REVIEW OF LITERATURE
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Padini an intinerate ophthalmologist of the 18th century was probably the first person to mention the possibility of lens implantation into the eye in place of the natural cataractous lens.

Later on, in 1795 Casamata implanted an artificial lens of glass after cataract extraction.

INTRODUCTION - I

Harold Ridley of London observed that the fragment of plexiglass (PMMA, Perspex) from shattered cockpit canopies could be well tolerated with in the eyes of British Pilots following ocular perforation. The first intraocular lens (IOL) was implanted into the capsular bag following extra-capsular cataract extraction at St. Thomas Hospital of London on November, 29, 1949 and the second on August, 23, 1950. These two lenses had too high a refractive power; therefore, the patient postoperatively had a -20.0 and -15.0 D myopia respectively. These results compelled Ridley to calculate the radius of curvature. The new lenses were implanted by him in 750 eyes, around 1959 he gave up implantation because there were too many complications.

Ridley summarized the complication of his IOL as follows:
(1) Iritis due to residual lens material in the eye or inadequate removal of implant sterilizing solution.
(2) Occlusion of the pupil by lens inflammatory membrane.
(3) Late thickening and opacification of posterior capsule especially in young patient.
(4) Loss of anterior chamber.
(5) Secondary glaucoma.
(6) Iris atrophy from pressure by optic of ICL.
(7) ICL Dislocation.

Ridley lens was soon followed by several other type of lenses that shared the feature that their rigid or elastic support was fixed with angle of anterior chamber. These are described as 2nd Generation lenses. The main advantage of them are -

(1) Implantation could be done after intra or extra capsular cataract extraction.
(2) Secondary implantation could be performed.
(3) Chances of dislocation of lens are minimal.

Baron (1952) performed the first anterior chamber lens implantation. This ICL was a curved disc with a bent forward curve toward the cornea and it comes into contact with the corneal endothelium leading to corneal decomposition.
In 1952 Danheim designed the first flexible closed loop type of anterior chamber lens. This lens failed because of the nylon haptics (Supramid-6) which undergoes hydrolytic biodegradation in the eye. This biodegradation led to irritation in the eye, breakdown of loops and disintegration of the ICL with dislocation.

Strampelli on 28th September, 1953 implanted a tripod anterior chamber lens which was a prototype of rigid anterior chamber ICLs. He had reported to the International Ophthalmological Congress in Brussels that two-thirds of his eyes on which he operated in 1953 developed bullous keratopathy after 5 years of quietness (1958).

In 1956, first Choyce rigid anterior chamber lens was introduced and later its modifications culminated in the product of near VIII and IX IOL. UGH syndrome of Ellingson was initially attributed due to warped foot plate and poor edge finish of same poorly made copies of these lenses.

Baraquer (1959) modified the Danheim lens and his closed loop anterior chamber lens in 'J' loop ICL for the first time after cutting away the one half of each of the closed loop. There lenses gave good results but the nylon loop biodegradation and erosions into angle recess were the main complication. The 'J' loop and its various modification have been incorporated with great success into modern PC ICL.
Pseudophakos of these kinds were implanted by among other - Deitti (1955), Schorg-vans (1961), Leib a Guerry (1958), Ridley (1952), Schurz (1953) and Schreik (1954).

**GENERATION + III:**

Centered development of anterior chamber lens and introduction of iris supported lens. In 1953 Epstein introduced iris supported lenses of collar stud type with iris fixation.

Binkhorst in 1957 developed the original iris clip lens which was implanted for the first time on 11th August, 1958. Binkhorst based his design on following consideration -

1. **PMMA is well tolerated in the eye provided it has been properly cleaned and sterilized.**
2. **Posterior chamber lenses, up to that time, had a strong tendency to dislocate.**
3. **Most of the anterior chamber lenses in use at that time had a high incidence of corneal complications.**
4. **The results with the original Ridley posterior chamber lens indicated that contact of the implant with posterior surface of iris did not, in itself, give rise to any complications. He believed that iris atrophy and its consequences were caused by uveitis and not by contact.**
In 1965 Binkhorst modified the original lens into two loop iridocapsular lens.

Later metal loops were introduced in Epstein maltesecross lens which evolved into Copeland lens.

Fyodorov in 1968 introduced sputnik iris clip lens in Soviet Union.

In 1972 worst medallion iridocapsular and in 1973 worst platina lens were introduced.

The following complications were encountered in long term with these IOL.

1. Atrophy Erosion of ocular tissues.
2. Corneal decompensation, oedema and pseudophakic bullous keratopathy.
3. Cystoid macular oedema.
5. Cellular proliferative reaction leading to posterior capsular membrane; pupillary membrane; secondary glaucoma, cocoon, membrane excessive fibrosis and synechiae, vitreous face opacities.
6. Subluxation or dislocation.
7. Complication related to biomaterials eg. nylon and metal loop.
Major improvement in micro-surgical techniques, lens materials and lens design; introduction of posterior chamber lenses.

From 1975 to the present there has been the increasing use of ECCE and posterior chamber implantation. Numerous modern, well-designed anterior and posterior chamber IOL have been introduced which are listed in Table - I. Now the implantation techniques are more refined and safer. This era has also seen the transition from nylon to polyethylene and PMMA as a loop material.

The most important breakthrough was a return to Ridley's original idea of posterior chamber IOL.

The first of the modern generation posterior chamber lens was pearce rigid tripod lens introduced in England in 1975.

In 1977 Shearing introduced 'J' loop IOLs and placed into posterior chamber by anchoring it at the ciliary sulcus or within the lens capsular bag. The use of various lens insertion glides and viscoelastic surgical adjuncts have made in the bag implantation as easier procedure.
Other iridocapsular lenses are - Simcoe ‘C’ loop lens, Kratz and Sinisky lens (mid 70 to late 1980’s), Caschmidtstorm lens, Paulkner lens, Rainin cotrolflex lens, ‘U’ loop, Lynell lens, Pannu lens, Shepard universal lens 3 M / 34 S lens and Mazzocco Silicon lens.

Many surgeons feel uneasy at placing a foreign body into the biologically active highly vascular and nerve containing tissue, such as the uvea. The removal of lenses from the ciliary body is extremely difficult. This further develop the placement of lens inside the capsular bag (endocapsular) after ECCE.

1978, 79, 82 Binkhorst realizes that the anterior loop of his 4 loop lens were unnecessary when he placed the posterior loop into the bag after PCCE, since the lens in most instances was adequately fixed. He changed the design accordingly and called it the Binkhorst endocapsular lens.

1980, 83 Anis presented the original and physiologic concept of lens design. He felt that the supportive element of ICL should be circular and fill almost the entire equatorial circumferences of capsular bag. Advantages of which are -

1. Decentralization of lens will not occur.
2. Subluxation is less likely.
3. Posterior capsule is evenly stretched in all direction preventing formation of folds in the capsule that might hamper the visual function.

4. No rotation is necessary.

Slight modification was done in Caland lens; and sheet lens.

In 1983 Binkhorst introduced an "all retropupillary lens (Moustache lens) having ultrathin optical part of PMMA of 6 mm diameter and 'J' loop haptic made up of 0.16 mm extremely soft polypropylene attached to the utmost periphery of lens. Overall length is 12 mm. The two haptic loops are oriented in mirror image in such a way that a straightforward" "One movement insertion" is possible.

In early, 1980 'J' loop lens for in-the-bag placement developed while original 'J' loop were designed to be placed in iridociliary sulcus. The diameter of iridociliary sulcus fixated lens were 13.5 to 14 mm, while slightly reduced about 12.5 mm for endocapsular fixation in bag.

The 'C' loop lens of Simcoe is also available in a diameter suitable for in-the-bag placement.

In 1983 Mazzocco (Staar) described a one piece silicone lens that is 6 mm in diameter but can be folded for insertion through a 3 mm corneoscleral wound. It is autoclavable and foldable and having excellent optical qualities and seem to be very gentle to the tissues.
Mitsuru Nakazawa MD and Kyoshi Ohtsuki MD (1983) in Japan measured apparent accommodation in 42 pseudophakic eyes (34 patients after implantation of posterior chamber IOL lenses. The mean apparent accommodation was $2.03 \pm 1.03$ diopters. The mean accommodation power of 16 phakic eyes used as controls was $2.91 \pm 1.29$ diopters. The diameter of the pupil appeared to be most important factor in apparent accommodation – the smaller the pupil, the greater the apparent accommodation. Apparent accommodation was universally proportional to the diameter of pupil. There was no correlation however, between apparent accommodation and corrected visual acuity, refractive error, corneal astigmatism, or axial length. There was a negative correlation between apparent accommodation and anterior chamber depth.

Thomas, J. Liesegang MD, Willam M, Bourne MD, and Duane M Ilstrup MS. (1984) carried out a study at Japan showing short term and long term endothelial cell loss associated with cataract extraction and intraocular lens implantation.

A group of 249 patients undergoing cataract extraction with intraocular lens implantation underwent specular microscope endothelial cell photographs before surgery and eight week, and two year after surgery. The intracocular lenses used were shearing posterior chamber lens and transiridectomy clip
lens after extracapsular cataract extraction and the medallion iris suture lens after intracapsular cataract extraction. Thirty seven patient, who underwent cataract extraction without implantation served as controls. Eight week after surgery, there was no statistical difference between the groups with intraocular lenses and the groups without them. One year and two year after surgery, endothelial cell loss had occurred in all groups except the group who underwent extracapsular cataract extraction without intraocular lens implantation a group in which the patients were younger.

The long term endothelial cell loss was greater after intracapsular cataract extraction and was greater in presence of an implant. There was statistically more endothelial lens with the transsiridectomy clip lens than with posterior chamber lens eight week and one year after surgery; the patient with posterior chamber lenses had continued to have more endothelial cell loss during the second postoperative year.

Coleiro JA (1986) studied combined intracapsular extraction and trabeculectomy with severin five loop posterior chamber intraocular lens. The efficacy and safety of combined operation for cataract and glaucoma is established. The result of treating 24 eyes in series of control of glaucoma are discussed.
There was a early pressure rise above 24 mm Hg in six eyes (35%) but this settled with in a week or month. This may have been steroid related.

The intraocular pressure was assessed at six and at 12 month (mean 15.7 months) and the procedure determined as successful of the reading was 20 mm Hg or less. 12 eyes (50%) were controlled off all the treatment, with 5 eyes (20.8%) on pilocarpine. Three eyes (12.5%) required pilocarpine and timolol with another three eyes controlled on timolol only. The glaucoma was uncontrolled in one eye (4.1%) which still required multiple preparation.

**Visual results** - Eighteen eyes (75%) achieved a corrected acuity of 6/12 or better. Four eyes (16.6%) had significant recovery of useful vision in range of 6/18 to 6/60 due to various grades of senile macular degeneration.

The degree of astigmatism was less than 2 diopter in all cases.

David M, Meisler MD et al (1986) studied six cases of chronic propionibacterium endophthalmitis after extracapsular cataract extraction and posterior chamber intraocular lens implantation. The inflammation was characterized by the clinical appearance of a granulomatus iridocyclitis. Cultures of intraocular specimen obtained from six eyes yielded propionibacterium; five yielded p. acnes. Post-
operative propionibacte rium endophthalmitis may masquerade as a chronic iridocyclitis.

Richard Bates (1986) developed a new forcep to simplify capsular bag fixation during posterior chamber lens implantation. This instrument has been designed especially to meet the needs of superior loop placement of Simky-Kratz posterior chamber IOL with minimal intraocular manipulation and it facilitate capsular bag fixation.

John G. Sebestyen MD (1986) studied the relationship between IOL and diabetes mellitus. The reviewed 74 consecutive unselected diabetic patient (91 eyes) who had cataract extraction with intraocular lens implantation. The retinopathy status remain unchanged in 79 eyes. Of the 12 in which retinopathy status changed, four eyes without previous retinopathy, seven eyes that had mild background retinopathy progressed to moderate background retinopathy, and one eye that had background retinopathy developed mild proliferative retinopathy. Sixty-four eyes (70.3%) achieved visual acuities of 20/40 or better.

Steven T. Simmons MD, David Litooff BA, and George L. Spaeth MD (1987) reviewed 75 consecutive cases of extra-capsular cataract extraction and posterior chamber lens implantation combined with trabeculectomy in 69 patients with glaucoma. The mean preoperative intraocular pressure was
19.3 mm Hg on an average of 2.3 glaucoma medication. Visual acuity improved in 55 eyes (61%) achieving a visual acuity of 20/40 or better; three patients had further deterioration of vision at the completion of followup because of progressive glaucoma or macular disease. Post-operatively, the average intraocular pressure was 2.3 and 3 mm Hg lower than the pre-operative level at the end 12 month (p<0.001) on 0.63 and 0.79 glaucoma medication respectively. However, 27 (38%) of the 78 eyes had a recorded intraocular pressure greater than 30 mm Hg or more above their preoperative level during the first six months after surgery. Despite improved long term control of intraocular pressure, detectable conjunctival filtering bleeds were present in only (42%) of 78 eyes at two months & in seven (12%) of 54 eyes at 12 months. Hyphaema occurred in 34 (45%) of cases.

Neumann R, Zalish M, and Oliver M (1988) studied the effect of intraocular lens implantation on combined extracocular cataract extraction with trabeculectomy. Author compared 23 eyes subjected to IOL and trabeculectomy with additional posterior chamber IOL implantation. The result showed that IOL implantation did not have a detrimental effect on postoperative IOP reduction, gain in visual acuity; or need for antiglaucoma medication. The incidence of anterior chamber reactions consisting of development of posterior synechiae and fibrin formation was significantly higher with
IOL had been implanted. However, the fibrosis was generally absorbed within 14 days and posterior synchiae did not occlude the visual axis. He concluded that IOL implantation should be included in these combined operation with the object to rehabilitating visual function.

Michael S. Wsler MD, Craig J. Helm BS, and Herbert Kaufman MD (1988) observed visual results after keratoplasty in patients with posterior chamber intraocular lenses. Authors performed penetrating keratoplasty in 20 consecutive patients who had posterior chamber intraocular lenses and who developed pseudophakic bullous keratopathy.

All patients received 8.0 mm grafts placed in 7.5 mm recipient beds. None of the intraocular lenses were removed. Final visual acuity was 20/40 or better in eight (40%) and 20/60 or better in 15 (75%) of the patient. Senile macular degeneration (one case), corneal graft rejection (two cases), and wound infection (one case) contributed to poor visual results in the remaining patients.

Khalid J. Awan MD (1988) performed uncomplicated posterior chamber intraocular lens implantation into two eyes that had been salvaged after expulsive choroidal haemorrhage during a previous cataract operation and in one eye after loss of fellow eye from expulsive choroidal haemorrhage. The procedure was performed in a 72 year old man four months after
the successful management of expulsive choroidal hemorrhage. A third patient, a 94 year old woman and posterior chamber intraocular lens implantation in her remaining eye six year after the loss of other eye. All patients had a final visual acuity of 20/40 or better after a followup period of six months to four years.

J Hollensak, B Zeisberg and T Pham Duy, Klim Monotibble (1988) in his series of 6,000 patients who has undergone extracapsular cataract extraction and Simcoe type posterior chamber implantation noted the incidence of retinal detachment of 0.33%.

Maninder Singh Dang and PP Sunder Raj (1989) studied 400 eyes which underwent cataract extraction with posterior chamber lens implantation to compare the predictive accuracy of various IOL power calculation formulae. The new Sanders Retzlaff-Kraff (SRK) II formular was more accurate than original SRK and Binkhorst II formulae. Modification of a constant used in the SRK II formula to make it 'surgeon specific' improved its performance further. 80% of the eyes less than 1 dioptre error and only one eye (0.3%) had an error of more than 3 dioptres.

H Kaz-Soong MD, David C. Musch Ph D; Vera Kowal; Alan Sugar MD; Roger F, Meyer MD in 1989 retrospectively studied the clinical records and the corneal endothelial counts
of 133 consecutive eyes that received sutured posterior chamber intraocular lenses during penetrating keratoplasty in the absence of lens capsular support. Postoperative followup time ranged from three to 24 months, with 82 patient having atleast one year followup at one year, 45.1% of these patients had 20/40 or better visual acuity, 30.5% had a visual acuity between 20/50 and 20/100; and 24.2 had a visual acuity of 20/200 or worse. At two year 63.6% had a visual acuity of 20/40 or better; 18.2% had between 20/50 and 20/100 and 18.2% had visual acuity of 20/200 or worse.

At 1 year the average endothelial cell loss in the graft averaged 19% with futureed posterior chamber lenses.

William E, Swiddy MD (1989) introduced a new technique of management of dislocated posterior chamber intracocular lenses. Posterior chamber dislocation of an intraocular lens in the vitreous cavity is an uncommon but serious complication of the standard extracapsular surgical technique for cataract extraction with intraocular lens implantation is managed by using vitrectomy techniques and scleral fixation suture of the intraocular lens and allows permanent, controllable relocation of intraocular lens and avoid trauma to the iris and cornea that previous technique for intraocular lens repositioning may induce.
S Tony Fernandez, Sebastian Picos and Noel Moniz (1989) analysed first 500 cases of posterior chamber lens implantation inserted in capsular bag. Followup was done for 6 month to 2 year. Although posterior capsule rupture occurred in 23 cases, the lens was inserted in 12 cases with a small tear. In general the complications were found to be more than 60% of cases. The only problem faced by authors were thickening of posterior lens capsule (11.6%) high astigmatism (12.2%) pupillary capture (5.6%) and decentering of the lens.

Sudhakar J, Ravindran RD, and Natchiar G (1989) analysed complication in 1,000 cases of primary posterior chamber lens implantation during period of one year. The important postoperative complications were uveitis (9%), Striate keratitis (7.3%), endophthalmitis (0.5%) malposition of IOL (2.8%) and cystoid macular edema (0.3%), posterior capsule opacification was seen in (11.5%) cases and was treated by YAG laser capsulotomy. More than 80% cases had 6/6 - 6/12 vision.

Keiki R, Mehta (1989) studied 50 cases of foldable posterior chamber IOL implant after phacoemulcification cataract extraction through a 3 mm opening. Lenses used were starr, silicone lens, hydrophilic HEMA disc lens, Adatomed silicone lens. Visual results were 86% had 6/6 to
Vilas Bidaye 1989, observed that PMMA is not the best material for the manufacture of IOL. It can not be autoclaved and its contamination by ethylene oxide may cause post-operative sterile uveitis, biodegradation as well as ultraviolet transmission can also damage PMMA. This lead to the search for other material for manufacturing IOLs and glass was found to be suitable. The main disadvantage of glass IOL is its inability to stand Nd-YAG laser posterior capsulotomy. The chaffed this lens.

But posterior capsular opacification after ECCE is less common with 'in-the-bag' glass lens implant. If needed secondary posterior capsulotomy can be easily done using 30G disposable needle bent at its tip. It becomes lens of choice for diabetic patients as glass optic is resistant to Argon laser and successful argon laser cayolation of retina could be done through glass optic.

Piers Percival 1989 conducted a study 'Early experience with diffractive Bifocal lens'. Author observed the visual result of 33 bifocal lens implantation are compared with 33 matched PMMA monofocal implantation. Eighty two percent of bifocal and 15% of monofocal eyes could see
N8 (J5) or better with the distance correction (F/2.001).
Fifty percent of +3.5D bifocal eyes could see N5 (J2) with
the distance correction. The mean reading addition for
seeing J2 at 25 cm was 0.7 D. The bifocal group and
2.2D in the monofocal group. Sixty percent of bifocal group
and 24% of the monofocal group felt that following surgery
they could depend on the eye for most of the time without
glasses.

C Huber 1989 developed surgical technique 'in-the-
bag' implantation by air bubble pressure'. Author implanted
'C' or 'J' loop posterior chamber lens into the capsular bag
by using the forces generated by an air bubble to introduce
the intraocular lens into the capsular bag. The method is
considered safe and easily taught because it uses mostly
ab-externo manoeuvres.

Neilmanson, 1989 in England presented a new lens
design for intracapsular cataract surgery. It is intended
to achieve circumferential equatorial fixation. The
accommodation of capsular bags of varying size and accurate
centration. The lens manufactured as a single piece
lathcut from a compression moulding of PMMA (ICI). Currently
two forms are available - Planoconvex & Biconvex lens.
Advantages are - (a) less distortion of posterior capsule; (b) near $360^\circ$ fixation of the loop without the need to fixate the optic with a large anterior capsular skirt; (c) centration of optic or the reduced risk of decentration allows foveal image with excellent acuity from the outset.

G Meur (1989) at Belgium introduced small incision disc lens. The preliminary result of in-the-bag implantation of a new intraocular lens whose mechanical feature are those of a large rigid disc, are presented. As it can be introduced through a $5\, \text{mm}$ incision it is an interesting alternative to a soft intraocular lens in the field of phaco-emulsification.

In the preliminary series of 100 implantations, no instances of sunset syndrome or of anterior capture have been observed. To evaluate the lens position 6 week post-operatively 28 eyes were fully dilated. In 16 (57%) cases; the lens remain perfectly centred. In 12 (43%) cases, three is a slight decentration always less than 1 mm - 9 (32%), upward and 3 (11%) downward.

Fortynine patients were checked for CME by fluorescenc angiography 6-7 week after surgery - three (6.1%) cases of CMO were observed. In 1 year followup posterior capsule thickening was not recorded as it is too early at that time to record this complication.
Yanaka Furuse, Seiji Hayasaka, Yuka H Yamamoto,

Tomoichi Setogawa (1990) observed the corneal endothelial changes after posterior chamber intraocular implantation in patient with or without diabetes mellitus. Authors examined 96 patients (111 eyes) who underwent ECCE with the implantation of a posterior chamber IOL. The central cornea of all patient were photographed by specular microscope pre-operatively and 3, 6 and 12 months postoperatively. No significant differences in the endothelial cell density, coefficient of variation or cell loss were noted between these two groups.

I.A. Cunliffe, DW Flanagan, NDI George, RJ Aggarwaal, AT Moore in 1991 published their study extracapsular cataract surgery with posterior chamber lens implantation in diabetic with and without proliferative retinopathy. Author had examined all diabetic (66 operated eyes) and an equal number of non diabetic matched control who underwent ECCE with IOL implant over a period of 2 year. Of the diabetic patient 76% eyes improved by atleast 2 lines of snellen acuity postoperatively. They concluded that diabetic retinopathy is no contraindication for IOL implant.
Namora Matsuda et al in 1991 did the comparative study of the effect of intracocular irrigating solution on corneal endothelium in intracocular lens implantation. The glucose glutathione bicarbonate solution (BSS plus) was better than citrate acetate bicarbonate solution (s - VA2) with respect to effect on corneal endothelium.

Vimal R Mehta (1991) at all conducted a randomized clinical trial to compare intercapsular or endocapsular technique of IOL insertion and conventional posterior chamber IOL insertion after can opener capsulotomy. Age and sex matched groups of 76 patient each underwent surgery by two technique, the corneal and uveal reaction was evaluated on the first day after surgery and specular counts were done at 6 weeks. Though the difference between 2 groups was not statistically significant a trend in favour of intercapsular technique emerged strongly.

Now a day endocapsular posterior chamber IOL implants are being done which are having following advantages –

A. **Intra-operative advantage :**

1. Smaller predictable, more controlled capsulotomy.

2. The same capsulotomy technique can be utilized for all type of cataract.

3. Hydrodissection of the nucleus can be carried out safely under the capsular flap.
4. Endothelium is protected during the nucleus delivery.

5. Endothelium is protected during aspiration of the cortical matter because of decreased turbulence.

6. Iris entanglement in the port and subsequent iris transillumination syndrome is reduced.

7. Smaller quality of visco-elastic substance are required to inflate the capsular bag.

8. 100% capsular fixation of the lower loop under direct vision.

9. ICL does not touch the iris or the endothelium during insertion.

10. A better centering of the implant can be achieved.

11. In case of rupture of the posterior capsule the anterior flap can provide support for a sulcus supported lens.

12. Useful technique when there are posterior synchiae.

13. Surgery can proceed after zonular dehiscence also the bag can be inflated again with visco-elastic material.

B. Post operative period:

1. Reduced corneal damage causes less oedema.

2. Reduced iridocyclitis.

3. Reduced incidence of cystoid macular oedema.

4. Sunset/Sunrise syndromes occurs infrequently.
Table - 1

EVOLUTION OF INTRAOCULAR LENSES

Generation - I : (1949-54) Original Ridley posterior chamber lens.

1. Ridley 1949.

Generation - II : (Ca 1952-62) Development of anterior chamber lens.

1. Rigid or Semirigid :
   . Baron 1952, 1954
   . Scharf 1953
   . Strampelli Tripod 1953
   . Schreck 1954
   . Beitti 1955
   . Choyce Mark I 1956
   . Ridley Mark I and II 1957, 1960
   . Boberg Ans 1961

2. Flexible or Semiflexible loops :
   a. Closed loops
      . Dannheim 1952
      . Strampelli 1956
      . Leib and Guerry 1957
   b. Open loop
      . Barraquer 'J' loop 1959
Generation - III: (c. 1950-1970) continued development of anterior chamber lenses and introduction of iris supported lenses.

1. Rigid or Semirigid -
   - Choyce Mark II 1957 to Choyce Mark VIII 1963.

2. Flexible -
   - Iris supported.
   - Epstein Collar stud lenses 1952
   - Binkhorst iris clip 1937, 1958
   - Epstein maltese cross (evolved into copeland -
      - Binkhorst lens) 1962
   - Fyodorov type I iris clip 1964
   - Binkhorst type I iris clip 1964
   - Binkhorst iridocapsular 1963
   - Fyodorov V-type II, sputnik iris clip, 1968
   - Worst medallion, iridocapsular early, 1970s.
   - Worst platina, early 1970s.

Generation - IV: (ca 1975 to present) Major improvement in microsurgical techniques, lens design and materials, introduction of posterior chamber lens.

Anterior Chamber lenses:

1. Rigid or Semirigid -
   - Azar mark II 1977
   - Tennant Anchor 1979
2. Flexible or Semiflexible loops or foot plates -
   A. Closed loop :
      - Leiske 1978
      - Hessburg 1981
      - Optiflex 1982
      - Stable Flex 1983
   B. Open loops or Foot plates -
      - Kelman II 3 point fixation, 1978
      - Kelman quadriflex, 1981
      - Kelman Omnifit, 1981
      - Kelman Multiflex, 1982
   C. Radial loops -
      - Copeland, 1962.

Posterior chamber lens :

   - Pearce rigid tripod, 1975
   - Shearing 'J' loop mid to late 1970's early 1980's.
   - Simcoe 'C' loop mid to late 1970's early 1980's.
   - Sinsky modified 'J' loop mid to late 1970's early 1980's
   - Kratz, modified 'J' loop mid to late 1970's, early 1980's.
   - Clayman, modified 'J' loop mid to late 1970's early 1980's.
   - Lindstrom, modified 'J' loop mid to late 1970's early 1980's.
- Harris, 1 open, 1 closed loop, modified 'J' loop.
- Closed modified 'J' loop both loops closed (eg. sheets, galand, knolle)
- Osher-Feinzl, modified 'J' loop with loop hole at tip of superior loop.
- Lewicky, modified 'J' loop with loop holes at lips of both loops.
- Rigid lens for YAG laser capsulotomy eg. Hoffer ridge.
- IOL with UVR absorbers in optics.
- IOL with biconvex or aspherical optics
- Lynell, glass optic
- Mezzocco silicine (elastic) IOL
- Universal types (designed to be placed in either anterior or posterior chamber (early, 1980's).
- Shepard universal (radial loops)
- Feaster Dualens
- Fannu type- III
- Mørur Disc lens, 1989
- Bifocal lens, 1989

Generation - V:

Improvement in material and design of anterior and posterior chamber lenses and introduction of visco-elastic substances in ophthalmic surgery.
Iridociliary sulcus fixated type of lenses: Flexible type:

(i) Bearing J-loop lens
(ii) McCor C-loop lens
(iii) Kska-Kratz loop lens
(iv) innu lens
(v) Keesy-Fenzl-Osher lens
(vi) mcell J-loop lens

ester type J-loop lens
BM 34S lens
(a) Rigid type:

(i) Pearce lens

(ii) Harris Arnot lens

(b) Flexible type:

(i) Anir lens

(ii) Galand lens

(iii) Ong lens

(iv) Sheets lens

(v) J-loop lens for capsular fixation

(vi) Harris II lens
(A) Iridociliary sulcus fixated type of lenses: Flexible type:

(i) Faulkner lens

(ii) Rainin lens

(B) Iris-clip fixated lenses: two types:

(a) Semirigid type:

(i) Severin lens

(b) Mixed type:

(i) Boberg-Ans lens

(ii) Litte-Arnot lens
Special synthetic material:

1. Polymethyl methacrylate (PMMA)
   (acetate, corninglas, plexiglas, perspex)

PMMA is light (specific gravity 1.18) yet breakable and durable. It has a high resistance to aging and to abrasive charge. It is as clear as glass with refractive index of 1.49.

Since 1940 intraocular lenses (IOL's) have been made of PMMA. It is even today the material of choice because of its high tensile, clarity and stability.

There are five ways to make IOLs from plastic today -
1. Injection moulding of the plastic is performed in a heated condition.
2. In the loose-cut method the lenses are cut out with a drill from a well aged, long stored PMMA plate.
3. Compression - Polymerization method.
5. Compression and loose-cut method.

Polyamide:

In American literature, nylon is synonymous with polyamides. It has high degree of breaking resistance (tensile-strength).
Polyamide sutures are being used for years to close the cataract wounds and suture iris. In past, they were also used to fix the IOL to the iris.

Nylon 6 (Supramid) is used for loops of iris clip lens. There are chances of biodegradation of loop.

(3) Polypropylene (Teflon)

It is used for manufacturing of sutures and of the loops of IOL. It is very light synthetic material.

It is also used to fix lenses to the iris.

Clayman (1981-83) feels that polypropylene is bad in the anterior chamber angle, may be bad in iridociliary sulcus (posterior chamber angle) also.

Yamanaka (1979) and Yamanaka et al (1979) found ultraviolet light also damages polypropylene.

Polymides:

In 1979, a glass lens was introduced that had polymide as its hapted. (Lynell medical technology-New York). The advantages of this lens is that it can be heat sterilized (autoclaved). The optical portion of lens is made of glass.

The popularity of this lens increased till the advent of YAG laser. YAG shattered these lenses and brought about the downfall of these lenses.
Vilas Bidaya (1989) used glass lenses in anterior chamber IOL, ciliary sulcus posterior chamber IOL and 'in-the-bag' implantation. The authors thinks that glass lenses have a good future in India.

**Silicon, Polysulfone, HEMA:**

Fyodorov et al (1983) and Mazzocco (1983) reported a lens made of medical grade silicon which can be folded and placed through a 3 mm incision.

The silicon lens is introduced in China (Epstein, personal communication, 1984).

Choyce (1983) is experimenting with a flexible lens made of polysulfone. Polysulfone is transparent and extremely heat resistant (260° and higher) so it can be sterilized in steam autoclaved and dry heat; as well as sodiumhydroxide, ethylene oxide and by gamma radiation. It is non toxic. It totally absorbs U.V. rays.

Mehta et al (1978, 1985) reported good results from hydroxy-ethyl methacrylate, HEMA. Tolu.

Since June 1984 Epstein has used on HEMA in-the-bag lens with very satisfying results. The lens can be sterilized with heat, gas radiation chemical.

Keiki R Mehta (1989) observed good result in his 50 foldable IOL cases after phacoemulsification cataract extraction.
Visco-elastic substances:

In order to reduce danger of contact between IOL implant and corneal endothelium visco-elastic substances are used in modern implant surgery.

First Binkhorst in 1973 recommended the air cushion technique to reduce the danger of contact between implant and cornea. Air, however, has the disadvantage that it tends to leave anterior chamber quickly for this reason, Kaufman and Ketz (1977) suggested placing a material between lens and cornea that is nonaggressive to the walls of the endothelial cells. Fechner has used methylcellulose in more than 1,000 implantation since 1976 (1977, 1979, 1980, 1982; Fechner, 1983). Possibility this was beginning of modern visco-surgery.

Later 1% sodium hyaluronate (Healon) became available and recently chondroitin sulfate and a diluted form of sodium hyaluronate (Amvisc).

Recently a combination of sodium hyaluronate and chondroitin sulfate Viscoat, is also used.

3% methyl cellulose as a suitable visco-elastic substance was used for almost 10 year by Fechner.

Akira Momose and Atsuhiro Kasahara (1989) have used 2% methyl cellulose in 8,000 cases of intracocular implant during the last five and half years. This study convinced them that methyl cellulose is safe and effective beside being convenient and economical. It is easily autoclavable has very low particulate matter and causes minimal rise of intraocular pressure. The endothelial protective function and breakdown of the blood aqueous barrier are comparable to that of Healon. He also observed that in-the-bag placement of the IOL is easier if methyl cellulose is used as compared to more viscous Healon. With Healon the lens tends to be pushed back when placing the inferior haptic in-the-bag specially in a IOL with polypropylene loops.

However, Healon may be more useful in unusually hard eyes. Healon is also more useful when cataract surgery is combined with keratoplasty i.e. the triple procedure.
During Surgery

1. Conjunctival Flap - A too large limbus-based flap is a hindrance and reduces back to take out visualization of anterior structures adequately. Also, a large flap of any size can contribute to postoperative acquired ptosis (Limer, 1977). It is better to have a 1 mm conjunctival miniflap, which just allows the lifting of the cornea with conjunctival flap (Limer, 1977). Better yet to have a small fornix based flap that leaves the limbus free of conjunctiva during surgery.

2. Stripping Descemet's Membrane - During cataract surgery is a common occurrence. The amount of stripping in most instances is minimal and rarely leads to permanent difficulties. Except a slight corneal edema which leads to corneal vessels visible only on slit lamp examination. The detachment of Descemet's membrane is 1/3 or more will lead to corneal decompensation and therefore, it should be reported by injection of air or cushion material like 1% sodium hyaluronate. If there is large detachment, then the flap is sutured to the cornea with a 10-0 nylon - or polypropylene mattress suture.
It is a common complication during intraocular surgery, and it usually occurs in patients aged 60 and above. The cause of hyphema is not always clear, but it is often associated with anticoagulant therapy, ocular trauma, or ocular surgery. Intraocular hematomas can range from minor to severe and can be associated with anterior chamber hyphema.

In 1962, E. H. W. M. de Boer reported that hyphema can occur postoperatively. In 1975, Z. J. D. E. M. de Boer et al. reported on the incidence of hyphema postoperatively in uveitis patients.

In 1981, M. J. D. E. M. de Boer et al. reported the incidence of hyphema in patients with uveitis.

In 1983, F. D. E. M. de Boer et al. reported the incidence of hyphema in patients with uveitis.

In 1986, F. D. E. M. de Boer et al. reported the incidence of hyphema in patients with uveitis.

(3) Post-operative complications:

(1) Early Complications:

1. Flat Anterior Chamber - A shallow or even more or flat anterior chamber is an absolute emergency in eyes that
In many cases of IOL especially involving ultrasonic IOL or to all other cases. Contact between IOL and the corneal endothelium is extremely damaging to the corneal endothelium. The majority of such cases occur from wound leak only (Elman Technique).2.3.1

Sivas, et al. (1979) reported the incidence 1.81.
Sivas, et al. (1981) also found 1.5 incidence of phakic anterior chamber.

- Hypertension Glaucoma: Due to intraocular pressure as a multifactorial entity, strong retinal blood closure, intensive corticosteroids treatment, circumvention of aqueous and aqueous veins, postoperative sealing of the trabecular meshwork in non-trabeculitic incision; plugging up of meshwork with cortical residual and protein, intra camera methylcellulose, chondroitin sulphate and sodium hyaluronate (Elman and Fechner, 1998).

Dr. Sarah Miller (London) in 1982 observed glaucoma in 2.33 cases.

J. Rowe 1976 in his 100 posterior chamber IOL did not observe secondary glaucoma.

Krats (1977) observed in his 500 cases 0.4% incidence of glaucoma with posterior chamber IOL. In 1979 Dr. David Worthen, Chairman of F.D.A. (Food & Drug Administration Bureau of Medical Devices) in his paper reported 4% incidence of secondary glaucoma.
The incidence of secondary glaucoma was reported in 1999 in a study by Klein et al. to be 2.2%.

The incidence of secondary glaucoma in the complication section is not specified, but it is noted that it may occur in association with systemic conditions.

Secondary glaucoma is a concern in cases where systemic conditions are present, especially in patients with diabetes, hypertension, or systemic vascular disease.

Postoperative glaucoma should be treated with topical medications, such as beta-blockers, carbonic anhydrase inhibitors, and prostaglandins. Systemic treatment options include systemic hypotensive drugs or the use of corticosteroids (Alpern, et al., 1998).

Intracocular lenses (ICL) are used in cases of posterior chamber ICL.

3. Ghost cell glaucoma: In some patients, intracapsular hemorrhage may occur, resulting in iris or ciliary body erosion, during the insertion of a sulcus-fixated posterior chamber IOL implant.

If the large quantity of blood is collected in the vitreous, the degenerated blood cells (ghost cells) may float in the anterior chamber and block the tubercular meshwork, causing secondary glaucoma.
Practical management with the help of corneal allograft and vitrectomy in cases of severe keratitis (Buchanan, 1988).

- Nitrogen fixation or nitrogen fixation in the early postoperative period may suggest toxic injury. In some cases a nitrogen level of 80 parts per million was noted, often corneal ulceration, subluxation, and other phenomena occurs in a series of cases when used in clinical practice.

The layers in each for the serious keratitis to diagnose the acute inflammatory process and the use of prophylaxis. It is due to the importance of drug therapy for the management of keratitis (Buchanan, 1989).

It is less observed with improvement of extracapsular technique, avoidance of aspiration of cortical remnants, and reduction of the size of corneal incision from 170 to 100 degrees. Maintenance of corneal clarity by continuous irrigation of balanced salt solution incorporating glutethione and adenosine may further reduce the postoperative serum keratolytic.

Steroids and hyperosmotic eye drop (5% sodium chloride) will help to clear the cornea but this does not cure the problem since pumping function of the endothelium is impaired. If the endothelial cell can cover the damaged area, the cornea will clear if not then the corneal transplant will become necessary.
C. M. Mills (1961) studied 77.1% incidence of stricate keratitis.

Ribeiro & Meira (1969) in his 79 posterior chamber IOL implanted cases observed 15.6% incidence of keratitis.

Eckard & Hill found 1.8% incidence of anterior keratitis, in his 190 posterior chamber implants.

B. B. Schwartz et al (1990) observed in 11.0% incidence of anterior keratitis.

3. Iridocyclitis - Due to surgical manipulation or as a response to traumatic breach of the anterior border.

A. B. Green (1961) in 160 posterior chamber IOL implants found minimal surgical uveitis, with no case of synechiae or hypopyon.

Rena in 1977 reported 3.3% incidence of iritis in his 2,800 posterior chamber IOL implant (Shearing type).

Rena et al (1981) found 3.3% iritis in his 750 'Y' loop posterior chamber IOL.

Dr. Petersen in 1973 in a 63% study reported 4.3% incidence of iritis.

Drew studied 128 patients with posterior chamber IOL and found 1.4% cases of iritis.

Subhash I Kadam (1967) reported 7.5% incidence of iritis.
Elder D. (2002) reported 4.8% incidence of persistent uveitis.

Varma Randhawa (1984) reported 3.4% incidence of uveitis.

This may be minimized by administration of prophylactic antibiotics such as tetracycline. The incidence of central uveitis is decreased mainly with improvement in surgical techniques. Better scrub techniques, better instrumentation techniques, better IOL design, and the advent of modern intracapsular and extracapsular sterilization (Apple et al, et al, 1967).

6. Infections endophthalmitis - Usually bacterial, manifest about 2nd or 3rd postoperative day, sometimes being Rhodococcus epidemidis endophthalmitis which manifest after 5th or 6th week of surgery. The fungal endophthalmitis is also a late complication that appears after 7 months of surgery.

In 1975 and 1976 two major outbreak were reported by Apple D. et al (1966) and Alper Reacher (1982). The cause of these outbreaks was contamination of intracapsular solution (sodium bicarbonate). 10 patients developed fungal endophthalmitis following IOL implants in 1975 and in 1976. 3 cases had pseudomonas aeruginosa endophthalmitis.

Dr. Worthen in FDA study 1979 reported 0.1% incidence of endophthalmitis.
Treatment of endophthalmitis depends on early diagnosis aided by cultures of aspirated vitreous.

Kocherhead & Co. authors 1973 reported that by treatment all eyes of bacterial endophthalmitis were saved with good retention of vision.

Schnier and Nomioka 1984 have shown that response to treatment and final visual acuity, in five patients with "post implantation bacterial endophthalmitis", did not appear to be related to retention of removal of IOL.

David N. Reisler ML et al (1985) studied 6 cases of chronic propionibacterium aerues endophthalmitis after IOLS and posterior chamber IOL implants.

7. Sterile Endophthalmitis - Toxic lens syndrome - it may occur in first several days following IOL surgery and manifest as a sterile hypopyon and vitreous opacification in single or mixed form of variable duration and severity. The eyes are relatively painless, hardly red and little or no chemosis is present (Alper, 1982).

Alper D. C. et al (1984) reported 7% incidence in dry pack and 15% in case of wet pack sterilized IOLS.

This problem is less frequently countered now a days due to improved manufacturing techniques.
C. MACULATIONS on MX and ANEURYSMATIC MACULAE - Alper

Fuchs' 1981 observed pigments on MX in aneurysmatic vitreous
face which usually disappeared in few weeks or months. Their
appearance signifies a flare up of uveitis and might be a
first sign of CMI. The best way to prevent the formation of
precipitation on MX (pigment, blood, cell, protein etc)
is careful control of bleeding during surgery, antieptic
surgery and control of postoperative inflammation.

Apple C.I. (1984) stated that this occur especially
during the immediate post-operative period and frequently
clears spontaneously as the operated eye quiets down but
if inflammation continues or haemorrhage occurs such as in
CMII syndrome, the precipitate may coalesce and becomes
sufficiently dense as to cause diminished vision.

reported 31 cases (43.5%) of pigmenatry deposit over IOL
implant.

II. POST OPERATIVE COMPLICATIONS – Late Complications +

1. Lens Dislocations – There are several names of
describe dislocation of the retroiridal posterior chamber
lens –

(a) Captive iris syndrome – in the condition in which
the iris slips behind one or both edges of lens. It occurs
with lenses close to the iris, such as Simcoe or original
In such cases during the postoperative period, the surgical intervention is needed.

2. Windshield wiper syndrome: The windshield wiper syndrome is a posterior displacement of the lens back and forth within the eye due to a too short lens (13 or even 15.5 mm) iris-collony fixation did not settle. Such lenses may be immobilized by the method of advancement or with double or Cannel sutures or they might need to be removed and replaced with a 14 mm or 14.5 mm diameter lens.

3. Sunset syndrome: Sunset syndrome is the dislocation of a retroiridal posterior chamber lens into the vitreous. This usually happens with a sulcus fixed lens if the capsule were damaged and the lens was not rotated or, in some cases even if it was or if the lens was implanted in an with extensive, but unrecognized damage to posterior capsule.
The subluxated lens may irritate uveal body causing pair, low grade uveitis and cystoid macular edema.

Often it is possible to retrieve such a lens with an iris hook. The optical part can be dislocated into anterior chamber, achieving in effect, double captive iris, and superior and inferior loops can be secured to the iris with 16-0 canal suture. Some time lens slip out of vitreous with ease or an intensive vitrectomy needs to be done, a replacement of 'C' loop posterior chamber lens with an anterior chamber angle fixed lens or an iris claw lens might be more advantageous.

J.H. Pearce in 1976 in his 140 posterior chamber IOL implant observed 3% incidence of anterior dislocation of implant within 2 days of surgery.

FDA study in 1978 mentioned 0.4% incidence of IOL dislocation.

Luchakar J in 1999 reported 2.6% incidence of relposition of IOL in his 1000 cases.

2. Intermittent touch syndrome and IOL corneal touch -

This syndrome between retroiridal fixed lens and corneal endothelium leads to continuing loss of endothelial cells and permanent corneal and often macular damage.
Since 1962, classified the syndrome of intermittent pain in the region of kerato-epithelial, keratotic corneal changes and macular changes.

This is absent with extracapsular extraction of clear IOL implants.

3. Posterior Synechiae - It is a well known complication of intraocular surgery. It occurs often with intracapsular than extracapsular extraction. It is not completely clear whether this, with rupture of the zonular integrity of perilenticular arteries, is caused by Nd:YAG laser injury, is secondary to nuclear dislocation or even direct traction from to the nucleus following vitreous shrink. There may be a contribution of factors.

A relationship to anterior segment inflammation associated with prostaglandin release and concurrent corneal decompensation and CME (corneal-retinal inflammatory syndrome) has been reported by Obstbaum & Galin in 1979. Galin in 1977 reported that approximately 7% of affected patients will have spontaneous resolution with visual improvement.

Cohn 1977 observed 2.1% incidence of CME in his 2500 posterior chamber Intraocular type IOL implant.

The Miami study group in 1979 concluded 4% incidence of angiographic CME.
of affected patient will have spontaneous resolution with visual improvement.

Since 1982, the incidence of CIC in the posterior chamber ICL implant.

The Miami study group 1978 concluded the incidence of angiographic CIC.

Since 1982 found 0.6% incidence of clinical CIC (yr. 1982/90) in posterior chamber ICL implants.

Peet and Coauthors 1984 reported 152 out of angiographic CIC in 798 patients who had ICL or anterior chamber implantation with primary capsulotomy and posterior chamber implantation. Majority of angiograms were performed between 1 to 6 months after surgery and the incidence of overall clinical CIC was approximately 4%.

Taylor and Coauthors in 1986, in 450 cases found an incidence of 1.8% of clinical CIC.

Tony Fernandez 1969 in the 500 posterior chamber ICL implant (endo-capsular) observed, cystoid macular edema in 3 cases (1.6%).

To date, no adequate treatment or prophylaxis of clinical CIC has proven effective. Several reports regarding the effect of corticosteroids and prostaglandin inhibitors such as flomethacin in treating CIC has published. Results have been somewhat, encouraging but inconclusive.
This is observed in posterior capsule hernia especially those that sit close to the iris such adhesion can be between lower the pupillary margin or iris, more seldom, however, not between the anterior capsular rim or anterior capsule and the iris itself. These are limitations or limitations inherent of adhesion or a groove formation between iris substance and the area around the edge of IOL.

The use of uncorrected former, especially at the anterior surface is during the posterior capsule. Nearsighted lens greatly reduces the occurrence of this complication.

3. Thickening and opacification of posterior capsule - opacification of the posterior capsule is a common complication of extracapsular extraction surgery.

Children and young adults seem to be more prone to this complication, over a period of 5 to 10 years. However, 30-50% of the posterior capsule may thicken, thicken, and opacify. If visual impairment occur these tissue must be opened at least in the visual axis. This can be accomplished with needles, fine needle knives, and with neodymium YAG laser. In very heavy membrane if the YAG laser is not available pars plana vitrectomy and membranectomy might be necessary.
C. C. Miller (1968) reported 53 cases (40.76%) of corneal edema lens rather in their posterior chamber IOL implant cases.

Subhash N. Dees (1977) reported 31% incidence of posterior capsule thickening.

Subhash C. et al. (1982) in his 80 posterior chamber IOL implant cases observed 11.5% incidence of late posterior capsule opacification.

Terry Fernandez (1989) in his 500 endocapsular intraocular implant observed 11.6% incidence of thickening of posterior capsule.

6. Visual results — Ridley (1982) reported in his 20 cases 50% had 20/40 or better vision.

... Vinod (1984) in his 100 posterior chamber IOL observed 70% cases, achieved visual acuity 6/9 or better without spectacles correction.

Subhash C. Pavithran & R. B. Nandakumar (1990) in 1000 cases of post cataract IOL implant observed good visual acuity i.e. 6/9 to 6/9 in 57.3% cases, 6/12 to 6/12 in 31.5% cases, 6/24 to 6/60 in 8.2% cases, 6/60 in 2.2% cases.

Terry Fernandez et al. in 1990 in his 500 posterior chamber endocapsular implants observed good visual acuity in more than 83% cases i.e. 6/6 or better in 50.4%, 6/9 to 6/18 in 52.2%, 6/24 to 6/60 in 12.2% and ≤6/60 in 4.2% cases.
what we have (1986) is that in the illumination, 6" were observed excellent visual results (6/9 on average) in 75% cases, 6/12 to 6/17 in 25% and 6/36 to 6/56 in 2% only.

7. Retinal detachment - The frequency of retinal detachment in these two eyes was definitely not aphakic eye. These in Canada, a significant difference between Minimal or complicated intracapsular and extracapsular cataract (Scheinman & Lepor, 1968).

Henderson et al (1983) reported the similar results.

Arora in 1977 reported 1.3% incidence of retinal detachment after 3 month to 4 years follow up of his 2003 phakic type posterior chamber IOI implant.

The WHO study in 1978 reported 0.3% incidence of retinal detachment.

Pollensak J (1985) in a series of 4,000 patients who had undergone extracapsular cataract extraction and silicone type posterior chamber lens, the incidence of retinal detachment was 0.3% (21 cases).
A. Light Sensitivity, erythropsia - Although the natural lens filters the greater part of ultraviolet light out, the PMS hardly present a barrier and the cornea filters only about 20% of the near ultraviolet light to the retina. Erythropsia (pink vision is an acute phenomenon) that occurs to a patient with an ocular system that does not filter out the near ultraviolet rays. Repeated attacks of erythropsia almost surely will lead to permanent damage of the retina due to macular oedema (Feschnner & Alper, 1988).

Until the safety of ultraviolet filter ICL is established one many consider using the ordinary ICLs and fitting ultraviolet filtering spectacles (Feschnner, 1980).
AIMS OF STUDY

1. To perform ECLE with posterior chamber lens implantation.

2. To assess the postoperative final visual acuity in posterior chamber lens implantation.

3. To record the complication in intraocular posterior chamber lens implantation, if any, after surgery.

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