

# Same-Day Cataract Surgery in the Age of COVID-19



ISBCS can offer an advantage to decrease surgical scheduling and follow-up visits.

BY CARLOS VERGES, MD, PHD; AND JESÚS MARÍN, OD, PHD

**T**he COVID-19 pandemic is necessitating the creation of new paradigms of ophthalmic care. One new paradigm that would decrease the frequency of surgery and the number of follow-up visits is immediate sequential bilateral cataract surgery (ISBCS). The procedure has gained adherents around the world, especially in Europe and Japan,<sup>1</sup> but it is not widely accepted. Perhaps now is a good time to consider the incorporation of ISBCS as a practical strategy to reduce surgical encounters and follow-up visits and to discuss how we can perform it effectively and with the least risk (Figure).

## ADVANTAGES AND DISADVANTAGES

A review of ISBCS reveals that this approach has not been shown to have any demonstrable downside or unsafe aspect.<sup>1-32</sup> Studies have demonstrated the efficacy and low risk of ISBCS, both comparable to that of delayed sequential bilateral cataract surgery (DSBCS). The literature also points out the advantages of ISBCS regarding the reduction of costs for patients and health care systems, reduction of number of visits, and faster rehabilitation and visual recovery.<sup>2-4</sup> Even the most critical of studies, such as the meta-analysis carried out by Kessel et al,<sup>5</sup> do not report significant differences between ISBCS and DSBCS.

The controversy around ISBCS focuses on two key factors: (1) the risk of bilateral endophthalmitis and (2) the inability to optimize refractive outcomes in the second eye based on results in the first eye. The risk of other complications, such as elevated IOP, corneal and cystoid macular edema, and even toxic anterior segment syndrome, is low if the published recommendations on how to manipulate the instruments and material that we use during surgery are followed.<sup>4,6</sup>

## REFRACTIVE RESULTS

In DSBCS, the refractive results in a patient's first operated eye are analyzed and, if a refractive surprise presents, calculations for the second eye are adjusted. Critics note that this adjustment is not possible in ISBCS, and a residual ametropia in one of the eyes can result in anisometropia.

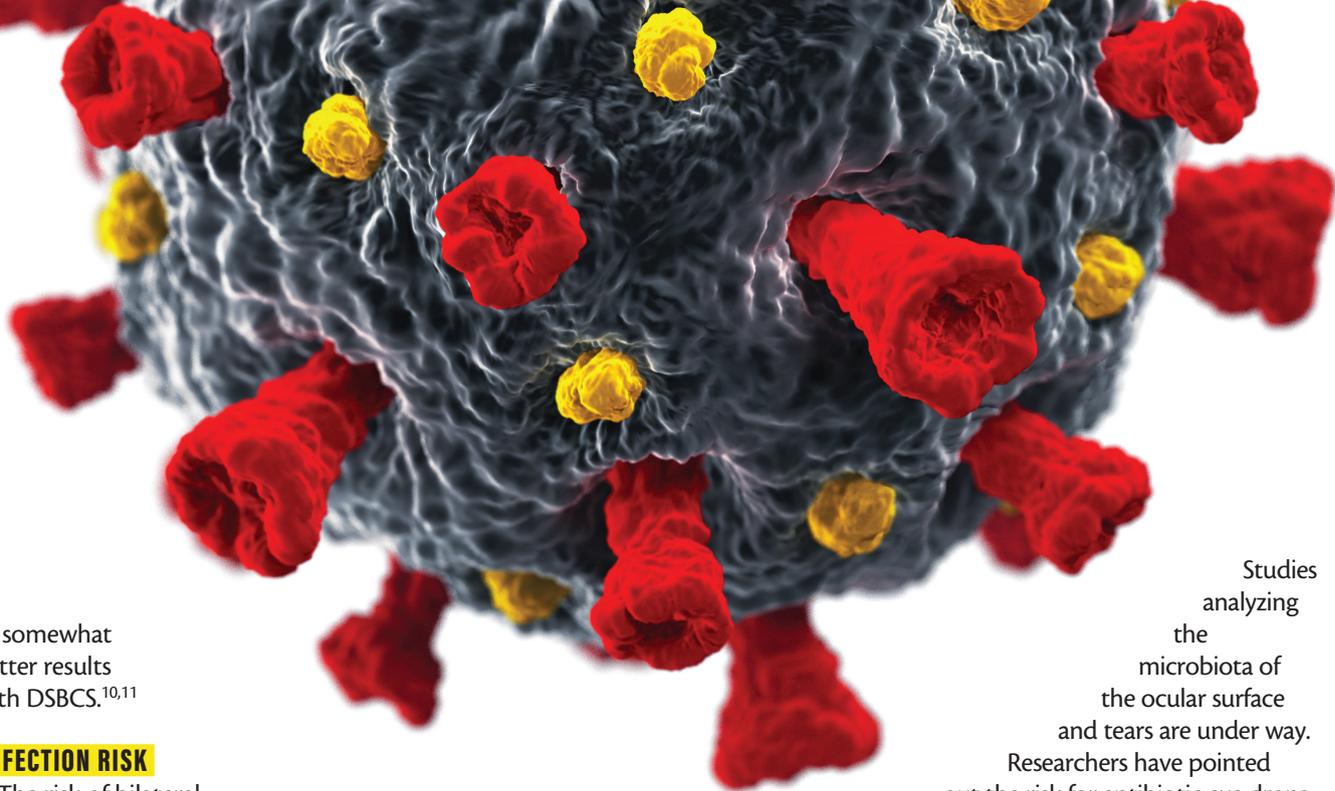
This is true, but only partially. Studies show that if modern diagnostic tools such as those for early detection of tear film abnormalities are used, if the best current technology for calculating IOL power is used, and if an intraoperative image-guided system is employed, results similar to those obtained with DSBCS can be achieved.<sup>7,8</sup>

To minimize the risk of a poor refractive result after ISBCS, biometric data can be useful for patient selection.

We can exclude patients with a difference of greater than 1 mm in axial length between the two eyes, those who are outside the safe range of 21 to 26 mm, and those with high myopia or hyperopic small eyes.<sup>9</sup> Even in the most critical studies and when the most advanced technologies were not used, results have not shown significant differences between outcomes in ISBCS and DSBCS. Only when differences of 0.50 D or less between both eyes were compared was it concluded that adjustment of the second eye based on the refractive result of the first eye led



Figure. Bimanual surgery can contribute to the success of ISBCS.



to somewhat better results with DSBCS.<sup>10,11</sup>

### INFECTION RISK

The risk of bilateral endophthalmitis is the most feared complication that can occur with ISBCS. It should be noted that publications have shown no greater incidence of endophthalmitis with ISBCS. In fact, only four cases of bilateral endophthalmitis resulting from ISBCS have been published, and all cases involved a breach of ISBCS protocol.<sup>12-14</sup> No cases of bilateral postoperative endophthalmitis after ISBCS have been reported when appropriate ISBCS guidelines were followed.<sup>3,5,14</sup> These include the heightened use of infection-prevention mechanisms, as proposed by Arshinoff and colleagues,<sup>14</sup> and the use of intracameral antibiotics at the end of surgery.<sup>15-17</sup>

There is debate about which intracameral antibiotics should be used and how. US surgeons typically use topical antibiotic drops and reserve intracameral vancomycin for high-risk cases. In Europe, intracameral cefuroxime (Aprokam, Théa Pharmaceuticals) is routinely used at the end of surgery, and vancomycin is reserved for treatment of active endophthalmitis.

The use of intracameral antibiotics has greatly reduced the frequency of postoperative infections in cataract surgery; however, vancomycin and cefuroxime each have negative side effects. Complications such as occlusive hemorrhagic vasculitis have been described with the use of vancomycin.<sup>18,19</sup> Cefuroxime has a limited spectrum of action against enterococci, enterobacteriaceae, pseudomonas, and *Staphylococcus aureus* and *epidermidis*, which are responsible for a large percentage of cases of endophthalmitis.<sup>20,21</sup>

Given this, some have proposed a change in strategy. A new quinolone, moxifloxacin (Vigamox, Alcon), is used intracamerally at the end of surgery, the eye is not patched, and topical applications are started within a few hours postoperatively so that the concentration of drug inside the eye is not reduced.<sup>22-24</sup> It remains an open question whether we will induce resistance if we use these antibiotics in this way.

Studies analyzing the microbiota of the ocular surface and tears are under way. Researchers have pointed out the risk for antibiotic eye drops

to cause changes and dysbiosis in the local microbiota that can result in the loss of the inhibitory role it plays against the proliferation of pathogenic bacteria from the eyelid skin or the environment. If this is true, it could possibly increase the chance of infection.<sup>25-27</sup>

The best strategy to prevent infections in ISBCS may be through disinfection systems in ORs and the strict use of two separate surgical trays, one for each eye, with different lots of OVD, antibiotics, etc.

The question of how best to make corneal incisions in ISBCS has been raised. It is recommended that a diamond knife be used, as metal knives can make less precise incisions that may facilitate the passage of microorganisms into the eye.<sup>28</sup>

### PERSONAL EXPERIENCE

My experience with ISBCS is similar to results in the literature. In the past 5 years, I have performed ISBCS in 417 patients, of which 283 received premium IOLs (toric and multifocal). Only one patient—a monofocal IOL patient—had postoperative anisometropia greater than 1.00 D, with a residual ametropia of -1.30 D in one eye and -0.20 D in the other eye. The monovision that resulted was well tolerated by the patient, who declined to undergo surgery for emmetropia.

In eight eyes of seven patients, toric IOLs had to be realigned (bilaterally in one patient), and in each case vision recovered within a few days after surgery.<sup>29</sup> These results are similar to those from patients undergoing DSBCS in a population with similar demographic data.

I had to convert from ISBCS to DSBCS in only three patients. In two of them, a posterior capsular tear occurred, and in the other an anterior capsular tear occurred. I deferred the second eye for 1 week in all three cases.

The good outcomes with ISBCS are the result of the care we have taken with these patients, including careful selection and diagnosis, examination for the presence of dry eye

disease to guard against anomalies in biometric measurements for the calculation of IOL power, and analysis of astigmatism of the posterior cornea.

There was no incidence of endophthalmitis. In all cases, we took the same safety precautions, including prophylaxis with povidone-iodine preoperatively and cefuroxime intracamerally at the end of the surgery. We did not cover the eyes, and we started postoperative treatment with topical dexamethasone and moxifloxacin the same day of the surgery.

### ADVANTAGES OF ISBCS

If we can ensure safety and reduce complications, the faster visual recovery and rehabilitation with ISBCS offer great advantages.<sup>30,31</sup> Additionally, we must consider the reduction of risks and burdens from entering the OR once instead of twice—this is especially attractive considering the current pandemic.

Further, ISBCS can ease the burden on the family and reduce the risks of mobility loss, anesthesia, and those related to preoperative systemic changes, such as changes in taking anticoagulants or insulin.<sup>10</sup>

When multifocal IOLs are combined with ISBCS, residual ametropia is not an obstacle if the appropriate technology is available. The brain adapts to multifocality faster and more easily than after DSBCS.<sup>22,31</sup>

Another advantage is the reduction of the costs of surgery. Lundstrom and colleagues reported an extra cost of 14% with DSBCS compared to ISBCS,<sup>32</sup> and Leivo and colleagues put the extra cost at €849 per patient.<sup>33</sup>

By contrast, however, in most countries the surgeon is penalized for ISBCS. Reimbursement for this approach to surgery represents a reduction of up to 100% in the second eye in Japan and 50% in Spain. Rush and colleagues put this reduction at an average of 21%, while noting that the effort for the surgeon, both pre- and intraoperatively,

is at least equal to that for DSBCS.<sup>10</sup> This reimbursement penalty is one of the important factors that has slowed the adoption of ISBCS, and joint action by surgeons in all countries will likely be needed to influence change.

### CONCLUSION

ISBCS, when performed with the aforementioned safety and patient selection criteria, can be a good option, especially for patients who want to recover their vision and lifestyle as soon as possible and for those with poor mobility, Down syndrome, and other conditions in which an additional trip to the OR may pose a high risk.

Now more than ever before, we should consider ISBCS as an excellent alternative to DSBCS in the right hospital or surgical setting. In the age of COVID-19, it can help to decrease surgical scheduling and follow-up visits. However, each facility must analyze whether it has the aforementioned safety requirements in place and whether its surgeons have the necessary expertise to avoid complications that may represent an obstacle rather than a clear path to proper adoption. Realistically, these conditions may not be met in most cases or in all countries affected by the pandemic. Therefore, use of ISBCS cannot be generalized to universally address the problem of increasing demand for cataract surgery. ■

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### CARLOS VERGES, MD, PHD

- Professor and Head, Department of Ophthalmology, Hospital Universitari Dexeus, Area Oftalmológica Avanzada, Barcelona, Spain
- Member, *CRST Europe* Editorial Advisory Board
- [cverges@cverges.com](mailto:cverges@cverges.com)
- Financial disclosure: None

### JESÚS MARÍN, OD, PHD

- Head of the Optometry Unit, Department of Ophthalmology, Hospital Universitari Dexeus, Area Oftalmológica Avanzada, Barcelona, Spain
- Financial disclosure: None