International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

Comparative Study of Visual Outcome of Anterior Chamber Intraocular Lens versus Scleral Fixated Posterior Chamber Intraocular Lens

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Abstract: ***Cataract is the commonest age related disease in most countries worldwide. The endocapsular placement of an IOL is undoubtedly anatomically preferable following successful cataract extraction. We describe a comparative study of visual outcome of the two different intraocular lens namely Anterior chamber IOL (ACIOL) and suture fixaed PCIOL (SFPCIOL). We analysed 60 patients and concluded that both ACIOL and SFPCIOL are safe and effective options in the absence of capsular support. Ultimately, individual patient factors and surgeon preference and expertise should be guide to decide as to which intraocular lens is most appropriate for each patient.***

Keywords: Cataract surgery, Posterior chamber IOL, secondary IOL, posterior capsular rupture

1. Introduction

Cataract is the commonest age related disease in most countries worldwide. There are approximately 45 million blind people in the world. At least 80% of these people live in developing countries and more than half are blind as a result of cataract.[1]

The endocapsular placement of an IOL is undoubtedly anatomically preferable following successful cataract extraction. However the presence of an unstable capsule-zonule complex or its absence, as with a dislocated lens or pseudoexfoliation syndrome, pre-empts the endocapsular fixation of the intraocular lens. An AC IOL can be primarily or secondarily implanted. Primary ACIOL is implanted at the time of cataract removal by intracapsular cataract extraction or extracapsular cataract extraction with ruptured capsule where as secondary AC IOL is implanted at a later attempt. Both are associated with various known complications like corneal oedema, endothelial damage, keratopathy, raised intraocular pressure, cystoid macular oedema, pupil distortion, uveitis, retinal detachment etc.[1]-[3]

Some surgeons prefer to implant flexible open loop ACIOL in the absence of capsular support, while others advise scleral fixed PCIOL. Despite some advantages of scleral fixation of PCIOL such as safety in long term because it preserves the corneal endothelium, minimizing an aniseikonia in contralateral eye that are phakic or pseuduphakic and by virtue of their anatomic location in the eye. [1]

Sutured PCIOL are appropriate for patients with glaucoma, diabetes, corneaguttata or low endothelial cell count, peripheral anterior synechiae, or known cystoid macular oedema. [4]- [6]

Both the techniques have its own benefits and complication. This is a comparative study of visual outcome of the two different intraocular lens.

2. Materials and Methods

This study was a prospective observational longitudinal study from 2010 to 2012 in department of Ophthalmology of Municipal hospital. Sixty patients who underwent ocular surgery with primary or secondary implantation of anterior chamber intraocular lens (ACIOL) or sclera fixated posterior chamber intraocular lens (SFPCIOL) were studied. Inclusion criteria included Posterior capsular rent during ECCE or phacoemulsification or SICS with inadequate anterior and posterior capsular support, Traumatic dislocation of lens with ruptured zonules or capsular perforation.

The anterior chamber intraocular lens (ACIOL) used were AUROLAB single piece polymethyl meth acrylate(PMMA) with flexible open loop haptics with front vaulting. the scleral fixated posterior chamber inraocular lens (SFPCIOL) used were AUROLAB single piece polymethyl meth acrylate (PMMA) with modified C haptics with at least 2 dialing holes in the haptics, with an optic diameter of atleast 6.5mm, with overall diameter 13.5mm.Suture used: 10-0 polypropylene(Figure 8) suture with double armed straight needles, 10-0 nylon suture with micropoint spatulated needle.
A Scan using SRK II Regression Formula was done and undercorrected for ACIOL and overcorrected for SFPCIOLs. B Scan ultrasound in traumatic mature cataract and routine advanced to mature cataract where fundus

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cannot be visualized, especially if other eye has preexisting retinovitreopathology.

Patients were followed up as per schedule with systemic assessment of best corrected visual acquity, intraocular pressure (with Schiotz tonometer), slit lamp biomicroscopy and fundoscopic examination in each visit. Finally after three months of follow up data was collected and then processed for different parameters and conclusion was drawn about.

3. Results

Out of the total number of patients 60, 34 were males and 26 were females .30 cases had ACIOL implantation and 30 cases had suture fixated PCIOL implantation done .Indication for the type of intra ocular lens insertion were as shown in table 1 .

Table 1: Indications for Aciol and Sutured Pciol Implantation

Type	Indication	ACIOL	SFPCIOL
Primary	Posterior Capsular(PC) rent in ECCE/SICS /Phacoemulsification	15	12
	Posterior capsular rent in trauma	2	5
	Zonular dialysis in ECCE/SICS/ Phacoemulsification	2	1
	ICCE in Traumatic subluxation /dislocation	2	1
	ICCE in subluxation /dislocation	1	0
Secondary	Dislocated / Decentered IOL	6	8
	Post ICCE	1	2
	Post ECCE with pc rupture	1	1

All patients were followed up for a period of 3 months and their visual acuity was assessed at each follow up visit . Table 2 shows the comparison of visual acuity between the 2 groups of IOL pre-operatively and post operatively.

Table 2: Comparison of Visual Acuity Preoperative and Postoperative at 1 Week

BCVA	ACIOL				SFPCIOL			
	Primary		Secondary		Primary		Secondary	
	Preop	Postop	Preop	Postop	Preop	Postop	Preop	Postop
<6/60	12	7	5	2	11	8	4	6
6/60-6/36	5	11	1	6	5	10	5	5
6/24-6/18	5	4	2	0	3	1	2	0
>=6/12	0	0	0	0	0	0	0	0

Improvement in visual acuity at the end of one week postoperatively was better in ACIOL patients than SFPCIOL patients and continued to be better till the last follow up visit.

4. Discussion

The indications of primary ACIOL implantation most commonly were inadvertent posterior capsular rent or zonular dialysis during extracapsular cataract cataract extraction (ECCE), small incision cataract surgery (SICS) or phacoemulsification, ICCE in subluxated or dislocated hypermature cataract. Blunt trauma causing subluxation or dislocation of crystalline or cataractous lens but cases of trauma that had or were suspected of posterior segment pathology were excluded so as not to contribute to post operative results of visual acuity.

The indications of secondary ACIOL implantation were aphakic eyes post ICCE and ECCE lacking adequate posterior capsular support intolerant to aphakic glasses, patients with subluxated or dislocated posterior capsular IOL. The indications of primary SFPCIOL were exactly same as that of ACIOL with the exception that patients with corneal degenerative pathology, shallow anterior chamber and pupillary distortion that could not be constricted were considered for SFPCIOL. The indications of secondary SFPCIOL were also based similarly.

Intraoperatively it was observed that ACIOL was easier to implant and sclera fixated PCIOL required more surgical skills and tissue manipulation.

Belluci R found that scleral- fixated posterior chamber PCIOLs were associated with more intraoperative and postoperative complications than angle-fixated anterior chamber IOLs and surgery took longer. [7] Zia ulMazhriin his study of scleral fixation of Intraocular lens said that sclera fixation of IOL is an effective but surgically demanding technique. [8]

Donaldson et al, who showed that, mean postoperative BCVA 20/60 in ACIOL group and 20/50 in SFIOL group with no stasistically significant difference between both groups in his study. [9] Amin F .Ellakwa et al concluded in his study that no significant differences in outcome comparing ACIOLs to SFIOLs in complicated cataract extraction with poor capsular support. [10]

In our study on sixty patients, 30 of ACIOL and 30 of SFPCIOL following observation were made; improvement in visual acuity at the end of one month postoperatively was better in ACIOL patients than SFPCIOL patients and was statistically significant. Both the type of IOL provided visual improvement at the end of three months and the difference was not statistically significant. Intraoperatively, ACIOL were easier to insert, comparably safe whereas SFPCIOL implantation require a meticulous surgical technique. SFPCIOL caused more early complication like uveitis, raised in IOP etc. than ACIOL and took longer time for recovery. Five patients of ACIOL implantation and seven patients of SFPCIOL developed CME which responded to medical management. One patient of ACIOL group developed pseudophakic bullous keratopathy. One patient of SFPCIOL group developed rhegmatogenous retinal detachment .In SFPCIOL group two patients developed hyphaema and one developed vitreous hemorrhage which resolved conservatively.

5. Conclusion

Both ACIOL and SFPCIOL are safe and effective options in the absence of capsular support. Ultimately, individual patient factors and surgeon preference and expertise should be guide to decide as to which intraocular lens is most appropriate for each patient.

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