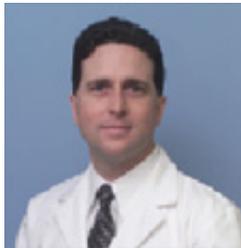


2013-9-3 13:58:06

[print now](#)

Date published online: July 2013

INTERNATIONAL **International outlook** **ALT, SLT ... PLT?**



Laser trabeculoplasty has evolved. Utilizing advanced targeting and firing algorithms, pattern laser trabeculoplasty (PLT) is the newest incarnation of a decades-old procedure to treat glaucoma. In this article Miho Nozaki, MD, describes her experience with a new laser that offers a more precise and perhaps safer option for our glaucoma patients. In an age of robots, drones, and automation, it seems only logical that our surgical instruments will become smarter as well.

John A. Vukich, MD,
international editor

by Matt Young EyeWorld Contributing Writer

New trabeculoplasty procedure offers an alternative to SLT

It used to be that selective laser trabeculoplasty (SLT) was called the more distinguished version of its older cousin, argon laser trabeculoplasty (ALT). SLT was called safer yet equally effective and able to tackle issues like compliance, unlike medications.

SLT may no longer be the great new buzzword of yesteryear. The new acronym? PLT (patterned laser trabeculoplasty).

Even though it's not available in all countries, it's making waves in Japan, where researchers have found it to be a novel computer-guided laser treatment for open-angle glaucoma.

The PLT advantage

"I have experience with selective laser trabeculoplasty," said Miho Nozaki, MD, associate professor, Department of Ophthalmology and Visual Science, Nagoya City University Graduate School of Medicine, Nagoya, Japan, who recently published a poster on PLT at the Association for Research in Vision and Ophthalmology (ARVO) annual meeting. "Without computer-guided automatic rotation, we have to remember where we put the treatment spot, and sometimes the total number of spots vary if we treat 360 degrees of trabecular meshwork. With PLT, it is easy and precise." Dr. Nozaki's poster described 11 eyes of nine patients that received PLT with the PASCAL Streamline 577 (Topcon Medical Laser Systems, Santa Clara, Calif.).

In it, they describe an IOP reduction rate of 31% at six months after PLT. Specifically, IOP significantly decreased from the pretreatment level of 20.5 +/-4.7 mm Hg to 15.0 +/-2.1 mm Hg at one month ($p < 0.01$) and remained until six months (13.4 +/-3.7 mm Hg, $p < 0.05$).

No significant change in medications occurred postoperatively from preop levels—important to Dr. Nozaki to show that IOP reduction was not occurring as a result of additional medications.

"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."

For those interested in the technical aspects of the procedure, the total number of laser spots ranged from 1248 to 1560, the treatment area was 360 degrees, and laser power averaged 343.8 +/-49.6 mW.

Despite that all cases were pretreated with an alpha-agonist, only one eye developed transient IOP elevation (9%) after PLT, while no eyes showed peripheral anterior iris synechia or corneal endothelial damage after PLT.

The transient IOP elevation is not a huge concern, Dr. Nozaki said.



An image capture of a movie in which Dr. Nozaki performed PLT.

Source: Miho Nozaki, MD, PhD



EyeWorld *rePlay*

Watch this video on your smartphone or iPad using your QR code reader. (Scanner available for free at your app store.)

"But if the patient has really advanced optic disc glaucoma damage, this complication might cause an effect. In that case, we can plan something like a temporary carbonic anhydrase inhibitor (CAI) prescription before treatment," she said.

"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 acknowledged.

Further thoughts on PLT

During a follow-up interview, Dr. Nozaki said that PLT has a similar effect and clinical results to SLT, but also has certain highlights. Asked about the benefit of PLT's automatic rotation, Dr. Nozaki said: "Since the PLT does not leave any visible lesions showing the treated area, it is important for the system to guide us to the location adjacent to the previous treatment site. So we only have to rotate the contact lens clockwise by 11.25 degrees, and just follow and adjust with the aiming beam."

Further, while the number of PLT spots may seem impressive (SLT treats 360 degrees with 80-100 spots, according to Dr. Nozaki), it's actually the area treated that counts.

"The trabecular meshwork is approximately 300 microns wide," Dr. Nozaki said. "SLT uses a 400-micron diameter beam to cover the trabecular meshwork width. PLT uses three 100-micron diameter adjacent spots to cover the trabecular meshwork width. The surface area treated is similar—it is just done with different diameter spots."

High IOP may be an especially useful indication for PLT treatment.

"The highest IOP in this study was 32 mm Hg," Dr. Nozaki said. "After one month, his IOP decreased to 14 and remained at 14 mm Hg after six months. So high IOP can be a good indication for PLT."

PLT also is customizable. You can choose a 180-degree treatment or 360-degree treatment.

While PLT wouldn't replace the so-called glaucoma gold standard—trabeculectomy—it could replace SLT.

"After trying medication, I will consider PLT," Dr. Nozaki said. "But if adherence to medications are low, I will consider PLT before I add another glaucoma medication. Before trabeculectomy, I think PLT will be a good option."

Dr. Nozaki said she uses PLT regularly in her practice. "Before we got PLT, we used to use SLT," Dr. Nozaki said. "But now, mainly we use PLT."

One thing to bear in mind—energy required for Asian eyes might be lower.

"The power in our study was lower than in previous reports," Dr. Nozaki said. "Despite that the wavelength was different (we used a yellow wavelength), since Asian eyes have more pigment, I think the required power would be lower. Lower power might be much less thermal injury to the trabecular meshwork, so it might be beneficial for Asian eyes. We have to do a study with a larger number of patients."

Editors' note: Dr. Nozaki has no financial interests related to this article.

Contact information

Nozaki: nozakim@med.nagoya-cu.ac.jp



