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Assessment of Intraoperative Complications of Manual Small Incision Cataract Surgery Done by Resident Doctors and Its Management.

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ABSTRACT

Small incision cataract surgery (SICS) is the most probably accomplished surgery for cataract in growing nations. This form is stable and adequate to maximization the output of cataract surgical services. At the same time economical. The present study is undertaken to know the incidence of intraoperative complications and how best the complications can be minimized and treated. A total of 100 cases examined from December 2020 to May 2021. Intraoperative complications were calculated and managed. Visual acuity in pursuit of these complications were examined by studying the best corrected visual acuity after 1st, 3rd and 6th week after surgery. Intraoperative complications were posterior capsule rent in 3%. Iris prolapse / dialysis 2%. Zonular dialysis 2 %. Incision and tunnel related complications 1 %. Descemet's detachment 1 %. Capsule related complications 2%. Others 1% of cases. Following prior detection and assessment of these complications the visual outcome was satisfactory after 6 weeks of surgery. Best corrected visual acuity of 6/6- 6/18 was achieved in 84.9% of cases. Small incision cataract surgery is very good surgery it provides very early and good visual prognosis. The complication of small incision cataract surgery is less and the logistics are finely appropriate for Indian population, where there is broad number of backlogs of cataract patients.

Keywords: Senile Cataract, Small incision cataract surgery, SICS Intraoperative complications

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INTRODUCTION

The lens is utmost vital structure which contributes to the refractive power of the eye [1]. Cataract is the most essential disease affecting the lens and its most necessary and definitive treating plan of action is surgery [2]. In patients over 65 years, cataract extraction is the most generally adopted surgery. In recent years Advances in fine operative equipment and micro surgical instruments have made surgery very safe and effective in restoring vision [3], in every way of life, Modern era demands a greater degree of visual perfection. For getting quality of vision, when we think of cataract surgery, the first technique that comes to mind is phacoemulsification [4]. That is justified as no other surgery had such an impact on ophthalmology in the last 20 years [5]. However, it is important not to forget that there are alternative techniques to phacoemulsification which complement the surgeon's armamentarium [6]. Moreover, these techniques have proven to be both medical and socio - economical were advantageous.

MATERIAL AND METHODS

100 eyes of 100 patients who suits the below standards were included in this study. Sample size was confirmed with the help of expert.

Inclusion Criteria

- Patient admitted in ophthalmology ward who selected for cataract surgery [Small incision cataract surgery]
- Patients who have been diagnosed with Senile Cataract

Exclusion Criteria

- Cataracts in pediatrics age group
- Traumatic cataracts
- Complicated cataract

Pre-Operative assessments

All patients who achieve the inclusion criteria were gone through every precise history and clinical assessments.

Ocular assessments were taken which Involves.

- Visual Acuity; unaided and best corrected
- Slit lamp bio microscopy assessments
- Posterior segment examination done after pupil dilatation with 90D lens over slit lamp bio microscopy
- Intra-ocular pressure measurement by applanation tonometer
- Keratometry
- Sac syringing
- A- Scan biometry and IOL power calculation

Anaesthesia: MSICS should be done in peribulbar, or retro bulbar, sub-Tenon or topical anesthesia [7] primarily one undergo through dilatation of being operated eye by using tropic amide eye drop and after peribulbar block should be apt and paint and drape the eye , superior rectus bridle suture seized and suture stiffed using forceps then fornix based peritomy should done and to uphold homeostasis diathermy cautery is needed. Curvilinear And partial-thickness scleral incision is being formed 3 mm posterior to the limbus. There are distinct kinds of incisions are present, which consists of the straight, smile, frown and chevron. The incision is smaller for a soft cataract and bigger for a dense, hard cataract. Usually, the incision is 7 to 8 mm long for a hard cataract (such as 4+ nuclear sclerosis). 6 to 7 mm long for a cortical cataract and the depth of wound could be approximately 0.3 mm.

This scleral incision could be achieved by advancing the crescent knife into the sclera and then cut either side, creating room for the crescent knife. Sufficient depth is planned by visualness of the knife (i.e., the crescent should be just visible through the sclera). To assure constant depth of the tunnel, heel of the crescent would be kept even on the globe in the process of dissection. Before the limbus is secured, the tunnel is reformed to a flap by forward and backward direction and the tissue is cut while coming outward. Scleral pockets are created on either side of the tunnel, thus helping the nucleus to accommodate during delivery. The width of the tunnel (i.e., the distance between the scleral incision and the inner corneal incision at the level of Descemet membrane) should be 4 mm. The tunnel is trapezoidal, as the inner corneal incision is 25 percent larger than the scleral incision.

Creating a paracentesis- A 24-gauge, 15-degree lancet tip blade is used to make paracentesis at the 9 o'clock position. Trypan blue injected through the side portis used to stain the lens capsule under an air bubble to protect the corneal endothelium. It is desirable to wait for 30 seconds for adequate staining of the capsule. Then the excess trypan blue is washed out of the eye using balanced salt solution. The anterior chamber is deepened by injecting a viscoelastic. Making the internal corneal incision- The keratome is advanced through the tunnel carefully, then tilted downward and slowly advanced to extend the tunnel into the anterior chamber. The keratome is now moved forward and laterally, creating an internal incision parallel to the limbus. The internal incision is extended on both sides.

Capsulorhexis and nucleus delivery. A continuous curvilinear capsulorhexis is made using a cystotome or a rhexis forceps. A large rhexis is preferred for easier prolapse of the nucleus. Multiple small hydro dissections facilitate prolapse of the nucleus into the anterior chamber. This hydro dissection minimize the aspiration of residual cortex. The nucleus can largely be prolapsed with hydrostatic force created by injecting BSS in the bag during hydro dissection. Any unprolapsed portion of the nucleus can be captured using a Sinskey hook as one would use a tire iron.

The nucleus is delivered with an irrigating lens loop. The globe is stabilized and the irrigating lens loop is introduced through the tunnel and positioned between the iris and the nucleus. The nucleus is engaged in the lens loop and slowly withdrawn from the anterior chamber while the posterior lip of the tunnel is depressed. It should be noted that depressing the posterior lip opens the tunnel, and lifting the anterior lip closes the tunnel. Once the nucleus gets engaged in the tunnel, BSS is injected steadily to maintain the anterior chamber. The hydrostatic pressure within the anterior chamber facilitates the delivery of the nucleus.

Residual cortex aspiration and implantation of a posterior chamber IOL. Simcoe's cannula is used to aspirate the residual cortex, and the sub incisional cortex is aspirated through the paracentesis port. The anterior chamber is washed with BSS, and viscoelastic is injected into the anterior chamber. A posterior chamber IOL is implanted in the bag through the tunnel and dialed in. Viscoelastic is aspirated and washed out with a Simcoe cannula.

Sealing the paracentesis port. Hhydrating the stroma seals the paracentesis port. This is done by injecting BSS steadily into the corners of the incision. Once the port site is sealed, the anterior chamber deepens, and the globe becomes firm. The tunnel is then checked for integrity. Finally, the conjunctiva is apposed gently by bipolar diathermy [8].

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RESULTS

Table 1: Age and gender wise distribution of patients

AGE GROUP	MALE	FEMALE	TOTAL
40-50	7	6	13
51-60	14	14	28
61-70	24	12	36
>70	13	10	23
TOTAL	58	42	100

Table 2: Gender wise distribution

SEX	NO
MALE	58
FEMALE	42
TOTAL	100

Out of 100 patients 58 were males and 42 females

Table 3: Type of cataracts (% wise distribution)

Type of cataract	%
mature	23
hyper mature	5
psc	42
cortical	22
nuclear	7
Posterior polar	1
total	100

Intraoperative complications	%
Pc tear	3
Iris prolapse	2
Capsular related	2
Zonular dialysis	2
Tunnel complication	1
Descemets detachment	1
others	1
total	12

Table 4: Association of types of cataract and intraoperative complication

Visual acuity	%
Less than 6/60	54
6/60-6/36	44
Better than 6/36	2
total	100

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Table 5: Complications interpretation

	complications						
cataract	Pc tear	Iris prolapse	Zonular dialysis	Tunnel complication	Capsular related	Descemets detachment	others
mature	0	0	0	0	3	0	0
hyper mature	3	0	3	0	1	0	0
psc	1	1	0	1	0	2	0
cortical	0	0	0	1	0	0	0
nuclear	1	4	0	0	0	0	2
Posterior polar	0	0	0	0	0	0	0

Table 6: Association of types of cataract and intraoperative complication

Vision	%
6/6-6/18	85
6/24-6/60	13
Less than 6/60	2
total	100

Out of 100 cases 86 cases came for follow up till 6th week following surgery. Out of the 86 cases (85) patients had BCVA of 6/6-6/18, after 6 weeks of surgery.

vision	Pc tear	Iris prolapse	zonular	tunnel	Capsule related	Descements detachment	others
6/6-6/18	0	2	0	1	1	1	1
6/24-6/60	1	1	0	0	0	0	0
Less than 6/60	0	0	0	0	1	0	0

DISCUSSION

One hundred patients of Small Incision Cataract Surgery were examined for intraoperative complications and management of these complications. Visual acuity was assessed at 1st, 3rd and 6th week. Males constituted the majority, 56 % as correlated to females in this exercise. Out of 100 cases, patients in the 61 to 70 years age group were maximum accounting for (36) cases. 23 patients were above 70 years. Mean age group being 63.4 years. In our study, cataract was posterior sub capsular type in (42), mature cataract 23, cortical 22, nuclear cataract 7 hyper mature in 5, posterior polar 1. Preoperative visual acuity of less than 6/60 was seen in (54) of cases. In the present study only 2 cases fitted in the group having pre-operative visual acuity 6/36 or better. Manual small incision cataract surgery was done in all 100 cases and PCIOL implantation was done in 99 cases. One case was left aphakic. In our exercise intraoperative complications occurred in 12 cases Intraoperative complications were posterior capsule rent in 3, iris prolapse/dialysis 2, zonular dialysis 2, incision and tunnel related etc.

Posterior capsule rent was seen in 3 cases in our study. Posterior capsule rent shows maximum in number of cases as a result of extension of rhexis or at the same time of irrigation aspiration. One case presented as difficulty in prolapsing the nucleus out of the bag. As soon as the complication was noted bridal suture released and aspiration reduced, anterior chamber filled with viscoelastic material. All five patients hadvitreous loss, so open sky vitrectomy was performed and PCIOL implanted in the sulcus in 4 cases. One patient was left aphakic. Out of the five cases of posterior capsule rent three of them occurred in hyper mature cataract which was statistically significant. Intra operative complications occurring mainly due to thin capsule and associated difficulty in performing capsulorrhexis. Iris prolapse/iridodialysis was seen in 2

cases Iris prolapsed occurred mostly during delivery of the nucleus. Tunnel construction was faulty in one case that is premature entry into anterior chamber noted. Iris reposited at various steps of the surgery and tunnel was sutured at the end Of the procedure with 8 -0 nylon. Remaining three cases had iris prolapse which was seen more with higher grade of nuclear cataract which was statistically significant. The cause may be due to either extension of the wound for delivery of large nucleusor increased pressure to deliver large nucleus through small wound.

Iridodialysis was seen in 1 (0.5%) case which was 1 clock hour in extent, and did not have any significance in the final visual outcome. This complication occurred during manipulation of hard cataract in the anterior chamber. Zonular dialysis was seen in 2 cases. All three cases of Zonular dialysis occurred in hyper mature type of cataract. Zonular dialysis was less than 90 degree and wasmanaged by PCIOL implementation in the bag. Tunnel related complication occurred in 1 case. One case had premature entry and the other had button hole of the tunnel. Premature entry was sutured with 8-0 nylon at the end of the surgery. One case had button hole which was managed by creating a tunnel in the deeper plane. Schroeder reported tunnel complications in 1.5% of cases. Descemet's detachment was seen in 2 (1%) cases in the present study. Schroeder reported Descemet's detachment in 0.7% of cases. In our study Descemet's detachment occurred probably due to faulty instrumentation. Detachment was small in both cases and placement of air bubble facilitated its opposition. Capsule related complications were seen in 2 cases, 1 cases had rhexis runoff and one had small rhexis. Rhexis runoff cases were converted to capsulotomy. 2 cases had mature intumescent cataract, raised intra lenticular pressure might have been the reason for rhexis run off. One had case small rhexis, relaxing cuts were given at 10 o' clock and 2 o' clock position because there was difficulty in prolapsing the nucleus out of the bag.Other complication included hypheama which was seen in 1 case in our study. Hypheama was seen after extension of wound for delivery of hard nucleus. It was managed by tamponade with air bubble in anterior chamber.

In our study 86 cases were followed up for six weeks after the cataract surgery. Poor visual outcome that is BCVA less than 6/60 was seen in 1 in our study. Out of the four patients 3 patients had intraoperative complication of PC rent with vitreous loss, which was statistically significant. One patient had ocular comorbid condition. The surgeon learning curves were not explored, as also the different styles. Complications were seen more in cases operated by residents. In case of complication, the supervising surgeon took over and completed the surgery. The backlog of cataract blindness in developing countries is far more despite of all the recent advances in surgery. MSICS (Manual Small Incision Cataract Surgery) is a safe surgery due to its lower complication rate. It gives uncorrected postoperative visual acuity of 6/18 or better in a greater proportion of patients. The surgeon has to be extra diligent in tunnel construction as the tunnel size is larger. An excellent self-sealing incision is more important for wound architecture on which the safety and lowered astigmatism potential rests. The incidence of posterior capsular rent and iridodialysis is low, and in case of such an eventuality, it is easier to manage the vitreous loss. In MSICS, the prolapse of nucleus into the anterior chamber and its delivery through the tunnel involve manipulations very close to the iris and the cornea. The surgeon has to be extra careful with these structures, as postoperative inflammation and corneal edema can be all too common. More attention needs to be paid to cortical wash and capsular polishing, as PCO may be the only factor for suboptimal visual acuity in the future. High volume surgery using appropriate techniques and standardized protocols doesnot compromise the outcome.

CONCLUSION

The complications managed with standard surgical techniques are compatible with good visual outcome. Although Manual Small Incision Cataract Surgery demands skill and practice from the cataract surgeon, it is a safe, effective, and economical alternative to competing techniques. Prospective standardized monitoring of cataract surgical outcomes with regular analysis of the causes of poor outcome is an important tool, which individual ophthalmic surgical teams can use to improve the results of their cataract surgery. The emphasis should be on continuous internal audit over time in order to improve results, rather than on inappropriate comparison of results between centers or surgeons.

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