

# **Effects of YAG LASER Iridotomy in AACG as Primary Mode of Therapy**

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## **ABSTRACT**

**Objective:** To determine the effect of YAG laser peripheral iridotomy as a primary mode of therapy in the AACG glaucoma.

**Place:** This study was conducted in Mayo hospital/KEMU Lahore from 1.1.07 to 31.12.07.

**Methods and material:** 70 patients with AACG later YAG laser iridotomy were performed (in these cases), and studied for a follow up period for 12 months , participants were 46 women and 24 men in which 42 were right 28 were left eye. Mean age of patients was 50.5 years with average of 40-60 years.

**Results:** The pre laser mean iop was 18mm of Hg ranges from 23 to 55mm of Hg and post-laser mean iop was 15 to 34mm of Hg. The mean decrease of iop was 3mm of Hg.YAG-LASER iridotomy was blocked in 10 (14.3%) eyes. Only 20 (28.6 %) eyes required simple iridotomy to control iop,32 ( 45.7%) eyes required added medical treatment and 18(25.7%) eyes required surgical treatment including glaucoma surgery 10(14.3%) trabeculectomy, 8 (11.4%) required phaco with pc iol. Mean i.o.p decrease was 3 mmHg. Eyes which require additional treatment had history of long duration of symptoms, history of intermittent attacks of AACG resolved with medications.

**Conclusion:** This study confirms that YAG laser peripheral iridotomy as primary mode of therapy may be inadequate to prevent recurrent of PACG (and inadequate prophylaxis iridotomy in cases of PACG). It is suggested that in selected cases other methods should be considered as a primary procedure.

**Key words:** Glaucoma, iridotomy, LASER

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## **INTRODUCTION**

Glaucoma is one of the leading causes of severe visual impairment and blindness worldwide. Angle closure glaucoma is an ophthalmic emergency, which affect on vision and some time patient loss his vision. It needs an urgent management to lower the IOP and minimize the risk of vision loss.<sup>1</sup>

It has been estimated that 3.9 million people worldwide will be blind owing to primary angle closure glaucoma by 2010 and this figure will rise to 5.3 million in 2020.<sup>2</sup> Glaucoma is approximately present in 0.6% or less in general population and primary angle glaucoma is approximately in 6% of all patients. There are certain characteristic features of eyes which could develop angle closure glaucoma including shallow anterior chamber, narrow angle, small corneal diameter, short axial length, thickness and relative anterior displacement of lens<sup>3,4,5</sup>.

YAG laser peripheral iridotomy is the proven prophylactic treatment for the symptomatic angle closure glaucoma. It eliminates the pupillary block by passage of aqueous from posterior to anterior

chamber which result in significance decrease in intraocular pressure<sup>6</sup>.

## **METHODS AND MATERIAL**

This study was conducted in Mayo hospital/ K.E.M. University Lahore from 1.1.07 to 31.12.07. This study was under taken as a consecutive group of 70 eyes of 70 patients aged varies from 40 to 60 years included 46 women and 24 men, 42 right 28 left eye presenting with history of acute angle closure glaucoma (AACG) and diagnosis was established on the basis of history of eye pain, blurring of vision and confirmed by finding a raised intraocular pressure (i.o.p), mid dilated pupil, corneal edema. The anterior chamber examined by direct observation, by slit lamp examination, angle examined by Gonioscopic. We included those eyes in this study in which 28 eyes who had history of recurrent attack of acute angle closure glaucoma 30 eyes with chronic angle glaucoma, 8 eyes pupil block with to silicone oil, in 4 eyes glaucoma due to incomplete surgical iridectomy .Data was collected on data form included, patients name, age, gender, personal and family history, ophthalmic history, including anti glaucoma treatment, ophthalmic surgery, contact lens, allergy. Complete ophthalmic examination including best corrected vision, adenaxa and external ocular examination including pupillary reflex and slit lamp examination of the anterior segment. Intra ocular

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pressure measure by Goldman applanation tonometer, angle examination carried out by Goldman gonioscopic.

Patient was admitted to hospital to control raise i.o.p by anti glaucoma medication to breaks the acute attack. (Tab diamox, pilocarpine eye drops, 0.5% timoptal eye drops, and mild steroids), after the acute attack was controlled YAG laser iridotomy was performed. And stop ant glaucoma medication. Patency of iridotomy was confirmed by slit lamp. If the iop was not controlled only by iridotomy start ant glaucoma medication if needs to do surgical intervention to control iop.

## RESULTS

We treated 70 eyes in this study who had history of recurrent attack of acute angle closure glaucoma in 28(40%) or patients with chronic angle glaucoma 30 eyes (43.0%), pupillary block due to silicone oil 8eyes(11.4%), glaucoma due to incomplete surgical iridectomy 4(5.7%)

Nd YAG laser peripheral iridotomy was performed with an Abraham lens. 2% pilocarpine was instilled in to eye 15 minutes before procedure. Then one drop of local anesthetic was to instilled, followed by placement of an Abraham contact lens on superior iris to assess the iris crypts from 10 to 2'o clock position. YAG laser was applied with initial setting of 2mj and then increases up to 4.5mj until the iris was fully perforated and aqueous was drained in to the anterior chamber and 0.3 mm size of iridotomy achieved. Laser applications and energy setting was recorded.

Table 1

No. of male patients	No. of female patients	Total
24	46	70

Out of 70 eyes 24 (34%) were male and 46 (66%) were female (Table 1). Initial diagnosis of eyes treated with YAG-LASER iridotomy (Table 2).

We noticed that 10 eye had raised iop more than 5mm of Hg after two hours of YAG laser iridotomy. Patent iridotomy were present in 60 eyes out of 70 (86%) eyes. There were bleeding in 6 eyes during the application of YAG laser iridotomy but controlled by applying pressure by iridotomy lens. We considered unsuccessful iridotomy to those in which iop was >21mm of Hg with patent iridotomy. And they need further medical and surgical management. We divided our study in three groups: In group A 20 eyes(30%) required no further treatment after Nd-YAG laser iridotomy, in group B 32 (45.71) eyes require additional medication to control iop. While In

group C 18 eyes (25.71%) required additional surgical management. 10 eyes required glaucoma surgery and 8 required phaco with iol implant (Table 3). On gonioscopic examination group a showed narrow angle, group B showed adequate angle, and group C represents eyes with compromised angle function. The mean duration of symptoms of group A was days 2.12 days (median 1 day) while the group B it was 3.98 days (median 2 days), group C it was 5.56 (median 3 days), this showed statistically significantly longer duration of symptoms in group C (rank sum test, p<0.01). The level of the i.o.p at presentation was not significantly different in these groups. In group A 10 eyes (20%) had a history of previously resolved AACG attack, where in group B 16 eyes (23%), in group C 22 eyes (31.6%) had similar symptoms (Table4).

Table 2: Primary angle closure glaucoma treated with Nd-YAG LASER Iridotomy: Group A, B, C

	A	B	C
Mean duration of symptoms (days)	2.12	3.98	5.56
Median duration of symptoms (days)	1	2	3
Presenting iop (mmHg)	51	42	48
Number of eyes with history of resolving AACD	10	16	22
%age of eyes with history of resolving AACD	20%	23%	31.6%

Table 3:

Non medication	Medications	Surgery
22	30	18

Table 4: Diagnosis of eyes treated with Nd-YAG LASER Iridotomy (n=70)

Diagnosis	No. of eyes	%age
AACG	28	40
CACG	30	43
Sec.pupil block	8	11.4
Incomplete surgical iridectomy	4	5.7

## DISCUSSION

YAG laser peripheral iridotomy is an establish procedure for angle closure glaucoma treatment. It is an approved prophylactic treatment for the prevention of the symptomatic angle closure. It eliminates the risk of acute attack in the fellow eye<sup>7</sup>.

It equilibrates the pressure between anterior chamber and posterior chamber by allowing the aqueous passes from posterior chamber to anterior chamber but results depend upon the stage of disease when there is no ischemia or damage o the trabecular meshwork, angle, C.D ratio the Nd-YAG laser is an ideal treatment procedure. On gonioscopic examination, we noticed the narrow drainage angle

showed a significance change in the anterior segment anatomy. In this study we noticed that duration of symptoms prior to presentation is significant in distinguishing between patients who will be relieved by simple iridotomy or required antiglaucoma medication or surgery we noticed that longer the duration of attack may leads to angle damaged and change in treatment to control iop .If the past history suggestive of spontaneous resolution of AACG in short duration. Only iridotomy control iop and if longer period of AACG attack (damaged the angle) prior to treatment medical and surgical management required for control of iop. (Our study showed that peripheral iridotomy does not change the axial length of eye. Gizzard et al<sup>8</sup> also confirmed that YAG laser peripheral iridotomy does not change the axial length of eye). Nd-YAG laser peripheral iridotomy. On Gonioscopic examination we noticed that in majority of cases there is no change in extent of angle in our study 10 eyes showed synechia was present at 5 -8o clock position there was no change in the extent of PAS during the follow up period. He et al<sup>9</sup> noticed that there is significance increase in angle width .Nolan<sup>2</sup> reported that although widening of the drainage angle has been documented by others but less quantitative method were used<sup>10</sup>. We noticed in our study that IOP decrease 4mm of Hg after YAG laser peripheral iridotomy. Schwenn<sup>11</sup> also recorded the reduction in i.o.p. We noticed in our study that there was rise in IOP from 5mm of Hg 10mmHg after 1 to 2 hours after YAG laser peripheral iridotomy. Krupin et al<sup>12</sup> reported that increase ranged from 3.4 to 10.3mmHg and then decrease 3.9 mm of Hg within 24 hours in European eyes after YAG laser iridotomy.

We noticed that removal of the lens create more space in the anterior chamber; widen the angle which may help in control of intra ocular pressure. In our study (8 eyes) 11.3% eyes had done phaco with intra ocular lens implantation resulting in deepen the anterior chamber to control intraocular pressure. Also confirmed by PACHIMKUL P. et al. R H GRAY et al noticed that 10% eyes underwent surgical iridotomy and 15% went on trabeculectomy despite a clinically patent iridotomy. Our study also showed 14.4% eyes with trabeculectomy to control intraocular pressure our study showed that in acute eye there is increase risk of iris bleeding 10% compare to 1.5% in fellow eyes. R H Gray et al also noticed that in acute eye risk of bleeding increased 16%comared to 3% in fellow eye SAUNDERS also noted the same results. In our study long term patency of Nd-YAG laser iridotomy was good, 30 eyes (85.7%) of eyes iridotomy remained patent. Closed or less effectiveness of iridotomy seems to be related to

small initial hole 10 iridectomies was closed in our study due to pigment epithelium proliferation, closure and failure of the iridotony seems to related to small initial holes closure MAZAR<sup>1</sup> 3et al also noticed the 94% iridotony were patent .SCHWENN stress the importance of large iridotony to prevent late failure as in nine out of ten had causes of late failure is smaller iridotony series (150 micrometer or less)

## CONCLUSION

This study confirmed that YAG laser peripheral iridotony should be given consideration as prophylactic procedure in selective cases as it may inadequate to prevent recurrent AACG in cases of various form of angle closure glaucoma.

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