate option for eyes that have had prior refractive surgery because after the initial power is estimated, it can then be changed and fine-tuned postoperatively. In our golf analogy, this would be like getting to take a second and third putt.

The LAL does not introduce halos and starbursts that are seen with multifocal lens implants, yet it provides a more extended focusing range compared to the basic single focus lens implant. This makes the LAL a good choice for those eyes that have some degree of corneal irregularity. It is also an excellent option for those patients who want one eye for distance and one with a closer focus. Patients selecting the LAL wear UV blocking spectacles for approximately one month following surgery. Because the LAL is adjustable postoperatively, many patients elect to have both eyes operated on at the same time with this option.

It is helpful to provide your cataract surgeon with your prior LASIK records that specify your vision both before and after the refractive operations. However, these records are frequently unavailable if many years have passed since the refractive surgery.