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Nd : Yag Laser Posterior Capsulotomy A Clinical Study

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Abstract: *Nd:YAG laser capsulotomy was carried out in 100 eyes of 99 patients in the Department of Ophthalmology,government General Hospital,Kakinada.Among them 2 cases are aphakic and the rest were pseudophakic.Out of the pseudophakics one of the patients has undergone triple procedure .The cases were followed up between October 2010 to September 2012.Average period follow up was 6 months.*

Keywords: YAG laser,capsulotomy,pathology,fundus examination

1. Introduction

In this project there are cases admitted from different parts of Andhra Pradesh.The details of the surgical procedure and the type of IOL implanted were not available as they were operated by different surgeons and the post-operative period varied between 2 month to 3 years

Chief complaints of all the cases was dimished vision which varied from hand movements to 6/24.Some also complained of haziness of vision and glare.

Each patient was evaluated before undergoing laser capsulotomy to confirm that the visual loss was only due to after contract. Following tests were done in each case prior to posterior capsulotomy.:

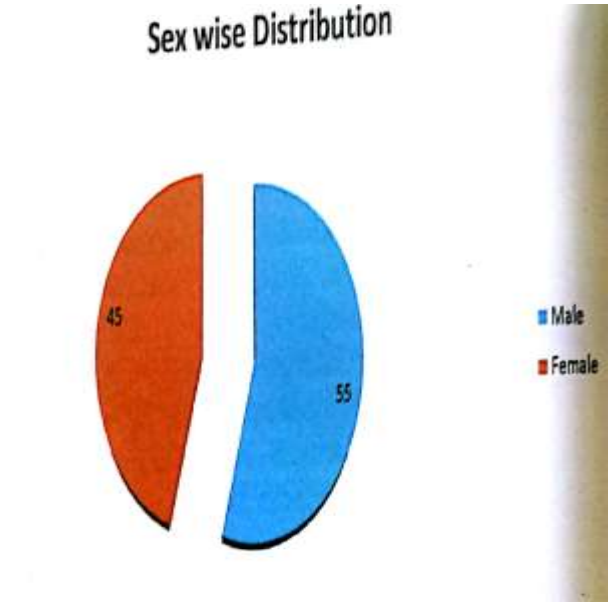
- Complete ophthalmic history and medical history
- Best corrected visual activity
- Intra ocular pressure recording
- Slit lamp examination for evaluation of red reflex and anterior segment pathology
- Fundus examination

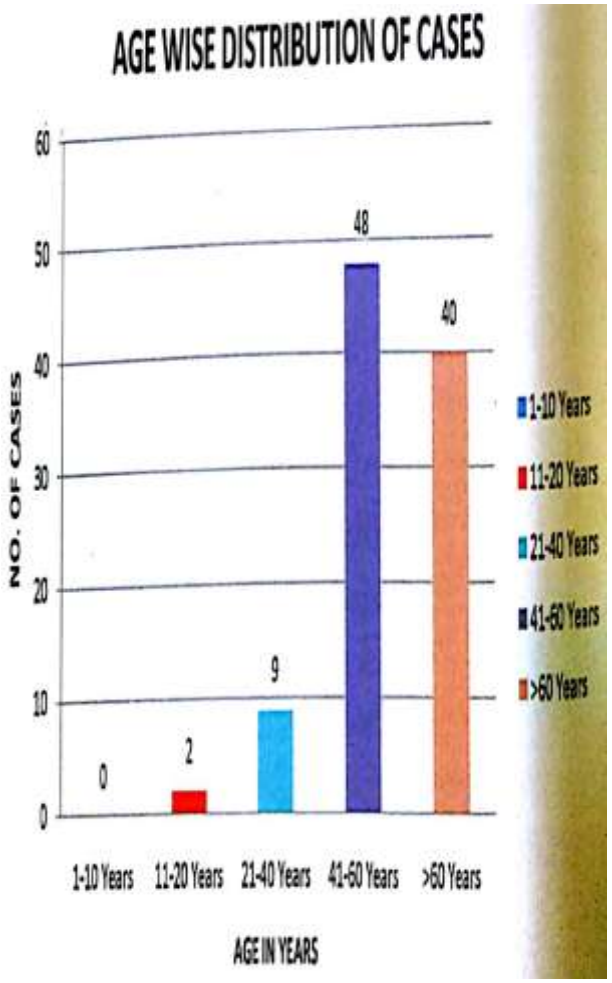
Judging the contribution of capsular opacity to patients overall visual deficit may be difficult. Some capsular opacities are impressive in oblique slit lamp illumination but are insignificant when viewed against red reflex.The single and most reliable technique for accessing capsular opacity is direct ophtolmosscopy.Fundus view with Hurby lens may also allow accurate assessment of capsular clouding where as the in indirect ophtholmoscopy can penetrate significant capsular opacity.

Unless the capsule is extremely dense, adequate visualization may be present with the Florescene angiography.In patients in whom the capsular opacity seems inadequate to explain the quality of vision,CME should be anticipated.

Ultra Sound B scan where posterior segment view is obscured by Dens after Contract, can also be done[1].

2.Observations and Results





After a short-term study of 6 months the following observations were made. Cases are divided according to age/sex wise and also according to duration between contract extraction and development of posterior capsular opacification[2].

TABLE 1: SEX WISE DISTRIBUTION OF CASES

SEX	Number of Cases
Male	55
Female	45

This shows no sex prediction .Mean age of patients was 56.91 years

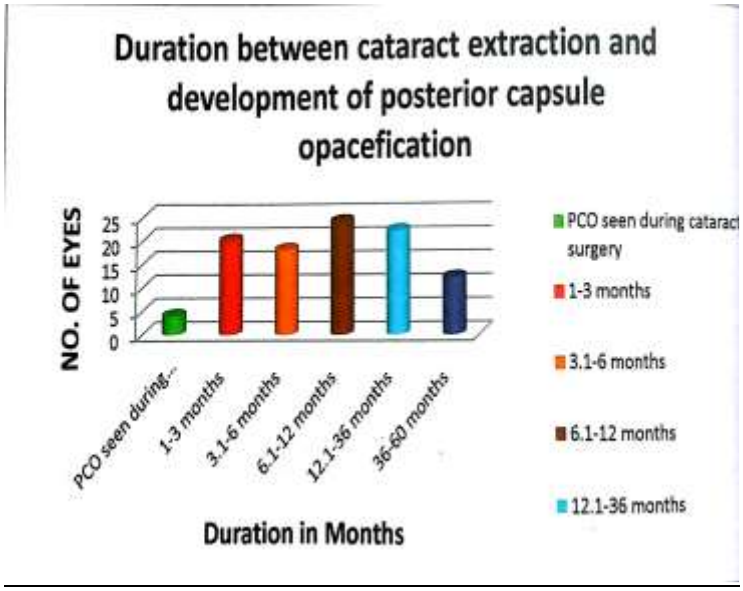


TABLE 2:DURATION BETWEEN CONTRACT EXTRACTION AND DEVELOPMENT OF POSTERIOR CAPSULE OPACIFICATION

Duration in months	Number of eyes	Percentage
PCO seen during cataract surgery	4	4
1-3 months	20	20
3.1-6 months	18	18
6.1-12 months	24	24
12,1-36 months	22	22
36-60 months	12	12
Total 100 eyes		

From this it can be found that posterior capsule opacification occurs within years.In about 66% of cases with in first year.

An attempt eas also made to see age of the patient and duration between contract extraction and development of posterior

capsular opacification which is shown in the following table[3].

TABLE 3

S.No.	Age In Yrs	Number of cases	Average duration between surgery and posterior capsule opacification in months
1.	1-10	0	–
2.	11-20	2	3Months
3.	21-40	9	12Months
4.	41-60	48	24Months
5.	>60	40	20Months

The main aim was to look for age group in which posterior capsule opacification occurs earlier.

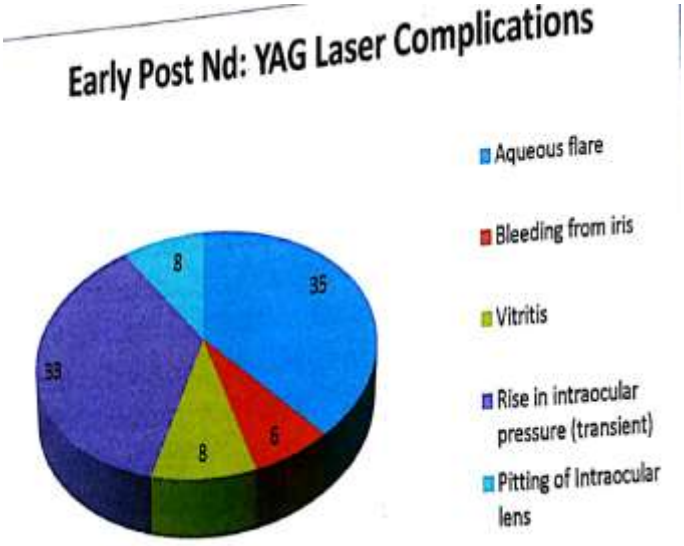
It has been shown that in patients under 40 years of age the posterior capsule opacification was early i.e before 1 year and in patients under 20 years of age it was before 3 months.

So it can be stated that younger the age earlier will be the posterior capsular opacification

Posterior capsule opacification has been graded as mild,moderate and severe depending on slit lamp examination and upon the visibility of fundus by direct and indirect ophthalmoscopy as follows[4]

TABLE 4 : GRADING OF POSTERIOR CAPSULAR OPACITY

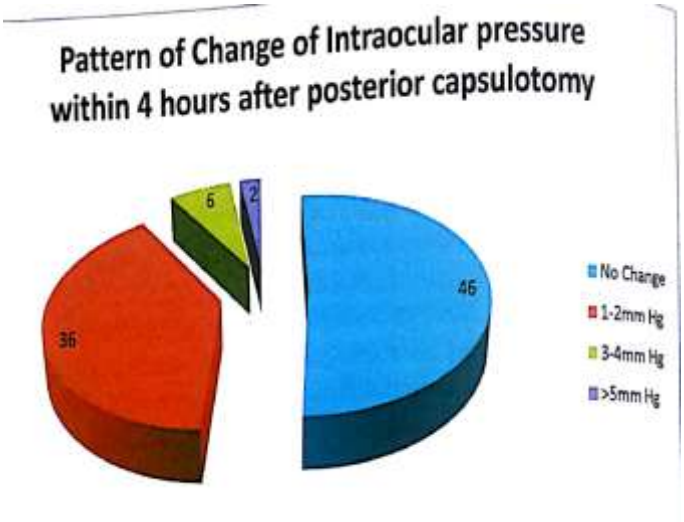
MILD	Fundus seen with direct ophthalmoscope	24
MODERATE	Fundus seen with indirect ophthalmoscope	52
SEVERE	No fundus view or details hazily see	24

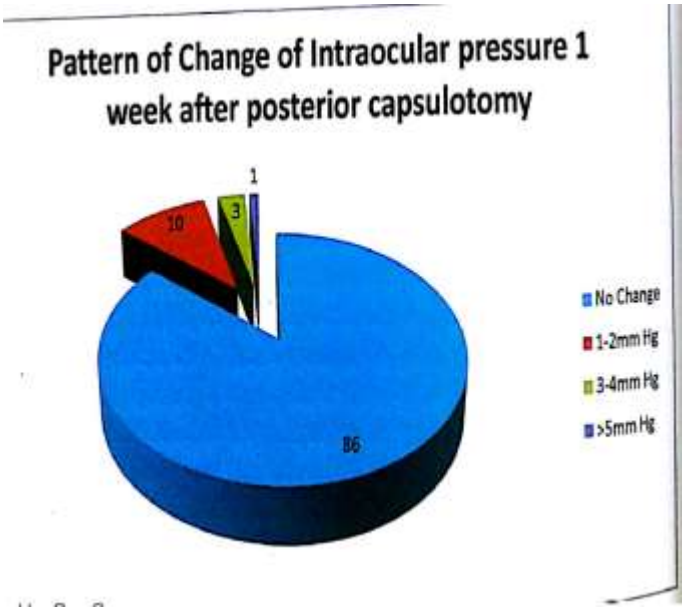


Cases were examined within 4 hrs and 24hrs for complications of Nd:YAG capsulotomy.Total no of eye examined were 100 and results are tabulated as follows[5]

TABLE 5:EARLY POSTERIOR ND:YAG LASER COMPLICATIONS

S.No.	Complication	No. of eyes	Percentage
1	Aqueous flare	35	35
2	Bleeding from iris	06	06
3	Vitritis	08	08
4	Rise in intraocular pressure (transient)	33	33
5	Pitting of Intraocular lens	08	08

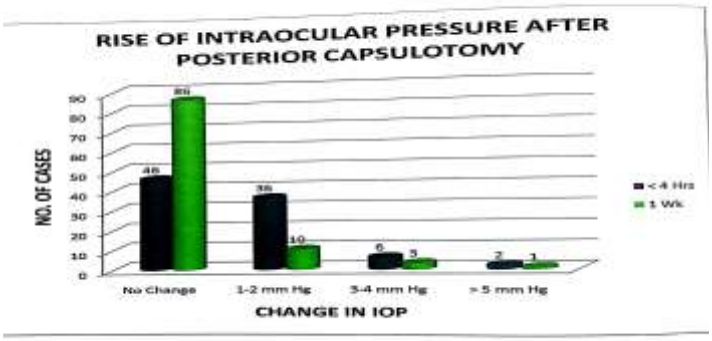




Following the Nd:YAG laser posterior capsulotimy procedure Intraocular pressure was recorded within 4hrs and 1 week and the results are tabular as follows:

TABLE 6 : RISE IN INTRAOCULAR PRESSURE AFTER ND:YAG LASER POSTERIOR CAPSULOTOMY

INTRAOCULAR PRESSURE IN mm	<4 Hrs	1 Wk
No Change	46	86
1-2 mm Hg	36	10
3-4 mm Hg	6	3
>5 mm Hg	2	1



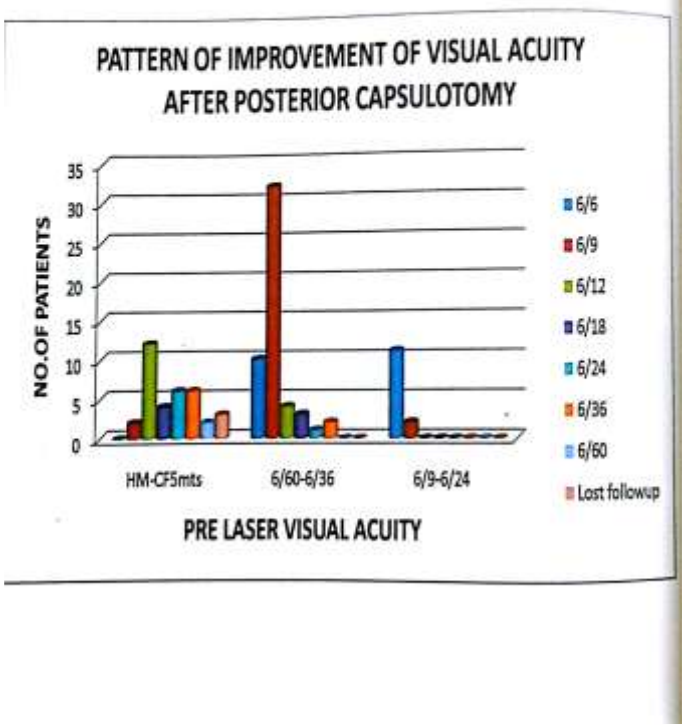


TABLE 7 : VISUAL IMPROVEMENT AFTER Nd:YAG LASER POSTERIOR CAPSULOTOMY

Pre laser VA	Post laser Visual acuity							
	6/6	6/9	6/12	6/18	6/24	6/36	6/60	Lost followup
HM – CF5 mts	0	2	12	4	6	6	2	3
6/60 – 6/36	10	32	4	3	1	2	0	0
6/9 -6/24	11	2	0	0	0	0	0	0

LATE POSTOPERA COMPLICATIONS

In the following period of 1 week,4 week,12 week and 24 weeks cases were examined for complications like cystoids macular edema retinal detachment and chronic glaucoma[6].

None of the cases presented with cystoids macular edema,Retinal detachment and chronic angle glaucoma.

3. Discussion

Posterior capsule opacity is a major complication of contract surgery with or without intraocular lens implantation.The use of Nd:YAG laser has definitely simplified the treatment of posterior capsule opacification.Another great advantage is that is entirely non-invasive.

In our short term study 100 cases the main aim was to evaluate the results of Nd:YAG laser capsulotomy in 100 eyes of 99 patients[7].

On review of pertinent literature the complication and results of Nd:YAG laser capsulotomy can be discussed as follows:

1.INCREASED INTRAOCULAR PRESSURE

Elevation of intraocular pressure has been well documented after virtually all anterior segment laser surgeries.The IOP rise after Nd:YAG laser posterior capsulotomy may be absent or transient.

Early researchers such as ARON-ROSA et al did not find any permanent elevation of IOP ,but subsequent studies revealed that it might occur Keates et al found elevation of IOP in 0.6% of his patients where as Stark et al reported 1.0% in their study.Jayne et al found that rise in IOP is more pronounced in patients with glaucoma and in those who experienced a higher rise of IOP within hours of capsulotomy. However Shani et al could not find any elevation of IOP .Chao et al in their 3 month follow ip study also did not find any persistent rise in IOP.

In our study there was rise in IOP up to 2mm Hg within 4hrs was 36%,6% cases showed IOP rise of 3mm Hg and 2 cases showed rise in of 5mm Hg.In 46% of cases there was no change .After 1 week 10% cases showed rise of IOP by 2mm Hg,3% cases showed rise by 3mm Hg,86% cases showed no change of IOP compared to per laser IOP.After 6 months 3 cases showed persistent elevation of 3mm Hg as they were cases of pre-existing glaucoma.All other cases came to pre Capulotomy state within 4 weeks.

Since all the cases have been given TImolol maletate 0.5% rise of IOP was minimal .In 2 cases of aphakia rise of IOP was most probably because of cortical and capsular matter blocking the tabecular mesh work.In rest of cases rise of IOP was probably because of irtis.

2.RETINAL DETACHMENT

Numerous studies have examined the relationship between Nd:YAG laser posterior capsulotomy and development of retinal detachment.Initial studies by ARON ROSA et al claimed an incidence of 0.08%.Ficker et al reported 2.1 % Rickman burger et al reported 3.6% Steinert et al reported 0.89% Jaritt et al reported 1.6%

In our study there was no case of retinal detachment.This could be because of the absence of risk factors in our cases.[8]

3.CYSTOID MACULAR EDEMA

The development of cystoids macular edema after NdYAG laser posterior capsulotomy has been demonstrated in many studies.The main diagnostic tools are evaluation with 78D lens and Fundus Fluorescein angiography.In our study no cases were identified as having cystoids macular edema.The incidence of cystoids macular edema according to Winslow and Taylor was 0.55% and they attributed this occurrence to viterious instability secondary to Hyaluonic acid and prostaglandin diffusion through the compromised posterior capsule.According to Alhert et al the incidence of cystoids macular edema was 5.4% Jampol hypothesized that UV-A light may generate free radicals,faciliatating prostaglandin production and including inflammation and ultimately cystoids macular edema[9]

4. OTHER COMPLICATIONS

Corneal complications like corneal abrasions and exacerbation of epithelial dystrophies have not been noted in our study.Pitting of IOL is seen in 8 cases because of uncooperativeness of patients.Bleeding from iris occurred in 6 cases.These cases have dense synechiae.But the bleeding was mild and it got substained within one week in all eight cases.Other rare complications like cornel stromal scarring,macular holes, endophthalmitis did not occur in our study[10].

Improvement in visual acuity

Improvement in visual activity was excellent in our study.Visual activity improved to 6/6 in 21 cases,6/9 in 36 cases ,6/12 in 16 cases 6/18 in 7 cases, 6/24 in 7 cases, 6/36 in 8 cases ,6/60 in 2 cases

In one visual activity was not improved due to glaucomatous optic atrophy which would be found only after capsulotomy.3 cases were lost for follow up.because of high astigmatism most of the cases could not be improved to 6/6.

4. Conclusion

- Improvement in visual activity with Nd:YAG laser Capsulotomy is excellent.
- Complications with Nd;YAG laser capsulotomy are minimal and transient
- Careful follow up with Nd:YAG laser capsulotomy is important and topical Timolo malerate 0.5% drops after capsulotomy prevents spikes of IOP which may occur in some case.Oral Acetaolamide along with topical Timolol can be used in patients who show rise of IOP uncontrollable with topical Timolol alone
- Proper Selection of case is important.Pitting of IOL may occur uncooperative patients Nd:YAG laser capsulotomy should be done with caution in patients with increase in axial length ,peripheral degenerations and retinal detachment in other eye as these patients are at increased risk of retinal detachment.Nd:YAG laser capsulotomy should be postponed by at least 3 months after contract surgery
  to decrease the incidence of iritis.
- Nd:YAG laser capsulotomy is a safe method of restoring vision in patients with posterior capsule opacification.
- The results of Nd:YAG laser capsulotoimy were comparable to those reported in literature

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