SELECTIVE LASER TRABECULOPLASTY INFORMATION FOR PATIENTS

Introduction

SLT is a simple, quick and effective outpatient treatment for reducing the pressure in the eye of patients with glaucoma or ocular hypertension. SLT is completely different from the laser used for short sight correction and is not associated in any way with the risks associated with “vision correction”. SLT is the latest version of laser trabeculoplasty, a procedure which has been used to treat patients with glaucoma since 1979 (1). SLT was first reported in 1998 (2) and has been in widespread use since 2004.

How and where is SLT done?

SLT is done as outpatient procedure. The laser is applied at a slit lamp very similar in appearance to that used by ophthalmologists and opticians to examine your eyes routinely. A nurse puts some drops into your eye to anaesthetise it and make the pupil smaller. Then a contact lens is applied to the eye to help focus the beam and to prevent you from blinking. The whole process takes about 10 minutes. You will not feel any pain during the procedure but some patients get mild glare and discomfort for a few days afterwards. The pressure in the eye should respond within two to three days and will be checked at an out-patient visit after 2 to 3 weeks.

How successful is SLT?

An increasing number of ophthalmologists in the UK are able to offer SLT, but the technique has been most widely employed in the USA. Numerous studies have demonstrated it's safety and efficacy (3). Most report an average drop of eye pressure (intraocular pressure or IOP) of between 7 and 8 mmHg. About 80% of patients get a 20% or more reduction in IOP. Some eyes respond more than others, but only about 4% fail to respond at all. If the pressure fails to fall by 3 mmHg or more after 2 to 3 weeks, I generally redo the laser procedure. About 10% of patients require 2 or more sessions to bring down the IOP to an acceptable level. Some patients may require drops in addition to SLT to bring the IOP down sufficiently, although SLT generally reduces the number of drops required.

What are the side effects?

Apart from slight discomfort after treatment, few side effects are encountered and the procedure can easily be repeated if not initially successful. To quote one study (4): "…ocular discomfort is not unusual in the first few days after SLT. Late complications causing ocular morbidity after SLT were not encountered." Transient ocular pain occurs in about 40% eyes. There have been 4 reported cases of hyphaema (out of millions of treatments). Patients with heavily pigmented drainage angles

should be treated with caution (reduced energy and number of pulses) to prevent intraocular pressure spikes.

Compliance

Patients do not receive any short-term gain from taking glaucoma medications; they do not see or feel better and medications can produce unwanted side effects. This means that it is easy to forget to take drops. With SLT, patients don't have to remember their drops. This probably explains why the visual fields of patients treated with laser trabeculoplasty were better preserved than those of patients treated with drops in the Glaucoma Laser Trial (6). Although my patients always insist they take their drops, studies have shown that non-compliant patients miss about 100 days of treatment per year and about a quarter of all glaucoma prescriptions are never picked up from the pharmacy. In a recent editorial in Ophthalmology (7), the editor stated that the 2 most important ways or reducing the toll of blindness from glaucoma in the community were to i) ensure screening of all first degree relatives of patients with glaucoma and ii) encourage more patients to have laser trabeculoplasty, which would improve compliance with treatment.

Why do SLT?

i) Why reduce IOP?

Fluid circulates inside the eye in order to nourish the internal structures such as the cornea and crystalline lens. This fluid escapes into a drain located between the edge of the iris and cornea known as the drainage angle. In patients with raised pressure, this angle gets blocked with debris, meaning that the pressure in the eye has to increase to restore the flow of fluid. Unfortunately, high pressures damage the delicate structures within the eye, particularly the optic nerve. Damage to the optic nerve results in loss of peripheral and, occasionally, central vision. There is overwhelming evidence (8) that that reducing

IOP lowers the risk of peripheral vision and eventually central vision loss in patients with glaucoma.

ii) Laser trabeculoplasty vs drops

The Glaucoma Laser Trial Research group (6) showed that eyes treated with ALT had lower IOP and better visual fields than fellow eyes receiving drops. Laser trabeculoplasty is particularly useful for the initial treatment of glaucoma and ocular hypertension, but has a place in the treatment of patients already taking some glaucoma drops (9).

iii) SLT vs ALT

SLT is a gentler form of laser trabeculoplasty than ALT, a technique which has been practised since the early 1980's for the treatment of raised intraocular pressure (glaucoma and ocular hypertension). ALT works by causing scarring of the trabecular meshwork, cannot be repeated and reduces the success of subsequent glaucoma surgery if this is needed. SLT causes minimal damage to the trabecular meshwork since the energy used for SLT is about 80 times less than that used for ALT. Unlike ALT, which generally fails to work after 18 to 24 months, the IOP lowering effect of SLT appears to persist for longer periods (10). Unlike ALT, the success rate of repeat SLT is no different from that of the initial SLT treatment. This means that if the IOP were to rise at a later date, patients have the option of further SLT rather than just drops or surgery (11).

How does it work?

SLT uses extremely short duration, low energy pulses of laser energy to selectively target pigmented cells in the drainage angle of the eye (the trabecular meshwork). The short duration of the laser pulses minimises collateral thermal damage to adjacent non-pigmented cells. Electron microscopy of the trabecular meshwork treated by SLT shows little mechanical disruption of the trabecular meshwork (5). It is thought that the treatment stimulates certain white blood cells called macrophages to release cytokines(chemical messangers)

which increase the permeability of Schlemm's canal. This allows fluid to escape from the eye more easily, lowers the eye pressure and protects the optic nerve.

Suitable patients

SLT is particularly suitable for the following patients:-
i) Patients with newly diagnosed primary open angle glaucoma, pseudoexfoliation or pigmentary glaucoma
ii) Patients with ocular hypertension who need IOP lowering according to the recent NICE guidelines.
iii) Patients already being treated with drops, who need additional lowering of IOP
iv) Patients who are intolerant of drops
v) Patients who might forget to take drops (see compliance above)