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EVALUATION OF COMPLICATIONS OF PHACOEMULSIFICATION WITH PCIOL IMPLANTATION SURGERY

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Abstract

Background: Phacoemulsification is a state of the art surgery for cataract removal. From the simple procedure of couching practiced by sushruta to latest method of phaco emulsification of Charles kelman, cataract surgery had undergone a tremendous metamorphosis. Phacoemulsification is one of the most successful surgical procedures performed, and its popularity is due to decreased operating time and a shorter postoperative healing period. The objective of the study was to evaluate intraoperative and postoperative complications of phacoemulsification with PCIOL implantation surgery.

Materials & Methods: The present prospective study was conducted over a period of 6 months on patients having visually significant cataract that presented to or were referred to ophthalmology Department, GMCH, Jammu and after getting admission underwent planned extracapsular cataract extraction by phacoemulsification with posterior chamber intraocular lens (PCIOL) implantation. After meeting inclusion & exclusion crieteria all the patients underwent complete examination as history, ocular examination, systemic examination and laboratory tests like haemoglobin etc.

Results: Out of 200, maximum numbers of patients were in age group of 41-50 i.e. 90 followed by 82 patients in 51-60yrs age group. Males were 112.Total of 148 patients were from urban area. Best corrected preoperative visual acuity of ≤6/36 was seen in 102 patients whereas 6th week postoperatively only 7 patients had visual acuity of ≤6/36. The final 6th week postoperative best corrected visual acuity of 6/12- 6/6 was found in 171 patients. Among intraoperative complications hyphaema & constriction of pupil each were seen in 2 patients, followed by posterior capsule rent in 3 patients only while postoperatively mild uveitis was seen in 30 followed by striate keratopathy in 12 patients.

Conclusion: From present study, we may conclude that phacoemulsification with posterior chamber intraocular lens implantation is a good surgical tecqinique for cataract which can be performed safely with good visual outcome, with few intraoperative and postoperative complications in expert hands.

Keywords: Phacoemulsification , visual outcome, complications

INTRODUCTION:

The worldwide leading cause of blindness is cataract.There are 314 million people with visual impairment of whom 269 million have low vision and 45 million are blind as estimated by World Health Organization (WHO).Cataract accounts for 17.7 million blind people globally.[1] Phacoemulsification is a state of the art of surgery for cataract removal.[2] Phacoemulsification is one of the most successful surgical procedures performed and its popularity is due to decreased operating time and a shorter postoperative healing period.[1] Phacoemulsification involves removing the opacified crystalline lens via emulsification and aspiration using an ultrasonic handpiece followed by implantation of an intraocular lens.[2] The surgery though simple has a learning curve. Phacoemulsification brings with it unprecedented demands on the surgeon.They report that surgeons need good manual dexterity, expertise with the operating room microscope along with a thorough knowledge of intraocular anatomy and phacodynamics.[3] Outcome of surgery become predictable and visual restoration is almost a certainty due to refinement of cataract surgery techniques.[1] Although phacoemulsification is the preferred cataract surgical technique worldwide, a less expensive method is gaining popularity in the developing world where a growing backlog of cataract blindness has resulted from insufficient health-care resources.[4] In large part because of cost, manual SICS is becoming an increasingly popular technique in the developing world. Although several outcome studies support the general safety and

efficacy of this approach, phacoemulsification remains the preferred method in developed countries.[4] However, even the most experienced and skilled surgeon will eventually be faced with some complications. It is important to collect data in order to identify patients at risk and to monitor their management before and after surgery & hence the present study was conducted.

Material and method:

After due approval from Institutional Ethical committee this prospective study was conducted from November 2018 to April 2019 on patients having visually significant cataract that presented to or were referred to ophthalmology Department, GMCH, Jammu and after getting admission underwent planned extracapsular cataract extraction by phacoemulsification with PCIOL implantation. Informed consents were obtained from all participants. Confidentiality was maintained regarding participants.

Inclusion crieteria:

Patients having visually significant cataract, both sexes, age more than 20yrs.

Exclusion crieteria:

Uncooperative patients, cataract with PEX, subluxation due to zonular dehiscence, eye diseases like uveitis, pathological myopia, retinal detachment, uncontrolled diabetes mellitus or uncontrolled hypertension were excluded, patients suffering from psychiatric disorder, patient s refused to participate in study.

All the patients underwent complete ophthalmological examination as under:

History:

The complete ophthalmic history as, diminution of vision, its onset, duration and progress, redness of eyes, pain, watering or any discharge from eyes, intolerance to light, ocular surgery etc. Relevant personal medical history as trauma, steroid exposure or drug intake, diabetes mellitus, asthma, hypertension, tuberculosis, past history of any other surgery etc. Family history was also collected from all patients.

Ocular examination:

Best corrected visual acuity (BCVA) was measured using Snellen's visual acuity chart preoperatively and postoperatively (day 1,week 1,4 and 6), IOP was measured by applanation tonometer, Gonioscopy was done to see status of angle/any other pathology involving angle, Detailed slit lamp examination was done before and after pupillary dilatation to grade the nucleus and to look for the pseudoexfoliative deposits on the cornea, iris, pupillary margin and on the anterior capsule of the lens, Dilated fundus examination, blood pressure measurement and laboratory tests like haemoglobin, bleeding time, clotting time, fasting blood sugar, urine examination etc were done.

Procedure:

Phacoemulsification with implantation of posterior chamber intraocular lens (PC-IOL).

A wire speculum is placed, eye was cleaned with povidone iodine (betadine) . Two side ports were created with MVR blade at 10 o' clock and 2 o'clock positions. Viscoelastic was injected into anterior chamber and continuous curvilinear capsulorrhesis was performed with bent-tipped 26 gauge needle. Thereafter, 2.8 mm clear corneal incision in the superior quadrant was given with the help of 2.8 mm kerotome. Then hydro-dissection was performed. A phaco probe was passed through the main incision to emulsify the nucleus. The surrounding cortex was removed with the help of irrigation aspiration cannula. The capsular bag was filled with viscoelastic solution. A foldable acrylic lens with injector system was placed in capsular bag. Viscoelastic material was removed using irrigation aspiration probe. Anterior chamber was formed and superior incision and side ports were hydrated with balanced salt solution. Postoperative pad and bandage was done. Intraoperative & Postoperative complications were noted. Patients were followed postoperatively on day-1, week-1,4 and 6 for visual acuity, slit lamp examination and refraction.

Statistical analysis:

The data was analysed using statistical software MS Excel / SPSS version 17.0 for windows. Data presented as number of patients/percentage (%) as discussed appropriate for quantitative & qualitative variables.

Observation & Results:

Total of 200 patients were studied in present study. All the surgeries were performed by surgeon who have experience of performing SICS for 20 years & phacoemulsification for 2years.

Out of 200, maximum number of patients were in age group of 41-50 i.e. 90 followed by 82 patients in 51-60yrs age group. Males outnumbered females in the present study i.e.112. Total of 148 patients were from urban area. About 12 patients were hypertensive & 23 were diabetic (Table no. 1).

In the present study best corrected preoperative visual acuity of ≤6/36 was seen in 102 patients while postoperatively on day1 total of 20 patients had visual acuity of ≤6/36 & 6th week postoperatively only 7 patients had visual acuity of ≤6/36 , among these 7 patients 2 had PC rent, 2 had ARMD, 3 patients had diabetic retinopathy. The final 6th week postoperative best corrected visual acuity of 6/12-6/6 was found in 171 patients. (Table no.2)

Among intraoperative complications hyphaema was seen in 2 patients, constriction of pupil in 2 patients followed by posterior capsule rent which was seen in 3 patients only while postoperatively mild uveitis was seen in 30 followed by striate keratopathy in 12 patients whereas hyphaema was seen in 1 patients.(Table-3,4)

An integral part of every surgical procedure are complications. No incidence of nucleus drop, endophthalmitis, retinal detachment, suprachoroidal hemorrhage was observed in this study.

Table 1: Demographic & Clinical characteristics of studied subjects:

Characteristics	Number of studied subjects
Age (in years)	
≤40	12
41-50	90
51-60	82
≥60	16
Sex	
Males	112
Females	88
Residence	
Urban	148
Rural	52
Any Systemic Comorbidity	
Hypertention	12
Diabetes	23
Others	0
No systemic illness	165
Type of cataract	
Cortical	98
HMSC/MSC	0
Nuclear	77
PSC	25

Table 2: Preoperative & postoperative best corrected visual acuity day 1,week 1,4 & after 6 weeks.

Visual Acuity	Pre-operative BCVA (no. of patients)	Day1 Post-operative BCVA (no. of patients)	1st weeks Post-operative BCVA (no. of patients)	4 weeks Post-operative BCVA (no. of patients)	6weeks Post-operative BCVA (no. of patients)
PL to <6/60	16	0	0	0	0
6/60-6/36	86	20	15	7	7
6/24-6/18	98	32	24	28	22
6/12-6/6	0	148	161	165	171

PL-perception of light, BCVA: best corrected visual acuity

Table 3: Intraoperative complications among studied subjects.

Complications	Number
Hyphaema	2
Constricted pupil	2
Retained cortex	0
PC rent	3
Vitreous loss	0
Descemets membrane stripping	0
No complication	193
Total	200

Table 4: Postoperative complications among studied subjects.

Complication	Post-operative day 1 (no. of patients)	Post-operativ first week (no. of patients)	Post-operative 4 week (no. of patients)	Post-operative 6 week (no. of patients)
Postoperative uveitis	30	10	0	0
Striate keratopathy	12	4	0	0
Hyphaema	1	0	0	0
Cystoid macular oedema	0	0	0	0
Secondary glaucoma	0	0	0	0
Other complication	0	0	0	0
No complication	157	186	200	200
Total	200	200	200	200

Discussion:

Clouding of the lens in the eye is cataract & one of the important cause is increasing age. It is treated by surgery but the choice of surgical technique is determined by the status of cataract & big task to a surgeon is to manage advanced cataract. Various factors favour one technique over the another like medical or pathological conditions of the eye, availability of equipment as well as level of training of the surgeon.[5] From the simple procedure of couching practiced by sushruta to latest method of phaco emulsification of Charles kelman cataract surgery had undergone a tremendous metamorphosis.[6] Therefore, early diagnosis, detailed examination, knowledge and surgical skills to manage complications during surgery and meticulous postoperative follow up in cataracts can increase the success rate of the surgical outcome.[5]

In the present study out of 200, maximum number of patients were in age group of 41-50 i.e. 90 followed by 82 patients in 51-60yrs age group. Males were 112.Total of 148 patients were from urban area.

In the present study best corrected preoperative visual acuity of ≤6/36 was seen in 102 patients while postoperatively on day1 total of 20 patients had visual acuity of ≤6/36 & 6th week postoperatively only 7 patients had visual acuity of ≤6/36, among these 7 patients 3 had PC rent, 2 had ARMD, 2 patients had diabetic retinopathy. The final 6th week postoperative best corrected visual acuity of 6/12-6/6 was found in 171 patients. This might be due to reason that timely and appropriate management of the complications yields good postoperative visual outcomes. Posterior chamber intra ocular lens was implanted in the bag in 198 patients and in ciliary sulcus 3 eyes. Singh A et al in their study with found that best corrected visual acuity of 6/36 to 6/18 was achieved in 8(16%) patients and 6/12 to 6/6 in 42(84%) patients.[7] Agrawal G et al in a study found that postoperative best corrected visual acuity at six weeks was 6/6 in 17 out of 20 cases in their study. [3] Ali A et al in their study found that after three weeks the vision was 6/12 or better in 83% of cases. [8] Ravinder K et al in their study found post-operative best corrected visual acuity of 6/9 or better in 83% of cases and 6/12 or better in 96% of cases after 6 weeks of follow up.[9]

In the present study among intraoperative complications hyphaema was seen in 2 patients, constriction of pupil in 2 patients followed by posterior capsule rent which was seen in 3 patients only while postoperatively mild uveitis was seen in 30 followed by striate keratopathy in 12 patients whereas hyphaema was seen in 1 patients. Other complications such as cystoid macula oedema, infective endophthalmitis, intraocular lens decentration and retinal detachment were not seen. Corneal edema following cataract surgery as mentioned in Kanski is usually transient and often caused by intraoperative trauma to the endothelium by contact with instruments, lens matter or the intraocular lens. A complicated, prolonged surgery and postoperative intraocular pressure spike may also contribute to this. Agrawal G et al in a study on 20 resident phacoemulsification cases found intraoperative posterior capsular rent in one case while emulsifying the last nuclear segment. It was managed with anterior vitrectomy, followed by intraocular lens implantation. There were no major post operative complications. Mild corneal edema was noted in 8 cases which resolved at one week postoperative with topical steroids.[3] Sharma P et al in their study found 6 cases of CME out of 500 patients.

No incidence of nucleus drop, endophthalmitis, retinal detachment, suprachoroidal hemorrhage was observed in this study.[1] Ali A et al in their study found that posterior capsular rupture (49/300) was the most common intraoperative complication wheras postoperatively corneal edema (185/300) on first postoperative day was significant problem.[8] Ravinder K et al in their study found that the most common complication encountered was difficulty in emulsifying an unexpectedly hard nucleus in 4% cases. PCR with vitreous loss was noted in 3.0% cases. Iris incarceration in the phaco probe was noted in 1% cases.Capsulorrhexis related complications were seen in 2.0% cases .Surge occurred in one (1%) case. Detachment of Descemet's membrane was noted in one (1%) case and prolapse of the iris through the side port was noted in another (1%).[9]

The only one measure of the functional success of cataract surgery is visual acuity & the good postoperative visual outcomes achieved by our patients further adds on to its benefits as a good surgical technique. A significant improvement in quality of life, quality of performance of community and home activities, mental health and life satisfaction was seen in patients who undergo cataract surgery.

Limitations:

The follow up period was only 6 weeks and late post-operative complications such as posterior capsular opacification and IOL related complications were not evaluated.

Conclusion:

From present study, we may conclude that in expert hands phacoemulsification with posterior chamber intraocular lens implantation is a good surgical tecqinique for cataract removal with good visual outcome, few intraoperative and postoperative complications

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