

A Study of Visual and Anatomical Outcomes of Cataract Surgery with Intraoperative Complications in a Teaching Institute

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ABSTRACT

Introduction: To study the incidence, visual outcomes, and anterior segment anatomical outcomes of intraoperative complications of cataract surgery.

Materials and Methods: This is a prospective observational hospital-based study conducted in the department of Ophthalmology SRMS IMS, Bareilly, Uttar Pradesh. In this study, 70 patients were studied for 1.5 yrs from 1st of November 2019 to 13th of April 2021. All these patients with intraoperative complications were evaluated preoperatively and post-operatively for vision and anterior segment anatomical outcomes.

Results: In this study, the commonest intraoperative complication was Injury to Iris/ Iridodialysis (52.9%). Based on pre-operative vision, the patients had 5/60 and 6/36 vision with 30.0%, each followed by 6/24 (14.3%) and 3/60 (12.9%). Corneal hazy/edema was reduced to 10.0% at one-month follow-up from 52.9% on post-operative day one. Also, DM folds were reduced to 11.4% from 75.7% at day one.

Conclusions: In this study, visual outcome of the cataract surgery was much better, and there is a significant progression in the visual acuity. Routine monitoring of the visual outcome of the cataract surgery at each hospital would go in long-way to enhance both the quantity and quality of the surgery and thus decrease the substantial amount of burden of blindness on our country.

Keywords: Anterior segment anatomical outcomes, Cataract surgery, Intraoperative complications, Visual outcomes.

How to cite this article: Singh S, Mehrotra N, Batra R, Rizvi S. A Study of Visual and Anatomical Outcomes of Cataract Surgery with Intraoperative Complications in a Teaching Institute. SRMS Journal of Medical Sciences. 2022;7(1):11-14.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

The visual outcome and complication rates are the objective means of assessing the success of cataract

surgery. While the cataract surgery is effective and safe, irreversible blindness, either from complications of an advanced untreated cataract, or from complications of surgery might occur.¹ In addition, the associated ocular diseases increase the risk of complications and reduce the chance of good visual outcome.¹

Recognizing this cataract problem, the main emphasis of National Program for Control of Blindness (NPCB) in India was on cataract blindness control.² Several studies have indicated that the long-term visual outcome of cataract surgery is often far from optimal.³

Cataract extraction is the commonest surgery performed by ophthalmology residents in training in Western countries.⁴ Outcomes are generally positive, however, less experienced surgeons, be likely to have higher rates of complications, ranging from 3.8 to 10.2%.⁵

Studies have also shown that regularly monitoring cataract surgical services improves outcomes.^{4,6} Researchers have long highlighted the need to monitor surgical outcomes as cataract surgery is one of the most performed surgical procedures.

In India, there is a need for adequate training of ophthalmology residents before they can operate on the patients. Several studies report rates of intra-operative and post-operative complications in the resident performed surgeries, though few reports on the visual and anatomic outcomes.^{7,8}

India is the populous Asian country with a population up surged over past decade, resulting in increasing cataract surgery. The goals of the WHO vision 2020 initiative for the elimination of avoidable blindness are enhanced quality and the outcome of the cataract surgery. Thus, knowledge of possible intra-operative complications of cataract surgery is necessary for training and planning to limit them.

MATERIALS AND METHODS

This is a prospective observational hospital-based study, conducted in the department of Ophthalmology SRMS IMS, Bareilly, Uttar Pradesh. In this study, 70 patients were studied for 1.5 years from 1st November 2019 to 13th April 2021. The Institutional Review Board/Ethics approved the study

Submission: 12/03/22; **Acceptance:** 22/04/22; **Published:** 30/06/22

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Committee. Patients with senile cataracts above 55 years undergoing manual SICS with intraoperative complications were only considered in this study. The surgery performed by the residents (with a minimum of complete surgery >15) was done under the supervision of a consultant.

Whereas patients with post-operative complications were excluded. Also, patients with pre-operative morbidity account for poor visual outcomes. (patients with complicated cataract, poorly dilating pupils, uveitis subluxated lenses and zonular dialysis) and with systemic diseases like HTN and diabetes.

These patients underwent pre-operative evaluations: Visual acuity, Retinoscopy, Keratometry, Gonioscopy, Tonometry, slit lamp biomicroscopic evaluation, indirect ophthalmoscope and later, they were followed up on post-op day1, 1 week and 1 month. Post operatively, they were evaluated for vision and anterior segment anatomy on slit lamp biomicroscope, if required anterior segment OCT.

Collected data were analyzed using IBM SPSS Statistics software version 23.0 (IBM Corp, Armonk, NY, USA). All descriptive analysis was performed and presented with mean (SD) or median (IQR) for continuous variables and frequency (percentage) for categorical variables. Pearson Chi-square value was given for categorical variables. The coefficients reported were log-odds ratios, and the P P-values were generated using a Wald test. The level of statistical significance was $p < 0.05$ in this study.

RESULTS

In total, 517 patients were evaluated preoperatively for cataract surgery and of those 517 patients, 70 (13.5%) patients have developed intraoperative complications (Table 1). So, we have further performed a detailed study on these 70 patients.

- The mean age of the total studied patients was found to be 62.34 ± 4.94 years and many of the studied patients were males (54.3%) followed by females (45.7%) (Table 2).
- The right eye (68.6%) was affected in most of the patients and NS2 nuclear sclerosis in 55.7%, whereas Posterior sub-capsular cataract was present in 68.6% patients (Table 2).

Table 1: The incidence of intraoperative complications of cataract surgery

Patients	Number of patients (n=517)	Percentage (%)
Intra-operative complications	70	13.5
Without Intra-operative complications	447	86.5

- The commonest intraoperative complication was Injury to Iris/ Iridodialysis (52.9%) followed by premature entry to anterior chamber (41.4%) (Table 3).
- Based on pre-operative vision, the patients had 5/60 and 6/36 vision with 30.0% each followed by 6/24 (14.3%) and 3/60 (12.9%) (Figure 1).

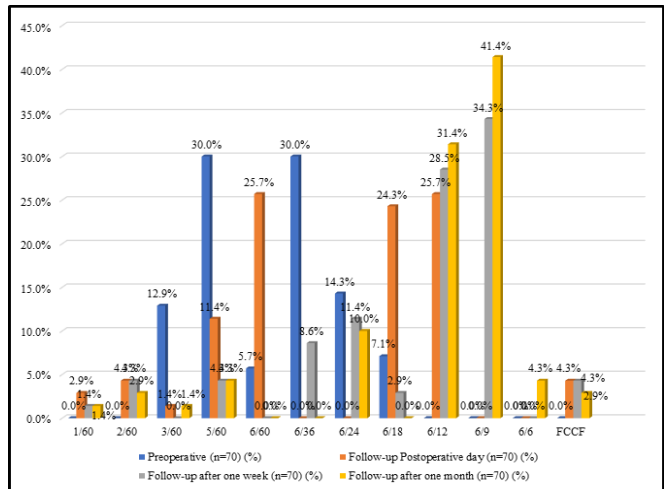


Figure 1: Comparison of vision at various follow up concerning pre-operative findings

Table 2: Demographic profile of the studied patients.

Variables	Frequency	Percentage (%)	
Age	<60	36	51.4
	>60	34	48.6
Sex	Male	38	54.3
	Female	32	45.7
Eye site	Left	22	31.4
	Right	48	68.6
Nuclear sclerotic	NS2 or Less	39	55.7
	NS3 or More	31	44.3
Posterior sub-capsular cataract (PSC) or Polar cataract	Yes	48	68.6
	No	22	31.4

Table 3: Frequency(n) and percentage (%) intra-operative Complication in the studied patients.

Intra-operative Complication	Frequency (n=70)	Percentage (%)
Retro Bulbar Haemorrhage	1	1.4
Buttonholing of Anterior Wall of Tunnel	5	7.1
Premature entry in anterior chamber	29	41.4
Injury to Cornea Descemet's Detachment	3	4.3
Injury to Iris/ Iridodialysis	37	52.9
Escaping Capsulorhexis	26	37.1
Posterior Capsular Rupture	13	18.6
Zonular Dehiscence	4	5.7
Vitreous Loss	15	21.4
Nucleus Drop	2	2.9
Iol Drop	1	1.4

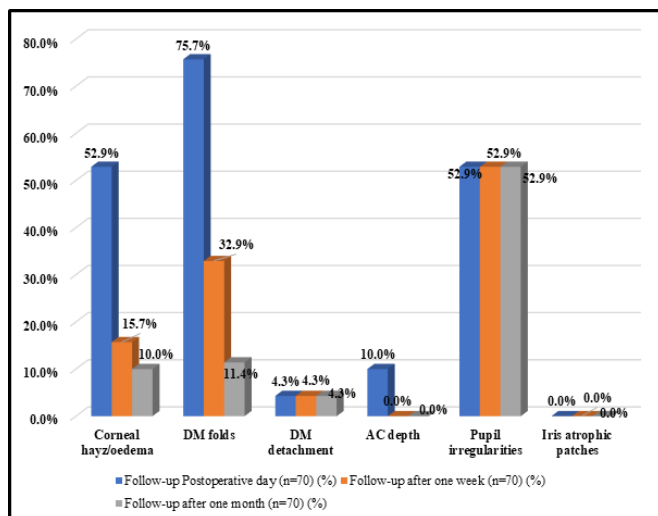


Figure 2: Anterior segment anatomical outcomes outcome at various follow-up.

- Corneal edema was reduced to 10.0% at one-month follow-up from 52.9% on post-operative day one. Also, DM folds reduces to 11.4% from 75.7% at day one, and AC depth reduce to 0.0% from 10.0% (Figure 2).
- Corneal Oedema and DM folds complications association was found to be statistically significant only for Posterior sub-capsular cataract and Nuclear sclerosis ($p < 0.05$) (Figure 2).

DISCUSSION

This prospective observational hospital-based study was performed to assess the visual and anatomical outcomes of the cataract surgery with intra-operative complications in the teaching institute in the Department of Ophthalmology SRMS IMS, Bareilly, Uttar Pradesh and the duration of the study was from 1st of November 2019 to 13th of April 2021 (1.5 years). The age at the presentation ranged from 55-80 years.

Much emphasis is laid upon increasing the coverage of cataract surgery. It includes organizing the eye camp surgeries by the government, and non-government organizations. Seeing the immense load of cataract blindness and the limited resources, it is not unlikely that the qualitative aspect might sometimes be overlooked.

In our study, the total 517 who underwent surgery 13.5% developed intraoperative complications and our findings were comparable to the study conducted by Pendke *et al.*, who reported that the intraoperative complications occurred in 9.8% of patients.

In present study, we observed that 36 (51.4%) patients were below 60 years of age while 34 (48.6%) were above 60 years of age and the mean age of the total studied patients was found to be 62.34±4.94 years. Our findings were comparable to Pendke *et al.*,⁹ who in their study reported that out of 824 cases, patients in 61 to 70 years

group were in the majority. 17 patients were above 80 years. Mean age group was 64.9 years. Rajurkar *et al.* reported that most patients were in age group of 46–60 years (63.33%), whereas the least cases were found in 16–30 years of age group.

In our study, most studied patients were males (54.3%), followed by females (45.7%). Vasantha⁹ reported similar results regarding the gender distribution as they reported 52.0% males and 48.0% females in their study.

In present study, it was found that the right eye (68.6%) was affected in the majority of the patients, NS2 nuclear sclerotic in 55.7% and Posterior sub-capsular cataract was present in 68.6% of patients. Kunwar *et al.*¹⁰ reported that out of 52 eyes studied, 26 (50.0%) were right eye, and 26 eyes (50.0%) were left.

In this study, it was found that the majority of the patients had injury to iris/iridodialysis, 52.9% followed by premature entry of anterior wall of tunnel.

In this study the visual acuity preoperatively was 6/36 (30.0%), 5/60 (30.0%), 6/24 (14.3%) and 3/60 (12.9%). Post operatively during the follow-ups, the VA becomes better in the majority of cases that, is 6/9 (41.4%) and 6/12 in 31.4%.

Vasantha¹¹ reported that most operations (60.0%) were performed on eyes with a pre-operative visual acuity of <6/60. Post-operative outcome was good in 86.0% of eyes, borderline in 8%, and poor in 4%. Limburg *et al.*³ stated the pre-operative and post-operative visual acuity for the operated eyes. Most operations (83.4%) were performed on eyes with a pre-operative visual acuity of <3/60. Post-operative outcome was good in 37.8% of eyes, borderline in 45.6%, and poor in 16.6%.

In our study at different follow-ups, it was found that Corneal edema was reduced to 10.0% at one month follow up from 52.9% at post-operative day one also DM folds reduced to 11.4% from 75.7% at day one, AC depth reduces to 0.0% from 10.0% and there was no difference seen in the pupil size before or after. Rajurkar *et al.*¹⁰ reported transient corneal edema was seen in 20% of patients, transient IOP elevation was seen in 10.0%, while vitreous hemorrhage and post-operative hyphaema was noted in 3.33% each.

Limitations of the Study

- Smaller sample size
- Surgically induced astigmatism, which is responsible for poor visual outcome, was not considered.

Strengths of the Study

- All the analysis was done based on the consent proforma.
- Very much reliable findings were obtained, which would be helpful in future perspective

REFERENCES

1. Al Faran MF. Visual outcome and complications after cataract extraction in Saudi Arabia. *British Journal of Ophthalmology*. 1990;74:141-143.
2. Jose R and Bachani D. World Bank assisted cataract blindness control project. *Indian J Ophthalmol*. 1995;43:35-43.
3. Limburg H, Foster A, Vaidyanathan K, GVS Murthy. Monitoring visual outcome of cataract surgery in India. *Bull WHO*. 1999;77:455-60.
4. Pascolini D and Mariotti SP. Global estimates of visual impairment: 2010. *Br J Ophthalmol*. 2012;96(5):614-8.
5. Rogers G, Oetting T, Lee A, Grignon C, Greenlee E and Johnson A. Impact of a structured surgical curriculum on ophthalmic resident cataract surgery complication rates. *J Cataract Refract Surg*. 2009;35:1956-60.
6. Jonas JB, George R, Asokan R, Flaxman SR, Keeffe J, Leasher J, et al. Prevalence and causes of vision loss in Central and South Asia: 1990-2010. *Br J Ophthalmol*. 2014;98(5):592-8.
7. Ti SE, Yang YN, Lang SS and Chee SP. A 5-year audit of cataract surgery outcomes after posterior capsule rupture and risk factors affecting visual acuity. *Am J Ophthalmol*. 2014;157(1):180-5:181.
8. Menda SA, Driver TH, Neiman AE, Naseri A and Stewart JM. Return to the operating room after resident-performed cataract surgery. *JAMA Ophthalmol*. 2014;132(2):223-4.
9. Pendke SS, Chauhan RA, Agrawal SO, Bhavsar CN and Bhalgat SS. Visual outcomes in cataract surgery. *Med. Res. Chron*. 2016;3(2):214-23.
10. Rajurkar S, Agrawal S and Chauhan R. A Study of Anatomical and Visual Outcome in Secondary Scleral Fixated Intra-Ocular Lens Implantation. *International Journal of Medical Science and Clinical Invention*. 2021;8(5):5387-5391.
11. Vasantha G. Outcomes of cataract surgery in rural population. *MedPulse International Journal of Ophthalmology*. 2021;17(1):01-03.
12. Kunwar S, Poudel J and Kattige J. To Assess the Intraoperative Complications in Small Incision Cataract Surgery and Visual Outcome. *Acta Scientific Ophthalmology*. 2020;3(8):48-53.