Advantages of Posterior Capsulotomy by ND: Yag laser

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Research Article

Abstract: **Aim:** To Assess the improvement of visual acuity in patients of pseudophakia with posterior capsular opacification after Nd:Yag laser posterior capsulotomy. **Objective:** 1) To find out the improvement in visual acuity after Nd:Yag laser posterior capsulotomy in pseudophakic patients. **Material and method**: The study was carried out during period 1st March 2009 to 1st March 2010 in GMCH A'BAD. In this study post operative adults with posterior capsular opacification were assessed. All these patients were OPD patients of both gender from urban or rural area. The sample size was 30. **Result**: Among the 30 cases 47% were males and 53% were females. The age of the patient was above 50 yrs in 63% cases while 23% cases were between 20 yrs and 50 yrs. of age 13% cases were less than 20 yrs of age. According to the type of cataract 76% were senile cataract and rest were of other types of cataract like congenital cataract, Developmental Cataract, Traumatic cataract and complicated cataract. 76% cases were not associated with any systemic diseases while the rest had diabetes mellitus, or Hypertension or some other systemic diseases. Less than 3 mj. of energy was used in 70% cases during the procedure. After the procedure 87% patient got vision between 6/18 to 6/6 while rest had vision between 6/60 to 6/18. After follow up the incidence of cystoids macular oedema corneal damage and hyphema was 3.3% while the incidence of Iritis was 6.6%. The incidence of Retinal detachment, sustained rise in Iop and damage to Iol was 0.0%. **Conclusion:** Nd:Yag Laser capsulotomy is a procedure that improves the vision of the patients having posterior capsular opacitication with minimum rate of minor complications and 0.0% incidence of major complications.

Keywords: Nd:Yag laser, poserior capsulotomy, posterior capsular opacification Yag Capsulotomy.

Introduction

Nd:Yag laser is a neodymium doped yittrium aluminum garnet laser. The Nd:Yag wave length is invisible to the eye and is not blocked by common glass, plastic and the visibly clear portions of the eye. As the Nd:Yag beam is invisible, visible red helium neon (He Ne) laserbem is used for aiming purposes. The focal point of the Nd:Yag beam is set posterior to that of the He Ne aiming beam providing an optimal energy density for cutting tissue. Nd:Yag laser is used for posterior capsnlotomy in plain extracapsnlar cataract extraction operation or in IOL implanted cases, when the posterior capsular opacification occurs. Other uses of Nd:Yag laser are membranectomies synechetomies, irridectomies, goniopuncture, trabeculectomy, cyclodestruction and cutting of vitreoretinal stronds. Inspite of all precautions and every modification post operatively about 18% to 50% cases develop posterior capsular opacification in about a period of 3-5 years. In children having congenital cataract or traumatic cataract, the incidence of thickening of posterior capsule is almost 100% within 2-5 years after surgery, Nd: Yag laser capsulotomy is a safe OPD procedure. It is done with surface anesthesia achieved by 4% xylocaine and with no need of extra care to be taken before and after the procedure

Materials and Methods

This study is carried out in the Government Medical College Aurangabad. The Patients were selected randomly from the OPD with no age and sex determination. The sample size was 30 The approval of the ethical committee was obtained. Before subjecting the patient to the procedure their full clinical, Ophthalmic examination as well as systemic examination was done. Routine Clinical investigations like haemogram, routine urine examination, blood sugar level was estimated and blood pressure recording were done to assess the general condition of the patient. Thus the systemic diseases such as Diabetic mellitus and Hypertension were ruled out. Specific routine ophthalmic investigations like intraocular tension recording, Slit lamp examination and Visual acuity testing was done. Funds examination was done in all patients. Out of 30 patients 3 were found to be having retinal pathologies in the form of diabetc and hypertensive retinopathies. The Nd:Yag laser capsutotomy was done in 30 psendophakic eyes with posterior chamber Iols. The uncomplicated cases are selected for this study. The OAYA Abraham Capsulotomy lens was used for the procedure. The Nd: yag laser capsulotomy is done on OPD basis. It was done preferably with undilated pupil, so that the exact visual

axis can be marked out and capsulotomy can be done in the visual axis. Patient was made is sit infront of the slit lamp of the laser the slit lamp is focused then the mode is decided after that the power of energy required is set up. With the help of capsulotomy lens the HeNe laser beam is focused by pressing the 'Standby' switch, the two red dots are focused such as they overlap each other and stop flickering . As soon as the HeNe beams are focused the switch of yag laser ' Laser ready' is pressed and by the hand control or foot control the pulses are given to perform the capsulotomy.

For Yag laser capsulotomy the minimum required energy in mj should be used. After the procedure the patient is given the following treatment.

1. Local Steroids are given prophalactically to prevent the iritis.
2. Local Timalol malliate 0.25% drops and systemic acetazolamide (it needed) are given to prevent rise in tenstion.
3. Renolene eye drops are given because it may absorb the cortical matter if present and liberated during Yag capsulotomy
4. Systemic B_1 B_6 and B_{12} are given to protect the retina.

After the procedure the patient may allowed to go home and asked to come for follow up. If there is any complication it is treated accordingly. In a case with no complication the refraction of the patient is done and spectacles are prescribed.

Result

The study consists of 30 cases upon whom the Nd:Yag laser capsulotomy was done.

Table 1: Distribution of Cases according to gender

Males	Females	Total
14	16	30

Table 2: Age wise distribution of Patients

Age in Years	No. of Cases
<20	4
20-50	7
>50	19
Total	30

Table 3: According to the type of cataract

Senile	Congenital	Developmental	Traumatic	Complicated	Total
23	1	2	3	1	30

Table 4: According to cases associated with systemic diseases

Cases Associated with systemic diseases			Cases not associated with systemic diseases	Total
DM	HT	Other		
2	3	2	23	30

Table 5: According to the duration between cataract surgery and Nd:Yag laser capsulotomy

< 6 Months	6 months to 2 yrs	>2yrs	Total
5	19	6	30

Table 6: According to energy used

<3 mj	3mj and 7 3mj	Total
21	9	30

Table 7: According to pulses used

5 or < 5 pulses	>5 pulses	Total
3	27	30

Table 8: Vision of patients before Yag laser capsulotomy (with spects)

<6/60	6/60 to 6/24	6/18 to 6/6	Total
18	11	1	30

Table 9: Vision of patients after Yag laser capsulotomy (with spects)

<6/60	6/60 to 6/24	6/18 to 6/6	Total
Nil	4	26	30

Table 10: According to complications occurred

Sr. No.	Complications	No. of Cases	Incidence
1	Retinal detachment	0	0.0%
2	cystoid macular o o edena	1	3.3%
3	Cornal damage	1	3.3%
4	Sustained Increased in IOP	0	0.0%
5	Damage to IOL	0	0.0%
6	Hyphema	1	3.3%
7	Iritis	2	6.6%

Discussion

This study consists of 30 Nd:Yag laser posterior capsutotomies done in 30 patients. The patients were selected randomly from OPD with no age and sex differentiation. The sex distribution is mentioned in lable No. 1 and age distribution is mentioned in table No.2 The Nd:Yag laser capsulotomies were done in 30 pseudophakic patients having posterior chamber Iols. The study consists of the patients operated for the various types of cataracts as mentioned in table No.3. Before yag laser posterior capsulotomy 18 patients were having visual acuity <6/60 with the correction of refractive error. while 11 were having corrected vision of 6/60 to 6/24 and one patient was having visual acuity more than 6/18 as mentioned in table No.8. Table No.9 shows the vision of patients with correction of refractive error after Nd:Yag laser capsulotomy It shows that there were 26 patients that improved to visual acuity between 6/18 to 6/6 4 patients improved to vision between 6/60 to 6/18. 3 out of them were found to have diabetic or Hypertensive retinopathy and there were no patient below 6/60. The energy used for the capsulotomy was more than 3 mj in 9 patients while 3mj. and less energy was used in 21 patients with average energy used in 2.6 mj. per pulse.

Among the 30 patients in 5 the duration between the operation and the Yag leaser Capsulotomy was less than 6 months. In 19 patients period was between 6 months to 2 years while in 6 patients the period was of more than 2 years. After doing the follow-up of the patients for the complications of the Nd:Yag laser capsulotomy 1 patient was found to have hyphema during the procedure. The quantity of hyphema was very less and get absorbed within 1 to 2 days. Two patients were found to have iritis which was responded well to the topical steroid eye drops for few days. corneal endothelial damage was found in one patient. Healing occurred in that patient. None of the patient showed any damage to the IOL. The follow-up of the patients were done and one patient had developed cystoid macular oedema, the incidence in present study was found to be 3.3%. The incidence of retinal detachment, sustained increase in IOP and damage to IOL was found to be 0.0% From the above results it is clear that the visual results obtained with Nd:Yag laser capsulotomies are excellent with very rare possibilities of hazardous complications.

Conclusion

After doing Nd:Yag laser posterior capsulotomy none of the patient showed reduced visual acuity, but definitely there is increase in the visual acuity of the patients. After doing follow up it was found that two patients had developed lritis but well responded to topical steroid eye drops. Corneal damage occured in one patient which was healed completely. Cystoid macular oedema was found in one patient. The incidence of retinal detachment, sustained increased intraocular pressure and damage to IOLS was 0.0%. With proper precautions and care maximum of the complications after Nd:Yag laser posterior capsulotomy can be avoided. If the patients are provided with prophylactic treatment with local steroid eye drops, vit B complex supplimentation, Renolene eye drops and antiglaucoma local drops there are least chances for complictions. Hence the Nd:Yag laser posterior capsulotomy is the best procedure for the patients with posterior capsular opacification.

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