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CASE REPORT

# Postoperative Outcomes and Backgrounds of Patients above the Age of 90 Years Who Underwent Cataract Surgery

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## Abstract

**Purpose:** To retrospectively analyze postoperative outcomes and backgrounds of patients above the age of 90 years who underwent cataract surgery.

**Methods:** The present study retrospectively analyzed the data pertaining to 18 patients (25 cases) ≥ 90 years of age who underwent cataract surgery at the Jikei University Daisan Hospital in 2019. The data regarding age, preoperative and postoperative visual acuity, underlying diseases, ocular comorbidities, intraoperative and postoperative complications, and living environment were extracted and assessed.

**Results:** Among the subjects included in the current study, five had ocular comorbidities, two had intraoperative complications, and one patient had postoperative complications. Moreover, seventeen patients had underlying diseases and six patients lived alone. All the patients displayed improved visual acuity.

**Conclusion:** Cataract surgery is beneficial in improving the QOL and ADL in elderly patients above the age of 90 years. Nonetheless, the scenario occasionally warrants family support.

## Keywords

Cataract surgery, Elderly patients, Surgical outcomes, Patient's background, Living environment

## Abbreviations

QOL: Quality of Life; ADL: Activities of Daily Living; M: Male; F: Female; AMD: Age-Related Macular Degeneration; GLA: Glaucoma; ERM: Epiretinal Membrane; PCR: Posterior Capsular Rupture; ACT: Anterior Capsular Tear; HIOP: High Intraocular Pressure; CAB: Complete Atrioventricular Block; CI: Cerebral Infarction; RA: Rheumatoid Arthritis; HT: Hypertension; DM: Diabetes Mellitus; CVD: Cerebrovascular Disease; CRF: Chronic Renal Failure; HD: Hemodialysis; CSH: Chronic Subdural Hematoma; MI: Myocardial Infarction; AF: Atrial Fibrillation; AS: Aortic Stenosis; SAS: Sleep Apnea Syndrome; AMI: Acute Myocardial Infarction; HL: Hyperlipidemia; LSS: Lumbar Spinal Stenosis; Family: At Home with Family; Alone: Alone at Home; Aged: At Home for the Aged

## Introduction

Recent times have witnessed an increase in the number of people who undergo cataract surgery with the increase in age of the population. In particular, with the extension of healthy life expectancy, very elderly people above the age of 90 years without any history of prior cataract surgery are undergoing the same. Moreover, cataract surgery in very elderly patients is of consequence, owing to the fact that visual impairment causes disorders or situations that result in reduced QOL, such as cognitive decline or accidental falls that cause fractures. Nevertheless, it is also a fact that very elderly people tend to avoid cataract surgery, owing to the problems associated with day-to-day life and social background.

The purpose of the present study was to retrospectively analyze the postoperative outcomes, preoperative health status, and social background pertaining to the patients ≥ 90 years of age who underwent cataract surgery at our hospital and to assess the benefits of cataract surgery in very elderly patients.

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## Material and Methods

The current study considered the data pertaining to 21 patients (29 cases) ≥ 90 years of age who were diagnosed with cataract, which was attributed as the cause of uncorrectable vision loss, glare, or impaired vision, by means of ophthalmologic examinations and evaluations and were eligible for the surgical procedure. Among the subjects who were evaluated, one case was excluded on account of an acute glaucoma attack. Furthermore, two cases were excluded, owing to the lack of confirmation of postoperative visual acuity due to circumstances. In addition, another case was excluded on account of the fact that cataract surgery was not performed, owing to the changes in the patient's physical condition. All the patients provided preoperative consent regarding the use of patient information for research and written consent was obtained using the form provided by the Ethics Committee of our institution. Accordingly, the current study included 18 patients (25 cases). All the surgical procedures were performed by three skilled surgeons (Y.K., Y.I., and T.O.).

The primary outcome measures employed in the present study were improvement in postoperative visual acuity, incidence of intraoperative and postoperative complications, respective living environments, and the presence of underlying diseases. The data pertaining to age, preoperative and postoperative visual acuity, underlying diseases, ocular comorbidities, intraoperative and postoperative complications, and living environment were extracted and assessed.

## Results

In the present study, 20 cases were not diagnosed with any ocular comorbidities prior to the surgical procedure. The current study involved five cases with ocular comorbidities, i.e, one case of age-related macular degeneration, three cases of glaucoma, one case of epiretinal membrane, and one case of severe phacodonesis and zonulolysis. The intraoperative complications included a single case of posterior capsular tear and one case of anterior capsular tear. The postoperative complications included a single case of high intraocular pressure. In the current study, all the patients showed an improvement in visual acuity (Table 1).

Regarding the physical comorbidities, five patients had a history of diabetes mellitus (7 cases), seven patients had a history of hypertension (12 cases), and two patients had dementia (2 cases).

Regarding the social background of the subjects, nine patients (13 cases) were living at home with their family, three patients (5 cases) were living in elderly care facilities, and six patients (7 cases) were living alone at home, which included one patient (1 case) who was under treatment in a different hospital and one patient (1 case) who underwent a short hospital stay for postoperative management.

## Discussion

In Japan, increase in the incidence of systemic diseases such as diabetes mellitus and increase in the number of patients with dementia are developing into considerable problems as the age of the population increases, which is concurrent with the state of affairs in other developed countries [1]. Although some cataract patients above the age of 90 years may be physically and mentally healthy, others exhibit reduced ADL and require family support, owing to the progression of dementia. Furthermore, cataract surgery in the elderly is a challenging endeavor in certain situations on account of the social background and anatomical problems concerning the lens (hard nucleus and zonular fragility) that make the surgical procedure difficult. However, advancements in the field with reference to the machines, instruments, and surgical techniques employed have enabled safe execution of the surgical procedure, even in elderly patients [2].

The current study compared the data pertaining to cataract patients ≥ 90 years of age, which was obtained from the patient records, with prior reports. Primarily, the present study assessed the effect of underlying diseases on the surgical procedure. A previous study by Pershing, et al. reported that patients with dementia were more likely to have complex surgical procedures with operative duration of more than 30 minutes. However, the study did not observe a higher risk of surgical complications or postoperative hospitalizations among the patients with dementia, compared to those without the same [3].

Nearly all the patients involved in the current study had underlying diseases and all the subjects displayed improved visual acuity. The aforementioned results imply that cataract surgery is beneficial in very elderly patients, despite the presence of systemic complications.

Secondly, the present study assessed the incidence of intraoperative and postoperative complications. A previous study by Berler reported that intraoperative complications occurred in merely 3% of the patients below the age of 88 years and in 10% of those above the age of 88 years [4]. Moreover, a study by Toyama, et al. reported that there was no difference between younger and older patients in regard to the frequency of intraoperative and postoperative complications [5].

The current study included two cases of intraoperative complications (8%) and one case of postoperative complication (4%). Notwithstanding the unavailability of accurate statistics regarding the incidence of intraoperative and postoperative complications concerning all generations of cataract surgeries performed at our institution, the incidence of complications (12%) was low, compared to previous reports. However, the statistics could not be analyzed,

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**Table 1:** Patient and eye characteristics.

| | Sex | Age | Preope VA | postope VA | Post-pre VA | Ocular comorbidities | Intra-ope complications | Post-ope complications | Dementia | Underlying disease | Living environment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F | 95 | 1.4 | 0.22 | -1.18 | - | - | - | - | CAB | family |
| 2 | M | 95 | 0.22 | 0 | -0.22 | - | - | - | - | CI | family |
| 3 | F | 95 | 0.82 | 0.046 | -0.774 | - | - | - | - | RA, HT | family |
| 4[3] | F | 95 | 0.7 | 0 | -0.7 | - | PCR | - | - | RA, HT | family |
| 5 | M | 94 | 0.7 | 0.22 | -0.48 | - | - | - | - | HT, DM, CVD, CRF, HD | family |
| 6[5] | M | 94 | 1.7 | 0.22 | -1.48 | - | - | - | - | HT, DM, CVD, CRF, HD | family |
| 7 | M | 93 | 2 | 0.52 | -1.48 | AMD | - | - | - | DM | family |
| 8 | F | 93 | 0.4 | -0.08 | -0.48 | - | - | - | - | HT, CSH | alone |
| 9[8] | F | 93 | 0.22 | -0.08 | -0.3 | - | - | - | - | HT, CSH | alone |
| 10 | F | 92 | 2.3 | 0.046 | -2.254 | - | ACT | - | + | MI, AF | alone |
| 11 | M | 91 | 0.22 | 0 | -0.22 | - | - | - | - | HT, DM, AF | alone |
| 12 | F | 91 | 0.3 | 0.15 | -0.15 | - | - | - | - | HT, AS, SAS | family |
| 13[12] | F | 91 | 0.15 | 0.01 | -0.14 | - | - | - | - | HT, AS, SAS | family |
| 14 | M | 91 | 1.1 | 0.82 | -0.28 | gla | - | - | - | HT, AMI | alone *2 |
| 15 | F | 90 | 0.7 | 0.52 | -0.18 | *1 | - | HIOP | + | HT, HL | alone *3 |
| 16 | M | 90 | 1.5 | 0.52 | -0.98 | - | - | - | - | DM, CI | aged |
| 17[16] | M | 90 | 1.5 | 0.52 | -0.98 | - | - | - | - | DM, CI | aged |
| 18 | F | 90 | 1.7 | 0.01 | -1.69 | - | - | - | - | - | family |
| 19[18] | F | 90 | 0.52 | 0.3 | -0.22 | - | - | - | - | - | family |
| 20 | F | 90 | 0.4 | 0.15 | -0.25 | - | - | - | - | CI | aged |
| 21[20] | F | 90 | 0.4 | 0.15 | -0.25 | - | - | - | - | CI | aged |
| 22 | M | 90 | 0.15 | -0.18 | -0.33 | - | - | - | - | CI, AF | family |
| 23 | F | 90 | 0.4 | 0.15 | -0.25 | ERM, gla | - | - | - | LSS | aged |
| 24 | F | 90 | 0.3 | 0.15 | -0.15 | gla | - | - | - | DM, MI | family |
| 25 | F | 90 | 0.7 | 0.15 | -0.55 | - | - | - | - | HT, HL | alone |

*1: Severe phacodonesis and zonulolysis; *2: At another hospital for postoperative management; *3: In short stay for postoperative management



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on account of the varying size of target populations. In addition, the present study could not assess race-based differences.

Furthermore, the present study assessed the postoperative visual acuity of the subjects. A previous report by Berler published in the year 2000 reported that a visual acuity of 0.30 logMAR or above was achieved after complex cataract surgery in 90.5% of the patients below the age of 88 years, whereas the same was achieved in merely 40% of the patients above the age of 88 years [4]. A study by Westcott, et al. reported that in the absence of ocular complications, the probability of achieving a visual acuity of 0.30 logMAR or above was 4.6 times higher in the patients in the age group of 60-69 years, compared to the patients above the age of 80 years. The aforementioned results indicate that age is an important determinant of the visual outcome [6]. A previous study by Rosen, et al. published in the year 2009 reported that improved postoperative vision was observed in 68% of the patients ≥ 90 years of age, whereas 16% of the subjects did not display any change and decreased vision was observed in 16% of the patients [7].

Conversely, in the year 2019, Theodoropoulou, et al. reported that in the absence of ocular comorbidities, a postoperative visual acuity of 0.30 logMAR or above was observed in 84.7% of the patients above the age of 90 years. The abovementioned study implied that cataract surgery effects improved vision in a majority of patients and is safe even in very elderly patients [8]. The authors are of the opinion that this can be attributed to the advancements in the field, i.e, advances in equipment and refinement of the techniques employed in cataract surgery.

Interestingly, a previous study by Toyama, et al. reported that even though patients above the age of 90 years exhibited significant decline in both preoperative and postoperative visual acuity, younger and older patients displayed comparable postoperative improvement in visual acuity [5].

In the present study, all the patients had improved postoperative visual acuity and 19 patients (95%) had improved visual acuity of 0.30 logMAR or above.

Moreover, the current study showed that there was no difference between elderly patients who lived alone and those who lived with family in regard to the rate of improvement in vision. Nevertheless, in situations involving cataract surgery in elderly patients, the means of administration of postoperative ophthalmic medication and hospital visits may need to be established. As a matter of fact, tracking of some of the patients in the current study was challenging, owing to dropouts.

Furthermore, cataract surgery has been reported to slow the progression of dementia [9]. In an aging world, problems associated with healthcare and consumption of social resources, which is attributable to the increase in number of patients with dementia, pose a conundrum. The present study suggests that we are living in an age where even the very elderly can safely undergo cataract surgery and the procedure in patients above the age of 90 years may be beneficial for both the individual and society.

## Conclusion

The results of the present study indicate that cataract surgery is beneficial in improving the QOL and ADL in elderly patients above the age of 90 years. The surgical procedure can be considered as a therapeutic option, even in patients above the age of 90 years, if family support is available.

## Author Contributions

R.K., Y.K., Y.I., T.O., and T.N. designed the research project; Y.K., Y.I., and T.O. performed surgical procedures; R.K., Y.K., Y.I. and T.O. wrote the manuscript. All authors read and approved the final version of the manuscript.

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