



Introduction

- Patterned Laser Trabeculoplasty (PLT), the computer-guided laser trabeculoplasty is a newly developed treatment modality using PASCAL® (Topcon Medical Laser Systems, Santa Clara, CA, USA).
- PLT with PASCAL streamline® (532 nm) has been reported as precise and minimally traumatic treatment, and exhibiting a 24% reduction in intraocular pressure (IOP).¹⁾
- Recently, not only green wavelength (532 nm) but also yellow wavelength (577 nm) became available with the pattern scan laser system.

Purpose

The purpose of this study is to evaluate the efficacy and safety of the PLT with yellow wavelength PASCAL (PASCAL Streamline 577®)(Fig.1) for open-angle glaucoma.



Figure 1. PASCAL® Streamline 577

Patterned Laser Trabeculoplasty (PLT)

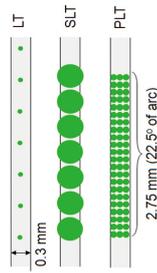


Figure 2. Comparison of Laser spots¹⁾

Diagram illustrating relative sizes of the laser spots and their placement on the trabecular meshwork in various approaches to trabeculoplasty: laser trabeculoplasty (LT), selective laser trabeculoplasty (SLT) and patterned laser trabeculoplasty (PLT).

References

1) Turini M, Gil-Carrasco F, Morales A, Quiroz-Mercado H, Andersen D, Marcellino G, Scheide G, Palanker D. Patterned laser trabeculoplasty. *Ophthalmic Surg Lasers Imaging.* 2010;41:538-45.

Commercial relationship

Patients & Methods

- We conducted a retrospective chart review of 9 patients (11 eyes) with open-angle glaucoma who received PLT with PASCAL® Streamline 577 (Table 2).
- Five men and four female (mean age, 63 years) were included and average follow-up period was 6.8 months.
- We evaluated pre- and postoperative IOP, medication score*, visual analog scale** for pain perception and laser setting parameter.

Number of patients	9
Number of eyes	11
Age	63 ± 15 (42-88)
Sex (Male:Female)	5:4
IOP (pre-PLT)	20.5 ± 4.7 mmHg
Diagnosis (number of eyes)	Primary Open Angle Glaucoma 5 Pseudoexfoliation Glaucoma 2 Steroid Glaucoma 2 Pigmentary Glaucoma 2

Table 2. Patients characteristics

Each value represents mean ± standard deviation (SD)

*Medication score was calculated by the numbers of topical anti-glaucoma drops, and fixed combination was counted as a score of 2, and more than 500 mg per day of acetazolamide was counted as a score of 2.

**After each PLT procedure, patients were asked to rate their pain on a 0 (no pain) –10 (worst possible, unbearable pain) scale.

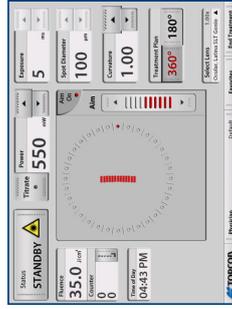


Figure 3. Control panel of PLT

Power was titrated for trabecular meshwork blanching at 10 ms and sub-visible treatment was applied with 5-ms pulses.

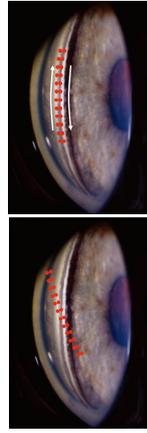


Figure 4. Computer guided procedure of PLT¹⁾

The clinician rotates the gonioscopic lens to align the pattern onto the trabecular meshwork. The arc patterns of 39 spots rotated automatically after each laser application so that the new pattern was applied at an untreated position. Approximately 1,248 laser spots were placed per eye in 32 steps, covering 360° of trabecular meshwork.

Results

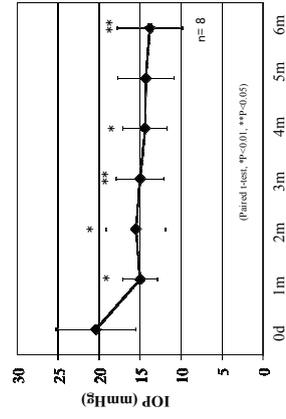


Figure 5. Intraocular pressure (IOP) follow-up during the first 6 months.

The IOP significantly decreased from the pretreatment level of 20.5 ± 4.7 to 15.0 ± 2.1 mm Hg at one month ($p < 0.01$, t-test) and remained until 6 months (13.4 ± 3.7 mmHg, $p < 0.05$).

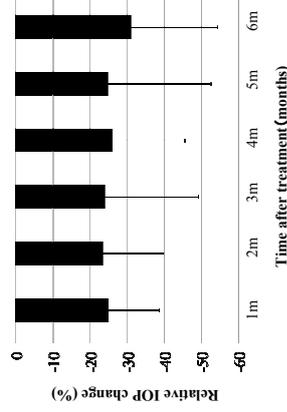


Figure 6. Relative IOP change (%) overtime.

Relative IOP reduction rate was 31% at 6 months after PLT.

Laser power (mW)	343.8 ± 49.6 (300-480)
Total number of Laser Spots	1287 (1248-1560)
Treatment Area	360°
Energy (mJ)	1.7 (1.5-2.3)

Table 3. Laser settings parameters

Each value represents mean ± standard deviation (SD).

*1. atina SLT Gonio Laser lens (× 1)(Ocular Instruments Inc., Bellevue, WA) was used.

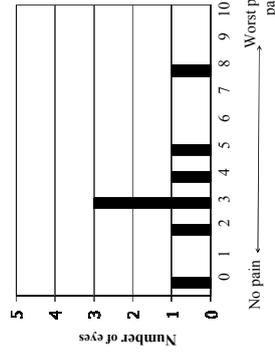


Figure 7. Visual Analog Scale (VAS) after PLT.

Average VAS was 3.3 ± 2.4. One eye which received more than 1,500 spots complained about pain (VAS was 8).

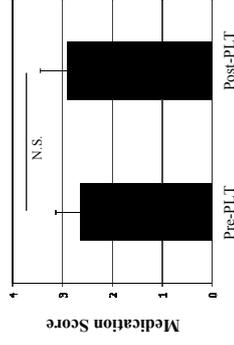


Figure 8. Medication score change pre and post-PLT.

There was no significant difference in pre- and postoperative medication score (2.6 and 2.8 respectively). N.S., not significant.

Complication

- One eye developed transient IOP elevation (9%) after PLT.
- There was no eye showed peripheral anterior iris synechia or corneal endothelial damage after PLT.

Conclusions

- PLT using 577-nm PASCAL exhibited a 31% reduction in intraocular pressure during 6 months of follow-up
- Despite the relatively small numbers of patients, our data showed that PLT using 577-nm PASCAL is a safe computer – guided laser treatment, and might be useful to lower the IOP for open-angle glaucoma.
- A larger study with a control group will be required to verify the extent and the long-term stability of the pressure reduction.