Glue Assisted Intrascleral Fixation of Posterior Chamber Intraocular Lens

An Essay

Submitted For Partial Fulfillment of Master Degree
(M.Sc) In Ophthalmology

By

Raghda Reda Ibrahim

M.B., B.Ch.

Misr University For Science and Technology

Supervised by

Professor Dr. Fikry Mohamed Zaher

Professor of Ophthalmology

Faculty of Medicine-Ain Shams University

Dr. Tarek Mohamed Abdelaziz

Lecturer Of Ophthalmology

Faculty of Medicine-Ain Shams University

Faculty Of Medicine

Ain Shams University

Cairo 2015

Acknowledgment

First and foremost thanks to **ALLAH**,
the most merciful

I wish to express my deep appreciation and sincere gratitude to **Prof. Dr. Fikry Mohamed Zaher,** *Professor of Ophthalmology, Faculty of Medicine, Ain Shams University, for his valuable instructions, continuous help, patience and guidance. he has generously devoted much of his time and effort for planning and supervision of this study. It was a great honor to me to work under his supervision.*

No words can fulfill the feeling of thanks I carry to **Dr. Tarek Mohamed Abdelaziz**, *Lecturer of Ophthalmology, Faculty of Medicine, Ain Shams University for his continuous meticulous support and close supervision.*

Raghda

List of Contents

Page No.

List of Figures

List of Tables

List of Abbreviations

AC	Anterior chamber
ACIOL	Anterior chamber intraocular lens
BCVA	Best corrected visual acuity
CME	Cystoid macular edema
DORC	Dutch Ophthalmic Research Center
DSAEK	Descemet stripping automated endothelial keratoplasty
ICCE	Intra capsular cataract extraction
IOL	Intra ocular lens
LASIK	laser-assisted in situ keratomileusis
OCT	Optical coherence tomography
PBK	Pseudophakic bullous keratopathy
PC	Posterior chamber
PCIOL	posterior chamber intraocular lens
PMMA	Poly methylmethacrylate
PPV	Pars plana vitrectomy
RD	Retinal detachment
SF	Scleral fixated

INTRODUCTION

When the posterior capsule ruptures or there is lack of a zonular support, an intraocular lens can be placed in the anterior chamber between the cornea and iris, as in iris-fixated and closed or open-loop anterior chamber intraocular lenses ***(Por and Lavin, 2005)***.

The intraocular lens can be implanted in the posterior chamber within the ciliary sulcus posterior to the iris, as in sutured iris-fixated and scleral fixated posterior chamber intraocular lens ***(McAllister and Hirst, 2011)***

Various techniques have been used in the past to implant an intraocular lens in eyes following a posterior capsular rupture, but every technique has its own limitations. Pre-requisites for an anterior chamber intraocular lens implantation are the presence of an anatomically normal anterior chamber and accurate sizing of its horizontal diameter ***(Apple et al., 2008)***

The subclinical uveitis secondary to lens-tissue contact creates inflammatory products that could be directly toxic to the endothelium and angle and could also result in Cystoid macular edema, uveitis-glaucoma-hemorrhage syndrome has been reported and late dislocations may occur. Iris-sutured intraocular lenses can cause cat-like pupil and iris chaffing,

with uveitis and/or pigment dispersion and secondary complications such as chronic inflammation and secondary glaucoma, These techniques need sufficient iris stroma for fixation ***(Scharioth, 2009)***.

Sutured scleral fixated intraocular lens are associated with visually significant complications due to late subluxation. In a histologic study, intraocular lens stability was the result of intact scleral sutures and not to fibrous encapsulation or correct placement of the haptic in the ciliary sulcus ***(Lubniewski et al., 2010)***.

As a result, intraocular lens dislocation is likely to occur if sutures are inadvertently removed or if suture fatigue occurs. Two-point suture fixation carries a higher risk of axial IOL tilt, and 3 or 4 point fixation heightens the risk for complications resulting from increased intraocular manipulations ***(Vote et al., 2006)***.

Glue assisted intrascleral fixation differs from other sutureless techniques in a way that two partial scleral thickness flaps are made 180 degrees apart and the scleral pockets are made at the edge of the flap base, parallel to the sclerotomy wound. The haptics are tucked in the scleral pockets and the flaps are then adhered to the base with the help of tissue fibrin glue. The glue also helps in sealing the sclerotomy site which

would otherwise act as a filtration site and cause hypotony ***(Gabor and Pavlid, 2007)***.

This technique has an advantage in that it can be performed in the presence of significant structural abnormalities of the anterior chamber and that it mitigates many of the adverse outcomes associated with anterior chamber intraocular lenses, iris fixated intraocular lenses and sutured scleral fixated intraocular lenses ***(Scharioth et al., 2010)***.

Externalization of the greater part of the haptic along its curvature stabilizes the axial positioning of the IOL and thereby prevents intraocular lens tilt. The use of scleral tunnel fixation of the haptic is less technically demanding because it stabilizes the intraocular lens in the posterior chamber without difficult suturing procedures ***(Scharioth et al., 2009)***.

Placing the IOL haptic beneath the flap prevents further movement of the haptic, reducing the pseudophacodonesis, that leads to constant motion in the vitreous and, ultimately, to retinal damage. The ends of the haptic are left in the tunnel to prevent foreign body sensation and erosion of the conjunctiva and to reduce the risk of inflammation ***(Jacobi and Jagger, 1981)***.

AIM OF THIS ESSAY

Is to discuss the glue assisted intrascleral fixation of posterior chamber intraocular lens in absence of capsular support and to evaluate advantages, post-operative outcomes, visual prognosis and complications of this technique.

INDICATIONS OF POSTERIOR CHAMBER INTRAOCULAR LENS FIXATION

1- Aphakia:

Visual rehabilitation with an intraocular lens (IOL) is an ideal option in aphakic eyes. In some cases, supplementary IOL implantation in the ciliary sulcus is a viable option; in others, the capsulorrhexis remnants are not sufficient to securely support an IOL. The use of an anterior chamber IOL has also been described, but so have the long-term complications associated with these lenses, especially in eyes with shallow anterior chambers ***(Sawada et al., 2010)***.

Another alternative is transcleral fixation of an IOL. This technique has gained popularity over the past 2 decades, most likely due to improvements in lens designs and implantation techniques. One technique to fixate a posterior chamber IOL in the absence of sufficient capsular support is transcleral suturing. It can be used in primary and secondary IOL implantation procedures and also to refixate a malpositioned lens ***(Kwong et al., 2007)***.

There are numerous surgical approaches for fixation of an IOL to the scleral wall adjacent to the ciliary sulcus or pars

plana, as well as for securing the lens to iris tissue. These techniques enable surgeons to achieve safe and stable fixation of posterior chamber IOLs in high-risk cases, avoiding the complications of anterior chamber IOLS ***(Kwong et al., 2007)***.

In pediatric aphakia, implantation of a scleral-fixated posterior chamber IOL is preferable to an anterior chamber IOL because of long-term complications associated with the latter, namely corneal decompensation, glaucoma, and pupillary ectopia. As with all treatment options for pediatric aphakia, posterior chamber IOL implantation can be associated with problems, especially in the long term, can result in lens decentration or subluxation ***(Burcu et al., 2014)***

In transscleral sulcus fixation of posterior chamber IOLs after intracapsular cataract extraction (ICCE) in aphakic eyes, although most posterior chamber IOLs can be sutured by their haptics to the sclera with square knots or slip knots, several specialized haptic designs facilitate this maneuver. These include haptics with enlarged ends to avoid suture slippage ***(Malbran et al., 2003)***.

2-Deficient capsular support:

Intraocular lens (IOL) implantation in eyes with deficient capsular support has been at the forefront of surgical research for many years now. IOL implantation in the ciliary sulcus is

possible in eyes with adequate anterior capsular support ***(Taskapili et al., 2007)***.

However, in eyes with deficient anterior capsular rim, anterior chamber (AC) IOL, iris claw lenses, or sutured scleral-fixated (SF) IOL are usually performed ***(Zeh et al., 2000)***.

Fibrin glue-assisted posterior chamber (PC) IOL implantation is a new technique started in eyes with deficient capsular support ***(Nair et al., 2009)***.

In eyes with insufficient or no capsular support, IOL implantation and fixation techniques are still controversial. Many reports confirm that anterior chamber or iris-fixated IOLs can be implanted, or, alternatively, a posterior chamber IOL can be fixated in the ciliary sulcus using transscleral suturing or gluing ***(Anand and Bonman, 2007)***.

The endocapsular placement of an intraocular lens (IOL) is undoubtedly anatomically most preferable following successful cataract extraction. However, the presence of an unstable capsule-zonule complex or its absence, as with a dislocated lens or pseudoexfoliation syndrome, prempts the endocapsular fixation of the IOL ***(Por and Lavin, 2005)***.

The implantation of an IOL in the capsular bag provides stable fixation at a position closest to the nodal point of the eye ***(McAllister and Hirst, 2011)***.

3-Trauma:

Scleral-fixated PC IOL's have a theoretic advantage over other IOL's with regard to complications, especially in eyes after trauma and in young patients ***(Vote et al., 2006)***.

Scleral-fixated PC IOL's provide better visual acuity and binocularity, lead to a lower incidence of strabismus than contact lenses, and avoid the complications of AC IOL's, which are seen more with rigid closed loop IOLs than with open-loop and iris-claw IOL'S ***(Epley et al., 2001)***.

Severe blunt ocular trauma or penetrating injury may result in loss of capsular support. All of the major fixation techniques have been reported in cases of post-traumatic cataract extraction and IOL implantation. If injury to the iris occurs, angle supported or iris-sutured fixation may not be enabled. Most recent series have described scleral fixation strategies for IOL placement after trauma ***(Agarwal et al., 2010)***.

4-Complicated Cataract Surgery:

Alternate fixation strategies are often needed following complicated cataract surgery. IOL placement may occur at the same time as complicated cataract extraction, or as a secondary procedure at a later date ***(Olsen and Pribila, 2011)***.