



ND: YAG LASER;

VISUAL ACUITY OUTCOME AFTER ND: YAG LASER CAPSULOTOMY FOR POSTERIOR CAPSULAR OPACIFICATION IN PSEUDOPHAKIC PATIENTS. 92 CASES STUDY

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Article received on:

21/02/2018

Accepted for publication:

15/09/2018

Received after proof reading:

03/12/2018

ABSTRACT... Objectives: To find out the visual acuity outcome after Nd: YAG laser capsulotomy in posterior capsular opacification in pseudophakic patients after cataract surgery. **Study Design:** Analytical study. **Setting:** Department of Ophthalmology Khyber Medical University Institute of Medical Sciences / K.D.A Teaching Hospital Kohat. **Period:** January 2016 to June 2017. **Materials and methods:** Special proforma was designed for record of patients. Pre Nd:YAG laser posterior capsulotomy best corrected visual acuity was checked and noted. Anterior and posterior segments examination was done with slit lamp and indirect slit lamp bimicroscopy. Pupils were dilated with tropicamide eye drops. Nd:YAG laser capsulotomy was done. All these procedure were conducted as out door. Patients were put on topical steroid and antiglaucoma drops for ten days to control inflammation and rise in IOP. Post laser best corrected visual acuity was recorded after one month of laser. **Results:** Total 92 patients were selected with age range from 21 to 83 years. Out of these patients 43(46.74%) were male and 49(53.26%) were female. Post surgical laser period was from 7 months to 13 years. Prelaser best corrected visual acuity of 6/24-6/36 was present in 59(64.13%) patients, 6/60 in 24(26.08%) patients while 9(9.78%) patients had visual acuity of counting finger (CF). Post laser best corrected visual acuity after one month of 6/6-6/9 was recorded in 43(46.39%) patients, 6/12-6/18 in 27(29.34%), 6/24-6/36 in 13(14.13%) and 6/60 & below in 9(9.71%) patients. **Conclusion:** Post laser best corrected visual acuity is highly improved with Nd:YAG laser capsulotomy in posterior capsular opacification.

Key words: Posterior Capsular Opacification (PCO) Visual Acuity (V.A), Best Corrected Visual Acuity (B.C.V.A). Neodymium-doped Yttrium Aluminium Garnet (Nd:YAG).

Article Citation: Alam M. ND: yag laser; visual acuity outcome after nd: yag laser capsulotomy for posterior capsular opacification in pseudophakic patients. 92 cases study. Professional Med J 2018; 25(11):1848-1851.
DOI: 10.29309/TPMJ/18.4743

INTRODUCTION

Cataract is the most common cause of treatable blindness in the world. The treatment modalities have an evolutionary history from intracapsular cataract extraction (ICCE) to extracapsular cataract extraction (ECCE) and then to phacoemulsification. For visual rehabilitation intraocular lens (I.O.L) are implanted. Cataract surgery has many peroperative and postoperative complications. Posterior capsular opacification (P.C.O) is one of the most important postoperative complication that can hinder vision. PCO has different prevalence in different age groups. In early age (children) PCO has been reported to be 100%¹ while in old age its prevalence of 7% to 31% has been documented.² The pathogenesis of PCO is due to proliferation of left over epithelial

cells on the surface of posterior capsule in the form of pearls (Elschnig pearls), capsular fibrosis or contract acquiring wrinkled shape. PCO causes visual deterioration in the form of decreased VA, affected contrast sensitivity and glare. Monocular diplopia has also been reported.^{3,4}

In past surgical capsulotomy was the only option of treatment for PCO. Being a surgical intervention this procedure has to some extent the same complications as cataract surgery by itself. With the invention of Yd:YAG laser surgical capsulotomy is now no more practiced except in children and very thick PCO. Nd:YAG laser capsulotomy is categorized as gold standard treatment of PCO by which an opening is made in the visual axis thus improving VA.⁵ Nd:YAG laser

ionizes plasma and make opening by disruption of posterior capsule. Nd:YAG laser capsulotomy is very effective and controlled procedure. This is being practiced in OPD as outdoor procedure. Nd:YAG laser capsulotomy has also some complications if done in unexperienced hands. IOL pitting, subluxation and decentration of lens have been reported. Prevalence of retinal detachment is more in high myopic pseudophakic patients after Nd:YAG laser capsulotomy. Rise in intraocular pressure (IOP), macular haemorrhage and cystoid macular oedema have also been reported as complications of Nd:YAG laser capsulotomy.^{6,7,8,9}

Several complications of Nd:YAG laser capsulotomy are associated with amount of energy used. Use of more energy has more complications and vice versa which may lead to vision threatening situation.¹⁰ In spite of these complications Nd:YAG laser capsulotomy is considered as standard procedure for the treatment of PCO. This study is focused on VA outcome after Nd:YAG laser capsulotomy for posterior capsular opacification.

Materials and Methods

This analytical study was conducted in the Department of Ophthalmology Khyber Medical University Institute of Medical Sciences / K.D.A Teaching Hospital Kohat from January 2016 to June 2017 with the objective to know visual acuity outcome after Nd:YAG laser capsulotomy for PCO in pseudophakic patients. Special proforma was designed for documentation of patients. 92 patients were included in the study with age range from 21 years to 83 years. Postsurgical Nd:YAG laser period was from 7 months to 13 years. Prelaser best corrected visual acuity was checked and noted. Pupils were dilated with tropicamide eye drops, Anterior and posterior segments examination was done with slit lamp and indirect slit lamp biomicroscopy for type of PCO and any other ocular pathology and type of surgery done. Nd:YAG laser capsulotomy was done. All these procedure were conducted in OPD. Patients were put on topical steroid and antiglaucoma drops for ten days to control inflammation and rise in IOP. Best corrected visual acuity was recorded after

one month of laser.

RESULTS

Total 92 patients were selected with age range from 2 to 83 years. Out of these patients 43(46.74%) were male and 49(53.26%) were female (Table-I).

Capsular fibrosis with calcification was present in 51(55.43%) patients, Elschnig pearls in 30(32.60%) and capsular wrinkling in 11(11.95%) patients (Table-II).

39(42.39%) patients had undergone extracapsular cataract extraction (ECCE), 31(33.69%) had sutureless manual small incision cataract surgery (MSICS) and 22(23.91%) had phacoemulsification with posterior chamber intraocular lens implantation (Table-III).

Prelaser B.C.V.A of 6/24-6/36 was present in 59(64.13%) patients, 6/60 in 24(26.08%) patients while 9(9.78%) patients had VA of counting finger (CF) (Table-IV).

Post laser B.C.V.A after one month of 6/6-6/9 was recorded in 43(46.39%) patients, 6/12-6/18 in 27(29.34%), 6/24-6/36 in 13(14.13%) and 6/60 & below in 9(9.71%) patients (Table-V). No improvement or minimal improvement in best corrected VA was due to pathology in posterior segment like maculopathy and glaucoma.

Gender	No of Patients	Percentage
Male	43	46.73
Female	49	53.36

Table-I. Gender distribution. No 92.

Type of PCO	Number of Patients	Percentage
Capsular Fibrosis	51	55.43
Elschnig Pearls	30	32.60
Capsular Wrinkling	11	11.95

Table-II. Types of posterior capsular opacification. No.92

Type of Surgery	Number of Patients	Percentage
ECCE	39	42.39
MSICS	31	33.69
Phacoemulsification	22	23.91

Table-III. Type of surgery. No 92.

Visual Acuity	Number of Patients	Percentage
6/24-6/36	59	64.13
6/60	24	26.08
Counting Finger	9	9.78

Table-IV. Pre laser best corrected visual acuity. No 92.

Visual Acuity	Number of Patients	Percentage
6/6-6/9	43	46.39
6/12-6/18	27	29.34
6/24-6/36	13	14.13
6/60 and below	9	9.7

Table-V. Post laser best corrected visual acuity. No 92.

DISCUSSION

Management of cataract and its complications is focused upon visual rehabilitation. PCO is important postoperative complication for which Nd:YAG laser capsulotomy is the proper treatment modality. There is significant improvement in the visual acuity after Nd:YAG laser capsulotomy. National and international studies conducted on this issue reported different results. But in all results there is significant improvement in VA than pre laser status. Study in our set up revealed fruitful results showing post laser B.C V.A of 6/6-6/9 in 46.39%, 6/12-6/18 in 29.34%, 6/24-6/36 in 14.13% and 6/60 & below in 9.7% patients. The lower VA was due to posterior segment pathology like maculopathy and glaucoma.

Khanzada MA et al have reported post laser BCVA of 6/6-6/9 in 74.4% patients¹¹. Although their results are better but they have also included patients of pre laser VA of 6/12-6/18 while in our study pre laser BCVA of 6/24 was upper limit for laser. Panzai MN et al have documented improvement of post laser BCVA in 91% patients being comparable to our study.¹² BCVA of 6/6 in 3.4%, 6/9 in 12.0% and 6/18 or better in 60.2% patients have been published.¹³ Hasan et al have reported improvement in post laser BCVA in 73 out of 86 patients.¹⁴ As Nd:YAG laser capsulotomy is the standard treatment for PCO in practice worldwide, it has been focus of research internationally. Serisha G et al reported significant improvement in post laser visual outcome.¹⁵ Soni P, Yadav D et al have achieved

BCVA of 6/6-6/12 in 87.3% patients.¹⁶ Results also depend upon the type of opacity and pre laser status. Gupta ML have reported post laser BCVA of 6/6 in 30% patients and no improvement was due to pre-existing retinal diseases.¹⁷ BCVA improvement in 95% patients and due to retinal diseases no improvement in 5% patients have also been published¹⁸ and nearly similar to our derived results have been notified by Gopinath GS et al in their studies.¹⁹ Another research study reported post laser BCVA of 6/6 in 11.36%, 6/9 in 9.94% and 6/18 or better in 63.9% patients being comparable to our results.²⁰ Some patients have pre-existing retinal pathology which reflects the final visual outcome.^{21,22}

The merits of Nd:YAG laser are that it is noninvasive, effective and eliminates surgical complications. Moreover it is out door procedure.

CONCLUSION

Nd:YAG laser capsulotomy is safe and effective procedure for treatment of PCO. BCVA is significantly improved. It should be performed by experienced person. Post laser inflammation and rise in IOP must be addressed. Our results of this procedure are supported by literature.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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