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Research Article

# Secondary Cataract in the Adult of Lubumbashi "Clinical Aspects and Treatment with the Neodium-YAG Laser Beam" Case of Saint Yvonne Katuba Ophthalmic Clinic

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## Abstract

**Purpose:** The objective was to determine the epidemiological and clinical profile of secondary cataract in adults in our environment.

**Methodology:** These are two types of studies. The first retrospective cross-sectional description determining the prevalence of secondary cataract was performed on 493 eyes, of which 107 eyes had developed secondary cataract, treated with YAG laser, which was the subject of the second longitudinal prospective study performed on a period of one month. The variables of the study were: age, sex, date of primary cataract surgery and surgical technique, type of gel, type of lens, date of Yag, evolution of visual acuity before and after the Yag, the surgeon's experience.

**Results:** The incidence of secondary cataract was 22% of cases, the age group was 59 to 79 years or 53.27% with a mean age of 64.7 ± 14.5 years, sex ratio 1.1 woman for a man. Mean surgeons (88.79%) induced secondary cataract by the small incision technique and extracapsular surgery accounted for 87.3% of cases with P = 0.00012; the onset time for the technique was ≤ 1 year with X2 = 1.9601. After Yag laser capsulotomy the visual improvement was 80.37% of the cases, complications related to the YAG technique were: a rise in intraocular pressure in 16.82% of cases and intraocular implant impact. in 4.67% of cases. The results of our study corresponded with those of the other authors.

**Conclusion:** Secondary cataract was the most common post-surgical cataract complication in our series in the medium term. Its management by posterior capsulotomy with the Yag laser allowed the improvement of the vision of the patients.

**Keywords:** Secondary Cataract; Adult; Clinical Aspects; Laser Yag

## Introduction

Secondary cataract is opacification of the posterior capsule occurring a few weeks after primary cataract surgery. It is the most common post-surgical complication due to the migration of residues of crystalline epithelial cells inevitably left at the time of surgery [1].

Its incidence varies according to the literature from 10% to 50% in 3 to 5 years after surgery [2-6]. Important risk factors for the development of secondary cataract include age, type of

surgical technique, lack of intraocular lens in posterior chamber (IOL), preoperative maledilation, large optical diameter IOL (7 mm), materials of the lens, the experience of the surgeon, and the persistence of the cortical material [4,7-13].

Currently the treatment of secondary cataract is mainly by posterior capsulotomy using laser beams or by performing surgery. The physical medium uses neodymium: yttrium aluminum garnet (Nd YAG) [3]. Outside the YAG, posterior capsulotomy can be surgically done via Pars Planaou preventively by splitting the posterior capsule intraoperatively [14].

The objective of our study was to contribute to the knowledge of the epidemiological profile of adult cataract operated patients who developed secondary cataract in our environment.

## Methodology

Our study was conducted at the Sainte Yvonne Ophthalmological Center at Katuba in the city of Lubumbashi, Haut Katanga province, in the Democratic Republic of Congo, during the period from July 1, 2016 to December 31, 2016 or 6 months. It consisted of two parts: the first study was retrospective cross-sectional descriptive on 493 eyes including107 cases of secondary cataract having benefited from posterior capsulotomy with Nd: YAG Laser. Patients aged 18 years and over having undergone primary cataract with lens in posterior chamber were included. The second longitudinal prospective over a period of one month, allowed us to appreciate the evolution after treatment Nd: YAG laser. We excluded from our study patients who underwent primary lens cataract surgery in the anterior chamber and were under 18 years of age as well as those who had surgery elsewhere. The surgical technique used was either extracapsular cataract extraction (EEC) or Small Incision Cataract Surgery (SICS) surgery, or the classic Phacoemulsification.

Sampling was exhaustive including all patients meeting the inclusion criteria and seen during our study period. Data was collected from patients' medical records from a pre-established form. The variables of the study were: age, sex, date of primary cataract surgery and surgical technique, type of gel, type of lens, date of Yag, evolution of visual acuity before and after the Yag, the surgeon's experience. The average surgeon was considered to have performed less than 100 cases, whereas an experienced surgeon was the one who performed more than 100 cases. Anesthesia was performed locally by retrobulbar injection for primary cataract surgery and was topical for posterior Yag capsulotomy.

For data entry and interpretation of results, we used Epi Info software version 7.2.1.0. Univariate and bivariate analyzes as well as statistical tests such as percentage calculation, sex ratio, mean, chi squared with the significance level P-values <0.05 were used.

## Results

In this study, out of 493 operated eyes, 107 had secondary cataracts. Thus the results will come in two aspects: sociodemographic and clinical.

### Sociodemographic data

The sociodemographic dataset would be divided according to the different parameters such as the frequency of the secondary cataract in the patients, the sex of the patient as well as the age of the patient.

### Frequency of secondary cataract

Figure 1 below gives the result obtained as part of this research.

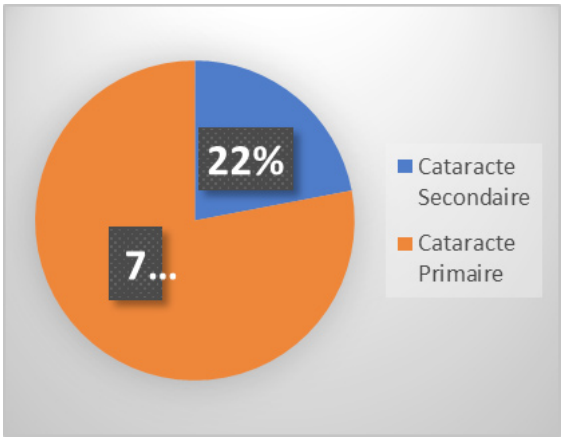


**Figure 1:** Frequency of secondary cataract.

The frequency of Secondary Cataract in adults was 22% compared to 78% for a population of 493 operated eyes.

### Distribution of patients by gender

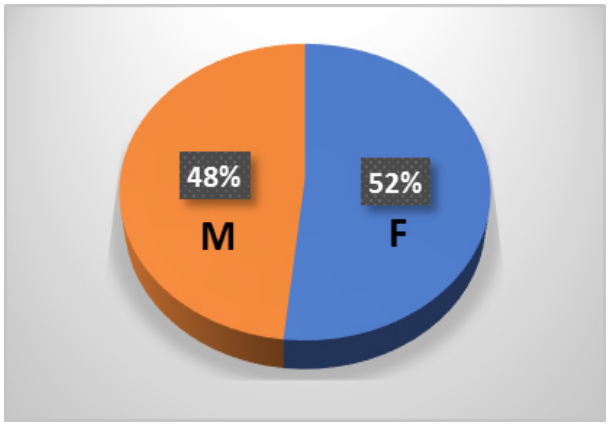


**Figure 2:** Distribution of cataract by sex.

From Figure 2 it emerges that secondary cataract had a frequency of 52.34% of cases in women against 47.66% of cases in men is a sex ratio of 1.1 woman for a man.

### Distribution of patients by age group

The distribution of patients by age group is shown in Table 1 below.

| Slice Age (Years) | N | % |
|---|---|---|
| 18 | 1 | 0.93 |
| 19 - 39 | 9 | 8.41 |
| 49 - 59 | 22 | 20.56 |
| 60 - 79 | 57 | 53.27 |
| 80 - 95 | 18 | 16.82 |
| **TOTAL** | **107** | **100.00** |

**Table 1:** Distribution of patients by age group.

This Table 2 shows that the average age group was that of 60 to 79 years with a number of 57 cases or 53.27%, followed by those between 40 to 59 years and 79 to 95 years with respectively; 20.56 % and 16.82% of cases.

## Clinical data

### Distribution of the eyes according to the experience of the surgeon

| Surgeons | n | % |
|---|---|---|
| Experienced | 12 | 11,21 |
| Means | 95 | 88,79 |
| **Total** | **107** | **100,00** |

**Table 2:** Distribution of the eyes according to the surgeon's experience.

The majority of Secondary Cataracts had been performed primarily by moderately experienced surgeons, with a total of 95 out of 107 surgeons (88.79%).

### Distribution of the eyes according to the surgical technique

| Technique | N | % |
|---|---|---|
| EEC + SICS | 87 | 81.31 |
| Phacoemulsification | 20 | 18.69 |
| **TOTAL** | **107** | **100.00** |

**Table 3:** Distribution of the eyes according to the surgical technique.

The choice of surgical technique has a significant impact on the development of secondary cataract. The study of this distribution would allow us to evaluate the most inductive technique.

This Table 3 shows that the technique of Extracapsular Cataract Extraction (EEC) + Small Incision Cataract Surgery (SCIS) was the most performed in our patients in a proportion of 81.31%.

### Eye distribution according to visual acuity after YAG laser capsulotomy

| Appreciation | N | % |
|---|---|---|
| Improved | 86 | 80,37 |
| Status quo | 21 | 19,63 |
| **Total** | **107** | **100,00** |

**Table 4:** Eye distribution according to visual acuity after YAG laser capsulotomy.

This Table 4 shows that improvement of visual acuity in our patients was observed in 80.37% of cases.

### Distribution of the eyes according to the complications

| Complications Post Yag | n | % |
|---|---|---|
| Impact Lio | 5 | 4.67 |
| High Intraocular Pressure | 18 | 16.82 |
| Any | 84 | 78.51 |
| **TOTAL** | **107** | **100.00** |

**Table 5:** Distribution of eyes according to complications.

In our series, most of our patients had not developed Post Yag complications with 84 patients or 78.51% of cases (Table 5).

### Eye distribution according to surgeon's experience and surgical technique

| Surgeon | Technique | | | | | |
|---|---|---|---|---|---|---|
| | EEC + SICS | | PHACO | | TOTAL | |
| | n | (%) | n | (%) | n | (%) |
| Expe rimented | 4 | (33.33) | 8 | (66.67) | 12 | (100.00) |
| Way | 83 | (87.37) | 12 | (12.63) | 95 | (100.00) |
| Total | **87** | **(81.31)** | **20** | **(18.69)** | **107** | **(100.00)** |

**Table 6:** Eye distribution according to surgeon's experience and surgical technique.

This Table 6 shows that moderately experienced surgeons performed more than either Extracapsular Extraction (EEC) or Small Incision Cataract Surgery (SICS) 87.37% of cases versus 66.67% of Phacoemulsification surgery cases.

P = 0.00012 Statistical + Test.

Total average of the eyes according to the surgical technique and the time of appearance (Year)

This Table 7 shows the time of onset of secondary cataract depending on the technique used.

| Technique | | Time Of Appearance (Year) | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ≤1 | 1-3 | 3-5 | 5-7 | 7-9 | 9-11 | 11-13 | 13-15 | |
| EEC + SICS | n | 43 | 22 | 7 | 7 | 5 | 2 | 0 | 1 | **87** |
| | % | 49.43 | 25.29 | 8.05 | 8.05 | 5.75 | 2.30 | 0.00% | 1.15 | **100.00** |
| Phaco | n | 11 | 3 | 1 | 3 | 0 | 0 | 2 | 0 | **20** |
| | % | 55.00 | 15.00 | 5.00 | 15.00 | 0.00 | 0.00 | 10.00 | 0.00 | **100.00** |
| **Total** | **n** | **54** | **25** | **8** | **10** | **5** | **2** | **2** | **1** | **107** |
| | **%** | **50.47** | **23.36** | **7.48** | **9.35** | **4.67** | **1.87** | **1.87** | **0.93** | **100.00** |

**Table 7:** Total average of the eyes according to the surgical technique and the time of appearance (Year).

From Table 7 we noted that secondary cataract occurred in less than one year in 50.47% of cases with a mean delay of onset of secondary cataract ± 3 years.

## Discussion

In our series, the frequency of secondary cataract was 22.00% in patients over 18 while Milazzo, studying the prevalence of secondary cataract in France, found a frequency of 37% in patients over 40 years, the literature reports a frequency of 10% to 50% [2-5,15]. It is the most common and unavoidable complication of primary cataract surgery as a target disease under the 2020 vision to reduce reversible blindness by the year 2020; This objective was also considered as the first for the Sainte Yvonne Ophthalmology Clinic, which provided surgeons with certified equipment, a well-trained team for the easy screening of this pathology, patient awareness and a social service dealing with the management of the disease. Free underprivileged patients.

We found that secondary cataract affected women more than men in a proportion of 52.34% against 47.66% or a sex ratio of 1.1. The literature consulted did not mention any correlation between the occurrence of secondary cataract and sex. It is therefore an informative addition thinking that women are born more numerous and have a longer life expectancy and also present their complaints early.

In our study, the majority age group was 59 to 79 years or 53.27% with an average age of 64, which was consistent with Ayed's results studying risk factors for secondary cataracts in Tunisia. found the average age of 61 years; this could be explained by the main cause of the occurrence of cataract which is senile [13]. In most African countries cataract is diagnosed late because of the difficult accessibility of remote areas: geographical barrier, high cost of care (financial barrier), lack of information (cultural barrier); the patients are operated on at the stage of blindness.

Speaking of surgeons, the moderately experienced had induced more secondary cataracts 88.79% and 11.21% for the experimentalists while T. Ayed, et al. (Tunisia) found a majority of confirmed surgeons (64%) and a minority of beginners at 36% [13]; this was explained by the fact that the Sainte Yvonne ophthalmological clinic is an eye surgery training center. We had included the beginners in the middle experienced class since in the learning those who mastered extra capsular extraction and the Small incision pass to the phacoemulsification and the class of the experienced made only of visiting framers which explained the low number of phacoemulsified eyes during this study period and the high percentage of secondary cataract over a total of phacoemulsification made. The majority class had more secondary cataract induced because it used the postage stamp technique incriminated in the literature as a causative agent of secondary cataract, promoting incomplete grooming of the cortex [13], inexperience creating a miosis peroperatively, however, phacoemulsification is performed with a curvilinear circular rhexis (CCC) that facilitates a good cleaning of the cortex.

Extracapsular extraction and Small incision techniques induced secondary cataract at 81.31% while the Phaco at 18.39%. T. Ayed et al. (Tunisia) found that the EEC gives 25%, the SICS 6% and the Phaco 1% [13]. It must also be emphasized that the technique of phacoemulsification was not yet sufficiently popularized in our environment. Extracapsular extraction and the Small incision used rigid lenses PMMA: (polymethyl methacrylate) incriminated in the literature as factors promoting the rapid onset of secondary cataracts. On the other hand, phacoemulsification used hydrophilic foldable lenses whose constituent material delays its occurrence; under other skies it is used the lenses with proven square edges better because preventing the migration of epithelial cells on the posterior capsule and thus prevents the appearance of secondary cataract. It must be emphasized that quality lenses have a high cost making their use in Africa difficult.

The majority of patients treated with YAG had improved vision (80.37%) with the exception of those who had a problem with the posterior segment (glaucomatous papilla and age-related macular degeneration) whose vision had remained statuquo. The use of a low energy of 1.1mj allowed us to minimize Yag laser postcapsulotomy complications. As complications, we mainly recorded the increase in temporary intraocular pressure that we had treated with timolol maleate. Patients whose posterior capsule was fibrotic were treated with posterior surgical capsulotomy and these patients came from remote areas. This result contrasts with that of R. Bhargava studying the treatment of post-Nd Yag capsule opacification with high energy (57.7 mJ to 77.7 mJ) in India had listed many complications including some serious as cystoid edema of the macula, the detachment of the retina and posterior vitreous [16].

The time of onset varies according to our study between 15.09% to 48.11% in 1 to 2 years which seems early compared to the study conducted by Apple DJ and Flament who found 10% to 50% in 3 to 5 years [2,4]. Here, we will again mention moderately experienced surgeons who are in the majority therefore practicing the SICS and the EEC, and some in the learning phase.

## Conclusion

Secondary cataract remains the most common complication of cataract surgery. Its management by posterior capsulotomy Yag laser had improved vision for the majority of patients despite some minimal transient complications. In order to reduce the incidence of secondary cataract, we recommend that surgeons: to ensure a good dilation in pre-operation, to practice more anterior capsulotomy with circular rhexis rather than capsulotomy by postage stamp, to ensure a good grooming of the cortex, a good postoperative follow-up of patients to detect early secondary cataract.

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