Posterior Segment Complications of Refractive Surgery

Both corneal and lens-based refractive surgery have potential posterior segment sequelae.

BY JEAN-FRANCOIS KOROBELNIK, MD

As a retina specialist, I have witnessed a trend in referrals for retinal detachments occurring after refractive surgery for high myopia. Other potential complications in the posterior segment as a result of refractive surgery include retinal breaks and macular disorders such as choroidal neovascularization (CNV), submacular hemorrhage, or macular holes. This article provides basic recommendations for refractive surgeons to consider in treating patients with high myopia. These suggestions differ slightly based on the type of refractive treatment—corneal refractive surgery (eg, PRK, LASIK, LASEK) or lens-based refractive surgery. The bottom line surgeons must remember is that a myopic eye that has undergone refractive surgery remains myopic in regard to the retina.

CORNEAL REFRACTIVE SURGERY

The most important consideration in this category is to hopefully avoid corneal refractive surgery in any patient who has a break in Bruch’s membrane. This kind of fundus may suggest that the posterior pole is highly sensitive to any changes in intraocular pressure. If corneal refractive surgery is performed in these patients, there is an increased risk for retinal complications, including submacular hemorrhage.

In the emmetropic eye, corneal laser refractive surgery is usually acceptable. However, some ophthalmologists believe that LASIK may induce retinal detachment in patients with high myopia. In 2001, Arevalo et al1 published a study suggesting that severe modifications to the eye during the suction phase of LASIK (Figure 1) caused trauma in the posterior segment. However, the number of documented posterior segment complications after refractive surgery is quite small. Two large studies confirmed that retinal complications after LASIK are minimal.2,3 In the first study, the incidence of retinal pathologies was 0.06%. Of 38,823 eyes that underwent LASIK, 14 retinal detachments, four retinal breaks, and one case of CNV occurred. In the second study,3 the rate of retinal complications was even lower (0.03% at 9 months). A total of 18,342 patients were enrolled, 9,598 of whom had high myopia. These two studies have a lower incidence of retinal detachment than one would expect in myopic eyes; we must question the accuracy of follow-up conducted in such a large number of eyes.

It is interesting that in Qin et al,3 retinal detachments occurred at approximately 9 months after LASIK. This is also our personal experience. We do not see retinal detachments until several months after refractive surgery. Therefore, we have concluded that corneal refractive surgery probably does not increase the rate of retinal detachment any more than if the patient had not undergone surgery.

Macular disease is another potential complication of corneal refractive surgery. In the literature, there have been...
TAKE-HOME MESSAGE

- Retinal detachments and CME tend to occur months after lens-based refractive surgery, not immediately postop.
- In regard to the retina, a myopic eye still remains myopic after refractive surgery.
- Patients with a break in Bruch’s membrane are at an increased risk for retinal complications.

LENSES-BASED REFRACTIVE SURGERY: REFRACTIVE LENS EXCHANGE

Multifocal IOLs may be a good option for the patient; however, they are not good at all for the retinal surgeon because it makes examining and accessing the fundus during vitreoretinal surgery more difficult, especially during macular surgery.

Several severe complications have occurred after lens-based refractive surgery, including endophthalmitis. We know that we can reduce its incidence by using cefuroxime in the anterior chamber. Additionally, the threat of posterior capsular opacification (PCO) is elevated in young patients with high myopia; avoiding PCO may be the best thing to do when you consider extracting a clear lens for a refractive purpose.

Most, if not all, refractive surgeons are aware of the threat of endophthalmitis and elevated PCO and are already taking the proper precautions to avoid these complications. However, retinal complications, including cystoid macular edema (CME) and retinal detachments, are less familiar to refractive surgeons. The use of topical NSAIDs may prevent or reduce the risk of CME, which may occur several months after refractive lens exchange.

The rate of retinal detachments after lens-based refractive surgery is significantly higher than it is after corneal refractive surgery. Neuhann et al studied 2,356 eyes in 1,500 myopic patients and found an incidence of retinal detachment between 1.5% and 2.2%. Alió et al studied 439 eyes of 274 myopic patients and found a slightly higher rate of retinal detachment at 2.7%. Alió’s study also pointed to an increased risk of retinal detachment in the long term. The rate of detachment was only 0.47% at 3 months; however, it increased to 3.28% at 5 years. This may be related to his patients’ young age at the time of surgery.

In France, we are currently conducting a prospective multicenter study of 150 myopic patients who will be followed for 5 years to record the incidence of retinal detachment, PCO, and the need for retreatments.

Although data are not yet available, we do know that the longer we wait after refractive lens exchange, the greater the chance of retinal detachment because of posterior vitreous detachment and of increasing PCO, requiring Nd:YAG capsulotomy.

RECOMMENDATIONS

During episcleral retinal detachment surgery, the retinal surgeon may induce refractive changes (astigmatism), which will may reverse the effects of a refractive procedure. Patients are generally unhappy if you induce myopia after retinal detachment. Therefore, it is imperative not only to be aware of the complications that may occur in the posterior segment after refractive surgery but also learn how to avoid them when possible. I offer three final recommendations for refractive surgeons to consider before performing surgery in myopic patients:

1. Inform the patient that retinal detachments can occur. If after refractive surgery (corneal or lens-based) he presents symptoms suggesting retinal traction, break, or detachment, explain the symptoms and see the patient as soon as possible.

2. When performing refractive lens exchange, use an IOL with a low rate of PCO.

3. Carefully examine the periphery of the fundus to detect any breaks or lattice degeneration that may require follow-up or laser treatment.

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