

The Use of Selective Laser Trabeculoplasty in Pigment Dispersion Glaucoma and Eyes with Highly-Pigmented Trabeculum

One of the main theories on the mode of action in selective laser trabeculoplasty (SLT) is that the laser energy is absorbed in melanin granules in the trabeculum, which triggers a reaction that effectively reduces intraocular pressure (IOP). If this is indeed the case, the results of the treatment should vary according to the degree of pigmentation of the trabecular meshwork.

There are conflicting reports in the literature on this subject. Melamed's seminar paper¹ reported three eyes with pigmentary glaucoma, with a mean IOP reduction of 24 percent after SLT. In another study² of 64 patients, the degree of trabecular pigmentation was found not to affect the success rate of SLT, or to have any effect on IOP reduction after one or four months after the procedure. However, after seven months, the IOP was significantly more reduced than in highly pigmented eyes. Similarly, in another study that followed 72 patients for a year, pigmentation was not found to be a predictor of SLT treatment success or failure³.

Two large studies on the subject were also conducted. In the first⁴, there were no differences in IOP lowering by SLT according to angle pigmentation of 74 eyes that were followed up for one year. In the second⁵ (167 patients), no difference in effect due to race (and thus, presumably) to angle pigmentation was found. However, four of the six eyes with either pigment dispersion syndrome or pseudoexfoliation [PXE] did not respond. The reason is probably that the pigment or pseudoexfoliation material accumulating at the angle prevents the low-energy laser beam from reaching the trabeculum cells. A trend towards a poorer response in PXE eyes was noted in yet another study⁶.

In contradistinction to those long-term follow ups, which clearly demonstrate lack of effect of angle pigmentation on the IOP-lowering results of SLT, there were a few case reports of complications resulting from the use of SLT in heavily pigmented anterior chamber angles.

Complications of SLT in Heavily Pigmented Trabecula

Harasymowycz et al⁵ reported four cases of eyes with heavily pigmented trabecular meshwork, three of them with pigmentary glaucoma, in whom SLT was followed by marked and sustained elevation of IOP in spite of receiving brimonidine 0.2% immediately before the procedure (three of the four required trabeculectomy due to uncontrolled IOP). Similar cases of temporary paradoxical IOP rise after SLT in eyes with heavily pigmented angles were recently reported. The rise occurred even at low energy radiation in the absence of steroid treatment and persisted until 12 weeks after treatment⁶.

Recommended Treatment Protocol

To avoid such complications while applying SLT on pigmented eyes, it is recommended that a lower level of energy be used, combined with a more sparse distribution of confluent spots during treatment. The physician may decide to slightly augment the treatment if IOP is strictly monitored following SLT and no untoward side effects are recorded.

References

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