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RESEARCH ARTICLE

A COMPARATIVE STUDY OF VISUAL OUTCOME WITH SUPERIOR, SUPERO TEMPORAL AND TEMPORAL INCISIONS IN MANUAL SMALL INCISION CATARACT SURGERY

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ABSTRACT

Purpose: To comparevisual outcome in patients undergoing manual small incision cataract surgery with superior, supero-temporal and temporal incisions.
Methods: A study was conducted between December 2014 and December 2015. A Prospective analysis of 102 cases meeting the inclusion and exclusion criteria were selected. The patients were randomly allocated to three groups of 34 each and surgeries were performed in group A with superior, group B with supero temporal and group C with temporal incision by single experienced surgeon. Post operatively unaided visual acuity was recorded in each patient post operatively on first week, six weeks and twelve weeks.
Results: A total of 102 cases of MSICS were analysed. Most of the patients were between 61yr to 70yrs of age. After 12 week 16(47.1%) of the patients in SI group and 20(58.8%) of the patients in supero-temporal group had visual acuity ranging 6/6-6/9 where as in temporal incision group 25 (73.5%) patients had visual acuity ranging 6/6-6/9 ($x2 – 4.981$, $p<0.01$).
Conclusion: Visual rehabilitation is better in temporal incision than superior incision.

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INTRODUCTION

Cataract comes from the latin word which means waterfall. It is the loss of transparency in the crystalline lens. Cataract is the leading cause of avoidable blindness. Of the 39 million people who are blind worldwide, approximately 47.8% are blind due to cataract (Avachat, 2014). In the developing countries it accounts for about three quarters of the blindness. The mainstay of the management of cataract is surgery. Manual small incision cataract surgery is a fast, economical and effective way to deliver high quality cataract surgery. Its results are proven better than conventional ECCE and nearly comparable with phacoemulsification (Gogate, 2005). Cataract extraction by nature is refractive surgery, as surgically induced refractive changes are a result of cataract extraction, intraocular lens (IOL) implantation, and incisional corneal astigmatic changes (Kohnen, 1996). The emerging standard in cataract surgery today goes beyond safe cataract removal and proper IOL power calculation to include surgical control of preoperative and induced astigmatism. Astigmatism occurs when toricity of any of the refractive surfaces of the optical system produces two principal foci delimiting an area of intermediate focus called the conoid of Sturm. Surgically induced astigmatism (SIA) is one of the important factors that hampers post-operative visual outcome. Thus control of post-operative astigmatism is a key factor in meeting patient's expectations (Rashid, 2013). The site, size and configuration of incision will determine the amount of surgically induced astigmatism in manual small incision cataract surgery. Hence we intend to conduct this study to evaluate and compare postoperative astigmatism in manual small incision cataract surgery through superior, supero-temporal and temporal approach.

Aims and Objectives

To comparevisual outcome in patients undergoing manual small incision cataract surgery with superior, supero-temporal and temporal incisions.

MATERIALS AND METHODS

102 patients attending to outpatient Department of Ophthalmology, R.L.Jalappa Hospital and Research Centre attached to SRI DEVARAJ URS MEDICAL COLLEGE, TAMAKA, KOLAR with senile cataract fulfilling the inclusion criteria framed were selected for manual small incision cataract surgery under peribulbar anesthesia between December 2014 to December 2015.

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Sample Size: A total number of 102 patients with senile cataract were randomly distributed to three groups with age and gender matching in this prospective study.

Group A: Manual small incision cataract surgery with superior scleral incision-34 patients
Group B: Manual small incision cataract surgery with superotemporal sclera Incision - 34 patients
Group C: Manual small incision cataract surgery with temporal scleral incision-34 patients

Inclusion Criteria: Patients with senile cataract.

Exclusion Criteria: Senile cataract patients with

- Patients with pterygium, corneal opacity and degeneration
- Posterior segment pathology
- Previous intra ocular surgery (trabeculectomy, refractive or
- retinal detachment surgery)
- Glaucoma
- Previous ocular trauma and inflammatory diseases
- Intraoperative complications like PC rent, zonular dialysis.

Visual acuity at pre-operative period between three groups

		Group					
		Superior		Supero Temporal		Temporal	
		Count	%	Count	%	Count	%
Preop VA	PL +ve to HM +ve	0	0.0%	1	2.9%	1	2.9%
	CF 1/2 to CF 3 mts	3	8.8%	4	11.8%	4	11.8%
	CF 3½ to 5½mts	1	2.9%	4	11.8%	3	8.8%
	>6/60	30	88.2%	25	73.5%	26	76.5%
	Total	34	100.0%	34	100.0%	34	100.0%

Comparison of Postoperative Visual Acuity in SI, STI and TI Groups

	Visual acuity	1st week		6 weeks		12 Weeks	
		Count	%	Count	%	Count	%
Superior	6/6-6/9	4	11.8%	14	41.1%	16	47.1%
	6/12 – 6/18	15	44.1%	16	47.1%	16	47.1%
	6/24 – 6/36	13	38.2%	3	8.9%	2	5.9%
	6/60	2	5.9%	1	2.9%	0	0.0%
Supero temporal	6/6-6/9	4	11.8%	19	55.9%	20	58.8%
	6/12 – 6/18	15	44.1%	11	32.3%	12	35.3%
	6/24 – 6/36	13	38.2%	4	11.8%	2	5.9%
	6/60	2	5.9%	0	0.0%	0	0.0%
Temporal	6/6-6/9	18	52.9%	23	67.6%	25	73.5%
	6/12 – 6/18	4	11.8%	8	23.5%	9	26.5%
	6/24 – 6/36	12	35.3%	3	8.9%	0	0.0%
Chi-square test		2.428		3.109		4.981	
P value		0.876		0.795		0.546	

$\chi 2 = 3.45$, df = 6, p = 0.751

Pre Operative Preparation

All patients were given systemic antibiotics (tablet ciprofloxacin 500 mg b.d) on the preoperative day and three hours before surgery one drop of Ciprofloxacin 0.3% hourly was instilled in the eye. On the day of surgery pupils were dilated adequately using instillation of 0.8% tropicamide and 5%/10% phenylephrine eye drops every 10 minutes, one hour before surgery.

Procedure

All surgeries were performed by a single surgeon under local anaesthesia by using peri bulbar block. A 6mm long scleral incision with sclera-corneal tunnel and self-sealing corneal valve was fashioned after making a fornix-based conjunctival flap. The frown shape external incision was about 2mm from the limbus with No.15 blade. A tunnel was created with crescent blade upto 1.5mm into clear cornea. Entry into AC was made with 3.2 mm Keratome and later extended. A continous curvilinear capsulorhexis was performed with a 26 G needle cystitome depending on cataract type and pupillary mydriasis. The nucleus was prolapsed into AC using hydro dissection and hydraulic expression and then was removed with sandwich technique. All the manipulation was carried out under cover of visco-elastics.

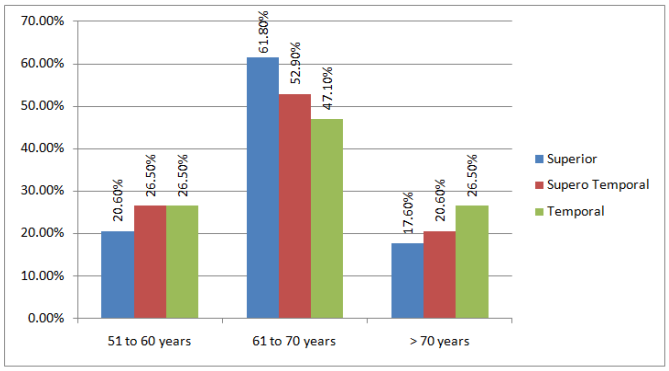
Cortex was aspirated with Simcoe cannula. Single piece PMMA 6mm Optic IOL was inserted through the tunnel into capsular bag and properly centered. Anterior chamber was formed and the wound allowed self-sealing by hydrating the side port entry. Surgery was concluded with a sub-conjunctival injection of Dexamethasone 1mg and Gentamycin 20 mg after repositing conjunctiva over the wound. Post operatively unaided visual acuity and with pin hole vision, keratometry and complications if any was recorded in each patient post operatively on first week, six weeks and twelve weeks. Postoperative astigmatism was evaluated by Baush and Lomb keratometry readings. Amount of astigmatism was calculated using only scalar analysis i.e. by subtracting the two K reading on that day.

Data was entered into Microsoft excel data sheet and was analysed using SPSS 22 version software.

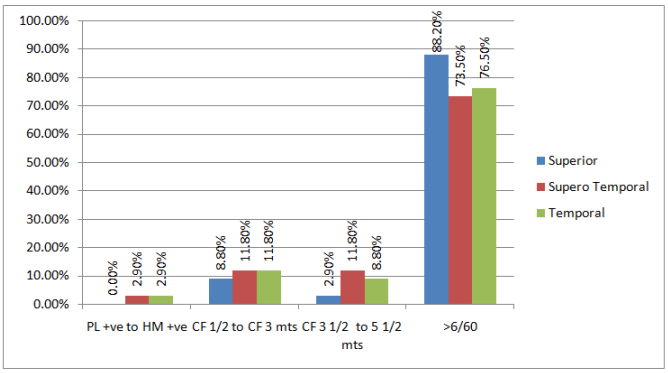
RESULTS

Mean age of subjects in Group 1 was 64.5 ± 6.7 years, in group 2 was 64.4 ± 7.3 and in group 3 was 64.8 ± 7.1 years. There was no significant difference in mean age between two groups. Majority of subjects in Group 1 (61.8%), group 2 (52.9%) and group 3 (47.1%) were in the age group between 61 to 70 years. There was no significant difference in age distribution between two groups. In the superior group majority of subjects (88.2%) had Visual acuity of >6/60, 2.9% had Visual acuity of CF of 3

½ to 5 ½ mts and 8.8% had CF of ½ to 3 ½ mts and none of them had PL +ve to HM +ve. In the supero temporal group majority of subjects (73.5%) had Visual acuity of >6/60, 11.8% had Visual acuity of CF of 3 ½ to 5 ½ mtsand CF of ½ to 3 ½ mts respectively and 2.9% of them had PL +ve to HM +ve.



Age distribution of subjects in three groups



Pre op visual acuity

In the temporal group majority of subjects (76.5%) had Visual acuity of >6/60, 8.8% had Visual acuity of CF of 3 ½ to 5 ½ mts and 11.8% had CF of ½ to 3 ½ mts and 2.9% of them had PL +ve to HM +ve. There was no significant difference in Visual acuity between three groups. In the superior group at 1st week, 11.8% had 6/6 to 6/9 VA, 44.1% had 6/12 to 6/18 VA, 38.2% had 6/24 to 6/36 VA and 5.9% had 6/60 VA. At 6 weeks 41.1 % had 6/6 to 6/9 VA, 47.1% had 6/12 to 6/18 VA and 8.9% had 6/24 to 6/36 VA, 2.9% had 6/60 VA. At 12 weeks 47.1 % had 6/6 to 6/9 VA, 47.1% had 6/12 to 6/18 VA and 5.9% had 6/24 to 6/36 VA. In the supero temporal group at 1st week, 11.8% had 6/6 to 6/9 VA, 44.1% had 6/12 to 6/18 VA, 38.2% had 6/24 to 6/36 VA and 5.9% had 6/60 VA. At 6 weeks 55.9 % had 6/6 to 6/9 VA, 32.3% had 6/12 to 6/18 VA and 11.8% had 6/24 to 6/36 VA. At 12 weeks 58.8 % had 6/6 to 6/9 VA, 35.3% had 6/12 to 6/18 VA and 5.9% had 6/24 to 6/36 VA. In the temporal group at 1st week, 52.9% had 6/6 to 6/9 VA, 11.8% had 6/12 to 6/18 VA and 35.3% had 6/24 to 6/36 VA. At 6 weeks 67.6 % had 6/6 to 6/9 VA, 23.5% had 6/12 to 6/18 VA, and % had 6/24 to 6/36 VA. At 12 weeks 73.5 % had 6/6 to 6/9 VA and 26.5% had 6/12 to 6/18 VA.

DISCUSSION

The term "refractive cataract surgery" has come to represent a reality for our cataract patients.

In order to achieve excellent visual results, the effect of astigmatism on postoperative vision must be minimized. After 12 week 16(47.1%) of the patients in SI group and 20(58.8%) of the patients in supero-temporal group had visual acuity in the range of 6/6to 6/9, where as in temporalincision group 25 (73.5%) patients had visual acuity 6/6 to 6/9 (x^2 – 4.981, $p<0.01$). The results of this study are consistent with previous reports that, temporal incision induces small amount of WTR astigmatism and gives early visual rehabilitation to the patients. In a study done by Gade SP, Khaire BS showed that uncorrected visual acuity was better in the temporal incision group as compared to the superior incision group (Gad, 2014). This study is in comparable with our study as we also recorded uncorrected visual acuity better in the temporal incision group as compared to other superior or Superotemporal group. In temporal incision, minimal WTR astigmatism and early rehabilitation of visual recovery could be due to the fact that temporal allocation is farther from the visual axis than superior location and any flattering due to wound is less likely to affect the corneal curvature at the visual axis

Conclusion

Our study supports that visual rehabilitation is early and better uncorrected visual acuity in the temporal scleral incision. No Significant statistical difference was found in visual acuity after a 6 weeks follow up period in between the three groups.

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