Original Article

Evaluation of Changes in the Iridocorneal Angle and Anterior Segment Parameters Following Selective Laser Trabeculoplasty in Pseudoexfoliation Glaucoma

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Abstract

Objectives: To investigate the effects of selective laser trabeculoplasty (SLT) on the iridocorneal angle, anterior chamber, and iris in patients with pseudoexfoliation glaucoma (PEXG) and to evaluate the relationship between these structural changes and intraocular pressure (IOP) reduction.

Materials and Methods: Thirty-two eyes of 32 PEXG patients were included in the study. Anterior segment optical coherence tomography (AS-OCT) images were obtained using the MS-39 combined Placido disk/AS-OCT system (Phoenix version 4.1.1.5) before SLT and at 1 week and 1 month after SLT. Anterior chamber angle (ACA), angle opening distance at 250 µm, 500 µm, and 750 µm (AOD250, AOD500, and AOD750), and trabecular-iris space area at 250 µm, 500 µm, and 750 µm (TISA250, TISA500, and TISA750) were measured from these images. In addition, iris thickness was assessed at 1000 µm, 2000 µm, and 3000 µm from the pupillary margin.

Results: The mean IOP decreased significantly from 23.47±3.56 mmHg at baseline to 17.81±2.62 mmHg at 1 week and 16.12±2.57 mmHg at 1 month after SLT ($p<0.001$). At both 1 week and 1 month after SLT, temporal and nasal ACA values were significantly greater compared to baseline (all $p<0.05$). At 1 month, significant increases were observed in all temporal AOD and TISA values, as well as in the nasal AOD, TISA500, and TISA750 values (all $p<0.05$). No significant change in iris thickness was observed ($p>0.05$). Changes in IOP showed no significant correlation with baseline visual field parameters, baseline peripapillary retinal nerve fiber layer thickness, ACA, AOD, or TISA values (all $p>0.05$).

Conclusion: In patients with PEXG, SLT effectively reduces IOP and leads to widening of iridocorneal angle parameters. However, the absence of a correlation between changes in angle parameters and IOP reduction strengthens the notion that the primary effect of SLT is related to cellular and biochemical mechanisms rather than a purely mechanical widening of the angle.

Keywords: Intraocular pressure, iridocorneal angle, anterior segment optical coherence tomography, pseudoexfoliation glaucoma, selective laser trabeculoplasty

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Introduction

Pseudoexfoliation glaucoma (PEXG), which develops due to the accumulation of pseudoexfoliation material at the iridocorneal angle, is the most common form of secondary open-angle glaucoma.[1,2] PEXG is characterized by more irregular diurnal intraocular pressure (IOP) fluctuations and more rapid long-term disease progression compared to primary open-angle glaucoma (POAG).[3,4] As in most forms of glaucoma, the main goal in the treatment of PEXG is the reduction of IOP, which is the only modifiable risk factor.[5] Therefore, it is essential to achieve and maintain target IOP levels through close follow-up and appropriate treatment in these patients. Accordingly, medical therapy and laser procedures are among the first-line treatment options for IOP reduction.

In recent years, selective laser trabeculoplasty (SLT) has become an important option in the treatment of POAG and secondary open-angle glaucomas.[6,7,8] SLT lowers IOP by targeting the trabecular meshwork in the iridocorneal angle, thereby increasing trabecular aqueous humour outflow.[4,6,7] In this procedure, a Q-switched, frequency-doubled 532-nm neodymium-doped yttrium aluminium garnet (Nd:YAG) laser selectively targets melanin-containing pigmented cells in the trabecular meshwork, thereby minimizing collateral tissue damage.[4,8] The selective photothermolysis mechanism of SLT avoids thermal damage and triggers biochemical and cellular responses such as cytokine release, macrophage activation, and extracellular matrix remodeling, resulting in enhanced trabecular meshwork permeability and consequently reducing IOP.[9] Previous studies have shown that SLT effectively lowers IOP, reduces the need for multiple topical antiglaucoma medications, and reduces the need for surgical intervention in patients with PEXG.[4,7,10]

Anterior segment optical coherence tomography (AS-OCT) is a reliable and reproducible imaging method that enables detailed visualization of anterior segment anatomy and related pathologies.[11,12] AS-OCT offers significant advantages in the evaluation of the iridocorneal angle in glaucoma, as it is a non-contact, highly reproducible, operator-independent method that provides objective and quantitative measurements.[11,13] Previous studies have reported significant changes in angle parameters on AS-OCT after laser iridoplasty,[14,15] Nd:YAG laser iridotomy,[16,17] and Nd:YAG capsulotomy.[18,19] Furthermore, only a limited number of studies have investigated the changes in anterior chamber and iris structures following SLT in glaucoma patients.[20] However, to the best of our knowledge, there are no studies specifically evaluating the effects of SLT on iridocorneal angle and anterior segment findings in patients with PEXG.

The aim of this study was to examine the changes in iridocorneal angle parameters and the anterior chamber and iris structures following SLT in patients with PEXG, and to evaluate the possible relationship between these changes and post-procedural IOP reduction.

Materials and Methods

This single-center, prospective, observational study was conducted at the glaucoma clinic of a tertiary referral hospital and included 32 eyes of 32 patients diagnosed with PEXG. The study was carried out in accordance with the principles of Good Clinical Practice and the Declaration of Helsinki. The study protocol was approved by the University of Health Sciences Türkiye, Ankara Etlik City Hospital Ethics Committee (decision no: AEŞH-EK-2025-224, date: 3/9/2025). Written informed consent was obtained from all participants prior to enrollment.

Patient Selection

Thirty-two eyes of 32 patients diagnosed with early-to-intermediate stage PEXG who were scheduled for primary SLT or were already receiving prostaglandin analog (PGA) therapy and planned to undergo adjunctive SLT were enrolled. The Hodapp-Parrish-Anderson criteria were used for staging early and intermediate PEXG.[21] Accordingly, the early stage was defined as a mean deviation (MD) value better than -6 dB, fewer than 25% of points on the pattern deviation plot depressed below the 5% level, fewer than 15% of points depressed below the 1% level, and no point within the central 5° with a sensitivity less than 15 dB. The intermediate stage was defined as MD between -6 dB and -12 dB, fewer than 50% of points on the pattern deviation plot depressed below the 5% level, fewer than 25% of points depressed below the 1% level, no point within the central 5° with a sensitivity below 0 dB, and only one hemifield containing a point with sensitivity below 15 dB.[21] In patients with bilateral SLT indication, the right eye was selected for inclusion. Exclusion criteria were defined as follows:

- Age ≤40 years,
- Iris anomalies that can cause iris deformity (iris coloboma, synechiae, iris atrophy, sphincter rupture, or history of ocular trauma),
- History of prior laser treatment or intraocular surgery involving iridocorneal angle, iris, or retina,
- History of uveitis, chronic intraocular inflammation, or ocular infection,
- Prior use of antiglaucoma drugs other than PGAs,
- Iridocorneal angle grade ≤2 on gonioscopy according to the Shaffer classification, angle neovascularization, or peripheral anterior synechiae,
- Lens opacity greater than grade 2 according to the Age-Related Eye Disease Study classification.[22]

Ophthalmological Assessment

All participants underwent a comprehensive ophthalmic examination, including best-corrected visual acuity (BCVA) measurement using a Snellen chart and IOP measurement with Goldmann applanation tonometry. Iridocorneal angle assessment was performed using the Latina SLT goniolens (Ocular Instruments, Bellevue, WA, USA). Additionally, slit-lamp biomicroscopic anterior segment examination and dilated fundus examination were performed. Visual field assessment was performed using the Humphrey Field

Analyzer 3 (Carl Zeiss Meditec, Dublin, CA, USA) with the 24-2 Swedish Interactive Threshold Algorithm Standard strategy, and MD and visual field index (VFI) values were recorded. Peripapillary retinal nerve fiber layer (ppRNFL) thickness was measured using the CIRRUS™ HD-OCT system (version 8.0.0.518; Carl Zeiss Meditec, Dublin, CA, USA).

Selective Laser Trabeculoplasty

SLT was performed by the same experienced clinician using a Q-switched Nd:YAG laser (Ellex Solo™ SLT Laser, Ellex Inc., Adelaide, Australia). The laser system operated at a wavelength of 532 nm with a pulse duration of 3 ns and spot diameter of 400 µm. Following topical anesthesia with 0.5% proparacaine hydrochloride (Alcaine™, S.A. Alcon-Couvreur N.V., Puurs, Belgium), the Latina SLT goniolens (Ocular Instruments, Bellevue, WA, USA) was used to visualize the trabecular meshwork. The entire trabecular meshwork (360°) was treated, targeting the pigmented trabecular meshwork. The initial energy was set at 0.9 mJ/pulse and titrated upward in 0.1-mJ increments until microcavitation bubbles were observed, indicating the appropriate energy level. A total of 100 non-overlapping laser spots were applied.

All participants were prescribed topical loteprednol etabonate (Lotemax®, Bausch & Lomb Inc., Tampa, FL, USA) 4 times daily for 5 days after SLT. Patients already receiving PGA therapy were instructed to continue their existing antiglaucoma treatment following the procedure.

Anterior Segment Optical Coherence Tomography Evaluation

In all participants, AS-OCT measurements were obtained before SLT, 1 week after SLT, and 1 month after SLT. Images were acquired using the MS-39 AS-OCT device (Phoenix software version 4.1.1.5; CSO, Florence, Italy), which integrates Placido disk topography with a spectral-domain OCT system. The MS-39 system provides a scan length of 16 mm and an axial resolution of 3.6 µm with an infrared superluminescent diode light source at a wavelength of 850 nm.

Each AS-OCT scan comprises 25 B-scans, each consisting of 1024 A-scans, acquired in approximately 1 second. All measurements were obtained by the same experienced technician between 10:00 AM and 12:00 PM under the same lighting conditions.

For AS-OCT analysis, the meridional cross-section along the 0°-180° axis was selected. The scleral spur, posterior corneal surface, and line tangent to the anterior iris surface were automatically identified by the device software. The angle opening distance (AOD) was measured as the perpendicular distance from the scleral spur to the anterior iris surface at 250 µm, 500 µm, and 750 µm, and recorded as AOD250, AOD500, and AOD750, respectively. The trabecular-iris space area (TISA) was automatically calculated by the device software as the area bounded by the AOD line, the posterior corneal surface, and the anterior iris surface, and was reported as TISA250, TISA500, and TISA750 (Figure 1). The anterior chamber angle (ACA) was calculated as the angle between the line passing through the scleral spur and the line along the anterior iris surface.

Iris thickness was measured at 1000 µm, 2000 µm, and 3000 µm from the pupillary margin (Figure 1). All measurements were analyzed separately for the temporal and nasal quadrants. Additionally, central corneal thickness (CCT) and anterior chamber depth (ACD) were obtained from MS-39 AS-OCT topography scans.

Statistical Analysis

Statistical analysis was performed using SPSS Statistics v22.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation, and categorical variables as frequency and percentage. The normality of quantitative data distribution was assessed using the Kolmogorov-Smirnov test. For normally distributed data, one-way repeated measures analysis of variance (ANOVA) followed by the Bonferroni post-hoc test was used to compare the three repeated measurements within the same subjects. Non-normally distributed data were analyzed using the Friedman test followed by post-hoc Wilcoxon signed-rank test with Bonferroni correction. Correlations between variables were assessed using the Pearson correlation coefficient. A p value of <0.05 was considered statistically significant.

The required sample size was calculated assuming an effect size of 0.25 with 85% power and a 95% confidence level, yielding a minimum of 31 subjects (G*Power version 3.1.9.4, University of Düsseldorf, Germany).

Results

The mean age of the patients was 64.4±8.53 (range: 48-75) years. Nineteen participants (59.3%) were male and 13 (40.6%) were female. Eight patients had intermediate PEXG and 24 patients had early PEXG. The mean BCVA was 0.094±0.10 (range: 0.0-0.30) logarithm of the minimum angle of resolution. Ten patients (31.2%) were treatment-naïve, while 22 patients (68.7%) were using PGA therapy. No changes were made to the medication regimen of PGA-treated patients during the 1-month post-SLT period. The patients' baseline mean visual field MD was -3.84±3.28 dB and mean VFI was 91.72±9.05. The mean baseline ppRNFL thickness was 85.77±12.54 μm.

Mean baseline IOP was 23.47±3.56 mmHg and decreased significantly to 17.81±2.62 mmHg at 1 week and 16.12±2.57 mmHg at 1 month post-SLT (all p<0.001). No significant change was observed in CCT or ACD (p>0.05) (Table 1).

Changes in angle parameters and iris thickness following SLT are presented in Table 2. Temporal and nasal ACA values increased significantly at both week 1 and month 1 compared with baseline (temporal: p=0.013 and p<0.001; nasal: p=0.022 and p<0.001, respectively). In the temporal quadrant, AOD250, AOD500, AOD750, TISA250, TISA500, and TISA750 values increased significantly at month 1 compared to baseline (p=0.007, p=0.006, p=0.038, p=0.005, p=0.002, and p=0.005, respectively). At week 1, only TISA500 was significantly higher than baseline (p=0.020). No significant change in temporal iris thickness was observed following SLT (p>0.05). In the nasal quadrant, AOD250, AOD500, AOD750, TISA500, and TISA750 values increased significantly at month 1 compared with baseline (p=0.007, p=0.009, p=0.029, p=0.003, and p=0.033, respectively). No significant changes in these parameters were observed at week 1 (all p>0.05). Nasal iris thickness also showed no significant change following the procedure (all p>0.05) (Table 3).

There was no significant correlation between IOP change at 1 month post-SLT and baseline MD, VFI, mean ppRNFL thickness, or changes in ACA, AOD, and TISA values at month 1 (all p>0.05) (Table 2).

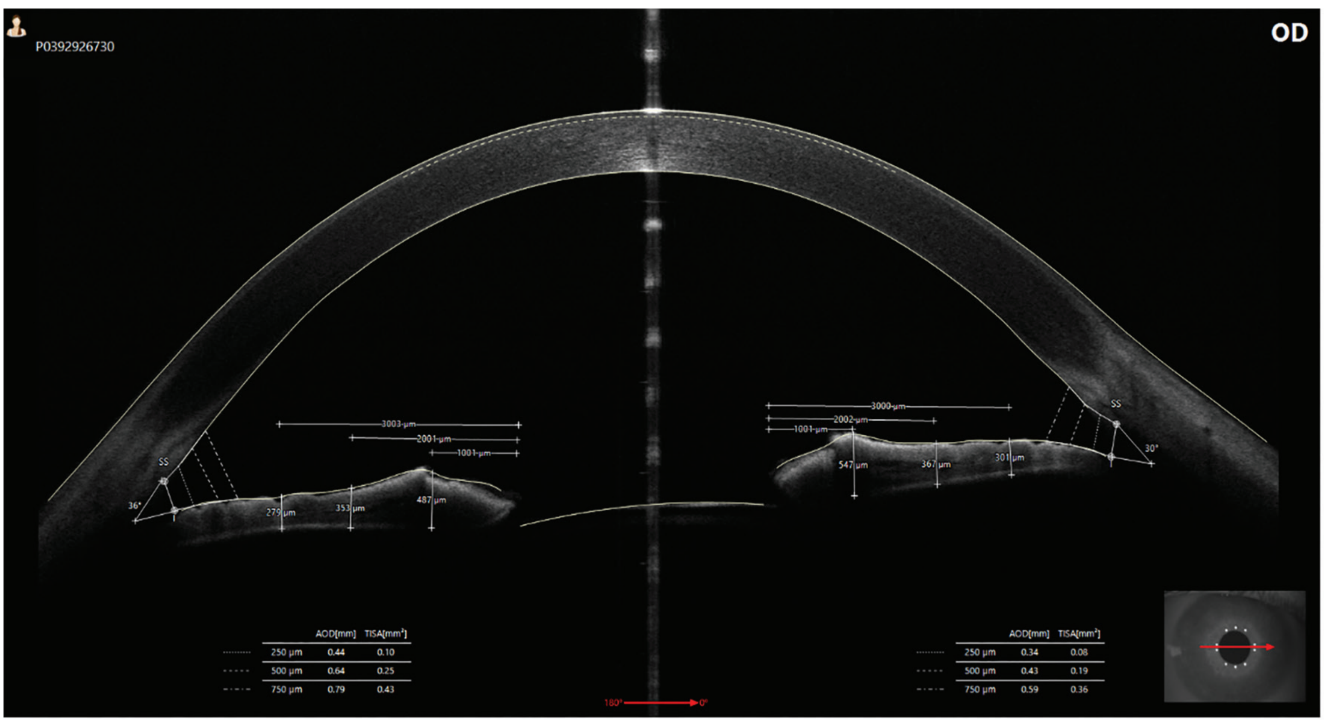

Figure 1. Measurement of iridocorneal angle parameters and iris thickness using anterior segment optical coherence tomography

Table 1. Intraocular pressure, central corneal thickness, and anterior chamber depth before and after selective laser trabeculoplasty

Variables	Pre-SLT	1 week post-SLT	1 month post-SLT	p^{α}	Paired comparisons		
					p^{β}	p^{γ}	p^{δ}
IOP (mmHg)	23.47±3.56	17.81±2.62	16.12±2.57	**<0.001**	**<0.001**	**<0.001**	**<0.001**
CCT (μm)	543.39±36.10	547.68±35.38	543.65±36.51	0.162	0.170	0.999	0.549
ACD (μm)	2995.78±511.76	2985.84±527.93	3012.13±511.07	0.240	0.999	0.719	0.338

p^{α}: Comparison of all three measurements, p^{β}: Pre-SLT vs. 1 week post-SLT, p^{γ}: Pre-SLT vs. 1 month post-SLT, p^{δ}: 1 week post-SLT vs. 1 month post-SLT, IOP: Intraocular pressure, CCT: Central corneal thickness, ACD: Anterior chamber depth, SLT: Selective laser trabeculoplasty

Table 2. Correlation of IOP change from baseline with changes in ppRNFL, MD, VFI, and anterior chamber angle parameters at 1 month after selective laser trabeculoplasty		
	ΔIOP (mmHg)	
	Correlation coefficient (r)	**p value**
ppRNFL (μm)	0.255	0.166
MD (dB)	0.065	0.732
VFI (%)	0.037	0.847
ΔTemporal ACA (°)	0.019	0.919
ΔNasal ACA (°)	-0.032	0.864
ΔTemporal AOD250 (mm)	0.122	0.508
ΔTemporal AOD500 (mm)	0.264	0.144
ΔTemporal AOD750 (mm)	0.151	0.409
ΔNasal AOD250 (mm)	0.225	0.215
ΔNasal AOD500 (mm)	0.269	0.136
ΔNasal AOD750 (mm)	0.152	0.406
ΔTemporal TISA250 (mm)	0.333	0.063
ΔTemporal TISA500 (mm)	0.328	0.067
ΔTemporal TISA750 (mm)	0.189	0.219
ΔNasal TISA250 (mm)	0.042	0.821
ΔNasal TISA500 (mm)	0.026	0.889
ΔNasal TISA750 (mm)	0.138	0.451

ppRNFL: Peripapillary retinal nerve fiber layer thickness, MD: Mean deviation, VFI: Visual field index, IOP: Intraocular pressure, ACA: Anterior chamber angle, AOD: Angle opening distance, TISA: Trabecular-iris space area

Table 3. Iridocorneal angle parameters and iris thickness before and after selective laser trabeculoplasty							
Variables	**Pre-SLT**	**1 week post-SLT**	**1 month post-SLT**	p^{α}	**Paired comparisons**		
					p^{β}	p^{γ}	p^{δ}
Temporal angle							
ACA (°)	34.03±4.55	35.50±5.19	38.03±5.48	**<0.001**	0.013	**<0.001**	**<0.001**
AOD250 (mm)	0.443±0.19	0.462±0.18	0.497±0.17	**0.001**	0.340	**0.007**	**0.037**
AOD500 (mm)	0.580±0.23	0.632±0.24	0.646±0.24	**0.004**	0.071	**0.006**	0.935
AOD750 (mm)	0.775±0.28	0.801±0.30	0.839±0.34	**0.029**	0.785	**0.038**	0.335
TISA250 (mm²)	0.102±0.05	0.108±0.05	0.117±0.05	**0.003**	0.952	**0.005**	0.101
TISA500 (mm²)	0.241±0.10	0.262±0.11	0.276±0.11	**<0.001**	**0.020**	**0.002**	0.388
TISA750 (mm²)	0.430±0.18	0.461±0.18	0.484±0.19	**0.002**	0.058	**0.005**	0.372
IT1000 (μm)	421.84±87.65	421.69±87.70	409.34±99.39	0.247	0.999	0.551	0.569
IT2000 (μm)	384.56±84.03	380.56±88.84	373.88±82.86	0.302	0.999	0.232	0.999
IT3000 (μm)	384.37±55.72	383.19±79.48	383.84±71.16	0.979	0.999	0.999	0.999
Nasal angle							
ACA (°)	33.34±5.18	35.66±4.74	36.81±4.79	**<0.001**	**0.022**	**0.001**	0.174
AOD250 (mm)	0.435±0.17	0.453±0.18	0.476±0.20	**0.005**	0.428	**0.007**	0.192
AOD500 (mm)	0.571±0.20	0.588±0.20	0.625±0.23	**0.002**	0.500	**0.009**	0.091
AOD750 (mm)	0.735±0.24	0.769±0.26	0.805±0.31	**0.010**	0.215	**0.029**	0.187
TISA250 (mm²)	0.100±0.04	0.102±0.05	0.108±0.06	0.244	0.999	0.191	0.923

Table 3. Continued							
Variables	Pre-SLT	1 week post-SLT	1 month post-SLT	p^{α}	Paired comparisons		
					p^{β}	p^{γ}	p^{δ}
TISA500 (mm^2)	0.230±0.09	0.243±0.08	0.256±0.10	**0.003**	0.195	**0.003**	0.288
TISA750 (mm^2)	0.422±0.17	0.428±0.15	0.455±0.18	**0.012**	0.999	**0.033**	0.127
IT1000 (µm)	467.28±85.31	462.09±84.84	456.03±81.59	0.136	0.999	0.189	0.577
IT2000 (µm)	411.69±68.36	407.19±69.15	400.56±71.39	0.349	0.999	0.713	0.999
IT3000 (µm)	398.75±66.62	391.03±58.49	379.12±64.49	0.055	0.789	0.132	0.269

p^{α}: Comparison of all three measurements, p^{β}: Pre-SLT vs. 1 week post-SLT, p^{γ}: Pre-SLT vs. 1 month post-SLT, p^{δ}: 1 week post-SLT vs. 1 month post-SLT, ACA: Anterior chamber angle, AOD: Angle opening distance, TISA: Trabecular-iris space area, IT: Iris thickness, SLT: Selective laser trabeculoplasty

Discussion

Our study demonstrated a significant reduction in IOP at both 1 week and 1 month following SLT in patients with PEXG. Previous studies have reported that the trabecular meshwork exhibits more intense pigmentation in PEXG compared to POAG.[3,23] The elevated IOP in PEXG is believed to result from obstruction of the trabecular meshwork by pigment and pseudoexfoliation material.[4,5] It has been suggested that this increased pigmentation may be one of the factors contributing to a better early response to SLT in PEXG.[5,7,10] However, although short-term studies have reported a more pronounced early IOP reduction in PEXG, long-term follow-up studies have found no significant difference in sustained IOP reduction between PEXG and POAG.[24,25]

AS-OCT enables objective, quantitative, and reproducible assessment of the iridocorneal angle, ACD, and iris morphology.[11,13] Widening of iridocorneal angle parameters has been reported following iris-targeted laser procedures such as iridotomy and iridoplasty, as well as after Nd:YAG capsulotomy applied to the posterior lens capsule.[15,16,17,18,19,26,27] In the present study, AS-OCT revealed significant increases in ACA, AOD, and TISA values at 1 month post-SLT in patients with PEXG. Özer et al.[20] evaluated ACA parameters in 50 POAG and ocular hypertension patients for 1 month and observed a significant increase in both nasal and temporal ACA, AOD, and TISA values, with no significant change in CCT or ACD. Our findings are consistent with those reported by Özer et al.[20] The absence of significant changes in CCT and ACD in our study may be attributable to the application of laser energy exclusively to the trabecular meshwork.[20] Indeed, no change in ACD has been reported even in primary angle-closure glaucoma following laser iridoplasty or peripheral iridotomy.[14,17]

The demonstration of Schlemm's canal expansion following SLT in previous studies may explain the observed increase in angle parameters.[28,29] However, iridocorneal angle parameters were not concurrently evaluated in those studies. Although angle parameters were quantitatively measured in our study, Schlemm's canal could not be measured due to image quality limitations. Future studies simultaneously evaluating both Schlemm's canal and iridocorneal angle parameters following SLT may provide a better understanding of the underlying anatomical changes. However, the IOP-lowering effect of SLT cannot be explained primarily by anatomical changes. SLT is thought to induce cytokine release, matrix metalloproteinase activation, and macrophage recruitment through the selective absorption of low-energy laser pulses by pigmented trabecular cells.[3,9,20,30] These processes facilitate trabecular debris clearance, extracellular matrix remodeling, and enhanced aqueous humor outflow. The presence of pseudoexfoliation material may also contribute to this process. Evidence suggests that the cellular and immune mechanisms driving changes in the trabecular meshwork are central to this effect.[9] Alvarado et al.[9] demonstrated that post-SLT cytokine and chemokine expression increased Schlemm's canal endothelial permeability. A subsequent study showed that SLT weakened intercellular junctions between Schlemm's canal endothelial cells, similar to PGAs.[31] Therefore, when evaluating SLT efficacy, cellular and cytochemical mechanisms should be considered before anatomical changes.[9,20]

Regarding iris morphology, a study using ultrasound biomicroscopy in POAG patients reported a transient increase in iris thickness at day 3 and week 1 following SLT, with no significant difference at 1 month.[32] This transient thickening has been attributed to post-SLT cytokine release. In our study, no significant change in iris thickness was observed. This finding is likely attributable to the inherent selectivity of SLT, which targets pigmented cells within the trabecular meshwork without causing thermal damage to the iris, although postoperative topical corticosteroid use may also have contributed. Similarly, Ayala et al.[33] reported no significant increase in anterior chamber flare following SLT. No significant change in iris thickness has been reported even following laser iridoplasty and peripheral iridotomy, procedures in which the iris is directly targeted.[14,34] However, it has been hypothesized that post-SLT corticosteroid use may suppress the beneficial inflammatory response (i.e., cytokine release, macrophage activation, and matrix metalloproteinase activity) integral to SLT's mechanism of action, potentially reducing laser efficacy.[9,33] Nevertheless, randomized controlled trials have reported that post-SLT corticosteroid use does not adversely affect IOP reduction outcomes.[35,36]

In the present study, no significant association was found between post-SLT IOP reduction and baseline MD, VFI, or ppRNFL thickness, which is consistent with previous reports.[10,37] Lee et al.[10] reported no significant difference in baseline visual field parameters between PEXG eyes with successful and unsuccessful SLT outcomes. Gillmann et al.[37] demonstrated that baseline ppRNFL thickness did not predict the magnitude of IOP reduction following SLT. Furthermore, no significant correlations were found between IOP change and changes in ACA, AOD, or TISA values.

Study Limitations

Although our study is the first study to evaluate anterior segment parameters following SLT in patients with PEXG, it has several limitations. These include the relatively small sample size, the lack of a POAG or healthy control group, and the follow-up period being limited to only 1 month. An additional limitation is that measurements were restricted to the temporal and nasal quadrants, as eyelid interference in vertical quadrant sections made identification of the scleral spur difficult and precluded calculation of AOD and TISA, thereby hindering the evaluation of changes in the superior and inferior quadrants of the iridocorneal angle. Consequently, our results may not have fully captured potentially greater structural effects arising from gravity-dependent pigment accumulation in the inferior quadrant. Similarly, the study by Özer et al.,[20] which evaluated iridocorneal angle parameters using AS-OCT in POAG patients who underwent SLT, was also limited to horizontal cross-sections. Another limitation is that the study group comprised both treatment-naive patients and those already receiving PGA therapy. The pre-existing modification of trabecular outflow by PGAs may have masked the additional effect of SLT.[31] Finally, concurrent assessment of Schlemm's canal dimensions alongside the other parameters would have provided valuable additional information. However, as previously noted, the quality of the acquired images did not technically allow evaluation of Schlemm's canal.

Conclusion

SLT is an effective IOP-lowering treatment option for patients with PEXG. Similar to findings reported in POAG, significant widening of iridocorneal angle parameters occurs in patients with PEXG following SLT.[20] However, the absence of a correlation between these anatomical changes and IOP reduction supports the view that the primary mechanism of SLT involves cellular and biochemical alterations rather than mechanical angle widening. The mechanical widening of the iridocorneal region following SLT may represent a secondary consequence of the cellular and biochemical changes induced by the procedure. A more comprehensive understanding of these mechanisms requires prospective studies with larger sample sizes, extended follow-up periods, and concurrent assessment of both the iridocorneal angle and Schlemm's canal.

Ethics

Ethics Committee Approval: The study protocol was approved by the University of Health Sciences Türkiye, Ankara Etlik City Hospital Ethics Committee (decision no: AEŞH-EK-2025-224, date: 3/9/2025).

Informed Consent: Written informed consent was obtained from all participants prior to enrollment.

Declarations

Authorship Contributions

Surgical and Medical Practices: B.D.Y.E., Concept: B.D.Y.E., S.B., Design: B.D.Y.E., S.B., Data Collection or Processing: B.D.Y.E., S.B., Analysis or Interpretation: S.B., Literature Search: B.D.Y.E., S.B., Writing: S.B.

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