Outcomes of manual small-incision cataract surgery using standard 22-Dioptre intraocular lenses at Nkhoma Eye Hospital Malawi

Justin C Sherwin^{1, 2}, William H Dean^{3, 4}, Isabelle Schaeffers³, Paul Courtright⁵, Nick Metcalfe³

1: Centre for Eye Research Australia, Department of Ophthalmology, University of Melbourne, Australia

2: Department of Public Health and Primary Care, Institute of Public Health, University of Cambridge, UK

3: Nkhoma Eye Hospital, Malawi

4: Department of Ophthalmology, Childrens Hospital Boston, Harvard Medical School, Boston, USA

5: Kilimanjaro Centre for Community Ophthalmology
Good Samaritan Foundation. PO Box 2254 Moshi, Tanzania

All authors have read and understood the criteria for authorship. Criteria for authorship has been met for all of the named authors.

CORRESPONDENCE:

Dr Justin C. Sherwin

Department of Public Health and Primary Care

University of Cambridge, UK

justincsherwin@gmail.com

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ABSTRACT

The aim of this study was to investigate the outcomes of sutureless, manual small-incision cataract surgery (SICS) in rural sub-Saharan Africa using standard intraocular lenses (IOL's). In order to assess the quality of surgery, we prospectively evaluated the visual outcomes of 1455 consecutive cataract operations performed in 2006 in patients ≥ 40 years at Nkhoma Eye Hospital, Malawi. All operations used standard 22.0 dioptre IOL's without pre-operative biometry. Outcomes were categorised according to the WHO criteria, and causes of a poor outcome were recorded. Mean age of patients was 71.5 ± 9.5 years, and 53% were female. Pre-operatively, 64% of eyes had a visual acuity (VA) $<6/60$, and 41.3% of eyes were blind (VA $<3/60$). Without correction (uncorrected VA), nearly eighty percent (78.7%) achieved a 'good' outcome (VA 6/6 to 6/18), 19.8% were 'borderline' (VA $<6/18-6/60$), and 1.5% had a poor (VA $<6/60$) outcome. With pinhole-correction, the proportion of good outcomes increased to 89.4%, and poor outcomes decreased to 0.9%. Poor outcomes were most commonly due to ocular co-morbidities (54.5%) and refractive error (36.4%). Increasing age and pre-operative blindness were strongly associated with borderline or poor visual outcomes. The most common surgical complication was posterior capsule tear (without vitreous loss). In a rural African environment, using standard IOL power plus SICS can lead to a high proportion of good outcomes and a low frequency of surgical complications. A comparative study is required to determine if any additional benefit in visual outcomes can be gained by the addition of biometry.

INTRODUCTION

Cataract is the leading cause of blindness in Africa,[1] where it is associated with a reduced quality of life[2], and surgical removal of cataract is one of the most cost-effective healthcare interventions. Consequently, management of cataract is a major focus in blindness prevention programmes in Africa, where there are seven million blind people[3], and this estimate is expected to rise by 600,000 blind people annually[4]. The VISION2020: The Right to Sight initiative includes the management of cataract as a key target for public health programs targeting preventable blindness, and cataract surgery remains the mainstay of treatment[5].

High volume cataract surgery is required to meet the unmet need, and in sub-Saharan Africa, the most common type of surgery now performed is extra-capsular cataract extraction (ECCE). Safer operations and faster post-operative recovery can be achieved by using sutureless, manual small-incision cataract surgery (SICS) with a scleral tunnel approach[6]. However, only a minority of surgical units in Africa routinely use pre-operative biometry, which would subsequently allow the use of targeted intra-ocular lens (IOL) implantation. In order to monitor the quality of cataract surgery, the World Health Organization (WHO) has set a target of at least 85% of eyes to achieve a post-operative presenting visual acuity (VA) of 6/18 or better[7]. Although some studies suggest that use of biometry is associated with improved cataract surgical outcomes in sub-Saharan Africa,[8] the findings have not been universal[9].

Nkhoma Eye Hospital originated as an eye department of the Nkhoma Synod Mission Hospital in 1957 and is located 40km from the Malawian

capital Lilongwe. Nkhoma, together with Kamuzu Central Hospital in Lilongwe, provides eye care service delivery to the approximately four million people in its catchment area of Central-Western and Central-Eastern Malawi. In 2006 only one ophthalmologist was working at Nkhoma, supported by more than 20 auxiliary ophthalmic personnel including cataract case finders, ophthalmic assistants and nurses. Cataract is the one most commonly encountered condition seen in the outpatient clinics at Nkhoma[10]. The chief objective of the Nkhoma Eye Programme is to provide high volume, high quality and appropriate VISION2020 service delivery with an emphasis on addressing cataract blindness.

The aim of this study was to investigate the visual and surgical outcomes of cataract surgery in Nkhoma Eye Hospital using standard 22-Dioptre (D) IOL's without use of biometry.

MATERIALS AND METHODS

A prospective study was undertaken in 2006 on 1455 consecutive patients aged ≥ 40 who had cataract surgery performed at Nkhoma Eye Hospital performed by one ophthalmologist (NM). Patients were referred for surgery having been examined by either a cataract case finder, auxiliary ophthalmic personnel or by an ophthalmologist. In order to correct for correlation only one eye per patient was analysed.

All VA measurements were performed with a Snellen 'E' chart at a distance of 6 metres (corrected with pinhole, and uncorrected). Blindness and visual impairment were classified according to World Health Organization (WHO) criteria[11]. All operations were extra-capsular cataract extractions,

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utilising a standard 22.0 dioptre (D) posterior chamber IOL. Small-incision extra-capsular cataract extraction (ECCE) using a scleral tunnel technique was used in all cases.

Ocular co-morbidities were recorded following comprehensive pre-operative clinical examination, including slit-lamp biomicroscopy, measurement of intra-ocular pressure (IOP) and evaluation of pupil response (including relative afferent papillary defect). No biometry was performed, as this service was not available at Nkhoma at the time. Complications of cataract surgery and post-operative visual acuity were recorded at discharge from hospital. Post-operative visual outcomes were classified in accordance with WHO criteria[12]. 'Good' was defined as a VA 6/6 to 6/18, 'borderline' was defined as VA <6/18 to 6/60 and 'poor' was defined as <6/60. The principle cause of a poor visual outcome was recorded. A poor outcome due to uncorrected refractive error (URE) was defined as an eye that had a 'poor' post-operative outcome uncorrected, and subsequently improved to $\geq 6/60$ with pinhole-correction. Ethical approval for this study was obtained by the committee of the Malawi National Health Sciences Research Committee. This study complied with the guidelines of the Declaration of Helsinki and subsequent revisions.

RESULTS

We investigated 1455 operations performed for senile cataract, (744 left eyes and 711 right eyes). Mean age of patients was 71.5 ± 9.5 years (range 41-100 years). 771 eyes (53.0%) were in female patients. Most eyes (64.8%) undergoing cataract surgery patients were severely visually impaired or blind

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pre-operatively (defined as VA<6/60) (Table 1). Six hundred and one eyes undergoing cataract surgery (41.3%) were blind (VA<3/60). This included 9 (1.5% of blind) able to count fingers (at half metre), 217 (36.1% of blind eyes) responsive to hand motion, and 119 (19.8% of blind eyes) with perception of light only (with good projection). The remaining blind eyes were VA 1/60 or 2/60. There were no eyes that had no perception to light.

Over three quarters of cataract operations performed at Nkhoma were associated with good post-operative visual outcomes at discharge (day 1-6 post-operatively) (Table 2). Less than two percent of operations performed at Nkhoma were associated with a poor outcome. There were 22 eyes (1.5%) with a poor outcome (uncorrected visual acuity). Nearly two-thirds of the eyes with poor outcomes were blind (VA<3/60) pre-operatively, including nearly 10% of blind that had only perception of light. Pre-operative blindness was a strong predictor of poor outcome (odds ratio [OR] 4.94, 95% confidence interval [CI] 1.81-13.47, P=0.002). Main reasons for poor outcome were pre-operative blindness (n=14), ocular co-morbidity (n= 12) and URE (n=8). Of the eyes with poor outcome, 14 eyes (63.6%) had VA<3/60, six eyes (27.3%) had VA (<6/60 to 3/60), and 2 eyes (9.1%) had VA equal to 6/60 pre-operatively. Ocular co-morbidities (n=12) comprised macular pathology, n=5 (macular degeneration, n=2; macular scar, n=1; macular hole, n=2), open-angle glaucoma (n=5), amblyopia (n=1) and uveitis (n=1). All of the cases of maculopathy, and all but one of the cases of glaucoma, occurred in people aged 70 years and over. Eight cases (36.4%) of poor outcome were due to URE. There were two surgical complications (tear in corneal endothelium and tear in anterior/ posterior capsule) causing poor outcome.

The frequency of intra-operative cataract surgical complications was low. The most common surgical complication was posterior capsule (PC) tear $n=37$ (2.5%) (Table 3). There were no cases of poor-outcome in people aged less than 60 years, rising to nearly 3% (corrected) in people aged 80 and over (Table 4). Increasing age group was associated with a borderline/poor outcome ($P_{\text{trend}} < 0.001$). Female sex was associated with a borderline/poor outcome following surgery, although was not statistically significant (OR 1.29, 95% CI 0.89-1.89, $P=0.177$).

DISCUSSION

We have demonstrated the short-term outcomes of a large clinic-based sample undergoing SICS in rural Malawi. Approximately 90% of eyes achieved a post-operative pinhole-corrected VA $> 6/18$ using standard 22D IOL's. Encouragingly, less than 2% of surgeries had a poor visual outcome, and less than 10% of operations resulted in a borderline outcome following pinhole correction. Although we consider 22D IOL's to be the most appropriate power, in another African population, best fit of IOL is considered to be +21D in men and +22D in females[8].

Our high proportion of 'good' visual outcomes is in keeping with other data from the highest recorded outcomes in Africa[9,13]. The proportion of good outcomes (and corresponding low percentage of poor outcomes) in clinic-based studies is higher than in population-based surveys in sub-Saharan Africa[14-16], however, findings from clinic-based studies such as ours may not be a good representation of the wider population. A recent rapid assessment of avoidable blindness survey in southern Malawi revealed that

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52.6% of operated eyes had a good outcome (could see 6/18) with pinhole-correction, and encouragingly, the majority of cataract operations (91.0%) used IOL's. Although there was a high proportion (32.1%) that could not see 6/60 with best correction, most subjects were very or partially satisfied with the visual outcome (84.8% of all persons who had surgery), with only 3% very unsatisfied.

The cataract surgical technique at Nkhoma entails a modified fishhook technique that utilises a scleral tunnel. Its success lies in its quick recovery, reduction in post-operative (against-the-rule) astigmatism, cost-effectiveness and high success rates[18]. Additionally, it is associated with a lower incidence of fibrinous anterior uveitis and rounder pupils than standard ECCE surgery. One further benefit of sutureless surgery is the avoidance of any suture related problems such as possible infection and irritation. Using SICS in this population, an initial post-operative rise in IOP resolves by approximately 48 hours[19]. High volume SICS has been instrumental for a 5-fold increase in the cataract surgical coverage within a 10-mile radius of Nkhoma in 6 years[20].

There are four reasons for poor outcome following cataract surgery; ocular co-morbidities, surgical complications, uncorrected refractive error and post-operative complications[21]. Our most common causes of a poor outcome were ocular co-morbidities and URE. Similarly, ocular co-morbidities and URE were also considered to be the main causes of a poor outcome in a multi-national study performed in Kenya, Bangladesh and Phillipines,[22] although our duration of follow up was considerably shorter. In patients with advanced cataract it is often difficult to assess the fundus, and three posterior

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segment co-morbidities were noted only after surgery. Therefore, posterior segment disease is often overlooked as a cause of reduced vision when advanced cataract is present.

Poor outcomes were more frequent in eyes of advanced age largely due to presence of additional age-related eye disease including glaucoma and maculopathy[23]. Our findings indicate that by recruiting patients with cataract who are younger and/or have better pre-operative VA, a reduction in the proportion of poor outcomes may be possible. A cohort study of patients with operable cataract from Tanzania in close proximity of an eye care programme found that only 23% of potential cataract surgical candidates had blindness or severe visual impairment, and that the elderly were the least likely group to accept free surgery[24]. This suggests that other measures in addition to visual acuity, such as vision-related quality of life, may be useful to select patients for surgery, and may reduce the likelihood of a poor outcome.

No post-operative data on refractive status was collected in this clinic population. Nonetheless, based on previous in patients undergoing SICS at Nkhoma[25], we estimate that in patients undergoing manual SICS using +22D IOL's, 2.8% of eyes in our hospital-based population would be emmetropic, 38.0% would have myopia, including 3.4% with SE >2.0D (34.6% SE ≤ -2.00D). The remaining 59.2% would be predicted to have hyperopia, including 15.6% with SE >2.0D (43.6% SE ≤ +2.00D). The finding of approximately 20% of patients having a poor refractive outcome with 22D IOL's has been found elsewhere in a rural African population[26]. Although it is difficult to generalize these findings due to potential differences in ocular, biometric and demographic characteristics, the visual outcomes in this

previous study were strongly correlated, the surgeon and surgical technique were identical, and the patients were from the same catchment region.

Our results were obtained with no biometry and using a standard 22D IOL only. However, if preoperative biometry and IOL power calculation was performed, the post-operative visual and refractive outcome may be improved. The large difference in proportion of borderline outcomes in uncorrected eyes and following pinhole correction highlights the importance of implanting an IOL of appropriate power. At Nkhoma, patients who were myopic with a spherical equivalent greater than -2.00D improved with correction in average 2.6 lines on the Snellen 'E' Chart[25]. The aim of adding biometry to the operative management would be to decrease the prevalence of post-operative hyperopia without increasing the proportion with myopia by allowing the most appropriate IOL to be implanted, although, accurate prediction is not always possible despite many prediction rules in use. There is a marked increase in prediction error of biometry in eyes with ocular co-morbidity, and eyes with no ocular co-morbidity with pre-operative VA<6/60 also increase the prediction error of biometry[27]. In Kenya, it was predicted that use of biometry could improve the proportion of 'good refractive outcomes' (defined as +1 to -1.5 D spherical equivalent)[8]. In that study, 48.8% of men and 61.4% of women had a good refractive outcome with standard 22D lenses without biometry. This rose to 71.1% in both sexes with biometry (real outcomes) and 80.3% (optimized A constant). Though, the authors also found that more than one-quarter would become more than -1.5 D myopic using biometry (real outcomes). Using a standard 22D IOL in Eritrea, approximately half (48%) of patients were within +/- 1 dioptries of

emmetropia in the absence of spectacles[28].

In adults in sub-Saharan Africa, URE is a common cause of visual impairment, but blindness due to URE is rare; nonetheless, uncorrected aphakia remains problematic in some areas where IOL use has been limited[29]. Beatty et al. proposed three potential solutions to avoid excessive post-operative high refractive error: pre-operative biometry and stocking three IOL's; post-operative auto-refraction and IOL replacement if extreme refractive error and; post-operative refraction with spectacles[30]. It is important to recognize that biometry is not always possible, especially in cases of concomitant corneal pathology, and is especially difficult to conduct in rural African environments[26]. Moreover, the addition of biometry will require additional training for auxiliary ophthalmic personnel, and changes in stocks of IOL's may result in increased costs to the clinic.

The WHO recommends aiming for less than 5% of vitreous loss during surgery. The rate of all complications in this study was < 5%, and vitreous loss with posterior capsule tear or zonular tears was 0.9%. Other complication rates were very low, and illustrate an excellent and appropriate surgical technique. However, we are unable to present data on medium and long-term surgical complications. In nearly all cases of vitreous loss, an anterior vitrectomy was performed, and sulcus-placed IOL achieved. Only one case required insertion of an anterior chamber IOL as a result of intra-operative vitreous loss.

We do not have medium or long-term follow-up data, a major limitation of our study, due to the exceedingly poor adherence to follow-up in patients, especially those from rural regions living very far from Nkhoma.

Consequently, we do not have data on the long-term complications and potential sequelae of cataract surgery, such as posterior capsule opacification, which occurred in approximately 5% of eyes in a study from Ethiopia[31]. With increased time it is possible that our proportion of poor and borderline outcomes would be even less as post-operative eyes with a borderline or poor outcome at discharge tend to reach their optimum vision approximately 4-6 months post-operatively[32]. We do not routinely ask patients to return due to long distances many must travel, and associated costs are often prohibitive. Follow-up for patients undergoing trabeculectomy is less than 50%. A study is currently underway to determine two-month post-operative refractive outcomes, and the subjective assessment of outcomes including quality of life.

In summary, in a rural African setting good quality SICS cataract surgery using standard IOL's in the absence of biometry performed at Nkhoma is associated with excellent visual outcomes and a very low risk of poor outcomes at discharge. Further study is required to determine whether or not improvements in refractive and visual outcomes can occur with the addition of biometry.

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REFERENCES

1. Resnikoff S, Pascolini D, Etya'ale D, Kocur I, Pararajasegaram R, Pokharel GP, Mariotti SP (2004) Global data on visual impairment in the year 2002. *Bull World Health Organ* 82 (11):844-851. doi:S0042-96862004001100009 [pii] /S0042-96862004001100009
2. Polack S, Kuper H, Mathenge W, Fletcher A, Foster A (2007) Cataract visual impairment and quality of life in a Kenyan population. *Br J Ophthalmol* 91 (7):927-932. doi:bjo.2006.110973 [pii]10.1136/bjo.2006.110973
3. Lewallen S, Courtright P (2001) Blindness in Africa: present situation and future needs. *Br J Ophthalmol* 85 (8):897-903
4. Wong TY (2005) Cataract surgery programmes in Africa. *Br J Ophthalmol* 89 (10):1231-1232. doi:89/10/1231 [pii] 10.1136/bjo.2005.072645
5. World Health Organization. The Global Initiative for Elimination of Avoidable Blindness. Geneva, 1997 (WHO/PBL/97.61 Rev 1).
6. Gurung R, Hennig A (2008) Small incision cataract surgery: tips for avoiding surgical complications. *Community Eye Health* 21 (65):4-5
7. World Health Organization. Global Initiative for the Elimination of Avoidable Blindness : Action Plan 2006-2011. Geneva, 2007.
8. Briesen S, Roberts H, Lewallen S (2010) The importance of biometry to cataract outcomes in a surgical unit in Africa. *Ophthalmic Epidemiol* 17 (4):196-202. doi:10.3109/09286586.2010.498662
9. Yorston D, Foster A (1999) Audit of extracapsular cataract extraction and posterior chamber lens implantation as a routine treatment for age related cataract in east Africa. *Br J Ophthalmol* 83 (8):897-901

10. Sherwin JC, Dean WH, Metcalfe NH (2008) Causes of blindness at Nkhoma Eye Hospital, Malawi. *Eur J Ophthalmol* 18 (6):1002-1006
11. World Health Organization. Change the Definition of Blindness. <http://www.who.int/blindness/Change%20the%20Definition%20of%20Blindness.pdf>. Accessed February 15th 2012.
12. World Health Organization. An Informal Consultation on Analysis of Blindness Prevention Outcomes. WHO, Geneva, Switzerland. 16-18 February 1998. WHO/PBL/98.68.
13. Yorston D, Gichuhi S, Wood M, Foster A (2002) Does prospective monitoring improve cataract surgery outcomes in Africa? *Br J Ophthalmol* 86 (5):543-547
14. Courtright P, Metcalfe N, Hoechsmann A, Chirambo M, Lewallen S, Barrows J, Witte C (2004) Cataract surgical coverage and outcome of cataract surgery in a rural district in Malawi. *Can J Ophthalmol* 39 (1):25-30
15. Imam AU, Gilbert CE, Sivasubramaniam S, Murthy GV, Maini R, Rabi MM (2010) Outcome of Cataract Surgery in Nigeria: Visual Acuity, Autorefractometry, and Optimal Intraocular Lens Powers-Results from the Nigeria National Survey. *Ophthalmology*. doi:S0161-6420(10)00873-0 [pii] 10.1016/j.ophtha.2010.08.025
16. Mathenge W, Kuper H, Limburg H, Polack S, Onyango O, Nyaga G, Foster A (2007) Rapid assessment of avoidable blindness in Nakuru district, Kenya. *Ophthalmology* 114 (3):599-605. doi:S0161-6420(06)01140-7 [pii] 10.1016/j.ophtha.2006.06.057

17. Kalua K, Lindfield R, Mtupanyama M, Mtumodzi D, Msiska V (2011) Findings from a rapid assessment of avoidable blindness (RAAB) in Southern Malawi. *PLoS One* 6 (4):e19226. doi:10.1371/journal.pone.0019226
18. Yorston D (2005) High-volume surgery in developing countries. *Eye (Lond)* 19 (10):1083-1089. doi:6701966 [pii]10.1038/sj.eye.6701966
19. Dean WH, Banda L, Kambewa ES, Sherwin JC (2012) Increased intraocular pressure on the first post-operative day following sutureless extracapsular cataract surgery in Africa. *Eye (Lond)* 26 (2):332. doi:eye2011273 [pii]10.1038/eye.2011.273
20. Dean WH, Patel D, Sherwin JC, Metcalfe NH (2011) Follow-up survey of cataract surgical coverage and barriers to cataract surgery at Nkhoma, Malawi. *Ophthalmic Epidemiol* 18 (4):171-178. doi:10.3109/09286586.2011.590918
21. Cook C (2000) How to improve the outcome of cataract surgery. *Community Eye Health* 13 (35):37-38
22. Lindfield R, Kuper H, Polack S, Eusebio C, Mathenge W, Wadud Z, Rashid AM, Foster A (2009) Outcome of cataract surgery at one year in Kenya, the Philippines and Bangladesh. *Br J Ophthalmol* 93 (7):875-880. doi:bjo.2008.152744 [pii]10.1136/bjo.2008.152744
23. Dandona L, Dandona R, Naduvilath TJ, McCarty CA, Mandal P, Srinivas M, Nanda A, Rao GN (1999) Population-based assessment of the outcome of cataract surgery in an urban population in southern India. *Am J Ophthalmol* 127 (6):650-658. doi:S0002939499000446 [pii]
24. Chibuga E, Massae P, Geneau R, Mahande M, Lewallen S, Courtright P (2008) Acceptance of cataract surgery in a cohort of Tanzanians with

operable cataract. *Eye (Lond)* 22 (6):830-833. doi:6702736

[pii]10.1038/sj.eye.6702736

25. Schwarzmam M (2008) Diploma Thesis. Postoperative refraction study for sutureless cataract surgery with standard 22 dioptre IOL. Aalen University, Germany.

26. Briesen S, Roberts H, Karimurio J, Kollmann M (2010) [Biometry in cataract camps. Experiences from north Kenya]. *Ophthalmologe* 107 (4):354-358. doi:10.1007/s00347-009-2021-2

27. Daniel C, Tuft S, Ionides A, Bunce C (2003) Effect of visual acuity on biometry prediction error after cataract surgery. *J Cataract Refract Surg* 29 (7):1365-1369. doi:S0886335002019132 [pii]

28. Connell B, Brian G, Bond MJ (1997) A case-control study of biometry in healthy and cataractous Eritrean eyes. *Ophthalmic Epidemiol* 4 (3):151-155

29. Sherwin JC, Lewallen S, Courtright P (2012) Blindness and visual impairment due to uncorrected refractive error in sub-Saharan Africa: review of recent population-based studies. *Br J Ophthalmol*. doi:bjophthalmol-2011-300426 [pii] 10.1136/bjophthalmol-2011-300426

30. Beatty J, Cook C, Murdoch I (2004) Refractive error following cataract extraction with the implantation of a standard power intraocular lens in a rural African blindness prevention programme. *Eye (Lond)* 18 (2):194-195; discussion 195. doi:10.1038/sj.eye.67005496700549 [pii]

31. Tilahun Y, Sisay A (2006) Audit of extracapsular cataract extraction with posterior chamber intraocular lens implantation in a tertiary eye care center in Ethiopia. *Ethiop Med J* 44 (1):61-66

32. Limburg H, Foster A, Gilbert C, Johnson GJ, Kyndt M, Myatt M (2005)

Routine monitoring of visual outcome of cataract surgery. Part 2: Results from eight study centres. Br J Ophthalmol 89 (1):50-52. doi:89/1/50 [pii]

10.1136/bjo.2004.045369

TABLES

Table 1. Pre-operative visual acuity (unaided or pinhole-corrected) in 1455 patients undergoing sutureless small-incision cataract surgery at Nkhoma Eye Hospital, Malawi.

Pre-operative visual acuity	N	%
6/6 to 6/18	0	0.0
<6/18 to 6/60	512	35.2
< 6/60	943	64.8
Total	1455	100.0

Table 2. Post-operative visual outcomes, uncorrected and pinhole-corrected, in 1455 patients undergoing sutureless small-incision cataract surgery at Nkhoma Eye Hospital, Malawi.

Visual outcome		Uncorrected		Pinhole-Corrected	
		N	%	N	%
Good	(6/6 – 6/18)	1145	78.7	1300	89.4
Borderline	(<6/18-6/60)	288	19.8	141	9.7
Poor	(<6/60)	22	1.5	14	0.9

Table 3. Intra-operative complications in 101 (of 1455) patients undergoing sutureless small-incision cataract surgery at Nkhoma Eye Hospital, Malawi.

Complication	N	%
PC tear without VL	26	1.8
PC tear with VL	11	0.8
Zonule weakness / tear	7	0.5
Endothelial tear	5	0.3
Anterior capsule tear	1	0.1
Iris root tear	1	0.1
Nucleus breaking on	4	0.3
Soft lens matter retained	2	0.1
Premature entry	6	0.4
Button hole	1	0.1
Total	101	4.4

Abbreviation: VL- vitreous loss; PC – posterior capsule

Table 4. Association between age and post-operative visual outcome in patients undergoing sutureless small-incision cataract surgery at Nkhoma Eye Hospital, Malawi

Age (years)	Good (6/6 to 6/18)		Borderline (<6/18-6/60)		Poor (<6/60)	
	Uncorrected	Pinhole-Corrected	Uncorrected	Pinhole-Corrected	Uncorrected	Pinhole-Corrected
	%	%	%	%	%	%
40-49	85.2	85.2	14.8	14.8	0.0	0.0
50-59	85.9	93.9	14.1	6.1	0.0	0.0
60-69	81.3	91.9	17.1	7.8	1.6	0.4
70-79	80.3	88.5	18.4	10.3	1.4	1.2
80 +	76.0	87.7	20.7	10.3	3.3	2.7

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Author/s:

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