Pars plana vitrectomy with posterior iris claw implantation for posteriorly dislocated nucleus and intraocular lens

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We evaluated the safety and efficacy of pars plana vitrectomy (PPV) with primary posterior iris claw intraocular lens (IOL) implantation in cases of posterior dislocation of nucleus and IOL without capsular support. This was a retrospective interventional case series. Fifteen eyes underwent PPV with primary posterior iris claw IOL implantation performed by a single vitreoretinal surgeon. The main outcome measures were changes in best corrected visual acuity and anterior and posterior segment complications. A total of 15 eyes were included in this study. Eight had nucleus drop, three had IOL drop during cataract surgery and four had traumatic posterior dislocation of lens. The final postoperative best corrected visual acuity was 20/60 or better in 11 patients. This procedure is a viable option in achieving good functional visual acuity in eyes without capsular support.

Key words: Dislocated nucleus, intraocular lens, iris claw lens, pars plana vitrectomy

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Loss of integrity of posterior capsule with dislocation of nucleus into the vitreous cavity is a vision-threatening complication of cataract surgery. Attempted placement of intraocular lens (IOL) in cases with posterior capsular rupture and zonular dialysis can occasionally lead to dislocation of IOL into the vitreous cavity. Dislocation of the lens into the vitreous cavity can follow blunt trauma. Management of these cases is with pars plana vitrectomy (PPV) with nucleus, lens or IOL removal and placement of IOL implantation in the same sitting or as a secondary procedure depending on the expertise of the surgeon. Choices of IOL in cases without capsular support are scleral fixated IOL, anterior chamber IOL and posterior iris claw. Posterior iris claw enclavation in the same sitting is a viable option due to less surgical time and minimal complications.[1-3]

Material and Methods

Retrospective interventional case series of 15 patients with posteriorly dislocated nucleus, lens or IOL, who underwent PPV with posterior iris claw implantation between January 2007 and December 2010. All surgeries were performed by a single surgeon. Ethics committee approval was taken.

Inclusion criteria
1. Patients who had posterior dislocation of nucleus or IOL following cataract surgery.
2. Patients who had traumatic posterior dislocation of the lens.

Exclusion criteria
1. Patients with retinal detachment, vitreous hemorrhage and central corneal pathology.
2. Preoperative data was obtained from the patient's record including age, sex, visual acuity, slit-lamp examination, fundus evaluation and cause for dislocation of lens, nucleus or IOL.

Surgical technique

All surgeries were performed under peribulbar anesthesia. For a lens or nucleus dislocated into the vitreous cavity, standard 20-gauge three-port PPV was performed followed by nucleus or lens removal with an ultrasonic fragmenter.

In case of IOL in vitreous cavity, PPV was done and IOL was removed with vitreous forceps through the original cataract incision. Two ports were closed with 7-0 vicryl suture with the infusion cannula in place.

Intracameral pilocarpine was used to constrict the pupil. Two paracentesis were made perpendicular to the scleral tunnel incision site in cases of post-cataract surgery. Iris claw IOL was inserted through the original scleral tunnel and rotated into horizontal position. Using a lens fixation forceps, iris claw IOL was slipped through the pupillary area, and maintaining the horizontal position, the IOL was recentered over the pupil behind the iris. At the same time, through paracentesis, an IOL dialer was introduced and the iris was enclaved by applying gentle pressure over it through the slotted center of the lens haptic. A similar maneuver was then repeated on the other side. Peripheral iridectomy was performed in all cases. Scleral tunnel was closed with a 10-0 nylon suture. The pars plana infusion cannula was removed and the port was closed with a 7-0 vicryl suture. Conjunctival closure was done with a 7-0 vicryl suture.

In cases of traumatic dislocation of the lens a new scleral tunnel was made for insertion of the iris claw IOL.

We have used excellens iris claw IOL [Fig. 1]. SRK/T formula was used and the surgeon-derived A constant was 117.0.

Results

In our study a total of 15 eyes of 15 patients were enrolled as per the inclusion criteria. Mean age of the patients was 60.2 years with range of 46 to 75 years. Nine (60%) were male and six (40%) were female. The left eye was involved in eight (53.33%) cases and right eye in seven (46.67%) cases.

Eight (53.33%) cases had nucleus drop, three (20%) cases had IOL drop during cataract surgery and four (23.67%) had traumatic posterior dislocation of the lens.

Preoperative best corrected visual acuity (BCVA) ranged from finger counting at one meter (FC 1) to 20/20 with correction [Table 1]. One case with nucleus drop had diabetic macular edema (DME).

Postoperative vision in these cases ranged from 20/200 to 20/20 with correction [Table 1].

All patients achieved BCVA 20/200 or better on the first postoperative day, with a well-centered IOL [Fig. 2]. Good postoperative pupillary dilatation was achieved for fundus examination [Fig. 3].

After 12 months of follow-up, BCVA in these cases ranged
from 20/200 to 20/20 [Table 2]. Eleven patients had BCVA >20/60, two patients had BCVA 20/80 due to chronic cystoid macular edema (CME). One had BCVA 20/200 due to DME. One patient had an epiretinal membrane (ERM) with BCVA 20/120 [Table 1].

**Discussion**

Our study was different when compared to other similar studies in that the iris claw lens was implanted in the same sitting as PPV, thereby avoiding the need for a second surgery. To our knowledge there are no Indian reports or publications on PPV with primary iris claw IOL for posterior dislocation of the nucleus or IOL with no capsular support. In these cases the major hurdle is implantation of IOL. The choices of IOL are scleral fixated IOL, anterior chamber IOL (ACIOL) and iris-fixated IOL. Trans-scleral fixation of a posterior chamber IOL is technically challenging, requiring more surgical time and with increased possibility of associated complications like retinal detachment (RD), IOL decentration and endophthalmitis. Angle-supported anterior chamber IOLs are associated with

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### Table 1: Preoperative indications for pars plana vitrectomy. Preoperative and postoperative BCVA taken according to Snellen’s distance visual acuity chart

| No. | Age/Sex | Affected Eye | Indication for TPPV | Pre operative BCVA | Post op BCVA day 1 | Post op complication | Final BCVA |
|-----|---------|--------------|---------------------|-------------------|-------------------|---------------------|-----------|
| 1   | 62/Male | OS           | Dislocated IOL      | 20/800            | 20/80             | CME                 | 20/80     |
| 2   | 63/Female | OS         | Nucleus drop       | CF 1              | 20/200            |                     | 20/60     |
| 3   | 45/Female | OS         | Traumatic Dislocated lens | CF 1           | 20/80             | CME                 | 20/80     |
| 4   | 73/Female | OD         | Nucleus drop       | CF 1              | 20/200            | DME                 | 20/200    |
| 5   | 63/Male | OD           | Dislocated IOL     | 20/20             | 20/20             |                     | 20/20     |
| 6   | 46/Male | OD           | Dislocated IOL     | 20/200            | 20/120            | ERM                 | 20/120    |
| 7   | 55/Male | OS           | Traumatic dislocated lens | CF 2           | 20/60             |                     | 20/60     |
| 8   | 58/Male | OD           | Nucleus drop       | CF 1              | 20/60             |                     | 20/20     |
| 9   | 65/Female | OD         | Nucleus drop       | CF 1              | 20/120            |                     | 20/20     |
| 10  | 75/Female | OS         | Traumatic dislocated lens | CF 2           | 20/200            |                     | 20/60     |
| 11  | 60/Male | OD           | Nucleus drop       | 20/1000           | 20/200            |                     | 20/40     |
| 12  | 57/Female | OS         | Nucleus drop       | CF 1              | 20/120            |                     | 20/60     |
| 13  | 60/Female | OS         | Nucleus drop       | 20/40             | 20/60             |                     | 20/60     |
| 14  | 61/Male | OS           | Traumatic Dislocated lens | 20/800           | 20/40             |                     | 20/40     |
| 15  | 60/Male | OD           | Nucleus drop       | CF 1              | 20/200            |                     | 20/40     |

CF 1-counting fingers at 1 meter, CF 2-counting fingers at 2 meters, CME- Cystoid macular edema, DME- Diabetic macular edema, ERM- Epiretinal membrane

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**Figure 2:** Postoperative photo showing iris enclavation

**Figure 3:** Postoperative pupillary dilatation
Table 2: Preoperative and postoperative BCVA in cases of pars plana vitrectomy with posterior iris claw lens

| Visual acuity grading | Preoperative BCVA | Number of patients | Postoperative 6 months BCVA | Final BCVA at 1 year |
|-----------------------|-------------------|--------------------|-----------------------------|---------------------|
| Preoperative BCVA     | Day 1             |                   |                             |                     |
| >20/60                | 2                 | 5                 | 11                          | 11                  |
| <20/60-20/200         | 1                 | 10                | 4                           | 4                   |
| <20/200-20/800        | 2                 | -                 | -                           | -                   |
| <20/800               | 10                | -                 | -                           | -                   |

Figure 4: Preoperative best corrected vision using Snellen’s distance visual acuity chart

Figure 5: Postoperative best corrected vision using Snellen’s distance visual acuity chart

However, our study was limited by the smaller sample size and shorter follow-up period. We feel a multicentric, large sample size study may be required before any further conclusion can be drawn.

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Posterior iris claw enclavation in the same sitting is a viable option than other techniques due to less surgical time and minimal complications. Posterior iris-fixated IOLs leave enough space between themselves and the endothelium to avoid injury to the endothelium. Progressive pigment dispersion glaucoma has not been identified as a common late complication with this form of fixation. An IOL fixated firmly to the posterior iris surface may not create as much recurrent sweeping pigment epithelial trauma as an undersized IOL floating loosely in the sulcus.

In our study the preoperative BCVA was <20/800 in 66.67% patients [Fig. 4]. Postoperative BCVA was >20/60 in 73.33% of patients [Fig. 5]. This suggests that the majority of the patients achieved good visual acuity post surgery.