

LASER TRABECULOPLASTY

SLT as primary glaucoma therapy

by Howard Larkin in Boston

Effective and repeatable, selective laser trabeculoplasty is gaining ground as a primary therapy for mild to moderate primary open-angle glaucoma (POAG), Garry P Condon MD, Drexel University College of Medicine, Pittsburgh, Pennsylvania, US, told a Glaucoma Day symposium at the ASCRS annual meeting.

The road to clinical acceptance for laser treatment of glaucoma has been long. As far back as 1995, the Glaucoma Laser Trial demonstrated the efficacy of lasers in treating glaucoma. The study group reported that argon laser trabeculoplasty (ALT) was as effective as medical treatment for lowering intraocular pressure in patients with POAG. Nonetheless, ALT never caught on as a first-line treatment, Dr Condon noted.

"Why didn't we use it? ALT produced visible thermal issue damage to the trabecular meshwork and complications including pain, peripheral anterior synechiae and inflammation. Also, retreatment results were poor, leading to a reputation for ALT as a 'one-shot deal'," he commented.

With the introduction of the Q-switched Nd:YAG laser by Mark Latina MD in 1997, many of the problems of ALT were addressed, opening the way for greater use of lasers early in glaucoma treatment. Known as selective laser trabeculoplasty (SLT) because it affects only melanin-pigmented cells in the trabecular meshwork, this new technology lowered IOP as much as ALT with 6,000 times less energy and without thermal tissue damage. Pain and complications are reduced.

Subsequent studies with three-years-plus follow-up have shown that SLT is as long-lasting and effective as ALT as an adjunctive therapy, Dr Condon said. The US FDA approved SLT in 2001. More recently, titanium-sapphire lasers in conjunction with the Gold Shunt (Solx) have shown promise in early tests. But the growing body of evidence supporting the efficacy, safety and repeatability of SLT makes it a leading glaucoma option.

In the early 2000s, this success prompted Shlomo Melamed MD of Israel to consider SLT as a primary therapy. In 2003 he reported a 90 per cent response rate with an average of 5.0 mmHg and 30 per cent IOP reduction in 45 eyes treated with SLT followed for one year. Similarly, studies comparing SLT with medical therapies, mostly prostaglandins, in

the US and Canada, have shown comparable response rates over follow-up periods of eight to 12 months, Dr Condon said.

While the repeatability of SLT has been controversial, Dr Condon pointed to a 2009 study in the *Journal of Glaucoma* by Bryan Wong and colleagues. It found that while secondary SLT treatments that were delivered one to three months after an initially successful 360 degree treatment did not reduce IOP as much as the initial therapy, treatments repeated after six and 12 months were just as effective as initial therapy, typically reducing IOP by 5.0 to 6.0 mmHg.

Dr Condon believes theory supports repeatability. With a pulse time of about three nanoseconds, SLT heats melanin-containing cells without disturbing surrounding tissue. This is thought to initiate a chemically mediated response prompting macrophages to clean up the affected cells, increasing the porosity of the trabecular meshwork in the process. ALT might also stimulate the same response, but because it permanently damages the tissue left behind there may be less reserve for future treatment, and mechanical factors could reduce retreatment efficacy, he added.

Still, SLT is not for everyone. Sensible patient selection criteria would include patients in need of a reasonable IOP, ie, mid-teens to mid-20s, with mild to moderate disc or visual field damage. Patients in a crisis, with advanced disease and high IOP, or who are not controlled with three-plus medications are poor candidates, he noted.

For eligible patients, Dr Condon likes to start SLT early, usually with a 180 degrees or 360 degrees treatment to start.

He also offers SLT as a second-line therapy for patients who are not controlled with a prostaglandin, or when he suspects non-compliance with medication is an issue.

Generally, he sees an IOP drop of 4-8 mmHg or more in 70 per cent of patients, with those with the highest initial IOP seeing the greatest drop and those on multiple medications the least. IOP spikes are most common among patients with pigmentary glaucoma. Final effects are generally observed six to eight weeks after treatment.

This combination of effectiveness, reduced side effects and retreatment potential make SLT an attractive laser option, Dr Condon concluded.

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