Original Article

Visual Outcome of Cataract Surgery after Phacoemulsification

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Purpose: To observe the effect of phacoemulsification cataract surgery on visual acuity as well as record the frequency of complications associated with this procedure.

Study design: Observational study.

Place and duration of study: The study was conducted at Khalifa Gul Nawaz Teaching Hospital (KGNTH), Bannu, Pakistan from Jan. 2014 to Dec. 2016.

Material and Methods: Patients who had significant senile cataract affecting quality of life were included in the study. Patients suffering from congenital, traumatic, secondary cataract amblyopia, corneal opacity, uncontrolled glaucoma, uncontrolled diabetes, severe diabetic retinopathy, diabetic macular edema or other retinal diseases were also excluded. All the included patients underwent assessment of their preoperative unaided visual acuity (UCVA) and best corrected visual acuity (BCVA). Detailed slit lamp examination including both anterior and posterior segments was carried out. Patients were reviewed on day 1, 14 and then at 01 month. Postoperative UCVA and BCVA were noted at 04 weeks.

Results: A total of 1061 eyes of 772 patients suffering from senile cataract were included in the study. Mean age of patients was 63.77 ± 5.27 years, 56% (594) of the patients were females while 44% (467) were males. All the surgeries were performed under local anesthesia. 54% (622) of the eyes were right while 46% (439) were left. Good final visual outcome was seen in 80.5% of the cases. Intraoperative complications occurred in 5.4% (60) eyes of patients and posterior capsular rupture seen in 3.01% (32).

Conclusion: Phacoemulsification is safe and effective procedure with good visual outcome if performed in experienced hands under meticulous disinfection and aseptic measures.

Keywords: Phacoemulsification, Cataract surgery, Visual outcome, Posterior capsular rupture.

Age related cataract is one of the leading cause of reversible blindness all over the world and its treatment can be traced back to 4000 years ago in ancient Egypt[1,2]. Cataract surgery is one of the commonest surgical procedure carried out all over the world and the number of cataract patients undergoing surgery are about 19 million per year and this number is expected to reach about 30 million by 2020[3,4].

Standard surgical procedure for cataract extraction is phacoemulsification, which utilizes ultrasonic waves to emulsify the cataract. Although this procedure is simple, safe, quick, and induces lesser amount of corneal astigmatism as compared to manual extracapsular cataract surgery (ECCE) it can be associated with complications such as corneal edema, posterior capsular rupture, macular edema

and endophthalmitis[5,6,7]. The clinical and refractive outcome of phacoemulsification and the associated risk of complications has largely been improved over the last decade with new machines and advent of premier intraocular lenses. The advancements in the evolution of latest techniques of cataract surgery has led us to the point that patients as well as surgeon have started expecting emmetropia after surgery[8,9].

In conventional phacoemulsification, manual creation of incision, capsulorhexis and phacoemulsification can affect the clinical as well as refractive outcome of surgery and the results can vary among the surgeons. The final visual acuity is the prime outcome measure which define the success of cataract surgery. World health organization (WHO) has categorized postoperative visual outcome of cataract surgery into three groups; good vision (6/6 - 6/12), impaired vision (6/18 – 3/60) and poor vision (< 3/60)[10]. Various studies has been conducted across the globe on assessing postoperative visual outcome of cataract surgery. Many authors concluded that 21 – 50% of patients have unaided visual acuity (VA) of worse than 6/18 and 11-25% have best corrected visual acuity (BCVA) of worse than 6/60 after cataract surgery[11,12].

The visual outcome of cataract surgery is dependent upon variety of preoperative factors such as selection of patients, visual potential, technique of cataract surgery, intraoperative complications and postoperative care[13,14]. Most of these factors are modifiable and can be improved which can therefore, improve the visual outcome and patients' satisfaction. The rationale of conducting this study is to do a clinical audit of this tertiary care hospital and measure the outcome of cataract surgery. This will help us understand and improve upon our surgical practices for management of patients.

METHODOLOGY

This was an observational study that was conducted at Army Field hospital, KGNTH district Bannu, Pakistan from Jan. 2015 to Dec 2016. All those patients who had significant senile cataract affecting quality of life were included in the study. Patients suffering from congenital, traumatic or secondary cataract were excluded from the study. Patients suffering from visual morbidity due to causes other than senile cataract such as amblyopia, corneal opacity, uncontrolled glaucoma, uncontrolled diabetes, severe diabetic retinopathy, diabetic macular edema or other retinal diseases were also excluded. Ethical approval was obtained from ethical review board of Army field hospital, Khalifa Gul Nawaz Teaching Hospital (KGNTH), Bannu. Informed consent was taken from all the patients. WHO calculator was used to measure the sample size which appeared to be about 500 eyes. Each eye of the patient was given separate consideration. All the included patients were registered the preoperative unaided visual acuity (UCVA), best corrected visual acuity (BCVA) and demographic details were noted. Detailed slit lamp examination including both anterior and posterior segments along with intraocular pressure measurement was carried out by consultant ophthalmologist. Postoperatively patients were reviewed on day 1, 14 and then at 01 month. Intraoperative complications such as corneal burns, posterior capsular rupture, supra choroidal hemorrhage and postoperative complications such as endophthalmitis or corneal decompensation were documented. Postoperative UCVA and BCVA were noted at 04 weeks postoperatively.

All the patients underwent phacoemulsification cataract surgery with intraocular lens (IOL) implantation under peribulbar local anesthesia. Phaco machine (Visalis 100 virgin 1 Zeis) was used to perform all the surgeries by one surgeon. Meticulous sterilization measures were observed and 5% pyodine was instilled in conjunctival sac for 3 mins. Main corneal incision was made at 12 o clock with 2.75 mm knife while two other incisions 1.5 mm were made at 10 and 2 o'clock positions. After removal of nucleus with phacoemulsification, two way Simcoe cannula was used to remove cortical matter. After insertion of IOL with injector, the incisions were hydrated and intra-cameral moxifloxacin was injected. Patients were prescribed oral analgesics and antibiotics for 05 days while topical steroids and antibiotics were advised for 04 weeks.

Statistical package for social sciences (SPSS 21.0) was used to perform statistical analysis. Both categorical and continuous variables were analyzed. Mean and standard deviation were measured for continuous variables such as age, while frequency distribution was measured for UCVA, BCVA, gender and other categorical variables.

RESULTS

A total of 1245 eyes of 842 patients were operated for cataract during the study period, however, only 1061

eyes of 772 patients suffering from age related cataract were included in the study. Age of the patients ranged from 55 to 74 years with a mean age of 63.77 ± 5.27 years. 594 (56%) of the patients were females while 467 (44 %) were males. All the surgeries were performed under local anesthesia. 54% of the eyes were right while 46% were left (Table 1). Mean unaided visual acuity (VA) and BCVA before and 04 weeks after the surgery is given in Fig 1 (P = 0.001). The percentage of operative and postoperative complications are given in Table 2.

Table 1: Age and Gender based distribution of patients.

Variable	Subgroups	Proportion of Patients	Percentage
Gender	Female	594	56%
	Male	467	44%
Laterality	Right eye	622	58.6%
	Left eye	439	41.3 %

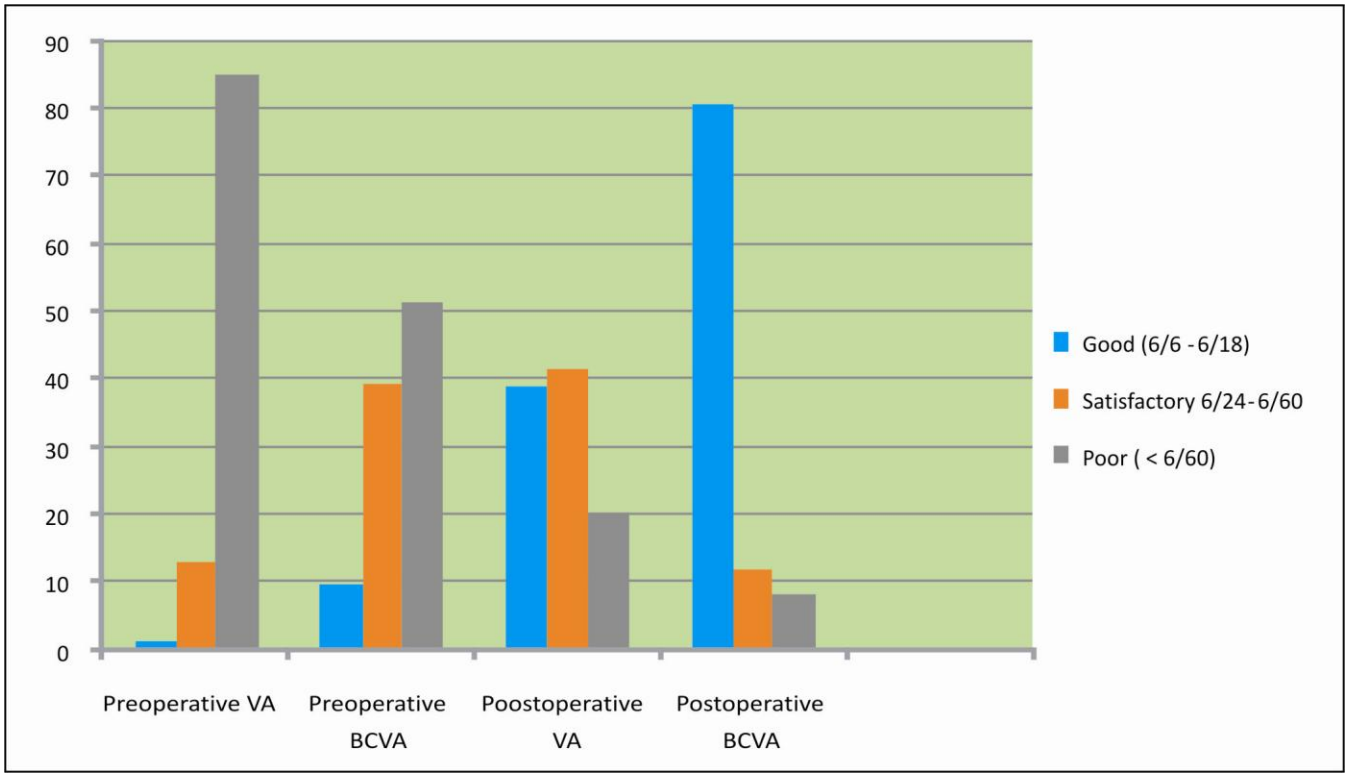

Fig. 1: Shows percentage of the visual outcome before and after cataract surgery.

Table 2: Frequency distribution of various operative and postoperative complications.

Complications	No of Patients (n = 1061)	Percentage
Uneventful	1001	94.44 %
Suprachoroidal hemorrohage	02	0.25
PCR with Nucleus/part of nucleus drop	7	0.6 %
PCR with PC IOL	32	3.01 %
PCR with ACI OL	6	0.5%
Zonular dialysis	2	0.2 %

Aphakia	5	0.5%
CMO	3	0.3%
Endophthalmitis	2	0.2 %

DISCUSSION

The continuous development of the techniques of cataract surgery over the past few decades has led us to the age of ultrasonic phacoemulsification which is the gold standard treatment for cataract treatment[15]. The visual outcome of cataract surgery has been variable in different parts of the world. In our study 39.0% of the patients had good visual outcome with an unaided visual acuity of 6/18 or better while after correction with spectacles 80.5% of the patients finally had vision of 6/18 or better. Out of total 8.1% patients sustained poor visual outcome with visual acuity of worse than 6/60 despite spectacle correction. Malik et al in their study conducted in Pakistani population also found a good visual outcome of 6/18 or better in 71.8% of the patients which improved to 92.3% with refraction and spectacle correction. They also found poor visual outcome in 7.7% of their cases[13]. Bourne et al in their study in Bangladeshi population found out a good visual outcome (VA better than 6/18) in 53.8% of patients while 3.5% patients had poor visual outcome[14]. Many authors believe that postoperative visual acuity is the best parameter to assess the visual outcome and they concluded that more than half of the patients have visual acuity better than 6/18 while only 11 – 25% have visual acuity worse than 6/60[16,17,18,19].

Poor visual outcome of patients after cataract surgery is dependent on many preoperative, intraoperative and postoperative factors. Like Bourne and Malik, the most common reason for reduced vision was refractive error in our study as evidenced in Table 2. The second common reason for unfavorable visual outcome was due to complications related with posterior capsular rupture (PCR) during surgery such as vitreous loss, tilted IOL, cystoid macular edema, persistent uveitis, anterior chamber IOL leading to raised IOP, corneal edema. The incidence of intraoperative and postoperative complications in our study was 5.56 %while Thanigasalam et al found out this to be 21.0% which is much higher than our study[10]. The probable reason for this is the patient selection whereby we excluded all predisposing factors and comorbidities associated with peroperative complications such as uncontrolled diabetes, uncontrolled glaucoma, phakodonesis.[20] In a study conducted by Hosemi H and his colleagues in Iran the rate of intraoperative complications during phacoemulsification was estimated to be 3.1% which is comparable to our study[21]. PCR was seen in 3.01% of our patients, however other authors found this to be 10% and 11.3% in African populations and 4.4% in an national survey conducted in UK[22,23].

Although, visual outcome of our patients was comparable to other published studies in the same population, the incidence of endophthalmitis was 0.2% which is slightly lower than the study conducted by Kim et al[24]. The incidence of CMO was just 0.3% which is less than expected. The probable explanation for this is the time of review of patients after surgery. CMO is believed to occur 4 – 6 weeks after cataract surgery while we examined our patients at the end of 01 month, so this can probably explain its lower incidence in our study[25].

In this clinical audit, We found out our practices of cataract surgery to be satisfactory and comparable to other published literature in similar population[22,23,24,25].

CONCLUSION

It is concluded that patients' selection, detailed history and examination is necessary before considering the patient for cataract surgery. Phacoemulsification is safe and effective procedure with good visual outcome if performed in experienced hands under meticulous disinfection and aseptic measures.

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