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Perspectives in Lens & IOL Surgery

Endoscopic cyclophotocoagulation comes of age

by Mark Packer, MD, I. Howard Fine, MD, Richard S. Hoffman, MD

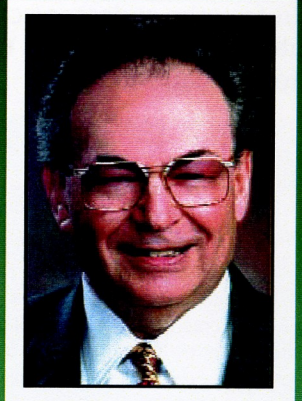
Glaucoma surgeons understand the unpredictability of the procedures they commonly employ. Outflow surgery, whether nonpenetrating, partial thickness or shunt, ultimately relies on the individual wound healing characteristics of each patient.

Cyclodestructive procedures have generally been held back as a final resort precisely because of the risk of hypotony and phthisis. Argon laser trabeculoplasty and selective laser trabeculoplasty may not produce any permanent effect at all.

Endoscopic cyclophotocoagulation (ECP) has now come upon the scene as the first controlled means of surgically reducing inflow. Developed by Martin Uram, MD, associate attending physician, Manhattan Eye, Ear and Throat Hospital, New York, and recently acquired by Medtronic, ECP allows photocoagulation of the ciliary body epithelium under direct endoscopic visualization. Initially evaluated as part of a combined procedure with phacoemulsification and intraocular lens implantation, the procedure is equally applicable to pseudophakic patients with uncontrolled intraocular pressure. The ECP probe features a light pipe with 110° illumination, an endoscope with a 10,000-pixel fiber bundle, and a 2-watt 810-nm diode laser delivery system with a 640-nm diode laser aiming beam, all contained within a 20-gauge instrument.

ECP's advantage lies in controlled ablation of tissue. Unlike traditional cyclodestructive procedures delivered through the sclera, ECP selectively ablates the ciliary epithelium. This procedure demonstrates an excellent safety profile. Last spring, Uram presented data at the American Society of Cataract and Refractive Surgery Symposium in Philadelphia comprising the experience of the ECP Study Group in more than 1,000 patients with combined phacoemulsification/ECP compared with phacoemulsification alone. They showed a typical reduction in IOP of 50% to 60% and a decrease in mean topical medications from 3.6 to 1.1. In more than 10,000 cases since 1990, there have been only a few patients with phthisis and no reports of massive choroidal hemorrhage, sympathetic uveitis, retinal detachment, chronic pain, severe and persistent inflammation, or other problems leading to the loss of the eye.

Other reports in the literature echo the success of Uram's study



Endocyclophotocoagulation is a new technology that has caused us to re-evaluate our entire approach to the glaucoma patient who is either a cataract surgery candidate, or a pseudophake. In the following article, Mark Packer, MD, discusses the history and use of this exciting new technology, as well as the spectacular results that have been achieved. We think you will find this technology interesting. We believe this treatment modality will become a major addition to the armamentarium of anterior segment surgeons.

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Column Editor

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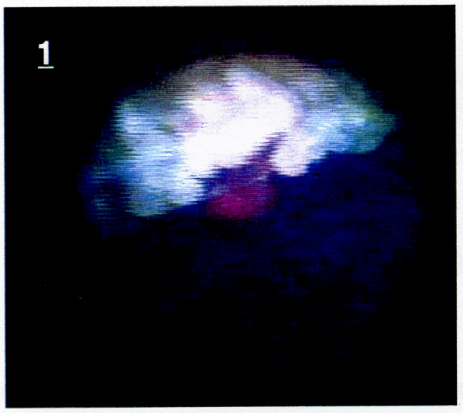
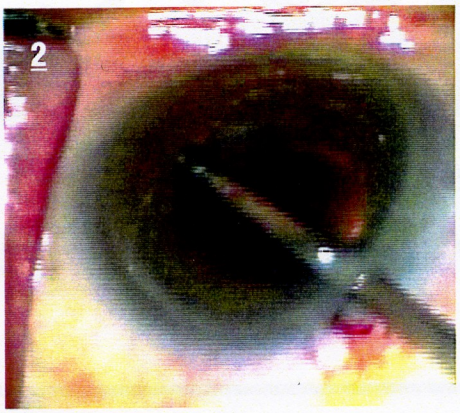
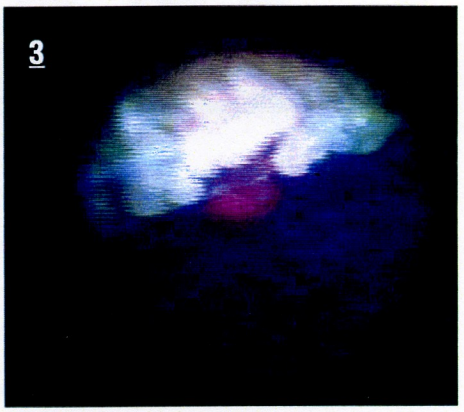


Laser-aiming beam highlights ciliary processes undergoing photocoagulation.



View through the operating microscope of the endoscope in the ciliary sulcus.



View of the ciliary body. The edge of the pupil is seen at the top.

group. Chen and coauthors[1] found a reduction in IOP of 34% in a group of 68 eyes that had failed medical and surgical treatment. There were no cases of hypotony, and visual acuity was stable or improved in 94%. Successful reduction of IOP to below 21 mm Hg was achieved in 82% of eyes at two years. Berke and coauthors[2] confirmed the excellent safety profile of this procedure, reporting no hyphema, iritis or pain in 26 eyes undergoing the combined procedure. They found improved IOP control with fewer medications in eyes with previously controlled glaucoma undergoing phacoemulsification. These exciting results make ECP a promising new technology in both combined and standalone procedures.

In performing combined procedures, we implant the IOL first for added protection of the posterior capsule. We place additional viscoelastic in the ciliary sulcus prior to performing ECP. The viscoelastic tents up the iris and creates room for the endoscope, which may be placed in the eye through any incision 2 mm or larger. The general luminance and aiming beam may be controlled with the footswitch. The challenge for the novice is to maintain orientation and proper distance as the endoscope is moved around the ciliary body.

For pseudophakic eyes, ECP may become the procedure of choice for inadequately controlled glaucoma. The operating time and required follow-up compare very favorably with outflow procedures such as deep sclerectomy, trabeculectomy and shunt implantation.

Surgeons sometimes save a unique case for their first experience with a new procedure because they have been waiting for something better to come along. However, the best initial learning experiences and outcomes are more often achieved with routine cases. In fact, the pseudophakic patient with pseudoexfoliation who has already had a YAG capsulotomy and failed a trabeculectomy may not be the best choice for one's first experience with ECP. That patient is an excellent candidate for ECP but not as one's maiden endoscopic voyage. In particular, the laxity of the zonular fibers and instability of the IOL may give one pause. In general, ECP is much more straightforward in an uncomplicated eye.

In a pseudophakic eye with a posterior chamber implant, we start with a temporal clear corneal 2-mm paracentesis-type incision. Intracameral lidocaine provides adequate anesthesia. However, bear in mind that diffusion of lidocaine posteriorly through an open capsulotomy or area of zonular dehiscence can temporarily reduce vision. A cohesive viscoelastic such as sodium hyaluronate 1% (Healon) is injected into the ciliary sulcus, pushing the iris anteriorly. The endoscope is inserted and placed as far to the right as possible, then moved to the left. It is rolled in the fingers to maintain orientation. Application of laser energy produces shrinkage of the ciliary processes. The endpoint of treatment is whitening of the ciliary epithelium. A full semicircle (180 degrees) may be treated through the temporal incision. The endoscope is removed prior to construction of a second incision on the nasal side, allowing full access to the remaining temporal 180 degrees. Generally, a minimum of 270 degrees is treated, and the effect is somewhat titratable.

The endoscope produces a unique view into the eye. It is sometimes surprising to see the extent of residual cortex or Soemmering's ring formation, or discover a haptic out of place. In fact, the endoscope can be a valuable tool apart from its use with photocoagulation.

References

1. Chen J, Cohn RA, Len SC, Cortes AE, Alvarado JA. Endoscopic photocoagulation of the ciliary body for treatment of refractory glaucomas. Am J Ophthalmol 1997; 124: 787-796.

2. Berke SJ, Cohen AJ, Sturm RT, Caronia RM, nelson DB. Endoscopic cyclophotocoagulation and phacoemulsification in the treatment of medically controlled primary open angle glaucoma. J Glaucoma 2000; 9: