

The Royal College of Ophthalmologists' National Ophthalmology Database Study of cataract surgery: Report 7, Immediate Sequential Bilateral Cataract Surgery in the UK: Current practice and patient selection

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Introduction:

The NICE Cataract Guidelines [NG77] suggest that immediate sequential bilateral cataract surgery (ISBCS) can be considered for patients with bilateral cataract satisfying either of the following requirements:

- 1: people who are at low risk of ocular complications during and after surgery.
- 2: people who need to have general anaesthesia (GA) for cataract surgery but for whom general anaesthesia carries an increased risk of complications or distress.

This analysis of data submitted to the Royal College of Ophthalmologists' National Ophthalmology Database (RCOPhth NOD), aims to describe current practice in ISBCS provision in contributing centres, comparing to patients undergoing delayed sequential surgery (DSCS).

Methods:

Eligible operations are those satisfying the eligibility criteria used in the National Cataract Audit (NOA) performed between 01/04/2010 and 31/08/2018, in centres with at least 50 eligible operations, and a record of at least one patient treated with ISBCS. For comparison, DSCS patients are those who had their second eye surgery within one year of the first in the same centre.

Pre-operative visual acuity (VA), Posterior Capsular Rupture (PCR) and case complexity adjustment of PCR were defined according to the criteria used in the NOA (www.nodaudit.org.uk), where the variables used for case complexity adjustment are marked with (#) in the tables.

Comparisons at the patient level are performed between ISBCS patients and the first eye surgery for DSCS patients using χ^2 tests or the student's t-test with the Welch adjustment.

Comparisons at the eye level were performed using univariate logistic regression with cluster adjustment for the standard errors where the patients are considered as the clusters.

Results:

During the study period, 1,073 patients had ISBCS and 248,341 patients DSCS from 73 centres. The median time between the first eye and second eye surgery for the DSCS patients was 3.4 months.

GA was administered to 630 (58.7%) ISBCS patients vs. 16,429 (6.6%) DSCS patients (either operation) ($p < 0.001$).

ISBCS surgery was more often performed on female patients and younger patients, Table 1 and Figure 1.

A lower proportion of ISBCS patients had diabetes mellitus.

More ISBCS patients were unable to lie flat during surgery.

More ISBCS patients were unable to cooperate during surgery.

The median LogMAR VA was 0.60 for the ISBCS left and right eyes, 0.50 for the DSCS patients first eye operation and 0.40 for the DSCS patients second eye operation, Figure 2.

ISBCS eyes more often had a brunescens / white / mature cataract ($p < 0.001$) and/or no fundal view / vitreous opacities ($p < 0.001$), Table 2.

PCR occurred in 41 (1.9%) ISBCS eyes and 5,720 (1.2%) DSCS eyes ($p = 0.001$).

Based on case complexity, the expected rate PCR was 2.2% for ISBCS eyes and 1.6% for DSCS eyes.

The case complexity adjusted rate of PCR was 1.0% for ISBCS eyes and 0.8% for DSCS eyes.

Table 1: Patient demographics

The percentage with	ISBCS	DSCS	Overall	p-value
Number of patients	1,073	248,341	249,414	-
Patients gender (#)				
Male	37.5	39.9	39.9	0.160
Female	62.5	60.0	60.0	
Not recorded	0.0	<0.1	<0.1	
Patients age (years)* (#)				
Median	74.6	76.9	76.9	-
Inter-Quartile range	62.7 – 82.2	70.0 – 82.4	70.0 – 82.4	
Range	21.4 – 100.6	18.0 – 112.5	18.0 – 112.5	
Mean	71.5	75.6	75.5	
Patient with the following*				
Diabetes Mellitus	14.3	18.1	18.1	<0.001
Could not lie flat during surgery (#)	11.3	1.8	1.9	<0.001
Could not cooperate with the surgery	9.7	2.7	2.7	<0.001

Figure 1: Cumulative frequency graph of the patients age at surgery

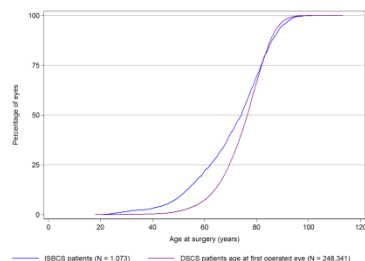


Figure 2: Cumulative frequency graph of pre-operative VA

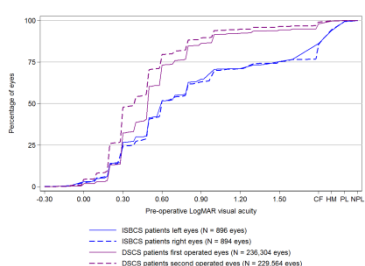


Table 2: Ocular co-pathology and known PCR risk factors

The percentage with	ISBCS	DSCS	Odds ratio	95% Confidence Interval	p - value
Number of eyes	2,146	496,682	-	-	-
No ocular co-pathology or known PCR risk factors	52.8	61.7	1.436	1.282 to 1.610	<0.001
At least one ocular co-pathology or known PCR risk factor	47.2	38.3			
The presence of					
Age-related macular degeneration	6.9	9.5	0.702	0.558 to 0.882	0.002
Amblyopia (#)	1.6	1.6	1.004	0.690 to 1.462	0.982
Brunescens / white / mature cataract (#)	14.9	3.3	5.118	4.367 to 5.999	<0.001
Corneal pathology	2.9	2.8	1.015	0.725 to 1.421	0.930
Diabetic retinopathy (#)	5.3	5.1	1.036	0.799 to 1.342	0.791
Glaucoma	7.1	7.9	0.886	0.706 to 1.113	0.298
High myopia (#)	6.5	4.8	1.362	1.074 to 1.727	0.011
Inherited eye diseases	1.4	0.1	10.982	6.616 to 18.229	<0.001
No fundal view / vitreous opacities (#)	6.6	0.8	8.381	6.647 to 10.568	<0.001
Other macular pathology	1.2	1.7	0.675	0.424 to 1.076	0.099
Other retinal vascular pathology	0.6	0.7	0.880	0.440 to 1.761	0.718
Optic nerve / CNS disease	1.1	0.3	3.283	1.900 to 5.675	<0.001
Pseudoxfoliation / Phacodonesis (#)	1.0	0.8	1.187	0.671 to 2.102	0.556
Previous retinal detachment	0.4	0.4	1.002	0.486 to 2.067	0.996
Previous vitrectomy	0.9	0.7	1.311	0.764 to 2.249	0.325
Previous trabeculectomy (#)	0.1	0.3	0.482	0.155 to 1.497	0.207
Uveitis / Synaehiae	0.6	0.6	1.029	0.483 to 2.196	0.940
Unspecified 'other' ocular co-pathology (#)	6.9	5.4	1.294	1.034 to 1.619	0.024

Conclusions:

ISBCS appears to be performed on a different case mix of patients than DSCS, evidenced by younger age, issues with cooperating and lying flat, worse pre-operative vision, higher rates of a number of known PCR risk factors and more frequent use of general anaesthesia.

Acknowledgments:

We would like to thank both the hospitals and the staff collecting the data for contributing data to the RCOPhth NOD.

All NOA participating centers are listed on the RCOPhth NOD website (www.nodaudit.org.uk).

It is with deep regret that we note the death of our friend and colleague Robert Johnston, who sadly died in September 2016. Without his inspirational vision, determination and career long commitment to quality improvement in ophthalmology this work would not have been possible.