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Functional Results of Cataract Surgery using the Phacoemulsification Technique "The CADES/O Experience

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Abstract

Introduction: The practice of phacoemulsification remains exceptional in low-income countries, unlike in developed countries.

The general objective was to study the functional results of cataract surgery using the phacoemulsification technique with posterior chamber implant at CADES/O located at University hospital Center Donka.

Material and methods: This was a prospective observational study for three months from 1er July to 30 September 2021. We included in our study all patients who performed cataract surgery per phacoemulsification technique with intra ocular lens (IOL) at CADES/O. Pre and post-operative visual acuity, intra and post-operative complications and factors related to poor outcomes were determined.

We classified postoperative visual acuities according to World Health Organisation recommendations into: good (VA ≥ 3/10), fair (1/10 ≤ VA < 3/10) and poor (VA < 1/10).

Results: During the study period, we were able to study the functional results of 159 eyes of the 159 operated patients. The average age was 64.28±12.5 years with extremes from 10 to 92 years. The most affected age group was 60-69 years (35.2%). The male sex dominated with 54.7% against 45.3% and a sex ratio of 1.2. At 30 days post-op without correction, our results were good with 82.4%, average with 14.5% and bad with 3.1%.

Intraoperative, early postoperative and late postoperative complications were dominated by posterior capsular rupture with 10.7%, corneal oedema with 64.8% and posterior capsule opacification with 0.6% respectively.

Conclusion: At the end of this study, our results show that phaco-E offers a better visual recovery after cataract surgery with nevertheless a rehabilitation time of at least one month. It offers a good level of operative safety with a low complication rate.

Keywords: Phaco-E - Cataract - Surgical complications -CADES/O

Functional Results of Cataract Surgery using the Phacoemulsification Technique "The CADES/O Experience

Introduction

Cataracts are the leading cause of curable blindness worldwide and account for 50% of all causes of blindness [1].

In sub-Saharan Africa, cataracts are responsible for 35% of blindness in adults over the age of 50 [2]. Its management is essentially surgical and is the most common surgical procedure in the world [3]. Functional results and post-operative complications are major concerns for ophthalmic surgeons.

Nowadays, there are several operative techniques among which phacoemulsification is the technique of choice in developed countries but exceptional in low-income countries.

In Guinea, phacoE is recent and its practice is very limited. Several obstacles secondary to deficits in financial means, technical facilities and qualified personnel make it difficult to access surgical services using this technique, and even when it does exist, their productivity remains relatively low because the financial burden in terms of health is borne by the patient and his or her family, all in a low-income context.

The lack of studies and the improvement of cataract management at CADES/O, motivated the choice of our study whose aim was to evaluate the functional results of cataract surgery by the phacoemulsification technique.

Methodology

We conducted a prospective observational study at the CADES/O at CHU Donka. We collected a total of 159 eyes of 159 patients received and examined in this department, and benefited from cataract surgery by the phacoemulsification technique, the surgery has been performed with The Phacomachine Oertli Faros anterior segment. The surgery has been performed per a same surgeon, his technique during the surgery after the preoperative preparation was to put a maintenar of anteriro chamber first afetr a small sideport in temporal inferiro then he made a main incision in temporal superior at two O ‘clock with a keratome knife after that , he performed a side port at then he started doing the capsulorhexis some time with trypan blue after that, he made hydrodissection and try to move lens, once the lens moved, he started divided thenucleos by making a pressure on his pedale during dividing nucleus, he moved lens and aspirated it severals times then he aspirated also the cortex with bimanual . He just use viscoelastique before injecting the lens into the bag then he appreciate the deeper of the anterior chamber and inject antibiotic in intracamerular and applied some ointment before putting the eyepad.The study period was three months (1er July to 30 September 2021). We conducted an exhaustive recruitment including all patients operated for cataract by the phacoemulsification technique during the study period. We collected patients’data included to performed this technic ,data was transferred from the patients' medical records using the kobocolect application, then it was sent to the kobotoolbox server where it was saved and then downloaded in Excel format.

We described variables related to socio-demographic characteristics, preoperative comorbidities, preoperative clinical examination data, intraoperative and postoperative complications, preoperative and postoperative visual acuity, preoperative and postoperative astigmatism. Implantation was performed in the posterior chamber with flexible implants and the anaesthesia was peribulbar.

The scales used to measure distance visual acuity were the Monoyer scale for literate patients and the Snellen 'E' scale for illiterate patients.

We have classified the VAs according to the recommendations of the World Health Organization's Prevention of Blindness Program in [4] :

- Poor for visual acuity below 1/10 (AV < 1/10);

- average visual acuity between 1/10 and 3/10 (1/10 ≤ AV < 3/10);

- or good if they are greater than or equal to 3/10 (AV ≥ 3/10).

We assessed postoperative visual acuity at D30. Data analysis was done using IBM SPSS version 21.0 software.

Variables	Type
Sociodemographic	-Frequence -Age -Sexe -Profession -Origin
Clinicals	-Reasons of consultation -Evolution -Background -Ophtalmogical Examination -Paraclinical Examination (Preoperative assessment)
Therapeutics	-Preoperative complication -Intraoperative Incidents -Postoperative complication

Tables and graphs were done using Microsoft Word, and Excel all from the office 2016 package.

Results

In total, 159 eyes were operated on during the study period.

Pre-operative results

The average age of our patients was 64.28±12.5 years with extremes of 10 and 92 years. The most represented age group was 60-69 years with a frequency of 35.2%. There were 87 men (54.7%) and 72 women (45.3%), i.e. a sex ratio of 1.2.

According to occupation, housewives were the most represented with 24.5%. The most frequent reason for consultation was VAD with 73%. Concerning the type of cataract **(figure 1)**, total white cataract was the most common with 60% (95 cases) followed by posterior subcapsular cataract with 26% (42 cases). Preoperative comorbidities were represented by hypertension and diabetes respectively 52.2% and 22%. The preoperative visual acuity was less than 1/10 with 79.9%, 17.6% between 1/10 and 2/10 and 2.5% greater than or equal to 3/10 **(Table I)**. We noted 1.3% of corneal dystrophy. The fundus was inaccessible with 62.6% and pathological with 12.58%.

In our study 79.9% of patients had poor visual acuity <1/10 before surgery (**Table I**) but the gained > 3/10 (82,4%) after surgery without any additional cor -rection as late post operative visual acuity after thirty days(**Table IV**).

The mean preoperative astigmatism was 0.11±0.20D with extremes of [0.01 and 2D]. The low objective preoperative astigmatism range was the most represented with 57.9%.

Post-operative results

The most operated eye was the right eye with 52.2% (83 cases). The most frequent intraoperative complications were posterior capsular rupture with 10.7% of which without vitreous outlet 7, with vitreous outlet 4, followed by subconjunctival haemorrhage with 1.3% **(Table II)**. Early postoperative complications were dominated by corneal oedema with 64.8% **(Table III)** , with a favourable outcome. Other complications were keratitis, superficial punctate

keratitis and hyalitis with 0.6% each. The late complication was posterior capsule opacification with 0.6%. The mean postoperative astigmatism was 1.12±0.44D, with extremes of [0.07 to 2 D]. The low objective postoperative astigmatism range was the most represented with 55.3%.

Functionally :

At D30, the results were good with 82.4%, average with 14.5% and bad with 3 .1%.

With the correction applied, the results were good with 93%, average with 4% and bad with 3% **(Table IV)**.

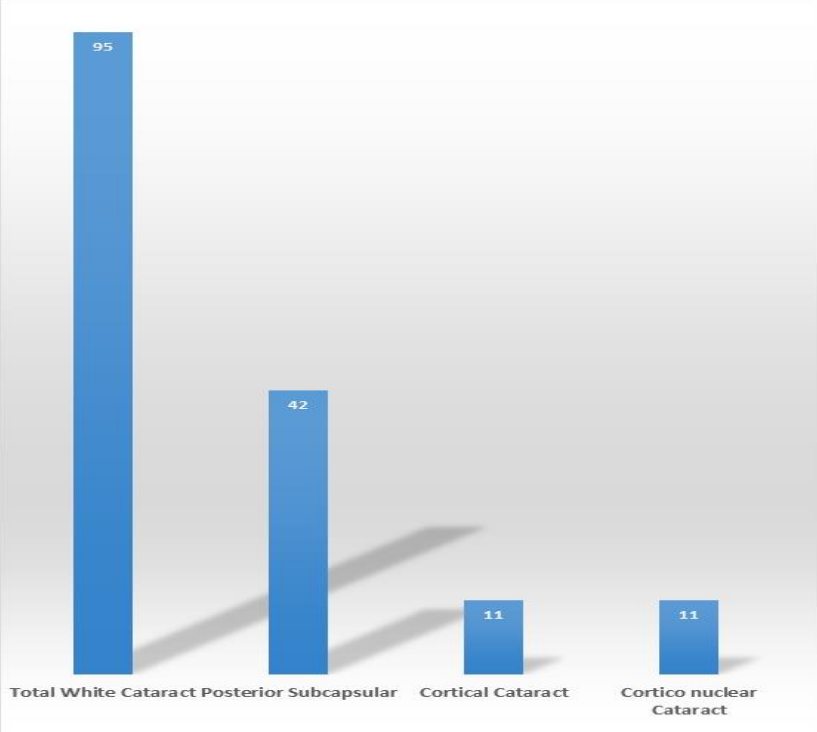

Figure 1: Type of cataract

Table I: Distribution of eyes operated on by phacoemulsification according to preoperative visual acuity without correction

AVSC Number	(N=159)	Percentage%
AV<1/10	127	79.9
≥1/10 AV <3/10	28	17.6
≥3/10	4	2.5

Intraoperative complications were dominated by posterior capsular rupture 10.7% (with 4% vitreous exit and 7% no vitreous exit).

Table II: Intraoperative complications

Intraoperative Complications	Number (N=159)	Percentage%
Posterior capsular rupture	17	10.7
Subconjunctival haemorrhage	2	1.3

Number of people per number of eyes.

Early postoperative complications were mainly corneal oedema followed by hypertonia and inflammation **(Table III).**

Table III : Early postoperative complications

Complications early postoperative	**Number (N=159)**	**Percentage %**
Corneal edema	103	64.8
Ocular hypertonia	2	1.3
Inflammation	2	1.3
Ptosis	1	0.6
Secretions	1	0.6

Table IV : Distribution of phacoemulsification patients according to postoperative visual acuity without correction on day 30

AVsc at D30	**Numbers (N=159)**	**Percentage%**
<1/10 **(Poor)**	5	3.1
1/10 ≥ AV < 3/10 (Average)	**23**	**1.5**
≥3/10(Good)	**131**	**82.4**

Discussion

In the literature, the average age of patients varies according to the selection criteria. In our series, we included patients of all ages and sexes and found an average age of 64.28 years. Our results are similar to those of **Guirou N et al [5]** and **Nadio T et al [6]** who obtained respectively 65 and 64.2 years. This average age is higher in the developed countries **Gineys [7]** in France, **Rodriguez [8]** in Spain. This age illustrates that this pathology is the prerogative of the elderly and occurs earlier in underdeveloped and sunny countries than in developed countries with a cold climate.

We found a male predominance (54.7%) with a sex ratio of 1.2. This male predominance contrasts with those of **Harba T et al [9]** in Chad in 2017 and **Djiguimdé et al [10]** who reported a female predominance in their series. This difference could be explained by the type of recruitment in the studies on the one hand and the economic factor on the other.

In our study, preoperative comorbidities were mainly dominated by hypertension with a frequency of 52.2% followed by diabetes with a frequency of 22%.

Our results are similar to the data in the literature where hypertension and diabetes are the most common comorbidities. However, the proportions are different according to the authors and the size of the samples. Our results are superior to those reported by **Ebana Mvogo et al [11]** in Gabon in 2017**,** who found a frequency of 25% for hypertension and 18.8% for type 2 diabetes. The preoperative visual acuity in our study was less than 1/10 with 79.9%. This means that the majority of patients had a real visual handicap. In the literature our result is lower than that reported by **Nadio T et al [6]** who found a frequency of 100%.

These proportions are characteristic of developing countries and could be justified by the late consultation of patients unlike developed countries where patients are seen at the stage of visual discomfort.

Surgery of the right eye represented 52.5% against 47.8% of the left eye. This result is comparable to those of **Guirou N** et **al [5]** who obtained 51.7% for the right eye against 48.3% for the left eye and

different from those of **Ammous I** et **al [12]** who obtained 47% for the right eye and 52.4% for the left eye. This could be explained by the random evolution of cataract in different eyes.

Intraoperative complications were dominated by posterior capsular rupture with a frequency of 10.7% (with 7.54% or 12 cases of vitreous exit and 3.14% or 5 cases without vitreous exit).

Our result is lower than those of **Ouffoué YG et al [13]** in Côte D'ivoire in 2021, who reported a frequency of 12.9% of posterior capsular rupture for post-uveitis cataracts whose surgical technique was classical extra capsular extraction, but it is higher than those of **Mba Aki T et al [14]**, in Gabon in 2017, who found a frequency of 3% by phacoE. The type of cataract and the surgical technique used could explain these results.

Corneal oedema was the most observed **early postoperative complication with 64.8%.**

Our result is lower than those of **Immous I** et **al [12]** in 2017 in Tunisia who found **75.8% corneal oedema** for those operated by **Phaco-E**, while **Mba Aki T et al [14]** in Gabon in 2017 reported only **1** case of **corneal oedema** out of 99 eyes operated by **Phaco-E**. The experience and skill of the surgeon could explain our result.

Opacification of the posterior capsule was the only one found with 0**.6%.**

Our result is lower than those reported by **Ouffoué YG et al [13]** in Côte D'Ivoire in 2021, who found a frequency of 22.58% for a follow-up period of **6 months** for all the patients operated on using the classic **EEC**, manual cataract surgery using a small incision without **MSICS** sutures and the **EIC**. The duration of follow-up in our study, which was only one month, could explain our low frequency.

The mean preoperative astigmatism was 0.11±0.20 D with extremes of 0.01 and 2.00 D and the mean postoperative astigmatism was 1.12±0.44 D with extremes of 0.07 and 2.00 D. The low astigmatism range was the most represented for both preoperative (57.9%) and postoperative (55.3%) astigmatism. Our mean postoperative astigmatism is slightly lower than that of **Barequet et al [15]** who found a mean of 1.17 D but lower than that of **Nadio T[6]** in Mali who reported a mean of 2.78 D with extremes of 0.50 and 8.50D.

These observed differences could be explained by the surgical technique used in each study. In phaco-E, the incision size is small and self-sealing without stitches which would not induce surgical astigmatism unlike other surgical techniques.

Comparing our results of the average preoperative and postoperative astigmatism, it appears that phacoemulsification hardly induces any surgical astigmatism due to the size of the incisions (2.2mm) and the absence of stitches.

On the functional level at D30, our results are good with82.4%, average with 14.5% bad with 3.1%.

In the literature, our results corroborate those reported by **Mba Aki T et al [14]** in Gabon in 2017 in their comparative series of phacoemulsification versus manual sutureless phacoalternative surgery, which found for those operated on by phacoemulsification 81.8% of good functional result and average in 18.2%. But they are superior to those of **Gábor L Sándor et al [16]** in Hungary in 2020 who reported in their study of 3,523 cataract patients operated on by phacoE, a frequency of 79.5% of good postoperative functional results, the main cause of poor prognosis being preoperative comorbidity (78.1%). While **Harba T et al .[9]** in Chad in 2017, reported only 7.0% good functional outcome for a total of 244 operated eyes whose surgical technique was extracapsular extraction from the start in all patients with overjet sutures.

With the correction applied, our results were **good** with **93%, average** with **4%** and **bad** with **3%** . The surgical technique used in our study, including phacoemulsification, could explain our results.

The limits of this study were that all of the patients after doing biometry, had not been implanted with their own biometry value and some of them did not allow to test their vision with glasses during the last check up after surgery because they were satisfied to their visual acuity post surgery .

Iconography

Conclusion

Reference technique for cataract management in developed countries. PhacoE is a fast, reproducible and safe surgery. Cataract treatment using the phacoemulsification technique with a posterior chamber implant results in early visual recovery and improved patient comfort. It offers a good level of surgical safety with a low rate of complications.

Declaration of interests

The authors declare that they have no conflict of interest in relation to this article.

References

1. Global data on visual impairement 2010 Available from www.who.int/blindness/GLOBALDATAFINAL for web.pdf accessed on 03/12/21 at 13:35.
2. **Naidoo K, Gichuhi S, Basáñez M, Flaxman SR, Jonas JB, Keeffe J et al.** Prevalence and causes of vision loss in sub-Saharan Africa:1990-2010.British Journal of Ophthalmology 2014;98:612-18.
3. **Abouzeid H.** Ophthalmology, new trends in cataract surgery. Rev Med Suisse 2011;7:128-32.
4. **Tabina G, Chenb M, Espandar L.** Cataract surgery for the developing world. Curr Opin Ophthalmol 2008; 19:55-59.
5. **Guirou N, Napo A, Dougnon A, Bakayoko S, Sidibé F, Sidibé MK, Conaré I, Traoré L, Traoré J.** Functional results of cataract surgery in adults. J Fr Ophthalmol 2013;36:19-22.
6. Nadio T, Napo A, Baldé R, et al. Extra capsular extraction versus manual Phaco

without sutures in the treatment of adult cataract at CHU-IOTA. Mal Med. 2017;32(3):16-19.

7. **Gineys R, Rohart C, Chaine G**. Socio-economic, ocular and systemic characteristics of cataract surgery patients. J Fr Ophthalmol 2008 ;31(1)56-61.
8. **Velarde Rodriguez J I, Casuso P, Gutierrez Del Rio C, Velez E, Rolon L, Valentin Gamazo L and de la Cruz J**. Efficacy, residual defect and best visual result one month after surgery: quality in cataract concerted series. J Fr Ophthalmol 2009; 32:112-1.
9. **Harba T, Djada DA, Didier KA.** Functional results of cataract surgery during the ophthalmological caravan at the Regional Hospital of Abeche in Chad. Revue Scientifique du Tchad-series B -January 2017.
10. **Djiguimdé PW, Diomandé IA, Ahnoux-Zabsonré A, Koffi KV, Meda TA, Diomandé GF et al**. Results of advanced cataract surgery by tunnelling: about 262 cases performed at the Banfora CHR (Burkina Faso). The Pan African Medical Journal 2015;(22):366.
11. **Ebana Mvogo SR, Dohvoma AV, Kagmeni G, Eyoup SG, Mayouego KJ, Ellong A et al.** Functional Results of Cataract Surgery at the Gynaeco-Obstetric and Paediatric Hospital of Douala: Assessment of the First Two Years. Health Sci. Dis: Vol 18 (2) Suppl 1 June 2017Available at www.hsd-fmsb.org
12. **Ammous I, Bouayed E, Mabrouk S, Boukari M, Erraies K, Zhioua R.** Phacoemulsification versus cataract surgery by manual mini incision:anatomical and functional results. French Journal of Ophthalmology 2017; 40:460-66
13. **Ouffoué YG, Konan AJ, Kouassi KLJ, Ouattara OAS, Coulibaly F, Ouonnebo L et *al.*** Management of post-uveitic cataracts: 2-year experience at the Treichville University Hospital Revue SOAO n° 01-2021, pp. 26-31
14. **Mba Aki T**, **Anyunzoghe E, Mekyna S, Assoumou PA, Agaya C, Mve Mengome E.** Phacoemulsification versus manual phacoalternative without sutures during mass cataract surgery. Mal Med 2019;34(2):6-11.
15. **Baraquet 1 S, Yu E, Vitale S, Cassard S, Azar DT, Stark WJ**. Astigmatism outcomes of horizontal temporal versus nasal clear incision cataract surgery.Journal of cataract and refractive surgery 2004 Feb; 30(2):418-23.
16. **Gábor L S, Gábor T, Dorottya S, Irén S, Regina L, Anita P et al.** Cataract blindness in Hungary.Int J Ophthalmol.18March 2020;13 (3) :438-444.

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