Comparison of Outcomes of Micropulse Laser Trabeculoplasty versus Selective Laser Trabeculoplasty

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Purpose
Micropulse laser trabeculoplasty (MLT) uses a 532-nm laser (Iridex) and breaks a continuous laser into short pulses, reducing thermal damage. MLT is thought to be safer compared to selective laser trabeculoplasty (SLT), but has not been well studied. In this interventional retrospective comparative cohort study, we evaluate the effectiveness of MLT compared to SLT in lowering intraocular pressure (IOP) at 12 months from baseline.

Methods
Patients with primary open angle glaucoma, pseudoexfoliation glaucoma and pigment dispersion glaucoma who underwent primary laser trabeculoplasty performed by a single surgeon at UCSF between 9/1/12 and 12/1/16 were included. Exclusion criteria included prior laser trabeculoplasty or filtering surgery, and follow-up less than 1 year. The primary outcome was percent reduction in mean IOP at 12 months. We defined success as reduction in IOP from baseline to 12 months by at least 20% and no additional intervention.

Results
Preliminary results demonstrated 34 (62%) eyes that underwent SLT and 21 (38%) eyes that underwent MLT. There was no significant difference between the SLT and MLT cohorts except for thicker central corneal thickness in the MLT group compared to the SLT group respectively (575µm (SD 54) vs 541µm (SD 46); *P*=0.03). Baseline IOP by Goldmann applanation was 17.6mmHg (SD 5.4) in the SLT group compared to 19.8mmHg (SD 4.3) in the MLT group (*P*=0.12).

All patients received 360 degrees of laser treatment. At 1-hour post-laser, 7 eyes treated with SLT had a transient increase in IOP of 5 mmHg or greater from pre-laser IOP, compared to 1 eye in the MLT group (*P*=0.11).

At post-operative month 12, there was no significant difference in mean IOP reduction between the 2 groups, with the SLT group demonstrating a 13% reduction (SD 20) compared to 11% (SD 23) in the MLT group (*P*=0.77). The success rate was comparable between the two groups (MLT 38% vs SLT 38%; *P*=0.99), as was the reduction in IOP drops (MLT -0.1 drops (SD 1.2) vs SLT -0.2 drops (SD 0.88); *P*=0.72). Both groups had comparable and low rates of need for additional intervention (*P*=0.32).

Conclusions
In summary, there was no difference in IOP reduction at 1 year after MLT or SLT treatment. Eyes treated with MLT experienced fewer post-laser IOP spikes, though this was not statistically significant. Further investigation with a prospective, randomized study is warranted.

Layman Abstract (optional): Provide a 50-200 word description of your work that non-scientists can understand. Describe the big picture and the implications of your findings, not the study itself and the associated details.