

## ***Retropupillary Iris claw lens as a choice for secondary IOL implantation***

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The surgical options available for optical correction of aphakic eyes with no capsular support include angle fixated anterior chamber intraocular lenses (AC IOLs), scleral fixated intraocular lenses (SF IOLs) and iris fixated intraocular lenses (IF IOLs).

Anterior chamber Intra ocular lenses have the advantage of easier insertion and less operating time but disadvantages are decreasing endothelial cell counts ,increasing corneal thickness ,localized peripheral corneal edema, and cystoid macular edema.<sup>2</sup>

Limitations of sutured scleral-fixated IOL are it needs surgical expertise, prolonged surgical time, suture-induced inflammation, suture degradation, and delayed IOL subluxation or dislocation due to broken sutures. It is also difficult and time-consuming, requiring minute and perfect adjustment of suture length and tension to ensure good centration of the scleral-fixated IOL.<sup>3</sup>

The iris claw IOL is a modified version of Dr. Worst and Dr Daljit Singh model. It combines the benefits of posterior chamber implants with a low-risk method of surgery and it offers considerable cosmetic benefit, by hiding the IOL haptic and parts of the lens behind the iris. Retropupillary fixation of iris-claw lenses enhances stability, prevents tilting of the lens and reduces the glare phenomenon, which is characteristic of the lens being implanted in the anterior chamber<sup>1,12,13</sup>

The advantages of Iris claw lenses are its Low incidence of pupillary block ,uveitis-glaucoma-hyphaema syndrome, pseudophakic bullous keratopathy and less endothelial loss.

Most importantly it is positioned at the nodal point of the eye and is distant from trabecular meshwork<sup>2,13</sup>

Its disadvantages being it may cause pigment dispersion and requires sufficient iris tissue<sup>2</sup>

### **Materials and Methods**

Fifteen aphakic eyes of twenty patients with inadequate capsular or zonular support for in-the-bag or sulcus placement of posterior chamber intraocular lens who underwent retropupillary iris fixation of iris claw intraocular lens (IOL) [Excel Optics – Chennai, Model No. PIC 5590] were included. (Authors have no financial interest in the product).

Three eyes were paediatric<sup>567</sup> age group who were aphakic as they were operated for congenital cataract and were wearing aphakic glasses.

Two of them were post traumatic subluxation of lens. The rest were routine post cataract cases where capsular support was lost intraoperatively. Two patients were implanted bilaterally.

All cases were taken up for secondary IOL implantation.

The IOL has an overall diameter of 9mm with a optic diameter of 5.5mm and has a 300 claw cut or vaulting for the claws. The estimated A constant is 117.0. Retropupillary posterior iris fixation of the IOL was done by a single surgeon under peribulbar anaesthesia.

**Surgical Technique:** Anterior vitrectomy was done in all cases. Cases in which the Iridotomy opening was not sufficient, peripheral iridectomy was enlarged using the vitrector. Two paracentesis were made 90 degrees from the

scleral section. Intracameral pilocarpine was injected to constrict pupil. Iris claw IOL was introduced into the anterior chamber through a 5.5mm scleral tunnel. Viscoelastic (2% HPMC) was injected at each stage to deepen the anterior chamber and maintain space. Holding the optic with a lens 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, the haptic was tilted up to produce an indent on the iris. The iris was enclavated into the haptic claw with gentle push with the Sinsky hook. Then with similar maneuver the other haptic enclavation was done. Viscoelastic was aspirated with simcoe canula, anterior chamber formed with BSS and conjunctiva repositioned.

**Postoperative examination:** Postoperatively prednisolone acetate and ofloxacin eye drops were given and tapered over one month. Ketorlac eye drops were given for three months. Patients were followed up on day one, one week, one month, three months and one year postoperatively. At each follow-up visit detailed slit lamp examination was done. Vision, refraction and intraocular pressure measurement done at one month, three months and one year were compared and studied.

### Results

Fifteen patients whose age ranged between 11 and 73 years were studied. The pre iris enclavation BCVA ranged between 2/60 and 6/9. Postoperatively 3 patients had BCVA 6/6, 7 patients had 6/9, 2 patients had 6/12, 1 patient had 6/18, one patient had 5/60. All the patients attained visual acuity equal to or better than their preoperative BCVA.

There was no significant increase in intraocular pressure in any of the cases. There was also no significant inflammation postoperatively. Two of the cases had pigment deposits on the IOL. All the IOLs were well centered except two which were slightly decentred but did not interfere in the

vision. One IOL developed disenclavation of one of the haptics for which reenclavation was done using the same technique as for the primary procedure, making sure that more of iris tissue was tucked in the claw.

No patients had serious complications like end ophthalmitis, retinal detachment or glaucoma during the follow up.

### Discussion

A review (literature search conducted for the years 1980 to 2001) was conducted by American Academy of Ophthalmology<sup>11</sup> to determine the safety and efficacy of open-loop anterior chamber, scleral-sutured posterior chamber, and iris-fixated posterior chamber intraocular lenses (IOLs) in eyes with inadequate capsular support for posterior chamber implantation in the capsular bag or ciliary sulcus. It also attempted to determine whether there is a preferred IOL or fixation site of choice in eyes with inadequate capsular support. The review supports the safe and effective use all the above mentioned types of IOL's for the correction of aphakia in eyes without adequate capsular support.

At this time, there is insufficient evidence to demonstrate the superiority of one lens type or fixation site.

Iris fixated IOL were there for a long time, nearly for 4 decades with mixed results. They attracted a lot of debates and controversies. Most of the problems and complications with iris fixated IOL were solved with improved design, manufacturing techniques and surgical technique.<sup>4,5,6,7,8,9,10</sup> Thanks to the efforts of its inventors Dr. John Worst and Dr. Daljit Singh, they stood test of time and emerged as a safe IOL FDA approved for phakic refractive IOL.

We have used a Iris claw lens (Excel Optics, Chennai Model No: PIC 5590, SIC4280P) in this study.

In our study, 14 eyes gained 2 or more Snellen lines of BCVA. One had same pre operative BCVA At the end of the follow-up period (avg 7.8 months)

in our study, the IOL was well-centered, the pupil was regular with a slight ovalisation in a few cases. All eye was quiet with no sign of iritis. Mild decentration of IOL of 0.5mm to 1mm was seen in 2 cases. In conclusion, implantation of a retro-pupillary iris fixated IOL for correction of aphakia was relatively easy to perform in all 15 eyes in our study. The retropupillary fixation of an iris claw lens seems to have the advantages of a true posterior chamber implantation with a low intra- and postoperative risk profile. The easy implantation process with this technique could replace the normally applied sclera suture fixed implantation of a posterior chamber lens as the method of choice. The learning curve is short and initial complications like iridodialysis, hyphaema, pupil ovalisation and decentration have to be kept in mind.

We believe, it is a better option than a scleral-fixated or angle-fixated IOL because of the

advantages of Iris claw lenses like the low incidence of pupillary block, uveitis-glaucoma-hyphaema syndrome, pseudophakic bullous keratopathy, suture erosion & lens subluxation and less endothelial loss.

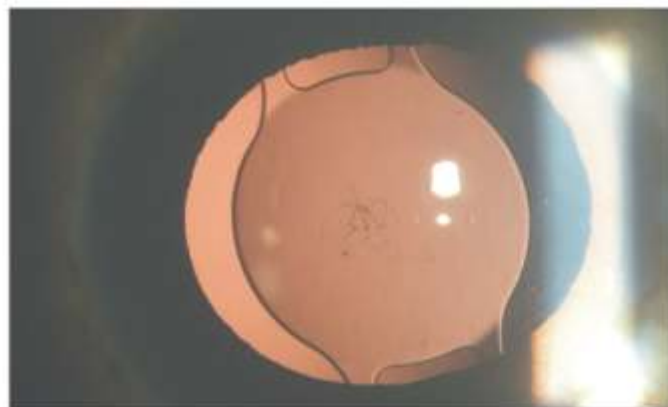
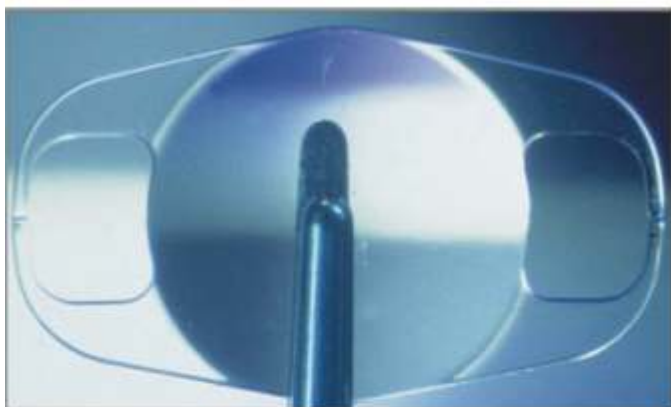
Most importantly it is positioned at the nodal point of the eye and is distant from trabecular meshwork<sup>214</sup>

However Multicentric studies with a larger cohort and over a longer period are needed.

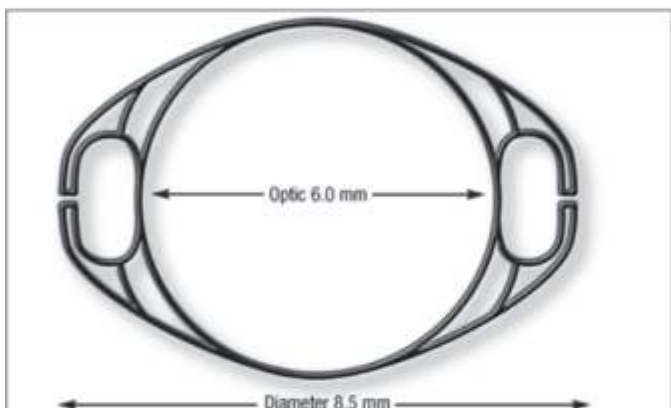
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PT	Age	Eye	Follow up	Diagnosis	Pre Op BCVA	Post Op BCVA	Complications
1	35	RE	18	Post traumatic corneal tear with lensectomy	2/60 + 10 6/12	6/9	
2	13	RE	3	aphakia	2/60	5/60	
3	45	LE	3	aphakia	+10 -6/9	6/9	Decentred IOL
4	11	RE	18	aphakic	6/18	6/12	Recenclavation done twice
5	11	LE	18	aphakic	6/12	6/9	
6	62	RE	18	aphakic	+14-6/9	6/18	
7	5	LE	3	aphakic	+12 6/9	6/6	
8	73	RE	6	aphakic	+10- 6/12	6/6	
9	73	LE	6	aphakic	+10 -6/12	6/9	
10	58	RE	9	aphakic	+10 -6/12	6/9	
11	60	LE	3	aphakic	+10 -6/18	6/9	Oval pupil
12	38	LE	3	aphakic	+10 6/12	6/9	Oval pupil
13	60	RE	3	Aphakic	+10 6/12	6/12	Decentred IOL
14	45	RE	3	aphakic	+10- 6/12	6/6	
15	47	RE	3	Post traumatic Subluxated lens	5/60	6/9	Oval pupil



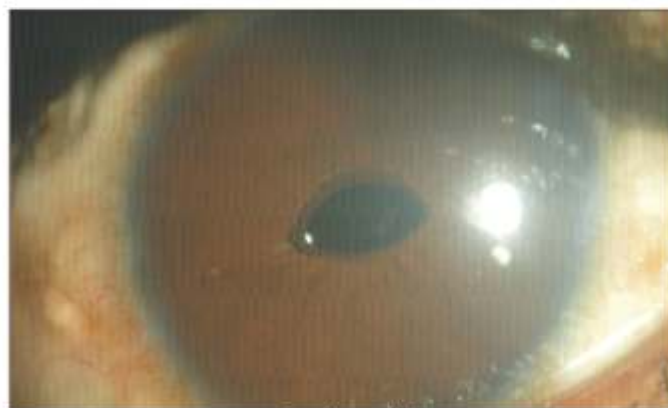
Dilated pupil with retro pupillary Iris claw in place



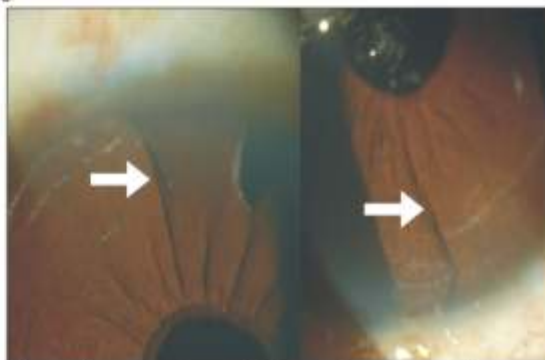
Mild decentration of IOL of 0.5mm to 1mm



Post operative



Oval pupil



Enclavation marks of Claw lens on Iris surface

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