

RESEARCH UPDATE ON LASER TRABECULOPLASTY

A literature search reveals interesting findings from 2016.

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Utilization of laser trabeculoplasty increased after the 2001 introduction of selective laser trabeculoplasty (SLT) but later plateaued and has begun to decrease again.¹ Despite efficacy comparable to that of prostaglandin analogue monotherapy and minimal side effects,^{2,3} SLT's role in the stepped management of glaucoma has not yet become clear.

Data published in 2016 may help clarify the optimal use of trabeculoplasty in glaucoma management.

ARGON AND SELECTIVE LASER TRABECULOPLASTY

Only 16 articles related to argon laser trabeculoplasty (ALT) were indexed into PubMed in 2016. Of these, just four included data on the procedure, none of which added significantly to eye care providers' understanding of ALT's safety, efficacy, or optimal use.

In contrast, a similar search for SLT identified 53 articles, 32 of which reported new data on the procedure. Some findings from last year were interesting. Perhaps most importantly, a series of studies by independent research teams established beyond a doubt that repeat SLT safely reduces IOP in previously treated eyes. Collectively, these articles⁴⁻⁶—coupled with

others published prior to 2016⁷⁻⁹—demonstrated that repeat SLT lowers IOP to the same level achieved by initial SLT. Several studies suggested that the IOP reduction provided by repeat SLT endures longer than that seen with initial SLT,^{5,6,8} although this observation remains unexplained.

One intriguing study described significant IOP reductions when SLT was administered transsclerally to the perilimbal region without the use of a gonioscope or coupling agent.¹⁰ In this randomized comparison with conventional SLT in patients with primary open-angle glaucoma who were on medical therapy, the mean IOP reductions achieved at 6 months were statistically comparable (4.71 and 5.14 mm Hg in the transscleral and conventional groups, respectively; $P = .744$). These results should be interpreted with caution, as this was a small study (27 subjects completed the trial) and no power analysis was reported.

Finally, a cautionary tale: surgeons should proceed carefully when performing SLT on eyes with pseudoexfoliation and/or heavily pigmented angles. In a case series of five eyes with exfoliation glaucoma, SLT was complicated by posttreatment IOP spikes.¹¹ All five eyes required trabeculectomy, and two required subsequent tube shunt implantation. Two eyes developed corneal endothelial failure requiring endothelial transplantation. These observations are consistent with a prior report of four cases of post-SLT IOP spikes (three requiring surgical intervention), all in eyes with heavily pigmented angles.¹² SLT can be safely performed in eyes with heavy meshwork pigmentation (as in both pigment dispersion and exfoliation syndromes), but some modifications to the standard approach are recommended. These include a lower power than is routinely used and staging the treatment over two 180° sessions rather than treating all 360° in a single setting.



AT A GLANCE

- The research published in 2016 updated eye care providers' understanding of selective laser trabeculoplasty (SLT).
- Perhaps most importantly, a series of studies by independent research teams established beyond a doubt that repeat SLT safely reduces IOP in previously treated eyes.
- A small case series suggests that surgeons should proceed with caution when performing SLT on eyes with pseudoexfoliation and/or heavily pigmented angles.

MICROPULSE LASER TRABECULOPLASTY

Unlike the continuous-wave laser beam utilized in ALT, micropulse laser trabeculoplasty breaks the wave (diode 532- or 577-nm) into duty cycles that include a brief pulse of laser energy followed by a rest cycle to allow tissue cooling and to prevent thermal tissue damage. No studies relevant to this approach were indexed into PubMed in 2016, but earlier articles suggest generally modest IOP reductions (approximately 20% or less).¹³⁻¹⁵

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Steven Vold, MD, and Tony Realini, MD, MPH, discuss his research on selective laser trabeculoplasty in African-derived patient populations in the developing world.



CONCLUSION

These new studies provide valuable information to guide therapeutic decision making in glaucoma management. SLT is efficacious, safe, and repeatable. It eliminates the need for daily dosing adherence. In addition, the procedure is cost-effective compared to medical therapy (when known nonadherence is considered).¹⁶ This procedure should therefore be considered a first-line intervention for IOP reduction in most eyes with ocular hypertension or open-angle glaucoma. ■

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