TCP gaining traction for glaucoma cases with good vision potential

Refining laser delivery improves safety for procedures; device allows for earlier intervention

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THE TYPICAL GLAUCOMA treatment algorithm progresses from medical therapy to laser procedures and then to traditional surgical procedures.

Laser procedures can be used to either increase aqueous outflow, such as with laser trabeculoplasty, or decrease aqueous production, such as with cycloablative procedures.

Just as argon laser trabeculoplasty has largely been replaced by selective laser trabeculoplasty (SLT), with lower levels of laser energy and fewer side effects, transscleral cyclophotocoagulation (TCP) is also getting a makeover.

Cyclophotocoagulation was traditionally relegated to cases of refractory glaucoma with poor visual potential due to the risks associated with the procedure.[1,2]

However, it has started to gain traction as a modality for glaucoma cases with good vision potential following refinements to the procedure, such as the use of an 810-nm laser and a transscleral approach. In a study evaluating the long-term results of TCP in eyes with ambulatory vision (6/36 or better), results showed a mean reduction of IOP of 43% and mean visual acuity preserved in the subgroups with good vision.[3]

Overall complication rate in this study was 9%, including hyphema, chronic iritis, and corneal edema.

LATEST LASER THERAPY

However, surgeons have been witnessing a paradigm shift in laser therapy for many ocular diseases. Work done surrounding retinal photocoagulation has demonstrated that rather than decreasing the production of angiogenic factors due to destruction of retinal cells, selective destruction of photoreceptors with laser while sparing the inner retina begins a healing cascade that increases the availability of oxygen while reducing the angiogenic and permeability factors.[4]

A very directed laser modality (MicroPulse, Iridex Corp.) chops a continuous wave laser the time and off 70% of the time. This creates just enough laser energy to be absorbed by pigment granules in cells of the pigmented ciliary epithelium that are being targeted, while preventing thermal build-up and collateral damage to surrounding tissue.

When applied to TCP, this "MicroPulse" strategy results in a much safer procedure that retains the efficacy of a traditional, continuous-wave TCP procedure.

A new glaucoma laser system (Cyclo G6 Glaucoma Laser System, Iridex Corp.) recently received FDA clearance to specifically treat patients diagnosed across a range of glaucoma stages, and features the MicroPulse tissue-sparing technology. *(Photo courtesy of Iridex)*

take-home

- **New laser delivery/technology is changing current thinking about cyclophotocoagulation by offering another option in the glaucoma treatment algorithm and allowing earlier laser intervention when medical treatment comes up short.**

RETROSPECTIVE SERIES

A new glaucoma laser system (Cyclo G6 Glaucoma Laser System, Iridex Corp.) was recently granted FDA clearance to specifically treat patients diagnosed across a range of glaucoma stages, and features the MicroPulse tissue-sparing technology. My colleagues and I presented data from a retrospective series of 48 eyes of 45 patients with refractory glaucoma treated with MicroPulse TCP (mTCP) with the Cyclo G6 laser and the MicroPulse P3 (Iridex Corp.) device.[5]

The three and nine o'clock hours were spared. The laser was set for a 31.3% duty cycle, creating 0.5 ms bursts followed by 1.1 ms rests, repeated for 50 to 90 seconds.

Mean IOP at baseline was 25.8 ± 1.3 mm Hg, which was significantly reduced to a mean IOP of 17.1 ± 2.1 mm Hg at month 3 (p = 0.027). This 29.8% change was also combined with a mean reduction in ocular hypotensive medications of 0.91 ± 0.3 (p = 0.018). This efficacy was delivered with an excellent safety profile. There were no visually significant cases of hypotony, macular edema or phthisis bulbi observed. One patient experienced a reduction in visual acuity due to the worsening of a pre-existing cataract.

ADVANTAGES INSTEAD OF INVASIVE SURGERY

The mTCP procedure offers an effective treatment that can potentially fit anywhere in the glaucoma surgical treatment algorithm.

Following medication use, individuals with

move on to more invasive procedures like trabeculectomy or placement of a glaucoma drainage device.

The first patients I offered mTCP were patients with severe glaucoma and few options, and it worked very well in that population. I found it easy to get IOP reduced from 50 to 20 mm Hg using a relatively straightforward procedure with a preferable safety profile to trabeculectomy or drainage devices.

Now that I am more comfortable with the procedure, I use it often in patients who still have good visual acuity but need to reduce their pressures significantly. I find the procedure relatively benign and with a favorable recovery period. There are no sutures or risk of infection. Pressures tend to decrease slowly, which I feel plays a role in it being a well-tolerated procedure.

Postoperative management of mTCP patients includes steroids and then the reduction of hypotensive medications depending on how quickly the pressure falls. The actual procedure can be uncomfortable due to ciliary body spasm during laser application, thus a peribulbar anesthetic injection is typically administered.

Following the procedure, patients do not have significant issues with discomfort.

My personal data indicates that 80% of patients who undergo mTCP have their pressures stay down for 6 to 9 months—my longest follow-up to date. I err on the side of under treatment with the knowledge that the procedure is easily repeatable, and an additional treatment will yield a greater effect. In the 20% of patients that require greater IOP reduction following the first treatment, I am able to achieve that with subsequent re-treatment.

CONCLUSION

When used to treat most patients that had good visual potential, TCP was effective and safe; mTCP is even more so.

The MicroPulse P3 device has changed current thinking about cyclophotocoagulation in that it offers another option in the glaucoma treatment algorithm and allows for earlier laser intervention when medical treatment comes up short. ■

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