Scientific Research Publishing

Open Journal of Ophthalmology, 2022, 12, 259-268
https://www.scirp.org/journal/ojoph
ISSN Online: 2165-7416
ISSN Print: 2165-7408

Functional Results without Correction of Cataract Surgery during a Free Campaign at Siguiri Prefectural Hospital in Guinea

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How to cite this paper: Lama, P.L., Sagno, C., Sylla, A., Camara, S., Sovogui, B., Ouendeno, N.A. and Diallo, O.R. (2022) Functional Results without Correction of Cataract Surgery during a Free Campaign at Siguiri Prefectural Hospital in Guinea. *Open Journal of Ophthalmology*, **12**, 259-268.
https://doi.org/10.4236/ojoph.2022.123024

Received: May 4, 2022
Accepted: August 27, 2022
Published: August 30, 2022

Abstract

Background: Cataract is the leading cause of blindness in the world and its treatment is exclusively surgical. However, the results of cataract surgery are not always as good as is assumed and this aspect of surgical services needs a lot of attention. The purpose of this study is to evaluate the functional results of the free cataract surgery campaign carried out at the Siguiri Prefectural Hospital in Guinea. **Patients and Method**: This was a descriptive and retrospective cross-sectional study over a period of three months (1 October-31 December 2017). Records of cataract-operated patients during the study period were reviewed. The complete files for the main variables sought were retained. Sociodemographic data and visual acuity without pre- and post-operative correction were assessed. Functional outcomes were analysed according to WHO guidelines and recommendations for post-operative functional outcomes of cataract surgery. The data was collected and processed using Excel version 2010 software. **Results:** A total of 108 eyes from 102 patients were the subject of this present study on 314 eyes from 289 operated patients. 64 (%) men and 38 women (%) had a follow-up of 6 weeks after cataract surgery, a sex ratio of 1.68 in favor of women. The average age was 62.45 ± 15.20 years with extremes of 25 and 90 years. The age group from 60 to 69 years is the most represented with 46 cases or 45.45%. Housewives and farmers are the most represented strata with 42 cases (41.18%) and 31 cases (30.39%) respectively. The operative technique was Phaco A in 4/5 of the cases. No implant calculations were performed. Functional results indicate that 66% of patients had good visual acuity (≥3/10); 29% of patients had borderline visual acuity (between 1/10 and 2/10) and 13.30% had poor visual acuity (<1/10). **Conclu-**

sion: The importance of the rate of poor results in our study should draw our attention to the conduct of free cataract surgery campaigns. The problem of cataract blindness is often compounded by poor outcomes of surgical procedures, especially in low-income settings. The use of biometrics, implants of appropriate power as well as compliance with operative indications, surgical protocols and postoperative follow-up by surgeons will improve the visual result without correction.

Keywords

Cataract, Surgery, Functional Results, Campaign, Siguiri, Guinea

1. Background

Cataracts are the leading cause of curable blindness and are one of the target diseases of the "Vision 2020, the right to sight" initiative, which aims to eliminate the causes of avoidable blindness by the year 2020. Its treatment is purely surgical and consists of the removal of the clouded crystalline nucleus and the correction of residual aphakia [1]. In Guinea, the prevalence of blindness is estimated at 1.4%, half of which is due to cataracts [2]. The quality of the surgery and the resulting patient satisfaction are the drivers that make it possible to provide sustainable cataract management services [3]. However, the communication of the functional results of cataract surgery varies considerably from one surgical center to another internationally [4]; in many countries for which data are available, the results of cataract operations are well below the standards recommended by the World Health Organization [5]. Cataract surgery remains the main surgical activity of Guinea's ophthalmology services. According to guineas' eye health strategic plan document developed in 2019, this activity is evolving from 4843 cases of Surgery in 2012 to 8993 cases in 2018. It is becoming clear that the results of cataract surgery are not always as good as is assumed and this aspect of surgical services needs a lot of attention. In recent years we have seen an increase in the number of cases of cataract surgery performed by free cataract surgery caravans in remote areas of our country; we have deemed it important to evaluate the functional results of cataract surgery operated by one of these caravans. Several techniques of cataract surgery exist whose reference is Phaco-emulsification to the present day. However, its practice is not widespread in developing countries because of its cost and the maintenance of its equipment [6]. The Manual Small Incision Cataract Surgery (MSICS) has supplanted Extra Capsular Cataract Extraction (ECCE) and has become the reference technique in developing countries. Monitoring the quality of cataract surgeries that allows health workers and health service administrators to identify problems and take steps to improve practice, patient outcomes and center performance is relatively rare in our country. This is why we set out to evaluate the functional results of the free surgery campaign carried out at the Ophthalmology Department of Siguiri Pre-

fectural Hospital in Guinea and thus contribute to the improvement of cataract care in our country.

2. Patients and Method

Siguiri is a health district of Guinea located in the northeast of the country about 770 km from Conakry the capital city. This district has an area of 15,500 Km^2, with only one ophthalmologist and one senior ophthalmologist technician for a population of 1,200,000 inhabitants in 2017. We conducted a descriptive and retrospective cross-sectional study over the period from 1 October to 31 December 2017 in the ophthalmology department of the Siguiri Prefectural Hospital. The cataract screening and surgery campaign were organized in several stages. A meeting and implementation mission was organized by the coordination of the National Eye Health Program in Siguiri health district one week before the start of the campaign. Its mission was to take stock of the situation in terms of logistics, the availability of medicines and consumables and to hold technical meetings with mainly local actors to explain the objectives of the campaign. It also made it possible to meet with local administrative and health authorities to solicit their support for the success of the campaign. Screening for cases of operable cataracts was carried out by senior ophthalmology technicians. Cases of bilateral cataracts with the best visual acuity of less than 1/10 were retained for surgery. The surgical phase began the day after the screening. The surgical team was composed of 4 medical ophthalmologists' surgeons, 8 Senior Ophthalmology Technicians (SOT) and 10 support agents. Interventions were at least 60 patients per day for 5 days. The records of patients who operated cataract by the two techniques: Manual Small Incision Cataract Surgery (MSICS) and Extra-capsular extraction (ECE) were examined. The anonymity of patients and surgeons was respected. The patients were operated on by four Guinean ophthalmologists' surgeons, three of whom had used the small manual incision technique (MCIS) and the fourth had performed the extra-capsular extraction (ECE) technique. Patients with a visual acuity of less than 1/10 at the best eye were selected for the operation. Ocular biometrics with the calculation of the power of the intraocular implant was not done. The surgical team used the implants of +22 Diopters called "standard in the ocular lens". Patients were operated on under peribulbar anesthesia with Lidocaine 2%. The implant was placed in the posterior chamber in 309 patients and 5 patients received the implant in the anterior chamber. We determined postoperative visual acuity using the Snellen decimal scales for the illiterate and Monoyer, by placing patients at a distance of 5 meters. Functional results were compared to WHO standards and recommendations for post-operative cataract outcomes [3] (see **Table 1**). No patients benefited from optical correction after surgery. The service does not have an optical workshop. **Table 1** shows the WHO-recommended standards for postoperative visual acuity (VA). Patients with complete records for the main variables sought (age, sex, preoperative visual acuity and postoperative visual acuity measured at 6 weeks post-operative

and causes of poor functional results) were selected for the study. We excluded from our study, patients who operated outside the caravan and patients who operated during the campaign but who did not observe the 6 weeks of postoperative follow-up. The data was collected and processed using Excel version 2010 software.

3. Results

During the study period, 314 eyes from 289 patients were operated. A total of 102 patients (108 eyes), who followed up for six (6) weeks were selected for this study. Male patients were in the majority 64 compared to 38 females, with a male-to-female sex ratio of 1.68 (Figure 1). The average age of patients was 62.45 ± 15.20 years with extremes ranging from 25 to 90 years. The age group between 60 and 69 years was the most represented, 45.45% of cases followed by that of 70 - 79 years, 32.85%. Table 2 summarizes the distribution of patients by age and sex. Farmers and housewives were the most represented socio-professional strata with 42 cases (41.18%) and 31 cases (30.39%) respectively;

Table 1. Recommended standard for post-operative visual acuity (VA).

	PRECOG study standards for postoperative assessment (1 to 3 days after surgery) (VAWC)	WHO Standards for postoperative assessment 6 weeks postoperatively (VAWC)
Good results (3/10 ≤ VA ≤ 10/10)	60%	>80%
Results limit (1/10 ≤ VA < 3/10)	35%	<15%
Bad results (VA < 1/10)	5%	<5%

WHO: World Health Organization; PRECOG: Prospective Review of Early Cataract Outcomes and Grading; VA: Visual acuity; VAWC: Visual Acuity Without Correction.

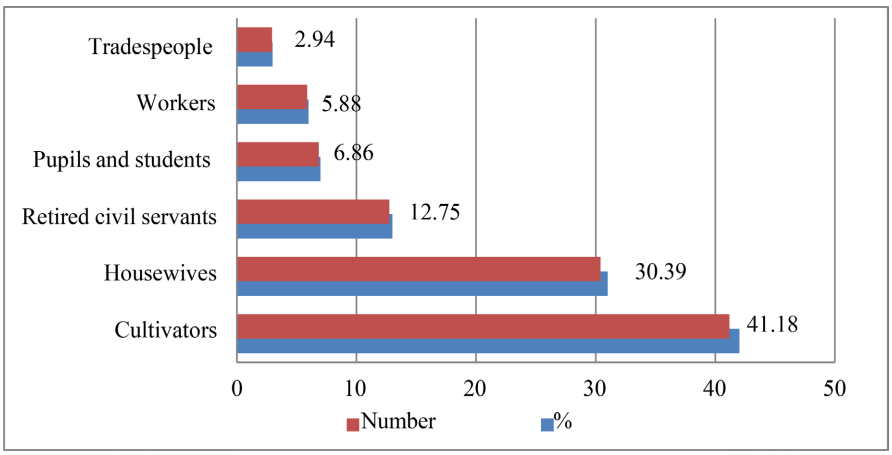

Figure 1. Distribution of patients by occupation.

Table 2. Distribution of the 102 patients by age and sex.

Old (years)	Men	Women	In all	%
20 - 29	0	2	2	1.55
30 - 39	0	3	3	2.8
40 - 49	1	3	4	3.9
50 - 59	2	2	4	4.1
60 - 69	33	13	46	45.45
70 - 79	21	13	34	32.85
80 - 89	6	2	8	8.55
90 - 99	1	0	1	0.8
In all	64	38	102	100

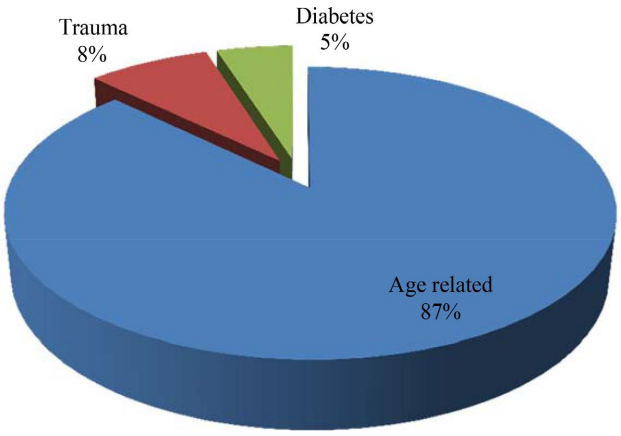

Figure 2. Distribution of the 102 patients by cataract etiology.

followed by retired civil servants 13 cases (12.75%). Figure 2 shows the distribution of patients by occupation. Age-related cataracts were the most represented etiology (87% of cases), followed by traumatic and diabetic cataracts 8% and 5% respectively (see Figure 2). Preoperative visual acuity without correction was less than 1/20th in all patients. Out of 108 eyes, 91 eyes were operated by the MSICS compared to 17 eyes operated by the ECCE technique. The intraocular lenses (IOL) of + 22 Diopters was placed in the posterior chamber in all patients regardless of the surgical technique. The postoperative functional results observed six weeks after the operation are well below WHO standards (58% good results against more than 80% according to the WHO and 13% bad results against less than 5%) as indicated in Table 3. The MSICS seems to give functional results close to those recommended by WHO (66% good results and 5% bad results against more than 80% good results and less than 5% bad results) as shown in Table 4. The functional results according to the observed ECCE technique are generally poor 53% (Table 5). The 67% of poor functional results were related to refractive errors due to lack of biometrics for intocular lens calculation, followed by complications related to surgery, 29% of cases (Table 6).

Table 3. Distribution of overall functional results of the 108 eyes after six weeks, compared to WHO recommended standards.

	WHO Standards for Postoperative Assessment 6 weeks postoperatively	The results of our 6-week post-operative study
Good results (3/10 ≤ VA ≤ 10/10)	>80%	58% (63 eyes)
Results limit (1/10 ≤ VA < 3/10)	<15%	29% (31 eyes)
Bad results (VA < 1/10)	<5%	13% (14 eyes)

The postoperative functional results observed six years after the operation are well below WHO standards (58% good results against more than 80% according to the WHO and 13% bad results against less than 5%).

Table 4. Distribution of the functional results of the 91 eyes operated by the MSICS six weeks compared to the standards recommended by the WHO.

	The functional results of our study according to the MSICS	WHO standards for postoperative assessment after 6 weeks
Good results (3/10 ≤ VA ≤ 10/10)	66% (60 eyes)	>80%
Resultslimit (1/10 ≤ VA< 3/10)	29% (26 eyes)	<15%
Bad results (VA < 1/10)	5% (5 eyes)	<5%

MCIS seems to give functional results close to those recommended by WHO (66% good results and 5% bad results against more than 80% good results and less than 5% bad results).

Table 5. Distribution of the functional results of the 17 eyes operated by the ECCE technique after six weeks compared to the standards recommended by the WHO.

	The functional results of our study according to the ECCE Technique	WHO standards for postoperative assessment after 6 weeks
Good results	18% (3 eyes)	>80%
Results limit	29% (5 eyes)	<15%
Bad results	53% (9 eyes)	<5%

The functional results according to the observed ECCE technique are generally poor 53%.

Table 6. Distribution of patients according to the causes of poor outcomes.

	Number	%
Poor patient selection	2	4
Surgical complications	14	29
Refractive errors (Absence of biometrics)	32	67
In all	48	100

67% of poor functional results were related to refractive errors due to lack of biometrics for implant calculation, followed by complications related to surgery, 29% of cases.

4. Discussion

Our work has some limitations and inadequacies whose reasons are among oth-

ers: The lack of evaluation of corrected visual acuity at 6 Weeks. The loss of many patients from the villages, who could not wait for the end of their follow-up, due to lack of necessary means of survival for 6 weeks and the lack of an adequate technical platform with Biometer and optical workshop to use intraocular lenses of adequate powers. Despite these few difficulties encountered, our results inspire us a number of comments. After reviewing the medical records of cataract camp patients, we retained 102 records out of 289 representing 35.30% of cataract patients during the study period. We excluded the other files because of lost sight of them. In Cameroon, Dohvoma V *et al.* [7] had noted 56% of lost to follow-up at 4 weeks postoperatively, while Maneh N *et al.* [8] in Togo recorded 35.51% of lost to follow-up over a period of 6 weeks. In low-income countries, post-operative follow-up is characterized by significant loss of patients operated on during post-operative follow-up, with retention rates in the cohort that can drop to 20% - 30% of treated patients [9] [10]. The low follow-up rate of patients due to difficulties in getting them back into the surgical department several weeks after the operation is also reported by Congdon N *et al.* [3]. Post-operative follow-up is difficult in the context of free cataract surgery campaigns during which a large volume of operations is carried out by a non-resident team. In addition, among the reasons for the loss is the improvement of the visual acuity of patients by surgery. This improvement, which seems to be insufficient for the surgeon, could prove satisfactory for patients operated on bilateral blinding cataracts. This reason has also been mentioned by Lama P L *et al.* in Guinea [6]. In addition, additional expenses related to living expenses for non-residents from rural areas can also be an additional barrier for patients with limited resources. We noted a male predominance (66.67%) with a sex ratio of 1.68 as is often the case in the literature [10] [11]. On the other hand, some studies such as those of Kamonporn N. and Pipat K [12] in Thailand and Krisnhaliani W *et al.* [13] in Indonesia reported a female predominance with sex ratios of 0.72 and 0.76 respectively. This male predominance found in our study contrasts with the demographic data of Guinea where women represent 52% of the general population [14]. The economic factor could be a barrier to women's access to care in some areas. The average age of the patients operated in our study was 62.45 ± 15.20 years with extremes ranging from 25 to 90 years. The age group between 60 and 69 years was the most represented, 45.45% of cases followed by that of 70 - 79 years, 32.85%, for a total of 78.3% for both tranches. The average age of patients varies in the literature, depending on the inclusion criteria: 65 years in the study of Hussen M S *et al.* in northwestern Ethiopia [15]; 59.40 years in the study of Tyau-Tyau H *et al.* in Chad [9] and 64.2 years in the study of Nadio T at the CHU-IOTA in Mali [16]. This average age is higher in Western countries for senile cataracts because of their later occurrence. The majority of the operated patients was retired farmers, housewives and civil servants and has low economic incomes. This situation is perfectly in line with the mission of free surgical campaigns that of giving sight to the poorest social strata. The profile of preoperative

visual acuities was blindness (visual acuity < 1/20) in all cases. Lama P L *et al.* [6] in Guinea and Hussen M S *et al.* [11] in Ethiopia found the same proportions of preoperative blindness 100% and 99% respectively. The reasons for this delay in care are related to fear of surgery, poverty, but also the lack of qualified personnel for cataract surgery in our country. The implementation of an advanced cataract surgery strategy could be an alternative in our country where the rate of cataract surgery is still low, of the order of 535/million inhabitants [17]. No biometrics for the calculation of the power of the implant have been made as was the case of the study conducted by Tyua-Tyau H *et al.* in Chad [9] on the functional results of cataract surgery during the ophthalmological caravan at the Regional Hospital of Abéché in Chad. On the other hand, in the studies conducted by Lama P L *et al.* [6] in Guinea and Dohvoma V *et al.* in Cameroon [7], intraocular lenses calculation was systematic in all operated persons. In our study, intraocular lenses from 22 so-called "standard" diopters were systematically used in all patients. As the power of the emmetropizing intraocular lenses is not available to all patients, the implantation of a no emmetropizing intraocular lenses can lead to ametropia and negatively impacted on results without correction. In our series, the overall post-operative functional results evaluated by measuring visual acuity without correction showed a good results rate of 58%, limit in 29% and bad in 13%. Our good functional results are below WHO standards which recommend a value greater than or equal to 80% for the right result without correction. Our rate of good functional results is also lower than those reported by Maneh *et al.* in Togo [8] and Sovogui *et al.* in Guinea [14] who found an improvement in visual acuity after cataract tunnelization surgery at rates of 88% and 90.98% respectively. Our poor results (13%) are lower than those of Hussen M S [15] in Ethiopia (44.5%) and those of Tyau-Tyau H *et al.* (77.5%) in Chad [9]. This difference in good and bad results could be explained by the placement of intraocular lens of appropriate powers and the mastery of operating techniques. Depending on the surgical technique used, the MSICS gave more good results (66%) than ECCE (18%). The Ophthalmologist surgeon practicing the ECCE technique will have to retrain for training in the MSICS in order to improve the quality of his surgery. A good functional result would on the one hand limit the expenses related to the purchase of corrective lenses that are not often available on site and, on the other hand, would avoid the difficulties related to maintenance and wearing glasses. The causes of poor functional outcomes were dominated by refractive errors (67%) related to lack of use of adequate intraocular lenses, followed by complications related to surgery (29%) and poor patient selection (4%). The functional results found during this cataract camp challenge us in the course of these free cataract surgeries. Eye health officials will have to ensure that the number of cases operated on matches the quality of the surgery. Although this study was the first for the free cataract surgery campaign performed by national ophthalmologists, it was a retrospective study. It was difficult to observe every postoperative visual progression. Thus, it would be plausible to conduct a pros-

pective follow-up study that incorporates associated factors to make it more informative and adapted to interventions thus allowing the design of strategies to maximize the level of postoperative functional outcome.

5. Conclusion

The postoperative functional results without correction of this cataract camp are below WHO standards. The problem of cataract blindness is often compounded by poor outcomes of surgical procedures, especially in low-income settings. The quality of the surgery and the resulting patient satisfaction are the drivers that make it possible to provide sustainable cataract management services. The use of biometrics, implants of appropriate power as well as compliance with operative indications, surgical protocols and postoperative follow-up by surgeons will improve the visual result without correction. Using the Better Operative Outcomes Software Tool (BOOST) application by all surgical ophthalmologists to measure cataract surgery outcomes can help practitioners and institutions identify and implement continuous improvements in the delivery of eye care.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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