

Patterned laser trabeculoplasty

Study demonstrates safety of PLT and its potential to treat open angle glaucoma

By Felicity Thomas

Reviewed by Dr Miho Nozaki

Glaucoma is still one of the leading causes of blindness globally. Although the first line treatment is generally accepted as medication (usually in the form of eye drops) there are still patients continuing to suffer from increased pressure and disease progression.

Laser surgery has become quite well-founded as a secondary option for glaucoma patients, offering a less invasive route than the more traditional surgical procedures. Patterned laser trabeculoplasty (PLT) is one laser option available to patients that is a computer-guided treatment using the PASCAL platform from Topcon Medical Laser Systems (Santa Clara, California, USA).

"PLT is a unique computer-guided laser treatment," said Dr Miho Nozaki (Nagoya City University Graduate School of Medical Sciences, Nagoya, Japan). Dr Nozaki and colleagues (Dr Shuichiro Hirahara and Dr Yuichiro Ogura) recently performed a study to examine the safety and efficacy of PLT with the PASCAL Streamline 577 (yellow wavelength) in open angle glaucoma patients.¹

"The concept and mechanism to reduce IOP are quite similar to SLT with this system," asserted Dr Nozaki. "However, with a computer-guided laser pattern manipulation, we don't miss any spots on the trabecular meshwork, allowing us to treat the entire area of trabecular meshwork."

First experience with yellow (577 nm) PLT

A report has previously been published on PLT with green wavelength (532 nm) describing it as a

precise and minimally traumatic treatment while also offering a good IOP reduction,² however, the yellow wavelength has not been reported on until now. "This," explained Dr Nozaki, "was the reasoning behind our study. It was our first experience with PLT (577 nm) on open angle glaucoma patients."¹

In the retrospective study, Dr Nozaki and colleagues looked at nine patients with open angle glaucoma. Each patient underwent PLT with the PASCAL Streamline 577. Both pre- and postoperative IOP, medication score and laser setting parameter were all evaluated by the team for analysis.

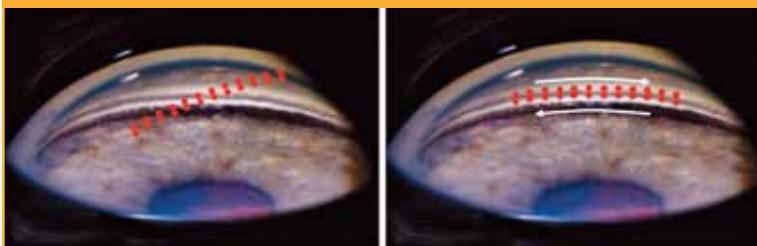
"All patients in this study were already taking topical medication," continued Dr Nozaki. "Several patients had also already undergone selective laser trabeculoplasty (SLT), but these procedures had occurred more than 6 months before our study."

Surprisingly significant

"PLT using 577-nm PASCAL exhibited a 31% reduction in IOP during 6 months of follow-up," said Dr Nozaki. "I thought this level of reduction in IOP was surprising but in our study, the patient population was quite small, so I think we really have to increase the number of patients, and follow them for a longer period."

In addition to the surprisingly significant reduction in IOP, Dr Nozaki revealed that there was no significant difference in the pre- and postoperative medication score. "As for complications," she added, "one eye developed transient IOP elevation (9%) after PLT, but there was no eye that showed peripheral anterior iris synechia or corneal endothelial damage after PLT."

Figure 1: Using PLT, 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. (Adapted from reference 2.)



In short...

Patterned laser trabeculoplasty (PLT) using green wavelength (532 nm) has been studied and found to be a precise and minimally traumatic treatment for patients in need of reducing intraocular pressure (IOP). However, until now there has been no such study looking at the yellow wavelength (577 nm). In this article, Dr Nozaki describes her recent study looking at the PASCAL Streamline 577 as a safe and viable option for open angle glaucoma patients.

Conclusion

"PLT is the only technology that can perform the automatic rotation of laser spots to apply a new treatment pattern," asserted Dr Nozaki (Figure 1). "This system enables us to target entire areas of the trabecular meshwork." She explained that for patients requiring reduced IOP but looking for an alternative to medical therapy, PLT offers a good option, particularly before surgical intervention in an operating room is considered. In this way, she believes that PLT may be almost the same as SLT.

"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," Dr Nozaki added. "For now, we are doing a retrospective study to compare SLT and PLT, and we are also performing PLT on more patients, to increase the patient population and increase the follow-up period."

References

1. M. Nozaki, S. Hirahara and Y. Ogura, *Patterned Laser Trabeculoplasty with PASCAL streamline 577*, Poster #1867 presented at ARVO 2013, Seattle, Washington, USA.
2. M. Turati *et al.*, *Ophthalmic Surg. Lasers Imaging*, 2010;**41**:538–545.

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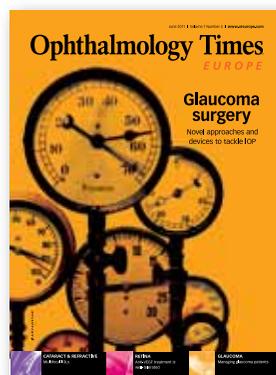
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