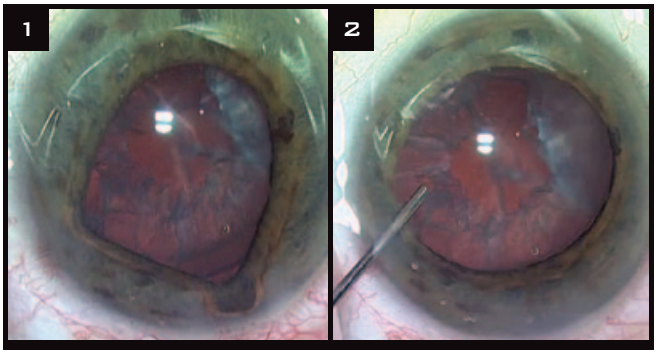
Taming IFIS With Phenylephrine

Researchers in Spain have reported a simple, inexpensive, and safe way to prevent intraoperative floppy iris syndrome (IFIS), which can occur during cataract surgery.[1] Their remedy, intracameral phenylephrine (IPH), also reversed the characteristic signs of IFIS: iris billowing, iris prolapse, and progressive miosis.

Ramón Lorente, MD, PhD, who headed the study, routinely uses IPH 1.5 percent to prevent or reverse IFIS. In fact, he and his colleagues have used it in more than 1,000 patients without any systemic side effects. Prior to this study, two small studies had used phenylephrine, but in lower concentrations, to reverse or prevent IFIS.

Phenylephrine hydrochloride acts predominantly on the alpha$_1$ receptors of the iris. In routine phacoemulsification surgery, intracameral IPH 1.5 percent provides intraoperative dilation. The solution is easy to prepare and can be stored for up to two months at room temperature in the operating room, said Dr. Lorente, chairman of ophthalmology, Complejo Hospitalario Universitario Orense.

His current study was inspired by a 2003 report that intracameral xylocaine plus phenylephrine 1.5 percent was safe in routine phacoemulsification surgery.[2] Dr. Lorente's group had tried several published approaches to IFIS prophylaxis that were not fully effective in their hands, including IPH 0.312 percent, he said. "We decided to employ the highest concentration at which safety had been proven; we hypothesized that intracameral phenylephrine 1.5 percent could help prevent IFIS." The study, which is believed to be the first prospective, randomized fellow-eye study testing phenylephrine's effect on IFIS, supported that hypothesis.



BEFORE AND AFTER. A patient under treatment with tamsulosin who forgot to mention his intake of the drug. **(1)** Severe IFIS developed during phacoemulsification. **(2)** Injection of 0.6 mL of intracameral phenylephrine (IPH) 1.5 percent caused the pupil to dilate back to its preoperative level, restored iris rigidity, and stopped the tendency of the iris to prolapse.

The study involved two surgeons at two sites who used their standard operating procedure on 42 patients (84 eyes). One eye of each patient was randomized to receive 0.6 mL of IPH 1.5 percent (group 1). The other eye received balanced saline solution (BSS) at the start of surgery, and IPH if IFIS occurred (group 2).

IFIS has been associated with systemic administration of tamsulosin and other alpha-adrenergic receptor antagonists. The study was limited to patients using tamsulosin because the in-

RAMÓN LORENTE, MD, PHD

cidence of IFIS in these patients is more frequent and severe than with other nonselective alpha-adrenergic blockers, Dr. Lorente said.

The surprise finding was IPH's efficacy. "IPH prevented IFIS in 100 percent of the cases and in the worst possible scenario—tamsulosin," Dr. Lorente said.

In the BSS group, IFIS occurred in 88 percent of eyes, with more than half experiencing miosis, iris prolapse, or both. However, the condition was successfully reversed with IPH, with a statistically significant increase in pupil size.

The authors reported no adverse effects. "The risk of systemic adverse reactions seems to be low because mean arterial pressure and heart rate did not differ significantly from preoperative values in our study" or in a 2003 report on the subject by Lundberg,[2] Dr. Lorente said.

Also, there were no significant differences in endothelial cell count, best-corrected visual acuity, or intraocular pressure between IPH-treated and nontreated eyes.

In fact, the findings were so robust that the group does not plan a follow-up study. "Considering that phenylephrine was effective enough to prevent IFIS in the worst possible scenario—intake of tamsulosin—we assume that it will have the same prophylactic effect with the remaining alpha-antagonists, since IFIS is less common and severe with those," Dr. Lorente said.

"We would recommend intracameral phenylephrine as a routine preventive measure for all patients taking tamsulosin and using it, if IFIS occurs, to reverse it."

—Miriam Karmel

1 Lorente R et al. *Ophthalmology.* 2012;119(10):2053-2058.
2 Lundberg B et al. *J Cataract Refract Surg.* 2003;29(12):2366-2371.

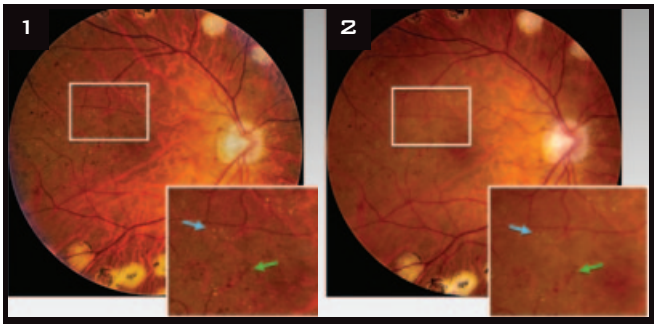
***Dr. Lorente** reports no related financial interests.*

Imaging Update

Point-and-Shoot Fundus Photography

University of Virginia researchers are one step closer to bringing low-cost retinal screening to communities with limited resources. "The least expensive retina camera is $8,500, which is not realistically affordable in many cases. We wanted to adapt available consumer technology to create a portable and cost-effective form of eye screening for populations where examination needs are not being met," said lead investigator, Paul A. Yates, MD, whose goal was to produce a high-image-quality point-and-shoot mydriatic fundus camera from off-the-shelf parts that cost roughly $1,000.[1]

Dr. Yates explained the assembly: "Most retina cameras are composed of five to seven precisely aligned lenses. All aid in shaping and focusing the light that is directed toward the posterior of the eye. Abstracting from this design, our objective was to simplify the apparatus, therefore reducing the cost and improving portability. We started with an indirect lens—the same type of lens used at all eye clinics to examine patients—because it produces the 50-degree view of the retina we want to observe. We then created a two-lens design that projects a ring of light onto the cornea, which diffuses over the retina, similar to commercially available cameras. Light is reflected from the retina back through the 'donut hole' in this ring of light. That light from the retina is imaged by the camera to produce quality fundus photos."



LOW-COST CAMERA. Photos taken of a diabetic patient's eye with (1) the authors' camera and (2) a commercial tabletop fundus camera. Hard exudates (blue arrows) and dot-blot hemorrhages (green arrows) of diabetic retinopathy are picked up by both cameras.

PAUL A. YATES, MD

He said that the technology behind the camera design is actually quite simple and is very similar to that seen in an astronomical telescope. "If someone wanted to build it from parts obtained online, it would take approximately 10 to 15 hours to construct and minimal training to operate," said Dr. Yates.

The primary obstacle to using this camera in clinical settings is FDA approval, he said. "Our camera is 100-fold below the light exposure safety levels, but in the absence of an institutional approved clinical trial, it can currently only be used for veterinary or animal research purposes." Dr. Yates' team is working on modifications that will not only allow for easier camera alignment and focusing but will also permit nonmydriatic photography—a device that, when complete, will be submitted for FDA approval.

—Leslie Burling-Phillips

1 Tran K et al. *Invest Ophthalmol Vis Sci.* Published online Oct. 9, 2012.

***Dr. Yates** is cofounder of RetiVue.*

Contact Dr. Yates (pyates@virginia.edu) for a list of parts and a 3-D-printable copy of the housing design.

Myasthenia Gravis News

Low-Dose Steroid May Minimize Side Effects

Use of corticosteroids in the immunologic treatment of ocular myasthenia gravis (OMG) is controversial, in part due to potentially significant side effects. But a retrospective study showed that long-term, low-dose systemic therapy (prednisone less than 10 mg daily) could minimize the adverse effects—including hypertension, diabetes, osteoporosis, GI disorders, and infections—that can occur with long-term moderate- to high-dose therapy.[1]

"Our study was done to show that we shouldn't condemn the drug because of complications that happen at a high dose," said Mark J. Kupersmith, MD, chairman of the Neuro-Ophthalmology Research Disease Investigator Consortium (NORDIC) and director of neuro-ophthalmology at New York Eye and Ear Infirmary. He coauthored the study with Beau B. Bruce, MD, assistant professor of neuro-ophthalmology at the Emory Clinic and member of the planning committee for a proposed NORDIC OMG study.

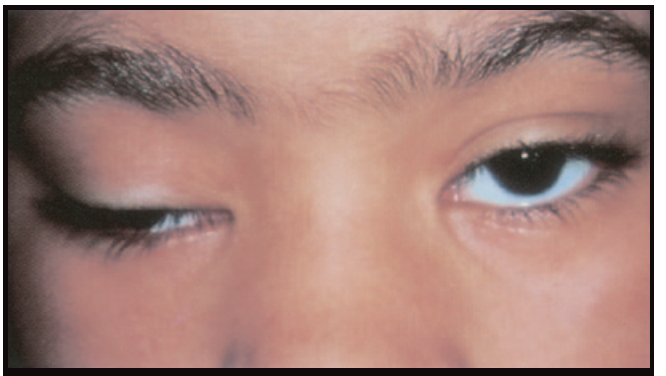
Consecutive patients with OMG were evaluated and managed at the Institute for Neurology and Neurosurgery at Roosevelt Hospital in Manhattan and New York Eye and Ear Infirmary. Eighty-three with confirmed OMG were included in the study. Seventy percent of study participants had follow-up of 24 months or longer. Almost all were begun on 40 to 60 mg prednisone daily; all were tapered to 10 mg or less daily. Assuming a constant rate of 2.2 serious complications per 100 person-years—as this two-year study found—and extrapolating results to a larger patient cohort, Dr. Kupersmith said the researchers would expect only 1.4 percent of subjects to develop a serious complication.

"What we know from this research is that with the cautious use of prednisone—along with preventive and as-needed care for potential side effects, including high blood pressure, osteoporosis, and elevated IOP—the benefit is there. Eye doctors need to be aware of co-interventions to prevent or reduce complications, as all adjunct or prophylactic therapies are important in keeping side effects down," he said.

"Doctors who deal with autoimmune and inflammatory disorders often move to more expensive immunomodulatory drugs that may not work as well. They have their own sets of risks and may take a long time to work. Newer isn't always better," Dr. Kupersmith said.

"If a clinical trial proves the hypothesis that low-dose prednisone is efficacious and safe and decreases the chance of [OMG] spreading to more systemic muscles, then—since this is a low-cost, effective therapy—more people can avoid visual and systemic disability. Collecting that evidence will change practice."

—*Laura B. Kaufman*



MYASTHENIA GRAVIS. This myasthenia gravis patient had bilateral ptosis (right more than left) with right hypotropia and exotropia.

1 Bruce BB, Kupersmith MJ. *J Neuro-Ophthalmol.* 2012;32(3):212-215.

Dr. Kupersmith *reports no related financial interests. This research was supported in part by an unrestricted grant from Research to Prevent Blindness and the National Institutes of Health/National Eye Institute.*

Glaucoma Report

Lens Extraction for Advanced PAC

Is filtration surgery the definitive procedure for advanced cases of primary angle closure (PAC) and primary angle-closure glaucoma (PACG) when intraocular pressure (IOP) is uncontrolled? A retrospective study conducted at Moorfields Eye Hospital in London indicates that, in patients with cataracts, lens extraction might offer an effective alternative for controlling IOP and disease progression.[1]

Previous studies have demonstrated benefits of cataract surgery on IOP control in patients with acute and chronic angle-closure, said coauthor Pari N. Shams, FRCOphth. "But it was unclear which disease characteristics were likely to be associated with poor outcomes or what the effect of lens extraction was on different grades of angle-closure severity."

Contrary to previous beliefs, lens extraction might be particularly beneficial in severe or advanced cases of primary angle closure, such as in those with higher preoperative IOP, more extensive peripheral anterior

© 2012 AMERICAN ACADEMY OF OPHTHALMOLOGY, BOSC, SECTION 6

synechiae (PAS), or established glaucomatous optic neuropathy, as well as in patients using more glaucoma medications.

In the study, 55 eyes of 39 patients with both PAC or occludable angles and visually significant cataract underwent phacoemulsification and IOL implantation. Nearly 62 percent of eyes had previously had a peripheral iridotomy (PI). A little more than seven months after lens extraction, a statistically significant reduction in IOP (median reduction, 3 mmHg) was observed in all eyes, with a greater drop seen in eyes with a higher preoperative IOP. Clinically, this translated on average into the use of one less glaucoma medication in patients previously taking them.

Eyes with more than 180 degrees of preoperative PAS achieved a much greater reduction in IOP postoperatively compared with those with less PAS (7.5 vs. 4.4 mmHg), and eyes with optic neuropathy experienced a greater reduction in IOP reduction than those without (5.6 vs. 2.5 mmHg). These were particularly encouraging findings, given that glaucomatous optic neuropathy and this level of PAS tend to correlate with poorer IOP control.

Additionally, despite the challenges of operating on eyes with PAC, no major postoperative complications occurred, said Dr. Shams.

Why the better results with more advanced PAC? The study did not fully answer that question, said Dr. Shams. "However, the cardinal anatomic characteristic in eyes with PAC is a thicker, more anteriorly positioned crystalline lens, so you can hypothesize that the narrower the iridotrabecular angle to begin with, the greater the effect from lens extraction and, hence, the greater the drop in IOP."

This retrospective, small, short-term study alone shouldn't change clinical practice, she said. But its data can be used to support future prospective studies, since researchers can now enroll patients with significant or advanced PAC without ethical concerns.

In the meantime, clinicians can anticipate the results of the Effectiveness in Angle-closure Glaucoma of Lens Extraction (EAGLE) study, she said, which aims to compare the clinical results and cost-effectiveness of early lens extraction surgery in patients with PACG compared with those who received standard care.

And unearthing evidence to guide interventions is more urgent than ever, given that 20.7 million people are expected to have angle-closure glaucoma by the year 2020, with about 1 in 4 becoming bilaterally blind.[2]

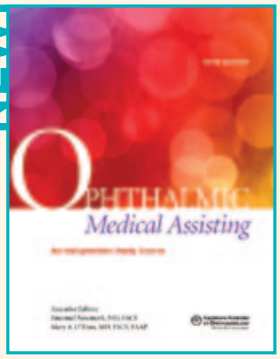
—Annie Stuart

1 Shams PN, Foster PJ. *J Glaucoma*. 2012;21(8):545-550.
2 Quigley HA, Broman AT. *Br J Ophthalmol*. 2006;90(3):262-267.

***Dr. Shams** reports no related financial interests.*

Build Practice Efficiency with Highly Trained Ophthalmic Medical Assistants

NEW!



Textbook and Online Examination: $150 #0211205V
Textbook Only: $110 #0211215
Online Examination Only: $68 #0211225V

AMERICAN ACADEMY OF OPHTHALMOLOGY
The Eye M.D. Association

Ophthalmic Medical Assisting: An Independent Study Course, Fifth Edition
From the American Academy of Ophthalmology

Build your practice by developing a skilled and confident ophthalmic health care team.

With this independent study course, consisting of a textbook and online examination, the ophthalmic medical assistant can:

- Study all topics in both the United States and international curricula
- Learn 44 procedures essential to their job
- Get up-to-date information with new chapters on ocular motility, low vision, ethics, and community health eye care
- Receive instant results upon completion of the online examination

Successful completion of this self-study course and online exam serve as a prerequisite for the Certified Ophthalmic Assistant (COA) examination administered by the Joint Commission on Allied Health Personnel in Ophthalmology (JCAHPO).

Order Today! Visit www.aao.org/store or call +1 415.561.8540 to order.
More training materials for allied health staff are available at www.aao.org/alliedhealth.