Research Paper

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Ultrasound Biomicroscopic Findings in Eyes with Posterior Capsular Tear

Medical Science

KEYWORDS : complication,rent,capsule,biomicroscopy

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ABSTRACT

Posterior Capsular rupture is the most dreaded complication of cataract surgery that leads to unwanted sequelae.Once it occurs,it can be detected by slit lamp examination but same is not possible in patients with hazy media & with non dilating pupils; in such cases,ultrasound biomicroscopy proves to be of great help. A prospective study was done in which 51 eyes of 51 patients with posterior capsular rent were evaluated using ultrasound biomicroscopy & B scan & various parameters were studied. After posterior capsular rent ,patient is either left aphakic or managed by anterior chamber intraocular lens,sulcus fixation intraocular lens or sclera fixated intraocular lens. Ultrasound biomicroscopy in cases of posterior capsular rupture helps in deciding further line of management.

INTRODUCTION

With the advent of better quality microscopes, instruments and technologies, results of cataract surgery are getting better and better. Even then, complications do take place. Posterior capsular rent is one of the most dreaded of them. It is always desirable to prevent this complication to achieve good outcome of cataract surgery.

Once posterior capsular rent occurs, there are no direct methods to detect it. Detection by slit lamp examination is not always possible especially when there is hazy media and non dilating pupil which is usually associated with this complication.

In such cases Ultrasound Biomicroscopy is very helpful to detect rent and its associated features.

Ultrasound biomicroscopy is a new imaging technique that uses high frequency that is 35-50 MHz ultrasound to produce images of the eye at near microscopic resolution. This technique was developed in Toronto, Canada based on basic research conducted by Charles J Pavlin & Stuart Foster. It provides two dimensional images of the anterior segment of the eye. It evaluates the various anterior segment structures both qualitatively & quantitatively.

AIMS AND OBJECTIVES

- Our aim is to study patients of posterior capsular rupture post surgical , and associated changes in anterior chamber like

1. residual lens matter
2. aphakic or pseudophakic
3. status of IOL whether in the bag or in the sulcus or in anterior chamber
4. IOL centration
5. vitreous present in anterior chamber
6. angle status
7. corneal thickness to assess corneal edema
8. intra ocular pressure etc.

with ultrasound biomicroscopy and slit lamp examination.

Principle of Ultrasound Biomicroscopy

UBM uses a scan transducer having a frequency of 35—50 MHz or more in contrast to conventional USG that uses 7.5 – 10 MHz each pulse will excite the electrodes of the peizoelectric crystal of the transducer generating sound waves. The returning echoes are received by the transducer & transformed into electric signals. These signals are processed in the receiver & demodulator & than displayed on the screen of display unit. UBM provides 25 micron axial & 50 micron lateral resolution

MATERIALS AND METHODOLOGY

- Ours is a prospective study done at M & J INSTITUTE OF OPHTHALMOLOGY, Civil Hospital ,Ahmedabad, Gujarat, India.
- As early as 15 days post operative day to as late as 11 years post postoperative day patients are included in the study.
- We have examined 51 eyes of 51 patients with posterior capsular rupture , with ultrasound biomicroscopy and B scan ultrasonography.
- A thorough history with respect to date of operation was assessed. Visual acuity of the patients was recorded for distance using Snellen's chart. Detailed slit lamp examination was done. Fundus examination was done using both direct and indirect ophthalmoscopy, wherever possible. Intraocular pressure was recorded in patients using Schiotz tonometer, where ever possible.
- All of these patients were subjected to Ultrasound biomicroscopic examination and Ultrasound B scan. Ultrasound B scan was done in supine position by contact mode and UBM examination was done in supine position.
- Ultrasound biomicroscopy was performed with OTI scan 3000 model (Ophthalmic Technologies Incorporation, Toronto, Canada) with a 50 MHz transducer. After topical anaesthesia with 4% lignocaine, the eyes were studied using an eye cup filled with normal saline. Care was taken not to touch the cornea with probe. Patient was instructed to look straight up at the ceiling. The probe was kept perpendicular to corneoscleral surface in constant ambient lighting condition.
- On B Scan we have seen for :

1. Condition of vitreous
2. Macular edema

- On Ultrasound Biomicroscopy, we have seen for :

1. Corneal edema
2. AC depth
3. IOL position
4. Peripheral anterior synechiae
5. Exudative membrane
6. Descemet's tear
7. Optic capture
8. Iris bombe
9. Pupillary block
10. Residual lens mater

Exclusion criteria

- Patients with traumatic posterior capsular rupture and congenital presence of posterior capsular rupture were excluded from the study.
- Patients with good vision were not taken in the study as they didn't come for follow up.
- Patients with immediate post op day were excluded.

RESULT AND DISCUSSION

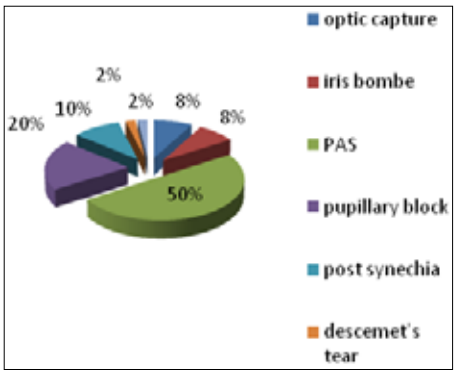

CHART 1. FINDINGS OF UBM IN 51 PATIENTS WITH POSTERIOR CAPSULAR RENT

One can see from the above chart that in our study 5o% of patients had peripheral anterior synechiae, 20% of patients had pupillary block, 10% patients had posterior synechiae, 8% patients had optic capture and iris bombe and 2% patients had descemet's tear and exudative membrane.

In patients with posterior capsular tear, 41% patients had anterior chamber IOL, 27% patients had IOL on anterior vitreous phase, 20% patients had tilted IOL in sulcus, 8% had sulcus fixated IOL and only 4% patients were kept aphakic.

So now a days trend is towards keeping patients pseudophakic as far as possible. Anterior chamber IOL is preferred if the rent is bigger. Sulcus fixated IOLs are preferred if rhexis margins are intact. If no support is found one can go for scleral fixated IOL placement.

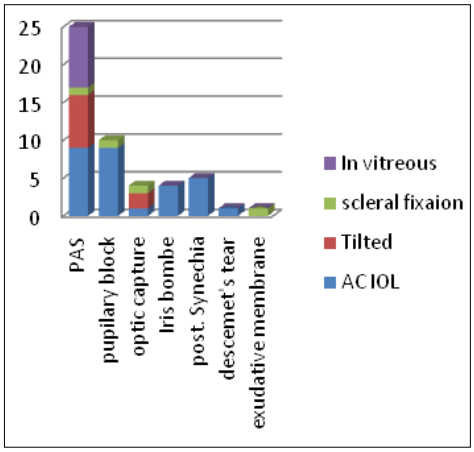

CHART 2.COMLICATIONS IN RELATION WITH POSITION OF IOL

From the above chart we can make out that complication rate in long term is more in anterior chamber IOL placement, followed by sulcus fixated tilted IOL and scleral fixated IOL

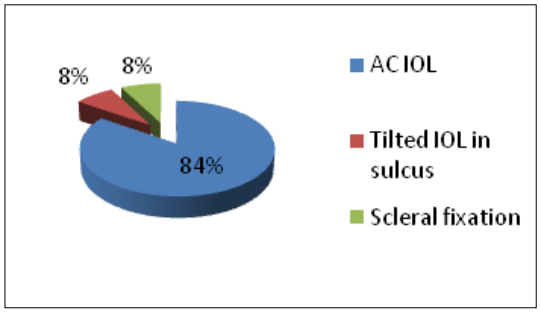

CHART 3.GLAUCOMA IN CASES OF POSTERIOR CAPSULAR RENT

Glaucoma is seen in most of the cases of anterior chamber IOL fixation & some cases of tilted IOL in sulcus and sceral fixation IOL.

SUMMARY AND CONCLUSIONS:

With slit lamp examination one can diagnose PC rent accurately when cornea is clear, but in patients with post operative corneal edema and non dilating pupil UBM has an important role in diagnosing PC rent and its associated changes.

After PC rent patient is left aphacik or managed by ACIOL, sulcus fixated IOL and scleral fixation of lens.

Tilting of IOL is mostly seen with sulcus fixated IOL.

Glaucoma is mostly seen with patients with ACIOL.

Low grade of uveitis is common due to uveal touch of IOL or residual lens matter and vitreous disturbances.

UBM in cases of PC rent helps to decide further line of management

REFERENCE

Pavlin CJ. Interpreting technology. Practical application of ultrasound biomicroscopy. Can J Ophthalmol 1995; 30(4): 225–229. | Pavlin CJ, Harasiewicz K, Sherar MD, Foster FS. Clinical use of ultrasound biomicroscopy. Ophthalmology 1991; 98: 287–295. | Liebmann JM, Ritch R, Esaki K. Ophthalmic imaging and diagnostics. Ultrasound biomicroscopy. Ophthalmol Clin North Am 1998; 11(3): 421–433 | Deramo VA, Gaurav KS, Baumal CR, Fineman MS, Correa ZM, Benson WE et al. Ultrasound biomicroscopy as a tool for detecting and localizing occult foreign bodies after ocular trauma. Ophthalmology 1999; 106: 301–305. | Ultrasound biomicroscopy. High frequency ultrasound imaging of the eye at microscopic resolution. Radiol Clin North Am 1998; 36:1047-58. | J Am Optom Assoc. 1996 Aug; 67(8) : 469-79. Ultrasound biomicroscopy of the anterior segment. Liebmann JM Ritch R.Department of Opthalmology, New York Eye and Ear Infirmary, NewYork 10003, USA | Acta Ophthalmol. Scand. 1998 Aug;76(4) : 447-55. Ultrasound bimicroscopy. I precision of measurements Urbak SF. Department of Opthalmology, Aalborg Hospital, Denmark | Anatomy and physiology of eye by Dr A.K.Khurana 2nd edition. | Cataract Surgery Techniques, complication and management by Dr Roger F. Steinert. | Chang, D. F. and R. B. Packard. J Cataract Refract Surg 2003;29: 1860–1865. | Chang, D. F. Tech Ophthalmol 2003;1(4):201–206. | Chang, D. F. "Strategies for Managing Posterior Capsular Rupture in Phaco Chop," in Mastering Techniques, Optimizing Technology, and Avoiding Complications (Thorofare, N.J.: Slack Inc., 2004 |