

# Secondary Intraocular Lens Implantation

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**Purpose:** To evaluate the visual outcome of secondary anterior and posterior chamber intraocular lens (IOL) implantation and to compare their results.

**Material and Methods:** The study was conducted from July 2003 to December 2005. Forty eyes of 40 patients were selected for secondary intraocular lens implantation. Twenty two patients (55%) were male while 18 patients (45%) were female. Age range was between 5 years to 62 years with mean age of 33.5 years. Anterior chamber implantation was performed in 20 patients with ruptured posterior capsule (Group I) while posterior chamber implantation was done in 20 patients with intact posterior capsule (Group II). All patients were followed for six months after surgery.

**Results:** In comparison to preoperative vision, 24 cases (60%) had improvement by one or more lines on Snellen's chart after surgery while 10 cases (25%) remained on the same vision level as they were with aphakic glasses. Visual acuity of 06 patients (15%) was dropped by two lines on Snellen's chart after surgery. Secondary posterior chamber IOL results were better and associated with fewer complications as compared to secondary anterior chamber IOL implantation.

**Conclusion:** Despite few complications which are more with anterior chamber IOLs than posterior chamber IOLs, secondary intraocular lens implantation is a better way to get rid of thick aphakic glasses and to restore binocular vision.

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The objective of an eye surgeon is to give patients a comfortable vision, minimize post operative astigmatism and quick recovery after surgery. Although we have been pushed into the new world with latest technologies for cataract surgery but still, as part of third world, we see some of the patients who were left aphakic due to the complicated surgery or trauma in which the surgeons decided to postpone the IOL implantation to a later date. Moreover, patients who have had ICCE without IOL implantation may ask for secondary IOL implantation after years of wearing contact lenses and aphakic glasses<sup>1</sup>. These thick aphakic lenses induce telescopic effects, aniseikonia and compromised depth perception and visual field<sup>2</sup>.

Contact lenses are good alternative of thick and heavy aphakic glasses. A large field of vision and less peripheral image distortion is provided by contact lenses as they are closer to the pupil entrance. Aniseikonia resulting from anisometropia is minimized by contact lenses. Its best example is use of these lenses in monocular aphakia. Regardless of the advantages, the thickness of these lenses greatly limits their gas transmissibility and corneal neovascularization is a common complication<sup>3</sup>.

An ethical and good solution to this problem is secondary intraocular lens implantation. It can be done in the anterior and posterior chamber depending upon the presence or absence of posterior capsular support. Although the ultimate decision lies in the hands of operating surgeon at the time of the procedure with adequate intraocular visualization, pre-operative evaluation allows better surgical planning<sup>4</sup>.

The purpose of the study was to evaluate the visual outcome of secondary anterior and posterior chamber intraocular lens (IOL) implantation and to compare their results.

## MATERIAL AND METHODS

This study was carried out at the department of Ophthalmology, Sir Syed College of Medical Science's hospital, Karachi and at the author's private set up. Secondary IOL implantation was performed in 40 patients (40 eyes) from July 2003 to December 2005. Patients with lack of binocularity due to aphakia in one eye and phakia/pseudophakia in the fellow eye, patients previously operated for congenital cataract and traumatic cataract, which led to monocular/binocular aphakia, were included in this study.

Exclusion criteria included central corneal opacity, glaucoma, uveitis and posterior segment diseases.

Detailed history was obtained especially regarding indication of previous surgery. Visual acuity with aphakic glasses was noted. Slitlamp examination was performed to assess the anterior and posterior segment, paying special attention to the type of previously undertaken surgical procedure. Biometry was performed using SRK II formula<sup>5</sup>.

We divided these 40 cases in two groups on the basis of status of posterior capsular support. Twenty patients (50%) were selected for anterior chamber IOL implantation (Group I) in which there was no or minimum posterior capsular support while 20 patients (50%) were selected for posterior chamber IOL (Group II) who had intact posterior capsule.

All surgeries were performed under retrobulbar anesthesia except 04 (10%) cases of congenital cataract where general anesthesia was given.

Eye was scrubbed using 5% pyodine, putting some solution in the cul-de-sac as well. Sterile draping was applied. Corneal incision of 6.5 mm was given in every patient using disposable 3.2 mm knives. After filling the anterior chamber and capsular bag with viscoelastic solution, posterior chamber IOL (PMMA) was implanted onto the posterior capsule. Viscoelastic solution was aspirated by Simco's cannula.

The technical ease or difficulty of secondary implantation depends mainly on how much capsular support was left behind primarily at the time of cataract surgery<sup>6</sup>. In eyes with large posterior capsular tear, anterior vitrectomy was performed to clean the vitreous from anterior chamber. Pupil was miosed using Miostat and an anterior chamber IOL was inserted in front of the pupil. Prophylactic peripheral iridectomy was done in all cases at 11<sup>o</sup> clock position, 10-0 nylon suture used to close the wound. Subconjunctival injection of steroid/antibiotic was given. Sterile dressings were applied at the end of the surgery.

Eye pad was removed on next day and patients were kept on steroid/antibiotic combination eye drops for 4-6 weeks. Patients were asked to visit on regular follow ups at one week, one month, three months and then at six months post operatively.

## RESULTS

Forty eyes of 40 patients were included in this study. Twenty two patients (55%) were male while 18

patients (45%) were female (Table-1). Age group was between 5 years to 62 years with mean age of 33.5 years. Out of these 40 patients, 20 (50%) were primarily operated for senile cataract, 16 (40%) patients were operated for traumatic cataract while 4 patients (10%) were operated for congenital cataract. We divided these 40 cases in two groups on the basis of status of posterior capsular support. 20 patients (50%) were selected for anterior chamber IOL implantation (Group 1) while 20 patients (50%) were selected for posterior chamber IOL (Group 2).

At the end of eight weeks, patients were given final refractive prescription. At the end of 3 months, best corrected vision was recorded for both groups.

In group I, visual acuity of 10 patients (50%) increased up to 6/9 while preoperatively it was 6/18 with aphakic glasses. Best corrected vision of 06 patients (30%) remained same (6/18) after secondary IOL implantation. Vision in four patients dropped to 6/60 while it was 6/24 with aphakic glasses preoperatively (Table 2).

In group II, 14 patients (70%) improved to 6/6p in comparison to preoperative vision of 6/12 with aphakic correction. Vision in 04 patients (20%) remained same as it was preoperatively i.e 6/12. Best corrected visual acuity of 02 patients (10%) was found to be decreased from 6/18 preoperatively to 6/36 postoperatively (Table 3).

**Table 1:** Patients data n=40

Gender	No of cases n (%)
Male	22 (55)
Female	18 (45)
Total	40 (100)

**Table 2:** Pre and post operative best corrected visual acuity of patients with secondary anterior chamber IOL implantation (Group I) n =20

No. of patient n (%)	Pre operative vision	Post operative vision
10 (50)	6/18-6/12	6/9
6 (30)	6/18	6/18
4 (20)	6/24	6/60

**Table 3:** Pre and post operative best corrected visual acuity of patients with secondary posterior chamber IOL implantation (Group II) n=20

No. of patient n (%)	Pre operative vision	Post operative vision
14 (70)	6/12	6/6 p
4 (20)	6/12	6/12
2 (10)	6/18	6/36

Nine patients (45%) developed complications after anterior chamber IOL implantation. Among them, commonest problem was post operative astigmatism (1.0D to 3.25DC) which was seen in 04 patients (20%), 02 patients (10%) developed post operative uveitis which resolved with topical steroid treatment. One patient (5%) developed raised IOP which was controlled by beta blocker eye drops. Hyphema was seen in 1 case (5%) of anterior chamber implantation in early post operative period and 1 patient (5%) had cystoid macular edema (Table 4).

Regarding complications of posterior chamber IOL implantation, 3 patients (15%) had post operative astigmatism and 1 patient (5%) developed uveitis. Hyphema was present in 1 case (5%) while iris prolapse was seen in 1 case (5%) on first post operative day which was immediately repositioned (Table 4).

**Table 4:** Complications of secondary anterior chamber (Group I) and posterior chamber IOL implantation (Group II)

Complication	Group 1 n=20 n (%)	Group II n=20 n (%)
Post operative astigmatism	4 (20)	3 (15)
Post operative anterior uveitis	2 (10)	1 (5)
Raised intraocular pressure	1 (5)	Nil
Hyphema	1 (5)	1 (5)
Iris prolapse	Nil	1 (5)
Cystoid macular	1 (5)	Nil

edema		
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## DISCUSSION

In the past many decades, aphakia was treated by either spectacles or contact lenses. The results were satisfying but spectacles made life difficult because of their weight, image magnification and distortion<sup>6</sup>. The next choice was contact lenses which provided wider visual field and were effective even in patients with unilateral aphakia. Many elderly patients found it difficult to cope with the necessary hygienic regimens. There was also an appreciable incidence of corneal infection<sup>7</sup>.

Secondary intraocular lens implantation is the most appropriate alternative to the contact lenses in this situation. ECCE with intact posterior capsule provides support for posterior chamber implants<sup>8</sup>. While anterior chamber intraocular lens implantation is among the options for the cases with ruptured posterior capsule or after ICCE. The procedure of the secondary IOL implants may lead to few complications but experienced surgical hand, appropriate use of viscoelastic and better quality of intraocular lenses have contributed to a decreased incidence of complications and visual status has improved.

Our study results showed that patients with posterior implants have better visual outcome as compared to the anterior chamber implants. Fourteen cases (70%) were improved to 6/9 or better vision in group II while 10 patients (50%) of group I had the same result.

Overall, 24 cases (60%) developed improvement of one or more lines on Snellen's chart postoperatively in comparison to their preoperative vision. Ali et al<sup>9</sup> reported nearly the same results. In their study 62.07% cases had improvement of one or more line on Snellen's chart postoperatively while 34.48% of their cases did not improve after surgery and had the same vision as it was preoperatively with aphakic glasses. In our study, the vision was same postoperatively in 10 patients (25%) as compared to preoperative vision.

Shammas et al<sup>10</sup> reported that 53% of their cases had improvement on Snellen's chart while 42% developed no change in postoperative vision compared to preoperative best corrected vision.

In view of postoperative complications, astigmatism was the most common problem seen in 7 patients (17.5%) followed by anterior chamber reaction

which was present in 3 cases (7.5%). Cystoid macular edema was seen in 1 case (2.5%) with anterior chamber IOL. Ali et al<sup>9</sup> had this problem in 6.89% cases. Hykin et al<sup>11</sup> concluded in their report that anterior chamber lenses are associated with more complications than posterior chamber lenses. In our study we also found that the results were slightly better with posterior chamber IOLs in comparison to anterior chamber IOLs but together these two sites for secondary intraocular lens implantation can provide appreciable results.

## CONCLUSION

Based on our results, we came to the conclusion that although anterior or posterior chamber secondary IOL implantation carries some hazards but still it is preferable to perform the procedure to restore patients' binocular single vision and visual field, to improve the quality of vision and prevent image distortion created by aphakic glasses.

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