

INTRAOCULAR PRESSURE CHANGES AFTER ND-YAG LASER CAPSULOTOMY

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Background: 28-43% of the patients develop posterior capsular thickening after extra capsular cataract surgery. Nd YAG laser capsulotomy is a method of choice to treat this complication. **Method:** We conducted a prospective, clinical, randomized comparative study to evaluate the post YAG laser IOP rise in 54 patients at Ayub Teaching Hospital Complex. **Result:** There were 43% male and 57% female patients with a mean age of 63.6 years. The mean time for capsular opacification was 14.6 months. Postoperative visual improvement was 6/24 to 6/6. All patients showed post laser IOP rise that was controlled by Topical Beta-blockers and steroids effectively.

INTRODUCTION

Cataract surgery has undergone great changes during the past two decades. Extra capsular cataract extraction manually or with phacoemulsification has largely replaced intra capsular surgery. This procedure is exceptionally safe and provides excellent visual results. However posterior capsular thickening that occurs in 28-43% of the cases is a serious drawback. The incidence is even higher upto 100% in younger patients.

To restore a clear visual axis, the surgeon needs to perform a capsulotomy, either done surgically or with a Neodymium yttrium aluminum garnet (Nd - YAG) photodisruptors.

Nd- YAG laser has a wavelength of 1064 nanometers with Q switched board and a spot size of 11 microns. It produces shock and acoustic waves causing ionization and plasma formation and the temperature rises upto 10,000°C. These lasers are commonly used for posterior capsulotomy, peripheral iridotomy and cutting of vitreous strands. The relative ease of its use and a high rate of post treatment visual improvement makes the Nd- YAG a method of choice for many ophthalmologists. However, its use is not without complications, the most common being an acute rise in intra ocular pressure⁴. Damage to 'the intraocular lens, Hypohaema, damage to the iris, rupture of anterior hyaloid face, pupillary block and retinal detachment have also been reported. A number of medications including oral acetazolamide \ topical beta blockers^{6,7}, topical NSAIDS² topical steroids⁹ and topical apraclonidine¹⁰ have been used to combat this initial rise in IOP

We conducted a prospective, clinical, randomized comparative case study to evaluate this initial pressure rise and to evaluate the prophylactic use of steroids either alone or its combination with a topical beta blocker or only a placebo in reducing the incidence of post laser JOP rise.

MATERIALS AND METHODS

This prospective, randomized, clinical, comparative case study was conducted at the Department of

Ophthalmology, Ayub Medical College, Abbottabad. A total of 54 pseudophakic or Aphakic eyes of 54 patients were enrolled after informed consent. Patients with pre- existing glaucoma or uveitis were excluded from this study. Patients were randomly assigned to any of the four groups. Group A (n= 10) received post laser topical placebo, Group B (n= 14) received post laser combination of 2 topical beta blockers and steroids. Group C (n=18) received post laser steroids only and Group D (n= 12) patients received post laser topical NSAIDS only.

Table-1: Treatment Groups

Group	Management Protocol
Group A	No post laser medication
Group B	Post laser steroid + Beta blocker
Group C	Post laser steroid Only
Group D	Post laser NSAID (Topical)

Each patient underwent complete ophthalmologic checkup, including VA, anterior segment slit lamp examination, gonioscopy, IOP checkup and fundoscopy. Intra ocular pressure measurements were performed pre laser, 1 hr, 24 hrs, and 7 days' post laser using applanation tonometry.

RESULTS

We studied 54 eyes of 54 patients. There were 23 (43%) male and 31 (57%) female patients. Table-2. The youngest patient was 16 yr. old while the eldest was 80 years old, with a mean age of 63.6 yr. Table II. The mean time for capsulotomy after surgery was 14.6 months with a range of 3 months to 5 years. Table-2. Pre laser visual acuity ranged from finger count 6/60 as compared to post-operative VA that improved and it ranged between 6/24 - 6/6 Table-3.

Table-2: Male/female and time ratio

PATIENTS DATA	
Total patients	54
Male	23
Female	31
Mean Age	63.6
Range	16-18 years
Mean time after surgery	14.6 months
Range	3 months 5 years

Table-3: Visual Acuity and IOP

PATIENT DATA	
Pre laser visual acuity	CF ½ 6-60
Pre laser intraocular pressure	60-20mm Hg
Mean	13-64 mm Hg
Post laser visual acuity	6/24 -6 6

Table-4: IOP measurement

Group	No. of Pts.	Prelaser IOP (mean)	IOP after 1 hr (mean)	IOP after 24 hrs (mean)	IOP after 3 days (mean)	IOP after 7 –days (Mean)
A	10	14.6	21.7	21.1	20	18.5
B	14	13.4	19.8	14.5	14.7	11.9
C	18	11.8	20	17.3	16.2	
D	12	13.9	21.8	18.2	17.8	15.3

The pre laser IOP for all groups ranged from 6-20 mm of Hg, with mean IOP reading of 13.64 mm of Hg (Table-3). Mean Prelaser IOP for the four groups is given in (Table-3). The mean IOP rose in all four groups when recorded 1 hour after laser treatment to approximately 20mm of Hg (Table-4). However, mean IOP returned to approximately pre-laser levels only in Group B Patients at the end of the first 24 hours (Table-4). -At the end of the first week, only group A patients showed persistent rise in mean IOP of 5mm of Hg (Table-4).

DISCUSSION

The most common non-preventable complication of modern cataract surgery is Posterior Capsular Specification. It has been reported between 28-43% of cases. The non-invasive Q-switched YAG laser became the procedure of choice for posterior capsulotomy soon after the first human trials. The most common complication associated with its use is post YAG elevation in IOP⁴. Our study confirms this complication to occur in similar fashion as previously reported § The IOP rise was related to thickening of posterior capsule hence release of lens debris into anterior chamber and the amount of laser energy used. Both steroids and beta blockers can effectively control this pressure rise^{6,7,8,9}. Our study shows that the combination of steroids along with beta-blockers is the most effective regimen to lower the IOP quickly and completely.

CONCLUSION

This study shows that IOP rises to about 20 mm of Hg one hour after laser. Without treatment, pressure remains at high level for more than three days, IOP can be effectively controlled within 24 hours by using topical beta-blockers, steroids, and NSAIDS whether used alone or in combination.

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