

## Complications of Nd Yag Laser Capsulotomy

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### Abstract

**Introduction:** Aim and objective is to study the intra and post laser complications of Nd yag laser posterior capsulotomy and to find out the incidence of complications. **Materials and Methods:** This study was conducted in the department of ophthalmology, Ad-Din Women Medical College 2, Bara moghbazar, Dhaka from July 2018 to June 2022. Our study included 206 patients of 220 eyes with significant PCO. Before laser capsulotomy all patients were assess by routine slit lamp examination, IOP measurement and posterior segment examination done for every patient for exclusion of gross posterior segment pathology. Nd yag laser capsulotomy was carried out under topical anesthesia. These patients were assessed for post laser visual acuity and complications in 1st POD after 7 day and 1 month. Every patients with post laser routine medications and as per need of other related eye problems. **Results:** Total 220 eyes of 208 patients included in our study ,including 93 male (44.71%) and 115 female (55.29%). Range of age were 21yrs to 87 years (table -1). Laser capsulotomy were done one eye in 208 patients and both eyes in 14 patients. Range of energy used in our study from 1 to 4.5 mJ. Complications were noted after yag laser capsulotomy in 29 eyes (13.76%) though after taking maximum precaution for avoiding complications including pre laser slit lamp examination, assessment of IOP, proper dilatation of pupil, power setting were minimum as per as possible. **Conclusion:** The Nd yag laser capsulotomy is an effective, safe procedure for the treatment of opaque posterior capsule which is unique and magical approach for improvement of vision and restoration of effective life style. Every procedure have some adverse effect, Nd yag laser capsulotomy also have some complications. But benefit are tremendous if we can go in proper way.

**Keywords:** PCO, Yag laser, capsulotomy.

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### Introduction:

Posterior capsular opacification is the most common visual impairment after cataract surgery, may be in small incision cataract surgery or modern technique by phacoemulsification. PCO is one of the most late complications of cataract surgery<sup>1</sup> in one study the frequency of PCO after cataract surgery were 1.6% , 12.3% and 26.5% at 1,2 and 3 years respectively <sup>2</sup>. PCO formed due to migration and proliferation of epithelium specially from equatorial region and the remnant of anterior lens capsule fibrosis and formation of posterior capsular opacity which causes gradual impairment of vision and also decreased contrast sensitivity.

### Materials and Methods:

It was a prospective study conducted over a period from July 2018 to December 2022 at AD-Din Medical College and Hospital 2, Bara moghbazar, Dhaka. A total of 206 patients (220eyes) were included in the study. Patients above the age of 15 years, more than 6 months after cataract surgery, significant posterior capsular opacity and uncomplicated cases of both male and female under our study. Extreme age, non-cooperative, previous history of retinal detachment surgery, active Ouveitis, glaucoma, dislocated IOL, zonular dialysis and any form of congenital defects were excluded our study. Before laser capsulotomy % detailed history was taken and complete ocular examination were done including visual acuity slit lamp examination, tonometry with Goldman applanation

tonometer and fundus examination. Study period was Ad-din Medical College Hospital department of ophthalmology from July 2018 to December 2022. The study method included a series of patients in out patient dept of ophthalmology were selected. After proper history was taken regarding cataract surgery of the respective patient. Pre laser detailed slitlamp examination, measurement of intra-ocular pressure and exclusion of posterior segment were done by funduscopy and some case colour fundus photography. Uncontrolled diabetes mellitus and severe hypertension and patients with ocular inflammation were excluded in our study.

**Result:**

A total of 206 patients (220 eyes ) were included in the study including 93 male (45.15%) 113 female (55.29%). Age range of 21 to 80 years. Age distribution of patients is shown in table -I, table- II shown side of eyes. Table -III shown sex distribution, table -IV shown distribution of Nd yag laser done after cataract surgery, Table V- energy level used in capsulotomy and table shown complications.

**Table-I: Age distributions**

Age	No	%
21-29	10	4.55%
30-39	08	3.64%
40-50	40	18.18%
51-60	70	31.82%
61-70	58	26.36%
71-80	28	12.73%
81 above	06	2.73%
	220	100%

**Table-II: Side of the eyes.**

Side	No	%
Re	123	55.91%
LE	97	44.09%
	220	100%

**Table -III: Sex distribution.**

Sex	No	%
Male	93	45.15%
Female	113	54.85%
Total	206	100%

**Table-IV: Time interval between PCO formation and Nd yag laser capsulotomy**

Time interval	No of eyes	%
6 month	15	6.82%
01 year	75	34.09%
02 years	60	27.27%
03 years	45	20.45%
04 years	25	11.36%
	220	100%

**Table-V: Energy level used for capsulotomy:**

Energy level(MJ)	No of eyes	Percentage
1-2	62	28.18%
2.1-2.5	55	25%
2.6—3	39	17.73%
3.1-3.5	38	17.27%
3.6-4.0	16	7.27%
4.1-4.5	10	4.55%
	220	100%

**Table-VI: Types of Complications of post yag laser:**

Complication	No of patient	Percentage
IOL pitting	10	34.48%
Transient IOP elevation	13	44.83%
Cystoid macular edema	02	6.90%
Uveal reaction	04	13.79%
Total	29	100%

**Discussion:**

The reported incidence of PCO is 20.7% at 2 years and 28.5% at 5 years after cataract surgery <sup>1</sup>. PCO is the most frequent cause of diminished visual acuity after extra-capsular cataract surgery <sup>2</sup>. Nd yag laser capsulotomy is the standard treatment of PCO <sup>3</sup>. An immediate improvement in visual acuity in 94% of cases treated by capsulotomy in a review by weiblinger et al .<sup>4</sup> though reliable, Nd -yag laser capsulotomy can lead to complication like spike in IOP, lens damage, change in refraction, macular edema, retinal tear and retinal detachment <sup>5,6</sup>. Despite the prophylactic treatment, increased IOP was reported in 15 -30% of the patients in several Studies<sup>7,8,9</sup>. Nd yag laser capsulotomy has been found to affect the lens position<sup>10</sup>. Retinal tears and detachments are established complications of Nd yag Laser capsulotomy. It has been estimated that the risk of retinal detachment is four times higher after laser capsulotomy<sup>11,12,13</sup>. Nd yag laser capsulotomy is a most common and effective procedure after small incision cataract surgery and phacoemulsification the currently most advanced cataract surgery. Posterior capsular opacification is a major most remote complication of cataract surgery , specially younger age group and children <sup>14,15,16</sup>. In our study 220 cases the time interval between cataract surgery and Nd yag laser capsulotomy were 2.5 years (range from 6 months to 4 years ) while it was reported as 2.49 years by Hasan <sup>17</sup> and two year in a national study <sup>18</sup>. In our study IOL pitting was 10 (34.48%). IOL Damage (IOL pitting) Hasan KS et al has noted IOL pitting 19.8% in a study of 86 eyes <sup>18</sup> and Haris WS noted 11.7% significant marks on IOL during laser capsulotomy in 342 eyes <sup>19</sup>. The Retro -focusing of laser beam can reduce the risk of IOL damage <sup>20</sup>.

**Transient raised of intraocular pressure:**

The second most complication of yag laser capsulotomy in our study was transient raised IOP which were seen in 13 cases (44.83%). The mean raised of IOP were 7 mm Hg above the baseline. The frequency of elevation of IOP after yag laser capsulotomy is highly variable ranging from 0.8mm Hg (B) to 82mm Hg <sup>18</sup> in different studies<sup>20,21,22</sup>. However the

IOP elevation is usually transient. In another study transient raised of intraocular pressure were 8.69%. In our study, the IOP was well controlled with topical beta blocker in all cases and suspected case we use also tab acetazolamide 250mg 4times daily and with potassium supplement.

#### **Cystoid macular edema:**

In our study cystoids macular edema was seen in 02–eyes (6.90% ). In other study cystoid macular edema was 6.90 % . In one study CME were seen in 9.6%<sup>23</sup>. In another study CME was seen in 8.0% cases while in another study it was seen in 0.2% cases<sup>27</sup>.

#### **Anterior uveitis:**

It was seen in our study was 04(13.79%). Other study Anterior uveitis was seen in 05 eyes (1.14)<sup>24</sup>. In another study it was 1.14%. In one study anterior uveitis was noted in 46.2% cases after yag laser capsulotomy<sup>27</sup>. In one study conducted by Muhammad et al anterior uveitis was seen in 8.0% cases<sup>25</sup> while in another study it was seen in 0.6% cases after yag laser capsulotomy<sup>26</sup>. In our study anterior uveitis was not so severe and responded well to topical steroid therapy. Retinal detachment, lens dislocation subluxation hyphema and endophthalmitis may happen. These complications were uncommon in other study as well<sup>21, 24, 16, 18</sup>. Other complications of yag laser such a corneal endothelial damage<sup>25</sup> vitreous haemorrhage 10 macular hole<sup>26</sup> and macular hemorrhage were not seen in our study<sup>27</sup>. Most of these complications are associated with the use of high energy level combined with minimum number of precisely focused shots for achieving the desired effect can reduced the risk of complications<sup>24,28</sup>.

#### **Conclusion:**

The Nd yag laser capsulotomy is an effective, safe procedure for the treatment of opaque posterior capsule which is unique and magical approach for improvement of vision and restoration of effective life style.

**Conflict of Interest:** None.

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