

# Factors Associated to Cataract Surgery Failure at Kankan Regional Hospital

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## Abstract

**Introduction:** Cataract surgery has undergone many changes with the size of incision progressively decreasing over time with an incision of 12.0 mm for intracapsular cataract extraction to 2.2 - 2.8 mm in phacoemulsification. However, phacoemulsification due to high cost and equipment maintenance cannot be employed widely in developing countries. The phacoalternative or Manual small-incision cataract surgery (MSICS) offers similar advantages with the merits of wider applicability, less time consuming, a shorter learning curve, and lower cost. Haven't not being without complications like any other surgery We have identified the factors influencing the outcome of phacoalternative cataract surgery in order to improve our quality of care for our patients suffering from blindness induced by the world's first leading cause of legal blindness. We have identified the factors influencing the outcome of cataract surgery. **Patients and Methods:** This was a prospective observational study of the descriptive type lasting six (6) months from March 1 to August 30, 2020 including all patients operated on for cataracts and having lower visual acuity at 3/10. The operating form included demographic data, the patient's personal ophthalmological history, postoperative visual acuity, per and postoperative complications and the type of pathology involved. The analysis was carried out using epi-info 7.2.0.1 software. **Results:** During this study period, we collected 61 cases of failure of cataract surgery out of a total of 1182 operated eyes, *i.e.* a frequency of 5.16%. Women represented more than half of the sample with 74%. Almost all of our patients, *i.e.* 96.72%, were over the age of 60. Loss of visual acuity was the main complaint in all our patients, *i.e.* 100% followed by photophobia with 24.4% of cases. Arterial hypertension present in 8.20% of patients was the most common comorbidity in our series followed by diabetes with 4.92%. 18 patients (29.5%) presented early post-

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operative complications such as corneal edema in 15 patients (24.6%) and hyphema in 3 patients (4.9%). Late postoperative complications were dominated by capsular fibrosis encountered in 42.89% of our patients. The causes of failure after cataract surgery were dominated by selection errors which accounted for 36.06% followed by late postoperative complications 34.43%. **Conclusion:** Like any surgery, cataract surgery can often be marred by various complications often occurring during the intraoperative or postoperative period. These complications in addition to negligence and/or non-deep analysis of certain cases (selection) are often associated with poor functional recovery.

## Keywords

Cataract, Small Incision, Complications, Failure

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## 1. Introduction

Cataract is the partial or total clouding of the lens [1]. It is the leading cause of curable blindness in the world and accounts for 50% of all causes of blindness [2].

The treatment of cataracts is surgical, several techniques exist whose reference is phacoemulsification. However, its practice is not widespread in developing countries because of the cost of phaco-alternative or small-incision cataract surgery.

Small Incision for Cataract Surgery (SICS) gives results comparable to phacoemulsification [3]. This operation has benefited from many technological advances, both in terms of surgical technique and implant development. It is performed on an outpatient basis, under simple local anesthesia [1].

However, there are causes of poor visual results at the end of cataract surgery that can be divided into three groups: inadequate correction of postoperative ametropia (lack of glasses), inability to detect pre-existing conditionsocular conditions (poor selection of candidates for surgery) and surgical complications.

The preoperative and postoperative complications of cataract surgery are extreme, unpredictable but some can be disastrous, threatening the visual acuity or even the integrity of the eyeball, hence the interest of taking all precautions to avoid them.

Nowadays, few studies have been done to identify the factors associated with cataract surgery failure. For the most part, they set out to evaluate the results without determining the share attributable to each of the factors involved [4] [5].

This is why we initiated this study which aims to identify the causes of poor results of phacoalternative cataract surgery.

## 2. Materials and Methods

We conducted a six-month descriptive prospective study on cataract patients during the period from 1<sup>st</sup> of March to August 30, 2020 at the ophthalmology

department of Kankan Regional Hospital.

All patients operated on cataracts and who had a corrected visual acuity of less than 3/10 on the 60<sup>th</sup> day postoperative were considered. The exclusion criteria were all patients who were operated cataract surgery by the phacoalternative technique and who had a corrected visual acuity greater than 3/10 on the 60th day postoperatively and all other cases of surgery observed for other diseases and techniques at Kankan Regional Hospital.

For each included case, we collected on a collection sheet, socio-demographic characteristics, ophthalmological and medical history, conditions of surgery, postoperative follow-up, corrected postoperative visual acuity, data from ophthalmological examination and additional examinations in order to identify the cause of the poor postoperative result. These causes were divided into inadequate correction, postoperative complications and poor patient selection.

All our patients were operated on by the same surgeon. They all benefited from a posterior chamber implantation with a rigid polymethylmetacrylate (PMMA) artificial lens whose power was previously calculated with the SRK II formula. Complicated cases of a rupture of the posterior capsule were implanted with iridescent fixation implants.

All patients who met our inclusion criteria and who on the 60th day postoperative by the phacoalternative technique had not obtained at least 3/10th as visual acuity by far with the best correction, patients in whom corneal edema persisted, the presence of secondary cataracts having impacted an improvement in visual acuity were considered surgical failure. Inadequate corrections were for patients who did not receive the implants according to the biometrics previously calculated before the intervention according to the SRK-T formula.

The input and analysis were done using the Epi info 7.2 software.

The confidentiality of the data has been respected according to the standards of ethics and professional conduct.

### 3. Results

During this study period, we collected 61 cases of cataract surgery failure out of a total of 1182 operated eyes, a frequency of 5.16%.

The implant used corresponded to the power calculated in 50 patients or 82%.

The average age of our patients was 65.04. More than half (68.85%) were in the 60 - 69 age group (**Table 1**).

The female sex was the most represented with a sex ratio of M/F of 0.35.

On the 60th day postoperatively, the most frequent complaints in our patients were the persistence of the decrease in visual acuity (100%) and photophobia (34.4%) (**Table 2**).

High blood pressure (8.20%), diabetes (4.92%) and the notion of trauma (1.64%) were the history found in our patients.

Biomicroscopic signs were dominated by postoperative corneal edema (24.59%), posterior capsule opacification (14.75%) and mydriasis (3.27%) (**Table 3**).

**Table 1.** Distribution of cataract patients with poor functional recovery from 01 March to 30 August 2020 by age.

| Age range     | Actual    | Percentage    |
|---------------|-----------|---------------|
| 60 - 69 years | 42        | 68.85         |
| 70 - 79 years | 17        | 27.87         |
| 40 - 49 years | 2         | 3.28          |
| <b>TOTAL</b>  | <b>61</b> | <b>100.00</b> |

**Table 2.** Distribution of cataract patients with poor functional recovery from 1<sup>st</sup> March to 30<sup>th</sup> August 2020 according to functional signs.

| Complaints      | Actual | Percentage |
|-----------------|--------|------------|
| BAV             | 61     | 100.0      |
| Photophobia     | 21     | 34.4       |
| Myodesopsias    | 18     | 29.5       |
| Pain            | 9      | 14.8       |
| Visual blurring | 8      | 13.1       |

**Table 3.** Distribution of cataract patients with poor functional recovery from March 01 to August 30, 2020 according to biomicroscopic examination.

| CA                         | Actual | Percentage |
|----------------------------|--------|------------|
| Narrow CA                  | 1      | 1.64       |
| Deronde pupil              | 2      | 3.27       |
| Corneal edema              | 15     | 24.59      |
| Posterior capsule fibrosis | 9      | 14.75      |
| Mydriasis                  | 2      | 3.28       |
| Myosis                     | 2      | 3.28       |

In the posterior segment, non-glaucomatous optic neuropathy was found in 9.83% of cases, glaucomatous optic neuropathy (8.19%) and macular scar (6.55%) (**Table 4**).

The only intraoperative complication was the rupture of the posterior capsule reported in two patients (n = 2) or 3.27%.

Corneal edema (24.6%) and hyphema (4.91%) were the two early postoperative complications found in our patients.

Late postoperative complications were posterior capsule fibrosis (42.86%), postoperative astigmatism (28.57%), macular edema (28.57%) and corneal decompensation (8.19%) (**Table 5**).

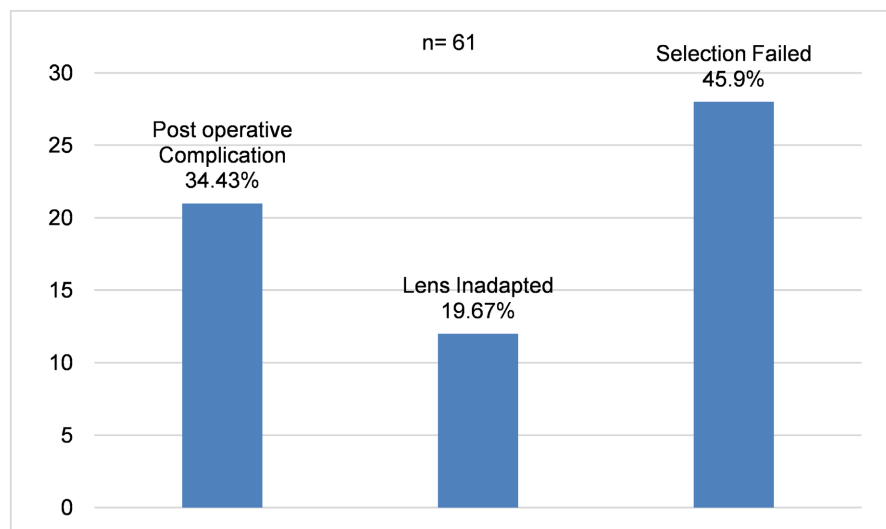
As the cause of the poor functional result, we blamed postoperative complications in 21 patients or 34.43% of cases, an unsuitable implant 12 patients or 19.67% of cases and selection errors 45.9% of cases (**Figure 1**).

**Table 4.** Distribution of cataract patients with poor functional recovery from March 01 to August 30, 2020 according to the pathologies of the posterior segment.

| Fundus               | Actual | Percentage |
|----------------------|--------|------------|
| Optical atrophy      | 6      | 9.83       |
| Glaucomatous papilla | 5      | 8.19       |
| Retinitis pigmentosa | 1      | 1.64       |
| Macular scar         | 4      | 6.55       |
| Vitré trouble        | 3      | 4.91       |
| AMD                  | 3      | 4.91       |

**Table 5.** Distribution of cataract patients with poor functional recovery from March 01 to August 30, 2020 according to late postoperative complications.

| Complications              | Actual    | Percentage    |
|----------------------------|-----------|---------------|
| Post op astigmatism        | 6         | 28.57         |
| Posterior capsule fibrosis | 9         | 42.86         |
| Macular edema              | 6         | 28.57         |
| Corneal decompensation     | 5         | 8.19          |
| <b>Total</b>               | <b>21</b> | <b>100.00</b> |

**Figure 1.** Distribution of cataract patients with poor functional recovery from March 01<sup>st</sup> to August 30<sup>th</sup>, 2020 because of the causes.

#### 4. Discussion

From 1<sup>st</sup> March to August 30<sup>th</sup> 2020, we conducted a prospective observational study on the causes of failure after cataract surgery. The general objective of this study was to identify the causes of poor outcomes of phacoalternative cataract surgery with posterior chamber implantation.

During this study period, we collected 61 cases of cataract surgery failure out

of a total of 1182 operated eyes, a frequency of 5.16%, comparable to that of CGF Ngana Ngabou *et al.* which reported 78.95% postoperative visual acuity greater than 3/10. Our result is found in the WHO standard for cataract surgery outcomes [6].

In Africa one of the main difficulties of surgery is access to implants of appropriate power especially implants of low or too high power. In our series, the implant used corresponded to the calculated power in 82% of cases. This result is higher than that of Jw Diallo *et al.*, who reported in their 2015 study that the power of the implant used was adequate in 59.67% [7].

The time between studies could be an explanation for this difference. Indeed, the more years pass, the easier access to implants is in developing countries.

Almost all of our patients or 96.72% were over 60 years old. The age group from 60 to 69 years was the most represented with 68.85%. In developing countries and especially in Africa, age is a random factor because many elderly and illiterate people are completely unaware of their ages. This result is different from those of Lindfield R. where the age group of 70 to 79 years was the majority in Bangladesh [8]. Despite the imprecise nature of this variable, it is accepted on the one hand that the vast majority of cataract patients are of the 3<sup>rd</sup> age and on the other hand that the frequencies of pathologies that can compromise the result of this surgery, such as optic atrophy, Age-Related Macular Degeneration (AMD), diabetic retinopathy, increase with age.

Decreased visual acuity was the main complaint in all our patients either 100% followed by photophobia with 24.4% of cases.

In the history, high blood pressure, present in 8.20% of patients was the most common comorbidity in our series followed by diabetes with 4.92%. Diallo JW *et al.* also reported a predominance of high blood pressure but in a greater proportion with 30.33% of cases [7]. This could be explained by the fact that the frequency of these two pathologies increases with age.

In our series, the causes of failure after cataract surgery were dominated by selection errors which accounted for 36.06% followed by late postoperative complications 34.43%. These results are different from those reported in the literature which attributed one third of complications to inadequate optical correction, one third to selection errors and the last third to postoperative complications. This difference could be explained by the availability in our department of a biometer and implants of various power to minimize refractive errors [8].

Corneal edema and capsular fibrosis were the most observed clinical signs during the biomicroscope examination. This result is close to that of Dolo M who found 28.7% corneal edema [9]. Its occurrence remains frequent in the alternative phaco due to manipulations in the anterior chamber and especially to the manual expulsion of the crystalline nucleus in this technique. These maneuvers can damage the corneal endothelium and thus lead to corneal edema.

Optic atrophy and macular edema were the most common pathologies of the posterior segment with 9.83% each. Macular edema is a common complication

of cataract surgery. However, the early implementation of anti-inflammatory treatment has made it possible to limit its occurrence.

Eye tone was normal in 56 patients (91.80%). We noted two cases of ocular hypertonia (3.28%). Hypertonia is a rare complication after cataract surgery. However in some cases the intraocular pressure or eye pressure increases because the aqueous humor cannot flow freely between the ciliary body, where it is produced, and the trabeculum, where it is excreted.

In our series, 18 patients (29.5%) presented with early postoperative complications such as corneal edema in 15 patients (24.6%) and hyphema in 3 patients (4.9%). Our results are comparable to those of Dolo M *et al.*, who in a study conducted in Burkina Faso reported 22.6% of cases of corneal edema and 9.7% of cases of hyphema [9].

Late postoperative complications were dominated by capsular fibrosis encountered in 42.89% of our patients.

Our limitations in this study were diverse both related to the technical platform and to the patients, they were dominated by the non-availability of varied choices of the powers of the implants precalculated during biometrics, the lack of diversification of the choice of the quality of implant according to the visual objective of the patient and its preoperative refraction, the lack of diversified technical platforms for in-depth preoperative examinations, the reception of patients at stages where cataracts were dense thus preventing the examination of the fundus for clinical evaluation and possible functional prognosis after surgery, which limited us through the examinations available to appreciate the posterior segment and to conclude a decision

## 5. Conclusions

Cataracts are a real public health problem, but they are no longer inevitable nowadays with the advent of intraocular implants and the evolution of different operating techniques, the results are more and more remarkable. Like any surgery, zero risk does not exist in cataract surgery. Some complications may occur in the intraoperative or postoperative period that can affect the functional result of the intervention. In addition to genuine postoperative complications, selection errors, refractive errors and the surgeon's experience are factors that can influence the outcome of surgery.

The complications of cataract surgery pose a challenge. The surgeon's responsibility is first and foremost to prevent complications. However, despite all the precautions, sooner or later he will face a complication.

By improving the ability to manage complications, they will definitely reduce the number of poor visual outcomes and disappointed patients.

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### Conflicts of Interest

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

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**SURVEY SHEET****I/ EPIDEMIOLOGY:**

- Name & Surname: .....
- N°:.....
- Origin: Rural  Urban
- Locality.....
- Age:..... years    ■ Profession:.....    ■ Sex: Male  Female
- Consultation deadline..... Days

**II/REASON FOR HOSPITALIZATION**

- Low visual acuity                       Visual fog
- Notion of trauma                       Photophobia

**III/BACKGROUND:*****PERSONAL:***

- Glaucoma: yes  no
- Another eye diseases: no  if yes  specify.....
- Highpressure concept: yes  no
- Notion of diabetes: yes  no
- Refractive disorders: no  if yes  specify .....
- Medication intake: no  if yes  specify.....
- Smoking: yes  no
- Alcohol: yes  no
- Other flaws: no  if yes  specify.....

***FAMILY***

- Glaucoma: yes  no
- Other eye diseases: No  if yes  specify.....
- Other flaws: no  if yes  specify.....

**VI/CLINICAL EXAMINATION:*****A/ Ophthalmological examination:******Affected eye***

Visual acuity from far..... from near.....

- Cornea: clear  dystrophic  degenerative
- Anterior chamber: shallow  deep  normal
- Iris: deformedpupil  synechia  myosis
- Crystalline: grade 1  2  3  4  5
- Intra ocular pressure:
- Vitreous: normal  pathological
- Retina: normal  pathological

**Controlateral Eye:**

Normal  abnormal  specify.....

**B/ General examination**

Weight:..... Kg      Blood Pressure: ...../.....mm Hg      Temperature: ..... °C  
Breath Frequency:.... Cycle /mn      Pulse :..... Batt. /mn

**C/ Somatic Examination:**

**VII/ ADDITIONAL EXAMINATIONS:**

**Ultrasound:** normal  pathological

**Biometrics:**

**K1**

**K2**

**The**

**IOL1**

**IOL2**

**VIII/ TYPE OF SURGERY**

EEC       Phaco A

**VIII/ COMPLICATIONS:**

**A-Early complications**

**1-Corneal complications**

Tears of cementics .....

Corneal edema.....

Loss of endothelial cells.....

**2-Hemorrhagic complications.....**

**3-Irian complications**

Hernia of the iris.....

Lesions of the iris sphincter .....

Disinsertion of the root of the iris.....

**4-Previous capsular complications:** Yes  No

**5-Posterior capsular complications**

Limited opening.....

Complete tear.....

Dislocation of the complete nucleus.....

Dislocation of nucleus fragments.....

**6-Zoular complications.....**

**7-Expellive hemorrhage.....**

**8-Acute endophthalmitis.....**

**B-Late complications**

**1-Capsular opacification:**

Fibrosis.....

beads.....

capsulophimosis.....

- 2-Corneal decompensation.....
- 3-retinal detachment.....
- 4-Macular edema.....
- 5-Chronic endophthalmitis.....

**IX RESULTS:**

**Functional:** Visual acuity Day1st ..... Day7th ..... Day30th .....