

## VISUAL OUTCOME AFTER RETROPUPILLARY FIXATION OF IRIS CLAW LENS IN PATIENTS WITH APHAKIA

### Ophthalmology

|                         |                                                                                           |
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### ABSTRACT

This prospective study was done to evaluate visual outcomes and complications in patients with retropupillary iris claw lens. Thirty nine patients were enrolled and observed for complications and visual outcomes. Visual improvement was statistically significant at 3 month evaluation ( $p < 0.001$ ). No intra operative complications and minimal post operative complications were noted.

### KEYWORDS

Aphakia, Retropupillary iris claw lens, Visual outcome

### INTRODUCTION

Implantation of Intraocular lens (IOL) has become procedure of choice in aphakic eyes.

Evolution of iris claw lens:

Prof Jan Worst implanted the first Iris Claw lens in 1978. Dr. Daljit Singh in India used three models for his study<sup>1</sup>

Indications<sup>2,3,4,5,6,7</sup>

- Aphakia following complicated cataract surgery for senile cataract.
- Traumatic cataract.
- Subluxation or dislocation of lens or IOL

Exclusion criteria<sup>2,4,7</sup>

- Inadequate iris tissue
- Rubeosis iridis
- Fixed dilated pupil
- Glaucoma.
- Vitreous hemorrhage.
- Retinal detachment.
- Recurrent uveitis
- Proliferative diabetic retinopathy

Advantages<sup>2,3,4</sup>:

- Implantation behind iris preserves the anatomy of the eye.
- It does not have suture related complications like sclera fixated IOLs.<sup>8</sup>
- It has small learning curve.
- The haptics are designed as pincers or claws, and are attached to the mid peripheral iris stroma avoiding difficulties in pupil dilation and enables excellent fundal visualization.<sup>2,9</sup>
- In sectoral loss of iris it can be implanted.<sup>10</sup>
- IOLs can be successfully re-enclaved if required.
- Iris claw IOL can be fixed in any meridian.

Complications<sup>11,12</sup>

Iritis, Hyphema, IOL dislocation, Pupil ovalization, Iris schaffing, increased intra ocular pressure, macular edema, Retinal detachment, epiretinal membrane.

### AIM & OBJECTIVES

#### Aim:

To evaluate the visual outcome after retropupillary iris claw lens implantation in patients of aphakia.

#### Objectives:

To evaluate the visual outcome and complication rate after retropupillary iris claw lens implantation by assessing

1. Pre and postoperative BCVA,
2. Intra and postoperative complications at 1<sup>st</sup> post OP day, 1 Week, 1 Month and 3 Months.

### MATERIALS AND METHODS

Sample size -39

A prospective study was done at Arasan Eye Hospital, Erode during the period of June 2013 to May 2014. All patients with inadequate capsular/zonular support were enrolled in the study. After informed consent, all patients underwent retropupillary fixation of iris claw lens.

Patient were subjected to following examinations preoperatively and 1<sup>st</sup> post op day, 1<sup>st</sup> Week, 1 Month and 3 Months.

1. VA using Snellen's visual acuity chart.
2. Detailed anterior segment evaluation using slit lamp biomicroscopy.
3. IOP measurement by Goldmann applanation tonometry
4. Fundus evaluation by Slit lamp biomicroscopy using 90D dioptre lens.
5. Keratometry

Inclusion criteria:

- Patients with aphakia due to intraoperative complication leading to inadequate capsular/zonular support.

Contraindications:

1. Inadequate iris tissue
2. Patients with glaucoma
3. Uveitis
4. Macular pathology

Approval of study was obtained from hospital ethical committee.

Iris claw IOL implantation was done as a secondary procedure after 2-4 weeks of the primary surgery once the inflammation was settled.

IOL power calculation was done in aphakic mode using SRK/T formula with a A constant of 117.2.

IRIS CLAW IOL model number: PIC 5590

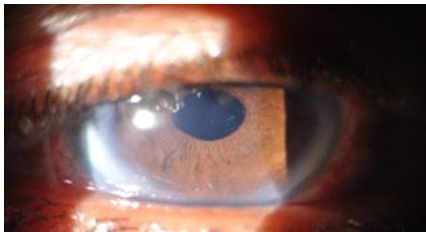
- Monofocal
- Single piece
- Biconvex lens
- Made up of pmma material
- Optic length : 5.50mm, total length : 9.00mm
- The haptics have fine fissures in which the iris gets enclaved.

Anaesthesia—Peribulbar block.

### Preparation and procedure

The eyelid and periorbital area of the eye to be operated were painted and draped. Iris claw implantation was done through a scleral tunnel or a clear corneal incision depending on the primary procedure. Two side ports were made diagonally opposite. Three port pars planar vitrectomy was done in patients with nucleus drop, IOL drop or residual cortex in vitreous cavity. In other patients anterior vitrectomy was done. Iris claw IOL was introduced into the anterior chamber. Holding the optic of the lens with lens holding forceps, one haptic was pushed under the iris. Simultaneously, dialer was passed through the sideport on the same side and enclavation done. End point was noting the dimple at the site of enclavation. Similarly haptic enclavation was done on other side. Peripheral iridectomy was done at the end.

Post operatively topical antibiotic steroids were tapered over 6 weeks.



### Statistical methods

Data analysis was done with the help of appropriate statistical software. Quantitative data was presented with the help of Mean, Standard Deviation and IQR, before and after comparison was done with the help of Paired T test. Qualitative data was presented with Frequency and Percentage table, P value less than 0.05 was taken as significant level.

### RESULTS

Distribution of patients according to gender:

Of the 39 patients included in the study, 14 patients (35.9%) were male and 25 patients (64.1%) were female.

#### Age distribution:

In our study, maximum (17 patients – 43.6%) of patients were in the age group of 60-69 years. The average age in this study was

| Table 1<br>Complications            | Post op day |         | 1st week post op |         | 1st Month post op |         | 3 <sup>rd</sup> month post op |         |
|-------------------------------------|-------------|---------|------------------|---------|-------------------|---------|-------------------------------|---------|
|                                     | No          | Percent | No               | Percent | No                | Percent | No                            | Percent |
| Corneal edema                       | 1           | 2.6     | -                | -       | -                 | -       | -                             | -       |
| Increased AC reaction               | 1           | 2.6     | -                | -       | -                 | -       | -                             | -       |
| Raised IOP                          | -           | -       | -                | -       | -                 | -       | -                             | -       |
| Pigments over IOL                   | 1           | 2.6     | 1                | 2.6     | 1                 | 2.6     | 1                             | 2.6     |
| Ovalization of pupil                | -           | 5.1     | 2                | 5.1     | 2                 | 5.1     | 2                             | 5.1     |
| Iris atrophy at site of enclavation | 1           | 2.6     | 1                | 2.6     | 1                 | 2.6     | 1                             | 2.6     |
| Subluxation of lens                 | -           | -       | -                | -       | -                 | -       | -                             | -       |
| Dislocation of lens                 | -           | -       | -                | -       | -                 | -       | -                             | -       |
| Cystoid Macular edema               | -           | -       | -                | -       | -                 | -       | -                             | -       |
| Endophthalmitis                     | -           | -       | -                | -       | -                 | -       | -                             | -       |
| Retinal detachment                  | -           | -       | -                | -       | -                 | -       | -                             | -       |

65 (range 48 – 93yrs)

#### Laterality:

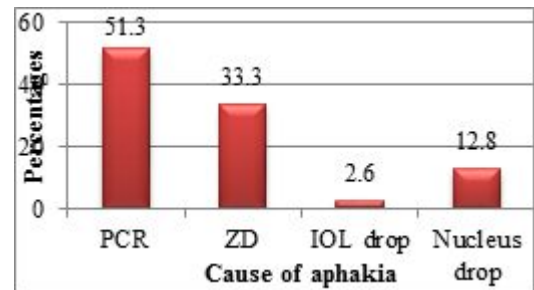
Among 39 eyes of 39 patients operated in our study, 22 (56.4%) were right eye while 17 (43.6%) were left eye.

#### Type of surgery:

Out of 39 patients, primary surgery done was SICS in 29 patients (74.4%) and phacoemulsification in 10 (25.6%) patients.

Distribution based on Cause of aphakia:

**Chart 1: causes of aphakia**



Cause of aphakia was posterior capsular rent (PCR) in 20 cases (51.3%), Zonular Dialysis (ZD) in 13 patients (33.3%), nucleus drop in 5 patients (12.8%) and IOL drop in 1 patient (2.6%) (chart 1)

Intra operative complications were NIL

Post operative complications: (Table 1)

Comparison of BCVA before the operation and after the operation at the end of 3 months: (Table 2)

| Table 2 Group  | Mean  | Std. Deviation | t-value | P-value |
|----------------|-------|----------------|---------|---------|
| Pre-operative  | 0.378 | 0.152          | 6.450** | < 0.001 |
| Post operative | 0.188 | 0.106          |         |         |

\*\*significant at 0.01 level

The final mean best corrected visual acuity (BCVA) (0.188 ± 0.106 [SD]) at the end of 3 months is significantly better than preoperatively (0.378 ± 0.152 [SD]) P < 0.001

### DISCUSSION

The ideal lens for correction of aphakia without capsular support would be one that has a relatively safe and easy insertion technique with minimal intraoperative and postoperative risk. It should fit through a small incision, correct any astigmatism result in good unaided visual acuity. The retropupillary iris claw IOL addresses a number of these issues.

In our series, we implanted the retropupillary iris claw IOL for surgical correction of aphakia.

We included all postoperative patients of aphakia with inadequate capsular or zonular support to place the IOL either in bag or sulcus.

Iris claw implantation was done once the inflammation was settled after the primary procedure. There was no significant difference in the visual outcome in the patients where the surgery was done before or after 2 weeks.

During the surgery no complications were observed. All of our patients had a well-centered IOL postoperatively and during the follow-up.

Postoperative BCVA improved in all patients. The mean preoperative BCVA was 0.378 logarithm of the minimum angle of resolution (logMAR). The mean postoperative BCVA was 0.188 logMAR and P value is < 0.001. In 69.2% of our patients BCVA improved to 20/20 to 20/40. Raghavendra Rao et al reported that postoperatively, BCVA improved significantly (< 0.002) in their patients and 80% of patients had good vision of 20/20 to 20/40.<sup>3</sup>

Corneal edema on first postoperative day was observed in one patient. One case had increased AC reaction during the first postoperative day. Both these complications were managed medically.

None of our patients had raised intraocular pressure postoperatively. Pigment dispersion was not observed in any patient. Johannes Gonnemann et al<sup>7</sup> reported that no eye had clinically significant

pigment dispersion or secondary glaucoma requiring additional postoperative treatment.

One patient showed iris atrophy at the site of enclavation and pupil ovalization was seen in 2 cases. Baykara et al reported persistent pupil ovalization in 12.7% of eyes. Pupil ovalization may be due to fixation of the haptic very tightly or asymmetrically.<sup>1</sup>

Another possible severe complication is the dislocation of the iris-claw lens. We did not see this complication in our patients.

In no patient clinically corneal decompensation was detected. Gicquel et al directly compared patients with implantation below the iris to patients with implantation in the anterior chamber and found a significant lower endothelial cell loss in patients with posterior chamber implantation.<sup>13</sup> Raghavendra Rao et al reported that endothelial cell loss was 8.96% at the end of 6 months. Cystoid macular oedema and retinal detachment were not observed in any of our patients. Raghavendra Rao et al reported that none of their patients developed any major complications like cystoid macular oedema, bullous keratopathy or retinal detachment.<sup>3</sup>

As the primary surgery was done by different surgeons, we could not compare the pre and postoperative astigmatism. Baykara et al reported that that implanting the iris-claw IOL through a scleral tunnel promotes faster visual recovery and better visual outcomes that result from a lower postoperative induced astigmatism and an increased refractive accuracy.<sup>1</sup>

Postoperatively, the diagnostic pupil dilatation was unaffected. Baykara et al reported that pupil dilatation remained unaffected postoperatively.<sup>1</sup>

Our study is limited by the smaller sample size, shorter follow up period and lack of endothelial cell count pre and postoperatively. Large sample size and a longer follow up is required to come to a conclusion.

## CONCLUSION

We conclude that retropupillary iris claw IOL is a viable option in patients with inadequate capsular or zonular support.

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