

Simultaneous Bilateral Refractive Lens Exchange: Madness or Brilliance?

Surgical protocol closely mimics bilateral cataract surgery.

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Immediate sequential bilateral cataract surgery (ISBCS) is becoming an accepted treatment modality in patients with significant bilateral cataract—but is a similar procedure appropriate for refractive lens exchange? With the right protocol in place and a meticulous surgical strategy, our answer is yes.

We have had surgeons tell me that the notion of simultaneous bilateral refractive lensectomy, at least on an emotional level, appears reckless. However, it is the standard of care for refractive lensectomy patients in our clinic, and we have had nothing less than safe, predictable outcomes and happy patients. In this article, we share our personal and clinical experience with this helpful treatment modality.

DISTINCT SURGERIES

The terms *simultaneous bilateral refractive lensectomy* and *immediate sequential bilateral refractive lensectomy* are both appropriate. The sequential qualifier is helpful to indicate that, while bilateral, surgery in each eye is treated distinctly. We offer this procedure to all patients who are undergoing refractive lensectomy for many reasons: There is no transient anisometropia, many of the pre- and postoperative visits that would be necessary for two unilateral surgeries are eliminated, and eye drop application is simplified because both eyes follow the same protocol. Additionally, we allow patients to use the same medication in both eyes starting 1 week after surgery, thus reducing medical costs. There is also a significant cost reduction for the clinic, allowing us to price the procedure at a more affordable level and thus provide services to a greater range of people.

Simultaneous bilateral refractive lensectomy also prevents the notoriously difficult situation of a unilaterally implanted patient who is unhappy with the immediate postoperative outcome. Patient satisfaction typically improves after second-eye surgery; however, temporary visual disturbances after multifocal IOL implantation can

dissuade some patients from proceeding with the second eye. Simultaneous surgery provides immediate binocular benefit, reducing the time required for neural adaptation and eliminating the “which eye is better?” comparison.

Having shared the advantages of simultaneous bilateral refractive lensectomy, it is important to clarify that this procedure should be reserved for surgeons who have significant refractive lensectomy and cataract surgery volume (at least 500 combined cases per year). Surgeons adopting the simultaneous approach should not make any significant changes to their surgical technique, especially during the learning curve; the single posterior capsular tear I had while performing simultaneous bilateral surgery was when I attempted to use an unfamiliar I/A tip. My clumsiness with the new instrument was responsible for the tear. Fortunately it was minor, and I was able to proceed with surgery.

SURGICAL CONSIDERATIONS

We have not had one case of infectious endophthalmitis in my private surgical center; however, in the public facility there is no mechanism for accurately determining the com-

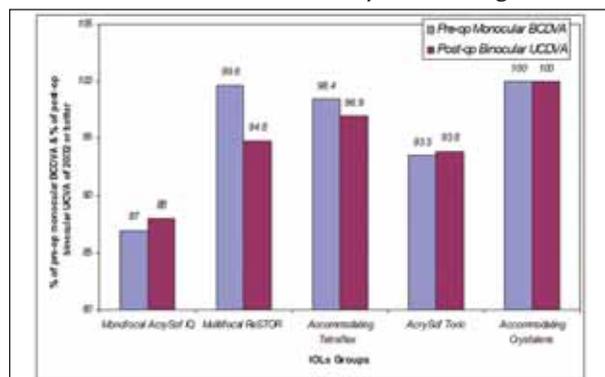


Figure 1. Percentage of patients with 20/32 or better preoperative distance BCVA and postoperative distance UCVA (n=4 for Crystals; all others n>30).

plication rate from bacterial endophthalmitis. Control of cleaning regimens and air quality may be more difficult in ambulatory surgery centers, contributing to an increased likelihood of infection, although rates of infection are expected to be low in all surgical suites. A single case of toxic anterior segment syndrome should be sufficient to suspend the practice of bilateral surgery until the cause is determined and a significant period without recurrence has been observed.

Some patients are not suitable for simultaneous surgery, including those with significant amblyopia or with the potential for complications such as pseudoexfoliation or intraoperative floppy iris syndrome. All other patients booked for refractive lensectomy are given the option of undergoing bilateral simultaneous surgery. A discussion of the relative risks is undertaken preoperatively. In the 6 years in which I have offered simultaneous bilateral refractive lensectomy, only one patient elected to undergo surgery on different days.

At the time of surgery, the operating nurse instills the preoperative eye drop regimen under the explicit instructions that any contaminated bottle should be immediately discarded and a new sample obtained. I do not require that a separate bottle be used for each eye. The patient is then brought into the operating room, where each eye is operated on separately. We always proceed with the right eye first with the caveat that it is safe to proceed with second-eye surgery only if there are no significant intraoperative complications.

At the end of first-eye surgery, all instruments and disposables are removed, and the nursing staff and surgeon rescrub with hand wash. With the patient still in the operating room, we then proceed to set up for the second-eye surgery with totally isolated surgical gear. I use intracameral vancomycin for both procedures, as I believe it is potentially efficacious in intraocular surgery. I do not ask the patients to keep separate right and left eye drops, as I believe that this is generally not complied with.

To date, I have aborted only one case, which was due to pathologically weak zonules. In that procedure, I aborted placement of an AcrySof IQ Restor +4.0 D IOL (Alcon Laboratories, Inc., Fort Worth, Texas) and instead used a three-piece monofocal IOL in the sulcus and aborted the procedure in the second eye.

STUDY OUTCOMES

I have presented preliminary results for 455 cases of simultaneous bilateral refractive lensectomy performed between June 2004 and October 2010.¹ A variety of lenses were implanted, with 70% of patients receiving bilateral Restor implants. The remaining patients received either bilateral aspheric monofocal, toric, or accommodating lenses. The two accommodating IOLs we used were the Crystalens

TAKE-HOME MESSAGE

- Simultaneous surgery provides immediate binocular benefit, reducing the time required for neural adaptation.
- Surgeons adopting a simultaneous approach should not make significant changes to their surgical technique.
- Procedures should be completely isolated as though they were separate surgeries.

(Bausch + Lomb, Rochester, New York) and the Tetraflex (LensteC, St. Petersburg, Florida). Figure 1 shows the percentage of patients with 20/32 or better distance BCVA preoperatively and distance UCVA postoperatively by lens group (n=4 for Crystalens; all others n>30). More than 97% of patients were within ± 1.00 D of intended refraction.

REFRACTIVE SURPRISES

One potential benefit of separated surgeries is that a postoperative refractive surprise in the first eye can be adjusted for the second eye. However, careful biometry reduces the likelihood that refractive surprises will occur, as does selecting patients who are ideal candidates for surgery.

Any biometric data that are not reproducible necessitate repeat measurements. Because of the potential for refractive surprises, all patients are advised that enhancement of their refractive outcomes is possible after simultaneous bilateral refractive lensectomy. In our patient cohort, we have had no major refractive surprises due to biometric error, but about 20% of patients required enhancement to optimize their refractive outcomes. (Patients undergoing bilateral lens exchange are typically demanding.)

SURGICAL APPROACH

Our surgical approach to refractive lensectomy and bilateral simultaneous refractive lensectomy is similar to our approach to cataract surgery, with a few significant differences. Many patients undergoing refractive lensectomy are highly myopic and have very deep anterior chambers. Fortunately, these eyes have soft cortical and nuclear lens elements that generally do not require phacoemulsification. After careful hydrodissection and hydrodelineation, the nucleus tends to prolapse at least partially into the anterior chamber. The lens is generally easy to remove with aspiration using short pulses of phacoemulsification for more resistant nuclear fragments.

Capsular polishing with a silicone tip under low vacuum and meticulous removal of cortical filaments are essential steps. Polishing or vacuuming the posterior surface of the anterior capsular remnant is also helpful, although this is difficult in the subincisional capsular area when coaxial microincision clear corneal surgery is employed. I almost

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always construct near-clear or corneoscleral incisions and leave a small remnant of conjunctiva to cover the external incision site. My belief is that these incisions minimize surgically induced astigmatism and are less likely than clear corneal incisions to lead to intraocular infection.

Meticulous clean-up of the ophthalmic viscosurgical device and creation of a continuous curvilinear capsulorhexis that encapsulates the lens margins are also important aspects of the refractive lensectomy procedure. Whenever possible, incisions are made on the steep axis of astigmatism. When a toric lens is used, markings for the incision and for the axis of astigmatism are placed prior to surgery using a No. 30 needle to nick the paralimbal blood vessels. All markings are performed at a slit lamp.

FUNDAMENTALS

The key fundamental in bilateral simultaneous refractive lensectomy is complete isolation of the two procedures as though they were separate. A meticulous surgical technique is followed; injection of vancomycin continues to be our preferred antibiotic prophylaxis.

In very short eyes with hyperopia and hyperopic astigmatism there may be some limitation of lens selection, and the biometry must be discussed with these patients prior to surgery. Generally, when a secondary enhancement procedure is anticipated, we aim for approximately 1.00 D of myopia, as it is far easier to correct myopia with a minor PRK or LASIK procedure than mixed astigmatism or hyperopic astigmatism. Lens selection is aimed at providing the patient with a treatable refractive range.

In conclusion, simultaneous bilateral refractive lensectomy has become the standard of care for refractive lensectomy patients in our clinic, with safe and predictable outcomes and happy patients. Both the clinic and our patients benefit from the associated cost reductions. The keys to our success are meticulous technique, attention to detail, and a willingness to delay surgery in the second eye at any sign of intraoperative complication. ■

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1. Blaylock JF. Simultaneous bilateral refractive lensectomy. Paper presented at the ASCRS Symposium on Cataract, IOL and Refractive Surgery; April 10, 2010; Boston.