

INTRAOCULAR LENS IMPLANTATION SURGERY IN ONITSHA, NIGERIA.

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SUMMARY

Objective: To evaluate the outcome of cataract extraction with intraocular lens implantation surgery at the Guinness Eye Center Onitsha, Nigeria.

Design: Retrospective case series.

Main Outcome Measures: Visual acuity; post-operative complications.

Materials and Methods: Consecutive patients who had cataract extraction with intraocular lens implant between January 2001 at the Guinness Eye Center Onitsha and follow up for at least 2 months post-surgery were studied. Information on age, sex, ocular and systemic co-morbidities; type of cataract; pre-and post-operative visual acuity and surgical complications were analyzed.

Results: 30 patients (41 eyes) were studied; mean age-66.1 years (range-10-90 years); M:F=1:1. Eleven patients (36.7%) had bilateral surgery. Follow up was 5-18 months. 35 eyes (85.4%) had senile cataract; traumatic cataract and couched eyes, 2 eyes each; post-uveitic cataract and secondary lens implant, 1 eye each. Systemic co-morbidities were diabetes mellitus and hypertension, 6 patients each; cardiovascular disease (2 patients); arthritis and bronchitis (1 patient each).

Pre-operative acuity in all eyes was <6/36. At 2 months post-surgery, 24.3% had presenting acuity >6/18; 46.1% had corrected acuity >6/18; 16.9% had acuity >6/9. At the last visit, 43.6% had presenting acuity >6/18 or better; 75.4% had corrected acuity >6/18; 29.1% had corrected acuity >6/9. Optimal post-operative acuity occurred in 2-5 months; mean- 3.5 months.

Surgical complications were recurrent uveitis, 20eyes (48.8%) astigmatism, 14eyes (34.1%); high intraocular pressure, 3 eyes (7.3%); posterior capsule opacity, 3 eyes (7.3%); posterior capsule tear, 2 eyes (4.9%). Poor post-operative acuity were due to posterior capsule opacity and macular scar, 3 eyes each; leukoma, 2 eyes; diabetic retinopathy, 1 eye.

Conclusion: In spite of lacking some facilities for ocular microsurgery, cataract surgery with IOL implantation is safe and ensures better visual rehabilitation in Nigerians. Use of A-mode ultrasound scan, keratometer, YAG laser and newer lens designs will improve our results. But ophthalmic surgeons should promptly attend to such vision threatening complications as post-operative uveitis.

KEY WORDS: Cataract; intraocular lens; visual acuity; surgical complications.

INTRODUCTION

Cataract is the commonest cause of blindness in Nigeria¹⁻⁵. In Anambra State it accounts for half to two-thirds of the blindness^{3,4}. Cataract blindness is reversible through surgical operation. However lens removal alone does not ensure optimal vision post-surgery. Therefore various methods have been used for visual rehabilitation following

lens surgery. These include spectacles, contact lens, and intraocular lens.

In the industrialized countries, intraocular lens (IOL) implant following cataract extraction has become routine practice since Harold Ridley's^{6,7} landmark success with posterior chamber lens implantation more than 5 decades

ago. The succeeding years witnessed great refinements in surgical techniques; availability of A-mode ultrasound scan and keratometer for ocular biometry; operating microscope with co-axial illumination; viscoelastic materials; better intraocular lens design and improved microsurgical instrumentation including fine monofilament nylon sutures⁷. All these advances ensured optimal visual rehabilitation after cataract surgery.

However, in developing countries, including Nigeria, the conversion to the intraocular lens surgical technique has been much slower. In an evaluation of cataract surgical services in Anambra State in 1993, it was found that only 2 out of 1055 cataract extractions had lens implant⁸. Since then the intraocular lens as well as the requisite surgical instruments including the operating microscope have become available at the Guinness Eye Center, Onitsha, Nigeria.

This paper reports the experience of cataract extraction with intraocular lens implantation at the Guinness Eye Center Onitsha over a 13- month period.

MATERIALS AND METHODS

Consecutive cataract extractions with intraocular lens (IOL) implantation at the Guinness Eye Centre Onitsha between January 2000 and January 2001 constitute the subject of this review. Excluded from the analysis were patients who had combined trabeculectomy, cataract extraction and intraocular lens implant as well as patients who were not followed up for up to 2 months.

Patients for cataract surgery were admitted at least 24 hours before operation. General physical and ocular examinations were performed. On the night before surgery, adult patients were given tablets of acetazolamide 500mg and diazepam 5mg. Chloramphenicol eye drops were instilled in each eye. The eye to be operated upon was dilated with cyclopentolate 0.5% and atropine 1% drops, one hour before going into the operating room

In the operating room additional premeditation given to adults included intramuscular injection of pentazocine 30mg. All adult patients were operated upon under local anesthesia using peribulbar injection of 2% xylocaine with or without adrenaline or a combination of 2% xylocaine and 0.5% bupivacaine.

In children and adolescents, a combination of intramuscular injections of atropine 0.5mg; ketamine hydrochloride (8mg/kg) and diazepam 10mg were used as previously reported⁹. The weight of these younger patients were used to calculate the drug dosage by the senior nurse anesthetist.

The cataract surgery consisted of standard extracapsular cataract extraction at the end of which the intraocular lens was implanted viz: fornix-based conjunctival flap; limbal incision; anterior capsulotomy (can-opener

technique); hydrodissection and lens nucleus removal; cortical lens matter clean up with Simcoe irrigation/aspiration cannula and Ringer's lactate solution. Viscoelastic (methycellulose) was used to maintain the depths of the anterior and posterior chambers to facilitate IOL implant. The viscoelastic was aspirated after IOL implantation. Subconjunctival injections of antibiotics and steroids were administered at the end of surgery.

The IOL used were single piece lenses (Lenstec, Inc., Christ Church, Barbados) in the range of 17-22 dioptres. All the operations were performed under the magnification of the operating microscope (Scanoptics, Adelaide, Australia). In the absence of keratometer and A-mode scan, preoperative ocular biometry was not done. However, previous refraction or current refraction in the contra- lateral eye of the unioocular cataract patients was used as a guide in deciding the IOL power. Where this is not possible, 18-20 dioptre lenses were implanted.

Post-operatively patients received steroid and antibiotics eye drops, topical mydriatics (cyclopentolate) and oral analgesics. Acetazolamide tablets were given for one week while the topical antibiotics and mydriatics were given for up to a month. Topical steroids were administered hourly for the first 2 weeks and then reduced to 4 times daily for the next 2-3 months depending on the degree of inflammation in the eye. Patients were discharged from the ward 1-3 days after surgery and reviewed within one week. Thereafter they were reviewed at two weekly intervals for the next 2 months. Subsequent follow-up appointments after 2 months vary from 2 to 6 weeks depending on the patient's condition. Refraction was done at 2 months after surgery and at subsequent visits.

RESULTS

During the study period, 38 patients (50 eyes) were operated upon. However, 6 patients (7eyes) has combined trabeculectomy, extracapsular cataract extraction and IOL implant; 2 patients (2eyes) defaulted after 2 weeks' follow up. Excluding these 8 patients (9eyes), data on the remaining 30 patients (41 eyes) were analysed.

There were 17 male and 13 female patients with mean age, 66.1 years (17.2SD); range 10-90 years. Eleven patients (36.7%) had bilateral surgery. Follow up was 5-18 months. Twenty-six patients (86.7%) were followed up for at least 12 months. Of the 41 eyes, 35 (85.4%) had senile cataract. Others were traumatic cataract (2 eyes); post-uveitic cataract (1 eye); couched eyes (2 eyes); secondary lens implant (1eye). Posterior chamber lens (PC IOL) was implanted in 38 eyes (92.7%) and anterior chamber lens (AC IOL) in 3 eyes-2 for couched eyes and for secondary lens implant.

The systemic co-morbidities documented in 16 patients were diabetes mellitus (6 patients); hypertension (6 patients); cardiovascular disease (2 patients); arthritis and bronchitis (1 patient each).

Table 1 shows the preoperative and visual acuity. Generally a steady improvement in visual acuity was observed over time. On the average it took 3.5 months, with a range of 2-5 months for the patients to achieve optimal vision post surgery.

The surgical complications were as follows: recurrent uveitis, 20 eyes (48.8%) raised intraocular pressure, 3 eye (7.3%); posterior capsule opacification, 3 eyes (7.3%); posterior capsule tear, 2 eyes (4.9%). Fourteen eyes had post-operative astigmatism ranging from 0.50-3.00 dioptres, with 0.50 dioptre as the modal value; 4 eyes had astigmatism of 2.00 or more dioptres. Some patients had more than one complication.

Reasons for persistently poor post-operative visual acuity were posterior capsule opacity (3 eyes); chorioretinal scar involving the macular (3 eyes); pre-existing corneal opacity (2 eyes); diabetic retinopathy (1 eye). Two eyes were suspected to have post-operative cystoid macular edema but in the absence of fluorescein angiography, this could not be proved.

Table 1: VISUAL ACUITY (EYES)

PRE-OPERATIVE				POST-OPERATIVE						
Acuity	No.	%	2 months Presenting		2 months Corrected		Last visit Presenting		Last visit Corrected	
			No.	%	No.	%	No.	%	No.	%
6/6					2	4.8	1	2.4	5	12.1
6/9					5	12.1	5	12.1	7	17.0
6/12			1	2.4	8	19.5	5	12.1	12	29.3
6/18			9	21.9	4	9.7	7	17.0	7	17.0
6/24			3	7.3	6	14.6	7	17.0	3	7.3
6/36	1	2.4	9	21.9	6	14.6	7	17.0	3	7.3
6/60	4	9.7	14	34.2	5	12.1	5	12.1	1	2.4
3/60	1	2.4	1	2.4	1	2.4	-	-	1	2.4
<3/60-L.P	35	85.4	4	7.7	4	7.7	4	9.7	4	9.7
Total	41	100.0	41	100.0	41	100.0	41	100.0	41	100.0

DISCUSSION

Although pseudophakos techniques and technology have been taken for granted for more than 2 decades in the industrialised countries-10, they are still emerging phenomena in many developing countries, especially in Africa¹¹⁻¹⁵. The first report of cataract extraction with IOL implant in Nigeria was by Agbeja¹³, who in a preliminary report in 1994 documented encouraging results in spite of the limitations of equipment for microsurgical procedures. Since then, Adejo¹⁴, in Kaduna and Bekibele¹⁵, in Ago-Iwoye have also reported on their initial experiences. The present study, being perhaps the first report from Eastern Nigeria, adds to the growing Nigerian experience.

Patients involved in the present study were aged 10-90 years. This age range is similar to those of Bekibele¹⁵ but differed from those of Agbeja¹³ and Adejo¹⁴ who

studied relatively younger patients. Age is no contraindication to IOL implantation surgery although in all the series so far reported from Nigeria, no patient was younger than 9 years. Reports of IOL implantation surgery in neonates, infants and children younger than 5 years abound in developed countries^{16,17}.

Up to 53.3% of the patients in the present study had such systemic co-morbidity as diabetes mellitus, hypertension, cardiovascular disease, bronchial asthma and arthritis. That none of these interfered with surgery or increased peri-operative systemic complications, once more emphasizes the importance of careful pre-operative evaluation of all patients and adequate control of any systemic disease before surgery.

The study recorded a steady improvement in both the post-operative presenting and corrected visual acuity. This is similar to experience of other workers. While Agbeja¹³ reported that 14% of her patients had uncorrected acuity of 6/9 or better, Bekibele¹⁵ recorded 9.8%. Adejo¹⁴ reported that 16.7% had uncorrected acuity of 6/12 or better. In the present study 14.5% had presenting (uncorrected) acuity of 6/9 or better and this rose to 26.6% when acuity of 6/12 or better was considered. A study in Nepal-18 reported that 2 months after IOL implantation surgery, 54.4% of the patients had uncorrected acuity greater than or equal to 20/60 (6/18) and 87.1% had corrected acuity of 20/60.

While no patient in our series had a pre-operative acuity better than 6/36, 29.1% had corrected acuity of 6/9 or better. Bekibele¹⁵ found that 22 out of 61 patients (36.1%) had corrected acuity of 6/9 or better. However, 18 patients (29.5%) in his series were not refracted. Similarly the Ibadan study¹³ reported that 18 of 51 patients (35.3%) had corrected acuity of 6/9 or better but noted that 19 patients (37.3%) did not have post operative refraction. Only 40% of the patients in Kaduna-14 were followed up for 3 or more months.

It has been the experience that many patients fail to keep follow up appointments. Only 40% of the IOL implantation surgery patients in Kaduna were followed up for 3 or more months¹⁵ and in other studies, 29.5-37.7% of the patients were not available for refraction 6-8 weeks after surgery^{13,15}. It is possible that the defaulting patients felt better post-operatively and therefore had no compelling enough reason to travel long distances to attend the usually crowded eye clinics.

In the present study, the 2 patients that defaulted from follow up were excluded from the analysis. The high follow up rate recorded in this study is contrary to our experience with non-surgical ophthalmic patients in our hospital. Perhaps this study cohort felt the need to always keep in touch with their doctors in case anything happens to the lens inside their eyes. The worry over something

going wrong with the intraocular lens was one of the greatest fears expressed by the patients and their relatives during preoperative discussion. The importance of persuading patients on the need for regular follow up cannot be over-emphasised. A study in New Zealand¹⁹ has shown that significant unexpected complications are common after IOL implantation surgery.

Traditionally, refraction is conducted 6-8 weeks after cataract surgery. However, the present study has recorded progressive improvement in visual acuity up to 5 months after surgery and it took a mean of 3.5 months for optimal improvement in acuity in most patients. It is therefore suggested that refraction done at 2 months post-surgery may not be enough to reach conclusion on visual acuity outcome in most patients. It is instructive that Agbeja-13 prescribed glasses for her patients only 3 months after surgery.

Contrary to the Kaduna experience-14 where posterior capsule rupture and vitreous loss occurred in 14%, only in 2 eyes (4.9%) were there posterior capsule tears in the present study. But these were small tears that did not preclude posterior chamber lens implantation. This is similar to the 4.9% reported in the Ago-Iwoye study-15 but higher than the 2% recorded at Ibadan-13. Ruit et al-18 recorded only a case of posterior capsule tear with vitreous loss out of 207 cataract extractions with IOL implant at the Chaughada eyes camp in Nepal. With a generally low complication rate of 2.9%, the authors concluded that with careful preoperative evaluation and attention to details of surgical technique, effective high volume lens implantation surgery is feasible in remote under-served nations-18. Post-operative raised intraocular pressure recorded in 3 eyes were controlled with timolol eye drops and acetazolamide tablets within a week and none required glaucoma surgery. This was thought to be due to the effect of residual viscoelastic material used during the surgery.

The commonest post-operative complication in the present study was recurrent uveitis which occurred in 48.8% of the patients. Post-operative uveitis was the commonest cause of poor visual outcome in Ibadan-13. Apart from the inflammation observed in the immediate post-operative period, the episodes of uveitis occurred several weeks or months after surgery and usually subside with topical steroids or in some cases depo-steroid injection. It is often associated with a drop in visual acuity. This complication is different from infective endophthalmitis which happily we did not encounter in this cohort of patients. All the affected patients had 2 or more episodes of uveitis. Cook et al¹² had reported that 30% of black patients had persistent uveitis after IOL surgery. Recurrent post-operative uveitis has always been of concern to workers in Africa where patients have highly pigmented

eyes¹². The importance of this complication lies in the fact that it leads to visual deterioration if not well treated. While it is necessary to promptly treat this complication, preventive measures should include maximum cortical lens matter clean up and implanting the lens in the capsule bag.

Posterior capsule opacity, causing visual deterioration was noted in 3 eyes. Perhaps more of such cases would have been recorded with longer follow up. It was the commonest reason for poor visual outcome in Ibadan¹³. These patients require Nd: YAG laser capsulotomy- an equipment not available to us. Apple et al-7 had noted that opaque posterior capsule was one of the most persistent complications of extracapsular cataract extraction with IOL implant. In a prospective study of 3493 eyes with PC IOL obtained post-mortem, Ram et al²⁰ concluded that secure in-the-bag implantation of a bio-compatible PC IOL after a good cortical lens matter clean up, creates a barrier to lens epithelial cell migration, considered the most important factor influencing posterior capsular opacification.

Pre-existing leukoma, diabetic retinopathy, chorioretinal scar and posterior capsule opacities were the main causes of poor visual outcome. Similar observations were made by Ruit et al¹⁸ in Nepal. Although surgically induced astigmatism caused poor presenting visual acuity in some patients, refraction improved vision in these patients. While a thorough pre-operative patient evaluation with a view to detecting and advising on ocular comorbidity is advocated, it is hoped that the availability of YAG laser, ocular biometry instruments and new lens designs that prevent posterior capsule opacification²¹, will greatly improve the patients' post-operative vision.

In conclusion, this study, like earlier reports from other parts of Nigeria¹³⁻¹⁵, has shown that in spite of lacking some requisite facilities for ocular microsurgery, cataract surgery with IOL implantation is safe and ensures better visual rehabilitation in Nigerians. Except for recurrent uveitis, the surgical complications in the present study is low. Use of A-mode ultrasound scan, Keratometer, YAG laser and newer lens designs will no doubt improve our results. But most importantly, ophthalmic surgeons should promptly attend to such vision threatening complication as post-operative uveitis.

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