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On the use of immediately sequential bilateral cataract surgery (ISBCS) in Ukraine

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Cataract surgery is most commonly performed today by utilizing the standardized phacoemulsification technique which results in successful outcomes and low complication rates. At present, most patients undergo cataract surgery in both eyes on separate days, referred to as delayed sequential cataract surgery (DSCS). Immediately sequential bilateral cataract surgery (ISBCS) has emerged as an alternative to traditional DSBCS and is, however, increasingly used in clinical practice throughout the world. The question arises: How safe is ISBCS with respect to postoperative complications?

The World Health Organization estimates that the number of cases of blindness from cataract will increase to 40 million in 2025 because of the aging population and longer life expectancies [1]. There is robust evidence to demonstrate that the cataract surgical rate uptake has been on an upward trend. Cataract surgery techniques are being constantly refined with the introduction of technological advancements [1]. Currently, sutureless clear corneal incision, continuous curvilinear capsulorhexis, phacoemulsification and in-the-bag placement of a foldable intraocular lens (IOL) represent the gold standard for routine cataract surgery.

At present, most patients undergo cataract surgery in both eyes on separate days, referred to as delayed sequential cataract surgery (DSCS) [2], with the second eye surgery done days, weeks or months after the first eye surgery. Immediately sequential bilateral cataract surgery (ISBCS) has emerged as an alternative to traditional DSBCS and is, however, increasingly used in clinical practice throughout the world. Active implementation of ISBCS is associated with technological advances and novel surgical techniques which enabled improved surgery safety and achievement of planned refractive outcome. The advantages of ISBCS include fast complete visual rehabilitation of the patient, prevention of postoperative anisometropia, fewer hospital visits, lower hospital costs and more efficient use of operating room time.

The International Society of Bilateral Cataract Surgeons (iSBCS) was founded in September 2008, and the society membership included the majority of prominent bilateral cataract surgeons worldwide. From 2005 to 2020, members of iSBCS shared data and promoted best principles of ISBCS during the European Society of Cataract & Refractive Surgeons (ESCRS) and American Society of cataract and Refractive Surgeons (ASCRS) annual meetings. As of January 1, 2020, iSBCS ceased to exist as the society felt it had fulfilled its mandate of promoting ISBCS into mainstream cataract surgery practice [1].

A fundamental and overriding principle to prevent complications is to treat each eye surgery as independent procedure, as recommended by the iSBCS (www.isbcs.org). This applies primarily to the strict aseptic and antiseptic measures in bilateral cataract surgery. Each eye requires an absolute change of covering, instruments, and staff's gloves and gowns [3]. Many authors emphasize that the instruments should come from different sterilization sets and substances used during the procedure, such as viscoelastics or irrigation fluids, should be different [4-7]. If in some special situation, any significant surgical problem remains unresolved in the first eye, surgery

should be performed only in one eye, and the DSBCS should be used.

Exclusion criteria for ISBCS have been reported [8]. These are broadly divided into conditions that increase the risk of postoperative endophthalmitis, ocular inflammation, corneal edema or decompensation, raised intraocular pressure and retinal detachment. In addition, the exclusion criteria include conditions that increase the risk of lenticular abnormalities, extremes of axial length and keratometry that may make the biometry unreliable [8].

In the past, cataract surgeons were hesitant to adopt ISBCS due to fear of bilateral endophthalmitis, macular edema and refractive surprise [1]. A review of literature over the past 50 years (2022) [9], however, showed only 9 published cases of bilateral simultaneous postoperative endophthalmitis.

No significant difference in postoperative measures (retinal tear and detachment; cystic macular edema; state of the corneal surface; IOL position; refraction and visual acuity) was found between DSBCS and ISBCS [10].

The question arises: How disturbing is the incidence of postoperative endophthalmitis after ISBCS?

It is noteworthy that the introduction of intracameral antibiotics during cataract surgery has been significant in reducing the incidence of postoperative endophthalmitis in different healthcare settings [1]. Two studies with large datasets from the Swedish National Cataract Register and from the American Academy of Ophthalmology Intelligent Research in Sight Registry Data demonstrated that the risk of postoperative endophthalmitis was not significantly different between patients who underwent ISBCS and DSBCS or unilateral cataract surgery [11, 12].

With intracameral moxifloxacin 600 µg in 0.4 mL, there have been no cases of bilateral endophthalmitis in the 5850 patients (11700 eyes) who have undergone ISBCS. From 2011 to 2014, the rate of unilateral postoperative endophthalmitis was 1 in 2380 or 0.042%, which decreased to 1 in 14493 ISBCS cases or 0.0069% from 2015 to 2019 with intracameral moxifloxacin 600 µg in 0.5 ml [13].

Qi and colleagues [14] conducted a cohort study of 2003 consecutive patients (4006 eyes) to evaluate the safety and outcomes of ISBCS at a Canadian academic teaching center. There were no cases of endophthalmitis or toxic anterior segment syndrome. Intraoperative complications were rare and included posterior capsule ruptures and partial zonulysis. The authors concluded that ISBCS performed following iSBCS recommended guidelines is a safe procedure [14].

Of note is evidence of the likelihood of the development of endophthalmitis even after intracameral moxifloxacin. In addition, cases of postoperative complications after ISBCS may be underreported in the literature. There may be isolated cases of bilateral endophthalmitis which have not been documented in the literature and therefore not included in the analysis. Is the actual likelihood of the

development of bilateral endophthalmitis different from that reported in the literature?

We believe that special attention should be given to refractive outcomes after ISBCS. Most publications on treatment outcomes of ISBCS report the proportion of eyes achieving a target refraction within 1.0 D or 0.5 D [15], which we believe are rather rough estimates of success in achieving target refraction in cataract surgery. In a study reviewing 2003 patients (4006 eyes) who had undergone ISBCS between January 2019 and December 2019, mean spherical equivalent based on automatic refraction was 0.213 ± 0.842 D [14]. This data indicate a wide variation in the treatment outcomes assessed.

Current IOL selection methods allow hitting the refractive target postoperatively, with the target being as close as possible to emmetropia. However, tissue regeneration mechanisms associated with the rigidity of ocular coats (first of all, the cornea) play an important role in establishing postoperative refraction. In addition, IOL position with respect to the macula, anterior chamber depth, integrity or weakness of zonules, fibrosis of the capsular bag, etc. are important for the postoperative refraction [16]. In DSBCS, the surgeon can take into account these characteristics of the patient when calculating the IOL power for the second eye, in an attempt to reduce the difference between the postoperative refraction and the target refraction as much as possible. The correction for a postoperative refractive error as small as 0.25 D may have a value for achieving optimal final visual acuity.

In our opinion, the use of multifocal IOLS in ISBCS deserves separate consideration. Modern multifocal IOLS allow correction of presbyopia during cataract surgery and restoration of vision at far, middle and near distances. However, even after successful cataract surgery with multifocal IOL implantation and perfect postoperative refraction, some patients still complain of low contrast sensitivity and visual aberrations like glare, halos, concentric rings and dysphotopsias. In a study by Kim and colleagues [17], 7% of patients with multifocal IOL underwent IOL explantation for this reason. Patients with multifocal diffractive IOL may have difficulty with night driving (have troubles with getting blinded by headlights from oncoming vehicles) [18]. Although indications and contraindications for the implantation of multifocal diffractive IOLS have been published, sometimes eye surgeons have to deal with the need of multifocal IOL exchange due to patient dissatisfaction [18]. In this context, a question arises: what should be done if there a need for multifocal IOL exchange in a patient who has undergone ISBCS? We noted that patients with clinical signs of visual aberrations in multifocal IOLS may have intolerable symptoms requiring urgent IOL exchange (multifocal to monofocal).

Of note that the global COVID-19 pandemic has contributed to faster introduction of ISBCS into cataract surgery practice because the advantages of this approach include fewer hospital visits, lower hospital costs and more

efficient use of operating room time. Proponents of ISBCS highlighted the overall reduced COVID-19 exposure risk with ISBCS because of the decrease of patient visits and contact exposures by half [12]. In 2020, the Royal College of Ophthalmologists Covid Response Team, UK and Ireland Society of Cataract and Refractive Surgeons presented a document recommending the adoption of ISBCS as a potential solution to challenges posed by the COVID-19 pandemic [19].

Recommendations on the feasibility of ISBCS have not been reflected in the Ukrainian protocol for the management of patients with cataract [20], though this is a burning issue in Ukraine since it has not been discussed among Ukrainian eye surgeons and there is no consensus on the use of ISBCS.

In conclusion, we would like to formulate our position on the feasibility of ISBCS in patients with bilateral cataract. We believe ISBCS is feasible in bilateral cataract patients either having severe systemic comorbidities, with the latter impeding repeat visits to the clinic and surgery, or requiring general anesthesia for surgery. It is reasonable to take into account recommendations of the International Society of Bilateral Cataract Surgeons (iSBCS) with regard to the exclusion criteria as well as the procedure itself. There are surgeons that oppose the ISBCS approach. ISBCS should be performed by the most skilled and experienced eye surgeon available. It would be interesting to know the opinions of other eye surgeons on the topic to enable the development of a unified concept of the use of ISBCS in Ukraine.

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