International Journal of scientific research and management (IJSRM)
\||Volume||3||Issue||3||Pages|| 2313-2321||2015||
Website: www.ijsrm.in ISSN (e): 2321-3418

A Clinical Study Of Post Operative Refraction In Pciol Patients

Dr.A.P.R.Naidu M.S[1], Dr.M.V.Bhavani M.S[2], Dr.V.Murali Krishna M.S.[3],Dr.R.Sasya M.S.[4]

[1] Rangaraya medical college,
Department of Ophthalmology,kakinada,
aprnaidu2@gmail.com

[2] Rangaraya medical college,
Department of Ophthalmology,kakinada,
salapubhavani@gmail.com

[3] Rangaraya medical college,
Department of Ophthalmology,kakinada
aprnaidu2@gmail.com

[4] Rangaraya medical college,
Department of Ophthalmology,kakinada
aprnaidu2@gmail.com

Abstract*:Contract is the cause of preventable blindness worldwide,with the developing world around three quarters of this blindness.One of the routinely done surgery in ophthalmic faculty is cataract operation. The purpose of cataract extraction with PC IOL (posterior chamber intra ocular lens) implantation is to restore the patient's vision as much and as fast as possible. Such visual rehabilitation involves the correction of significant preoperative astigmatism and refractive error and the avoidance of post operative astigmatism, which may make the prescription of post operative glasses very difficult and even binocular vision impossible*

Keywords: Contract,blindness,case study

1.Introduction

Many factors affect post operative astigmatism. Among them are the size and suture materials used, the depth & size of the suture bites, various techniques of making corneoscleral sections and different suturing techniques, etc.Preoperative knowledge of the spherical and astigmatic errors in each eye, therefore, contributes to the surgical planning process. Planning of the final refractive outcome needs to take into account the other eye and the patient's needs and desires in the context of his or her lifestyle.In the pre suture era it is a known fact that in cataract surgery astigmatism is produced due to healing of section, about 2-4 diopters against the rule. This astigmatism is contributed by the site of incision, quality of incision and extent of incision. With the advent of finer suture materials various techniques of making corneoscleral sections and different suturing techniques, the degree and type of astigmatism has varied.

After successful completion of cataract surgery the main problem facing the surgeon is postoperative astigmatism and the patient may have to use some cylindrical correction to achieve good visual acuity. In spite of good surgical procedure the patient may end up with large cylindrical correction which may at times come in the way of achieving a good quality of vision.

The emphasis now is not only on minimising or eliminating surgically induced astigmatism but also neutralising any pre existing astigmatism.To overcome all these problems cataract surgery has developed with the use of smaller and smaller incisions and advanced techniques namely phaco emulsification, wherein the cataract extraction and intraocular lens (IOL) implantation is done through a scleral tunnel or a corneal incision which do not require any suture.

Advancement in microsurgical techniques and suture material have led to meticulous wound closure & hence a good post operative refraction in patients with posterior chamber intraocular lens implantation.

2. Aims and objectives

- To compare the incidence, nature and amount of post operative astigmatism in conventional extracapsular cataract extraction and small incision cataract surgery
- To compare the refractive outcome of conventional extracapsular cataract extraction and small incision cataract surgery
- To study the influences of surgical and suture techniques on post operative refraction

3. Materials and Methods

This is a prospective study of 100 patients, assigned to undergo conventional ECCE (50 cases) and manual small incision cataract surgery (50 cases). Study was done from August 2011 to December 2012 (one and half years) at Rangaraya Medical College, Government General Hospital, Kakinada. The surgeries were done by different consultants and residents in the department of Ophthalmology, Rangaraya Medical College, Kakinada.

Properative Assessment

Patients were admitted two days before surgery. Detailed history was taken of each patient and anterior segment assessment was performed using slitlamp. Visual acuity was checked with Snellen's visual acuity chart. After pupillary dilatation, detailed fundus examination and retinoscopy was done. Lenticular opacity was assessed and graded. IOP was measured with Goldmann's Applanation tonometer and patency of lacrimal system checked. Keratometry was carried out using the Appasamy keratometer. Axial length was measured by Appasamy A-scan machine and the IOL power was calculated using the SRK II formula. Routine investigations were carried out to rule out diabetes, hypertension and other infections.

All patients received antibiotic eye drops hourly one day before the surgery. All patients received oral antibiotic, ciprofloxacin 500mg B.D for 5 days starting one day prior to the surgery.

Preoperative adequate mydriasis was achieved with instillation of tropicamide with phenylephrine. Flurbiprofen eyedrops were instilled one hour prior to surgery for every 15 minutes

Inclusion criteria

Uncomplicated senile cataracts (Both Male & Female)

Exclusion criteria

Patients with

1.Complicated cataracts

2.Associated glaucoma

3.Associated Posterior segment pathology

4.Systemic diseases like hypertension & diabetes mellitus

Complications occuring during and after surgery have been excluded from this study.

Surgical Technique

All cases were done under local peribulbar anesthesia. Pre operatively 5% Povidone iodine was instilled into the cul-de-sac. Under aseptic precautions, eye was draped, a wire speculum was placed and superior bridle suture was passed.

Conventional ECCE

A fornix based conjunctival flap was made and superior scleral vessels were cauterised with ball point thermal cautery. Mid limbal incision was made from 11 o'clock to 2 o'clock (incision length of 10-12mm) and anterior chamber entered and filled with viscoelastic. Can opener capsulotomy was performed. Inciision was extended on either side using corneal scissors and nucleus delivered by pressure-counter pressure technique. Cortical matter was aspirated with the help of simcoe cannula. Anterior chamber was formed with viscoelastic substance and posterior chamber IOL was implanted in the bag. Viscoelastic substance was washed off and anterior chamber formed with ringer lactate solution. Wound was closed with 5 interrupted 10-0 mersilk sutures. Conjunctiva and Tenon's capsule were brought into place and subconjunctival antibiotic steroid injection given.

Manual small incision cataract surgery

A fornix based conjunctival flap was made. Superficial scleral vessels were cauterised. A 5.5- 6.5 mm straight incision was made on the sclera 1.5- 2 mm away from the limbus. Sclerocorneal tunnel was constructed with the help of a crescent knife. The dissection was carried out 2mm into the clear cornea. A side port entry was made 2-3 clock hours away

from the primary incision. Anterior chamber was filled with viscoelastic through the side port. A can opener capsulotomy was performed. With the help of keratome, anterior chamber was entered at the anterior limit of the tunnel and extended to the periphery. Hydrodissection was performed. Nucleus prolapsed into anterior chamber and delivered using sandwich technique. Cortical matter was aspirated using simcoe cannula and posterior chamber IOL was implanted into the bag.

Viscoelastic was washed off and anterior chamber was formed with ringer lactate. Side port opening was sealed with stromal hydration. Wound was checked for leakage with blunt instrument by pressing over cornea at various places. Conjunctiva and Tenon's capsule were brought to place and subconjunctival antibiotic and steroid injection was given

A detailed post operative examination of patients was done on day 1, week 2 and week 6. The examination included checking visual acuity,keratometry and slitlamp biomicroscopy. At the end of 6 weeks, a final best corrected subjective refraction was performed and the spectacles prescribed. Keratometry was performed at all three visits and surgically induced astigmatism calculated using algebraic method.

Statistical Methods: Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean +/- SD (Min-Max) and results on categorical measurements are presented in number (%).

Significance is assesses at 5% level of significance. Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups.

Statistical Software: The statisical software namely SPSS 15.0, Stata 8.0, MedCalc 9.0.1 and Systat 11.0 were used for the analysis of the data and Microsoft word and excel have been used to generate graphs, tables, etc.

100 cases were studied, in which 50 cases underwent conventional ECCE and 50 cases underwent MSICS

Table 1- Age Distribution

Age in Years	ECCE		SICS		Pooled	
	No	%	No	%	No	%
41- 50	1	2.0	4	8.0	5	5.0
51-60	9	18.0	17	34.0	26	26.0
61-70	27	54.0	26	52.0	53	53.0
71-80	13	26.0	3	6.0	16	16.0
Total	50	100.0	50	100.0	100	100.0

The majority who underwent cataract surgery were in the age group of 61-70 years. The mean age of patients in the conventional ECCE group was 65.88+/-6.24 and that in the MSICS group was 61.54 +/- 6.75.

Table 2 - Sex Incidence

Gender	ECCE		SICS		Pooled	
	No	%	No	%	No	%
Male	28	56.0	25	50.0	53	53.0
Female	22	44.0	25	47.0	47	47.0
Total	50	100.0	50	100.0	100	100.0

Samples were gender matched with p=0.548

Table 3- Comparision of visual acuit

VA	Group	Pre-op	Post-Operative			% Change	P value
			Day 1	Week 2	Week 6		
6/6 - 6/12	ECCE (n=50)	-	1 (2.0%)	4 (8.0%)	15 (30.0%)	+30.0	0.051+
	SICS (n=50)	-	11 (22.0%)	26 (52.0%)	28 (56.0%)	+56.0	
6/18 - 6/36	ECCE (n=50)	-	20 (40.0%)	43 (86.0%)	35 (70.0%)	+70.0	0.008**
	SICS (n=50)	-	31 (62.0%)	21 (42.0%)	22 (44.0%)	+44.0	
6/60 - 1/60	ECCE (n=50)	15 (30.0%)	29 (58.0%)	3 (6.0%)	-	-30.0	<0.001**
	SICS (n=50)	31 (62.0%)	8 (16.0%)	3 (6.0%)	-	-62.0	
< 1/60	ECCE (n=50)	35 (70.0%)	-	-	-	-70.0	-
	SICS (n=50)	19 (38.0%)	-	-	-	-38.0	

Majority of patients who underwent cataract surgery in the ECCE group had preoperative visual acuity <1/60 and majority of patients in the MSICS group had preoperative visual acuity in the range 6/60-1/60. Post surgery patients in SICS group had faster visual recovery than that in the ECCE group. 42 out of 50 patients in the MSICS group recovered a visual acuity better than 6/18 on the first postoperative day as compared to only 21 patients in the conventional ECCE group.

Table 4 - Postoperative Astigmatism

Astigmatism	Group	Pre-op	Post-Operative		
ECE (n=50)	ATR	33 (66.0%)	1 (2%)	1 (2%)	7 (14%)
	WTR	9 (18.0%)	49 (98%)	49 (98%)	43 (86%)
	NA	8 (16.0%)	0	0	0
SICS (n=50)	ATR	24 (48.0%)	38 (76%)	46 (92%)	45 (90%)
	WTR	19 (38.0%)	4 (8%)	2 (4%)	2 (4%)
	NA	7 (14.0%)	8 (16%)	2 (4%)	3 (6%)

In the preoperative period majority of patients in the conventional ECCE group had ATR astigmatism as compared to the MSICS group where WTR and ATR cases were almost equal. Postoperatively, in conventional ECCE group, almost all patients converted to WTR astigmatism on first postoperative day and week 2, out of which 7 patients degraded to ATR astigmatism by week 6. In MSICS group, ATR astigmatism increased, with 90% patients showing ATR shift at week 6 postoperatively[1].

Table 5- Surgically Induced Astigmatism

Surgically Induced Astigmatism	Group	Post-Operative			% Change
		Day 1	Week 2	Week 6	
ECCE (n=50)	ATR	0	0	4 (8.0%)	+8.0
	WTR	50 (100.0 %)	50 (100.0%)	45 (90.0%)	-10.0
	NA	0	0	1 (2.0%)	+2.0
SICS (n=50)	ATR	48 (96.0 %)	49 (98.0%)	46 (92.0%)	-4.0
	WTR	1 (2.0%)	1 (2.0%)	1 (2.0%)	+0.0
	NA	1 (2.0%)	0	3 (6.0%)	+4.0

It was observed that in that in conventional ECCE, WTR astigmatism increased , ATR astigmatism decreased and cases with no astigmatism converted to WTR in majority of patients. In MSICS group, WTR astigmatism decreased, ATR astigmatism increased and no astigmatism converted to ATR astigmatism in majority of cases. This is because of tissue compression and steepening of cornea in the meridian of incision in sutured wound and wound slide and flattening of cornea in the meridian of incision in unsutured wound.

Table 6- Mean SIA

Surgically Induced Astigmatism	Post Operative		
	Day1	Week 2	Week 6
ECCE	4.32±1.57	2.99±1.39	1.81±1.33
SICS	-1.06±0.71	-1.26±0.71	-1.27±0.88
P value	<0.001 **	<0.001 **	<0.001 **

Table 7 -Study of SIA in conventional ECCE

Surgically Induced Astigmatism- ECCE	**Group**	**Pre-Op**	**Post-operative (n=50)**		
			Day 1	**Week 2**	**Week 6**
WTR	**≤ 0.5**	**-**	**0**	**1 (2.0%)**	**1 (2.0%)**
	0.6-2.00	**-**	**4 (8.0%)**	**14 (28.0 %)**	**25 (50.0%)**
	2.1-4.00	**-**	**27 (54.0%)**	**25 (50.0 %)**	**17 (34.0%)**
	>4.00	**-**	**19 (38.0%)**	**10 (20.0 %)**	**2 (4.0%)**
ATR	**0 to -1.0**	**-**	**0**	**0**	**2 (4.0%)**
	-2.0 to -1	**-**	**0**	**0**	**2 (4.0%)**
	≤ -2.0	**-**	**0**	**0**	**0**
No Astigmatism	**-**	**-**	**0**	**0**	**2 (4.0%)**

SIA in ECCE group was 0.6-2.0D WTR in 50% patients whereas it was 0-1D ATR in majority ie., 44% patients in the MSICS group. Lesser SIA in the MSICS group led to faster visual recovery in that group as compared to the ECCE group[2].

Table 8 - Study of SIA in manual SICS

Surgically Induced Astigmatism-SICS	Group	Post-Operative		
		Day 1	Week 2	Week 6
ATR	0 to -1.0	27 (54.0 %)	13 (26.0 %)	16 (32.0%)
	-2.0 to -1.0	10 (20.0 %)	29 (58.0 %)	20 (40.0%)
	≤ -2.0	12 (24.0 %)	8 (16.0 %)	11 (22.0%)
NA	-	2 (4.0 %)	1 (2.0 %)	3 (6.0 %)

Table 9 – Refractive Outcome

Refractive Outcome	ECCE (n=50)	SICS (n=50)
Emmetropia	0 (0.0%)	1 (2.0%)
Myopia	0 (0.0%)	2 (4.0%)
Hyperopia	0 (0.0%)	0 (0.0%)
Simple Myopic Astigmatism	8 (16.0%)	12 (24.0%)
Compound Myopic Astigmatism	41 (82.0%)	33 (66.0%)
Simple Hyperopic Astigmatism	0 (0.0%)	0 (0.0%)
Compound Hyperopic Astigmatism	1 (2.0%)	0 (0.0%)
Mixed Astigmatism	0 (0.0%)	2 (4.0%)

‘’

4.Discussion

Cataract is the main cause of avoidable blindness worldwide and cataract blindness is thought to be increasing by 1-2 million per year. Modern cataract surgery has evolved from simple operation involving the Graefe knife and no lens replacement to a refractive surgical procedure capable of improving both uncorrected and best corrected visual acuity. With the introduction of the intraocular lens and consequent improvement in prediction of IOL power, the spherical component of patients refractive error has become reasonably predictable. This has led to greater expectations by the surgeon and patient for rapid and stable visual rehabilitation following cataract surgery. The astigmatic component of refractive error following cataract surgery remains the greatest obstacle to achievement of this goal[3].

Factors implicated in induced astigmatic error and stability after cataract surgery include incision location, configuration, length and closure technique. Incisions in the cornea and limbus have shown to have a high potential for induction of iatrogenic astigmatism and limbal incisions can induce long term instability with corresponding refractive changes. Self sealing scleral tunnel incisions are less likely to induce astigmatism because of their posterior (external) location, anterior corneal (internal) location and the blocking effect of the limbus on induction of astigmatism.

The use of smaller incisions with advantages of faster rehabilitation, less astigmatism and better post operative vision without spectacles led to phacoemulsification becoming the preferred technique where resources are available.This may not be an affordable technique due to cost involved in the developing countries.

Manual SICS has evolved as an effective alternative to phacoemulsification in present times. Recent studies have shown that manual SICS is cost effective and has more benefits as compared to conventional ECCE[4].

1. Better and early wound stability
2. Less post operative inflammation
3. Can avoid suture and suture related complications

4.The surgery is done in a relatively closed chamber. The advantages of a normotensive eyeball are - maintainence of vascular dynamics of eyeball, no prostaglandin release, n inflammation, no cystoid macular edema, no choroidal hemorrhage, intact blood aqueous barrier.

Results of this study are consistent with previous reports that MSICS induces small amount of ATR astigmatism and gives early visual rehabilitation as compared to conventional ECCE which induces moderate amount of WTR astigmatism.

Table 10 – Comparable studies for conventional ECCE

Name of the Study	WTR Astigmatism
Sood Archana et al (2003)	1.7 +/- 1.35D
Richard SC et al (1998)	0.75 to 1.25D
George R et al (2005)	1.77D +/- 1.61
Present study	1.81 +/-1.33D

Table 11- Comparable studies for MSICS

Name of the Study	ATR Astigmatism
Hennig A et al (2003)	-1.41+/-0.8D
Gokhale Nikhil & Saurabh Sawhney(2005)	-1.36+/-1.03D
George r et al (2005)	-1.17+/-0.95D
Lam DSC (2007)	-1.13+/-0.84D
Kimura et al (1999)	-1.41+/-0.72D
Reddy B et al(2007)	-1.92 +/-0.53D
Present study	-1.27+/-0.88D

Armeniades C.D et al studied the effect of incision length, location and shape on the structural integrity of the globe. They found that incision length had the greatest adverse effect, 12mm incisions causing most structural disturbance and 3mm scleral pocket incisions the least[6].

Flaharty Patrick and Steven B. Siepser studied surgically induced astigmatism in human cadaver eyes by using limbal incisions of 5.0mm and 10.0mm and scleral pocket incisions of 3.5mm and 7.0mm. They closed these wounds in a uniform fashion, first loosely and then tightly using interrupted 10-0 mersilk sutures. They found that tighter sutures, larger wound size and limbal rather than scleral pocket incisions were associated with a greater degree of immediate post operative astigmatism in the cadaver eye.

Hennig A et al reported the short and medium term outcomes of a series of sutureless manual extracapsular cataract extractions at a high volumes surgical centre in Nepal. The best corrected visual acuity was 6/18 or better in 96.2% of eyes at 6 weeks. Surgery led to an increase in against the rule astigmatism, which was the major cause of uncorrected visual acuity less than 6/18. Six weeks post operatively, 85.5% of eyes had against the rule astigmatism, with a mean induced cylinder of 1.41D(SD 0.8). The results were comparable to this study[5].

Gogate P compared conventional ECCE and manual SICS and found that MSICS gave an uncorrected visual acuity of 6/18 or better in a higher proportion of patients than ECCE at 6 weeks. His study found that MSICS gives better short term visual results than standard ECCE, particularly before correction, without a higher rate of complications or adverse outcomes, and at a marginally lower cost.

Neumann Albert et al compared planned ECCE through 10mm incision with phacoemulsification through 3.0mm to 4.0mm incisions with foldable IOL or 6.0mm incision with rigid PMMA IOL and found that phacoemulsification had mean induced cylinder levels which were significantly less than mean induced cylinder in the ECCE group at 3 and 6 months after surgery.

Sood Archana et al compared keratometric astigmatism induced by wound closure with continuous and interrupted sutures in conventional ECCE with PCIOL implantation and found that continuous suture group had significantly higher astigmatism (3.53 +/-2.19D) as compared to the interrupted suture group (1.7 +/-1.35) at the end of 6 weeks and a majority of patients in both groups had WTR astigmatism. In this study only interrupted sutures were used and the mean induced astigmatism at the end of 6 weeks was comparable to the mentioned study[8].

Bansal R.K et al in their study found a high WTR suture induced astigmatism following conventional ECCE and did selective suture cutting to reduce it. Mean keratometric astigmatism in their study was 5.76 and 5.42 dioptres at 3 and 6 weeks postoperatively and 77.5% of eyes had astigmatism above 2D[7].

Gokhale Nikhil and Saurabh Sawhney compared the astigmatism induced by superior, superotemporal and temporal incision in manual small incision cataract surgery and found that the mean post operative astigmatism at 3 months follow up for the superior incision group was 1.45 +/-0.94 ATR and the mean surgically induced astigmatism was 1.36 +/-1.03D ATR. The results were comparable to this study.

Masket Samuel et al studied the post operative astigmatic course of unsutures and sutures 4.0mm scleral pocket incisions and found initial WTR changes in the sutured group but at the end of one year after surgery, the group without suture showed a -0.45D shift while the sutured group showed a -0.34D shift.

Zheng L et al compared the change over time of the astigmatism caused by "large" incision extracapsular cataract extraction and smaller incisions for phacoemulsification. They found that two weeks after ECCE the mean induced cylinder was +3.37D,which decayed to about -1.25D after 6 months.

Axt JC conducted a longitudinal study of post operative astigmatism in 503 eyes that underwent ECCE with PCIOL implantation and found that a large amount of WTR astigmatism was induced immediately after surgery, by the end of the year over 60% of patients shifted towards ATR.

Ravindra MS in his study stated that bisecting or trisecting the nucleus avoids stretching of the tunnel during delivery, minimizes the surgically induced astigmatism and offers maximum protection to the endothelium.

Storr-Paulsen A et al studied the longterm natural and modified course of surgically induced astigmatism after extracapsular cataract extraction. They found that 1) post operative astigmatism was significantly increased in all eyes after 1 week and 3 months, but decreased in time approaching pre operative values after 3 years. 2.) surgically induced astigmatism was WTR at 1 week and 3 months but turned ATR in time. Astigmatism decay rate was significantly steeper in eyes with suture cutting. 3.) the keratometric axis was exclusively WTR after 1 week, but turned ATR in both groups, approaching the pre operative distribution of axis after 3 years. They concluded that surgically induced astigmatism is a dynamic feature showing changes in size and axis even in a period of 1-3 years post operatively.

Suture cutting intensifies the decrease in the induced astigmatism and accelerates the shift in astigmatic axis, turning astigmatism into ATR compared to eyes with intact sutures.

Kimura et al have shown by vector analysis that surgically induced astigmatism is less with an oblique incision(1.02 +/- 0.66D) than with a superior incision (1.41+/- 0.72D)

Reddy B et al compared the astigmatism induced by a superior and temporal incision in MSICS and compared the astigmatism induced by clear corneal incision versus scleral tunnel in phacoemulsification surgery. They found significantly ATR shift in astigmatism in the phacoemulsification group and the MSICS superior scleral tunnel group. At 90 days, conventional SICS superior incisions gave 1.92+/-0.53D ATR and phacoemulsification scleral pocket incisions gave 1.23 +/- 0.71 D ATR astigmatism.

Richards SC et al studied long term course of surgically induced astigmatism. They found that surgically induced astigmatism continued to change for atleast 3 years after surgery. The pre operative astigmatism was found to have only minimal effect on post operative astigmatism if the corneal curvature was controlled with keratometry at the time of surgery. The optimal amount of WTR astigmatism at 3-5 weeks post operatively was found to be 0.75D- 1.25 D. The results were comparable to this study.

Anders N et al analyzed factors modifying the post operative astigmatism after no stitch cataract surgery. They found that the induced astigmatism was higher after limbal incisions in the 12' o clock position and lowest after scleral incisions in the temporal positions. Age and pre operative astigmatism were also found to influence induced astigmatism significantly. All these factors have to be taken into account to minimize post operative astigmatism.

Roman S et al compared surgically induced astigmatism, post operative astigmatism and uncorrected visual acuity after cataract surgery depending on the site of a 4 mm sutureless incison (superior scleral or temporal) and on the preoperative astigmatism. They found that in cases of preoperative WTR </= 0.75D the two sites of incisions are possible. In cases of WTR astigmatism over 0.75D superior scleral approach is better. In cases of ATR astigmatism the temporal incision is the only one to consider.

Nagpal Kamal et al studied 40 pseudophakic patients and found that those with neutral astigmatism (<0.5D at any axis) fared best for unaided distance visual acuity, the ATR group was better than the WTR group for distant vision and the

ATR group fared best for unaided near vision. They explained this in accordance with Sturms hypothesis by saying that vertical lines in WTR and horizontal lines in ATR astigmatism appear sharper for distance. Also, the horizontal lines become sharper in WTR and vertical lines in ATR astigmatism for near vision. This is known as astigmatism paradox.

Bradbury J A et al in their study stated that the subjects with between 1 and 2 D of myopic astigmatism and virtually no sphere were able to see 6/12 and N10 in 82% of cases, thus confirming the benefits for both distance and near vision of myopic astigmatism.

Merriam JC et al studied the effect of incisions for cataract on corneal curvature. They measured the pattern of change on the horizontal and vertical meridians and time for the cornea to stabilize after each incision. They found that the corneal meridians stabilized 4-5 months after ECCE and 1-2 months after 6mm superior scleral incision.

5.Conclusion

- Manual small incision cataract surgery induces minimal amount of ATR astigmatism in the early post operative period as compared to conventional ECCE which induces moderate amount of WTR astigmatism.
- Post surgery patients in MSICS group had faster visual recovery than that in ECCE group
- In MSICS group, the astigmatism was stabilized by the 6th week in majority of the cases whereas the astigmatic shift was still unstable in many cases in the conventional ECCE group
- High WTR astigmatism is seen with tight sutures in conventional ECCE.
- The key factor of astigmatism in MSICS is construction of sclerocorneal tunnel. Carefully constructed tunnel with incision lying within the incisional funnel and adequate inner corneal lip, which is parallel to the limbus ,induces minimal astigmatism.
- To conclude MSICS has definite advantages over conventional ECCE in terms of early visual rehabilitation, minimal surgically induced astigmatism and no suture related complications .

References

[1].Venkatesh R, Das M, Prashanth S, Muralikrishnan R. Manual small incision cataract surgery in eyes with white cataracts. Indian J Ophthalmol 2005;53:173-

[2].Roy PN, Mehra KS, Deshpande PJ. Cataract surgery performed before 800 B.C Br J Ophthalmol 1975;59:171.

[3].Basti S, Vasavada AR, Thomas R, Padhmanabhan P. Extracapsular cataract extraction: Surgical Techniques. Indian J Ophthalmol 1993;41:195-210.

[4].Shah AR, Vasavada AR, Extracapsular cataract extraction and IOL implantation In: Dutta LC, editor Modern Ophthalmology. 3rd ed. New Delhi: Jaypee Brothers Medical Publishers; 2005. p.367-377

[5].Emery J, Steinert RF. Extracapsular cataract surgery: indications and techniques In: Steinert RF, editor. Cataract surgery: techniques, complications and management. 2nd ed. Elsevier Science(USA); 2004. p. 97-107

[6].Kratz RP, Colvard DM, Mazzocco TR, et al Clinical evaluation of the terry surgical keratometer. Am Intraocular Implant Soc J 1980:6:249-51

[7].Haldipurkar SS, Shikari HT, Gokhale V. Wound construction in manual small incision cataract surgery. Indian J Ophthalmol ;57:9-13

[8].Singer JA. Frown incision for minimizing induced astigmatism after small incision cataract surgery with rigid optic intraocular lens implantation. J Cataract Refract Surg 1991;17:677-88.