

Original Research Paper

Effect of IOP Changes before and after Nd YAG Laser Capsulotomy in Patients with Posterior Capsule Opacification Reported to Ophthalmology opd, AIMSRS, Chittoor, Andhra Pradesh, India

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ABSTRACT:

Background: Effect of IOP changes before and after Nd YAG laser capsulotomy in patients with posterior capsule opacification reported to ophthalmology opd, AIMSRS, Chittoor, Andhra Pradesh, India **Methods:** A total of 50 patients (50 eyes) who attended to our ophthalmology opd during the period July 2022 to December 2022 were included in the study. They were examined for visual acuity, slitlamp examination for anterior segment evaluation, fundus evaluation with 90D lens, IOP measurement using Goldmann Applanation Tonometer. **Results:** In our study, out of 50 patients 25 patients were in the age group 51-60 years. Male patients were 30 and female patients were 20. Mean intraocular pressure preoperatively was 14.895, at 1st hr was 21.384, after 24hrs was 18.786, after 1 week was 15.308. statistically significant difference was noted at 1st hr and after 24hrs. **Conclusion:** In our study it was concluded that there can be significant rise in intraocular pressure following Nd YAG laser capsulotomy for patients with posterior capsule opacification.

Keywords : *posterior capsule opacification, IOP, Nd YAG laser capsulotomy*

INTRODUCTION:

Cataract is the main cause of curable blindness worldwide. Prevalence of blindness due to senile cataract is high in Indian population. There is a need to undertake quality cataract surgery for both rural and urban population. Posterior capsule opacification is the most common long term complication of modern IOL surgery. PCO causes reduction in visual acuity and contrast sensitivity by obstructing the view or by scattering the light that is perceived as glare by the patient. It also decreases the field of view during therapeutic and diagnostic procedures and also causes unocular diplopia [1]. Posterior capsular opacification is usually found in three forms, thin membranous, the ring of Sommering, Elschnig pearls forming dense membrane /fibrous membrane. Although various methods employed for prevention like capsular polishing, implanting IOL's with convex posterior surface, surface-modified lens, use of antimitotics, etc, have not been shown to be very successful in long-term

follow-up. The incidence of PCO ranged between 25-50%. The incidence of PCO in up to 50% of patients is in-between 2months and 5years.[2] PCO can be treated with secondary posterior capsulorhexis, Nd: YAG laser and other methods. Nd: YAG laser provides the advantage of cutting the lens capsule, capsular membrane, strands, and adhesions without surgical intervention, thereby avoiding and minimizing infection, wound leaks, and other complication of intraocular surgery. Nd YAG laser capsulotomy remains the cornerstone of its treatment. One of the consequences of Nd: YAG laser capsulotomy is raised IOP which in some cases may affect the visual outcome especially when there is a coexisting glaucoma In this study, an attempt is made to determine the effect of IOP changes before and after Nd YAG laser capsulotomy.

MATERIAL AND METHODS:

The prospective observational study was conducted on 50 patients (50 eyes) attended to ophthalmology opd during the period July 2022 to December 2022,

Inclusion Criteria: Age >40 years , patients with posterior capsule opacification.

Exclusion Criteria: Patients with corneal disorders, Ocular pathologies, patients with history of glaucoma, patients with post operative cystoid macular edema, An uncooperative patient who is unable to remain still or hold fixation during the procedure with inadvertent damage to adjacent intraocular structures, Patients who are not willing to participate in study

All the patients who were included in the study underwent visual acuity testing using Snellen chart. Distant and near visual acuity, both presenting and best corrected visual acuity after refraction, were measured using Snellen's charts. Intra Ocular Pressure was measured using Goldmann Applanation Tonometer. After dilating the pupils, detailed fundus examination was done using 90D lens. Detailed anterior segment evaluation was done using slitlamp by direct illumination, oblique and indirect illumination and retro illumination. When assessed using slit lamp or slit lamp photographs, various authors have used various subjective methods for grading of PCO. To mention, Sellman and Lindstrom devised a system which has also been used by a study which is as follows[3]

Assessment of PCO on a 4 point scale:

1. No or slight PCO without reduced red reflex, no pearls or pearls far from the IOL edge.
2. Mild PCO reducing the red reflex, Elschnig pearls to the IOL edge but with a clean visual axis.
3. Moderate fibrosis or Elschnig pearls inside the IOL edge but with a clean visual axis.
4. Severe fibrosis or Elschnig pearls covering the visual axis and severely reducing the red reflex.

An Nd: YAG capsulotomy was performed if a combination of the following was present;

1. Reports of decreased visual function, contrast sensitivity glare
2. Loss of 2 snellen's lines of BCVA

PCO grading was done as by Kucuksumer Y et al[4] by subjective assessment of the extent and density (assessed by its adverse effect on BCVA) of the lens epithelial cells migration on the posterior capsule as follows.

Grade 0: posterior capsule completely clear and no LEC migration.

Grade 1: LEC migration at the periphery with a clear visual axis.

Grade 2: LEC migration onto the visual axis with no drop in BCVA.

Grade 3: LEC migration onto the visual axis with BCVA better than 6/12

Grade 4: LEC migration onto the visual axis with BCVA of 6/12 or worse

Procedure:

The procedure was explained to the patients and an informed consent was taken.

- topical anesthesia achieved using 1 – 2 drops of proparacaine 0.5 %.
- The patient was seated comfortably at ZEISS Nd: YAG laser machine and an illuminated target were provided to the patient for maintaining steady fixation.
- Abraham lens (contact lens) was placed to stabilize the eye and to improve the laser optics and facilitate accurate focusing.
- A cruciate capsulotomy was created with the Nd: YAG laser, avoiding the central 4 mm of the lens and with the focus of the aiming beam slightly posterior to the posterior capsule.
- The opening was created beginning superiorly near the 12^o clock and progressing down to and towards the 6^o clock position. This is followed by placing the shots at 3 and 9^oclock. Any flaps during the procedure are cut so as to cause them to retract and fall back to the periphery.
- A capsulotomy was started eccentrically with minimal energy 1 to 2 mJ/ pulse to predict the behavior of the posterior capsule to the photodisruptive forces and to avoid pitting of the IOL in the central position.
- Once the procedure is completed, the patient was advice regarding the scheduled follow up of this study.
- Capsulotomy size should be as large as the size of the pupil in ambient light.

Postoperative:

- Mild topical NSAIDs and systemic NSAIDs were given.
- Topical steroid eye drops 6 times per day were given.
- IOP measurement 1st, 24th hour and 1 week after capsulotomy.
- During each follow-up, the BCVA was recorded.
- The IOP was measured using applanation tonometry. Any rise in IOP was noted.
- Look fundus for Nd: YAG laser procedure complications like lens pitting, cystoid macular edema, retinal detachment

Follow up was done at 1st hour, after 24hrs and after 1 week.

RESULTS:

Table 1 : age distribution

Age	number
40-50years	9
51-60years	25
61-70years	10
>70years	6
Total	50

Table 2 : gender distribution

gender	Number
Male	30
Female	20
total	50

Table 3 : mean IOP

Intraocular pressure	Mean
Pre op	14.895
At 1 st hour	21.384
After 24hrs	18.786
After 1 week	15.308

DISCUSSION:

Posterior capsular opacification is one of the major post operative delayed complication of cataract surgery. The overall incidence of PCO is 11.8% at one year; 20.7% at two year and 28.4% at five year after cataract surgery. Worldwide Nd: Yag laser capsulotomy has become the standard treatment for the posterior capsular opacification. Ophthalmologist has used it successfully for last 20yrs with excellent visual recovery; however the procedure is not entirely risk free.[5] In our study, 50 patients (50 eyes) underwent Nd YAG laser capsulotomy for posterior capsule opacification. Out of 50 patients, 9 patients were in age group 40-50 years, 25 patients in age group 51-60 years, 10 patients in age group 61-70 years, 6 patients in age group >70 years. Most patients are in the age group between 51-60 years. Of these 50 patients, 30 were males and 20 were females. Mean intraocular pressure was calculated for 50 patients before the procedure and after 1st hour, after 24 hours and after 1 week. Mean intraocular pressure preprocedure was 14.895, after 1st hour was 21.384, after 24 hours was 18.786 and after 1 week was 15.308. In a study done by Bhargava R et al [6] they randomly selected the patients and performed capsulotomy and found that there was increase in intraocular pressure following laser at 1.5- 4hrs correlating with our study. In

a study done by Gabriel et al [7], they found an increase in IOP in the first hours after the capsulotomy Nd: YAG laser, which decrease gradually until reaching the values presented before the procedure, in not more than a week period correlating with our study. In a study done by Stuart Fourman et al [8], they showed transient rise in IOP just after laser along with long term elevation in IOP. In our study there is transient elevation in IOP is noted immediately after procedure but not longterm elevation.

CONCLUSION:

Development of posterior capsule opacification is most common long term complication following cataract surgery. Increase in intraocular pressure is noted immediately following YAG capsulotomy which is then declined to near normal IOP after 1 week. Hence Nd YAG laser capsulotomy is considered a safe procedure.

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