

Complications and Visual Outcome of Sclerally Fixed Posterior Chamber Intraocular Lenses

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Hundred eyes of 97 patients were operated for determining complications and visual outcome of Sclerally Fixed Posterior Chamber Intraocular Lenses at Institute of Ophthalmology, Mayo Hospital, Lahore from January 2002 till December 2002. Those operated either had ICCE done previously, per-operated large rent in posterior capsules, dislocated lens and traumatic subluxated cataractous lens. Immediate complications were transient rise in IOP, corneal edema, triate keratopathy. Late complications noted had decentration of IOL (4%), Cystoid Macular edema 4%, suture erosion (2%) and lens tilt (1%). 80% patients had Post-operative V/A of 6/6-6/12 and 20% had V/A 6/18- 6/60 as compared to Pre-Operative V/A of 56% in 6/6-6/12, 10% in 6/18-6/60 and 34% in 3/60-PL+ ve. Encouraging results favour this procedure.

Key words: Visual outcome, complications, scleral fixation of PCIOL

The sclerally-fixed posterior chamber IOL is implanted in the same plane as the crystalline lens and does not interfere with pupillary function, anterior chamber anatomy, or corneal endothelial integrity. It can be used when an inadequate lens capsule precludes the use of a capsule-supported posterior chamber IOL. Recent histopathological studies reveal that, at the loop axis, the haptics of both transscleral ciliary-sulcus fixated IOLs and in the bag posterior chamber IOLs commonly lie posterior to the ciliary processes rather than within the ciliary sulcus¹.

Sclerally-fixated posterior chamber IOLs may introduce additional complications not seen with Primary posterior chamber IOL implantation such as ciliary body haemorrhage, delayed hyphema, chronic uveitis, transscleral haptic erosion and scleral thinning. Late onset Endophthalmitis originating from suture track has also been described; however this risk can be minimized by the use of partial-thickness scleral flaps to prevent suture erosion. Pupillary distortion from suture-related iris scarring and non-cicatricial iris damage have been reported².

Accurate ciliary sulcus fixation reduces the risk of injury to the iris and ciliary body and produces stable long term fixation; however, the accuracy of needle placement cannot be guaranteed because the needle cannot be visualized behind the iris. Microendoscopic instrumentation³ can visualize the ciliary sulcus directly and has been used by Kora and co-authors. Scleral entry point 0.50 mm to 0.75 mm from the surgical limbus avoids the major arterial circle and entire ciliary body and provides true ciliary sulcus placement⁴.

Aims & Objectives

1. To observe and view the complications with sclerally fixed IOLs.
2. To evaluate the gradual increase in visual acuity.
3. To ensure safety of the procedure.

Material and method:

The research was carried at Institute of Ophthalmology, Eye Unit-III, Mayo Hospital Lahore from January 2002 to December 2002. The population included all the cases examined in the out patients department. It included various cases referred from other hospitals. A total of 100 eyes of 97 patients underwent scleral fixation of posterior chamber intraocular lens implant that had inadequate posterior capsular support. Data recording was carried out on coding sheets. The information was transferred to data base III + Programme. Analysis was carried out with SPSS-PC programme. Frequency distribution of all variables were performed for both continuous and discrete variables. Baseline visual axis (Y-axis) was plotted against post-operative visual acuity (8 weeks) to examine visual outcome. Baseline findings & findings at post-operative visits for every patient was tabulated. Patients were divided into two groups:-

a- Those having pre-operative visual equal to post-operative visual acuity.

b- Those in post-operative V/A > pre-operative V/A

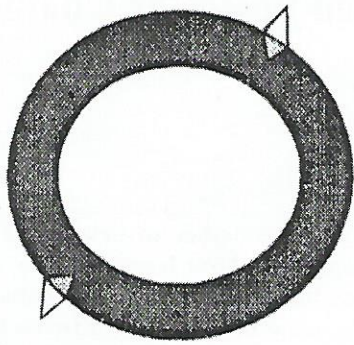
Continuous variables between two groups were compared using t-test with the level of significance of $P < 0.05$. The patients were examined on the 1st, 7th, 30th, 90th and 180th day post-operatively for V/A, IOP, SLE and fundus evaluation.

Indications:

1. Planned ICCE done in 62 cases.
2. Pre-operative large rent in the posterior capsule in 28 cases.
3. Dislocation of lens secondary to trauma in 4 cases.
4. Traumatic cataract with subluxation in 6 cases.

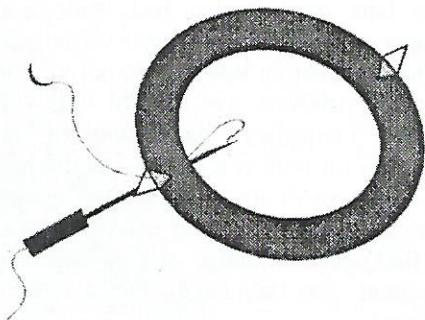
Methodology:

- Diagonally opposite partial thickness scleral flaps were raised first.



Diagonally opposite triangular scleral flaps were raised.

- A corneal incision of approximately 7.0 – 8.0 mm from 10 to 2 o'clock was given. Anterior vitrectomy was done to prevent postoperative tilt of lens. 10/0 polypropylene suture was used. The free end of 10/0 polypropylene was threaded into the 27 gauge needle which was passed into the anterior chamber. The 27 gauge needle was inserted 0.75 – 1.0 mm from the limbus to have true sulcus placement.



A 27-gauge threaded needle was passed from the scleral bed into the anterior chamber

- The straightened 27 gauge needle was tied to the maximum convexity of the haptics.

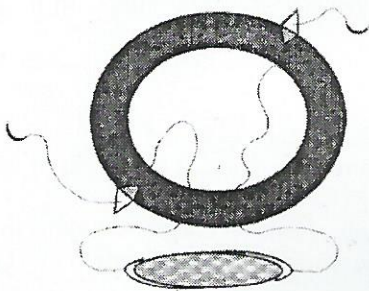
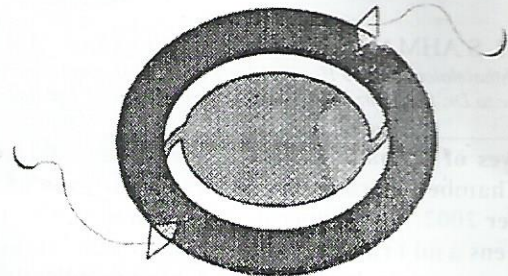


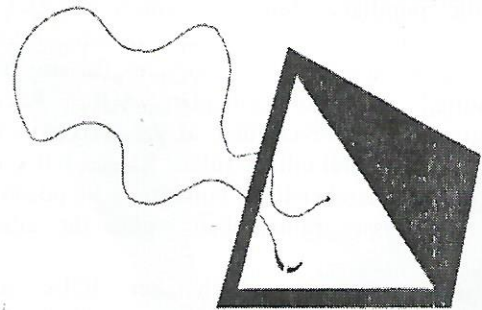
Fig. 3:- The two ends of 10-0 polypropylene were tied to the IOL haptics after pulling them out of the corneo scleral wound.

- The two ends of the haptics were tied with 10/0 polypropylene & free ends of the thread already out.



The sutures were pulled to secure the IOL in the ciliary sulcus.

- 10/0 polypropylene suture was 1st tied to the scleral bed and then to the free ends of 10/0 suture attached to the haptics of the IOL. Thus a three end knot was applied.



The 10-0 polypropylene (prolene) was tied to itself in the scleral bed.

Results:

Hundred eyes of 97 patients were successfully operated by sclerally fixed IOLs. The age of patients ranged from 20-78 years with the average of 50 years. The male to female ratio was 60:40. 12% were known hypertensive, 10% were diabetics, and 68% had previous surgery done while 32% had first surgery. Total mean hospital stay was 2 days ranging from 1-4 days. 6 months follow-up was done.

Immediate Postoperative Complications (1st PO)

- Anterior Uveitis (24%)
- Corneal edema (18%)
- Striate Keratopathy (18%)
- Transient rise in IOP (16%)
- Vitritis (6%)
- Hyphema (5%)
- Vitreous Haemorrhage (4%)

Late Post-operative Complications (6 months)

- Decentration of IOL (4%)
- Lens Tilt (1%)
- Suture Erosion (2%)
- Cystoid Macular Edema (4%)

Preoperative Best Corrected Visual Activity

- 6/6-6/12 (56%)
- 6/18-6/12 (10%)
- 3/60-PL+ (34%)

Post-Operative Best Corrected Visual Activity

- 6/6-6/12 (80%)**
 - a) 6/6 without glasses (18%)
 - b) 6/6 (18%)
 - c) 6/9-6/12 (44%)
- 6/18-6/60 (20%)**
 - a) 6/18-6/24 (16%)
 - b) 6/36-6/60 (4%)
- 3/60-PL+ (0%)**

Discussion:

Visual Outcome and complications of 100 eyes of 97 patients who had transscleral fixation of posterior chamber intraocular lenses were retrospectively reviewed. All operations were performed in a consecutive series using a comparable technique in each case. In 1992, Friedlander⁵ mentioned that most transscleral suturing techniques for posterior chamber intraocular lens involve passing the suture needles through the corneo-scleral wound without visualization from behind the iris (inside-out). These techniques increase the risk of bleeding and haptic malpositioning in the ciliary sulcus. In 1989, Dahan⁶ reported that inside-out techniques also require entry of needle holder with the needle into the anterior chamber, risking damage to the corneal endothelium and other delicate ocular structures. In 1992, Kershner⁷ presented a report in which he mentioned that transscleral technique requires a double pass of a pair-packed fixation suture with specifically designed needles and considerable manipulation.

This technique refines the technique described by Sharpiro and Leen⁸ and incorporates suture placement on the scleral bed using the same conventional suture (10/0 Prolene). It uses a measured site of entry on the sclera and employs the routinely used 10/0 polypropylene suture and 27 gauge needle. Only Mcpherson forceps is needed to pull out the suture from the corneo-scleral wound. This technique does not require specialized IOLs, sutures, or instruments and can be done without a significant change in existing surgical technique. A one-piece, all PMMA, 10 degree vaulted, 13.50 mm haptic spread provides excellent optic centration and haptic stabilization when the haptic suture is placed at the greatest haptic spread and one transscleral suture pass per haptic is made. In all patients these types of IOLs were inserted with good IOL centration. The study was published by Basti and coworkers⁹ in which they discussed this technique and reported that it is more simple and provides more predictable placement of the suture within the ciliary sulcus, proper haptic stabilization, and optic centration. It also decreases the bleeding and requires minimal manipulation within the anterior chamber. It is relatively

atraumatic to the delicate ocular structures and facilitates safe posterior chamber IOL implantation in the absence of posterior capsular support. The incidence of cystoid macular edema after transscleral fixation was noted to be 4% in the present study, whereas McCluskey¹⁰ in 1994 described the incidence to be 6.25%, Qazi¹¹ in 1995 as 1.5%, Bleckmann¹² in 1994 as 2.2% and Solomon¹³ in 1993 as 23.3%. Sternberg & Michels¹⁴ discussed on the "treatment of dislocated posterior chamber intraocular lens" that it is possible that the prolonged surgical time and intraocular manipulation may increase the risk of CME in some of the eyes. Nonetheless excellent results without retinal complications had been reported. Vitreous haemorrhage was noted in 4% of patients which resolved in 3 to 4 weeks time. All the cases had clear fundal view at 3rd visit i.e. 1 month post-operatively. As compared to other studies Qazi reported in 5.1% cases, Kora¹⁵ in 21.7% and McCluskey in 3.1% cases. Hyphema was seen in 5% cases in the present study which settled within the post-operative hospital stay and was not seen in any at 1st post-operative follow-up. McCluskey noted hyphema in 6.25% cases and Agapitos's¹⁶ in his study noted it was 18.8%. Two cases in the present study had suture erosion of the buried transscleral polypropylene suture. Both the cases were appropriately managed surgically by placing the knots beneath the partial thickness scleral flaps and by reapproximating the conjunctiva. Agapitos described suture erosion in 92% cases, McCluskey in 9.39% cases, Stark¹⁷ in 4.25% cases and Solomon in 18.8% cases. Decentration of IOL was noted in 4% of cases in the present study. It was only noted when pupils were dilated for retinal examination and could not be judged in normal pupils. All the patients were symptom free. No surgical intervention was required. Agapitos described decentration in 1/7 cases, Bleckmann in 9/48 cases, Solomon in 3/30 cases and Qazi in 5/62 cases. All the patients i.e. 100 eyes of 97 patients had either maintained or improved visual acuity following surgery in the present study whereas Agapitos reported all cases having visual acuity equal-to or improved post-operative with the exception of one case i.e. 1/19 cases. Basti reported improved visual acuity in all cases 5/5. McCluskey in his study also reported improved or maintained visual acuity in 30/32 cases except 2 cases.

In the present study 56% had preoperative best corrected visual acuity of 6/6-6/12, 10% had 6/18-6/12 and 34% had 3/60-PL+ whereas 80% had post-operative best corrected visual acuity of 6/6-6/12 and 20% had 6/18-6/60. Shapiro reported all cases 7/7 having post operative visual acuity of 6/6. Basti reported 60% cases having post-operative visual acuity of 6/6-6/9 and 40% had visual acuity of 6/12. In the present study all the 66% aphakic patients maintained their pre-operative visual acuity or had one or two step improvement while 34% phakic patients who had mature cataract had three or more steps improvement 2 months post-operatively.

Hence it is suggested and recommended that the procedure can be practiced safely at different hospitals using similar criteria of evaluation. Patients having distorted anterior chamber structures, aniridia and previously done ICCE may undergo this procedure. Anterior core vitrectomy should be routinely practiced before sclerally fixating the IOLs as it reduces the incident of lens tilt. Those patient having dislocation / subluxation of lens / inadequate posterior capsular support may benefit from this procedure. Post-operative complications mainly UGH syndrome, iris chafing and corneal oedema experienced with anterior chamber IOLs can be prevented with this technique.

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