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UNILATERAL VERSUS SIMULTANEOUS BILATERAL CATARACT SURGERY IN A NIGERIAN EYE HOSPITAL

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ABSTRACT

Objective: To compare the outcome of *unilateral versus bilateral simultaneous cataract surgery at the Guinness Eye Center Onitsha, Nigeria.*

Materials and Methods: The visual outcome and complications rates in patients who had *bilateral simultaneous cataract surgery (BSCS)* intraocular lens implant between 01 January, 2014 and 31 December, 2016 and had been followed up for 6 months were compared with those who had *unilateral cataract surgery (UCS)* within the same period. Information on socio-demographic characteristics, domicile, pre-operative visual acuity, visual acuity on last follow up, intra-operative complications, post-operative complications and causes of poor vision were analyzed.

Results: Thirty nine patients with bilateral simultaneous surgery and 142 with unioocular surgery were studied. The age range was 6 – 93 years, median – 66years. There were 104 males (57.5%). Pre-operatively 62 (79.5%) and 134 (94.4%) eyes had visual acuity <3/60 in bilateral and unioocular surgery patients respectively. Post-operatively, 36 (46.1%) and 60 (42.3%) eyes of bilateral and unioocular surgery patients respectively had unaided acuity ≥6/18. Post-operative acuity significantly improved in both unilateral ($X^2 = 9.626$; $p < 0.05$) and bilateral ($X^2 = 9.556$; $p < 0.05$) surgeries. However, there was no statistically significant difference in the improvement in visual acuity between unilateral and bilateral surgeries ($X^2 = 0.562$; $p > 0.05$)

Intra-operatively, vitreous loss occurred in one (1.3%) BSCS and 2 (1.4%) UCS patients. Post-operatively posterior capsule opacification occurred in 10 (12.8%) and 22 (15.5%) eyes of bilateral and unioocular surgery patients respectively. Recurrent uveitis occurred in 8 (10.3%) and 13 (9.2%) eyes of bilateral and unioocular surgery patients respectively. Post-operative endophthalmitis occurred in one (0.7%) eye of a unioocular surgery patient.

Conclusion: Simultaneous bilateral cataract extraction with intraocular lens implant has visual outcome and complication rate similar to those of unioocular surgery. It should be recommended for patients who do not want staged surgery and those who cannot afford long hospital admission.

Keywords: Cataract, Simultaneous Bilateral Surgery, Unioocular Surgery, Outcomes.

INTRODUCTION

Cataract is the commonest cause of blindness in Nigeria.¹ Cataract accounts for 50% of blindness in Nigeria - about 500,000 persons in immediate sight restoration surgery¹. Cataract affects all ages although age-related cataract is more prevalent in the elderly. This disease occurs equally in both males and females without any sex predilection. Many cataract blind patients reside in underserved communities.

Surgery is, for now, the confident method of restoring vision in the cataract blind. Cataract surgery with intraocular lens

implant ensures better post-operative visual rehabilitation. For fear of severe complications such as endophthalmitis, it is often advised that cataract surgery be performed on a unioocular basis.^{2,3} The 2011 American Academy of Ophthalmology preferred practice pattern of cataract in an adult eye further cautioned that where it is intended to perform bilateral simultaneous cataract surgery, the pros and cons of the procedure should be carefully discussed with the patient.²

Indeed bilateral simultaneous cataract surgery (BSCS) has been the subject of

extensive debates in developed countries where phacoemulsification via small clear corneal incision is the standard surgical technique.⁴⁻⁶

Nevertheless, there may be many compelling reasons for performing BSCS especially in developing countries. These include late presentation of many patients with bilateral hypermature cataract, the inability of many patients to afford both the direct and indirect costs of prolonged hospital stay. In developing countries including Nigeria, health facilities with capability of intraocular surgery are often located in the urban areas far from the rural abode of many patients.

The Guinness Eye Center Onitsha is the only publicly-owned eye hospital in Anambra State (population 4.1million by 2006 census). It offers comprehensive eye care services including medical, surgical and optical care as well as 24-hour emergency service. Elective surgeries are performed 4 days every week. Although other private eye clinics exist, it has the highest concentration of ophthalmic manpower and facilities in the State. It attends to patients from all over Nigeria and beyond although its immediate catchment area is Anambra and the adjoining states.

The present study is a retrospective comparison of outcome of unilateral versus bilateral simultaneous cataract surgery at the Guinness Eye Center Onitsha, Nigeria over a 2-year period.

MATERIALS AND METHODS

Patients who had bilateral simultaneously cataract surgery (BSCS) with intraocular lens implant between 01 January, 2014 and 31 December, 2015 and had been followed up for 6 months were studied. Information on socio-demographic characteristics, domicile, pre-operative visual acuity, visual acuity on last follow-up, intra-operative complications, post-operative complications and causes of poor vision were analyzed.

The findings were compared with those of patients who had unilateral cataract surgery (UCS) with intraocular lens implant and followed up for 6 months in the same

hospital during the same period. Statistical test comparing the post-operative visual outcome and surgical complications between unilateral and bilateral simultaneous surgery was with the chi square (X^2) test with the alpha at 0.05.

RESULTS

A total of 215 patients were operated upon during the 2-year period. Of these, 48 had bilateral simultaneous cataract surgery (BSCS) while 167 had unilateral cataract surgery (UCS). However only 39 patients with bilateral simultaneous surgery and 142 with unilateral surgery were followed up for 6 months and they formed the subjects of this retrospective study. Twenty-one (11.6%) patients had ocular co-morbidities namely glaucoma 13 patients, diabetic retinopathy 5 patients, retinal detachment and age-related macular degeneration 3 patients each.

The UCS included 4 eyes that had undergone couching before presenting in our hospital. These patients had bilateral mature cataract but requested that the couched eyes which were causing them distress be operated upon.

There were 104 males (57.5%) and 77 females (42.5%). Up to 95 patients (52.5%) were subsistent farmers, 143 (79.0%) resided more than 75 kilometres from our hospital – a distance beyond the outermost periphery of Anambra State from our hospital. There was no age difference between those who had BSCS and those who received UCS. For the UCS patients, the age range was 6 -80 years, median 65 years. For BSCS, the age range was 12 – 93 years, median - 68 years. For all the 181 patients, the age range was 6 – 93 years, median – 66 years. Table 1 shows the socio-demographic characteristics of the patients.

Table 2 details the presenting and post-operative visual acuity of the patients. Pre-operatively all the patients had severe visual impairment in the operated eye with 62 (79.5%) and 134 (94.4%) eyes blind in BSCS and UCS patients respectively.

Table 1: Socio-demographic characteristics

Characteristic	Bilateral surgery	Unilateral surgery
Age range (years)	12-93	6-80
Median age (years)	68	65
Gender		
- Male	22 (56.4%)*	82 (57.7%)**
- Female	17 (43.6%)	60 (42.3%)
Domicile >75km	33 (84.6%)	110 (77.5%)

Legend: *% based on 39 patients;
**% based on 142 patients

Table 2: Pre-operative and uncorrected post-operative acuity (Eyes)

Acuity (Snellen)	Pre-operative*		Post-operative*	
	Bilateral (%)	Unilateral (%)	Bilateral (%)	Unilateral (%)
6/6 - 6/18	-	-	36 (41.2)	60 (42.3)
6/24 - 6/60	-	-	28 (35.9)	61 (42.8)
3/60	16 (20.5)	8 (5.6)	11 (14.1)	17 (12.0)
CF-LP	62 (79.5)	134 (94.4)	3 (3.8)	4 (2.9)
Total	78 (100.0)	142 (100.0)	78 (100.0)	142 (100.0)

Legend: *Post-operative acuity significantly improved in both unilateral ($X^2 = 9.626$; $p < 0.05$) and bilateral ($X^2 = 9.556$; $p < 0.05$) surgeries. However, there was no statistically significant difference in the improvement in visual acuity between unilateral and bilateral surgeries ($X^2 = 0.562$; $p > 0.05$)

Post-operatively, 36 (46.1%) and 60 (42.3%) eyes of bilateral and unilateral surgery patients respectively had visual acuity better or equal to 6/18. Only 3 (3.8%) and 4 (2.9%) eyes of the bilateral and unilateral surgery patients respectively remained blind post-surgery. No patient was bilaterally blind post-surgery. Of the 4 unilateral eyes which had been couched before the patients came to our hospital, 3 remained blind with one achieving a post-

operative vision of 6/60. Post-operative acuity, even unaided, significantly improved in both unilateral ($X^2 = 9.626$; $p < 0.05$) and bilateral ($X^2 = 9.556$; $p < 0.05$) surgeries. However, there was no statistically significant difference in the improvement in visual acuity between unilateral and bilateral surgeries ($X^2 = 0.562$; $p > 0.05$) Refraction results were available in 22 eyes of 11 (28.2%) bilateral and 30 eyes of 30 (21.1%) unioocular surgery patients (Table 3).

Table 3: Corrected post-operative acuity

Acuity (Snellen)	Bilateral (%)	Unilateral (%)
6/6-6/18	16 (72.7)	22 (73.4)
6/24-6/60	5 (22.7)	7 (23.3)
CF-LP	1 (4.6)	1 (3.3)
Total	22 (100.0)	30 (100.0)

Intraoperative complications were vitreous loss and hyphaema. Vitreous loss occurred in one (1.3%) bilateral and 2 (1.4%) unilateral surgery patients while one (0.7%) unilateral surgery patient had intraoperative hypphema. Table 4 shows the post-operative complications.

Table 4: Post-operative complications

Complication*	Bilateral (%)	Unilateral (%)
Posterior capsule opacification	10 (12.8)	22 (15.5)
Recurrent uveitis	8 (10.3)	13 (9.2)
Uvea prolapse	1 (1.3)	2 (1.4)
Retinal detachment	1 (1.3)	1 (0.7)
Endophthalmitis	-	1 (0.7)

Legend: *No significant difference in the complication rate between unilateral and bilateral cataract surgeries ($X^2 = 0.775$; $p > 0.05$).

The major post-operative complications were posterior capsular opacification and recurrent uveitis. Posterior capsule opacification occurred in 10 (12.8%) and 22 (15.5%) eyes of bilateral and unilateral surgery patients

respectively. Recurrent uveitis occurred in 8 (10.3%) and 13 (9.2%) eyes of bilateral and unilateral surgery patients respectively. Post-operative endophthalmitis occurred in one (0.7%) eye of a unilateral surgery patient who had undergone couching before presenting to our hospital. Although 3 of the couched eyes were suspected to have retinal detachment pre-operatively, post-surgery one eye of a bilateral surgery patient and another eye of a unilateral surgery patient were also found to have retinal detachment. While the detachments detected pre-operatively were taken as co-morbidities, the two new detachments found after surgery were considered as post-operative complication. Overall there was no significant difference in the complication rate between unilateral and bilateral cataract surgeries ($X^2 = 0.775$; $p > 0.05$)

The causes of post-operative visual impairment are shown in Table 5.

Table 5: Causes of post-operative poor vision

Cause	Bilateral (%)	Unilateral (%)
Posterior capsule opacification	10 (12.8)	24 (16.9)
Recurrent uveitis	8 (10.3)	13 (9.2)
Glaucoma	7 (8.9)	6 (4.2)
Couching	-	4 (2.8)
Retinal detachment	1 (1.3)	4 (2.8)
Diabetic retinopathy	4 (5.1)	1 (0.7)
Age-related macular degeneration	2 (2.6)	1 (0.7)

Posterior capsule opacification occurred in 10 (12.8%) and 22 (15.5%) eyes of BSCS and UCS patients respectively. Recurrent uveitis developed in 8 (10.3%) and 13 (9.2%) eyes of bilateral and unilateral surgery patients respectively while glaucoma occurred in 7 (9%) and 6 (4.2%) of bilateral and unilateral surgery patients respectively.

DISCUSSION

Unilateral cataract surgery (UCS) with intraocular lens implant is routinely practiced in our hospital with good post-operative results.⁷

However, BSCS is controversial and has been a subject of persistent debate.²⁻⁶ But the need to embark upon this procedure often arises and this is one of the reasons a strict

protocol was provided.^{6,8} Simultaneous bilateral cataract surgery is performed in Nigeria.

However, only few reports on the outcome have been published. Mpyet et al in a review of BSCS in Jos, Nigeria reported an encouraging outcome and concluded that with modern cataract surgery techniques simultaneous bilateral cataract extraction in developing countries could save cost and theatre time as well as reduce cataract backlog.⁹

Pre-operative visual acuity suggests that we operate on those who have severe visual incapacitation. This is so because at the stage of mild to moderate visual impairment, not many patients submit to surgery. Indeed some patients with unioocular hyper-mature cataract do not accept surgery. Even among those with bilateral mature cataract, most would reluctantly opt for operation on one eye only. The fear of surgery and its possible negative consequences had been highlighted as a major barrier to the uptake of cataract surgery in our hospital.¹⁰

Although refraction greatly improved the post-operative outcome, this should not lead to generalization as only a third or less of the operated eyes were refracted. Reasons for this small number are many. Patients pay for refraction and eyeglasses are relatively expensive. Thus patients are often not willing to submit to refraction once they have satisfactory post-operative outcome. Most patients after refraction do not purchase the eyeglasses. In our environment, persons who do not engage in reading or persistent close work generally do not bother about wearing spectacles once vision is good enough for their daily activities.

Nevertheless, refraction results show a favorable visual outcome. The good visual outcome could be further improved with pre-operative biometry for more precise selection of the intraocular lens.

This study is limited to 6 months follow-up. Eye surgery and post-operative follow-up visits impose considerable economic burden on the patients many of whom reside far from the hospital (Table 1). For these and other socio-economic reasons, most patients fail to keep follow-up appointments, especially if

they feel clinically better. Up to 79% of the patients resided more than 75 kilometres away from our hospital - a distance beyond the farthest boundary of Anambra State from our hospital. This coupled with poor transport infrastructure, travelling long distance by road to our hospital becomes an arduous task. Blindness is very tragic. In Nigeria, facilities are often very far from the domicile of most inhabitants.

Fear, unpleasant experience of neighbors, cultural beliefs and prejudice about the effectiveness of eye surgery are some of the barriers to surgical uptake.¹⁰ Therefore the decision to visit the city eye hospital is a weighty one, sometimes requiring the convocation of extended family meetings.

Consequently, many patients wait until they are completely bilaterally blind before seeking hospital care.

Post-operative complications are comparable in both the unilateral and bilateral surgical cases with posterior capsule opacification being the commonest in both cases. A previous study in our hospital documented posterior capsule opacification and recurrent uveitis as the commonest complications.⁷ But Nd:YAG laser, a device required for removal of the opacified capsule, was not available in our hospital at the time of the study.

Other causes of poor vision include glaucoma, retinal detachment, diabetic retinopathy and macular degeneration (Table 3). These conditions are prevalent especially among the elderly in our environment.¹¹⁻¹³

Glaucoma frequently coexists with cataract, with both conditions requiring either simultaneous or staggered surgical intervention leading to intraocular pressure control and some vision improvement. However the glaucoma damage may be so advanced that surgical intervention may not improve vision. Almost all our patients came with hyper-mature cataract thus precluding the ophthalmoscopic view of the fundus. But some of these patients may have coexisting retinal detachment. There is therefore the need to include B-mode ultrasound scan in the pre-operative evaluation of all patients with hyper-mature cataract in Nigeria.

Similarly, the use of optical coherent

tomography (OCT) will greatly assist in the pre-operative detection of macular pathologies including diabetic macula edema and exudative age-related macular degeneration, thus helping to advise the affected patient on the possible poor outcome of cataract surgery and also advise the patient on the need for further surgery.

Fear of post-operative endophthalmitis is one of the main reasons for discouraging bilateral simultaneous cataract surgery. The lone case of post-operative endophthalmitis recorded in this study had unilateral surgery and had undergone couching before presentation in our hospital. Thus the eye might have been infected prior to our intervention. Nevertheless it needs to be emphasized that in most cases the microbes leading to endophthalmitis are introduced into the eye during surgery. Therefore it bears to once more highlight the need to ensure that surgical instruments are properly sterilized.

Furthermore, surgeons and assistants should observe strict aseptic, non-touch practice during surgery as part of universal precautions. The throat and nasal swabs of operating room staff should be regularly analyzed and those harboring pathogenic organisms should be treated. With regard to conjunctival flora, use of pre-operative povidone-iodine drops has been shown to eliminate the microbial load.¹⁴

In conclusion, our study shows that simultaneous bilateral cataract extraction with intraocular lens implant is safe with visual outcome and complication rate comparable to those of unilateral surgery. It should be recommended for patients from remote areas, those who do not want staged surgery and individuals who cannot afford long hospital admission.

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