

Ophthalmologists' attitudes toward immediate sequential bilateral cataract surgery: Dutch national survey



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Purpose: To evaluate current practice patterns of immediate sequential bilateral cataract surgery (ISBCS) in the Netherlands and assess ophthalmologists' attitudes toward performing ISBCS in future cataract care.

Setting: Dutch ophthalmic society members.

Design: Cross-sectional study (national survey).

Methods: An electronic survey on ISBCS was sent as part of an annual survey on cataract practice patterns to members of the Dutch ophthalmic society. Questions regarding current ISBCS practice patterns, willingness to perform ISBCS routinely in future care, reasons for performing ISBCS, and reasons for not performing ISBCS were included. Data were analyzed using descriptive statistics.

Results: 237 (45.6%) of 520 survey recipients responded to the overall survey. Data on the ISBCS questions were available from 227 respondents. 62 ophthalmologists (27.3%) currently performed ISBCS, predominantly in low patient volumes (90.3%

on 1 to 5 patients per month). However, 108 (47.6%) of 227 ophthalmologists considered performing ISBCS routinely in future practice. Procedures for which ISBCS was mainly considered included age-related cataract surgery using topical and general anesthesia. Availability of separate products and instruments for both eyes and patient advantages were considered of high importance when performing ISBCS. Main reasons for not performing ISBCS included the risk for endophthalmitis and potential medicolegal aspects.

Conclusions: Although ISBCS is currently not a routine procedure in the Netherlands, it is considered by almost 50% of surgeons. To improve implementation on a national level, potential barriers identified in this survey (fear of bilateral endophthalmitis, potential medicolegal issues, and a lack of availability of separate products for both eyes) should be addressed.

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Cataract surgery involves a high volume procedure. With an estimated number of 180 000 procedures per year, it is the most performed type of surgery in the Netherlands.¹ In case of bilateral cataracts, the commonly applied procedure is to perform cataract surgery on both eyes with a delay of at least 2 weeks between first-eye and second-eye surgery, called delayed sequential bilateral cataract surgery (DSBCS).² An important innovation is to perform surgery on both eyes on the same day, known as immediate sequential bilateral cataract surgery (ISBCS). Because of multiple advantages (faster visual rehabilitation, fewer hospital visits, no anisometropia, and a reduction of costs for patients, hospitals, and society) and the need to re-evaluate the organization of cataract care during the

COVID-19 pandemic, there is an increased interest to implement this procedure on a larger scale.^{3–6}

However, the fear of potential disadvantages of ISBCS (bilateral endophthalmitis, refractive surprise, or other complications) can impede implementation of the procedure.^{3,7} In addition, other potential implementation barriers may arise. One potential barrier includes the recommendation in national guidelines to perform ISBCS only in selected patient populations.^{2,8,9} Furthermore, there is a potential implementation barrier to logistics. A strict aseptic separation of surgical procedure, instruments, and other materials for first-eye surgery compared with that for second-eye surgery is required when performing ISBCS.¹⁰ This demands an (initial) additional effort from the

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hospital (eg, sterilization departments, operating room personnel, and reorganization of stocking locations) and from companies that provide surgical supplies. Finally, there is a potential financial barrier. Although Dutch cataract surgeons are currently fully reimbursed for surgery on the second eye, this could change based on potential cost savings in ISBCS (eg, when recommendations in national guidelines change). For instance, in some countries, cataract surgeons already receive considerably lower reimbursement rates when performing ISBCS.^{11,12}

To optimize support for implementation and to examine the effect of potential implementation barriers, it is important to explore the beliefs of cataract surgeons toward performing ISBCS. Therefore, the aim of the study was to evaluate the current practice patterns of ISBCS in the Netherlands and to assess Dutch ophthalmologists' attitudes toward performing ISBCS in future cataract care.

METHODS

Survey questions regarding ophthalmologists' attitudes toward performing ISBCS were formulated using main concerns and reasons for reluctance as reported in literature.^{3,7,11,13} Thereafter, formulated questions were reviewed by the Clinical Epidemiology and Medical Technology Assessment department of the Maastricht University Medical Centre+ because of their expertise in qualitative research and development and validation of questionnaires (eg, patient-reported outcome measures). In addition, the survey questions were reviewed by an ophthalmologist in charge of the national cataract quality registry.

In total, 7 questions on ISBCS were added to the 2020 annual survey of the Dutch ophthalmic society (Nederlands Oogheelkundig Gezelschap). This annual survey aims to investigate practice patterns in cataract and refractive surgery in the Netherlands. The added questions (Supplemental Table A, <http://links.lww.com/JRS/A537>) were as follows: (1) Do you currently perform ISBCS? (2) In how many patients per month (on average) do you perform ISBCS? (3) Would you consider performing ISBCS routinely in the near future? (4) Would you administer intracameral antibiotics as per standard when performing ISBCS? (5) For which procedures would you consider ISBCS? (6) To what extent are the arguments listed important to you when considering whether to perform ISBCS? (7) To what extent are the arguments listed important to you when considering not to perform ISBCS. Response options were either by multiple choice (varying from 1 response option to multiple response options) or on a 4-point Likert scale for importance (ie, not important/quite important/important/very important). Regarding questions 6 and 7, respondents were given the opportunity to add a personal argument if they felt an important argument was missing.

The online survey was created using Qualtrics software v. XM (Qualtrics). A total of 520 Dutch ophthalmologists were approached in writing to complete the survey using a link or a QR code. The electronic survey was sent in May 2020 and responses up to 2 months were included in the analysis. During the response period, one reminder to complete the survey was sent. Responses were anonymous, although surgeons were given the option to voluntarily leave a name and/or email address. Raw data were extracted from the Qualtrics software environment (Qualtrics Advanced Core XM package) and manually cleaned (ie, reorganization of data, removal of blank, and/or double entries). Data analysis was performed using descriptive statistics. Personal argument responses on questions 6 and 7 were not analyzed using qualitative methods (listed in Supplemental Table B, <http://links.lww.com/JRS/A538>).

RESULTS

Of the 520 ophthalmologists invited to complete the annual survey, 237 (45.6%) responded. Of these respondents, 227 completed the questions on ISBCS.

Current Practice and Attitudes Toward Implementation of ISBCS

Regarding the question on whether surgeons currently performed ISBCS (question 1), 62 (27.3%) responded yes and 165 (72.7%) responded no. Of the surgeons performing ISBCS, most (90.3%) indicated that this was performed on average on 1 to 5 patients per month (question 2, [Figure 1](#)). Only few surgeons (3.2%) indicated to perform ISBCS on a more regular base (16 to 20 or >20 patients per month). Furthermore, 108 of 227 ophthalmologists (47.6%) responded that they consider to perform ISBCS routinely in the near future (question 3). Of these respondents, 100 (92.6%) replied that they would administer intracameral antibiotics by default when performing ISBCS. The remaining 8 respondents (7.4%) indicated they would administer intracameral antibiotics only in patients at increased risk for endophthalmitis, as defined in the current Dutch national cataract guidelines (question 4).

Surgical Procedures

Regarding the question on types of surgical procedures for which performance of ISBCS was considered (question 5), respondents were allowed to select multiple options. Potential surgical procedures included cataract surgery for age-related cataracts using topical anesthesia, cataract surgery for age-related cataracts using general anesthesia, refractive lens exchange (RLE), phakic intraocular lens (IOL) implantation, and congenital cataract surgery. Percentages of responses for the selected combinations of surgical procedures are provided in [Figure 2](#). The leading procedures for which ISBCS was considered included both age-related cataract surgery using topical anesthesia and using general anesthesia (38.0%), followed by age-related cataract surgery using general anesthesia only (14.8%) and age-related cataract surgery using topical anesthesia only (12.0%).

Reasons in Favor and Against Performing ISBCS

The various reasons given by ophthalmologists who performed or considered to perform ISBCS are presented in [Table 1](#). Overall, the availability of separate products and instruments for right vs left eyes (very important: 63.0%, important: 22.2%) and patient advantages (very important: 36.1%, important: 41.7%) were the most selected reasons of high importance. The responses for patient request, advantages for the organization, and cost reductions were predominantly important and quite important (44.4% and 32.4%, 39.8% and 25.0%, and 50.0% and 25.0%, respectively). Main reasons for not performing ISBCS included the risk for endophthalmitis (very important: 56.8%, important: 23.3%), potential legal aspects (very important: 30.8%, important: 35.2%), the risk for refractive surprise (very important: 27.8%, important: 42.7%), and risk for

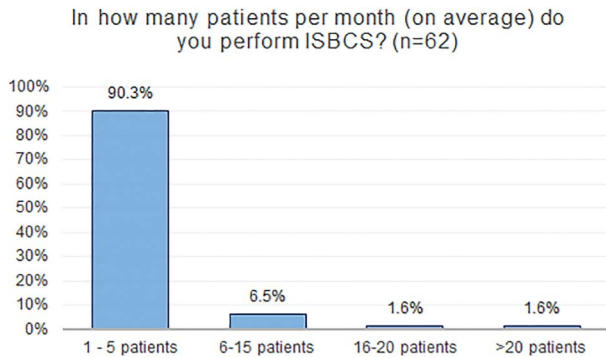


Figure 1. Patient volumes reported by ophthalmologist performing ISBCS. ISBCS = immediate sequential bilateral cataract surgery

other complications (very important: 20.3%, important: 37.9%) (Table 2).

DISCUSSION

This study showed current practice patterns of ISBCS in the Netherlands and Dutch ophthalmologists' opinions on performing ISBCS in future cataract care.

Regarding current practice patterns, we found that 27.3% of respondents currently performed ISBCS. This percentage is higher than numbers reported by a similar survey performed in the United Kingdom (13.9%) but lower than reported in a European survey by Mills et al. (67.2%).^{13,14} However, Mills et al. presumed this was likely an over-estimation because of member and selection bias, which is feasible given a lower overall response rate of 13.7%. In our study, we had a high response rate on a national level of 45.6% (compared with 9.6% for the U.K. survey), increasing the generalizability of the results and providing insights into Dutch ophthalmologists' beliefs regarding ISBCS.

Dutch ophthalmologists who currently perform ISBCS indicated this was predominantly performed in low patient volumes (ie, 1 to 5 patients per month). This is in line with the results from the European survey, in which 73.5% of surgeons performed ISBCS in exceptional cases only or in 1% to 20% of patients.¹³ Another survey, performed among surgeons from the Permanente Medical Group, reported high percentages of surgeons who performed ISBCS (86%) but did not describe corresponding patient volumes.¹⁵

Therefore, the extent to which ISBCS was performed routinely by these surgeons cannot be compared. Since most respondents who currently perform ISBCS reported low patient volumes in our study, it can be assumed that ISBCS is generally performed not as a routine procedure but in selected patient populations only (eg, under general anesthesia) as recommended by current Dutch national guidelines. However, adjustment of these guidelines in favor of ISBCS could lead to a fair increase in the use of this procedure, since 47.6% of respondents indicated to consider performing ISBCS on a routine base in the near future. This was also supported by the additional reasons provided in the free-text sections (see Supplemental Tables A and B, <http://links.lww.com/JRS/A537> and <http://links.lww.com/JRS/A538>, respectively). The fact that this survey was performed during the start of the COVID-19 pandemic in 2020 may have resulted in still low numbers of surgeons who perform ISBCS; however, approximately 50% of the respondents consider ISBCS as a routine procedure. The COVID-19 pandemic has rapidly increased the worldwide interest for ISBCS, and some countries have adjusted cataract guidelines on this point.^{5,6,16-18} Nevertheless, to which extend this will influence Dutch practice patterns could be evaluated further in repeated surveys.

In our survey, most of the respondents indicated that they would consider ISBCS for age-related cataract surgery under topical anesthesia, age-related cataract surgery under general anesthesia, or both. The willingness to perform ISBCS in patients in need for RLE, in patients receiving phakic IOLs, and in patients with congenital cataracts was relatively low. A potential explanation for the hesitation toward the performance of ISBCS in these procedures could be a lack of high-quality evidence and the potential requirement of more individualization. Patients who require phakic IOLs or RLE are likely to have particularly high expectations on refractive outcomes, which may cause surgeons to have more tendency to evaluate first-eye refractive outcomes in an attempt to optimize refractive results for the second eye. On contrary, we are well aware of specialized refractive surgery clinics offering simultaneous bilateral RLE to avoid postoperative anisometropia and enhance the neural adaptation process when using presbyopia-correcting IOLs. Furthermore, no high-quality evidence on ISBCS for congenital cataracts is available,

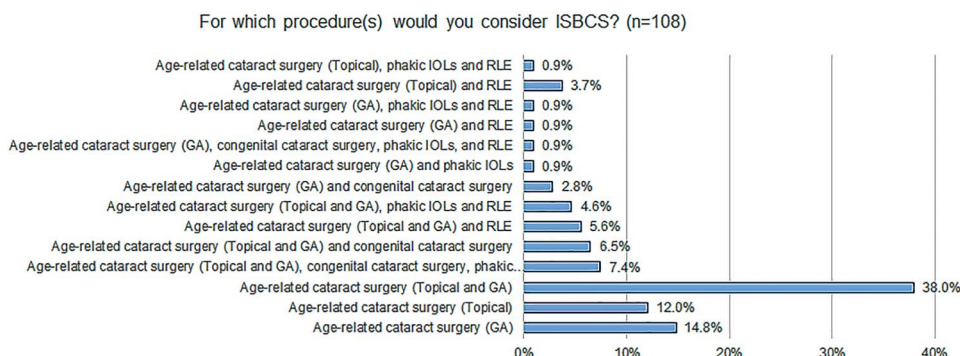


Figure 2. Surgical procedures for which ISBCS could be considered. GA = general anesthesia; ISBCS = immediate sequential bilateral cataract surgery; RLE = refractive lens exchange

Table 1. Reasons for performing immediate sequential bilateral cataract surgery among ophthalmologist who consider performing this procedure (n = 108)

| Reason | Importance, n (%) | | | | |
|---|-------------------|-----------------|-----------|----------------|-------------|
| | Not important | Quite important | Important | Very important | No response |
| Patient request | 6 (5.6) | 35 (32.4) | 48 (44.4) | 18 (16.7) | 1 (0.9) |
| Patient advantages (eg, less visits to hospital, less anisometropia, and equal schedule for postoperative antibiotic/anti-inflammatory drops) | 3 (2.8) | 20 (18.5) | 45 (41.7) | 39 (36.1) | 1 (0.9) |
| Advantages for organization (eg, operating room efficiency) | 14 (13.0) | 27 (25.0) | 43 (39.8) | 24 (22.2) | 0 (0.0) |
| Cost reduction (for hospital and society) | 12 (11.1) | 27 (25.0) | 54 (50.0) | 15 (13.9) | 0 (0.0) |
| Availability of separate products/instruments for right vs left eyes | 7 (6.5) | 9 (8.3) | 24 (22.2) | 68 (63.0) | 0 (0.0) |
| Others (see Supplemental Table A) | 4 (3.7) | 1 (0.9) | 10 (9.3) | 14 (13.0) | 79 (73.1) |

since recent studies reporting on pediatric ISBCS outcomes are only retrospective.^{19,20} However, despite the hesitation toward the performance of pediatric ISBCS, positive outcomes such as reduction of nystagmus have been reported.²¹ In addition, the avoidance of a second general anesthesia is considered an important benefit in children, since the immaturity of physiological systems causes an increased risk from anesthesia, and no differences in complication rates for ISBCS vs DSBCS are reported.²⁰ Nonetheless, an increase in high-quality evidence providing comparable results is likely to improve adaptation of ISBCS in children with congenital cataracts.

One of the main reasons for reluctance toward ISBCS is the fear of bilateral endophthalmitis.^{3,4} In our survey, this was also the most selected reason of high importance for not performing ISBCS (ie, 56.8% of respondents selected very important), which was comparable with the European and UK results (69.0% and 73.2% of respondents selected very important, respectively). Opponents of ISBCS advocate that the potential devastating consequences of a bilateral endophthalmitis should outweigh the potential benefits of ISBCS.⁷ However, the calculated risk for bilateral endophthalmitis is extremely low and 2 recent large registry studies showed no statistical significant differences in endophthalmitis rates between ISBCS and DSBCS.^{3,15,22} In addition, one of these studies that report on data from 165 609 ISBCS patients and 3 695 440 DSBCS patients from the Intelligent Research in Sight Registry database of the

American Academy of Ophthalmology found no cases of bilateral endophthalmitis in the ISBCS group compared with 7 cases of bilateral endophthalmitis with supporting clinical data in the DSBCS group.¹⁵ This negates the argument that the event can be prevented by performing DSBCS. Furthermore, the few cases on bilateral endophthalmitis as reported in literature can be attributed to the nonadherence of guidelines regarding preferred practice patterns in ISBCS.⁸ These guidelines include a strong recommendation on the use of intracameral antibiotics in ISBCS. Notably, although 92.6% of respondents in our survey indicated they would use intracameral antibiotics in ISBCS patients by default, 7.4% of surgeons still indicated that they would perform the same protocol regarding antibiotic prophylaxis in ISBCS patients as they use now in unilateral cataract patients or DSBCS patients. This prophylaxis protocol recommends the administration of intracameral antibiotics in patients at increased risk for endophthalmitis (eg, immunocompromised patients, complex surgery, men older than 80 years, atopic patients or patients with rosacea and blepharitis, clear corneal incisions, silicone lenses, and complicated surgery) instead of administration by default.²

Similar to other surveys, we found medicolegal issues were the second most important reason not to perform ISBCS, an important potential barrier to implementation of this procedure. The increasing concern regarding medicolegal issues may be due to not only the risk for rare but

Table 2. Reasons for not performing immediate sequential bilateral cataract surgery (all respondents, n = 227)

| Reason | Importance, n (%) | | | | |
|---|-------------------|-----------------|-----------|----------------|-------------|
| | Not important | Quite important | Important | Very important | No response |
| Effectivity not proven | 65 (28.6) | 63 (27.8) | 66 (29.1) | 16 (7.0) | 17 (7.5) |
| Risk for endophthalmitis | 15 (6.6) | 22 (9.7) | 53 (23.3) | 129 (56.8) | 8 (3.5) |
| Risk for refractive surprise | 15 (6.6) | 46 (20.3) | 97 (42.7) | 63 (27.8) | 6 (2.6) |
| Risk for cystoid macula edema | 47 (20.7) | 71 (31.3) | 81 (35.7) | 23 (10.1) | 5 (2.2) |
| Risk for other complications | 36 (15.9) | 54 (23.8) | 86 (37.9) | 46 (20.3) | 5 (2.2) |
| Potential decrease in reimbursement hospital and/or ophthalmologist | 87 (38.3) | 77 (33.9) | 41 (18.1) | 15 (6.6) | 7 (3.1) |
| Potential legal aspects | 26 (11.5) | 46 (20.3) | 80 (35.2) | 70 (30.8) | 5 (2.2) |
| Hurdles for implementation | 88 (38.8) | 61 (26.9) | 51 (22.5) | 19 (8.4) | 8 (3.5) |
| Others (see Supplemental Table A) | 30 (13.2) | 3 (1.3) | 6 (2.6) | 8 (3.5) | 180 (79.3) |

potentially severe complications but also medicine becoming more defensive in general.²³ Evidence-based support by the national ophthalmic society in the form of clear guidelines for the performance of ISBCS could reduce the fear of being accused of malpractice among cataract surgeons. In addition, highlighting the importance of informed shared decision making between surgeons and patient could reduce these risks as well.

When considering not to perform ISBCS, the occurrence of macular edema and other complications was reported to be of less high importance compared with the risk for endophthalmitis and refractive surprise. Indeed, various complications are manageable or can occur in later postoperative stages, supporting the argument that the effect of the ISBCS procedure on the risk for bilateral occurrence of those complications may be expected to be comparable with DSBCS (if only days or a few weeks are left between first-eye and second-eye surgery). In addition, a systematic review comparing postoperative complications of ISBCS and DSBCS found no differences between groups.²⁴ However, there was a large inconsistency in numbers of complications between studies, and the quality of the data were therefore graded as very low. Furthermore, careful patient selection should be performed to reduce risks for complications in general (eg, exclude patients at risk for postoperative corneal edema).

The availability of separate products and instruments for right vs left eyes was considered important to perform ISBCS (ie, 63.0% of respondents selected very important), followed by patient advantages. This figure is higher than numbers reported by Mills et al. (30.1% to 50.0%) and Lee et al. (4.9%) and emphasizes the need for well-designed logistics in the hospital (eg, regarding sterilization processes of reusable instruments) and a role for companies that provide surgical supplies. It also shows that a potentially important barrier may arise when logistics do not allow for routine performance of ISBCS.

Although considered less important than patient advantages, potential advantages for the organization, such as an increased efficiency and potential cost savings for both the hospital and society, were reported to be at least quite important. Meanwhile, potential decreases in reimbursement for hospital and/or ophthalmologists were predominantly reported to be not important (38.3%) or quite important (33.9%). This is remarkable, since a reduced reimbursement rate is described to be a potentially important barrier for implementation of ISBCS.^{11,12} However, the reason of this less predominant importance of potential decreases in reimbursement remains unclear, since the questionnaire did not provide the opportunity to give an explanation on each of the questions separately.

A strength of our study is the high response rate (45.6%) compared with previous national surveys (ie, 13.7% for a European Survey and 9.6% for a U.K. survey) and online surveys in general, thereby increasing the likelihood of a good identification of the importance of potential implementation barriers.²⁵ However, our study also has some

limitations. First, implementation barriers are because of not only a results of cataract surgeon beliefs but also patient beliefs. Although patient beliefs were not included in the scope of this survey, a recent study by Shah et al. showed that 45% of patients agreed with opting for ISBCS, predominantly because of patient/carer convenience and a reduction in hospital visits. In addition, they showed that only 23% of patients had familiarity with the ISBCS concept, suggesting a need for patient education.¹⁶ Second, we did not include data on characteristics of the respondents and nonresponders, although this could provide more insight into individual beliefs (eg, age, field of expertise, and working in a hospital or a private practice). Finally, this study is observational and provides no relational data but shows Dutch ophthalmologists' opinions at a specific timepoint.

In conclusion, this survey showed that to date, ISBCS is not performed routinely in the Netherlands but mostly in selected patients only. However, approximately 50% of respondents consider to implement the procedure routinely in future cataract care. Main potential barriers for implementation on a national level include the fear of bilateral endophthalmitis and potential medicolegal issues. Adjustment of recommendations in national guidelines using high-quality evidence may assist in overcoming these barriers. In addition, well-designed logistics to ensure the availability of separate products and instruments for left and right eyes are considered important by Dutch ophthalmologists. Addressing these potential barriers could lead to an increase of routine ISBCS in the Netherlands and is needed to profit from the procedure's benefits to patients, healthcare providers, and society.

WHAT WAS KNOWN

- Reluctance toward routine implementation of immediate sequential bilateral cataract surgery (ISBCS) remains. The chief reported barriers include fear of bilateral complications (most importantly endophthalmitis), medicolegal risks, a lack of college approval, lack of high-quality evidence, and a potential decrease in reimbursement rates.
- Currently available surveys that identify potential implementation barriers on a national or European level have lower response rates and therefore an increased likelihood of response bias.

WHAT THIS PAPER ADDS

- Current practice patterns of ISBCS in the Netherlands showed that the procedure is performed in limited patient volumes, although 47.6% of respondents consider to perform it routinely in the near future.
- The relatively high response rate (45.6%) to this survey on a national level increased the generalizability of the main potential implementation barriers found (the fear of bilateral endophthalmitis, potential medicolegal issues, and a lack of availability of separate products for both eyes).

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