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Research Article

Post-Operative Visual Results at the Introduction of Phacoemulsification Technique for Cataract Surgery at the Bartimée Ophthalmological Clinic in Guinea

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Abstract

Purpose: To assess postoperative functional outcomes from cataract surgery to the introduction of phaco-emulsification.

Material and Methods: This is a prospective, descriptive and analytical study from March 01 to August 30, 2023. Included were patients operated by phaco-emulsification, who had received regular post-operative follow-up for one month. We used the Phaco SOPHI A (Swiss Ophthalmology Innovation A) as a device. Excluded were patients in whom consent to participate in the study was not obtained. Recruitment was thorough. Our variables were epidemiological, clinical, therapeutic, and evolutionary. Epi info version 7.4.0 was used for analysis.

Results: A total of 319 patients, including 239 cataracts, were operated on, of which 61, or 19.12%, were operated on by phaco-emulsification. Mean age 60.52 ± 15.5 years, sex ratio 1.17. Corneal edema was the most common complication at 48.4%. Preoperative visual acuity was <1/10 in 77.4% of cases and postoperative visual acuity ≥ 3/10 in 83.9%. Postoperative visual results were rated as good according to WHO standards in 83.9% of cases and 73.8% of patients were very satisfied with visual results.

Conclusion: Phacoemulsification is a reference technique in the treatment of cataracts. This study showed excellent functional and anatomical results, with improved patient satisfaction. However, the acquisition of phacoemulsifier as well as its complete mastery of use is a challenge to be met in our region.

Keywords: Cataract; Phacoemulsification; Guinea

Introduction

Cataract is a partial or total clouding of the lens that causes a decrease in visual acuity [1]. In the world, 100 million people have vision loss due to cataracts. Among them, 17 million people are blind and 83 million people suffer from visual impairment. For these people, sight can be restored through cataract surgery [2]. Phacoemulsification is the surgical technique for cataracts that has nowadays become the reference method worldwide and the gold standard in industrialized countries [3,4]. Its practice remains exceptional in developing countries due to the high cost of the phaco-emulsification machine and the implants used [5]. This technique involves making a small incision in the limbal area, after achieving maximum pupil dilation beforehand, allowing access to the lens [3]. It allows for excellent functional and anatomical results, with

a reduction in ocular morbidity [6]. In Hungary in 2020, Gábor L Sándor., *et al*. [7] reported in their study conducted on 3,523 patients who underwent phaco-E surgery, a frequency of 79.5% of good functional outcome. In Gabon in 2017, Mba Aki T., *et al*. [5]. They reported 81.8% good postoperative functional outcomes in patients operated on by phacoemulsification. In Guinea in 2022, Lama PL., *et al*. [8] in their study, they reported an 89% frequency of good functional results during phacoemulsification surgery by a Spanish team. This surgical technique is recent in our region, and its practice remains very limited due to the high cost of the equipment. Thus, the improvement of the technical platform through the acquisition of the phacoemulsification machine at the Bartimée Clinic motivated the conduct of this study, whose objective is to evaluate the functional results of cataract surgery by phacoemulsification at the Bartimée Clinic.

Methodology

Study design

After training in cataract surgery using phacoemulsification abroad, followed by the acquisition of the phacoemulsification machine at the Bartimée Clinic, we used the Phaco SOPHI A device (Swiss Ophthalmology Innovation A). The introduction of this technique prompted the evaluation of the visual outcomes of cataract surgery. This was a prospective, descriptive, and analytical study lasting 6 months, from March 1 to August 30, 2023. It took place at the Bartimée Ophthalmology Clinic, which is a secondary-level hospital specializing in ophthalmology. It is located in the Nongo neighborhood, Sector I, Ratoma commune, Conakry.

Study participants

A total of 319 patients underwent surgery during the study period, including 239 cases of cataract surgeries, among which 61 patients, or 19.12%, had 62 eyes operated on by phacoemulsification. Included were patients who underwent phacoemulsification and had regular postoperative follow-up for one month. Excluded were patients who did not give consent to participate in the study. Recruitment was exhaustive. Our variables were epidemiological, clinical, therapeutic, and evolutionary. Epi Info version 7.4.0 was used for analysis.

Sampling

We conducted exhaustive recruitment according to the selection criteria as we received patients who were undergoing cataract surgery by phacoemulsification at the Bartimée Ophthalmology Clinic.

Data collection instrument

Questions related to sociodemographic characteristics, clinical, therapeutic, and developmental variables were asked in the local language and in French through a questionnaire prepared for this purpose. The classification and comparison of preoperative and postoperative visual acuity were done according to WHO standards as follows: a distance visual acuity without correction ≥ 3/10 (good) in ≥ 80% of cases; a distance visual acuity without correction between 1/10 - 2/10 (moderate) in ≤ 15% of cases; and a distance visual acuity without correction <1/10 (poor) in < 5% of cases. Regarding the degree of satisfaction of our patients, the rating score is from 0 to 10: scores of 1 to 3 correspond to the unsatisfied level; scores of 4 to 7 correspond to the satisfied level, and scores of 8 to 10 correspond to the very satisfied level. This allowed us to categorize our patients according to their levels of satisfaction. The parameters studied were age, sex, profession, preoperative and postoperative visual acuity, perioperative and postoperative complications, and the degree of patient satisfaction.

Data analysis

The data were processed and analyzed using the Epi-info software version 7.4.0, entered with the Word and Excel software from the Office 2016 suite. The Zotero software, version 5.0.96.2, was used for bibliographic references.

Ethical and regulatory aspects

The study protocol was approved by the scientific committee of the Faculty of Health Sciences and Techniques at Gamal Abdel Nasser University of Conakry. We ensured the confidentiality of the data, and the free and informed consent of the participants was obtained before any inclusion.

Results

A total of 319 patients were operated on during the study period, including 239 cases of cataract surgery, of which 61 cases, or 19.12%, were operated on by phacoemulsification. The mean age was 60.52 ± 15.5 years, with a sex ratio of 1.17.

In this study, biometry was performed on all patients, with an average calculated biometry power of 24.08 D. The average power of the implants used was 23.04 D, with extremes of 0.05 D and 4.50 D. However, there was a difference in dioptric power between the calculated biometries and the implants used, with an average deviation of ± 1.04 D. According to Table I, uncorrected postoperative visual acuity was by far considered better according to WHO standards compared to preoperative visual acuity.

Table I: Comparison of preoperative and postoperative visual acuities of operated patients according to WHO standards.

WHO standards	Percentages of visual acuity (N = 62)	
	Preoperative	Postoperative
≥ 3/10 (Good visual result)	4(6,5%)	52(83,9%)
1/10 – 2/10 (Average visual result)	10(16,1%)	8(12,9%)
<1/10 (poor visual result)	48(77,4%)	2(3,2%)
Total	62(100%)	62(100%)

In Table II, it appears that visual acuity ≥ 3/10 was predominant on postoperative days 15 and 30.

Table II: Postoperative visual acuities of the operated eyes.

Postoperative visual acuity	Day 1		Day 15		Day 30	
	n	%	n	%	n	%
<1/10	44	71	6	9,7	2	3,2
1/10 – 2/10	16	25,8	25	40,3	8	12,9
≥ 3/10	2	3,2	31	50,0	52	83,9
Total	62	100	62	100	62	100

According to Table III, corneal edema was by far the most frequent complication before day 30.

Table III: Distribution according to the complications found in patients operated on by phacoemulsification at the Bartimée Clinic from March 1 to August 30, 2023.

Complications found (N = 62)	Effective	Percentage
Intraoperative complications		
Posterior capsular rupture without vitreous loss	3	4,8
Posterior capsular rupture with vitreous loss	2	3,2
No intraoperative complications	57	92,0
Postoperative complications on day 1		
Corneal edema	30	48,4
Residual cortex	5	8,1
Hyphema	1	1,6
Superficial Punctate Keratitis	1	1,6
No complications on day 1	25	40,3
Postoperative complications on day 15		
Corneal edema	2	3,2
No complications on day 15	60	96,8
No postoperative complications at day 30	62	100

More than half of the patients were very satisfied with the visual outcome (see Table IV).

Table IV: Postoperative patient satisfaction level.

Level of satisfaction	Effective (N = 61)	Percentage
Not satisfied	2	3,3
Satisfied	14	22,9
Very Satisfait	45	73,8
Total	61	100

Discussion

In this study, uncorrected postoperative visual acuity was considered good according to WHO standards in almost all cases. Corneal edema was the most commonly observed complication, occurring in nearly half of the cases on day 1, with only 2 cases observed on day 15 and none on day 30. Almost all patients were satisfied with the visual outcome of the operated eye. However, this study has a limitation, namely the unavailability of certain implant numbers in our inventory, resulting in a difference in diopter strength between the calculated biometries and the implants used, with an average deviation of ± 1.04 D. Regarding the post-operative visual acuity results, these results are superior to those of Gábor L Sándor., *et al*. [7]. In Hungary in 2020, which reported in their study 79.5% of good postoperative functional outcomes. Regarding intraoperative complications, our results are similar to those of Mba Aki T., *et al*. [5]. In Gabon in 2017, who found a 3% frequency of posterior capsular rupture. These results could be explained by prolonged exposure of the corneal endothelium to ultrasound and the fact that most cataracts were mature. As for corneal edema, our results are different from those of Ammous I., *et al*. [9]. In 2017 in Tunisia, which found 75.8% corneal edema, and comparable to those of Mba Aki T., *et al*. [5]. In Gabon in 2017, only one case of corneal edema was reported out of 99 eyes operated on. Regarding patient satisfaction, our data are identical to those reported by Lama PL., *et al*. [8]. In 2022, which reported that 96.20% of all patients were satisfied with the functional outcome of the operated eye. Regarding sociodemographic data, our results are similar to those of Ammous I., *et al*. [9] who had an average age of 65.6 ± 10.6 years with a sex ratio of 1.5.

Conclusion

Phacoemulsification is a reference technique in the treatment of cataracts. This study allowed us to determine that it provides excellent functional and anatomical results, with higher patient satisfaction. However, acquiring the phacoemulsification device and mastering its complete usage remains a challenge in our region.

Conflicts of Interest

The authors declare no conflicts of interest related to this work.

Authors' Contributions

The authors contributed at one or more stages of the manuscript preparation, from the protocol, data collection, to writing. All have read and approved the manuscript.

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