Vol. 16, No. 1
ORIGINAL PAPER

OPTHALMOLOGY

MEDICAL CHANNEL
JANUARY - MARCH 2010

TRANSSCLERAL SUTURE FIXATION OF POSTERIOR CHAMBER INTRAOCULAR LENSES

1. **MUHAMMAD MUNEER QURAISHY**
FRCOphth
2. **MEHVASH HUSSAIN**
MBBS

1. *Associate Professor*
Ophthalmology
DOW MEDICAL COLLEGE
KARACHI
2. *Postgraduate Trainee*
Department of Ophthalmology
DOW MEDICAL COLLEGE
KARACHI

Correspondence Address:
DR. MUHAMMAD MUNEER QURAISHY
Associate Professor of
Ophthalmology
DOW MEDICAL COLLEGE
KARACHI
E-mail: opsy@cyber.net.pk
Tel: 0300 2011243

ABSTRACT

PURPOSE: *The aim of this study was to ascertain the outcome of transscleral suture fixation of posterior chamber intraocular lenses.*
METHODS: *This was a retrospective study. We reviewed the records of patients undergoing scleral fixation of posterior chamber intraocular lenses from June 2007 to December 2008 in the Ophthalmology Department Unit II Civil Hospital and Dow Medical College Karachi.*
RESULTS: *18 eyes of 12 patients underwent transcleral suture fixation of posterior chamber Intraocular lenses during this period. Age ranged from three years to forty nine years. Indications included idiopathic lens subluxation, aphakia due to surgery, traumatic lens subluxation and Marfan's syndrome. All patients had improved post operative visual acuity. Complications included lens tilt and vitreous haemorrhage in one patient.*
CONCLUSION: *Transscleral suture fixation of posterior chamber intraocular lenses is a useful technique for the treatment of aphakia in the absence of adequate zonular/ capsular support*

KEY WORDS: Transscleral suture fixation, posterior chamber intraocular lenses, aphakia, capsule deficiency, visual acuity.

INTRODUCTION

Intraocular lens implantation is an essential component of modern cataract surgery. Most cataract procedures are carried out with posterior chamber intraocular lens (IOL) implantation. However if capsular/zonular support is inadequate it may not be possible to implant a posterior chamber lens[1]. In these cases anterior chamber IOL's, iris claw IOL's or iris/ sclera sutured IOL's are other options available[1].
Most commonly used are anterior chamber IOL's. These are associated with a number of complications[2]. Iris claw IOL's have also been associated with various complications[3]. Posterior chamber IOL placement without capsular support can also be carried out with either transscleral suturing[4,5,6] or iris suture fixation[7]. Iris suture fixation has a high incidence of lens dislocation in children[7]. Suturing an IOL to the sclera was first described by Girard in 1981[4] and then later refined by Malbran and colleagues in 1986[5]. In 2003, an American Academy of Ophthalmology sponsored report on IOL implantation in the absence of capsular support concluded after a through literature assessment that scleral sutured posterior chamber IOLs were safe and effective in adults[6].
The aim of this study was to ascertain the outcome of patients undergoing transscleral suture fixation of PCIOL.

MATERIALS AND METHODS

We retrospectively reviewed the records of all patents undergoing transscleral suture fixation of PCIOL from June 2007 to December 2008 in the Ophthalmology Department Unit II Civil Hospital and Dow Medical College Karachi. 18 eyes of 12 patients were included. Data were collected on demographics, indications, procedure, complications and visual acuity. Follow up was done from 6 to 12 months postoperatively.
Surgery was carried out in general anaesthesia in children and local anaesthesia in adults. Local anaesthesia consisted of retrobulbar injection of 1:1 mixture of 0.5% bupivacaine and 2% lignocaine. Proparacaine eye drops were used topically. Conjunctival peritomy was carried out and scleral flaps were constructed temporally and nasally. A 6.5mm biplanar corneal incision was given superiorly. If crystalline lens was present it was removed through the corneal incision. Anterior vitrectomy was carried out. 10/0 prolene

Sr. No.	Sex	Age	Laterality	Aetiology	Preop visual acuity	Postop visual acuity	Complications
1	F	3	R	Congenital lens subluxation	6/36	6/12	None
2	F	3	L	Congenital lens subluxation	6/36	6/12	None
3	M	4	R	Congenital lens subluxation	6/24	6/12	None
4	F	38	R	Idiopathic lens subluxation	6/24	6/12	Lens tilt, vitreous haemorrhage
5	M	25	R	Idiopathic lens subluxation	6/60	6/18	None
6	F	33	R	Congenital lens subluxation	6/60	6/18	None
7	F	40	R	Aphakia due to complicated cataract surgery	6/18	6/12	None
8	F	40	L	Aphakia due to complicated cataract surgery	6/18	6/9	None
9	M	25	R	Marfan's	6/24	6/9	None
10	M	25	L	Marfan's	6/24	6/9	None
11	F	34	R	Idiopathic lens subluxation	6/36	6/12	None
12	F	34	L	Aphakia due to complicated cataract surgery	6/24	6/18	None
13	M	49	L	Idiopathic lens subluxation	6/12	6/9	None
14	f	5	R	Congenital lens subluxation	6/24	6/9	None
15	f	5	l	Congenital	6/18	6/6	None
16	M	11	R	Marfan's	6/24	6/12	None
17	M	11	L	Marfan's	6/18	6/9	None
18	F	45	L	Traumatic lens subluxation	HM	6/12	None

DEMOGRAPHIC DATA, INDICATIONS & OUTCOME OF PATIENTS UNDERGOING TRANSSCLERAL FIXATION OF PCIOL'S

was used in all cases. Ab interno fixation as well as ab externo fixation was used depending on the availability of suture material. In the ab externo approach, a 27 gauge needle was passed through sclera on one side and a 10/0 prolene suture on a straight needle through opposite scleral bed. The prolene suture needle was passed into the 27 gauge needle. The 27 gauge needle was withdrawn along with the prolene needle. The suture was drawn out through the dilated pupil and corneal incision.

The suture was cut and each end tied to the haptics of the IOL. If haptic eyelets were present suture was passed and tied there. In other cases heat cautery was used to bend haptic ends to prevent suture slippage and prolene ends were tied to the haptics. Sutures were pulled through the scleral bed and tied. Scleral flaps and conjunctiva were sutured with 10/0 nylon. The corneal wound was also closed with 10/0 nylon. In the ab interno approach prolene suture ends were first tied to the haptics in a similar fashion and then curved needles were passed inside out 1.5mm posterior to limbus and suture ends tied in scleral bed.

RESULTS

18 eyes of 12 patients underwent transcleral suture fixation of posterior chamber Intraocular lenses during this period. Seven patients were females and five were males. Age ranged from three years to forty nine years. Follow up was available for 6 to 12 months. Two male and four female patients underwent bilateral fixation the rest needed unilateral surgery. Indications included idiopathic lens subluxation, aphakia due to surgery, traumatic lens subluxation and Marfan's syndrome. In four eyes polymethylmethacrylate(PMMA) IOL's with haptic eyelets were used. In the rest PMMA IOL 6.5 mm was used and the haptic ends were bent with electrocautery. In seven eyes ab interno approach was used and in the rest ab externo approach was carried out for transscleral suture fixation. One case of vitreous haemorrhage with lens tilt was encountered which necessitated removal of IOL with replacement with anterior chamber IOL in a 38 year old female patient. No late complications were noted. All patients had improved post operative visual acuity.

DISCUSSION

In the absence of adequate capsular support or in the presence of zonular dialysis various techniques of IOL implantation are available. Capsular loss or zonule weakness may be due to trauma, old age, pseudoexfoliation,

complicated cataract surgery, Marfan's syndrome, homocystinuria etc[1]. If the dialysis is limited in extent, in the bag implantation of IOL can be attempted. Larger dialysis can be managed by capsular tension ring(CTR) with IOL implantation in the bag. In general, up to 6 clock hours of zonular dialysis may be present for a CTR to prevent postoperative IOL decentration[1]. If the extent of dialysis is more sutured CTR or capsule tension segment can be used[1]. Smaller capsular tears often permit in the bag implantation. Larger tears may allow ciliary sulcus implantation. However in some cases dialysis may be too large or enough capsule may not be present to support a posterior chamber IOL either in the sulcus or in the bag.

Iris suturing of posterior chamber IOL may be carried out if there is not enough capsular support to implant a posterior chamber IOL in the sulcus or bag. However this may result in a high incidence of IOL dislocation in the paediatric population[7]. Anterior chamber IOL is another option in these cases. These are associated with endothelial cell loss, glaucoma and other complications[2]. If an anterior chamber IOL is used in the younger population it may lead to enough endothelial cell loss over a period of time to result in bullous keratopathy. Iris claw lenses are a choice too. They are also associated with various complications[3].

10/0 Prolene is used for transscleral suture fixation of IOL's. Prolene is less biodegradable than nylon. It has the potential not to degrade for decades. It may be better to use 9/0 prolene instead of 10/0 since this is stronger and may reduce chances of IOL dislocation[8] . Gore tex is another suture material used for this purpose[9].

Various methods of scleral fixation have been described. These include ab interno and ab externo approaches. Prolene suture is available with straight or curved needles depending on the approach to be used. Straight needle is used for ab externo approach and curved needle for ab interno approach. If nylon suture is used it may degrade leading to IOL dislocation.PMMA IOL's are usually used for scleral suture fixation. However if a small incision is desired foldable IOL's maybe used[7,10,11].

Complications of scleral fixation include lens tilt/rotation[1], dislocation of IOL due to suture erosion[12,13], vitreous haemorrhage[14], retinal detachment[14,15], cystoid macular oedema. In this case series one complication of vitreous haemorrhage and IOL tilt was seen in the same patient. No case of retinal detachment or suture erosion with lens dislocation or cystoid macular oedema was seen.

CONCLUSION

Scleral suture fixation of posterior chamber IOL's is an effective option for eyes in which due to zonular dialysis or capsule deficiency enough support for sulcus or bag PCIOL implantation is not possible.

REFERENCES

1. Y.M. Por, M.J. Lavin. Techniques of Intraocular Lens Suspension in the Absence of Capsular/Zonular Support. Survey of Ophthalmology. 2005;50:429-62.
2. Apple DJ, Brems RN, Park RB, Norman DK, Hansen SO, Tetz MR, Richards SC, Letchinger SD. Anterior chamber lenses. Part I: Complications and pathology and a review of designs. J Cataract Refract Surg. 1987;13:157-74.
3. Lorencová V, Rozsíval P, Urminský J. Clinical results of the aphakia correction by means of secondary implantation of the iris-fixated anterior chamber intraocular lens Cesk Slov Oftalmol. 2007;63:285-91.
4. Girard L. Pars plana phacoprosthesis (aphakic intraocular implant): a preliminary report. Ophthalmic Surg. 1981;12:19–22.
5. Malbran ES, Malbran E, Negri I. Lens guide suture for transport and fixation in secondary IOL implantation after intracapsular extraction. Int Ophthalmol. 1986;9:151–60.
6. Wagoner MD, Cox TA, Ariyasu RG, Jacobs DS, Karp CL. Intraocular lens implantation in the absence of capsular support: a report by the American Academy of Ophthalmology. Ophthalmology. 2003;110:840–59.
7. Kopel AC, Carvounis PE, Hamill MB, Weikert MP, Holz ER Iris-sutured intraocular lenses for ectopia lentis in children. J Cataract Refract Surg. 2008;34:596-600.
8. Edward G. Buckley, Hanging by a thread: the long-term efficacy and safety of transscleral sutured intraocular lenses in children Trans Am Ophthalmol Soc. 2007; 105: 294–311.
9. R. Hoffman, I. Fine, M. Packer, I. Rozenberg Scleral fixation using suture retrieval through a scleral tunnel J Cataract Refract Surgery;2006;32:1259-63.
10. Michaeli-Rohen Adi, Rootman David S. Scleral fixation of a foldable intraocular lens Ophthalmic surgery and lasers. 2002;33:257-9.
11. Mark Packer, I.Howard Fine, Richard S Hoffman Suture fixation of a foldable acrylic intraocular lens for ectopia lentis J Cataract Refract Surgery. 2002;28:182-5.
12. Parag Parekh, W. Richard Green, Walter J. Stark, Esen Karamursel Akpek, Subluxation of Suture-Fixated Posterior Chamber Intraocular Lenses A Clinicopathologic Study Ophthalmology. 2007;114:232–7.
13. Ehud I Assia, Arie Nemet, Dani Sachs, Bilateral spontaneous subluxation of scleral-fixated intraocular lenses J Cataract Refract Surgery. 2002;28:2214-16.
14. Reza Asadi, Ahmad Kheirkhah Long-term Results of Scleral Fixation of Posterior Chamber Intraocular Lenses in Children Ophthalmology. 2008; 115:67-72.
15. Y F Yang, C Bunce, J K G Dart, R L Johnston and D G Charteris Scleral-fixated posterior chamber intraocular lenses in nonvitrectomised eyes. Eye.2006;20:64–70.