Original Article/นิพนธ์ต้นฉบับ

ประสิทธิภาพในการแก้ไขมุมม่านตาปิดโดยการรักษาด้วย Sequential Argon-YAG Laser Iridotomy

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาถึงประสิทธิภาพในการแก้ไขมุมม่านตาปิดโดยการรักษาด้วย sequential argon-YAG laser iridotomy

วิธีการศึกษา: เป็นการศึกษาในผู้ป่วยที่มีมุมม่านตาแคบและมุมม่านตาปิด จำนวน 91 ตาใน 52 รายที่มารับการรักษาที่โรงพยาบาลเมตตาประชารักษ์ (วัดไร่ขิง) ระหว่างเดือนเมษายนถึงตุลาคมปี พ.ศ. 2547 โดยผู้ป่วยจะได้รับการตรวจวัดการมองเห็น ตรวจตาด้วย slit lamp ตรวจวัดความดันลูกตา ตรวจดูมุมม่านตา (gonioscopic examination) และตรวจดูขั้วประสาทตา หลังจากนั้นผู้ป่วยทุกรายที่มีมุมม่านตาปิดจะได้รับการรักษาด้วยเลเซอร์ (sequential argon-YAG laser iridotomy) หลังได้รับการรักษาด้วยเลเซอร์ ผู้ป่วยจะได้รับการตรวจวัดความดันลูกตา และตรวจดูภาวะแทรกซ้อนจากการรักษาด้วยเลเซอร์ และได้รับการติดตามผลที่ 1 สัปดาห์, 1 เดือน, 3 เดือน และหลังจากนั้นอีกทุกๆ 3 เดือน

ผลการศึกษา: มีผู้ป่วยจำนวน 52 ราย (91 ตา) ได้รับการยิงเลเซอร์เพื่อแก้ไขมุมม่านตาปิด ระยะเวลาการติดตามผลเฉลี่ย (±SD) เท่ากับ 12.92±6.24 เดือน ไม่มีผู้ป่วยรายใดเลยที่มีการตันของรูม่านตาที่เกิดจากการยิงเลเซอร์เมื่อติดตามผลครั้งสุดท้าย พบว่าการรักษาด้วยเลเซอร์ (sequential argon-YAG laser iridotomy) อย่างเดียวมีประสิทธิภาพในการแก้ไขมุมม่านตาปิดได้ 81 ตา (ร้อยละ 89.01) ผู้ป่วย 10 ราย (ร้อยละ 10.99) ได้รับการรักษาเพิ่มเติมโดย argon iridoplasty และมี 1 ราย (ร้อยละ 1.1) ได้รับการผ่าตัด trabeculectomy เพื่อควบคุมความดันลูกตา ไม่มีผู้ป่วยรายใดเลยที่มีสายตาแย่ลงหลังการรักษาด้วยเลเซอร์ และไม่พบภาวะแทรกซ้อนที่รุนแรงจากการยิงเลเซอร์

สรุป: การรักษาด้วยเลเซอร์โดยวิธี sequential argon-YAG laser iridotomy เป็นวิธีที่มีประสิทธิภาพ และปลอดภัยในการแก้ไขผู้ป่วยส่วนใหญ่ที่มีมุมม่านตาปิด **จักษุเวชสาร 2550; กรกฎาคม-ธันวาคม 21(2): 98-102.**

ศูนย์การแพทย์เฉพาะทางด้านจักษุวิทยา โรงพยาบาลเมตตาประชารักษ์ (วัดไร่ขิง)

Original Article/นิพนธ์ต้นฉบับ

Sequential Argon-YAG Laser Iridotomy for Occludable Drainage Angle

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Abstract

Aim: To evaluate the efficacy of sequential argon-YAG laser iridotomy as a treatment of occludable drainage angle.

Methods: This prospective observational study comprised 91 eyes of 52 subjects with occludable drainage angles who were treated with sequential argon-YAG laser iridotomy at Mettapracharak hospital from April to October 2004. Gonioscopic findings, patency of iridotomy, visual acuity, intraocular pressure (IOP)and complications of treatment were recorded. The patients were asked to return for follow-up at 1 week, 1 month, 3 months and then every 3 months. The treatment was classified as successful in eyes with patent iridotomy and the drainage angle was no longer classified as occludable after treatment.

Results: Mean follow-up period (±SD) was 12.92 (±6.24) months. All eyes had patent iridotomy at the time of last follow-up. Successful outcome were found in 81 eyes (89.01%) with sequential argon-YAG laser iridotomy alone. Nine eyes (9.89%) required additional argon iridoplasty to widen drainage angle at least 180 degree and one eye (1.1%) required trabeculectomy to control IOP. None of the subjects had decrease BCVA and no serious complication was found after the laser treatment.

Conclusion: Sequential argon-YAG laser iridotomy is a safe and effective treatment in widening the drainage angle in the majority of the eyes with occludable drainage angle. **Thai J Ophthalmol 2007; July-December 21(2): 98-102.**

Keywords: *Laser iridotomy, occludable angle, laser iridoplasty.*

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Introduction

Glaucoma is one of the leading causes of blindness of the world. It had been estimated that 66.8 million people from all over the world were suffering from glaucoma in 2000.[1] The prevalence of primary angle closure glaucoma (PACG) is higher in Asians than Caucasians. The prevalence of PACG in Asian eye is around 0.5-1.2% in people with the age of 40 or older.[2-5] Bourne RR et al reported the prevalence rate of 0.9% of PACG and 14% of occludable drainage angle in Rom Klao District, Bangkok, Thailand in 2003.[5]

Laser iridotomy is an effective treatment for PACG although some topical medications or surgeries may be required in advanced cases.[6-8] Prophylactic iridotomy can decrease risk of developing an episode of angle closure in the unaffected fellow eye of patients who have had acute angle closure.[6] Iridotomy can make the drainage angle widening by eliminating the relative papillary block which is one mechanism for the development of angle closure. But there are some mechanisms which are non pupillary block that can contribute angle closure which the benefit of iridotomy in such cases are not clear.

In this study the authors evaluated the efficacy of sequential argon-YAG laser iridotomy in the management of occludable drainage angles with and without glaucoma. Vision change and complications after the laser treatment were also evaluated.

Materials and Methods

This is a prospective study. The authors studied in 52 subjects (91 eyes) with occludable drainage angle who attended the eye clinic of Mettapracharak hospital from April to October, 2004.

The drainage angle was defined as occludable angle when three quarters or more of the posterior pigment trabecular meshwork was not visible on viewing gonioscopy in the primary position of gaze without indentation. Ocular examination in all subjects included visual acuity (by mean of Snellen charts), anterior segment examination and intraocular pressure (by Goldmann applanation tonometry). Gonioscopy was performed with Zeiss-4-mirror goniolens. The width of the drainage angle was recorded in four quadrants. The optic disc was examined by using 90D lens with slit lamp examination on undilated pupil. Patients with an occludable drainage angle and glaucomatous optic neuropathy were diagnosed primary angle closure glaucoma (PACG). Sequential argon-YAG laser iridotomy was performed in eyes with an occludable drainage angle by using argon laser (Visulas Argon II; Zeiss, Oberkochen, Germany) first to make the initial bore and then Nd-YAG laser (Visulas YAG II; Zeiss, Oberkochen, Germany) to complete the perforation. The intraocular pressure was checked at one and two hours after the procedure. Then the patients were asked to return for follow-up at 1 week, 1 month, 3 months and every 3 months. The treatment was defined as successful in eyes with patent iridotomy and the drainage angle was no longer classified as occludable after the procedure.

Statistical Analysis

Mean (±Standard deviation, SD), range and frequency (%) were used.

Results

Ninety one eyes of 52 patients (14 males and 38 females) were treated with sequential argon-YAG laser iridotomy. The mean follow-up period (±SD) was 12.92 (±6.24) months (range 6-23 months). All eyes had patent iridotomy at the time of last follow-up. Of 91 iridotomy treated eyes, 81 (89.01%) were no longer classified as occludable angle and 10 (10.99 %) had the remaining occludable angle which were underwent argon laser iridoplasty. Nine of those ten eyes had the drainage angle opening at least

180 degrees after the laser iridoplasty. Only one eye still had occludable drainage angle and the intraocular pressure was not controlled. Trabeculectomy was performed in this patient. The other eyes had well controlled intraocular pressure with or without some medications after sequential argon-YAG laser iridotomy.

In eyes those were classified as successful treatment after sequential argon-YAG laser iridotomy the median change in angle width before and after iridotomy was an increase in two Shaffer grades.

None of the patients had decreased best corrected visual acuity (BCVA) after the procedure. Complications from sequential argon-YAG laser iridotomy in this studied population were shown in Table 1. The acute intraocular pressure rising after sequential argon-YAG laser iridotomy in 6 eyes (6.59%) were transient which could be lowering to normal range by some medications within 3 hours. Eight eyes (8.79%) had minimal intraoperative bleeding and could be stopped by pressuring the laser contact lens on the eyes within a minute and resolved within 48 hours. Two eye (2.2%) had focal endothelial damage which could resolve within 7 days after laser treatment.

Discussion

Many studies have been performed to evaluate the efficacy of laser iridotomy as a treatment of primary angle closure and prophylaxis for the fellow eye. These studies reported the success rate between 73.4-100%.[9-15] Our study showed the success rate of 89.01%. The difference of the results could be from different population studied, laser technique and follow-up period. The median change in angle width before and after laser iridotomy was an increase in two Shaffer grades in our study. The same result was reported by Nolan WP et al in 2000.[14] Nine eyes in our study required an additional laser treatment (laser iridoplasty) to open the drainage angle and trabeculectomy was needed in only one eye that the intraocular pressure was not controlled after laser iridotomy and iridoplasty.

The authors found some complications after sequential argon-YAG laser iridotomy included acute intraocular pressure rising, focal endothelial damage and intra-operative bleeding. Six in 91 eyes (5.49%) had acute intraocular pressure rising after the laser treatment in our study. Shani L et al reported 21.2% of acute intraocular pressure rising for ten or more mmHg within two hours after Nd-YAG laser iridotomy which was higher than ours.[16] The different rate of this complication may be from different laser technique used and time of intraocular pressure monitor. In addition to acute intraocular pressure rising, two eyes in our study had focal endothelial damage from the laser treatment and eight eyes had intra-operative bleeding which could be stopped by pressuring the laser contact lens on the eyes. One patient complaint of glare after the laser treatment but the symptom was disappeared at 3 months follow-up. None of the eyes in our study had decrease BCVA at one week follow-up period.

In conclusion, sequential argon-YAG laser iridotomy is an effective treatment to open the drainage angle of the eyes in most subjects with occludable drainage angle and the serious complication from this procedure is extremely low.

Table 1 Complications from the laser treatment

Type of complication	No. of eyes (%)
Acute IOP rising ≥ 10 mmHg	6 (6.59)
Focal endothelial damage	2 (2.2)
Intra-operative bleeding (minimal)	8 (8.79)
Glare	1 (1.1)
Total	17 (18.68)

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