Visual Rehabilitation of Aphakia – The Indian Perspective

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Abstract: Aim of study: To evaluate efficacy of surgical intervention in patients having aphakia by secondary IOL implant and to study their complications.Design: A time bound study for management of aphakia in the department of ophthalmology , SAIMS Indore from Feb. 2004 to Feb. 2012. Method: After clinical evaluation on individual basis, we carried out a secondary procedure on thirty two eyes of thirty one patients from age group twenty-six months to seventy four years. Placement of implant in posterior compartment was given first priority in cases of aphakia reporting on out patient basis. In cases where cataract surgery was eventful or could not be completed we preferred doing in the bag placement.If this was not feasible then placement of haptic in ciliary sulcus was the next preferred choice.In the event of pre-existing PAS or insuffecient iris ,we chose to do scleral fixation. In absence of these with inadequate capsular support, anterior chamber placement of lens was done . Power of intraocular lens was calculated by SRK formula. In all cases, except one ab externo, a scleral tunnel was made or previous tunnel used for implantation, depending on duration elapsed between cataract surgery and secondary implantation. Best corrected visual acuity for distance and near was determined at the end of six weeks. In traumatic cases A-Scan biometry was done after six weeks using aphakic mode. Undercorrection of implant power in paediatric patients was done according to age. Result: On the basis of visual acuity recorded patients were categorized into three groups. Twenty four (80%) patients achieved BCVA of 6 /18 or better, four(13.3%) patients gained vision between 6/24 to 6 /60 while two (6.6%) had visual acuity between 3/60 to 5/60. Mean spherical refractive correction was - 0.616 , mean value of cylinder was -0.742 ,which is considerred the most optimal and desired outcome after IOL implantation. Conclusion: Though secondary intervention was done in eyes where ocular tissues had undergone prior surgical handling , inclusive of patients with poor visual prognosis, still 80% could achieve BCVA 6/18 or better. This shows that secondary implantation is an effective means of rehabilitating aphakic patients. Traumatic cases should better be dealt with by a sequential approach. [Lubna Khan et al NJIRM 2013; 4(1) : 125-133]

Key Words: Secondary Implantation, Aphakia, visual outcome

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Introduction: Secondary IOL implantation refers to IOL insertion at a time ahead of the initial cataract extraction or, less commonly from the trauma that led to loss of crystalline lens, or a cataractous lens in order to provide visual rehabilitation and binocular single vision.

The most dramatic example of the benefit of a secondary IOL is the case of an aphakic patient , particularly the monocular aphakic patient.

Aim of Study:

1. To study efficacy of secondary intervention in cases of aphakia reporting on out patient basis , in eye camps or occurring as a result of eventful cataract surgery .
2. To evaluate if secondary intervention is of any added advantage in traumatic cases.

It was a time bound study for management of aphakia in the department of ophthalmology, SAIMS, from Feb. 2004 to Feb. 2012.

Magnitude of the problem : Spectacles related untoward effects like aniseikonia interfering with binocular single vision, limited feasibility of dispensing contact lens due to illiteracy and in extremes of age, moreover, in a majority of cases surgical options like epikeratophakia cannot be elected due to financial constraint. As long as trauma cases, congenital and developmental cataracts and eventful cataract surgeries persist, aphakia will remain an ongoing concern for Ophthalmic surgeons.

Material and Methods:

Inclusion criteria –

- Unilateral aphakia with pseudophakic fellow eye.
- Unilateral aphakia with normal fellow eye
- Unilateral traumatic cataract
- Congenital cataract / post - discission unilateral or bilateral aphakia

Exclusion criterion -Patients with glaucoma filtering bleb or extensive peripheral anterior synechiae, traumatic corneal perforations with cataract, (subsequent closure of corneal entry wound having taken place with no evidence of retained intraocular foreign body),any past record suggestive of compromised cornea where there was likelihood of corneal decompensation and aphakia with ocular surface disorder where further surgery could improve vision at the expense of symptomatic worsening of OSD.

Placement of implants was of four types: anterior chamber angle supported, posterior chamber in the bag,haptics in ciliary sulcus and scleral fixated IOLs.

Pre Operative Evaluation : Examination of each patient included recording of distant vision, best corrected aphakic vision, recording intraocular pressure, testing patency of lacrimal passage, a thorough slit lamp examination under dilatation to see extent of posterior capsular support, iridocapsular synechiae, atrophic patches in iris, ability and extent of pupillary dilatation and corneal transparency. Any vitreous herniation anterior to pupillary plane or strand of vitreous coming into the incision was noted. Fundus was examined not only for visual prognosis but also to inform the patient regarding expected outcome . Patients (or parents) were fully explained why they were undergoing the procedure, especially in paediatric aphakia, with emphasis on need of follow-ups and occlusion. In children, before undertaking secondary implantation features like nystagmus, strabismus and possibility of amblyopia were assessed and parents were informed that final visual outcome would depend on these associated findings.

Favourable prognostic features include optically transparent ocular media and good retinal function. Axial length varied from 18.46 to 25.31 (mean value – 22.688). IOL power ranged from 6.0D to 28.0D. All were PMMA lenses implanted through posterior limbal scleral tunnel. Overall size of implant varied from 12mm to i7.25mm. The latter, an aniridia lens, could not be inserted through self sealing scleral tunnel, hence this was implanted through ab-externo incision. All angle supported anterior chamber lenses were Kelman multiflex design.

During preoperative evaluation of a patient who approached us for for IOL in left eye, (f ellow eye being pseudophakic) with semidilated pupil and atrophic iris, posterior capsular support being poor in the centre, we had almost decided on anterior chamber IOL but Elschnigs pearls seen through peripheral iridectomy gave sufficient evidence of possibility of sulcus fixation which was elected and successfully done. Hence, evaluating every prospective candidate very thoroughly is of extreme importance before deciding whether a secondary IOL is feasible, if so, which type of placement would be best for that individual.

At times we had to choose a secondary IOL to give the benefit of near vision also. This could be of professional advantage for a person who has previously been explained poor outcome for distant vision

In our series ten patients had pseudophakia in fellow eye , apart from these, two patients were bilateral aphakes {having undergone discission}, 6 were unilateral traumatic with normal fellow eye, 1 unilateral congenital cataract due to Rubella where discission was done at the age of five weeks and secondary implantation at 26 months. Of eleven other aphakic patients , five had normal fellow eye, three had visually significant cataract and three had grade one nuclear sclerosis. All underwent a secondary procedure. A thorough clinical assessment for judgement regarding corneal status was done using oblique illumination during examination using slit lamp . Two aphakic patients having cataractous fellow eye were consenting for cataract surgery with IOL in fellow eye first instead of gaining useful vision in aphakic eye by a secondary procedure.Our understanding that they would eventually get a secondary procedure done-- especially after experiencing good quality vision with IOL in in fellow eye proved to be erroneous as they never turned up for reasons discussed later. One female with unilateral

aphakia (fellow eye pseudophakic) did not want a secondary procedure as she did not want her son to bear any expenses.

The procedure: For angle supported secondary anterior chamber implantation, horizontally visible iris diameter was assessed using callipers for sizing the IOL after giving peribulbar block. An anterior vitrectomy was not required in any patient as there was no vitreous anterior to pupillary plane evaluated on slit lamp preoperatively.Viscoelastic was injected over iris peripherally all around.Implant was introduced over the iris and in the same plane as iris. Sinskys hook was used to give rotational movement to superior haptic.An iridectomy was done superiorly from tunnel, all viscoelastic washed out, air injected, single infinity pattern suture applied and chamber formed with lactated Ringer .

For planned sulcus fixation viscoelastic was injected between iris and capsule,thereafter implant manoeuvred such that haptic remained as far away from rent in posterior capsule or dialysed zonules.To accomplish this mostly a new tunnel was made, or, (when this was not feasible owing to short time period between cataract surgery and secondary procedure), the implant was oriented in the desired direction in clock hours from tunnel made in previous surgery .While holding superior haptic either clockwise or anticlockwise movement shifted the leading haptic away from area to be bypassed.(eg: leading haptic along 8clock hours and trailing haptic along 2 clock hours in case of rent or dialysed zonules at 5 clock hours)Rotational movements of optic were avoided to prevent increase in clock hours of zonular dehiscence and enlargement of rent.
For scleral fixated IOLs one point fixation with 10 - 0 prolene suture was done by scleral tunnel incision or ab-externo.

Results: With implant the visual acuity in thirty one eyes was as under: Visual acuity of 6/18 or better was achieved in19 out of 31 cases (61.29%) before refractive correction, between 6/60 to 6/24 were 8 patients (25.8%) and less than 6/60 with implant alone was achieved in4 patients (12.9%).

Graph- 1: Visual acuity with Implant in the series

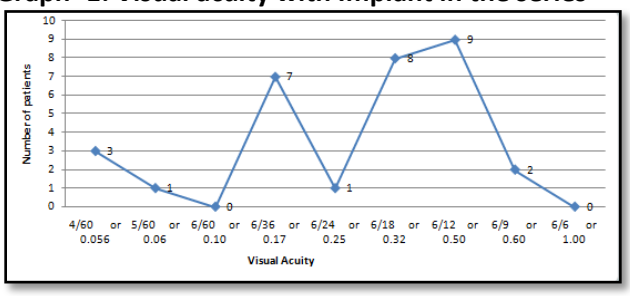

Table:1 : Visual acuity with Implant in the series

visual acuity	Number of patient
4/60 or 0.056	3
5/60 or 0.06	1
6/60 or 0.1	0
6/36 or 0.17	7
6/24 or 0.25	1
6/18 or 0.32	8
6/12 or 0.5	9
6/9 or 0.6	2
6/6 or 1	0
Visual acuity could not be assessed in one child aged 26 months	31

Mean BCVA – 0.53 (approx 6/12): Best corrected visual acuity BCVA was as follows

Table:2 : Best corrected visual acuity in the series

visual acuity	Number of patient
4/60 or 0.056	1
5/60 or 0.06	1
6/60 or 0.1	1
6/36 or 0.17	1
6/24 or 0.25	2
6/18 or 0.32	4
6/12 or 0.5	4
6/9 or 0.6	9
6/6 or 1	7
Visual acuity could not be assessed in one child aged 26 months and in another 12 year old who did not report for follow-up.	30

Graph- 2: Best corrected visual acuity in the series

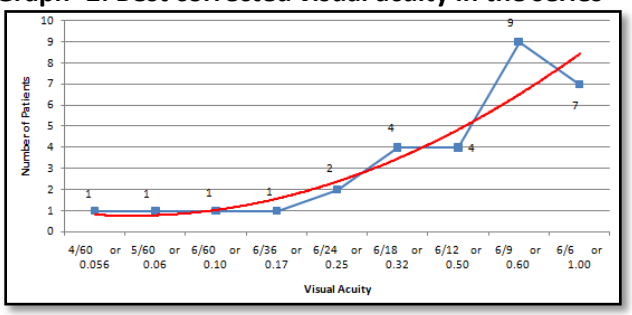

Table:3 : Stratification of the series

visual acuity with Implant	Numbers of patients	Total Number of patients	Percentage
6/18 to 6/6	19	31	61.29%
6/60 to 6/24	8	31	25.8%
Less than 6/60	4	31	12.9%

Mean visual acuity with implant was 0.32: Mean visual acuity with implant and refractive correction (BCVA) was 0.53 which is between 6 /12 and 6/9 (closer to 6/12)

Table:4 : Stratification of BCVA in the series

Best corrected visual acuity(BCVA)	Numbers of patients	Total Number of patients	Percentage
6/18 to 6/6	24	30	80%
6/60 to 6/24	4	30	13.3%
Less than 6/60	2	30	6.6%

Mean BCVA was 0.53: Best corrected visual acuity of 6/18 and better was achieved in 24 out of 30 cases (80%) , between6/60 to 6/24 was achieved in 4(13.3%) patients and less than 6/60 was achieved by 2 patients (6.6%)

Spherical refractive correction after secondary implantation ranged from -4.0D to + 0.75D. mean value - 0.613. Astigmatic correction ranged from -5.75D to+ 0.75D. Mean value of cylinder (-0.7426).

Our outcome as per WHO criteria for visual function based on visual acuity testing was as follows:

Low vision.

Category I –After secondary implantation four patients still attained visual acuity 6/60 to less than 6/18

Category II -- After secondary implantation two patients attained vision between 3/60 to less than 6/60

In the former ,that is category I, we had four patients, one being occlusio pupillae with grade four nuclear cataract with pigmentary mottling at the fovea (6/36) second was traumatic aphakia with aniridia (6/24), third patient was bilateral aphakia due to discission (6/24 in eye with anterior chamber IOL), fourth being scleral perforation who reported late, eventually developed corneal opacity and retinal toxicity due to intravitreal antibiotics (6/60).

In category II we had two patients, one being aphakia due to congenital cataract having myopia and nystagmus, (5/60), while second had healed patches of choroiditis in central fundus oculi bilaterally (4/60).

Except these six patients with poor prognostic features, all other patients in our series attained visual acuity 6/18 or better.

Discussion: Of the series of thirty-two implantations done in thirty one patients, five were AC IOLs, one was in the bag PC IOL, two were scleral fixated lenses in ciliary sulcus (of which one was aniridia lens) and 24 were posterior chamber sulcus fixated.Intraoperative problems faced namely included: Excessive hypotony causing scleral depression at and posterior to scleral tunnel met with only in one patient who had granulomatous uveitis with occlusio pupillae.During secondary procedure a new tunnel was prepared superotemporally, fashioning which also posed a problem. However,having anterior chamber fully filled with viscoelastics enabled completion of tunnel and application of suture at

the tunnel could be done with air in AC, replacement of which could be easily done through side port incision at the end. This difficulty was not due to secondary procedure per se, it was due to eye having uveitis preoperatively. Other complication include rent caused in posterior capsule at the time of enlargement of tunnel to accommodate a6mm optic at the end of cortical aspiration.Inadequate viscoelastic or a convex posterior capsule and changed site of tunnel all contributed to superior rent with tip of keratome. Air was injected and sulcus fixation done after two days.If anterior vitrectomy cannot be done due to non availability of vitrectomy unit, then in the event of minimal vitreous disturbance a secondary procedure gives excellent outcome since air in anterior chamber pushes anterior hyaloid face and when fully absorbed, IOL can be inserted in sulcus or even in the bag with least vitreous manipulations.There were instances when we had to change the direction of insertion of haptic in order to bypass either a rent (which would enlarge) or a dialysed zonular segment.As far as possible we designed a scleral tunnel away from such an area.

Absence of fundal glow after nucleus delivery was met with in two patients. Both could gain good vision(better than 6/18) after secondary implantation.We chose to treat uveitis first, Under coaxial illumination implantation became safer since reversal of faint fundal glow enabled better visualization. One out of these two patients developed membrane behind IOL in early post operative period.

Post-operative complications:

- Raised Intra-ocular pressure - none
- High astigmatic error (Owing to lens tilt) - 1
- Uveitis - 2
- Myopic surprise - 1

All the Anterior chamber Kelman multiflex models did well and we did not see any complication. A peripheral iridectomy was done in all cases.In open loop design the optic is anteriorly vaulted just enough to prevent contact with iris, the haptic resists increased vaulting under high compression, which prevents endothelial damage[1, 10]. Also, rounded highly polished edges particularly at haptic optic junction minimizes trauma to iris . For this reason we elected anterior chamber implantation in the sole pseudoexfoliation in our series[2].

All the sulcus fixated lenses did well and outcome was satisfactory. However, we encountered mishap in power calculation for sulcus fixation in a young myopic patient who sustained dog nail injury, reporting to us in aphakic status. Our hunch to get a B scan ultrasound done to exclude posterior staphyloma whereby an axial length measurement of 25mm made us change our calculated Emmetropia power by one dioptre. Non availability of this power added an error of another 1 dioptre, hence we implanted 12 dioptre instead of calculated 10 dioptre. To our dismay she accepted -4.0D Sph after one month. By our calculation (SRK regression formula) she would have been -2.0 dioptres myopic.As per our calculation, if we would have deducted 1.5D from our calculated power of 10D for sulcus placement, she would have been having 0.5D residual myopia after secondary implantation[3].

The wide difference between unaided acuity better than 6/18 and BCVA better than 6/18 (61.29% versus 80% respectively) could be due to anatomical factors,machine dependent factors , assistant related or surgeon related factors:- To enumerate, this wide difference was due to:

Pre –existing large astigmatic error due to past ab-externo.Few patients underwent cataract surgery with large corneo scleral incision over ten years back . Wherever possible, we tried to reduce this by making a scleral tunnel along steepest meridian,but this could not be done in cent percent cases.

Limitations were: Pre - existing vitreous disturbance at a position where placing the tunnel would have corrected some part of the astigmatism.

Where time interval between cataract surgery and secondary intervention was short, original scleral tunnel being made at superior location irrespective of attention to steep meridian, we chose to insert implant through same site.

In eventful cataract surgery sometimes the tunnel was extended on both sides to enable nucleus delivery and corneoscleral suturing done, hence large astigmatic error creeped in.

Failure on part of operating surgeon to get repetition of A-scan biometry done in aphakic mode after eventful cataract surgery in cent per cent cases due to improper formation of mires during keratometry. Secondary procedure was done based on initial A scan biometry done in phakic condition or keratometry repeated with instillation of lubricating drops. In both conditions there is bound to be error in IOL power calculation. Multiple assistant hands performing A-scan biometry during the study contributed to residual refractive error .

While performing A-scan biometry, axial length recording with anterior chamber depth monitoring could not be done as there was no provision for AC depth display in the A-scan machine we used.

Misalignment of probe could be a source of error. Ultrasound machines itself is not free from error, especially in myopic eye velocity of sound wave in vitreous is faster hence axial length calculated tends to be lesser than what it actually is, hence under estimation of IOL can occur.

We did power calculation by the contact technique which is not as accurate as immersion technique. We did not incorporate any correction factor (0.34 for most ultrasound machines) in the power of IOL calculated by the SRK formula, neither applied Holladay formula while doing biometry.

We had only two scleral fixated IOLs one implanted through tunnel incision while other by ab externo. Implantation of scleral sutured intra ocular lenses can be done by the ab-externo or ab-interno through pars plana. In the ab-externo technique a two point fixation offers better centration than one point fixation, since in the former technique prolene suture is passed for a second time one millimeter lateral to the point where prolene enters and leaves the sclera, which ensures better centration of lens with lesser chance of tilt. Tilt of a scleral fixated lens was due to:-

- Unequal placement of 10-0 polypropylene at two points from limbal blue zone[4.]
- Unequal tension on prolene suture while tying to sclera (due to hesitation on part of operating surgeon to pull the prolene suture tightly which could break with subsequent recession of pseudophakos into vitreous)
- Improper localization of corneo–scleral junction, especially large ab-externo made in first surgery or trachomatous pannus causing faulty measurement from limbus. Posterior limit of blue zone at limbus, therefore, is the best guide and prolene should be passed 0.8 mm from it in oblique meridia. This distance goes on decreasing as we approach 3 to 9 meridian positions.

Normally prolene suture is passed from superonasal to inferotemporal quadrant of globe or from three to nine clock hours, but we had to go from suprotemporal to inferonasal quadrant to avoid the vitrectomy port. In this patient a high nose bridge along with sutured vitrectomy port temporally did not allow passing of prolene suture with ease, therefore a one point fixation was done, which could be contributing to a tilt in lens .

The first patient with severe postoperative uveits attained a final visual acuity of 6/9. She had to undergo YAG membranectomy, since exudates behind the implant were interfering with vision.

The second patient with postoperative uveits had traumatic aniridia who underwent scleral fixation. Upto ten days post operatively aniridia component of IOL could not be seen due to AC reaction.

Preoperatively he was put on systemic steroid and NSAID topically, but he was not fully compliant. Though vitrectomy was done before scleral fixation in one of the two cases ,the one who underwent vitrectomy had lesser inflammation in post operative period.

This was due to:-
1. Stabilization of blood aqueous barrier as patient was compliant with premedication
2. She was aphakic due to congenital cataract whereas the patient with aniridia was a traumatic one.

Our target post operative refractive status: In children with normal fellow eye, secondary implant interferes with binocularity due to loss of accommodation, hence planned myopia should be the aim for good distance as well as compatible near vision. Even if the child does away with glasses, vision with pseudophakos alone allows binocular single vision. Amongst the elderly only in one patient we aimed for a residual plus one spherical . She had been operated for cataract elsewhere , the fellow eye which was pseudophakic accepted +2.5D Sph with + 0.50 cyl at 180^0, hence we aimed for post operative + 1.0D sph in the second eye when she approached us for cataract surgery. During secondary procedure for sulcus placement, we deducted 0.5D from calculated power that would make her 1.0D hyperopic (as A scan biometry could not be adequately done in aphakic mode) and she accepted +1.25D Sph after five weeks. Another septugenarian lady with good pseudophakia in left eye and aphakic right eye was implanted a +6D IOL in right eye and she could read very well on first postoperative day with +2.5D sph for near. Her acuity for near on first day after secondary implant was N_8 in right eye and N_6 in left eye. She had been aphakic in right eye for over seven years as her acuity for distance was 6/18, but had difficulty in reading. Secondary implantation helped her not only to see clearly for distance (6/9) , but enabled her to do near work with full binocularity and ease. Another fifteen year old myopic girl who had discission done owing to bilateral congenital cataract , though attained visual acuity 5/60, could complete graduation after secondary implantation. Thus, significance of near vision cannot be overlooked.

A physiological mechanism for accommodation cannot be restored with an inelastic monofocal IOL implantation. Surgically induced astig matism has been shown to allow pseudophakic "pseudoaccomodation''. Huber[5] found residual postoperative myopic astigmatism an effective substitute for accommodation ,granting independence from spectacles. Trinidade et al also suggest the benefit of low simple ATR for better under corrected visual acuity for near vision in pseudophakes[6].

The drawbacks of this procedure are :

- Necessity for added expertise -namely for scleral fixation
- Possession of vitrectomy unit and preferably specular microscope.

We had no provision for endoscopy assisted[7] sulcus fixation, which would have been ideal for scleral fixated IOL's. Also sizing of AC IOL was done by white to white diameter measurement which is not as accurate and can lead to vaulting. For anterior chamber lens sizing, ideal would have been AC width[8] assessment by OCT.

In many cases it was noticed that financial constraint compelled aphakics to remain status quo for many years, (longest period of aphakia was twenty-three years in our series, that too, bilateral!) This female, aged twenty seven, chose to have two of her three children operated for cataract before seeking consultation for herself, although under National Programme for Control of Blindness (NPCB) , surgical opportunity can be availed free of cost for preventable blindness due to "cataract or its complication". Lack of awareness still withholds the needy. In older age group dependency on children for bearing surgical expenses is the prime factor for prolonged period of aphakia, especially if fellow eye has been operated for cataract with IOL implantation , as happened with three unilateral aphakic patients who could not be included in our series, since we

operated the fellow eye with cataract first. They never turned up for secondary implantation to us since they gained good vision in fellow eye.Also they are not aware that aphakia is a complication of cataract surgery and that under the National Programme it is to be dealt with free of cost. To procure consent for aphakic eye first should be the optimal approach.All paramedical , nursing and field workers must educate rural population.

Optimising a traumatized eye: We had aimed for an acuity of 6/9 in children with normal fellow eye and could achieve this in all cases of perforating injury with traumatic cataract, (corneal, scleral or corneo scleral). An acuity of 6/9 in one eye with 6/6 in other eye not only allows the child to see clearly for distance but allows substantially good near vision without glasses for near. We preferred to do a repair first followed by Ascan biometry in aphakic mode after six weeks. This is likely to give precision since corneal scarring can lead to faulty IOL power calculation. In two out of three perforating injuries there was no spherical refractive aid,while third accepted only - 0.50 D sph.

In one study "Long term outcome of primary versus secondary implantation after simultaneous removal of bilateral congenital cataract" it was concluded that similar visual outcome and complications were observed during long term follow up after both primary and secondary implantation.In another study by Lan-Hsin Chuang in Taiwan on open globe injuries with secondary implantation done,56.7% achieved final BCVA of 20/40,76.7% patients had residual refractive correction within 1.0 D from Emmetropia based only on biometry of traumatized eye.Postoperative refractive results were comparable to those of routine cataract surgery,BCVA improving 0.66 logMAR preoperatively to 0.38 logMAR postoperatively.In another retrospective review of 50 eyes in paediatric age undergoing secondary implantation in ciliary sulcus,or bag, it was concluded that mean absolute value of prediction error was consistent with previous paediatric primary and secondary IOL data.More important conclusion from this study was considerable difference from that expected in adult population.There are many variations in paediatric eyes to account for this difference.

David B ,Davis IJ compared secondary IOL with Epikeratophakia and considered secondary IOL advantageous over Epikeratophakia owing to quick visual recovery and no need of added expertise since cataract surgeons are already well versed with IOL implantation.Epikeratophakia does not provide the same quality vision as secondary IOL, apart from the need for suture adjustments in post operative period,lesser predictability of post operative refraction (+2 to -2D is considered good outcome) ,non availability of lenticle if dropped accidentally and above all higher cost which, in developing countries, limits feasibility of Epikeratophakia .

Use of contact lens in extremes of age is not only practically difficult, the background of patient and need for education ,vigilance and possibility of infection are an all time concern for Ophthalmologist.

Conclusion: Patients were selected for secondary surgery irrespective of presence of poor prognostic parameters met with during pre- operative evaluation. We included traumatic cases, congenital and developmental cataracts with nystagmus, patients with old healed choroiditis, uveitis, myopia , pseudoexfoliation and amblyopia still an outcome of 6/18 or better with implant could be achieved in nineteen out of thirty-one patients (61.1%). After refractive correction, a visual acuity of 0.32 (6/18) or better could be achieved by 80% patients. This is a fairly good outcome. This encouraging result shows that Secondary implantation is a very promising and effective means which an ophthalmic surgeon has at hand and can be undertaken to rehabilitate vision. Compared to other means like spectacles having the problem of aniseikonia and aberrations, limited feasibility of contact lens and surgical method such as Epikeratophakia, the low cost efficacy, quick rehabilitation and adequate post operative predictability of refraction makes secondary implantation the treatment of choice

for rehabilitating patients with aphakia in the developing countries[9].

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