

BARRIERS TO ISBCS

Several hurdles prevent widespread adoption of this approach.

BY GRACE SUN, MD; AND CHARLES COLE, MD



Cataract surgery is one of the most commonly performed, cost-effective, and successful surgical procedures worldwide. With a globally aging population, it has been reported that the demand for cataract surgery is likely to more than

double during the next 25 years, requiring health care providers and institutions to develop more cost-effective and efficient methods of caring for these patients.¹ One potential way to enhance cataract surgery productivity and maintain patient satisfaction and quality of care is through surgery performed on both eyes on the same day, referred to as *immediate sequential bilateral cataract surgery* (ISBCS). Although some surgeons prefer and advocate for ISBCS, the current standard of care in most countries is *delayed sequential bilateral cataract surgery* (DSBCS), wherein cataract extraction is performed on one eye one day and then the fellow eye days to weeks later.

With potential cost savings for health care payers, patient convenience, and decreased wait times for surgery, ISBCS has become an increasingly important alternative to DSBCS. There are, however, several concerns and hurdles that prevent widespread adoption of ISBCS. Among these are the perceived risk of bilateral complications, the inability to fine-tune IOL selection in the second eye, economic constraints

for facilities and surgeons, and liability concerns because ISBCS is not an established standard of care.

RISK OF BILATERAL SURGICAL COMPLICATIONS

Risk No. 1: Bilateral endophthalmitis. Bilateral postoperative endophthalmitis is the most serious and feared complication of ISBCS, as it can lead to permanent bilateral damage and blindness. Unilateral postoperative endophthalmitis is extremely rare, occurring in only 0.02% to 0.5% of all cataract surgeries when current techniques are used.²⁻⁵ Bilateral postoperative endophthalmitis after ISBCS is even more rare, having never been reported when appropriate ISBCS guidelines are followed. However, because of this potential consequence, it remains a concern.⁶⁻⁸

Risk No. 2: TASS. Toxic anterior segment syndrome (TASS), another potentially devastating surgical complication, is an inflammatory reaction caused by a noninfectious substance that enters the anterior chamber. TASS can occur after any anterior chamber procedure.⁹⁻¹¹ It has been linked to a variety of factors, but the causative agent is not identified in most cases. To date, no cases of bilateral TASS after ISBCS have been reported, but it has the potential to be a serious complication.

Risk No. 3: CME. Cystoid macular edema (CME) is among the most common causes of visual impairment following cataract surgery. It occurs due to postoperative inflammatory changes. Four cases of bilateral CME have been reported after ISBCS.⁶ However, it is still unclear whether ISBCS increases the risk of bilateral CME compared with DSBCS.⁶

Although bilateral complications are rare, the risk exists and should be considered in this era of heightened awareness for patient safety. Bilateral complications after cataract surgery should be of paramount concern, surgeons should continue to strive to make it a never event.

OTHER MAJOR CONCERNS

Concern No. 1: Postoperative refractive surprise. Another major concern with ISBCS is that, if there is a refractive surprise in the first eye, a delayed procedure may allow this to be corrected in the second eye. A study by Guber et al, however, found little predictive value from the first eye to second eye, using a target range of ± 1.00 D as the measured outcome.¹² It is interesting to note that if a target range of ± 0.50 D was used instead of ± 1.00 D, only 61% of first eyes and 51% of second eyes would have been within target range. Although being within ± 1.00 D of target is frequently used as a benchmark in studies, with multifocal, low-power multifocal, and extended



AT A GLANCE

- Bilateral complications are rare, but the risk exists and should be carefully considered in this era of heightened awareness of patient safety.
- DSBCS allows the prediction error in the first eye to be used to improve refractive prediction for the second eye.
- For ISBCS to become more widely adopted, alternative reimbursement models will have to be developed that are collectively beneficial to patients, payers, and health care providers.
- For surgeons considering ISBCS, it is imperative to consider patient selection; to conduct a thorough discussion of the risks, benefits, and alternatives with the patient; to treat each eye as a separate procedure; and to follow strict aseptic guidelines.

BARRIERS TO ISBCS

- Perceived risk of bilateral complications
- Inability to fine-tune IOL selection in the second eye
- Economic constraints for facilities and surgeons
- Liability concerns, as ISBCS is not an established standard of care



depth of focus IOLs, being within ± 0.50 D is more desirable. This is an important consideration, as improved technologies have raised the expectations of patients and surgeons.

Concern No. 2: Prediction error. A major source of prediction error is difficulty in knowing the effective lens position. DSBCS allows the prediction error of the first eye to be used to improve the refractive prediction for the second eye. In a study by Olsen, his corrections, albeit small, had the effect of raising the percentage of patients within ± 0.50 D of target by about 8% in the second eye.¹³ Jivrajka et al also found a clinically significant improvement in second-eye predicted refractive error when first-eye results were considered. They found that improvements ranged from 0.54 to 1.13 D from the first to the second eye, depending on the refractive error in the first eye.¹⁴

Advances such as optical biometry, tomography, intraoperative aberrometry measurements, and improved IOL formulas have improved prediction error but have not eliminated it. Using first-eye results to improve second-eye outcomes continues to have value.

FINANCIAL BARRIERS FOR FACILITIES AND SURGEONS

Other difficulties in adoption of ISBCS include the financial barriers for hospitals, ambulatory surgery centers, and surgeons. In the United States, Medicare and Medicaid reimburse at 100% for the first eye but at only 50% for the second if it is done on the same day. In Japan and Israel, the second eye is not reimbursed at all. It is estimated that transitioning from DSBCS to ISBCS could cause a net loss of US\$19,000 to US\$91,000 per year for private practices, and it may not be possible to offset this loss by increasing office visits, growing patient volume, or offering premium IOLs.¹⁵⁻¹⁷

These results were supported by a recent study, which highlighted that surgeons spent approximately the same amount of time in surgery for both eyes, irrespective of using ISBCS or DSBCS, but were reimbursed 21% less for ISBCS.¹⁸ Ambulatory surgery centers may also face an estimated net revenue loss of US\$118,557 to US\$151,466 if they transition from DSBCS to ISBCS.¹⁹

For ISBCS to become more widely adopted, alternative reimbursement models that are beneficial to patients, payers, and health care providers will have to be developed.

LEGAL CONSIDERATIONS

Limitations to adoption of ISBCS also remain in the medicolegal arena. In the United States and other countries, ISBCS is not the standard of care. Surgeons may be

uncomfortable going against established practice patterns, as complications or poor refractive outcomes may leave them vulnerable to a large legal settlement.

CONCLUSION

With the number of cataract surgeries performed expected to rise, ISBCS has been proposed as a way to increase efficiency, decrease costs, and maintain quality of care and excellent surgical outcomes. Despite this, the potential risk of bilateral complications, the presence of economic and medicolegal disincentives, and the inability to refine refractive targets remain concerns. As technology continues to improve, the expectations of both patients and surgeons for better surgical outcomes will also rise. For the surgeon considering ISBCS, it is imperative to consider patient selection; have a thorough discussion of the risks, benefits, and alternatives with the patient; treat each eye as a separate procedure; and follow strict aseptic guidelines. ■

1. Hatch WV, Campbell Ede L, Bell CM, El-Defrawy SR, Campbell RJ. Projecting the growth of cataract surgery during the next 25 years. *Arch Ophthalmol*. 2012;130:1479-1481.
2. Chang DF, Braga-Mele R, Henderson BA, Mamlis N, Vasavada A; ASCRS Cataract Clinical Committee. Antibiotic prophylaxis of postoperative endophthalmitis after cataract surgery: Results of the 2014 ASCRS member survey. *J Cataract Refract Surg*. 2015;41:1300-1305.
3. Creuzot-Gärcher C, Benzenine E, Mariet AS, et al. Incidence of acute postoperative endophthalmitis after cataract surgery: a nationwide study in France from 2005 to 2014. *Ophthalmology*. 2016;123:1414-1420.
4. Jabbarvand M, Hashemian H, Khodaparast M, Jouhari M, Tabatabaei A, Rezaei S. Endophthalmitis occurring after cataract surgery: outcomes of more than 480 000 cataract surgeries, epidemiologic features, and risk factors. *Ophthalmology*. 2016;123:295-301.
5. Kessel L, Flesner P, Andresen J, Erngaard D, Tendal B, Hjortdal J. Antibiotic prevention of postcataract endophthalmitis: a systematic review and meta-analysis. *Acta Ophthalmol*. 2015;93:303-317.
6. Arshinoff SA, Odoric S. Same-day sequential cataract surgery. *Curr Opin Ophthalmol*. 2009;20:3-12.
7. General Principles for Excellence in ISBCS. ISBCS. 2009. Available at: ISBCS.org. Accessed July 6, 2017.
8. Cataract Surgery Guidelines. The Royal College of Ophthalmologists. September 2010. Available at: <https://www.rcophth.ac.uk/wp-content/uploads/2014/12/2010-SCI-069-Cataract-Surgery-Guidelines-2010-SEPTEMBER-2010.pdf>. Accessed July 6, 2017.
9. Braga-Mele R, Chang DF, Henderson BA, Mamlis N, Talley-Rostov A, Vasavada A; ASCRS Clinical Cataract Committee. Intracameral antibiotics: safety, efficacy, and preparation. *J Cataract Refract Surg*. 2014;40:2134-2142.
10. Cetinkaya S, Dadaci Z, Aksoy H, Acir NO, Yener HI, Kadioglu E. Toxic anterior-segment syndrome (TASS). *Clin Ophthalmol*. 2014;8:2065-2069.
11. Suzuki T, Ohashi Y, Oshika T, et al; Japanese Ophthalmological Society HOYA Intraocular Lens-Related Endophthalmitis Investigation Commission. Outbreak of late-onset toxic anterior segment syndrome after implantation of one-piece intraocular lenses. *Am J Ophthalmol*. 2015;159:934-939.
12. Guber I, Remont L, Bergin C. Predictability of refraction following immediate sequential bilateral cataract surgery (ISBCS) performed under general anaesthesia. *Eye Vis*. 2015;2:13.
13. Olsen T. Use of fellow eye data in the calculation of intraocular lens power for the second eye. *Ophthalmology*. 2011;118:1710-1715.
14. Jivrajka RV, Shammam MC, Shammam HI. Improving the second-eye refractive error in patients undergoing bilateral sequential cataract surgery. *Ophthalmology*. 2012;119:1097-1101.
15. Neel ST. A cost-minimization analysis comparing immediate sequential cataract surgery and delayed sequential cataract surgery from the payer, patient, and societal perspectives in the United States. *JAMA Ophthalmol*. 2014;132:1282-1288.
16. Naseri A, McLeod S. Benefits of and barriers to immediate sequential cataract surgery. *JAMA Ophthalmol*. 2014;132:1362-1363.
17. Neel ST. Premium intraocular lens effect on the immediate sequential cataract surgery physician perspective cost-analysis model. *JAMA Ophthalmol*. 2015;133:491-492.
18. Rush SW, Gerald AE, Smith JC, Rush JA, Rush RB. Prospective analysis of outcomes and economic factors of same-day bilateral cataract surgery in the United States. *J Cataract Refract Surg*. 2015;41:732-739.
19. Neel ST. Effect of conversion to immediate sequential cataract surgery on ambulatory surgery centers in the United States in the cost-analysis model. *JAMA Ophthalmol*. 2015;133:856-857.

Grace Sun, MD

- Director, Ophthalmology Residency Program and Assistant Professor of Ophthalmology, Weill Cornell Medical College, New York
- grs2003@med.cornell.edu
- Financial disclosure: None acknowledged

Charles Cole, MD

- Clinical Assistant Professor of Ophthalmology, Weill Cornell Medical College, New York
- charles1k@mac.com
- Financial disclosure: None acknowledged