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“A New Titanium Sapphire (TiSa) Laser Activated Ultrathin Gold Shunt Drainage Device (LAGD) for the Treatment of Glaucoma”

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Purpose: This study was undertaken to evaluate an innovative, new solid-state Titanium:Sapphire Laser (Solx-TiSa™) 790nm, 8msec, 200um spot size, in combination with a novel, microscopic, 24 karat ultrathin, 30 micron gold shunt which contains laser activated microtubules (channels) for increasing aqueous outflow without a bleb (LAGD™). **Methods:** Clinical validation of the 790 nm laser device in glaucoma laser trabeculoplasty (GLT) completed at 18 months compared it with conventional ALT and SLT treatments. Following implantation of the LAGD™, a 200 micron spot from the TiSa laser was used to activate each microchannel, one at a time, to increase outflow through the device. **Results:** When used alone, the Solx-TiSa laser induced significantly less trabecular thermal tissue damage than ALT or SLT. From baseline to 18 months, average IOP decreased from 29.0 to 17.4 mmHg and the average number of required medications decreased from 3.3 to 1.2. Six month data of the Solx TiSa™ laser in combination with the gold drainage device resulted in a greater reduction in IOP than when either the laser or implant was used alone. Laser application to the implanted Gold Drainage Device resulted in 1-3 mm reduction for each 200 micron spot channel opening. **Conclusions:** The Solx TiSa™ decreases intraocular pressure in glaucomatous eyes with less thermal damage and more selectivity than conventional treatments. LAGD treatment lowered further by 1-3 mm for each channel opened in the device. In combination with the laser, LAGD allows the treating surgeon to titrate the target treatment goal for better IOP management.