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Long-term Outcome of Argon Laser Peripheral Iridoplasty in the Management of Plateau Iris Syndrome Eyes

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Abstract

Purpose—To report long-term (>5 years) outcomes of plateau iris syndrome patients treated with argon laser peripheral iridoplasty (ALPI).

Patients and Methods—A retrospective chart review was performed on all patients with plateau iris syndrome treated with ALPI from 1996 to 2007. The study included 22 eyes from 22 patients with plateau iris after peripheral iridotomy that were followed for at least 1 year after ALPI. The primary outcome was incidence of needing any intraocular pressure (IOP)-lowering medications or surgery (either a filtering procedure or phacoemulsification). Demographic and baseline clinical data were summarized by mean ($\pm$ standard deviation) or frequency (percentage). Snellen best-corrected visual acuity was converted to logMAR. The paired *t*-test was used to compare IOP changes, number of IOP-lowering medications, and best-corrected visual acuity from baseline to annual follow-up.

Results—Mean follow-up was 76 months. Only 2 (9%) eyes maintained an IOP <21 mm Hg without requiring medication or surgery. Seventeen (77%) eyes underwent surgery at an average of 49.1 ± 7.9 months after ALPI. Eight (36%) eyes underwent filtering surgery, and 9 (41%) eyes underwent phacoemulsification. Three months after cataract extraction, no eyes required IOP-lowering medication.

Conclusions—The beneficial effects of ALPI last for less than 4 years, with the majority of patients (77%) requiring surgery. Phacoemulsification alone was a successful treatment for plateau iris in our patient population.

Keywords

Iridoplasty; glaucoma; plateau iris; laser peripheral iridotomy

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INTRODUCTION

Primary angle closure glaucoma (PACG) is a leading cause of blindness. It is estimated that 5.3 million people will be blind worldwide from PACG by 2020,¹ and the estimated number of those affected by PACG will rise from 23 million in 2020 to 32 million in 2040 worldwide.² Pupillary block, in which iris-lens apposition prevents the normal flow of aqueous, is the most common cause of primary angle closure (PAC).^{3, 4} However, angle closure may also be caused by plateau iris syndrome (PIS), in which a larger than normal or anteriorly positioned ciliary body narrows the angle by physically apposing the iris root against the trabecular meshwork, inhibiting the flow of aqueous.⁵

Laser peripheral iridotomy has long been considered the initial treatment for PAC by creating a conduit for aqueous flow that bypasses the pupillary block. Some eyes with gonioscopic plateau iris configuration are adequately treated with iridotomy alone. However, if a patent iridotomy fails to deepen the angle and lower IOP, PIS is the likely etiology.^{5, 6} Patients with PIS are treated with argon laser peripheral iridoplasty (ALPI), where multiple laser burns are placed in the peripheral iris to deepen the angle recess by contracting the iris and pulling it away from the trabecular meshwork. When ALPI and/or medications fail to adequately control IOP, filtering surgery or phacoemulsification lens extraction may be necessary.

Ritch et al reported that in their study 20 of 23 PIS eyes (87%) remained open 6.5 years after a single treatment of ALPI.⁶ Despite the high percentage of angles that deepened after a single ALPI treatment, the changes of IOP were not statistically different from pre-ALPI to the last visit. In addition, IOP remained elevated (IOP > 21 mmHg) in 5 of 23 eyes (22%), and 10 eyes (43%) were on pilocarpine at the last follow-up. Although only one eye underwent phacoemulsification during the follow-up period, the mean visual acuity was significantly decreased due to cataract development. Thus, the overall clinical efficacy of ALPI for treating PIS may have to be re-evaluated.

The goal of this study is to report long-term overall clinical outcomes of ALPI for patients with PIS, with success defined as IOP ≤ 21 mm Hg without the need for IOP-lowering drops, filtering surgery, or phacoemulsification.

PATIENTS AND METHODS

A retrospective chart review was performed to identify all patients with PIS who were treated with ALPI at the Robert Cizik Eye Clinic of the Ruiz Department of Ophthalmology and Visual Science at the McGovern Medical School at The University of Texas Health Science Center at Houston (UTHealth) from 1996 to 2007 and followed for at least 1 year. This study was reviewed and approved by The University of Texas Committee for the Protection of Human Subjects (Institutional Review Board/Ethics Committee). All research followed the tenets of the Declaration of Helsinki and was HIPAA compliant.

Study Population

Charts were identified using CPT codes corresponding to ALPI, and only patients with a diagnosis of nonacute PAC who had a patent peripheral iridotomy at the time of ALPI were included. Patients were excluded if they had any previous intraocular surgery or less than 1 year of follow-up. In each patient, only the first eligible eye treated with ALPI was selected.

A clinical diagnosis of PIS was based on the criteria suggested by Tran et al⁷ that despite the presence of a patent peripheral iridotomy during dark room gonioscopic examination, the presence of iridotrabecular appositional angle close, an iris root angulating forward and then centrally, a flat or slightly convex iris contour, and a double hump sign on indentation gonioscopy is required.

Gonioscopic Examination

Gonioscopy was performed using a Posner 4-mirror lens at high magnification (10x), with the eye in the primary position of gaze under the lowest possible ambient lighting conditions by turning off all ambient light sources and closing the door of the exam room. Gonioscopic examination was first performed without indentation, with care taken to minimize light from the slit lamp beam from entering the pupil.

Gonioscopic examination results were recorded before and after the ALPI procedure and routinely at subsequent visits to monitor for any angle configuration changes. Peripheral angles were graded using the Spaeth grading system,^{8,9} and iris bow and presence or absence of peripheral anterior synechiae (PAS) were recorded.

ALPI Procedures

ALPI was performed by one of 2 glaucoma specialists (RMF or NPB). Each surgeon used similar techniques. Typical ALPI settings were a spot size of 200–400 μm with a power of 250–500 mW per shot for 0.2 seconds, titrated until a visible contraction of the iris was noted. No lens was used during the procedure.

Data Collection

Data collected included participant demographics, visual acuity, IOP, number of IOP-lowering medications, gonioscopic exam, glaucomatous visual field and/or optic disc damage, and the dates, types and reason of subsequent procedures (i.e. repeat ALPI, phacoemulsification, or trabeculectomy). Scheduled study visits included the pre-ALPI (baseline) visit and all appointments post-ALPI corresponding to annual (± 6 months) visits. If no data were recorded in a scheduled follow-up window, this was considered as missing data at that time point. If an eye underwent trabeculectomy after ALPI, the last visit was the visit before trabeculectomy.

Data Analysis

Demographic and baseline clinical data were summarized by mean ($\pm$ standard deviation) or frequency (percentage) for categorical variables. Snellen best-corrected visual acuity (BCVA) was converted to logMAR by $-\log_{10}(\text{BCVA})$. The paired *t*-test was used to compare

changes of IOP, number of IOP-lowering medications, and BCVA from baseline to annual follow-up.

The primary outcome measure was the incidence for needing any IOP-lowering medical or surgical treatment. A complete success was defined as IOP ≤ 21 mm Hg without IOP-lowering medications, filtration surgery, and/or phacoemulsification. A qualified success was defined as an eye without additional filtration surgery and/or phacoemulsification. A repeat ALPI during the follow-up period was not considered as an additional surgical treatment or failure of the initial ALPI procedure. The secondary outcome was to compare the extent of angle opening grades at the first and the last visit after ALPI to before ALPI.

All statistical tests were conducted at a 5% level of significance. Analysis was performed using SAS software version 9.4 for Windows (SAS Institute, Inc., Cary, NC).

RESULTS

Thirty patients with 49 eyes that underwent ALPI between February 1996 and June 2007 were identified. A total of 27 eyes were excluded from the study for the following reasons: 5 eyes from 3 patients did not have a previous iridotomy; 5 eyes from 4 patients had an iridotomy performed after ALPI; 4 eyes from 3 patients had less than 12 months of follow-up; and 13 eyes were the second eye of previously included patients. Thus, we included a total of 22 eyes from 22 participants in our study (Figure 1). The mean age was 57.7 (± 10.2) years. Four (18%) participants were male. Fourteen (64%) participants were White, 5 (23%) Hispanic, and 3 (14%) Black. Fourteen (64%) study eyes were the right eyes. Eyes were followed for a mean of 76 months (± 39), ranging from 19 to 170 months.

Baseline Characteristics

Gonioscopy prior to the procedure revealed appositional closure with Spaeth grade A or B in 4 (18%) and 12 (53%) eyes, respectively. Six (29%) eyes with Spaeth grade C had a plateau iris configuration as determined by gonioscopy (steep insertion and a double hump sign by indentation gonioscopy) and verified by ultrasound biomicroscopy. In addition, 4 of these 6 eyes had elevated IOP. Eighteen (82%) eyes had no iris bow, and 7 (32%) eyes had PAS.

Eleven eyes (50%) had elevated IOP (> 21 mmHg or on IOP-lowering medications) at baseline. Seven (32%) eyes used at least one IOP-lowering medication, and 2 (9%) eyes had glaucomatous visual field damage with or without optic nerve damage. The mean ($\pm$ SD) treated IOP and logMAR visual acuity were 21.3 (± 7.1) mmHg and 0.32 (± 0.84) logMAR, respectively. ALPI was performed at a mean time of 33.7 months (± 71.7) after initial iridotomy.

Outcomes

Gonioscopy—A gonioscopic exam was performed in 21 of 22 study eyes (95%) during the first follow-up visit after ALPI. Spaeth grading showed that the angle deepened in 15 eyes (71%) by at least one grade (Table 2) and did not improve in 6 eyes (29%) after ALPI. Of these 6 eyes with no improvement in angle grading, 3 eyes had peripheral iris flattening from steep to regular and/or angular approaches increased by at least 10 degrees. In the other

3 eyes, the angle did not deepen after the first ALPI treatment, and repeat ALPI was performed.

Ten of 21 (48%) gonioscopically examined eyes were open to at least Spaeth grade C at the last follow-up visit or prior to additional surgery (phacoemulsification or trabeculectomy).

Repeat ALPI—Seven eyes were either not improved after the initial treatment (3 eyes) and/or gradually narrowed during the follow-up period and required a repeat ALPI at an average of 48 months (± 30) after the initial ALPI. All angles were deepened by at least one Spaeth grade after repeat ALPI, except one eye where appositional closure was not deepened, but the peripheral iris grade was no longer steep (Table 3).

Intraocular Pressure and Number of IOP-lowering Medications—The mean IOP measured at the first visit after initial ALPI was 16.6 mmHg (± 5.9), which was reduced by 4.7 mmHg (± 6.7) from baseline IOP ($P=0.004$). Of 7 eyes on IOP-lowering medications prior to ALPI, one eye was not using medications at the first postoperative visit, and medications were increased in 2 eyes. No medications were added to the eyes which were not on IOP-lowering medications preoperatively (Table 4).

At the last visit or the visit before additional treatment, the mean IOP (19.7 mm Hg [± 6.4]) gradually increased to the baseline level (21.3 mmHg [± 7.1], $P=0.38$), but the number of the eyes on IOP-lowering medications doubled from 7 eyes at baseline to 14 (64%) eyes.

Additional Treatment—Two eyes (9%) eyes did not require any medication or surgery (complete success), and 3 eyes required IOP-lowering medications without any other IOP-lowering procedures (qualified success). The remaining 17 eyes (77%) required a surgical procedure at a mean time of 49.1 months (± 7.9) after the initial ALPI (Figure 2). Eight (36%) eyes required filtering surgery with or without phacoemulsification with intraocular lens implantation, and 9 (41%) eyes underwent phacoemulsification with intraocular lens implantation alone (Figure 2). The indication for additional medical and surgical treatment for each participant is listed in Table 4 with Spaeth grade, IOP, and number of IOP-lowering medications at visits before ALPI, first visit after ALPI, and before additional treatment.

Eight eyes underwent filtering surgery with or without phacoemulsification and intraocular lens implantation after ALPI. The indications for surgery were progressive glaucomatous visual field and/or optic disc damage ($n=3$) and uncontrolled IOP on maximum tolerated IOP-lowering medications ($n=3$). The remaining 2 eyes underwent unplanned trabeculectomy with anterior vitrectomy due to vitreous prolapse in a planned surgical iridectomy. All 6 eyes that underwent planned trabeculectomy were on IOP-lowering medications with a mean treated IOP of 23.3 mmHg (± 8.2) prior to additional surgery.

Nine eyes underwent phacoemulsification and intraocular lens implantation only. Four eyes had cataracts with visual acuities worse than 20/40 and a stable angle prior to the cataract surgery. Three eyes had visual acuities of 20/20 and underwent a clear lens extraction for the purpose of deepening the angle. Two eyes had cataracts with angle narrowing. These 9 eyes were followed for a mean of 41 months (± 42) after phacoemulsification and intraocular lens

implantation. The 5 eyes that had angle narrowing before phacoemulsification were deepened by 1 to 3 Spaeth grades, and all 9 eyes had angles opened to Spaeth grades C or D. In addition, 5 of 9 eyes that were using IOP-lowering medications prior to surgery were free of IOP-lowering medications with IOP < 21 mmHg. All eyes had visual acuity 20/30 or better at the last visit (Table 5).

Annual Intraocular Pressure and Visual Acuity—Table 6 shows the treated IOP, number of IOP-lowering medications, and visual acuity at the annual follow-up visits for eyes prior to additional surgical treatment. Treated IOP was significantly reduced at year 1 and then gradually increased by year 5. After year 2, the number of IOP-lowering medications used significantly increased. Visual acuity after ALPI decreased between years 2 and 4.

DISCUSSION

ALPI involves the application of argon laser to the peripheral iris, resulting in immediate shrinkage due to coagulation of collagen, followed by the long-term formation of fibroblastic membranes that contract the iris, ultimately pulling it away from the angle.¹⁰ Although ALPI is sometimes used to help break acute attacks of PAC,³ it is often utilized to treat PIS after iridotomy fails to deepen the angle. In addition, ALPI may reduce the needs for filtration surgery in PACG eyes with patent iridotomy.¹¹ In this study, we demonstrated that while ALPI is effective in the short term, the majority of eyes required surgical intervention to manage progressive angle narrowing and control IOP. In addition, our findings suggest that phacoemulsification alone may be a successful treatment for patients with PIS.

Our results showed that at year 1 the majority of patients that underwent ALPI had their IOP controlled on topical medication. However, in our study, at 2 years after ALPI, additional IOP-lowering medications became increasingly necessary, suggesting that the effects of ALPI were subsiding. Visual acuity also decreased over this time period. Given the age of our participant population, this is likely attributed to cataract formation, and less likely to be a direct result of ALPI.

Most prior studies examining success rates of ALPI in PAC eyes either evaluated the acute angle closure attack setting or had only short-term follow-up. However, one other long-term study by Ritch et al followed 23 eyes from 14 patients with PIS treated with ALPI after iridotomy for an average of 6.5 years and reported that 3 eyes (13%) had gradual reclosure of the angle that required a repeat ALPI procedure to reopen the angle; 1 eye (4%) developed progressive glaucomatous visual field damage; and 3 eyes (13%) required further glaucoma procedures (2 eyes required argon laser trabeculoplasty, and 1 eye required a repeat iridotomy for closure of iridotomy).⁶ In our study, although ALPI did help open angles with PIS, the effects were short-lived. Seventeen patients (77%) required filtering surgery and/or phacoemulsification after 4 years.

The differences between our findings and those in the Ritch et al study are likely attributed to different patient populations, ALPI settings, outcome measures, and different

management options available to the treating physicians. First, our study eyes had higher IOP (mean IOP = 21.3 mmHg) prior to ALPI with less eyes on IOP-lowering medications (7 eyes [33%] on 1 – 2 medications) compared to Ritch study (mean IOP = 18 mm Hg with 16 eyes [70%] on pilocarpine, 7 [30%] on beta blockers, 2 [9%] on dipivefrin, and 2 [9%] on oral acetazolamide).⁶ In addition, 7 eyes (33%) in our study had PAS, and 2 eyes (9%) had glaucomatous damage before ALPI, while PAS was not documented and no eyes had glaucomatous damage in the Ritch study.⁶ It is likely that our study population had more advanced disease than the patients in the Ritch study.

Secondly, to avoid atrophic iris scarring, our ALPI settings were of less strength (spot size of 200 – 400 μ m for 0.2 seconds) and required more applications (mean 36 spots) compared to the settings in Ritch et al (spot size of 500 μ m for 0.5 seconds with an average of 29 spots).⁶ It is expected that a repeat ALPI may be required using our settings; thus, an eye with repeat ALPI was not considered as a failure of ALPI treatment.

Thirdly, the long-term outcome after ALPI was assessed using the criteria proposed by Rosman et al for evaluating the outcome after laser peripheral iridotomy in chronic angle closure glaucoma eyes. The failure criteria were a rise in IOP (IOP > 21 mmHg) during follow-up and requiring treatment by medication or surgery (as deemed necessary by the clinician involved).¹¹ These outcome measures were created to treat the patient and not just the angle.

Finally, the management options were different between 2 studies. Visual acuity at the last visit was significantly reduced from pre-ALPI in the Ritch et al study. Only one eye underwent phacoemulsification in their study; however, 11 eyes (48%) had a visual acuity 20/40 or worse.⁶ In our study, 9 patients (40%) who underwent phacoemulsification alone had the angle opened to Spaeth grade C or D and visual acuity of 20/30 or better at the last visit. All of these eyes were free of IOP-lowering medications with IOP < 21 mm Hg after phacoemulsification. A number of recent studies have demonstrated that lens extraction effectively lowers IOP and maintains an open angle in eyes with PAC after LPI.^{12–14} It is not clear exactly why the IOP drops after cataract surgery. Several possible hypotheses have been proposed: (1) slimmer IOL replacement of the thicker crystalline lens deepens the anterior chamber and widens the angle^{15, 16}; (2) as the scleral spur relaxes after cataract surgery, the trabecular beams may be mechanically pulled open with consequent improved aqueous outflow¹⁷; (3) trabecular endothelial remodeling due to ultrasonic energy from the phacoemulsification handpiece¹⁸ or mechanical stretching caused by high intraoperative IOP¹⁹; and (4) irrigation of the anterior chamber at the end of cataract surgery may flush debris in the angle. However, these are not the definitive answers. A prospective randomized study comparing ALPI versus lens extraction as treatment (after iridotomy) could help determine the best clinical management for PIS.

Another difference in managing PIS patients between the 2 studies was that while no eyes underwent filtration surgery in the Ritch et al study, 5 eyes had an elevated IOP (IOP > 21 mmHg), 10 eyes were on pilocarpine, and one eye had visual field damage without additional incisional surgery.⁶ In our clinical practice, medical treatment was given to patients whose IOP > 21 mmHg. If patients were intolerant to medications or noncompliant,

trabeculectomy was performed to control disease progression. This may also contribute to the higher rate of filtration surgery in our study than in the Ritch et al study.

There are limitations to our retrospective study. The extent of PAS was not documented consistently in the charts, and therefore a detailed, quantified extent of PAS was not available for all participants. Also, the decision to perform surgery and the type of procedure selected were based on the clinical discretion of the treating physician and not determined by strictly defined criteria. Consequently, our outcomes may be skewed by inherent management patterns and biases. In addition, our sample size was small, and it is uncertain if our findings may be extrapolated to the population at large.

In summary, our study demonstrates a low long-term success rate of ALPI in controlling IOP in patients with PIS. After 4 years, the majority of participants required filtering surgery or phacoemulsification. Participants who underwent phacoemulsification were able to maintain an IOP < 21 mmHg without IOP-lowering medications. Thus, phacoemulsification alone may be an effective treatment for patients with PIS.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.
Participant inclusion diagram.

Figure 2.
Summary chart of additional surgical procedures after argon laser peripheral iridoplasty

Table 1

Summary of Ocular Characteristics at Baseline and Argon Laser Settings

	Pre-ALPI (N=22)
Number of IOP-lowering medications (%)	
0	15 (68%)
1	5 (23%)
2	2 (9%)
IOP, mmHg ($\pm$ SD)	21.3 ($\pm$ 7.1)
Best-corrected visual acuity, logMAR ($\pm$ SD)	0.03 ($\pm$ 0.08)
Gonioscopic examination	
Spaeth grade, n (%)	
A (anterior to Schwalbe's line visible)	4 (18%)
B (between Schwalbe's line and scleral spur visible)	12 (55%)
C (scleral spur visible)	6 (27%)
D (ciliary body visible)	0 (0%)
E (beyond 0.1 mm of ciliary body visible)	0 (0%)
Bow grade, n (%)	
0	18 (82%)
1	1 (5%)
2	1 (5%)
3	2 (9%)
Presence of PAS, n (%)	7 (32%)
Primary angle closure spectrum disease (%)	
Primary angle closure	20 (91%)
Primary angle closure glaucoma	2 (9%)
ALPI settings (Mean ($\pm$ SD), [Range])	
Spot size (μ m)	311 ($\pm$ 107) [200 – 500]
Energy level (mW)	291 ($\pm$ 141) [100 – 650]
Number of spots (n)	36 ($\pm$ 10) [19 – 64]

IOP=intraocular pressure; PAS=peripheral anterior synechiae; SD=standard deviation; ALPI=argon laser peripheral iridoplasty

Angle Opening Grade at Pre-argon Laser Peripheral Iridoplasty and at the First Visit and Last Visit or Visit Before Additional Incisional Surgery

Table 2

Pre-ALPI	First visit after ALPI				Last visit			
	A	B	C	D	A	B	C	D
A (n, %)	0 (0%)	1 (25%)	1 (25%)	2 (50%)	1 (25%)	1 (25%)	2 (50%)	0 (0%)
B* (n, %)	0 (0%)	2 (18%)	6 (55%)	3 (27%)	1 (9%)	4 (36%)	3 (27%)	3 (27%)
C (n, %)	0 (0%)	0 (0%)	4 (67%)	2 (33%)	0 (0%)	4 (67%)	2 (33%)	0 (0%)
Total	0	3	11	7	2	9	7	3

* One data point missing: gonioscopic examination after ALPI

ALPI=argon laser peripheral iridoplasty

Table 3

Gonioscopic Examination (Spaeth Angle Grade/Angular Approach/Peripheral Iris Orientation) Before and First Visit After Initial and Repeat Argon Laser Peripheral Iridoplasty (ALPI) for Eyes Treated with Repeat ALPI

ID	Initial ALPI		Repeated ALPI	
	Before	First Visit After	Before	First Visit After
4	C/20/S	C/20/S	B/20/S	C/30/S
5	B/5/S	D/30/R	B/20/S	C/20/R
7	C/20/S	C30/R	C/20/S	C/20/R
9	B20S	B/20/S	A/20/S	B//20/S
12	B/5/S	C/20/S	A/20/S	C/30S
25	A/5/S	D/20S	B/20/S	D/30/R
29	C/20/S	C/20/S	B/30/S	C/20/S

Spaeth angle grade: A to E; angular approach (10 to 40 degrees incremented by 10 degrees, 5 = slit); Peripheral iris orientation: S=steep or R=regular

ALPI=argon laser peripheral iridoplasty

Table 5

Gonioscopy (Spaeth Angle Grade/Angular Approach/Peripheral Iris Orientation), IOP, Number of IOP-lowering Medications, and Visual Acuity Before Phacoemulsification and Last Visit

ID	Gonioscopy		IOP (mmHg)		Number of IOP-lowering Medications		Best-Corrected Visual Acuity	
	Pre-Phaco	Last Visit	Pre-Phaco	Last Visit	Pre-Phaco	Last Visit	Pre-Phaco	Last Visit
1	C/20/R	C/30/R	16	14	0	0	20/50	20/30
3	B/20/S	C/30/R	19	13	0	0	20/20	20/20
4	B/20/S	C/30/R	15	14	1	0	20/20	20/25
5	C/20/S	D/30/S	17	14	0	0	20/80	20/20
11	D/20/R	D/40/R	14	12	0	0	20/60	20/30
12	B/30/S	D/30/S	15	15	2	0	20/40	20/25
13	C/20/R	n/a	19	19	1	0	20/40	20/25
22	B/20/S	D/40/S	22	19	1	0	20/50	20/20
25	A/25/S	D/40/R	17	12	1	0	20/20	20/20

Phaco = phacoemulsification

Spaeth angle grade: A to E; angular approach (10 to 40 degrees incremented by 10 degrees, 5 = slit); Peripheral iris orientation: S=steep or R=regular

Table 6

Summary of Treated Intraocular Pressure, Number of IOP-lowering Medications, and Vision at Each Visit prior to Additional Procedure after Argon Laser Peripheral Iridoplasty

Visit	N	IOP (mmHg)	P	Number of IOP-lowering Medications	P	logMAR	P
Baseline	22	21.3 (±7.1)	---	0.41 (±0.67)	---	0.32 (±0.84)	---
Year 1	16	16.9 (±3.3)	0.012	0.81 (±0.83)	0.054	0.75 (±1.13)	0.056
Year 2	15	16.5 (±3.9)	0.002	1.07 (±0.96)	0.001	0.87 (±1.13)	0.007
Year 3	13	17.2 (±4.2)	0.016	1.38 (±1.33)	0.015	1.00 (±1.29)	0.026
Year 4	11	16.6 (±2.7)	0.014	1.55 (±1.21)	0.008	1.00 (±1.26)	0.024
Year 5	6	18.3 (±3.2)	0.062	1.67 (±1.03)	0.033	1.00 (±1.67)	0.44

P Obtained from paired t-test

IOP=intraocular pressure