

Clinical Investigation

Comparison of iris claw lens and scleral fixated intraocular lens in terms of visual outcome and complications.

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Received: 12th october-2014 Accepted: 18th November-2014 Published: 31st-December 2014

Abstract

Background: To compare the visual outcome and complications of posterior iris claw lens and scleral fixated posterior chamber lens. **Methods:** Prospective interventional hospital based study. A minimum of 60 patients fulfilling the inclusion criteria attending to R.L. Jalappa Hospital and Research centre, Tamaka, Kolar were selected for follow up study from December 2012 to June 2014. **Results:** 73.4% ICIOL & 63.3% SFIOL patients had final BCVA 6/18 – 6/6. 23.33% ICIOL patients and 33.33% patients were found in 6/60-6/24 group. Only 3.33% patients were in less than 6/60 group. Mean logMAR BCVA in both the groups were comparable. So in ICIOL group 80 % patients and 76.6% in SFIOL group had vision better than preoperative VA. Mean IOP in both the groups was same. Surgical time in ICIOL was significantly less than SFIOL group ($P=0.00$). Complications rate was high in SFIOL group than ICIOL group. Suture related complications and hyphema was common in SFIOL group but all these complications were treated. Pupil peaking was more in ICIOL group. One ICIOL was disenclavated on the 1st week visit which was re-enclavated again. **Conclusion:** Our results suggest that both the lenses have good visual results but in terms of complications posterior iris claw lens offers low incidence of complications, less invasive and time saving surgery. However , selection and meticulous surgical technique are critical and strongly influences the success of the procedure.

Key words: posterior iris claw lens , scleral fixated posterior chamber lens, aphakia.

Introduction

With the development of modern cataract surgery and excellent visual outcomes with PCIOL , the problem of aphakia correction is less commonly encountered. The most preferred method nowadays is the implantation of PCIOL but this may not be possible in cases of weak or no capsular support. ¹ When capsular support is inadequate or absent , the treatment options are anterior chamber IOL implant, an iris fixated IOL implant, or a scleral fixated (sutured) posterior chamber IOL implant². The first iteration of Iris Claw lens appeared in 1978 and the lens was designed by Prof. Jan G.F Worst. The technique of retro pupillary iris fixation of iris claw lens which was first reported by Andreas Mohr in 2002³, offers several advantages it combines the benefit of posterior chamber implants with a low-risk method of surgery and its cosmetic benefit, by hiding the IOL

haptic and parts of the lens behind the iris ,less surgical time and also preserves the anatomy of the anterior segment with respect to the position of the natural crystalline lens. There are also few disadvantages like disenclavation, pupillary deformity and iris atrophy. Having diverse options to correct the aphakic vision, many studies have been carried to know cons and pros of iris fixated and scleral fixated IOL

SFIOL offers a superior optical rehabilitation when compared to ACIOL³ but it is not free of complications which include suture erosion, IOL tilting or decentration, fibrin reaction, and vitreous prolapse into the anterior chamber and takes more time as it is technically difficult. The results of standard techniques and current knowledge about recently adopted techniques need to be elicited and compared prospectively to know the benefits of either

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modality. In this regard, we will be analyzing mainly the complications and visual outcome of SFIOL and posterior iris claw lenses to find the efficacy of each lens by comparing with each other.

Materials and Methods

This study comprised of 60 patients who had posterior iris claw lens implantation (group A (n=30)) or scleral fixated IOL (group B (n=30)) implantation by the same surgeon between december 2012 to June 2014. The study was approved by the Institutional Review Board and Ethics Committee at Sri Devaraj Urs Medical College and Hospital.

Patients with complicated cataract surgery leading to posterior capsular rupture or subluxated lens were included in this study and patients with preexisting pathologies of cornea, retina, macula, chronic uveitis, glaucoma were excluded from the study. Preoperative information included demographic data, snellens visual acuity, slit lamp examination, IOP, fundus evaluation, A-scan, B-scan. Postoperative information obtained included UCVA, near vision over the 1st day, 1st week, 1st month, 3rd month, 6th month. Final BCVA was measured at the 6th month.

Posterior iris claw IOL (ICIOL)

A corneo-scleral 12 o'clock frown tunnel incision which is 5.5 mm was made. Two paracenteses are used for the introduction of Sinsky hook needed for the retropupillary enclavation of the iris claw aphakia IOL and are positioned at 2 o'clock and 10 o'clock. Intracameral pilocarpine was injected to constrict the pupil. A small amount of viscoelastic was injected from the periphery of the eye, but never directly into the pupillary area. Holding the optic with iris claw holding forceps one haptic was tilted down and pushed under the iris with gentle manipulation simultaneously a Sinsky hook was passed through the paracentesis on the same side. Once the haptic of the IOL was behind the iris and the iris was enclavated into the haptic law with gentle push with the Sinsky hook, noting the dimple at the site of enclavation. Similar maneuver was done for the other haptic. Iridectomy was done.

SFIOL :- Ab- externo 4 point fixation technique

After adequate peritomy two partial thickness scleral flaps 1.5 to 2 mm posterior to the limbus was fashioned at the 3 o'clock and 9 o'clock meridians, 180° apart. A doubled arm 10-0 prolene suture with straight needle was used. The needles were railroaded out of the eye through the bed of the

opposite scleral flap using a bent 25g needle introduced through the scleral bed. A limbal section was fashioned and the sutures were drawn out of the eye, and cut into two halves. Each half of the sutures were passed through the fixation eyelet on the superior and inferior haptic of the IOL at the point of maximum haptic spread. A single piece, all PMMA, large optic IOL (equiconvex 6.5mm optic, 13mm overall length) was used for scleral fixation. The IOL was introduced into the posterior chamber, and the sutures were tightened and tied & the suture knots were buried in the scleral bed and the scleral flap sutured. The viscoelastic was cleared from the AC. The sclerocorneal and conjunctival peritomies were closed with 10-0 nylon sutures. Subconjunctival gentamycin and dexamethasone 0.5cc was given at the end of both the procedures. Postoperative visual outcome comparison is done using descriptive studies using proportions and difference in proportions between the two groups and Chi square test.

Results

The patients were matched in terms of age, sex, laterality. Age group in both the groups ranged from 37-75 years. The majority of patients in both the groups were in the 60-75 years age group. In the study majority were males i.e. 53.33% and 46.77% were females. In ICIOL group males were more than females and in SFIOL group females were more but the difference was insignificant. In both the groups majority were operated on the right eye (63.33%).

Most common etiology of aphakia in our study was post complicated cataract surgery and in that secondary implantation (65%) was more common than primary. Majority patients in our study were treated within 0-1 years of aphakia. Maximum number of patients had unocular aphakia with good vision in the fellow eye. Mean surgical time for ICIOL was 12+/- 4.21 minutes which was significantly less than time required for SFIOL implantation (30.9± 5.81) minutes (P<0.05).

VA	ICIOL	SFIOL
6/18 – 6/6	22 (73.4%)	19 (63.3%)
6/60-6/24	7 (23.3%)	10 (33.3%)
<6/60	1 (3.4%)	1 (3.4%)

Table 1: Postoperative VA

Postoperatively 6/18- 6/6 vision was found in 73.3% in ICIOL group as compared to 63.3% in SFIOL. LogMAR BCVA of preoperative and postoperative in both the groups were compared and the difference was found to be statistically significant.

BCDV ICIOL	Mean & SD
Pre operative logMAR BCDV	0.63±0.33
Postoperative logMAR BCDV at 6 months	0.41±0.32
Pre op Log BCDV SFIOL	0.59±0.26
Post op LogMAR BCDV at 6 months	0.45±0.37

Table 2: Comparison of preoperative and postoperative BCDV in ICIOL and SFIOL group.

Visual acuity	ICIOL		SFIOL	
	No of pts	%	No of pts	%
Better than preop VA	24	80%	23	76.66%
Equal to preop VA	5	16.66%	4	13.33%
Worse than VA	1	3.33%	3	10%
Time	preoperative	final	Preoperative	final
Mean IOP	14.46 ± 2.48	14.50 ± 2.80	14.06 ± 2.39	14.37 ± 2.76

Table 3: Visual acuity in both the groups (postoperative)

Complications	Groups			
	ICIOL (n=30)		SFIOL (n=30)	
Striate Keratopathy	4	13.33%	5	16.66 %
Hyphema	0	-	4	13.33%
Vitreous in Anterior Chamber	0	-	0	-
Iritis	4	13.33 %	6	20 %
Peaked pupil	5	16.66 %	1	3.33 %
Tilted IOL	2	6.66 %	4(2)	13.33%
Suture Related	0	-	4	13.33%
Secondary Glaucoma	1	3.33%	4	13.33%
CME	0	-	3	10%
Retinal detachment	0	-	0	-
others	2	6.66%	1	3.33%

Table 4: Comparison of complications of both the groups

Discussion

ACIOL and SFIOLs have been the most popular type of IOLs used in implantation in the absence of adequate capsule support,³ and they avoid the need for aphakic spectacles or contact lenses. However, there is much discussion on the best method for secondary IOL implantation that offers the lowest complication rate and best possible visual rehabilitation over several years.^{4,5}

In our study ICIOL group mean preoperative BCVA was 0.63 ± 0.33 logMAR. The mean Postoperative BCVA was 0.41±0.32 and SFIOL group mean postop BCVA was 0.45 ± 0.37 in ICIOL which was comparable to Schallenberg⁶ et al. Out of 30 eyes in ICIOL group 24 (80%) patients achieved a final BCVA better than preoperative BCVA which was comparable with Schallenberg⁶ and better than Mohr A⁴ and Gonnerman⁷. In our study 22 (73.33%)⁶ eyes with ICIOL and 21 (70%) eyes with SFIOL achieved BCDV of > 6/18. This is comparable to previous studies of PC IOLs and SFIOL.

Farrahi⁸ et al compared ICIOL vs SFIOL in which mean postop BCVA in ICIOL group was 0.44±/-0.24 which was comparable to our study i.e 0.45±/-0.32 and for SFIOL was 0.61±0.25 logMAR wherein in our study it was 0.45±/- 0.32 for SFIOL our results were better than Farrahi⁸ et al but statistical difference was not found in both the studies regarding postoperative BCVA which was almost the same with Farrahi⁸ et al. Mean surgical time required for ICIOL group was 12±/- 4.21 minutes compared to other studies which was around 11.23±/-1.54 57 minutes and 20±/-8.9 56 min. Mean time required for SFIOL group in our study was 30.9 ± 5.81 minutes which was comparable to other study in which it was 31.68±/-3.1557 less than study by Hara et al.⁶

Pupil ovalization was the most common complication in our study in ICIOL, among 5 patients (16.6%), we observed 3(10%) patients had permanent ovalization as opposed to 1 in SFIOL. It can occur due to asymmetrical fixation of haptic, tight fixation and was less than a study done by Gonnerman⁷. In our study there was no significant difference in mean preoperative IOP (14.46±/- 2.28) and mean postoperative IOP (14.50±/-2.80) in both the groups. Despite elevated IOP in first few weeks in few patients no eye had clinically significant secondary glaucoma as seen in a study by Gonnerman⁷ and Baykara¹⁰ et al therefore, primary open angle and secondary glaucoma are not contraindications to posterior iris-claw IOL implantation.

One patient had subluxation of ICIOL due to disenclavation of a single haptic but it was re-encavated. One patient in our study has slightly decentered IOL which was insignificant. Similar citing was seen by Gonnerman⁷ who found dislocation rate upto 8.7%. Other studies of posterior-fixated iris-claw IOLs^{4,11,12} report a similar dislocation rate (0% to 10%). In the present study four cases of SFIOL had hyphema, which was cleared within 1 month, similar findings was supported by Mazhri et al with 50 cases and found hyphema in 8 eyes (16%) which cleared in all the patients within 1-3 weeks with no residual

complications. Retinal detachment was not observed over the follow up period which is in agreement to other studies.^{4,9}

No CME in the ICIOL group was identified but in SFIOL patients two patients developed CME. According to Gonnerman⁷ incidence of postoperative macular edema was 8.7% after 6 to 7 months which was higher than 4.1% to 4.8% on other Studies^{4,12}. In a study done by De Silva⁶² on ICIOL two patients had CME of which one had chronic CME. Suture erosion was seen in two patients and one patient had loose sutures due to which he had tilted IOL and significant glare which was resutured again. Erosion was seen in 3/17 patients in a study described similar to the present study.

ICIOL and SFIOL have statistically comparable results as far as post-operative BCVA is concerned but ICIOL has slightly higher percentage of patients with better visual acuity. ICIOL has lesser rate of complications most common was pupil ovalization which was harmless and others were also treatable. The implantation of a retropupillary iris-claw lens in the absence of sufficient capsular support is a good alternative. The easy implantation process with this technique and short surgical time can replace the scleral fixated IOL as the method of choice.

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How to cite this article: Ashwini R Mahajan , Narendra P Datti. Comparison of iris claw lens and scleral fixated intraocular lens in terms of visual outcome and complications. *J Clin Biomed Sci* 2014; 4(4):357-60.

Conflict of interest: The authors claim to have no conflict of interests in the context of this work.