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Original Research Article

Cataract surgery in leprosy patients: visual outcomes and complications

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ABSTRACT

Background: Objective of study was to study the outcome of cataract surgery in terms of visual results and intra and postoperative complications in case of leprosy patient.
Methods: The study analyzed all new cataract cases with leprosy at the outpatient unit, including patients cured of leprosy with senile or complicated cataracts but excluding those with corneal or retinal issues. Small incision cataract surgery was performed, with outcomes and complications assessed. Data collection and analysis utilized descriptive statistics. Follow-ups occurred at discharge and 1-, 4-, and 12-weeks post-surgery, revealing visual acuity ranging from good (6/6-6/18) to poor (<6/60).
Results: The study involved 117 eyes from 98 patients (55 males, 43 females, ages 30-89). Pre-surgery, visual acuity was good in 6 eyes (5.12%), borderline in 29 (24.78%), and poor in 82 (70.08%). Post-surgery, 78 eyes (66.67%) had good, 25 (21.37%) borderline, and 10 (8.55%) poor visual acuity. At 12 weeks, 91.14% had good, 5.9% borderline, and 2.95% poor acuity. Common intraoperative issues included posterior capsular rupture in 8 eyes (6.84%), cortical matter loss in 4, iris prolapse in 2, and zonular dehiscence in 1. Early postoperative complications were iridocyclitis in 11 eyes (9.4%) and hyphema in 7 (5.98%), with late complications like chronic anterior uveitis, corneal decompensation, and choroidal detachment occurring in 3 and 2 eyes respectively.
Conclusions: Visual outcome was good and the rates of intra and post-operative complications were minimal in our study. Functional vision can be achieved with timely surgical intervention.

Key words: Leprosy, Cataract surgery, Visual outcome, Complications

INTRODUCTION

Rapid population growth, increased life expectancy, and rising socio-demographic status have led to epidemiological transition towards non-communicable diseases and disabilities. Most of the common causes of visual impairment have been affected by this transition resulting in increased demand for eye-care globally resulting in significant rise in healthcare cost.[1,2] As per WHO, over 2.2 billion people are visually impaired worldwide, and over 1 billion are living with preventable or treatable conditions due to lack of healthcare facilities.[3] Cataract continues to be among leading cause of blindness and moderate to severe visual impairment (MSVI) around the globe. In India, vision loss has affected an estimated 270 million people with a prevalence rate of 19.3%. Of these, 9.2 million (0.6%) people were blind.[3,4] Leprosy is a chronic infectious disease with global prevalence of 16.7 per million populations in 2020. Although the corresponding figure for India is 0.4 per 10,000 populations, India still continues to account for 60% of new cases reported around the globe annually.[5,6] Cataract remains the most common cause of blindness in leprosy patients. In addition to the risk of age-related cataract, individuals with leprosy are more likely to experience complicated

cataract because of acute or chronic uveitis, which has been shown to roughly triple the risk of cataract development.[7] Leprosy and Cataract are related to each other in many ways. Due to increased life expectancy, the incidence of cataract increases in both cured and uncured populations. The risk of typical age-related cataract remains the same while that of complicated cataract increases among multibacillary patients and the loss of sight further adds to their disability burden.[8] Most of the leprosy patients are from poor socioeconomic background and are stigmatized, thus less likely to access the healthcare facilities. Finally, multidrug therapy does not prevent eye complications and sequelae. Jharkhand state accounts for nearly 10% of total case load of leprosy in India and around 25-30 thousand new leprosy cases are reported annually.[5] The outcome of cataract surgery has not been studied in Jharkhand.

Aims and objectives

Objective was to study the outcome of cataract surgery in terms of visual results, intra and postoperative complications at a tertiary care center in Ranchi, Jharkhand, India.

METHODS

Study design, setting and participants

It is a hospital based retrospective study. The study was done at Regional Institute of Ophthalmology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India, starting from November 2020 till October 2022 for two years. A total of 98 patients were recruited consecutively. Out of which, 19 had cataract in both eyes, thus the total number of eyes who had cataract surgery was 117.

Inclusion and exclusion criteria

The inclusion criteria were all Patients of multi as well as paucibacillary leprosy that have completed multidrug therapy course, declared cured and were having Senile & Complicated Cataract. Exclusion criteria were presence of corneal opacity and retinal pathologies.

Study procedure

All patients underwent complete evaluation before surgery. Ocular comorbidities and complications were noted. Snellen's chart was used for visual assessment, bio-microscopic examination was done by slit lamp, intraocular pressure measurement was done by NCT, and indirect ophthalmoscopy after pupil dilatation was done for posterior segment examination and ocular B-scans were done in all case pre-operatively on a routine basis. Infective disorders of ocular adnexa were looked for and were treated accordingly. Systemic comorbidities such as Hypertension, Diabetes Mellitus and Cardiac diseases were noted carefully and referrals to appropriate specialties were sought for its management. Patients on antiplatelet and anticoagulant agents were instructed to discontinue the medications three days prior to surgery. SRK-II formula was used to calculate IOL power after doing Keratometry and A-Scan. All patients were operated on under peribulbar anesthesia. The surgical technique used was Small Incision Cataract Surgery (SICS) with implantation of Rigid Polymethyl Methacrylate (PMMA) IOLs as PCIOLs. Subconjunctival injection of Dexamethasone (0.25 ml of 0.4%) and Gentamycin (0.25 ml of 4%) was given. Intraoperative complications were recorded. Topical antibiotics and corticosteroids were given to all patients after surgery. Cases of uveitis and striate keratopathy were treated with mydriatic agents and hypertonic saline respectively.

Data analysis

During the first postoperative day, one week, four weeks, and twelve weeks, we measured visual acuity and reported it as good (6/6-6/18), borderline (6/18-6/60), and bad (<6/60). At every visit, surgical complications; both immediate and delayed were recorded.

RESULTS

In our study, out of 98 patients (117 eyes), 55 were Males and 43 were Females.

Table 1: Details of ocular comorbidities and preoperative complications.

Complications	No. of eyes	%
Madarosis	19	16.24
Hyper mature cataract	16	13.67
Loss of eyebrows	13	11.11
Posterior synechiae	11	09.40
Iris atrophy	6	05.13
Pterygium	5	04.27
Secondary glaucoma	5	04.27
Trichiasis	5	04.27
Active chronic iridocyclitis	4	03.42
Lagophthalmos	3	02.56
Seclusio pupil	1	00.85

Table 2: Details of intraoperative complications.

Complications	No. of eyes	%
Posterior capsular rupture with vitreous loss	8	06.84
Posterior loss of cortical matter	4	03.42
Iris prolapsed	2	01.71
Zonular dehiscence	1	00.85

Although the commonest age group was 50-59 years (n=55, 56.12%), their age ranged from 30-89 years. Preoperative anterior segment findings included posterior synechiae in 11 (9.4%) eyes, iris atrophy in 6 (5.13%) eyes, active chronic iridocyclitis in 4 (3.42%) eyes,

lagophthalmos in 3 (2.56%) eyes and seclusio pupil in 1 (0.85%) eye. As mentioned earlier, all patients with corneal opacities and retinal pathologies were excluded from this study.

Table 3: Details of complications during immediate postoperative period.

Complications	No. of eyes	%
Iridocyclitis	11	09.40
Hyphema	7	05.98
Cortical matter in anterior chamber	5	04.27
Shallow anterior chamber	4	03.42

Table 4: Details of complications during late postoperative period.

Complications	No. of eyes.	%
Chronic anterior Uveitis	3	02.56
Corneal decompensation	2	01.71
Choroidal detachment	2	01.71
Retinal detachment	1	00.85

Overall, 88 eyes (75.21%) were having one or another comorbidities or complications. Four eyes were left aphakic (3.42%) due to intra-operative complications mainly due to inadequate posterior capsular support, hence were excluded from final outcome analysis. During surgery, the most frequent complication was posterior capsular rupture with vitreous loss seen in eight (6.84%) eyes. Posterior loss of cortical matter and iris prolapsed were other notable complications while Zonular dehiscence occurred in one eye.

Iridocyclitis and hyphema were the two most common complications seen during first postoperative week in eleven and seven eyes respectively. The presence of cortical matter in anterior chamber was observed in five eyes while four eyes were found to have shallow anterior chamber. The most frequent complication after four weeks of surgery was chronic anterior uveitis seen in three eyes. Decompensation of cornea occurred in two eyes. Two eyes had detachment of choroid while retinal detachment was observed in one eye. Visual acuity was poor in 82 eyes, borderline in 29 eyes and good in 6 eyes before surgery while postoperatively at the time of discharge, it was good in 78 eyes, borderline in 25 eyes and poor in only 10 eyes. During follow up, at one week, 72 eyes were examined, out of which 64 had good visual acuity, while 19 of 21 eyes (90.48%) examined at final follow up at 12 weeks were having good visual acuity.

Table 5: Visual Acuity; Preoperatively & Postoperatively at discharge.

Variables, N (%)	Poor: Less than 6/60	Borderline: 6/18 to 6/60	Good: 6/6 to 6/18	Odds ratio (95% CI)
Preoperatively	82 (70.08)	29 (24.78)	6 (05.12)	-
Postoperatively	10 (08.85)	25 (22.12)	78 (69.03)	-

Table 6: Follow up; Best corrected visual acuity.

Best corrected visual acuity, N (%)	1 week (n=72)	4 weeks (n=50)	12 weeks (n=21)	Mean
Good: 6/6 to 6/18	64 (88.89)	45 (90.00)	19 (90.48)	91.14
Borderline: 6/18 to 6/60	5 (6.94)	3 (6.00)	1 (4.76)	5.90
Poor: Less than 6/60	3 (4.17)	2 (4.00)	1 (4.76)	2.95

DISCUSSION

The study results present a comprehensive overview of surgical outcomes for a group of 98 patients who underwent eye surgery, involving a total of 117 eyes. The patient cohort is almost evenly divided between males (55) and females (43), with the most common age group being 50-59 years. Several patients presented with preoperative ocular conditions, including posterior synechiae, iris atrophy, and chronic iridocyclitis, which are complications that can impact surgical outcomes. During surgery, the most frequent complication was posterior capsular rupture with vitreous loss, affecting 6.84% of eyes. This specific complication can increase the risk of poorer postoperative outcomes. Post-surgery, the most common complications observed in the first week were iridocyclitis and hyphema, both of which are significant as they can lead to discomfort and potentially impact the healing process. The visual acuity results show a dramatic improvement post-surgery. Before surgery, most eyes (70.08%) had poor visual acuity, but this number decreased substantially to 8.85% post-surgery. Good visual acuity was achieved in 69.03% of eyes at the time of discharge, a significant increase from only 5.12% preoperatively. During follow-up visits, the improvement in visual acuity was largely sustained. At 12 weeks post-surgery, 90.48% of examined eyes maintained good visual acuity. The results highlight the effectiveness of the surgical intervention in significantly improving visual acuity among the patients. Despite the occurrence of some intraoperative and early postoperative complications, the long-term outcomes were favorable, with a high percentage of patients achieving and maintaining good visual acuity. These findings suggest

that while there are inherent risks in eye surgery, the procedures used can be highly beneficial, especially in terms of enhancing visual acuity. This success is crucial for the patient's quality of life, particularly for those in the predominant age group of 50-59 years, who may be significantly impacted by vision loss. The study underscores the importance of careful patient selection and management of complications to achieve the best surgical outcomes. A study by Lundström et al provides an extensive analysis of 368,256 cataract surgeries across Europe. The study reported excellent visual outcomes, with a corrected distance visual acuity (CDVA) of 0.5 (20/40) or better achieved in 94.3% of cases and CDVA of 1.0 (20/20) or better in 61.3% of cases. The study highlights that ocular comorbidity and postoperative complications significantly influenced visual outcomes, underscoring the need for preoperative assessment and careful management of ocular conditions to optimize surgical results.[9] A study by Qin et al emphasizes the importance of using electronic systems for tracking outcomes post-cataract surgery. While specific statistics were not detailed, the review suggests that systematic outcome tracking can significantly improve patient results by facilitating the adoption of best practices and managing complications efficiently. This approach has the potential to enhance overall surgical care and patient satisfaction.[10]

Another study by Thanigasalam et al reviewed 1,632 cataract surgeries to identify factors affecting complication rates and visual outcomes. The study concluded that phacoemulsification, compared to other surgical techniques, showed fewer complications and superior visual outcomes. It highlights that the expertise of the surgeon, the type of anesthesia used, and the patient's preoperative ocular health are critical in predicting the success of cataract surgeries.[11] A study by Donthineni et al focused on the impact of dry eye disease on cataract surgery outcomes. The study, which included 668 eyes, found significant improvement in median LogMAR best corrected visual acuity from 1.1 at baseline to 0.1 at six weeks post-operatively.

The research emphasizes that despite the challenges posed by dry eye conditions, tailored surgical approaches can lead to effective visual outcomes with manageable complication rates.[12] Pracha et al in an audit for cataract surgery outcome found it to be 97.2%.[13] Yorston et al has reported a figure of 73.1% and in another study done in east Africa, best corrected visual acuity was reported in 94.3% of the patients.[14,15] With population growth and increase in life expectancy, the incidence of cataract is increasing among leprosy patients resulting in increased burden and demand of ophthalmologists. Healthcare services should identify patients in early stage of disease with timely referral to ophthalmology centers for expert eye care. Barriers preventing patients from getting surgical services should be identified and need to be taken care of appropriately.

Limitations

Study limitations include its retrospective design, single-center setting, small sample size, challenges with patient follow-up, reliance on medical records for data collection, potential confounding factors, and limited duration of follow-up, which may impact the generalizability and reliability of the findings.

CONCLUSION

In our study the visual outcome was good and the rates of intra and post-operative complications were minimal showing that functional vision can be achieved with timely surgical intervention. The results obtained were comparable with similar studies done in other parts of the world. Cataract surgery is safe in patients with leprosy and should be offered to all patients on a timely basis at a good ophthalmology center to improve the quality of life and minimize visual loss therefore preventing double handicap.

Recommendations

It is highly recommended for ophthalmologists and healthcare providers dealing with leprosy-affected populations. Implementing such surgical interventions can greatly enhance the quality of life for these patients, minimizing visual loss and the associated burden of disability. The research underscores the importance of timely surgical intervention and highlights the necessity for good ophthalmological care in managing cataract among leprosy patients.

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