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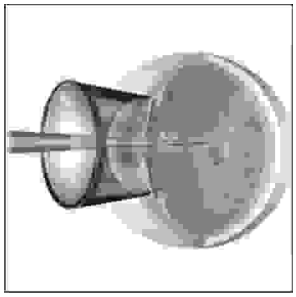
ND: YAG LASER CAPSULOTOMY AND COMPLICATIONS



DR. EJAZ AHMAD JAVED, FCPS
Senior Registrar Ophthalmology
Allied Hospital/ PMC, Faisalabad

DR. ZIA UD DIN AHMAD, FRCS
Ex. Prof. Ophthalmology
Allied Hospital/PMC, Faisalabad

DR. MUHAMMAD SULTAN, FCPS
Associate Prof. Ophthalmology
Allied Hospital/ PMC, Faisalabad

ABSTRACT... eajaved@hotmail.com **Objectives:** To evaluate the complications of Nd:Yag laser when applied on postoperative posterior capsule opacification (PCO), following extra capsular cataract extraction (ECCE) with intraocular lens (IOL). **Design**: Analytical and descriptive study. **Setting:** Eye OPD of DHQ Hospital, PMC and Clinic of Professor Zia ud Din Ahmad, Faisalabad. **Period:** From Jan 2006 to Jan 2007. **Material & Methods.** There were 120 patients; age ranged from 15 years to 80 years with post operated extra capsular cataract extraction with posterior capsular opacification. A Proforma was made which included detailed history of diabetes, hypertension, time period of cataract extraction, other relevant surgical or medical history, and examination e.g. Visual acuity, slit lamp examination, intraocular pressure measurement (applanation tonometry) dilated posterior capsule examination and slit lamp biomicroscopy etc. The patients were kept under observation for 5 hour and called for follow up after one week. **Results**. Out of 120 patients 70 eyes showed visual improvement from 6/18 to 6/6 (58.34%), while 30 Shown visual acuity improvement from count figures to 6/24 (25%), mild anterior uveitis occurred in 8 cases (6.67%), corneal damage in 2 cases (1.6%) while transient raised Intraocular Pressure (IOP) in 7 cases (5.83%). The damage to IOL observed in 3(2.5%), the corneal damage was seen in 2 cases (1.67%). **Conclusions:** The Nd; Yag Laser is very effective, cheap and easy mode of treatment for PCO with minimal post laser complications.

Key words: Nd; Yag Laser, PCO, CME, Elschning's pearls, Capsular fibrosis, Lens pitting.

INTRODUCTION

Laser is an acronym for light amplification by the stimulated emission of radiation. The laser light is coherent (all photons have same wavelength) and collimated (waves of light are parallel)[1].

The neodymium yttrium aluminum garnet, (Nd:Yag) laser is solid type of laser, causes disruption of tissues by ionization mode of action. It has 1064nm wave length, with infrared radiation. It is a powerful continues wave (CW) laser which is usually Q switched when used to treat the eye. It is commonly used to disrupt the posterior capsule following cataract surgery or the iris (iridotomy) in narrow angle glaucoma and to cut vitreous bands[2].

All lasers have more or less complications despite their useful benefits. Nd:Yag laser when used for posterior capsulotomy include mild anterior uveitis transient rise of intraocular pressure, damage to corneal endothelium, cystoids macular edema[3]. (when used before 6 month of surgery), retrial detachments (especially in myopes), macular hemorrhage[4].The retinal detachment is more commonly seen in myopes, but the incidences of retinal detachments, holes or tears increases if capsulotomy is done with Nd:Yag laser with in one year of cataract surgery[5].

The macular hemorrhage is very rare complication. This is very less described in literature. The mechanism is supposed to be the disruption of microvessels in the macular area, with application of Yag laser shots posteriorly on the macula[6].

MATERIAL AND METHODS

120 patients visited the OPD of District Head Quarter Hospital, Punjab Medical College and Prof. Dr. Zia ud Din's Clinic Faisalabad from January 2006 to January 2007 with posterior capsule opacification after extra capsular cataract extraction with posterior chamber intraocular lens(PMMA) implantation were included in the study. The ages of patients varied from 15 to 80 years. 80 were males, and 40 females. Detailed history and examination regarding, visual acuity, tonometry, slit lamp examination, direct ophthalmoscopy, indirect ophthalmoscopy and silt lamp biometry was performed before performing Nd:Yag laser therapy.

The pupils were dilated with tropicamide 1% drops with a minimum number of bursts varing from 1 to 3 MJ frequencies of Nd:Yag laser applied. A 3 to 4mm hole (approx) in the posterior capsule was created. The laser was applied and pre and post laser examination was done only by three doctors. The eyes were examined at two hourly intervals for anterior uveitis, corneal damage, and intraocular pressure. Theses patients were kept under observations and examinations for 5 hours. The patients with raised intraocular pressure were treated with beta-blockers and carbonic anhydrase inhibitors (acetazolamide) where as the others were prescribed a combinations of topical steroid, antibiotic combination with instructions to attend the OPD/clinic for follow up the next day and then after one week.

RESULTS

90(75%) patient's best corrected visual activity (BCVA) was between hand movements and 6/36 before laser applications. There were 30(25%) patients having visual activity between 6/24 to 6/ 18 before laser application.

There was no patient having visual activity better than 6/18 before treatment. After treatment with Nd:Yag laser most of the patient's improved visual activity except 3(2.5%) which had posterior segment pathology (proliferathve diabetic retinopathy). There were 76(63.33%) having good visual activity from 6/18 to 6/6 after laser application.

Table-I. Showing visual activity before Yag laser

Best corrected visual activity	No of pts	%age
Hand movements	18	15%
Counting fingers	22	18.33%
6/60	24	20%
6/36	26	21.67%
6/24	18	15%
6/18	12	10%
Total	120	100%

Table-II. Showing improvements in visual activity after Yag laser

Visual activity	No of pts	%age
6/6	21	17.5%
6/9	26	21.67%
6/12	29	24.17%
6/18	22	18.33%
6/24	10	8.33%
6/36	6	5%
6/60	3	2.5%
Counting fingers	3	2.5%
Total	120	100%

Table-III. Sex distribution		
Sex	**No of pts**	**%age**
Male	80	66.67%
Female	40	33.33%
Total	120	100%

Table-IV. Age distribution		
Age (years)	**No of pts**	**%age**
15-25	4	3.33%
25-35	5	4.17%
35-45	10	8.33%
45-55	25	20.83%
55-65	30	25%
65-75	40	33.33%
75-80	6	5%
Total	120	100%

Table-V. Nd: Yag laser complications		
Complication	**No of pts**	**%age**
Raised IOP	1	8.33%
Damage to IOL	4	3.33%
Damage to corneal endothelium	2	1.67%
Mild anterior uveitis	7	5.83%
Total	23	19.16%

The most of patients were between ages 45 to 75 years, in the study (because of common age related cataract), 95(79.16%).Regarding the Yag laser complications, the common problem was transient rise of intraocular pressure 10(8.33%) which was normalized with topical beta blockers and oral carbonic anydrase inhibitors. None of the patients had rise in intraocular pressure after one week.

The damage to IOL was in 4 cases (3.33%), not significantly interfering visual activity. During follow up period of one week 2 patients (1.67%) had corneal edema and anterior uveitis was seen in 7 patients (5.85%). Both of these complications subsided with antibiotics + steroids + mydriatics for 3 days.

The patients having transient complications were 23(19.16%) while 97 patients (80%) had fortunately no complications on complete examination. Neither retinal detachments, cystoid's macular edema nor macular

DISCUSSION

Visually significant posteriors capsule opacifications (PCO) is the most common late complication of uncomplicated cataract surgery.

PCO may impair contrast sensitivity or can cause glare or monocular diplopia. Certain acrylic IOL's may be associated with lower rates of PCO than PMMA and silicon lenses[7]. The incident of PCO is 10 – 50 % in post operated cataract extraction[8].

Elschning's pearls is most common type that is due to proliferation of the lens epithelial cell layer on the posterior capsule at the site of opposition of the anterior capsule with the posterior capsule[9].

The other type of PCO' i-e capsular fbroris is due to fibrous metaplasia of epithelial cells is less common than elschning's pearls.

Jacob et al have suggested that a retinal growth factor may be responsible[10]. The rise in IOP was 8.33% and was relived with medical treatment similar to study of M. Naseem Panezai[11]. The lens pitting was due to poor co operation of the patients by moving their eyes, the and incidence was 3.33%, almost half the study of panezai.

We have seen no case of macular edema retinal detachment or macular hemorrhage, contrary to observation reported by Abdul Majeed and colleagues in 1995[12].They reported and called it an unusual and rare complication.

The mild anterior uveitis was seen in 7 cases (5.83%) and was relived and settled with topical steroids + antibiotics + mydriatics drops. The treatment of such uveitis is similar to other local studies but incidence was slightly higher.

CONCLUSION

Most of the patients 90(75%) in our study had BCVA between HM to 6/36 before laser application. No patients had BCVA better than 6/18 before treatment.

After Nd:Yag laser treatment most of patients 71(59.1%) had visual activity between 6/18 to 6/6. So this Laser is usual visual restoring way after PCO, following uncomplicated cataract surgery with IOL.

In our study the expected complications of Nd:Yag laser therapy was very minimal as compared to the other studies. But extreme care should be observed while applying laser, the focus should be right on the posterior capsule sparing

IOL, vitreous phase, macula or retina or iris or corneal surface. The procedure is easy and visual recovery is rapid as compared to invasive surgical copsulotomy[13].

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