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Original Research Article



OUTCOMES OF PSEUDOPHAKIA SURGERY: AN EVALUATION OF EARLY AND LATE POSTOPERATIVE COMPLICATIONS.

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ABSTRACT

OBJECTIVE: To evaluate the outcomes of intraocular lens implantation in terms of early and late postoperative complications. **MATERIAL AND METHODS:** This retrospective study was conducted at the Department of Ophthalmology, Liaquat University of Medical and Health Sciences, Jamshoro. Patients who had undergone pseudophakia intraocular lens implantation and for whom comprehensive preoperative, intraoperative, and postoperative medical records were studied. On the first postoperative day, cases were examined using a slit lamp, and relevant findings were documented for each case. In most instances, patients were discharged on the first postoperative day after measuring visual acuity and conducting slit lamp examinations of the cornea, anterior chamber, iris, intraocular implant, anterior vitreous, and assessing suture and wound condition. Follow-up examinations included measurements of visual acuity, refraction, slit lamp examinations, ophthalmoscopy, and tonometry. The patients were given dark glasses for 2 weeks post operatively and after 6 weeks correcting spectacles were prescribed. SPSS version 21 was used for the purpose of data entry and analysis. **RESULTS:** There were 59.0% males and female patients were 40.0% of the total implant patients, with overall mean age of 49.23+24.33 years. Majority of patients had unilateral cataract 81.0%. As per the retrospective various complications, retrobulbar hemorrhage was found 31.5%. Concerning intraoperative complications, capsular rupture was occurred in 7 patients, zonular breaks occurred in I case. Early postoperative complications included striate keratopathy 5.5%, fibrinous reactions 3.5%, pupillary block glaucoma 0.5%, endophthalmitis 0.5%, and panophthalmitis was 1.5%. Late postoperative complications included pupillary capture 5.5%, followed by corneal decompensation and cystoid macular edema 0.5%. Peripheral opacification was 1.5%, central mild opacification 1.0%, central moderate opacification 0.5% and central severe opacification 0.5%. **CONCLUSION:** Intraocular lens implantation is the most suitable procedure for visual rehabilitation in patients who have undergone cataract extraction. The overall outcomes of its implantation are generally favorable, with a few notable early and late postoperative complications.

KEY WORDS: IOL, Early Complications, Delayed Complications

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INTRODUCTION

Cataract surgery is the primary method for addressing vision impairment and blindness on a global scale, with cataracts being the predominant cause.¹ Currently, this surgical procedure stands as the most successful approach to restoring vision. During cataract surgery, the opaque natural lens of the eye is extracted and substituted with an artificial intraocular lens, resulting in improved vision.¹ The occurrence of cataracts in individuals aged 40 years and older is estimated to range from approximately 11.8% to 18.8%.² As per the findings of the Malaysia National Eye Survey II conducted in 2014, the majority of cases of blindness 58% and visual impairment 68% were attributed to cataracts.^{3,4} In terms of the

combined prevalence of blindness and vision impairment across all age groups, Pakistan holds the third position among South Asian nations, following India and Bangladesh, with a total of 21.78 million affected individuals.⁵

At present, surgical intervention remains the sole effective method for addressing cataracts.² The effectiveness of cataract surgery hinges on its end result, specifically the enhancement of visual acuity VA. It is of significant importance to identify risk factors that influence the visual outcome of cataract surgery.³ This helps in enhancing the quality of cataract surgery by allowing surgeons to implement additional preoperative or intraoperative measures aimed at reducing surgical complications.³ Surgical techniques have evolved as the principal

approach to managing cataracts, and the implantation of intraocular lenses IOLs following cataract removal can rectify refractive issues, ultimately bringing a patient's vision back to an acceptable level.^{6,7} Various methods exist for eliminating the lens, and there is a wide array of intraocular lens options accessible for implantation. Until the last two decades, the most commonly employed surgical method for cataract treatment was the extracapsular cataract extraction ECCE combined with the placement of a posterior chamber intraocular lens PCIOL.⁸ However nearly it was believed phacoemulsification, manual small incision cataract surgery MSICS, and ECCE each hold their own significance and should be chosen based on the specific characteristics and risk factors associated with the cataract in question.⁸ The outcomes of cataract surgery can be influenced by the initial or subsequent implantation of intraocular lenses IOLs.⁹ While intraocular surgery is generally safe and is usually performed without significant complications, certain patients may require a second procedure to either exchange or remove the IOL.^{9,10} While this procedure is generally safe and effective, it is essential to be aware of potential complications that can occur both in the early and late postoperative periods. However, each technique possesses its unique set of risks associated with postoperative complications.¹¹ This retrospective study has been done to evaluate outcomes in Pseudophakia Surgery in terms of early and late postoperative complications.

MATERIAL AND METHODS

The present retrospective study was conducted at the Department of Ophthalmology, Liaquat University of Medical and Health Sciences, Jamshoro. The study patients record who had undergone pseudophakia intraocular lens implantation using the extracapsular cataract extraction ECCE technique and phacoemulsification. Patients who had undergone pseudophakia intraocular lens implantation and for whom comprehensive preoperative, intraoperative, and postoperative medical records were available. Additionally, included patients had adequate follow-up data, including both early within 30 days and late beyond 30 days postoperative assessments. Patients who had undergone additional ocular surgeries or interventions that could potentially confound the assessment of outcomes, individuals with ocular conditions or comorbidities unrelated to the study of ECCE outcomes in pseudophakia and those with inadequate follow-up data, including those lost to follow-up before the required postoperative assessments, were not considered in the study. Ocular assessments included the evaluation of macular function in the cataractous eye and the measurement of uncorrected and corrected visual acuity in the normal eye. External examinations of both eyes, ocular motility tests, and slit lamp examinations of both normal and cataractous eyes were performed as per medical

record. Intraocular pressure measurements were typically conducted using Schiotz tonometry, although applanation tonometry was utilized in some cases preoperatively. Refraction of the normal eye was carried out meticulously, while the refractive status of the cataractous eye was determined based on historical data and pre-cataractous prescription records. As part of the preoperative routine, patients were administered topical antibiotic drops chloramphenicol at a frequency of 1 drop every 6 hours and a systemic antibiotic for one day prior to the surgery. Pupillary dilation was achieved using Tropicamide 1% eye drops 1 drop every 5 minutes, repeated five times on the morning of the operation day. In some cases, a combination of Tropicamide 1% and phenylephrine 10% was employed. Non-steroidal anti-inflammatory drops were used in certain instances to prevent pupillary constriction during the surgical procedure. On the first postoperative day, cases were examined using a slit lamp, and relevant findings were documented for each case. In most instances, patients were discharged on the first postoperative day after measuring visual acuity and conducting slit lamp examinations of the cornea, anterior chamber, iris, intraocular implant, anterior vitreous, and assessing suture and wound condition. Follow-up examinations included measurements of visual acuity, refraction, slit lamp examinations, ophthalmoscopy, and tonometry. According to the postoperative follow-up, the first postoperative visit occurred one week after the surgery, the second postoperative visit took place three weeks after the surgery, the third postoperative visit was scheduled for five weeks post-surgery, and the fourth postoperative visit was conducted at the three-months. The patients were given dark glasses for 2 weeks post operatively and after 6 weeks correcting spectacles were prescribed. All the demographic information including early and late postoperative complications were documented via self-structured study proforma. SPSS version 21 was used for the purpose of analysis.

RESULTS

There were 59.0% males and female patients were 40.0% of the total implant patients, with overall mean age of 49.23+24.33 years. The majority of patients had unilateral cataract 81.0%, while a smaller proportion had bilateral cataract 19.0%. Among the patients, several associated ocular conditions were observed, with the most common being uveitis in 14.0% cases, followed by pterygium in 5.0% cases, pseudoexfoliation in 2.0% cases, chronic simple glaucoma in 3.0% cases, secondary glaucoma was in 1.0% cases and paracentral corneal opacity was in 1.0% cases. Corneal degeneration and corneal dystrophy were present in 1.0% and 0.5% cases respectively. Nystagmus was observed in one case. In terms of associated diseases, 44 patients 22.0% had diabetes, 48 patients 24.0% had hypertension, and 2 patients 1.0% had asthma. Table. 1

In this retrospective study, the occurrence of various complications is outlined. Retrobulbar hemorrhage was observed in 31.5% of the cases. Concerning intraoperative complications, capsular rupture was encountered in 7 patients during surgeries involving vitreous loss, while zonular breaks occurred in 0.5% of the cases. While no cases of suprachoroidal complications were recorded during surgery. Early postoperative complications included striate keratopathy 5.5%, fibrinous reactions seen 3.5%, pupillary block glaucoma 0.5%, endophthalmitis was recorded in 1 patient, and panophthalmitis

was identified in 1 patient. Late postoperative complications included pupillary capture, observed in 11 patients 5.5%, followed by corneal decompensation noted in 1 patient, cystoid macular edema was seen in 1 patient. In terms of opacification of posterior capsule, peripheral opacification occurred in 3 patients, central mild opacification was identified in 2 patients, central moderate opacification was reported in 1 patient and central severe opacification was observed in 1 patient 0.5%.
Table. 2

Table. 1. Demographic and clinical characteristics of patients n=200

Variables		No. of patients	%
Gender	Male	120	60.0%
	Female	80	40.0%
Laterality of cataract in implant patients	Unilateral	162	81.0%
	Bilateral	38	19.0%
Associated ocular conditions	Pterygium	10	05.0%
	Corneal opacity paracentral	02	01.0%
	Uveitis	28	14.0%
	Corneal degeneration	02	01.0%
	Corneal dystrophy	01	0.5%
	Pseudoexfoliation	04	02.0%
	Chronic simple glaucoma	06	03.0%
	Secondary glaucoma	02	01.0%
	Nystagmus	02	01.0%
	Associated disease	Diabetes	44
Asthma		02	01.0%
Hypertension		48	24.0%

Table. 2. Intraoperative, early and late postoperative complications of Pseudophakia n=200

Complication		No. of patients	%		
Retrobulbar hemorrhage		03	1.5%		
Intraoperative complication	Capsular rupture	With vitreous loss	07	3.5%	
		Without vitreous loss	-	-	
	Zonular break		01	0.5%	
	Supra choroidal		-	-	
Post operative complications	Early	Striate keratopathy	11	05.5%	
		Fibrinous reaction	07	3.5%	
		Pupillary block glaucoma	01	0.5%	
		Endophthalmitis	01	0.5%	
		Panophthalmitis	1	0.5%	
	Late	Pupillary capture	11	5.5%	
		Toxis suture syndrome	-	-	
		Corneal decompensation	1	0.5%	
		Cystoid macular edema	1	0.5%	
		Opacification of posterior capsule			
		Peripheral	03	1.5%	
		Central mild	2	1.0%	
Central moderate	1	0.5%			
Central severe	1	0.5%			

DISCUSSION

Intraocular lens IOL implantation is a well-established and effective surgical procedure for restoring clear vision in patients who have undergone cataract extraction. While the majority of patients experience favorable

outcomes, it is essential to acknowledge and discuss the potential early and late postoperative complications that can occur as part of the comprehensive patient care process. This study was conducted to assess the results of intraocular lens implantation concerning both early and late

postoperative complications. In this study there were 59.0% males and female patients were 40.0% of the total implant patients, with overall mean age of 49.23 ± 24.33 years. In the comparison of this study Thanigasalam T et al¹² reported that the average age of the patients was 66.9 years, and there was an even distribution between genders. In another study by Raza MI et al¹³ reported that out of all study subjects, 25 individuals 41.7% were male, while 35 individuals 58.3% were female, with an average age of 56.15 ± 4.90 years. Sanaullah MS et al¹⁴ found average age of the patients 63.77 ± 5.27 years, with 56% of them being female and 44% being male. The higher proportion of male patients in our study compared to other research studies can be attributed to the retrospective nature of our data collection, which reflects the demographics of the specific patient pool during the data collection period. Additionally, differences in sample size and selection criteria can contribute to variations in the gender distribution of participants.

In terms of comorbidities, 44 patients 22.0% had diabetes, 48 patients 24.0% had hypertension, and 2 patients 1.0% had asthma. In the comparison of this series Alsarhani DK et al¹⁵ found higher rate of comorbidities, hypertension was the most commonly documented comorbidity 71%, followed by 62.1% dyslipidemia, 8.3% hypothyroidism and 3.4% obesity. Kim BZ et al¹⁶ also found higher rate of comorbidities as 59% hypertension and 31% diabetes mellitus. This higher rate of comorbidities in other studies may be because in their study mostly patients were aged with mean age of more 70 years.

In terms of comorbidities, our study revealed that 44 patients 22.0% had diabetes, 48 patients 24.0% had hypertension, and 2 patients 1.0% had asthma. When comparing our findings to the study conducted by Alsarhani DK et al., it's evident that they reported a higher rate of comorbidities, with hypertension being the most frequently documented comorbidity at 71%, followed by dyslipidemia at 62.1%, hypothyroidism at 8.3%, and obesity at 3.4%. Similarly, Kim BZ et al. also identified a higher prevalence of comorbidities, with 59% of their patients having hypertension and 31% having diabetes mellitus. One possible explanation for the higher prevalence of comorbidities in other studies could be related to the age of the patient populations. In these other studies, the majority of patients were older, with a mean age of over 70 years. Advanced age is often associated with an increased likelihood of having comorbid conditions, which could account for the elevated rates observed in those studies.

In this retrospective study, the occurrence of various complications is outlined. Retrobulbar hemorrhage was observed in 31.5% of the cases. Concerning intraoperative complications, capsular rupture was encountered in 7 patients during surgeries involving vitreous loss, while zonular breaks occurred in 0.5% of the cases. While no cases of suprachoroidal complications were recorded during surgery. Early

postoperative complications included striate keratopathy 5.5%, fibrinous reactions seen 3.5%, pupillary block glaucoma 0.5%, endophthalmitis was recorded in 1 patient, and panophthalmitis was identified in 1 patient. Late postoperative complications included pupillary capture, observed in 11 patients 5.5%, followed by corneal decompensation noted in 1 patient, cystoid macular edema was seen in 1 patient. In terms of opacification of posterior capsule, peripheral opacification occurred in 3 patients, central mild opacification was identified in 2 patients, central moderate opacification was reported in 1 patient and central severe opacification was observed in 1 patient 0.5%. In the comparison of this study Thanigasalam T et al¹² reported that the intraoperative issues were observed in 21% of the subjects, and postoperative complications encompassed occurrences of endophthalmitis, as well as the need for additional surgical procedures attributed to complications like iris prolapse, wound dehiscence, or dislocated intraocular lenses. Honjo M et al¹⁷ reported that among postoperative complications, fibrin reactions occurred in 10% 8 eyes, posterior synechia of the iris was observed in 14% 11 eyes, and 10% 8 eyes experienced a recurrence of retinal detachment. According to another study the complications were observed in 2.5% when phacoemulsification was conducted, whereas they occurred in 4.1% when extracapsular cataract extraction ECCE was employed.¹⁸ According to this study Castells et al.¹⁶ also discovered that patients who underwent phacoemulsification experienced fewer intraoperative complications when compared to those undergoing ECCE, particularly with regards to occurrences of intraoperative iris trauma $P = 0.004$.¹⁶ Consistent with the findings of Castells et al., our study also revealed a lower incidence of intraoperative complications in patients undergoing phacoemulsification when compared to those opting for extracapsular cataract extraction ECCE. However, it's essential to acknowledge that our study primarily comprises retrospective data, where the majority of cases involved ECCE, and only a minority underwent phacoemulsification. While our findings align with the benefits of phacoemulsification, the imbalance in the distribution of surgical techniques within our dataset should be considered when interpreting these results.

CONCLUSION

Intraocular lens implantation is the most suitable procedure for visual rehabilitation in patients who have undergone cataract extraction. The overall outcomes of its implantation are generally favorable, with a few notable early and late postoperative complications. The extracapsular cataract extraction was the procedure of choice of the surgeons before the inclusion of a phacoemulsification. Phacoemulsification procedure is superior to extracapsular cataract extraction in carefully selected cases. By following best practices in

patient evaluation, surgical expertise, and postoperative care, favorable outcomes can be enhanced.

ETHICS APPROVAL: The ERC gave ethical review approval.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

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CONFLICT OF INTEREST: No competing interest declared.

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